NOTIFIER®

PN 15088:K ECN 01-149

Fire Alarm Control Panel

AM2020/AFP1010

Document 15088
3/21/01 Revision K

Fire Alarm System Limitations

While a fire alarm system may lower insurance rates, it is not a substitute for fire 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 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.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise 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. 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, or chimneys 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.
- Smoke detectors 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, crippling its ability to report a fire.

Audible warning devices such as bells 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:

- 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 or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise 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 fire alarm 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. It is essential to use only equipment listed for service with your control panel.

Telephone lines needed to transmit alarm signals from a premise 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 fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm 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 Chapter 7 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 fire alarm installers only. Adequate written records of all inspections should be kept.

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 this manual is read and understood.

CAUTION - *System Reacceptance Test after Software Changes.* To ensure proper system operation, this product must be tested in accordance with NFPA 72 Chapter 7 after any programming operation or change in site-specific software. Reacceptance 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 0-49° C/32-120° F and at a relative humidity of 85% RH (non-condensing) at 30° C/86° 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 all peripherals be installed in an environment with a nominal room temperature of 15-27° C/60-80° 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 interferences, 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, and 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.

Though designed to last many years, system components can fail at any time. 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 by authorized personnel.

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 device pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his 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.

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AM2020
AFP1010

Chapter One
Installation

Introduction

Capabilities and Capacities

The AM2020/AFP1010 is an Intelligent Analog Addressable Combination Fire Alarm/Security Control Panel capable of supporting the following:

Intelligent Analog Addressable Fire Detectors
Photoelectric, ionization, and thermal (heat) detectors.

Intelligent Addressable Fire and Security Initiating Devices
Pull Stations and modules that monitor any conventional normally open contact type devices (4-wire smoke detectors, heat detectors, pull stations, supervisory switches, water flow switches), 2-wire conventional smoke detectors or any normally closed contact type device, such as a door contact that may be used in security applications.

Intelligent Addressable Notification Devices and Addressable Control Relays
Modules that can supervise and switch power to notification appliances or serve as Form-C control relays.

Notification Appliance Power
Notification appliance power is provided by the main power supply. Additional notification appliance power may be provided by optional power supplies listed for fire protective signaling.

Voice Evacuation Functions
Prerecorded or live voice alarm messages can be dispatched through an audio message generator. A fire fighter's master telephone unit allows communication between the control panel and fire fighter's telephones installed throughout the system.

Audio Amplifier Power
Audio power is provided by several sizes of audio amplifiers for use in voice alarm applications.

Peripherals
An AM2020/AFP1010 system can support remotely-mounted video display units, printers, and serial annunciators.

AM2020 Maximum Intelligent Addressable Device Capacity (10 LIB-200/LIB-200A or five LIB-400 modules)

	990	Intelligent photoelectric, ionization, and thermal (heat) detectors.
+	**990**	Addressable pull stations, monitor modules, control modules and XP Transponder circuits.
=	**1980**	Addressable devices system wide.

AFP1010 Maximum Intelligent Addressable Device Capacity (four LIB-200/LIB-200A or two LIB-400 modules)

	396	Intelligent photoelectric, ionization, and thermal (heat) detectors.
+	**396**	Addressable pull stations, monitor modules, control modules and XP Transponder circuits.
=	**792**	Addressable devices system wide.

To the right are general terms and their associated specific part numbers as referenced in this manual:

TERM	PART NUMBER
PRN	PRN-4, PRN-5
CRT	CRT-2
MMX	MMX-1, MMX-101, MMX-2
CMX	CMX-1 or CMX-2

Note: The term "loop" is used in a general way throughout this document and does not necessarily mean that the circuit is a Class A configuration, unless a reference is made to Style 6, Style 7, Style D or Style Z circuit performance.

Fire Alarm and Related Service Standards

It is imperative the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and review the following documents for applicability:

NFPA 72 National Fire Alarm Code
NFPA 90A Air Conditioning and Ventilating Systems
NFPA 92A Smoke Control Systems
NFPA 92B Smoke Management Systems in Malls, Atria, Large Areas
UL 916 Energy Management Systems
UL1076 Proprietary Burglar Alarm Units and Systems
UL 1459 Surge Suppressor Device Compatibility
UL1610 Central Station Burglar Alarm Units
CAN/ULC - S527 - M87 Standard for Control Units for Fire Alarm Systems
EIA-232E Serial Interface Standard
EIA-485 Serial Interface Standard
NEC Article 300 Wiring Methods
NEC Article 760 Fire Protective Signaling Systems
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 1638 Visual Signaling Appliances
CAN/ULC - S524 - M91 Standard for Installation of Fire Alarm Systems
Applicable local and state building codes

Section One
Installation Overview

Section 1.1 Basic Equipment

The basic equipment package for the Notifier AM2020 is the BE-2020N and the basic equipment package for the Notifier AFP1010 is the BE-1010N. The following list may be used to identify the components provided in a BE-2020N and/or BE-1010N shipment. Refer to Appendix B of this manual for an optional equipment listing.

Cables:
MPS/ICA Power Cable (75378)
CPU/MPS Supervisory Cable (71031)

BP-3 Battery Dress Panel

CPU-2020 (BE-2020N) or CPU-2 (BE-1010N) Central Processor Unit

DIA-1010 or DIA-2020 Display Interface Assembly
CPU to DIB Cable (75226)

ICA-4L Interconnect Chassis Assemblies

Refer to Section Six, Standard Specific Requirements, for minimum system equipment requirements.

Section 1.2 Related Documentation

To obtain a complete understanding of specific features within the AM2020/AFP1010 or to become familiar with functions in general, make use of the documentation noted in **Table 1.2-1**.

VeriFire™ is a Windows® 95/98 based software program which provides an off-line programming and test utility designed to reduce installation programming time.

The Notifier Document chart (DOC-NOT) provides the current document revision. A copy of this document is included with each shipment of Notifier products.

TITLE	NUMBER	TITLE	NUMBER
AM2020/AFP1010 Fire Alarm Control Panel	15088	Annunciator Control System	15842
Liquid Crystal Display (LCD-80)	15037	Lamp Driver Modules (LDM)	15885
Network Control Station	51095	Voice Alarm Multiplex	15889
Intelligent Network Annunciator (INA)	15092	The XP Series Transponder System	15888
Universal Zone Coder Installation (UZC-256)	15216	Network Adaptor Module (NAM-232)	50038
Product Installation Document (CCM-1)	15328	The UDACT Universal Digital Alarm Communicator/Transmitter	50050
Product Installation Document (MPS-TR)	15331	FCPS-24/FCPS-24E Field Charger/Power Supply Installation, Operation and Application Manual	50059
AM2020/AFP1010 Operator Instructions	15337	Signaling Line Circuit (SLC) Manual	511253
Notifier Device Compatibility Document	15378	Media Interface Board (MIB)	50255
Analog Fire Panel (AFP-200)	15511	Repeater (RPT)	50256
Canadian Requirements for the AM2020/AFP1010	15631	**NOTI-FIRE-NET™**	50257
Network Interface Board (NIB-96)	15666	Telephone/Panel Interface (TPI-232)	50372
Smoke Control Manual	15712	Automatic Fire Alarm Warden Station Series Product Installation Drawing	50705
Analog Fire Panel (AFP-300/AFP-400)	50253/50259/ 50260	MMX-2 Installation Instructions	M500-03-00
ACT-2 Audio Coupling Transformer	51118	CHG-120 Battery Charger	50641
APS-6R Auxiliary Power Supply	50702	XP5 Series Transponders	50786
RM-1 Series Remote Microphones	51138	VEC 25/50 Voice Evacuation ControlPanel	50686
NBG-12LX Pull Station	51093	PageNet Manual	51311

Table 1.2-1 Related Documentation

Section Two
Cabinet Selection and Component Installation

General

The cabinet assembly consists of two basic components; the backbox (SBB) and door (DR). All cabinets for the AM2020/AFP1010 are fabricated from 16-gauge steel.

Cabinet parts are painted Notifier gray or red with navy blue windows.

Provided with the key-locked door are a pin-type hinge, window, two keys, and the necessary hardware to mount the door to the backbox.

The backbox has been engineered to provide ease-of-entry, with knockouts positioned at numerous points to simplify conduit installation.

The hinges are field-selectable for either left or right mounting. The door opens 180 degrees.

Product Line Information

Cabinets are available in sizes A through D. The cabinets are identified by product codes CAB-A3 for the smallest enclosure through CAB-D3 for the largest.

A trim ring (TR) option is available for semi-flush mounting (TR-A3, TR-B3, TR-C3, TR-D3).

A wire channel (WC) option provides a pair of wire trays to neatly route wire between rows in the cabinet. Order one pair per cabinet row.

Prior To Installation

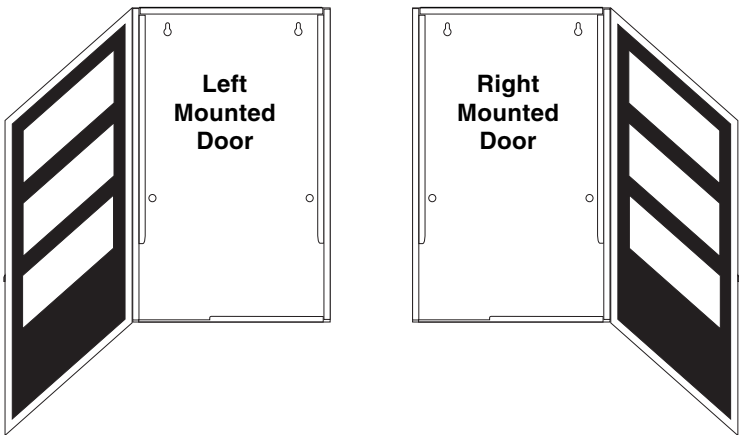
The doors may be mounted in either a left or right opening configuration; aiding in installation and service when two control panels are mounted in a confined area or side-by-side (as shown). In this manner the doors may be opened "barn door" style, creating an open work space. Note that in this type of installation it is necessary to leave enough space between cabinets to insert a key into the locks on the door frames.

Left Mount

On a left mounted door, the Display Interface Assembly (DIA) dress panel cannot be opened when the door is at less than a 120 degree angle to the cabinet. If you are using the left mounting option, be sure that the door can open at least 120 degrees. This is especially important if the cabinet is to be mounted in a closed area, such as a closet or utility room.

NOTE

The two hinges and the two alignment tabs should be attached to the backbox before any equipment is mounted in the backbox. See the Door Assembly Instructions section.



Section 2.1 Mounting the Backbox

The cabinet may be either surface mounted or semi-flush mounted (refer to **Figure 2.1-1**). Mount the cabinet in a clean, dry, vibration-free area, using the four holes provided in the back surface of the backbox. Locate the cabinet so that the top edge is 66 inches (168 cm) above the surface of the finished floor. This procedure places the center of the control panel keypad 60 inches (152 cm) above the finished floor.

