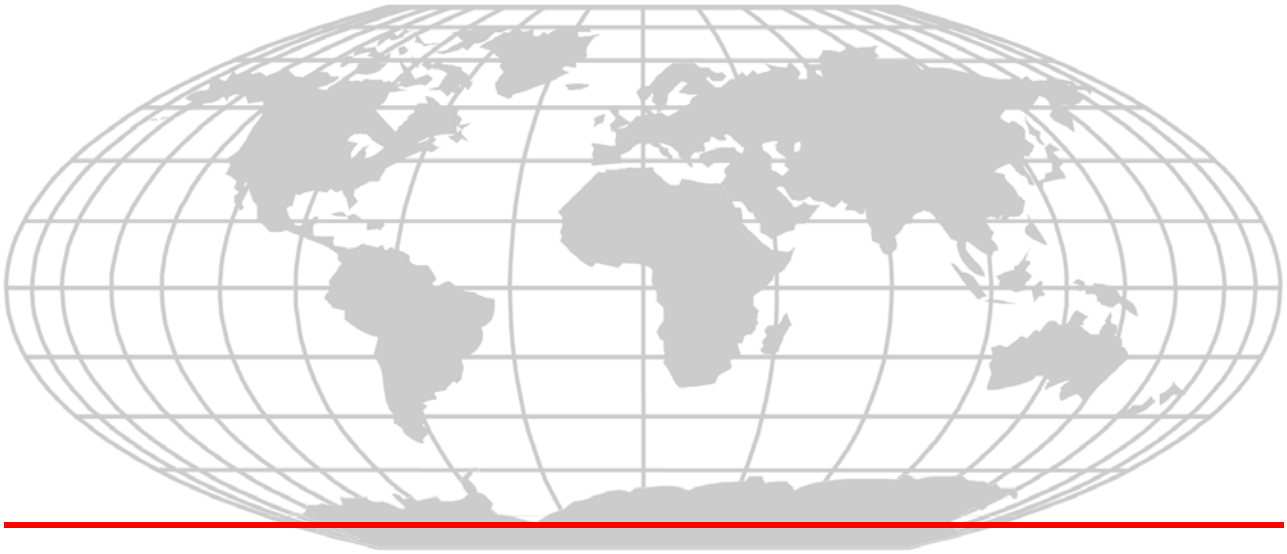
NOTIFIER®
by Honeywell



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.

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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. 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.

Table of Contents

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.

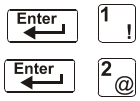
1.2.3 Supplemental Information

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

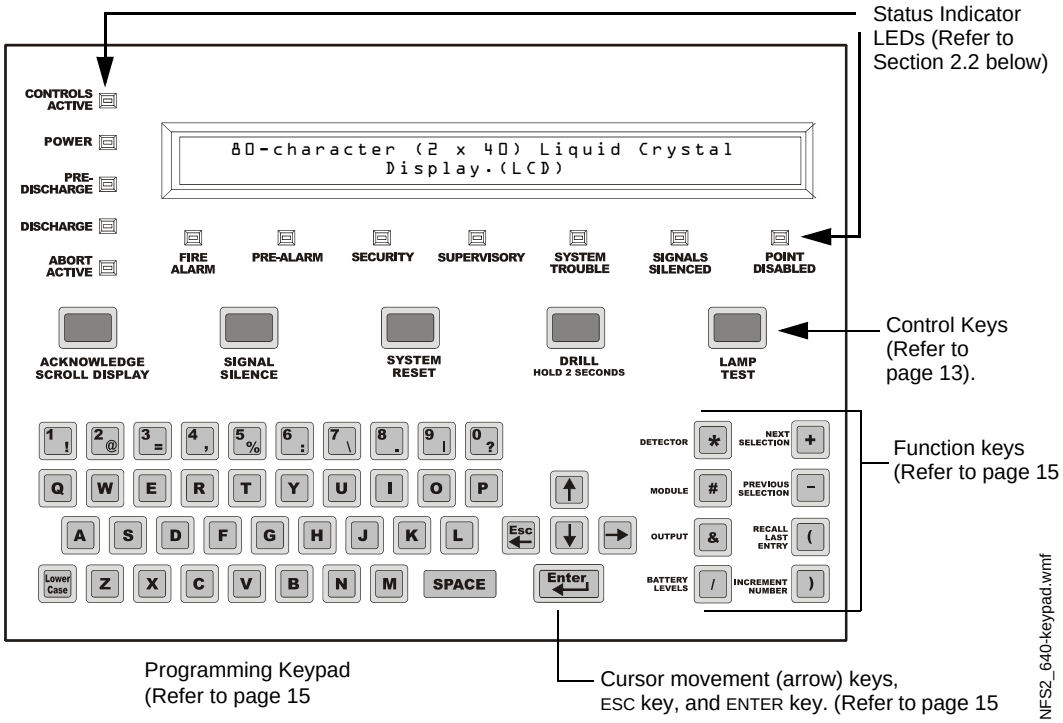


Figure 2.1 NFS2-640 Control Panel Keys and Indicators

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.

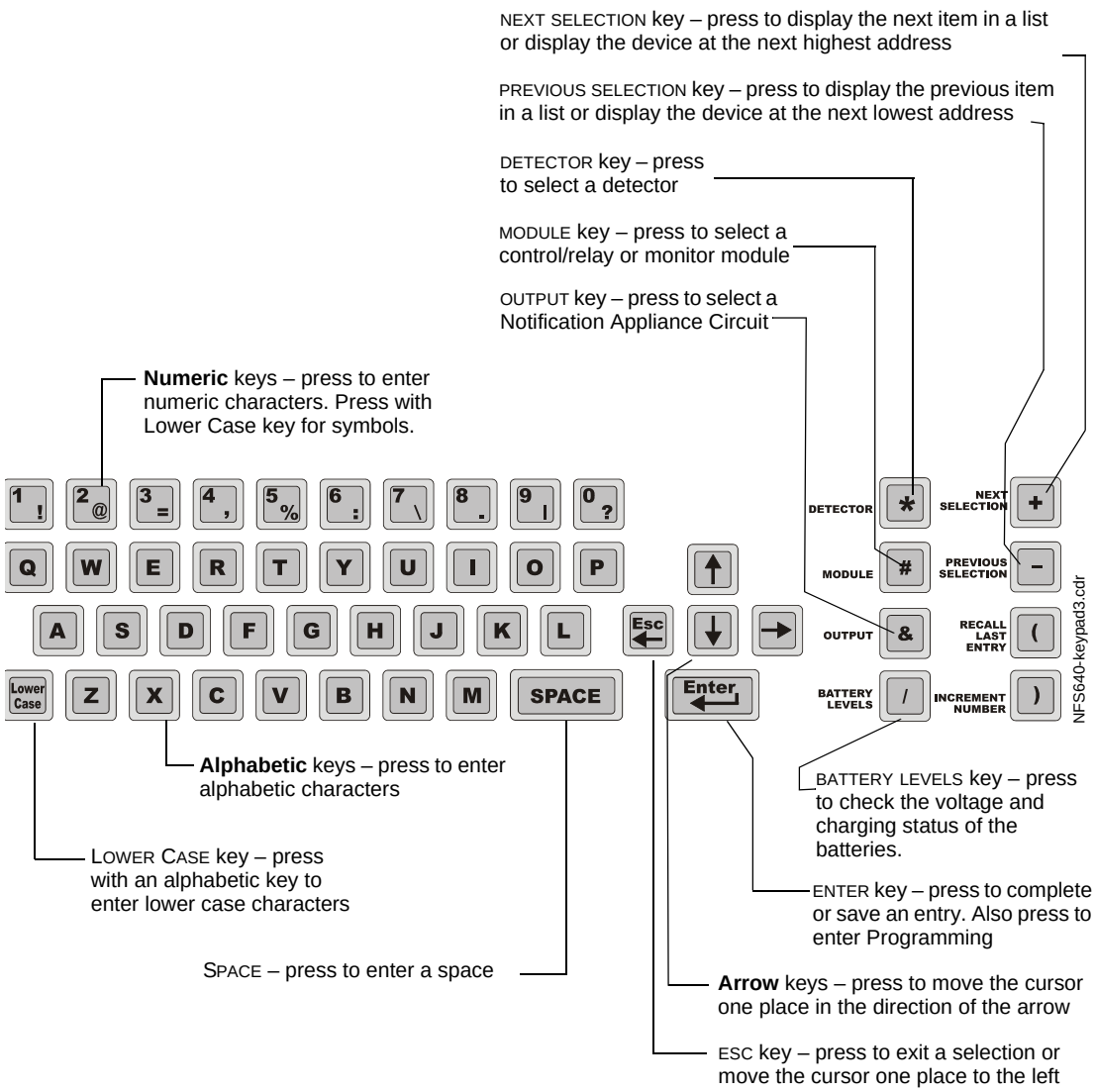


Figure 2.2 Programming Keypad

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:

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

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:

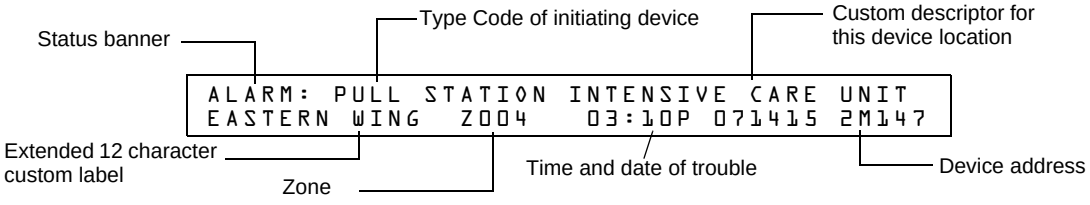


Figure 3.2 Sample Fire Alarm Display

- 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.

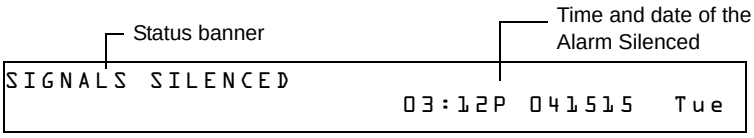


Figure 3.3 Sample Alarm Silenced Message

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:

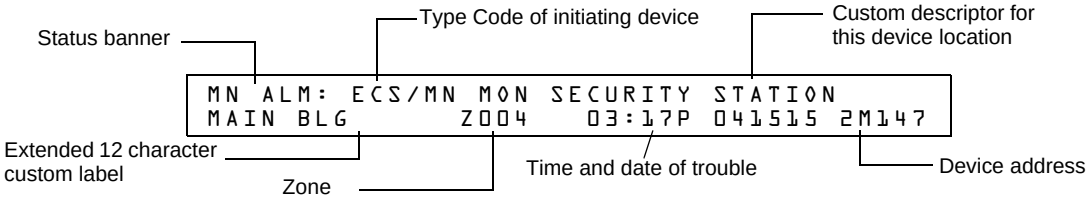


Figure 3.4 Sample MN Alarm Display

- 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.

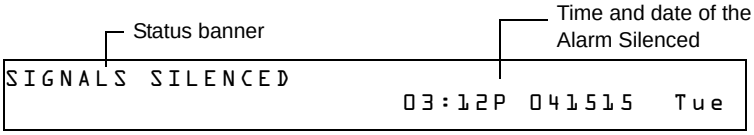


Figure 3.5 Sample MN Alarm Silenced Message

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:

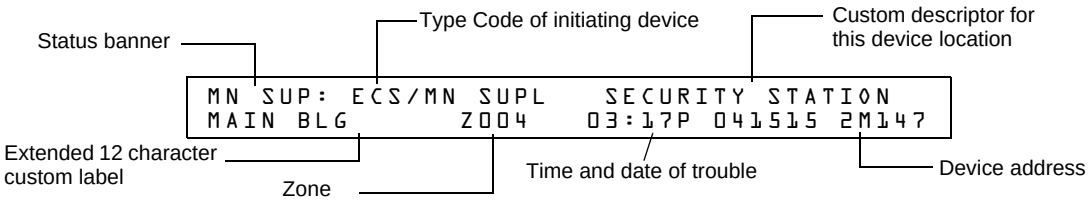


Figure 3.6 Sample MN Supervisory Display

- 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:

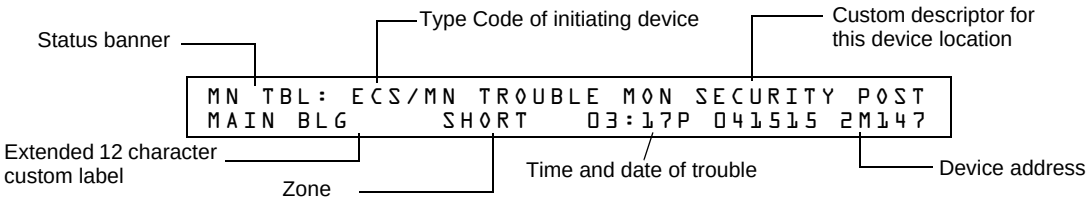


Figure 3.7 Sample MN Trouble Display

- 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:

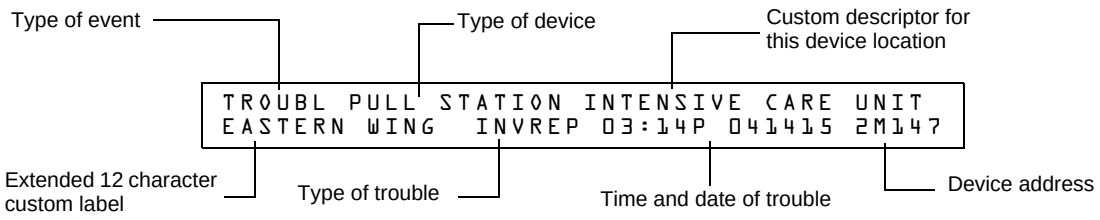


Figure 3.8 Sample Trouble Message

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.

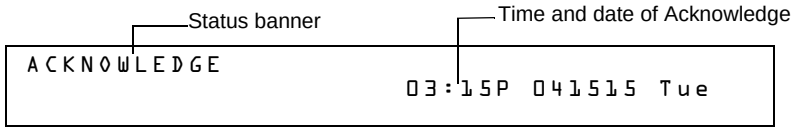


Figure 3.9 Sample Acknowledge Message

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:

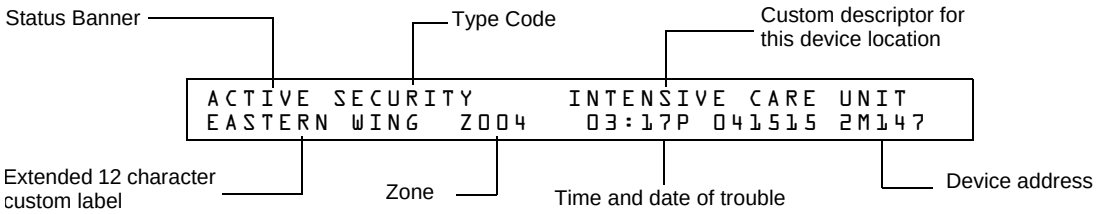


Figure 3.11 Sample Security Alarm Message

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:

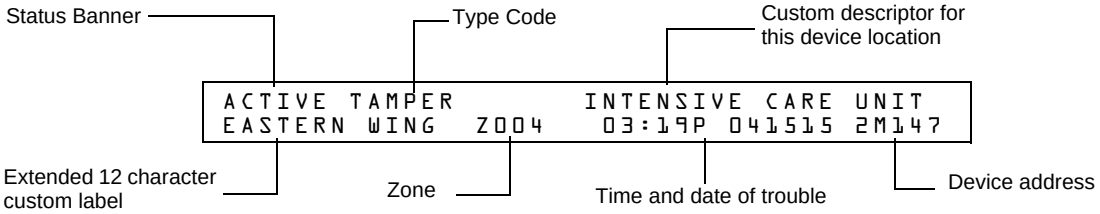


Figure 3.12 Sample Supervisory Signal Message

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:

Type Code	Latching (Y/N)	Purpose	What it does
Monitor Modules			
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.

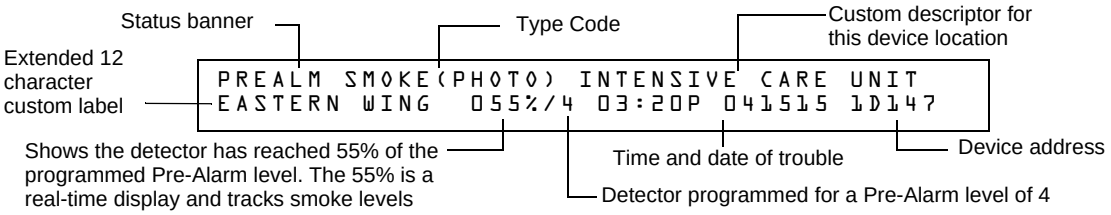


Figure 3.13 Sample of an Alert Pre-Alarm Message

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

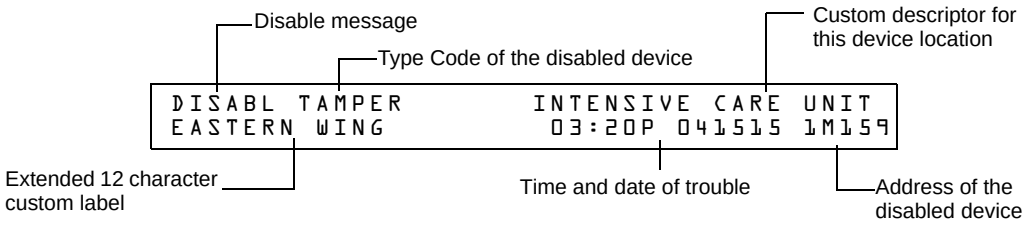


Figure 3.14 Sample Disabled Point Message

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

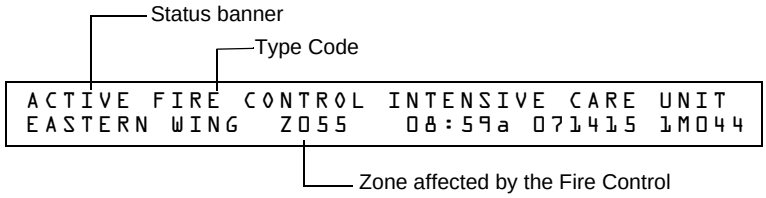


Figure 3.15 Sample Fire Control Point Display

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:

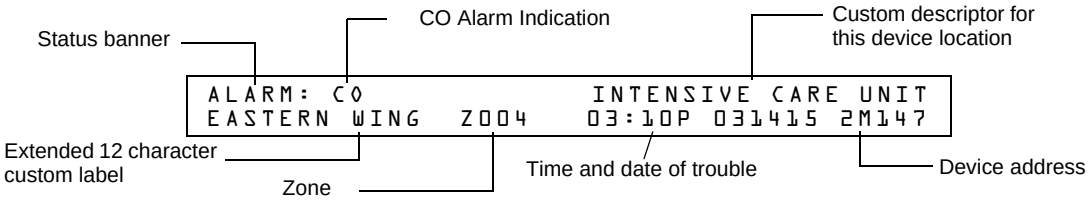


Figure 3.16 Sample CO Alarm Display

- 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.

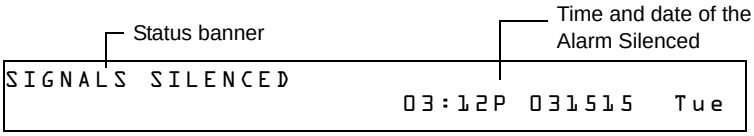


Figure 3.17 Sample Alarm Silenced Message

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:

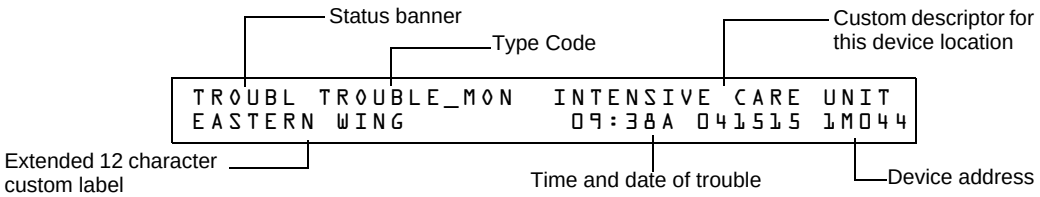


Figure 4 Sample Trouble Monitor Point Message

- 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

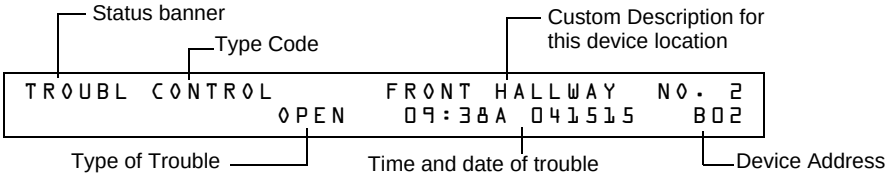


Figure 3.1 Sample of a NAC in Trouble Message

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

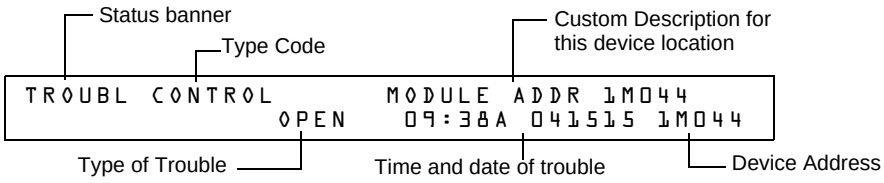


Figure 3.2 Sample of a Control/Relay Module in Trouble Message

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:

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:

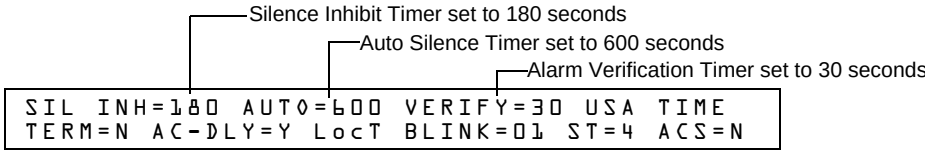


Figure 3.3 Sample System Function Selection Screen

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.

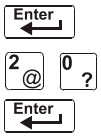
4.2 What is Read Status?

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:

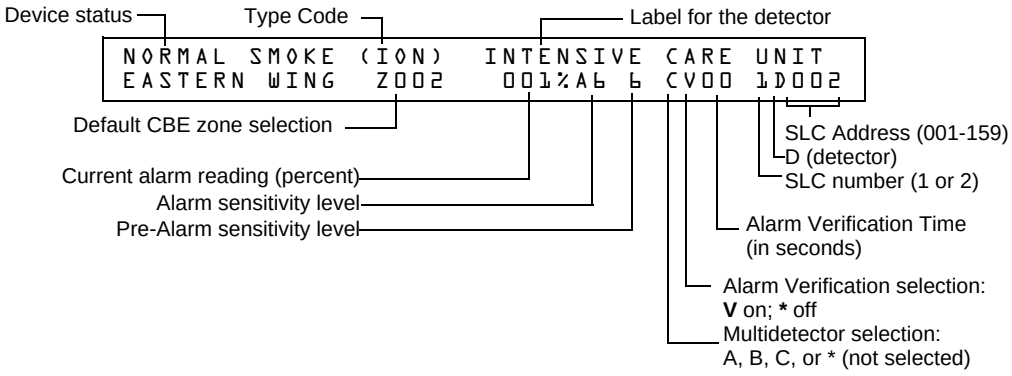


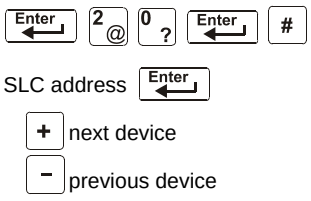
Figure 4.1 Sample Detector Read Status Display

- **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:

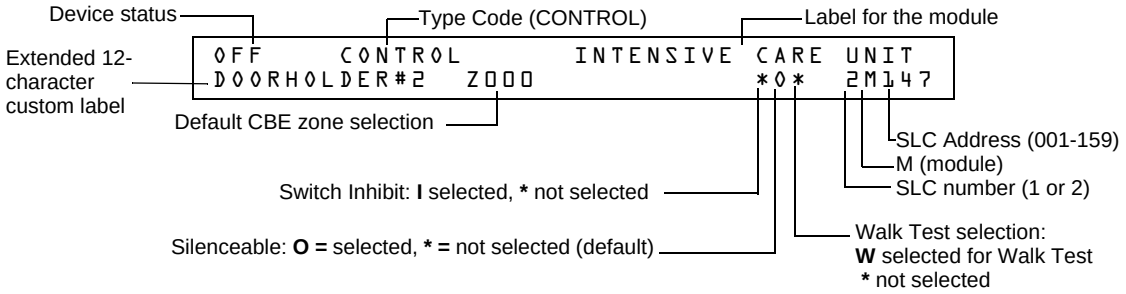


Figure 4.2 Sample Control/Relay or Monitor Module Read Status Display

- **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

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:

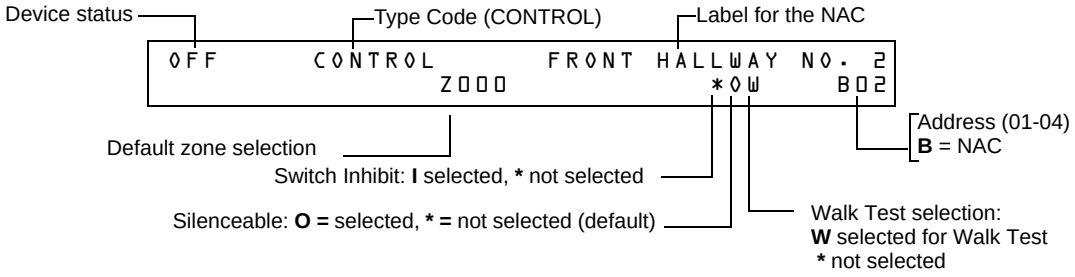


Figure 4.3 Sample NAC Read Status Display

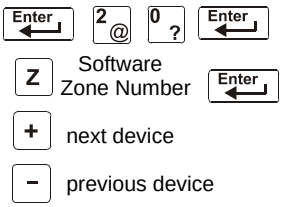
- **Device Status** The status of the device: ON (device active) OFF (device not active).
- **Type Code** The software Type Code that identifies the type of NAC. Refer to "Appendix F - Type Codes" in *NFS2-640 Programming Manual*.
- **CBE List** Only the first zone in the NAC's CBE list will be displayed 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.

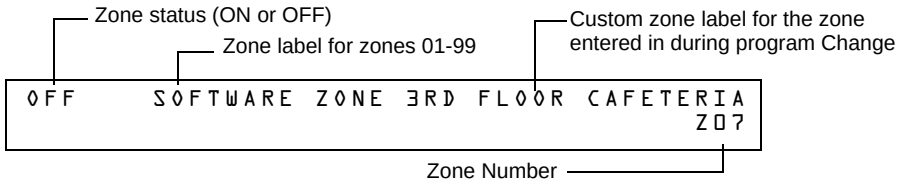
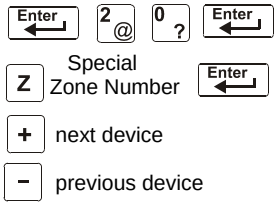


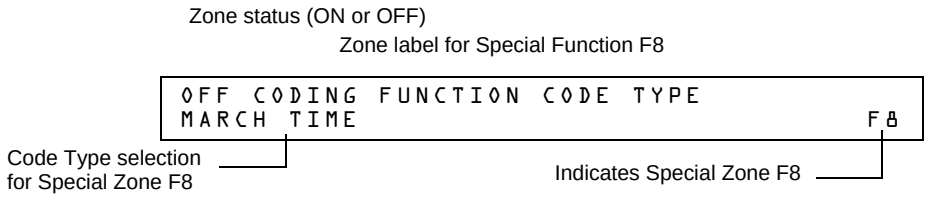
Figure 4.4 Sample Software Zone Read Status Display

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.

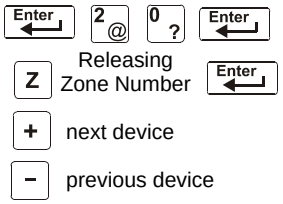
NOTE: The zone label depends on the type of Special Zone. For example, CODING FUNCTION CODE TYPE for F8.



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.

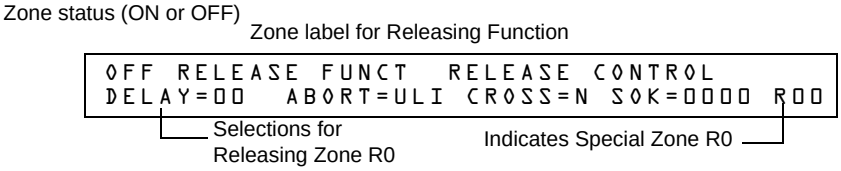
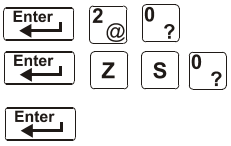


Figure 4.6 Sample Releasing Zone Read Status Display

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:

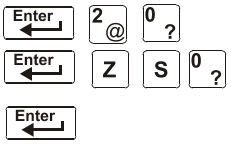
Parameter	Description	Settings
SIL INH=000	Silence Inhibit timer in seconds. Required in Canada and some areas of the USA.	000 = no timer; or the timer duration in seconds up to 300.
AUTO=000	Auto Silence Timer in seconds.	000 = no timer; 600-1200 seconds.
VERIFY=30	Alarm Verification Timer	00 = no timer; 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:

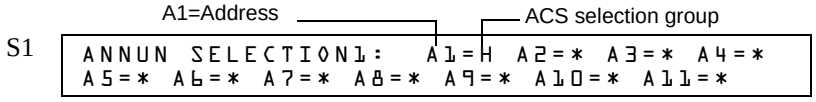


Figure 4.7 Annunciator Selection 1 Screen

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

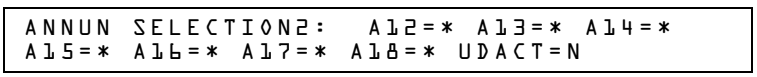


Figure 4.8 Annunciator Selection 2 Screen

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

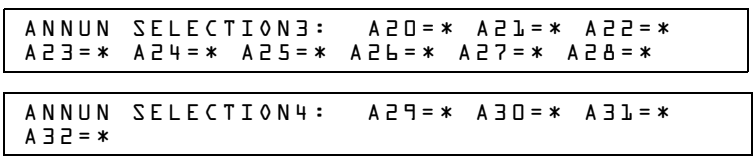


Figure 4.9 Annunciator Selections 3 and 4 Screens

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.

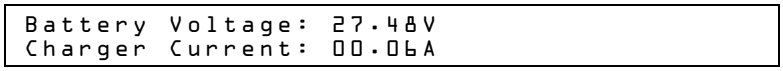


Figure 4.15 Battery Levels

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:

```
EVENT HISTORY START
EVENTS IN HISTORY: 550
```

The number of events in the History buffer

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:

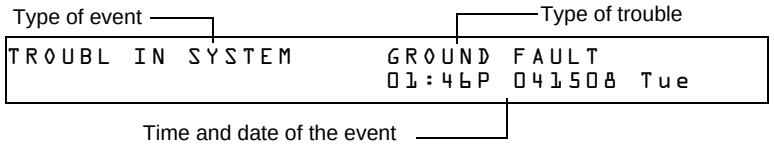


Figure 4.17 Sample Trouble Event Display

A sample LCD display for a Program Change event:

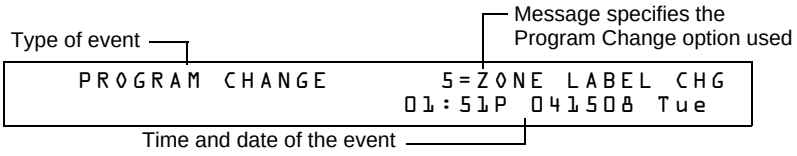


Figure 4.18 Sample Program Change Event Display

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:

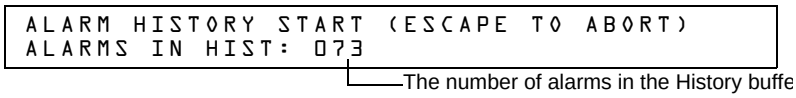


Figure 4.19 Sample Alarm History Display

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:

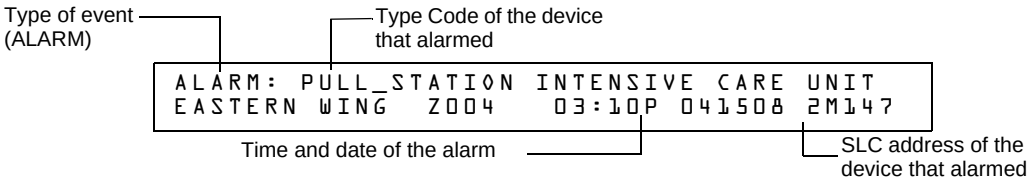


Figure 4.20 Sample Alarm Event Display

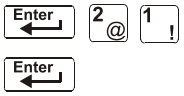
4.4.3 How to Print Points, Event and Alarm History

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:

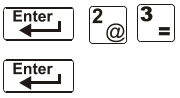
```
                                STATUS PRINT
```

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:

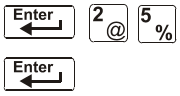
```
                                HISTORY PRINT
```

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.

Figure 4.24 History Empty Display

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:

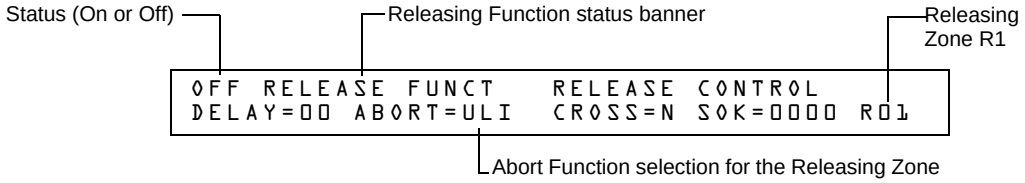
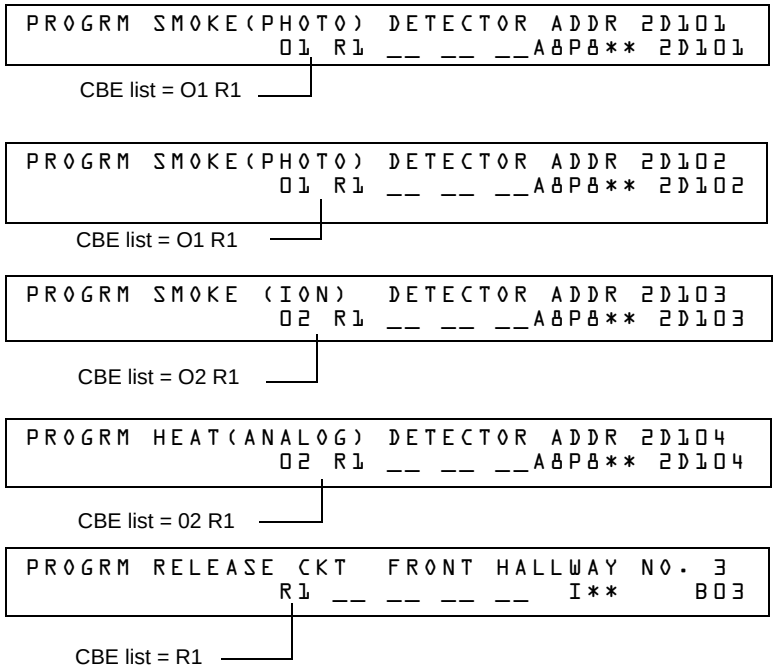


Figure A.1 Sample Read Status for a Releasing Zone

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:



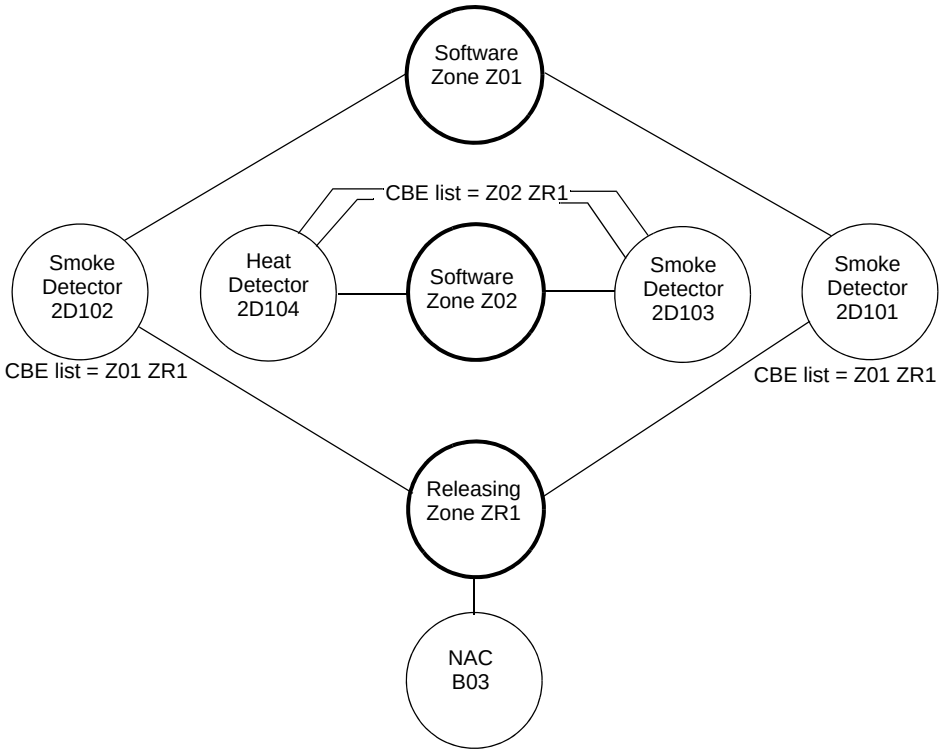


Figure A.2 Illustrated Example of Cross Zone Programming

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:

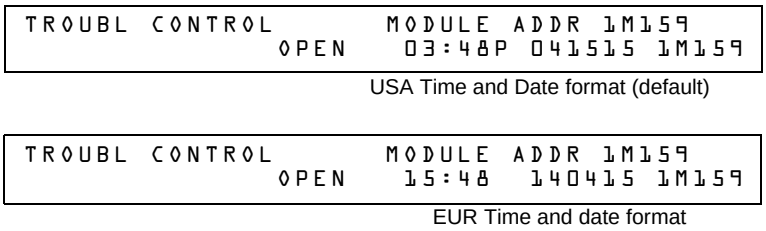


Figure A.3 Sample USA and EUR Time/Date Formats

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:

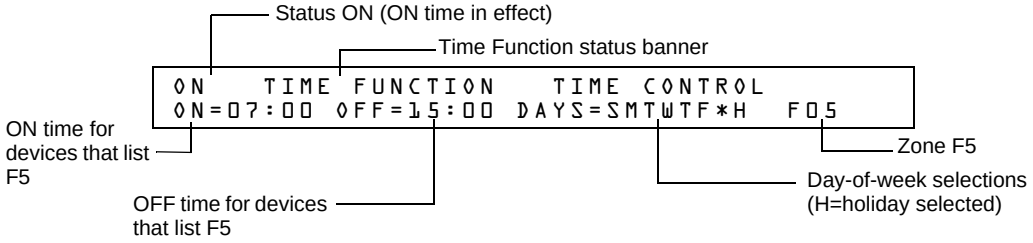


Figure A.4 Sample Read Status for Time Function

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:

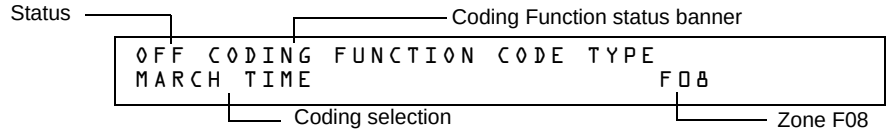


Figure A.6 Sample Read Status for Coding Function

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.

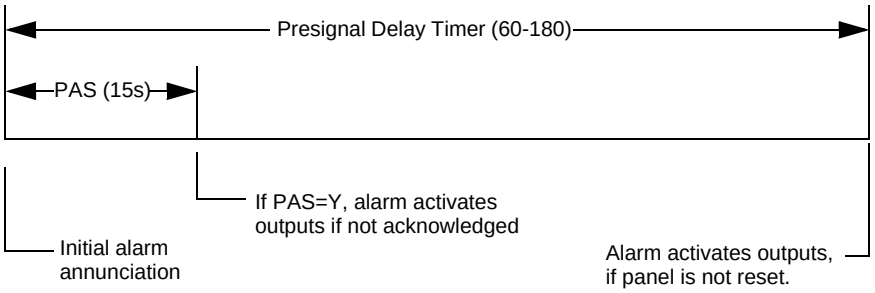


Figure A.7 Presignal and PAS Time

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:

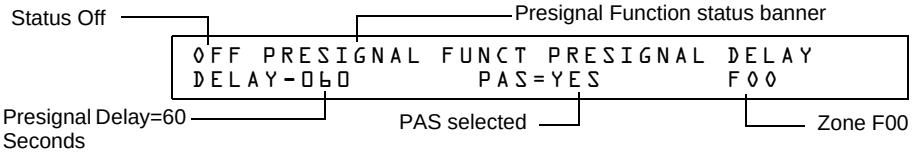


Figure A.8 Sample Read Status for Presignal Function

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:

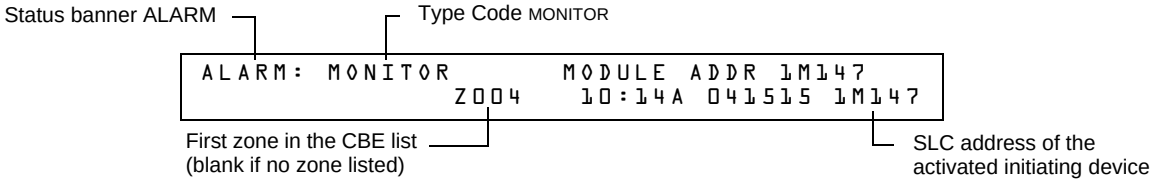


Figure A.9 Sample Alarm Display Screen

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:

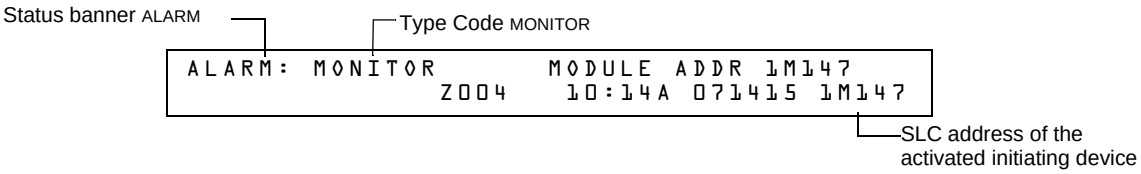


Figure A.10 Sample Alarm Display Screen

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
```

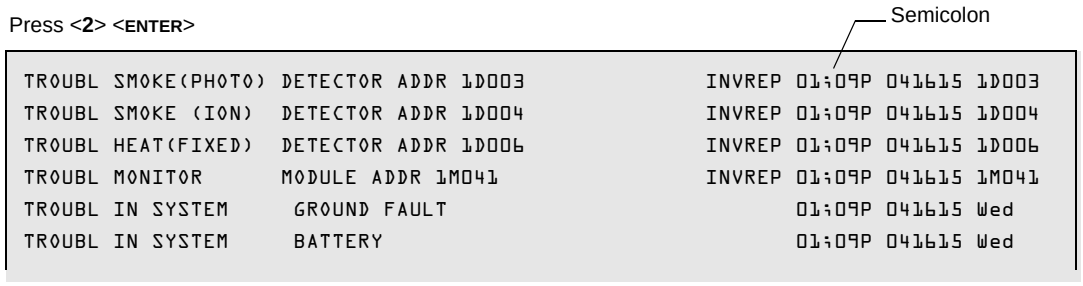
Press <**NEXT**>

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

C.3.4 Display Devices in Alarm or Trouble

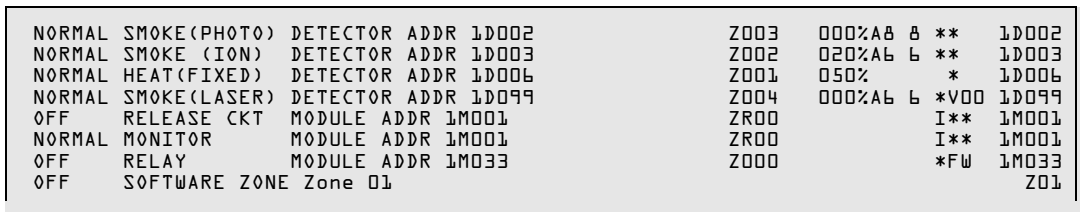
From the “Read Status” menu, select option **2** - Read Alarms/Troubles. The CRT-2 will display the alarm and trouble history.

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

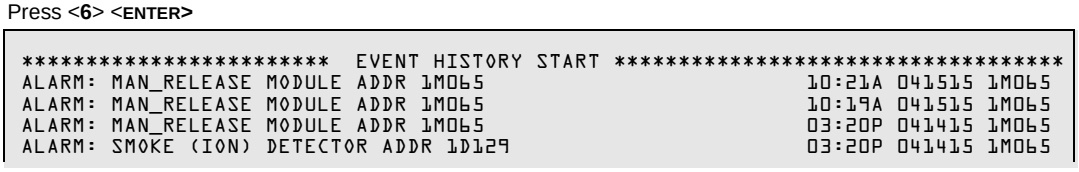
From the “Read Status” menu, select option **5** - History ALL. The entire history of events will display on the screen.

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**>

```
*****
```

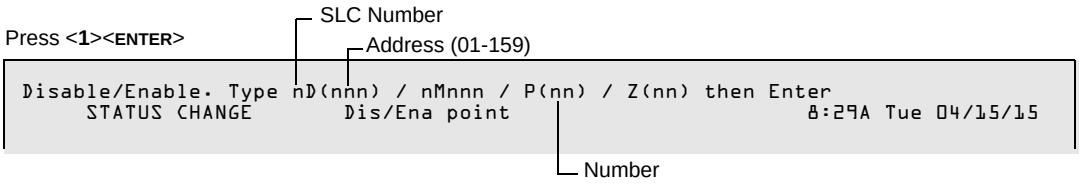
The Alter Status Options menu appears.

```
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/		

Table D.2 System Troubles

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W

X

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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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®
by Honeywell

World Headquarters
12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161
fax 203-484-7118

www.notifier.com

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NOTIFIER®
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Fire Alarm Control Panel
NFS2-640/E
Installation Manual

Document 52741 Rev: P8
9/14/17 ECN: 17-433

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 (noncondensing) 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.

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.

Table of Contents

Section 1: About This Manual

1.1 Standards and Other Documents

■ This Fire Alarm Control Panel complies with the following NFPA standards:

- NFPA 12 CO_2 Extinguishing Systems
- NFPA 12A Halon 1301 Extinguishing Systems
- NFPA 13 Sprinkler Systems
- NFPA 15 Water Spray Systems
- NFPA 16 Foam/Water Deluge and Foam/Water Spray Systems
- NFPA 17 Dry Chemical Extinguishing Systems
- NFPA 17A Wet Chemical Extinguishing Systems
- NFPA 72 Central Station Fire Alarm Systems (Automatic, Manual and Waterflow) Protected Premises Unit (requires Notifier UDACT/UDACT-2).
- NFPA 72 Local (Automatic, Manual, Waterflow and Sprinkler Supervisory) Fire Alarm Systems.
- NFPA 72 Auxiliary (Automatic, Manual and Waterflow) Fire Alarm Systems (requires TM-4).
- NFPA 72 Remote Station (Automatic, Manual and Waterflow) Fire Alarm Systems
- NFPA 72 Proprietary (Automatic, Manual and Waterflow) Fire Alarm Systems (Protected Premises Unit).
- NFPA 2001 Clean Agent Fire Extinguishing Systems

■ The installer should be familiar with the following documents and standards:

- NFPA 72 Initiating Devices for Fire Alarm Systems
- NFPA 72 Inspection, Testing and Maintenance for Fire Alarm Systems
- NFPA 72 Notification Appliances for Fire Alarm Systems

Underwriters Laboratories

- UL 38 Manually Actuated Signaling Boxes
- UL 217 Smoke Detectors, Single and Multiple Station
- UL 228 Door Closers - Holders for Fire Protective Signaling Systems
- UL 268 Smoke Detectors for Fire Protective Signaling Systems
- UL 268A Smoke Detectors for Duct Applications
- UL 346 Waterflow Indicators for Fire Protective Signaling Systems
- UL 464 Audible Signaling Appliances
- UL 521 Heat Detectors for Fire Protective Signaling Systems
- UL 864 Standard for Control Units for Fire Protective Signaling Systems
- UL 1481 Power Supplies for Fire Protective Signaling Systems
- UL 1971 Visual Signaling Appliances
- UL 1076 Proprietary Burglar Alarm Systems
- UL 2017 Standard for General-Purpose Signaling Devices and Systems
- UL 2572 Standard for Mass Notification Systems
- UL 60950 Safety of Information Technology Equipment

Underwriters Laboratories of Canada (ULC)

- Standard CAN/ULC-S527-M99
- CAN/ULC-S524-M91 Standard for the Installation of Fire Alarm Systems
- ULC-S537-11 Standard for Control Units for Fire Alarm Systems

Other

- EIA-485 and EIA-232 Serial Interface Standards
- 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

1.2 UL 864 Compliance

1.2.1 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 9th Edition.

The following products have not received UL 864 9th Edition certification and may only be used in retrofit applications. Operation of the NFS2-640/E 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).

- For a complete list of all peripherals that can be used with this fire alarm control panel (FACP), and which of those peripherals have not received UL 864, 9th Edition certification and may only be used in retrofit applications, see Section 2.4, "Compatible Equipment", on page 15.

1.3 Related Documents

Table 1.1 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

Table 1.1 Reference Documentation (1 of 2)

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 PRO Intelligent Aspiration Sensing Technology Document	I56-3903
FWSG Wireless Manual	LS10036-000NF-E

Table 1.1 Reference Documentation (2 of 2)

* If you are installing the panel in the same cabinet as digital audio equipment, heat dissipation calculations must be made. Please refer to document #53645.

1.4 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.

Section 2: System Overview

2.1 System Description

The NFS2-640/E control panel is a modular, intelligent fire alarm control panel (FACP) with an extensive list of powerful features. The control panel uses the CPS-24/E integral power supply with battery charger. This is combined with a mounting chassis and cabinet to create a complete fire alarm control system. The panel supports FlashScan® protocol and has network capabilities. A single SLC loop is supported with the basic equipment package; a second SLC loop can be added by attaching an optional loop expander module (LEM-320).

Modular devices mount to the chassis to provide additional output circuits, including voice and telephone modules to form a complete voice evacuation system. Five cabinet options are available for enclosing system components; each is available in red or black.

The control panel has the capacity for installing up to 636 addressable points; 159 detectors and 159 monitor/control modules per SLC (Signaling Line Circuit).

2.1.1 Standard Features

- Uses Notifier's VIEW® early warning fire detection and the FlashScan or Classic Loop Interface Protocol (CLIP) families of detectors and modules
- Integral power supply with battery charger
- Four standard Notification Appliance Circuits (NAC), Class A or B
- Alarm, Trouble, Supervisory and Security relays
- Support for 32 annunciator addresses, with 10 special annunciator groups
- Supports Style 4, Style 6, Style 7 SLC loops
- Connections to easily mount an expander board to add a second SLC loop
- Releasing service using on-board NACs or FCM-1 modules
- Logic Equations
- Display scroll selection
- Alarm verification supervisory indication (NYC)
- Supervisory duct detectors
- Supports Advanced Warning Addressable Combustion Sensing (AWACS) algorithms
- Network operation
- Battery charger supports 18 to 200 amp hour sealed lead-acid batteries
- EIA-485 connections for wiring ACS annunciators (including LDM custom graphic annunciators), TM-4 transmitter
- EIA-232 connections for printer, CRT, printer/CRT, or network operation
- Autoprogram feature for faster programming of new devices
- The control panel provides 6 amps of usable output power in an alarm condition; it provides 3 amps of usable output power in normal or continuous operating conditions
- Diagnostic LEDs and switches
- Ground fault detection (0 ohm impedance)
- Battery and battery-charger supervision, voltage-monitoring, and current-monitoring
- Disconnect of deeply-discharged battery (low battery disconnect)
- Programmable for strobe synchronization
- Mass Notification System compatible

2.1.2 Options

Refer to Section 2.4 "Compatible Equipment" for other peripherals listed for use with this panel.

- QWERTY silicone-rubber keypad with a 2x40 LCD display and eight indicator LEDs
- Optional LEM-320 provides a second SLC loop that is electrically identical to the one on the main board
- Optional devices include: UDACT/UDACT-2 Universal Digital Alarm Communicator/Transmitter, ACM-8R remote relay module to increase point capacity, and audio and voice components.
- Optional annunciators connected through the EIA-485 interface allow remote system monitoring.

2.1.3 System Limitations

System expansion must take into consideration the following:

1. The physical limitations of the cabinet configuration.
2. The electrical limitations of the system power supply.
3. The capacity of the secondary power source (standby batteries). (Note that batteries larger than 26 AH will require a separate battery backbox.)

2.2 System Components

2.2.1 Basic Equipment

A basic NFS2-640/E system has the following components:

1. The control panel with integral power supply. CPU2-640 (120V operation) or CPU2-640E (240V operation) is the "control panel" itself and the heart of the system; it ships with a grounding cable, battery interconnect cables, and document kit. It includes power supply CPS-24/E, mounted directly on the CPU2-640/E.

NOTE: The CPS-24/E is an integral part of the CPU2-640/E and is not available separately.

2. One or more chassis. The NFS2-640/E chassis (included with the CPU) mounts the CPU2-640/CPU2-640E and peripherals. Mount additional rows of equipment in a compatible chassis selected from Table 3.3 on page 21.
3. *Optional:* A primary display. Generally this is a KDM-R2 keypad/display behind a DP-DISP2 or ADP2-640 dress panel. For information on using NCA-2 as primary display instead of KDM-R2, see Section 3.5.2 "Using NCA-2 as Primary Display" and the *NCA-2 Manual*.
4. A backbox and door:
   SBB-A4 and DR-A4 (one row of equipment) or
   SBB-B4 and DR-B4 (two rows of equipment) or
   SBB-C4 and DR-C4 (three rows of equipment) or
   SBB-D4 and DR-D4 (four rows of equipment)
   (For a solid-metal door add "B" to the part number; for a red door add "R".)
5. A battery dress panel BP2-4 is required.
6. Batteries (Refer to Appendix A.3 "Calculating the Battery Requirements" for system current-draw calculations; CAB-4 series backboxes holds batteries up to 26 AH maximum.)

Refer to Section 2.4, "Compatible Equipment" for other peripherals listed for use with this FACP.

2.2.2 Control Panel Circuit Board

The control panel electronics are contained on one printed circuit board that incorporates a signaling line circuit (SLC) and the central processing unit (CPU). The built-in power supply includes an integral battery charger. A keypad/display unit can be installed over the power supply; see Figure 2.1. Wiring connections and system components are detailed in Figures 2.2 and 2.3.

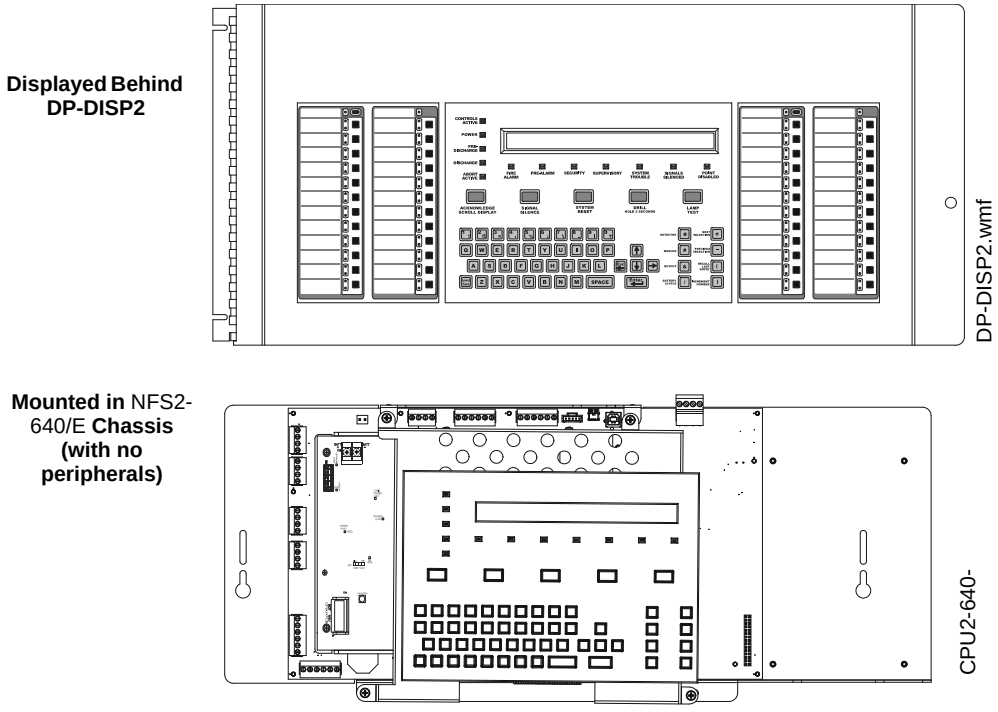


Figure 2.1 NFS2-640/E Control Panel with Optional Keypad/Display Unit Installed

2.2.3 Main Power Supply (CPS-24/E)

The main power supply is an integral part of the **NFS2-640/E** and mounts directly over the control panel's circuit board. It provides a total of 3 A (6 A in alarm) and contains an integral battery charger. This can be used for many functions including:

- Powering the NFS2-640/E
- Powering a variety of UL-listed 24 VDC notification appliances from four built-in NAC outputs
- Providing up to 1.25 A of resettable power for four-wire smoke detectors

- Providing up to 1.25 A of non-resettable power for external devices such as the TM-4 Transmitter Module.
- Providing auxiliary 24 VDC power @ 0.5A and 5 VDC power @ 0.15A.
- Fuse: 8 amps, 250 V, 5 x 20 mm, Fast-Acting, ceramic, p/n 12117.

When AC Power is lost, the deeply-discharged battery cutoff protection will be invoked at 17 volts. The power supply will be disconnected from the batteries. The power supply's normal operation will be restored when AC power returns.

See Figure 2.2, "CPU2-640/CPU2-640E and Power-Supply: Wiring Connections" and Figure 2.3, "CPU2-640/CPU2-640E and Power-Supply: Jumpers, LEDs and Switches" for details.

2.2.4 Circuit Board Components

The following two figures illustrate the location of the various connections, switches, jumpers and LEDs on the CPU2-640/CPU2-640E and its power supply. Figure 2.2 shows wiring connections; Figure 2.3 shows jumpers, LEDs and switches. See Section 3 “Installation” for larger images and more details. (Larger images are referenced on these drawings.)

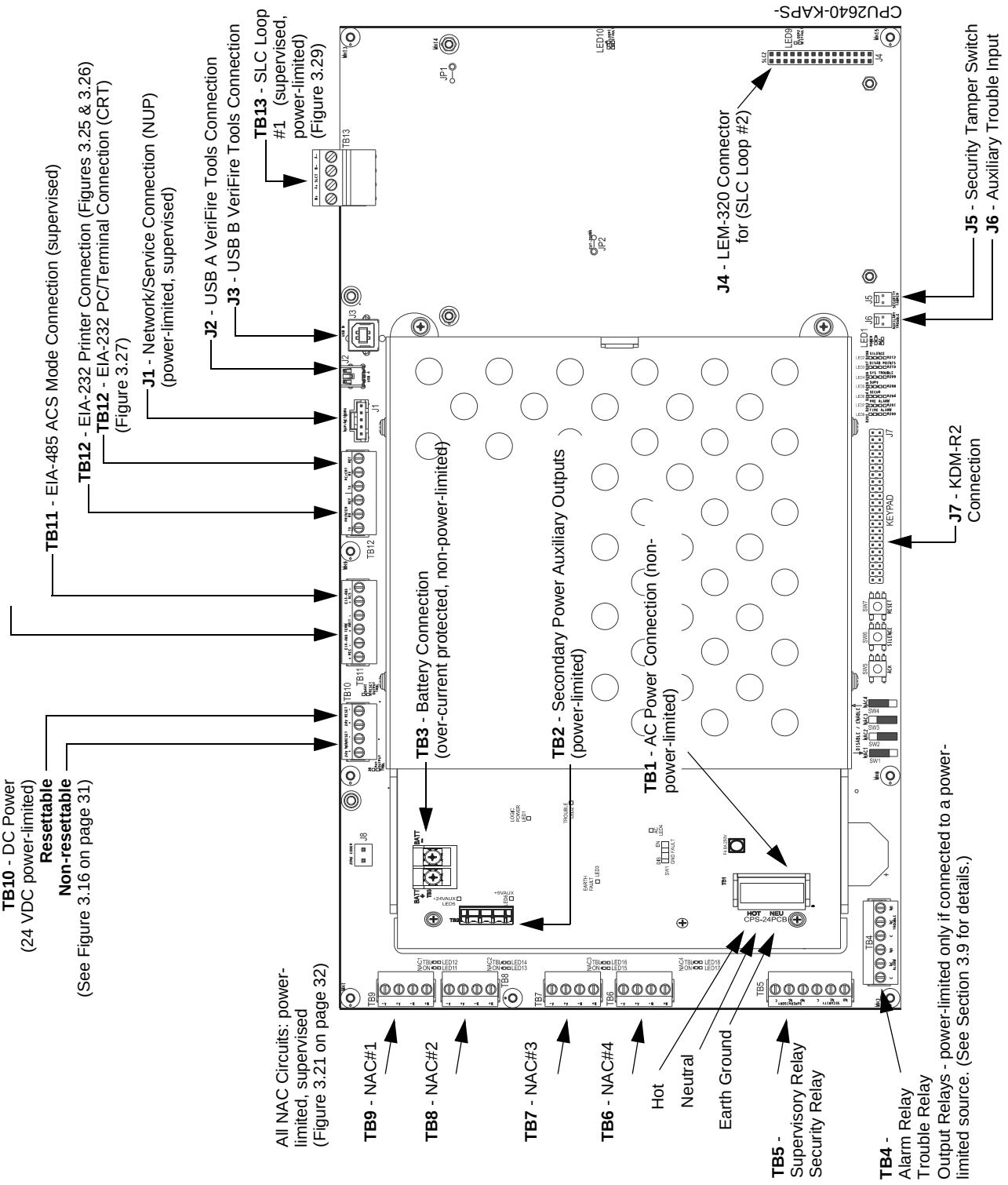


Figure 2.2 CPU2-640/CPU2-640E and Power-Supply: Wiring Connections

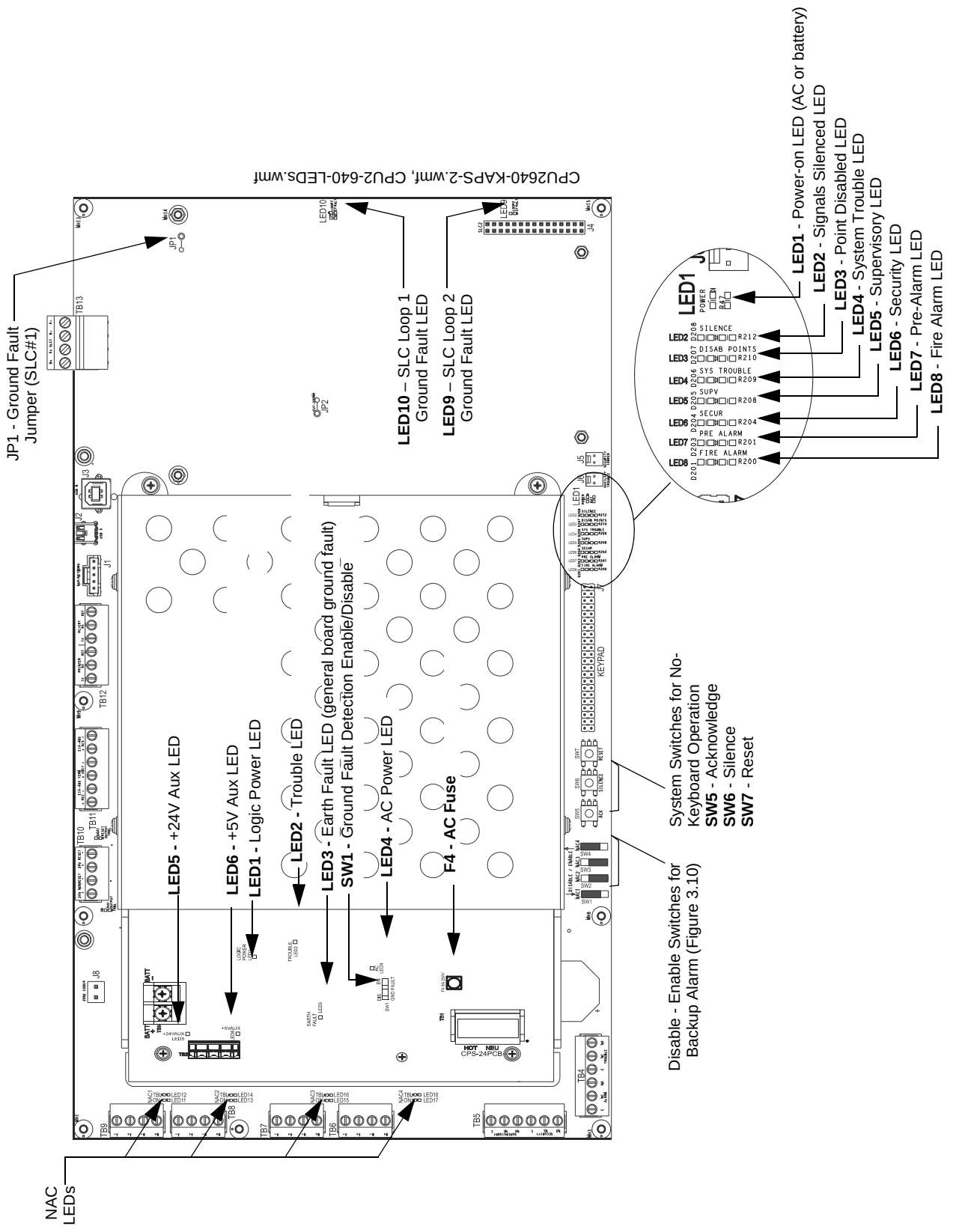


Figure 2.3 CPU2-640/CPU2-640E and Power-Supply: Jumpers, LEDs and Switches

2.3 System Cabinets

The control panel and modules are installed in a CAB-4 series backbox . There are four different sizes available, holding from one to four rows of equipment plus batteries (up to two 26 AH batteries). Backboxes are ordered separately from doors. The doors can be mounted on the left or the right side of the cabinet; reversible hinges are provided so that this choice can be made in the field. Doors open a full 180 degrees and have locks. Mounting methods include surface-mounting or semi-flush mounting on a wall between 16 inch (40.64 cm) on-center studs. A trim ring option is available for semi-flush mounting.

External measurements for each backbox are provided below; door dimensions are larger. Refer to *CAB-3/CAB-4 Series Cabinet Installation Document* (shipped with the cabinet) for specific mounting drawings and door dimensions.

A-size backbox (one row)	24.00 in (60.96 cm) wide 20.00 in (50.8 cm) tall 5.218 in (13.254 cm) deep Uses optional trim ring TR-A4	**Optional trim ring TR-A4** Opening: 24.062 in (61.118 cm) wide; 20.062 in (50.881 cm) tall. Molding width: 1.375 in (3.493 cm)
B-size backbox (two rows)	24.00 in (60.96 cm) wide 28.5 in (72.39 cm) tall 5.218 in (13.254 cm) deep Uses optional trim ring TR-B4	**Optional trim ring TR-B4** Opening: 24.062 in (61.118 cm) wide; 28.562 in (72.548 cm) tall. Molding width: 1.375 in (3.493 cm)
C-size backbox (three rows)	24.00 in (60.96 cm) wide 37.125 in (94.297 cm) tall 5.218 in (13.254 cm) deep Uses optional trim ring TR-C4	**Optional trim ring TR-C4** Opening: 24.062 in (61.118 cm) wide; 37.187 in (94.455 cm) tall. Molding width: 1.375 in (3.493 cm)
D-size backbox (four rows)	24.00 in (60.96 cm) wide 45.75 in (1162.05 cm) tall 5.218 in (13.254 cm) deep Uses optional trim ring TR-D4	**Optional trim ring TR-D4** Opening: 24.062 in (61.118 cm) wide; 45.812 in (114.775 cm) tall. Molding width: 1.375 in (3.493 cm)
Trim Rings: When using trim rings, mount backbox with at least 1 inch (2.54 cm) between wall surface and front of backbox, to allow door to open fully past the trim ring.		

For details on mounting options within the cabinet, see Section 3.4, “Laying Out Equipment in Cabinet and Chassis”.

2.4 Compatible Equipment

These are the most common devices at time of publishing; the most complete list of compatible intelligent SLC loop devices is provided in the *SLC Wiring Manual*; for conventional non-addressable equipment see the *Device Compatibility Document*. These devices are UL and ULC listed unless marked otherwise (in parentheses next to the product). Other control panels and their equipment can also be connected in a network, via Noti•Fire•Net version 5.0 or the High-Speed Noti•Fire•Net; refer to the *Noti•Fire•Net Version 5.0 & Higher Installation Manual* or the *High-Speed Noti•Fire•Net Installation Manual* for details. For products documented separately, see Section 1.3 “Related Documents”.

WARNING: UL 9TH 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. OPERATION OF THE NFS2-640/E 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).
PERIPHERAL DEVICES IN THE SECOND LIST WERE LISTED UNDER UL 8TH EDITION AND MAY ONLY BE USED IN RETROFIT APPLICATIONS (SEE SECTION 1.2, “UL 864 COMPLIANCE”, ON PAGE 7).

Notifier Compatible Equipment

NOTE: Products marked with a checkmark have not received UL 864 9th Edition certification and may only be used in retrofit applications.

NOTE: The wireless option is not suitable for ULC.

Electronic Equipment

AA-30 30-Watt Audio Amplifier
AA-100 100-Watt Audio Amplifier
AA-120 120-Watt Audio Amplifier
ACM-24AT Annunciator Control Module
ACM-48A Annunciator Control Module
ACM-8R Annunciator Control Module
ACPS-610 Addressable Charger/Power Supply
APS2-6R Auxiliary Power Supply
ACT-1 Audio Coupling Transformer
ACT-2 Audio Coupling Transformer
AEM-24AT Annunciator Expander Module
AEM-48A Annunciator Expander Module
AKS-1B Annunciator Key Switch
APJ-1B Annunciator Phone Jack
BACNET-GW-3 BACNET Gateway
BAT-12120 Battery 12-volt, 12 amp-hour
BAT-12180 Battery 12-volt, 18 amp-hour
BAT-12250 Battery 12-volt, 25 amp-hour
BAT-12260 Battery 12-volt, 26 amp-hour
BAT-12550 Battery 12-volt, 55 amp-hour
BAT-12600 Battery 12-volt, 60 amp-hour
BX-501 Intelligent Detectors/Sensors Base
B501, B501-BL, B501-IV 4” Intelligent base
B501BH Sounder base
B501BH-2 Sounder base, steady tone
B501BHT-2 Sounder base, temporal tone
B200S/A Addressable sounder base
B200SR/A Sounder base

B200SCOA Addressable sounder base with CO marking for Canada
B200S-LF Addressable Low Frequency sounder base
B200SR-LF Low Frequency sounder base
B210LP/A, B210LPBP, B300-6, B300-6-BP, B300-6-IV 6" Intelligent detector base
CAP-GW CAP Gateway
CCM-1 Communication Converter Module
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU2-640/E Control Panel Circuit Board
CPX-551 Ionization Smoke Detector
CPX-751 Intelligent Ionization Smoke Detector
CRT-2 Video Display Monitor with Keyboard
DAA Digital Audio Amplifier Series
DAA2 Digital Audio Amplifier
DAX Digital Audio Amplifier
DS-DB Digital Distribution Board
DS-AMP Digital Amplifier
DS-BDA Backup Amplifier
BDA-25V/75V Backup Amplifier
DS-XF70V Step-up Transformer
DPI-232 Direct Panel Interface
DVC-EM Digital Voice Command Extended Memory
DVC-RPU Digital Voice Command Remote Paging Unit
DVC-AO Digital Voice Command Audio Output
FCM-1 NAC Module
FCM-1-REL Control Module
FCPS-24S6/S8 Field Charger Power Supply
FDX-551 Intelligent Thermal Sensor
FDU-80, FDU-80G Remote Fire Annunciator
FHS Fireman's Handset
FMM-1 Monitor Module
FMM-101 Mini Monitor Module
FSA-851A Intelligent Aspiration Detector
06-NF10 Baffle for the FSA-851A
FSC-851 IntelliQuad Multi-Criteria Smoke Detector
FCO-851 IntelliQuad PLUS Multi-Criteria Fire/CO Detector
FSB-200S Single-ended beam smoke detector with sensitivity testing
FSB-200 Single-ended beam smoke detector.
FSD-751P Photoelectric Duct Detector
FSD-751RP Photoelectric Duct Detector with alarm relay
FSD-751PL Low-flow Duct Detector
FSD-751RPL Low-flow Duct Detector with alarm relay
FSP-851R/DNR Remote Test Capable Photoelectric Smoke Detector
FDRM-1 Dual Monitor/Dual Relay
DHX-501, DHX-502 Duct Detectors
FSI-751, FSI-851 Ion Detector
Acclimate Plus™ FAPT-751, FAPT-851 Combination Photoelectric/Heat Detector
FSH-751 HARSH™ Smoke Detector
HPX-751 Intelligent HARSH™ Detector
FSL-751 VIEW® Low Profile Laser Detector
FSM-101 Pull Station Monitor Module
FPJ Firefighter's Phone Jack
FRM-1 Relay Module
FSP-751, FSP-851, FSP-951, FSP-951-IV Photo Detector
FSP-751T, FSP-851T, FSP-951T, FSP-951T-IV Photo/Thermal Detector
FST-851H,FST-951H, FST-951H-IV High Temperature Detector
FST-751, FST-851, FST-951, FST-951-IV Thermal Detector
FST-751R, FST-851R, FST-951R, FST-951R-IV Thermal Detector (rate of rise)
FTM-1 Telephone Module
FZM-1 Monitor and Zone Interface Module
FDM-1 Dual Monitor Module
FWSG Wireless Gateway
FWD-200P Wireless photo detector for use with the FWSG Wireless Gateway
FWD-200ACCLIMATE: Wireless Acclimate detector for use with the FWSG Wireless Gateway
FWH-200FIX135: Wireless, fixed-temperature heat detector for use with the FWSG Wireless Gateway
FWH-200ROR135: Wireless, rate-of-rise heat detector for use with the FWSG Wireless Gateway
FW-MM: Wireless monitor module for use with the User Interface for use with the FWSG Wireless Gateway
FW-RM: Wireless relay module for use with the FWSG Wireless Gateway
FSA-5000(A) FAAST XS Intelligent Aspiration Detector
FSA-8000(A) FAAST XM Intelligent Aspiration Detector
FSA-20000(A) FAAST XT PRO Intelligent Aspiration Detector
HS-NCM-MF High-Speed Network Communications Module (Multi-Mode Fiber)
HS-NCM-MFSF High-Speed Network Communications Module (Multi-Mode Fiber to Single-Mode Fiber)
HS-NCM-SF High-Speed Network Communications Module (Single-Mode Fiber)
HS-NCM-W High-Speed Network Communications Module (Wire)
HS-NCM-WMF High-Speed Network Communications Module (Wire to Multi-Mode Fiber)
HS-NCM-WSF High-Speed Network Communications Module (Wire to Single-Mode Fiber)
ISO-X Loop Fault Isolator Module
ISO-6/A Loop Fault Isolator Module
KDM-R2 Keypad/Display Unit
LCD-80 Liquid Crystal Display Annunciator
LCD2-80 Liquid Crystal Display Annunciator
LEDSIGN-GW LED Sign Gateway
LDM-32 Lamp Driver Module
LDM-E32 Lamp Driver Module
LDM-R32 Lamp Driver Module
LEM-320/A Loop Expander Module
LPX-751 VIEW® Low Profile Laser Detector (CLIP)
MODBUS-GW-3 Modbus Gateway
N-MPS MPS Series Pull Stations
MMX-1 Addressable Monitor Module
MMX-2 Addressable Monitor Module
MMX-101 Addressable Mini Monitor Module
NBG-12LRA Agent Release-Abort Station
NBG-12 Series Manual Pull Station
NBG-12LX Addressable Manual Pull Station
NBG-12LXP Portuguese-labeled Addressable Manual Pull Station
NBG-12LXSP Spanish-labeled Addressable Manual Pull Station
NCA-2 Network Control Annunciator
NFN-GW-EM-3 NFN Gateway
NWS-3 NFN Webserver
NCM-F Network Communications Module (Fiber)
NCM-W Network Communications Module (Wire)
NCS Network Control Station
NFV-25/50 Notifier FireVoice-25/50
N-ELR Assortment ELR Pack with Mounting Plate
ONYXWorks Graphical Workstation
PRN-6 80-Column Printer
PRN-7 80-Column Printer
R-120 120 Ohm End-of-Line Resistor
R-2.2K 2.2K End-of-Line Resistor
R-27K 27K End-of-Line Resistor
R-470 470 End-of-Line Resistor
R-47K 47K End-of-Line Resistor
A77-716B End-of-Line Resistor Assembly
RPJ-1 Fireman's Phone Jack
RPT-485F EIA-485 Repeater (Fiber)
RPT-485W EIA-485 Repeater (Wire)
RPT-485WF EIA-485 Repeater (Wire/Fiber)
RM-1 Remote Microphone
RM-1SA Remote Microphone
SCS-8, SCE-8 Smoke Control Station
SCS-8L, SCE-8L Smoke Control Lamp Driver
SDX-551 Intelligent Photoelectric Detector
SDX-751 Intelligent Photoelectric Detector
SLC-IM Signaling Line Control Integration
STS-1 Security Tamper Switch
TM-4 Transmitter Module
UDACT Universal Digital Alarm Communicator Transmitter
UDACT-2 Universal Digital Alarm Communicator Transmitter
XPIQ Quad Intelligent Audio Transponder
XP6-C/A Supervised Control Module
XP6-R Six Relay Control Module
XP6-MA/A Six Zone Interface Module
XP10-M/A Ten Input Monitor Module
DNR/W/A Intelligent Non-Relay Photoelectric Duct Detector

Backboxes, Chassis, and Dress Panels, etc.

NOTE: /C after a part number indicates the back box is available to be used and purchased in Canada.

ABF-1B/C Annunciator Flush Box
ABF-1DB/C Annunciator Flush Box with Door
ABF-2B/C Annunciator Flush Box
ABF-2DB/C Annunciator Flush Box with Door
ABF-4B Annunciator Flush Box
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ABS-1TB/C Annunciator Surface Box
ABS-1B/C Annunciator Surface Box
ABS-2B Annunciator Surface Box
ABS-2D/C Annunciator Surface Box
ABS-4D/C Annunciator Surface Box
ABS-8RB Annunciator Backbox for ACM-8R
ADP2-640 Dress Panel: NFS2-640/E in lower row
ADP-4B Annunciator Dress Panel
BMP-1 Blank Module Plate
BP2-4 Battery Dress Plate
CAB-4 Series Doors (Black unless "R" is added to the P/N. Add B to the P/N for blank door)
DR-A4 A-sized door, 1 row of equipment
DR-B4 B-sized door, 2 rows of equipment
DR-C4 C-sized door, 3 rows of equipment
DR-D4 D-sized door, 4 rows of equipment
CAB-4 Series Backboxes (Black unless "R" is added to the P/N.)
SBB-A4 A-sized backbox
SBB-B4 B-sized backbox
SBB-C4 C-sized backbox
SBB-D4 D-sized backbox
CAB-4 Series Trim Rings (Black unless "R" is added to the P/N)
TR-A4 A-sized trim ring
TR-B4 B-sized trim ring
TR-C4 C-sized trim ring
TR-D4 D-sized trim ring
Trim Ring: TR300, TR300-IV
Color Kit: CK300, CK300-IV, CK300-BL
IR Color Kit: CK300-IR, CK300-IR-IV, CK300-IR-BL
CA-1 Audio Chassis
CA-2 Audio Chassis
CHS-4L Low-Profile Chassis
CHS-4, CHS-4N Chassis for 4 Option Boards
NFS2-640 Chassis for 1st row (included in basic equipment package)
DP-1B Blank Dress Plate
DPA-1 Dress Plate
DPA-2B Dress Plate
DPA-1A4 Dress Plate
DP-DISP2 Dress Panel: NFS2-640/E in top row
DPDW-1B Double Well Dress Plate
DPSW-1B Single Well Dress Plate
NFS-LBB Battery Box
NFS-LBBR Red Battery Box
VP-2B 2" Filler Dress Plate

System Sensor Equipment

A2143-00 End of Line Resistor Assembly
EOLR-1 End-of-Line Resistor Assembly
FSB-200, FSB-200S Beam Detectors

Retrofit Equipment: Compatible Notifier Equipment Listed Under Previous Editions of UL 864

NOTE: The products in this list have not received UL 864 9th Edition certification and may only be used in retrofit applications (see Section 1.2, "UL 864 Compliance", on page 8).

✔**ACM-16AT** Annunciator Control Module
✔**ACM-32A** Annunciator Control Module
✔**ACPS-2406** Auxiliary Charger/Power Supply
✔**AEM-16AT** Annunciator Expander Module
✔**AEM-32A** Annunciator Expander Module
✔**AMG-E** Audio Message Generator
✔**AMG-1** Audio Message Generator
✔**APS-6R** Auxiliary Power Supply
✔**AVL-1** Audio Voice Link *(Not ULC-listed)*
✔**BGX-101L** Addressable Manual Pull Station
✔**CHG-120** Battery Charger
✔**FCPS-24** Field Charger Power Supply
✔**FFT-7** Fire Fighters Telephone
✔**FFT-7S** Fire Fighters Telephone
✔**IPX-751** Advanced Multi-Sensor Intelligent Detector
✔**NCA** Network Control Annunciator
✔**P-40** Keltron Printer
✔**P40-KITB** Dress plate for Keltron Printer
✔**PRN-4, PRN-5** 80-Column Printers
✔**RA400** Remote Annunciator
✔**RA400Z** Remote Annunciator with diode
✔**XPC-8** Transponder Control Module
✔**XPDP** Transponder Dress Panel
✔**XPM-8** Transponder Monitor Module
✔**XPM-8L** Transponder Monitor Module
✔**XPP-1** Transponder Processor
✔**XPR-8** Transponder Relay Module
✔**XP5-C** Transponder Control Module
XP5-M Transponder Monitor Module

NOTE: The FWSG Wireless Gateway as part of the wireless network has been tested for compliance with the Federal Communications Commission (FCC) requirements of the United States Government. This product has not been evaluated for use outside the USA. Use of this system outside the USA is subject to local laws and rules to which this product may not conform. It is the sole responsibility of the user to determine if this product may be legally used outside the USA.

Section 3: Installation

3.1 Preparing for Installation

Choose a location for the fire alarm system 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 3.11 “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, including temperature and humidity limits for the system (Page 3).
- 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”.

CAUTION:

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:

THIS SYSTEM CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY CIRCUITS. USE STATIC-SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES REMOVED FROM THE UNIT.

3.1.1 Standards and Codes

In addition, installers should be familiar with the following standards and codes:

- 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.
- C22.1-98 The Canadian Electrical Code, Part 1.
- CAN/ULC-S5524-01 Standard for the Installation of Fire Alarm Systems.

3.2 Installation Checklist

Table 3.1 provides an installation checklist for installing, wiring, and testing the NFS2-640/E system. It has references to installation information included in manuals listed in Section 1.3 “Related Documents”.

Seq	Task	Refer to
1.	Mount the cabinet backbox to the wall.	Section 3.3 “Mounting a Cabinet”
2.	Install hinges for door	*CAB-3/CAB-4 Series Cabinet Installation Document*
3.	Install all required chassis in cabinet.	Section 3.5 “Installing the Control Panel”
4.	Install control panel onto chassis.	Section 3.5.1 “Control Panel Circuit Board & Keypad/Display Unit”
5.	Optional: Install auxiliary power supply and/or external battery charger	Auxiliary power manuals
6.	Connect AC wiring, place batteries into backbox without connecting them, and run cable to optional power supplies, DC power outputs, NACs, and relays. **CAUTION: Do not apply AC or DC power at this time.**	Section 3.7 “Connecting the Power Cables”
7.	Set switches for backup alarm (SW1-SW4).	Section 3.10 “Backup-Alarm Switches”
8.	Optional: Install option boards, annunciators, network equipment, and Audio components	Section 3.6, “Mounting Option Boards”, the relevant annunciator/network-card manual, *DVC Manual, and DVC-RPU Manual*.
9.	Optional: Install output devices such as a printer, or CRT terminal.	Section 3.13 “Installing Remote Printers and/or CRT”
10.	Optional: Install NCA-2, NCS or ONYXWorks.	*NCA-2 Manual, NCS Manual or ONYXWorks Manual*
11.	Secure any unused mounting holes in control panel circuit board.	Figure 3.6
12.	Wire the Signaling Line Circuits.	Section 3.14 “Wiring a Signaling Line Circuit (SLC)”
13.	Terminate wire shielding as instructed.	SLC Wiring Manual
14.	Apply AC power to the control panel by placing the external circuit breaker to the ON position. **Do NOT connect batteries**.	
15.	Check AC power.	Table 3.3 in Section 3.7 “Connecting the Power Cables”
16.	Connect the batteries using interconnect cable, P/N 75560 and 75561.	
17.	Install the CAB-4 series door.	CAB-3/CAB-4 Series Cabinet Installation Document
18.	Program the control panel.	*NFS2-640/E Programming Manual*
19.	Field test the system.	Section 5 “Testing the System”

Table 3.1 Installation Checklist

3.3 Mounting a Cabinet

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

- Locate the backbox so that the top edge is 66 inches (1.6764 m) above the surface of the finished floor.
- Access to the cabinet shall be provided in accordance with NFPA 90, article 110.33.
- Allow sufficient clearance around cabinet for door to swing freely. (See Section 2.3 “System Cabinets”.)
- 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 (0.25 inch, 0.635 cm). Use mounting hardware appropriate for the mounting surfaces and weight of loaded cabinet; see UL 2017 Pull-Test Requirements.
2. Select and punch open the appropriate knock-outs. (For selection guidelines, see Section 3.11 “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 control panel and other components according to Section 3.5 “Installing the Control Panel” before installing hinges and door according to *CAB-3/CAB-4 Series Cabinet Installation Document.*

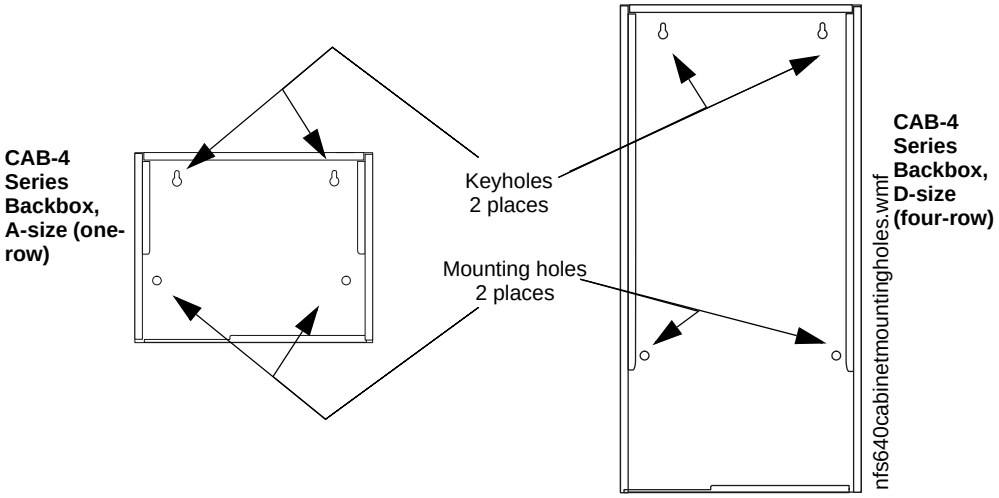


Figure 3.1 Mounting Holes of a Backbox

3.4 Laying Out Equipment in Cabinet and Chassis

The NFS2-640/E allows for flexible system design. Backboxes are available to hold up to four rows of equipment (four chassis), plus batteries. Each chassis has four "slots" -- the basic positions available side by side on a chassis. The number of modules that can be mounted in each position depends on the chassis model and the module size.

Follow these guidelines when deciding where to locate equipment in the backbox.

The NFS2-640/E control panel and adjacent first-row modules mount in the NFS2-640 chassis, typically installed in the first/top row of the backbox behind DP-DISP2. (Use ADP2-640 if mounting NFS2-640 chassis in a lower row.) NFS2-640 chassis holds four layers of equipment, including the control panel. See Figure 3.3. The primary display (KDM-R2 or NCA-2) mounts in front of NFS2-640/E.

The CPU mounts in the NFS2-640 chassis behind DP-DISP2 (top row) or ADP2-640 (lower row). The control panel fills three positions in the first-installed layer against the chassis; its power supply occupies two positions on top of the control panel; and the optional display occupies two positions in the fourth layer (flush with the dress panel).

Mount second, third, or fourth rows of equipment in other compatible chassis, such as chassis CHS-4L, CA-1, or CA-2. (See Table 3.3, "Chassis Compatibility," on page 25.) For details on audio equipment see the *DVC Manual*.

Option boards use standard mounting hole positions to allow them to be mounted in various locations and layers, depending on the desired system configuration. (See Table 3.2 to determine hardware.) Some equipment such as annunciators may be mounted on a dress panel directly in front of the control panel. The BMP-1 Blank Module Plate covers unused positions in a dress-panel, also providing an additional mounting location for some option boards, such as TM-4 (see *BMP-1 Product Installation Drawing* for details).

Annunciators can be mounted in dress panels such as ADP-4B; one or two annunciators can be installed in the DP-DISP2 or ADP2-640 with the control panel. Installing the BMP-1 blank plate in these dress panels provides an additional mounting location for option boards. Refer to the equipment's documentation for details.

Install BP2-4 Battery Plate in front of the battery compartment in NFS2-640/E installations and provides Protected Premises Unit labels.

NOTE: The BP2-4 is required for NFS2-640/E installations due to UL's revised labeling requirements. If using NFS2-640/E in retrofits, order BP2-4 to replace previous BP-4 battery dress panels.

If DP-DISP2 is not being used in the top row of the backbox, install VP-2B above the first row to cover the remaining space.

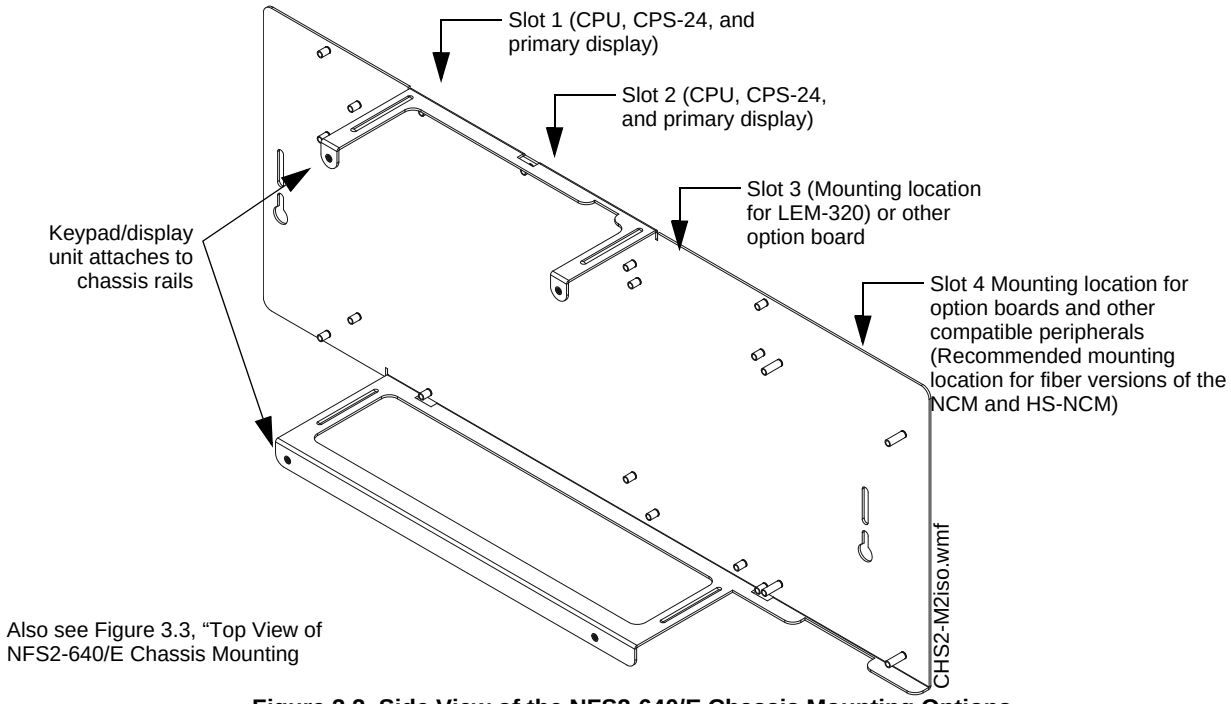


Figure 3.2 Side View of the NFS2-640/E Chassis Mounting Options

NOTE: When designing the cabinet layout, consider separation of power-limited and non-power-limited wiring as discussed in Section 3.11 "UL Power-limited Wiring Requirements".

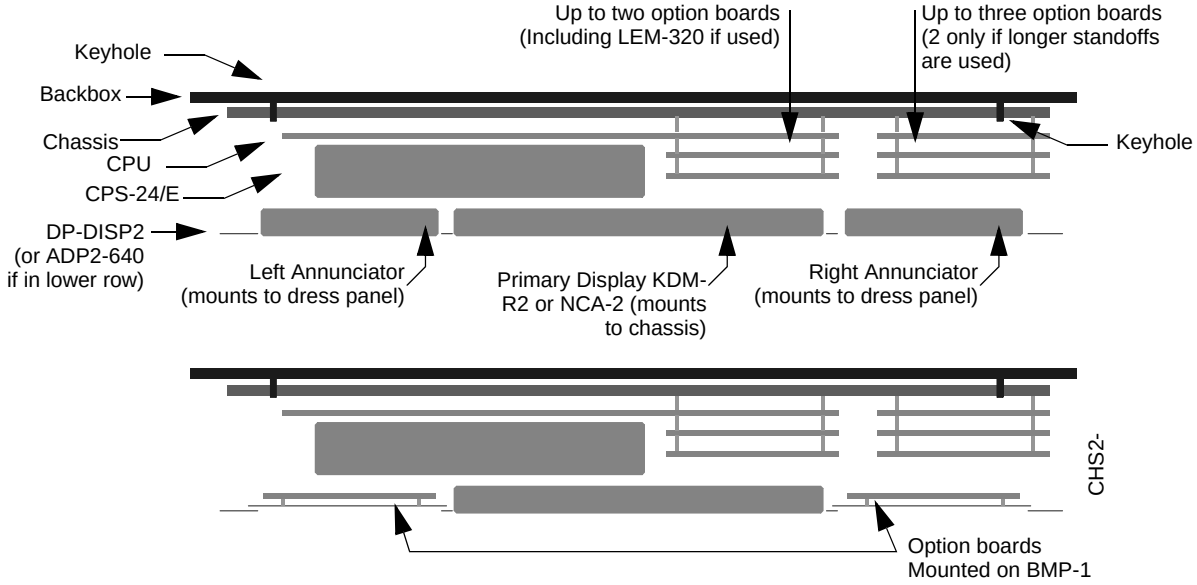


Figure 3.3 Top View of NFS2-640/E Chassis Mounting Options

From…	To…	Required Stand-off or Hardware
NFS2-640/E chassis	Control panel or option board on first layer	Attaches directly to chassis.
NFS2-640/E chassis	Keypad/display unit	Attaches directly to chassis rails.
NFS2-640/E chassis	NCA-2	Attaches directly to chassis rails with mounting hardware NCA/640-2-KIT (ordered separately)
Control panel (third slot)	Any option board in third slot (such as LEM-320)	4 male-female stand-offs 1 inch (25.4 mm) P/N 42118; installed and shipped with CPU2-640/CPU2-640E.
Option board or NFS2-640/E chassis (fourth slot)	Option board in next layer (not including LEM-320)	4 male-female stand-offs either 1.5 inch (38.1 mm) P/N 42175 or 0.937 inch (23.8 mm) P/N 42166, both shipped with option boards. Choose stand-off length that allows space for your option board's connectors; using longer stand-offs may reduce the number of option boards that fit in the chassis position.
Chassis or Dress Panel	Annunciator	Attaches directly to dress panels or attaches to flanges on chassis CHS-4/4N. (Screws provided with annunciator.)
Dress panels DP-DISP2, ADP2-640, ADP-4B	Option board	BMP-1 attaches to dress panel; option module attaches to BMP-1. (Screws provided with option module). See Figure 3.7.
Dress panel ADP-4B	NCA-2	Use "NCA-2 RETRO kit" hardware if mounting NCA-2 to a dress panel; cannot be mounted in front of the NFS2-640/E chassis.

Table 3.2 Stand-off Lengths

Product	Chassis/Door-mounting options
NFS2-640/E	• NFS2-640/E chassis
NCA-2	• CHS-M2, NFS2-640/E chassis, CHS-M3 • CA-2; requires two rows in the backbox
DVC	• CA-1 • CA-2
DVC-RPU	• CA-1
DAA	• Factory-mounted in its own chassis.
Analog audio amplifiers AA-30, AA-100, AA-120	• Mounts directly onto CAB-4 backbox
Option boards	• NFS2-640/E chassis, CHS-4, CHS-4L, CHS-4N (shipped as part of kit CHS-4MB), or on BMP-1 inside dress plate • **Note:** Mount LEM-320 in front of CPU2-640 in the NFS2-640/E chassis. • **Note:** Mount UDACT/UDACT-2 in second or lower row, or in slot 4 of the NFS2-640/E chassis with nothing in front of it. • **Note:** Mount fiber versions of the NCM and HS-NCM in the top row under knockouts, to avoid excessive bend on the fiber-optic cable.
ACS series annunciators ACM-24AT, ACM-48A and expanders	• Dress Panel DP-DISP2, ADP2-640, or ADP-4B

NOTE: In retrofit applications, the CAB-3 series backbox may be used, but order BP2-4 to replace previous BP-4 battery dress panels.

Chassis/Dress plate	Typical Backbox Location(s) in CAB-4 Backboxes
NFS2-640/E chassis	Top row of backbox typical; lower rows also possible.
CA-1	Second or lower row of backbox
CA-2	Requires two rows of backbox
CHS-4, CHS-4L, CHS-4N	Second or lower row of backbox
DPA-2 Dress Panel	Mounts in front of CA-2 covering two rows of the backbox
DP-DISP2 Dress Panel	Mounts in front of the NFS2-640/E chassis in top row of backbox
ADP2-640 Dress Panel	Mounts in front of NFS2-640/E chassis in second or lower row of backbox

Chassis/Dress plate	Typical Backbox Location(s) in CAB-4 Backboxes
ADP-4B Dress Panel	Mounts in front of any chassis

3.5 Installing the Control Panel

3.5.1 Control Panel Circuit Board & Keypad/Display Unit

The control panel comes pre-mounted in the NFS2-640/E chassis, which is usually positioned in the top row of the backbox. The control panel's CPU occupies three positions at the back of the chassis; the KDM-R2 occupies three positions flush with the dress panel. The NCA-2 may be mounted directly in front of the control panel if no KDM-R2 is being used; use NCA/640-2-KIT as described in the *NCA-2 Installation Manual*.