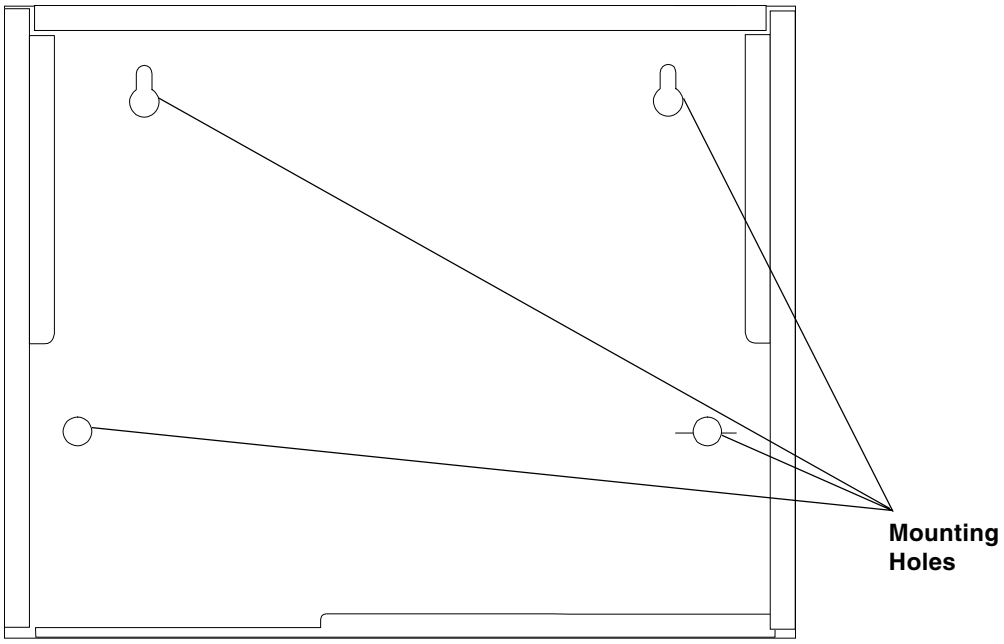


Figure 2.1-1 Cabinet Backbox Mount

CAUTION!

Unless you are familiar with the placement of components within this backbox, use only the knockout locations provided for conduit entry. Do not allow any conduit entry at the bottom of the panel where the batteries are to be mounted (see Figure 2.4-2).

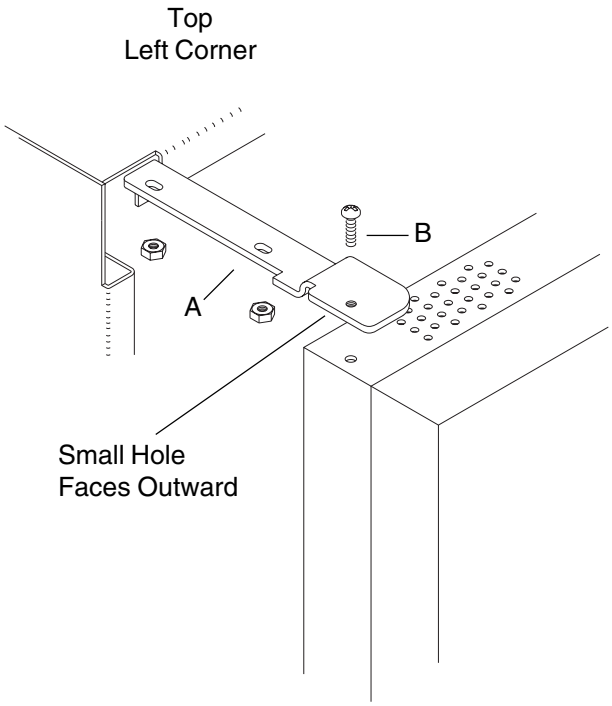
Door Assembly Instructions

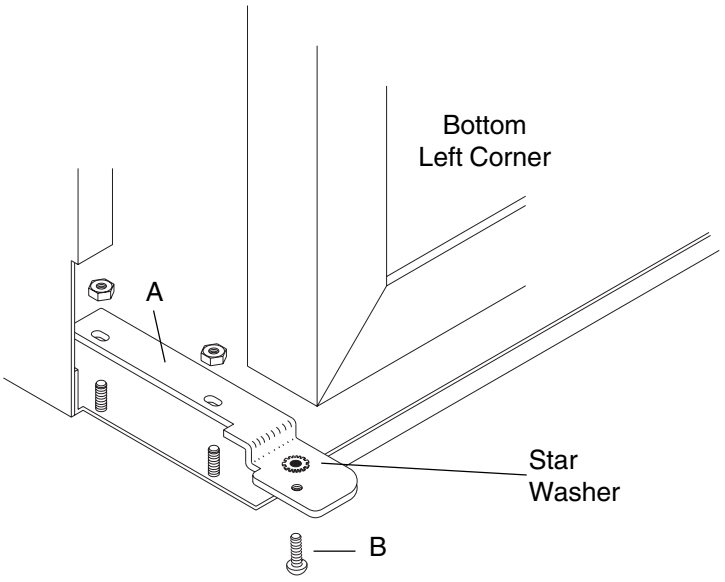
Hinges can be either left or right mounted. The illustrations and text depict a left-mount example. For right mounting, simply substitute right for left in the instructions.

1) Insert door hinges (A) into the top and bottom slots of the side to be hinged (in this case the left side). Secure the hinges to the studs in the backbox with the nuts provided. Note that the small hole on the outer tab faces outward.

2) Thread stud (B) into the BOTTOM hinge first. Thread from the bottom up. Place the grounding star washer on the stud. Place the door's lower corner onto this stud. Placing the door on the lower stud first provides a place for the door to rest while completing the assembly.

3) Align the door on the backbox, so that the door sits directly under the top hinge. Thread remaining stud (B) into the TOP hinge and through the hole in the top of the door. The door should now swing freely.

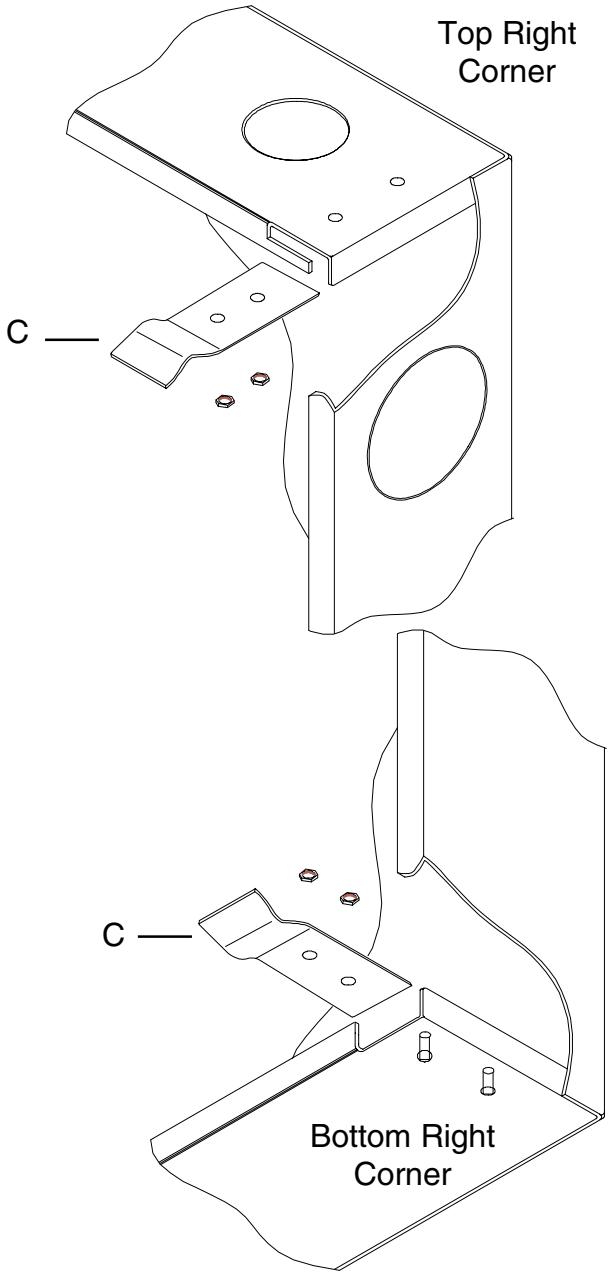


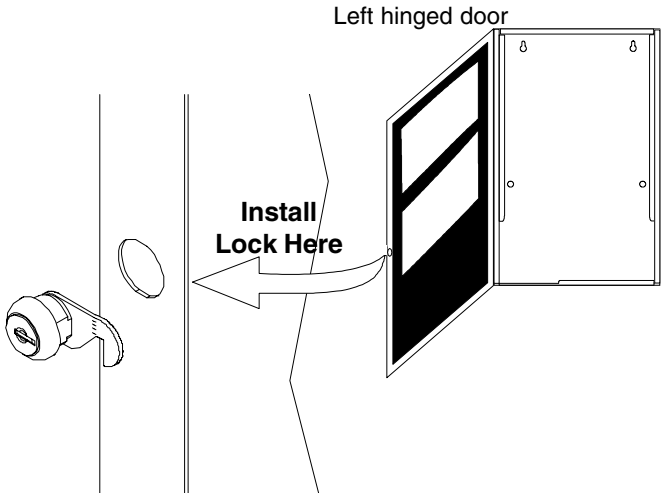


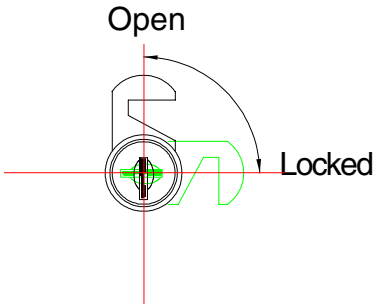
4. Install the door alignment tabs (C) in the unused slots on the backbox (top and bottom). (In this example the door was mounted on the left, leaving the unused slots on the right). Secure alignment tab (C) to top PEM stud with nut provided. These tabs align the door correctly with the backbox and prevent the door from being "skewed" open.

5. Punch out the knockout for the door lock and install the snap-in lock mechanism by pressing it into the hole. Be sure to do this LAST, so you will be sure to knock out the correct side.

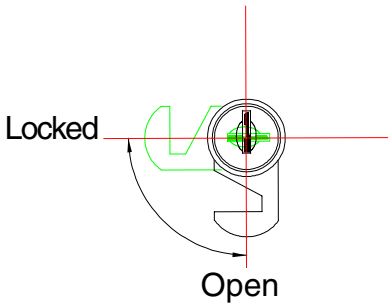
CAUTION: The lock must be installed in locked position with the key removed. The installation picture below shows the proper lock position for a left-hand mounted cabinet door.