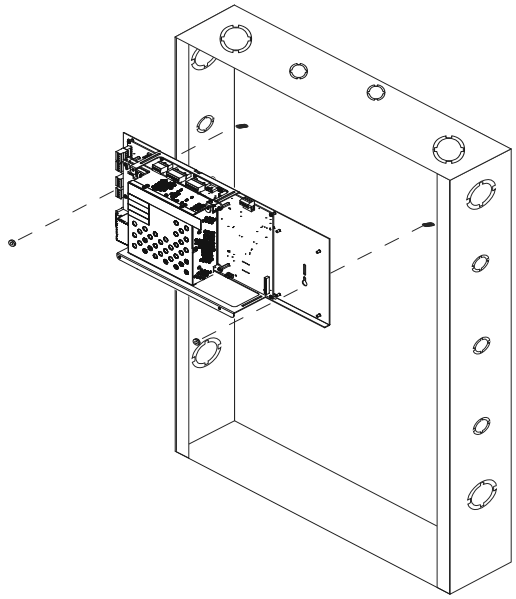


Figure 3.4 NFS2-640/E Chassis Mounting

Perform the following steps when installing the NFS2-640/E:

1. Screw chassis to the backbox.†
2. If installing KDM-R2 as primary display:
   - Attach ribbon cable from keypad to J7 connector on control panel. (See Figure 2.2.)
   - Align the keypad with the mounting holes as shown in Figure 3.6 and screw it down.
3. If installing the NCA-2 as primary display: Secure it to the NFS2-640/E chassis with NCA/640-2-KIT as described in the *NCA-2 Manual*.
4. If installing option boards, do so as described in Section 3.6, "Mounting Option Boards". If NFS2-640/E is being installed into an older backbox, two additional steps must be taken:
5. Battery Plate BP-4 must be replaced with BP2-4, per UL's revised labeling requirements.
6. The older door and dress panel must be replaced with equipment compatible with KDM-R2.

†If the NFS2-640/E chassis is not assembled as when shipped, attach CPU2-640 to the chassis. Slide control-panel tabs into slots on chassis and lay the board onto stand-offs so that mounting holes line up with those on the chassis. Secure with six screws and four 1 inch stand-offs as shown in Figure 3.5, "Mounting KDM-R2".

CAUTION:

IT IS CRITICAL THAT ALL MOUNTING HOLES OF THE NFS2-640/E ARE SECURED WITH A SCREW OR STANDOFF TO INSURE CONTINUITY OF EARTH GROUND.

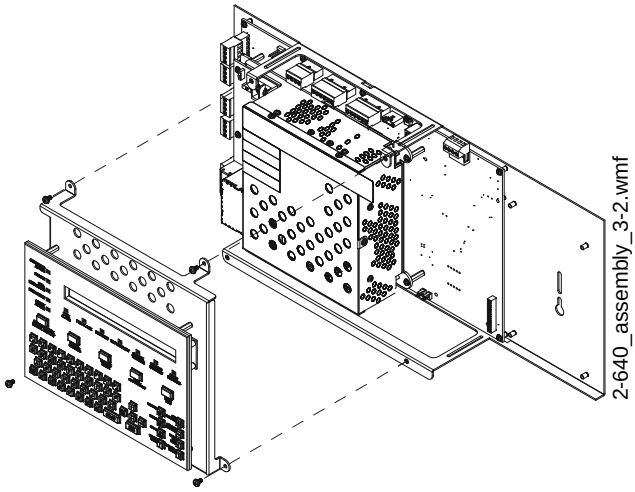


Figure 3.5 Mounting KDM-R2

3.5.2 Using NCA-2 as Primary Display

The NFS2-640/E can be set up to use the NCA-2 as the primary display. In this system design, mount NCA-2 to the NFS2-640/E chassis in front of CPS-24/E, and connect the network/service port on the NFS2-640/E (J1) directly to the network/service port on the NCA-2 (J3). See the *NCA-2 Manual* for specific instructions.

NOTE: This system design is required in Canadian stand-alone applications.

If the NFS2-640/E and NCA-2 are being used as a stand-alone pair, each device must be programmed using VeriFire Tools. Connect the VeriFire Tools PC to NFS2-640/E using USB B Port J3 and program as described in VeriFire Tools on-line help.

For older PCs without USB connectors, NFS2-640/E and NCA-2 must be temporarily disconnected and separately programmed, because VeriFire Tools also uses the network/service port. Follow VeriFire Tools instructions for off-line programming mode.

If the NFS2-640/E with NCA-2 is connected to a network, there are two additional options for programming: either connect the VeriFire Tools programming PC to the network port on the NCM/HS-NCM board, or program the NFS2-640/E through another network node.

NOTE: This is the only NCA-2 application that does not require an NCM or HS-NCM connection to .

3.6 Mounting Option Boards

If installing option boards into a CAB-4 Series backbox, mount and connect those boards at this time. General instructions follow; the sections about individual option boards contain any module-specific instructions such as mounting LEM-320's stacker-connector.

3.6.1 Option Boards in the NFS2-640/E Chassis

Mount option boards in slots 3 and 4 of the NFS2-640/E chassis. (See Figure 3.2, Figure 3.6, and Figure 3.7.) For standoff lengths, see Table 3.2.

NOTE: Another option board can be mounted above a Loop Expander Module or Network Communications Module; for ease of access, be sure to complete installation of those devices before mounting a second layer.

NOTE: If using the fourth (right-side) position of the NFS2-640/E chassis, the chassis needs to be installed on the backbox before option boards or modules are installed in that position. These modules will block access to the keyhole opening.

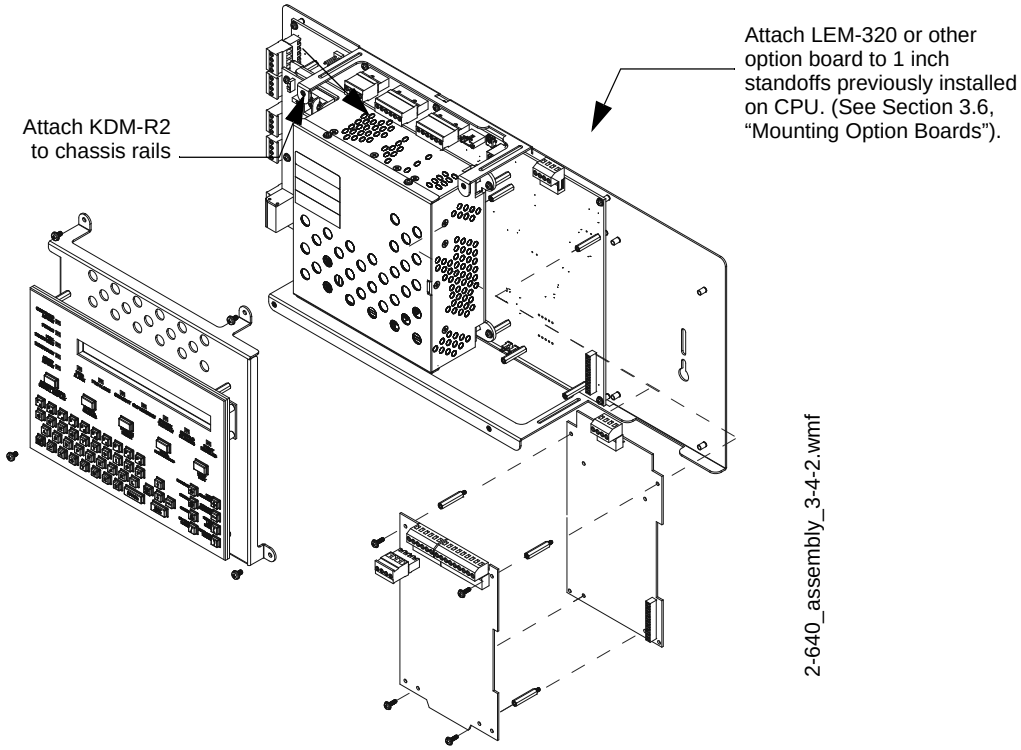


Figure 3.6 Attaching Option Boards Behind KDM-R2

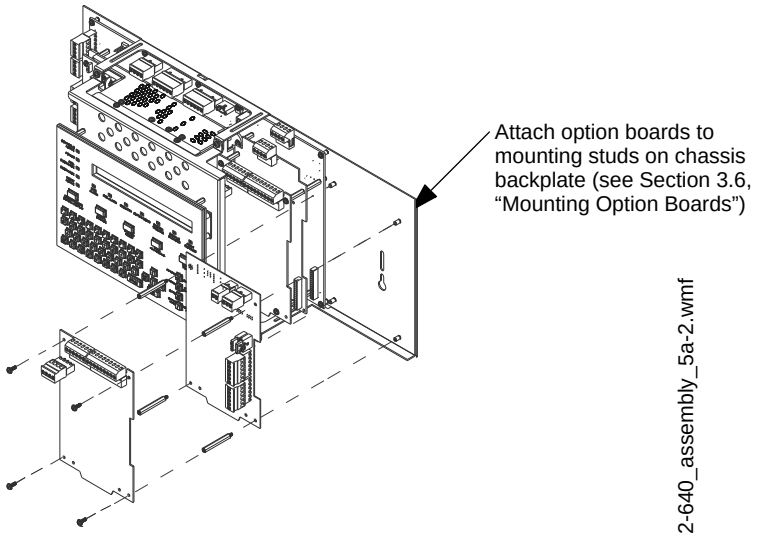


Figure 3.7 Attaching Option Boards to the Right of the CPU

3.6.2 Option Boards in CHS-4L

1. Slide the tabs at the bottom of the option board into slots on the chassis as shown in Figure 3.9.
2. Lay the board back onto the flanges so that the studs line up with mounting holes on the option board.
3. Attach the option board using screws provided with the board, or if installing a second option board, with stand-offs provided with the second board.

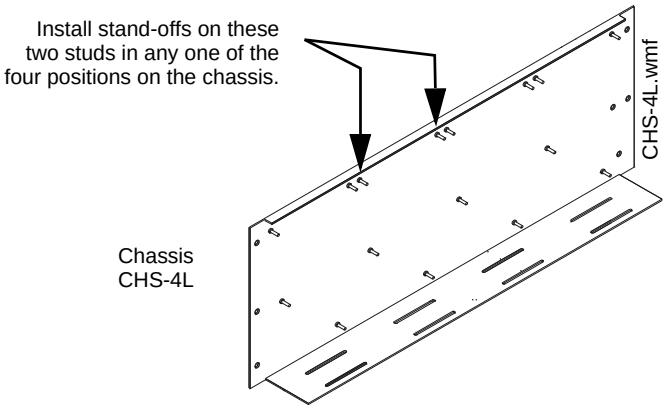


Figure 3.8 Standoff Locations on CHS-4L

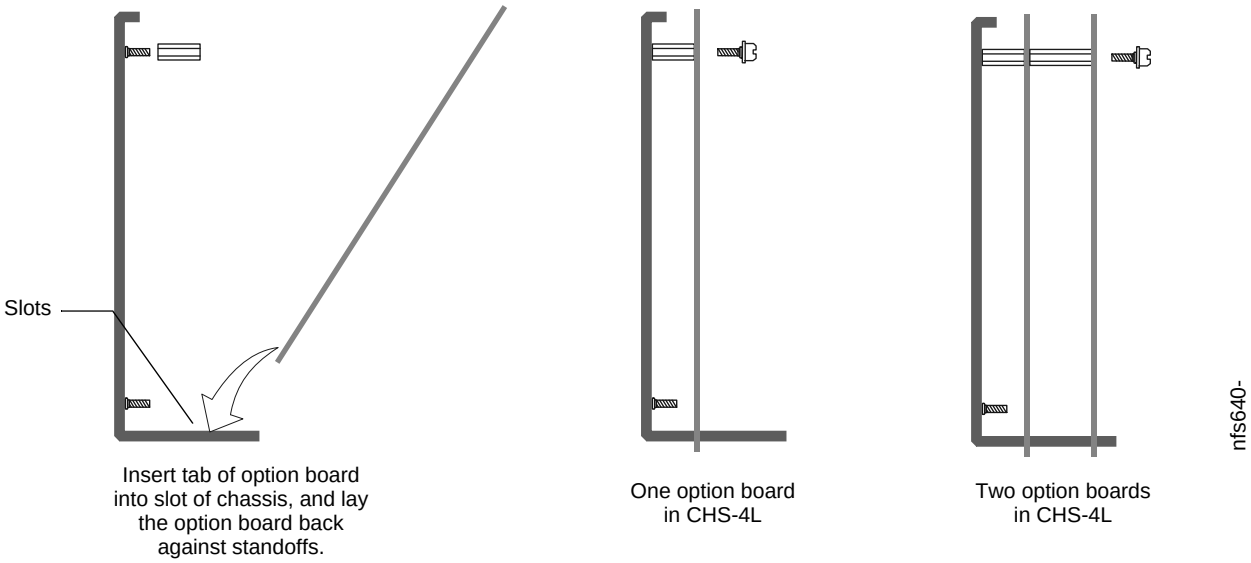


Figure 3.9 Mounting an Option Board in a Chassis (CHS-4L Shown)

3.6.3 Option Boards on BMP-1 in Dress Panels

Option boards can be mounted on BMP-1 blank module plate, inside dress panels such as DP-DISP2, ADP2-640, ADP-4B, as shown in Figure 3.10.

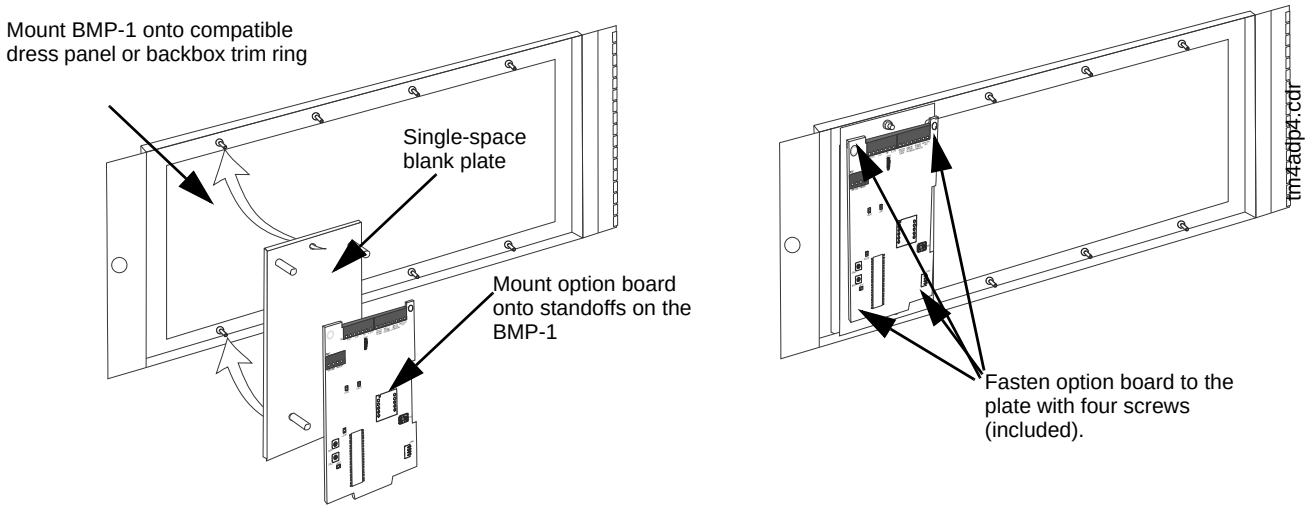


Figure 3.10 Mounting an Option Board onto a Dress Panel with BMP-1 (ADP-4B Shown)

NOTE: See the *BMP-1 Product Installation Drawing* for details if considering mounting the module behind blank module plate in a dress plate or annunciator backbox. This dress plate is suitable for modules that do not need to be visible or accessible when the door is closed.

3.6.4 Transmitter Module TM-4

TM-4 is power-limited. Connections are on TB10 nonresettable output and TB11 EIA-485 ACS Mode. Refer to the *Transmitter Module TM-4* installation document for installation details.

3.6.5 Loop Expander Module

Installing a Loop Expander Module adds a second SLC loop to the control panel. Refer to Figure 3.12 for stacker-connector illustrations.

1. Plug short end of the stacker-connector into J4 on the CPU2-640.
2. Align the LEM with the four 1 inch standoffs and the stacker-connector as shown in Figure 3.12; firmly seat the stacker-connector.
3. Attach LEM to standoffs using screws or another set of standoffs.
4. After LEM is mounted on the control panel, connect the SLC loops to TB1 on the LEM and TB13 on the CPU2-640. This system supports either FlashScan or CLIP mode devices. Refer to the SLC loop manual for wiring requirements and specific details.

CAUTION:

FOR THE SLC TO FUNCTION CORRECTLY, TH
INSTALLED AS SHOWN IN FIGURE 3.12. **DO N**
TOP OF THE LEM-320.

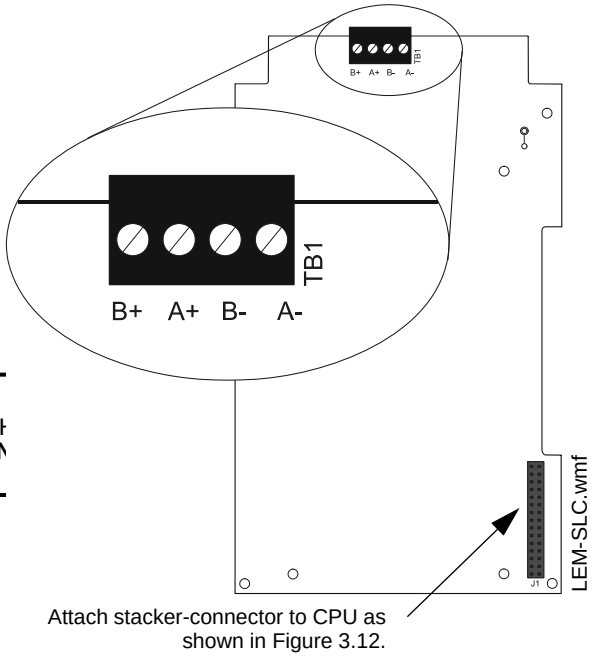


Figure 3.11 SLC Connections for LEM-320

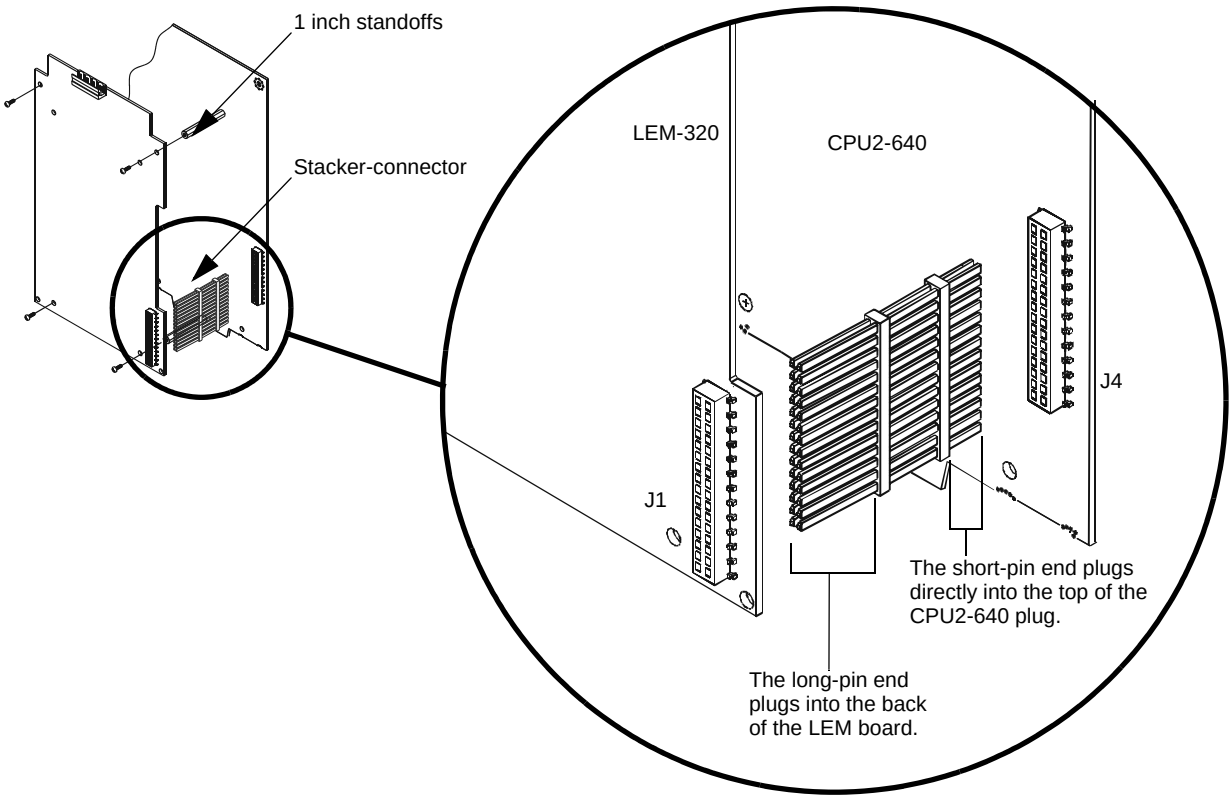


Figure 3.12 Mounting LEM-320 with the Stacker-connector

3.6.6 Network Communications Module

If networking two or more control panels or network control annunciators, each unit requires a Network Communications Module (NCM) or a High-Speed Network Communications Module (HS-NCM); wire and fiber versions of each are available. The wire and/or fiber versions of the NCM or the HS-NCM can be installed in any standard option-board position (see Section 3.6 “Mounting Option Boards”); the default position is immediately to the right of the control panel.

1. Mount the NCM/HS-NCM in the selected position and screw in place firmly.
2. Connect J1 on the control panel to J3 on the NCM or J6 of the HS-NCM using the network cable provided (P/N 75556) as described in the *NCM Installation Document* and the *HS-NCM Installation Document*. Do not connect two NCM/HS-NCMs via NUP ports (aka NUP to NUP).
3. **When installing the NCM**: Connect Channel A and/or Channel B as described in the *NCM Installation Document*.
   When installing the HS-NCM: Connect Channel A to Channel B as described in the *HS-NCM Installation Document*

NOTE: See the *Noti•Fire•Net Manual* or the *High-Speed Noti•Fire•Net Manual* and *NCM Installation Document* or *HS-NCM Installation Document* for wiring diagrams and system configuration information. See the *BMP-1 Product Installation Drawing* if considering mounting the module behind blank module plate in a dress plate or annunciator backbox.

NOTE: Over-bending fiber-optic cable can damage it. Do not exceed a 3 inch (7.62 cm) minimum bend radius.

NOTE: NCM hardware is not compatible with HS-NCM hardware and should not be mixed on the same network.

3.6.7 DVC Digital Voice Command

Each DVC Series model is a multi-featured audio processor with digital audio functionality that operates as an event-driven audio message generator and router. It is designed for use with the DAA2, DAX, DAA Series digital audio amplifiers, and the DVC-RPU Remote Paging Unit, as well as the DS-DB distribution boards, in a single panel or networked environment, and may also be used as an analog audio source or configured as a remote paging unit. Refer to the *DVC Manual* and *DVC-RPU Manual*.

The NFS2-640/E may be directly connected to the DVC for single panel applications. An associated NCA-2 is required when a DAL (digital audio loop) is part of the configuration; this configuration supports NUP-to-NUP-to-NUP configuration for single panel DAL applications.

Network configurations require an associated NCA-2, and will support all Network Control-by-Event; each node (DVC, CPU-2 and NCA-2) requires a network address/NCM port in network applications.

NOTE: The DVC Series consists of all the model versions listed in the bullets below this note. Individual part numbers are used in this manual only when it is necessary to distinguish features or functions that differ. The term DVC is used in all other cases.

- DVC-EM - Digital Voice Command, extended memory, wire version (standard)
- DVC-EMF - Digital Voice Command, extended memory, multi-mode fiber version
- DVC-EMSF - Digital Voice Command, extended memory, single-mode fiber version.

For information regarding audio storage for the DVC-EM Series models listed above, refer to the *DVC Digital Voice Command Manual*.

NOTE: The term DAA is used in this manual to refer to all DAA wire and fiber models. Individual part numbers are used only when it is necessary to distinguish features or functions that differ.

Figure 3.13 gives simplified overview illustrations of typical applications for the DVC Series and its Digital Audio Loop (DAL). Wire and fiber, or multi-mode and single-mode, can be mixed.

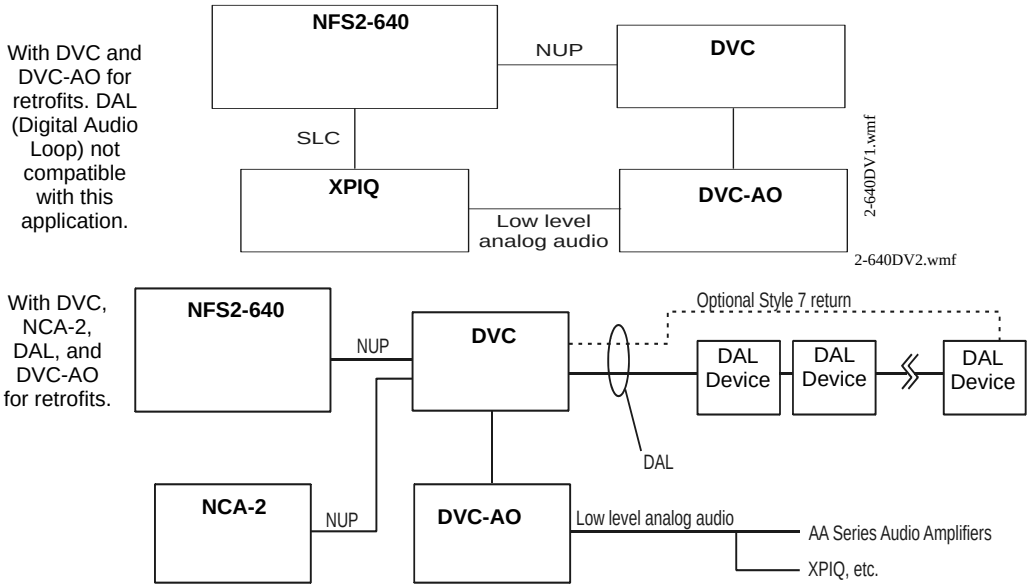


Figure 3.13 Block Diagrams of DVC Series Applications

3.7 Connecting the Power Cables

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.

3.7.1 Overview

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

- Primary AC power source – 120 VAC, 50/60 Hz, 5.0 A (with NFS2-640E use 240 VAC, 50/60 Hz, 2.5 A) from line voltage source. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes. Use 12 AWG (3.31 mm^2) wire (maximum) with a 600-volt rating.
- Secondary power source – 24 VDC from batteries, installed in the control panel (or in an optional battery cabinet). Secondary (battery) power is required to support the system during loss of primary power.
- External power sources – 24 VDC power for Smoke Detectors (4 wire), NACs, and Annunciators.
- Auxiliary power source – 24 VDC power @ 0.5 A and 5 VDC power @ 0.15 A from TB2 on the CPS-24/E.

See Appendix B.1 “Electrical Specifications” for details and overall installation guidelines.

3.7.2 Connecting the Control Panel to AC Power

Connect primary power as follows (see Figure 3.14):

1. Turn off the circuit breaker at the main power distribution panel.
2. Open the hinged insulating cover on TB1.
3. Connect the service ground to terminal marked Ground (Earth).
4. Connect the primary neutral line to terminal marked NEUTRAL and the primary Hot line to terminal marked HOT.
5. Close the hinged insulating cover over TB1.

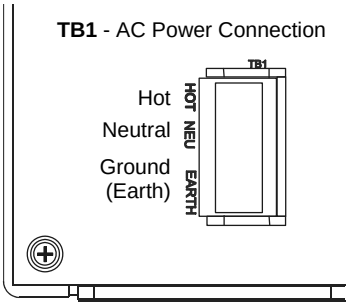


Figure 3.14 CPS-24/E: AC Power Connections

3.7.3 Checking AC Power

Table 3.3 contains a checklist for checking the system with AC power applied:

CAUTION:

WHILE CHECKING AC POWER, MAKE SURE BATTERIES ARE NOT CONNECTED. FOLLOW THE SEQUENCE OF STEPS IN SECTION 3.2 “INSTALLATION CHECKLIST”, TABLE 3.1; THIS IS STEP 15.

Component	Status
Control panel circuit board	The green AC Power indicator on; the system Trouble indicator on because batteries are not connected.
Each option board	The yellow Trouble indicator may come on for approximately 10 seconds after applying AC power. (This only applies to an unconfigured system.)
Each auxiliary power supply	The yellow Trouble indicator comes on because batteries are not connected.

Table 3.3 AC Power Checklist

3.7.4 Installing and Connecting the Batteries

WARNING:

BATTERY CONTAINS SULFURIC ACID WHICH CAN CAUSE SEVERE BURNS TO THE SKIN AND EYES, AND CAN DESTROY FABRICS. IF CONTACT IS MADE WITH SULFURIC ACID, IMMEDIATELY FLUSH SKIN OR EYES WITH WATER FOR 15 MINUTES AND SEEK IMMEDIATE MEDICAL ATTENTION.

WARNING:

DO NOT CONNECT THE BATTERY INTERCONNECT CABLES (P/N 75560 AND 75561) AT THIS TIME. MAKE THIS CONNECTION AFTER INITIAL SYSTEM PRIMARY POWERUP. FOLLOW SEQUENCE OF STEPS IN SECTION 3.2 “INSTALLATION CHECKLIST”, TABLE 3.1; THIS IS STEP 16.

Batteries are installed in the control panel cabinet or in a separate battery cabinet which can be mounted below the control panel or up to 20 feet (6.096 m) away from the control panel, in conduit in the same room.

Connect the battery as follows (see Figure 3.14 above):

1. Install batteries into bottom of cabinet or into separate battery cabinet.
2. Connect the red cable from TB3(+) on the CPS-24/E power supply to the positive (+) terminal of one battery.
3. Connect the black cable from TB3(–) on the CPS-24/E power supply to the negative (–) terminal of the **other** battery.
4. Connect the remaining cable between the negative (-) terminal on the first battery to the positive (+) terminal on the second battery.

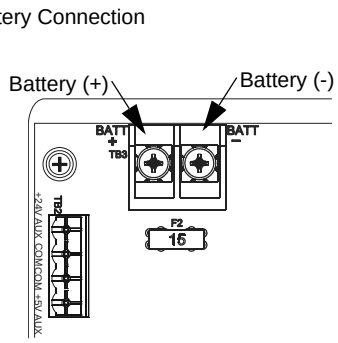


Figure 3.15 CPS-24/E: DC Power Connections

3.7.5 External DC Power Output Connections

Terminal TB10 provides two (2) power outputs, resettable and non-resettable. Each output is power-limited. Follow sequence of steps in Section 3.2 “Installation Checklist”, Table 3.1; this is part of Step 6. TB2 (on CPS-24), TB10 and all 4 NACS share a maximum of 3.0 A in standby and 6.0 A in alarm.

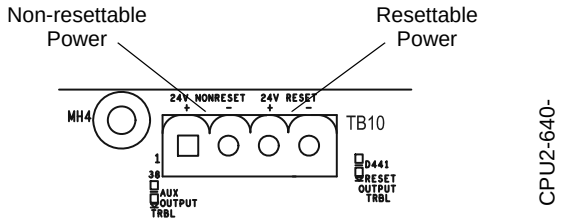


Figure 3.16 Power Supply DC Outputs - TB10

24 VDC Resettable Power Circuit (Four-Wire Smoke Detectors). The power supply provides a single 24 VDC filtered, power-limited, resettable power circuit for devices that require resettable power (such as four-wire smoke detectors). This circuit is power-limited, but must be supervised. To provide supervision, install a UL-listed end-of-line power supervision relay (such as the System Sensor model EOLR-1) after the last device. Connect the power supervision relay normally open contact in series with an Initiating Device Circuit (IDC). The four-wire power circuit energizes the power supervision relay. When you reset the system, the control panel removes power from these terminals for approximately 15 seconds.

Connect external field wires to the power supply terminals TB10 RESET(+) and (–) to provide up to 1.25 A of current for powering four-wire smoke detectors. See Figure 3.16 above. TB2 (on CPS-24), TB10 and all 4 NACS share a maximum of 3.0 A in standby and 6.0 A in alarm.

24 VDC Non-resettable Power Circuit The power supply provides one 24 VDC filtered, power-limited, non-resettable power output, capable of up to 1.25 A. Use this circuit to power devices that require low-noise 24 VDC power (such as annunciator model ACM-24AT or the transmitter module TM-4).

Connect external field wires to power supply terminals TB10 NONRESET(+)and(–) to provide up to 1.25 A of non-resettable current for powering external devices such as annunciators. See Figure 3.16 above. TB2 (on CPS-24), TB10 and all 4 NACS share a maximum of 3.0 A in standby and 6.0 A in alarm.

CAUTION:
DURING SYSTEM RESET, POWER REMAINS AT TERMINALS TB10 NONRESET(+)AND(–).

3.7.6 Accessories DC Power Output Connections

Terminal TB2 supplies one (1) non-resettable, power-limited 24 VDC circuit and one non-resettable, power-limited 5 VDC circuit available to power external devices. Applications that require a 5V connection to the Accessories Output, such as an UZC-256, must be within 10 feet (3.658 meters) of the power supply. The distance from the power supply to the accessory requiring power must not extend past the length of the supplied cable, P/N 75657 (supplied with UZC-256), which is 10 feet long. Do not splice or otherwise extend P/N 75657. Refer to section B.2, "Wire Requirements" of this manual for all applications requiring a 24V connection. Connect wiring with all power sources off.

- 24 VDC (nominal) @ 0.5 A max
- 5 VDC (nominal) @ 0.15 A max

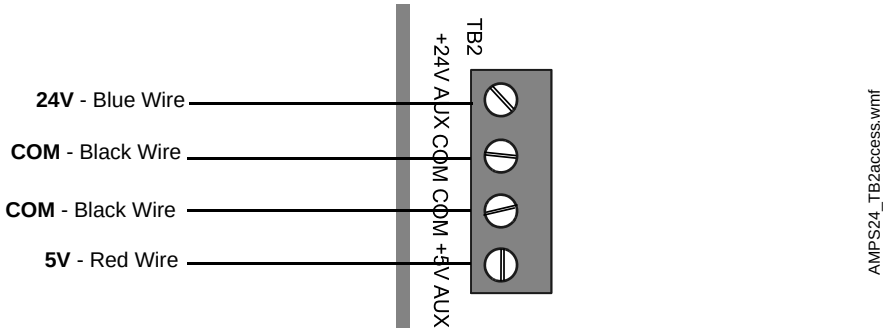


Figure 3.17 Connecting to the Accessories Output TB2 on CPS-24/E

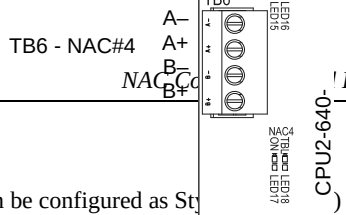


Figure 3.19 NAC Terminals and NAC LEDs

3.8 NAC Connections and Releasing Circuits

The control panel provides four NAC terminals as shown in Figure 3.19. Each can be configured as Sty) or Style Z (Class A) as shown in Figure 3.18. Each circuit can provide 1.5 A of current, but the total current drawn from the main power supply cannot exceed 7.4 A in alarm condition (refer to Table A.2). Additionally, TB10, TB2, and TB4 NAC circuits share a total of 3.0 A in standby and 6.0 A in alarm; see Appendix A. NAC circuits are supervised and power-limited. Use UL-listed AV notification appliances only (refer to the *Device Compatibility Document*).

NOTE: Any NAC can be programmed as a releasing circuit, and the releasing circuit must be supervised; see Figure 4.8–Figure 4.10. For more information, refer to Section 4 "Applications" in this manual and the *NFS2-640/E Programming Manual.* Refer to the *Device Compatibility Document* for UL-listed compatible releasing devices. Sample connections for NAC terminals are shown in Figure 3.18. Follow sequence of steps in Section 3.2 "Installation Checklist", Table 3.1; this is part of Step 6.

3.8.1 Stat-X Devices

Figure 3.20 shows typical wiring for STAT-X devices using the Ematch Protection Device (P/N 3005014). When using Stat-X devices, note the following:

- Each Stat-X device requires an Ematch Protection Device to protect against high-voltage transient signals, such as lightning, that may cause the device to accidentally release.
- Multiple Stat-X devices can be connected in series (as shown).
- No more than ten (10) Stat-X devices can be connected on a single releasing circuit.
- A REL-2.2K can be installed on a single Stat-X device for short circuit detection. For multiple Stat-X devices installed in series, the REL-2.2K is installed on the last device on the releasing circuit (as shown). A REL-2.2K is required for ULC applications.
- Stat-X devices are not to be used with the FCM-1 or FCM-1-REL.

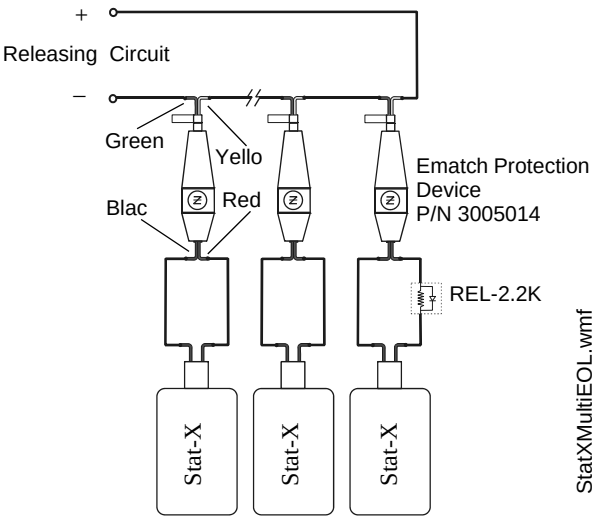


Figure 3.20 Wiring Diagram for Stat-X Devices

3.9 Output Relay Connections

The panel provides a set of Form-C relays. These are rated for 2.0 A at 30 VDC (resistive):

- Alarm - TB4
- Trouble - TB4
- Supervisory - TB5
- Security - TB5

These are power-limited only if connected to a power-limited source.

Using VeriFire Tools, the Supervisory and Security contacts can also be configured as Alarm contacts. Follow instructions in the VeriFire Tools online help.

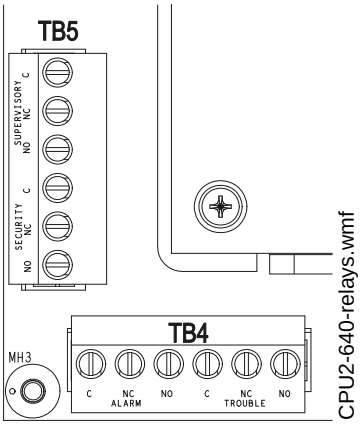


Figure 3.21 Form-C Relay Connections

3.10 Backup-Alarm Switches

WARNING:

DO NOT ENABLE THE BACKUP OPTION SWITCH FOR ANY OF THE FOUR NOTIFICATION APPLIANCE CIRCUITS (NACS) IF THEY ARE USED FOR RELEASING FUNCTIONS!

Backup alarm switches are provided that enable NACs and the alarm relay to activate during a backup alarm condition. If the main board's microcontroller fails and an alarm is reported by any detector or a monitor module that has backup reporting enabled, the NAC will turn on if the corresponding switch was enabled. The alarm will activate during microcontroller failure regardless of the settings of switches SW1–SW4.

- SW1 - NAC#1
- SW2 - NAC#2
- SW3 - NAC#3
- SW4 - NAC#4

So, for example, if SW1 and SW4 were enabled at the time of an alarm during microcontroller failure, NAC#1 and NAC#4 would activate. Follow sequence of steps in Section 3.2 "Installation Checklist", Table 3.1; this is Step 7.

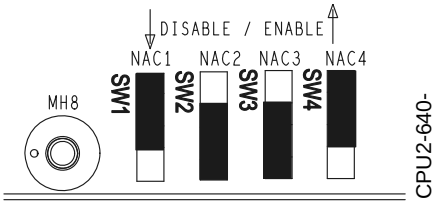


Figure 3.22 Backup Alarm Switches

3.11 UL Power-limited Wiring Requirements

Power-limited and nonpower-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 nonpower-limited circuit wiring. All power-limited and nonpower-limited circuit wiring must enter and exit the cabinet through different knockout and or conduits. To maintain separation, group non-power limited modules together, i.e., group modules on the same side of the enclosure or in separate rows.

Figure 3.23 shows one configuration that meets these UL requirements. The first two rows of modules are configured with at least a 0.25 inch (6.35 mm) separation between power-limited and nonpower-limited wiring; AC and battery wiring is routed away from power-limited wiring.

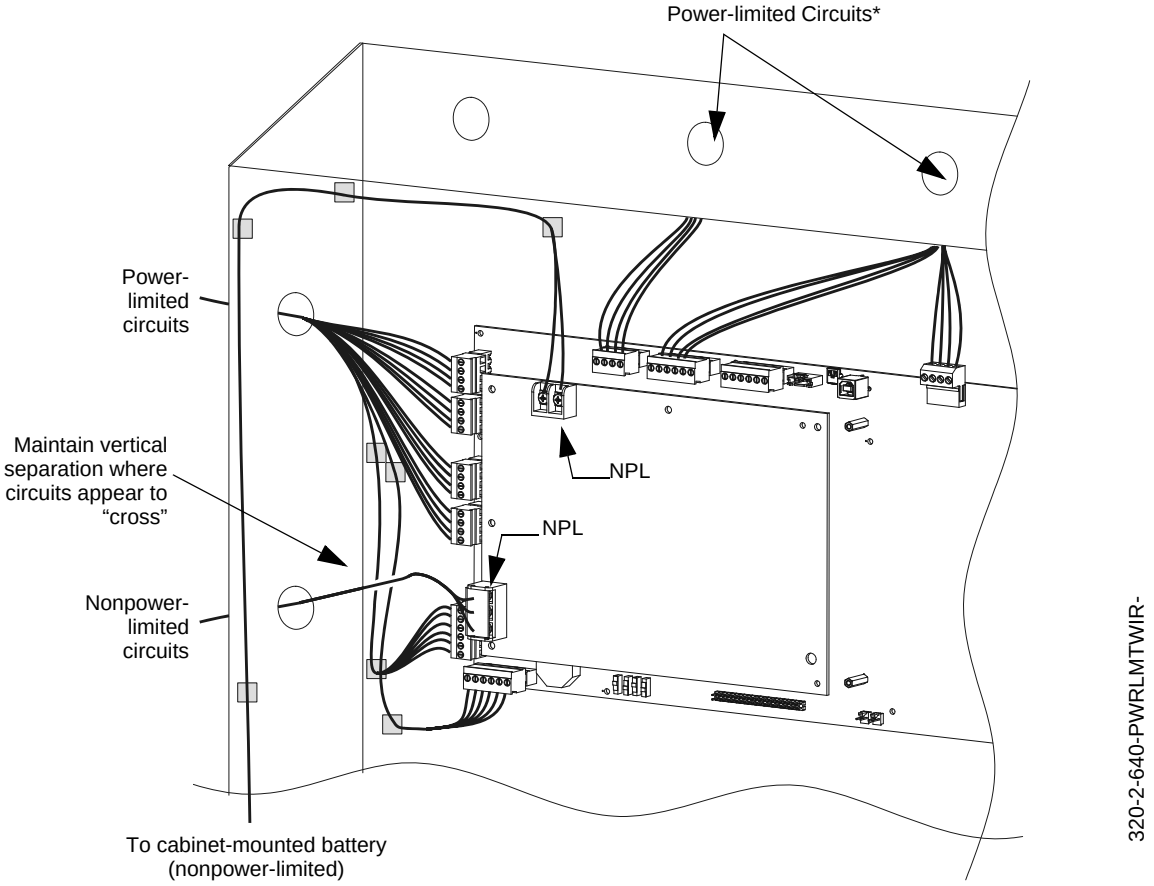


Figure 3.23 Typical Wiring for UL Power-limited Wiring Requirements (Shown with relays as connected to power-limited modules)

NOTE: AC and battery wiring are not power-limited. Maintain at least 0.25 inches (6.35 mm) between power-limited and non power-limited circuit wiring. Install tie wraps and adhesive squares to secure the wiring. Use a power-limited source for relay output on terminals TB8 – TB11.
See Figure 2.2, "CPU2-640/CPU2-640E and Power-Supply: Wiring Connections" on page 13 to identify power-limited and non-powerlimited circuits.

NOTE: Drawing is not to scale; proportions and angles are exaggerated to show wire-placement more clearly.

NOTE: If additional knockouts are added to the backbox, proper separation of power-limited and nonpower-limited wiring should be maintained.

3.11.1 Labeling Modules and Circuits

At the time of installation, each nonpower-limited circuit connected to ACM-8R, and LDM-R32 modules must be identified in the space provided on the cabinet door label when connected to a non-power-limited source of power.

The label lists all compatible power-limited modules and circuits; also see Figure 2.2 on page 13.

The LDM-R32 is power-limited only when connected to power-limited sources. When connected to a non-power-limited source, the power-limited marking must be removed.

3.12 Installing EIA-485 Devices

Figure 3.24 provides a closer view of the EIA-485 connections provided on TB11. Because specific connections can vary by the type of device being connected, refer to the product installation manual for details.

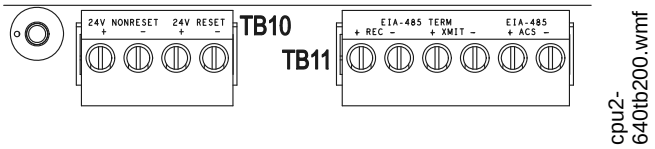


Figure 3.24 EIA-485 Connections

3.13 Installing Remote Printers and/or CRT

3.13.1 Custom Cable Fabrication

A custom cable needs to be fabricated to connect the PRN Printer, Keltron Printer or the CRT-2 Monitor to the system. Length of the cable will vary with each installation, but should not exceed a maximum length of 50 feet (15.24 m). Printer must be installed in the same room as the panel, within 20 feet (6.10 meters) and the cable must be installed in conduit. Construct cable as follows:

1. Using overall foil/braided-shield twisted-pair cable, properly connect one end to the DB-25 or DB-9 Connector using the wiring specifications shown in the table below.
2. Tighten clamp on connector to secure cable.

DB-9 Connector	DB-25 Connector	TB12 on Control Panel
Pin 2	Pin 3	TX
Pin 3	Pin 2	RX
Pin 5	Pin 7	REF

Table 3.4

3.13.2 Installing and Configuring the PRN Series Printer

When connected to the Control Panel via an EIA-232 interface, the PRN prints a copy of all status changes within the control panel and time-stamps the printout with the time of day and date the event occurred. It provides 80 columns of data on standard 9" by 11" tractor-feed paper.

NOTE: You can also use the EIA-232 printer interface with UL-listed information technology equipment, such as personal computers, to monitor the control panel for supplementary purposes.

This section contains information on connecting a printer to the control panel and for setting the printer options.

Connecting a Remote PRN Series Printer

Remote printers require a 120 VAC, 50/60 Hz primary power source. 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. You may use your building emergency power supply, so long as it meets the power continuity requirements of NFPA 72. Refer to NFPA 72 for further details.

Connect the remote printer to the Control Panel as follows:

1. Connect the three (3) open leads of the custom cable to the TB12 terminal block on the control panel as shown in Figure 3.25.
2. Plug the DB-25 or DB-9 connector end of the custom cable into the EIA-232 port of the remote printer. Tighten securely.

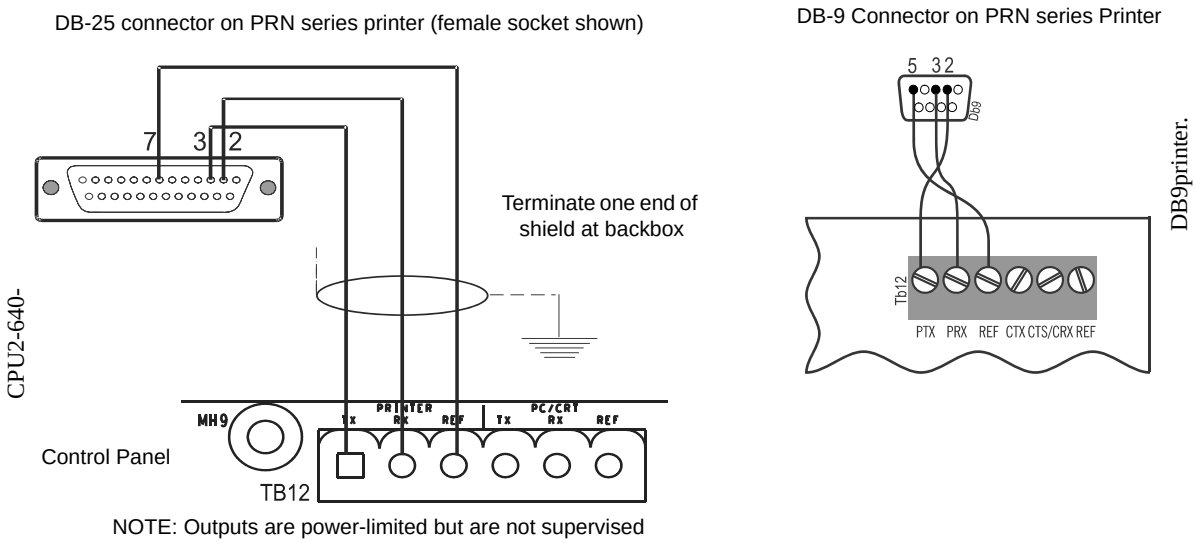


Figure 3.25 Remote Printer Connections

Setting Printer Options

Refer to the documentation supplied with the PRN series printer for instructions on using the printer menu controls. Set the printer options (under the menu area) according to the settings listed in Table 3.5.

Option	Setting	Option	Setting
Font	HS Draft	CPI	10 CPI
LPI	6 LPI	Skip	0.5
ESC Character	ESC	Emulate	Epson FX-850 PRN-6, LQ-2550 PRN-7
Bidirectional Copy	ON	I/O	
CG-TAB	Graphic	Buffer	40K PRN-6, 64K PRN-7
Country	E-US ASCII	Serial	
Auto CR	OFF	Baud	9600, 4800, or 2400
Color Option	Not Installed	Format	7 Bit, Even, 1 Stop
Formlen		Protocol	XON/XOFF
Lines	6LPI=60	Character Set	Standard
Standard	Exec 10.5” PRN-6, 11” PRN-7	Sl.Zero	On
		Auto LF	Off
		PAPER	
		BIN 1	12/72"
		BIN 2	12/72"
		SINGLE	12/72"
		PUSH TRA	12/72"
		PULL TRA	12/72"
		PAP ROLL	12/72"

Table 3.5 PRN Setup Options

3.13.3 Installing and Configuring a Keltron Printer

Connect the remote printer to the Control Panel as follows:

1. Connect the three (3) open leads of the custom cable to the TB12 terminal block on the control panel as shown in Figure 3.26.
2. Connect DC power from TB10 terminal block on the control panel as shown in Figure 3.26.
3. Plug the DB-25 connector end of the custom cable into the EIA-232 port of the Keltron printer. Tighten securely.

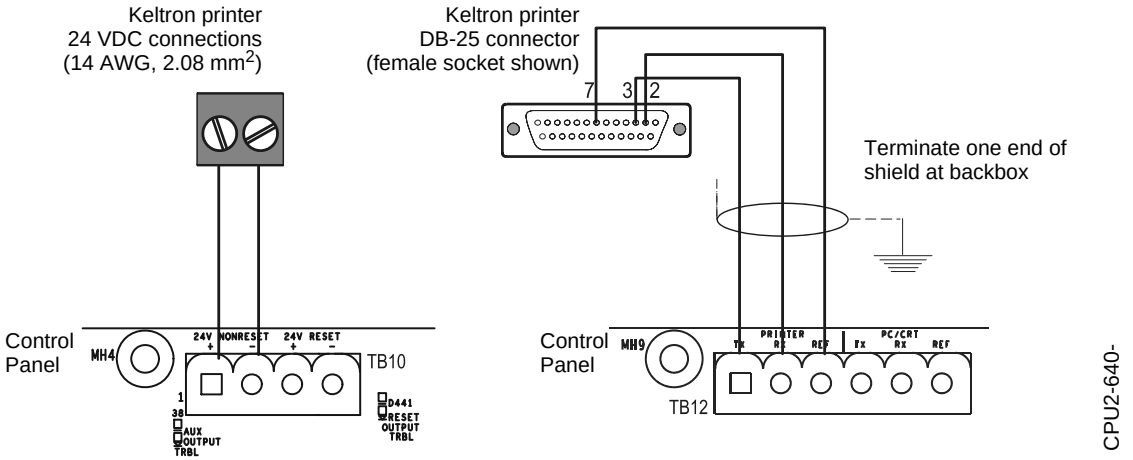


Figure 3.26 Keltron Printer Connections

Setting up the Keltron Printer

Set up a Keltron printer as follows:

1. The printer communicates using the following protocol:
   • Baud Rate: 9600 • Parity: Even • Data bits: 7
2. Set the printer DIP switches SP1 and SP2 according to settings in Table 3.7.

SP1	On	Off
1		X
2		X
3		X
4	X	
5		X
6	X	
7	X	
8		X

Table 3.6

SP2	On	Off
1		X
2		X
3		X
4	X	
5		X
6		X
7	X	
8		X

Table 3.6

Table 3.7 Keltron DIP Switch Settings

3.13.4 Installing and Configuring a CRT-2

A CRT-2 can only be used in a non-networked application when used with the NFS2-640/E. For further details on setting up the CRT-2, refer to the *NFS2-640/E Operations Manual.*

Connect a CRT-2 to the Control Panel as follows:

1. Connect the three (3) open leads of the custom cable to the TB12 terminal block on the control panel as shown in Figure 3.27.
2. Plug the DB-25 connector end of the custom cable into the EIA-232 port of the CRT-2. Tighten securely.
3. Set parameters as discussed in Table 3.27.

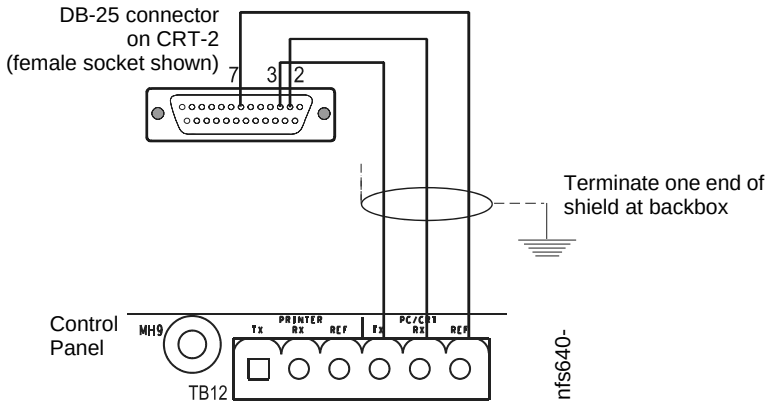


Figure 3.27 Connecting a CRT-2

Setting CRT-2 Parameters

The CRT-2 communicates with the control panel through a protocol defined by thirteen groups of parameters. To access a parameter group, press the corresponding function key (F1-F12) as shown in Table 3.8 below. You can then program parameters in each group.

Enter the CRT-2 setup menu by pressing and holding the <Ctrl> key while pressing the <Scroll Lock> key. Use arrow keys to move through the selections in each setup group; press the space bar to view the options for each parameter. When finished programming all setup groups, press the <Pause> key. To save all changes, press <Y>.

Table 3.8 shows the standard settings for using the CRT-2 with the NFS2-640/E; for one instance where these settings may change slightly see Section 3.13.5 “Connecting Multiple Printers, CRTs, or CRT/PRN Combination”. The basic settings for using the CRT-2 with NFS2-640/E are:

• Baud Rate 9600 • Data format 8 1 N • Protocol xon/off.

NOTE: This section covers installation only; for information on how the CRT-2 functions as part of the fire alarm system, see the *NFS2-640/E Operations Manual*.

NOTE: The CRT cannot be connected at the same time as the network.

Function Key	CRT-2 Parameters		
F1: Quick	Emulation=CRT-2	EIA Baud Rate=9600	EIA Data Format=8/1/N
(“Read Status” key)	Comm Mode=Full Duplex	Aux Baud Rate=9600	Aux Data Format=8/1/N
	Enhanced=On	Language=U.S.	Host/Printer=EIA/Aux
F2:Genrl	Emulation=CRT-2	Enhanced=On	Auto Wrap=Off
(“Alter Status” key)	Auto Font Load=On	Auto Page=Off	Auto Scroll=On
	Monitor Mode=Off	Bell Volume=09	Warning Bell=On
	Host/Printer=EIA/Aux		
F3: Displ	Page Length=24	Screen Length=26 Lines	Screen Video=Normal
(“Prog” key)	Display Cursor=On	Cursor=Blink Line	Auto Adjust Cursor=On
	Columns=80	Width Change Clear=Off	Speed=Normal
	Scroll=Jump	Refresh Rate=60 Hz	Overscan Borders=Off
F4: Kybd	Language=U.S.	Char Set Mode=ASCII	Key Mode=ASCII
(“Spl Funct” key)	Keyclick=Off	Key Repeat=Off	Margin Bell=Off
	Key Lock=Caps	Keyboard Present=Yes	
F5: Keys	Enter Key=<CR>	Return Key=<CR>	Backspace=<BS>/<DEL>
(“Prior” key)	Alt Key=Meta	Disconnect=Pause	Desk Acc=Disabled
	Pound Key=U.S.		
F6: Ports	EIA Baud Rate=9600	EIA Data Format=8/1/N	EIA Parity Check=On
(“Next” key)	Aux Baud Rate=9600	Aux Data Format=8/1/N	Aux Parity Check=On
	EIA Xmt=Xon-Xoff	EIA Recv=Xon-Xoff(XPC)	EIA Xmt Pace=Baud
	Aux Xmt=Xon-Xoff	Aux Recv=Xon-Xoff(XPC)	Aux Xmt Pace=Baud
	EIA Break=Off	EIA Modem Control=Off	EIA Disconnect=2 sec
	Aux Break=Off	Aux Modem Control=Off	Aux Disconnect=2 sec
F7: Host	Comm Mode=Full Duplex	Local=Off	Recv <CR>=<CR>
(“Auto Step” key)	Recv <DEL>=Ignore	Send ACK=On	Send Line Term=<CR><LF>
	Send Block Term=<CR>	Null Suppress=On	
F8: Print	Prnt Line Term=<CR><LF>	Prnt Block Term=<CR>	Secondary Recv=Off
(“Activ Signal” key)			
F9: Emul	Attribute=Page	Bright Video=Off	Page Edit=Off
	WPRT Intensity=Dim	WPRT Reverse=Off	WPRT Underline=Off
	WPRT Blink=Off	Display NV Labels=Off	Save Labels=On
	Status Line=Off	Fkey Speed=Normal	
F10	Setup Group F10 does not affect communications with the control panel.		
F11	Setup Group F11 does not affect communications with the control panel.		
F12: Prog	Program the function keys as follows: F1 ~A F2 ~B F3 ~C F4 ~D F5 ~E F6 ~F F7 ~G		
(“Ack Step” key)	F8 ~H F9 ~I F10 ~J F11 ~K F12 ~L F13 ~M F14 ~N F15 ~O F16 ~P Shift F13 ~Q		

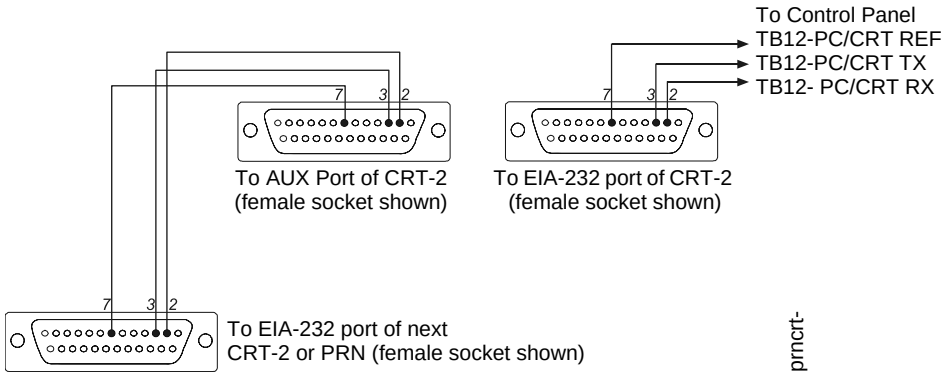
Table 3.8 Standard CRT-2 Settings for Use with NFS2-640/E

3.13.5 Connecting Multiple Printers, CRTs, or CRT/PRN Combination

Connecting multiple devices requires changing the CRT-2 setup using the F1(Quick) menu:

- Set Host/Printer=EIA/AUX.
- Set EIA Data Format=8/1/N.
- If the AUX device is a printer, set the Printer and AUX Data Format=7/1/E.
- If the AUX device is a second CRT-2, set the AUX Data Format=8/1/N.

Connect multiple devices as shown in Figure 3.28.



Note: For wire requirements, see Table B.5 in Appendix B.1 “Electrical Specifications”.

Figure 3.28 Connecting Multiple Devices on the EIA-232 Circuit

3.14 Wiring a Signaling Line Circuit (SLC)

■ Overview

Communication between the control panel and intelligent and addressable initiating, monitor, and control devices takes place through a Signaling Line Circuit (SLC). You can wire an SLC to meet the requirements of NFPA Style 4, Style 6, or Style 7 circuits. This manual provides requirements and performance details specific to this control panel; for installation information and general information, refer to the *SLC Wiring Manual*.

■ Wiring

Maximum wiring distance of an SLC using 12 AWG (3.31 mm^2) wire is 12,500 feet (3810 meters) total twisted-pair for Style 4, Style 6 and Style 7 circuits.

■ Capacity

The NFS2-640/E provides one (1) SLC, with a total capacity of 318 intelligent/addressable devices:

- 01-159 intelligent detectors
- 01-159 monitor and control modules

An optional expander board provides one (1) additional SLC, with the same capacity.

Units employing multiple detector operation shall include a minimum of two detectors in each protected space and reduce the detector installation spacing to 0.7 times the linear spacing in accordance with National Fire Alarm Code, NFPA. For spacing requirements refer to the detector's installation instruction.

NOTE: To meet the ten-second response time required by UL 864, 9th edition, when SLC loops are configured to run in CLIP mode, all input modules must be set to address 19 or lower on both loop one and 2. There are no limits to detectors or output modules.

■ Installation

This control panel supports one or two SLC loops; a second SLC loop is obtained by installing an LEM-320 module. SLC loop #1 connects to TB13 on the control panel; SLC loop #2 connects to TB1 on the LEM-320. For details on designing, installing and configuring SLC loops, see the *SLC Wiring Manual*.

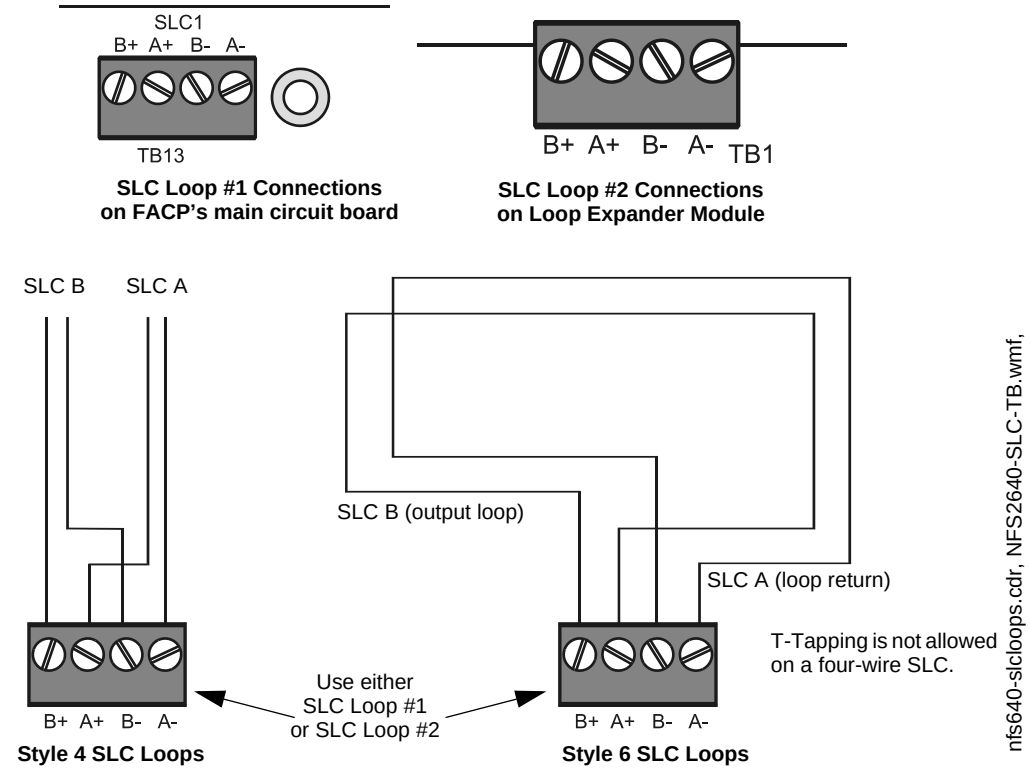


Figure 3.29 SLC Loop Connections and Wiring

3.15 Connecting a PC for Off-Line Programming

A PC can be hooked up to the control panel to allow the VeriFire Tools programming utility to upload and download the operating program. Refer to the insert in the VeriFire Tools CD insert and to the program's on-line help function for instructions. There are two options for connection:

1. For PCs with USB Ports, connect the PC to USB B via a standard USB B cable.
2. For PCs without USB Ports, connect the PC's serial port to the Control Panel Network/Service Connection (J1, NUP).

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.

Section 4: Applications

4.1 Overview

Chapter	Covers the following topics
Section 4.3 “NFPA 72 Central or Remote Station Fire Alarm System (Protected Premises Unit)”	How to install UDACT/UDACT-2 with the control panel for use as a NFPA Central or Remote Station Fire Alarm System (Protected Premises Unit)
Section 4.5 “NFPA 72 Proprietary Fire Alarm Systems”	How to set up a Protected Premises Unit to communicate with a listed compatible Protected Premises Receiving Unit.
Section 4.6 “Fire/Security Applications”	How to use the control panel as a combination Fire/Security system, including the following: • Installing a Security Tamper Switch into the cabinet • Circuit Wiring
Section 4.7 “Releasing Applications”	How to install the following releasing applications: • Releasing Device to the Control Panel (NAC integral circuits) • Releasing Device to the FCM-1 Module • Releasing Device to the FCM-1-REL Module • NBG-12LRA Agent Release-Abort Station

Table 4.1

Municipal Box (Auxiliary)

Municipal Box applications require a TM-4 Transmitter module. Refer to the *TM-4 Transmitter Module* installation document for installation details.

4.2 Devices Requiring External Power Supervision

With software version 12.0 or higher, certain type codes have external power supervision (FlashScan only) built into the software. An external power-supervision relay is required (see Figure 4.1) unless one of the following typecodes is selected for the device:

- Control
- Strobe
- Horn
- (Blank)
- Release Ckt
- Rel Ckt Ulc
- Nonreset Ctl
- Alarms Pend
- Gen Alarm
- Gen Supervis
- Gen Trouble
- Gen Pend
- Trouble Pend

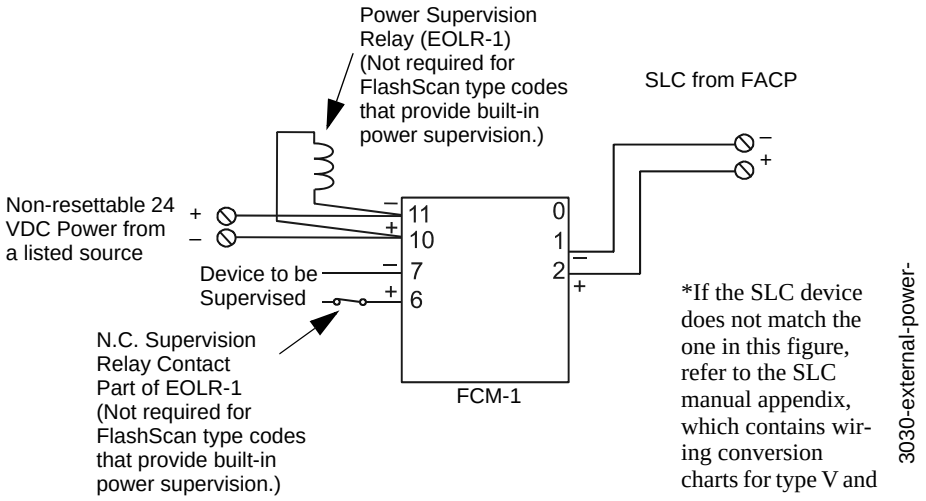


Figure 4.1 Enabling External Power Supervision Using Relays

4.3 NFPA 72 Central or Remote Station Fire Alarm System (Protected Premises Unit)

Figure 4.2 shows typical wiring diagram for a NFPA 72 Central Station Fire Alarm System (Protected Premises Unit) or a Remote Station Fire Alarm System (Protected Premises Unit) using the Universal Digital Alarm Communicator/Transmitter (UDACT or UDACT-2) and control panel. This provides typical wiring only; connect and program the UDACT or UDACT-2 according to the directions given in the *UDACT Instruction Manual* or *UDACT-2 Instruction Manual*.

NOTE: An NFPA 72 Central Station or Remote Station requires 24 hours of standby power and 5 minutes in alarm.

NOTE: This application can also be done with the TM-4 Transmitter; refer to the *TM-4 Transmitter Module* installation document for more details.

NOTE: For additional setup information for the UDACT-2, refer to the *UDACT-2 Instruction Manual*.

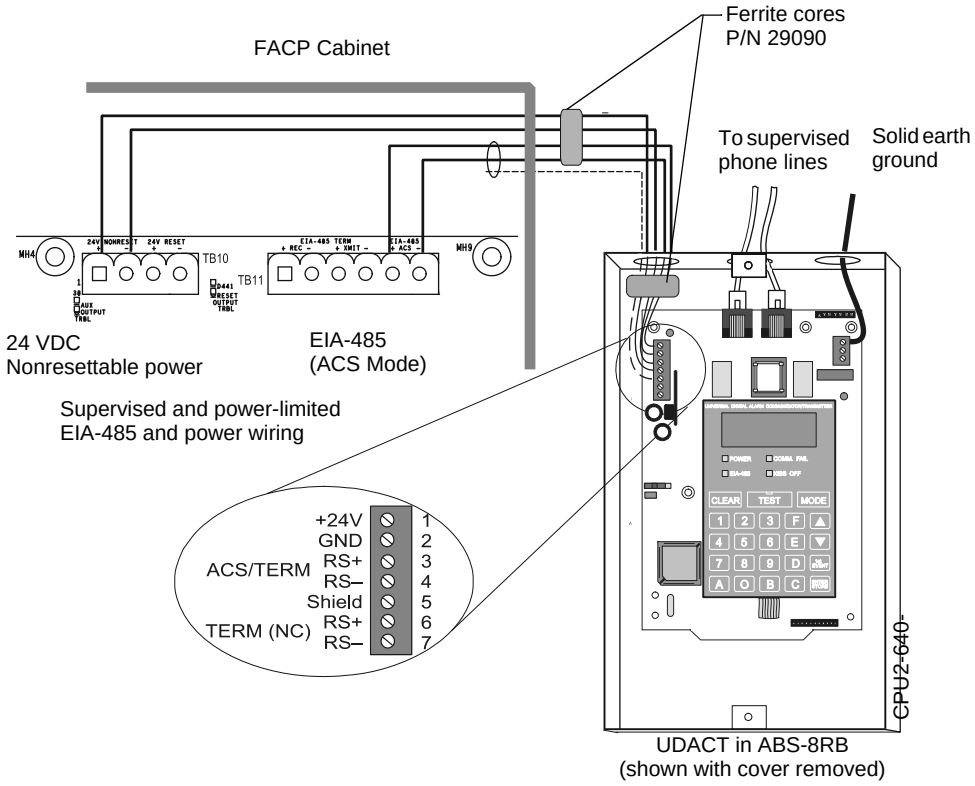
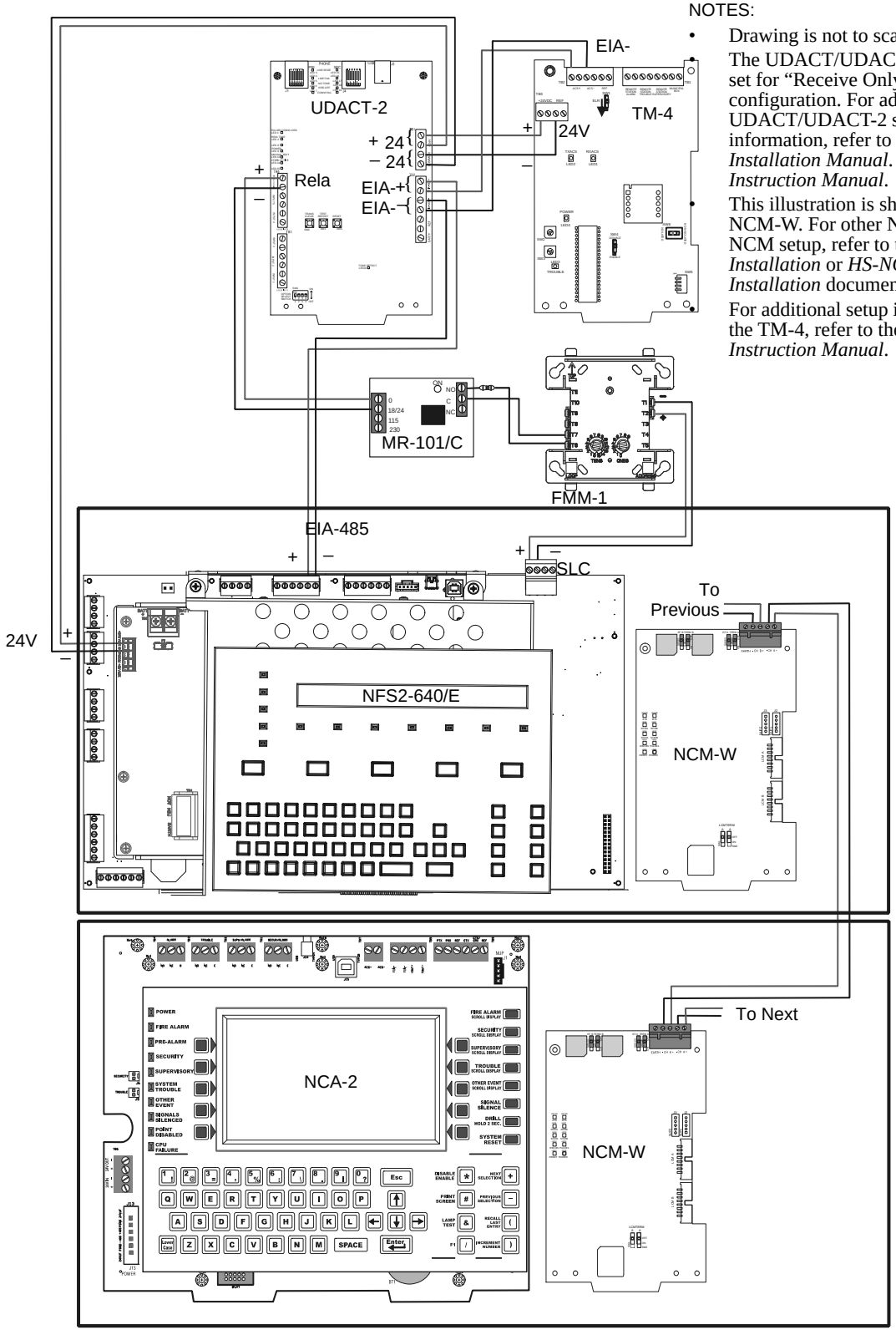


Figure 4.2 Typical Wiring Diagram for a Central Station Fire Alarm System

NOTE: Install a UL-listed 120 ohm End-of-Line resistor (P/N 71244) UDACT TB1 terminals 3 and 4 if this is the last or only device on EIA-485 line.

4.4 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 4.3 Central Station Canadian Requirements for Second Dial-Out Connection

4.5 NFPA 72 Proprietary Fire Alarm Systems

When connected and configured as a protected premises unit with UDACT or UDACT-2, the NFS2-640/E will automatically transmit General Alarm, General Trouble, and General Supervisory signals to a listed compatible Protected Premises Receiving Unit. See the *UDACT Manual* or *UDACT-2 Manual* for compatible receiving units. A simplified drawing of connections between the receiving unit and the NFS2-640/E protected premises unit is shown in Figure 4.4.

Connect the receiving unit to the protected premises unit as shown in Section 4.3 “NFPA 72 Central or Remote Station Fire Alarm System (Protected Premises Unit)”.

For information on installing and programming the Receiving unit, refer to the documentation for that control panel.

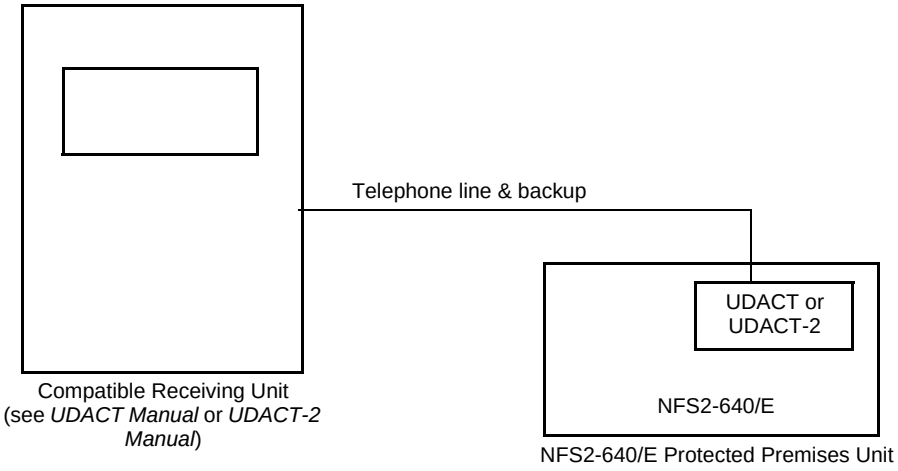


Figure 4.4 Typical Proprietary Fire Alarm Systems Wiring Connections

4.6 Fire/Security Applications

NOTE: NFS2-640/E is not approved for use in security applications in Canada.

4.6.1 General Operation

The control panel can be used as a combination Fire/Security system when installed and operated according to the instructions in this section.

For security applications, program one or more monitor modules (listed for security applications) with the SECURITY Type Code, and wire as shown in Figure 4.6. Activating this type of module lights the SECURITY LED, and displays a security alarm condition on the control panel LCD display. The panel sounder will sound until the Security alarm is acknowledged. You can also program additional sounders or output devices to activate with the security alarm initiating device. The SECURITY Type Code is designed to indicate an alarm as follows: (a) on an open or short circuit; or (b) on a ±50% change in resistance value from the End-of-Line resistor value.

A tamper switch installed in the cabinet door will indicate a door tamper condition whenever the door is open. If the control panel indicates a Security alarm, you can acknowledge, silence, and reset the condition from the control panel.

When the system resets, a 30-second exit timer starts. During this time the tamper switch and all Security alarms are ignored. There is no entrance delay timer.

For bypass of security zones, use the DISABLE routine (covered in the *Status Change* section of the *NFS2-640/E Operations Manual*) for Security type devices.

WARNING:
DAMAGE CAN RESULT FROM INCORRECT WIRING CONNECTIONS.

4.6.2 Installing a Security Tamper Switch

To wire the cabinet with a Security Tamper Switch kit model STS-1, refer to Figure 4.5:

1. Install the STS-1 Tamper Switch onto the side of the backbox opposite the door hinge, pushing the switch through the opening until it snaps into place.
2. Install the magnet on the same side of the cabinet door as the lock. Push the magnet through the opening in the door until it snaps into place.
3. Connect the STS-1 connector to J5 (Security Tamper) on the Control Panel. (As shown in Figure 4.5, J5 is located on the circuit board, underneath the edge of KDM-R2.)

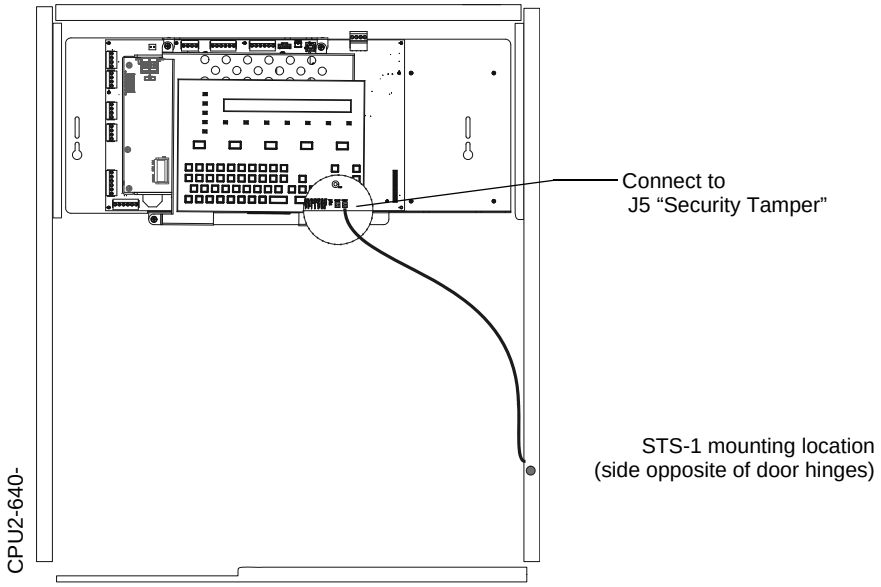


Figure 4.5 Installing the STS-1 Security Tamper Switch

4.6.3 Receiving Unit

For applications requiring transmission of security alarm information to a central receiving unit, the control panel may be connected via the UDACT or UDACT-2 to a compatible receiving unit (see the *UDACT Manual* or *UDACT-2 Manual*). For information on configuring the Receiving unit for Combination Fire/Security applications, refer to the documentation for that control panel.

4.6.4 Programming

The control panel can communicate with any number of security devices. To do so, program the points as follows:

1. Select the address of the module(s) to be used for security.
2. Select the Type Code SECURITY.

NOTE: For detailed instruction on programming Type Codes, refer to the NFS2-640/E *Programming Manual.*

4.6.5 Wiring for Proprietary Security Alarm Applications

Table 4.6 shows typical wiring for proprietary security alarm applications with FMM-1 modules. Note the following:

- The module is programmed with software SECURITY Type Code.
- For use with UL listed systems only; application not for ULC security usage.
- NAC devices used for security cannot be shared with fire NAC devices.
- Refer to the *Device Compatibility Document* for compatible NAC devices.
- All monitor modules used for security application must be installed in the NFS2-640/E cabinet with STS-1 Security Tamper Switch.

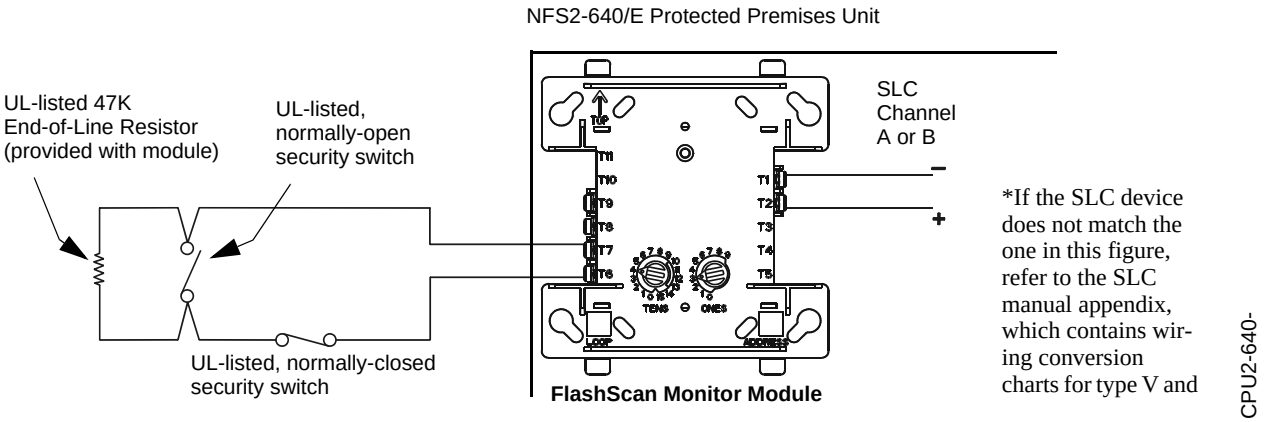


Figure 4.6 Wiring Diagram for Proprietary Security Alarm Applications

4.7 Releasing Applications

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.

WARNING:

DO NOT ENABLE THE BACKUP OPTION SWITCH FOR ANY OF THE FOUR NOTIFICATION APPLIANCE CIRCUITS (NACS) IF THEY ARE USED FOR RELEASING FUNCTIONS!

4.7.1 Overview

This control panel can be used for agent release or preaction/deluge control applications. In a properly configured system with compatible, listed actuating and initiating devices, this control panel complies with the following NFPA standards for installation in accordance with the acceptable standard:

Standard	Covers
NFPA 12	CO_2 Extinguishing Systems
NFPA 12A	Halon 1301 Extinguishing Systems
NFPA 13	Sprinkler Systems
NFPA 15	Water Spray Systems
NFPA 16	Foam-Water Deluge and Foam-water Spray Systems
NFPA 17	Dry Chemical Extinguishing Systems
NFPA 17A	Wet Chemical Extinguishing Systems
NFPA 2001	Clean Agent Fire Extinguishing Systems

Table 4.2 NFPA Standards for Releasing Applications

To locate your specific releasing applications, including type codes and wiring diagrams, see the checklist in Table 4.3:

Refer to
Section 4.7.2 “Programming”
Section 4.7.3 “Connecting a Releasing Device to the Control Panel”.
Section 4.7.4 “Connecting a Releasing Device to the FCM-1 Module”.
Section 4.7.6 “Connecting an NBG-12LRA Agent Release-Abort Station”.

Table 4.3 Locating Specific Releasing Application Details in This Manual

4.7.2 Programming

The control panel supports up to ten releasing software zones. You can map these zones to activate Control Panel releasing outputs and FCM-1 modules. Program the FCM-1 module for the appropriate type code according to the chart below:

Type Code: RELEASE CKT	Type Code: REL CKT ULC
• For use in UL applications. • Do not use REL device at the solenoid. • Cannot use power-limited wiring. • Supervised for open circuit only. • Supervised for power loss with power-supervision relay.	• For use in UL or ULC applications. • Requires REL device at solenoid. • Power-limited wiring. • Supervised for open circuit and shorts. • Supervised for power loss with power-supervision relay.

For more information, refer to the *NFS2-640/E Programming Manual*.

4.7.3 Connecting a Releasing Device to the Control Panel

Use TB6 (NAC#4), TB7 (NAC#3), TB8 (NAC#2), or TB9 (NAC#1) on the control panel for NAC/Releasing Circuits. The releasing circuit must be supervised and use listed, compatible releasing devices; see Figure 4.8–Figure 4.10 (page 48).

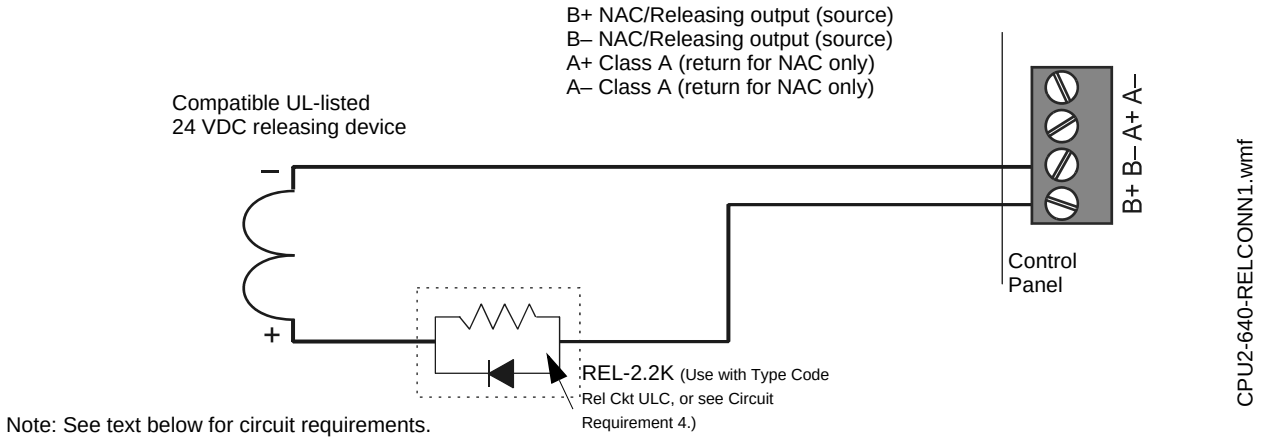


Figure 4.7 Typical Style 4 Connection of a Releasing Device to Control Panel

WARNING:

DO NOT ENABLE THE BACKUP OPTION SWITCH FOR ANY OF THE FOUR NOTIFICATION APPLIANCE CIRCUITS (NACS) IF THEY ARE USED FOR RELEASING FUNCTIONS!

Circuit Requirements. When connecting a releasing device, note the following:

1. The control panel provides four NAC/Releasing Circuits (Style Y or Z). Each circuit can provide 1.5 A. Total current drawn from the power supply cannot exceed 7.4 A in an alarm condition (refer to Table A.2, "System Draw Current Calculations," on page 55). Use compatible UL-listed 24 VDC appliances only. For more information on compatible appliances, refer to the *Device Compatibility Document*.
2. Refer to the Releasing Applications appendix in the *NFS2-640/E Programming Manual* for configuration details (such as setting the Soak Timer).
3. For applications using power-limited circuits:

   a) Use an in-line supervisory device (P/N REL-2.2K) with control panel releasing circuits. Connect the End-of-Line device as shown in Figure 4.7.

   b) Program the releasing circuit for Type Code REL CKT ULC.

   c) Circuits are supervised against opens and shorts.
4. For applications <u>not requiring power-limited circuits</u> –

   a) If the application does not require supervising the releasing device against shorts, in-line supervisory devices (P/N REL-2.2K) are not required.

   b) In non-power-limited applications, program the releasing circuit for Type Code RELEASE CKT.

   c) Limited energy cable cannot be used to wire a non-power-limited releasing device circuit

   d) Maintain a 0.25 inch (6.35 mm) spacing between the non-power-limited releasing circuit device wiring and any power-limited circuit wiring.)
5. The releasing circuit must be programmed with a releasing type code listed in the *NFS2-640/E Programming Manual*.

NOTE: As per UL 864 9th Edition, a supervisory signal must be indicated at the panel whenever a releasing circuit is physically disconnected. Use a monitor module to monitor dry contacts off the switch. See 4.11.

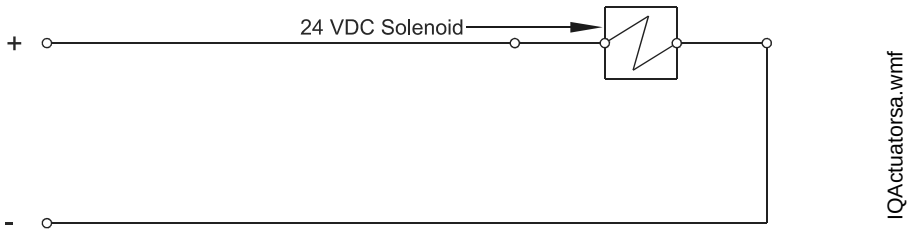


Figure 4.8 Releasing Circuits (Option 1)

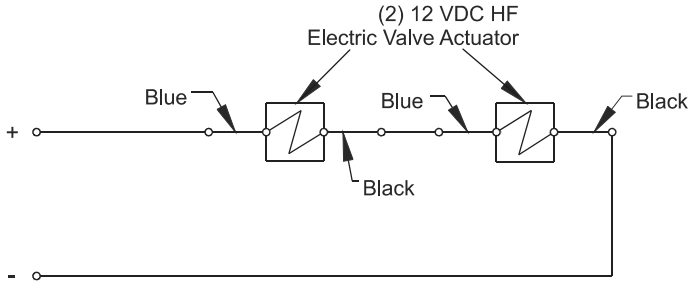


Figure 4.9 Releasing Circuits (Option 2)

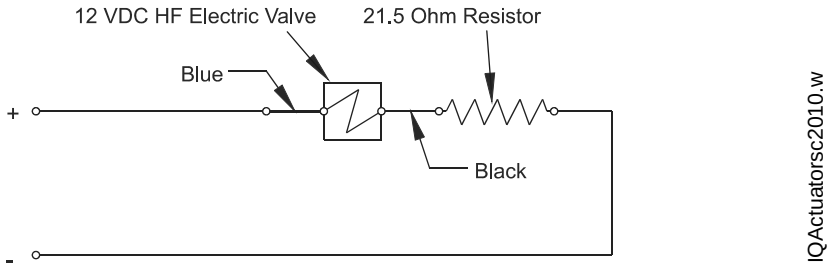


Figure 4.10 Releasing Circuits (Option 3)

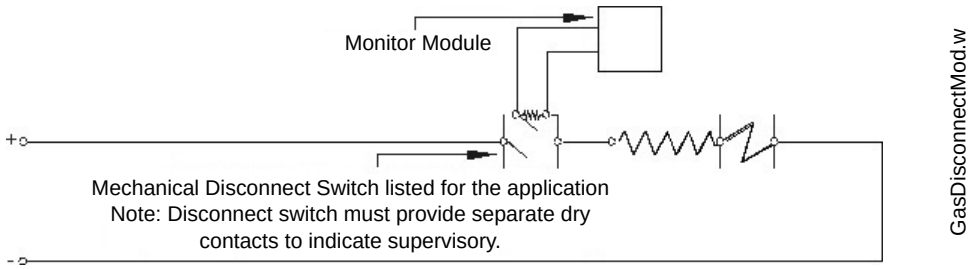


Figure 4.11 Release Circuits (Mechanical Disconnect Switch)

4.7.4 Connecting a Releasing Device to the FCM-1 Module

The module can control 1 A of current. Make sure to keep total system current within the limits of the power supply. You can power the module from the power supply of the Control Panel or any UL/ULC listed 24 VDC regulated power-limited power supply for Fire Protective Signaling. For more information, refer to the *Device Compatibility Document.*

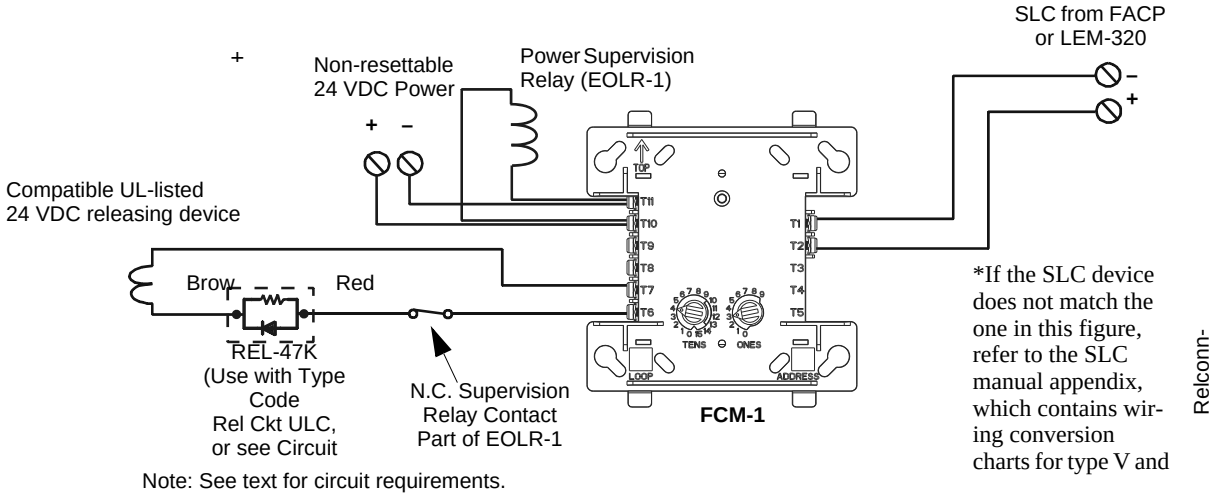


Figure 4.12 Typical Connection of a 24 VDC Releasing Device to the FCM-1 Module

Circuit Requirements When connecting a releasing device to the FCM-1 module, note the following:

1. Refer to the Releasing Applications appendix in the *NFS2-640/E Programming Manual* for configuration details (such as setting the Soak Timer).
2. For applications using power-limited circuits:

   a) Use an in-line supervisory device (P/N REL-47K) with the FCM-1 module. Connect the in-line supervisory device as shown in Figure 4.12.

   b) Program the releasing circuit for Type Code REL CKT ULC.

   c) Circuits are supervised against opens and shorts.
3. For applications not requiring power-limited circuits:

   a) In-line supervisory devices (P/N REL-47K) are not required; however, the releasing device circuit is not supervised against shorts.

   b) In non-power-limited applications, program the releasing circuit for Type Code RELEASE CKT.

   c) Limited energy cable cannot be used to wire a non-power-limited releasing device circuit.

   d) Maintain a 0.25 inch (6.35 mm) spacing between the non-power-limited releasing circuit device wiring and any power-limited circuit wiring.

WARNING:

THE XP6-C IS NOT LISTED FOR RELEASING APPLICATIONS AND CANNOT BE SUBSTITUTED FOR FCM-1

NOTE: As per UL 864 9th Edition, a supervisory signal must be indicated at the panel whenever a releasing circuit is physically disconnected. Use a monitor module to monitor dry contacts off the switch. See 4.11.

4.7.5 Connecting Releasing Devices to the FCM-1-REL Control Module

Typical Connections Figure 4.13 and Figure 4.13 show typical connections for wiring a releasing device to the FCM-1-REL. Refer to the Device Compatibility Document for compatible releasing devices.

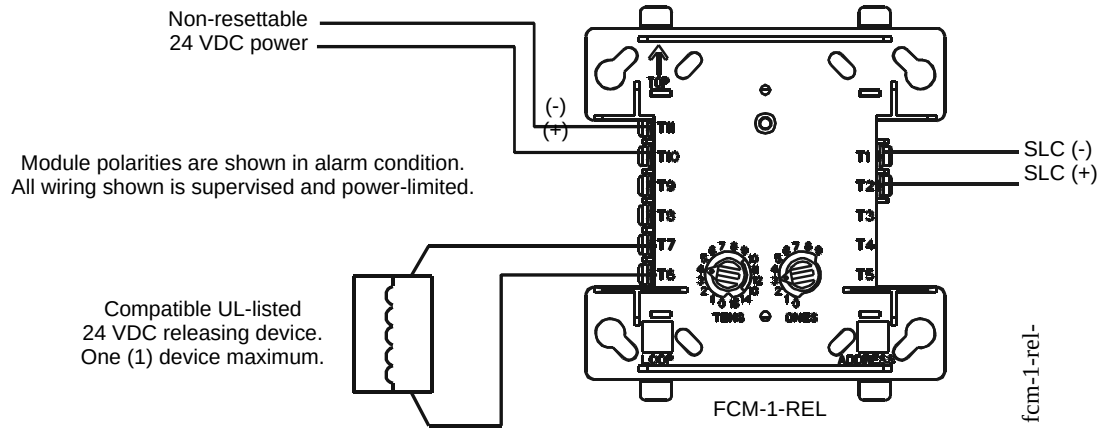


Figure 4.13 NPFA Style Y (Class B) Wiring of the FCM-1-REL

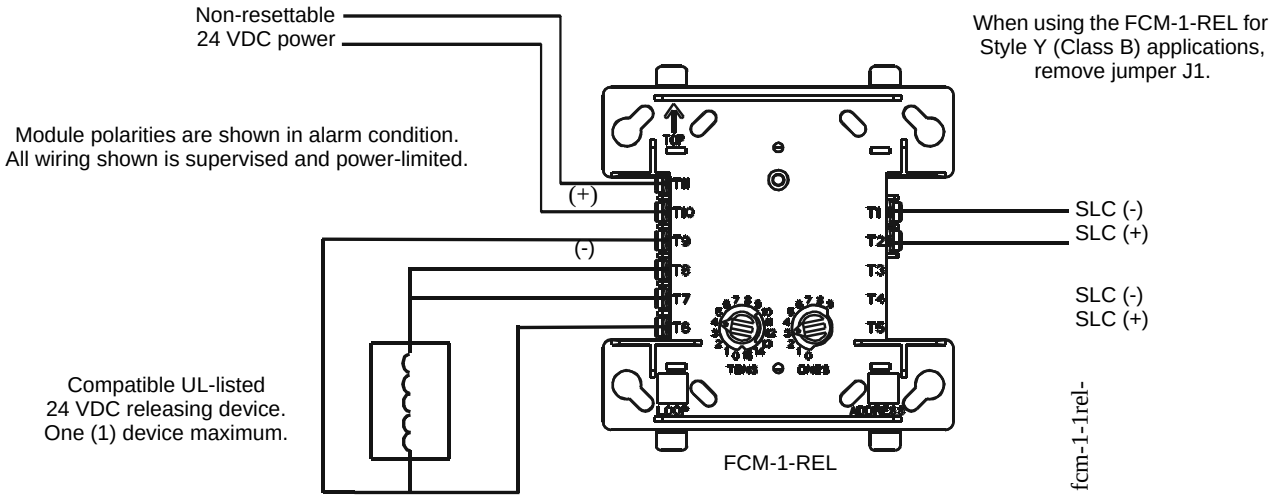


Figure 4.13 NPFA Style Z (Class A) Wiring of the FCM-1-REL

NOTE: With firmware version 12.0 or higher ALL new FlashScan Mode SLC releasing applications require the FCM-1-REL control module. The V-type FCM-1 control module may be used in SLC releasing applications with firmware version 14.0 or higher. H-type FCM-1 control modules do not support FlashScan Mode releasing applications with firmware version 14.0 or higher. Use H-type FCM-1 for CLIP mode SLC releasing applications, with firmware version 12.0 or higher.

Critical Requirements. When connecting a releasing device to the FCM-1-REL module, note the following:

1. See “Power Considerations” on page 52 for information on monitoring 24 VDC power.
2. Do not T-tap or branch a Style Y or Style Z circuit.
3. Only one (1) 24V solenoid or two (2) 12V solenoids in series can be connected to the FCM-1-REL.
4. Do not loop wiring under the screw terminals. Break the wire run to provide supervision of connections.
5. All applications using the FCM-1-REL are power-limited:
   1. Program the releasing circuit for Type Code REL CKT ULC or RELEASE CKT.
   2. Circuits are supervised against opens and shorts.
6. Refer to the *NFS2-640/E Programming Manual* for instructions on setting the Soak Timer.

The FCM-1-REL module must be programmed with the correct releasing type code listed in the *NFS2-640/E Programming Manual*.

4.7.6 Connecting an NBG-12LRA Agent Release-Abort Station

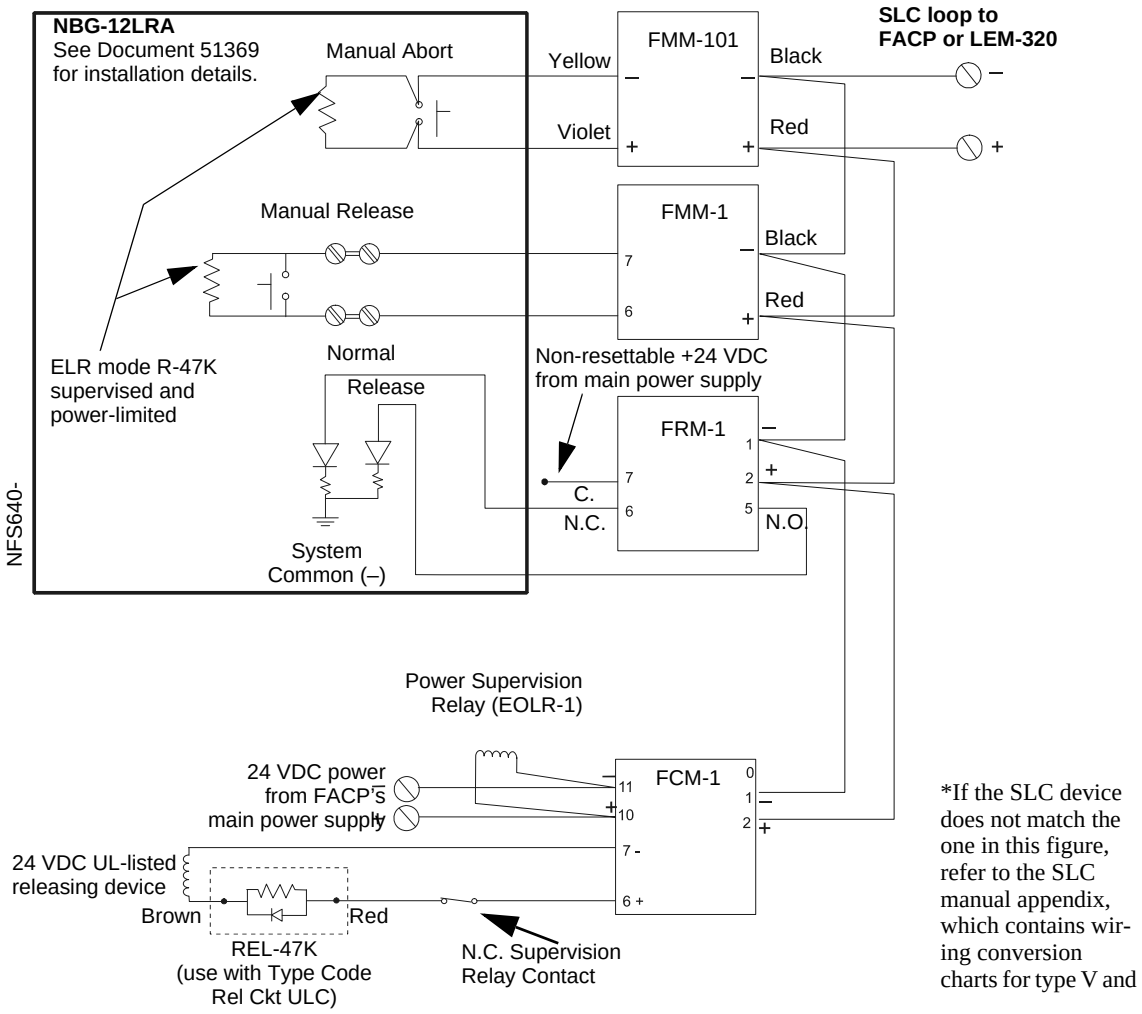


Figure 4.14 Typical Connections for an NBG-12LRA Agent Release-Abort Station

NOTE: If using the on-board NACs, see Circuit Requirements for Section 4.7.3 “Connecting a Releasing Device to the Control Panel” on page 47. If using FCM-1, see Circuit Requirements for Section 4.7.4, “Connecting a Releasing Device to the FCM-1 Module”, on page 49. If using the FCM-1-REL, see Circuit Requirements for Section 4.7.5, “Connecting Releasing Devices to the FCM-1-REL Control Module”, on page 51.

Section 5: Testing the System

5.1 Acceptance Test

When finished with the original installation and all modifications, conduct a complete operational test on the entire installation to verify compliance with applicable NFPA standards. Testing should be conducted by a factory-trained fire alarm technician in the presence of a representative of the Authority Having Jurisdiction and the owner's representative. Follow procedures outlined in NFPA Standard 72's section on *Inspection, Testing and Maintenance*.

5.2 Periodic Testing and Service

Periodic testing and servicing of the control panel, all initiating and notification devices, and any other associated equipment is essential to ensure proper and reliable operation. Test and service the control panel as required by the Authority Having Jurisdiction and according to the schedules and procedures outlined in the following documents:

- NFPA Standard 72's section on *Inspection, Testing and Maintenance*.
- Service manuals and instructions for the peripheral devices installed in the system. Correct any trouble condition or malfunction immediately.

5.3 Operational Checks

Before proceeding: a) notify the fire department and the central alarm receiving station if transmitting alarm conditions; b) notify facility personnel of the test so that alarm sounding devices are disregarded during the test period; and c) when necessary, disable activation of alarm notification appliances and speakers to prevent their sounding.

- Disconnect all releasing devices to prevent accidental activation in accordance with NFPA 2001 and NFPA 12A releasing agents.

WARNING:

DO NOT RELY ON DISABLE/ENABLE SOFTWARE SETTINGS TO LOCKOUT RELEASING DEVICES.

- Check that the green POWER LED lights.
- Check that all status LEDs are off.
- Press and hold the LAMP TEST key. Verify that all LEDs and all LCD display segments work.
- Activate an Initiating Device Circuit using an alarm initiating device or an addressable initiating device on the SLC and check that all programmed active notification appliances function. Reset the alarm initiating device, the control panel, and any other associated equipment. Repeat the above step with each Initiating Device Circuit and each addressable device.
- Remove AC power, activate an Initiating Device Circuit through an alarm initiating device or an addressable initiating device on the SLC, and check that programmed active notification appliances sound, and alarm indicators illuminate. Measure the battery voltage with notification appliances active. Replace any battery with a terminal voltage less than 21.6 VDC and reapply AC Power.

NOTE: The battery test requires fully charged batteries. If batteries are new or discharged due to a recent power outage, allow the batteries to charge for 48 hours before testing.

- Return all circuits to their pretest condition.
- Check that all status LEDs are off and the green POWER LED is on.
- Notify fire, central station and/or building personnel when you finish testing the system.

5.4 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; the charge rate depends on the battery size (2.0A for 18-26AH; 5.0A-5.7A for 26AH-200AH).

Batteries should be replaced in accordance with the battery manufacturer's recommendations. Immediately replace a leaking or damaged battery.

WARNING:

BATTERIES CONTAIN SULFURIC ACID WHICH CAN CAUSE SEVERE BURNS TO THE SKIN AND EYES AND DAMAGE TO FABRICS.

- If a battery leaks and contact is made with the Sulfuric Acid, immediately flush skin and/or eyes with water for at least 15 minutes. Water and household baking soda provides a good neutralizing solution for Sulfuric Acid.
- If Sulfuric Acid gets into eyes, seek immediate medical attention.
- Ensure proper handling of the battery to prevent short circuits.
- Take care to avoid accidental shorting of the leads from uninsulated work benches, tools, bracelets, rings, and coins.

WARNING:

SHORTING THE BATTERY LEADS CAN DAMAGE THE BATTERY, EQUIPMENT, AND COULD CAUSE INJURY TO PERSONNEL.

Appendix A: Power Supply Calculations

Calculations must be done to determine standby and alarm DC current loads. Ampere-hour requirements must be calculated as well to determine battery size.

The on-board power supply provides filtered 24VDC power that may be used for operating external devices. Use Table A.2 to determine if external loading is within the capabilities of the power supply.

A.1 Calculating AC Branch Circuit Current

Use Table A.1 below to determine the total amount of current, in AC amperes, that a 120 VAC, 50/60 Hz service must be able to supply to the fire alarm system. Devices rated for 240 VAC operation will draw approximately one-half the current listed in Table A.1.

Device Type	No. of Devices		Current (amps)		Total Current
CPS-24 Power Supply	[1]	X	5.0	=	5.0
CPS-24/E Power Supply	[..]	X	2.5A	=	
AA-30	[ ]	X	1.00	=	
AA-120	[ ]	X	1.85	=	
FCPS-24S6/S8	[ ]	X	3.2	=	
ACPS-2406	[ ]	X	2.7*	=	
ACPS-610	[ ]	X	.0*	=	
ACPS-610/E	[ ]	X	2.5	=	
APS-6R	[ ]	X	2.5	=	
CHG-120	[ ]	X	2.0	=	
Sum column for AC Branch Current required=amps					

Table A.1 120 VAC Fire Alarm Circuit

* Separate calculations are required for any devices powered by the ACPS-2406 and ACPS-610. It has its own integral battery charger and batteries can be connected directly to it. Refer to the *ACPS-2406 or ACPS-610 Installation Manuals* for battery calculations.

AC Branch Circuit Installation

For guidelines on wiring the AC branch circuit current, see “Operating Power: AC Branch Circuit” on page 59 in Appendix B.1 “Electrical Specifications”.

A.2 Calculating the System Current Draws

The control panel’s main power supply must be able to power all internal system devices (and several types of external devices) continuously during non-fire alarm conditions. Use column 1 in Table A.2 to calculate the Non-Fire Alarm Load on the power supply regulator when applying primary power. The main power supply must also provide a finite amount of additional current during a fire alarm condition. Use column 2 in Table A.2 to calculate the additional current needed during fire alarms. The requirements for non-fire alarm and fire alarm current loads cannot exceed the capabilities of the power supply as listed below:

- 4.4 A at 24 VDC during Standby; and
- 7.4 A at 24 VDC during Alarm.

The current draw from all NACs plus DC output from TB10 and TB2 is 3.0 A during standby and 6.0 A during alarm.

How to Use the Calculating Tables

As used in this section, “Primary” refers to the control panel’s on-board power supply, its primary source of AC power. “Secondary” refers to the control panel’s backup batteries (or any other 24 VDC power supply listed for Fire Protective Signaling and connected in place of the batteries). The term “standby” refers to the output current required when no fire alarm is present. The term “alarm” refers to the output current required when a fire alarm is present.

The Primary Power Source Non-Alarm Current and Alarm Current columns are DC current calculations. These calculations confirm that the power supply can provide enough current to support the system during Primary Non-Fire Alarm and Fire Alarm conditions.

Quantities List the number of devices powered by the FACP and its power supply. Devices powered by the Accessories Output (TB10 and TB2) draw current directly from the panel. Devices powered by the Panel Output draw current through the fire panel’s connection to the power supply. Use these quantities to calculate total current draw of each set of devices in calculation columns 1, 2, and 3.

Calculation Column 1 (Primary, Non-Fire Alarm Current in amps) Add the contents of calculation column 1 to get the current drawn from the power supply during a non-alarm condition, with AC power applied. This current draw cannot exceed 4.4 A without an auxiliary power supply.

Calculation Column 2 (Primary, Fire Alarm Current in amps) Calculation column 2 lets the system designer determine the current load that the power supply must support during a fire alarm. The total current draw during a fire alarm cannot exceed 6 A without an auxiliary power supply.

Typically, a system should contain capacity to activate all output circuits and relays, and support fire alarms on no less than 10% of Initiating Device Circuits, subject to the requirements of the Authority Having Jurisdiction (AHJ).

The Control Panel provides power for Notification Appliance Circuits. Refer to the Device Compatibility Document for 24 VDC notification appliances that are UL- and ULC-listed for fire alarm systems.

Calculation Column 3 [Secondary (Battery) Non-Alarm Current] Column 3 lets the system designer calculate the non-fire alarm current drawn from the secondary source in a non-fire alarm condition during AC power loss.The non-fire alarm current is required to complete the standby battery calculations. After summing all current draws, insert the total in Table A.3.

Category	Calculation Column 1 Primary, Non-Fire Alarm Current (amps)			Calculation Column 2 Primary, Fire Alarm Current (amps)			Calculation Column 3 Secondary, Non-Fire Alarm Current (amps)		
	Qty	X [current draw]=	Total	Qty	X [current draw]=	Total	Qty	X [current draw]=	Total
CPU2-640/E	1	x [0.250] =		1	x [0.250] =		1	x [0.250] =	
# NACs in use (0, 1, 2, 3 or 4)*	[ ]	x [0.035]		[ ]	x [0.035]		[ ]	x [0.035]	
CPS-24/E	n/a	n/a		n/a	n/a		n/a	x [0.040]	
KDM-R2 (Backlight on)	[ ]	x [0.100]=		[ ]	x [0.100]=		[ ]	x [0.100]=	
LEM-320	0 / 1	x [0.100]=		0 / 1	x [0.100]=		0 / 1	x [0.100]=	
SLC loop†:	1/2	x [.200]=		1/2	x [.200]=		1/2	x [.200]=	
NCA, NCA-2 (Back light ON)	[ ]	x [0.400]=		[ ]	x [0.400]=		[ ]	x [0.400]=	
NCA, NCA-2 (Back light OFF)	[ ]	x [0.200]=		[ ]	x [0.200]=		[ ]	x [0.200]=	
NCM-W, NCM-F	[ ]	x [0.110]=		[ ]	x [0.110]=		[ ]	x [0.110]=	
HS-NCM-	[ ]	x [0.400]=		[ ]	x [0.400]=		[ ]	x [0.400]=	
W/MF/SF/WMF/WSF/MFSF	[ ]	x [0.110]=		[ ]	x [0.175]=		[ ]	x [0.110]=	
TM-4	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
DPI-232 (Refer to manual**)									
APS-6R							[ ]	x [0.025]=	
APS2-6R							[ ]	x [0.0013]=	
ACPS-2406, ACPS-610									
DVC components (Refer to	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
manual**)	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
AA-30							[ ]	x [0.045]=	
AA-100, AA-120							[ ]	x [0.050]=	
ACM-24AT	[ ]	x [0.016]=		[ ]	x [0.070]=		[ ]	x [0.016]=	
ACM-48A	[ ]	x [0.016]=		[ ]	x [0.070]=		[ ]	x [0.016]=	
AEM-24AT	[ ]	x [0.002]=		[ ]	x [0.056]=		[ ]	x [0.002]=	
AEM-48A	[ ]	x [0.002]=		[ ]	x [0.056]=		[ ]	x [0.002]=	
Maximum number of LEDs illuminated on these annunciators during non-fire conditions:	[ ]	x [0.0054]=					[ ]	x [0.0054]=	
AFM-16AT, AFM-32A	[ ]	x [0.040]=		[ ]	x [0.056]=		[ ]	x [0.040]=	
ACM-16AT, ACM-32A	[ ]	x [0.040]=		[ ]	x [0.056]=		[ ]	x [0.040]=	
AEM-16AT, AEM-32A	[ ]	x [0.002]=		[ ]	x [0.018]=		[ ]	x [0.002]=	
AFM-16A	[ ]	x [0.025]=		[ ]	x [0.065]=		[ ]	x [0.025]=	
ACM-8R (refer to manual**)	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
LDM (refer to manual**)	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
FDU-80 LCD-80, LCD2-80	[ ]	x [0.0643]=		[ ]	x [0.0643]=		[ ]	x [0.0643]=	
	[ ]	x [0.100]=			x [0.100]=			x [0.050]=	
AMG-1, AMG-E	[ ]	x [0.060]=		[ ]	x [0.060]=		[ ]	x [0.060]=	
RM-1	[ ]	x [0.020]=		[ ]	x [0.020]=		[ ]	x [0.020]=	
FZM-1, MMX-2	[ ]	x [0.0094]=		[ ]	x [0.090]=		[ ]	x [0.0094]=	
RPT-W, RPT-WF, RPT-F	[ ]	x [0.017]=		[ ]	x [0.017]=		[ ]	x [0.017]=	
RPT-485W, RPT-485WF									
UDACT Communicator	[ ]	x [0.040]=		[ ]	x [0.100]=		[ ]	x [0.040]=	
UDACT-2 Communicator	[ ]	x [0.052]=		[ ]	x [0.087]=		[ ]	x [0.052]=	
NFV-25/50 (see manual**)	[ ]	x [ ]=			x [ ]=			x [ ]=	
Four-Wire Smoke Detectors‡	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
Power Supervision Relay	[ ]	x [0.020]=		[ ]	x [0.020]=		[ ]	x [0.020]=	
EOLR-1									
FWSG (only if powered by the FWSG 24V connections TB:A2 and TB:A3)	[ ]	x [0.040]=		[ ]	x [0.040]=		[ ]	x [0.040]=	
Notification Appliance powered from Main Power Supply**				[ ]	x [ ]=				
				[ ]	x [ ]=				
DHX-501, FSD-751RP, FSD-	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
751RPL (Duct Detectors with internal relays)	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
Refer to installation document									
CHG-120 Battery Charger							[ ]	x [0.060]=	
Local Energy Municipal Box				[ ]	x [ ]=				
Compatible Devices not listed	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
above††	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
Sum each column for totals	Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		

Table A.2 System Draw Current Calculations

* Maximum current draw for all NACs plus DC output from TB10 and TB2 is 3.0 A during standby.
† Value represents an SLC's maximum current draw. Refer to device datasheets for individual current draws.
‡ The total regulated load current supplied to four-wire smoke detector and power supervision relays cannot exceed 1.25 A.
** Enter the total notification appliance draw from the Main Power Supply, excluding the current from APS-6R supplies. Refer to Device Compatibility Document.
††Refer to manual and/or Device Compatibility Document. See Table 1.1, "Reference Documentation," on page 8 for specific documentation part numbers.

A.2.1 Calculating the Maximum Secondary Power Fire Alarm Current Draw

Use Table A.3 below to determine the maximum current requirements of secondary power source during fire alarm conditions. The result obtained is the amount of current that the batteries must be able to supply to the fire alarm system. Use the result in Table A.4 to determine the size of the batteries needed for the fire alarm system.

Results taken from Table A.3 below assume that, while in a fire alarm condition, batteries must feed the main power supply (and any additional supplies such as the APS-6R and AA-30) with the maximum rated power each supply can provide.

Device	Quantity		Current (in amps)		Total Current/Type
Alarm Current, from Table A.2, col 2				=	
APS-6R*	[ ]	X	6	=	
APS2-6R	[ ]		6	=	
AA-30†	[ ]	X	3	=	
AA-120	[ ]	X	7.3	=	
Sum Column for Secondary Fire Alarm Load			=		

Table A.3 Maximum Secondary Power Fire Alarm Current Draw

* Actual load current may be used in place of maximum rated supply current. To calculate actual load current, sum the current draws for each appliance connected to APS-6R supplies.

† Exclude Amplifiers that are employed for backup.

NOTE: The Secondary Fire Alarm Load cannot exceed the following:
12 A with BAT-12260 batteries (12 V, 26 AH).
20 A with BAT-12550 batteries (12 V, 55 AH).

A.3 Calculating the Battery Requirements

A.3.1 Calculating the Battery Capacity

Use this table to determine the battery capacity needed for the system:

Current (amps)	X	Time (hours)	=	AH
Secondary Non-Fire Alarm Current (from column 3 in Table A.2) (see Note 8) _____	X	Required Secondary Non-Fire Alarm Standby Time (24 or 60 hours) _____	=	_____AH
APS-6R Standby Load Current _____	X	Required Secondary Non-Fire Alarm Standby Time (24 or 60 hours) _____	=	_____AH
Secondary Fire Alarm Load (from Table A.3) (see Note 8) _____	X	Required Fire Alarm Standby Time: (for 5 minutes, enter 0.084; for 15 minutes, enter 0.25) _____	=	_____AH
Sum Column for Total Secondary Amp Hours calculated			=	_____AH
Multiply by the derating factor x 1.2 (see Note 7)			=	_____AH
Battery Size – Total Secondary Amp Hours Required			=	_____AH

1. NFPA 72 Local, Proprietary, and Central Station systems require 24 hours of standby power followed by 5 minutes in alarm.
2. NFPA 72 Auxiliary and Remote Station Systems require 24 hours of standby power followed by 5 minutes in alarm.
3. Batteries installed in a system powered by an automatic starting engine generator need to provide at least 4 hours of standby power.
4. Factory Mutual requires 90 hours of standby for deluge-preaction systems.
5. Emergency voice/alarm communications systems require 2 hours of operation in the alarm condition. Due to the sporadic nature of voice operation, however, NFPA 72 permits 15 minutes of operation at a maximum connected load to equal 2 hours of normal use.
6. If the total exceeds 26 AH, the system requires a separate NFS-LBB, BB-100 or BB-200 battery enclosure for two larger capacity batteries.
7. The following battery derating factors must be used for Canadian installations using NFS2-640/E charger:
   - For a 26 AH battery, use derating factor of 1.5
   - For a 55 AH battery, use derating factor of 1.8
   - For a 100 AH battery, use derating factor of 2.5
   - For a 200 AH battery, use derating factor of 2.5
8. For 26 AH batteries: maximum standby current cannot exceed 0.65A; maximum alarm current cannot exceed 6.75A.

Table A.4 Secondary Power Standby and Fire Alarm Load

A.3.2 Calculating the Battery Size

Use this table to choose the battery size, in amp-hours, needed to support the fire alarm system.
The CPS-24/E can charge batteries from 18 to 200 AH. Select batteries that meet or exceed the Total Amp-Hours calculated in Table A.4 and that are within the acceptable battery charger range. Write the amp-hours requirements on the Protected Premises label.

The maximum battery size that can be mounted inside a CAB-4 series backbox is 26AH.

Battery Size	Voltage Rating	Number Required	Our Part Number	Backbox Part Number†
18 AH	12 volts	two	BAT-12180	SBB-A4*, SBB-B4*, SBB-C4*, SBB-D4*, BB-25
26 AH	12 volts	two	BAT-12260	SBB-A4, SBB-B4, SBB-C4, SBB-D4, BB-25
100 AH	12 volts	four for 100 AH two for 200 AH	BAT-121000	BB-100 BB-200

*Manufactured to our specifications.
†Red version available; add “R” to part number listed here

Table A.5 Selecting Battery and Battery Backbox

Appendix B: Electrical Specifications

B.1 Electrical Specifications

AC Power

Component	Values
Main Power Supply	120 VAC, 50/60 Hz, 5.0 A; or 240 VAC, 50/60 Hz, 2.5 A
Wire size	Maximum 12 AWG (3.31 mm^2) with 600 VAC insulation

Table B.1

NOTE: If using an auxiliary power supply such as FCPS-24S6/S8, APS-6R, ACPS-2406, or ACPS-610, or audio amplifiers, refer to the documentation for that equipment.

Batteries

The control panel uses **only** sealed lead-acid batteries for secondary standby power. Maximum battery capacity for the CPS-24/E main power supply is 200 AH. CAB-4 Series backboxes provide space for two 26 AH (or smaller) batteries. Use external battery boxes if the installation requires larger capacity batteries; see Table A.5, "Selecting Battery and Battery Backbox," on page 57.

The table below contains battery charger specifications.

Charger	Description	Specifications
CPS-24/E Main Power Supply	An internal battery charger for 18 AH to 200 AH	Normal Charge: 27.6 VDC +/- 0.24 VDC Charging Current: 2.0 A or 5.7 A (Software selectable)
CHG-120 Battery Charger	An external battery charger designed to charge lead-acid batteries between 26 AH and 120 AH	Dual Rate: High Charge: 28.1 VDC Normal Charge: 27.6 VDC Charging Current: 4.5 A
ACPS-2406 Auxiliary Charger/Power Supply	An internal battery charger for 7AH to 26 AH	Normal Charge: 27.6 VDC Charging Current: 1.1 A max (0.750 A typical)
ACPS-610 Addressable Charger/Power Supply	An internal battery charger for 12AH to 200AH	Normal Charge: 27.6 VDC +/- 0.24 VDC Charging Current: 2A, 5A, or OFF (Software Selectable)

Table B.2

Signaling Line Circuit (SLC)

Item	Value
Voltage	24 VDC nominal, 27.6 VDC maximum
Maximum length	12,500 ft. (3810 m) total loop or circuit length (NFPA Style 4, 6 and 7) **Note:** Refer to Appendix B.2 "Wire Requirements" for limitations.
Maximum current	400 mA peak, 200 mA average (max short circuit; circuit will shut down until short is fixed). For battery calculation purposes use 200mA.
Maximum resistance	50 ohms (supervised and power-limited)

Table B.3

Notification Appliance Circuits & Releasing Circuits

Item	Value
Max. wiring voltage drop	2 VDC (Retrofit note: SLCs with old CMX modules are restricted to 1.2 VDC.)
NAC Nominal operating voltage	24 VDC regulated, 1.5 A max.
Special Applications for Releasing Circuits	20.16 - 26.42 VDC
Current for all external devices connected to the control panel's power supply	6.0 A in alarm (3 A continuous) TB2, TB10 and all 4 NACs share a maximum of 3.0 A in standby and 6.0 in alarm.
Optional ACPS-2406	Total 6 A in alarm (5 A continuous)
Optional ACPS-610	Total 6 A in alarm (1.5 A single output)
Optional APS-6R	Total 6 A in alarm (4 A continuous)
End-of-Line Resistors (ELRs)	Control Panel NACs (TB6, TB7, TB8, TB9): 2.2K, 1/2 watt XP6-C, FCM-1 Modules: 47K, 1/2 watt
NOTE: For a list of compatible Notification Appliance Circuits and Releasing Circuits see Notifier Device Compatibility Document 15378.	

Table B.4

Output Relays

Output relays for Alarm and Trouble are common on TB4; Supervisory and Security are programmable on TB5. See Figure 3.21, "Form-C Relay Connections" on page 32).

Contact ratings: 2.0 A @ 30 VDC (resistive)

Four-wire Smoke Detector Power

Control Panel terminals TB10 RESET (+) and (–) supply filtered, low-noise power for four-wire smoke detectors. Specifications are:

- Nominal voltage: 24 VDC special applications.
- Maximum rated current: 1.25 A DC
- Maximum ripple voltage: 176 mVrms
- TB10, TB2, and all 4 NACs share a maximum of 3.0 A in standby and 6.0 A in alarm.

Refer to the *Device Compatibility Document* for compatible 24 VDC detectors.

Power Output

Control Panel terminals TB10 NONRESET (+) and (–) supply one (1) power-limited circuit available to power external devices, such as notification appliances and annunciators.

- Nominal voltage: 24 VDC regulated, special applications, 1.5 A max.
- Maximum rated current: 1.25 A DC
- Maximum ripple voltage: 176 mVrms
- TB10, TB2, and all 4 NACs share a maximum of 3.0 A in standby and 6.0 A in alarm.

Refer to the *Device Compatibility Document* for compatible devices and notification appliances.

NOTE: The Control Panel provides a total of 7.4 A of power in alarm (4.4 A in standby), shared by all internal circuitry and external provisions (24 V resettable and non-resettable). TB10 and all 4 NACs share a maximum of 3.0 A in standby and 6.0 A in alarm. For power requirements, refer to the power supply calculation tables in Appendix A.

Operating Power: AC Branch Circuit

The control panel requires connection to a separate dedicated AC branch circuit. Follow these guidelines when connecting the AC branch circuit:

- Label the branch circuit "Fire Alarm". This must be a separate dedicated AC fire alarm circuit.
- Connect the branch circuit to the line side of the main power feed of the protected premises.
- Do not power other equipment from the fire alarm branch circuit.
- Run the AC branch circuit wire continuously, without any disconnect devices except for overcurrent protection, from the power source to the fire alarm control panel.
- Overcurrent protection for the AC branch circuit must comply with Article 760 of the National Electrical Codes, as well as local codes.
- Use 12 AWG (3.31 mm^2) wire with 600 VAC insulation for the AC branch circuit.

Connect the ground terminal (TB1-Earth) to a solid earth ground (a metallic, cold water pipe may be suitable in some installations). This connection is vital in reducing the panel's susceptibility to transients generated by lightning and electrostatic discharge.

Operating Power: Secondary Power Source (Batteries)

The battery charger is current-limited and can recharge sealed lead-acid type batteries. The battery charger shuts off when the control panel is in alarm.

B.2 Wire Requirements

Each type of circuit within the Fire Alarm Control System requires use of a specific wire type to ensure proper circuit operation. The wire gauge of a particular circuit depends on the length of that circuit and the current traveling through it. Use Table B.5 below to determine the specific wiring requirements for each circuit.

Compliance with the Federal Communications Commission (FCC) and Canadian Department of Communication regulations on electrical energy radiation requires the following: Use twisted-pair shielded wire for any non-SLC-loop wiring entering or exiting the cabinet that is not enclosed in conduit. Use twisted-pair unshielded wiring for SLC-loop wiring.

NOTE: If running an SLC in conduit with Notification Appliance Circuits, you can reduce problems by exclusively using electronic sounders (such as the SpectrAlert, SpectrAlert Advanced or MA/SS-24 Series) instead of more electronically noisy notification appliances (such as electromechanical bells or horns).

Circuit Type	Circuit Function	Wire Requirements	Distance (feet/meters)	Typical Wire Type
SLC (power limited)	Connects to intelligent and addressable modules.	Twisted-unshielded pair, 12 to 18 AWG (3.31 to 0.82 mm^2). 50 ohms maximum per length of Style 6 & 7 loops. 50 ohms per branch maximum for Style 4 loop.	12,500 ft. (3,810 m) 9,500 ft. (2,895.6 m) 6,000 ft. (1,828.8 m) 3,700 ft. (1,127.76 m)	12 AWG (3.31 mm^2) 14 AWG (2.08 mm^2) 16 AWG (1.31 mm^2) 18 AWG (0.82 mm^2)
		Twisted, shielded pair NOTE: • Shields must be isolated from ground. • Shields should be broken at each device.	5,000 ft. (1,524 m) 3,700 ft. (1,127.76 m)	12 to 16 AWG (3.31 to 01.31 mm^2) 18 AWG (0.82 mm^2)
		Untwisted, unshielded wire, in conduit or outside of conduit. **Note:** Maximum total capacitance of **all** SLC wiring (both between conductors and from any conductor to ground) should not exceed 0.5 mircofarads.	5,000 ft. (1,524 m) 3,700 ft. (1,127.76 m)	12 to 16 AWG (3.31 to 01.31 mm^2) 18 AWG (0.82 mm^2)
EIA-485 (power limited)	Connects to FDU-80, ACS modules, LCD-80, or TM-4 Transmitter	Twisted-shielded pair with a characteristic impedance of 120 ohms. 18 AWG (0.82 mm^2) minimum.	6,000/1829 (max)	16 AWG (1.31 mm^2)
EIA-232 (power limited)	Connects to Printers, CRT, or PC.	Twisted-shielded pair in conduit. 18 AWG (0.82 mm2) minimum.	20 feet (6.1 m) (without modem)	16 AWG (1.31 mm^2)
IDC Initiating Device Circuit	FMM-1, FMM-101, **FDM-1**XP10-M, XP6-MA (power limited)	12-18 AWG (3.31 to 0.82 mm^2). Maximum circuit resistance is 20 ohms.		12 to 18 AWG (3.31 to 0.82 mm^2)
NAC Notification Appliance Circuit	FCM-1*, XP6-C (power limited)	12-18 AWG (3.31 to 0.82 mm^2). At alarm current level, no more than a 1.2 V drop at the end of the circuit, or sized to provide the minimum rated operating voltage of the appliances used.	.To meet 1.2 V drop, or sized to provide the minimum rated operating voltage of the appliances used.	12 to 18 AWG (3.31 to 0.82 mm^2)
Releasing Module	FCM-1-REL	12-18 AWG (3.31 to 0.82 mm^2). 5 ohms maximum per circuit for class A or B, or sized to provide the minimum rated operating voltage of the appliances used.	To meet 5 ohms maximum circuit resistance, or sized to provide the minimum rated operating voltage of the appliances used	12 to 18 AWG (3.31 to 0.82 mm^2)
24 VDC Power Runs (power-limited)	To TM-4 Transmitter, Annunciator and FCM-1 modules	12-18 AWG (3.31 to 0.82 mm^2). Size wire so that no more than 1.2 V drop across wire run from supply source to end of any branch.	To meet 1.2 volt drop	12 to 18 AWG (3.31 to 0.82 mm^2)
CHG-120	External battery charger	12 AWG (3.31 mm^2) in conduit	20/6.1 (max)	12 AWG (3.31 mm^2)
Note: * FCM-1 cannot be used for synchronized strobe/sounder applications.				

Table B.5 Wire Requirements

NOTE: Lightning arresters required on circuits extending between buildings; 999 meter length maximum to meet UL 60950.

Appendix C: Canadian Applications

C.1 Standalone Application

C.1.1 NFS2-640/E with KDM-R2

If using KDM-R2 as the primary display for NFS2-640/E, an ACS series annunciator must be mounted adjacent to the panel or within NFS2-640/E enclosure.

C.1.2 NFS2-640/E with NCA-2

Network Control Annunciator (NCA-2) with 640-character, multi-line display complies with ULC requirements when used as the primary display for NFS2-640/E.

C.2 Network Applications

To meet ULC requirements, the network's Manual Controls may only be operated from one location at any given time. When panels are networked (using NCM Network Communications Modules or High-Speed Network Communications Modules), use AKS-1B Key Switch on each panel's Primary Annunciator to enable its functions. NCA-2 may be a Primary Annunciator when AKS-1B is installed. Refer to the *NCA-2 Manual* for more information.

The NCA-2 or ONYXworks may be employed as a Display and Control Center. In the event that communication fails between the panels and the Control Center, the panels will continue to function in local/standalone mode.

C.3 Automatic Alarm Signal Silence

If selecting this feature for a system requiring annunciators, consult the Authority Having Jurisdiction.

If Auto Silence is enabled, the value must be set to 20 minutes. An ACS point is required to monitor special function zone ZF40.

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

C.4 Annunciator Applications

1. In Canada, the ACM series annunciator modules must be used to annunciate the fire alarm input points/zones only, if no multi-line sequential display is installed.
2. For Canadian applications, the following LED colors must be employed:
   – Red must be used to indicate active alarm inputs.
   – 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.
3. Two Stage Systems (3/5 minute timer) - ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer. For applications using Two Stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.
4. The ACM point designated for Automatic Alarm Signal Cancel should be labeled as "Automatic Alarm Signal Cancel" or "Auto Alm Signal Cancel."
5. If the DCC option is enabled, an ACS point is required to monitor ZF36 for the panel itself as well as each DCC on the network.

C.5 Releasing Devices

Supervision for shorts is required; use REL devices and type code REL CKT ULC.
(With on-board NACs, use REL-2.2K; with FCM-1 modules use REL-47K. Refer to Section 4.7.5 "Connecting Releasing Devices to the FCM-1-REL Control Module" for details.)

C.6 Ancillary Devices

Panel control functions (Acknowledge, Signal Silence, Reset, and Drill) will not function on ancillary devices such as the ACM-24-AT, FDU-80, or the LCD2-80. (Local acknowledge will function on the ancillary device to silence the piezo and steady the LEDs).

C.7 Isolating NACs with Audio Isolator Modules

C.7.1 Description of Modules

The audio isolator modules described below may be used to isolate short circuits during alarm signaling. These modules are listed with ULC for use with the NFS2-640C.

• **AIM-1** - This module provides isolation to a separate circuit on an audible notification riser. A short circuit on an AIM-1 NAC circuit will not disable other NACs circuits on the riser.

• **RSM-1** - This module works the same as the AIM-1, with the exception that there is a silence button for in-suite operation. The silence button will silence the audible signal to the module's circuit for ten minutes during alarm. Resounding will occur automatically after ten minutes.

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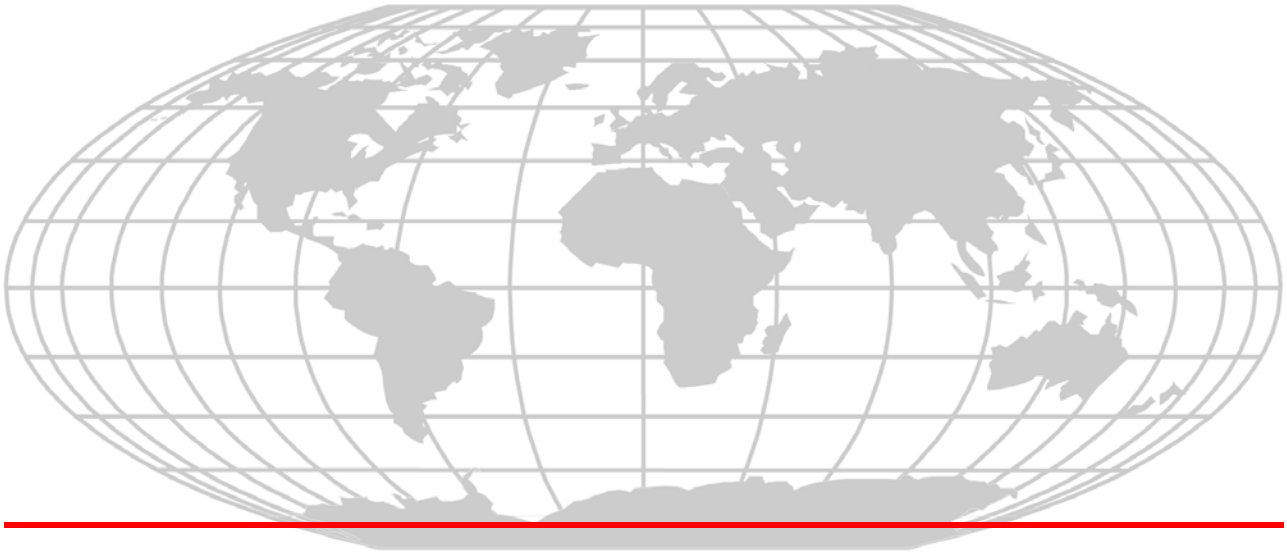

Fire Alarm Control Panel
NFS2-640/E
Programming Manual

Document 52742
11/14/16 Rev: L6
P/N 52742:L6 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 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. 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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Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

Table of Contents

Section 1: General Information

1.1 UL 864 Compliance

1.1.1 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 9th Edition, and ULC-527-11.

A complete listing identifying which products have or have not received UL 864 9th Edition certification is located in the installation manual of this fire alarm system. Those products which have not received UL 864 9th Edition certification may only be used in retrofit applications. Operation of the NFS2-640/E with products not tested for UL 864 9th Edition has not been evaluated and may not comply with NFPA 72 and /or UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

1.1.2 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.

Table 1.1 Programming Settings

This product incorporates field-programmable software. In order for the product to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.					
Program Feature or Option	**Permitted in UL 864? (Y/N)**	**Permitted in ULC 527-11? (Y/N)**	**Possible Settings**	**Settings Permitted in UL 864**	**Settings Permitted in ULC 527-11**
IP downloads over a local area network (LAN) or the internet (WAN - WIde Area Network)	No	No	Yes No Timed	No	No
Releasing: Abort Switch	Yes	Yes	NYC AHJ ULI IRI	ULI IRI	ULI IRI
For Wireless Applications: Trouble Resound	Yes	Yes	4 hours, 24 hours	4 hours	4 hours
Detector Programming: Supervisory Type Codes	Yes	Yes	SUP L(DUCTI) SUP T(DUCTI) SUP T(DUCTP) SUP L(DUCTP) SUP L(ION) SUP T(ION) SUP L(PHOTO) SUP T(PHOTO) SUP L(LASER) SUP T(LASER) PHOTO/CO (P SUP)	SUP L(DUCTI) SUP T(DUCTI) SUP L(DUCTP) SUP T(DUCTP)	SUP L(DUCTI) SUP T(DUCTI) SUP L(DUCTP) SUP T(DUCTP)
ALA.SCROLL (Scroll Display)	Yes	Yes	Y N	N	N
TBL.REMIND	Yes	Yes	*, 1, 2, 3, 4, 5	2	2
REGION	No	No	0 (No special setting) 1 (China) 2 Canada	0 (No special setting)	2 (Canada)
Alarm Verification Time	Yes	Yes	0 to 240 seconds	0 to 60 seconds	0 to 60 seconds

1.2 About This Manual

1.2.1 Cautions, Warning, and Notes

The following graphics appear in the manual to indicate a caution or a warning.

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

WARNING:
Information about procedures that could cause irreversible damage to the control panel, irreversible loss of programming data or personal injury.

NOTE: Information that highlights an important part of the preceding or subsequent text or illustration.

1.2.2 Typographic Conventions

This manual uses the following conventions as listed below:

Table 1.2 Typographic Conventions in this Manual

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 an 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	*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

NOTE: The term NFS2-640 is used in this manual 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.

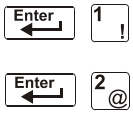
Compatible Conventional Devices (Non-addressable)	**Document Number**
Device Compatibility Document	15378
Fire Alarm Control Panel (FACP) and Main Power Supply Installation	**Document Number**
NFS2-640/E Installation, Operations, and Programming Manuals	52741, 52742, 52743
SLC Wiring Manual	51253
Note: For individual SLC Devices, refer to the *SLC Wiring Manual*	
Off-line Programming Utility	**Document Number**
VeriFire® Tools CD help file Veri•Fire Medium Systems Help File	VERIFIRE-TCD VERIFIRE-CD
Cabinets & Chassis	**Document Number**
CAB-3/CAB-4 Series Cabinet Installation Document	15330
Battery/Peripherals Enclosure Installation Document	50295
Power Supplies, Auxiliary Power Supplies & Battery Chargers	**Document Number**
ACPS-610 Addressable Power Supply Manual	53018
ACPS-2406 Installation Manual	51304
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-24S Field Charger/Power Supply Manual (Sync)	51977
Networking	**Document Number**
Noti•Fire•Net Manual, Network Version 4.0 & Higher	51584
High-Speed Noti•Fire•Net Manual	54013
HS-NCM Installation Document	54014
NCM-W/F Installation Document	51533
NCS Network Control Station Manual, Network Version 4.0 & Higher	51658
NCA-2 Network Control Annunciator Manual	52482
ONYXWorks™ Workstation Manuals	52305, 52306, 52307
System Components	**Document Number**
DVC Digital Voice Command Manual	52411
DAL Device Reference Document	52410
DVC-RPU Manual	50107425-001
DVC-RPU UL Listing Document	50107424-001
DS-DB Digital Series Distribution Board and Amplifier Manual	53622
DAA2 and DAX Amplifiers Manual	53265
Annunciator Control System Manual	15842
Annunciator Fixed Module Manual	15048

Table 1.3 Related Documentation (1 of 2)

AFM-16A Annunciator Fixed Module Manual	15207
ACM-8R Annunciator Control Module Manual	15342
LCD-80 Manual	15037
LCD2-80 Manual	53242
FDU-80 Remote Annunciator Manual	51264
LDM Series Lamp Driver Annunciator Manual	15885
SCS Smoke Control Manual (Smoke and HVAC Control Station)	15712
FireVoice-25/50ZS & FireVoice 25/50ZST Manual	52290
FirstCommand Emergency Communication System	LS10001-001NF-E
RPT-485W/RPT-485WF EIA-485 Annunciator Loop Repeater Manual	15640
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 (Universal Digital Alarm Communicator/Transmitter) Listing Document	54089LD
UDACT-2 Manual (Universal Alarm Communicator/Transmitter)	54089
ACT-2 Installation Document	51118
RM-1 Series Remote Microphone Installation Document	51138
RA100Z Remote LED Annunciator Installation Document	I56-0508
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

Table 1.3 Related Documentation (2 of 2)

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.

1.3 Introduction to the Control Panel

The NFS2-640 is an intelligent, field-programmable Fire Alarm Control Panel. Field-programming the control panel lets you customize the fire alarm system by selecting and setting program options for intelligent/addressable detectors and modules, and Notification Appliance Circuits (NACs).

This manual provides information for programming using the NFS2-640 keypad connected to the control panel. VeriFire™ Tools must be used for programming if no keypad is used, or if a network control annunciator is used as the keypad in either a network or standalone application. Refer to VeriFire™ Tools for information on programming without the NF2S-640 keypad, and the *NF2S-640 Installation Manual* and *NCA-2 Manual* for installation information.

For details on control panel operation, refer to the *NFS2-640 Operations Manual*.

The NF2S-640 provides two methods for field-programming the control panel:

- Using the built-in "Program Change" interface
- The VeriFire™ Tools Programming Utility

The benefits of each method are listed below:

Programming method	Benefits	Refer to
Program Change	Speed and convenience of putting the control panel on line quickly (using the Autoprogram function) and changing programming information.	Section “Programming” on page 14
VeriFire™ Tools Programming Utility	Efficient means of creating and editing programs that require a lot of data entry.	Product documentation & Software help file

1.4 Features

Programming features include the following:

- Ease-of-use – Field program the control panel without needing special software skills.
- Autoprogram option – Automatically detects newly installed, addressable devices, allowing quicker installation.
- Local programming – program directly from the control panel keypad to reduce installation time.
- PC programming – input long data entry programming information on a PC; transfer programming data between a PC and the control panel using VeriFire™ Tools programming utility.
- Security – use passwords to control access to the control panel and protect memory.
- 80-Character (2x40) Liquid Crystal Display – view programming and device information on the control panel.

1.5 How to Enter a Password

The control panel provides two types of selectable passwords:

- Program Change
- Status Change

Listed below are uses and the factory-setting for each password type:

Table 1.4 Programming Passwords

Password type	Use to	Factory Setting
Program Change (high level)	Enter Program Change option to program essential control panel functions, including basic system functions and utility options.	**00000**
Status Change (low level)	Enter Status Change option to program minor functions.	**11111**

From the "SYSTEM NORMAL" screen: Press ENTER, press **1** (the password screen will display). Enter a password, then press ENTER

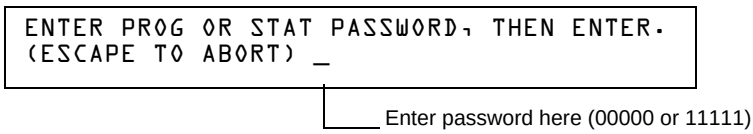


Figure 1.1 Password Screen

In Program Change or Status Change, the control panel does the following:

- Activates the System Trouble relay
- Shuts off the panel sounder
- Flashes the SYSTEM TROUBLE LED, which continues to flash while programming

For security purposes, passwords can be changed. To do so, follow the instructions in "Change a Password (3=passwd)" on page 26.

NOTE: The Read Status selection, which does not require a program password, is covered in the *NF2S-640 Operations Manual*.

NOTE: The NF2S-640 continues to monitor and report alarms in programming mode, except in autoprogramming.

Section 2: Programming

2.1 Overview

Program Change is the programming level that lets you change the essential control panel functions, such as point programming, changing passwords, changing system functions. Included are four options: Basic Program, Network, FlashScan Poll, and Utility Program.

The structure of the Program Change option is shown below:

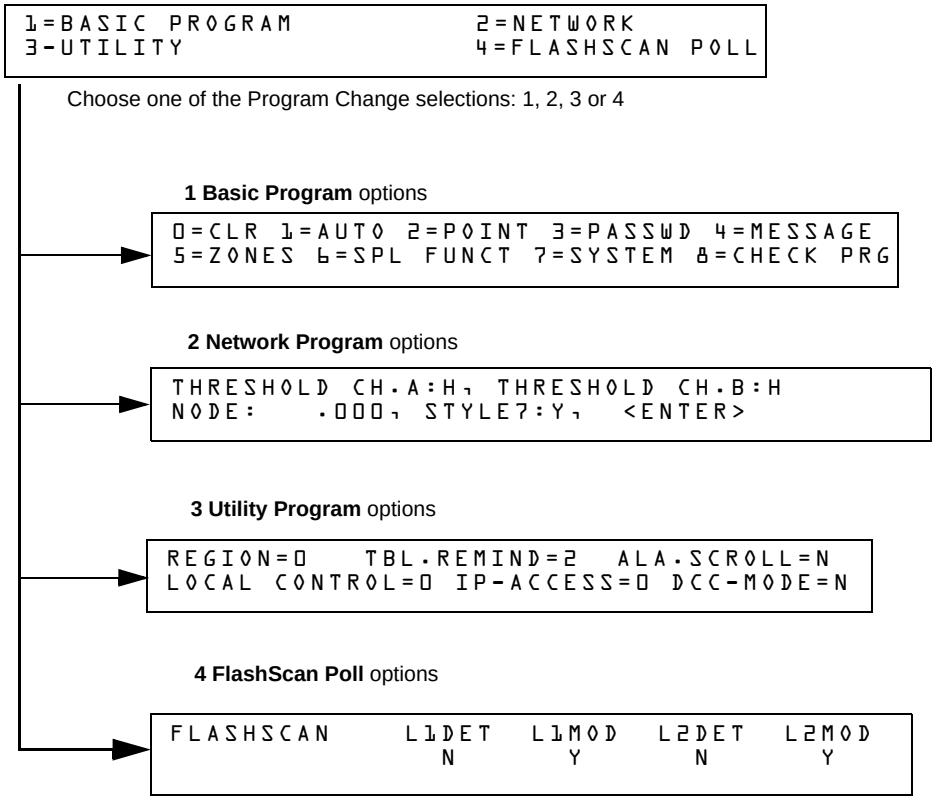


Figure 2.1 Program Change Selections

This section contains instructions and sample screens for using the Programming selections:

- **Basic Program** The Basic Program lets you program essential functions, such as clearing the program, Autoprogramming the system, programming points, and setting system functions. Refer to “Basic Program” on page 15.
- **Network Program** The Network Program allows programming of network channel thresholds, network node number, and wiring style.“The Network Program” on page 48.
- **Utility Program** The Utility Program screen provides selections for selecting a Trouble Reminder per NFPA, a Region setting, and enabling or disabling local control of the ACKNOWLEDGE/SCROLL DISPLAY, SIGNAL SILENCE, SYSTEM RESET and DRILL keys. Refer to “The Utility Program” on page 49.
- **FlashScan Poll** The FlashScan Poll screen provides the option for selecting between CLIP (Classic Loop Interface Poll) and FlashScan Poll. Refer to “FlashScan Poll” on page 50.

2.2 How to Enter Programming

To enter Program Change, follow these steps:

1. At 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. At the "Entry" screen, press the **1** key. The control panel displays the "Enter Password" screen as shown below:

```
ENTER PROG OR STAT PASSWORD, THEN ENTER.
(ESCAPE TO ABORT) _
```

3. Enter your Program Change password (See "How to Enter a Password" on page 12). The control panel displays the "Program Change Selection" screen, as shown below:

```
1=BASIC PROGRAM              2=NETWORK
3-UTILITY                    4=FLASHSCAN POLL
```

4. Select a Program Change selection: **1**, **2**, **3** or **4**.

2.3 Basic Program

From the "Program Change Selection" screen, press the **1** key to display the "Basic Program" screen which provides nine (9) options as shown below:

```
0=CLR 1=AUTO 2=POINT 3=PASSWD 4=MESSAGE
5=ZONES 6=SPL FUNCT 7=SYSTEM 8=CHECK PRG
```

Press the number of any one of the nine (9) options as detailed below

Option 0=CLR - Clears all existing user programming. For details, refer to How to Clear Memory (0=CLR) on page 16. Note: The user is prompted to double-check that this is what is really wanted.

Option 1=AUTO - Add or remove addressable devices to the control panel program. For details, refer to How to Autoprogram the Control Panel (1=AUTO) on page page 16.

Option 2=POINT - Modify or delete a point. For details, refer to "How to Modify or Delete a Point (2=POINT)" on page page 20.

Option 3=PASSWD - Change the Program Change or the Alter Status password. For details, refer to "How to Change a Password (3=PASSWORD)" on page page 26.

Option 4=MESSAGE - Edit the 40-character message that displays on the first line. For details, refer to "How to Create a System Message (4=MESSAGE)" on page page 27.

Option 5=ZONES - Edit the 20-character custom zone label for zones 01-99. For details, refer to "How to Create a Custom Zone Label (5=ZONE)" on page page 28.

Option 6=SPL FUNCT - Program Releasing Zones and Special Zones. For details, refer to "How to Program Special Zones (6=SPL FUNCT)" on page page 28.

Option 7=SYSTEM - Program Global System Functions. For details, refer to "How to Change Global System Functions (7=SYSTEM)" on page page 32.

Option 8=CHECK PRG - Check the program for errors. For details, refer to "How to Check the Program for Errors (8=check prg)" on page 48.

2.3.1 Clear Memory (0=CLR)

The Clear option removes all programming information from control panel memory. If installing the control panel for the first time, use option 0 to clear control panel memory. To do so, follow these steps:

1. From the "Basic Program" screen, press the **0** (zero) key to display the Clear Program screen. The control panel prompts for verification as shown below:

```
PRESS ENTER TO CLEAR ENTIRE PROGRAM
OR ESCAPE TO ABORT
```

2. Press the ENTER key to clear control panel memory or press the ESC key to exit the screen without clearing.

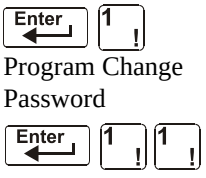
2.3.2 Autoprogram the Control Panel (1=AUTO)

Purpose

The Autoprogram option identifies all addressable devices connected to the control panel. Devices include addressable detectors and modules connected to SLC 1 or SLC 2, and NACs. You can use the Autoprogram option to create a new program and add or remove devices. A summary of the Autoprogram functions, when to use the functions, and where to find information on using the functions is found below:

Autoprogram Function	Control Panel Configuration	Refer to...
Create a new program for the control panel	A new control panel or a control panel with no existing program in memory.	"Create a New Program for the Control Panel" on page 16
Add one or more SLC-connected detectors and modules to an existing program	A program exists in memory and you want to add a detector or module to the existing program—without modifying information for existing detectors and modules.	"Add a Device to the Program" on page 17
Remove one or more SLC-connected detectors and modules from an existing program	A program exists in memory and you want to remove an installed detector or module from the existing program—without modifying information for existing detectors and modules.	"Remove a Device from the Program" on page 18
View system defaults	A program exists in memory and you want to view system settings assigned during Autoprogram, such as custom labels, passwords, and so on.	Page 19 "Change Autoprogram Default Value" to see the system defaults

Create a New Program for the Control Panel



This section covers how to use the Autoprogram option to create a new program for the control panel. The control panel will identify all addressable detectors and modules connected to the SLC.

To create a new program for the control panel, follow these steps:

1. Use the Clear option to clear program information from memory. For instructions on clearing memory, refer to "How to Clear Memory (0=**CLR**)" on page page 16.

NOTE: Once Step 1 is completed, Step 2 will cause the panel to assess whether a loop is comprised of all FlashScan devices or not. If they are all FlashScan, autoprogramming will change the loop setting to FlashScan if it was not already at that setting. If the devices are not all FlashScan, autoprogramming will not make a change to the default setting of CLIP. (See "FlashScan Poll" on page 50 for FlashScan settings.)

2. From the "Basic Program" screen, press the **1** key to start Autoprogram. While the control panel scans the system to identify all SLC devices and NACs, it displays the following screen:

```
AUTOPROGRAM          PLEASE WAIT
```

When the autoprogram is finished identifying SLC devices and NACs, it displays a summary screen that gives a count of all the devices it has located. Refer to the following screen for an example of this display.

```
L1:010Dets, 159Mods L2:159Dets, 159Mods
SB L1:000, L2:159   Bells: 04
```

SB represents detectors with B200 series sounder bases. Refer to VeriFire Tools for B200 sounder base programming.

3. Press ENTER. All devices are automatically accepted during initial autoprogramming. The following screen displays briefly, followed by the SYSTEM NORMAL screen.

```
ACCEPT ALL DEVICES   Please Wait!!!
```

To edit the autoprogramming default values for a point, refer to "How to Modify or Delete a Point (2=POINT)" on page page 20.

To edit the autoprogram default values assigned to all modules and detectors during autoprogramming, refer to "Change Autoprogram Default Values" on page 19.

Add a Device to the Program

You can also use the Autoprogram option to add addressable devices to the control panel program.

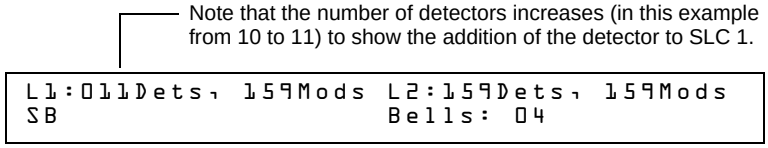
NOTE: When using the Autoprogram option with an existing program, the control panel does not change program information for installed and programmed devices. However, it will assess whether a loop contains all FlashScan devices and change the loop setting to FlashScan if necessary.

The following steps describe how to add a new detector at SLC address 1D147 with 10 detectors in the existing program:

1. Physically install the addressable detector to SLC 1 at address 147 (for instructions, refer to the *NF2S-640 Installation Manual* and the installation document that comes with the detector).
2. From the "Basic Program" screen, press the **1** key to start Autoprogram. The Autoprogram Prompt screen appears in the LCD display as the control panel identifies addressable devices. When finished identifying addressable devices, the control panel displays information for the new detector at SLC address 1D147 on the LCD display as shown below:

```
PROGRM SMOKE(PHOTO) DETECTOR ADDR 1D147
                03 __ __ __ __A8P8** 1D147
```

3. Press the ENTER key to add detector 147 to the program with the default program information. If you want to change the default information, use the programming keys to do so, then press the ENTER key to add detector 147 to the program.
   The Autoprogram Summary screen appears. You can verify addition of the detector to the program by noting the new count of detectors as shown below:



4. Press the ENTER key, then press the esc key to save the program in memory and return to the "Basic Program" screen).

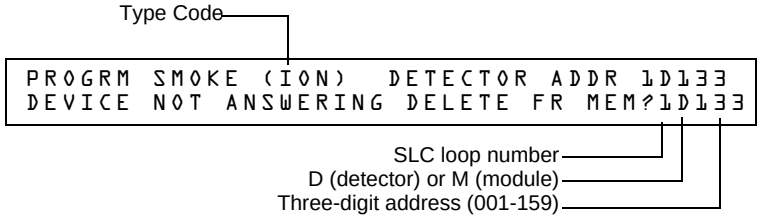
Remove a Device from the Program

You can also use the Autoprogram option to remove addressable detectors and modules from the control panel program.

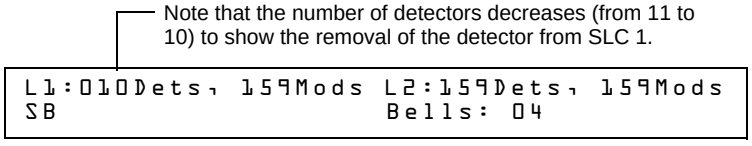
NOTE: When using the Autoprogram option with an existing program, the control panel does not change program information for installed and programmed devices.

The following steps describe how to delete a detector at SLC address 1D133 with 11 detectors connected to SLC 1 in the existing program:

1. Disconnect and remove the detector from SLC 1 at address 1D133.
2. From the "Basic Program" screen, press the **1** key to start Autoprogram. The Autoprogram Prompt screen displays while the control panel identifies addressable devices.
3. When finished identifying addressable devices, the control panel displays a screen, indicating a missing detector at SLC address 1D133 as shown below:



4. Press the ENTER key to delete detector 1D133 from the program.
   The Autoprogram Summary screen appears. You can verify removal of the detector from the program by noting the new count of detectors as shown below:



5. Press the ENTER key, then press the **ESC** key to save the program in memory and return to the "Basic Program" screen.

Change Autoprogram Default Values

To assign system default values from the basic program screen, Press **0** (clear), then press **1** (autoprogram). Refer to the chart below for default values and how to modify them.

Table 2.1 Autoprogram Defaults (1 of 2)

Function	Default Values	To Alter, refer to
Software Zones 01-99	Default custom label “Zone xx” where xx is the number of the zone **Note**: Zone 00 is reserved for a general alarm.	“How to Create a Custom Zone Label (5=ZONE)” on page 28
F0	PRG PRESIGNAL FUNCT PRESIGNAL DELAY DELAY=180 PAS=NO F00	“F0 (Presignal/PAS) The Presignal screen provides fields for changing the delay time or PAS. For details on Presignal selections, refer to “Presignal and PAS Time” on page 93. From the Special Function Change screen, press the F key, then press the 0 key to display the Presignal Function screen.” on page 30
Releasing Zones R0-R9	PRG RELEASE FUNCT RELEASE CONTROL DELAY=00 ABORT=ULI CROSS=N SOK=0000	“R0-R9 (Releasing Functions) The Releasing Function screen provides fields for changing releasing functions: Delay Timer, Abort Switch, Cross Zone, and Soak Timer. For details on releasing applications, refer to “NFPA Releasing Applications” on page 62.” on page 30 and “How to Program a Releasing Zone” on page 62. NOTE: The FCM-1-REL has an inherent two second delay, which must be factored into the DELAY TIME and SOK (soak time) entries.
F5 and F6	PRG TIME FUNCTION TIME CONTROL ON=**:** OFF=**:** DAYS=********	“F5-F6 (Time Control Functions) The Time Control screen provides fields for changing the start time, stop time, or days of the week. For details on time selections, refer to “Time Control Zones” on page 94. From the Special Function Change screen, select F5 or F6 to display the Time Control screen:” on page 31
F7	PRG HOLIDAY FUNCTION **/** **/** **/** **/** **/** **/** **/** **/** **/**	“F7 (Holiday) The Holiday screen provides fields for specifying up to nine holiday dates. For details on holiday selections, refer to “Time Control Zones” on page 94. From the Special Function Change screen, press F7 to display the Holiday screen:” on page 31
F8	PRG CODING FUNCTION CODE TYPE MARCH TIME F08	“F8 (Coding Function) The Coding Function screen provides fields for specifying one of the following coding functions: March Time, Two-stage, California, Temporal, Two-Stage Canada (3 minutes), Two-Stage Canada (5 minutes), Two-Stage Canada Manual, System Sensor Strobe, Gentex Strobe, and Wheelock Strobe. For details on selecting coding functions, refer to “Coding Functions for NACS” on page 94. From the Special Function Change screen, press F8 to display the Coding Function screen:” on page 31
F9	PRE-ALARM FUNCT ALERT F09	“F9 (Pre-Alarm) The Pre-Alarm screen provides fields for programming the Alert or Action Pre-Alarm functions. For details on Pre-Alarm selections, refer to “Pre-Alarm” on page 101. From the Special Function Change screen, press F9 to display the Pre-Alarm screen:” on page 32
System Parameters	SIL INH=0000 AUTO=0077 0 VERIFY=30 USA TIME TERM=N AC_DLY=Y LocT BLINK=01 ST=4 ACS=N	“How to Change Global System Functions (7=SYSTEM)” on page 32
Passwords	Default programming passwords are: Program Change=00000 Status Change=11111	“How to Change a Password (3=PASSWD)” on page page 26
SYSTEM NORMAL message	(YOUR CUSTOM SYSTEM MESSAGE HERE) SYSTEM NORMAL 10:23A 041515 Tue A message, along with the current day, time, and date, that displays on the second line of the LCD display during normal operation.	**Note**: The second line, “SYSTEM NORMAL”, is a standard system message that you cannot change

Table 2.1 Autoprogram Defaults (2 of 2)

Function	Default Values	To Alter, refer to
System Message	(YOUR CUSTOM SYSTEM MESSAGE HERE) SYSTEM NORMAL 10:23A 041515 Tue The first line of the LCD display contains 40 blank characters for a custom message.	"How to Create a System Message (4=MESSAGE)" on page page 27
IP ACCESS	Default setting is zero (0), IP Access not enabled.	"The Utility Program" on page 49
DCC Mode	Default setting is N, no DCC participation.	"The Utility Program" on page 49

2.3.3 Modify or Delete a Point (2=POINT)

Enter 1 !

Program Change Password

Enter 1 ! 2 @

After programming all SLC-connected devices into the system, you can modify or delete points. From the "Basic Program" screen, press the **2** key to display the Point Programming screen:

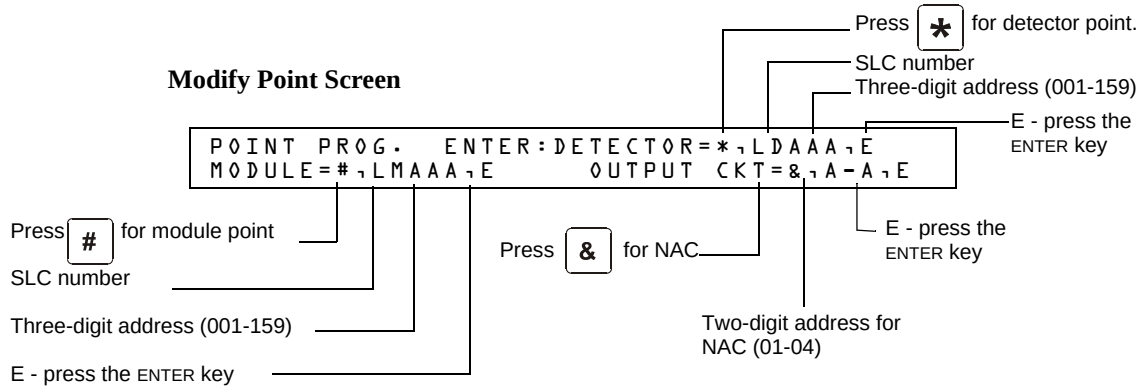
```
POINT PROG.                          1=MODIFY POINT
2=DELETE POINT
```

To modify a point for a detector, module, or NAC: press the **1** key to display the "Modify Point" screen.

NOTE: When programming points, take the following into design consideration:
Each general zone must be dedicated to a single event type (i.e. Fire, MN, Security, etc.)
Map inputs only to general zones designed for the input's event type. For example, map mass notification devices to general zones designed for mass notification.
Outputs can be mapped to multiple general zones that are dedicated to different event types. For instance, a single output can be mapped to an MN general zone and a Fire general zone.

To delete a point for a detector, module, or NAC: press the **2** key to display the "Delete Point" screen.

Modify Point Screen



Delete Point Screen

```
DELETE POINT. ENTER:DETECTOR=*,LDAAA,E
MODULE=#,LMAAA,E       OUTPUT CKT=&,A-A,E
```

The Modify Point and Delete Point screens let you edit or delete points for a detector, a monitor or control module, or NAC. To select a point, follow these steps:

To select	Do the following	Refer to
an addressable detector	Press [*] Type the SLC number (1 or 2) and detector (D) and address (001-159) Press [Enter]	"Modify an Addressable Detector Point" on page 21.
an addressable monitor module	Press [#] Type the SLC number (1 or 2) and module (M) and address (001-159) Press [Enter]	"Modify an Addressable Monitor Module Point" on page 23.
an addressable control module	Press [#] Type the SLC number (1 or 2) and module (M) and address (001-159) Press [Enter]	"Modify an Addressable Control Module Point" on page 24.
a NAC	Press [&] Type the NAC address (01-04) Press [Enter]	"Modify NAC Points" on page 25.

The next four sections describe how to program the points selected.

Modify an Addressable Detector Point

This section contains a sample detector programming screen, detector default selection, and instructions for modifying a detector point. Autoprogram default values for a detector are shown:

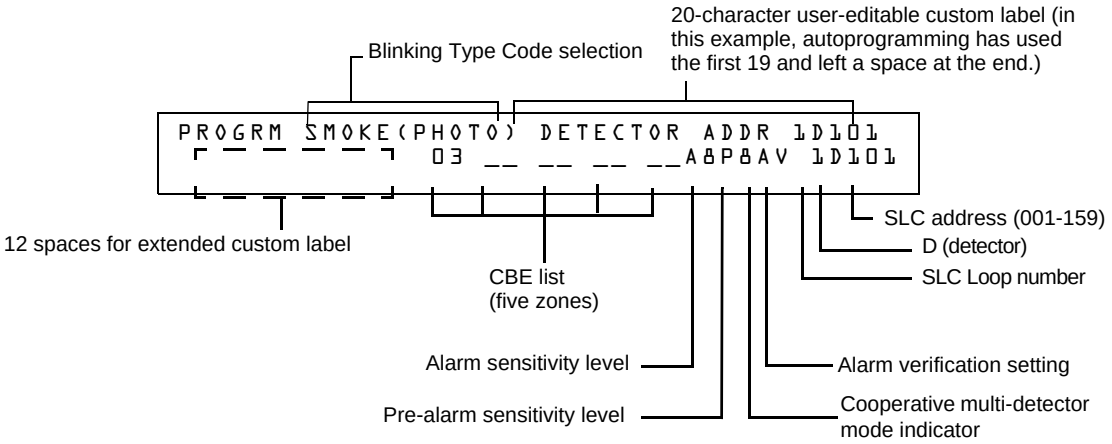


Table 2.2 Detector Program Values

Field	Description	Set as Follows
Type Code	Detector function specification - SMOKE(PHOTO) in example.	Press the NEXT or PREVIOUS Selection keys to scroll through valid detector Type Code selections. See F.4.2 on page 114 for lists and descriptions.
Custom Label	20 character custom label.	Change by placing the cursor into the first space of the field using the arrow keys, then typing the descriptor. DETECTOR ADDR 1D101 is the autoprogram default custom label for the detector at address 101 on SLC 1.

Table 2.2 Detector Program Values

Field	Description	Set as Follows
Extended Label	12 character custom label extension.	See “Custom Label” above. Note that spaces must be input by the user, including any space necessary between the custom and extended label fields. An 80-column printout will run the two fields together.
CBE List	Five zones can be listed - one zone, Z03, is shown in the example. Up to 4 more could be added to this detector.	Zones can be changed or added to the CBE list by placing the cursor in the zone field using arrow keys, then typing. Defaults: Zone 01 (Heat detectors) Zone 02 (Ion detectors) Zone 03 (Photo detectors, Beam detectors) Zone 04 (Laser detectors) Zone 05 (Multisensor)
Alarm Sensitivity	The alarm sensitivity level, with 9 the least sensitive alarm level and 1 the most sensitive alarm level.	Refer to Table C.2 on page 103 for settings. Select by placing the cursor in the field using the arrow keys, then either pressing the NEXT or PREVIOUS keys to make the selection, or typing the value. Defaults: A8 (Photo) A6 (Ion) A6 (Laser) A5 (Multisensor)
Pre-alarm level	Shows the Pre-Alarm level setting—a number between 0 and 9—as follows: 0 – no Pre-Alarm 1 – self optimizing 2 – most sensitive Pre-Alarm level 9 – least sensitive Pre-Alarm level	Refer to Table C.2 on page 103 for settings. Select by placing the cursor in the field using the arrow keys, then either pressing the NEXT or PREVIOUS keys to make the selection, or typing the value. Defaults: P8 (Photo) P6 (Ion) P6 (Laser) P5 (Multisensor)
Cooperative Multi-detector mode	Indicates the cooperative multi-detector mode (A in the example).	Select by placing the cursor in the field using the arrow keys, then either pressing the NEXT or PREVIOUS keys to make the selection, or typing the value. ***** = OFF (Default) **A** combines the detector's alarm decision with the next address above **B** combines the detector's alarm decision with the next address below **C** combines the detector's alarm decision with the next address above and the next address below
Alarm verification	Indicates the alarm verification setting (V in the example).	Indicates Alarm Verification (V=on, *=off). Select by placing the cursor in the field using the arrow keys, then pressing the NEXT or PREVIOUS keys to make the selection. Refer to “Interpreting a Detector Status Display or Maintenance Report” on page 106 for more information on the alarm verification feature. Note: Do not use this setting when an alarm activation requires activation of two or more automatic detection devices.

Modify an Addressable Monitor Module Point

When you select a point address, the control panel returns a screen that displays information about the point. Below is an example of information for a monitor module (2M101) in the LCD display:

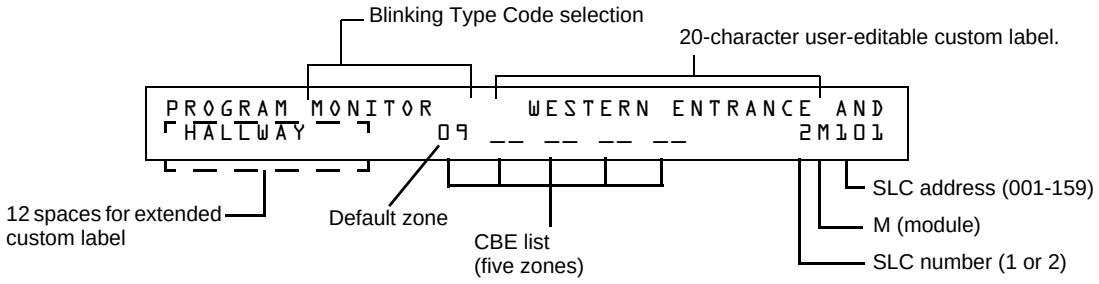


Table 2.3 Modifying Monitor Module Programming Selections

Field	Description	Set as Follows
Type Code	Monitor Module function specification - MONITOR in example.	Press the NEXT or PREVIOUS Selection keys to scroll through valid monitor module Type Code selections. Lists and descriptions are in See Table F.2 on page 116.
Custom Label	20 character custom label.	Change by placing the cursor into the first space of the field using the arrow keys, then typing the descriptor. Note: Spaces must be input by the user, including any space necessary between the custom and extended label fields. An 80-column printout will run the two fields together.
Extended Label	12 character custom label extension.	See “Custom Label” above.
CBE List	Five zones can be listed - one zone, Z09, is shown in the example. Up to 4 more could be added to this module.	Zones can be changed or added to the CBE list by placing the cursor in the zone field using arrow keys, then typing. See Table 2.4 on page 23 for defaults.

When finished modifying a point, press the ENTER key; then press the NEXT or PREVIOUS key to select another point.

Monitor Module Default Zone Assignments

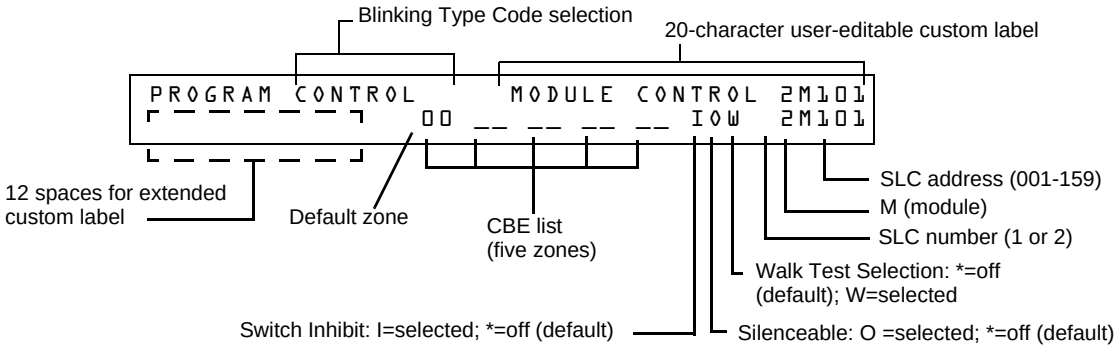
Listing of the monitor module address range and the default zone assignment for each range:

Table 2.4 Monitor Module Default Zones

Monitor Module Address	Zone Default
01 through 19	Z04
20 through 39	Z05
40 through 59	Z06
60 through 79	Z07
80 through 99	Z08
100 through 119	Z09
120 through 139	Z10
140 through 159	Z11

Modify an Addressable Control Module Point

When you select a point address for modification, the control panel returns a screen that displays information about the point. For example, the illustration below shows sample information for a control module (2M101) in the LCD display.



NOTE: On a control module, the default zone is always set to Zone 00 (general alarm).

To modify a point, follow these steps. A blinking cursor indicates the selected field.

1. From the programming screen, use the arrow keys to move to a field that you want to modify. See below for descriptions and settings.

Table 2.5 Modifying Control Module Programming Selections (1 of 2)

Field	Description	Set as follows:
Type Code	Specifies the function of the control module	Press the NEXT or PREVIOUS Selection keys to scroll through valid control module Type Code selections (listed in Table F.3 on page 117)
Custom Label	20 character custom label.	Change by placing the cursor into the first space of the field using the arrow keys, then typing the descriptor. Note: Spaces must be input by the user, including any space necessary between the custom and extended label fields. An 80-column printout will run the two fields together.
Extended Label	12 character custom label extension.	See “Custom Label” above.
CBE list	Up to five software zones can be entered to define the output responses of the control module based on various initiating conditions (events)	Type the number of up to five zones, including E0-E9, F0-F9, L0-L9, R0-R9, and zones 00-99. The first zone default is Z00 (general alarm).
Switch Inhibit	Specifies if an operator can manually activate an output	Type one of the following entries. **I** = Switch Inhibit enabled ***** = no switch inhibit (default for all but releasing circuits)
Silenceable	Specifies if an operator can manually silence an activated output	Type one of the following entries. ***** = 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 **C** = silenceable, resound by CO detection If the “Strobe” Type ID is used with System Sensor, Gentex or Wheelock Strobe synchronization,“*” will silence the horn portion only, and resound will occur only by fire alarm. F, U, B, T, or O will silence the entire circuit, and resound will occur according to the above definitions.

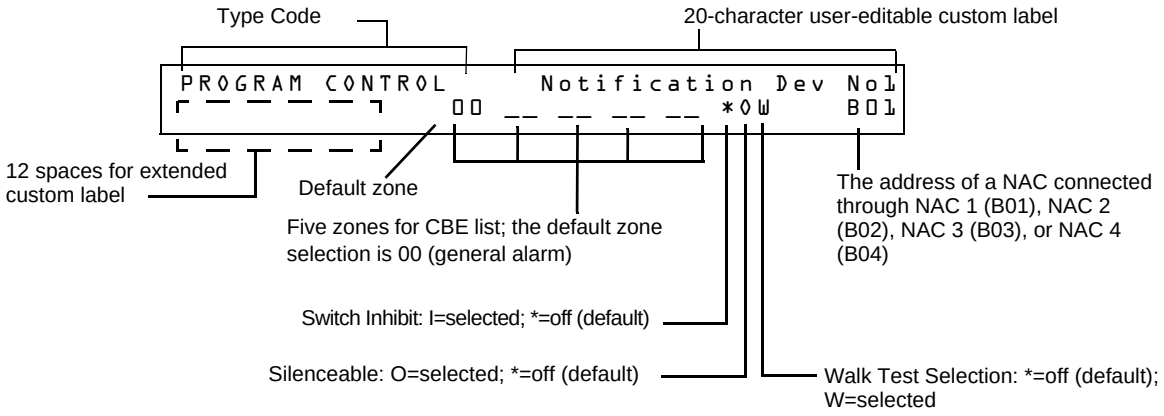
Table 2.5 Modifying Control Module Programming Selections (2 of 2)

Field	Description	Set as follows:
Walk Test	Specifies if outputs sound during Walk Test	Type one of the following entries. **W** = devices sound (Basic Walk Test) ***** = devices do not sound (Silent Walk Test) (default)

2. When finished modifying a point, press the ENTER key; then press the NEXT or PREVIOUS key to select another point.

Modify NAC Points

Modifying NACs (four NACs on the NFS2-640) is like modifying control modules—except for the Type Code and device address.



To modify a point, follow these steps. A blinking cursor indicates the selected field.

1. From the programming screen, use the arrow keys to move to a field that you want to modify and refer to information below for descriptions and settings.

Table 2.6 Modifying a NAC Programming Selections (1 of 2)

Field	Description	Set as follows:
Type Code	Specifies the function of the NAC.	Press the NEXT or PREVIOUS Selection keys to scroll through the NAC Type Code selections (listed in Table F.4 on page 118)
Custom Label	20 character custom label.	Change by placing the cursor into the first space of the field using the arrow keys, then typing the descriptor. Note: Spaces must be input by the user, including any space necessary between the custom and extended label fields. An 80-column printout will run the two fields together.
Extended Label	12 character custom label extension.	See “Custom Label” above.
CBE zones	Specifies up to five software zones to define the output responses of the NAC based on various initiating conditions (events)	Type the numbers of up to five zones, including E0-E9, F0-F9, L0-L9, R0-R9, and zones 00-99. The first zone default is 00 (general alarm)
Switch Inhibit	Specifies if an operator can manually activate an output	Type in one of the following values. **I** = Switch Inhibit enabled ***** = Switch Inhibit disabled (default for all but releasing circuits)

Table 2.6 Modifying a NAC Programming Selections (2 of 2)

Field	Description	Set as follows:
Silenceable	Specifies if an operator can manually silence an activated output	Type in one of the following values. ***** = 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 **C** = silenceable, resound by CO detection If the "Strobe" Type ID is used with System Sensor, Gentex or Wheelock Strobe synchronization,"*" will silence the horn portion only, and resound will occur only by fire alarm. F, U, B, T, or O will silence the entire circuit, and resound will occur according to the above definitions.
Walk Test	Specifies if outputs sound during Walk Test	Type in one of the following values. **W** = devices sound (Basic Walk Test) - default ***** = devices do not sound (Silent Walk Test)

2. When finished modifying a point, press the ENTER key; then press the NEXT or PREVIOUS key to select another point.

2.3.4 Change a Password (3=PASSWD)

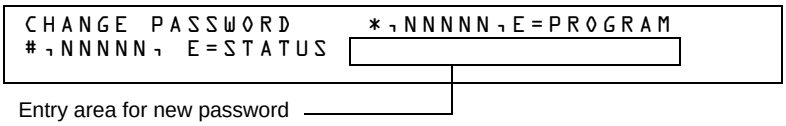
Enter 1 !

Program Change Password

Enter 1 ! 3 =

Password Change lets you select a custom Program Change (high level) or Status Change (low level) password. From the "Basic Program" screen, press the **3** key to display the "Change Password" screen.

.



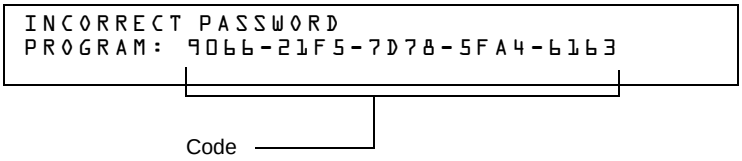
To change a password, follow the instructions below:

Table 2.7 Changing a Password

To	Press	Then
Change the Program Change password	*	Enter the new Program Change password. Use five digits, no characters.
Change the Status Change password	#	Enter the new Status Change password. Use five digits, no characters.
Save the password	Enter	The Verify Password screen appears. Press ENTER to verify.
Leave the Change Password screen without changing a password	Esc	The Basic Program screen appears.

A Forgotten Password?

If a password is entered incorrectly, the panel will respond by displaying an INCORRECT PASSWORD message and a code. The programmer may hit escape and reenter the password correctly. However, if the password has been forgotten, record the code and contact Notifier. After proper authentication, the original password can be determined by deciphering the code. An example of an INCORRECT PASSWORD display is given below:



2.3.5 Create a System Message (4=MESSAGE)

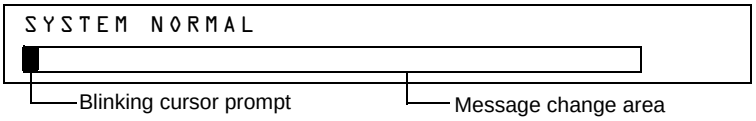
Enter 1 !

Program Change Password

Enter 1 ! 4 ,

The Message option lets you create a 40-character custom System Message that displays on the first line of the "SYSTEM NORMAL' screen as shown below:

From the "Basic Program" screen, press the **4** key to display the "System Message Change" screen:



To create the system message, follow these guidelines:

- Enter one character at a time, indicated by the blinking cursor on the second line of the display.
- Enter up to 40 characters maximum.

Instructions for entering characters in the Message Change screen:

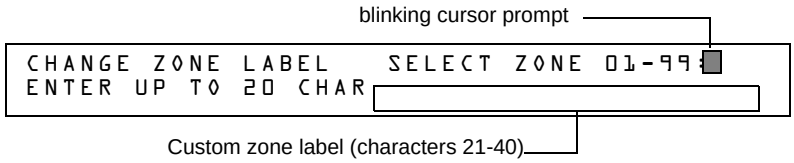
Table 2.8 Creating Messages

To	Do this
Change a blinking character	Enter a character from the keypad
Move to the next character	Press →
Enter lower case characters	Press Lower Case, then press the character of your choice.
Enter additional characters ! @ = , % : \ . | ?	Press Lower Case, then press a number key as follows: 1 ! 2 @ 3 = 4 , 5 % 6 : 7 \ 8 . 9 | 0 ? For example, press Lower Case, then press the 3 (3 =) key to enter a "=" character.
Save the new message	Press Enter

2.3.6 Create a Custom Zone Label (5=ZONE)

Enter 1 !
Program Change Password
Enter 1 ! 5 %

The Zone option lets you change the custom label assigned to zones 1-99. From the "Basic Program" screen, press the **5** key to display the "Zone Change" screen as shown below:



The zone number displays in the first line, characters 39 and 40. When changing a zone label, follow these guidelines.

- For single-digit numbers, enter a leading zero before the digit.
- Enter an alphanumeric zone label into line 2, characters 21–40.

To change a custom label for a zone, follow these instructions:

Table 2.9 Create or Change a Custom Zone Label

To	Do this
Change a zone label	Enter a new zone label from the keypad.
Save the zone label in memory	Press Enter. The program stores the zone label in memory and displays the Zone Change screen with all fields blank.
Leave the Zone Change screen without changing a zone label	Press Esc. The display returns to the Program Change screen.

2.3.7 Program Special Zones (6=SPL FUNCT)

Enter 1 !
Program Change Password
Enter 1 ! 6 :

The Special Zone Change option lets you change the program for Special Zones F0-F9, Releasing Zones R0-R9, FA (Verification), FB (Custom drill zone) or FC (CO Alarm). From the "Basic Program" screen, press the **6** key to display the "Special Function Change" screen as shown below:

.

```
SPECIAL FUNCTION: F0=PRESIG  R0-R9=REL
F5-F6=TIME F7=HOL F8=CODE    F9=PRE-ALARM
```

Special Zone Descriptions

Descriptions for each Special Zone that appears in the "Special Function Change" screen are detailed below:

NOTE: Special Zones F0-F9 appear in the CBE list of a device as ZF0-ZF9. For example, if you list F0 for a detector, one of the five zones in the CBE list of the detector will display as ZF0.

Table 2.10 Summary of Special Zones

Special Zone	Lets you
F0=PRESIG	Select a Presignal Delay Timer and select PAS (Positive Alarm Sequence)
F5-F6=TIME	Specify Time Control functions such as the start time, stop time, or days of the week
F7=HOL	Specify up to nine holiday dates. An F7-programmed device activates on the specified holiday dates
F8=CODE	Specify one of the following coding function selections: March Time, Temporal, California, Two-Stage, Two-Stage Canada (3 minute or 5 minute), Two-Stage Canada Manual, System Sensor Strobes, Gentex Strobes, or Wheelock Strobes. F8 only takes effect if you program one or more NACs to F8
F9=PRE-ALARM	Select a Pre-Alarm level: Alert or Action
FA (ZF10*)	Turn on when detector in verification mode. This is a fixed point and is not programmable
FB (ZF16*)	Turn on if custom drill set to Y and the panel in Drill mode (Alarm Signal for Canadian mode
FC (ZF18*)	Turn on when a CO alarm occurs
FD (ZF20*)	Turns on when a mass notification alarm occurs (Not applicable for FirstCommand applications)
FE (ZF21*)	Turns on when a mass notification supervisory occurs
FF (ZF22*)	Turns on when a mass notification trouble occurs
ZF36*	If the local control active LED is on, this special zone will activate
ZF37*	Automatic Alarm Signal Activation Timer will turn on when the first alert stage has been entered.
ZF38*	Turns on when the panel enters the second (evacuation) stage.
ZF39*+	Automatic Alarm Signal Timer canceled. Can only be canceled if there is an ACS button mapped to this zone.
ZF40*	Auto Silence Activation. ZF40 will activate when the auto silence timer has expired and silenceable outputs on the fire panel have been silenced as a result. ZF40 will remain active until a system reset, resound, or drill (alarm signal for Canadian applications) is performed.
NOTE: Special Function Zones FA through FF are not field programmable.	
R0-R9=REL	Program up to ten Releasing Zones, each with a selection for a Delay Timer, an Abort Switch, a Cross Zone selection, or a Soak Timer
* VeriFire Tools settings	

Mass Notification

When used for mass notification, special zones ZF20, ZF21, and ZF22 can be used to signal the MN event.

NOTE: During local or network Walk Test, activating a Mass Notification device will activate associated special function zones according to CBE programming and simulate a Mass Notification event. Any network nodes, zones, or devices not participating in Walk Test will not participate in the simulated Mass Notification event.

Special Zones F1-F4

The control panel also provides four Special Zones, F1-F4, which are outputs that do not appear on the Special Function Change screen. You can program Special Zones F1 to F4 into the CBE of an output device. Descriptions of F1, F2, F3, and F4 are detailed below:

To view the status of Special Functions F1-F4, use the Read Status function (refer to the *NFS2-640 Operations Manual*).

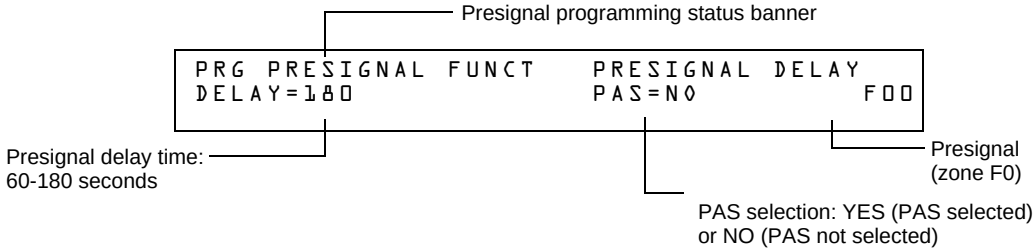
Table 2.11 Special Output Functions F1-F4

Special Function	Specifies
F1 (Trouble less AC)	An output programmed to turn on/off if a system trouble—other than an AC power loss—occurs
F2 (AC Trouble)	An output programmed to turn on/off if an AC power loss or a brownout condition occurs
F3 (Security)	An output programmed to turn on/off if a Security input activates
F4 (Supervisory)	An output programmed to turn on/off if a Supervisory input activates

Selecting Special Zones

Select Special Zones by entering the Special Zone letter and number (for example, F0, R0, and so on) from the Special Function Change screen. The following sections show sample screens that display when you select a Special Zone.

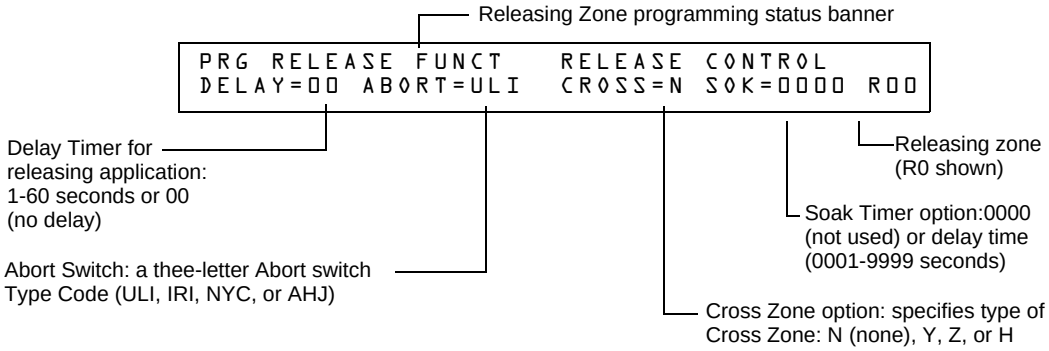
F0 (Presignal/PAS) The Presignal screen provides fields for changing the delay time or PAS. For details on Presignal selections, refer to “Presignal and PAS Time” on page 93. From the Special Function Change screen, press the **F** key, then press the **0** key to display the Presignal Function screen.



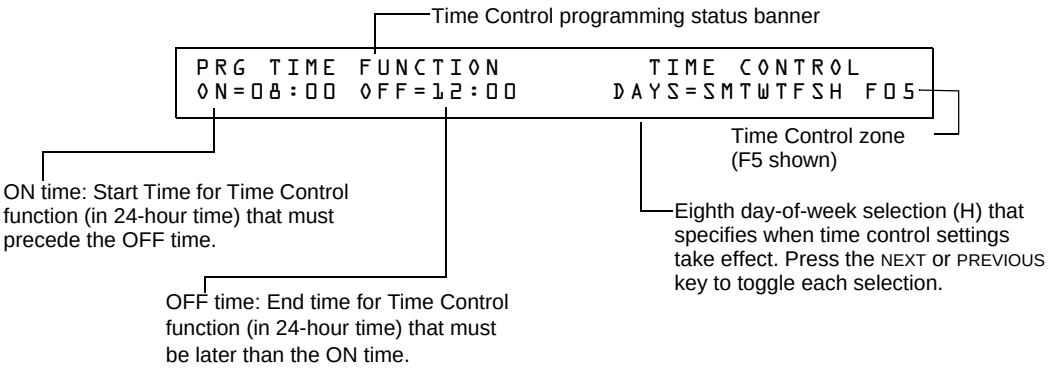
R0-R9 (Releasing Functions) The Releasing Function screen provides fields for changing releasing functions: Delay Timer, Abort Switch, Cross Zone, and Soak Timer. For details on releasing applications, refer to “NFPA Releasing Applications” on page 62.

NOTE: The FCM-1-REL has an inherent two second delay, which must be factored into the DELAY TIME and SOK (soak time) entries.

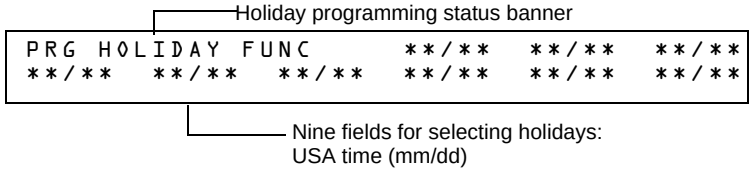
From the Special Function Change screen, select a function (R0-R9) to display the Releasing Function screen:



F5-F6 (Time Control Functions) The Time Control screen provides fields for changing the start time, stop time, or days of the week. For details on time selections, refer to “Time Control Zones” on page 94. From the Special Function Change screen, select F5 or F6 to display the Time Control screen:

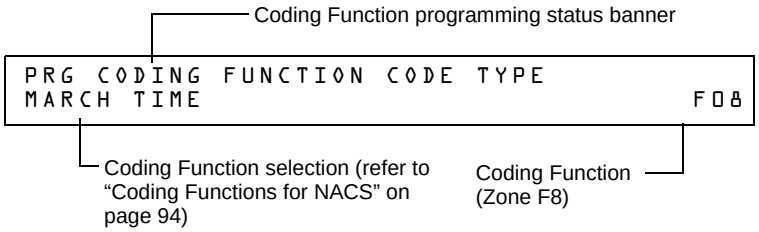


F7 (Holiday) The Holiday screen provides fields for specifying up to nine holiday dates. For details on holiday selections, refer to “Time Control Zones” on page 94. From the Special Function Change screen, press **F7** to display the Holiday screen:

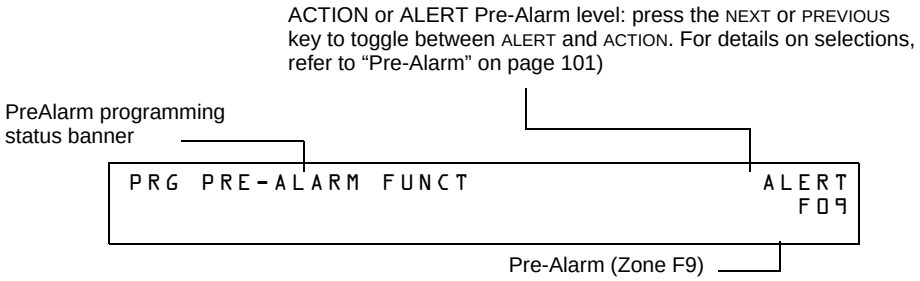


F8 (Coding Function) The Coding Function screen provides fields for specifying one of the following coding functions: March Time, Two-stage, California, Temporal, Two-Stage Canada (3 minutes), Two-Stage Canada (5 minutes), Two-Stage Canada Manual, System Sensor Strobe,

Gentex Strobe, and Wheelock Strobe. For details on selecting coding functions, refer to "Coding Functions for NACS" on page 94. From the Special Function Change screen, press **F8** to display the Coding Function screen:



F9 (Pre-Alarm) The Pre-Alarm screen provides fields for programming the Alert or Action Pre-Alarm functions. For details on Pre-Alarm selections, refer to "Pre-Alarm" on page 101. From the Special Function Change screen, press **F9** to display the Pre-Alarm screen:



FA (Verification) Turn on when detector in verification mode. This is a fixed point and is not programmable.

FB (Custom drill zone) Turn on if custom drill set to Y and the panel in Drill mode (Alarm Signal Mode for Canadian Applications).

FC (CO Alarm) Turn on in the event a CO alarm is present on an FCO-851 detector or monitor module with a CO monitor type code.

FA, FB and FC can map to output point only. It can be mapped to the output device as a CBE using either panel key pad or VeriFire tools. But the custom drill option (Yes or No) is only programmed by VeriFire tools.

FD (MN Alarm) Turn on when an MN Alarm occurs on the fire panel. (Not applicable for FirstCommand applications).

FE (MN Supervisory) Turn on when an MN Supervisory occurs on the fire panel.

FF (MN Trouble) Turn on when an MN Trouble occurs on the fire panel.

2.3.8 Change Global System Functions (7=SYSTEM)

Enter 1 !