The lock mechanism as viewed in a left-hinged mounting application. The lock would be placed in the right edge of the door.



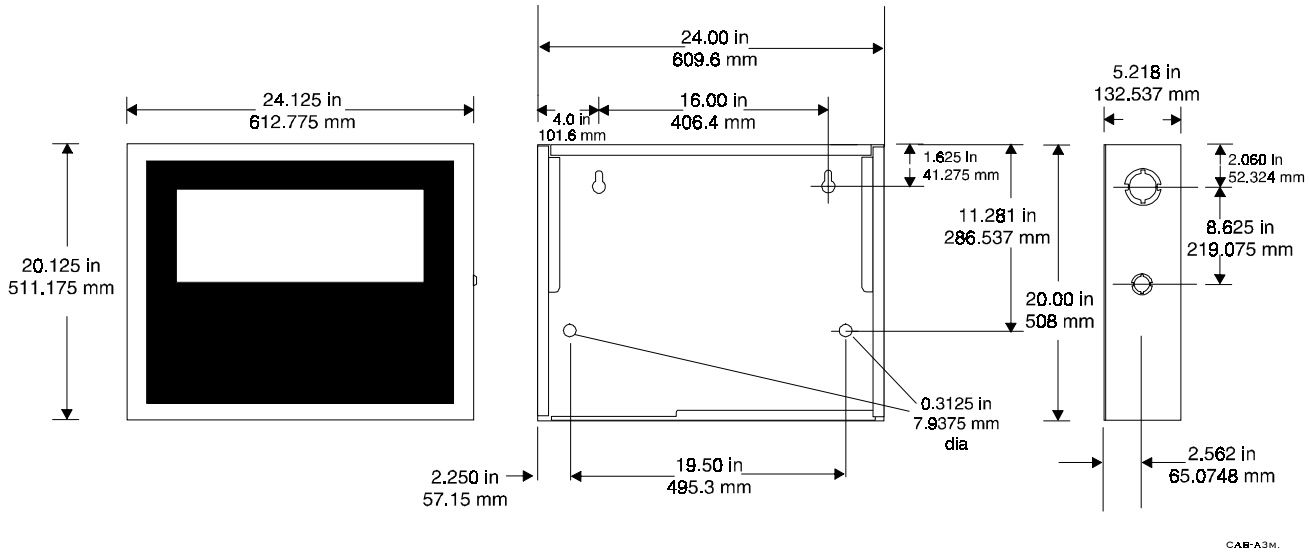
The lock mechanism as viewed in a right-hinged mounting application. The lock would be placed in the left edge of the door.

Section 2.2 CAB-3 Series Backboxes

CAB-A3

The CAB A-3 is the cabinet and door assembly for one mounting row. An optional TR-A3 trim ring is available for use with the A-size cabinet, which is 24.125 inches wide by 20.125 inches high (612.775 mm wide by 511.175 mm high). The following replacement parts are available:

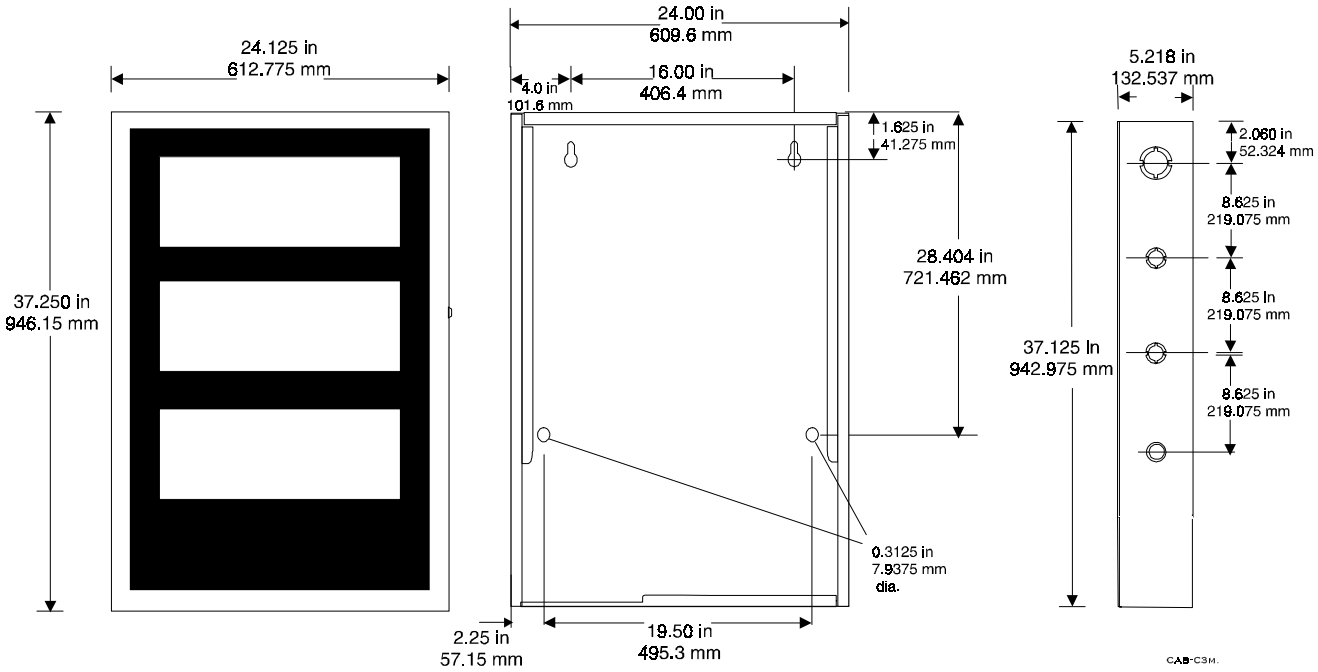
- DR-A3 door
- SBB-A3 backbox



CAB-C3

The CAB-C3 is the cabinet and door assembly for three mounting rows. An optional TR-C3 trim ring is available for use with the C-size cabinet, which is 24.125 inches wide by 37.250 inches high (612.775 mm wide by 946.15 mm high). The following replacement parts are available:

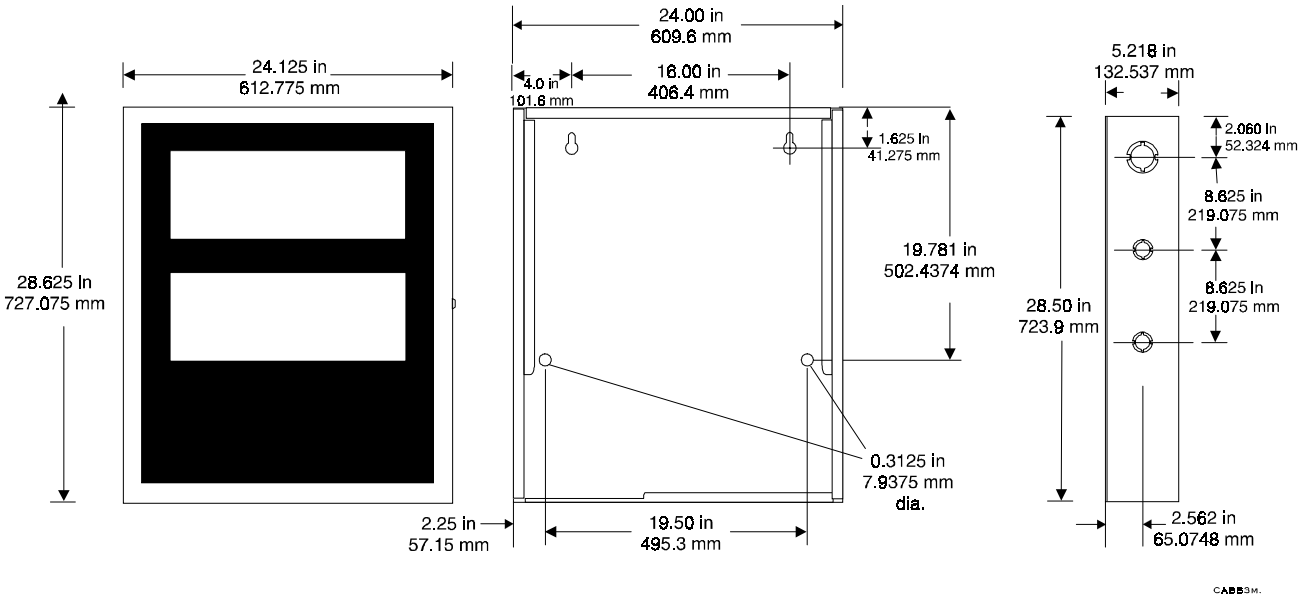
- DR-C3 door
- SBB-C3 backbox



CAB-B3

The CAB-B3 is the cabinet and door assembly for two mounting rows. An optional TR-B3 trim ring is available for use with the B-size cabinet, which is 24.125 inches wide by 28.625 inches high (612.775 mm wide by 727.075 mm high). The following replacement parts are available:

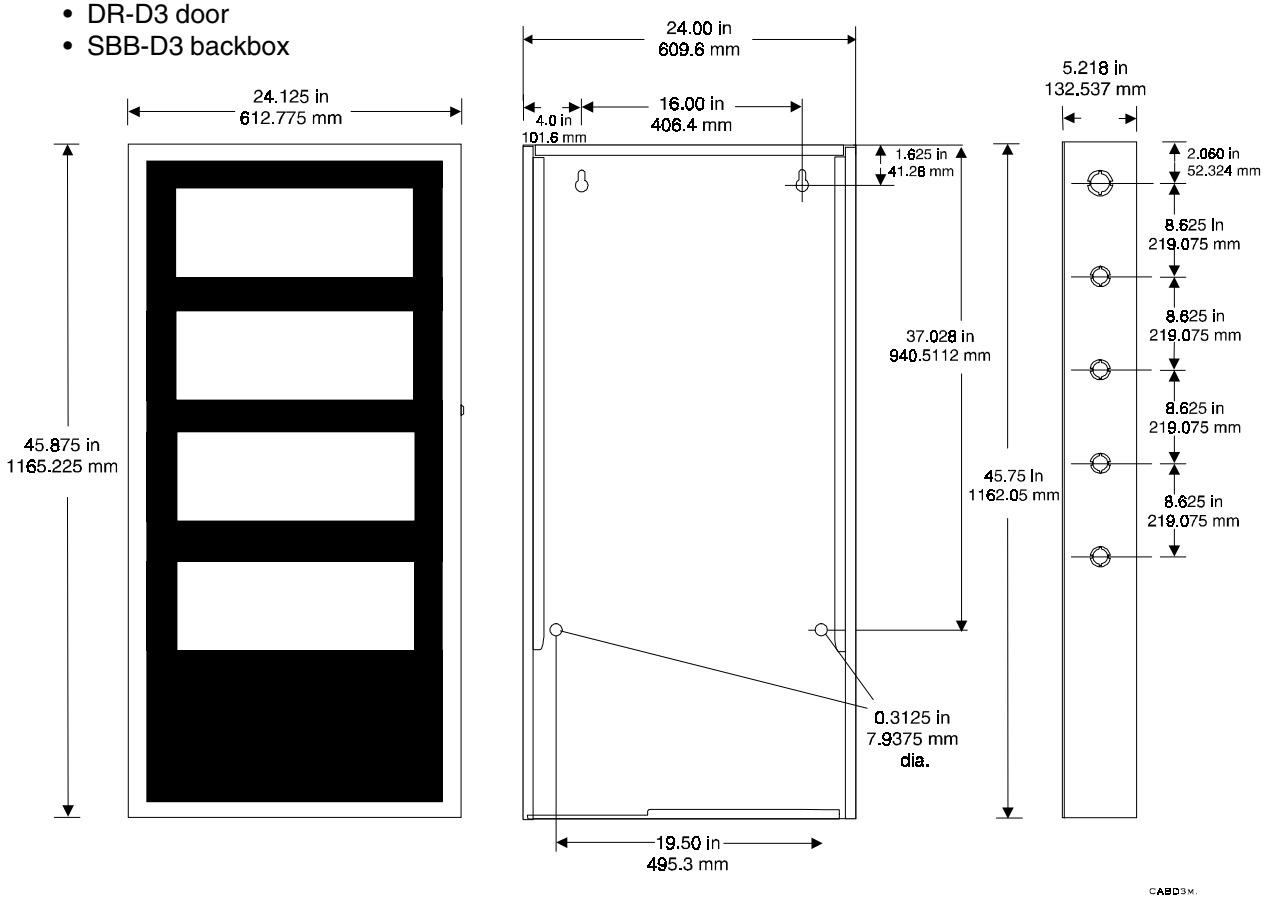
- DR-B3 door
- SBB-B3 backbox



CAB-D3

The CAB-D3 cabinet and door assembly for four mounting rows. An optional TR-D3 trim ring is available for use with the D-size cabinet, which is 24.125 inches wide by 48.875 inches high (612.775 mm wide by 1165.225 mm high). The following replacement parts are available:

- DR-D3 door
- SBB-D3 backbox



Section 2.3 Mounting the ICA-4L

The AM2020/AFP1010 system may use one to three Interconnect Chassis Assemblies (ICA), depending on the specific installation requirements. The AFP1010 requires only one ICA when using LIB-400s.

The ICA-4L is a low profile mounting chassis that currently replaces the ICA-4 in all BE-1010N and BE-2020N basic equipment kits. The ICA-4L is compatible with both CAB-2 and CAB-3 cabinets and the ICA-4 chassis. The ICA-4L is required when employing the LIB-400 local mode general alarm bus (refer to The Loop Interface Boards, Section 4.2 of this chapter).

When using more than one ICA-4L, interconnect each ICA-4L before mounting it to the backbox by mating the male connector on one chassis to the female connector on the other (no cable is required). Align all ICA-4L Assemblies over the studs in the backbox. Connect chassis grounding cable, part number 71073 for each board to be installed on the ICA-4L to an ICA-4L stud. Secure the assemblies and cables with the nuts and washers provided. Each ICA-4L is marked with "TOP" for proper orientation.

The ICA-4L is recommended when installing the SIB-2048A, SIB-NET, LIB-200A, or LIB-400 because a 16-position receptacle is mated with a 16-pin plug. The LIB-400 is used to illustrate this in **Figure 2.3-1**.

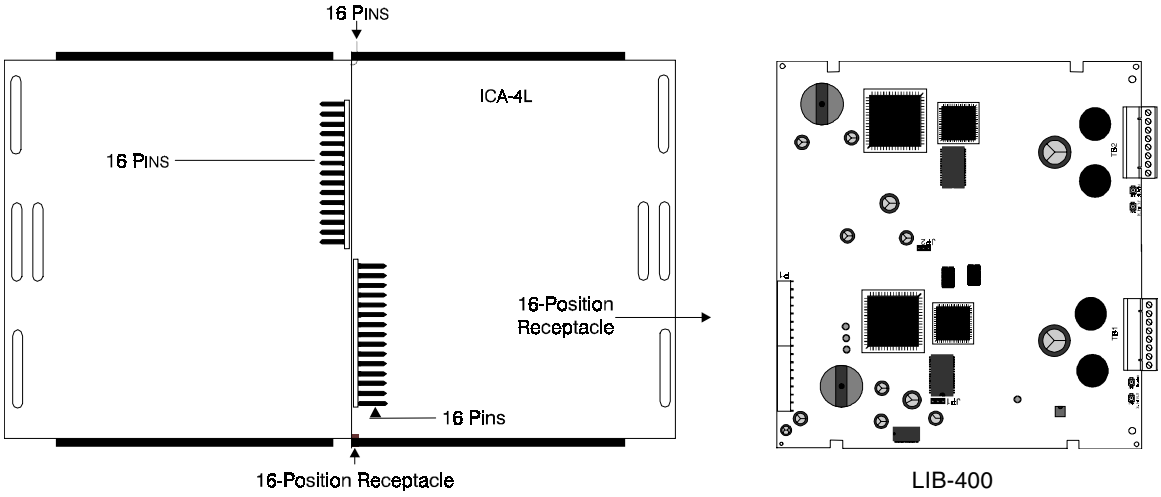


Figure 2.3-1 ICA-4L 16 Position Receptacle Connections

The power cable part number 75378, (refer to **Figure 2.3-2**) is able to mate properly with the ICA-4L since it has a 16 position receptacle. The power cable also has an 8-position receptacle to connect to the main power supply (refer to **Figure 2.3-3**).

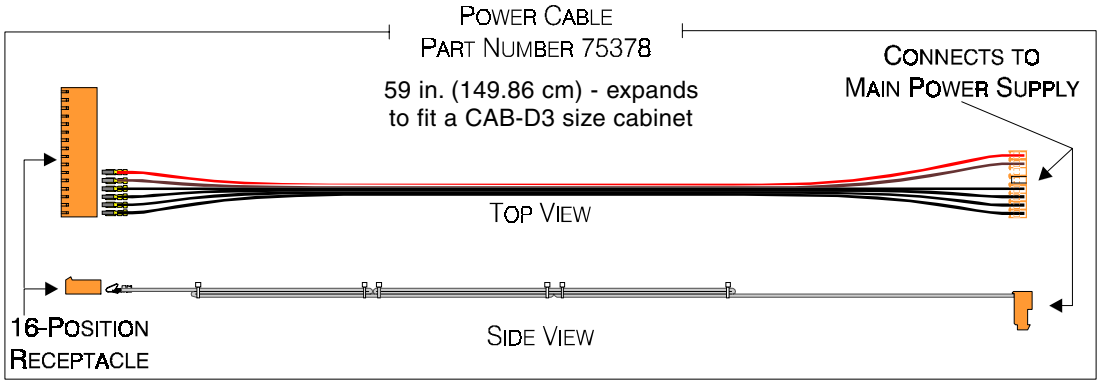


Figure 2.3-2 Power Cable Part Number 75378

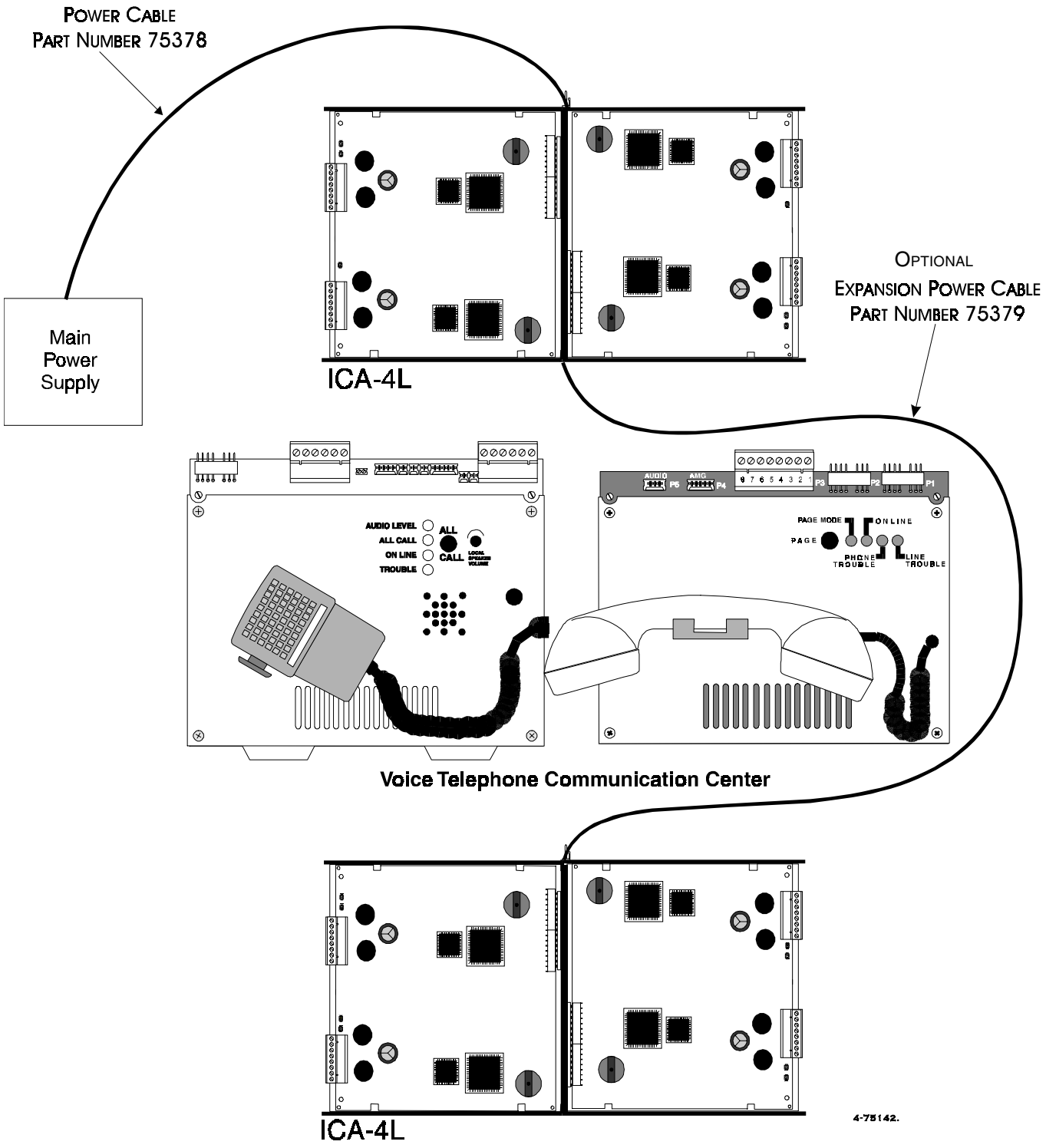


Figure 2.3-3 Using the Optional Expansion Power Cable

Expansion power cable part number 75379 (**Figure 2.3-4**), is able to mate properly with the ICA-4L since it consists of a 16-pin plug and a 16-position receptacle (**Figure 2.3-3**).