Program Change Password

Enter 1 ! 7 \

The System option lets you select settings for global system functions that apply to all programmed devices and zones. For instance, selecting an Alarm Verification Timer for 30 seconds means that all initiating devices selected for Alarm Verification use a 30-second timer. From the "Basic Program" screen, press the **7** key to display the "System Function" screen as shown below:

Global System Functions

Settings for global system functions:

Table 2.12 Settings for Global Systems Functions

System Function	Setting	Default
SIL INH (Silence Inhibit Timer)	0 to 300 seconds	000
AUTO (Auto Silence Timer) - After the time delay expires, functions like pressing the SIGNAL SILENCE key, silencing active outputs programmed as silenceable.	000 (none); 600 to 1200 seconds **Note**: When Auto Silence activates, special function zone ZF40 will activate and will remain active until a system reset alarm resound or drill (alarm signal for Canadian applications) is initiated. **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. **Note:** Activation of Auto Silence will activate the Signal Silence LED on the fire panel display and any ACM LED point programmed for Auto Silence.	000
VERIFY (Alarm Verification Timer)	0 to 240 seconds*	60
USA TIME	USA time (mm/dd/yy) or EUR time (dd/mm/yy) Press the NEXT or PREVIOUS key to change. Note that (European) time changes to 24-hour time format and date format.	USA
TERM - Allows supervision for devices connected to TB11, i.e., FDU-80.	N = no supervision Y = supervision enabled	N
AC_DLY**	AC delay – delays loss of AC reporting for 3 hours. Y=AC delay; N=no AC delay	Y
LocX - One of three operating modes of PC or terminal connected to the control panel through TB12 on the CPU2-640. **Note**: For a complete list of functions, refer to the *NFS2-640 Operations Manual.*	LocT -(terminal connected to control panel and located in same room). LocM -(same as LocT but requires password). RemT -(terminal connected through a modem for Read Status only).	LocT
BLINK - Addressable SLC device LED blink.	Select from 00 to 16. (00 = no blink, 01 = blink every poll, 02 = blink every 2nd poll, 03 = blink every 3rd poll up to 16 = blink every 16th poll). Note that this setting affects FlashScan modules only.	01
ST - The NFPA wiring style used for the SLC.	6=Style 6 SLC wiring 4=Style 4 SLC wiring	4
ACS - Use ACS Selection Groups (Refer to “Annunciator Options” on page 34).	N or Y	N

*This value can not exceed 30 seconds for ULC installations. Can not exceed 60 seconds for UL 864.
**The onboard trouble relay will activate (TB4 on the NFS2-640 CPU) and TM-4s will report according to this setting. UDACTs and UDACT-2s are notified immediately of AC failure by the panel, regardless of the panel’s delay setting. Once the UDACT or UDACT-2 receives notification, it operates according to its own programmed AC Fail Delay reporting schedule.

Example: AC Failure occurs at 1:00 p.m. on a panel with an AC_DLY setting of Y (3 hours). The UDACT/UDACT-2 is set for notification after 1 hour.

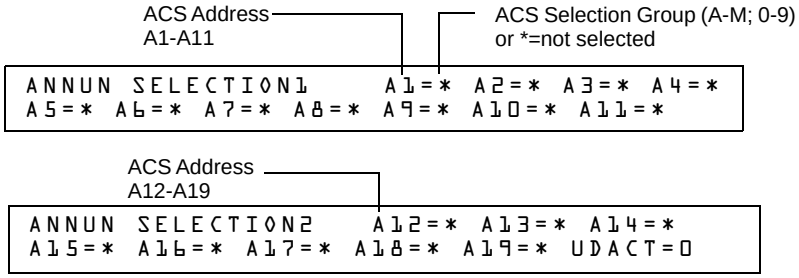
1:00 p.m. - AC Failure. Panel notifies UDACT/UDACT-2. Panel and UDACT/UDACT-2 timers begin countdown to report time.
2:00 p.m. - UDACT/UDACT-2 reports.
4:00 p.m. - TM-4 reports, TB4 trouble relay activates.

The ACPS-610 and ACPS-2406 power supplies must be set to an AC Delay value of 0 (zero) when used with this panel.

Annunciator Options

NOTE: An ACM-24AT or AEM-24AT LED point must be programmed as a dedicated visual indicator for a mass notification or CO event. This is not required for displayless systems.

Use Annunciator Selection screens to select information that will display on the ACS annunciators. (Table 2.13 on page 35 contains the ACS display selections.) Setting ACS=Y from the "System Function" screen displays the Annunciator Selection 1 screen, address A1-A11. Press enter to display Annunciator Selection 2 screen, address A12 - A19:



If UDACT=2: The UDACT is installed with Detector Maintenance Reporting. A24-A31 are pre-programmed to send control panel status to the UDACT. Only the first 100 detectors on Loop 1 and Loop 2 participate in Detector Maintenance Reporting. For pre-programmed point addressing, refer to associated table for Groups P through W on the following pages. UDACT-2 does not support this option.
If UDACT=1: The UDACT or UDACT-2 is installed. Addresses A20-A32 are available to send control panel status to the UDACT (software release #UDACT02.1 or higher) or the UDACT-2
If UDACT=0: No UDACT or UDACT-2 is installed. The control panel displays the Annunciator Selection 3 & 4 screen for addresses A20-A32.

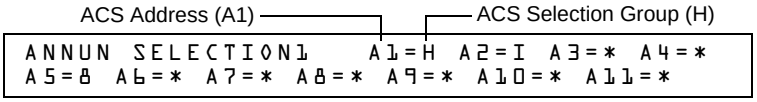
Enter "N" (ACS Selection Group N) for a TM-4 module used for remote station communication.

Enter "O" (ACS Selection Group O) for a TM-4 used as a municipal box trip. This will provide a "Master Box" trouble message at the panel.

Refer to page page 42 for further information on Group N and Group O.

ACS Selection Group Example

An example of a screen listing ACS Selection Groups (H, I and M):



Annunciator selections for addresses A1, A2 and A3 (addresses A4-A11 not selected).

- Annunciators set to Address 1 display the status of detectors 1-64 (Group H) on SLC 1
- Annunciators set to Address 2 display the status of detectors 1-64 (Group I) on SLC 2

Annunciation Points

The control panel's annunciation points are divided into 23 ACS selection groups of 64 points each. The table below contains a list of these groups, what an annunciator displays when a group is selected, and where to locate a definition of the 64 points within the group.

Table 2.13 ACS Selection Groups (1 of 2)

ACS Selection Group	Annunciator Display	Refer to
A	8 System points & Zones 1 - 56	Table 2.14 on page 36
B	Zones 57 - 99, 9 F Zones, 8 R Zones, 4 NACs	Table 2.15 on page 37
C	Loop 1, Modules 1 - 64	Table 2.16 on page 37
D	Loop 2, Modules 1 - 64	Table 2.17 on page 38
E	Loop 1, Modules 65 - 128	Table 2.18 on page 38
F	Loop 2, Modules 65 - 128	Table 2.19 on page 38
G	Loop 1, Modules 129 - 159 (1 unused point) Loop 2, Modules 129 - 159 (1 unused point)	Table 2.20 on page 38
H	Loop 1, Detectors 1 - 64	Table 2.21 on page 39
I	Loop 2, Detectors 1 - 64	Table 2.22 on page 40
J	Loop 1, Detectors 65 - 128	Table 2.23 on page 40
K	Loop 2, Detectors 65 - 128	Table 2.24 on page 40
L	Loop 1, Detectors 129 - 159 (1 unused point) Loop 2, Detectors 129 - 159 (1 unused point)	Table 2.25 on page 41
M	Programmable for use with FireVoice NFV-25/50ZS or FirstCommand	Table 2.26 on page 42
N	8 System Points & Zones 1-56	"ACS Selection Group N" on page 42
O	8 System Points & Zones 1-56	"ACS Selection Group O" on page 42
P*	Loop 1, Modules 65-100 Loop 1, Detectors 1-14 (Each detector occupies 2 points)	Table 2.27 on page 43
Q*	Loop 2, modules 65-100 Loop 2, Detectors 1-14 (Each detector occupies 2 points)	Table 2.28 on page 44
R*	Loop 1, detectors 15-46 (Each detector occupies 2 points)	Table 2.29 on page 45
S*	Loop 2, Detectors 15-46 (Each detector occupies 2 points)	Table 2.30 on page 45
T*	Loop 1 Detectors 47-78 (Each detector occupies 2 points)	Table 2.31 on page 46
U*	Loop 2, Detectors 47-78 (Each detector occupies 2 points)	Table 2.32 on page 46
V*	Loop 1, Detectors 79-100 (Each detector occupies 2 points)	Table 2.33 on page 47
W*	Loop 2, Detectors 79-100 (Each detector occupies 2 points)	Table 2.34 on page 47
*Group only available with UDACT programmed as option 2.		
1	Programmable Annunciator #1	See Note
2	Programmable Annunciator #2	See Note
3	Programmable Annunciator #3	See Note

Table 2.13 ACS Selection Groups (2 of 2)

ACS Selection Group	Annunciator Display	Refer to
4	Programmable Annunciator #4	See Note
5	Programmable Annunciator #5	See Note
6	Programmable Annunciator #6	See Note
7	Programmable Annunciator #7	See Note
8	Programmable Annunciator #8	See Note
9	Programmable Annunciator #9	See Note
0	Programmable Annunciator #10	See Note

NOTE: Refer to the VeriFire™ Tools programming utility for programming these annunciators.

ACS Selection Group A:

Table 2.14 ACS Group A

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	System Alarm	System Trouble	Acknowledge
2	Output	Not Used	Signal Silenced	Alarm Silence
3	Output	Not Used	Program Mode	System Reset
4	Output	Not Used	Supervisory	Drill
5	Output	NAC #1 Active	NAC Trouble	Control NAC #1
6	Input	Security	P/A Maint. Alert	Not Used
7	Input	Not Used	Low Battery	Not Used
8	Input	Not Used	AC Fail	Not Used
9	Input	Zone 1 Active	Zone 1 Trouble	Not Used
10	Input	Zone 2 Active	Zone 2 Trouble	Not Used
11	Input	Zone 3 Active	Zone 3 Trouble	Not Used
to		to (see note)	to (see note)	
64	Input	Zone 56 Active	Zone 56 Trouble	Not Used

* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.

NOTE: Point number to Zone number relationship is sequential. To determine Point to Zone relationship subtract 8 from Point number to arrive at Zone number.

ACS Selection Group B:

Table 2.15 ACS Group B

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Zone 57 Active	Zone 57 Trouble	Not Used
2	Input	Zone 58 Active	Zone 58 Trouble	Not Used
3	Input	Zone 59 Active	Zone 59 Trouble	Not Used
to		to (see note 1)	to (see note 1)	
43	Input	Zone 99 Active	Zone 99 Trouble	Not Used
44	Output	Zone F1 Active	Zone F1 Trouble	Not Used
45	Output	Zone F2 Active	Zone F2 Trouble	Not Used
to		to (see note 2)	to (see note 2)	
52	Output	Zone F9 Active	Zone F9 Trouble	Not Used
53	Release Ckt #0	Zone R0 Active	Zone R0 Trouble	Not Used
54	Release Ckt #1	Zone R1 Active	Zone R1 Trouble	Not Used
to	to	to (see note 2)	to (see note 2)	
60	Release Ckt #7	Zone R7 Active	Zone R7 Trouble	Not Used
61	NAC Output	NAC B01 Active	NAC B01 Trouble	Controls NAC B01
62	NAC Output	NAC B02 Active	NAC B02 Trouble	Controls NAC B02
63	NAC Output	NAC B03 Active	NAC B03 Trouble	Controls NAC B03
64	NAC Output	NAC B04 Active	NAC B04 Trouble	Controls NAC B04
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Zone number relationship is sequential. To determine Point to Zone relationship, add 56 to Point number to arrive at Zone number.
2. Point number to Zone number relationship is sequential; therefore, point 48 is zone F5 and point 57 is zone R4.

ACS Selection Group C (SLC #1, Modules 1-64):

Table 2.16 ACS Group C

Point	Type	Red LED	Yellow LED	Switch Function
1	Input or Output	Module 001 Active	Module 001 Trouble	Controls Output Module
2	Input or Output	Module 002 Active	Module 002 Trouble	Controls Output Module
3	Input or Output	Module 003 Active	Module 003 Trouble	Controls Output Module
to		to (see note)	to (see note)	
64	Input or Output	Module 064 Active	Module 064 Trouble	Controls Output Module

NOTE: Point number to Module number relationship is sequential; therefore, point 48 is Module 048.

ACS Selection Group D (SLC #2, Modules 1-64):

Table 2.17 ACS Group D

Point	Type	Red LED	Yellow LED	Switch Function
1	Input or Output	Module 001 Active	Module 001 Trouble	Controls Output Module
2	Input or Output	Module 002 Active	Module 002 Trouble	Controls Output Module
3	Input or Output	Module 003 Active	Module 003 Trouble	Controls Output Module
to		to (see note)	to (see note)	
64	Input or Output	Module 064 Active	Module 064 Trouble	Controls Output Module

NOTE: Point number to Module number relationship is sequential; therefore, point 48 is Module 048.

ACS Selection Group E (SLC #1, Modules 65-128):

Table 2.18 ACS Group E

Point	Type	Red LED	Yellow LED	Switch Function
1	Input or Output	Module 065 Active	Module 065 Trouble	Controls Output Module
2	Input or Output	Module 066 Active	Module 066 Trouble	Controls Output Module
3	Input or Output	Module 067 Active	Module 067 Trouble	Controls Output Module
to		to (see note)	to (see note)	
64	Input or Output	Module 128 Active	Module 128 Trouble	Controls Output Module

NOTE: Point number to Module number relationship is sequential. To determine Point to Module relationship add 64 to Point number to arrive at Module number.

ACS Selection Group F (SLC #2, Modules 65-128):

Table 2.19 ACS Group F

Point	Type	Red LED	Yellow LED	Switch Function
1	Input or Output	Module 065 Active	Module 065 Trouble	Controls Output Module
2	Input or Output	Module 066 Active	Module 066 Trouble	Controls Output Module
3	Input or Output	Module 067 Active	Module 067 Trouble	Controls Output Module
to		to (see note)	to (see note)	
64	Input or Output	Module 128 Active	Module 128 Trouble	Controls Output Module

NOTE: Point number to Module number relationship is sequential. To determine Point to Module relationship add 64 to Point number to arrive at Module number.

ACS Selection Group G (SLC #1 and #2, Modules 129-159):

Table 2.20 ACS Group G (1 of 2)

Point	Type	Red LED	Yellow LED	Switch Function
1	Output	SLC 1, Module 129 Active	SLC 1, Module 129 Trouble	Controls SLC 1, Module 129
2	Output	SLC 1, Module 130 Active	SLC 1, Module 130 Trouble	Controls SLC 1, Module 130

Table 2.20 ACS Group G (2 of 2)

Point	Type	Red LED	Yellow LED	Switch Function
3	Output	SLC 1, Module 131 Active	SLC 1, Module 131 Trouble	Controls SLC 1, Module 131
to		to (see note 1)	to (see note 1)	
31	Output	SLC 1, Module 159 Active	SLC 1, Module 159 Trouble	Controls SLC 1, Module 159
32	Not Used			
33	Output	SLC 2, Module 129 Active	SLC 2, Module 129 Trouble	Controls SLC 2, Module 129
34	Output	SLC 2, Module 130 Active	SLC 2, Module 130 Trouble	Controls SLC 2, Module 130
35	Output	SLC 2, Module 131 Active	SLC 2, Module 131 Trouble	Controls SLC 2, Module 131
		to (see note 2)	to (see note 2)	
63	Output	SLC 2, Module 159 Active	SLC 2, Module 159 Trouble	Controls SLC 2, Module 159
64	Not Used			

NOTE:
1. Point number to Module number relationship is sequential. To determine Point to Module relationship add 128 to Point number to arrive at Module number.
2. Point number to Module number relationship is sequential. To determine Point to Module relationship add 96 to Point number to arrive at Module number.

ACS Selection Group H (SLC #1, Detectors 1-64):

Table 2.21 ACS Group H

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 001 Alarm	Detector 001 Trouble	Not Used
2	Input	Detector 002 Alarm	Detector 002 Trouble	Not Used
3	Input	Detector 003 Alarm	Detector 003 Trouble	Not Used
to		to (see note)	to (see note)	
64	Input	Detector 064 Alarm	Detector 064 Trouble	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE: Point number to Detector number relationship is sequential; therefore, point 48 is Detector 048.

ACS Selection Group I (SLC #2, Detectors 1-64):

Table 2.22 ACS Group I

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 001 Alarm	Detector 001 Trouble	Not Used
2	Input	Detector 002 Alarm	Detector 002 Trouble	Not Used
3	Input	Detector 003 Alarm	Detector 003 Trouble	Not Used
to		to (see note)	to (see note)	
64	Input	Detector 064 Alarm	Detector 064 Trouble	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE: Point number to Detector number relationship is sequential; therefore, point 48 is Detector 048.

ACS Selection Group J (SLC #1, Detectors 65-128):

Table 2.23 ACS Group J

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 065 Alarm	Detector 065 Trouble	Not Used
2	Input	Detector 066 Alarm	Detector 066 Trouble	Not Used
3	Input	Detector 067 Alarm	Detector 067 Trouble	Not Used
to		to (see note)	to (see note)	
64	Input	Detector 128 Alarm	Detector 128 Trouble	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE: Point number to Detector number relationship is sequential. To determine Point to Detector relationship add 64 to Point number to arrive at Detector number.

ACS Selection Group K (SLC #2, Detectors 65-128):

Table 2.24 ACS Group K

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 065 Alarm	Detector 065 Trouble	Not Used
2	Input	Detector 066 Alarm	Detector 066 Trouble	Not Used
3	Input	Detector 067 Alarm	Detector 067 Trouble	Not Used
to		to (see note)	to (see note)	
64	Input	Detector 128 Alarm	Detector 128 Trouble	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE: Point number to Detector number relationship is sequential. To determine Point to Detector relationship add 64 to Point number to arrive at Detector number

ACS Selection Group L (SLC #1, Detectors 129-159, and SLC #2, Detectors 129-159):

Table 2.25 ACS Group L

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	SLC 1, Detector 129 Alarm	SLC 1, Detector 129 Trouble	Not Used
2	Input	SLC 1, Detector 130 Alarm	SLC 1, Detector 130 Trouble	Not Used
3	Input	SLC 1, Detector 131 Alarm	SLC 1, Detector 131 Trouble	Not Used
to		to (see note 1)	to (see note 1)	
31	Input	SLC 1, Detector 159 Alarm	SLC 1, Detector 159 Trouble	Not Used
32	Not Used			
33	Input	SLC 2, Detector 129 Alarm	SLC 2, Detector 129 Trouble	Not Used
34	Input	SLC 2, Detector 130 Alarm	SLC 2, Detector 130 Trouble	Not Used
35	Input	SLC 2, Detector 131 Alarm	SLC 2, Detector 131 Trouble	Not Used
		to (see note 2)	to (see note 2)	
63	Input	SLC 2, Detector 159 Alarm	SLC 2, Detector 159 Trouble	Not Used
64	Not Used			

* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.

NOTE:
1. Point number to Detector number relationship is sequential. To determine Point to Detector relationship add 128 to Point number to arrive at Detector number.
2. Point number to Detector number relationship is sequential. To determine Point to Detector relationship add 96 to Point number to arrive at Detector number.

ACS Selection Group M

FirstCommand NFC-50/100 and FireVoice (NFV-25/50ZS) are single channel and can play one message. Message priority is determined by the message number: lower-numbered messages have the higher priorities (that is, Message 2 has a higher priority than Message 3). Message 0 (OFF) has the lowest priority.

To use ACS for controlling the FirstCommand and FireVoice, install by programming Annunciator A1 as Group M through panel or VeriFire Tools programming. Refer to the First Command or FireVoice manual to properly configure the FACP.

■ VeriFire Tools Programming

Annunciator programming must be performed as follows:

- Program Annunciator Address 1 as Group M. (Refer to Table 2.26 for point definitions.)
- Assign ACS points in user Map 1.

- Map the panel zones to the desired annunciator point. Refer to the FirstCommand or FireVoice NFV-25/50ZS manual for more information, including dipswitch settings.

Table 2.26 Point Definitions for Group M

Annunciator Point	Type
1 - 9	Unused
10	Message 0 (No Message/Message Off)
11	Message 1
12	Message 2
13	Message 3
14	Message 4
15	Message 5
16 - 39	FFT Circuits
40	All-Call
41 - 64	Speaker Circuits 1 - 24

■ Panel Programming

If VeriFire Tools is not used and Group M is programmed at the panel, Zone 00 (general alarm) will be mapped to A1p11 and A1p40. A general alarm will play message 1 and activate an all-call on the FirstCommand or FireVoice. VeriFire Tools must be used for speaker circuit and message control.

ACS Selection Group N

This group is the same as Group A (See Table 2.14 on page 36), with the following exceptions:

- It should be selected only for TM-4s used for remote station communication.
- Selection Group N follows the alarm relay for annunciation (Selection Group A annunciates immediately).
- The yellow LED of annunciator point 2 is for Alarm Silence only (in Selection Group A it is for Signal Silenced).

ACS Selection Group O

This group is the same as Group A (See Table 2.14 on page 36), with the following exceptions:

- It should be selected for only for TM-4s used as Fire Municipal Box Trip outputs.
- Selection Group O provides a “Master Box” trouble displayed at the panel.
- Selection Group O follows the alarm relay for annunciation (Selection Group A annunciates immediately).

The yellow LED of annunciator point 2 is for Alarm Silence only (in Selection Group A it is for Signal Silenced).

ACS Selection Group P (SLC #1, Modules 65-100 and Detectors 1-14):

Table 2.27 ACS Group P (see note 3)

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	SLC 1, Module 65 Alarm	SLC 1, Module 65 Trouble	Not Used
2	Input	SLC 1, Module 66 Alarm	SLC 1, Module 66 Trouble	Not Used
3	Input	SLC 1, Module 67 Alarm	SLC 1, Module 67 Trouble	Not Used
to		to (see note 1)	to (see note 1)	
36	Input	SLC 1, Module 100 Alarm	SLC 1, Module 100 Trouble	Not Used
37	Input	SLC 1, Detector 1 Alarm	SLC 1, Detector 1 Trouble	Not Used
38	Input	SLC 1, Detector 1 Trouble Maintenance Urgent	SLC 1, Detector 1 Trouble Maintenance Alert	Not Used
39	Input	SLC 1, Detector 2 Alarm	SLC 1, Detector 2 Trouble	Not Used
40	Input	SLC 1, Detector 2 Trouble Maintenance Urgent	SLC 1, Detector 2 Trouble Maintenance Alert	Not Used
		to (see note 2)	to (see note 2)	
63	Input	SLC 1, Detector 14 Alarm	SLC 1, Detector 14 Trouble	Not Used
64	Input	SLC 1, Detector 14 Trouble Maintenance Urgent	SLC 1, Detector 14 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Module number relationship is sequential. To determine Point to Module relationship add 64 to Point number to arrive at Module number.
2. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, count by 2 starting from point 37.
3. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 24.

ACS Selection Group Q (SLC #2, Modules 65-100 and Detectors 1-14):

Table 2.28 ACS Group Q (see note 3)

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	SLC 2, Module 65 Alarm	SLC 2, Module 65 Trouble	Not Used
2	Input	SLC 2, Module 66 Alarm	SLC 2, Module 66 Trouble	Not Used
3	Input	SLC 2, Module 67 Alarm	SLC 2, Module 67 Trouble	Not Used
to		to (see note 1)	to (see note 1)	
36	Input	SLC 2, Module 100 Alarm	SLC 2, Module 100 Trouble	Not Used
37	Input	SLC 2, Detector 1 Alarm	SLC 2, Detector 1 Trouble	Not Used
38	Input	SLC 2, Detector 1 Trouble Maintenance Urgent	SLC 2, Detector 1 Trouble Maintenance Alert	Not Used
39	Input	SLC 2, Detector 2 Alarm	SLC 2, Detector 2 Trouble	Not Used
40	Input	SLC 2, Detector 2 Trouble Maintenance Urgent	SLC 2, Detector 2 Trouble Maintenance Alert	Not Used
		to (see note 2)	to (see note 2)	
63	Input	SLC 2, Detector 14 Alarm	SLC 2, Detector 14 Trouble	Not Used
64	Input	SLC 2, Detector 14 Trouble Maintenance Urgent	SLC 2, Detector 14 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Module number relationship is sequential. To determine Point to Module relationship add 64 to Point number to arrive at Module number.
2. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, count by 2 starting from point 37.
3. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 25.

ACS Selection Group R (SLC #1, Detectors 15-46):

Table 2.29 ACS Group R

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 015 Alarm	Detector 015 Trouble	Not Used
2	Input	Detector 015 Trouble Maintenance Urgent	Detector 015 Trouble Maintenance Alert	Not Used
3	Input	Detector 016 Alarm	Detector 016 Trouble	Not Used
4	Input	Detector 016 Trouble Maintenance Urgent	Detector 016 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 046 Alarm	Detector 046 Trouble	Not Used
64	Input	Detector 046 trouble Maintenance Urgent	Detector 046 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1.Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 15 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 26.

ACS Selection Group S (SLC #2, Detectors 15-46):

Table 2.30 ACS Group S

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 015 Alarm	Detector 015 Trouble	Not Used
2	Input	Detector 015 Trouble Maintenance Urgent	Detector 015 Trouble Maintenance Alert	Not Used
3	Input	Detector 016 Alarm	Detector 016 Trouble	Not Used
4	Input	Detector 016 Trouble Maintenance Urgent	Detector 016 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 046 Alarm	Detector 046 Trouble	Not Used
64	Input	Detector 046 Trouble Maintenance Urgent	Detector 046 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 15 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 27.

ACS Selection Group T (SLC #1, Detectors 47-78):

Table 2.31 ACS Group T

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 047 Alarm	Detector 047 Trouble	Not Used
2	Input	Detector 047 trouble Maintenance Urgent	Detector 047 Trouble Maintenance Alert	Not Used
3	Input	Detector 048 Alarm	Detector 048 Trouble	Not Used
4	Input	Detector 048 Trouble Maintenance Urgent	Detector 048 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 078 Alarm	Detector 078 Trouble	Not Used
64	Input	Detector 078 Trouble Maintenance Urgent	Detector 078 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 47 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 28.

ACS Selection Group U (SLC #2, Detectors 47-78):

Table 2.32 ACS Group U

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 047 Alarm	Detector 047 Trouble	Not Used
2	Input	Detector 047 Trouble Maintenance Urgent	Detector 047 Trouble Maintenance Alert	Not Used
3	Input	Detector 048 Alarm	Detector 048 Trouble	Not Used
4	Input	Detector 048 Trouble Maintenance Urgent	Detector 048 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 078 Alarm	Detector 078 Trouble	Not Used
64	Input	Detector 078 Trouble Maintenance Urgent	Detector 078 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 47 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 29.

ACS Selection Group V (SLC #1, Detectors 79-100):

Table 2.33 ACS Group V

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 079 Alarm	Detector 079 Trouble	Not Used
2	Input	Detector 079 Trouble Maintenance Urgent	Detector 079 Trouble Maintenance Alert	Not Used
3	Input	Detector 080 Alarm	Detector 080 Trouble	Not Used
4	Input	Detector 080 Trouble Maintenance Urgent	Detector 080 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 100 Alarm	Detector 100 Trouble	Not Used
64	Input	Detector 100 Trouble Maintenance Urgent	Detector 100 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 79 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 30.

ACS Selection Group W (SLC #2, Detectors 79-100):

Table 2.34 ACS Group W

Point	Type	Red LED	Yellow LED	Switch Function*
1	Input	Detector 079 Alarm	Detector 079 Trouble	Not Used
2	Input	Detector 079 Trouble Maintenance Urgent	Detector 079 Trouble Maintenance Alert	Not Used
3	Input	Detector 080 Alarm	Detector 080 Trouble	Not Used
4	Input	Detector 080 Trouble Maintenance Urgent	Detector 080 Trouble Maintenance Alert	Not Used
to		to (see note 1)	to (see note 1)	
63	Input	Detector 100 Alarm	Detector 100 Trouble	Not Used
64	Input	Detector 100 Trouble Maintenance Urgent	Detector 100 Trouble Maintenance Alert	Not Used
* Pressing the switch button when the Switch Function is “Not Used” will cause the associated LED to stop blinking. This is a local acknowledgement at the annunciator only: no message is sent to the panel.				

NOTE:
1. Point number to Detector number relationship is sequential in groups of 2. Since each detector occupies 2 points, to determine the Point to Detector relationship, start with detector 79 and count by 2 starting from point 1.
2. This group is only available when UDACT setting is programmed as option 2 and will automatically be assigned to ACS address 31.

2.3.9 How to Check the Program for Errors (8=CHECK PRG)

Enter 1 !
Program Change Password
Enter 1 ! 8 .

When finished programming, you can use the Check option to search the program entries for possible errors. From the "Basic Program" screen, press the **8** key. The Check option searches the program for the following conditions that can cause errors:

- Output points mapped to a zone without a mapped input
- A zone with mapped input points without mapped output points (including Z00 outputs)
- Releasing zone inputs (R0-R9) with no RELEASE CKT outputs mapped to them; or RELEASE CKT outputs with no R0-R9 inputs mapped to them
- RO-R9 inputs not mapped to MAN. RELEASE.

For more information on Releasing Zones, refer to "Releasing Applications" on page 61.

If the Check option detects multiple devices that fail the check, press the PREVIOUS or NEXT key to step through the devices. If the Check option displays errors, return to Point Programming ("Modify or Delete a Point (2=point)" on page 20) and correct the errors. The figure below shows a sample display of program screen that appears after a successful program check:

```
PROGRAM CHECK OK.
RE-TEST PANEL NOW      08:34A 041515 Tue
```

2.4 The Network Program

Enter 1 !
Program Change Password
Enter 2 @

From the "Program Change Selection" screen, press the **2** key to display the "Network" screen, which displays as follows:

```
THRESHOLD CH.A:H,  THRESHOLD CH.B:H,
NODE:     .000,  STYLE7:N,  <ENTER>
```

THRESHOLD CH.A: - Enter H or L, for high or low threshold setting for channel A on the NCM module.

THRESHOLD CH.B: - Enter H or L, for high or low threshold setting for channel B on the NCM module.

NODE: - Enter the panel's network node number. The valid network node number range is 1-103. The number will be entered after the decimal point; the spaces before the decimal point are for future use.

STYLE7: - Enter N for network style determination (either Style 4 or Style 7) through autoprogramming. Enter Y to force a Style 7 designation for network wiring.

NOTE: If network Style 7 wiring is determined by autoprogramming, a change in the wiring (for example, a break in the network wiring) would cause the system to reassess the network wiring style as 4. If network Style 7 wiring is forced, a break in the wiring will create a trouble message.

To select network options, follow these steps:

1. Using the arrow keys, move the blinking cursor to a selection.
2. Press the NEXT or PREVIOUS key to select **H** or **L** (Threshold Ch. A, Threshold Ch. B). a three-digit number (Node), or **Y** or **N** (Style 7).

When finished making selections, press the ESC key three times to return the control panel to normal operation.

When programming is complete, the panel must be reset to register the programming.

2.5 The Utility Program

There are five options available in the Utility Program. Enter the program and select an option as described below.

Enter 1 !

From the "Program Change Selection" screen, press the **3** key to display the "Utility Program" screen as shown below:

Program Change Password

Enter 3 =

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

Descriptions of the five options on the Utility Program screen:

Table 2.35 Utility Program Options (1 of 2)

Utility Option	Description
REGION	0 = No special region setting (default) 1 = China 2 = Canada
TBL.REMIND TBL Reminder* *Use of a setting other than "2" requires AHJ approval.	This option provides trouble resound selections to meet the requirements of NFPA 72-2002, which you can select as follows: • Select ***** if you don't want a trouble reminder • Select **1** to sound a short trouble reminder tone every minute • Select **2** to resound a trouble tone every 24 hours at 11:00 AM, and to send a reminder every sixty seconds for acknowledged events. • Select **3** to display a detector while in the alarm verification mode and no trouble reminder • Select **4** for once a minute trouble reminder with alarm verification display • Select **5** for trouble reminder resound every 24 hours at 11:00 AM with alarm verification display, and to send a reminder every sixty seconds for acknowledged troubles
ALA.SCROLL Alarm Scroll* *Setting this field to "Y" requires AHJ approval.	This option allows the programmer to select how alarms are displayed. • Select **Y** if you want each alarm displayed for approximately two seconds, and to acknowledge all alarms with a single acknowledgement. (default) • Select **N** if you want only the first alarm and the alarm count displayed, and to acknowledge each alarm singly, point by point.
LOCAL CONTROL	This option allows the programmer to disable local control of the ACKNOWLEDGE/SCROLL DISPLAY key, SIGNAL SILENCE key, DRILL key and SYSTEM RESET key. Select local control as follows: • Select **0** to disable local control • Select **1** to enable local control (default) • Select **2** to enable partial local control. This setting allows control of the ACKNOWLEDGE and SYSTEM RESET keys only (required in Chicago.) Note that if the panel is to be controlled exclusively by a Display and Control Center (DCC), Local Control should be disabled.

Table 2.35 Utility Program Options (2 of 2)

Utility Option	Description
IP ACCESS	Note: Use of this option is subject to local AHJ approval. This option allows the programmer to choose one of three options for Wide Area Network (WAN) communication. Acceptance of commands, downloads and programming from over the WAN can be enabled, disabled or timed. Select IP ACCESS as follows: • Select **0** to disable IP access • Select **1** to enable IP access • Select **2** to enable IP access for two hours. Note that enabling IP ACCESS allows downloads over a local area network (LAN) or the internet (Wide Area Network - WAN) using VeriFire Tools through a Noti•Fire•Net(NFN) Web Server (NWS), or a wide-area enabled NCS through a PC version of NFN Gateway. Always verify system operation after programming changes are made in this manner.
DCC Mode	This option allows the programmer to select whether this panel will participate in DCC (Display and Control Center) functions. Select **Y** for participation, **N** for no participation. NOTE: For Mass Notification applications, DCC participation should be disabled.

To select utility options, follow these steps:

1. Using the arrow keys, move the blinking cursor to a selection.
2. Press the NEXT or PREVIOUS key to select
   - Local Control
   - *****, **1**, **2**, **3**, **4**, **5** (TBL Reminder)
   - **0**, **1**, or **2** (IP ACCESS)
   - DCC Mode
3. When finished making selections, press the ESC key three times to return the control panel to normal operation.

2.6 FlashScan Poll

Enter 1 !

Program Change Password

Enter 4 ,

From the “Program Change Selection” screen, press the **4** key to access the “FlashScan Poll” selection screen as shown below:

FLASHSCAN	L1DET	L1MOD	L2DET	L2MOD
	N	N	N	N

This menu allows the selection of CLIP (Classic Loop Interface Protocol) or FlashScan detectors and modules for each loop. Once this screen is accessed, the cursor will be positioned underneath the Loop #1 Detector selection, blinking the currently selected protocol type. The default selections are shown in the above figure. This indicates that both Loop #1 and Loop #2 detectors and modules are selected to use CLIP devices. If FlashScan devices are to be employed, change the blinking cursor by pressing the **Y** key or toggle it by using the PREVIOUS or NEXT key. After the selections have been made to the detectors and modules of both loops, press the ENTER key, at which time the panel will reset.

Most FlashScan devices can be programmed to run in either CLIP or FlashScan mode. Observe one of the following three options when using FlashScan devices:

Option 1 Program all modules and detectors on an SLC as FlashScan.
(In the “FlashScan Poll” screen, enter Y for DET and Y for MOD. It is possible to have up to 159 FlashScan modules and 159 FlashScan detectors on this SLC.)

Option 2 Program all modules and detectors on an SLC as CLIP.
(In the "FlashScan Poll" screen, enter N for DET and N for MOD. It is possible to have up to 99 CLIP modules and 99 CLIP detectors on this SLC.)

CAUTION:
Do not program more than 99 CLIP addresses, as this will compromise the response time of the panel to display off-normal events.

Option 3 Program all detectors as CLIP and all modules as FlashScan on an SLC.
(In the "FlashScan Poll" screen, enter N for DET and Y for MOD. It is possible to have up to 99 CLIP detectors and 159 FlashScan modules on this SLC.)

CAUTION:
Do not program modules as CLIP and detectors as FlashScan on the same SLC. This combination is not an option: Y for DET, N for MOD in the "FlashScan Poll" screen.

NOTE: Autoprogramming following a Clear Program command will cause the panel to determine the FlashScan capability of each loop based on whether all devices on a loop are FlashScan or not. It will set the loop settings to FlashScan if necessary.

Refer to the SLC manual for available devices.

2.7 Setting the Baud Rate of Serial Ports

2.7.1 Printer Serial Port

The default baud rate of the EIA-232 Printer connection (serial printer port) is 9600. To change baud rate to 2400 or 4800, follow these steps:

1. From the "SYSTEM NORMAL" screen, press the ENTER key to display the Program Entry screen, as shown below:

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

2. Press the **1** key. The control panel displays the Enter Password screen, as shown below:

```
ENTER PROG OR STAT PASSWORD, THEN ENTER.
_  (ESCAPE TO ABORT)
```

3. Enter **2400B** and press Enter. The five asterisks that appear when you type in the baud rate will disappear when you press Enter.
4. Press Esc twice to return to the "SYSTEM NORMAL" screen.
5. To switch from 2400 baud to 4800 or 9600 baud repeat steps 1, 2, and 3 entering **9600B** or **4800B**.

2.7.2 CRT Serial Port

The default setting for the serial EIA-232 CRT port is “disabled”. To enable the EIA-232 CRT port at 9600 baud, follow the steps below.

NOTE: The serial EIA-232 CRT port can only be enabled in standalone (non-networked) applications. The only baud rate supported is 9600.

1. From the SYSTEM NORMAL screen, press the ENTER key to display the Program Entry screen, as shown below:

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

2. Press the **1** key. The control panel displays the Enter Password screen, as shown below:

```
 ENTER PROG OR STAT PASSWORD, THEN ENTER.
 _  (ESCAPE TO ABORT)
```

3. Enter **CRT96** and press Enter. The five asterisks that appear when you type in the code will disappear when you press Enter.
4. Press Esc twice to return to the “SYSTEM NORMAL” screen.
5. To switch back to the default network mode (no CRT) repeat steps 1, 2, and 3 entering **NOCRT**.

Section 3: Status Change

3.1 Overview

Status Change provides a second programming level - accessed by an assigned password - for changing operating parameters. (These operating parameters do not affect control program settings.) For example, the Status Change password lets you change settings such as detector sensitivity and system time and date.

NOTE: Assign the Status Change password to persons who do not have access to Level 1 programming options.

Status Change Options are described below.

Option 1=DISABL - The Disable/Enable option lets you disable programmed points for detectors, modules, zones and NACs. For details, refer to “Disable or Enable a Point” on page 54.

Option 2=SENSITIV - The Detector Sensitivity option lets you change the Alarm and Pre-alarm (sensitivity) level for an installed detector. For details, refer to “Changing Detector Sensitivity” on page 55.

Option 3=CLR VER - The Clear Verification screen lets you clear all counters for detectors selected for Alarm Verification. For details, refer to “Clearing Alarm Verification Counters” on page 56.

Option 4=CLR HIST - The Clear History screen lets you clear the entire History buffer from memory. For details, refer to “Clearing the History Buffer” on page 56.

Option 5=TIME - The Time/Date option lets you set the time and date for the system clock. For details, refer to “Setting the System Time and Date” on page 56.

Option 6=WALK TEST - The Walk Test option lets you test the entire fire alarm system while away from the control panel. For details, refer to “Walk Test” on page 57”.

3.2 How to Enter Status Change

To enter Status Change, 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
```

2. From the “Entry” screen, press the **1** key. The control panel displays the “Enter Password” screen as shown below:

```
ENTER PROG OR STAT PASSWORD, THEN ENTER.
```

3. Enter your Status Change password (See “How to Enter a Password”, page page 12). The control panel displays the “Status Change Selection” screen, as shown below:

```
STATUS CHANGE PRESS: 1=DISABL 2=SENSITIV
3=CLR VER 4=CLR HIST 5=TIME 6=WALK TEST
```

4. Select a Status Change selection: **1**,**2**,**3**,**4**,**5**, or **6**.

3.3 Disable or Enable a Point

WARNING:
Do not rely on disable/enable software settings to lock out releasing devices. Releasing devices must be physically disconnected.

NOTE: When an input or output point associated with releasing functions is disabled, a single supervisory trouble will be generated.

Enter 1 !
Status Change Password
Enter 1 !

The Disable/Enable option lets you disable programmed points for detectors, modules, zones, and NACs. The program allows you to disable an initiating device in alarm: however, the disable will not take effect until after the panel has been reset.

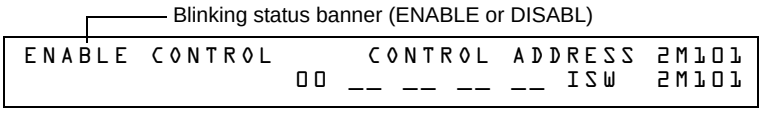
1. From the "Status Change Selection" screen, press the **1** key to display the "Disable/Enable" screen.
2. Select the point type:

   * for detectors
   # for modules
   & for NACs
   Z for zones

The cursor will blink the first SLC address digit in the detector, zone, module, or NAC field.

WARNING:
Disabling a zone disables all input and output devices that use the zone as the first entry in the CBE list.

3. Enter the address of the point, then press the ENTER key. A sample display follows:



When you disable a point and press the ESC key to return to the Disable/Enable screen, the control panel: a) turns on the POINT DISABLED LED; b) sounds the panel sounder; and c) changes the status banner to TROUBL for the point.

You can disable or enable a point by changing the status banner as follows:

Table 3.1 Changing the Status Banner (1 of 2)

To	Press
Change the status	Maneuver the cursor with the arrow keys until it is in the status field. Press + (Next Selection) or – (Previous Selection)

Table 3.1 Changing the Status Banner (2 of 2)

To	Press
Save the status	Enter
Go to the next or previous point address	+ (Next Selection) or − (Previous Selection)

3.4 Changing Detector Sensitivity

Enter 1 !

Status
Passwo

Enter 2 @

The Detector Sensitivity option lets you change the Alarm and Pre-Alarm (sensitivity) level for an installed detector. From the "Status Change Selection" screen, press the **2** key to display the "Detector Selection" screen as shown below:

```
DET. SENS. & COMP.  ENTER POINTS:LDAAA,E
```

To select a detector, enter the SLC address (2D101) of an installed detector in the "LDAAA" field (shown above). The control panel displays the following screen:

```
PROGRM SMOKE(PHOTO) DETECTOR ADDR 2D101
                03 __ __ __ __A8P8AV 2D101
```

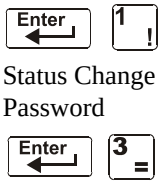
Alarm Level — Pre-Alarm Level

Use the instructions below to set/change detector sensitivity, display additional detectors, and set Pre-alarm values.

NOTE: If not using Pre-Alarm, set PA=0. PA=1 is the self-optimizing mode. For details, refer to "Pre-Alarm" on page 101.

To	Enter or Press
Display detector information on the screen.	The detector address, then press Enter.
Set alarm sensitivity level.	A value (1-9) or increase or decrease values by pressing the NEXT or PREVIOUS keys: + or −.
Set Pre-alarm level	A value (0-9) or increase or decrease values by pressing the NEXT or PREVIOUS keys: + or −.
Save the sensitivity values.	Enter
Display the next existing detector address.	+ (Next Selection)
Display the previous existing detector address.	− (Previous Selection)

3.5 Clearing Alarm Verification Counters



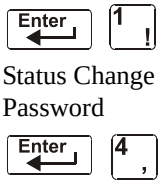
The Clear Verification screen lets you clear all counters for detectors selected for Alarm Verification. From the "Status Change Selection" screen, press the **3** key to display the "Clear Verification" screen as shown below:

```
PRESS ENTER TO CLEAR VERIFICATION COUNTS
OR ESCAPE TO ABORT
```

From the Clear Verification screen, you can do the following:

- Press the ENTER key to clear all verification counters and return to the "Status Change Selection" screen; or
- Press the ESC key to return to the "Status Change Selection" screen without clearing.

3.6 Clearing the History Buffer



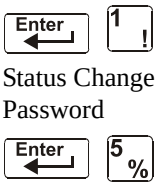
The Clear History screen lets you clear the entire History buffer from memory. Press the **4** key from the "Status Change Selection" screen to display the "Clear History" screen as shown below:

```
PRESS ENTER TO CLEAR HISTORY FILE
OR ESCAPE TO ABORT
```

From the Clear History screen, you can do the following:

- Press the ENTER key to clear the contents of the History buffer and return to the "Status Change Selection" screen; or
- Press the ESC key to return to the "Status Change Selection" screen without clearing.

3.7 Setting the System Time and Date



The Time/Date option lets you set the time and date for the system clock. Press the **5** key from the "Status Change Selection" screen to display the "Time/Date" screen as shown below:

```
CHANGE TIME/DATE
                        11:40A Tue 04/15/2015
```

The first digit flashes until you change the value or press the ENTER key. To set the system time and date, follow the instructions below:

To	Do this
Change the time and date values	Enter values from the numeric keys on the keypad.
Change A (AM) or P (PM)	Press + (Next Selection) or – (Previous Selection)
Change the day	Press + (Next Selection) or – (Previous Selection)
Move to another digit	Press →

To	Do this
Save the time and date and return	Press Enter

3.8 Walk Test

Walk Test allows the user to test the entire fire alarm system. There are two kinds of Walk Test - Basic and Advanced, described later in this section.

Before entering Walk Test, note the following:

- For each individual activation, the control panel sends "TEST Axx" (for alarm testing) or TEST Txx (for trouble testing) to the History buffer, installed printers and CRT-2s so results can be reviewed.
- Basic Walk Test, Silent – In order to keep the test silent, do not program any of the output modules with "W" in the Walk Test field.
- Advanced Walk Test - This test overrides a setting of "*****" (silent) in the Walk Test field. All activated outputs will sound until panel reset.
- The control panel provides a 1-hour timer for Walk Test mode. When the hour expires with no activity, the control panel automatically returns to normal operation.
- Walk Test may be exited at any time by pressing the ESC key.

WARNING:
Walk Test mode deactivates fire protection. Always observe the following:

1. Prior to Walk Test, secure all protected buildings, and notify the building owner/operator, fire department, and other pertinent personnel that testing is in progress.
2. Immediately after Walk Test is completed, notify the same people that testing is complete and is restored to normal operation.

WARNING:
Physically disconnect all releasing devices before starting Walk Test. It is not sufficient to disable in any other manner.

NOTE: Walk Test will not start if any devices are active (i.e., fire alarms, security, supervisories or pre-alarms.) To perform a walk test while a device is active, disable the device and press the System Reset button.

For information on programming Walk Test field selections, refer to "Modify an Addressable Monitor Module Point" on page 23 or "Modify NAC Points" on page 25.

3.8.1 Basic Walk Test

When the tester activates an input during Basic Walk Test, all silenceable outputs mapped by CBE to that input will activate. The activations are tracking; once the activation stimulus is removed, the input will deactivate. Basic Walk Test may be audible or silent, depending on the Walk Test setting of participating outputs. Program the Walk Test field for control modules and NACs as follows:

For	Program Silenceable Outputs with	Silenceable Outputs will
an audible Basic Walk Test	**W**	sound for approximately 4 seconds during Walk Test
a silent Basic Walk Test	*****	not sound during Walk Test
a trouble Basic Walk Test	**W**	sound for approximately 8 seconds when put into trouble

Enter Basic Walk Test in the following manner:

Enter 1 !
Status Change Password
Enter 6 :

From the “Status Change Selection” screen, press the **6** key. The control panel displays the “Walk Test” screen as shown below:

```
WALK TEST                    PRESS ENTER TO START
ESCAPE TO ABORT
```

Operate the control panel in Walk Test as follows

To	Press
Put the control panel into Walk Test mode	Enter
Stop a Walk Test and return to the “Status Change Selection” screen	Esc

Basic Walk Test directs the control panel to do the following:

- Activate silenceable outputs associated by programming with each new alarm. (The panel does not activate non-silenceable outputs.)
- Save and store each test in the History buffer
- Send a TEST Axx status banner for each alarm, and a TEST TXX banner for each trouble, to the printer (xx equals the number of tests for a detector or input device with this address)
- Turn on the System Trouble LED
- Turn on the System Trouble relay
- Disable activation of the System Alarm relay

3.8.2 Advanced Walk Test

During Advanced Walk Test, when the tester activates an input, all CBE mapped to that input will activate with the exception of releasing functions. Each input activation is latching; that is, it will not deactivate until the system is reset. Advanced Walk Test will sound all activated outputs, overriding a setting of "*****" (silent) in the Walk Test field.

NOTE: Some detectors, laser detectors for example, can be difficult to place in alarm using a magnet. Advanced Walk Test facilitates magnet testing of these detectors.

Enter Advanced Walk Test as follows:

Enter, 1 !

LTEST

Enter

Enter LTEST at the password screen. Asterisks will display where LTEST has been typed. Pressing ENTER displays the following screen.

```
TROUBL IN SYSTEM     ADV WALK TEST
PROCESSING DISABLED 10:07a 041515 MON
```

NOTE: The control panel can not be put into Walk Test from an alarm condition.

To	Press
Stop an Advanced Walk Test and return to the "Status Change Selection" screen	Esc

Advanced Walk Test directs the control panel to do the same as it does for Basic Walk Test (see "3.8.1, "Basic Walk Test"" above) with the following exceptions:

- alarm and trouble messages are sent to the printer, not test messages. (These Walk Test messages can be distinguished from others at the printer because they begin with the trouble message generated when Walk Test is entered, and end with the cleared trouble when Walk Test is exited.)
- all CBE mapped to the test input is activated except releasing functions.

3.8.3 Walk Test Activation Indications

Walk Test Activation Indications

FlashScan poll mode - Once the test is started:

- each intelligent addressable input device will blink its address in red, and each intelligent addressable output device will blink its address in green. Pattern examples are given below.

Address	Blink Pattern
8	8 blinks, long stop, 8 blinks, long stop,....
37	3 blinks, stop, 7 blinks, long stop, 3 blinks, stop, 7 blinks, long stop,....
70	7 blinks, stop, 10 blinks, long stop, 7 blinks, stop,.....
107	10 blinks, stop, 7 blinks, long stop, 10 blinks, stop,.....
152	15 blinks, stop, 2 blinks, long stop, 15 blinks, stop, 2 blinks, long stop....

- an input device activated in Basic Walk Test latches on steady green for the duration of the test.
- an output device activated in Basic Walk Test will remain active and the LED will glow steady green for:
  - approximately 4 seconds for alarms
  - approximately 8 seconds for troubles.
- an output device activated in Advanced Walk Test will remain active and the LED will glow steady green until the reset key is pressed.

CLIP mode - Once the test is started:

- intelligent addressable input and output devices continue to blink red as usual until activated.
- an input device activated in Basic Walk Test latches on steady red during activation. If the device is put in trouble (for instance, the detector head is removed, then replaced), the LED will be latched on for the duration of the test.
- an output device activated during Basic Walk Test will remain active and the LED will glow steady green (if a FlashScan module) or steady red (if a CLIP module) for:
  - approximately 4 seconds for alarms
  - approximately 8 seconds for troubles.
- an output device activated in Advanced Walk Test will remain active and the LED will glow steady green (if a FlashScan module) or steady red (if a CLIP module) until the reset key is pressed.

3.8.4 Viewing Walk Test Results

When finished with a Walk Test, view the History buffer, installed printers and CRT-2s to check the results of the Walk Test. View the History buffer by using the Read Status function. From the SYSTEM NORMAL screen, press the ENTER key, press the **2** key two times, then press the ENTER key to view the History buffer. For further instructions on using the Read Status function, refer to the *NF2S-640 Operations Manual*.

Appendix A: Releasing Applications

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.

Do not enable the BACKUP option switch for any of the four Notification Appliance Circuits (NACs) if they are used for releasing functions.

A.1 Overview

A.1.1 Description of Releasing Zones

The control panel includes ten Releasing Zones (R0-R9) that can be used to control up to ten releasing operations. Each zone operates independently, and is fully programmable..

NOTE: Releasing Zones R0-R9 appear in the CBE list of devices as ZR0-ZR9. For example, if you list R5 for a detector, one of the five zones in the CBE list of the detector will display as ZR05.

From the “Special Function Change” screen (refer to “Program Special Zones (6=spl funct)” on page 28), select a Releasing Zone (R0-R9) to display the “Releasing Function” screen:

```
PRG RELEASE FUNCTION RELEASE CONTROL
DELAY=30 ABORT=ULI CROSS=N SOK=0000 R05
```

Each Releasing Zone includes four releasing functions, outlined below:

Table A.1 Releasing Zone Functions

Function	Lets You
Delay	Program a 01 to 60-second Delay Timer (or 00, no delay). The Delay Timer equals the time that must elapse between activating an initiating device and activating the releasing zones mapped to the active initiating device. Refer to “Programming a Delay Timer” on page 62.
Abort	Select a 3-letter Abort switch Type Code (ULI, IRI, NYC, or AHJ) that adds a delay time to a Releasing Zone, or prevents a release of a Releasing Zone. Refer to “Abort Switches” on page 63.
Cross	Select one of three Cross Zone types or “N” (not used). A Cross Zone requires tripping two or more devices to activate the outputs mapped to one of the Releasing Zones. Refer to “Using Cross Zones” on page 71.
Soak	Select a Soak Timer (0001-9999 seconds) or “0000” (not used). Refer to “Programming a Soak Timer” on page 73.

A.1.2 NFPA Releasing Applications

This control panel can be used for agent release or preaction/deluge control applications. In a properly configured system with compatible, listed actuating and initiating devices, this control panel complies with the following NFPA standards for installation in accordance with the acceptable standard:

Table A.2 NFPA Standards for Releasing Applications

Standard	Covers
NFPA 12	CO_2 Extinguishing Systems
NFPA 12A	Halon 1301 Extinguishing Systems
NFPA 13	Sprinkler Systems, Installation of
NFPA 15	Water Spray Fixed Systems
NFPA 16	Foam-water Deluge and Foam-water Spray Systems
NFPA 17	Dry Chemical Extinguishing Systems
NFPA 17A	Wet Chemical Extinguishing Systems
NFPA 2001	Clean Agent Fire Extinguishing Systems

A.2 How to Program a Releasing Zone

This section provides details for programming the releasing functions: Delay Timer, Abort Switch, Cross Zone, and Soak Timer.

A.2.1 Programming a Delay Timer

Use a Delay Timer to specify the elapsed time between alarm activation of an initiating device and activation of all output devices programmed as release circuits and mapped to that initiating device. You can set the Delay Timer from 01 to 60 seconds, or to 00 for no delay. The figure below shows graphical representation of a 15-second timer:

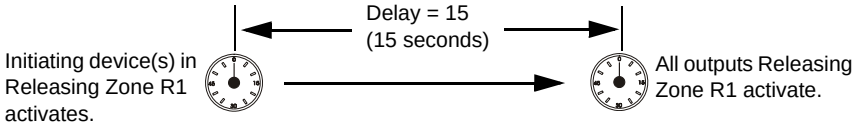


Figure A.1 Example of 15-Second Delay Timer

To Program	Do this
Delay Timer	Enter a value (00-60) from the numeric keys on the keyboard.

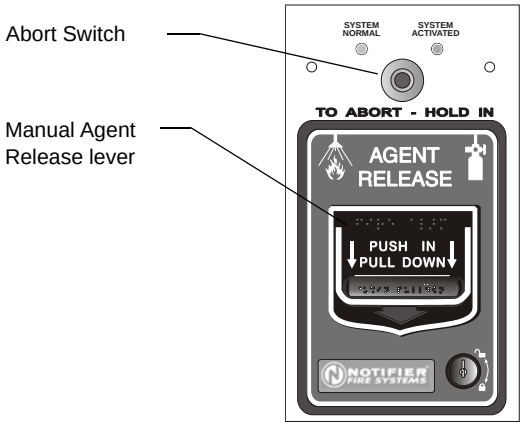
Press Enter at this point to save the Delay Timer value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys.

A.2.2 Abort Switches

Definition of Abort Switches

The control panel provides for four (4) types of Abort Switches (ULI, IRI, NYC, and AHJ) that you can use, that will affect the operation of a Delay Timer mapped to the same Releasing Zone. For example, an Abort Switch selected for Releasing Zone R05 only affects the Delay Timer selected for R05. Other requirements for using an Abort Switch include the following:

- Connecting a monitor module to a UL-listed abort station, such as the NBG-12LRA shown below.
- Program the monitor module with the Type Code ABORT SWITCH. (Refer to "Modify an Addressable Monitor Module Point" on page 23.)
- Abort switch shall not be used with a preaction system or a CO_2 system.



NBG-12LRA station with Abort Switch

NBG12LRAface.wmf

Figure A.2 UL-listed Abort Station

This section contains information for programming each type of Abort Switch for a Releasing Zone.

How an Abort Switch Works

The figure below contains an example for configuring an Abort Switch and shows the requirements for using an Abort Switch for Releasing Zone R05, which are:

- A monitor module is wired to an abort station
- The monitor module is programmed with the Type Code, ABORT SWITCH
- All initiating devices and outputs are mapped to a common Releasing Zone (R05 shown)
- Releasing Zone R05 is programmed with the releasing functions: Delay, Abort, Cross, and Soak

NOTE: The abort switch can only be associated with one releasing zone.

When an initiating device activates, you must press and hold the Abort Switch or the control panel will send the command to dump releasing agents when the Delay time (15 seconds shown) expires. The Abort selection (ULI, IRI, NYC, or AHJ) determines the function of the Abort Switch.

```
PRG RELEASE FUNCT    RELEASE CONTROL
DELAY=15  ABORT=ULI CROSS=N SOK=0000  R05
```

Releasing Zone R05 sample programming selections

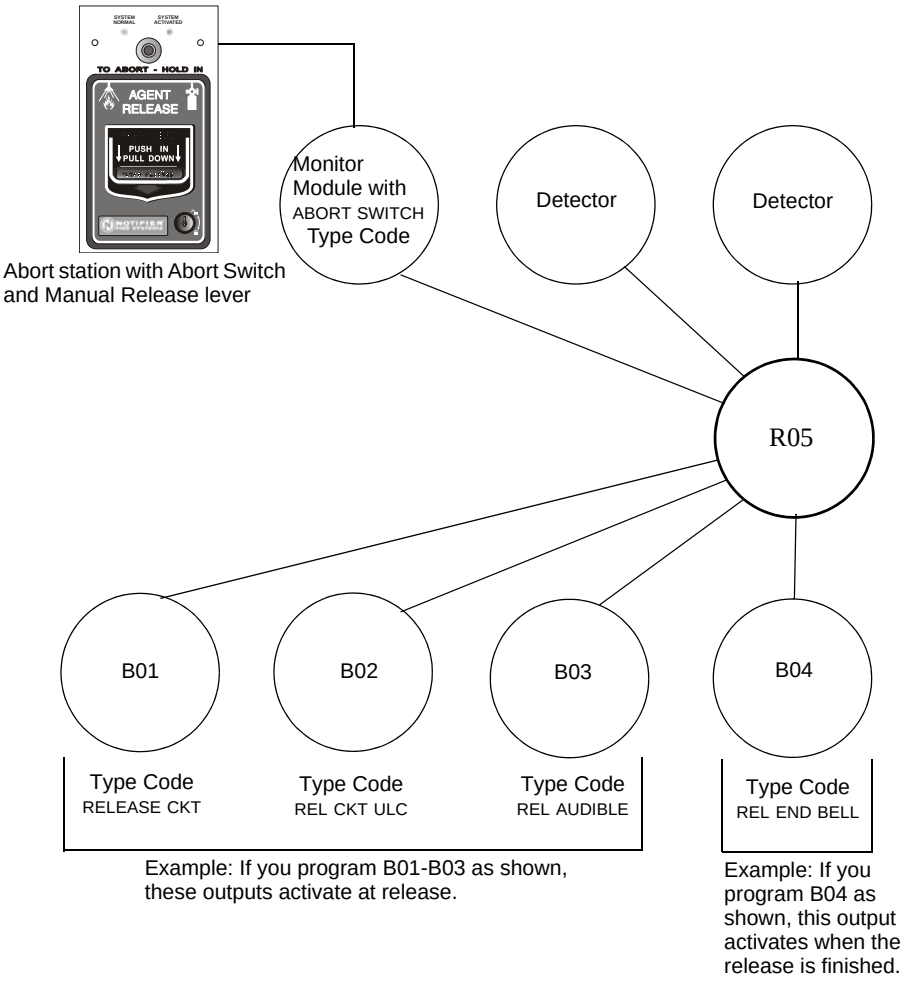


Figure A.3 Example of a Basic Configuration for an Abort Switch

Programming a ULI Abort Switch

The following contains information needed to program a ULI Abort Switch.

■ Description

Requires a standard UL-type delay timer that complies with UL Standard 864.

■ How to Program

1. Program the monitor module connected to the abort station with the Type Code ABORT SWITCH as detailed in "Modify an Addressable Monitor Module Point" on page 23.
2. Select a time for the Releasing Zone Delay Timer (refer to"Programming a Delay Timer" on page 62).

To Program	Do this
ULI Abort Switch	Type ULI in the ABORT= field, or press the NEXT or PREVIOUS keys: [+] or [−] until ULI appears in the field.

3. Press [Enter] at this point to save the Abort Switch value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

■ How It Works

When an alarm initiates in the programmed Releasing Zone, you can press and hold the Abort Switch while the Delay Timer continues to count down. (If the delay timer has expired, the abort switch has no effect.) When you release the Abort Switch, a 10-second ULI timer counts down. At the end of the 10-second ULI timer, the control panel activates the Releasing Zone outputs.

■ Example

A ULI Abort Switch and a Delay Timer programmed to Releasing Zone R05:

```
PRG RELEASE FUNCT    RELEASE CONTROL
DELAY=15  ABORT=ULI CROSS=N SOK=0000  R05
```

Program selections for Releasing Zone R05

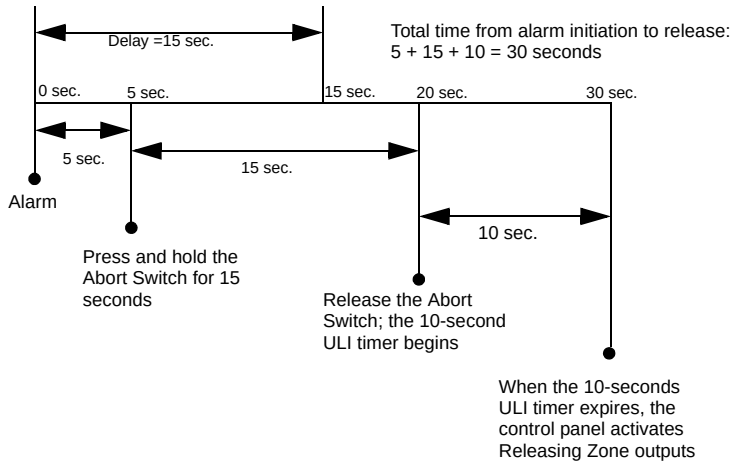


Figure A.4 ULI Abort Switch Example

Programming an IRI Abort Switch

The following contains information needed to program an IRI Abort Switch.

■ Description

A standard UL-type delay timer (complies with UL Standard 864) that operates like ULI, but with additional functions for Cross Zones.

■ How to Program

1. Program the monitor module connected to the abort station with Type Code ABORT SWITCH as detailed in "Modify an Addressable Monitor Module Point" on page 23.
2. Select a time for the Releasing Zone Delay Timer (refer to"Programming a Delay Timer" on page 62.)

To Program	Do this
IRI Abort Switch	Type IRI in the ABORT= field, or press the next or previous keys, [+] or [−], until IRI appears in the field.

3. Press [Enter] at this point to save the Abort Switch value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

■ How it Works

When the first alarm occurs in a releasing zone programmed with a cross-zone code, pressing the abort switch will prevent activation of the releasing zone should a second alarm occur while the switch is held. When the abort switch is released, if a second alarm has occurred while the switch was held, the ten-second IRI timer activates immediately, and the control panel activates the releasing zone outputs at the end of the IRI timer countdown. When the abort switch is released and a second alarm has not occurred while the switch was held, the panel waits for the cross-zone conditions to be met before activating the releasing zone.

WARNING:
The IRI abort switch will only work if it is pushed before the second alarm occurs. If it is pushed after the second alarm, the releasing zone will already have been activated, and the switch will have no effect.

■ Example

An IRI Abort Switch and a Delay Timer programmed to Releasing Zone R05:

```
PRG RELEASE FUNCT   RELEASE CONTROL
DELAY=15 ABORT=IRI   CROSS=Z SOK=0000   R05
```

Program selections for Releasing Zone R05

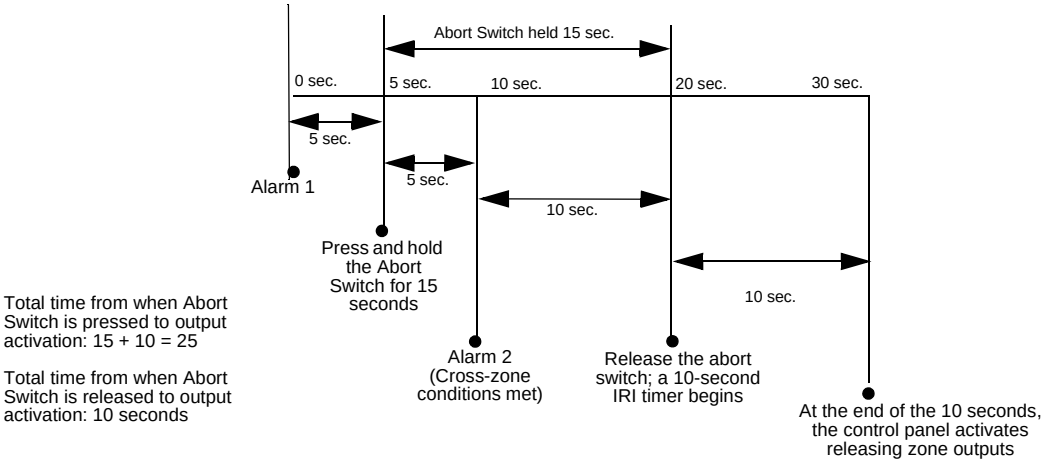


Figure A.5 IRI Abort Switch Example

Programming a NYC Abort Switch

The following contains information needed to program an NYC Abort Switch.

■ Description

A standard NYC delay timer that adds 90 seconds to the programmed Delay Timer.

NOTE: NYC timers do not comply with UL Standard 864.

■ How to Program

1. Program the monitor module connected to the abort station with the Type Code ABORT SWITCH as detailed in "Modify an Addressable Monitor Module Point" on page 23.
2. Select a time for the Releasing Zone Delay Timer (refer to"Programming a Delay Timer" on page 62).)

To Program	Do this
NYC Abort Switch	Type NYC in the ABORT= field, or press the next or previous keys, [+] or [−], until NYC appears in the field.

3. Press [Enter] at this point to save the Abort Switch value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

■ How It Works

When an alarm initiates in the programmed Releasing Zone, pressing and holding the Abort switch stops the Delay Timer countdown. The Delay Timer restarts at the beginning of its countdown when the Abort switch is released. When the Delay Timer expires, the 90-second NYC timer starts counting down. When both timers expire, the control panel activates Releasing Zone outputs.

NOTE: 120 seconds is the maximum delay after the Abort switch is released. If the Delay Timer time plus the NYC delay time of 90 seconds exceeds 120 seconds, Releasing Zone outputs will still be activated at 120 seconds after the Abort switch is released.

■ Example 1 - Delay Time Does Not Exceed 120 Seconds

Select a Delay Timer value for R05 of 15 seconds. The Releasing Zone activates and the 15-second Delay Timer starts. Ten seconds into the Delay Timer countdown, press and hold the Abort Switch for 30 seconds, then release the Abort Switch. The control panel restarts the Delay Timer at 15 seconds and adds the NYC delay of 90 seconds. The delay timers will both expire at 105 seconds,

and Releasing Zone outputs will begin releasing at that time. Following is an example of a NYC Abort Switch and a Delay Timer programmed to Releasing Zone R05:

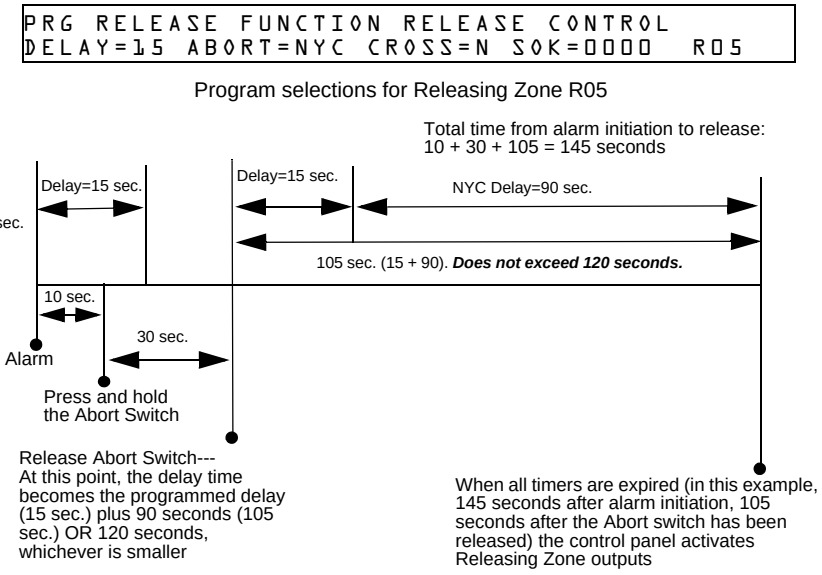


Figure A.6 NYC Abort Switch Example 1

■ Example 2 - Delay Time Exceeds 120 Seconds

Select a Delay Timer value for R05 of 60 seconds. The Releasing Zone activates and the 60-second Delay Timer starts. Ten seconds into the Delay Timer countdown, press and hold the Abort Switch for 30 seconds, then release the Abort Switch. The control panel restarts the Delay Timer at 60 seconds and adds the NYC delay of 90 seconds. The delay timers will both expire at 150 seconds: however, this time exceeds the maximum of 120 seconds, so the Releasing Zone outputs will begin releasing at 120 seconds, not at 150. Following is an example of a NYC Abort Switch and a Delay Timer programmed to Releasing Zone R05:

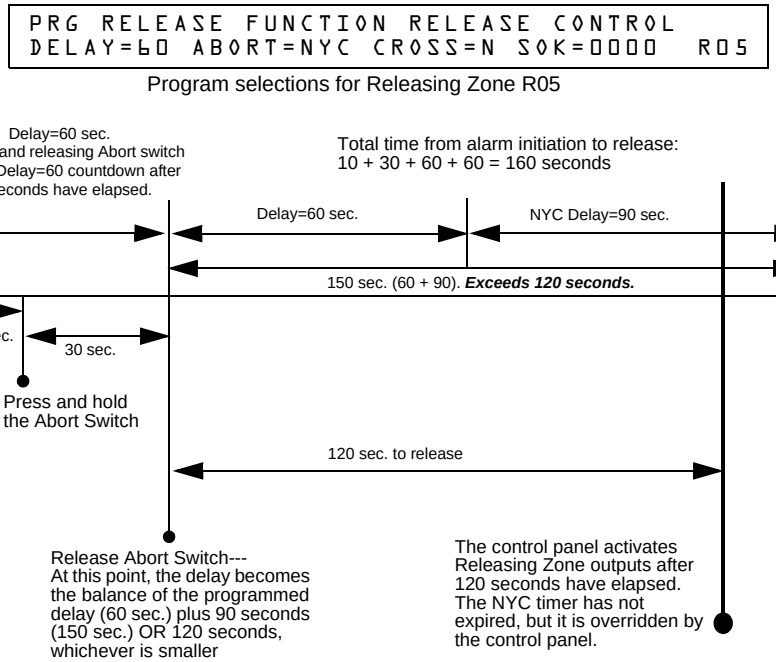


Figure A.7 NYC Abort Switch Example 2

Programming an AHJ Abort Switch

The following contains information needed to program an AHJ Abort Switch:

■ Description

An AHJ (Authority Having Jurisdiction) delay timer that restores the programmed Delay Timer.

NOTE: An AHJ timer does not comply with UL Standard 864.

■ How to Program

1. Program the monitor module connected to the abort station with the Type Code ABORT SWITCH as detailed in "Modify an Addressable Monitor Module Point" on page 23.
2. Select a time for the Releasing Zone Delay Timer (refer to"Programming a Delay Timer" on page 62.

To Program	Do this
AHJ Abort Switch	Type AHJ in the ABORT= field, or press the NEXT or PREVIOUS keys, [+] or [–], until AHJ appears in the field.

3. Press [Enter] at this point to save the Abort Switch value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

■ How It Works

When an alarm initiates, the programmed Delay Timer starts. Press and hold the Abort switch and the control panel suspends the Delay Timer. When you release the Abort Switch, the control panel restores the value of the programmed Delay Timer and the Delay Timer counts down. When the Delay Timer expires, the control panel activates Releasing Zone outputs.

■ Example

An AHJ Abort Switch and a Delay Timer programmed to Releasing Zone R05:

```
PRG RELEASE FUNCTION RELEASE CONTROL
DELAY=60 ABORT=AHJ CROSS=N SOK=0000  R05
```

Program selections for Releasing Zone R05

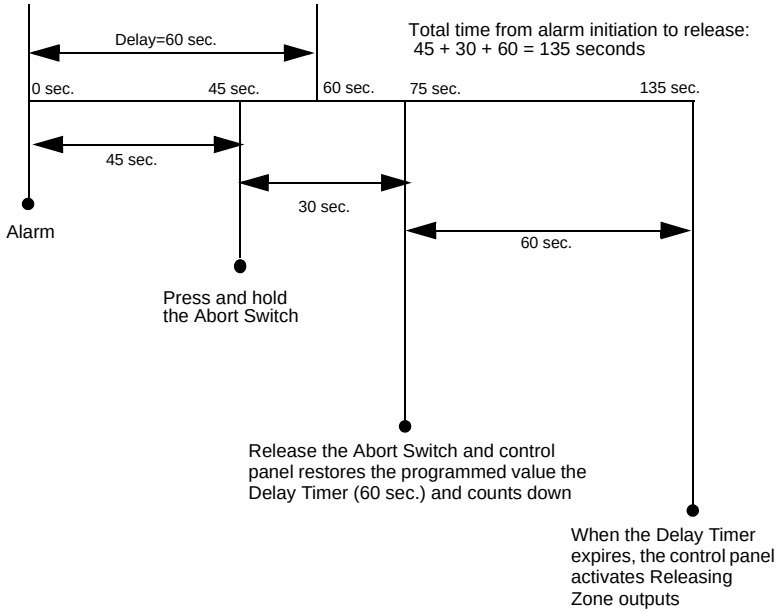


Figure A.8 AHJ Abort Switch Example

A.2.3 Using Cross Zones

Purpose of Cross Zones

Using Cross Zones lets you program the control panel to activate a Releasing Zone and any output mapped to the Releasing Zone only after a predetermined sequence of events occurs. (If not using Cross Zones, set CROSS= N.)

NOTE: Only the first Software Zone (Z01-Z99) listed in the zone map is used to determine Cross=Z.

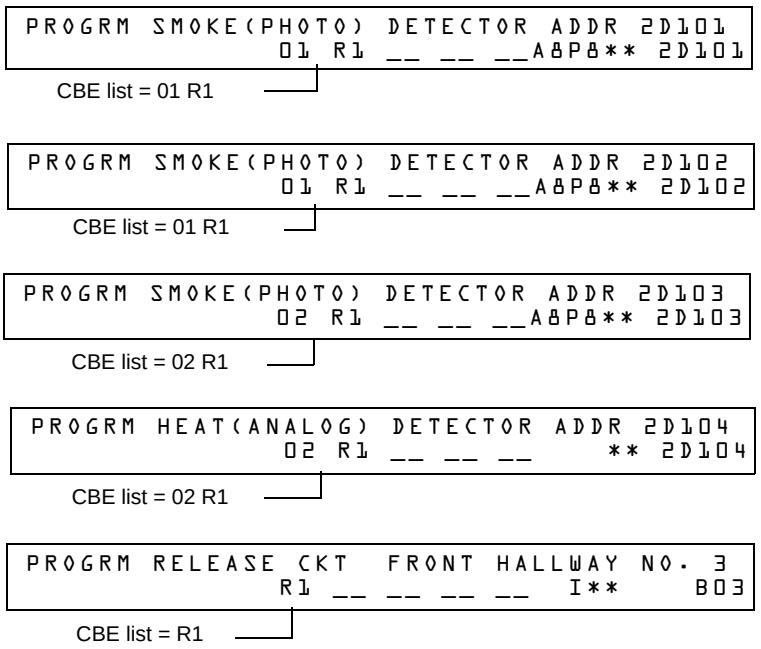
A summary of the types of Cross Zones and the conditions for activating a Releasing Zone:

Type	Activates when
Y	Two or more detectors or modules are alarmed that are mapped to one of the ten Releasing Zones (R0-R9).
Z	Two or more detectors or modules 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 or module mapped to one of the ten Releasing Zones (R0-R9) is alarmed and at least one heat detector mapped to the same Releasing Zone (R0-R9) is alarmed.

NOTE: When in alarm, Special Zones R0-R9 appear in the CBE list as ZR00-ZR09. For example, R5 appears in the CBE list as ZR05.

How Cross Zones Work

Below is an illustrated example of how Cross Zones work, using five Cross Zone selections (four detectors and a NAC mapped to Releasing Zone R1):



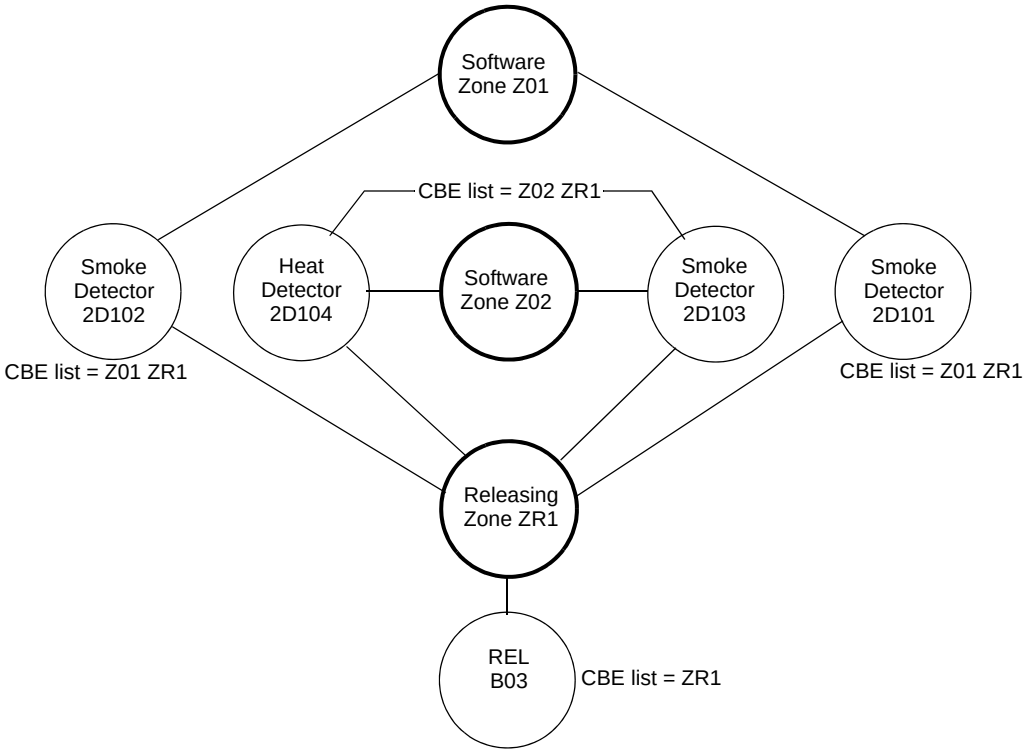


Figure A.9 Illustrated Example of Cross Zone Programming

A listing of each Cross Zone option and the conditions required to activate the Releasing Zone, according to the example shown above.

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 • An alarm from 2D102 and 2D104 • An alarm from 2D101 and 2D104 • An alarm from 2D102 and 2D103 The two detectors listed in each set above are each mapped to different zones, but both list ZR1 in their CBE.
Cross=**H**	Activation of heat detector 2D104 and one smoke detector (2D101, 21D102, or 2D103) or a module mapped to the same releasing zone.

Select a time for the Releasing Zone Delay Timer (refer to“Programming a Delay Timer” on page 62.)

To Program	**Do this**
Cross Zones	Type N, Y, Z, or H in the CROSS= field, or press the NEXT or PREVIOUS keys, [+] or [–], until N, Y, Z or H appears in the that field.

Press Enter at this point to save the Cross Zone value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

A.2.4 Programming a Soak Timer

The Soak Timer specifies the length of time (0001 to 9999 seconds, or 0000 for not used) to dump releasing agents when a Releasing Zone activates. When the Soak Timer expires, the control panel automatically shuts off the releasing solenoids for the active Releasing Zone. To program a Soak Timer for a Releasing Zone, follow these instructions:

To Program	Do this
Soak Timer	Type a seconds value of 0000 (no soak timer) to 9999 from the numeric keys on the keypad in the SOK= field.

Press Enter at this point to save the Soak Timer value if no other fields on the screen are changing. To change another field on the screen, move the cursor into position by pressing the arrow keys on the keypad.

A Soak Timer value of 600 seconds is shown below:

```
PRG RELEASE FUNCTION RELEASE CONTROL
DELAY=00 ABORT=ULI CROSS=N SOK=0600  R00
```

A.2.5 Using Type Codes for Releasing Zones

The control panel provides a set of Type Codes designed for releasing applications for inputs and outputs. This section details how to program each of these Type Codes.

Type Codes designed for Releasing Zone **inputs** (monitor modules).

Type Code	What the Type Code does	Refer to
ABORT SWITCH (tracking)	Provides an abort function through a monitor module (connected to a UL-listed abort station) for a Releasing Zone.	"abort switch Type Code" on page 75
MAN. RELEASE (latching)	Provides a manual release through a monitor module (connected to a UL-listed pull station) for a Releasing Zone.	"man. release Type Code" on page 76
MAN REL DELAY (latching)	Provides a manual release with a 30-second delay (dependent on the FACP Delay setting) through a monitor module (connected to a UL-listed pull station) for a Releasing Zone.	"manrel delay Type Code" on page 77
SECOND SHOT (latching)	Provides a second manual release through a monitor module (connected to a UL-listed pull station) for a Releasing Zone.	"second shot Type Code" on page 79

Type Codes designed for Releasing Zone **outputs** (control modules and panel NACs).

Type Code	What the Type Code does	Refer to
REL END BELL	Activates a NAC audio or visual device when releasing circuits shut off.	"release end bell" on page 80
REL CKT ULC	Directs outputs to perform a release function as required by ULC.	"rel ckt ulc Type Code" on page 82
RELEASE CKT	Directs outputs to perform a releasing function.	"release ckt Type Code" on page 84
RELEA. FORM C	Directs relay outputs to perform a releasing function.	"Relea. Form-C Type Code" on page 86
REL AUDIBLE	Activates audio or visual devices steady when releasing starts.	"rel audible Type Code" on page 88
INSTANT RELE	Activates non-releasing output (panel NAC or control modules) with no delay time.	"instant rele Type Code" on page 90
REL CODE BELL	Activates audio or visual devices to pulse at 20 ppm (initial zone of a Cross Zone) or 120 ppm (Cross Zone satisfied).Steady on release.	"REL CODE BELL Type Code" on page 91

ABORT SWITCH Type Code

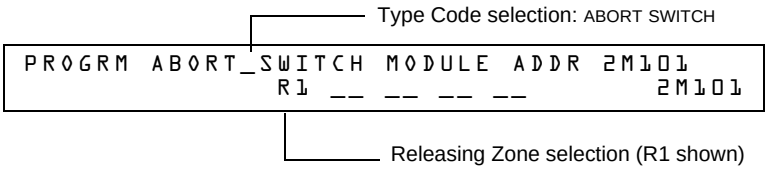
The following contains information needed to program an Abort Switch for a monitor module

■ Description

A monitor module, connected to a UL-listed abort station (such as the Notifier NBG-12LRA), that you use as an abort switch for a Releasing Zone. You can program multiple monitor modules with the ABORT SWITCH Type Code that work like multiple conventional abort switches on a conventional zone.

■ Programming

1. Select a monitor module to use as an Abort Switch (refer to "Modify or Delete a Point (2=point)" on page 20).
2. Select the ABORT SWITCH Type Code.



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the enter key to save, then press the esc key until you return to the Program Change screen.
5. Select the type of Abort Switch for your releasing application (refer to "Abort Switches" on page 63).

■ Example

A programming example of a monitor module programmed as an Abort Switch for Releasing Zone R5.

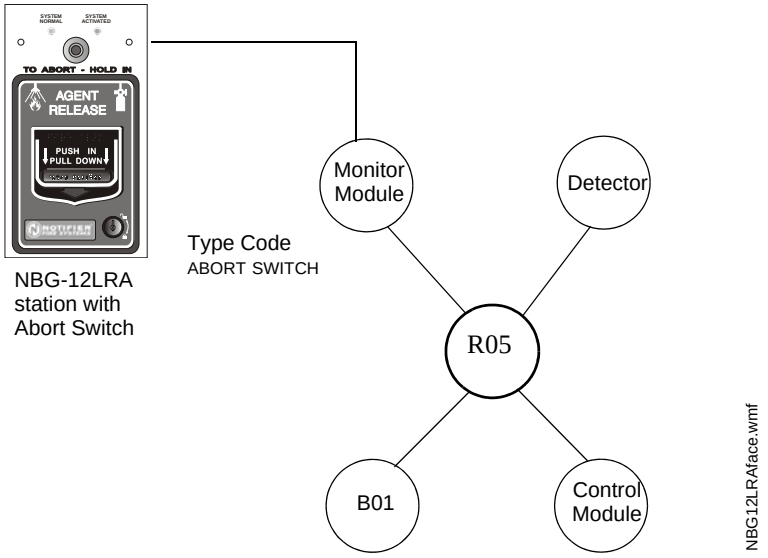


Figure A.10 Monitor Module Configured as an Abort Switch

MAN. RELEASE Type Code

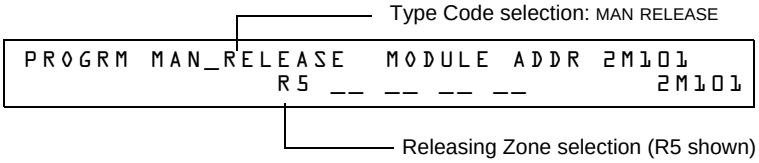
The following contains information needed to program a Manual Release switch for a monitor module.

■ Description

A monitor module—connected to a UL-listed manual station (such as the Notifier NBG-12LRA)—used to manually release agents. A Manual Release switch overrides all timers, such as a Delay Timer or a Soak Timer. You can install multiple monitor modules with a MAN. RELEASE Type Code that work like multiple conventional manual release switches on a conventional zone.

■ Programming

1. Select a monitor module (refer to "Modify or Delete a Point (2=point)" on page 20) to use for the manual release function.
2. Select the MAN. RELEASE Type Code.



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key until you return to the Program Change screen.

■ Example

A programming example of a monitor module programmed as an manual release switch for Releasing Zone R5.

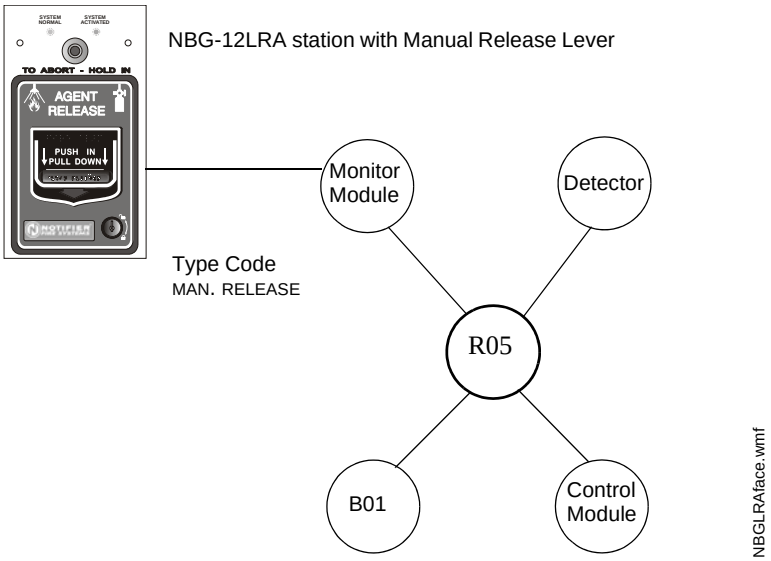


Figure A.11 Monitor Module Configured as a Manual Release Switch

MANREL DELAY Type Code

The following contains information needed to program a Manual Release Delay switch for a monitor module using the MANREL DELAY Type Code.

■ Description

A monitor module—connected to a UL-listed manual station (such as the Notifier NBG-12LRA)—used to initiate a manual release with 30-second delay time.

A Manual Release Delay switch overrides the FACP programmed Delay Timer in certain circumstances, but not the soak timer.

Override Circumstances:
When the Manual Release Delay Switch activates, the control panel replaces the Delay Time with 30 seconds if the Delay Timer

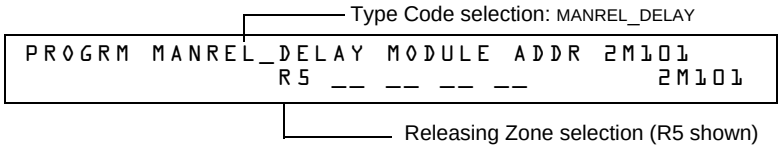
- is set to more than 30 seconds
- is running, *and*
- has not counted down below 30 seconds.

NOTE: When the Delay Timer is set to less than 30 seconds, activation of the Manual Release Delay Switch will invoke the FACP programmed Delay Time if the Delay Timer is not running, or the FACP programmed Delay Timer countdown time if it is running. Refer to the examples 1 through 5 later in this section.

Multiple monitor modules can be programmed with a MANREL DELAY Type Code. They work like multiple conventional manual release switches on a conventional zone.

■ How to program

1. Select a monitor module (refer to “Modify or Delete a Point (2=point)” on page 20) to use for the manual release function.
2. Select the MANREL DELAY Type Code.



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key until you return to the Program Change screen.

■ Examples

A programming example of a monitor module programmed for MANREL DELAY switch for Releasing Zone R5.

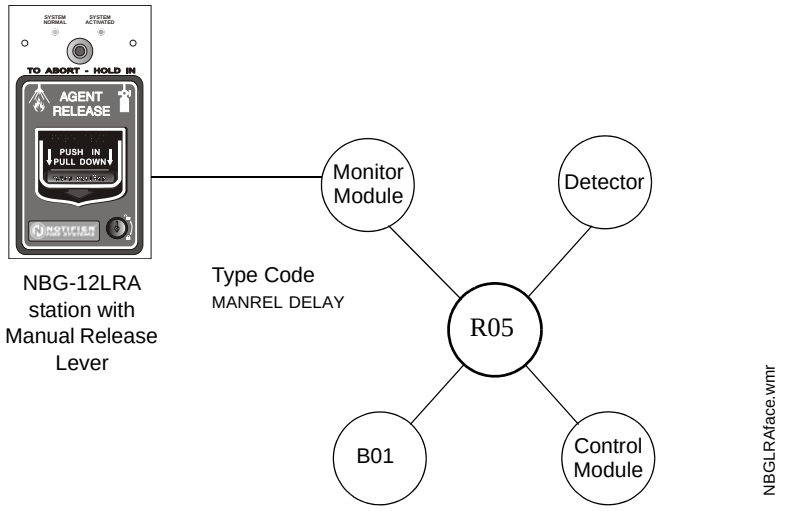


Figure A.12 Monitor Module Configured as a Manual Release Delay Switch

For examples 1, 2, and 3, program Releasing Zone R5 with a Manual Release Delay switch and the following releasing selections:

```
PRG RELEASE FUNCTION RELEASE CONTROL
DELAY=60 ABORT=ULI CROSS=N SOK=0030 R05
```

Example 1 - The FACP programmed Delay Timer begins its 60 second countdown. The Manual Release Delay switch is pulled when the FACP Delay Timer has counted down to 48 seconds (elapsed time of 12 seconds). The 48 seconds remaining in the countdown are overridden by the 30-second delay initiated by the Manual Release Delay switch. In this example, the total time elapsing from FACP countdown initiation to agent release is 42 seconds (12 + 30), less than the original 60 second FACP Delay Timer countdown.

Example 2 - The FACP programmed Delay Time begins its 60 second countdown. The Manual Release Delay switch is pulled when the FACP Delay Timer has counted down to 8 seconds. The 8 seconds remaining in the countdown is not changed when the switch is pulled. In this example, the total time elapsing from FACP countdown initiation to agent release is 60 seconds.

Example 3 - The FACP programmed Delay Time is not running (as would happen if the releasing station were pulled before an alarm registered). The Manual Release Delay Switch is activated by the pull station. Agent release will occur in 30 seconds.

For examples 4 and 5, the delay is changed to DELAY=10.

Example 4 - The FACP programmed Delay Timer begins its 10 second countdown. The Manual Release Delay switch is pulled when the FACP Delay timer has counted down to 8 seconds. The 8 seconds remaining in the countdown is not changed. In this example, the total time elapsing from FACP countdown initiation to agent release is 10 seconds.

Example 5 - The FACP programmed Delay Timer is not running (as would happen if the releasing station were pulled before an alarm registered). The Manual Release Delay switch is activated by the pull station. Agent release will occur in 10 seconds.

SECOND SHOT Type Code

NOTE: The Second Shot switch can only be used with the MANREL DELAY Type Code.

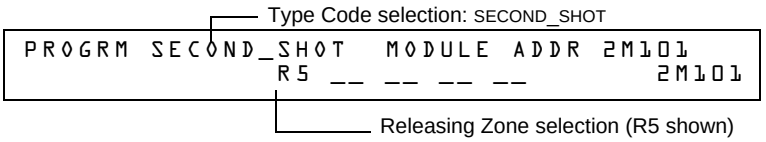
The following contains information needed to program a Second Shot switch for a monitor module

■ Description

A monitor module—connected to a UL-listed manual station (such as the NBG-12LRA)—used as for a second release of agents. A Second Shot switch overrides a Delay Timer, programmed to the same Releasing Zone.

■ Programming

1. Select a monitor module (refer to "Modify or Delete a Point (2=point)" on page 20) to use for the manual release function.
2. Select the SECOND SHOT Type Code.



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key until you return to the Program Change screen.

■ Examples

A programming example of a monitor module programmed as a Manual Release Delay switch (Type Code MANREL DELAY) for the first shot and a Second Shot switch (Type Code SECOND SHOT) for the second shot.

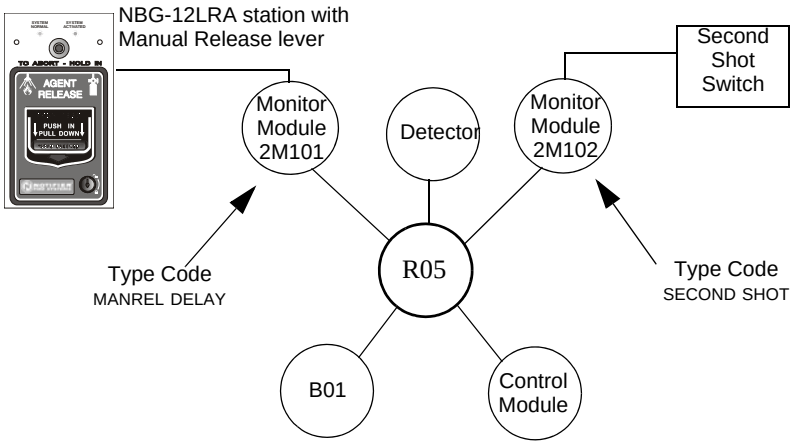


Figure A.13 Monitor Module Configured as a Second Shot Switch

With two monitor modules configured as shown above, program Releasing Zone R5 with the following releasing selections.

```
PRG RELEASE FUNCTION RELEASE CONTROL
DELAY=15 ABORT=ULI CROSS=Y SOK=0030 R05
```

R05 can be activated in one of two ways, as described in the examples given below.

Example 1: If the detector initiates the alarm, R05 activates. Releasing begins after the delay timer has expired (15 seconds). Releasing will continue for the soak timer duration (30 seconds). Once the Soak Timer expires, the Second Shot Switch can then be activated to initiate an additional soak cycle.

Example 2: If the NBG-12LRA (Type Code MANREL DELAY) lever is pulled, the delay timer begins its 15 second countdown. Releasing will begin after the delay timer has expired, and will continue for the soak timer duration (30 seconds). Once the Soak Timer expires, the Second Shot Switch can then be activated to initiate an additional soak cycle.

RELEASE END BELL

NOTE: A releasing circuit with this Type Code requires the following selections: A Releasing Zone selection (R0-R9); An output circuit mapped to the same Releasing Zone; Switch Inhibit selected; Non-Silenceable; No Walk Test.

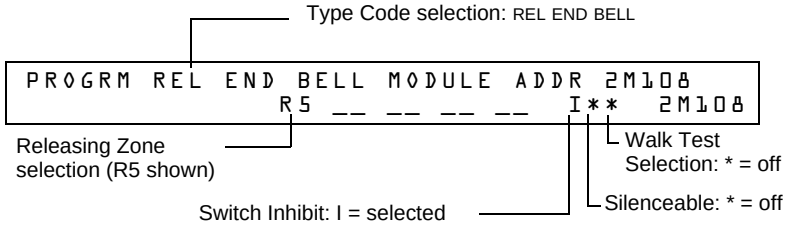
The following contains information needed to program a Release End Bell circuit for a control module or a NAC.

■ Description

A control module or NAC to activate an audible or visual device when releasing devices shut off. You can also program multiple outputs with the REL END BELL Type Code to the same Releasing Zone. When all the Releasing Zone functions are complete, all outputs with the REL END BELL Type Code activate at the same time. A REL END BELL circuit remains on until you reset the system

■ Programming

1. Select a control module or NAC (refer to “Modify or Delete a Point (2=point)” on page 20) to use as a Release End Bell circuit.
2. Select the REL END BELL Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the enter key to save, then press the esc key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as a Release End Bell for Releasing Zone R5.

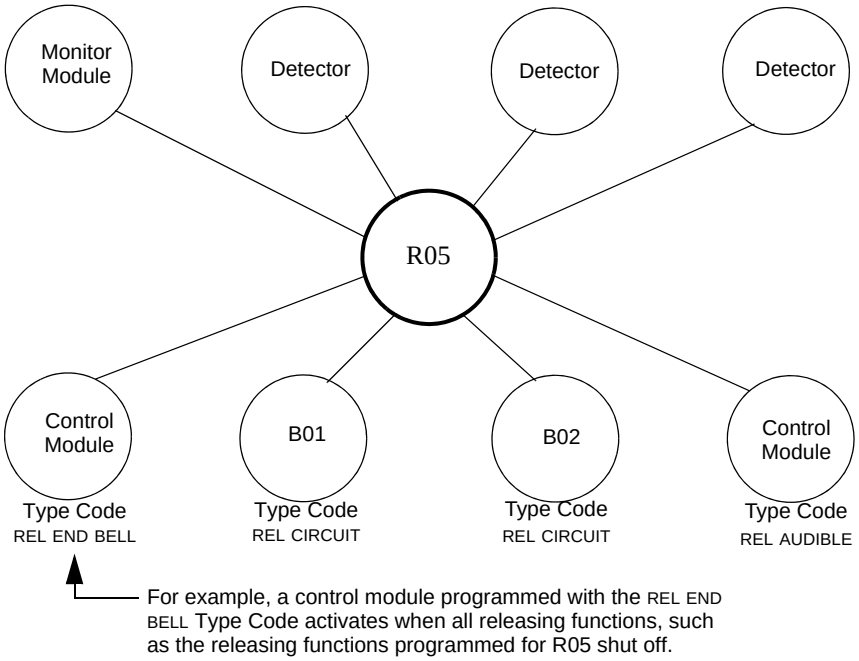


Figure A.14 Control Module Configured as a Release End Bell Circuit

REL CKT ULC Type Code

NOTE: A ULC Release Circuit with this Type Code requires the following selections: A Releasing Zone selection (R0-R9); An output circuit mapped to the same Releasing Zone; Switch Inhibit selected; Non-Silenceable; No Walk Test.

The following contains information needed to program a ULC Release Circuit for a control module or a NAC.

■ Description

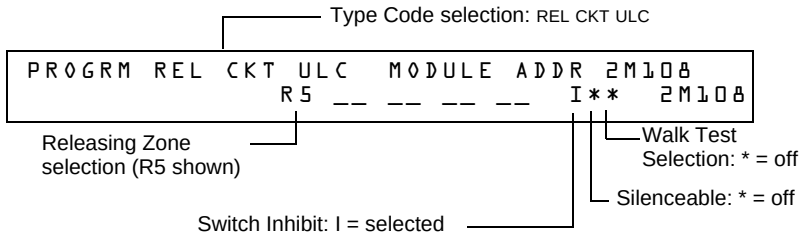
A control module or a NAC used to activate a releasing solenoid or other releasing device. You can also program multiple outputs with the REL CKT ULC Type Code to the same Releasing Zone. When the Releasing Zone activates, all outputs with the REL CKT ULC Type Code also activate at the same time. A ULC Release Circuit activates when:

- An initiating device programmed to the same Releasing Zone activates (two devices if using the Cross Zone option)
- The Delay Timer for R0-R9 (if used) expires
- No Abort Switch for R0-R9 (if used) is active

A ULC Release Circuit—and all wiring to the release device—is fully supervised and usable with power-limited energy cable.

■ Programming

1. Select a control module or a NAC (refer to “Modify or Delete a Point (2=point)” on page 20) to use as a ULC Release Circuit.
2. Select the REL CKT ULC Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as a ULC Release Circuit for Releasing Zone R5.

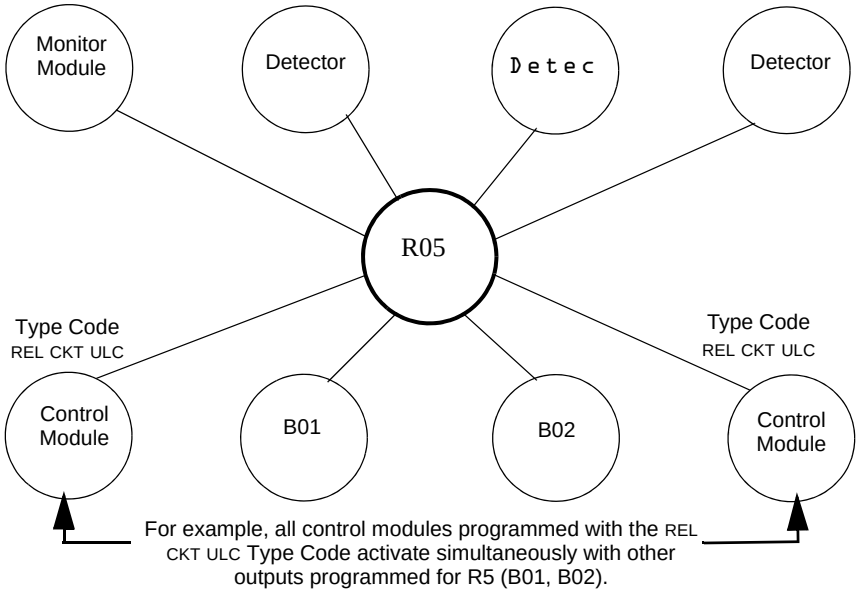


Figure A.15 Control Module Configured as a ULC Release Circuit

RELEASE CKT Type Code

NOTE: A Release Circuit with this Type Code requires the following selections: A Releasing Zone selection (R0-R9); An output circuit mapped to the same Releasing Zone; Switch Inhibit selected; Non-Silenceable; No Walk Test.

NOTE: Do not use a Release Circuit for the following: An application requiring ULC Listing; An application requiring power-limited energy cable.

The following contains information needed to program a Release Circuit for an output circuit (control module or NAC).

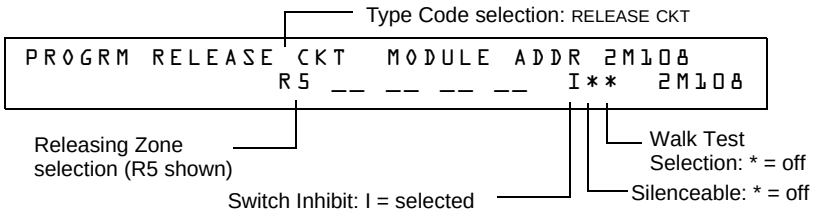
■ Description

A control module or a NAC used to activate a releasing solenoid or other releasing device. You can also program multiple outputs with the RELEASE CKT Type Code to the same Releasing Zone. When the Releasing Zone activates, all outputs associated with the releasing zone and with the RELEASE CKT Type Code also activate at the same time. A Release Circuit activates when:

- An initiating device programmed to the same Releasing Zone activates (two devices if using the Cross Zone option)
- The Delay Timer for R0-R9 (if used) expires
- The Abort Switch for R0-R9 (if used) is not active

■ Programming

1. Select a control module or a NAC (refer to “Modify or Delete a Point (2=point)” on page 20) to use as a Release Circuit.
2. Select the RELEASE CKT Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as a Release Circuit for Releasing Zone R5.

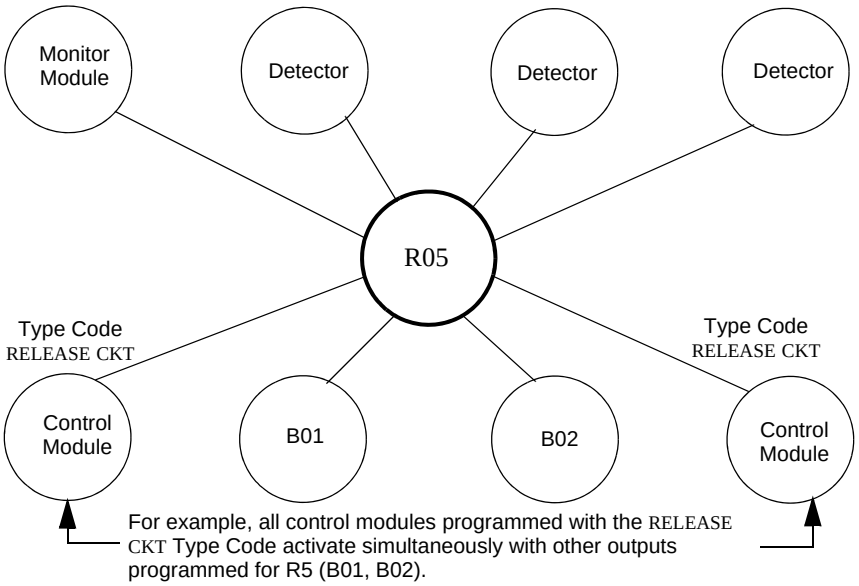


Figure A.16 Control Module Configured as a Release Circuit

Relea. Form-C Type Code

NOTE: An output with a relea.form c Type Code requires the following selections: A Releasing Zone selection (R0-R9); An output circuit mapped to the same Releasing Zone; Switch Inhibit selected; Non-Silenceable; No Walk Test.

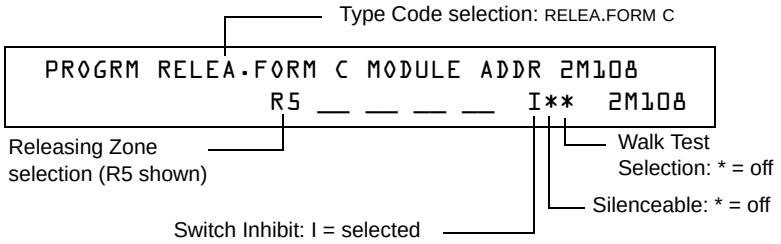
The following contains information needed to program a Release Form-C circuit for an output circuit.

■ Description

An output circuit, configured as a relay, programmed to activate an output by opening or closing a switch. Typical applications include closing doors and air handlers.

■ Programming

1. Select a control module (refer to “Modify or Delete a Point (2=point)” on page 20) to use as a Releasing Form-C Circuit.
2. Select the RELEA.FORM C Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as a Release Form-C circuit for Releasing Zone R5.

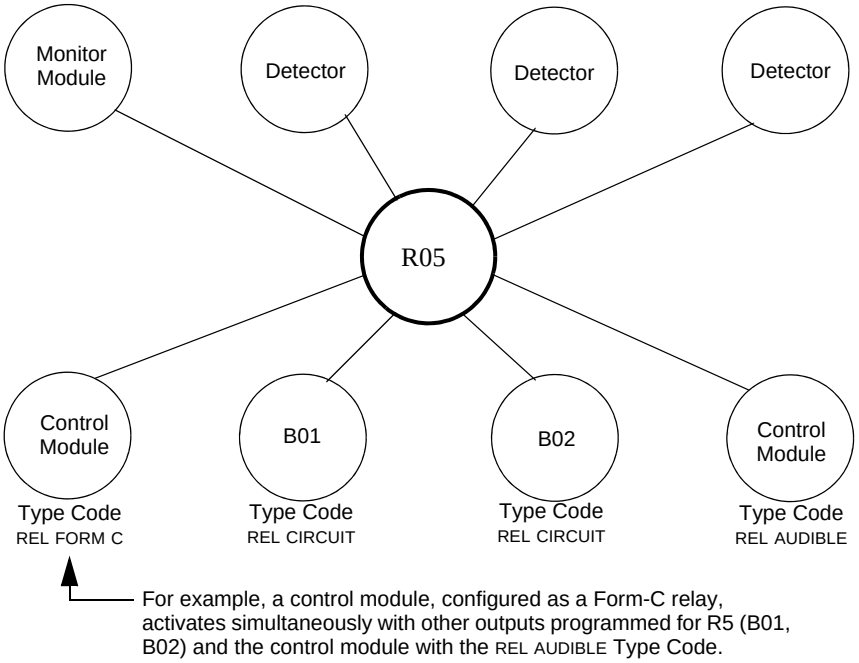


Figure A.17 Control Module Configured as a Release Form-C Circuit

REL AUDIBLE Type Code

NOTE: An output with a REL AUDIBLE Type Code requires the following selections: A Releasing Zone selection (R0-R9); An output circuit mapped to the same Releasing Zone; Switch Inhibit selected.

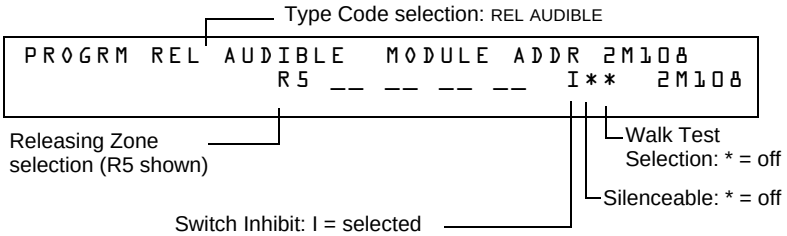
The following contains information needed to program a Release Audible circuit for an output circuit (control module or NAC).

■ Description

An output circuit programmed to activate an audio or visual device when all releasing outputs, programmed to the same Releasing Zone, turn on. You can also program multiple outputs with the REL AUDIBLE Type Code to the same Releasing Zone. When the Releasing Zone activates, all outputs with the REL AUDIBLE Type Code activate at the same time.

■ Programming

1. Select a control module or NAC (refer to “Modify or Delete a Point (2=point)” on page 20) to use as a Releasing Circuit.
2. Select the REL AUDIBLE Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as a Release Audible circuit for Releasing Zone R5.

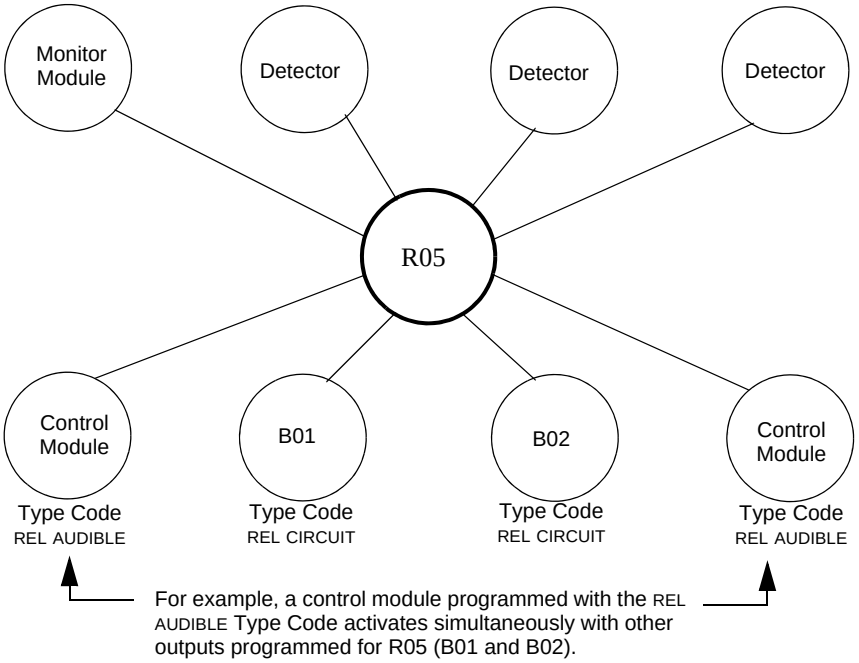


Figure A.18 Control Module Configured as a Release Audible Circuit

INSTANT RELE Type Code

NOTE: An output with an INSTANT RELE Type Code requires the following selections: a zone selection (a releasing zone may be used, but is not required); an output circuit mapped to the same zone; Switch Inhibit selected; Non-Silenceable; No Walk Test.

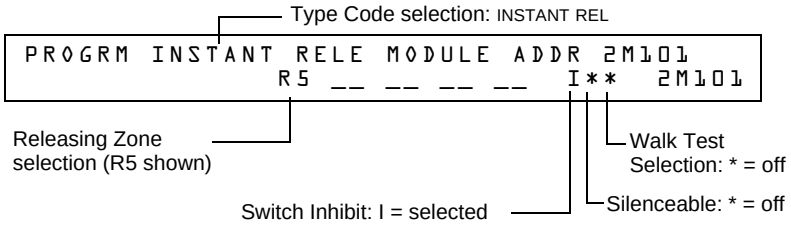
The following contains information needed to program an Instant Release circuit for an output circuit (control module or NAC).

■ Description

An output circuit programmed to activate non-releasing devices, such as door openers or warning sounders, without counting down delay timers. A device programmed with the INSTANT RELE Type Code device is supervised for open circuits and ground faults.

■ Programming

1. Select a control module or a NAC (refer to"Modify or Delete a Point (2=point)" on page 20) to use as a Releasing Circuit.
2. Select the INSTANT RELE Type Code, as shown in the following example (control module shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a control module programmed as an Instant Release circuit for Releasing Zone R5.

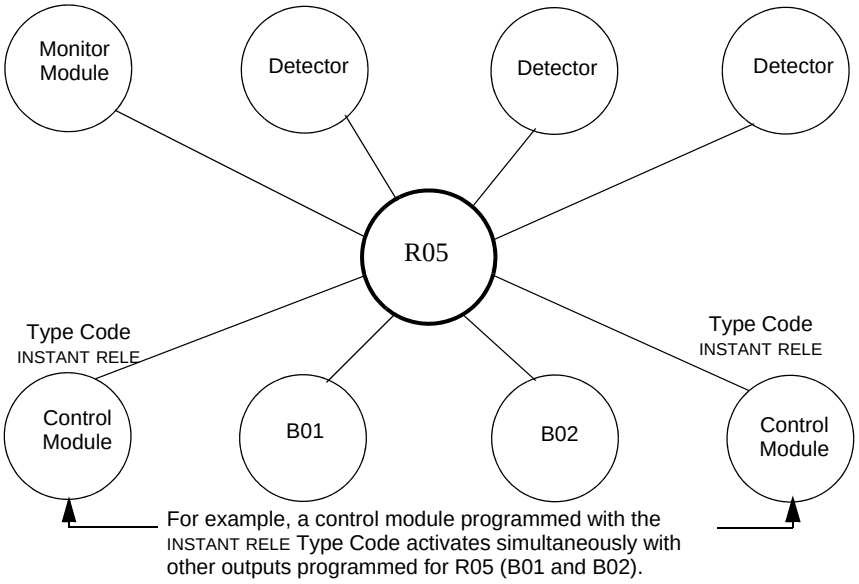


Figure A.19 Control Module Configured as an Instant Release Circuit

REL CODE BELL Type Code

NOTE: An output with a REL CODE BELL Type Code requires the following selections: A Releasing Zone selection (R0-R9); An input circuit mapped to the same Releasing Zone.

NOTE: For instructions on programming Switch Inhibit, Silenceable, and Walk Test, refer to "Modify NAC Points" on page 25.

The following contains information needed to program a Release Code Bell circuit for a NAC.

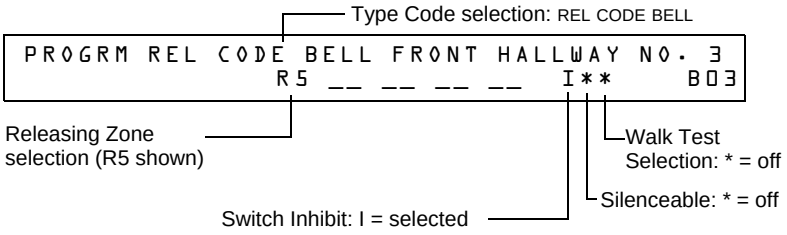
■ Description

A NAC programmed to pulse an audio or visual device as follows:

- 20 ppm when a the initial zone of a cross-zone activates.
- 120 ppm when a Cross Zone is satisfied.
- Steady when a release occurs.

■ Programming

1. Select a NAC (refer to "Modify NAC Points" on page 25) to use as a Release Code Bell Circuit.
2. Select the REL CODE BELL Type Code, as shown in the following example (NAC shown).



3. Select the Releasing Zone (R0-R9) for your releasing application.
4. Press the ENTER key to save, then press the ESC key two times to return to the Program Change screen.

■ Example

A programming example of a NAC programmed as a Release Code Bell circuit for Releasing Zone R5.

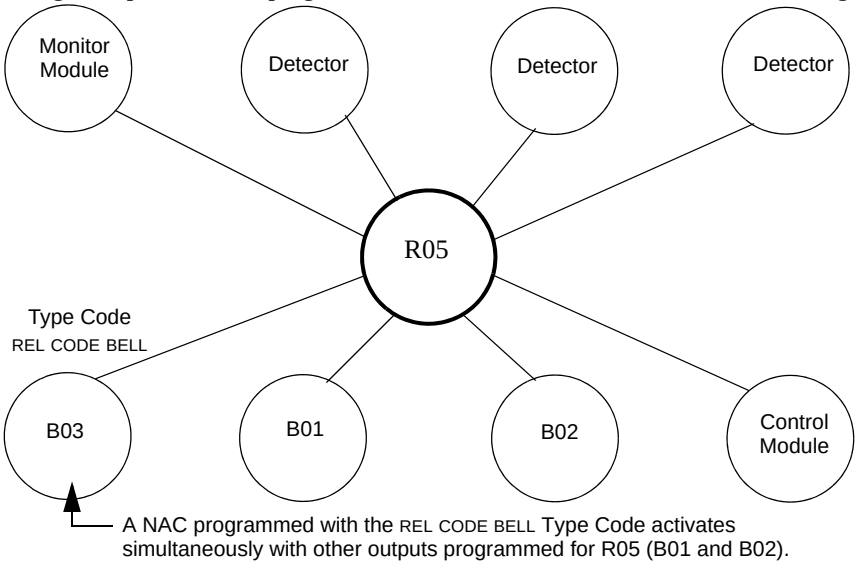


Figure A.20 NAC Configured as a Release Code Bell Circuit

A.3 Initiating Devices

Releasing zone initiating devices include the following:

- FST-851 intelligent heat detectors
- FSI-851, FSP-851, FAPT-851, FSL-751 intelligent smoke detectors
- Conventional detection UL-listed devices connected to monitor modules

Refer to the SLC manual for the most up-to-date information about initiating devices.

You can use multiple initiating devices for the same releasing hazard. Do so by mapping initiating devices to the same Releasing Zone. Factory Mutual and certain Local Authorities Having Jurisdiction require using redundant wiring (NFPA 72 Style 6 or Style D) for initiating devices in releasing applications.

A.4 Warning Sounders

Warning sounders connect to any of the four panel NACs, or to control module circuits (refer to the *NF2S-640 Installation Manual*). Note the following:

- If selecting Cross Zones, a warning sounder only activates when two zones alarm.
- Warning sounders—unlike release solenoids—do not wait for a Delay Timer.
- If Coding Functions are required for warning sounders, use one of the NACs—not a control module.
- The same releasing hazard can activate multiple NACs.

Instructions for activating warning sounders:

To activate a sounder	Do this
When the Delay Timer starts, when the releasing device activates, or both	Map the control module or NAC to a releasing hazard zone (R0-R9).
Immediately when one of the initiating devices activate	Map the control module or NAC to a separate zone (not R0-R9) that is also mapped to all initiating devices of the hazard.

A.5 Auxiliary Control Functions

Instructions for using control functions:

Function	Do this
A releasing application requires control relays	Use control modules set for dry contact operation. Program the control relays for different functions by following the instructions in “To activate a sounder” above.
Providing control functions	Use an ACM-8R remote relay module mapped to the software zones of the control panel.

A.6 ACS Annunciation

Instructions for annunciating ACS points and detectors:

To Annunciate	Do this
Points of releasing functions	Select ACS Selection Group B to annunciate any of the software zones described previously, including zones R0-R9. For instructions, refer to “Annunciator Options” on page 34.
Individual detectors	Select ACS Selection Group H, I, J, K or L. For instructions, refer to “Annunciator Options” on page 34.

Appendix B: Special Zone Outputs

B.1 Presignal and Positive Alarm Sequence (PAS)

B.1.1 What is Presignal and PAS?

Purpose

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 up to 180 seconds after the start of alarm processing. The control panel Presignal feature provides two selections:

- A **Presignal Delay Timer** (60-180 seconds) that delays activation of all outputs with a CBE that includes Special Zone F0.
- A **PAS** (Positive Alarm Sequence) 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.

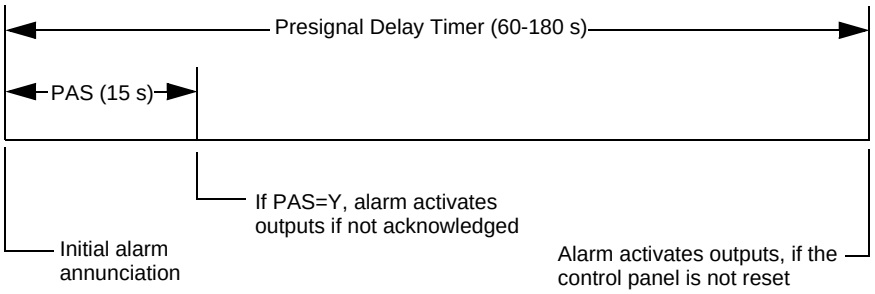


Figure B.1 Presignal and PAS Time

The control panel delays activation of outputs containing F0 in their Control-By-Event (CBE) list for all alarm initiating devices that contain F0 in their CBE list. A subsequent alarm will abort the Presignal Delay Timer and execute CBE lists.

Notes on using F0

- NFPA 72 requires installation of a PAS Inhibit switch, that can be used to turn off the PAS delay timer when the control panel is unattended. Do so by programming a monitor module with the Type Code, PAS INHIBIT. For details, refer to “Modify or Delete a Point (2=point)” on page 20.
- The Presignal Delay timer countdown can be stopped by pressing the SYSTEM RESET key before the Presignal Delay Timer expires.
- Program zone F0 to participating inputs and outputs that have appropriate CBE zone map entries.
- Outputs must be programmed for resound by fire.

Restrictions on using F0

- Do not include F0 in the CBE list for a releasing device.
- Do not include F0 in the CBE list for any monitor module that connects to a device other than an automatic fire detector.

B.1.2 Selecting Presignal and PAS Outputs

Presignal

You can set Presignal Delay Timer between 60 and 180 seconds. A Presignal Delay Timer does not apply to the following:

- The System Alarm relay
- TM-4 polarity reversal alarm output
- TM-4 municipal box output
- UDACT/UDACT-2

Positive Alarm Sequence (PAS)

Outputs selected for PAS delay for 15 seconds. Pressing the ACKNOWLEDGE/SCROLL DISPLAY key within the 15-second delay will set the Presignal Delay Timer to the full programmed value (60-180 seconds, including the PAS delay of 15 seconds). When an alarm comes from an initiating device with a CBE list that includes F0, the control panel delays the following outputs:

- System Alarm relay
- TM-4 Polarity Reversal Alarm output
- TM-4 Municipal Box output
- UDACT/UDACT-2

B.2 Time Control Zones

NOTE: All active Time Control outputs will turn off temporarily while resetting or programming the control panel

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 occupied level (lowest sensitivity, AL:9) within the times specified for the days of the week listed in ZF5 or ZF6. Refer to “Intelligent Sensing Applications” on page 97 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. Enter the time 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.

B.3 Coding Functions for NACS

Coding Functions are pulsed signals that can be selected, using Special Zone F8, to energize NACs when a fire alarm activates. NACs must be programmed with a CBE list that includes F8.

NOTE: Do not include F8 in the CBE list of NACs used for releasing or zone coding applications.

Select Coding Functions on a global basis, through Special Zone F8. That is, all NACs selected for Coding Functions will sound the same code when activated. Table B.1 contains descriptions of each Coding Function selection.

Table B.1 Coding Function Selections

Coding Function Selection	Signal
March Time (default)	120 PPM (pulses per minute)
Temporal	0.5s on, 0.5s off, 0.5s on, 0.5s off, 0.5s on, 1.5s off, repeats
California	10 sec. on, 5 sec. off, repeats
Two-stage	Alert signal - 20 PPM; General Alarm Signal - Temporal
Two-Stage Canada 3	Alert Signal - 20 PPM; Drill Switch activated, 3 minute timer has expired, or device's CBE Zone activation (Z00 plus Zones 1-99 or Logic Zones 1-20) - Temporal (3 min. timeout) **Note:** In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer.
Two-Stage Canada 5	Alert Signal - 20 PPM; Drill Switch activated, 5 minute timer has expired, or device's CBE Zone activation (Z00 plus Zones 1-99 or Logic Zones 1-20) - Temporal (5 min. timeout) **Note:** In Canadian applications ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage Timer.
Two-Stage Canada Manual	Alert Signal - 20 PPM; Drill Switch activated or device's CBE Zone activation (Z00 plus Zones 1-99 or Logic Zones 1-20) - Temporal
System Sensor Strobe	Synchronizes System Sensor Horn/Strobes (Applies to NAC on CPU2-640 only) **Note:** If the "Strobe" Type ID is used with System Sensor Strobe synchronization,"*" will silence the horn portion only, and resound will occur only by fire alarm. F, U, B, T, O, or C will silence the entire circuit. Refer to "Modify an Addressable Control Module Point" on page 24 and "Modify NAC Points" on page 25
Gentex Strobe	Synchronizes Gentex Horn/Strobes (Applies to NAC on CPU2-640 only) **Note:** If the "Strobe" Type ID is used with Gentex Strobe synchronization,"*" will silence the horn portion only, and resound will occur only by fire alarm. F, U, B, T,, O or C will silence the entire circuit. Refer to "Modify an Addressable Control Module Point" on page 24 and "Modify NAC Points" on page 25
Wheelock Strobe	Synchronizes Wheelock Horn/Strobes (Applies to NAC on CPU2-640 only) **Note:** If the "Strobe" Type ID is used with Wheelock Strobe synchronization,"*" will silence the horn portion only, and resound will occur only by fire alarm. F, U, B, T, O, or C will silence the entire circuit. Refer to "Modify an Addressable Control Module Point" on page 24 and "Modify NAC Points" on page 25

Before selecting an output for Two-stage coding, note the following:

The control panel automatically sends an Alert Signal to any of the four NACs mapped to Z00 and F8, but not mapped to the alarm signal. After five minutes without an acknowledge or silence, the Alert Signal changes to Temporal pattern.

Two-stage Canada 3 and 5: Function the same as Two-stage except the second stage is achieved when

- The three or five minute timer expires without an acknowledge or silence.

OR

- The Drill Switch (or an input programmed with the type code DRILL SWITCH or EVACUATE SW) is activated.

OR

- A CBE event has occurred on the device containing both General Alarm Z00 and a general zone (Zones 1-Z99) or logic zone (Logic Zones 1-20).

If Acknowledge or Silence is pressed within the three or five minute timeout period, the NAC will remain at first stage. Subsequent alarm(s) will restart the timer.

Two-stage Canada Manual: Functions the same as Two-stage except the first stage will continue to sound until a CBE event for that device or a Drill is activated. Subsequent alarms will not activate the second stage. If a panel Reset or Silence occurs before a Drill or CBE event occurs, the second stage will not sound.

For Canadian applications using Two-stage with the ACPS-610, see the ACPS-610 manual for additional programming instructions.

Appendix C: Intelligent Sensing Applications

C.1 Overview

"Intelligent Sensing" is a set of software algorithms that provide the *NF2S-640* with industry-leading smoke detection capability. You can program Intelligent Sensing functions on a global or on a per-detector basis.

Intelligent Sensing topics covered in this appendix:

C.2 Features

Intelligent Sensing Applications features include the following:

- Drift Compensation and Smoothing
- Maintenance Warnings - Three Levels
- Self-optimizing Pre-Alarm
- Detector Sensitivity
- Cooperative Multi-Detector Sensing

C.2.1 Drift Compensation and Smoothing

Drift compensation uses algorithms (U.S. patent 5,764,142) that identify and compensate for long-term changes in the analog readings from each smoke detector. (Typically, dirt and dust accumulation inside the smoke chamber causes long-term changes in detector readings.) Drift compensation does the following:

- Allows a detector to retain its original ability to detect actual smoke, and resist false alarms, even as dirt and dust accumulates.
- Reduces maintenance requirements by allowing the control panel to automatically perform the periodic sensitivity measurements required by NFPA Standard.

The software also provides smoothing filters to remove transient noise signals, usually caused by electrical interference. Different smoothing algorithms are used, depending on the sensitivity selection of each detector. Refer to "Detector Sensitivity Settings" on page 103 for more information on detector sensitivity levels.

A graphic representation of a detector analog reading using drift compensation and smoothing:

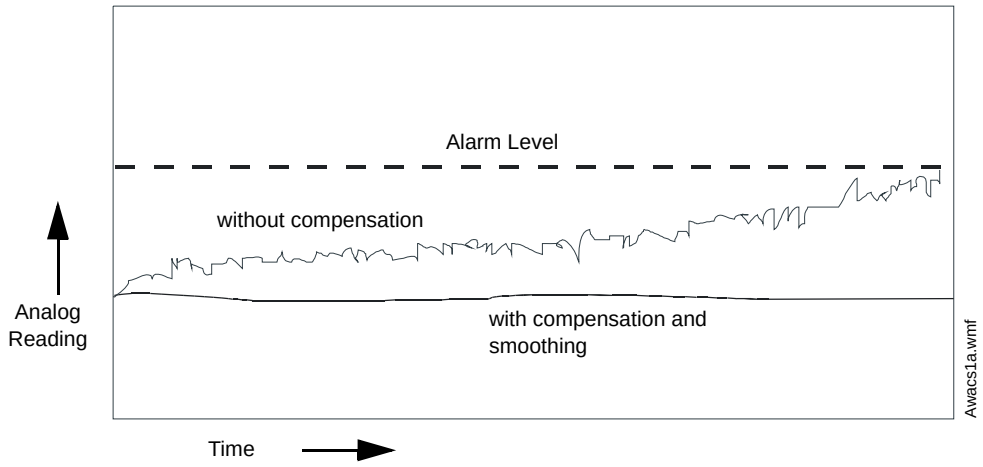


Figure C.1 Graphic Representation of Drift Compensation

C.2.2 Maintenance Warnings – Three Levels

The software determines when the drift compensation for a detector reaches an unacceptable level that can compromise detector performance. When a detector reaches an unacceptable level, the control panel indicates a maintenance warning. The table below summarizes the three levels of maintenance warnings:

Table C.1 Definitions of Maintenance Levels

Maintenance Level	Indicates
Low Chamber value	A hardware problem in the detector.
Maintenance Alert	Dust accumulation that is near but below the allowed limit. The Maintenance Alert level indicates the need for maintenance before the performance of the detector is compromised.
Maintenance Urgent	Dust accumulation above the allowed limit.

A graphic representation of the maintenance levels:

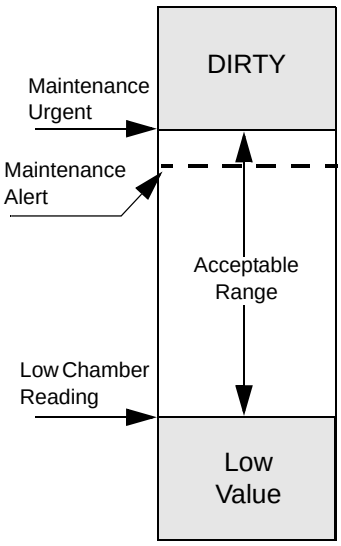


Figure C.2 Diagram of Maintenance Levels

C.2.3 Self-Optimizing Pre-Alarm

You can set each detector, except Heat, for Self-Optimizing Pre-Alarm (PA=1). In this Self-Optimizing mode, the software measures the normal peak analog readings and sets the Pre-Alarm level just above these normal peaks. This allows extremely sensitive Pre-Alarm capability with reasonable protection against non-fire signals. The figure below shows a graphical representation of the Self-Optimizing Pre-Alarm level:

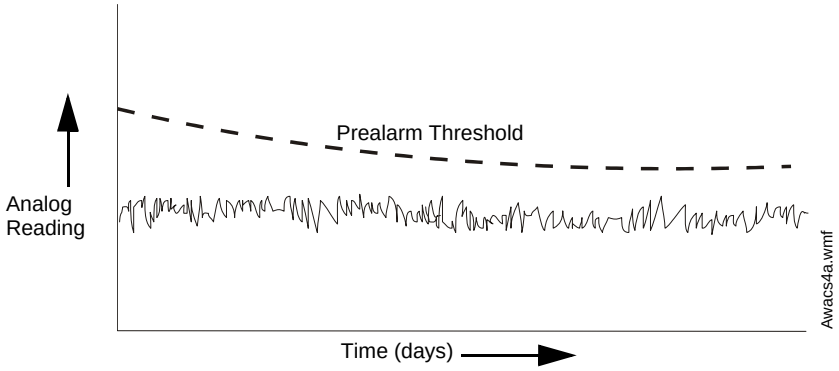


Figure C.3 Self-optimizing Pre-Alarm Level

For more information on setting Pre-Alarm levels, refer to “Changing Detector Sensitivity” on page 55

C.2.4 Detector Sensitivity

The control panel provides nine Sensitivity Levels for alarm detection and pre-alarm as follows:

NOTE: For a list of all detector sensitivity levels, see Table C.2 on page 103.

- **Alarm Sensitivity Levels** - Select the sensitivity of a detector from 1-9 (1=highest sensitivity; 9=lowest sensitivity).
- P**re-Alarm Sensitivity Levels** - Select one of nine levels from 1 to 9 (0=no Pre-Alarm, 1=self-optimizing, 2=highest sensitivity, 9=lowest sensitivity). You can set Pre-Alarm operation to Action (latching) or Alert (non-latching) and to activate Special Zones. For instructions on programming, refer to “How to Select a Pre-Alarm Level” on page 102.

Set the sensitivity levels as fixed or programmed for day and night operation. For details, refer to “Time Control Zones” on page 94.

A sample sensitivity window for a laser detector:

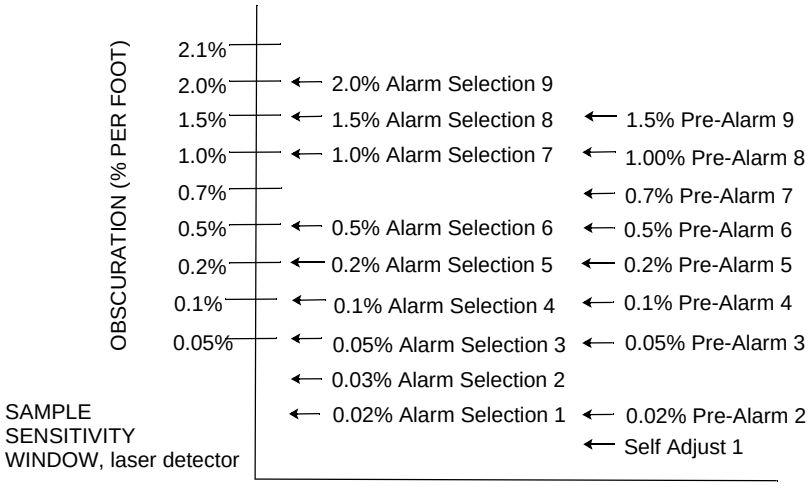


Figure C.4 Sensitivity Levels for a FlashScan View® Laser Detector

C.2.5 Cooperative Multi-Detector Sensing

Cooperative Multi-Detector Sensing is the ability of a smoke detector to consider readings from nearby detectors in making alarm or pre-alarm decisions. Each detector can include up to two other detectors in its decision. Without statistical sacrifice in the ability to resist false alarms, Cooperative Multi-Detector Sensing allows a detector to increase its sensitivity to actual smoke by a factor of almost 2 to 1. Cooperative Multi-Detector Sensing also allows the combination of ionization with photoelectric technology in reaching an alarm decision. The figure below shows a graph representing Cooperative Multi-Detector Sensing:

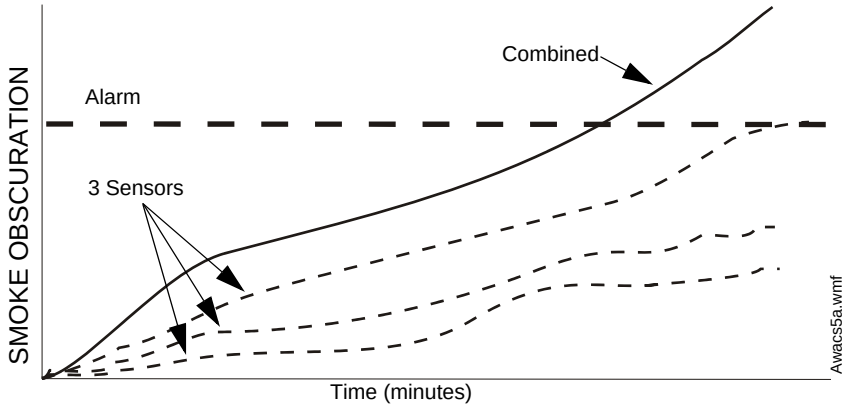


Figure C.5 Cooperative Multi-Detector Sensing

C.3 Pre-Alarm

C.3.1 Definition

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. There are two levels of Pre-Alarm:

- Alert (Refer to "Alert Level" below)
- Action (Refer to "Action Level" on page 102)

Alert and Action Pre-Alarm settings are global. For instance, if you program Pre-Alarm for Alert, all intelligent detectors programmed for Pre-Alarm are set to Alert (refer to "How to Select a Pre-Alarm Level" on page 102). You can, however, set unique Pre-Alarm sensitivity levels (PA) for individual detectors (refer to "Detector Sensitivity Settings" on page 103).

C.3.2 Alert Level

Alert Functions

The control panel software, in addition to checking for alarm levels, checks for Pre-Alarm thresholds for each addressable, intelligent smoke detector programmed for Pre-Alarm. If a detector's real-time sensing level exceeds the programmed Alert threshold, the control panel indicates an Pre-Alarm condition for the detector. The control panel does the following functions when a detector reaches pre-alarm level:

- The Pre-Alarm message is sent to the History buffer and to any installed FDU-80s and printers. The message is sent (and time stamped) at the time that it first occurred. This historical data could provide valuable information about the progress of a fire.
- The PRE-ALARM LED flashes and the panel sounder pulses until acknowledged.
- Zone F9 activates—but Zone 00 (general alarm) or any other zone, System Trouble relay and System Alarm relay do not activate.
- The Pre-Alarm indication for this detector will restore automatically to normal if its sensitivity, programmable to one of nine settings, drops below pre-alarm level. Zone F09 clears automatically when no Pre-Alarm conditions exist.
- A subsequent alarm for this detector also clears the Pre-Alarm indication.

Example of an Alert Level

When an ion detector is programmed for AL:7 and PA:5 (covered in "Changing Detector Sensitivity" on page 55), an Alert Pre-Alarm occurs at measured smoke detector levels that exceed 1.00% per foot obscuration. When this happens the panel sounder and the PRE-ALARM LED pulse, and a display appears on the LCD, similar to the sample screen shown below:

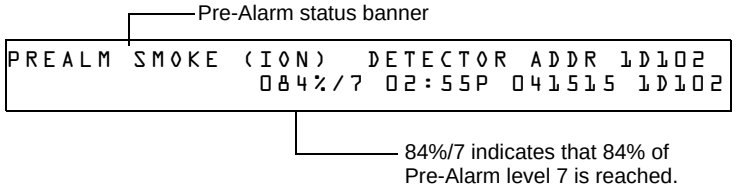


Figure C.6 Sample Display of a Pre-Alarm Alert Condition

C.3.3 Action Level

Action Functions

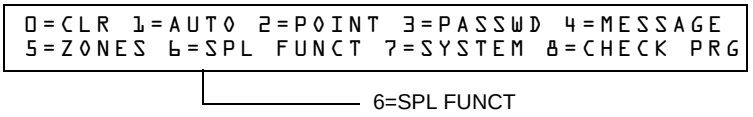
If you program a detector for Action Pre-Alarm and the detector reaches a level that exceeds the programmed Pre-Alarm level, the control panel indicates an Action condition. Indication at the panel is the same as in Figure C.6 above. The control panel does the following functions when a detector reaches the programmed pre-alarm level:

- The Action message is sent to the History buffer and to any installed FDU-80s and printers. The message is sent (and time stamped) only at the time that it first occurred. This historical data could provide valuable information about the progress of a fire.
- The PRE-ALARM LED and panel sounder pulse until acknowledged.
- Zone F09 is activated—but Zone Z00 (general alarm or any other zone) and the System Trouble and System Alarm relays do not activate.
- The fifth zone programmed (not the first four) for this detector activates. The fifth zone is the right-most entry on line two of the detector CBE list in the Point Programming screen. (For more information, refer to “Modify an Addressable Detector Point” on page 21). You can use the fifth zone to control functions of a detector or group of detectors once the pre-alarm level is reached. Fifth zone activations also allow ACS annunciation by a detector or group of detectors in Action Pre-Alarm condition.
- The Pre-Alarm condition and the zone programmed will latch until system reset, even if the sensitivity drops below the pre-alarm level.
- A subsequent alarm condition for this detector clears the Action indication from the LCD display alarm list.

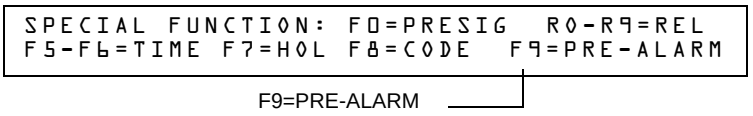
C.3.4 How to Select a Pre-Alarm Level

Instructions and sample displays to program Pre-Alarm for Alert or Action

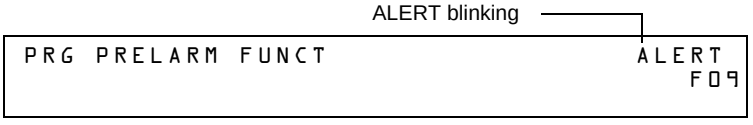
1. At the “Enter Password” screen, enter your Program Change Password to display the “Program Change Selection” screen. Press **1** to enter the “Basic Program” screen:



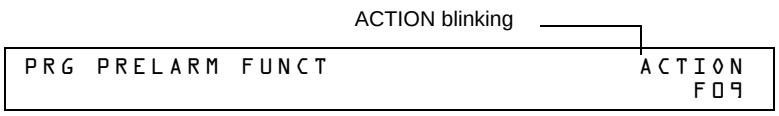
2. From the “Basic Program” screen, press the **6** key to display the “Special Function Zone Change” screen.



3. From the ‘Special Function Zone Change” screen, press **F9** to display the “Pre-Alarm Function” screen, with Alert blinking.



4. To select Action, press the + (Next Selection) or – (Previous Selection) key.



C.4 Detector Sensitivity Settings

C.4.1 How to Select Pre-Alarm and Alarm Sensitivity

Each detector provides a host of selectable intelligent options. The control panel provides nine levels of Pre-Alarm (PA:1–PA:9) and Alarm (AL:1–AL:9) in percent per foot obscuration:

- **PA:0** no Pre-Alarm selection.
- **PA:1** usually the self-optimizing setting where the control panel selects a suitable Pre-Alarm level for a detector.
- **PA:2**–**PA:9** the detector Pre-Alarm sensitivity level - with PA:2 the most sensitive and PA:9 the least sensitive.
- **AL:1**–**AL:9** the detector Alarm sensitivity level - with AL:1 the most sensitive and AL:9 the least sensitive.

NOTE: (d) Signifies the factory default setting in Table C.2.

Table C.2 Detector Sensitivity (in percent obscuration per foot) (1 of 2)

Detector Type	Alarm (FlashScan)	Alarm (CLIP)	Pre-Alarm
Photo Electric SMOKE (PHOTO) (See note *)	AL:1=0.50 % AL:2=0.73 % AL:3=0.96 % AL:4=1.19 % AL:5=1.43 % AL:6=1.66 % AL:7=1.89 % AL:8=2.12 % (d) AL:9=2.35 %	AL:1=0.50 % AL:2=0.73 % AL:3=0.96 % AL:4=1.19 % AL:5=1.43 % AL:6=1.66 % AL:7=1.89 % AL:8=2.12 % (d) AL:9=2.35 %	PA:1=Auto PA:2=0.30 % PA:3=0.47 % PA:4=0.64 % PA:5=0.81 % PA:6=0.99 % PA:7=1.16 % PA:8=1.33 % (d) PA:9=1.50 %
Ion SMOKE (ION) (See notes * and †)	AL:1=0.50 % AL:2=0.75 % AL:3=1.00 % AL:4=1.25 % AL:5=1.50 % AL:6=1.75 % (d) AL:7=2.00 % AL:8=2.25 % AL:9=2.50 %	AL:1=0.50 % AL:2=0.75 % AL:3=1.00 % AL:4=1.25 % AL:5=1.50 % AL:6=1.75 % (d) AL:7=2.00 % AL:8=2.25 % AL:9=2.50 %	PA:1=Auto PA:2=0.40 % PA:3=0.50 % PA:4=0.75 % PA:5=1.00 % PA:6=1.25 % (d) PA:7=1.50 % PA:8=1.75 % PA:9=2.00 %
FlashScan View® Laser (See Note ‡)	AL:1=0.02 % AL:2=0.03 % AL:3=0.05 % AL:4=0.10 % AL:5=0.20 % AL:6=0.50 % (d) AL:7=1.00 % AL:8=1.50 % AL:9=2.00 %	AL:1=0.02 % AL:2=0.03 % AL:3=0.05 % AL:4=0.10 % AL:5=0.20 % AL:6=0.50 % (d) AL:7=1.00 % AL:8=1.50 %** AL:9=2.00 %	PA:1=Auto PA:2=0.02 % PA:3=0.05 % PA:4=0.10 % PA:5=0.20 % PA:6=0.50 % (d) PA:7=0.70 % PA:8=1.00 % PA:9=1.50 %
Acclimate Plus™ (See Note ††)	AL:1=0.50 % AL:2=1.00 % AL:3=1.00 to 2.00 % AL:4=2.00 % AL:5=2.00 to 3.00 % (d) AL:6=3.00 % AL:7=3.00 to 4.00 % AL:8=4.00 % AL:9=thermal 135°F	Alarm (CLIP) AL:1=1.00 % AL:2=1.00 % AL:3=1.00 to 2.00 % AL:4=2.00 % AL:5=2.00 to 4.00 % (d) AL:6=2.00 to 4.00 % AL:7=2.00 to 4.00 % AL:8=4.00 % AL:9=4.00 %	PA:1=0.50 % PA:2=1.00 % PA:3=1.00 % PA:4=1.00 to 2.00 % PA:5=1.00 to 2.00 % (d) PA:6=2.00 % PA:7=2.00 % PA:8=2.00 to 3.00 % PA:9=2.00 to 3.00 %
Beam Detector (See Note ‡‡)	AL:1=25 % AL:2=30 % AL:3=40 % AL:4=50 % AL:5=30 - 50 % AL:6=40 - 50 %	AL:1=25 % AL:2=30 % AL:3=40 % AL:4=50 % AL:5=30 - 50 % AL:6=40 - 50 %	N/A

Table C.2 Detector Sensitivity (in percent obscuration per foot) (2 of 2)

Detector Type	Alarm (FlashScan)	Alarm (CLIP)	Pre-Alarm
FSC-851 IntelliQuad Detector***	AL:1=1% AL:2=2% AL:3=3% AL:4=3% w/ 10 minute confirmation††† AL:5=4% w/ 10 minute confirmation AL:6=Thermal 135°F AL:7=Thermal 135°F AL:8=Thermal 135°F AL:9=Thermal 135°F		PA:1=1% PA:2=1% PA:3=2% PA:4=3% PA:5=3% w/ 10 minute confirmation PA:6=4% w/ 10 minute confirmation PA:7=4% w/ 10 minute confirmation PA:8=4% w/ 10 minute confirmation PA:9=4% w/ 10 minute confirmation
Photo/CO	AL:1=1% AL:2=2% AL:3=3% AL:4=3% w/ 10 minute confirmation AL:5=4% w/ 10 minute confirmation AL:6=Thermal 135°F		PA:1=1% PA:2=2% PA:3=3% PA:4=3% w/ 10 minute confirmation PA:5=4% w/ 10 minute confirmation PA:6=Thermal 135°

* Detectors are suitable for open area protection within the listed air velocity range. Typically, this range is 0 - 4,000 ft/min for photoelectric detectors and 0 - 1,200 ft/min for ionization detectors. Be sure to confirm this range before installing the detector by referring to the manufacturer's installation instructions.

† Use only alarm sensitivity setting of AL=1, AL=2 or AL=3 for ION detectors installed in Canada.

‡ The use of alarm sensitivities below 0.50% obscuration per foot requires a 90 day test to ensure that the environment for the detectors is suitable for the higher sensitivity setting. (Refer to "How to Test Detectors Set Below 0.50% Obscuration per Foot" on page 104.)

** 1% maximum on CLIP. Higher figures may display.

†† For Acclimate detectors installed in Canada: Use only the alarm settings of AL:1 or AL:2.

‡‡ Refer to the beam detector manual to determine the alarm settings: they are a function of the distance between the detector and its reflector.

*** In CLIP mode, any AL: settings over AL:5 will be set to AL:5 by the panel. Any PA: settings over PA:5 will be set to PA:5 by the panel.

†††Within the 10 minute fire signature confirmation delay period if there is a detection of another fire signature (Carbon Monoxide, Infrared or Thermal) it overrides the 10 minute confirmation time.

C.4.2 How to Test Detectors Set Below 0.50% Obscuration per Foot

Using alarm sensitivities below 0.50% obscuration per foot requires a 90-day test to ensure that the detector environment is suitable for the higher sensitivity setting. To meet Notifier and Underwriters Laboratory requirements, test each detector planned to operate below 0.50%/ft obscuration as follows:

1. Set the detector as follows:

Step	Action
1	Initially set to the 0.50% obscuration per foot Alarm level.
2	Set the Pre-Alarm level to the desired final Alarm sensitivity.
3	Set the Pre-Alarm to Alert mode (non-latching).

2. Operate detectors continuously for 90 days with all environmental factors (such as, temperature, humidity, air flow, occupancy, and so on) similar to the intended application for the detectors. Record all events for each tested detector with an electronic History buffer or a printout.
3. At the end of the 90-day test: An authorized Notifier representative, or an end user trained by an authorized Notifier representative must inspect the results of the test. If the test results show no alarms or pre-alarms for the tested detectors, reprogram the fire alarm system to set the Alarm sensitivity to the more sensitive Pre-Alarm level of the test.

C.5 Detector Maintenance Features

C.5.1 Overview

The NF2S-640 provides features to check the maintenance performance level of addressable, intelligent detectors. Detector maintenance features include the following:

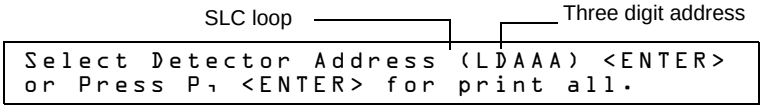
- View detector maintenance information for an individual detector
- Print a detector maintenance report for all detectors

C.5.2 How to Access Detector Maintenance Information

1. Access detector maintenance functions by pressing the ENTER key. The control panel displays the Program Entry screen:

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

2. At the Program Entry screen, press the **M** key. The control panel displays the Detector Maintenance Selection screen:



3. Press **1** or **2** to specify the SLC loop, then the detector's three digit address, then press the enter key; or to print a Detector Maintenance Report (Figure C.8 on page 106): Press **P**; then, press the enter key.

C.5.3 View Detector Maintenance for a Detector

When you enter the detector SLC address the control panel displays the Detector Maintenance Status screen as shown below:

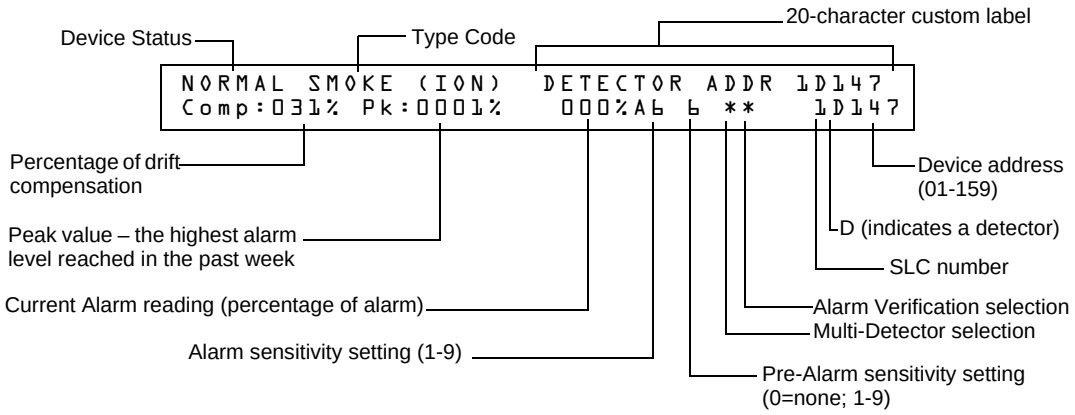


Figure C.7 Detector Maintenance Status Screen

Once you display information for a detector, you can use the + (Next Selection) and − (Previous Selection) keys to view information for the next or previous detector on the SLC.

Refer to "Interpreting a Detector Status Display or Maintenance Report" on page 106 for descriptions of each item.

C.5.4 Print a Detector Maintenance Report

A Detector Maintenance Report lists detector maintenance status for each installed addressable detector [except FDX-551(an analog heat detector)].

When you press and enter the **P** key the control panel sends a Detector Maintenance Report (Figure C.8) to the printer connected to the control panel.

```
Detector Maintenance Report
1
*** PRINT SMOKE DETECTOR MAINTENANCE  ***
NORMAL  SMOKE (PHOTO) INTENSIVE CARE UNIT Comp:032%  Pk:0002%   000% A8 8 **   1D043
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D044 Comp:027%  Pk:0001%   000% A8 8 **   1D044
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D045 Comp:028%  Pk:0001%   000% A8 8 **   1D045
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D046 Comp:030%  Pk:0001%   000% A8 8 **   1D046
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D047 Comp:024%  Pk:0002%   000% A8 8 **   1D047
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D048 Comp:031%  Pk:0002%   000% A8 8 **   1D048
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D049 Comp:033%  Pk:0002%   000% A8 8 **   1D049
NORMAL  SMOKE (PHOTO) DETECTOR ADDR 1D050 Comp:008%  Pk:0003%   000% A8 8 **   1D050
 **************************      PRINT END
**************************************
```

Figure C.8 Sample Detector Maintenance Report

C.5.5 Interpreting a Detector Status Display or Maintenance Report

Detector Maintenance Status Screens and Detector Maintenance Reports provide the same information (such as Device Status, Compensation, Peak Value) about a detector. This section contains descriptions of each item that appears in a Detector Maintenance Status Screen or a Detector Maintenance Report.

```
NORMAL  SMOKE (PHOTO)  DETECTOR ADDR 1D044  Comp:027%  Pk:0001%  000%  A8   8  C  *  1D044
```

1 2 3 4 5 6 7 8 9 10 11

1. **Device Status** (NORMAL) The status of the detector: NORMAL, ALARM, DISABL OR TEST.
2. **Type Code** (SMOKE (PHOTO)) The software Type Code that identifies the type of detector. Refer to “Intelligent Detector Type Codes” on page 114.
3. **Custom Label** (DETECTOR ADDR 1D044) The 19-character user-defined custom label.
4. **Drift Compensation** (COMP:027%) The relative cleanliness of a detector determined by sampling the amount of contaminants in the detector, ambient air conditions, and the age of the detector. The Comp value also indicates if a detector requires maintenance. Refer to “Maintenance Warnings – Three Levels” on page 98 for definitions of maintenance levels. The table below contains a list of the maintenance level values for each type of detector:

Table C.3 Maintenance Levels by Detector Type

Type of Detector	Normal	Low Chamber Reading	Maint. Alert	Maint. Urgent
Ion	006-068	less than 006	92-99	100
Photo	006-069	less than 006	93-99	100
Laser	003-063	less than 003	83-99	100
Acclimate Plus™	n/a	LO-VAL	Dirty1	Dirty2

5. **Peak Value** (PK:0001%) The highest analog value reached by the detector during the past week. The peak value slowly returns to zero.

6. **Alarm Reading** (000%) The current alarm reading of the detector, as a percentage of the Alarm Sensitivity setting.
7. **Alarm Sensitivity Setting** (A8) The Alarm Sensitivity (x=1-9) entered in the Detector Sensitivity Screen.
8. **Pre-Alarm Sensitivity Setting** (8) The Pre-Alarm Sensitivity (1-9; 0 = Pre-Alarm not used) entered in the Detector Settings Screen. Refer to “Detector Sensitivity Settings” on page 103 for more information on the Pre-Alarm sensitivity settings.
9. **Multi-Detector Selection** (*) A smoke detector programmed so that it evaluates 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. See “Modify an Addressable Detector Point” on page 21 for instructions on setting Cooperative Multi-Detector Settings.
   ***** – Multi-not used.
   A – combines the detector’s alarm decision with the next address above.
   B – combines the detector’s alarm decision with the next address below.
   C – combines the detector’s alarm decision with the next address above and the next address below.
10. **Alarm Verification** (*)
    ***** – Alarm Verification not programmed for this detector.
    V– Alarm Verification enabled.
    xx – Alarm Verification programmed for the detector; xx equals the Verification Counter (00-99). See “Modify an Addressable Detector Point” on page 21 for instructions on setting Alarm Verification.
11. **Device SLC Address** (1D044) The SLC address of the detector.

Appendix D: CBE (Control-By-Event)

D.1 Description

CBE (Control-By-Event) is a software function that provides a means to program a variety of output responses based on various initiating events. The control panel operates Control-By-Event (CBE) through 99 Software Zones with the following features:

- Each input point (detector, monitor module) can list up to five Software Zones
- Each output point (control module or NAC) can list up to five Software Zones
- Output points can list zone Z00 (general alarm). Non-Alarm or Supervisory points do not activate Software Zone Z00 (general alarm)

D.2 Input and Outputs

Input and output devices with CBE-listed Software Zones work as follows:

These devices	Operate with CBE as follows
Inputs (detectors, monitor modules)	When an input device activates, so do all Software Zones listed to the input device.
Outputs (control modules and NACs)	When a Software Zone activates, the output device(s) in that zone turns on.

D.3 Equations

Space for up to twenty logic or time delay equations is included in the control panel. Each equation can be a logic equation or a time delay function. A time delay function can have a logic equation as an internal equation, but not vice versa. The rules of the equations are:

1. Equations can be entered, edited and viewed in the VeriFire™ Tools program, but can only be viewed on the control panel.
2. The twenty equations are designated in the panel as ZE0-ZE9 and ZL0-ZL9, and are evaluated in that order.

NOTE: In the VeriFire™ Tools program, ZL1 - ZL10 corresponds to ZE0-ZE9, and ZL11 - ZL20 corresponds to ZL0-ZL9.

3. Equations will always begin with a logic or a time delay function.
4. Equations will be a maximum of 73 characters long, including parentheses and commas.
5. Equations can have a maximum of 10 logic functions. The function set is listed below in “Equation Entry” on page 109.
6. These equations are to be evaluated after all other devices have been evaluated.
7. One logic equation can be used as a variable in another equation only if the equation used has previously been evaluated. For example, the results of the ZE0 equation can be used in the ZL5 equation but the opposite is not true.
8. Time delay equations can use any other functions as an internal equation, but the other function can not use time delay equation as an internal equation.
9. A logic instruction can have a maximum of 20 arguments (inclusive start and stop address).
10. Maximum for the delay timer is 18 hours 12 minutes.

D.4 Equation Entry

The equations must be entered using the VeriFire™ Tools Program Utility. All are subject to the maximum number of arguments possible in a logic instruction as discussed above (Item Number 9 on page 108).

D.4.1 Logic Functions

The “AND” Operator

Requires that each argument be in alarm.

Example: AND(Z02,Z05,Z09)

All three arguments in the equation must be in alarm for the output point to be activated.

The “OR” Operator

Requires that any argument be in alarm

Example: OR(Z02,Z05,Z09)

If any one of the three arguments in the equation is in alarm the output point will be activated.

The “NOT” Operator

Inverts the state of the argument (activated to deactivated OR deactivated to activated).

Example: NOT(Z02)

The output point will remain activated until the argument goes into alarm.
If the argument goes into alarm the output point will deactivate.

The “ONLY1” Operator

Requires that only one argument be in alarm.

Example: ONLY1(Z02,Z05,Z09)

If only one of the arguments is in alarm the output point will be activated.

The “ANY2” Operator

Requires that two or more arguments be in alarm.

Example: ANY2(Z02,Z05,Z09)

If any two or more of the arguments are in alarm the output point will be activated.

The “ANY3” Operator

Requires that three or more arguments be in alarm.

Example: ANY3(Z02,Z05,Z07,Z09)

If any three or more of the arguments are in alarm the output point will be activated.

The “XZONE” Operator

Requires that any combination of two or more input devices programmed to a zone be in alarm.

Example: XZONE(Z02)

If any combination of two or more initiating devices that have been programmed (CBE) to this software zone comes into alarm, then this output point will be activated.

The “RANGE” Operator

Each argument within the range must conform to the requirements of the governing operator. The range limit is 20 consecutive arguments.

Example: AND(RANGE(Z1,Z20))

Zone 1 through Zone 20 must all be in alarm for the output point to be activated.

D.4.2 Equation Syntax Example

OR(AND(L1D1,L1D4),AND(L2D6,L2M3,NOT(L2M4)),ANY2(L1M13,L1M14,L1M15))

Equation begins with a logic or time delay function - OR

67 Characters (maximum of 73) - includes parentheses and commas.

5 Logic Functions (maximum of 10) - OR, AND, AND, NOT and ANY2.

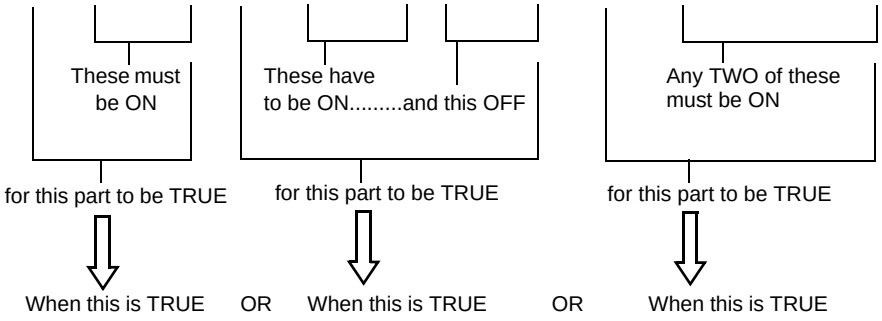
8 Arguments (maximum of 20 per logic function) - L1D1,L1D4,L2D6,L2M3,L2M4....

The equation contains no spaces.

D.4.3 Evaluating an Equation

When you evaluate an equation, you 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)),ANY2(L1M13,L1M14,L1M15))



Then all outputs programmed with this equation will be turned ON.

D.4.4 Argument Entries

The argument entries of the logic functions can be another logic function or any of the devices listed below:

1D1 – 1D159	detectors loop 1	(159)
1M1 – 1M159	modules loop 1	(159)
2D1 – 2D159	detectors loop 2	(159)
2M1 – 2M159	modules loop 2	(159)
B1 – B4	panel bells	(4)
Z0 – Z99	zones	(100)
F0 – F9	special function zones	(10)
R0 – R9	releasing zones	(10)
ZE0 – ZE9**	equations 0-9	(10)
ZL0 – ZL9***	equations 10-19	(10)
*Node numbers can be entered in VeriFire™ Tools for network programming. **Corresponds in VeriFire™ Tools to ZL1-ZL10 ***Corresponds in VeriFire™ Tools to ZL11-ZL20		

Equations must be evaluated before use in another equation.

D.4.5 Time Delay Functions

The "DEL" Operator

Used for delayed operation

Example: DEL(HH:MM:SS,HH:MM:SS,ZE5)

- The first HH:MM:SS is the delay time, the second HH:MM:SS is the duration time.
- If delay of zero is entered (00.00.00), the equation will evaluate true as soon as the internal equation (ZE5) evaluates true and will remain that way for the specified duration, unless the internal equation becomes false.
- If no duration is specified, then the device will not be deactivated until a reset occurs or the internal equation evaluates false.

The "SDEL" Operator

A latched version of the DEL operator. Once the equation evaluates true, it remains activated until a reset, even if the internal equation (ZE5) becomes false.

Example: SDEL(HH:MM:SS,HH:MM:SS,ZE5)

- The first HH:MM:SS is the delay time, the second HH:MM:SS is the duration time.
- If delay of zero is entered (00.00.00), the equation will evaluate true as soon as the internal equation (ZE5) evaluates true and will remain that way for the specified duration.
- If no duration is specified, then the device will not deactivate until reset.

The installer can enter the equations in any combination wanted as long as the format of the logic function or time delay is followed from the lists above. Error checking will be performed after the user has entered the complete equation. Possible errors are too many or too few parentheses, too many or too few arguments inside the parentheses, unknown function and unknown device type.

D.5 CBE Example

An example of CBE, where monitor module 1M101 lists zone Z04 and Z05, and control module 1M108 lists zone Z05 and zone Z07:

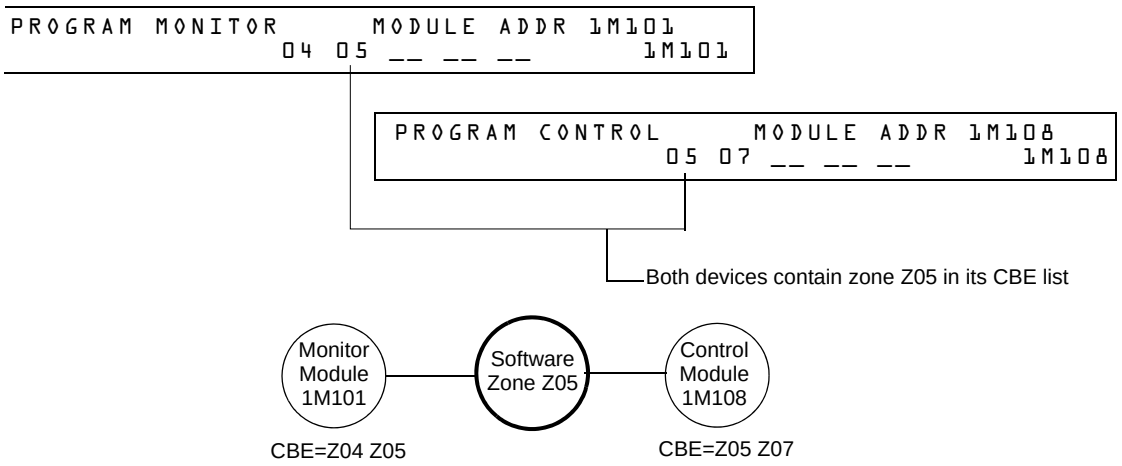


Figure D.1 CBE Example

When monitor module 1M101 activates, the following CBE takes place:

1. Software Zones Z04 and Z05 activate.
2. Since control module 1M108 has Z05 in its CBE list, all of its outputs would activate. All output devices with Z04 or Z05 would activate.

Appendix E: Detector Initialization

E.1 Overview

The control panel automatically performs a detector initialization routine when you add or change a detector, unless the control panel is in Walk Test or Advanced Walk Test. If you change a detector with the control panel in Walk Test or Advanced Walk Test, you must manually initialize the detector as detailed in “How to Manually Initialize a Detector” on page 113. The detector initialization routine takes approximately 2.5 minutes, during which time the FACP remains in service. While initializing a detector, follow these guidelines:

- Make sure the detector is free of residual smoke during detector initialization.
- Do not test a detector during detector initialization.

NOTE: The control panel only performs detector initialization if it senses that a detector was removed for at least 15 seconds. This is what actually “turns on” the detector. It is an automatic procedure but is specified here because of the delay between detector connection and full function. The rest of the system remains in full service during this time.

A sample screen that appears on the LCD display during detector initialization.