Note: Only one power expansion cable is needed per system.

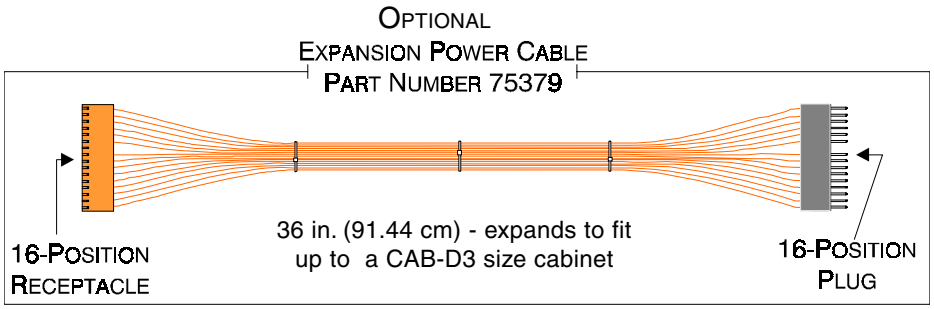


Figure 2.3-4 Expansion Power Cable Part Number 75379

Any board with a 15-position receptacle suitable for use on the ICA-4 may also be mounted on the 16-pin plug ICA-4L. The following nine boards have 15-position receptacles and may be installed on the ICA-4L:

- CPU-2
- CPU-2020
- SIB-64
- SIB-232
- SIB-2048
- UZC-256
- CCM-1
- LIB-200
- NIB-96

When installing any board consisting of 15-position receptacles on the 16-pin plug ICA-4L, only pins one through 15 will engage. The 16th pin will remain on the outside of the board receptacle (refer to **Figure 2.3-5**). A 16-position ICA-4L is required for local mode general alarm bus operation (refer to The Loop Interface Boards, Section 4.2 of this manual).

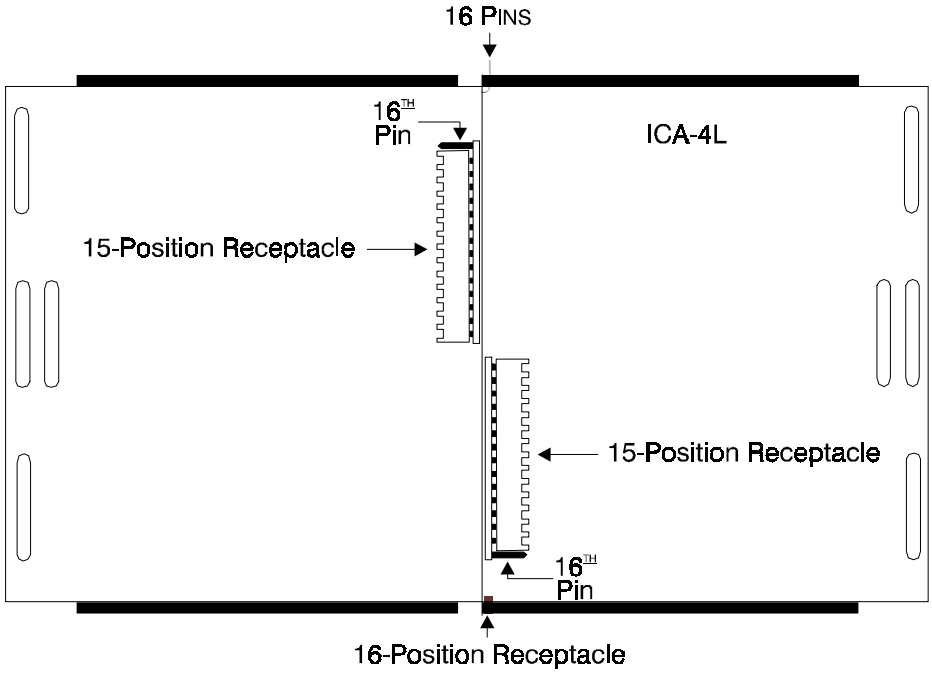


Figure 2.3-5 ICA-4L 15 Position Receptacle Connections

Although cable part number 75142 consists of a 15-pin plug and a 15-position receptacle (**Figure 2.3-6**) it can still be mated on the 16-pin plug ICA-4L, only pins one through 15 will engage. The 16th pin will remain on the outside of the board receptacle (**Figure 2.3-7**).

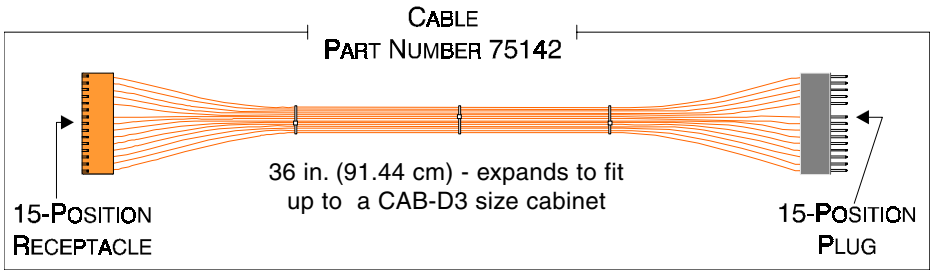


Figure 2.3-6 Cable Part Number 75142

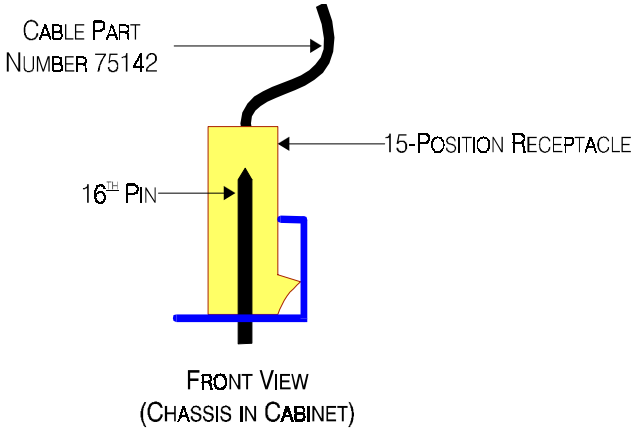
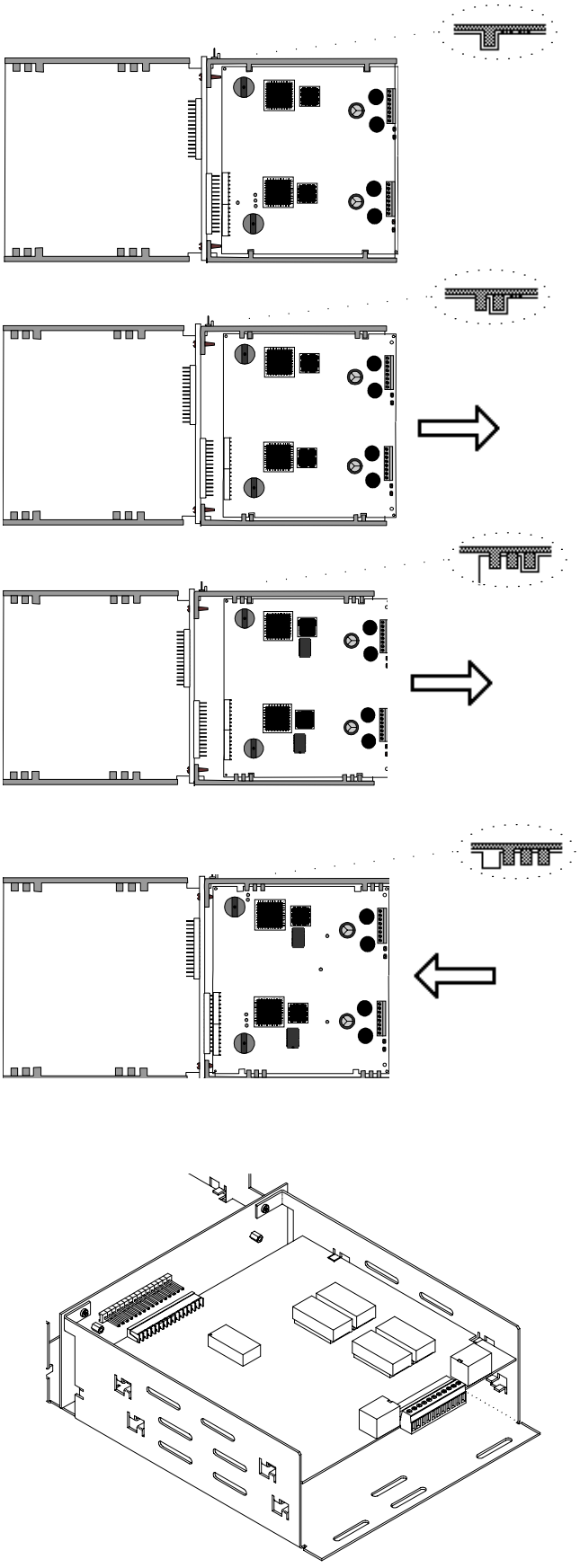


Figure 2.3-7 Cable Part Number 75142 Connected to the ICA-4L

Figure 2.3-8 illustrates the installation of a LIB-200, LIB-200A, and/or LIB-400 module in the back right position of an Interconnect Chassis Assembly (behind the CPU, which is installed later). Installation of boards in the remaining ICA-4L positions involve a similar procedure.



Step 1
Place the board in front of the Interconnect Chassis Assemblies (ICA-4L) in the position where it will be installed. Tilt the board into the ICA-4L and align the square slots on the board with the first set of four tabs on the ICA-4L as illustrated.

Step 2
Carefully push the board back to the first level and then slide it away from the ICA-4L, until it is directly over the second set of four tabs, now located immediately behind the printed circuit board.

Step 3
Push the board back again to the second level and then slide it away from the ICA-4L until it is directly over the third set of four tabs, now located immediately behind the printed circuit board.

Step 4
Now push the board back so that it is resting on the four tabs behind the board. Slide the board inward toward the center of the ICA-4L and carefully engage the female connector on the board with the male connector on the ICA-4L. When the board is correctly seated, it will be stopped by a mechanical tab. Some force is required. Before applying force, carefully check alignment of all pins. When finished, the board should be seated in a channel consisting of four retaining tabs in front of the printed circuit board and four retaining tabs behind the printed circuit board.

CAUTION
Remove Serial Interface Boards (SIBs) carefully, as the metal tabs on the ICA-4L may shear off some of the SIB components.

NOTE
For installation of system boards in the first level of the ICA-4L, omit Steps 2 and 3.

Figure 2.3-8 Mount System Boards to the ICA-4L Chassis

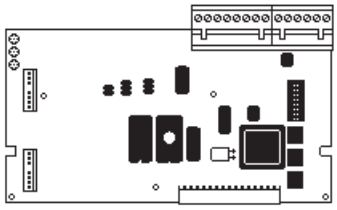
Section 2.4 Component Placement

Each component in the system has a specific mounting position in the cabinet. Mount any optional APS-6R power supplies and amplifiers in CHS-4/4L chassis positions A through D as required. It is recommended that the CHS-4/4L chassis always be installed in the lowest cabinet row available (refer to **Table 2.4-1**).

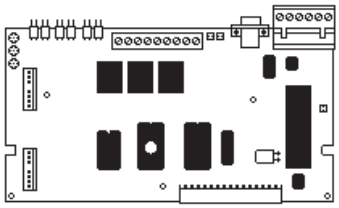
Cabinet Models	Cabinet Rows
CAB-A3	1
CAB-B3	2
CAB-C3	3
CAB-D3	4

Table 2.4-1 Cabinet Size Information

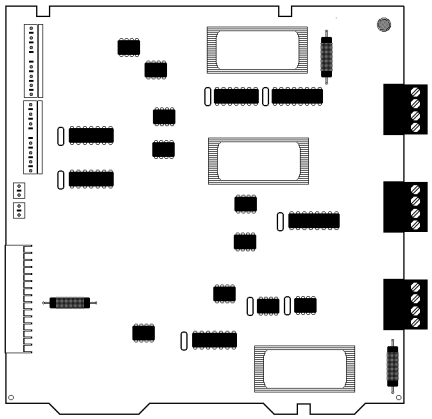
Optional component placement guidelines are provided in **Figure 2.4-1**.



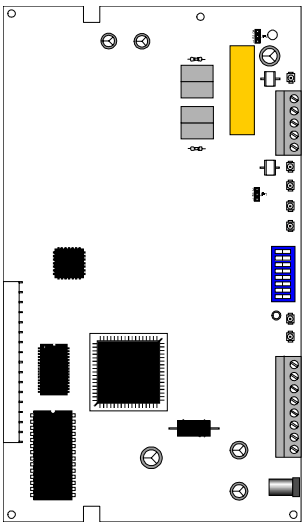
NIB-96 (Power-limited) Mounts in any one LIB position or any two CHS-4/4L positions.



UZC-256 (Power-limited) Mounts in any one LIB position or any two CHS-4/4L positions.



CCM-1 (Power-limited) Mounts in any one LIB position or any two CHS-4/4L positions.



NAM-232 (Power-limited) Mounts in either the left or right position of a CHS-4 by using four PEM studs on the CHS-4 chassis.

Figure 2.4-1 Component Placement Guidelines

Figure 2.4-2 depicts the LIB SLC numbering scheme for an AFP1010 in a CAB-B3 cabinet. If a CAB-A3 cabinet is used with LIB-400 modules exclusively, it may house a maximum four loop AFP1010 system (refer to **Figure 2.4-4**). One or two ICA-4L or ICA-4 chassis are required to mount the LIB modules depending upon the number and type of LIB modules employed. Refer to **Figure 2.4-3** as an example of AM2020 applications.

NOTE

The installation of LIB modules resulting in duplicate LIB SLC numbers is never permitted.

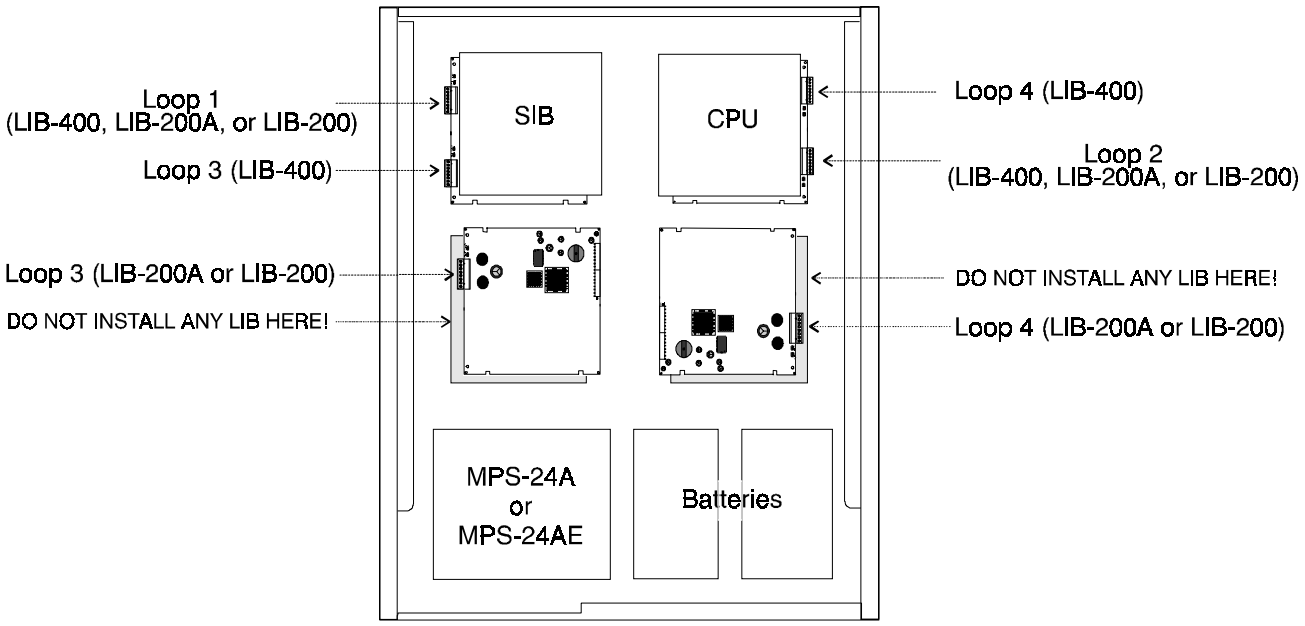


Figure 2.4-2 AFP1010 LIB SLC Numbering Scheme

Figure 2.4-3 depicts the LIB SLC numbering scheme for an AM2020 in a CAB-D3 cabinet. Three ICA-4L chassis are required to mount the various types of LIB modules employed. Refer to **Figure 2.4-2** as an example of AFP1010 applications.

NOTE

The installation of LIB modules resulting in duplicate LIB SLC numbers is never permitted.

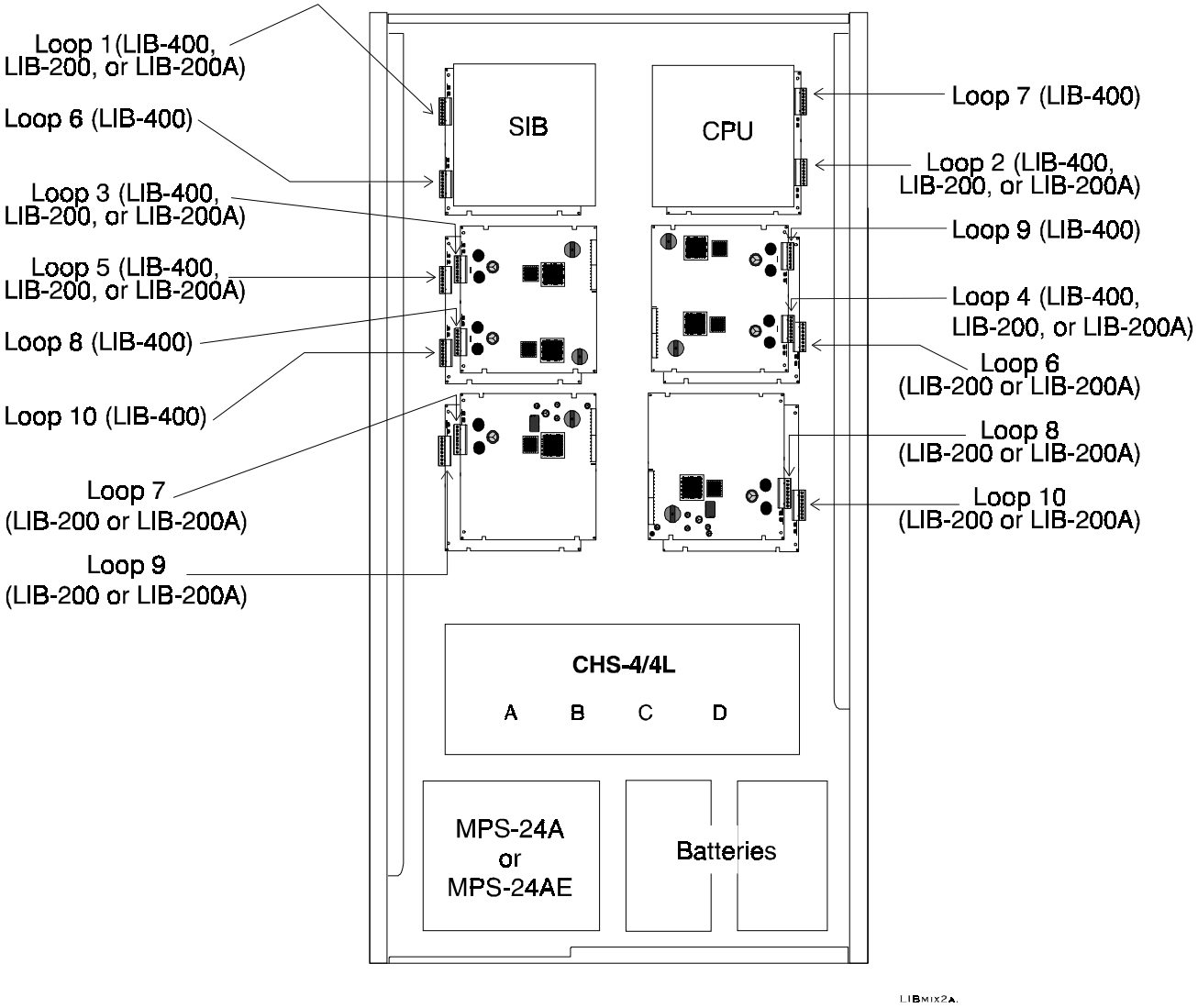


Figure 2.4-3 AM2020 LIB SLC Numbering Scheme

Figure 2.4-4 depicts a CAB-A3 cabinet used with LIB-400 modules exclusively, which means it may house a maximum four loop AFP1010 system. An ICA-4L or ICA-4 chassis (neither of which is shown in the figure) is required for mounting the LIB-400.