```
Detector Initializing _ Please Wait
                        02:48P 041515 Sat
```

WARNING:
If you replace any detector with a different type of detector (for example, replace a laser detector with a photoelectric detector), you must immediately program the control panel with the new detector Type Code. Failure to do so can cause incorrect control panel operation, including false alarms. For instructions on replacing a detector, refer to “How to Replace a Detector” on page 112.

E.2 System Testing and Detector Initialization

To facilitate system testing, the control panel does not initialize detectors during Walk Test and Advanced Walk Test. You can remove a detector to confirm supervision, then replace the detector for immediate testing. If you replace a removed detector with a different detector of the same type, you must manually initialize the detector according to the instructions in “How to Manually Initialize a Detector” on page 113. If, however, you want to replace a removed detector with a different type of detector, refer to “How to Replace a Detector” on page 112.

E.3 How to Replace a Detector

If you replace a detector with a different type of detector, you must immediately program the control panel for the new detector type. To replace a detector, follow these steps:

NOTE: Parentheses show an example of replacing an existing photoelectric detector at address 1D101 with a laser detector.

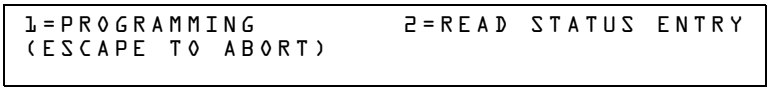
Step	Action
1	Disable the point of the detector. (point 1D101)
2	Remove the photoelectric detector and replace with laser detector set to the same address.
3	Autoprogram the panel to recognize the new detector type.
4	Enable new detector.

E.4 How to Manually Initialize a Detector

You only need to manually initialize a detector when you change a detector during Walk Test or Advanced Walk Test. If, however, you replace a detector with a different type of detector, you must immediately program the new detector according to the instructions in "How to Replace a Detector" on page 112.

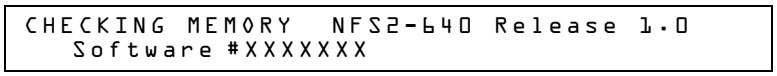
To manually initialize a detector, follow these steps:

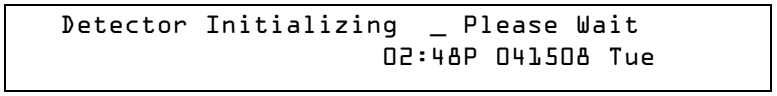
1. Press the ENTER key. The control panel displays the Program Entry screen:



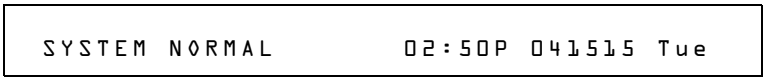
2. Press the **1** key. The control panel displays the Enter Password screen:

3. Enter the password RESET, which starts detector initialization. The control panel displays the following three screens, in the sequence shown, while initializing a detector:





When the control panel completes the detector initialization, it displays system status as shown below:



Appendix F: Type Codes

F.1 What are Type Codes?

Type Codes are software selections for initiating devices (detectors and monitor modules) and output devices (control modules and NACs). Some Type Codes are self-explanatory; that is, the Type Code matches the function of the device, such as a “Monitor” for a monitor module, “Photo” for a photoelectric detector, and so on. Type codes also provide special functions, such as activating switches, solenoids, and control panel functions.

F.2 How to Select a Type Code

You select a Type Code through the Point Programming screen. For instructions, refer to “Modify an Addressable Detector Point” on page 21.

F.3 In this Appendix

This appendix contains detailed descriptions of Type Codes for input and output devices, as listed below:

F.4 Type Codes for Input Devices

F.4.1 Overview

This section provides Type Codes for intelligent detectors and monitor modules. For instructions on programming Type Codes, refer to “Modify or Delete a Point (2=point)” on page 20.

F.4.2 Type Codes for Intelligent Detectors

A list of intelligent detector Type Codes, which specify the type of detector installed at an SLC address.

Table F.1 Intelligent Detector Type Codes (1 of 3)

Type Code	Point Characteristics			Device Function
	Point Type	Latching (Y/N)	Point Function	
SMOKE (ION)	fire alarm	Y	lights fire alarm LED and activates CBE	Ionization smoke detector
SMOKE(DUCTI)	fire alarm	Y	lights fire alarm LED and activates CBE	Duct Ionization smoke detector
SUP.T(DUCTI)[3]	supervisory	N	lights supervisory LED	Ionization smoke detector used as a duct detector to report supervisory condition rather than alarm. Tracking.
SUP.L(DUCTI)	supervisory	Y	lights supervisory LED	Ionization smoke detector used as a duct detector to report supervisory condition rather than alarm. Latching.
SUP.T(ION)[2,3]	supervisory	N	lights supervisory LED	Ionization smoke detector used to report supervisory condition rather than alarm. Tracking.
SUP.L(ION)[2]	supervisory	Y	lights supervisory LED	Ionization smoke detector used to report supervisory condition rather than alarm. Latching.
SMOKE(PHOTO)	fire alarm	Y	lights fire alarm LED and activates CBE	Photoelectric smoke detector
SMOKE(DUCTP)	fire alarm	Y	lights fire alarm LED and activates CBE	Duct Photoelectric smoke detector
SUP.T(DUCTP)[3]	supervisory	N	lights supervisory LED	Photoelectric smoke detector used as a duct detector to report supervisory condition rather than alarm. Tracking.

Table F.1 Intelligent Detector Type Codes (2 of 3)

SUP.L(DUCTP)	supervisory	Y	lights supervisory LED	Photoelectric smoke detector used as a duct detector to report supervisory condition rather than alarm. Latching.
SUP.T(PHOTO)[2,3]	supervisory	N	lights supervisory LED	Photoelectric smoke detector used to report supervisory condition rather than alarm. Tracking.
SUP.L(PHOTO)[2]	supervisory	Y	lights supervisory LED	Photoelectric smoke detector used to report supervisory condition rather than alarm. Latching.
RF_PHOTO	fire alarm	Y	lights fire alarm LED and activates CBE	Wireless Photoelectric smoke detector
SMOKE(HARSH)[1]	fire alarm	Y	lights fire alarm LED and activates CBE	HARSH smoke detector
PHOTO/CO[4]	fire alarm	Y	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)	Photoelectric, Carbon Monoxide, and Heat detector
PHOTO/CO (P SUP)[2,4,5]	fire alarm/ supervisory	N	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)	Photoelectric, Carbon Monoxide, and Heat detector
PHOTO/CO (C SUP)[4]	fire alarm/ supervisory	Y	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)	Photoelectric, Carbon Monoxide, and Heat detector
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.				
SMOKE(BEAM)	fire alarm	Y	lights fire alarm LED and activates CBE	Beam smoke detector
SMOKE(LASER)	fire alarm	Y	lights fire alarm LED and activates CBE	Laser smoke detector
SUP.L(LASER)[2]	supervisory	Y	lights supervisory LED	Laser smoke detector used to report supervisory condition rather than alarm. Latching.
SUP.T(LASER)[2,3]	supervisory	N	lights supervisory LED	Laser smoke detector used to report supervisory condition rather than alarm. Tracking.
SMOKE(DUCTL)	fire alarm	Y	lights fire alarm LED and activates CBE	Duct Laser smoke detector
SUP T(DUCTL)	supervisory	N	lights supervisory LED	Laser smoke detector used as a duct detector to report supervisory condition rather than alarm. Tracking.
SUP L(DUCTL)	supervisory	Y	lights supervisory LED	Laser smoke detector used as a duct detector to report supervisory condition rather than alarm. Latching.
AIR REF	fire alarm	Y	lights fire alarm LED and activates CBE	Assign to one or more FSL-751 detectors used to monitor the quality of air entering the protected area. The air quality measurement allows the VIEW® system to compensate for vehicle fumes, fog, or other particles brought into the protected area through the ventilation system. Poor air quality will lower the sensitivity of all FSL-751 detectors on the SLC. The detector sensitivity, however, remains within approved limits (always less than 1% obscuration per foot).
NOTE: A reference detector still functions as a smoke detector, but you should set the detector sensitivity level to the least sensitive level—AL:9 and PA:9 Change Alarm and Pre-Alarm sensitivity. Refer to “Detector Sensitivity Settings” on page 103 for a complete list of detector sensitivity settings.				
HEAT	fire alarm	Y	lights fire alarm LED and activates CBE	190°F intelligent thermal sensor
HEAT+	fire alarm	Y	lights fire alarm LED and activates CBE	190°F intelligent thermal sensor with low temperature warning.
HEAT(FIXED)	fire alarm	Y	lights fire alarm LED and activates CBE	135°F intelligent thermal sensor
HEAT (ROR)	fire alarm	Y	lights fire alarm LED and activates CBE	15°F per minute rate-of-rise detector
SMOKE ACCLIM	fire alarm	Y	lights fire alarm LED and activates CBE	Combination Photoelectric/heat detector without freeze warning (Acclimate Plus™)
SMOKE(ACCLI+)	fire alarm	Y	lights fire alarm LED and activates CBE	Combination Photoelectric/heat detector with freeze warning (Acclimate Plus™, or IntelliQuad FSC-851 Photoelectric Multi-Criteria Smoke Sensor)
SMOKE(MULTI)[1]	fire alarm	Y	lights fire alarm LED and activates CBE	Multisensor smoke detector
ASPIRATION[6]	fire alarm	Y	lights fire alarm LED and activates CBE	Aspiration smoke detector
ASPIR (SUP)[6]	supervisory	Y	lights supervisory LED and activates CBE	Aspiration detector supervision
ASPIR (PRE)[6]	prealarm	N	lights prealarm LED and activates CBE	Aspiration detector prealarm

Table F.1 Intelligent Detector Type Codes (3 of 3)

ASPIR (NON)[6]	non-fire	N	activates CBE	Aspiration detector non-alarm
ASPIR (REF)[6]	non-fire	N	activates CBE	Used as a reference for other aspiration detectors on the loop
NOTE: Aspiration detector (FAAST) programming requires 5 SLC addresses. Refer to the FAAST Installation document for additional programming information.				
ACCLIMATE				
ACCL (P SUP)	fire	Y (see note below)	activates CBE	Combination Photoelectric/Heat detector. Photo element activation generates a supervisory condition
ACCL+ (P SUP)	fire	Y (see note below)	activates CBE	Combination Photoelectric/Heat detector with low temperature warning. Photo element activation generates a supervisory condition.
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.				

[1] CLIP Mode only
[2] Requires approval of AHJ.
[3] Not suitable for Canadian applications.
[4] LED representation of a CO alarm may be performed using an ACS annunciator.
[5]Photo element can be programmed as latching or tracking for all Photo/Co devices programmed as this type ID via VeriFire Tools.
[6]When a device associated with a FAAST device is disabled locally, all devices associated with that FAAST will automatically be disabled as well.

F.4.3 Type Codes for Monitor Modules

A list of monitor module Type Codes, which you can use to change the function of a monitor module point.

Table F.2 Type Codes for Monitor Modules (1 of 2)

	Point Characteristics			
Type Code	**Point Type**	**Latching (Y/N)**	**Point Function**	**Device Function**
MONITOR	fire alarm	Y	Lights fire alarm LED and activates CBE	Alarm-monitoring device
PULL STATION	fire alarm	Y	Lights fire alarm LED and activates CBE	Manual fire-alarm-activating device, such as a pull station
RF MON MODUL	fire alarm	Y	Lights fire alarm LED and activates CBE	Wireless alarm-monitoring device
RF PULL STA	fire alarm	Y	Lights fire alarm LED and activates CBE	Wireless manual fire-alarm-activating device, such as a pull station
SMOKE CONVEN	fire alarm	Y	Lights fire alarm LED and activates CBE	Indicates activation of a conventional smoke detector attached to an FZM-1
SMOKE DETECT	fire alarm	Y	Lights fire alarm LED and activates CBE	Indicates activation of a conventional smoke detector attached to an FZM-1
WATERFLOW	fire alarm	Y	Lights fire alarm LED and activates CBE	Monitor for waterflow alarm switch
WATERFLOW S	supervisory	Y	Lights supervisory LED and activates CBE	Indicates supervisory condition for activated waterflow switch
ACCESS MONTR	non-alarm	N	Activates CBE	Used for monitoring building access
AREA MONITOR	security	Y	Lights security LED and activates CBE	Monitors building access
AUDIO SYSTEM	trouble	N	Lights trouble LED	Used for monitoring audio equipment
EQUIP MONITR	security	N	Activates CBE	Used for recording access to monitored equipment
RF SUPERVSRY	supervisory	N	Lights Supervisory LED	Monitors a radio frequency device
SECURITY	security	Y	Lights security LED	Indicates activation of security alarm
LATCH SUPERV	supervisory	Y	Lights supervisory LED	Indicates latching supervisory condition
TRACK SUPERV	supervisory	N	Lights supervisory LED	Monitors for waterflow tamper switches for alarm points
SYS MONITOR	security	Y	Lights security LED and activates CBE	Monitors equipment security
TAMPER	supervisory	Y	Lights supervisory LED, activates CBE	Indicates activation of tamper switch
ACK SWITCH	non-alarm	N	Performs Acknowledge function, no CBE	Silences panel sounder, gives an Acknowledge message on the panel LCD
ALLCALL PAGE	non-alarm	N	Activates all speaker circuits, no CBE	Performs AMG-1 All-call
DRILL SWITCH[4]	non-alarm	N	Performs Drill function	Activates silenceable outputs
EVACUATE SWITCH	non-alarm	N	Performs Drill function	Activates all silenceable outputs
FIRE CONTROL	non-alarm	N	Activates CBE	Used for non-fire activation of outputs
NON FIRE	non-alarm	N	Activates CBE	Used for building energy management

Table F.2 Type Codes for Monitor Modules (2 of 2)

PAS INHIBIT	non-alarm	N	Inhibits Positive Alarm Sequence	Inhibits Positive Alarm Sequence
POWER MONITR	trouble	N	Indicates trouble	Monitors auxiliary power supplies
RESET SWITCH	non-alarm	N	Performs Reset function	Resets control panel
SIL SWITCH	non alarm	N	Performs Signal Silence function	Turns off all activated silenceable outputs
TELE PAGE	non-alarm	N	Performs function of Page Button on FFT-7	Allows remote paging to a fire area
DISABLE MON	disable	N	When a point with this type code activates, it will create a disable on the panel for that point. No CBE generated.	Module can not be disabled via ACS, Alter Status, or over the network.
TROUBLE MON	trouble	N	Indicates Trouble	Monitors trouble inputs
ABORT SWITCH	non alarm	N	Indicates Active at the panel	Aborts activation of a releasing zone
MAN RELEASE	fire alarm	Y	Lights Fire Alarm LED and activates CBE	Indicates activation of a monitor module programmed to releasing zone to perform a releasing function
MANREL DELAY	fire alarm	Y	Lights Fire Alarm LED and activates CBE	Indicates activation of a monitor module programmed for a release output
SECOND SHOT	fire alarm	Y	Indicates Active at the panel and activates CBE	Provides second activation of releasing zone after soak timer has expired.
Blank	fire alarm	Y	Lights fire alarm LED and activates CBE	Monitors for a device with no description
HEAT DETECT	fire alarm	Y	Lights fire alarm LED and activates CBE	Monitors for conventional heat detector
CO MON[1]	CO alarm	Y	No LED will light.	Monitors conventional CO detector
ECS/MN MONITOR[3]	MN alarm	Y	Does not light any LEDs, overrides existing fire event[2], shuts off silenceable outputs and all fire activated strobes and activates CBE.	Monitors mass notification devices
ESC/MN SUPT	supervisory	N	Lights supervisory LED and activates CBE.	Monitors mass notification devices
ECS/MN SUPL[3]	supervisory	Y	Lights supervisory LED and activates CBE.	Monitors mass notification devices.
ECS/MN TROUBLE MON[3]	trouble	N	Indicates trouble on a Mass Notification device.	Monitors mass notification devices. Will generate a trouble condition for both open and short conditions.
RF GATEWAY	non-alarm	N	Activates CBE	Provides communication between wireless device and the fire panel.

[1] LED representation of a CO alarm may be performed using an ACS annunciator.
[2] If ECS/MN Override is not selected in VeriFire Tools, the fire events take precedence over ESC/MN audio events.
[3] This type code is not compatible with FirstCommand applications
[4].The Drill Switch type code should not be used for Canada mode.

F.5 Type Codes for Output Devices

F.5.1 Overview

This section provides Type Codes for control modules and NACs. For instructions on programming Type Codes, refer to “Modify or Delete a Point (2=point)” on page 20.

F.5.2 Type Codes for Control Modules

A comprehensive list of control module Type Codes, which you can select to change the function of an control module point.

Table F.3 Control Module Type Codes (1 of 2)

Type Code	Silenceable (Y/N)	Configuration	Device Function
CONTROL	Y	NAC	Supervised NAC for notification appliance
RELAY	Y	Form-C relay	Relay output
BELL CIRCUIT	Y	NAC	Supervised NAC for notification appliance
STROBE CKT	Y	NAC	Supervised NAC for notification appliance
HORN CIRCUIT	Y	NAC	Supervised NAC for notification appliance
AUDIBLE CKT	Y	NAC	Supervised NAC for notification appliance
SPEAKER	Y	NAC	Supervised NAC for notification appliance
ISOLATED NAC	Y	NAC	Supervised NAC for notification appliance, used with audio isolators. Activates even if there is a short on its NAC circuit. For ULC installations only.
ISOLATED SPK	Y	NAC	Supervised NAC for speaker circuits, used with audio isolators. Activates even if there is a short on its audio circuit. For ULC installations only.
REL END BELL	N	NAC	Supervised NAC for notification appliance

Table F.3 Control Module Type Codes (2 of 2)

blank	Y	NAC	Supervised NAC (for use when no other Type Code applies)
REL CKT ULC*	N	NAC	Releasing Circuit, power-limited, supervised for opens, shorts and ground faults (always non-silenceable)
RELEASE CKT*	N	NAC	Releasing circuit, nonpower-limited, supervised for opens and ground faults
RELEA.FORM C*	N	Form-C Relay	Relay output, contacts operate upon release
REL AUDIBLE	Y	NAC	NAC, activated upon release
NONRESET CTL	N	Form-C Relay and NAC	Relay output, unaffected by “System Reset” command
FORM C RESET	N	Form-C Relay and NAC (SLC only)	Relay module used to interrupt 24V power to four-wire conventional detectors for over 10 seconds upon reset. Used in conjunction with a monitor module with a conventional detector Type ID
TELEPHONE	N	NAC	Standard Telephone circuit
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. It is programmed as “switch inhibit”.
CONTROL NAC	Y	NAC	Supervised NAC
GEN ALARM	N	NAC	Control Module, an XPC-8 circuit, or an XP5-C (in NAC mode) configured as a Municipal Box Transmitter for NFPA 72 Auxiliary Fire Alarm Systems applications. This Type ID can also be used for general alarm activation. It is programmed as “switch inhibit”.
GEN SUPERVIS	N	NAC	Control Module, an XPR-8 relay, or an XP5-C (in relay mode) activated under any Supervisory condition (includes sprinkler type). It is programmed as “switch inhibit”.
GEN TROUBLE	N	NAC	Control Module, an XPR-8 relay, or an XP5-C (in relay mode) activated under any System Trouble condition. It is programmed as “switch inhibit”.
GENERAL PEND	N	NAC	Control Module, an XPC-8 circuit, or an XP5-C (in NAC mode) 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	NAC	Control Module, an XPC-8 circuit, or an XP5-C (in NAC mode) that will activate upon receipt of a trouble condition, and remain in the ON state until all troubles have been ACKNOWLEDGED. It is programmed as “switch inhibit”.
MNS GENERAL	N	NAC	Mass notification supervised output.
MNS CONTROL[1]	N	NAC	Mass notification supervised NAC.
MNS STROBE[1]	N	NAC	Mass notification supervised NAC.
MNS SPEAKER[1]	N	NAC	Mass notification supervised NAC for speaker circuits.
MNS RELAY[1]	N	NAC	Mass notification relay output.

* The FCM-1-REL checks for shorts with all releasing type codes.
[1] The type code is not compatible with FirstCommand applications.

F.5.3 NAC Type Codes

A comprehensive list of Type Codes for panel NACs. For instructions on programming Type Codes, refer to “Modify or Delete a Point (2=point)” on page 20.

Table F.4 NAC Type Codes

Type Code	Silenceable (Y/N)	Device Function
CONTROL	Y	Supervised NAC
BELL CIRCUIT	Y	Supervised NAC for notification appliance
STROBE CKT	Y	Supervised NAC for notification appliance
HORN CIRCUIT	Y	Supervised NAC for notification appliance
AUDIBLE CKT	Y	Supervised NAC for notification appliance
SPEAKER	N	Supervised NAC for speaker circuits
REL END BELL	N	Supervised NAC
blank label	Y	Supervised NAC for undefined device
REL CKT ULC	N	Releasing Circuit, power-limited, supervised for opens, shorts and ground faults (always non-silenceable)
RELEASE CKT	N	Releasing circuit, nonpowerlimited, supervised for opens and ground faults
REL AUDIBLE	Y	NAC, activated upon release

Table F.4 NAC Type Codes

REL CODE BELL	N	Supervised NAC (NFS2-640 NAC only)
INSTANT RELE	N	NAC, short = normal; supervised for open circuits and ground faults. Always non-silenceable and switch-inhibited.
ALARMS PEND	N	Output that will activate upon receipt of an alarm condition, and remain in the alarm state until all alarms have been acknowledged. It is programmed as “switch inhibit”.
CONTROL NAC	Y	Supervised NAC
GEN ALARM	N	Control Module, an XPC-8 circuit, or an XP5-C (in NAC mode) configured as a Municipal Box Transmitter for NFPA 72-2002 Auxiliary Fire Alarm Systems applications (MBT-1 required). This Type ID can also be used for general alarm activation. It is programmed as “switch inhibit”.
GEN SUPERVIS	N	Control Module, an XPR-8 relay, or an XP5-C (in relay mode) activated under any Supervisory condition (includes sprinkler type). It is programmed as “switch inhibit”.
GEN TROUBLE	N	Control Module, an XPR-8 relay, or an XP5-C (in relay mode) activated under any System Trouble condition. It is programmed as “switch inhibit”.
GENERAL PEND	N	Control Module, an XPC-8 circuit, or an XP5-C (in NAC mode) 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 XP5-C (in NAC mode) that will activate upon receipt of a trouble condition, and remain in the ON state until all troubles have been ACKNOWLEDGED. It is programmed as “switch inhibit”.

Appendix G: Region Settings

G.1 China

The REGION panel programming selection provides a setting for China. (Refer to “The Utility Program” on page 49.) This selection 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

G.2 Canada

The REGION panel programming selection for Canada must meet the following requirements:

G.2.1 Standalone Applications

Two-Stage Systems (3/5 minute time) - An ACM-24AT control point is required for Automatic Alarm Signal Cancel. Acknowledge will not cancel the Two-Stage timer. See the ACPS-610 Manual for additional programming information.

G.2.2 Network Applications

- The network’s manual controls may only be operated from one location at any given time. When panels are networked (using NCM Network Communications Modules or High-Speed Network Communication Modules), use AKS-1B Key Switch on each panel’s Primary Annunciator to enable it’s functions. NCA-2 may be a Primary Annunciator when AKS-1B is installed.
- The NCA-2 or ONYXWorks may be employed as a Display and Control Center (DCC). In the even that communications fails between the panels and the Control Center, the panels will continue to function in local/standalone mode.
- If the DCC option is enabled on the NFS2-640:
  - 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.

G.2.3 Automatic Alarm Signal Silence

For a system requiring annunciators, consult the Authority Having Jurisdiction.

G.2.4 Auto Silence

If Auto Silence is enabled:

- The value must be set to 20 minutes.
- An ACS point is required to monitor special function zone ZF40.

G.2.5 Annunciator Applications

ACM series annunciator modules must be used to annunciate the fire alarm input points/zones only, if no multi-line sequential display is installed.

The following LED colors must be employed:

- Red must be used to indicate active alarm inputs.
- 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.

The ACM point designed for Automatic Alarm Signal Cancel should be labeled as “Automatic Alarm Signal Cancel: or “Auto Alm Signal Cancel.”

G.2.6 Ancillary Devices

Panel control functions (Acknowledge, Signal Silence, Reset, and Drill) will not function on ancillary devices such as the LCD2-80 and ACM-24AT. (Local acknowledge will function on the ancillary device to silence the piezo and steady the LEDs.)

G.2.7 Releasing Devices

Supervision for shorts is required. Use REL devices and type code Rel Ckt ULC. (With FCM-1 modules use REL-47iK).

Appendix H: Intelligent Sounder Base Programming and Operation

The NFS2-640 is compatible with the B200 Intelligent Sounder Base. This sounder base allows for multiple tone generation that is user programmable via VeriFire Tools.

Programming the Intelligent Sounder Base into the Control Panel:

Once the sounder base has been installed and a detector has been plugged into the sounder base, you can do one of the following to program the sounder base into the control panel:

- Autoprogram—Perform an autoprogram at the control panel. The sounder base will have the same SLC device address as the detector installed on the sounder base. Once the Autoprogram is performed, the display will show the number of sounder bases installed on the control panel. Refer to *Section 2.3.2, "Autoprogram the Control Panel (1=*auto)", on page 16.
- VeriFire Tools —Using VeriFire™ Tools, program the detector that is to be installed in the sounder base and select the Intelligent Sounder Base option. Refer to the *VeriFire Tools Help File* for additional information.

Intelligent Sounder Base Options:

The sounder base has user programmable options that can be modified via VeriFire Tools. These features and their defaults are as follows:

Table H.1 Intelligent Sounder Base Options

Feature:	Description and Options:	Default:
Zone Mapping	The sounder base allows for up to three (3) zones to be programmed for specific tone generation. The tones available are: • Continuous • Temp-3 • Temp-4 • March Time The first of the three zones has the highest priority, the second zone has second priority, and the third has third priority.	No zones mapped. (When set as default, a fire alarm will generate a Temp-3 tone and a CO alarm will generate a Temp-4 tone.)
Silence and Resound	The intelligent sounder base may be programmed for silenceable operation as well as signal resound. The silence and resound options available are: • No silence • Silence and resound by Fire Alarm • Silence and resound by Supervisory • Silence and resound by CO alarm • Silence and no resound	Silenceable and Resound by Fire

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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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by Honeywell

World Headquarters
12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161
fax 203-484-7118

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Universal Digital Alarm Communicator/Transmitter

UDACT-2

Instruction Manual

Document 54089
12/15/2014 Rev: B2
P/N 54089:B2 ECN 14-0593

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 saftety 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. 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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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.

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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.

Table of Contents

Section 1: Overview

1.1 Introduction

This document contains information for installing, programming and operating the UDACT-2, Universal Digital Alarm Communicator/Transmitter.

1.2 UL 864 Compliance

1.2.1 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 9th Edition.

The following products have not received UL 864 9th Edition certification and may only be used in retrofit applications. Operation of the UDACT-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).

AM2020/AFP1010	NFS-640
AFP-300/400	NCA
AFP-200	NFS-3030

1.2.2 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, certain programming features or options must be limited to specific values or not used at all as indicated below.			
Program Feature or Option	**Permitted in UL 864? (Y/N)**	**Possible Settings**	**Settings Permitted in UL 864**
AC Loss Reporting Delay	YES	1,2,6,7,8,9,10,11,15,16,17,20, 21,22, 23 hours, and “Immediate” (0)	1 hour 2 hours
Host Panel ID	YES	NFS2-3030 NFS-3030 NCA-2 NCA NFS2-640 NFS-640 NFS-320 AM2020 AFP1010 AFP-200 AFP-300 AFP-400	NFS2-3030 NCA-2 NFS2-640 NFS-320

1.3 Related Documentation

The table below contains a list of document sources for supplemental information.

Control Panels	Part Number
VeriFire Tools CD help file	
AFP-200 Instruction Manual	15511
AFP-300/AFP-400 Installation Manual	50253
NFS-320 Installation Manual	52745
NFS-320SYS Installation Manual	53717
NFS-640 Installation Manual	51332
NFS2-640 Installation Manual	52741
NFS-3030 Installation Manual	51330
NFS2-3030 Installation Manual	52544
AM2020/AFP1010 Installation Manual	15088
NCA Network Control Annunciator	51482
NCA-2 Network Control Annunciator	52482
Notifier Device Compatibility Document	15378

Table 1.1 Related Documentation

1.4 Description

The Universal Digital Alarm Communicator/Transmitter (UDACT-2) may be used with a variety of control panels. The UDACT-2 transmits system status to UL Listed Central Station Receivers, using modular jacks to interface primary and secondary phone lines to the public switched telephone network. The UDACT-2, which is compact in size, mounts internally in some panels or externally in a separate enclosure. EIA-485 annunciator communications bus and 24 volt (nominal) connections are required. The UDACT-2 is compatible with the following panels and network annunciators:

- NFS2-3030
- NFS2-640
- NFS-320
- NCA-2
- AM2020/AFP-1010
- AFP-300/400
- NFS-3030
- NFS-640
- AFP-200
- NCA
- NFS-320SYS

NOTE: Only one UDACT-2 can be installed on a host's EIA-485 ACS circuit.

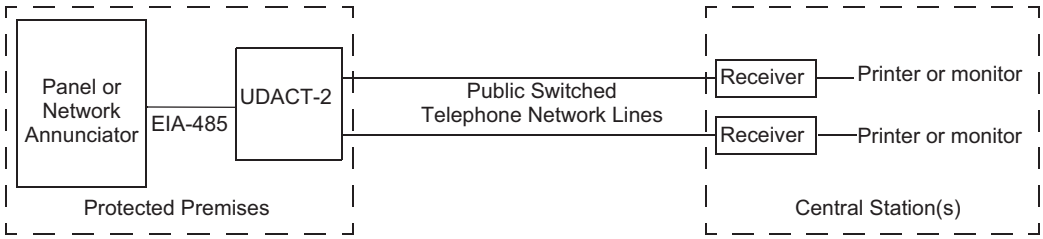


Figure 1.1 Block Diagram of a UDACT-2 Setup

For current and compatible firmware, refer to Magni-Fire.

1.5 Features

- Dual telephone lines.
- Dual telephone line voltage detection.
- Digital Communicator provides:
  - Line Seizure - takes control of the phone lines disconnecting any premises phones
  - Dial tone recognition - 440 hertz tone typical in most networks
  - Central Station number(s) dialing, Touch-Tone®
  - Protocols: SIA, 4 + 2, Ademco Contact ID.
- Programming created with VeriFire Tools, downloaded to UDACT-2 through USB port.
- Manual test report function.
- Manual master transmission clear function.
- Compact in size: 6.75" x 4.25".
- Mounts in the panel box or in a separate enclosure.
- Communicates vital system status including:
  – Independent zone/point alarm, trouble and supervisory
  – Security, panel off-normal, NAC trouble
  – AC (main) power loss (programmable report delay).
- LED status indicators for power, EIA-485 loss, primary and secondary line seizure, line failure, lack of tone, kissoff, communication failure, and manual test. (Refer to Table 1.2 on page 12 for a complete list.)
- Relay driver for Total Communication Failure or UDACT-2 trouble.
- Real Time Clock keeps time for up to 48 hours when the UDACT-2 is unpowered. (UDACT-2 must be powered for 24 hours or longer to ensure the 48 hours. Handling or moving the unit may discharge it faster.)
- Simple EIA-485 interface to host panel.
- Up to 14 point trouble messages transmitted per hour.

1.6 Specifications

1.6.1 DC Power - TB1

Requires 24VDC (nominal) regulated, non-resettable and power-limited power. Supervised.

52 mA in standby, 72 mA maximum while communicating and 87 mA with the output engaged and communicating.

12-18 AWG - wire must be sized for a voltage drop of no more than two volts.

1.6.2 EIA-485 - TB2

EIA-485 Serial Interface (EIA-485+, EIA-485–, Ref).

Power-limited source must be used. Supervised by control panel and UDACT-2.

12 - 18 AWG twisted shielded pair, characteristic impedance: 120 Ohms, +/- 20%.

1.6.3 Earth - TB2

12 AWG solid wire to provide lightning protection.

An earth ground connection to the UDACT-2 is required for transient protection.

1.6.4 Relay Drive - TB4

Output rated at 40 mA. Power limited, unsupervised.

Drives UL-listed relay MR-101/C or MR-201/C.

Normal output condition is ON (energized).

1.6.5 Telephone

NOTE: This equipment complies with Part 68 of the FCC rules and the requirements adopted by the ACTA. On the back of the UDACT-2 is a label that contains, among other information, a product identifier in the format US:AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

Circuitry

Ringer Equivalence Number (REN) = 0.0B

- AC Impedance 10.0 Mega Ohm
- Mates with RJ31X Male Connector
- Supervision Threshold: less than 4.0 volts for 2 minutes
- FCC Registration Number: US:1W6AL00BUDACT2

The REN is used to determine the quantity of devices which may be connected to the telephone line. Excessive REN on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the REN should not exceed five (5.0). To be certain of the number of devices that may be connected to the line, as determined by the total REN, contact the telephone company to determine the maximum REN for the calling area.

Before connecting the UDACT-2 to the public switched telephone network, the installation of two RJ31X jacks is necessary. The following information is provided if required by the local telephone company:

Manufacturer:	Honeywell Life Safety 12 Clintonville Road Northford, CT 06472
Product Model Number:	UDACT-2
FCC Registration Number:	US:1W6AL00BUDACT2
Ringer Equivalence:	0.0B

CAUTION:
The UDACT-2 must <u>not</u> be used to dial a phone number that is call-forwarded per requirements of UL 864 9th Edition.

1.6.6 Telephone Company Rights and Warnings

The telephone company under certain circumstances may temporarily discontinue services and/or make changes in its facilities, services, equipment or procedures which may affect the operation of this control panel. However, the telephone company is required to give advance notice of such changes or interruptions.
If the control panel causes harm to the telephone network, the telephone company reserves the right to temporarily discontinue service. Advance notification will be provided except in cases when advance notice is not practical. In such cases, notification will be provided as soon as possible. The opportunity will be given to correct any problems and to file a complaint.

DO NOT CONNECT THIS PRODUCT TO COIN TELEPHONE, GROUND START, OR PARTY LINE SERVICES..

When the control panel activates, premise phones will be disconnected.
Two separate phone lines are required. Do not connect both telephone interfaces to the same telephone line.
The control panel must be connected to the public switched telephone network upstream of any private telephone system at the protected premises.
An FCC compliant telephone cord must be used with this equipment. This equipment is designed to be connected to the telephone network or premises wiring using a compatible RJ31X male modular plug which is Part 68 compliant.

1.6.7 For Canadian Applications

The following is excerpted from CP-01 Issue 5:

"NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. In some cases, the company's inside wiring associated with a single line individual service may be extended by means of a certified connector assembly (telephone extension cord). The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

CAUTION: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the total of the Load Numbers of all the devices does not exceed 100."

Industry Canada (IC) Compliance - "This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications."

IC Registration Number: 2132A-UDACT2 REN (Ringer Equivalence Number): 0.0B

1.7 Board Layout

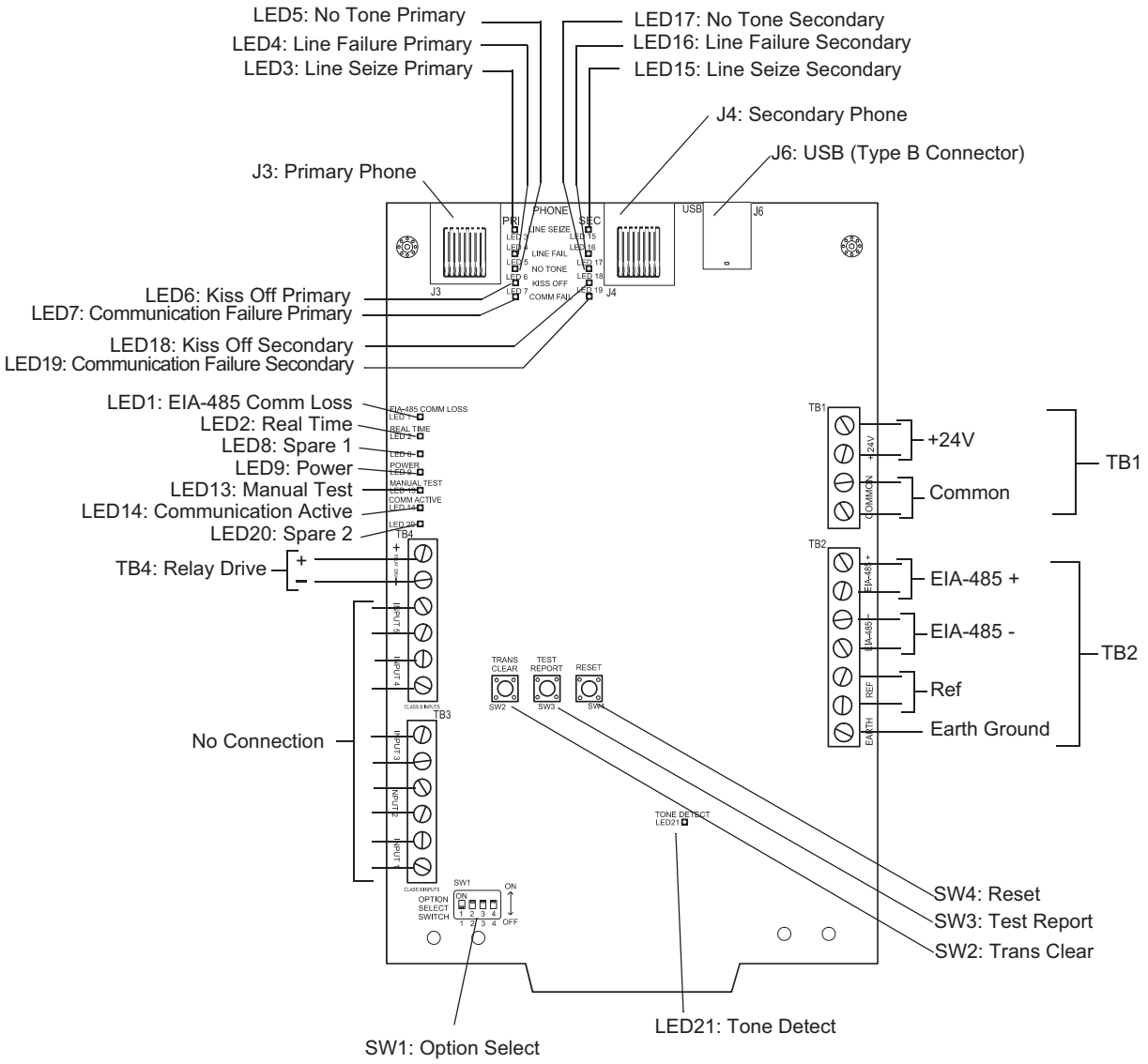


Figure 1.2 UDACT-2 Layout

LED #	LED Name	Color	Function
1	EIA-485 COMM LOSS	Yellow	Illuminates when the EIA-485 port loses communication.

Table 1.2 LED Indicators

LED #	LED Name	Color	Function
2	REAL TIME	Yellow	Illuminates when the real time clock is not functioning properly. It also may light during power-up after the UDACT-2 has been turned off for awhile. To ensure that the UDACT-2's time is accurate, extinguish the LED by downloading the database, waiting 3 minutes, then pressing reset. (The UDACT-2 will get the correct time from the PC that does the download.) The light will extinguish within 3 minutes if the reset button is pressed without downloading the database, but the time may not be accurate without the accompanying download.
3	LINE SEIZE PRI	Red	LINE SEIZE PRIMARY - Illuminates when the primary phone line is seized.
4	LINE FAIL PRI	Yellow	LINE FAILURE PRIMARY - Illuminates when the primary phone line voltage test fails.
5	NO TONE PRI	Yellow	NO TONE PRIMARY - Illuminates when the primary phone connection does not receive a "handshake" tone from the Central Station. When the UDACT-2 is in transmit/receive mode, a trouble message is sent to the panel.
6	KISS OFF PRI	Red	KISS OFF PRIMARY - Illuminates when the Central Station does not acknowledge receipt of each transmitted message from the primary telephone.
7	COMM FAIL PRI	Yellow	COMMUNICATION FAILURE PRIMARY - Illuminates when the maximum number of attempts to reach both Central Stations has failed over the primary telephone line.
8	SPARE 1	Yellow	• Illuminates during initial SDRAM test during power up. Goes out when test is successfully completed. If this LED remains on for more than 30 seconds during power up, contact Customer Service for a replacement. • Illuminates when the UDACT-2's Class B relay outputs are de-activated, indicating the UDACT-2 is in trouble. • Illuminates in bootloader mode once the UDACT-2 is ready for download.
9	POWER	Green	Illuminates when there is 24VDC power.
13	MANUAL TEST	Red	Illuminates when a manual test has been initiated by pressing SW3 on the UDACT-2. The LED goes off automatically when the test transmission is complete.
14	COMM ACTIVE	Green	COMMUNICATION ACTIVE - Illuminates during USB communication.
15	LINE SEIZE SEC	Red	LINE SEIZE SECONDARY - Illuminates when the secondary phone line is seized.
16	LINE FAIL SEC	Yellow	LINE FAILURE SECONDARY - Illuminates when the secondary phone line voltage test fails.
17	NO TONE SEC	Yellow	NO TONE SECONDARY - Illuminates when the secondary phone connection does not receive a "handshake" tone from the Central Station. When the UDACT-2 is in transmit/receive mode, a trouble message is sent to the panel.
18	KISS OFF SEC	Red	KISS OFF SECONDARY - Illuminates when the Central Station does not acknowledge receipt of each transmitted message from the secondary telephone.
19	COMM FAIL SEC	Yellow	COMMUNICATION FAILURE SECONDARY - Illuminates when the maximum number of attempts to reach both Central Stations has failed over the secondary line.
20	SPARE 2	Yellow	• Illuminates while the initial CRC test is in progress. Turns off when this test has been successfully completed. If this LED remains on for more than 10 seconds during the initial CRC test, try downloading the application or database again. • Illuminates while downloaded application or database information is moved from the SDRAM to the UDACT-2's memory. It turns off when this process is complete. The DIP switch may be changed at this time back to the OFF position.
21	TONE DETECT	Yellow	Lights any time a tone is detected on a UDACT-2 phone line.

Table 1.2 LED Indicators

Switch #	Switch Name	Description
DIP1:1	Download App Mode	Set to ON when downloading an application. Set to OFF when downloading is complete. Normally OFF.
DIP1:2	Download DBase Mode	Set to ON when downloading a database. Set to OFF when downloading is complete. Normally OFF.
DIP1:3	Piezo	The piezo sounds when troubles are found at startup, or when the UDACT-2 is in trouble. UDACT-2 troubles are: • EIA-485 fail • phone line voltage test fail • phone line communication fail • no handshake tone detected.
DIP1:4	EIA-485 termination	Connects a 120 Ohm terminating resistor on the EIA-485 bus when set to ON. Set to ON when the UDACT-2 is the last or only EIA-485 device.
2	TRANS CLEAR	Press and hold this button switch down for over 3 seconds to immediately stop UDACT-2 transmissions, hang up from the telephone network, clear out any messages that were waiting for transmission and reset, and return to normal system processing.
3	TEST REPORT	Press and hold this button switch down for over 3 seconds to have the UDACT-2 transmit a test message to both Central Stations. The message reported is the same as the automatic test message for all formats except Ademco Contact ID.
4	RESET	Press this button switch down for a hardware reset.

Table 1.3 Switches

Section 2: Installation and Wiring

2.1 Installation Options

The UDACT-2 is either installed internally in the panel cabinet or remotely in an ABS-8RB, UBS-1B or UBS-1R enclosure. The following table contains information specific to each panel that is compatible with the UDACT-2. See "Internal Installation" on page 15 for instructions on internal installation and "Remote Installation" on page 21 for instructions on remote installation. Additional information required for installing the UDACT-2 in a specific Fire Alarm Control Panel will be found in the appropriate appendix relating to that panel.

Host Control Panel	Host Panel Cabinet Style	Remote Cabinet	Where Installed
AFP-200	AFP-200 Cabinet	ABS-8RB, UBS-1B, UBS-1R	Remote Only
AFP-300/AFP-400	CAB-400AA	ABS-8RB, UBS-1B, UBS-1R	Remote Only
	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
AM2020/AFP1010	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NCA-2	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NCA	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NFS2-640	CAB-3/4 Series	ABS-8RB, UBS-1, UBS-1B, UBS-1R	Internal or Remote
NFS-320	NFS-320 Cabinet	ABS-8RB, UBS-1, UBS-1B, UBS-1R	Internal or Remote
NFS-320SYS	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NFS-640	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NFS2-3030	CAB-3/4 Series	ABS-8RB, UBS-1B, UBS-1R	Internal or Remote
NFS-3030	CAB-3/4 Series	ABS-8RB,UBS-1B, UBS-1R	Internal or Remote

Table 2.1 Installation Options

Internal Installation

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before installation or making any connections to prevent personal and/or circuit damage.

■ Mounting on the NFS-320 Chassis

The UDACT-2 is installed on the chassis within the NFS-320 backbox as described and shown below:

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Remove the KDM-R2 keypad. Do not remove the onboard power supply.
3	Remove the two 1" standoffs from the bottom of the CPU and replace with the two #4-40 x 0.5" standoffs provided with the UDACT-2.
4	Position the UDACT-2 on the standoffs and fasten with two #4-40 x .25" screws provided.

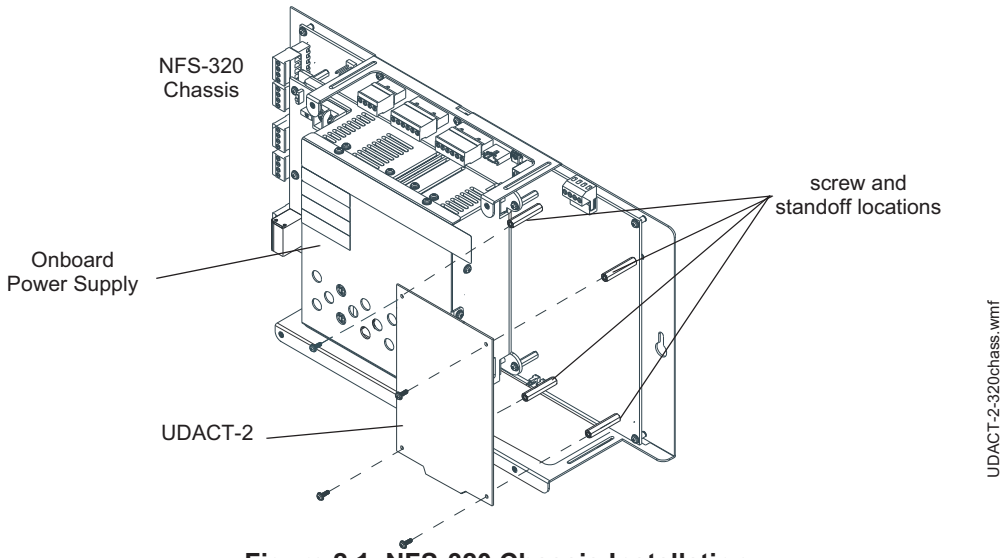


Figure 2.1 NFS-320 Chassis Installation

■ NFS2-640 Chassis Mounting

The UDACT-2 is installed on the NFS2-640 chassis within the NFS2-640 backbox as described and shown below:

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Position the UDACT-2 on the standoffs and fasten with #4-40 screws.

NOTE: The UDACT-2 can be mounted in the fourth column of the NFS2-640 Chassis. Be sure to mount the chassis to the backbox before mounting the UDACT-2.

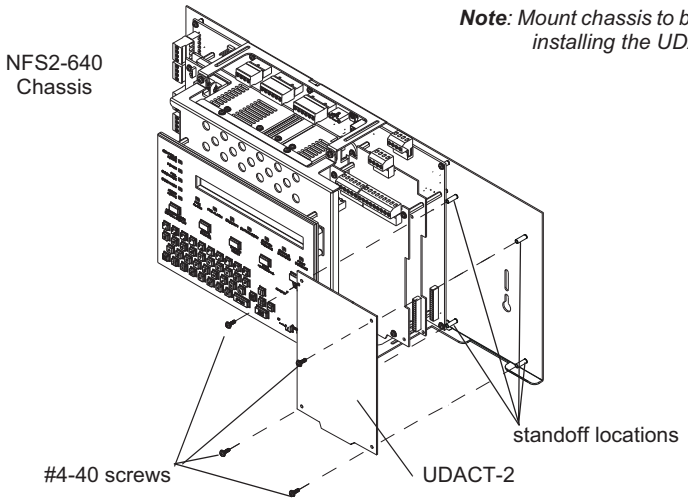


Figure 2.2 NFS2-640 Chassis Installation

■ CHS-M2 Chassis Mounting

The UDACT-2 is installed on a CHS-M2 Chassis within the control panel backbox as described and shown below:

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Insert the tab at the bottom of the board into the chassis slot as indicated.
3	Position the UDACT-2 on the standoffs and fasten with #4 screws.

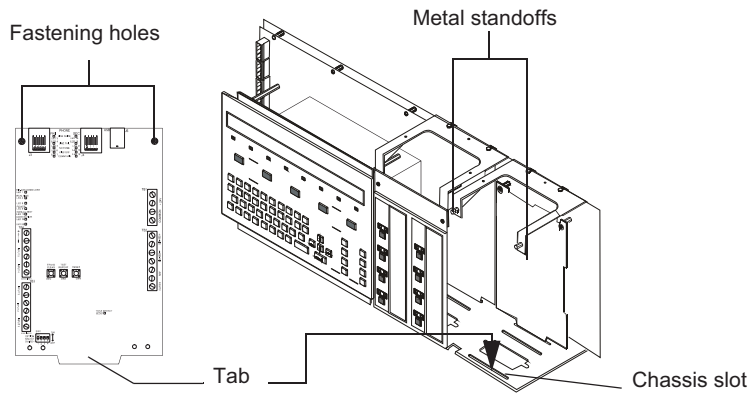


Figure 2.3 CHS-M2 Installation

■ CHS-4

The UDACT-2 may be mounted in the CHS-4 chassis within the control panel backbox as described and shown below.

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Insert the tab at the bottom of the board into the chassis slot as indicated.
3	Position the UDACT-2 on the standoffs and fasten with #4 screws.

NOTE: The UDACT-2 can be mounted only in one of the front positions of this chassis.

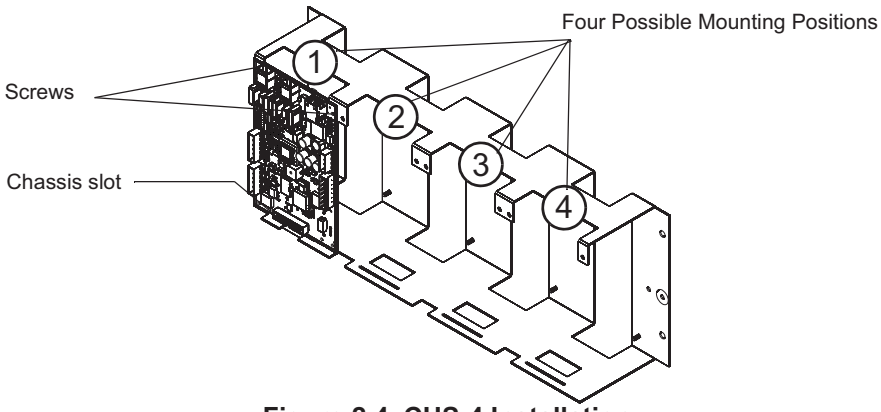


Figure 2.4 CHS-4 Installation

■ CHS-4L

The UDACT-2 may be mounted in the CHS-4L chassis within the control panel backbox as described and shown below.

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Insert the tab at the bottom of the board into the chassis slot as indicated.
3	Position the UDACT-2 on the standoffs and fasten with #4 screws.

NOTE: The UDACT-2 can be mounted in one of the rear positions of this chassis.

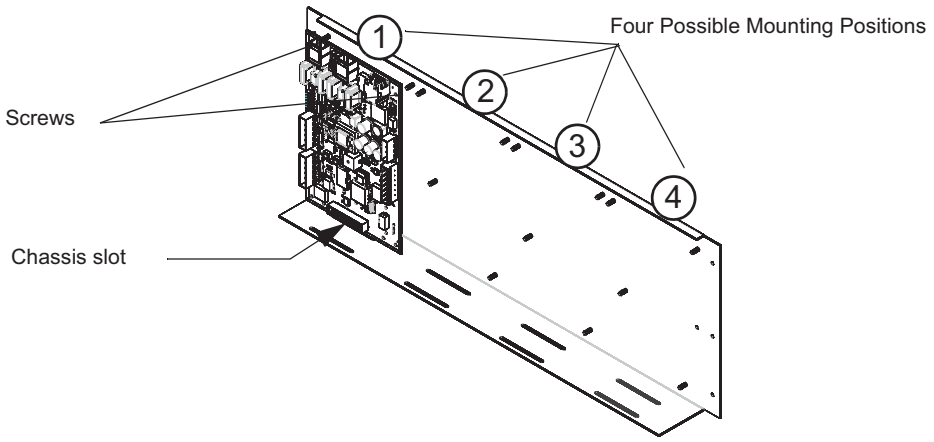


Figure 2.5 CHS-4L Installation

■ CA-1

The UDACT-2 may be mounted in the CA-1 chassis behind the DVC as described and shown below.

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Position the UDACT-2 on the standoffs and fasten with #4 screws.

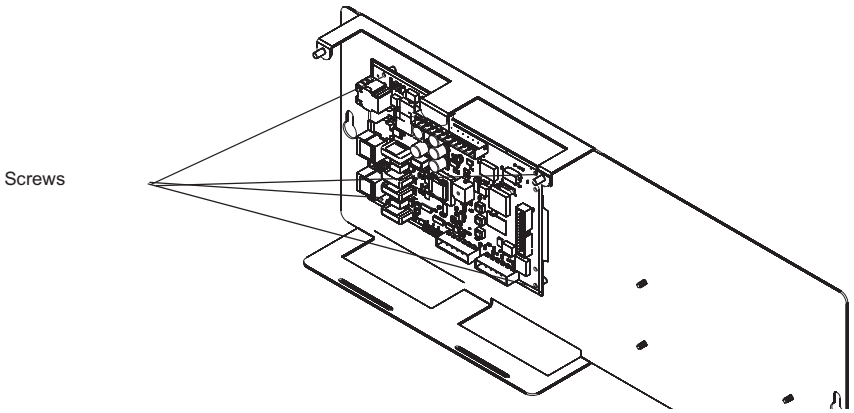


Figure 2.6 CA-1 Installation

■ CA-2

The UDACT-2 may be mounted in the CA-2 chassis behind the DVC, NFS2-3030 or NCA-2 as described and shown below.

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Position the UDACT-2 on the standoffs and fasten with #4 screws.

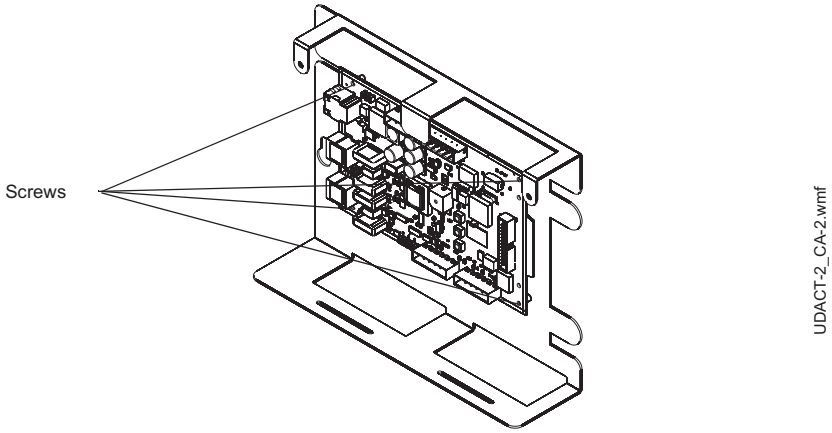


Figure 2.7 CA-2 Installation

■ CHS-M3

The UDACT-2 can mount in back of an NFS2-3030, or on one of the front mounting spaces to the right of it.

Mounting in back of an NFS2-3030:

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Position the UDACT-2 on the standoffs and fasten with four #4 screws.

Mounting to the right of an NFS2-3030:

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Insert the tab at the bottom of the board into the chassis slot as indicated.
3	Position the UDACT-2 on the standoffs and fasten with two #4 screws.

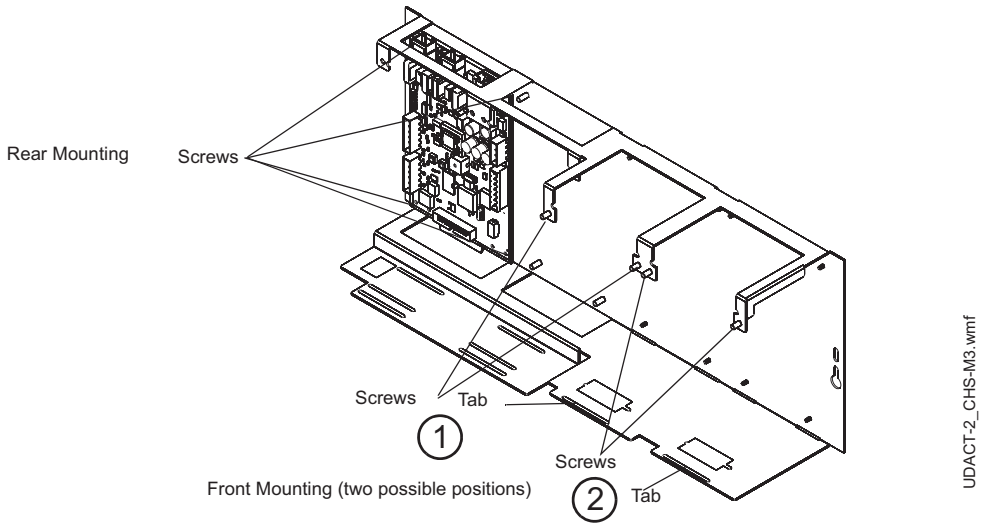


Figure 2.8 CHS-M3 Installation

■ BMP-1 Blank Module Plate

The UDACT-2 mounts on the back of a BMP-1 blank module plate, so it can be mounted on a DP-DISP, DP-DISP2, or ADP-4B dress panel.

Step	Action
1	Disconnect AC power and disconnect batteries.
2	Mount the BMP-1 onto a DP-DISP, DP-DISP-2, or ADP-4B dress panel by placing it over the two threaded studs and fastening with two 4-40 KEPS hex nuts (included with BMP-1) as indicated.
3	Attach four 3/16” hex standoffs (p/n 42170, included with UDACT-2) to the BMP-1’s four threaded studs.
4	Align the UDACT-2 over the standoffs and fasten with four 4-40 screws (included with UDACT-2, p/n 38122).

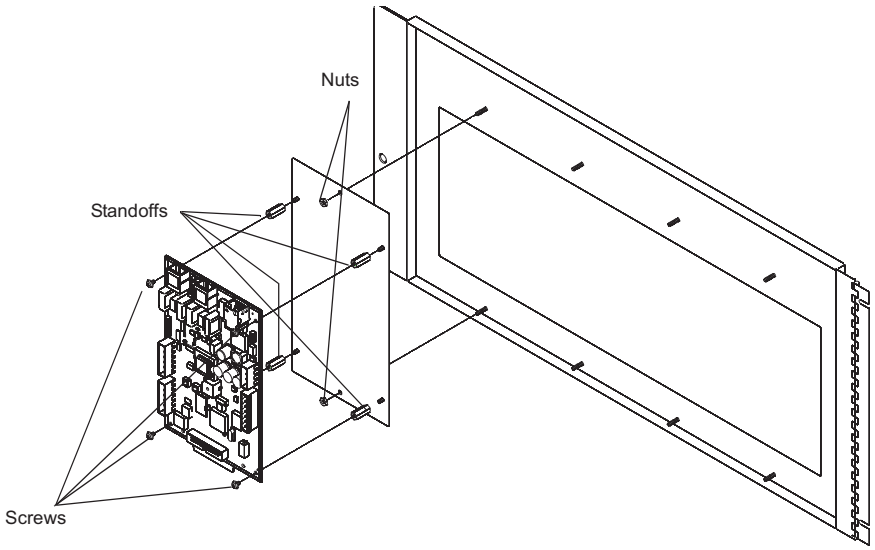


Figure 2.9 BMP-1 and Dress Panel Installation

Remote Installation

For remote installation, the UDACT-2 can mount in an ABS-8RB, UBS-1B, or UBS-1R enclosure. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel or network annunciator. Wiring must be enclosed in conduit.

■ ABS-8RB

The UDACT-2 comes with an insulating barrier that must be used in this installation.

Step	Action
1	Place the UDACT-2 inside the folds of the insulating barrier, as shown below.
2	Align the UDACT-2 and insulating barrier over the four (4) threaded standoffs at the back of the ABS-8RB enclosure.
3	Secure using the four (4) screws supplied with the enclosure. Tighten securely.
4	After completion of connections and programming, secure cover to ABS-8RB box with two (2) screws. Tighten securely.

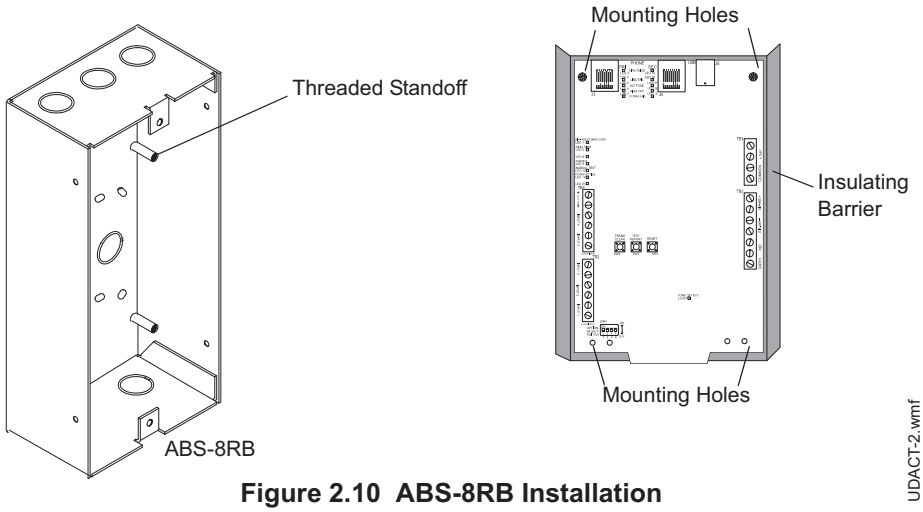


Figure 2.10 ABS-8RB Installation

■ UBS-1B and UBS-1R

These cabinets come with door and UDACT-2 mounting plate. The mounting plate comes attached to the backbox.

Step	Action
1	Align the UDACT-2 over the four (4) threaded standoffs at the back of the UBS-1B/R enclosure.
2	Secure using the four (4) screws supplied with the UDACT-2. Tighten securely.

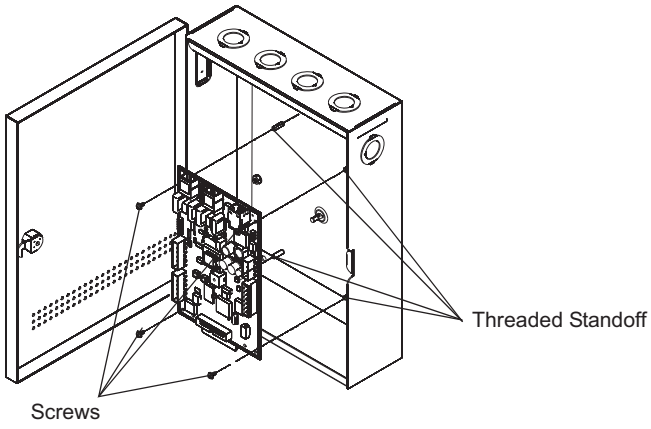


Figure 2.11 UBS-1B/R Installation

2.2 TB1 - 24 VDC Power Connections

24 VDC filtered, non-resettable power is connected between the Main Power Supply of the panel and the UDACT-2 using twisted pair wire.

One +24V and one Common terminal are used for input from the power source. The other terminals may be used as pass throughs to the next device from the power source.

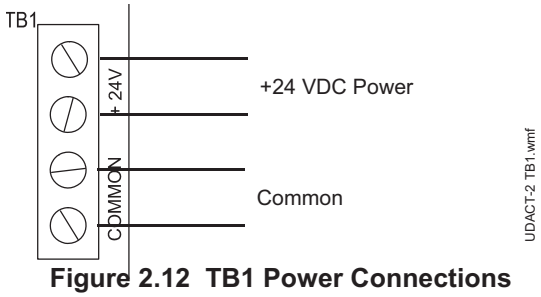


Figure 2.12 TB1 Power Connections

2.3 TB2 - EIA-485 Connections

Communications between the UDACT-2 and the host control panel is accomplished over a two wire EIA-485 serial interface which is power-limited and supervised by the control panel and the UDACT-2. The wiring connections are made to the EIA-485 +, EIA-485 –, and REF terminals of TB2 on the UDACT-2.

The EIA-485 circuit cannot be T-Tapped and must be wired in a continuous fashion from the control panel to the UDACT-2 and, if installed, annunciators. Limit the total wire resistance to 100 Ohms on the EIA-485 circuit. Do not run cable adjacent to, or in the same conduit as 120 volts AC service, noisy electrical circuits that are powering mechanical bells or horns, audio circuits above 25 volts RMS, motor control circuits, or SCR power circuits.

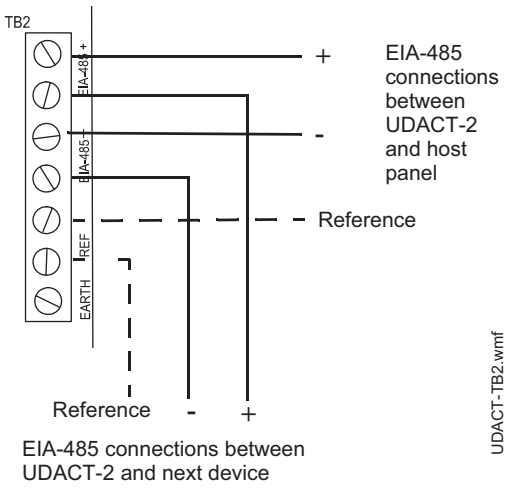


Figure 2.13 TB2 EIA-485 Interface Connections

NOTE: Only one UDACT-2 can be installed on a host's EIA-485 ACS circuit.

2.4 TB2 - Earth Connection

An earth ground connection to the UDACT is required for transient protection. TB2 provides a connection to ground for lightning protection.

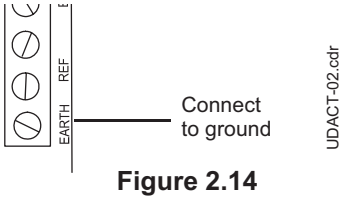


Figure 2.14 TB2 Earth Connection

2.5 Telephone Connections - J3 and J4

Provision to connect to two independent telephone lines is available via two telephone jacks labeled "PRI" (Primary) and "SEC" (Secondary). Telephone line control/command is possible via double line seizure using an RJ31X style interconnection. (RJ31X jacks must be ordered separately).

NOTE: It is critical that the UDACT-2 be located as the first device on the incoming telephone circuit to properly function.

Important! *The UDACT-2 must <u>not</u> be used to dial a phone number that is call-forwarded per requirements of UL 864 9th Edition.*

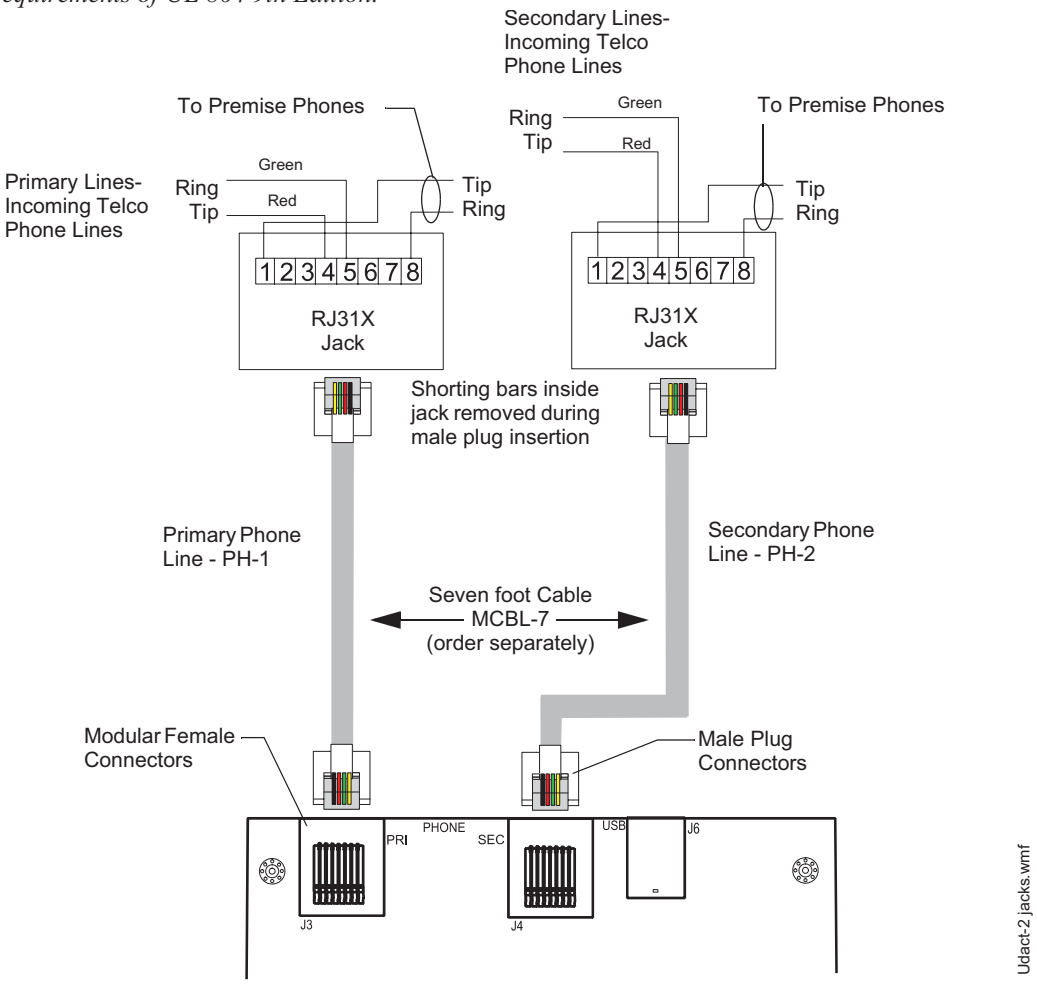


Figure 2.15 Wiring Phone Jacks

2.6 Relay Driver (Auxiliary Output) Connections - TB4

The UDACT-2's output on TB4 (RELAY DRIVE), is provided for Communicator Failure and UDACT-2 trouble. It can be used to drive UL-listed relay MR-101/C or MR-201/C. The output is rated for 40 mA. The normal condition for the output is ON (energized).

Communicator Failure occurs when the maximum number of attempts to reach both Central Stations has taken place or when both phone lines are disconnected. UDACT-2 trouble conditions include loss of telephone line voltage to the primary and/or secondary phone lines, communication failure to the primary or secondary Central Stations, total communication failure, entry into program, type, and troubleshoot modes.

Wiring from the UDACT-2 terminal TB4 to the relay must be in the same room, no more than 20 feet in length, and enclosed in conduit. Wiring from the relay output contacts must remain in the same room as the UDACT-2.

When the UDACT-2 is programmed for “Receive Only” (typically this occurs when annunciators are also used and are set for “Receive/Transmit”), the relay output is used to provide a UDACT-2 trouble input to the host control panel. Use an FMM-1 module to supervise the relay closure (refer to Figure 2.17 on page 26). Program the custom label field to read “UDACT-2 Trouble”.

When the UDACT-2 is programmed for "Receive/Transmit", EIA-485 supervision and UDACT-2 trouble status are automatically handled by the host control panel. The relay output may, however, be used for UDACT-2 communications failure if desired.

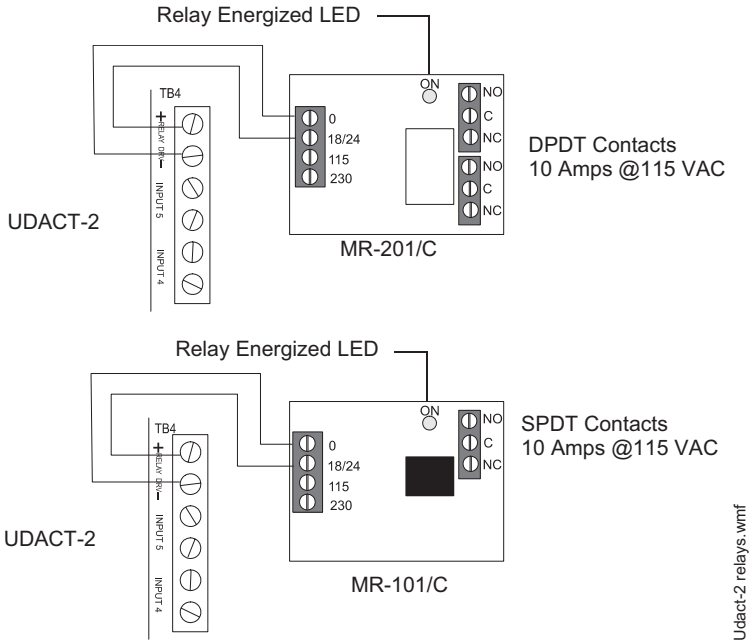
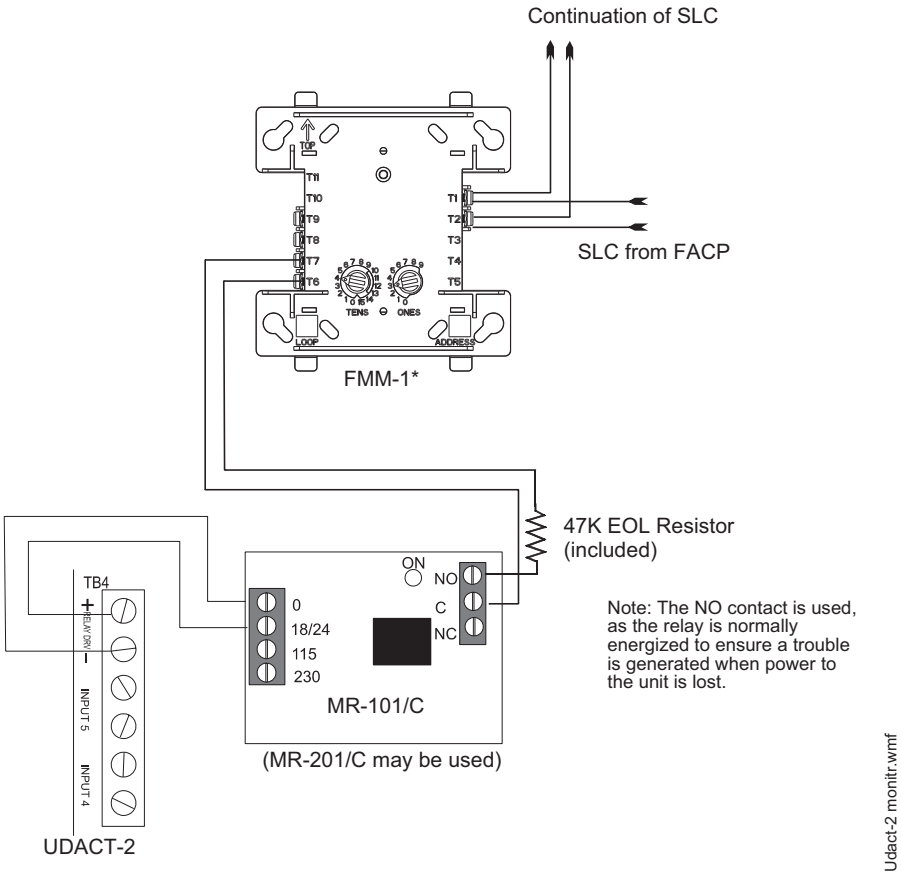


Figure 2.16 Relay Driver Connections



*If the SLC device does not match the one in this figure, refer to the SLC manual appendix, which contains wiring conversion charts for type V and type H modules.

NOTE: An FMM-1 Monitor Module is used to supervise the Normally Open output of MR-101/C. If a Trouble Condition or Communication Failure occurs on the UDACT-2, the MR-101/C relay contact will close, causing the FMM-1 to transmit a trouble condition to the FACP.

Figure 2.17 Monitoring for UDACT-2 Trouble

2.7 USB Port - J6

The UDACT-2's USB port (J6) provides a USB Type B connection for a computer running VeriFire Tools for UDACT-2 programming.

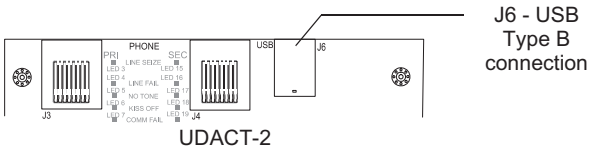


Figure 2.18 USB Port, J6

2.8 UL Power-limited Wiring Requirements

Power-limited and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited circuit wiring must remain at least 0.25" (6.35 mm) away from any nonpower-limited circuit wiring. Furthermore, all power-limited circuit wiring and nonpower-limited circuit wiring must enter and exit the cabinet through different knockouts and/or conduits.

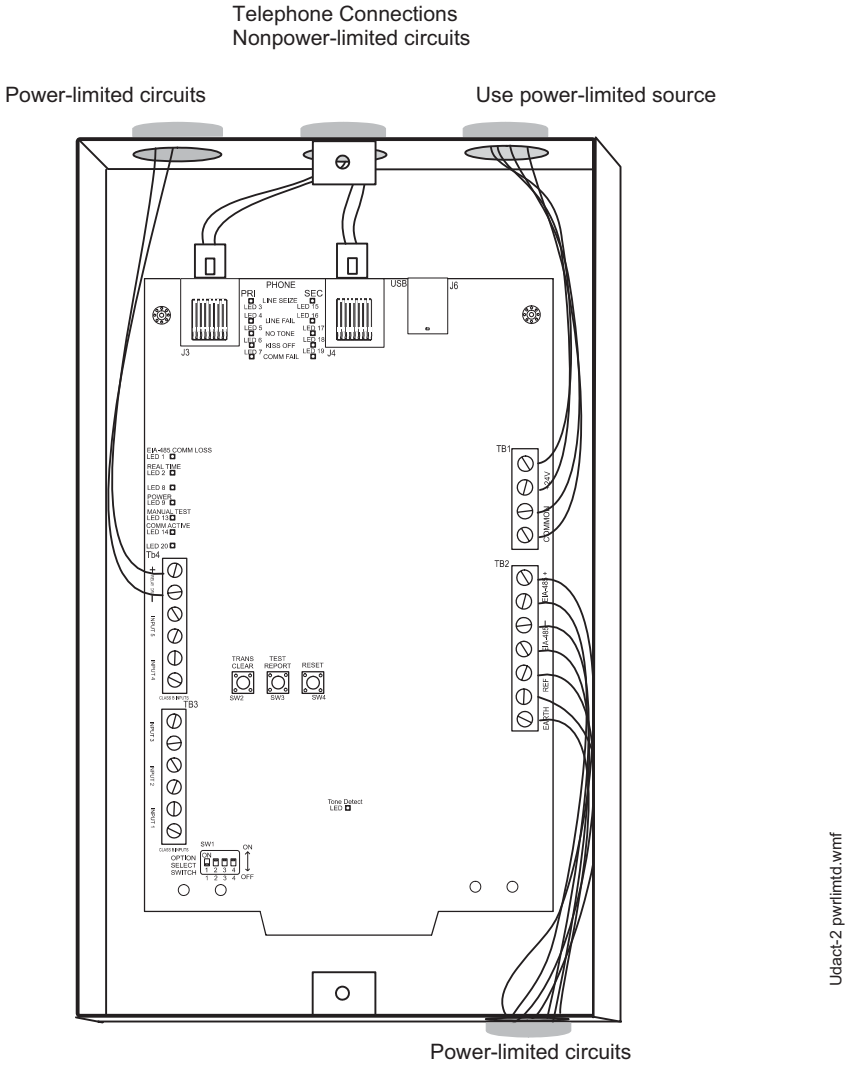


Figure 2.19 Typical Wiring for UL Power-limited Requirements

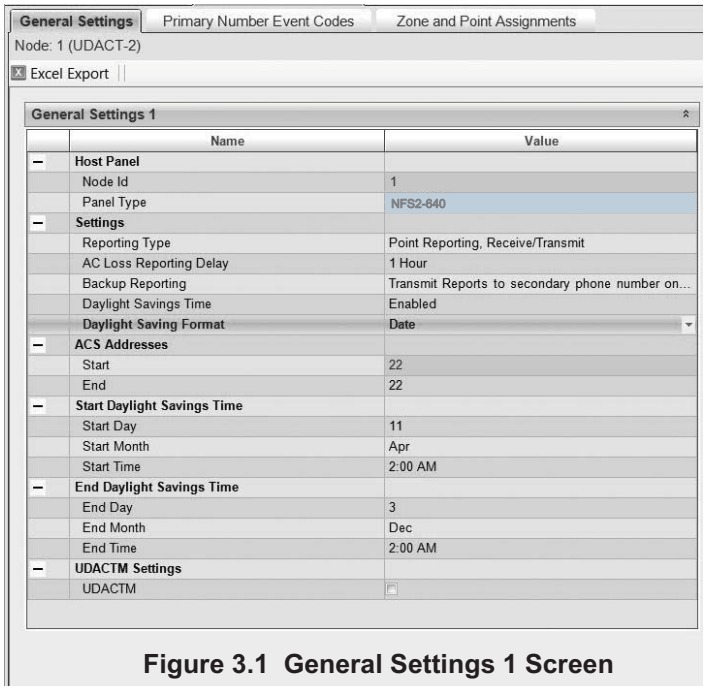
Section 3: Programming

The UDACT-2 is programmed using VeriFire Tools, version 6.6 or higher.

NOTE: Only one UDACT-2 can be installed on a host's EIA-485 ACS circuit.

NOTE: Check the time on the laptop used for VeriFire Tools programming for accuracy. The 24 hour test time is determined from the laptop's time signature taken from the downloaded VeriFire Tools database.

3.1 General Settings 1



Genrl 1 tab.jpg

Figure 3.1 General Settings 1 Screen

Node ID: Select the node number of the UDACT-2's host panel.

Panel Type: Select the UDACT-2's host panel or network annunciator type. The NFS-320 menu selection includes the NFS-320SYS.

Reporting Type: Select from the following lists of reporting types.

- Disable Communications - Select this option to disable Central Station reporting.
- Zone Reporting, Receive Only - Select when the UDACT-2 will receive messages from the panel, but will not transmit back to the panel. When "Receive Only" is selected, an external trouble relay must be used. Refer to Section 2.6 on page 24. This selection should be made when an annunciator shares the same EIA-485 address as the UDACT-2.
- Zone Reporting, Receive/Transmit - Select when the UDACT-2 will receive messages from the panel, and will transmit a response back to the panel. Typically this selection is made when a UDACT-2 does not share an EIA-485 address with another device.
- Point Reporting, Receive Only - Select when the UDACT-2 will receive messages from the panel, but will not transmit back to the panel. When "Receive Only" is selected, an external trouble relay must be used. Refer to Section 2.6 on page 24. This selection should be made when an annunciator shares the same EIA-485 address as the UDACT-2.

- Point Reporting, Receive/Transmit - Select when the UDACT-2 will receive messages from the panel, and will transmit a response back to the panel. Typically this selection is made when UDACT-2 does not share an EIA-485 address with another device.

The AFP-200 panel does not accommodate Point Reporting.

AC Loss Reporting Delay: Select the time delay for AC Loss Reporting. Values are 1, 2, 6, 7, 8, 9, 10, 11, 15, 16, 17, 20, 21, 22 and 23 hours, and Immediate for immediate reporting. Refer to "Programming Features Subject to AHJ Approval" on page 7 for UL-compliant values.

Backup Reporting: Select the type of backup reporting desired. Reports will be transmitted to the secondary phone number when attempts to notify the primary phone number fail, or reports will always be transmitted to the secondary phone number.

Daylight Savings Time: Select Enabled or Disabled.

Daylight Savings Format: Select" Day of Week" or "Date"

- Day of Week - Select the starting and ending weeks, days, months and times. The start and stop times must be at least 24 hours apart.
- Date - Select the specific starting and ending month and day. The day fields must be in different months.

ACS Addresses: Select a start and end address for addresses that will be monitored.

- The NFS2-3030, NFS-3030, NCA-2, NCA, AM2020 and AFP1010 use:
  - 32 addresses - 1-32 - for point reporting

CAUTION: THE START ADDRESS MUST EQUAL THE HOST'S UDACT-2 ACS ADDRESS.

- The NFS2-640, NFS-640, NFS-320/NFS-320SYS use:
  - two monitoring addresses - 20 and 21 - for zone reporting.
  - ten monitoring addresses - 22 through 31 - for point reporting.
- The AFP-300 and AFP-400 use:
  - two monitoring addresses - 11 and 12 - for zone reporting
  - seven addresses - 13 through 19 - for point reporting.
- The AFP-200 uses two monitoring addresses - 1 and 2 - for zone reporting.

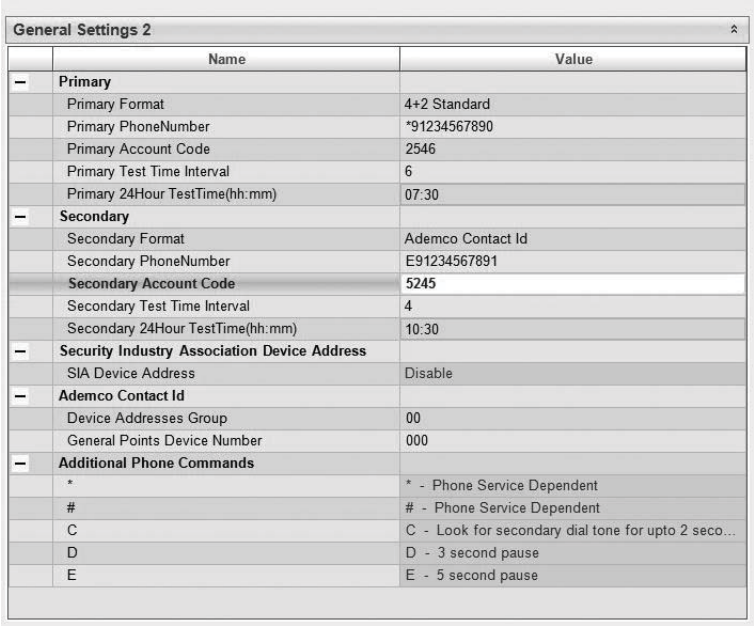
Start Daylight Savings Time - Enter start day, month, time.

End Daylight Savings Time - Enter end day, month, time.

UDACTM: This box activates for NFS2-640 and NFS-320 panels when a point reporting type is selected. Check the box to enable 4-point UDACT-2 reporting (Alarm, Trouble, Dirty 1, Dirty 2) when the UDACT-2 is programmed as Option 2 in ACS programming on these panels.

Note: This option enables the UDACT-2 to report Alarm, Trouble, Dirty 1 (Maintenance) and Dirty 2 (Maintenance Urgent) per addressable detector. Note that enabling this option will limit the system to only report the first 100 detector (L1D1 - L1D100/L2D1-L2D100) and module (L1M1-L1M100/L2M1-L2M100) addresses per loop. Addresses higher than 100 are supported by the system but will not report.

3.2 General Settings 2



General Settings 2

	Name	Value
–	**Primary**	
	Primary Format	4+2 Standard
	Primary PhoneNumber	*91234567890
	Primary Account Code	2546
	Primary Test Time Interval	6
	Primary 24Hour TestTime(hh:mm)	07:30
–	**Secondary**	
	Secondary Format	Ademco Contact Id
	Secondary PhoneNumber	E91234567891
	Secondary Account Code	5245
	Secondary Test Time Interval	4
	Secondary 24Hour TestTime(hh:mm)	10:30
–	**Security Industry Association Device Address**	
	SIA Device Address	Disable
–	**Ademco Contact Id**	
	Device Addresses Group	00
	General Points Device Number	000
–	**Additional Phone Commands**	
	*	* - Phone Service Dependent
	#	# - Phone Service Dependent
	C	C - Look for secondary dial tone for upto 2 seco...
	D	D - 3 second pause
	E	E - 5 second pause

Genrl 2 tab.jpg

Figure 3.2 General Settings 2 Screen

Primary:

Primary Format: Select SIA, 4+2 standard*, or Ademco Contact ID.

Primary Phone Number: Enter the primary phone number. The phone number may be preceded by one or more command codes. See the description of the "Additional Phone Commands" field below.

Primary Account Code: Enter the vendor account code for the primary phone number. The field for 4+2 Standard and Ademco Contact ID accommodates four digits. The field for SIA accommodates six digits.

Primary Test Time Interval: Select 4, 6, 8, 12, or 24 for automatic test report transmission to the primary phone number every 4, 6, 8, 12, or 24 hours.

Note that if the primary and secondary test times are different, the first test message will select the primary line. The next test message will select the secondary phone line. The line selection will continue to alternate in this manner.

If the primary and secondary test times are the same, the secondary line will be used for both messages and no alternation will occur.

Primary 24 Hour Test Time: Enter the start time (in HH:MM format, where HH = 00 to 23 hours, MM = 00 to 59 minutes) at which the test should be performed and transmitted. The first test will be performed at that time, and again as indicated by the Test Time Interval setting.

*Note: When using 4 + 2 Format, some receivers will display the character "A" as "0".

Secondary:

Secondary Format: Select SIA, 4+2 standard*, or Ademco Contact ID.

Secondary Phone Number: Enter the secondary phone number. The phone number may be preceded by one or more command codes. See the description of the "Additional Phone Commands" field below.

Secondary Account Code: Enter the vendor account code for the secondary phone number. The field for 4+2 Standard and Ademco Contact ID accommodates four digits. The field for SIA accommodates six digits.

Secondary Test Time Interval: Select 4, 6, 8, 12, or 24 for automatic test report transmission to the secondary phone number every 4, 6, 8, 12, or 24 hours.

Secondary 24 Hour Test Time: Enter the time (in HH:MM format, where HH = 00 to 23 hours, MM = 00 to 59 minutes) at which the test should be performed and transmitted. The first test will be performed at that time, and again as indicated by the Test Time Interval setting.

*Note: When using 4 + 2 Format, some receivers will display the character "A" as "0".

SIA Device Address: This field appears if SIA has been selected as the format for either the primary or secondary phone number. Select whether to have the device address appear in Central Station reporting or not by selecting "Enable" or "Disable".

Ademco Contact ID: These optional fields appear if Ademco Contact ID has been selected as the format for either the primary or secondary phone number. Entries in these fields will appear in the reporting at the Central Station.

- Group - enter a value of 1 through 99. The number entered will appear in the "GG" reporting field described in Section 5.2, "Ademco Contact ID", on page 39.
- General Points Device Number - enter a value of 1 through 999. The number will appear in the "CCC" reporting field for general reports. Refer to Section 5.2, "Ademco Contact ID", on page 39.

Additional Phone Commands:

The commands listed below may be added to the phone number. Multiple commands may be used.

- * - Phone Service Dependent - Functions as the * in the phone UDACT-2's phone system.
- # - Phone Service Dependent - Functions as the # in the phone UDACT-2's phone system.
- C - Look for secondary dial tone for up to 2 seconds (then, dial anyway).
- D - 3 second pause.
- E - 5 second pause.

3.3 Primary Number Event Codes

This screen displays the default Event Code assignments for the protocol selected for the primary telephone line. The Event Codes are user-programmable.

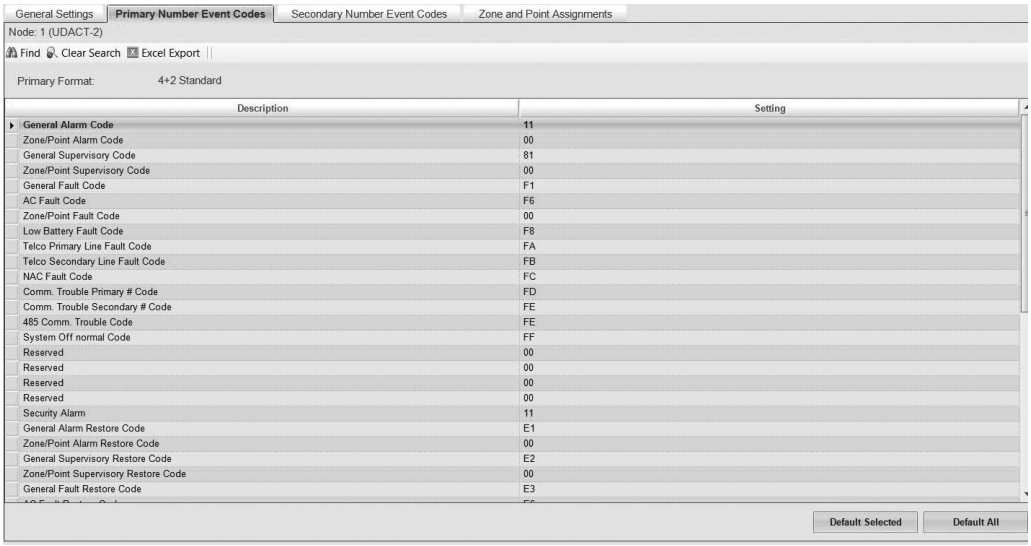


Figure 3.3 Primary Number Event Codes

Description: This display-only field gives a text description of the Event Code.

Setting: This field may be modified to accommodate the user. The field may be changed to an alpha code, numeric code, or alpha-numeric code. SIA and "4+2" accomodate two digits, Ademco Contact ID accomodates three.

Default: Press to return the Setting fields to default values.

3.4 Secondary Number Event Codes

This screen displays the default Event Code assignments for the protocol selected for the secondary telephone line. The Event Codes are user-programmable

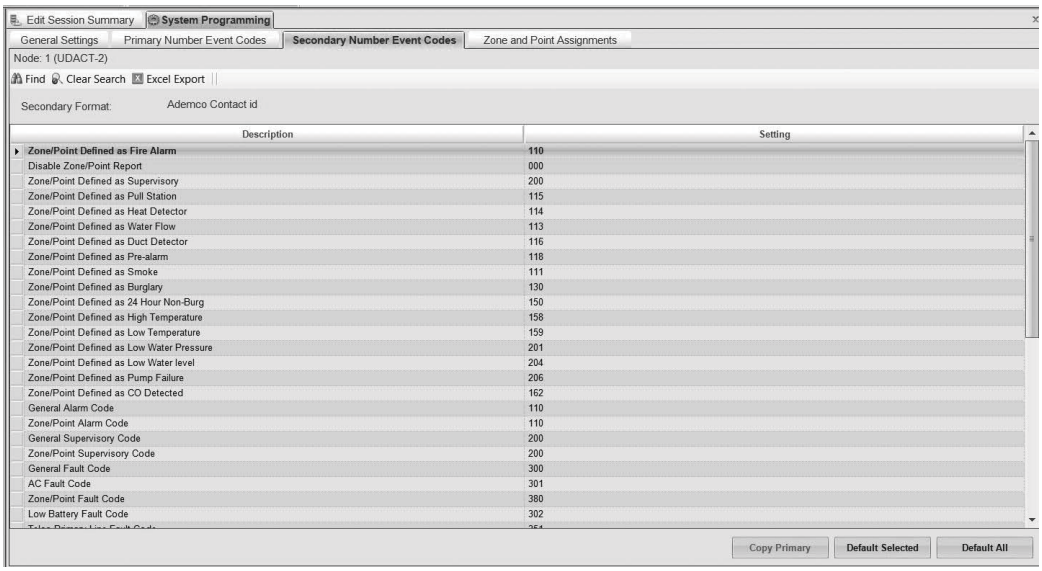


Figure 3.4 Secondary Number Event Codes Tab

Description: This display-only field gives a text description of the Event Code.

Setting: This field may be modified to accommodate the user. The field may be changed to an alpha code, numeric code, or alpha-numeric code. SIA and "4+2" accomodate two digits, Ademco Contact ID accomodates three.

Copy Primary: When the primary and secondary reporting formats are the same, this button will activate. Press to copy the Setting values entered at the Primary Number Event Codes tab.

Default: Press to return the Setting fields to default values.

3.5 Zone and Point Assignments

Zone and point assignments are displayed at this screen. The function default is to Fire Alarm.

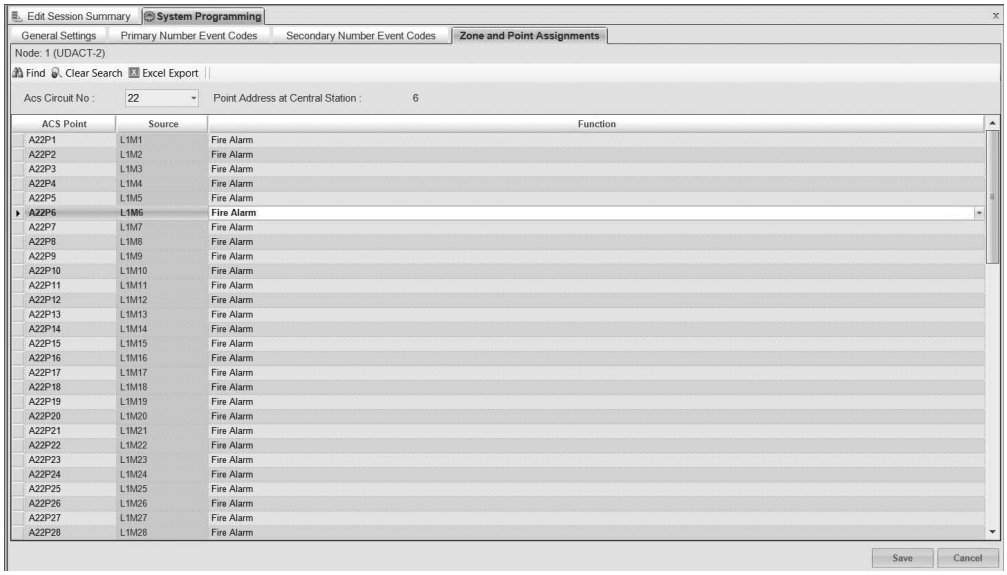


Figure 3.5 Zone and Point Assignments Tab

ACS Point: Automatically filled with ACS point numbers generated from the ACS addresses selected for monitoring in the General Settings screens (see page 29).

Source: This field appears when Zone reporting is selected in the General Settings screen (see page 29). It displays the zone source.

Function: Defaults to Fire Alarm. From the pull-down menu, select the point/zone type that matches the FACP's point type.
Point/zone type selections are:

- Fire Alarm
- Disabled
- Supervisory
- Pull Station
- Heat Detector
- Water Flow
- Duct Detector
- Pre-alarm
- Smoke
- Burglary
- 24 Hour Non-Burglary
- High Temperature
- Lower Temperature
- Low Water Pressure
- Low Water Level
- Pump Failure
- Photo/CO detect

CAUTION:
BE SURE THE CORRECT POINT TYPE IS ENTERED. IF THERE IS A MISMATCH BETWEEN THE UDACT-2'S POINT TYPE AND THE FACP OR NETWORK ANNUNCIATOR'S POINT TYPE, THE UDACT-2 WILL TRANSMIT A FIRE ALARM MESSAGE TO THE CENTRAL STATION WHEN THAT POINT ACTIVATES.

Point Address at Central Station: When an ACS point is selected in this tab, this field displays the point address number that will display on a report to the Central Station. It is read-only.

For the NFS2-3030, NFS-3030, NCA-2, NCA, AM2020 and AFP1010 the first eight points to be monitored by the Central Station are reserved for system trouble messages from the panel, and can not be programmed. Figure 3.5 above shows that the first eight addresses - A1P1 through A1P8 - are reserved for the panel. If the ACS addresses to be monitored had started with A2, A2P1 through A2P8 would be reserved for system trouble messages. These addresses do not generate a point address to the Central Station. A1P9 will display at the Central Station as Point Address 1.

For the NFS2-640 and NFS-320, point reporting is displayed below. Note that Loop 2 reporting is only available for the NFS2-640.

Loop 1, Modules 1 - 64 report as device numbers 001 - 064

Loop 2, Modules 1 - 64 report as device numbers 065 - 128

Loop 1, Modules 65 - 128 report as device numbers 129 - 192

Loop 2, Modules 65 - 128 report as device numbers 193 - 256

Loop 1, Modules 129 - 159 report as device numbers 257 - 287 (288 is not used)

Loop 2, Modules 129 - 159 report as device numbers 289 - 319 (320 is not used)

Loop 1, Detectors 1 - 64 report as device numbers 321 - 384

Loop 2, Detectors 1 - 64 report as device numbers 385 - 448

Loop 1, Detectors 65 - 128 report as device numbers 449 - 512

Loop 2, Detectors 65 - 128 report as device numbers 513 - 576

Loop 1, Detectors 129 - 159 report as device numbers 577 - 607 (608 is not used)

Loop 2, Detectors 129 - 159 report as device numbers 609 - 639)640 is not used)

3.6 Report

A printed report with point or zone information can be generated from VeriFire Tools for an ONYX Series panel or network annunciator. In the UDACT-2 programming service, select UDACT-2 from the dropdown Reports Menu on the top menu bar.

NOTE: Programming for the panel or network annunciator and the UDACT-2 must be contained in the same database for this report to generate.

The point report consists of the central station point address; ACS point, ACS point function; panel label; panel point; type code; custom and extended label; alarm verification and walktest participation; and presignal and PAS information. This report may be sent to the Central Station for their records.

The zone report consists of a grid with the central station point address; ACS point address; source; ACS point function; custom label; and panel label.

Section 4: Operation

4.1 Switches

4.1.1 SW1 - Option Select Switch

This DIP switch gives the user four UDACT-2 settings.

- Switch DIP1 - Download App mode.

  Set to ON prior to downloading an application file. Set to OFF when download is complete.
- DIP2 - Download Database mode.

  Set to ON prior to downloading a database file. Set to OFF when download is complete.

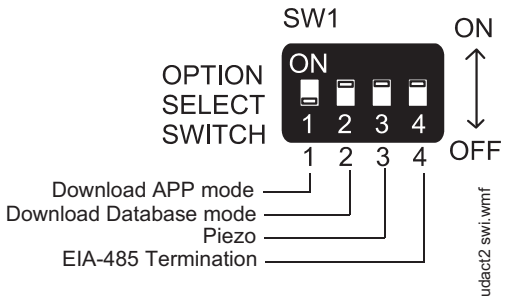


Figure 4.1 SW1 - Option Select Switch

NOTE: DIP1 and DIP2 may both be ON at the same time. However, the UDACT-2 does not leave bootload mode until both switches are returned to the OFF position.

- Switch DIP3 - Piezo.

  Set to ON to have the piezo sound when an error occurs in self-test mode, or when the UDACT-2 is in trouble.
- Switch DIP4 - EIA-485 Termination

  Set to ON to enable a 120 Ohm terminating resistor on the EIA-485 bus. This setting is required if the UDACT-2 is the only or last device on the bus.

4.1.2 SW 2 - Trans Clear Button

Press and hold this button switch down for over 3 seconds to immediately stop UDACT-2 transmissions, hang up from the telephone network, clear out any messages that were waiting for transmission, and reset, and return to normal system processing.

4.1.3 SW 3 - Test Report Button

Press and hold this button switch down for over 3 seconds to have the UDACT-2 transmit a test message to both Central Stations. The message reported is the same as the automatic test message for all formats except Ademco Contact ID.

4.1.4 SW 4 - Reset Button

Press and hold this button switch down for a hardware reset.

4.2 Telephone Line Testing

Connect your telephone test set across a modular test adapter to test for a dial tone.

WARNING: DO NOT CONNECT TEST EQUIPMENT TO TRANSFORMER T1. DOING SO WILL DAMAGE THE TRANSFORMER.

Section 5: Reporting Formats

The formats sent by the UDACT-2 to the Central Station are set out in this section. Event codes are defined for each protocol.

Use Ademco Contact ID for specific zone or point identification.

Pulsed formats typically require 15 to 20 seconds for message transmission.

Refer to Section 6.1, “Compatible UL Listed Receivers”, on page 44 for a list of compatible receivers.

5.1 “4 + 2” Standard

Standard “4 + 2” reporting consists of the following format:

XXXX EE

- XXXX = 4-digit Customer Account Code.
- EE = Event Code Refer to Table 5.1 for code definitions.

The table below shows the data reporting format for the "4+2 Standard" pulsed format.

Data Description	Data Reporting Format	
	4-digit Customer Account Code	Event Code
General Alarm	xxxx	11
Zone/point alarm code	xxxx	00
General Supervisory	xxxx	81
Zone/point supervisory code	xxxx	00
General Fault	xxxx	F1
AC Fault	xxxx	F6
Zone/point fault code	xxxx	00
Low Battery fault	xxxx	F8
Telco Primary Line Fault	xxxx	FA
Telco Secondary Line Fault	xxxx	FB
NAC Fault	xxxx	FC
Communication Trouble Primary #	xxxx	FD
Communication Trouble Secondary #	xxxx	FE
485 Communication Trouble	xxxx	FE
System Off Normal	xxxx	FF
Reserved	xxxx	00
Reserved	xxxx	00
Reserved	xxxx	00
Reserved	xxxx	00
Security alarm	xxxx	11
General Alarm restore	xxxx	E1
Zone/point alarm restore	xxxx	00
General Supervisory restore	xxxx	E2
Zone/point supervisory restore	xxxx	00
General Fault Restore	xxxx	E3
AC Fault Restore	xxxx	E6
Zone/point fault restore	xxxx	00
Low Battery Fault Restore	xxxx	E8
Telco Primary Line Fault Restore	xxxx	EA
Telco Secondary Line Fault Restore	xxxx	EB
NAC Fault Restore	xxxx	EC
Communication Trouble Primary Number Restore	xxxx	ED
Communication Trouble Secondary Number Restore	xxxx	EE
485 Communication trouble restore	xxxx	EE
System Off Normal Restore	xxxx	EF
Reserved	xxxx	00
System 24 Hour Test	xxxx	99
System 24 Hour Test with Active Event	xxxx	91
Manual Test	xxxx	92
Security alarm Restore	xxxx	E1
Note: Zero event entries prevent the transmission of the report to the Central Station.		

Table 5.1 4+2 Standard Data Reporting Format

5.2 Ademco Contact ID

Ademco Contact ID reporting consists of the following format:

SSSS 18 QXYZ GG CCC

- SSSS = 4-digit Customer Account Code.
- 18 = Identifies transmission as Ademco contact ID to the receiver at the Central Station.
- Q = Event Qualifier
  - 1 = New Event
  - 3 = New Restore
- XYZ = Event code. Refer to Table 5.2 for event code definitions.
- GG = Group number. Zeroes, or the value defined in VeriFire Tools programming. (Refer to page 31.)
- CCC = Device or Zone number.
  - If the report concerns a specific point or zone, this field contains the UDACT-2 address of the device or zone. (See the description of the "Point Address at Central Station" field on page 34).
  - If the report is general (i.e., not a report concerning a specific point or zone) this field will display zeroes, or the value defined in VeriFire Tools programming. (Refer to page 31.)

NOTE: For general reports (alarm, trouble and supervisory), the GG and CCC fields are transmitted as 00 and 000 unless values are entered in the VeriFire Tools "Group" and "General Points Device Number" fields. (Refer to page 31.)

Data Description	Event Code
General Alarm	110*
Zone/point Alarm	110*
General Supervisory	200
Zone/point Supervisory	200
General Fault	300
AC Fault	301
Zone/point Fault	380
Low Battery	302
Telco Primary Line Fault	351
Telco Secondary Line Fault	352
NAC Fault	321
Communication Trouble Primary #	354
Communication Trouble Secondary #	354
485 Communication Trouble	300
System Off Normal	308
Reserved	000
System 24 Hour Test	602
System 24 Hour Test with Active Event	608
Manual Test	601
Security Alarm	130
Future Use	310
Future Use	394
Future Use	393
Zone/point defined as fire alarm	110
Disable zone/point report	000
Zone/point defined as supervisory	200
Zone/point defined as pull station	115
Zone/point defined as heat detector	114
Zone/point defined as water flow	113
Zone/point defined as duct detector	116
Zone/point defined as pre-alarm	118
Zone/point defined as smoke	111
Zone/point defined as burglary	130
Zone/point defined as 24 hour non-burglary	150
Zone/point defined as high temperature	158
Zone/point defined as low temperature	159
Zone/point defined as low water pressure	201
Zone/point defined as low water level	204
Zone/point defined as pump failure	206
Zone/point defined as photo-co detector	162

* Factory default, reprogrammable.
Note: Zero event entries prevent the transmission of the report to the Central Station.

Table 5.2 Ademco Contact ID Reporting Format

A typical printout of alarm and trouble reports in the Ademco Contact ID Reporting Structure follows:

Time	Date	Rcvr/ Line ID	SSSS	QXYX	GG	CCCC	Description
11:28	10/14	11	2456	E110	00	C000	General Alarm
11:28	10/14	11	2456	E111	00	C046	Alarm SD46
11:28	10/14	11	2456	E300	00	C000	General Trouble
11:28	10/14	11	2456	E380	00	C046	Trouble SD46
11:28	10/14	11	2456	R110	00	C000	General Alarm Restore
11:28	10/14	11	2456	R111	00	C046	Alarm SD46 Restore
11:28	10/14	11	2456	R300	00	C000	General Trouble Restore
11:28	10/14	11	2456	R380	00	C046	Trouble SD46 Restore

NOTE:
18, which is used in the reporting structure to identify the transmission as Contact ID, is not printed out in the alarm and trouble report.

In the sample report, SD46 refers to smoke detector at address 46 or in zone 46.

Q, which is the Event Qualifier for the reporting structure, is printed out in the report as an E for New Event or R for New Restore.

CCCC, the first C is not transmitted by the UDACT-2 but is printed by the Central Station Receiver printer output.

5.3 SIA

The SIA reporting format is as follows:

TT AAAA

- TT = Event code.
- AAAA = Zone or Device address.

Code Description	Event Code	Code Description	Event Code
General alarm code	FA	System 24 hour test w/ active event	RY
Zone/point alarm code	FA	Manual test	RX
General supervisory	FS	Security alarm restore	BH
Zone/point supervisory	FS	Zone/point defined as fire alarm	FA
General fault	FT	Disable zone/point report	00
AC fault	AT	Zone/point defined as supervisory	FS
Zone/point fault	FT	Zone/point defined as pull station	FA
Low battery fault	YT	Zone/point defined as heat detector	FA
Telco primary line fault	LT	Zone/point defined as water flow	SA
Telco secondary line fault	LT	Zone/point defined as duct detector	FA

Table 5.3 SIA Event Codes

Code Description	Event Code	Code Description	Event Code
NAC fault	YA	Zone/point defined as pre-alarm	FA
Comm. trouble primary #	YC	Zone/point defined as smoke	FA
Comm. trouble secondary #	YC	Zone/point defined as burglary	BA
485 comm. trouble	YC	Zone/point defined as non-burglary	UA
System off normal	FT	Zone/point defined as high temperature	KA
Reserved	00	Zone/point defined as low temperature	ZA
Reserved	00	Zone/point defined as water pressure	SS
Reserved	00	Zone/point defined as water level	SS
Reserved	00	Zone/point defined as pump failure	SS
Security alarm	BA	Zone/point defined as photo/co detector	GA
General alarm restore	FH	Zone/point defined as fire alarm restore	FH
Zone/point alarm restore	FH	Disable zone/point report restore	00
General supervisory restore	FV	Zone/point defined as supervisory restore	FV
Zone/point supervisory restore	FV	Zone/point defined as pull station restore	FH
General fault restore	FJ	Zone/point defined as heat detector restore	FH
AC fault restore	AR	Zone/point defined as water flow restore	SH
Zone/point fault restore	FR	Zone/point defined as duct detector restore	FH
Low battery fault restore	YR	Zone/point defined as pre-alarm restore	FH
Telco primary line fault restore	LR	Zone/point defined as smoke restore	FH
Telco secondary line fault restore	LR	Zone/point defined as burglary restore	BH
NAC fault restore	YH	Zone/point defined as 24 hour non--burglary restore	UH
Comm. trouble primary number restore	YK	Zone/point defined as high temperature restore	KH
Comm. trouble secondary number restore	YK	Zone/point defined as low temperature restore	ZH
485 Comm. trouble restore	YK	Zone/point defined as low water pressure restore	SR
System off normal restore	FR	low water level restore	SR
Reserved	00	Zone/point defined as pump failure restore	SR

Table 5.3 SIA Event Codes

Code Description	Event Code	Code Description	Event Code
System 24 hour test	RP	Zone/point defined as photo/co detector	GH
Note: Zero event entries prevent the transmission of the report to the Central Station.			

Table 5.3 SIA Event Codes

Section 6: Compatible UL Listed Receivers

6.1 UL Listed Receivers

The chart below shows UL listed receivers compatible with the UDACT-2. A check in the protocol column indicates the receiver supports that protocol.

Receiver	4+2 Standard 1800/2300	Ademco Contact ID	SIA
Ademco 685 (1)	✔	✔	
Ademco MX8000 (2)	✔	✔	✔
Silent Knight 9500 (3)	✔	✔	✔
Silent Knight 9800 (4)	✔	✔	✔
FBI CP220FB (5)	✔	✔	✔
Osborne Hoffman 2000E (6)		✔	✔
Radionics 6600 (7)		✔	✔
SurGard MLR2 (8)	✔	✔	
SurGard System III (9)		✔	✔
SurGard MLR-2000 (10)		✔	

Table 6.1 Compatible UL Listed Receivers

NOTE:
(1) With 685-8 Line Card with Rev 4.4d software.
(2) With 124060V206B and 124063 Line Card Rev. B.
(3) With version V2.4 Receiver and 126047 Line Card Rev G.
(4) With 124077V2.00 Receiver and 126047 Line Card Rev M.
(5) With software V3.9.
(6) With V.7301 Receiver S/W.
(7) With 01.01.03 Receiver S/W and Line Card 01.01.03.
(8) With software V1.86.
(9) With software V1.72.
(10) With DSP4016 and V1.6 Line Card.

Appendix A: Panel-Specific Information

A.1 AFP-200

A.1.1 General

The UDACT-2 is capable of reporting a maximum of 99 zones when used with the AFP-200.For the UDACT-2 to correctly report a zone to the Central Station, both the panel and the UDACT-2 must have each zone programmed as the same function type (refer to "Zone and Point Assignments" on page 34). If a UDACT-2 point does not match the panel point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

For more information on the AFP-200 see the AFP-200 Instruction Manual.

A.1.2 Mounting

Since the AFP-200 does not accommodate the UDACT-2 in the control panel enclosure, the UDACT-2 must be mounted remotely using an ABS-8RB, UBS-1B, or UBS-1R. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel. Wiring must be enclosed in conduit. Refer to "Remote Installation" on page 21 for installation instructions.

A.1.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figure A.1.

Connect the communication line between the EIA-485 terminal block TB5 on the AFP-200 and TB2 terminals +EIA-485 and -EIA-485 on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 earth terminal on TB2 to a solid building earth ground.

Connect 24VDC filtered, non-resettable power from terminal block TB1 on the AFP-200 to TB1 +24V and Common terminals on the UDACT-2.

Notes

1. Recommended wire is 12 AWG (3.25mm2) to 18 AWG (0.75mm2) twisted pair, shielded cable. Connect only one end of shield: shield may be connected to a Common Terminal at TB2 on the UDACT-2 as shown in Figure A.1.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an AFP-200:

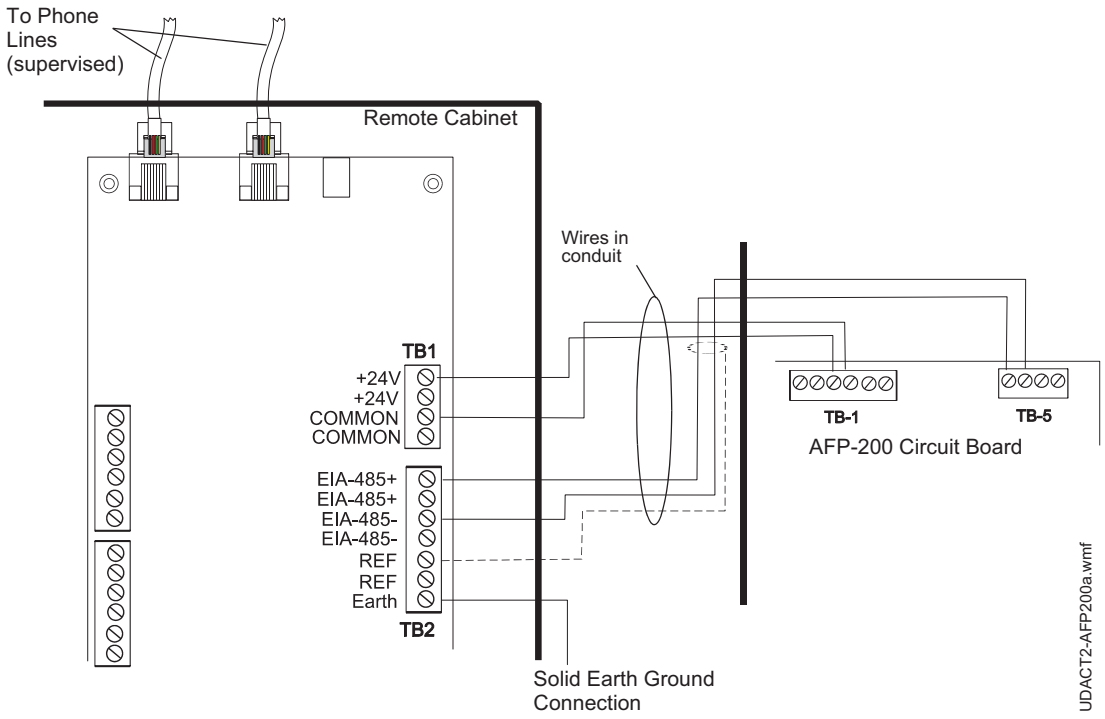


Figure A.1 UDACT-2 and AFP-200

A.2 AFP-300/AFP-400

A.2.1 General

The UDACT-2 is capable of reporting a maximum of 99 zones or 256 points when used with the AFP-300, and 99 zones or 448 points when used with the AFP-400. For the UDACT-2 to correctly report a point to the Central Station, both the panel and the UDACT-2 must have each point programmed as the same function type (refer to "Zone and Point Assignments" on page 34). If a UDACT-2 point does not match the panel point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

A.2.2 Mounting

If the AFP-300 or AFP-400 is contained in a CAB-400AA cabinet, then the UDACT-2 must be mounted remotely in an ABS-8RB, UBS-1B, or UBS-1R enclosure. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel. Wiring must be enclosed in conduit.

If the AFP-300 or AFP-400 is contained in a CAB-3/4 Series cabinet, then the UDACT-2 may be mounted to another chassis within that cabinet.

A.2.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figures A.2 and A.3.

Connect the communication line between the EIA-485 terminal block TB4 on the AFP-300/AFP-400 and TB2 terminals EIA-485+ and EIA-485- on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the ground wire (PN 71073, provided) from the UDACT-2 EARTH terminal on TB2 to the CHS-4 Chassis or to a solid building earth ground.

Connect 24VDC filtered, non-resettable power from the MPS-400 (Main Power Supply) to TB1 +24V and Common terminals on the UDACT-2.

Notes

1. Recommended wire is 12 AWG (3.25mm^2) to 18 AWG (0.75mm^2), twisted pair, shielded cable. Connect only one end of shield: a) shield may be connected to cabinet (earth ground) at fire alarm panel, or b) shield may be connected to a Common Terminal at TB2 on the UDACT-2 as shown in Figure A.3.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance, since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an AFP-300/AFP-400:

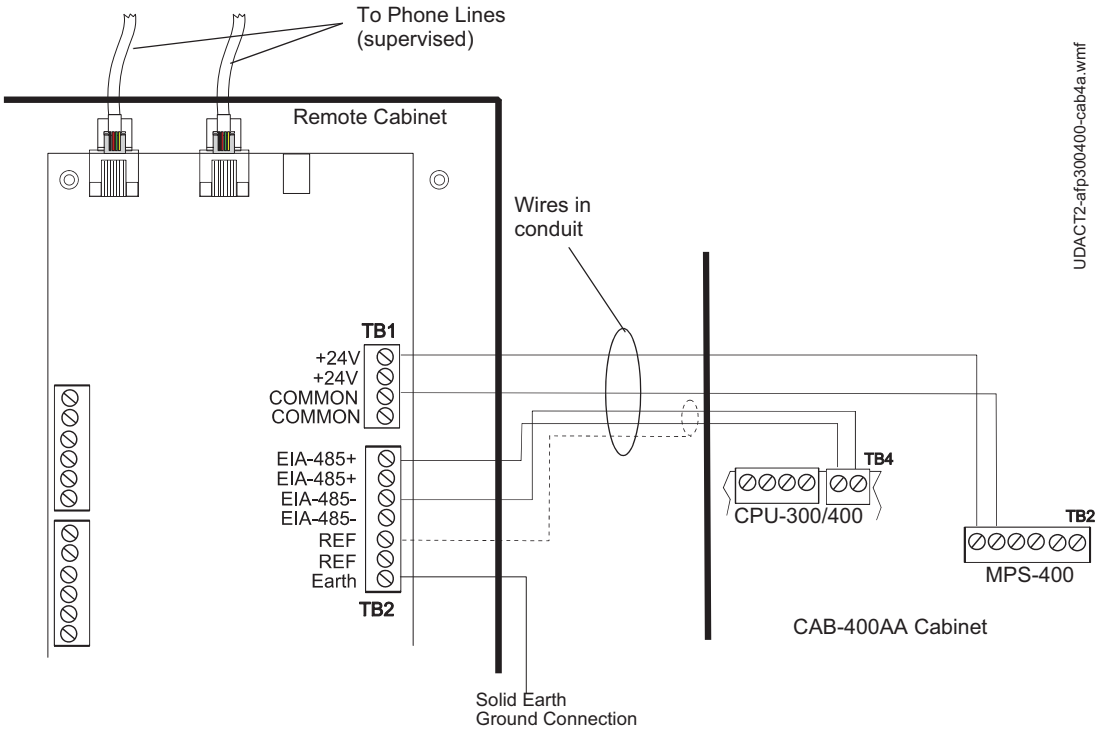


Figure A.2 UDACT-2 and AFP-300/AFP-400 in CAB-400AA

Below is an internal installation of a UDACT-2 with an AFP-300/AFP-400:

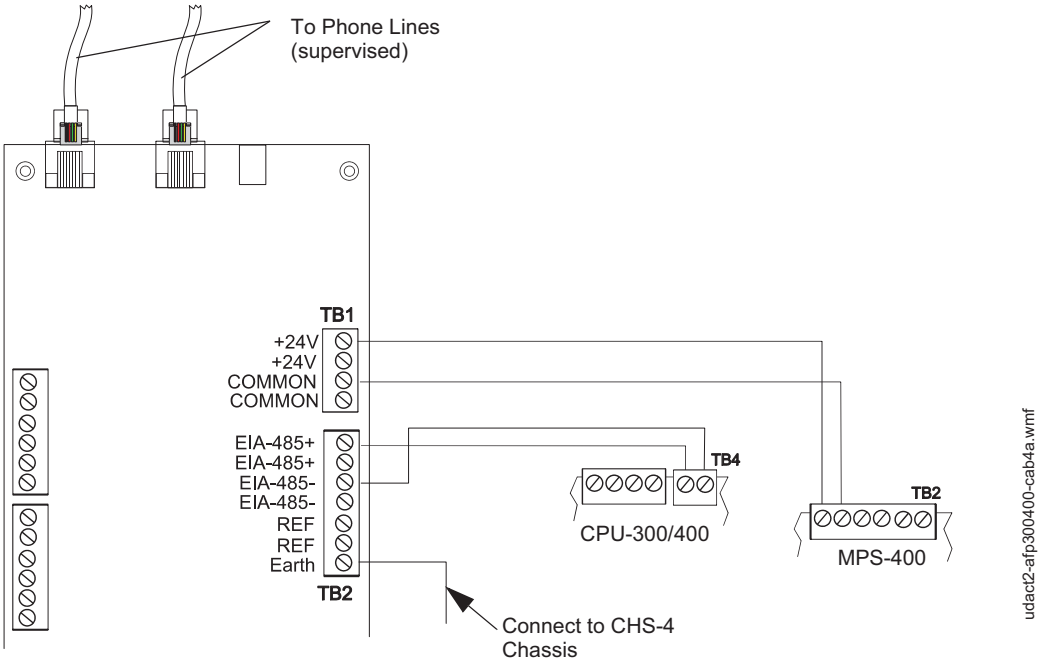


Figure A.3 AFP-300/AFP-400 and UDACT-2 in CAB-3/4

A.3 NFS2-640 (UL 9th), NFS-320/SYS (UL 9th), NFS-640 (UL 8th)

A.3.1 General

The UDACT-2 is capable of reporting a maximum of 99 zones, or 636 ACS points when used with the NFS2-640 or NFS-640. It has a maximum of 99 zones or 318 ACS points when used with the NFS-320/SYS. For the UDACT-2 to correctly report a point to the Central Station, both the panel and the UDACT-2 must have each point programmed as the same function type (refer to "Zone and Point Assignments" on page 34). If a UDACT-2 point does not match the panel point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

A.3.2 Mounting

If the UDACT-2 is not mounted within the cabinet that contains the NFS2-640, NFS-640, or NFS-320/SYS, then it must be mounted remotely in an ABS-8RB, UBS-1B, or UBS-1R enclosure. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel. Wiring must be enclosed in conduit. This is the recommended installation for use with the NFS2-640

- If the UDACT-2 is mountedwithin the cabinet that contains an NFS-640, then it may be mounted to another chassis within the CAB-3/4 backbox.
- within the cabinet that contains an NFS-320, then it must be mounted to the NFS-320 chassis and programmed before installing the KDM2-R2 keypad.
- within the cabinet that contains the NFS2-640 or NFS-320SYS, then it may be mounted to the panel chassis or another chassis within the CAB-3/4 backbox. If mounted on the panel chassis, the UDACT-2 must be mounted in the rear position of the fourth column with no other option boards in front.

A.3.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figures A.4 through A.7.

To the NFS2-640 and NFS-320

Connect the communication line between the EIA-485 terminal block TB11 on the CPU2-640 and TB2 terminals EIA-485+ and EIA-485- on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 EARTH terminal on TB2 to the CHS-4 Chassis or to a solid building earth ground.

Connect 24VDC filtered, non-resettable power from the CPU2-640 TB10 to TB1 24V+ and 24V- terminals on the UDACT-2.

To the NFS-640

Connect the communication line between the EIA-485 terminal block TB13 on the CPU2-640 and TB2 terminals EIA-485+ and EIA-485- on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 EARTH terminal on TB2 to the CHS-4 Chassis or to a solid building earth ground.

Connect 24VDC filtered, non-resettable power from the CPU2-640 TB7 to TB1 +24V and -24V terminals on the UDACT-2.

Notes

1. Recommended wire is 12 AWG (3.25mm^2) to 18 AWG (0.75mm^2), twisted pair, shielded cable. Connect only one end of shield: a) shield may be connected to cabinet (earth ground) at fire alarm panel, or b) shield may be connected to TB1 Terminal 5 (Shield) at UDACT-2 as shown in Figure A.4.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an NFS2-640/NFS-320/NFS-320SYS:

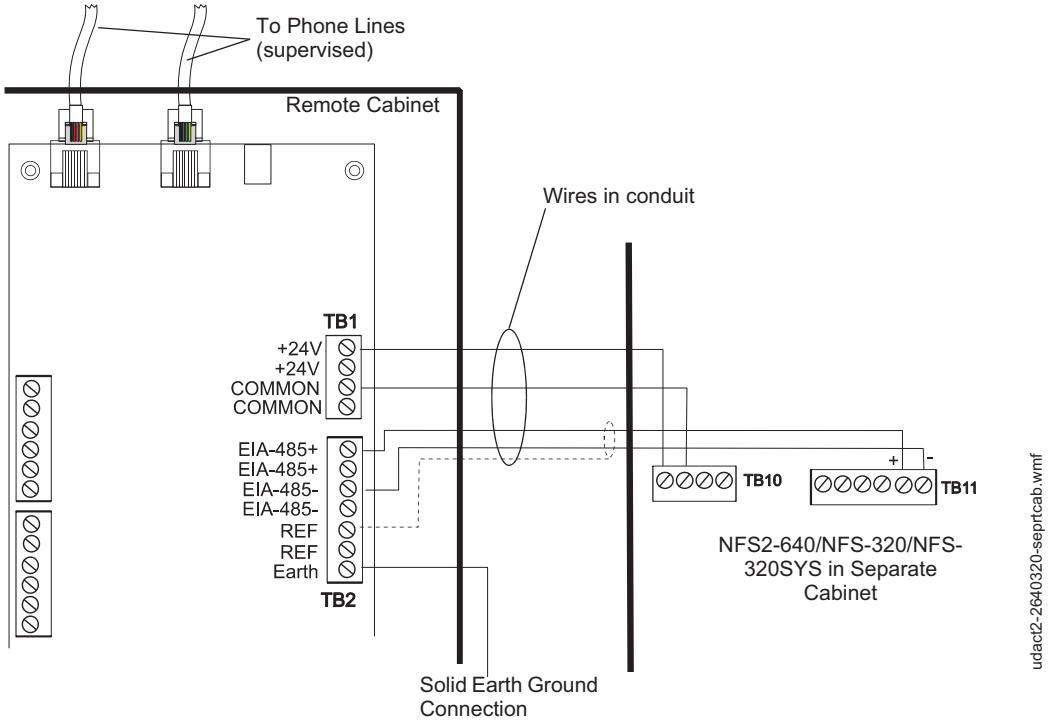


Figure A.4 UDACT-2 and NFS2-640/NFS-320/NFS-320SYS in Separate Cabinets

Below is an internal installation of a UDACT-2 with an NFS2-640/NFS-320/NFS-320SYS:

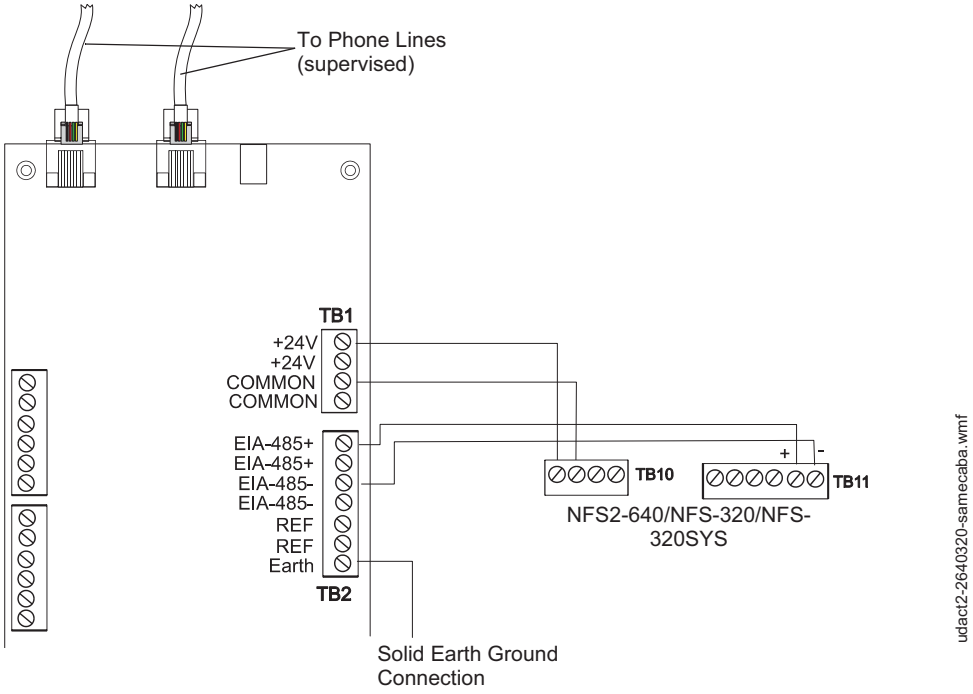


Figure A.5 UDACT-2 and NFS2-640/NFS-320/NFS-320SYS in the Same Cabinet

Below is a remote installation of a UDACT-2 with an NFS-640:

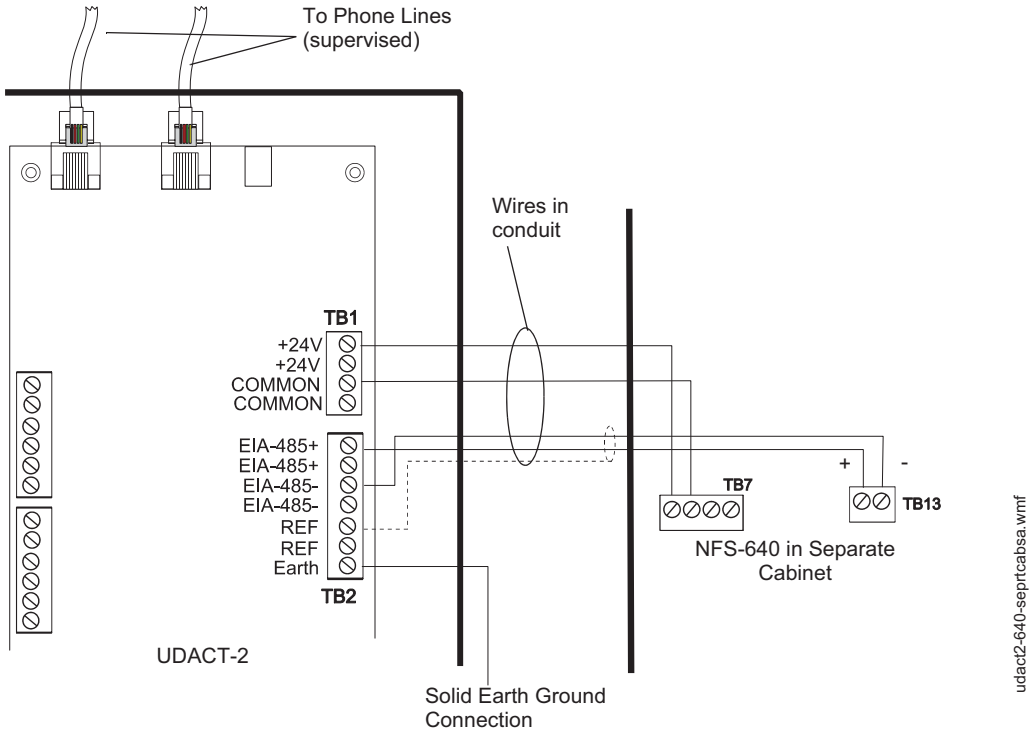


Figure A.6 UDACT-2 and NFS-640 in Separate Cabinets

Below is an internal installation of a UDACT-2 with an NFS-640:

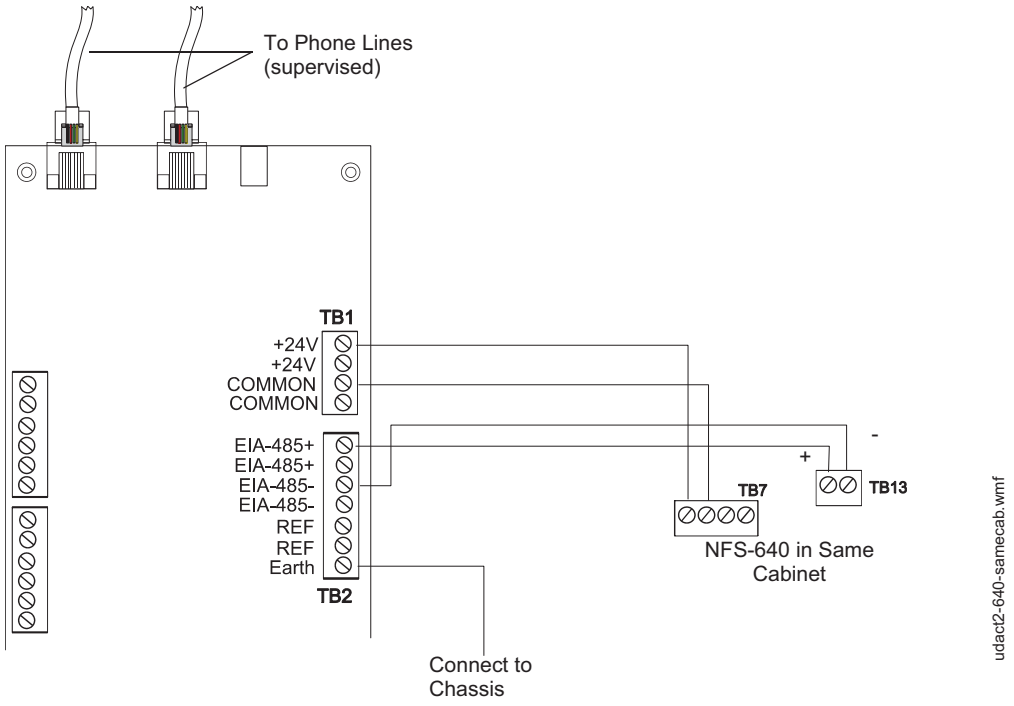


Figure A.7 UDACT-2 and NFS-640 in the Same Cabinet

A.4 NCA-2 (UL 9th), NCA (UL 8th)

A.4.1 General

The UDACT-2 is capable of reporting a maximum of 2040 ACS points when used with the NCA or NCA-2. For the UDACT-2 to correctly report a point to the Central Station, both the NCA-2/NCA and the UDACT-2 must have each point programmed as the same function type (refer to "Zone and Point Assignments" on page 34). If a UDACT-2 point does not match the NCA-2/NCA point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

A.4.2 Mounting

If the UDACT-2 is not mounted in the same cabinet that contains the NCA or NCA-2, it must be mounted remotely in an ABS-8RB, UBS-1B, or UBS-1R. The unit must be placed within the same room and within 20 feet (6.1 meters) of the network annunciator. Wiring must be enclosed in conduit.

If the NCA or NCA-2 is contained in a CAB-4 Series cabinet, then the UDACT-2 may be mounted to a CHS-4/CHS-4MB chassis assembly within that cabinet.

A.4.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figures A.8 through A.11.

Connect the communication line between the EIA-485 terminal block TB3 on the NCA or TB7 on the NCA-2 and TB2 on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 earth terminal on TB2 to the chassis or to a solid building earth ground.

Connect 24VDC filtered, non-resettable power from TB1 on the NCA or TB6 on the NCA-2 to TB1 +24V and -24V terminals on the UDACT-2. Power can also be supplied from TB3 AUX on an AMPS-24/E when using an NCA-2.

Notes

1. Recommended wire is 12 AWG (3.25mm^2) to 18 AWG (0.75mm^2), twisted pair, shielded cable. Connect only one end of shield: a) shield may be connected to cabinet (earth ground) at fire alarm panel, or b) shield may be connected to TB1 Terminal 5 (Shield) at UDACT-2 as shown in Figure A.8.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an NCA:

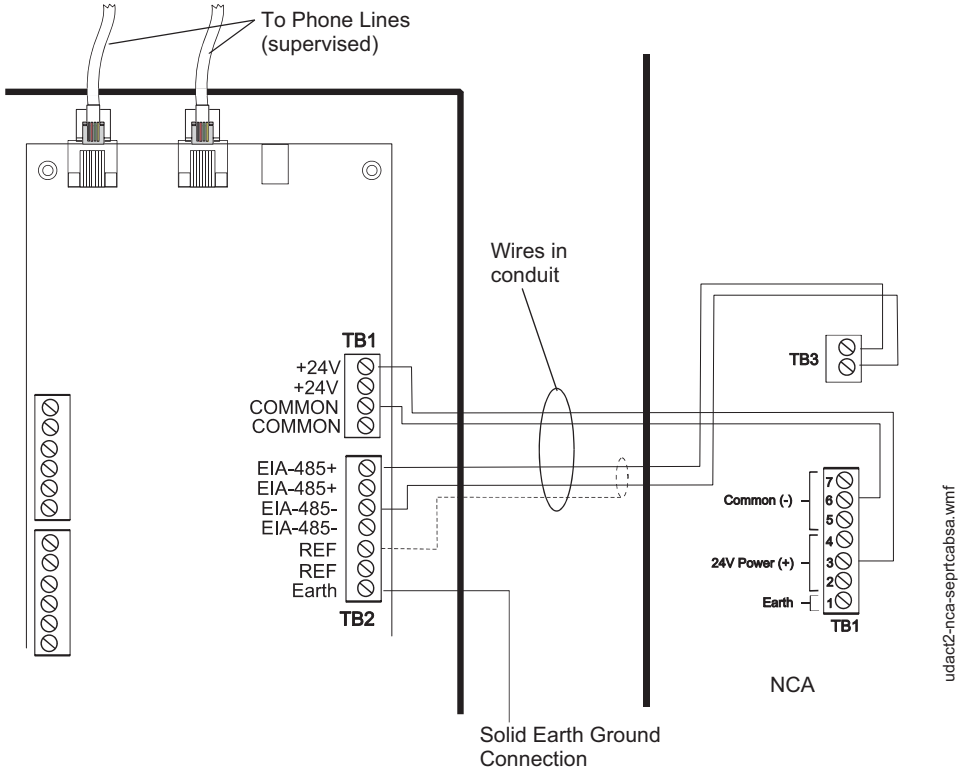


Figure A.8 UDACT-2 and NCA in Separate Cabinets

Below is an internal installation of a UDACT-2 with an NCA:

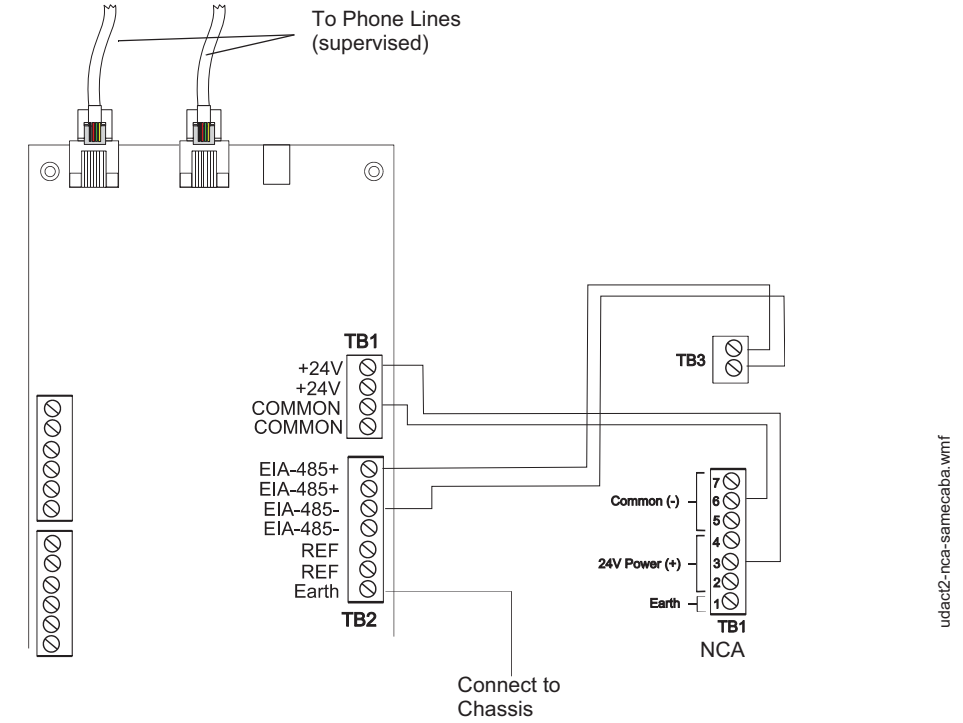


Figure A.9 UDACT-2 and NCA in the Same Cabinet

Below is a remote installationof a UDACT-2 with an NCA-2 using power supplied by the control panel:

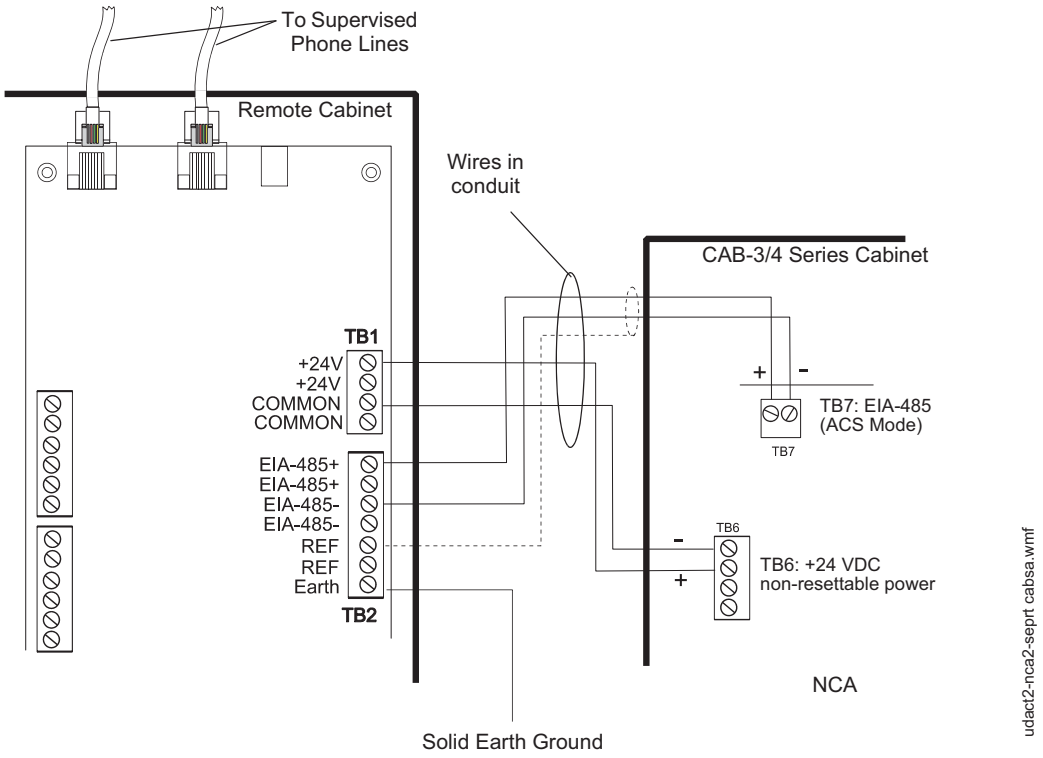


Figure A.10 UDACT-2 and NCA-2 in Separate Cabinets

Below is a remote installation of a UDACT-2 with an NCA-2 using power supplied by an AMPS-24/E:

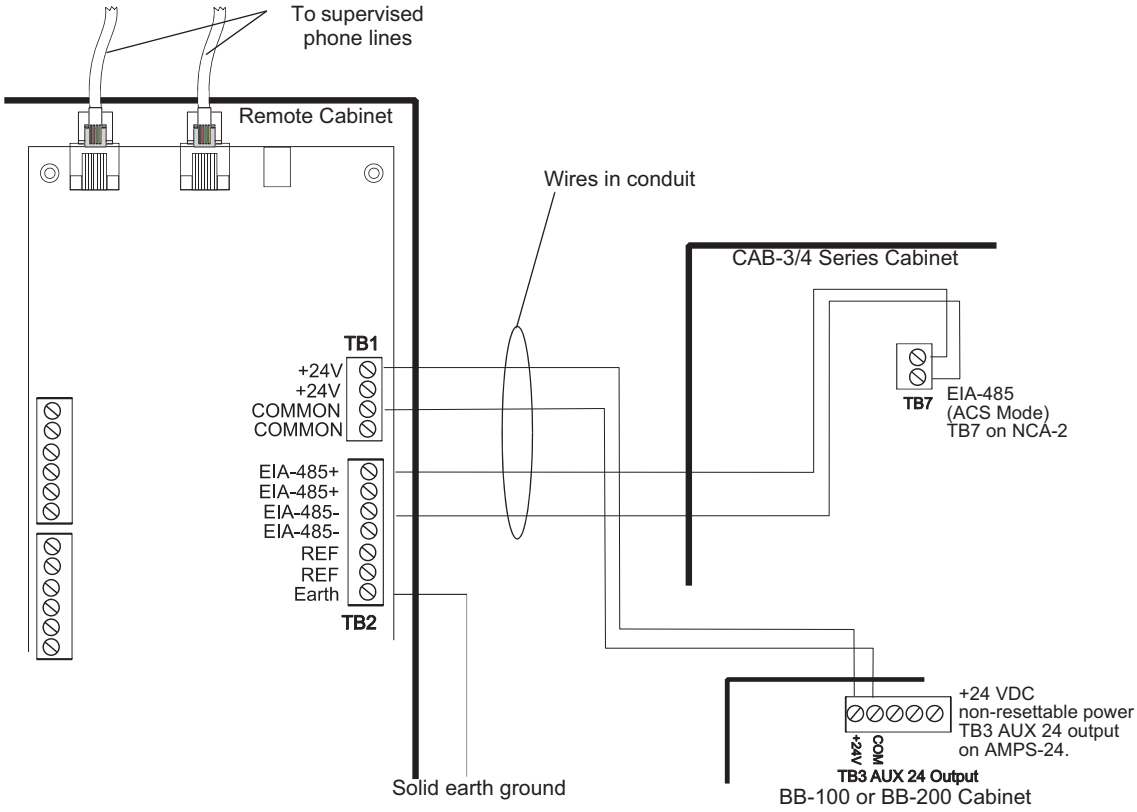


Figure A.11 UDACT-2 and NCA-2 powered by AMPS-24/E

A.5 AM2020/AFP1010 (UL 8th)

A.5.1 General

The UDACT-2 is capable of reporting up to 2,040 ACS points when used with the AM2020/AFP1010. For the UDACT-2 to correctly report a point to the Central Station, both the FACP and the UDACT-2 must have each point programmed as the same function type (refer to "Zone and Point Assignments" on page 34). If a UDACT-2 point does not match the panel point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

NOTE: The UDACT-2 does not support voice and burglary options when used with the AM2020/AFP1010. Refer to the panel's Installation Manual for additional restrictions and more information.

A.5.2 Mounting

The UDACT-2 may be mounted in the AM2020/AFP1010 control panel enclosure or be mounted remotely using an ABS-8RB, UBS-1B, or UBS-1R enclosure. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel. Wiring must be enclosed in conduit.

A.5.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figures A.12 and A.13.

Connect the communication line between the EIA-485 terminal block on the AM2020/AFP1010 and EIA-485+ and EIA-485- terminals on TB2 on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2's 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 EARTH terminal on TB2 to the CHS-4 Chassis or to a solid building earth ground.

Connect 24 VDC filtered, regulated power from the MPS-24A or MPS-24B (Main Power Supply) to +24V and -24V terminals on the UDACT-2.

Notes

1. Recommended wire is 12 AWG (3.25mm^2) to 18 AWG (0.75mm^2), twisted pair, shielded cable. Connect only one end of shield: a) shield may be connected to cabinet (earth ground) at fire alarm panel, or b) shield may be connected to TB1 Common at the UDACT-2 as shown in Figure A.12.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an AM2020/AFP1010 using an MPS-24A main power supply:

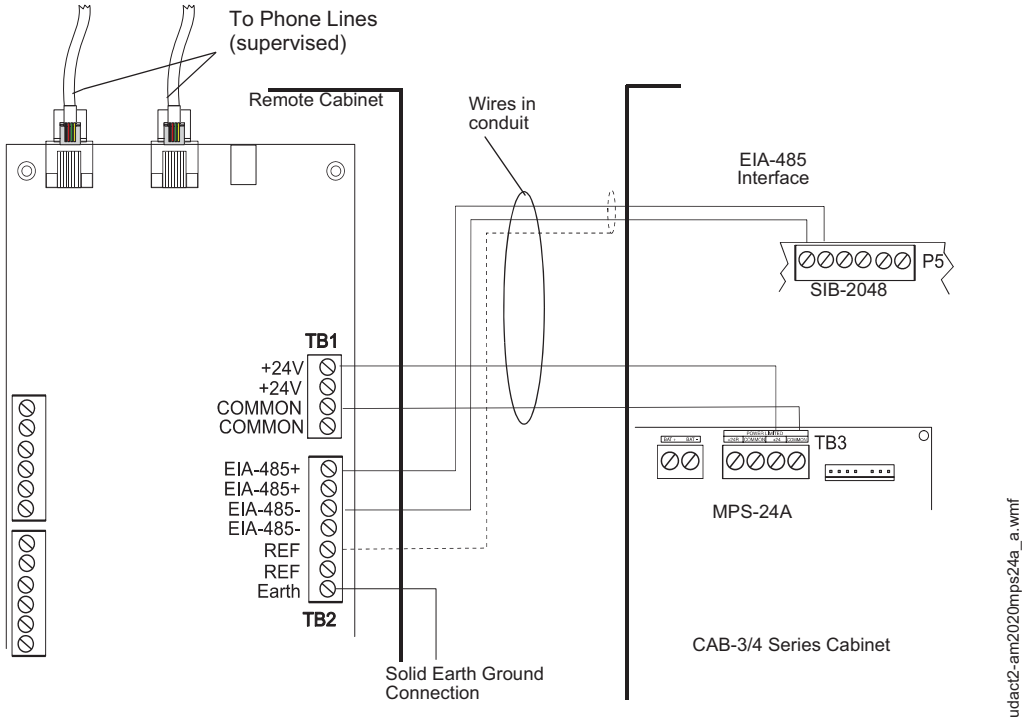


Figure A.12 UDACT-2 and AM2020/AFP1010 **with MPS-24A**

Below is an internal installation of UDACT-2 with an AM2020/AFP1010 using an MPS-24B main power supply:

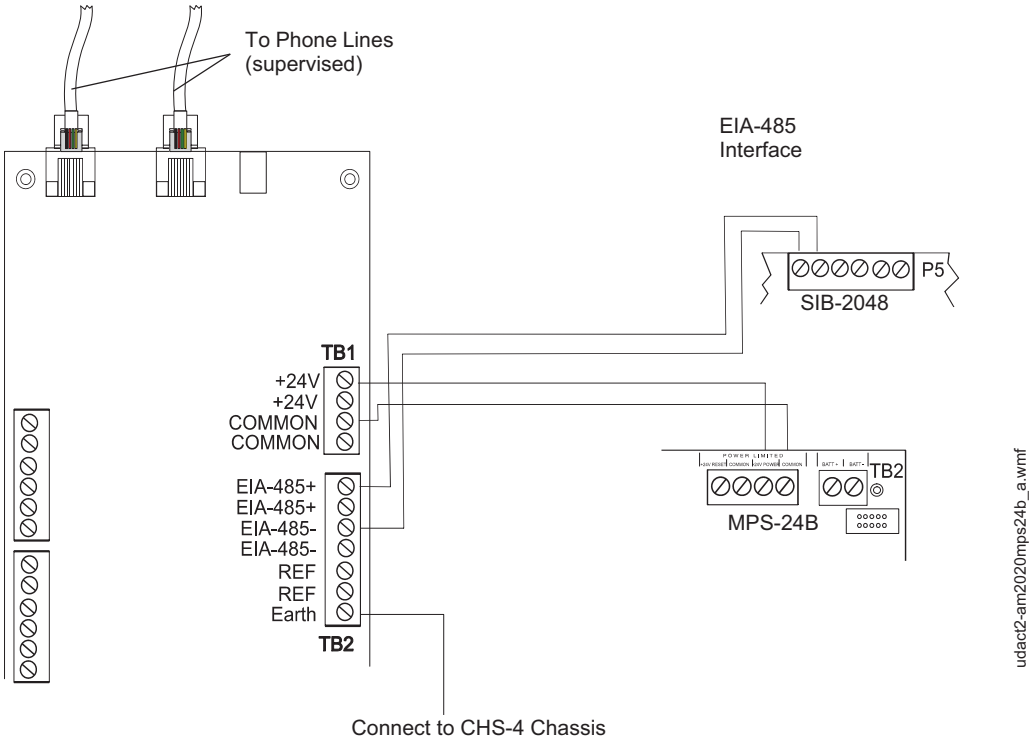


Figure A.13 UDACT-2 and AM2020/AFP1010 **with MPS-24B**

A.6 NFS2-3030 (UL 9th), NFS-3030 (UL 8th)

A.6.1 General

The UDACT-2 is capable of reporting up to 2,040 ACS points when used with the NFS2-3030/NFS-3030. For the UDACT-2 to correctly report a point to the Central Station, both the FACP and the UDACT-2 must have each point programmed as the same function type (refer to “Zone and Point Assignments” on page 34). If UDACT-2 point does not match the panel point in function, the point will default to fire alarm and a fire alarm signal will be transmitted to the Central Station.

A.6.2 Mounting

The UDACT-2 may be mounted in the control panel enclosure or be mounted remotely using an ABS-8RB, UBS-1B, or UBS-1R enclosure. The unit must be placed within the same room and within 20 feet (6.1 meters) of the panel. Wiring must be enclosed in conduit. For mounting instructions see "Remote Installation" on page 21 or "Internal Installation" on page 15.

A.6.3 Wiring

CAUTION: Remove all power from the control panel by disconnecting AC and batteries before making any connections to prevent personal and/or circuit damage.

Connections

Refer to Figures A.14 through A.16.

Connect the communication line between the EIA-485 terminal block on the CPU2-3030/CPU-3030 and EIA-485+ and EIA-485- terminals on the UDACT-2, being certain to observe polarity.

If the UDACT-2 is the only or last device connected to the EIA-485, set SW1 DIP 1:4 to ON to enable the UDACT-2’s 120 ohm terminating resistor.

Connect the Ground Wire (PN 71073, provided) from the UDACT-2 EARTH terminal on TB1 to the CHS-4 Chassis or to a solid building earth ground.

Connect 24 VDC filtered, regulated power from the CPU2-3030/CPU-3030 or AMPS-24/E (Main Power Supply) to +24V and -24V on TB1 on the UDACT-2.

Notes

1. Recommended wire is 12 AWG (3.25mm^2) to 18 AWG (0.75mm^2), twisted pair, shielded cable. Connect only one end of shield: a) shield may be connected to cabinet (earth ground) at fire alarm panel, or b) shield may be connected to Common on TB2 on the UDACT-2.

NOTE: The shield end that is not connected should be insulated to prevent accidental grounding. Do not connect both ends of shield under any circumstance since a ground fault may result.

2. Conduit is required for external wire runs. Consult local building codes.
3. Refer to "Specifications" on page 9 for power requirements.

Below is a remote installation of a UDACT-2 with an NFS-3030 using power supplied by the control panel:

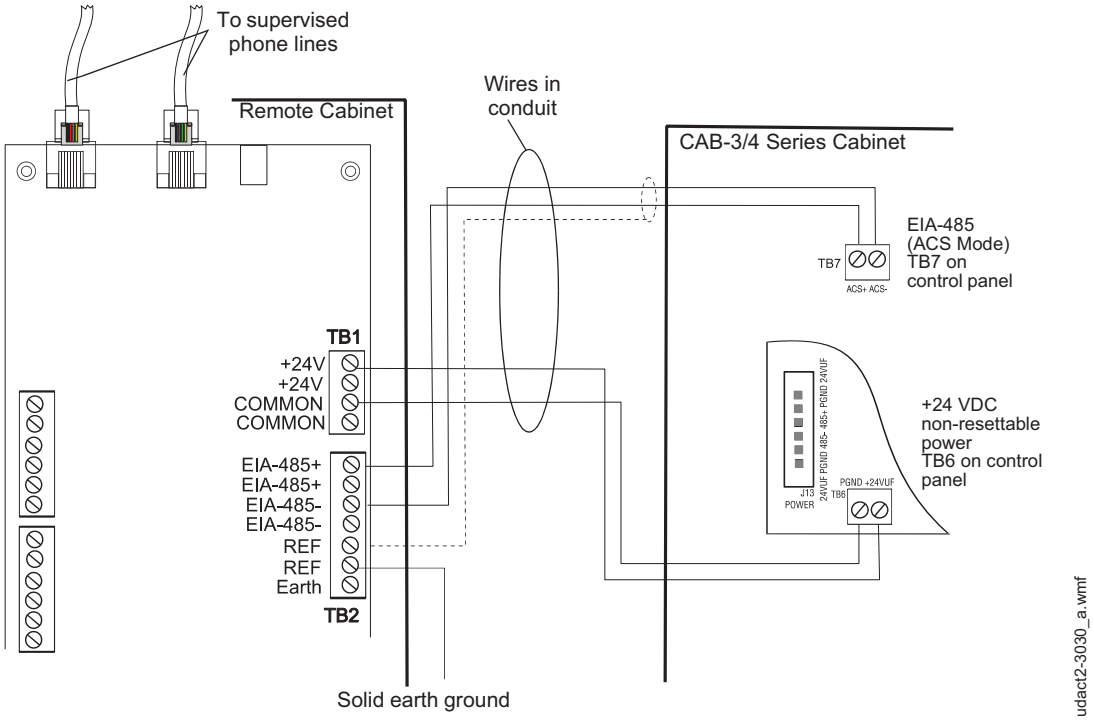


Figure A.14 UDACT-2 and NFS-3030

Below is a remote installation of a UDACT-2 with an NFS2-3030 using power supplied by the control panel:

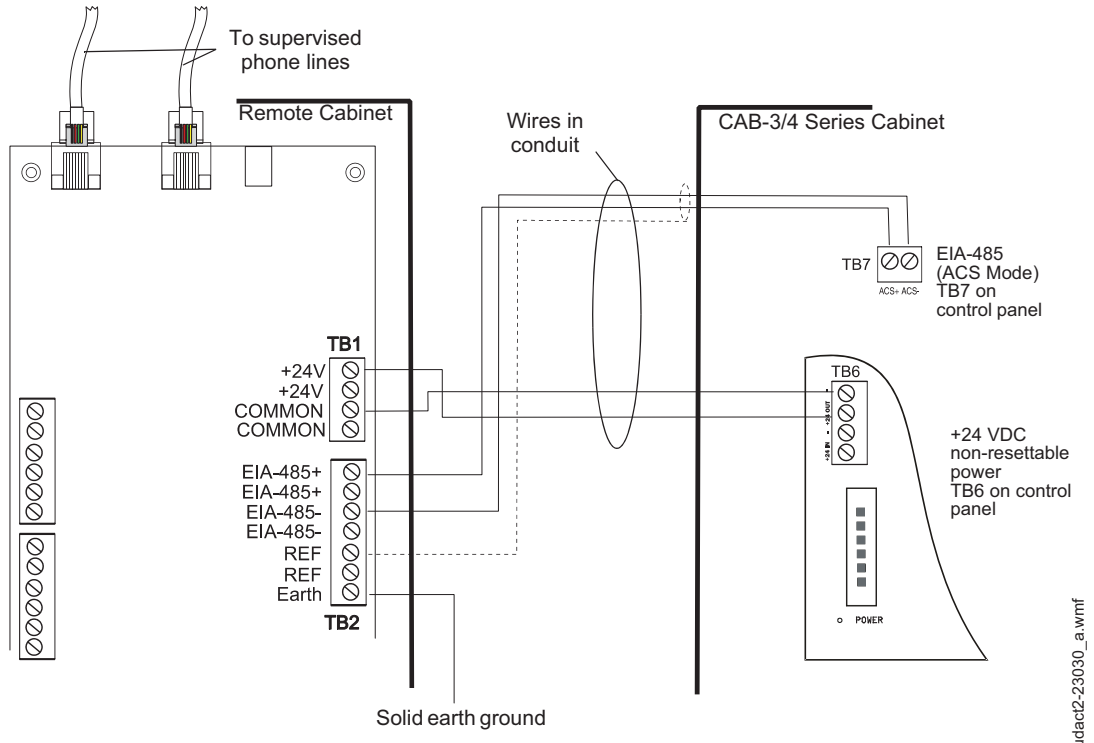


Figure A.15 UDACT-2 and NFS2-3030

Below is a remote installation of a UDACT-2 with an NFS-3030/NFS2-3030 using an AMPS-24/E main power supply:

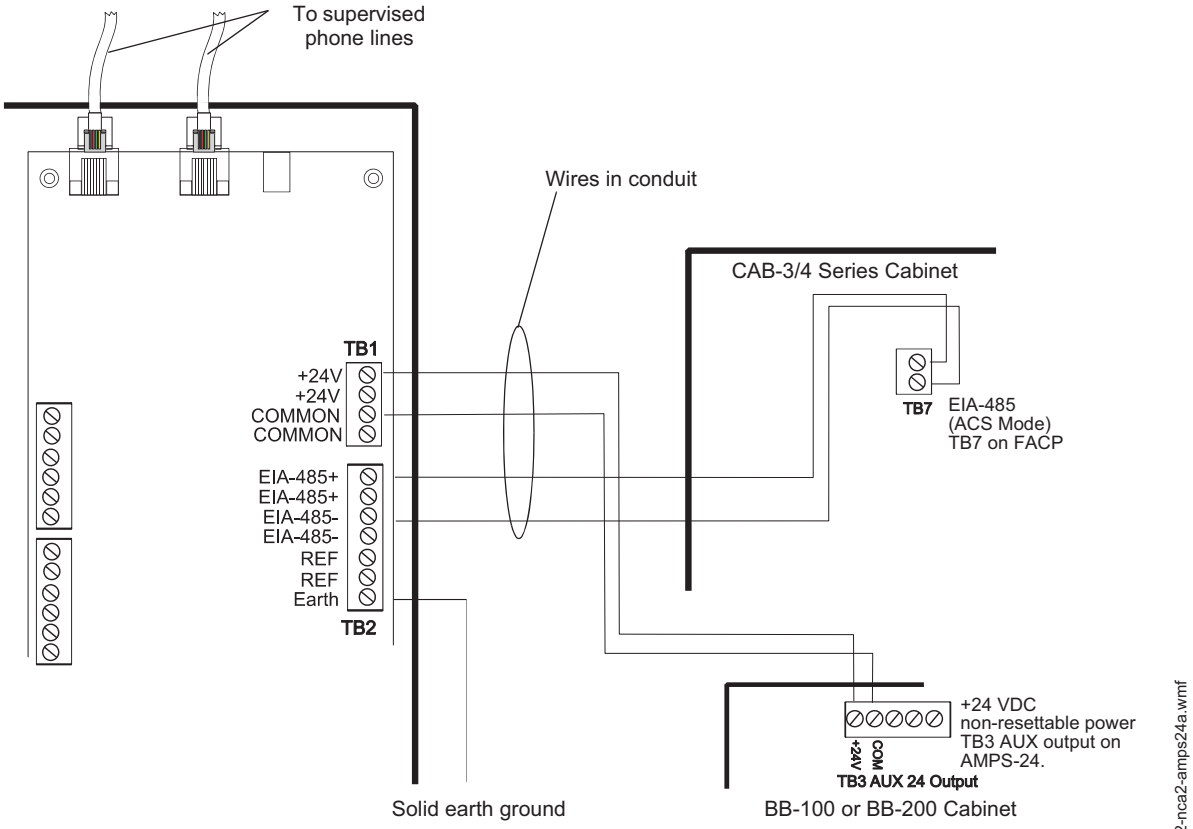


Figure A.16 UDACT-2 and NFS2-3030/NFS-3030 powered by AMPS-24/E

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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.

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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QUALITY SYSTEMS

NOTIFIER®
by Honeywell

12 Clintonville Road
Northford, CT 06472-1610 USA
203-484-7161 • FAX 203-484-7118
www.notifier.com

NFC-CE6 Circuit Expander Product Installation Document

PN LS10033-001NF-E:A 4/19/2013 13-187

1 NFC-CE6 Installation Instructions

The NFC-CE6 adds six audio circuits, 3 primary and 3 secondary, to the NFC-50/100 FirstCommand Center. The NFC-CE6 mounts onto the NFC-50/100 main control board. Refer to the NFC-50/100 Manual #LS10001-001NF-E for more information.

NOTE: Installation and wiring of this device must be done in accordance with NFPA 72 and local ordinances.

2 Board Layout & Mounting

1. Turn off AC power and disconnect batteries.
2. Remove the screw and wire clamp that secures the display cable from the top left of the board as shown. The remaining 1-5/8” standoff will be used to mount the NFC-CE6.

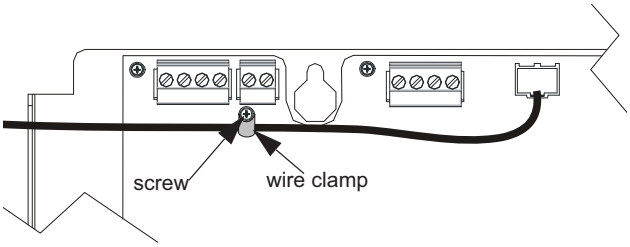

Figure 1 Removing the Screw/Wire Clamp

3. Install the NFC-CE6 into a 25V or 70V system as described below.

2.1 Mounting to a 25V System

1. Remove the screws from the NFC-50/100 main control board and replace with the seven (7) supplied 1-5/8" long male-female standoffs as shown.
2. Align the NFC-CE6 over the standoffs installed in step 1. Insert header JH1 on the NFC-CE6 into P1 on the NFC-50/100 main control board, being careful not to bend any pins.
3. Secure the NFC-CE6 to the standoffs with eight (8) #4-40 screws removed previously.
4. Route the display cable under the NFC-CE6.

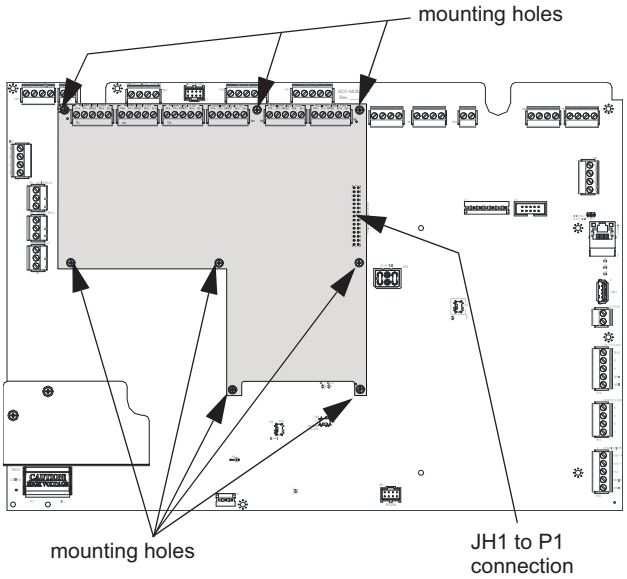

Figure 2 Mounting the NFC-CE6

2.2 Mounting to a 70V System

If the NFC-CE6 will be used in a 70V system, it must be mounted in conjunction with the NFC-XRM-70V Transformer.

1. Remove the screws from the NFC-50/100 main control board and replace with seven (7) total standoffs, five (5) 1-5/8” standoffs (supplied with the NFC-CE6) and two (2) 1-9/16" long standoffs (supplied with transformer bracket) as shown.
2. Secure transformer bracket to the chassis using two (2) #8-32 keps nuts. Install using an 11/32” socket.

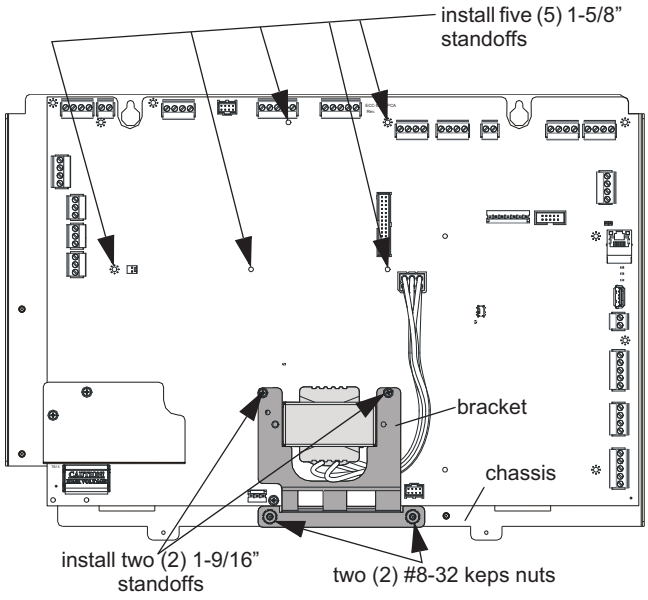

Figure 3 Installing the Transformer Bracket

3. Align the NFC-CE6 over the standoffs installed in step 1. Install header JH1 on the NFC-CE6 into P1 on the NFC-50/100 main control board, being careful not to bend any pins.
4. Secure the NFC-CE6 to the standoffs with the eight (8) #4-40 screws previously removed. The bottom end of the NFC-CE6 will mount on the transformer bracket. See Figure 4.
5. Route the display cable under the NFC-CE6.

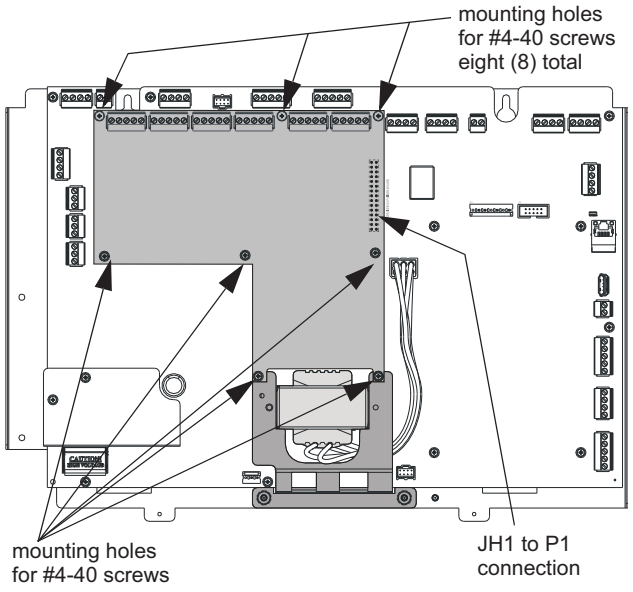

Figure 4 Mounting the NFC-CE6 & Transformer

3 Wiring

Speakers can be wired in either Class A (Style Z) or Class B (Style Y). Circuits are configured through the web-based programming utility. Use of the secondary circuits requires the optional secondary amplifier NFC-BDA-25/70V. All circuits are supervised and power-limited. When all wiring is complete, restore AC power and reconnect batteries. See Figure 5.

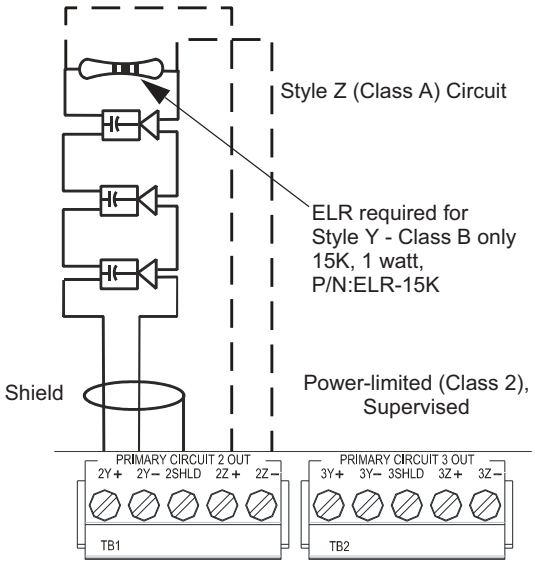

Figure 5 Speaker Wiring

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NFC-BDA-25/70V Optional Amplifier Product Installation Document

PN LS10035-001NF-E:A 4/19/2013 13-187

1 Overview

An optional second audio amplifier can be plugged into connectors J10 & J11 located in the upper right of the main control board in the NFC-50/100. This amplifier also provides 50 watts of power at 25 V_{RMS} or 70 V_{RMS}, depending on the model, and can therefore be used to expand system power to 100 watts (providing dual 50 watt speaker circuits) or it can be used as a backup amplifier. The output is power-limited and speaker circuit connections to it are provided on the main control board and optional speaker circuit expander module. The circuit can be wired for Style Y (Class B) or Style Z (Class A) operation. For more information, including application examples, refer to the *NFC-50/100 Manual* P/N LS10001-001NF-E.

NOTE: Both the primary and secondary amplifiers must be same voltage output (25V or 70V).

NOTE: Installation and wiring of this device must be done in accordance with NFPA 72 and local ordinances.

2 Installation

1. Remove mounting screws shown, from the main control board, and save (refer to Figure 1).
2. Install four supplied metal standoffs (using a 1/4") socket in locations from which mounting screws were removed in Step 1.
3. Secure the Audio Amplifier Module with the screws removed in Step 1. It is important to secure the module with the metal screws in order to help protect against electrical transients.
4. Plug the supplied power cable into J10 on the main control board, then into J1 on the audio amplifier. Plug the supplied control cable into J11 on the main control board, then into J2 on the audio amplifier.
5. Configure the slide switch, SW6, on the amplifier for 50W operation. Only the 50W setting is compatible. *Do not use any other setting.*
6. Configure the slide switch, SW5, on the main control board for 25V or 70V operation. (70V operation requires the optional amplifier model NFC-BDA-70V and the NFC-XRM-70V transformer, sold separately.)
7. Connect field wiring to TB21 on the main control board (if not using the amplifier as backup). Refer to the *NFC-50/100 Manual* for illustration of speaker connections.
8. Configure the Audio Amplifier for primary or backup operation, and 70V operation, through the web-based programming utility.

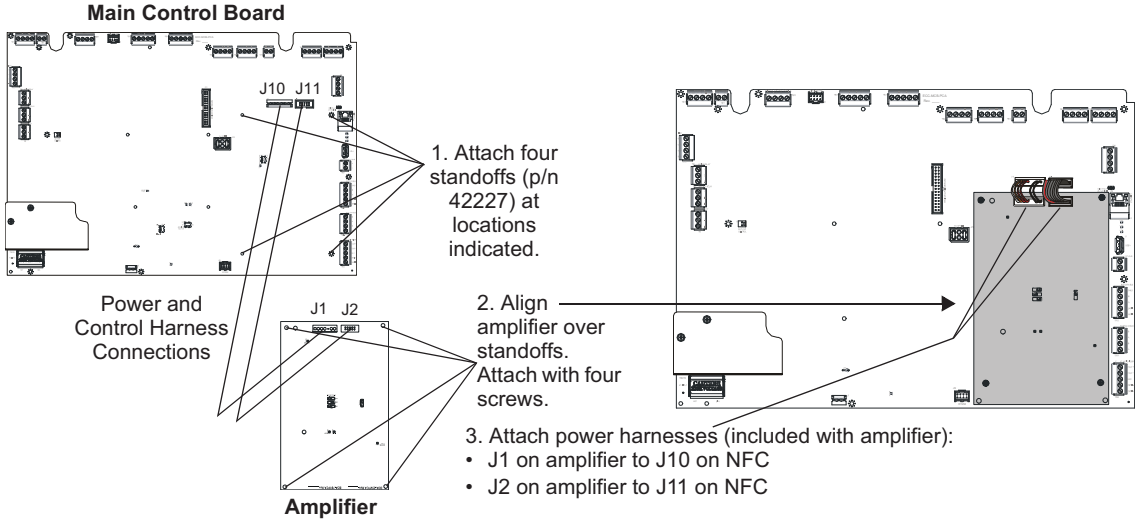

Figure 1 NFC-BDA-25/70V Installation

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NFC-RM Remote Microphone Product Installation Document

PN LS10029-001NF-E:C 9/11/2014 14-717

1 Overview

The NFC-RM is an optional Remote Microphone compatible with the NFC-50/100 FirstCommand Center. ALL CALL paging can be broadcast over the speaker circuits by depressing the microphone's push-to-talk switch. The RM requires an external data bus connection, an external audio riser connection, and an external operator interface power connection (24 volts DC) from the NFC-50/100 main console. Refer to the NFC-50/100 Manual, LS10001-001NF-E, for more information.

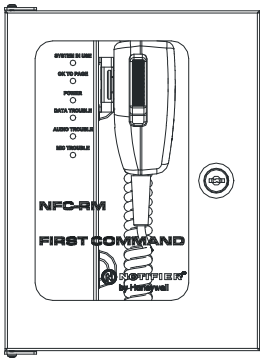

Figure 1 NFC-RM

NOTE: Installation and wiring of this device must be done in accordance with NFPA 72 and local ordinances.

2 Installation

2.1 Removing the Bracket/ Microphone Assembly

1. Unlock the cabinet door.
2. Remove the two screws holding the assembly in place.

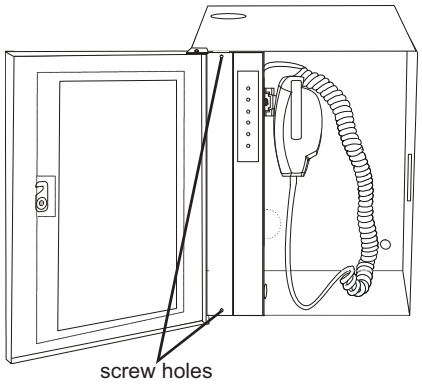

Figure 2 Microphone Assembly Screw locations

3. Remove the bracket/microphone by sliding the assembly out of its mounting slots.
4. Store assembly in a safe location.

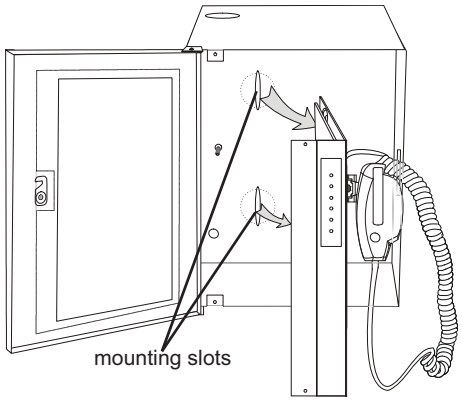

Figure 3 Removing the Microphone Assembly

2.2 Mounting the Backbox

1. Mark and predrill two holes for the top and two for the bottom of the backbox.
2. Hold cabinet on wall and tighten down all fasteners to complete backbox mounting.

3. Carefully reinstall the bracket/microphone assembly. Remember to attach the ground cable.

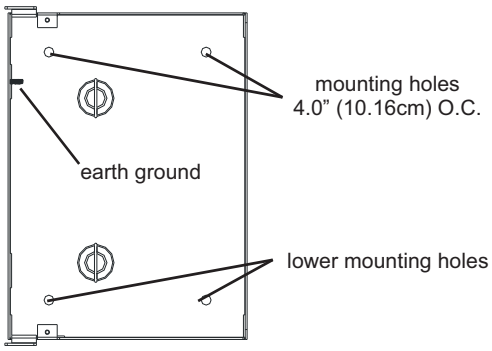

Figure 4 Backbox Mounting

3 Wiring

Connections are made from TB24, TB12, and TB22 on the NFC-50/100 main control board to TB3, TB2, and TB1 on the RM. If the NFC-RM is the last device on the audio and data bus chain, signal terminations are required. For the external data bus, a removable jumper must be on pins 1 and 2 of JS4. If the NFC-RM is not the last device, the jumper must be on pins 2 and 3 of JS4. For the external audio riser, termination (15K ohm resistor) must be on pins 4 and 5 on TB2.

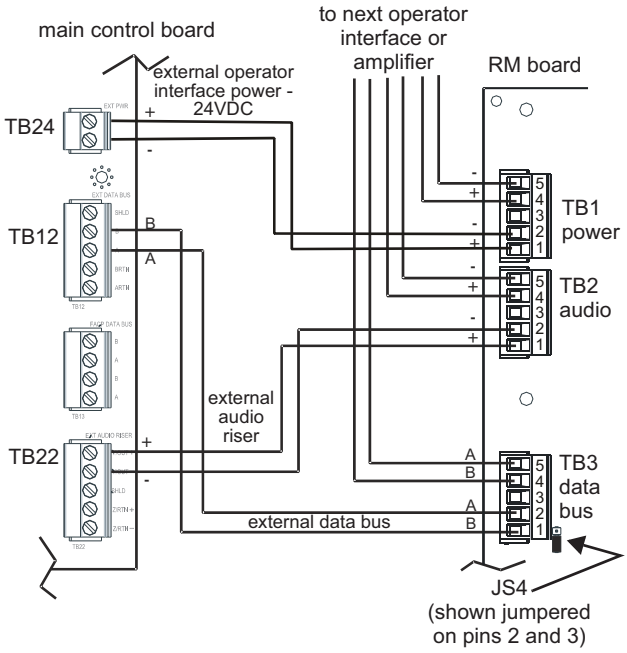

Figure 5 Remote Microphone Wiring (Class B/Style Y)

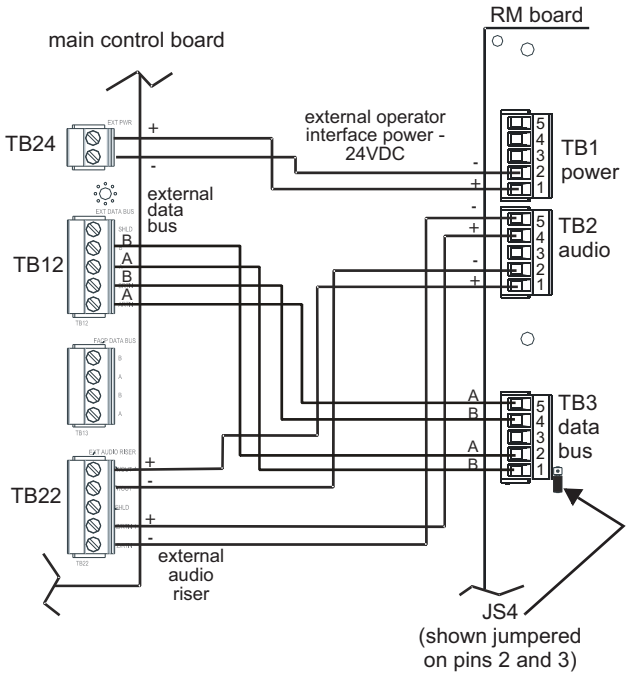

Figure 6 Remote Microphone Wiring (Class A/Style Z)

4 LED Indicators

System in Use A green LED that turns on steady when the main console, an LOC, an RPU, or an RM has control of the audio system.

OK to Page A green LED that turns on steady to instruct the operator that he/she may start speaking.

Power A green LED that turns on steady when DC power is present.

Data Trouble A yellow LED turns on steady when the main console and RM cannot communicate.

Audio Trouble A yellow LED that turns on steady when the audio riser wiring is open or short-circuited.

Mic Trouble A yellow LED that turns on steady to indicate a microphone wiring fault.

NOTIFIER®
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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

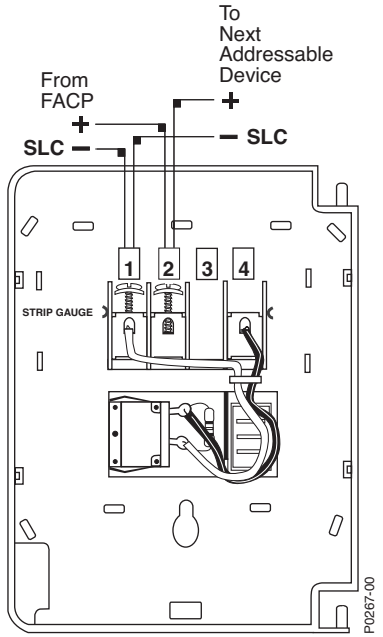
The NBG-12LX Addressable pull station can be surface mounted to an SB-10 or SB-I/O surface backbox or semi-flush mounted on a standard single-gang, double-gang or 4″ (10.16 cm) square electrical box. The optional BG-TR trim ring can be used if the NBG-12LX is to be semi-flush mounted.

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)

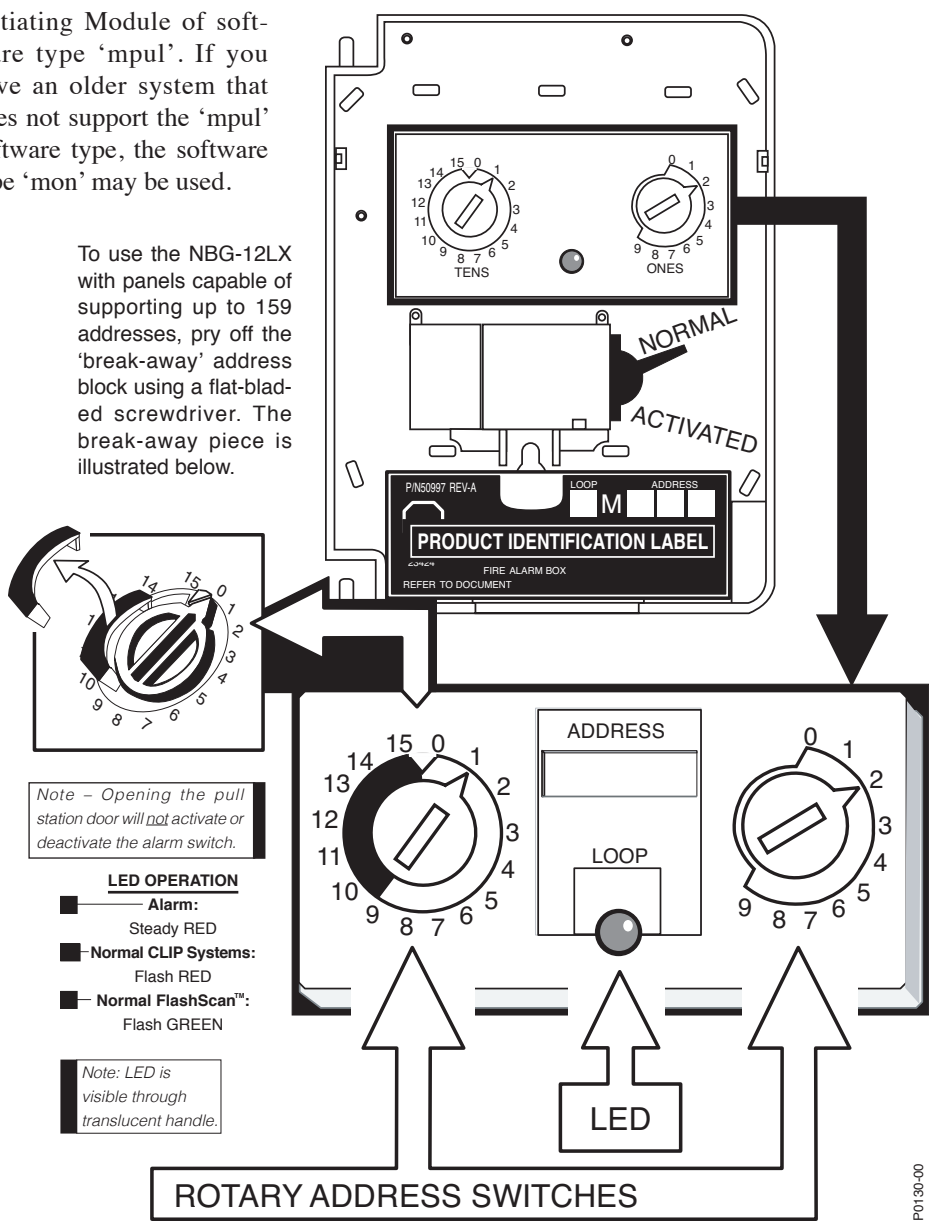
Setting the NBG-12LX Address

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

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.

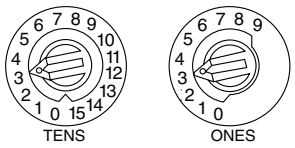
UL 268 listed for Open Air Protection.
UL268A listed for Duct Applications.
This sensor must be installed in compliance with the control panel system installation manual. The installation must meet the requirements of the Authority Having Jurisdiction (AHJ). Sensors offer maximum performance when installed 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.

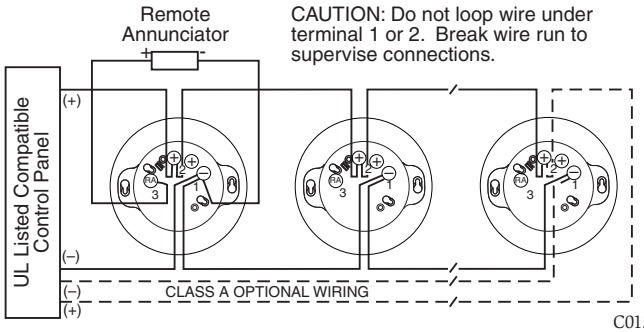
Remove power from the communication line before installing sensors.

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

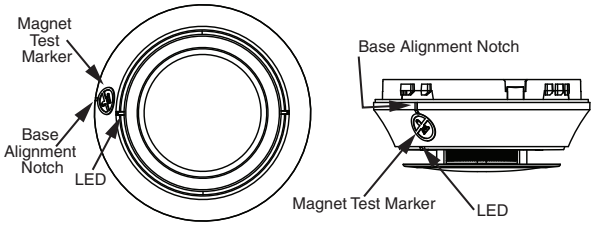


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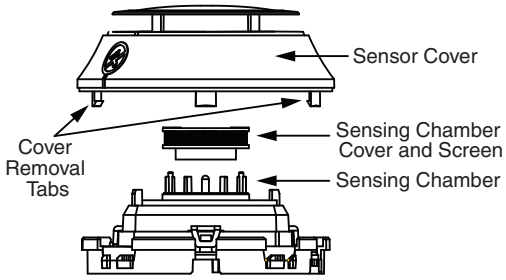
FIGURE 4: CLEANING THE PHOTO DETECTOR



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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.

B224BI Plug-in Isolator Detector Base

3825 Ohio Avenue, St. Charles, Illinois 60174
1.800.SENSOR2; Fax: 630.377.6495
www.systemsensor.com

SPECIFICATIONS

Base Diameter:	6.85 in (17.4 cm)
Base Height:	1.61 in (4.1 cm)
Operating Temperature Range:	Refer to applicable sensor Operating Temperature Range using the Base/Sensor Cross Reference Chart at systemsensor.com
Operating Humidity Range:	10% to 93% Relative Humidity (Non-condensing)
Electrical Ratings	
Operating Voltage:	15 to 32 VDC
Standby Current:	450µA Maximum
Isolation Current:	15mA Maximum

BEFORE INSTALLING

Please read the *System Smoke Detector Applications Guide*, which provides detailed information on detector spacing, placement, zoning, wiring, and special applications. This manual is available online at www.systemsensor.com. NFPA 72 guidelines should be observed.

NOTICE: This manual should be left with the owner/user of this equipment.

IMPORTANT: The detectors used with these bases must be tested and maintained following NFPA 72 requirements. The detectors used with these bases should be cleaned at least once a year.

GENERAL INFORMATION

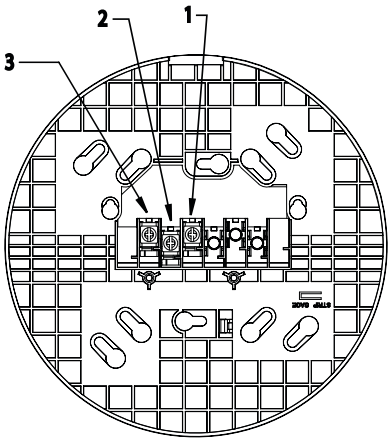
The isolator base is intended for use in an intelligent system. Isolator bases prevent an entire communications loop from being disabled when a short circuit occurs. They accomplish this by isolating that part of the loop containing the short from the remainder of the circuit. These bases also automatically restore the entire loop when the cause of the short circuit is corrected. In general, up to 25 addressable devices may be isolated between isolator bases.

B224BI TERMINALS

NO. FUNCTION

1. Positive (+) Comm. Line In
2. Negative (–) Comm. Line In and Out
3. Positive (+) Comm. Line Out

FIGURE 1: TERMINAL DESIGNATION:



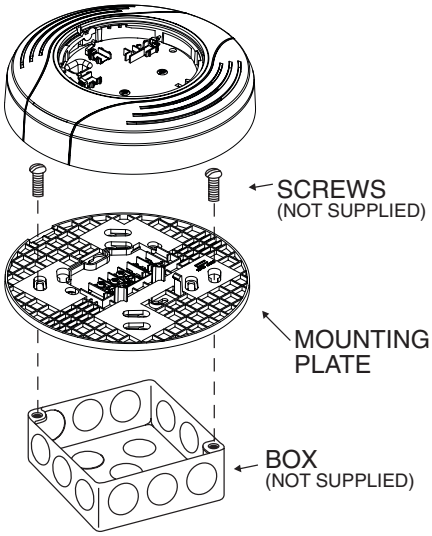
C0471-05

MOUNTING

Mount the mounting plate directly to an electrical box. The plate will mount directly to 4-inch square (with and without plaster ring), 4-inch octagon, 3 1/2-inch octagon, single gang and double gang junction boxes.

1. Connect field wiring to terminals, as shown in Figure 3 and 4.
2. Attach the mounting plate to the junction box as shown in Figure 2.
3. To mount the base, hook the tab on the base to the groove on the mounting plate.
4. Then, swing the base into position to engage the pins on the product with the terminals on the mounting plate.
5. Secure the base by tightening the mounting screws.
6. Install a compatible smoke detector as described in the installation manual for the detector.

FIGURE 2. MOUNTING BASE TO ELECTRICAL BOX:



C1008-01

INSTALLATION GUIDELINES

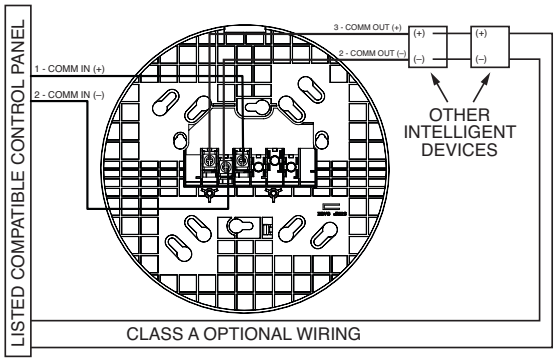
All wiring must be installed in compliance with all applicable local codes and any special requirements of the local authority having jurisdiction, using the proper wire sizes. The conductors used to connect smoke detectors to control panels and accessory devices should be color-coded to reduce the likelihood 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 square mm). However, wire sizes up to 12 AWG (3.31 square mm) can be used with the base.

Alarm system control panels have specifications for allowable loop resistance. Consult the control panel specifications for the total loop resistance allowed before wiring the detector loops.

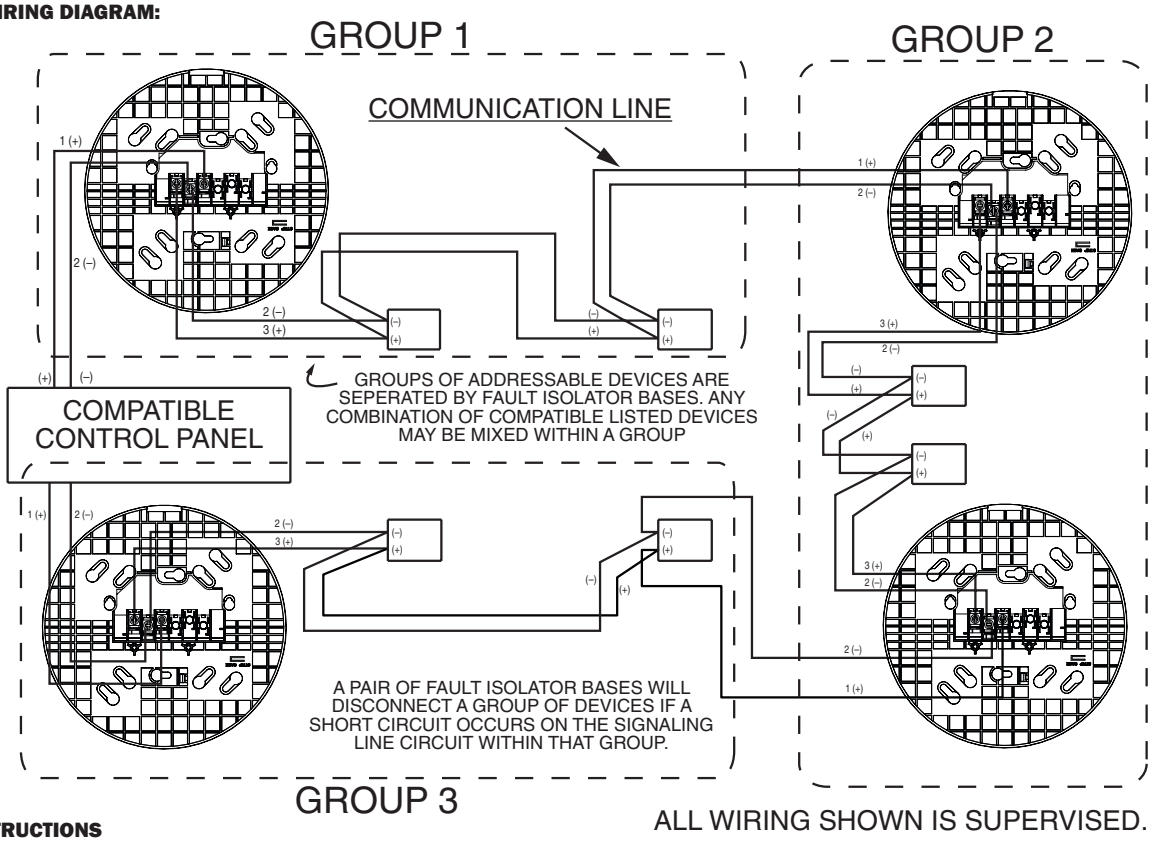
Check the zone wiring of all bases in the system before installing detectors. This includes checking the wiring for continuity, correct polarity, ground fault testing, and performing a dielectric test.

FIGURE 3:



C1003-01

FIGURE 4. WIRING DIAGRAM:



WIRING INSTRUCTIONS

Make wiring connections by stripping about 3/8 of an inch (10 mm) of insulation from the wire end. Then, insert the wire into the appropriate terminal and tighten the screw. Wire the communication line in (+) to terminal 1. Insert both communication line in (–) and communication line out (–) to terminal 2. Wire communication line out (+) to terminal 3 (see Figures 3 and 4).

A label is affixed to the base for recording the zone, address, and type of detector being installed at the base location. This information is useful for setting the detector head address and for verification of the sensor 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 the removal tool is to be used.

This detector base includes a tamper-resist feature that prevents its removal from the base without the use of a tool.

To activate this feature, break the tab from 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, insert a small-bladed screwdriver into the slot from the top and press down on the lever (see Figure 5B). This allows the detector to be rotated 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.

FIGURE 5A. ACTIVATING THE TAMPER-RESIST FEATURE:

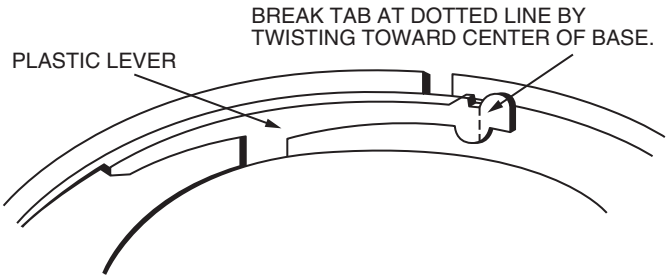
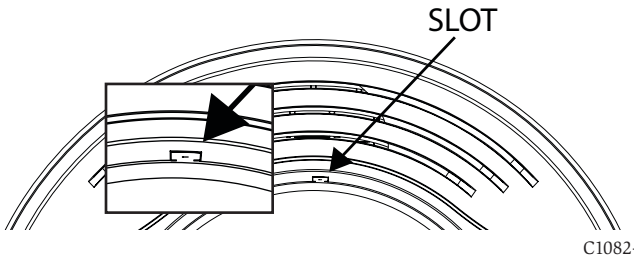


FIGURE 5B. REMOVING THE DETECTOR HEAD FROM THE BASE:



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 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 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.

I56-3736-003R

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.

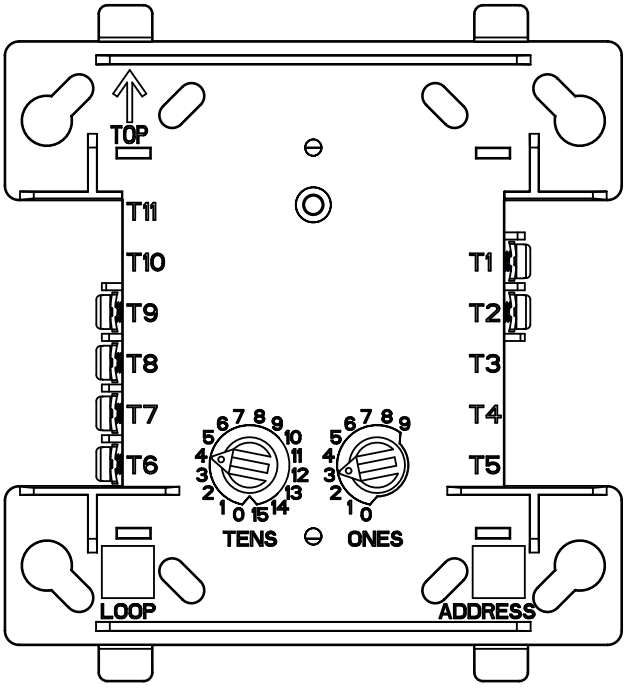
GENERAL DESCRIPTION

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:



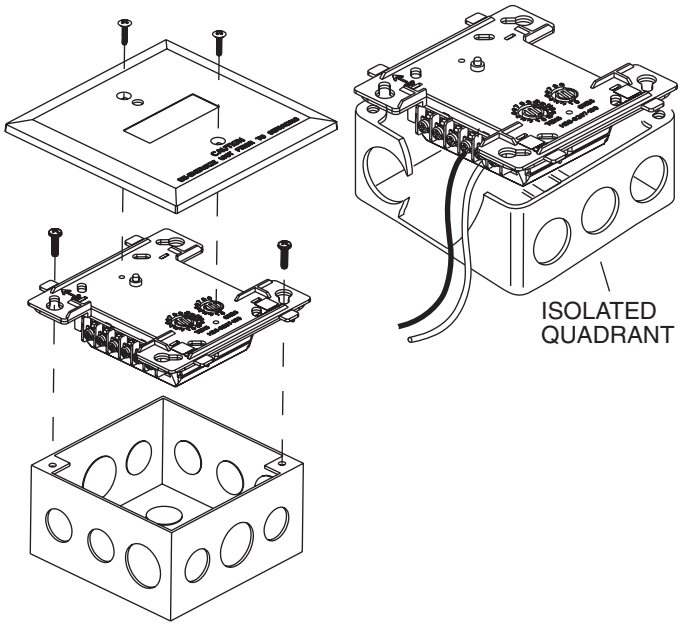
C1067-00

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

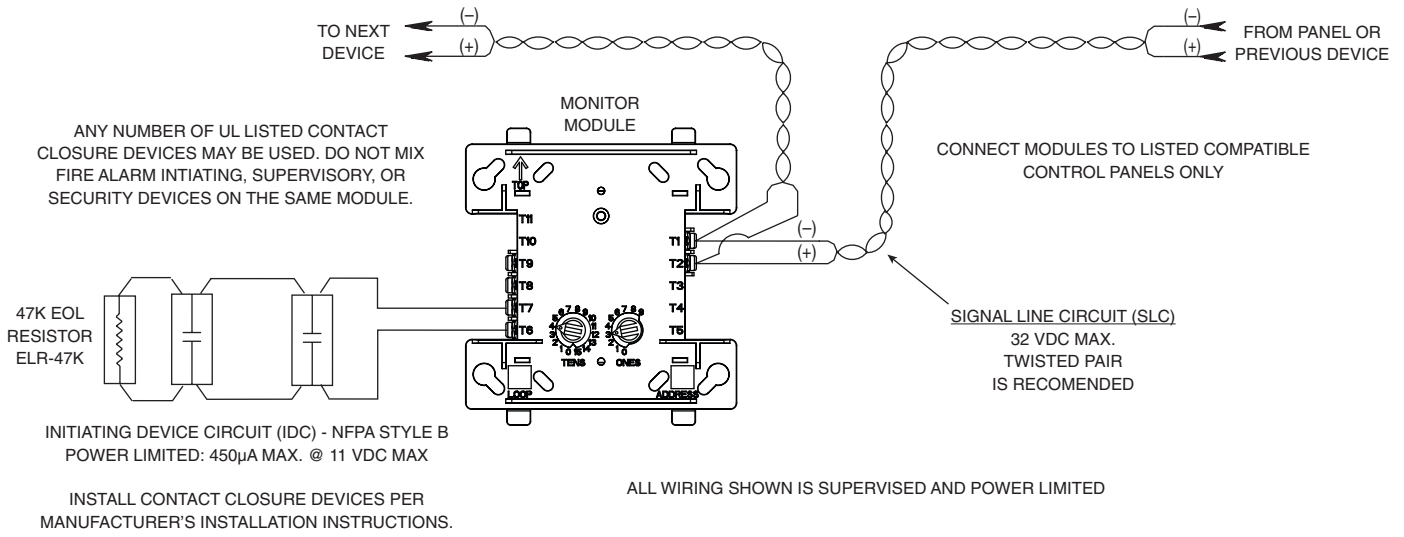
WIRING

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.

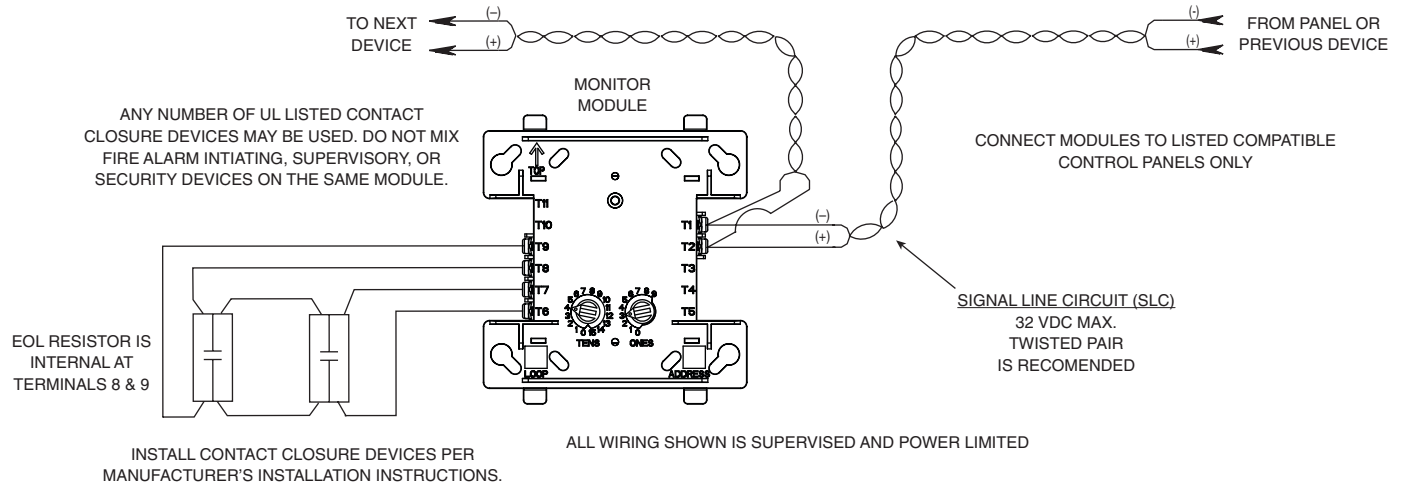
FIGURE 3. TYPICAL 2-WIRE INITIATING CIRCUIT CONFIGURATION, NFPA STYLE B OR SECURITY SYSTEMS:

NOTE: For UL Listed security installations, the FMM-1 must be mounted within the control panel enclosure.



C0918-00

FIGURE 4. TYPICAL 4-WIRE FAULT TOLERANT INITIATING CIRCUIT CONFIGURATION, NFPA STYLE D:



C0919-02

NOTIFIER by Honeywell

12 Clintonville Road
Northford, CT 06472-1653
Phone: 203.484.7161

FRM-1 Relay Control Module

SPECIFICATIONS

Normal Operating Voltage:	15 to 32 VDC
Maximum Current Draw:	6.5 mA (LED on)
Average Operating Current:	230µA direct poll; 255µA group poll
EOL Resistance:	Not used
Temperature Range:	32˚F to 120˚F (0˚C to 49˚C)
Humidity:	10% to 93% Non-condensing
Dimensions:	4.675˝ H x 4.275˝ W x 1.4˝ D (Mounts to a 4˝ square by 2⅛˝ deep box.)
Accessories:	SMB500 Electrical Box; CB500 Barrier

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

BEFORE INSTALLING

This information is included as a quick reference installation guide. Refer to the appropriate Notifier 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.

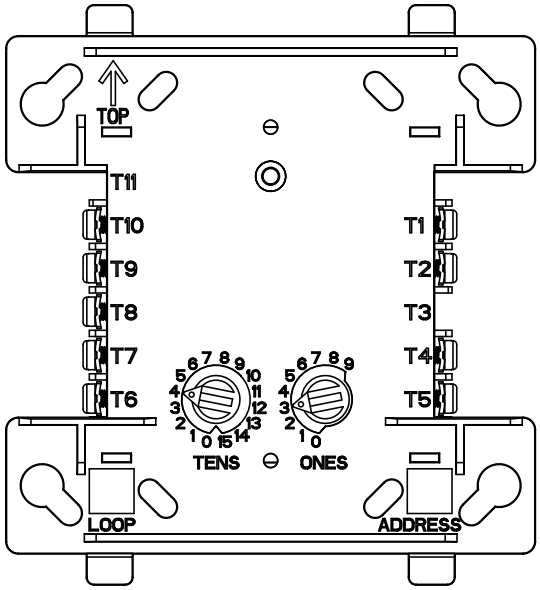
GENERAL DESCRIPTION

The FRM-1 Relay Control 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 allows a compatible control panel to switch discrete contacts by code command. The relay contains two isolated sets of Form-C contacts, which operate as a DPDT switch and are rated in accordance with the table in the manual. Circuit connections to the relay contacts are not supervised by the module. The module also has a panel controlled LED indicator. This module can be used to replace a CMX-2 module that has been configured for Form-C operation.

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:



C1071-00

MOUNTING

The FRM-1 mounts directly to 4-inch square electrical boxes (see Figure 2A). The box must have a minimum depth of 2⅛ inches. Surface mounted electrical boxes (SMB500) are available from Notifier. The module can also mount to the DNR(W) duct housing.

FIGURE 2A. MODULE MOUNTING WITH BARRIER:

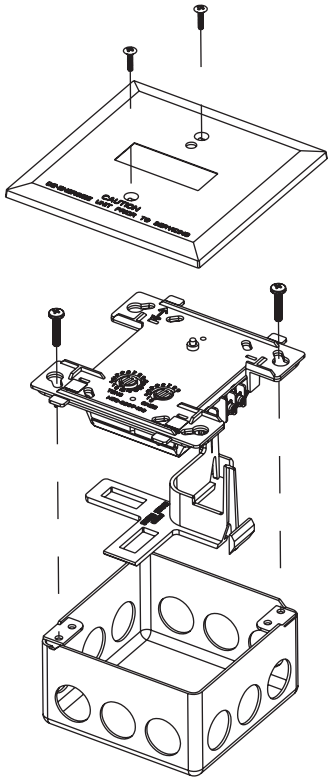
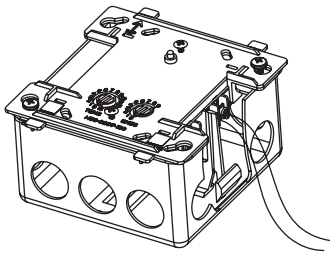


FIGURE 2B:



C1070-00

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).

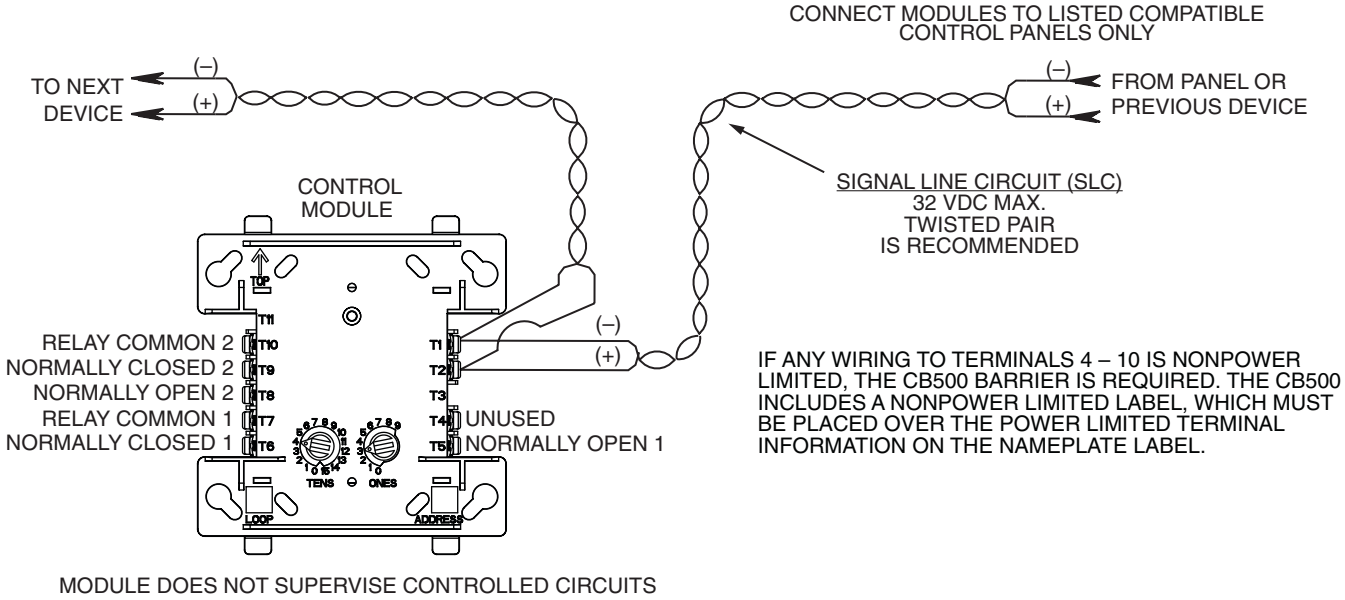
1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams.
2. Set the address on the module per job drawings.
3. Secure module to electrical box (supplied by installer), see Figure 2A.

Wire should be stripped to the appropriate length (recommended strip length is 1/4" to 3/8"). Exposed conductor should be secured under the clamping plate and should not protrude beyond the terminal block area. Caution: Do not loop wire under terminals. Break wire run to provide supervision of connections.

⚠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.

FIGURE 3. RELAY MODULE WIRING DIAGRAM:



*NOTE: ANY FAULT IN THE POWER SUPPLY IS LIMITED TO THAT ZONE AND DOES NOT RESULT IN A FAULT IN A SEPARATE ZONE.

C0946-00

ISO-X FAULT ISOLATOR MODULE INSTALLATION INSTRUCTIONS

SPECIFICATIONS

Normal Operating Voltage:	15-32 VDC
Stand-By Current:	450µA (not isolating, relay closed)
Temperature Range:	32°F to 120°F (0°C to 49°C)
Humidity:	10% to 93% Non-condensing
Dimensions:	$4^1/_2$″ H × 4″ W × $^1/_4$″ D (Mounts to a 4″ square by $2^1/_8$″ deep box)

This information is included as a quick reference installation guide. Refer to the appropriate Notifier 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

ISO-X FAULT ISOLATOR MODULES enable part of the communications loop to continue operating when a short circuit occurs on it. An LED indicator blinks in the normal condition and turns on during a short circuit condition. The module will automatically restore the entire communications loop to the normal condition when the short circuit is removed.

COMPATIBILITY REQUIREMENTS

To insure proper operation, these modules shall be connected to compatible Notifier system control panels only.

NOTE: In general, up to 25 addressable devices may be grouped between isolator modules. However, for the purposes of determining the number of devices between isolator modules, one IPX-751 is equivalent to 12 addressable devices. For example, (13) SDX-751's and (1) IPX-751 may be grouped between two isolator modules.

MOUNTING

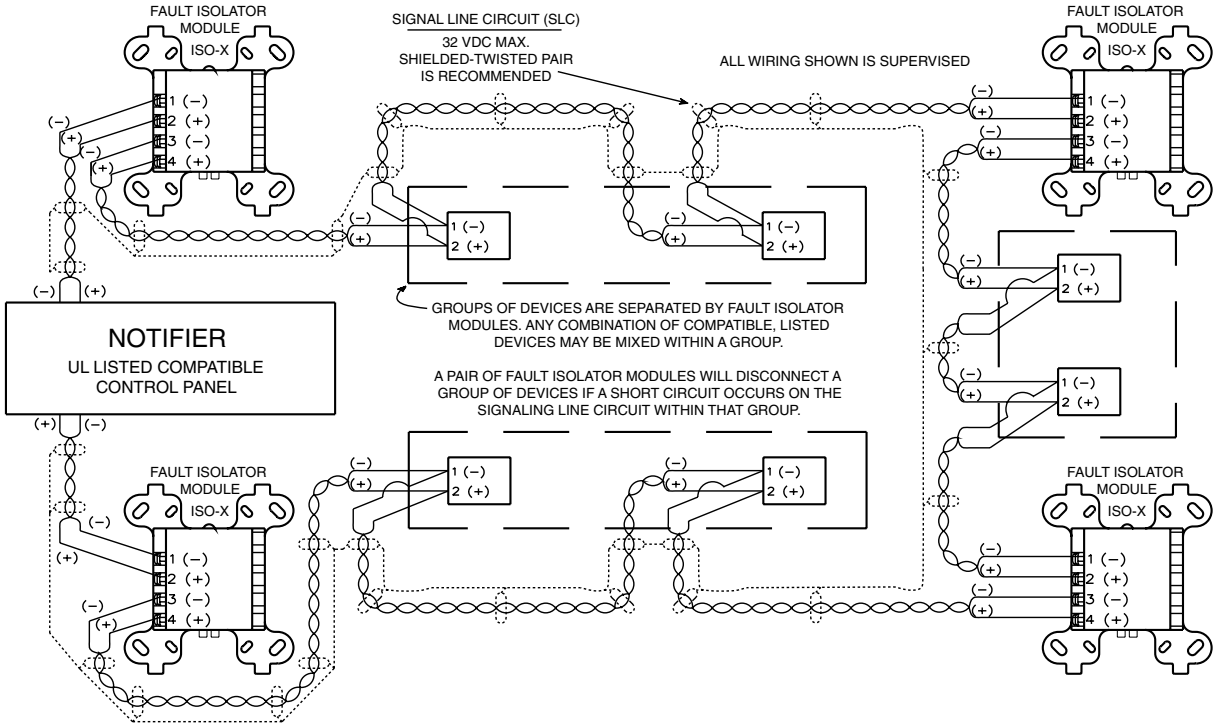
ISO-X modules mount directly to 4 inch square electrical boxes. The box must have a minimum depth of $2^1/_8$".

WIRING

NOTE: All wiring must conform to applicable local codes, ordinances, and regulations.

1. Install module wiring in accordance with the job drawings and the wiring diagrams in Figure 1.
2. Secure module to electrical box (supplied by installer).

FIGURE 1. FAULT ISOLATOR MODULE WIRING:



C0774-01

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.

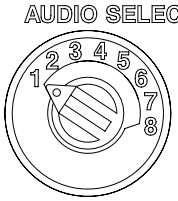
To select the tone, turn the rotary switch on the back of the product to the desired setting. (See Figure 1.) Available horn settings can be found in Table 1. Available chime settings can be found in Table 2.

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



A0518.00

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

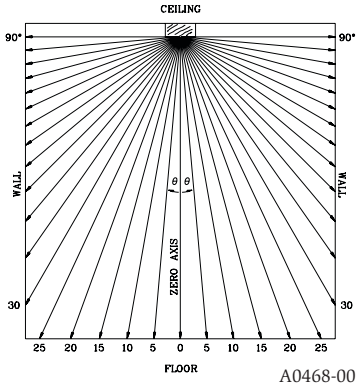


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FIGURE 4. LIGHT OUTPUT – HORIZONTAL DISPERSION

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

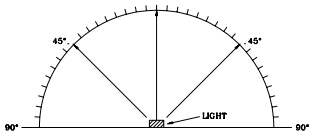

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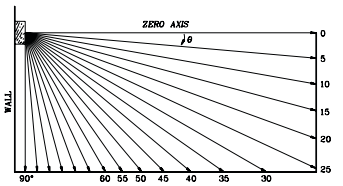
FIGURE 5. VERTICAL DISPERSION, WALL TO FLOOR

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.

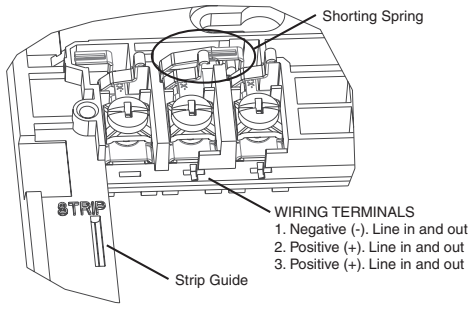
⚠CAUTION

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

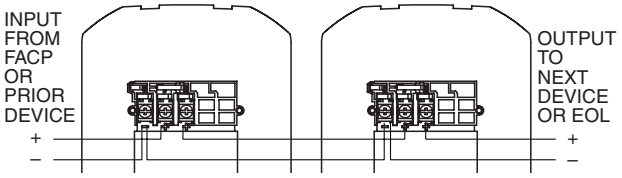

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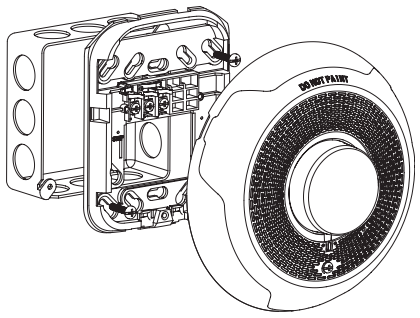
FIGURE 8. MOUNTING



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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

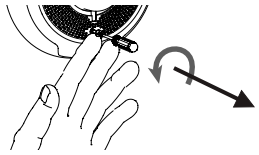

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TABLE 5. CEILING-MOUNT CHIME STROBE CURRENT DRAW (mA) AND SOUND OUTPUT (dBA)

			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:

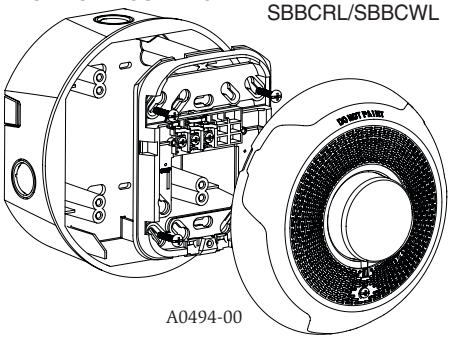


FIGURE 11. CUT-OUTS FOR SPK AND STR

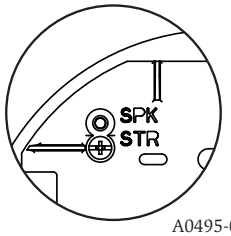
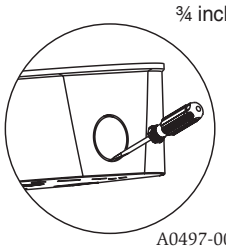
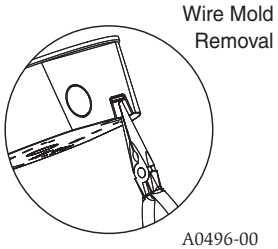


FIGURE 12. KNOCKOUT AND V500/V700 REMOVAL FOR SURFACE MOUNT BACK BOX





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.

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

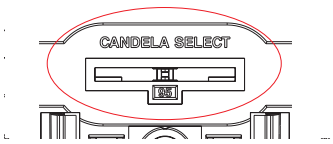


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TABLE 3. WALL-MOUNT STROBE CURRENT DRAW (mA)

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

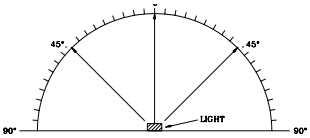

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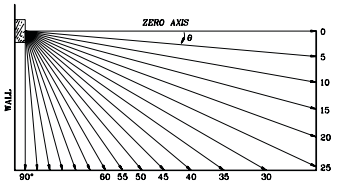
FIGURE 4. VERTICAL DISPERSION– WALL TO FLOOR

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



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*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.

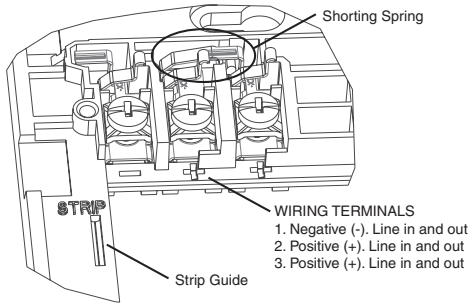
⚠CAUTION

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

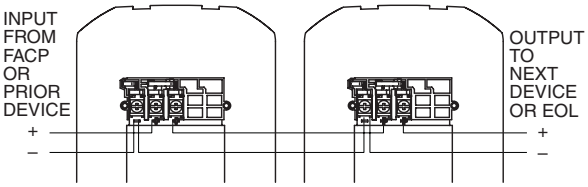


A0475-01

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.)

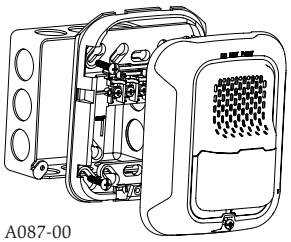
2. Connect field wiring according to terminal designations. (See Figures 5 and 6.)

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

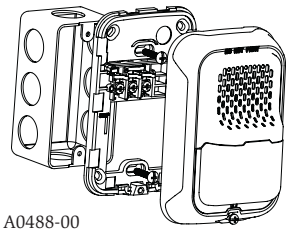
FIGURES 7 AND 8. MOUNTING

Standard Device



A087-00

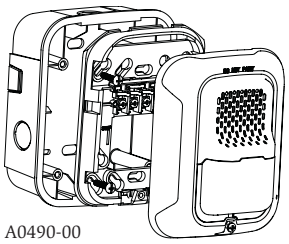
Compact Device



A0488-00

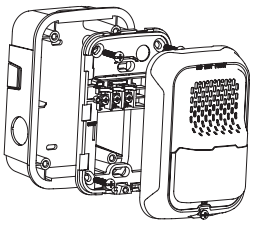
FIGURES 9 AND 10. SURFACE MOUNT BACK BOX MOUNTING:

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.

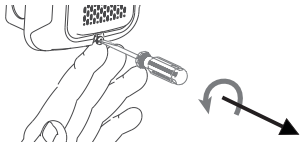
6. To remove the knockout turn pliers up, as shown in Figure 13.

TAMPER SCREW

For tamper resistance, the standard captive screw may be replaced with the enclosed Torx screw.

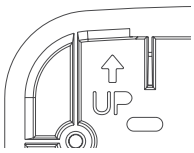
1. To remove the captive screw, back out the screw and apply pressure to the back of the screw until it disengages from the housing. Replace with the supplied Torx screw. (See Figure 11.)

FIGURE 11. TAMPER SCREW



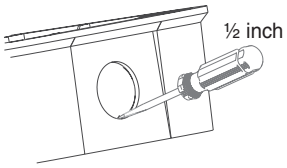
A0478-00

FIGURE 12. SMBB UP ARROW



A0481-00

FIGURE 13. KNOCKOUT AND V500/V700 REMOVAL FOR SURFACE MOUNT BACK BOX



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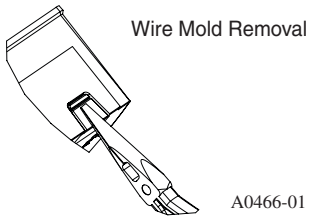


A0466-01

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

Dual Voltage Speakers for Fire and ECS/MNS Systems – Wall and 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:
Wall Speakers: SPRL, SPWL
Ceiling Speakers: SPCRL, SPCWL

PRODUCT SPECIFICATIONS

Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
Humidity Range:	10 to 93% Non-condensing
Nominal Voltage:	25 Volts or 70.7 Volts
Maximum Supervisory Voltage:	50 VDC
Speaker Frequency Range:	400 – 4000 Hz
Power Settings:	¼, ½, 1, 2 Watts
Input terminal wire gauge:	12 to 18 AWG

PRODUCT DIMENSIONS			
WALL PRODUCTS	Length	Width	Depth
Wall Speaker	6.520" (165 mm)	5.00" (127 mm)	0.97" (24.6 mm)
CEILING PRODUCTS	Length	Width	Depth
Ceiling Speaker	6.8" (173 mm)	N/A	1.00" (25.4mm)

MOUNTING BOX OPTIONS
SPEAKERS
4" x 4" x 2 1/8" or deeper

NOTICE: This manual shall be left with the owner/user of this equipment.

BEFORE INSTALLING

Please read the System Sensor Voice Evacuation Application Guide, which provides detailed information on speaker 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 line of speakers is designed to be used at either 25 or 70.7 volts, and operate at any one of four input power levels. Our speakers are suitable for dry and damp environments. These products are electrically backwards compatible with previous generation of System Sensor speakers. With its low total harmonic distortion, the System Sensor SPL series offers high fidelity sound output. Wall and ceiling products may be used interchangeably (wall products may be used on ceiling and ceiling product may be used on wall).

The speakers, and all power level settings, are listed to ANSI/UL 1480 requirements for public mode applications.

FIRE ALARM SYSTEM CONSIDERATIONS

All wiring must be installed in compliance with the National Electrical Code (NEC) and applicable local codes. System Sensor recommends installing fire alarm speakers in compliance with NFPA 72, ANSI/UL 1480 and NEC 760.

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.

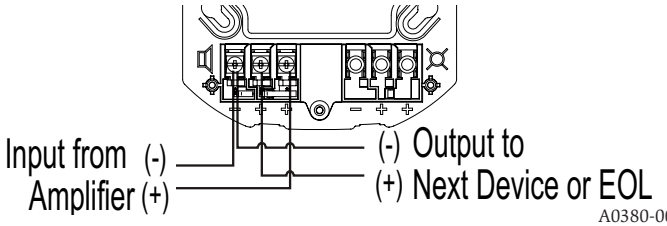
Make wire connections by stripping about 3/8" of insulation from the end of the wire. Then slide the bare end of the wire under the appropriate clamping plate and tighten the clamping plate screw.

See Figure 1 for wiring terminals and strip guide reference.

1. Connect the speaker as shown in Figure 1.

2. There are two rotary switches on the back of the product. The first switch is used to select either 25 or 70.7 volts input and the second switch is used to select the input power of ¼, ½, 1 or 2 watts. (See Figure 2.)

FIGURE 1. WIRING DIAGRAM AND WIRING TERMINALS



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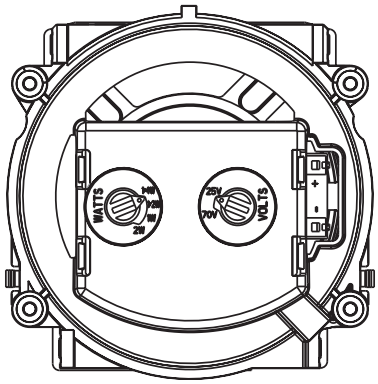
Wiring Terminals	
1. Negative (-). Line in and out 2. Positive (+). Line in and out 3. Positive (+). Line in and out	NOTE: Do not loop electrical wiring under terminal screws. Wires connecting the device to the control panel must be broken at the device terminal connection in order to maintain electrical supervision.

FIGURE 2. SPEAKER WATTAGE AND VOLTAGE SETTINGS



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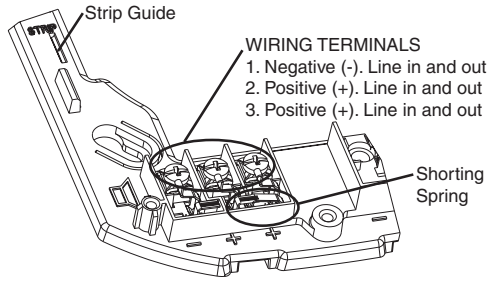
SHORTING SPRING FEATURE

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 3.) This spring will automatically disengage when the product is installed, to enable supervision of the final system.

FIGURE 3. SHORTING SPRING



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AVAILABLE POWER SETTINGS

System Sensor offers a wide range of power settings for your life safety needs, including ¼, ½, 1, and 2W.

Sound levels data per UL 1480 can be found in Table 1. Directional characteristics can be found in Table 2.

TABLE 1. SOUND LEVELS FOR EACH TRANSFORMER POWER SETTING

Setting	UL Reverberant (dBA @10 ft)	UL Anechoic (dBA @10 ft)
¼ W	79	79
½ W	82	82
1 W	85	85
2 W	88	88

⚠CAUTION

Signal levels exceeding 130% rated signal voltage can damage the speaker. Consequently, an incorrect tap connection may cause speaker damage. This means that if a 25V tap is selected when a 70.7V amplifier is being used, speaker damage may result. Therefore, be sure to select the proper taps for the amplifier voltage/input power level combination being used.

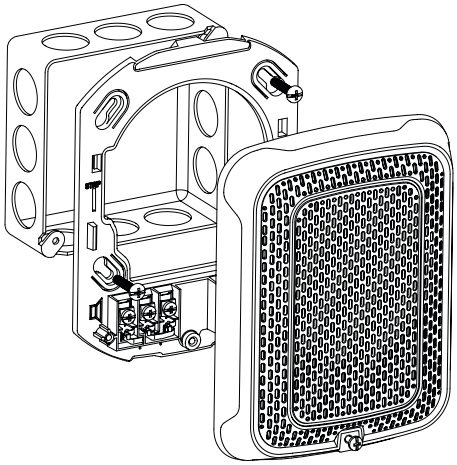
TABLE 2 DIRECTIONAL CHARACTERISTICS

Angle (degrees)	Decibels
70°	-3dB
90°	-6dB

MOUNTING

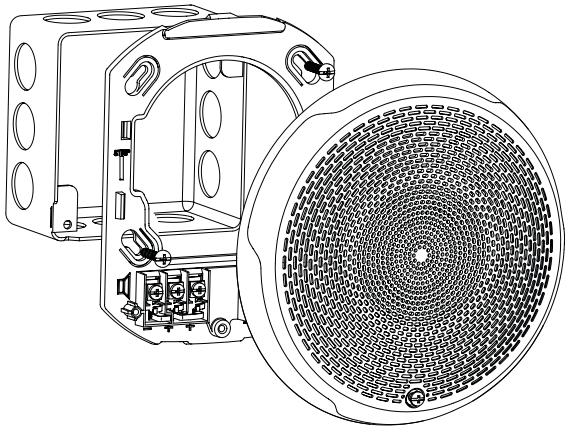
1. Attach mounting plate to junction box. The mounting plate is compatible with 4" x 4" x 2⅛" or deeper junction boxes. (See Figures 4 and 5.)

FIGURE 4. WALL SPEAKER



A0500-00

FIGURE 5. CEILING SPEAKER



A0501-00

1. Connect field wiring to terminals, as shown in Figure 1.

2. 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.

3. To attach product to mounting plate, remove the protective dust cover, hook tabs on the top of the product housing into the grooves on mounting plate.

4. 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.

⚠CAUTION

The "hold in place" snaps are not intended to secure the product to the back box. The product must be secured to the back box using the screws provided.

⚠CAUTION

Factory finish should not be altered: Do not paint!

⚠CAUTION

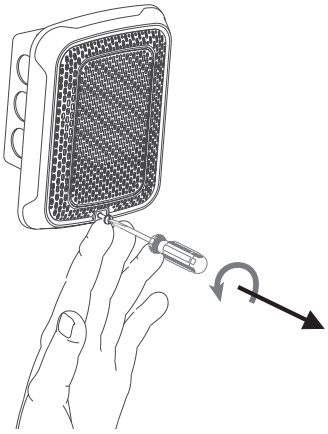
Do not over tighten mounting plate screws; this may cause mounting plate to flex.

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 until it disengages from the housing. Replace with the supplied Torx screw. (See Figure 6.)

FIGURE 6. TAMPER SCREW



A0502-00

NOTE: Wall speaker shown in this example.

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 wall see Figure 7, and for ceiling see Figure 8.

FIGURE 7. WALL SURFACE MOUNT BACK BOX

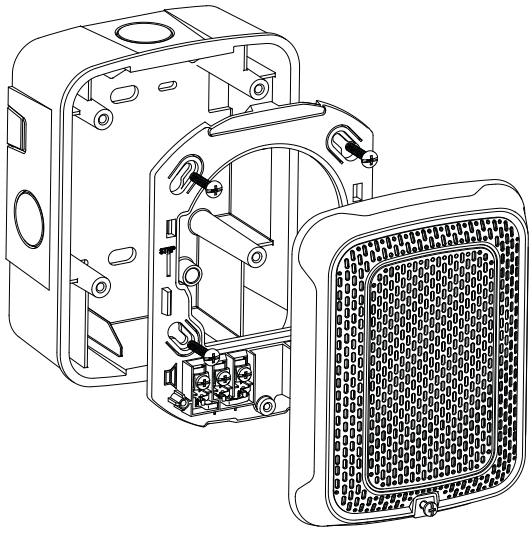


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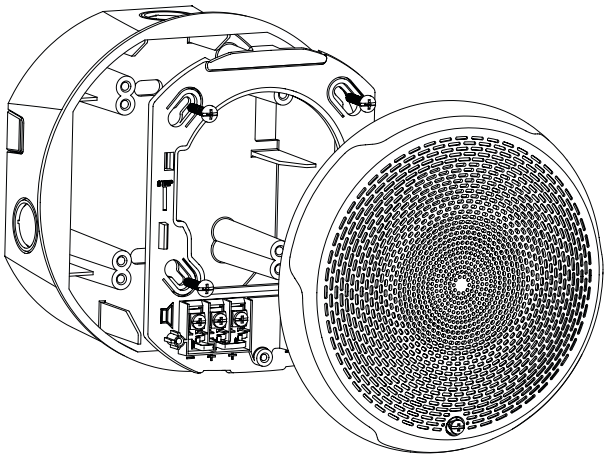
FIGURE 8. CEILING SURFACE MOUNT BACK BOX



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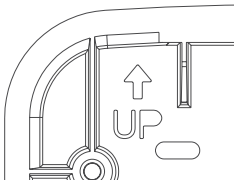
2. The wall mount box must be mounted with the up arrow pointing up. (See Figure 9.)

FIGURE 9. SMBB UP ARROW



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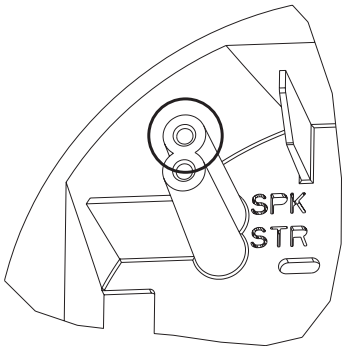
NOTE: Ceiling Surface Mount Back Box, SBBCRL/CWL is a common back box for ceiling horn strobes, strobes and ceiling speakers and speaker strobes. Use the top mounting holes for ceiling speaker and speaker strobe products. (See Figure 10.)

FIGURE 10. CEILING SURFACE MOUNT BACK BOX MOUNTING KEY HOLE PATTERN



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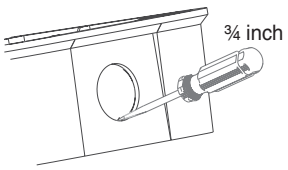
3. Threaded knockout holes are provided for the sides of the box for ¾ inch conduit adapter. Knockout holes in the back of the box can be used for ¾ inch rear entry.

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 11.

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.

FIGURE 11 AND 12. KNOCKOUT REMOVAL FOR SURFACE MOUNT BACK BOX AND WIRE MOLD REMOVAL



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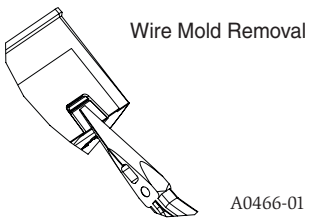

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NOTE: Use caution not to strike the knockout near the top edge of the wall version of the surface mount back box.

Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

THE LIMITATIONS OF SPEAKERS

Always make sure that the individual speakers are tested after installation per NFPA regulations. The speakers may not be heard. The loudness of the speaker meets (or exceeds) current Underwriters Laboratories' standards. However, the speaker may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The speaker 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 speaker may not be heard by persons who are hearing impaired.

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.

Selectable Output Speaker Strobes – Wall and 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:
Wall Speakers: SPSRL, SPSWL, SPSRL-P, SPSWL-P, SPSRL-SP, SPSWL-CLR-ALERT
Ceiling Speakers: SPSCRL, SPSCWL, SPSCWL-P, SPSCWL-SP, SPSCWL-CLR-ALERT

PRODUCT SPECIFICATIONS

Standard Operating Temperature:	32°F to 120°F (0°C to 49°C)
Humidity Range:	10 to 93% Non-condensing
Nominal Voltage (speakers):	25 Volts or 70.7 Volts
Maximum Supervisory Voltage:	50 VDC
Speaker Frequency Range:	400 – 4000 Hz
Power Settings:	¼, ½, 1, 2 Watts
Input terminal wire gauge:	12 to 18 AWG
Strobe Flash Rate:	1 flash per second
Nominal Voltage (strobes):	Regulated 12VDC, regulated 24VDC or 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)

DIMENSIONS FOR PRODUCTS AND ACCESSORIES			
WALL PRODUCTS	Length	Width	Depth
Wall Speaker Strobe	6.5" (165 mm)	5.00" (127 mm)	2.30" (58.4 mm)
CEILING PRODUCTS	Length	Width	Depth
Ceiling Speaker Strobe	6.8" (173 mm)	N/A	2.87" (73mm)
WALL SURFACE MOUNT BACK BOX	Length	Width	Depth
Speaker Strobe with SBBSPRL/WL Surface Mount Back Box	6.62" (168mm)	5.12" (130 mm)	2.30" (58.4 mm)
CEILING SURFACE MOUNT BACK BOX	Diameter		Depth
Speaker Strobe with SBBCRL/WL Surface Mount Back Box	6.92" (176 mm)		5.37" (116mm)

MOUNTING BOX OPTIONS
SPEAKER STROBES
4" x 4" x 2⅛" or deeper, SBBSPRL/WL (wall), SBBCRL/WL (ceiling)

NOTICE: This manual shall be left with the owner/user of this equipment.

BEFORE INSTALLING

Please read the System Sensor Voice Evacuation Application Guide, which provides detailed information on speaker notification devices, wiring and special applications. Copies of this manual are available from System Sensor. NFPA 72 and NEMA guidelines should be observed. System Sensor also recommends installing fire alarm speakers in compliance with NFPA 72, ANSI/UL 1480 and NEC 760