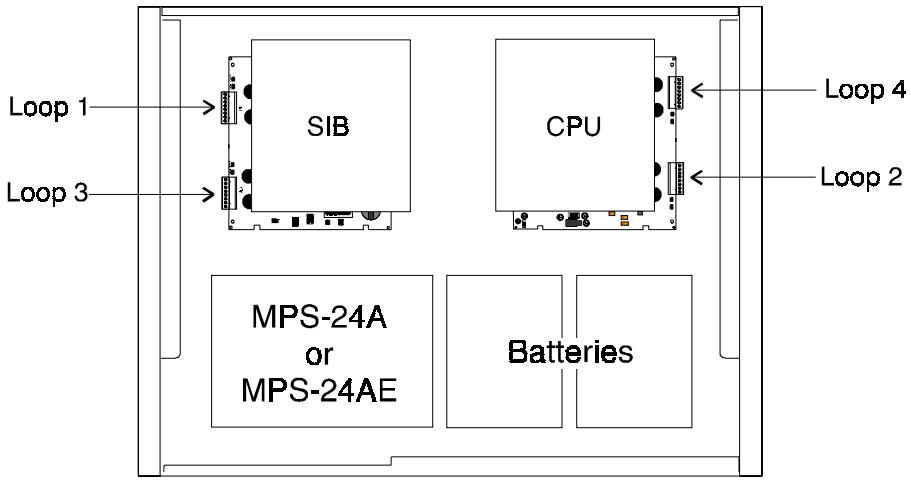


Figure 2.4-4 LIB-400 Placement in an AFP1010

Figure 2.4-5 depicts the AFP1010 with a combination of LIB-400, LIB-200A, and LIB-200 modules installed in the first and second rows of a CAB-C3 cabinet. Two ICA chassis are required, but are not shown in the figure. The LIB-400 always occupies both addresses (refer to **Figures 2.4-4** and **2.4-6**). Various combinations of LIB boards may be installed (refer to **Figure 2.4-3**) as long as the following measures are taken:

- Do not install duplicate loop numbers.
- When installed in the ICA the LIB-200 or LIB-200A always occupies the lower number address for a given ICA position.
- Do not install LIB boards in the back right or back left positions of the second row.
- Do not install LIB boards in row three.

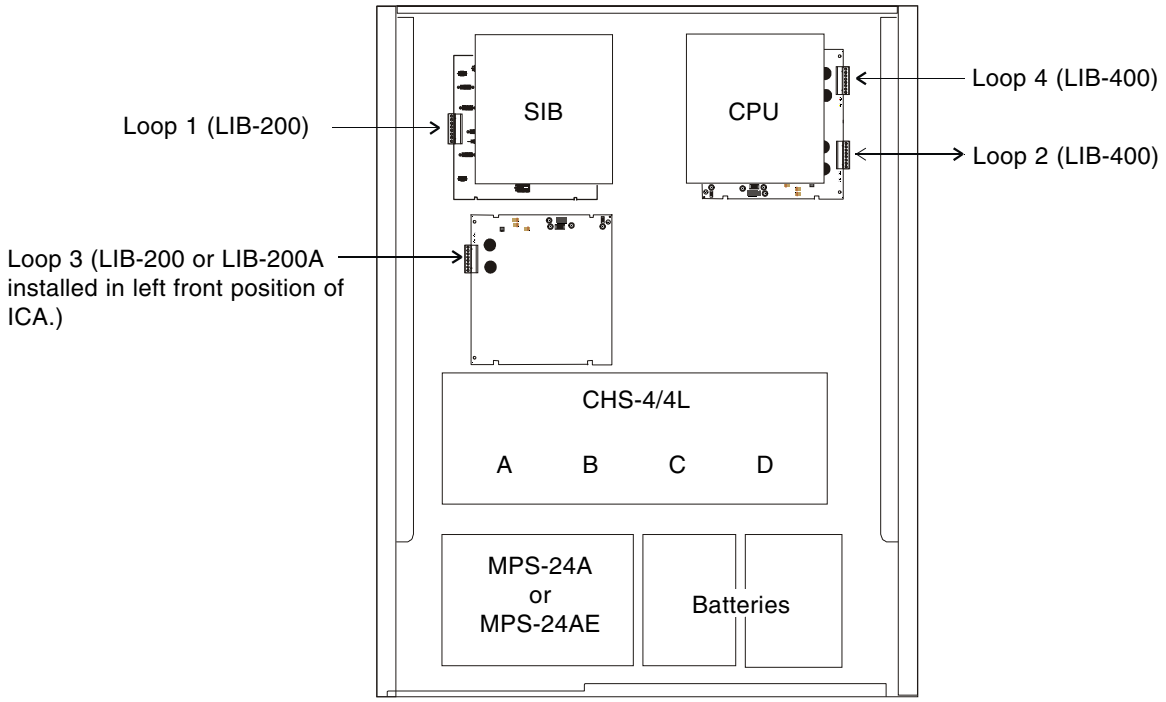


Figure 2.4-5 LIB Placement Example in an AFP1010

Figure 2.4-6 depicts a CAB-C3 cabinet used with LIB-400 modules exclusively, which means it may house a maximum ten loop AM2020 system. An ICA-4L or ICA-4 chassis (neither of which is shown in the figure) is required for mounting the LIB-400.

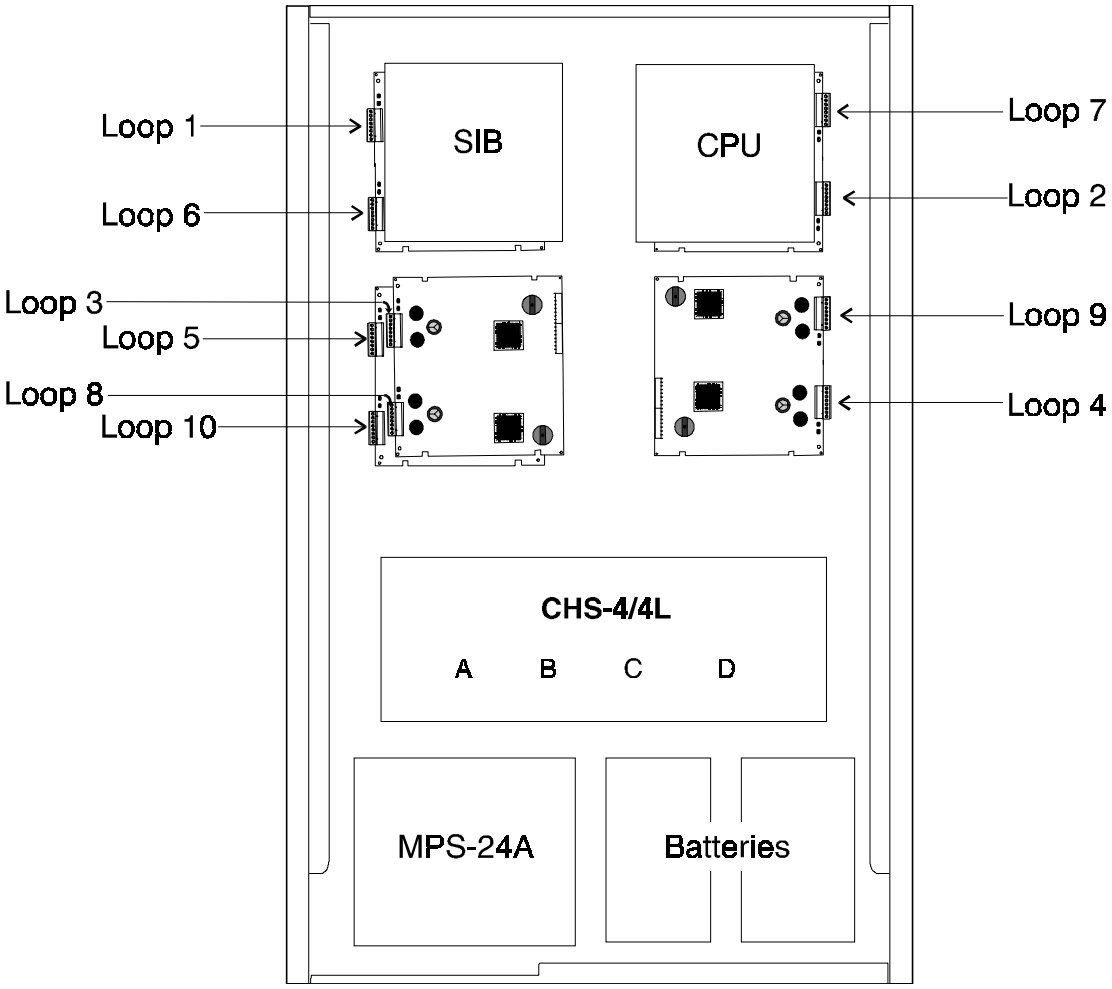


Figure 2.4-6 LIB-400 Placement in an AM2020

Figure 2.4-7 depicts the AM2020 with a combination of LIB-400, LIB-200A, and LIB-200 modules installed in the first and second rows of a CAB-C3 cabinet. Two ICA chassis are required, but are not shown in the figure. The LIB-400 always occupies both addresses (refer to **Figures 2.4-4** and **2.4-6**). Various combinations of LIB boards may be installed (refer to **Figure 2.4-3**) as long as the following measures are taken:

- Do not install duplicate loop numbers.
- When installed in the ICA the LIB-200 or LIB-200A always occupies the lower number address for a given ICA position.