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 indoor speaker strobes come with 7 field selectable candela setting. The strobe portion is designed to be used in 12 VDC, 24VDC, or 24V FWR (full wave rectified) systems. The speaker is designed to be used at either 25 or 70.7 volts, and operate at any one of four input power levels. Our speaker strobes are suitable for dry and damp environments. These products are electrically backwards compatible with previous generation of System Sensor speaker strobes. With its low total harmonic distortion, the System Sensor SPL series offers high fidelity sound output.

Speakers Strobes are public mode notification appliances intended to alert occupants of a life safety event. The speaker is listed to ANSI/UL 1480 (public mode) and the strobe is listed to ANSI UL 1638 (public mode).

FIRE ALARM SYSTEM CONSIDERATIONS

System Sensor also recommends installing fire alarm speakers in compliance with NFPA 72, ANSI/UL 1480 and NEC 760.

SYSTEM DESIGN

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 for 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. Note that if Class A wiring is installed, the wire length may be up to twice as long as it would be circuits that are not fault tolerant. The total number of strobes on a single NAC must not exceed 69 for 24 volt applications.

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 1.)

The candela setting can also be verified by looking into the small window on the front of the unit. See Tables 1 and 2 for candela settings for wall and ceiling products. All products meet the light output profiles specified in the appropriate UL Standards. (See Figures 2–4.)

FIGURE 1. CANDELA SELECTOR

A0486-00

CURRENT DRAW AND AUDIBILITY RATINGS

For the strobe, the current draw for each setting is listed in Tables 1 and 2.

TABLE 1. 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.

TABLE 2. 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.

FIGURE 2. WALL 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

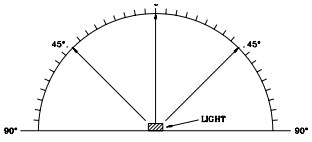

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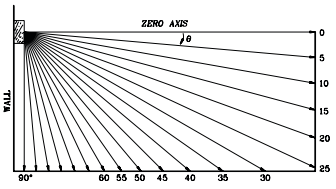
FIGURE 3. VERTICAL DISPERSION, WALL TO FLOOR

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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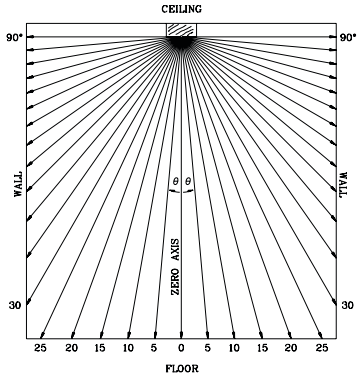
*Tolerance of ± 1 degree is permitted.

FIGURE 4. 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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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.

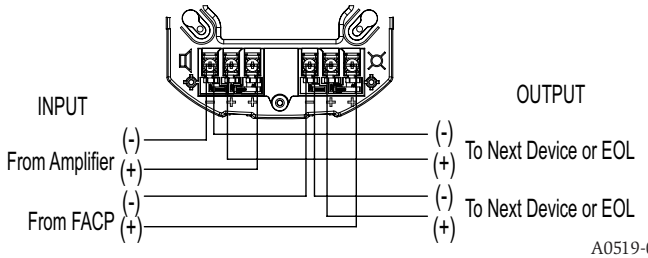
Make wire connections by stripping about 3/8" of insulation from the end of the wire. Then slide the bare end of the wire under the appropriate clamping plate and tighten the clamping plate screw.

See Figure 5 for wiring terminals and strip guide reference.

1. Connect the speaker as shown in Figure 5.

2. There are two rotary switches on the back of the product. The first switch is used to select either 25 or 70.7 volts input and the second switch is used to select the input power of ¼, ½, 1 or 2 watts. (See Figure 6.)

FIGURE 5. WIRING DIAGRAM AND WIRING TERMINALS



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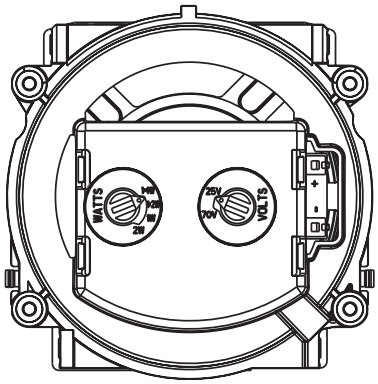
Wiring Terminals	NOTE: Do not loop electrical wiring under terminal screws. Wires connecting the device to the control panel must be broken at the device terminal connection in order to maintain electrical supervision.
1. Negative (-). Line in and out 2. Positive (+). Line in and out 3. Positive (+). Line in and out	

FIGURE 6. SPEAKER WATTAGE AND VOLTAGE SETTINGS



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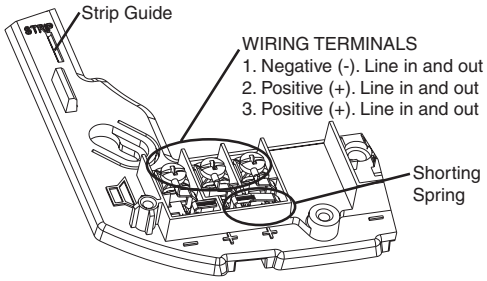
SHORTING SPRING FEATURE

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 7.) This spring will automatically disengage when the product is installed, to enable supervision of the final system.

FIGURE 7. SHORTING SPRING



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AVAILABLE POWER SETTINGS

System Sensor offers a wide range of power settings for your life safety needs, including ¼, ½, 1, and 2W.

Sound levels data per UL 1480 can be found in Table 3.

TABLE 3. SOUND LEVELS FOR EACH TRANSFORMER POWER SETTING

Setting	UL Reverberant (dBA @10 ft)	UL Anechoic (dBA @10 ft)
¼ W	77	77
½ W	80	80
1 W	83	83
2 W	86	86

⚠CAUTION

Signal levels exceeding 130% rated signal voltage can damage the speaker. Consequently, an incorrect tap connection may cause speaker damage. This means that if a 25V tap is selected when a 70.7V amplifier is being used, speaker damage may result. Therefore, be sure to select the proper taps for the amplifier voltage/input power level combination being used.

MOUNTING

1. Attach mounting plate to junction box. The mounting plate is compatible with 4" x 4" x 2⅛" or deeper junction boxes. (See Figures 8 and 9.)

2. Connect field wiring to terminals, as shown in Figure 5.

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, remove the protective dust cover, hook tabs on the top of the product housing into the grooves on mounting plate.

5. 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.

6. Secure product by tightening the single mounting screw in the front of the product housing.

⚠CAUTION

The "hold in place" snaps are not intended to secure the product to the back box. The product must be secured to the back box using the screws provided.

⚠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 8. WALL SPEAKER

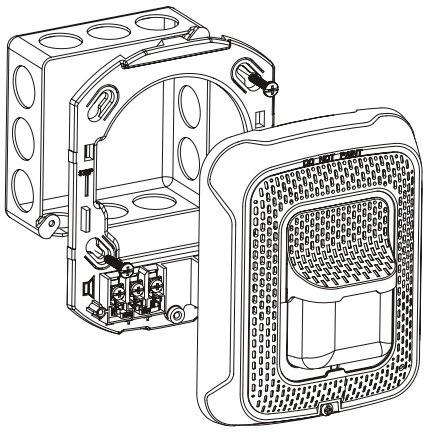

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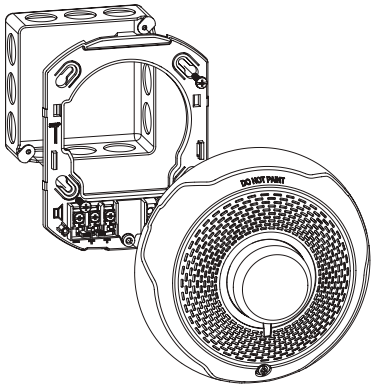
FIGURE 9. CEILING SPEAKER



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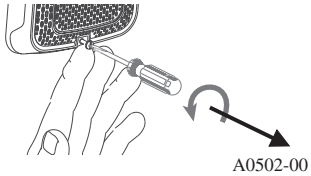
TAMPER SCREW

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 10.)

FIGURE 10. TAMPER SCREW



A0502-00

NOTE: Wall speaker shown in this example.

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 wall see Figure 11, and for ceiling see Figure 12.

FIGURE 11. WALL SURFACE MOUNT BACK BOX

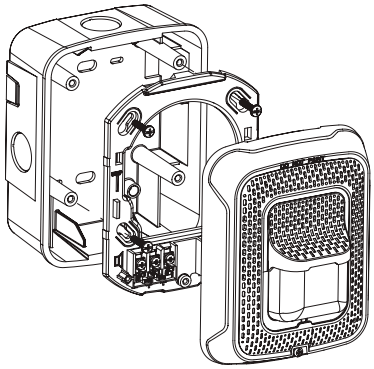


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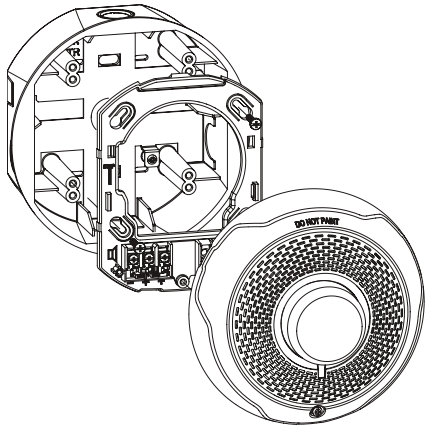
FIGURE 12. CEILING SURFACE MOUNT BACK BOX



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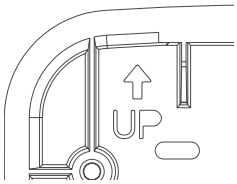
2. The wall mount box must be mounted with the up arrow pointing up. (See Figure 13.)

FIGURE 13. SMBB UP ARROW



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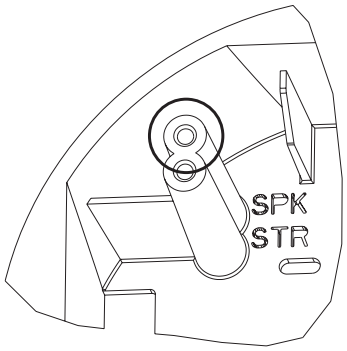
NOTE: Ceiling Surface Mount Back Box, SBBCR/CWL is a common back box for ceiling horn strobes, strobes and ceiling speakers and speaker strobes. Use the top mounting holes for ceiling speaker and speaker strobe products. (See Figure 14.)

FIGURE 14. CEILING SURFACE MOUNT BACK BOX MOUNTING KEY HOLE PATTERN



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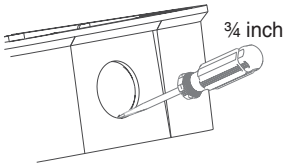
3. Threaded knockout holes are provided for the sides of the box for ¾ inch conduit adapter. Knockout holes in the back of the box can be used for ¾ inch rear entry.

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 15A. **NOTE: 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 15B.

FIGURE 15A AND 15B . KNOCKOUT AND WIRE MOLD REMOVAL FOR SURFACE MOUNT BACK BOX



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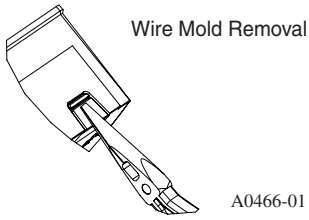


A0466-01

NOTE: Use caution not to strike the knockout near the top edge of the wall version of the surface mount back box.

Please refer to insert for the Limitations of Fire Alarm Systems

⚠WARNING

THE LIMITATIONS OF SPEAKERS

Always make sure that the individual speakers are tested after installation per NFPA regulations. The speakers may not be heard. The loudness of the speaker meets (or exceeds) current Underwriters Laboratories' standards. However, the speaker may not alert a sound sleeper or one who has recently used drugs or has been drinking alcoholic beverages. The speaker 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 speaker may not be heard by persons who are hearing impaired.

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

System Sensor speakers 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.

COOPER Notification
273 Branchport Avenue
Long Branch, N.J. 07740
(800) 631-2148
www.coopernotification.com

Thank you for using our products.

INSTALLATION INSTRUCTIONS
SERIES STH MSR CLUSTER SPEAKER ASSEMBLY

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

MODELS:

STH-2 MSR	Red	2-STH-15SR UL Listed under UL 1480 for Speaker Appliances and 1-DC-MAX-C UL Listed under UL-1638 for strobe appliances.
STH-3 MSR	Red	3-STH-15SR UL Listed under UL 1480 for Speaker Appliances and 1-DC-MAX-C UL Listed under UL-1638 for strobe appliances.
STH-4 MSR	Red	4-STH-15SR UL Listed under UL 1480 for Speaker Appliances and 1-DC-MAX-C UL Listed under UL-1638 for strobe appliances.

GENERAL:

The series STH-MSR Cluster Speaker Assembly is designed for ceiling or wall mounting in high ambient noise level environments. The Series STH-MSR Cluster Speakers are a speaker/visual alerting systems, equipped with UL Listed STH-15SR supervised horn loudspeakers, and a UL Listed DC-MAX-C Strobe, mounted to a galvanized steel enclosure, 10"W X 10"L X 6"D. Speakers and Strobe are pre-wired to the internal terminal block. Each speaker can be wired for single or multiple speaker circuit operation.

The STH-15SR loudspeaker provides multiple power requirements with high dBA output at each power tap. STH models offer a choice of field selectable taps, 1 to 15 Watts for either 25VRMS or 70VRMS audio systems. The Series STH design incorporates a compression driver, mounted on a double re-entrant horn for maximum output at minimum power across a UL rated frequency range of 400 to 4,000Hz and an anechoic range of 400 to 14,000Hz. The individual speaker line inputs are compatible with standard supervision of circuit wiring by a Voice Control Panel. A capacitor is wired in series with the multi-tap transformer for this purpose. Each loudspeaker meets or exceeds the UL listed standards for audible signal appliances and is capable of operating within the ambient temperature range of 66º C (150º F) to -35ºC (-30ºF). This unit complies with UL Standard 1480 (Speakers for Fire Protective Signaling Systems). Additional information is available from the Installation Sheet P82697.

The DC-MAX-C strobe is a 5 inch tall, 6.2 inch diameter, cylindrical strobe light. The DC-MAX-C strobe provides a highly visible, clear lens, 100 candela and 60 double flashes per minute that can be seen in all directions. It operates on all standard voltages from 10.5VDC to 31.0VDC. The strobe appliance contains a blocking diode that allows this device to be supervised using standard reverse polarity. The DC-MAX-C strobe complies with UL Standard 1638 and is capable of operating within the ambient temperature range of 66ºC (150º F) to -35ºC (-30ºF). Additional information is available from the Installation Sheet P83857.

NOTE: All **CAUTIONS** and **WARNINGS** are identified by the symbol ⚠. All warnings are printed in bold capital letters.

⚠ **WARNING: PLEASE READ THESE INSTRUCTIONS CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

SPECIFICATIONS (SPEAKER):

Each speaker has a slotted rotating switch used to change the dB setting for the output. Table 1 shows the settings and the outputs.

Table 1: Wattage Selector Switch Settings and dBA

Setting	70V	dB	25V	dB
1	0.9W	91	Not Used	Not Used
2	1.8W	93	Not Used	Not Used
3	3.8W	96	0.48W	87
4	7.5W	98	0.94W	90
5	15.0W	101	1.8W	93
6	Not Used	Not Used	7.5W	98
7	Not Used	Not Used	15.0W	100

⚠ **WARNING: COOPER NOTIFICATION STRONGLY RECOMMENDS THAT THE VOLTAGE APPLIED TO THESE PRODUCTS BE WITHIN THEIR RATED INPUT VOLTAGE RANGE. THE APPLICATION OF IMPROPER VOLTAGE MAY RESULT IN DEGRADED OPERATION OR DAMAGE TO THESE PRODUCTS, WHICH COULD RESULT IN PROPERTY DAMAGE AND SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

NOTES:
1. Power Handling Capacity (RMS): 15W
2. Sound Dispersion: 70 Degrees
3. Constant Voltage Line: 25Vrms or 70Vrms
4. Frequency Response: UL rated at 400 - 4,000Hz (@ Full Rated Output), Anechoic 400 – 14,000 Hz.
5. Sound Level (Peak): 120dB @ 15W, 1 Meter
6. Dimensions: 7-7/8W X 8-3/4H X 9-5/16L

⚠ **CAUTION:** Do not place switch in settings marked "not used". Failure to comply with these restrictions may cause damage to components and will void the warranty.

STROBE:

Table 2A: Rating Per UL					
Model Code	Lens Color	Rated Voltage	Input Current	Flash Rate	Typ. Eff. Candela
DC-MAX-C	Clear	10.5 to 31.0 VDC	See Table 2b	60/Min Typical	100cd

Table 2B: DC-MAX-C Input Current Versus Input Voltage		
Voltage (VDC)	12	24
Current (mA)	1010	470

NOTES:
1. Temperature range for all models is -30°F to +150°F (-35°C to +66°C)
2. Flash energy and flash rate are specified for double flash operation.
3. Effective candela is measured per IES specifications.

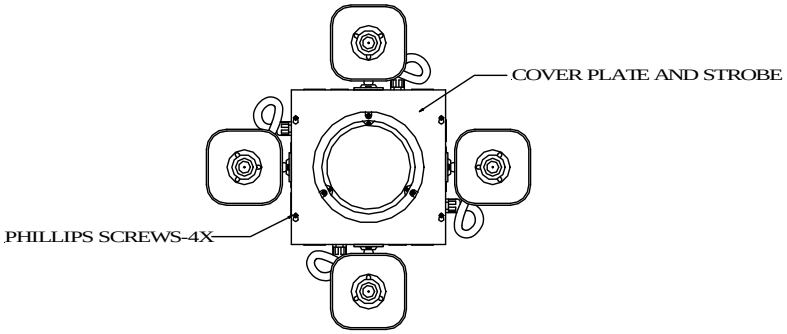
INSTALLATION INSTRUCTIONS:

SPEAKER WATTAGE SELECTOR SWITCH SETTING:
1. Remove the cable entrance interface adaptor and gasket. (See Installation Sheet P82697)
2. Adjust the Speaker Wattage Selector Switch for the desired dB and wattage setting (Table 1) for each speaker.
3. Replace the cable entrance interface adaptor and gasket.

APPLICATION NOTES:

1. Loosen the 4 Phillips screws holding the cover plate and MAX-DC-C Strobe to the enclosure box. (Figure 1)
2. Remove the cover plate and MAX-DC-C Strobe.

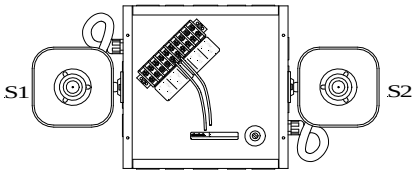
Figure 1: Phillips Screw Location



3. Mount the speaker assembly to the desired location.
4. Punch out desired knockouts and attach conduit and fittings.

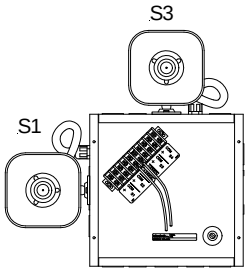
SPEAKER NUMBERING:

Figure 2: STH-2MSR



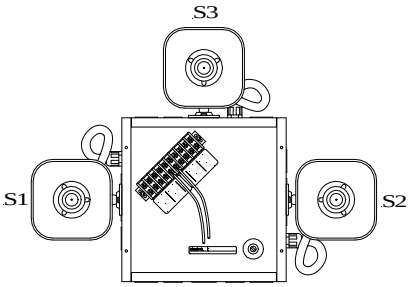
Assembly Weight - 16.7 lbs.

Figure 3: STH-2X-90



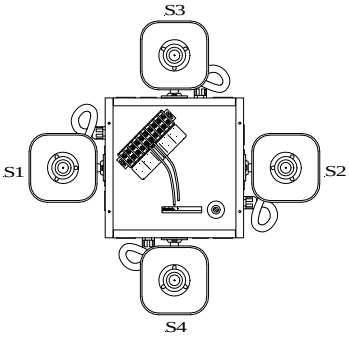
Assembly Weight - 16.7 lbs.

Figure 4: STH-3MSR



Assembly Weight - 21.2 lbs.

Figure 5: STH-4MSR



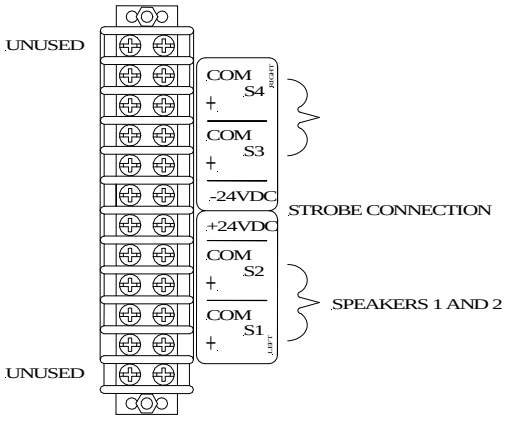
Assembly Weight - 25.7 lbs.

WIRING INFORMATION:

NOTE: The Series MAX Strobe is not designed to operate on a synchronized circuit.

1. Jumper desired speakers together in parallel on the terminal block (Figure 6) using the same gauge wire as input. (Refer to Figure 2, 3, 4 and 5 for proper model numbering sequence.)
2. Attach the speaker input wire to the proper terminals on the terminal block.
3. Attach the 24VDC strobe input wires to the ± 24VDC terminals on the terminal block.

Figure 6: Terminal Block Layout



ASSEMBLY:

1. Connect ± 24VDC pre-wires from the terminal block to the strobe pre-wires on the enclosure box cover plate using the wire-nuts (provided). (Red to red. Black to black.)
2. Replace enclosure box cover to the enclosure box and tighten the 4 Phillips Screws.
3. Adjust the angle for the speakers to point in the directions desired.

⚠ **CAUTION:** Always operate audio amplifiers and speakers within their specified ratings. Excessive input may distort sound quality and may damage audio equipment. Do not exceed +130% of speaker input voltage per UL 1480. Improper input voltage can damage speaker. If distortion is heard, check for clipping of the audio appliance with an oscilloscope and reduce the amplifier input level or gain level to eliminate any clipping.

NOTE: NFPA 72/ANSI 117.1 conform to ADAAG Equivalent Facilitation Guidelines in using fewer, higher intensity strobes within the same protected area.

⚠ **CAUTION:** Check the installation instructions of the manufacturers of other equipment used in the system for any guidelines or restrictions on wiring and/or locating Notification Appliance Circuits (NAC) and notification appliances. Some system communication circuits and/or audio circuits, for example, may require special precautions to assure electrical noise immunity (e.g. audio cross talk).

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Thank you for using our products.

INSTALLATION INSTRUCTIONS
STH-15 HORN SPEAKER WITH MULTI-TAP TRANSFORMER AND CAPACITOR FOR LINE SUPERVISION

Use this product according to this instruction manual. Please keep this instruction manual for future reference.

MODELS:

STH-15S	Grey	UL Listed under UL 1480 for Speaker Appliances
STH-15SR	Red	UL Listed under UL 1480 for Speaker Appliances

GENERAL:
The STH-15 is designed for multiple power requirements with high dBA output at each power tap. STH-15 models offer a choice of field selectable taps, 1 to 15 Watts for either 25VRMS or 70VRMS audio systems. The Series STH-15 design incorporates a compression driver, mounted on a double re-entrant horn for maximum output at minimum power across a frequency range of 400 to 4,000Hz. The speaker line inputs are compatible with standard reverse polarity supervision of circuit wiring by a Fire Alarm Control Panel (FACP). A capacitor is wired in series with the multi-tap transformer for this purpose.

NOTE: All **CAUTIONS** and **WARNINGS** are identified by the symbol ⚠. All warnings are printed in bold capital letters.

⚠**WARNING: PLEASE READ THESE INSTRUCTIONS CAREFULLY. FAILURE TO COMPLY WITH ANY OF THE FOLLOWING INSTRUCTIONS, CAUTIONS AND WARNINGS COULD RESULT IN IMPROPER APPLICATION, INSTALLATION AND/OR OPERATION OF THESE PRODUCTS IN AN EMERGENCY SITUATION, WHICH COULD RESULT IN PROPERTY DAMAGE, SERIOUS INJURY OR DEATH TO YOU AND/OR OTHERS.**

SPECIFICATIONS:

Table 1: Wattage Selector Switch Settings and dBA

Setting	70V	dB	25V	dB
1	0.9W	91	Not Used	Not Used
2	1.8W	93	Not Used	Not Used
3	3.8W	96	0.48W	87
4	7.5W	98	0.94W	90
5	15.0W	101	1.8W	93
6	Not Used	Not Used	7.5W	98
7	Not Used	Not Used	15.0W	100

NOTES:
1. Power Handling Capacity (RMS): 15W
2. Sound Dispersion: 70 Degrees
3. Constant Voltage Line: 25V or 70V
4. Frequency Response: 400 - 4,000Hz (@ Full Rated Output)
5. Sound Level (Peak): 120dB @ 15W, 1 Meter
6. Dimensions: 7-7/8W X 8-3/4H X 9-5/16L

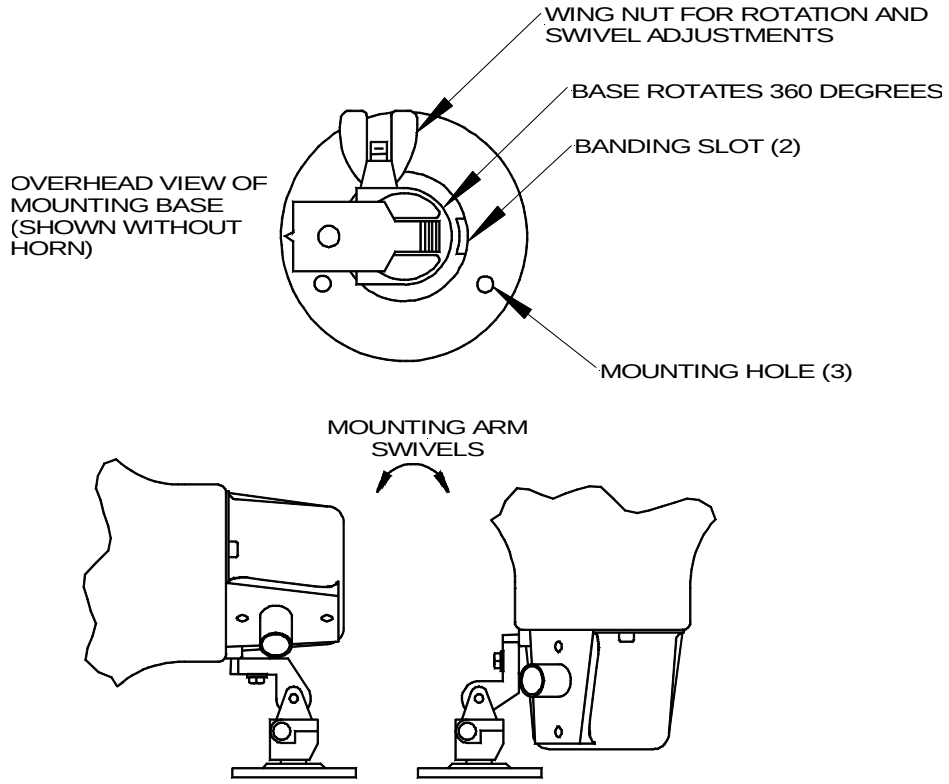
⚠**CAUTION:** Do not place switch in settings marked "not used". Failure to comply with these restrictions may cause damage to components and will void the warranty.

INSTALLATION INFORMATION:
There is a slotted shaft, underneath the cable entrance interface adapter, which operates a 7-position selector switch. Remove the interface adapter and set the switch for the desired wattage at the specified speaker line voltage (25V or 70V). Adjust the switch by turning the slotted shaft until the end of the slot which is opposite the flat on the shaft points to the desired number. The wattage provided at each selector number is shown on the decal affixed to the rear of the housing.

MOUNTING INFORMATION:
The horn speakers may be wall mounted by simply using the holes in the swivel base to locate and drill mounting holes. Mount the base to the surface with appropriate hardware. Slots are also provided in the base for banding straps, to allow mounting to beams, poles, and girders. The mounting base is also fully adjustable in both the vertical and horizontal planes (See Figure 1).

⚠ **CAUTION:** These devices are not intended for use in hazardous locations as defined by the National Electrical Code (NEC) and by the National Fire Protection Association (NFPA).

Figure 1:

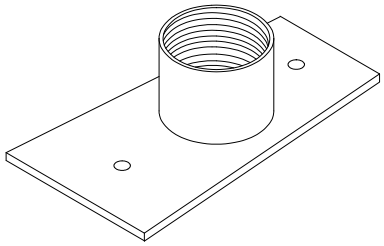


NOTE: Loosening the wing nut will allow for both pitch and rotation of the unit.

⚠ **CAUTION:** When adjusting horn position, be careful not to lose adjusting hardware.

The interface adapter (mounted to the horn) permits conduit connection. The interface adapter is threaded for standard 1/2" pipe, and will accommodate BX cable, flexible or rigid conduit and matching connectors. The interface adapter is shown in Figure 2 below.

Figure 2: Interface Adapter



WIRING INFORMATION:

UL Listed Models

Remove the Interface Adapter, to expose the two (2) screw terminals, and connect the audio installation wires as shown in Figure 3. The terminals are numbered (1 and 2) to indicate phasing, which should be maintained throughout the system. For example: In an installation with multiple horns, connect the same color audio wire to all number 1 terminals and another color audio wire to all number 2 terminals to ensure proper phasing, as shown in Figure 4. Mount Interface Adapter or clear plastic shield back on horn.

Figure 3: Wiring

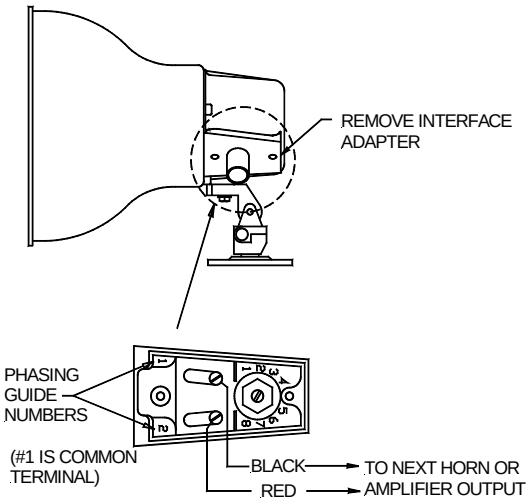
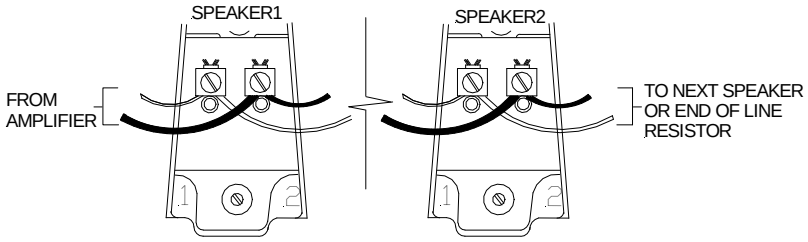


Figure 4: Wiring Diagram



⚠ **CAUTION:** Break wire run to provide supervision of connection.

APPLICATION NOTES:

1. STH-15 Horn Speakers are UL Listed for indoor/outdoor use with a temperature range of -31^{O}F to 150^{O}F (-35^{O}C to 66^{O}C) and maximum humidity of 95% RH.
2. Each doubling of rated watts increases sound output by 3 dBA. Field selectable wattage selection switches are provided on each unit. The following wattage selections are available (Ref. 70 Volt): 0.9W, 1.8W, 3.8W, 7.5W, 15.0W. Frequency range of speakers is 400-4,000Hz.
3. A blocking capacitor for DC supervision of audio lines by the FACP is factory wired in series with the speaker input.

⚠ **CAUTION:** Excessive bass energy can damage horn voice coils, especially at high power levels. To avoid possible damage, an amplifier with a bass roll-off filter (horn protect circuit) should be used.

⚠ **CAUTION:** Always operate audio amplifiers and speakers within their specified ratings. Excessive input may distort sound quality and may damage audio equipment. Do not exceed +130% of speaker input voltage per UL 1480. Improper input voltage can damage speaker. If distortion is heard, check for clipping of the audio appliance with an oscilloscope and reduce the amplifier input level or gain level to eliminate any clipping.

⚠ **CAUTION:** Check the installation instructions of the manufacturers of other equipment used in the system for any guidelines or restrictions on wiring and/or locating Notification Appliance Circuits (NAC) and notification appliances. Some system communication circuits and/or audio circuits, for example, may require special precautions to assure electrical noise immunity (e.g. audio crosstalk).

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6/09

FSB-200, FSB-200S
Single-ended Reflected Type Projected Beam Smoke Detector

NOTIFIER by Honeywell

12 Clintonville Road
Northford, CT 06472-1653
Phone: 203.484.7161

SPECIFICATIONS

GENERAL

Range:	16 to 230 Feet (5 to 70m); 230 to 328 Feet (70 to 100m) using optional accessory BEAMLRK
Sensitivity:	25% to 50% Total Obscuration in 6 levels Level 1 = 25% Level 2 = 30% Level 3 = 40% Level 4 = 50% Level 5 = 30% to 50% (Acclimate) Level 6 = 40% to 50% (Acclimate)
Spacing:	30 to 60 Feet (9.1 to 18.3m)
Response Time:	ALARM - 20 seconds typical; TROUBLE - 30 seconds typical
Trouble Conditions:	Beam Blockage (96% or More Obscuration) Improper Initial Alignment Self-compensation limit reached (service needed) In Alignment mode
Test/Reset Features:	Integral Sensitivity Test Filter (FSB-200S only, requires additional external power supply) Sensitivity Filter (Incremental scale on reflector) Local Alarm Test Switch Local Alarm Reset Switch Remote Test and Reset Switch Capability
Indicators:	ALARM - Remote Output, Local LED (red) TROUBLE - Remote Output, Local LED (yellow), Blink Pattern Indicates Trouble Diagnostics NORMAL OPERATION - Local LED (flashing green with communication) ALIGNMENT AIDS - Optical Gunsight (coarse adjustment), 00 to 99 Digital Display (fine adjustment) SENSITIVITY - Digital Display Readout in Percent Obscuration
Style 7 Operation:	On-board isolators provide style 7 operation. (may be disabled via shunts on circuit board)

ENVIRONMENTAL

Temperature:	–22°F to 131°F (–30°C to 55°C); NOTE: for applications below 32°F (0°C) see Special Applications section of this manual.
Humidity:	10% to 93% Relative Humidty, Non-condensing

MECHANICAL

Shipping Weight:	3.9 lbs. (1.77 kg)
Shipping Size:	15″ × 10.5″ × 6.5″ (381mm × 267mm × 165mm)
Mounting:	Wall only without optional accessories
Wiring:	Plug-in Terminal Blocks (12 to 22AWG)
Adjustment Angle:	±10° Horizontal and Vertical
Paintable Trim Ring:	May be painted using enamel or acrylic type paints

ELECTRICAL

Voltage:	15 to 32 VDC	
Standby Current:	Avg. Standby -	2mA Max. (1 communication every 5 sec., LED flashing, SLC @ 24 V)
	Max. Alarm (LED on) -	8.5mA Max.
	Max. Trouble (LED on) -	4.5mA Max.
	Max. Alignment -	20mA Max.
External Supply (FSB-200S only):	VOLTAGE - 15 to 32 VDC; CURRENT - 0.5A Max.	
Remote Output: (alarm)	VOLTAGE - 15 to 32 VDC; NOTE: Output voltage same as device input voltage. CURRENT -15mA maximum; 6mA minimum; NOTE: Output current is limited by 2.2Kohm resistor	

GENERAL DESCRIPTION

Model FSB-200/FSB-200S is a long range projected beam smoke detector designed to provide open area protection. It is to be used with UL-listed compatible control panels only. The detector consists of a transmitter/receiver unit and a reflector. Smoke entering the area between the transmitter/receiver and reflector causes a reduction in signal. When the obscuration reaches alarm thresholds (chosen at the transmitter/receiver unit), the detector generates an alarm signal. Complete blockage of the beam causes a trouble signal. Slow changes in obscuration due to a build up of dirt or dust on the lens of the detector are compensated for by a microcontroller that continuously monitors the signal strength and periodically updates the alarm and trouble thresholds. When the self-compensation circuit reaches its limit, the detector generates a trouble signal, indicating the need for service.

Three LEDs on the detector indicate the current status: a red LED for alarm, a yellow LED for trouble, and a blinking green LED for standby operation. Note: The panel controls the status of the red and green LEDs. The local reset button is accessible by removing the outer paintable trim ring. The yellow LED will blink in specific patterns to provide a diagnostic aid when diagnosing the cause of a trouble signal. It will also blink the amount of drift compensation that has been used at the conclusion of the local test. Trouble signals automatically reset upon removing the cause of trouble. Red and yellow LEDs can be remotely connected to the remote Alarm and Trouble outputs. These outputs mimic the functions of the detector's red and yellow LEDs. In addition to these indicators, there is a dual digital display that reads 00 to 99. This display is used to indicate the signal strength of the beam in alignment mode and to

indicate the sensitivity setting of the detector in percent obscuration when setting the sensitivity of the detector. No additional equipment is needed for alignment of the beam.

SPECIAL APPLICATIONS

Due to the inherent capabilities of projected type beam detectors they are often installed in locations where spot-type detection is impractical. Projected type beam smoke detectors are ideally suited for environmental conditions that might include high ceilings, dusty and dirty environments, or environments that experience temperature extremes. Often these conditions present special problems for the installation of spot-type detectors and even greater problems for their proper maintenance. Due to the inherent flexibility of mounting locations and large coverage area of projected type beam detectors often the conditions above can be addressed or minimized.

Some examples of applications for beam detectors might include freezers, aircraft hangars, cold storage warehouses, shipping warehouses, enclosed parking facilities, sporting arenas and stadiums, concert halls, barns, or stables. Some of these environments might be considered too hostile for spot-type smoke detectors. If the environment is considered to be hostile then the colder alarm threshold settings should be used.

Before installing the transmitter/receiver unit or reflector in these types of applications special consideration should be given to ensure proper operation of the beam detector. The beam detector should not be installed in environments where heavy condensation or icing is likely. Condensation or icing of the reflector surface or the outer surface of the transmitter/receiver unit will obscure the light beam resulting in a false alarm. If elevated humidity levels and rapidly changing temperatures can be expected then condensation will likely form and the application should not be considered acceptable for the beam detector. The beam detector should not be installed in locations where the transmitter/receiver unit, the reflector, or the optical pathway between them may be exposed to outdoor conditions such as rain, snow, sleet, or fog. These conditions will impair the proper operation of the detector and must be avoided.

APPROVED ACCESSORIES

The following accessories can be purchased separately for use with this beam detector.

BEAMLRK

The BEAMLRK allows reflected beam detectors to be installed at separations between 230 and 328 feet (70 to 100 meters). At these distances, four 8 inch × 8 inch reflectors must be used to provide enough reflected infrared light. This kit includes 3 additional reflectors with new test scale legends. The reflector included with the transmitter/receiver unit is the fourth reflector to be used. This kit is not compatible with the multi-mount kit (BEAMMMK).

BEAMMMK

The BEAMMMK allows reflected beam detectors and reflectors to be mounted to either a vertical wall or the ceiling. The kit allows for additional alignment range in cases where the detector and reflector cannot be mounted within 10° of each other. The kit includes the hardware necessary to mount either a single transmitter/receiver unit or a single reflector. (To mount the transmitter/receiver the surface mount kit, BEAMSMK, must also be used). If the transmitter/receiver and the reflector require additional alignment range two kits are required. The kit is not compatible with the long-range reflector kit (BEAMLRK).

BEAMSMK

The BEAMSMK allows reflected beam detectors to be mounted when surface wiring is used. This kit must be used when mounting the transmitter/receiver unit with the multi-mount kit (BEAMMMK).

6500-MMK

The 6500-MMK provides a heavy-duty multi-mount bracket for installations prone to building movement or vibration. It offers similar tilt and swivel flexibility found on the BEAMMMK. (To mount the transmitter/receiver to the 6500-MMK, the surface mount kit, 6500-SMK, must be used).

6500-SMK

The 6500-SMK allows the transmitter/receiver to be mounted to the 6500-MMK heavy duty multi-mount kit.

BEAMHK

The BEAMHK allows the transmitter/receiver unit to operate in environments prone to the formation of condensation. Condensation forming on the beam detector unit may result in trouble or false alarm conditions. BEAMHK will lessen the likelihood of condensation by maintaining the unit at a temperature that is slightly higher than the surrounding air. Please refer to the BEAMHK installation manual for operation instructions.

BEAMHKR

The BEAMHKR allows the reflector to operate in environments prone to the formation of condensation. Condensation forming on the reflector may result in trouble or false alarm conditions. BEAMHKR will lessen the likelihood of condensation by maintaining the reflector at a temperature that is slightly higher than surrounding air. The kit requires a 24V power supply. When used with the long-range reflector kit (BEAMLRK), it is necessary to purchase and install four BEAMHKR kits. Please refer to the BEAMHKR installation manual for operation instructions.

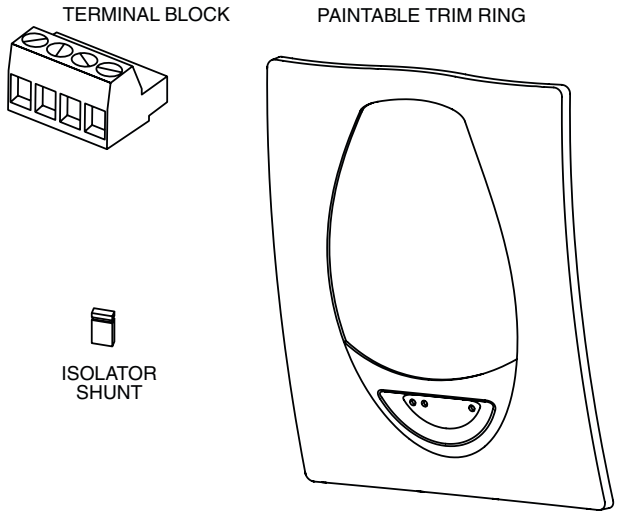
RTS451/KEY/RTS151/KEY

The remote test accessory allows for the beam detector to be tested remotely. The test accessory provides test and reset functions and green and red LED's that mimic the LED's on the detector.

Parts List

Description	Quantity
Transmitter/Receiver Unit	1
Paintable Trim Ring	1
Reflector	1
Plug-in Terminal Blocks	3
Isolator Shunts	2
Instruction Manual	1
Orange Paper Sheet	1

PARTS DIAGRAM (NOT TO SCALE)



C0306-00

DETECTOR PLACEMENT

This section of the manual discusses the placement of projected beam detectors. Though this information is based upon industry expertise, it is intended to be used only as a technical guide. Always comply with the requirements of applicable codes and standards such as, NFPA 72, National Fire Alarm Code, as well as directives of the Authority Having Jurisdiction (AHJ).

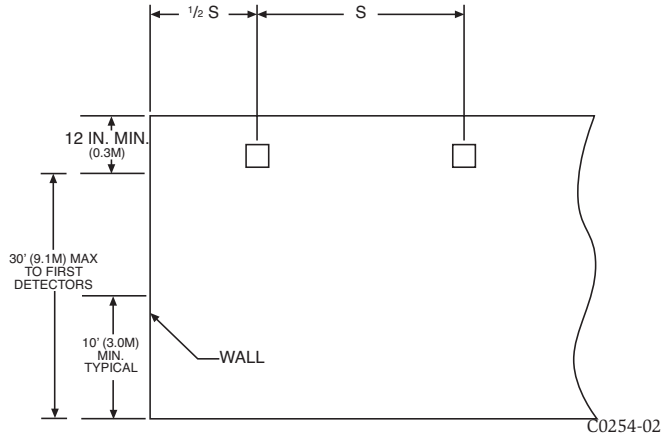
Projected beam detectors are usually located with their beams parallel to the ceiling. However, they can be mounted vertically or at any angle to protect the area involved. Since beam detectors sense the smoke buildup over a distance, they are ideal for locations with high ceilings. They can also be mounted on a wall or ceiling below the level of a spot type detector, reducing the effects of air stratification. Some typical locations would include large areas with high ceilings such as atriums, warehouses, and factories.

NOTE: Projected beam smoke detectors should always be mounted to stable mounting surfaces. See the MOUNTING LOCATION section for details.

Some fire codes specify spacing on a given center-to-center distance between detectors under ideal conditions. This spacing is based on rooms with smooth ceilings and no physical obstructions between the contents being protected and the detectors. Moreover, they are also based on a maximum ceiling height, and on the assumption that the value and the combustible nature of the contents of the room being protected do not warrant greater protection or closer spacing.

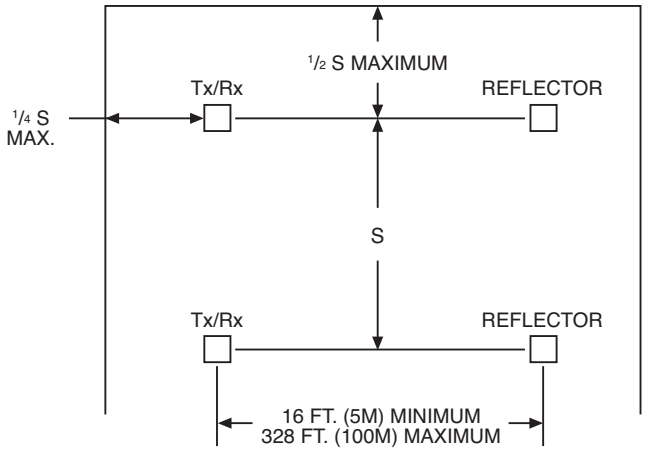
In a room with a smooth ceiling, detectors should be spaced horizontally between 30 and 60 feet (9.1 to 18.3m). One-half that spacing between the beam and the sidewall may be used as a guide. See Figure 1. The beam detector can be mounted with the transmitter/receiver on one wall and the reflector on the opposite wall, or both suspended from the ceiling, or any wall/ceiling combination. In the case of the ceiling mount, the distance from the end walls should not exceed one-quarter of the selected spacing (7.5 ft. [2.3m] maximum if the spacing is 30 ft. [9.1m]). See Figure 2.

FIGURE 1. SPACING FOR SMOOTH CEILING (SIDE VIEW):



C0254-02

FIGURE 2. SPACING FOR SMOOTH CEILING (TOP VIEW):

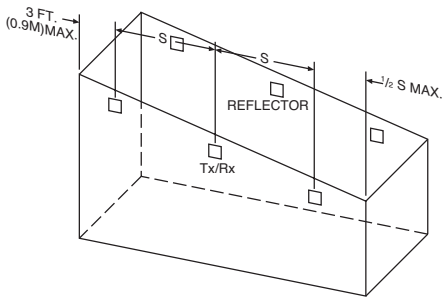


C0255-00

In the case of peaked or sloped ceilings, codes may specify spacing of detectors by using horizontal spacing from the peak of the roof or ceiling. Figures 3 and 4 show the spacing for both the shed type and peaked type sloped ceilings.

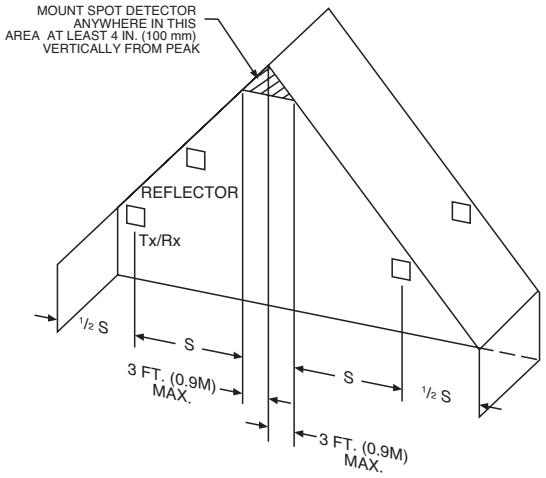
On smooth ceilings, beam smoke detectors should generally be mounted a minimum of 12 inches (0.3m) from the ceiling or beneath structural obstructions such as joists, ducts, etc. See Figure 1 In many cases, however, the location and sensitivity of the detectors shall be the result of an engineering evaluation that includes the following: ceiling heights above 30 feet (9.1 m) - refer to the "Single-Ended Reflected Beam Smoke Detector" application guide A05-0095 for more information regarding the effects of stratification, structural features, size and shape of the room and bays, occupancy and uses of the area, ceiling height, ceiling shape, surface and obstructions, ventilation, ambient environment, burning characteristics of the combustible materials present, and the configuration of the contents in the area to be protected. As a general rule, reflective objects such as ductwork or windows should be a minimum of 15 inches (38.1cm) from the path of the beam.

FIGURE 3. SLOPED CEILING (SHED TYPE):



C0256-00

FIGURE 4. SLOPED CEILING (PEAKED TYPE):



C0257-02

MOUNTING LOCATIONS

Beam detectors require a stable mounting surface for proper operation. A surface that moves, shifts, vibrates, or warps over time will cause false alarm or trouble conditions. Initial selection of a proper mounting surface will eliminate false alarms and nuisance trouble signals.

Mount the detector on a stable mounting surface, such as brick, concrete, a sturdy load-bearing wall, support column, structural beam, or other surface that is not expected to experience vibration or movement over time. DO NOT MOUNT the beam detector on corrugated metal walls, sheet metal walls, external building sheathing, external siding, suspended ceilings, steel web trusses, rafters, nonstructural beam, joists, or other such surfaces.

In cases where only one stable mounting surface as defined above can be used, the transmitter/receiver unit should be mounted to the stable surface and the reflector should be mounted to the less stable surface. The reflector has a much greater tolerance for the unstable mounting locations defined above.

MOUNTING INSTRUCTIONS

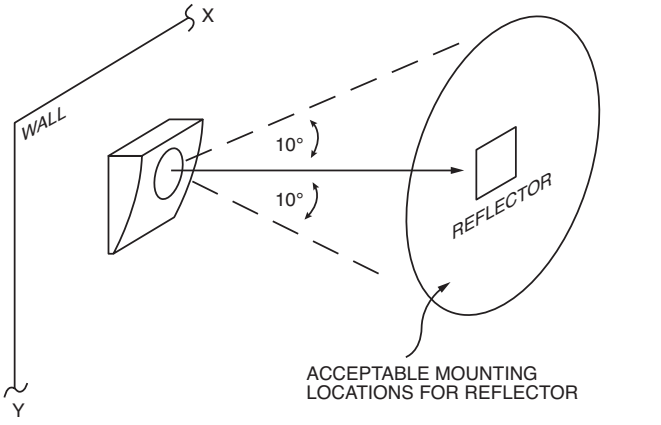
The transmitter/receiver unit may be mounted over a recessed junction box. The cavity behind the detector is then used for routing of the wiring from the junction box to the terminal blocks on the detector. The transmitter/receiver unit should be mounted to the wall such that unit covers the recessed junction box in the wall completely. If the junction box is not recessed then you may use the surface mount kit (BEAMSMK). See the BEAMSMK installation instructions for surface mounting instructions. The transmitter/receiver unit can be mounted to the wall using the supplied drilling template (see Appendix II). The detector base has 4 primary mounting keyholes, one in each corner of the base. All four hole locations should be used to provide a secure mounting. The outer housing of the beam detector is held to the base using four screws. In order to mount the detector you must remove the outer housing first.

The reflector can be mounted to the wall using the supplied drilling template (see Appendix III). The reflector has 4 mounting holes, one in each corner. All four hole locations should be used to provide a secure mounting. The reflector must be mounted such that it is within 10° in both the X and Y planes of the transmitter/receiver unit. See Figure 5a. The reflector must also

be mounted such that the plane of the reflector is perpendicular to the optical line of sight to the transmitter/receiver unit. The maximum tolerance for non-perpendicular mounting locations is 10°. See Figure 5b. If the reflector cannot be mounted within 10° of the transmitter/receiver unit then the multi-mount kit (BEAMMMK) or the heavy-duty multi-mount kit (6500-MMK) may be used to provide greater angular adjustment of the transmitter/receiver unit. If the perpendicular plane of the reflector cannot be mounted within 10° of the optical line of sight then the multi-mount kit can be used for the reflector. See BEAMMMK or 6500-MMK instructions.

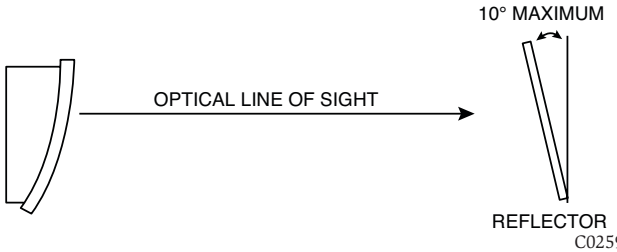
To aid in locating the reflector in the alignment mirror at long distances a an orange, adhesive-backed sheet of paper is provided. Remove the protective backing from the orange paper. Temporarily affix the orange paper next to the reflector. The location of the paper is not critical. It may be placed anywhere near the reflector as long as it not covering the reflective surface of the reflector. This paper should be removed once the installation is completed.

FIGURE 5A. REFLECTOR MOUNTING GUIDELINES



C0258-01

FIGURE 5B. REFLECTOR MOUNTING GUIDELINES



C0259-00

MOUNTING CONSIDERATIONS FOR SINGLE ENDED BEAM DETECTORS

There must be a permanent clear line of vision between the detector and the reflector. Reflective objects must not be near the line of vision between the detector and reflector. Reflective objects too near to the line of sight can reflect the light beam from the transmitter to the receiver. If this occurs, the detector will not be able to distinguish these reflections from those of the reflector and the protected space will be compromised. Reflective objects such as ductwork or windows should be a minimum of 15 inches (38.1cm) from the path of the beam. In cases where reflective objects cannot be avoided, the complete reflector blockage test can be used to determine if the installation is acceptable. See Testing and Maintenance Section of this manual.

Light sources of extreme intensity such as sunlight and halogen lamps, if directed at the receiver, can cause a dramatic signal change resulting in fault and alarm signals. To prevent this problem direct sunlight into the transmitter/receiver unit should be avoided. There should be a minimum of 10° between the pathway of the light source and detector and the line of sight between detector and reflector.

Operation of the detector through panes of glass should be avoided. Since single ended beam detectors operate on a reflection principle, a pane of glass perpendicular to the line of sight between the detector and the reflector can reflect the light beam from the transmitter to the receiver. If this occurs, the detector will not be able to distinguish these reflections from those of the reflector and the protected space will be compromised.

Panes of glass will also absorb some of the light as it passes through it. This absorption of light will reduce the acceptable installed distance between the detector and the reflector.

In cases where operation through panes of glass cannot be avoided some specific installation practices can help to minimize the effects of the glass. These practices include: avoid penetration of multiple panes of glass, position the glass so that it is not perpendicular to the line of sight between the detector and the reflector, (A minimum of 10° off perpendicular should be considered), and make certain that the glass is smooth, clear and mounted securely. The complete reflector blockage test can be used to determine if the installation is acceptable. See Testing and Maintenance Section of this manual.

Where high ceilings (in excess of 30 feet or 9.1 meters) are present additional beam smoke detectors mounted at multiple heights may be required to detect smoke at lower levels. See the Detector Placement section in this installation manual.

WIRING INSTALLATION GUIDELINES

Always install all wiring in compliance with the National Electrical Code, and/or the applicable local codes, and any special requirements of the local authority having jurisdiction. Proper wire gauges and suitable means for strain relief should be used. The conductors used to connect beam 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.

Installation wire used for the beam detector shall be no smaller than 22 AWG (1.0 mm^2). For best system performance, all wiring should be twisted pair and installed in separate grounded conduit. Do NOT mix fire system wiring in the same conduit as any other electrical wiring. Shielded cable may be used to provide additional protection against electrical interference.

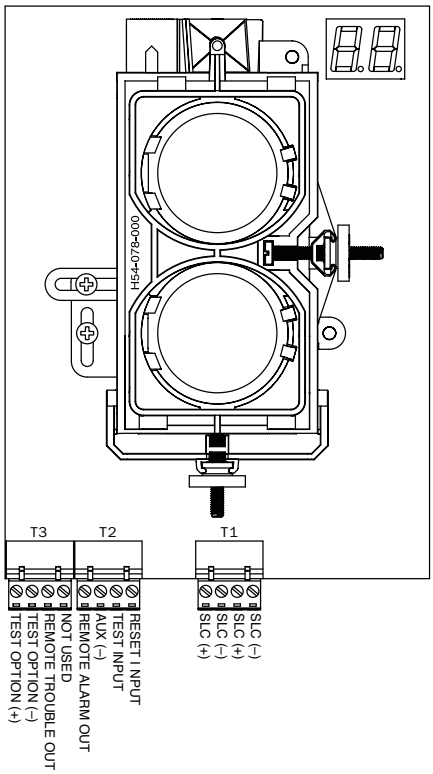
When installing the beam smoke detector in applications where the head unit will be mounted to either a wall or the ceiling using the multi-mount kits (BEAMMMK or 6500-MMK) flexible conduit will be used. The surface mount kits (BEAMSMK or 6500-SMK) and multi-mount kits (BEAMMMK or 6500-MMK) must be installed with the cable before wiring the unit, according to the instructions supplied with the kit.

When the detector has been mounted over a recessed junction box, all wiring should be routed out of the box and behind the detector to the bottom of the detector where the terminal blocks are located. When installing the wiring in the junction box be sure to leave enough wire in the box to connect to the terminal blocks. (Approximately 9″ (23cm) of wire outside of the junction box will be required for proper installation). All wiring to the detector is done via pluggable terminal blocks. In order to properly make electrical connections strip approximately 1/4″ (6mm) of insulation from the end of the wire, sliding the bare end of the wire under the clamping plate screw.

Figure 6 shows all the wiring connections to the transmitter/receiver unit. Figure 7 shows the proper wiring diagram for either class A or class B operation. Figure 8 shows the connections that are necessary when using one of the optional remote test stations. Figure 9 shows the remote output for alarm indication.

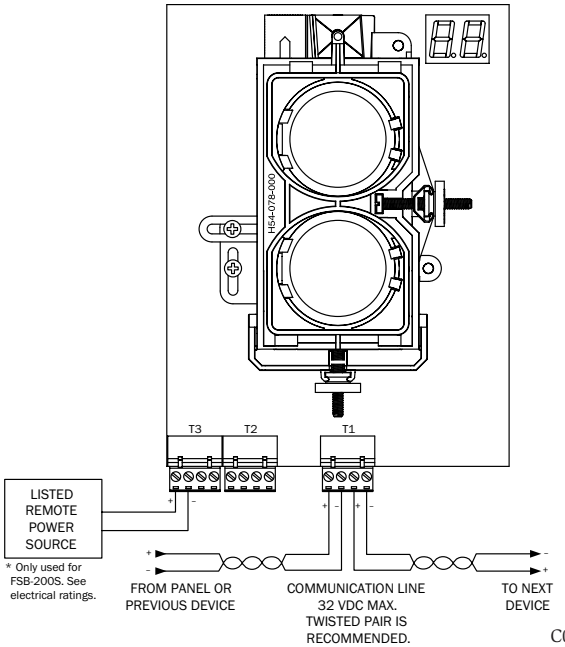
WARNING: Disable the zone or system before applying power to the beam detector to prevent unwanted alarms. When applying power to the beam detector before the alignment procedure has been completed the detector may enter alarm or fault.

FIGURE 6. WIRING CONNECTIONS AT DETECTOR



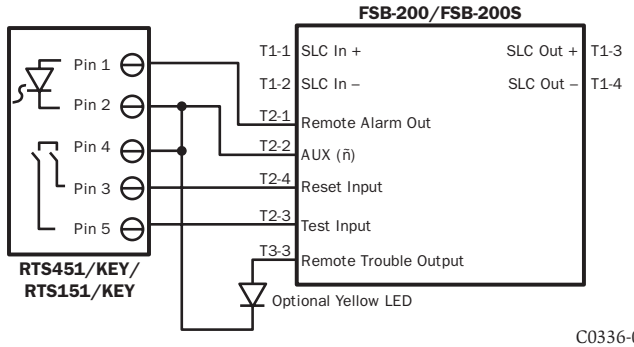
C0260-01

FIGURE 7. WIRING DIAGRAM



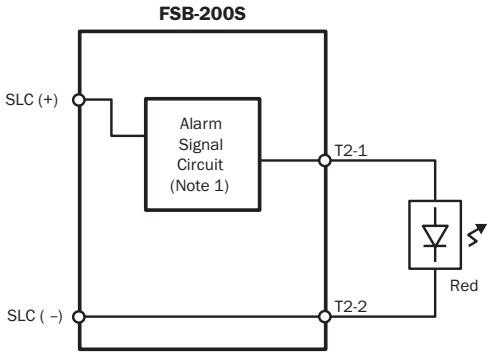
C0335-00

FIGURE 8. WIRING DIAGRAM (RTS451/RTS151)



C0336-03

FIGURE 9. WIRING DIAGRAM (RTS451/RTS151)



Note 1: See electrical ratings section of this manual for cir cuit output ratings.

C0326-00

INSTALLATION / ALIGNMENT

Reference Figures 10 through 14 for installation, alignment, and maintenance.

Please make sure to complete all steps in order to ensure a successful installation. Proper application, mounting, alignment, and set-up will minimize false alarms and nuisance trouble signals.

PRE-ALIGNMENT CHECKLIST

- Ensure that both the detector and reflector are mounted securely to stable surfaces.
- Ensure that all wiring is correct.
- Ensure that terminal blocks are fully seated into their receptacles on the detector.
- Complete any wiring dressing to minimize movement to the detector once the alignment procedure is completed.
- Ensure that the appropriate number of reflectors are used for the installed distance. Distances between 230 & 328 Feet (70 - 100m) require additional reflectors (4 total). The BEAMLRK accessory should be used in these cases.
- Ensure that the line of sight between the detector and reflector is clear and that reflective objects are not too near. See Mounting Instructions for more details.
- Ensure that both the detector and reflector are mounted within their operational parameters for off axis angles. See Mounting Instructions for more details.
- Disable the zone or system to prevent unwanted alarms before applying power.
- Ensure power to the detector is “ON”.
- Ensure that the appropriate address is set on the code wheels.

You are now ready to begin the alignment procedure.

STEP 1. COARSE ALIGNMENT

Refer to Figures 11 and 12 for this step.

1. Ensure that both optics lock-down screws are loose (Figure 11).
2. Look through the alignment mirror and find the reflector (Figure 12). If it is difficult to spot, use the orange adhesive-backed paper installed with the reflector as a reference. Make sure there are no people or objects obstructing your view of the reflector. This is also a good time to confirm that there are no obstructions or reflective objects within 15” (38.1cm) of the beam’s path.
3. Once you’ve located the reflector in the mirror, adjust the horizontal and vertical alignment wheels (Figure 11) until the reflector is centered in the mirror. The objective is to align the reflector with the hole in the gunsight and the circle on the mirror. This step will take some practice. Your eyes must shift focus between the reflector and alignment gunsight in order to successfully complete step 3.

STEP 2. FINE ADJUSTMENT

Refer to Figures 10 through 12 for this step.

1. Ensure that neither you nor any other objects are in the line of sight between the detector and the reflector.

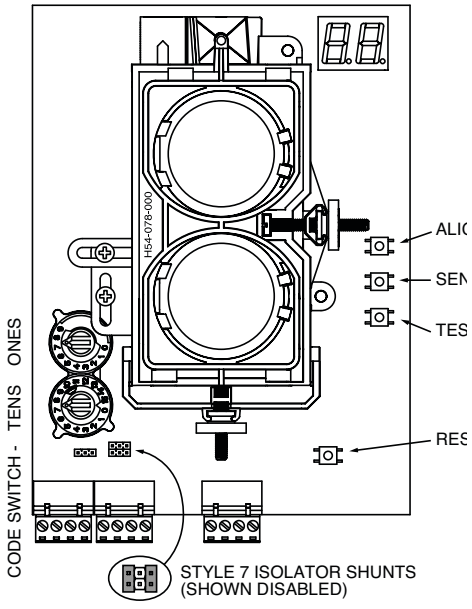
NOTE: This detector has a built-in amplifier that will occasionally adjust its gain, or detection sensitivity, throughout the alignment process. This will be indicated by a "--"on the digital display. Do not disturb the detector while the gain is auto-adjusting.

2. Depress the alignment switch once (Figure 10). Both the digital display and yellow LED should turn on (Figure 11). The display should read "--" indicating an electronic gain adjustment. After a few moments, the display should show a number. If the display reads "Lo", confirm that you've completed the steps in the pre-alignment checklist and repeat the coarse alignment process. The display will continue to read "Lo" until the detector receives enough light from the reflector to function properly.
3. With the display indicating a numeric value, begin adjusting the horizontal adjustment wheel in the direction that increases the number on the display. When the number starts decreasing, continue rotating the knob 3-4 revolutions past the peak value to confirm that you've truly reached the peak. Once you have confirmed that the true peak was reached, rotate the knob back until you reach the peak value again. Repeat this process with the vertical adjustment knob.

NOTE: If a value of 90 is reached, the detector will display "--", indicating that it is auto-adjusting its gain. Once a numeric value returns on the display, you can continue adjustment. The number displayed after the gain adjustment will be much lower than 90 in order to make it easier for you to find the peak value. The number only aids in alignment – it is not an indicator of signal strength.

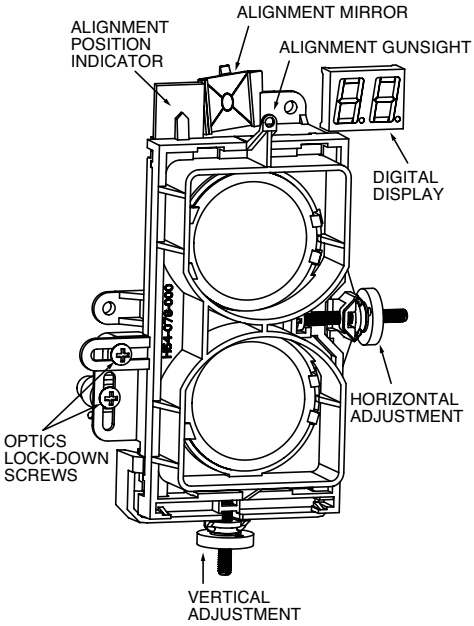
4. Repeat step 3, switching back and forth between the horizontal and vertical adjustment knobs until you have achieved the peak value. Remember that the goal is not to reach a value near 90; rather, it is to reach a peak whereby the numbers decrease with further rotation of either the horizontal or vertical adjustment knob.
5. Once satisfied with the alignment, depress the alignment button. The digital display will turn "OFF" and the yellow LED will remain "ON". This step must be performed or else the alignment procedure is void and the information will be lost.

FIGURE 10. SWITCH LOCATIONS



C0263-00

FIGURE 11. ALIGNMENT ADJUSTMENT LOCATIONS



C0264-00

FIGURE 12. COARSE ALIGNMENT PROCEDURE

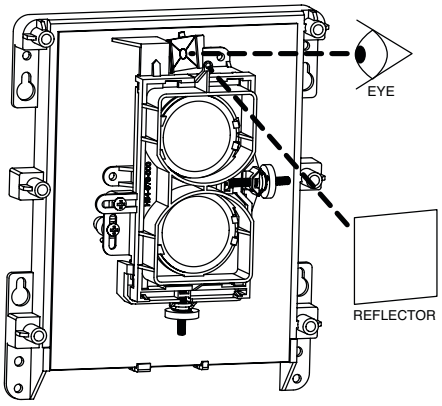


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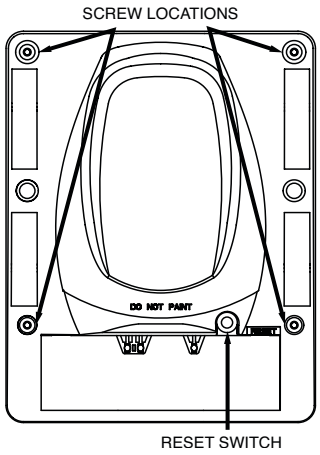
FIGURE 13. OUTER HOUSING SCREW LOCATIONS



C0266-00

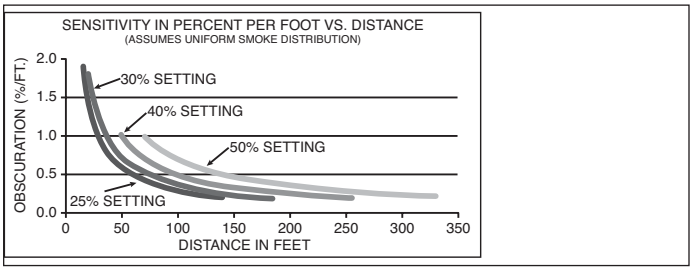
STEP 3. SENSITIVITY SELECTION

Set the sensitivity of the detector using the sensitivity switch (Figure 10) and digital display. Use the chart below to determine which setting is acceptable (per UL 268) for your installed distance. Before attempting to set the sensitivity, make sure that you have completed the fine adjustment process (the digital display should be "OFF"). To set the sensitivity, depress the sensitivity button once. The digital display will illuminate and read the current sensitivity setting as indicated on the chart. Continue to depress the sensitivity button until the desired setting is achieved. The display will turn off automatically. The default sensitivity will be factory set at level 4 or 50%.

Sensitivity Setting	Percent Obscuration	Display Reading	Acceptable Distance Between Detector & Reflector	
			Feet	Meters
Level 1	25	25	16.4 to 120	5.0 to 36.6
Level 2	30	30	25 to 150	7.6 to 45.7
Level 3	40	40	60 to 220	18.3 to 67
Level 4	50	50	80 to 328	24.4 to 100
Acclimate Level 1	30 to 50	A1	80 to 150	24.4 to 45.7
Acclimate Level 2	40 to 50	A2	80 to 220	24.4 to 67

In addition to the four standard sensitivity selections the detector has two Acclimate settings. When either of these settings is chosen the detector will automatically adjust its sensitivity using advanced software algorithms to select the optimum sensitivity for the environment. The sensitivity will be continuously adjusted within the ranges specified in the chart above.

Total obscuration can be converted to percent per foot, assuming uniform smoke density for the entire length of the beam. The charts below converts total obscuration to percent per foot for all acceptable sensitivity settings.



C0268-00

STEP 4. SHORT CIRCUIT ISOLATION

The detector includes an on-board circuit isolator that allows for NFPA72 style 7 operation. In cases where style 7 operation is not desired the isolator can be disabled using the two shunts on the circuit board. See Figure 10 for jumper locations. When the jumpers are present the isolator is disabled. This is the default state.

STEP 5. COMPLETING THE INSTALLATION

Refer to Figure 13 for this step.

1. Tighten the optics lock down screws so the optics are secure. Take special care not to shift or disturb the optics. Use a hand screwdriver to avoid overtightening or jarring the optics.
2. Install the outer housing of the detector, making sure to tighten all four screws in each corner of the housing.

NOTE: The housing contains a gasket seal that protects the detector from moisture.

3. Remove the protective film from the front surface of the outer housing.
4. Press the reset button, making sure to avoid blocking the line-of-sight between the detector and reflector. The yellow LED will begin to blink for about 20 seconds. At this time, the detector is making its final gain adjustment to compensate for the effects of installing the outer housing. When the gain adjustment is complete, the yellow LED will turn off and the green LED will begin blinking, indicating a successful gain adjustment.
5. Install the trim ring by snapping it onto the outer housing. If the trim ring was painted, ensure that the paint is completely dry before installing.

STEP 6. FINAL VERIFICATION

1. Block the entire reflector with an opaque material. Nearly any non-reflective opaque material will do, including this manual or the cardboard packaging inserts. The detector should enter a trouble condition, indicated by the fault relay and the yellow LED (see Appendix 1) after 30 seconds. If the detector does not enter a trouble condition, there is a problem with the installation. Refer to troubleshooting section in Appendix 1 for assistance.
2. Complete a sensitivity test of the detector. Refer to the Sensitivity Testing section of this manual for the appropriate procedure.
3. Remove the orange adhesive-backed sheet used to aid in coarse adjustment.

Congratulations. You have completed the final installation and alignment procedure.

SENSITIVITY TESTING

NOTE: Before testing, notify the proper authorities that the smoke detector system is undergoing maintenance, and therefore the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

Detectors must be tested after installation and following periodic maintenance. The sensitivity of the FSB-200/FSB-200S may be tested as follows:

NOTE: Before testing the detector, check for the presence of the flashing green LED at the receiver, making sure not to disturb or block the beam. If it does not flash and the detector is not in trouble or alarm, power has been lost to the detector (check the wiring).

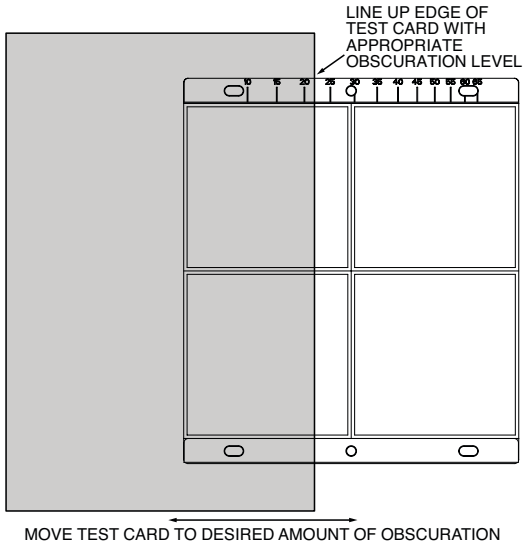
A. Calibrated Test Filter

The sensitivity of the detector can be tested using an opaque material to cover the reflector by an amount indicated by the graduated scale on the reflector. (Due to the high optical efficiency of the reflector the selection of the opaque material used to block the reflector is not critical. Acceptable materials include, but aren't limited to, this manual or the cardboard packaging inserts.)

Refer to Figure 14 for this procedure.

1. Verify the sensitivity setting of the detector in % obscuration. See the Sensitivity Selection section of this manual for sensitivity determination if sensitivity is unknown.
2. Place the blocking material over the reflector, lining it up with the graduated marks that are 10 less than the detector's setting in % obscuration. The detector should not alarm or fault. Keep the material in place for a minimum of 1 minute.
3. Place the blocking material over the reflector lining it up with the graduated marks that are 10 more than the detectors setting in % obscuration. The detector should enter alarm within 1 minute.

FIGURE 14. REFLECTOR TEST CARD PROCEDURE



C0267-00

4. The detector can be reset with the reset switch on the detector unit or remote reset.
5. Notify the proper authorities that the system is back on line.

If the detector fails this test several steps should be taken to determine if the detector is faulty or simply needs to be re-adjusted before returning the unit. These steps include:

1. Verify all wiring connections and appropriate power is applied to the detector.
2. Verify that the optical line of sight is free from obstructions and reflective objects.
3. Apply the maintenance procedure in this manual. Repeat the test procedure. If the detector still fails the test procedure proceed with step 4.
4. Repeat the alignment procedure in this manual. If the alignment procedure is successful repeat the test procedure. If the detector still fails the test it should be returned.

NOTE: For the FSB-200S the external power supply must be connected for the test switch to work.

B. Test Switch

The detector can be tested using the local test switch on the transmitter/receiver unit or remotely using the remote test station.

The remote test station can be used with the FSB-200/FSB-200S beam smoke detector. Follow instructions included with the test station for proper use. See Figure 8 (Remote Test Station) for wiring diagram.

The FSB-200S is equipped with an integral sensitivity test feature that consists of a calibrated test filter attached to a servo motor inside the detector optics. When a test is initiated using the remote test station or local test switch the test filter is moved in the pathway of the light beam. The on-board microprocessor then determines if the proper level of signal reduction is received at the receiver. If the proper level of signal reduction is received the detector will enter alarm. If the proper level of signal reduction was not achieved, indicating that the sensitivity of the detector is out of tolerance, the detector will enter the trouble condition.

Always perform a complete reflector blockage test as in step 4 of the Installation/Alignment procedure to ensure that the pathway between the detector and reflector is clear.

NOTE: For the FSB-200 this test does not satisfy the requirements of NFPA72 for periodic maintenance and sensitivity verification of beam type detectors. For the FSB-200S this test in conjunction with the complete reflector blockage test (see step 4 of the Installation/Alignment procedure in this manual) does satisfy the requirements of NFPA72 for periodic maintenance and sensitivity verification of beam type detectors.

If the detector fails this test several steps should be taken to determine if the detector is faulty or simply needs to be re-adjusted before returning the unit. These steps include:

1. Verify all wiring connections and appropriate power is applied to the detector.
2. Verify that the optical line of sight is free from obstructions and reflective objects.
3. Apply the maintenance procedure in this manual. Repeat the test procedure. If the detector still fails the test procedure proceed with step 4.
4. Repeat the alignment procedure in this manual. If the alignment procedure is successful repeat the test procedure. If the detector still fails the test it should be returned for repair.

NOTE: For the FSB-200S, the external power supply must be connected for the test switch to work.

MAINTENANCE

NOTE: Before cleaning the detector, notify the proper authorities that the smoke detector system is undergoing maintenance, and therefore the system will be temporarily out of service. Disable the zone or system undergoing maintenance to prevent unwanted alarms.

1. Carefully clean the outer housing lens face. A damp soft cloth with a mild soap may be used. Avoid products with solvents or ammonia.
2. Carefully clean the reflector. A damp soft cloth with a mild soap may be used. Avoid products with solvents or ammonia.
3. Notify the proper authorities that the system is back on line.

PAINTING

The outer aesthetic ring may be painted using a spray or brush type paint of appropriate type. See specification section of this manual for paint types.

NOTE: Never paint the flat lens surface of the outer housing.

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.

Appendix I. Operation Modes and Troubleshooting Guide

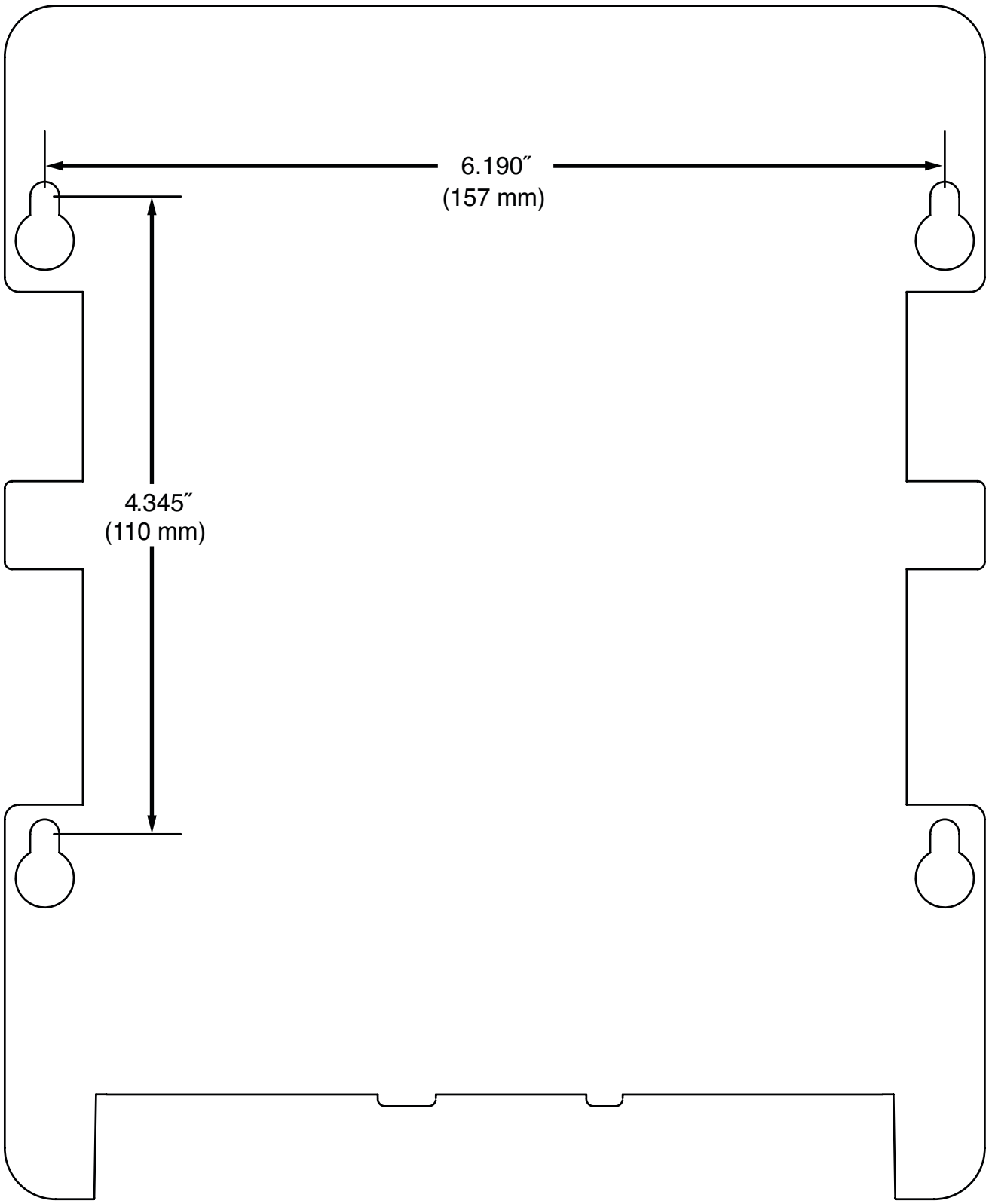
Modes	*Red See Note Below	Yellow and Remote Trouble Output	*Green See Note Below	Remote Alarm Output	Dual Digital Display	Initiating means	Comments & Troubleshooting Tips
Normal	Off	Off	Blink	Blink	Off	Successful completion of initialization or detector reset	
Alignment	Off	On	Blink	Blink	On, Relative amount of signal 0-99, or – if automatic gain resetting, or Lo if signal is too low	Alignment Switch	
Alarm	On	Off	Off	On	Off	Smoke, Test Filter, RTS451 /RTS151 Test Stations	
Trouble-Drift Comp Elevated Signal	Off	3 Quick Blinks	Blink	Blink	Off	Long Term Drift Reference Out of Range	• Sunlight into detector or reflector. • Re-Align detector.
Trouble-Drift Comp Reduced Signal	Off	2 Quick Blinks	Blink	Blink	Off	Long Term Drift Reference Out of Range	• Clean detector and reflector.
Trouble-Signal Over Range	Off	2 Quick Blinks	Blink	Blink	Off	Increase of Reflected Signal	• Inspect line of sight between detector and reflector for reflective objects in the pathway.
Trouble-Beam Blockage Response	Off	4 Quick Blinks	Blink	Blink	Off	Beam Blockage	• Remove blockage. • Faulty unit.
Initialization-Power on	Off	Blink until complete	Blink	Blink	Off	Apply Power from discharged state.	
Initialization-alignment exit	Off	Blink until complete	Blink	Blink	Off	Depressing RESET switch after alignment	
Local Test (FSB-200S) Pass Result	On	Blinks out amount of drift used	Off	On	Off	Panel or RTS451/KEY/ RTS151/KEY	Remains in alarm until reset or time-out
Local Test (FSB-200S) Fail Result	Off	On until reset or time-out	Blink	Blink	Off	Panel or RTS451/KEY/ RTS151/KEY input	Remains in fault until reset or time-out
Local Test (FSB-200) Fail	Off	On until reset or time-out	Blink	Blink	Off	Panel or RTS451/KEY/ RTS151/KEY input	Remains in fault until reset or time-out
Local Test (FSB-200) Pass Result	On	Blinks out amount of drift used	Off	On	Off	Panel or RTS451/KEY/ RTS151/KEY	Remains in alarm until reset or time-out

Note: Green and Red LEDs are controlled by the control panel.

Blinks output by Yellow LED and Remote Trouble Output once the device has passed a local remote test:

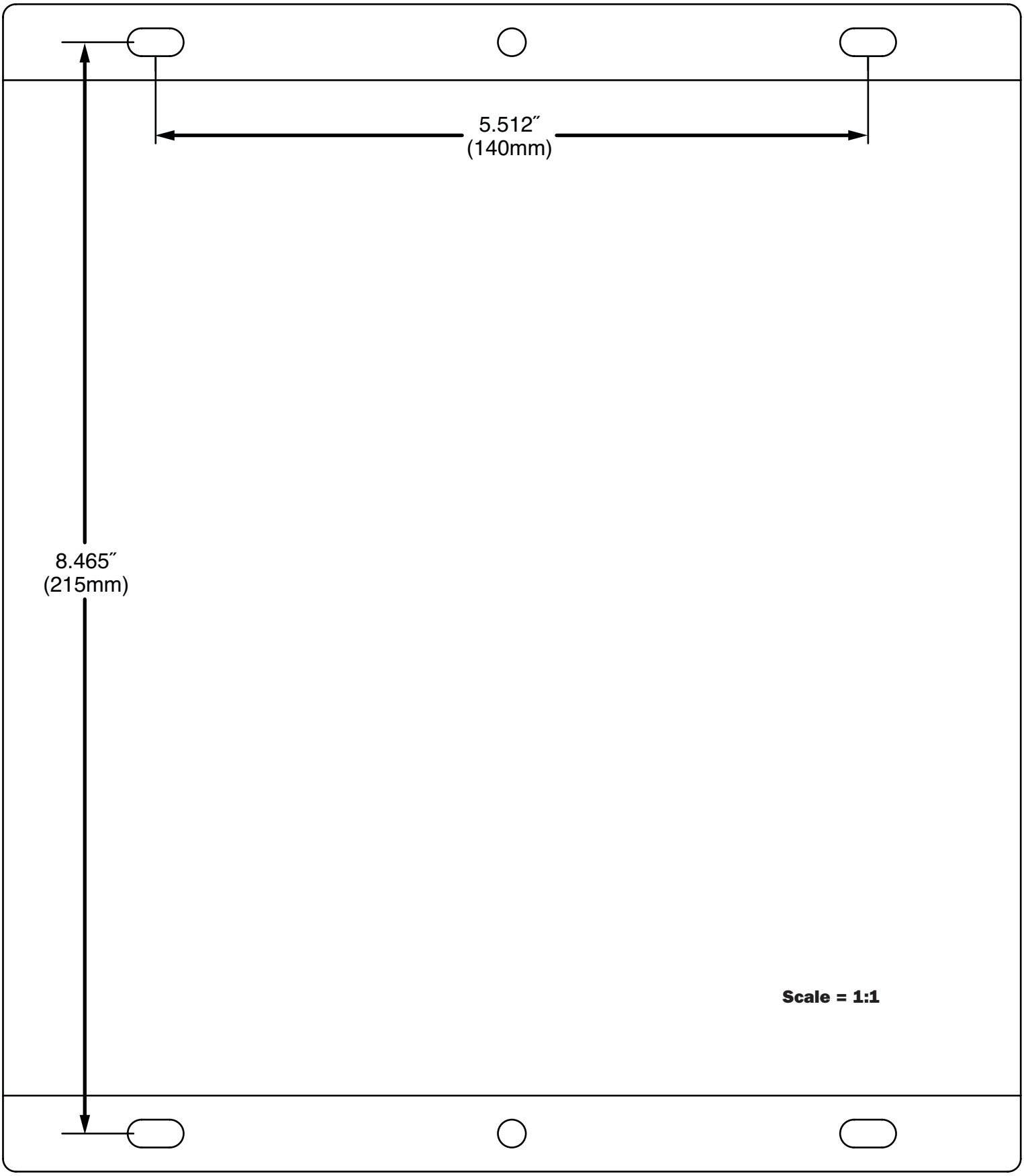
Percent the detector has drifted	Number of blinks output
<10%	None
<20%	1
<30%	2
<40%	3
<50%	4
<60%	5
<70%	6
<80%	7
<90%	8
<100%	9

APPENDIX II. DETECTOR DRILLING TEMPLATE



Scale = 1:1

APPENDIX III. REFLECTOR DRILLING TEMPLATE



Please refer to insert for the Limitations of Fire Alarm Systems

FCC Statement

This projected beam smoke detector 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 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.