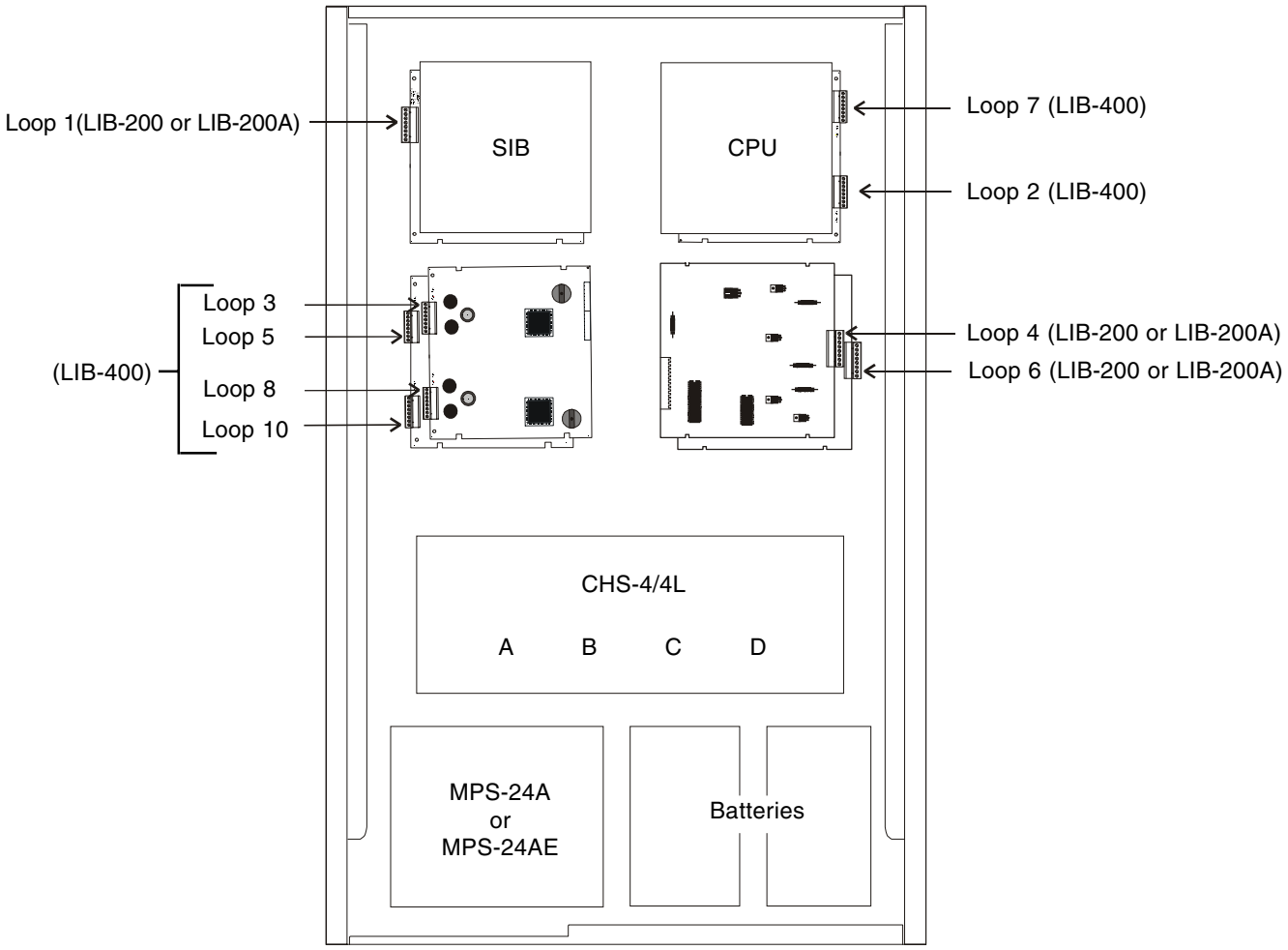


Figure 2.4-7 LIB Placement Example in an AM2020

Section 2.5 Optional Chassis Mounting

When using an optional CHS-4/4L Chassis (refer to **Figure 2.5-1**), mount the chassis in the lowest available row in the cabinet, below previously mounted Interconnect Chassis Assemblies (ICA-4L). The CHS-4/4L is marked to identify the top of the chassis. Connect grounding wires of equipment to be placed in the CHS-4/4L to the PEM stud indicated. Secure the unit to the cabinet with the nuts and lock washers provided.

NOTE

The CAB-A3 Cabinet will not accept an additional chassis.

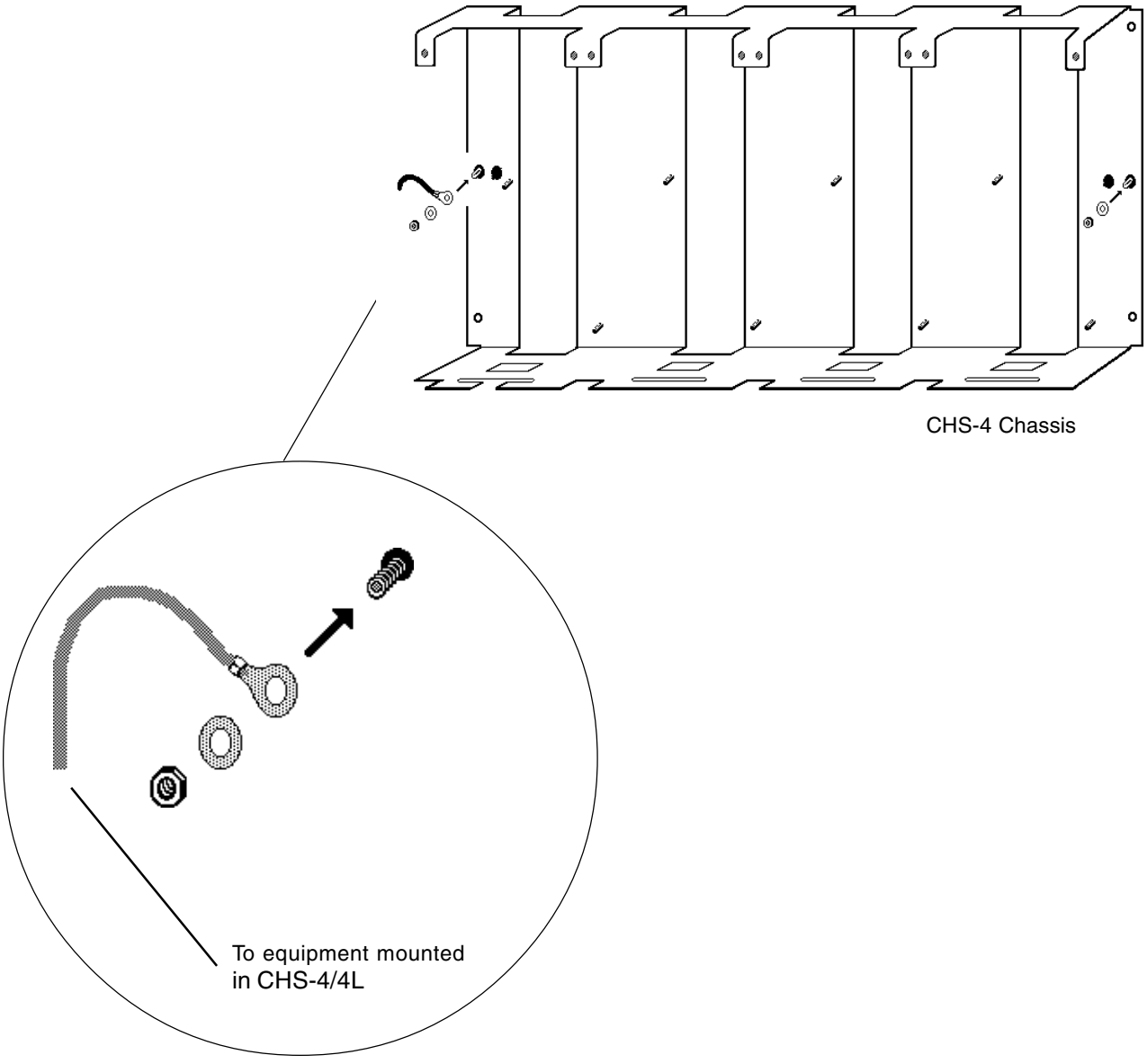
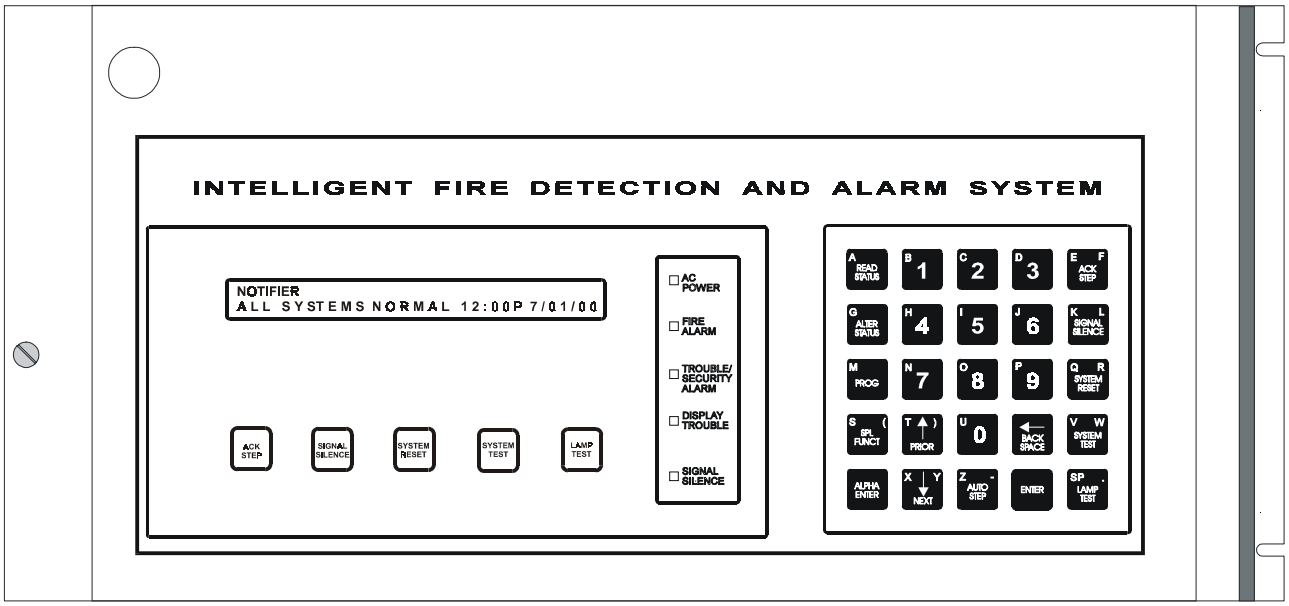


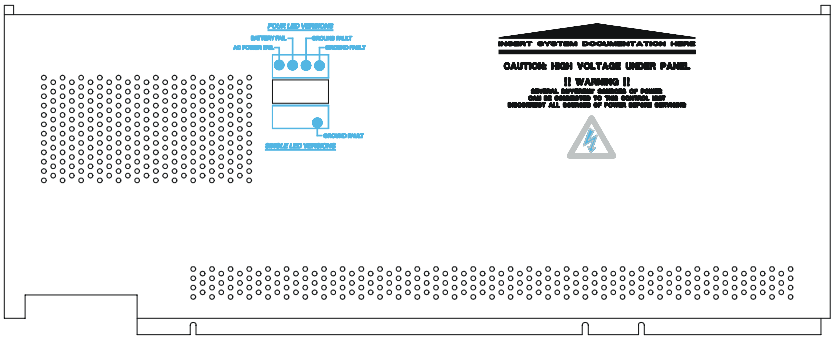
Figure 2.5-1 Optional Chassis Mount

Section 2.6 Other Components

Display Interface Assemblies

The Display Interface Assembly (DIA) includes a backlit Liquid Crystal Display (LCD), operator keypad, the Display Interface Board (DIB), hinged dress panel, and the CPU to DIB cable. Only one DIA is required per system. The DIA-2020 is included with the BE-2020N Basic Equipment Package for the AM2020. The DIA-1010 is included with the BE-1010N Basic Equipment Package for the AFP1010. **Figure 2.6-1** shows elements visible from the cabinet front. Note that the DP-1 dress panel is not included in the BE-1010N or BE2020N.





BP-3

The **Battery Dress Panel (BP-3)** covers the Main Power Supply and the batteries in the cabinet. Only one BP-3 is required per system.

DP-1

The **Dress Panel (DP-1)** covers additional ICA-4L or CHS-4/4L assemblies in the cabinet.

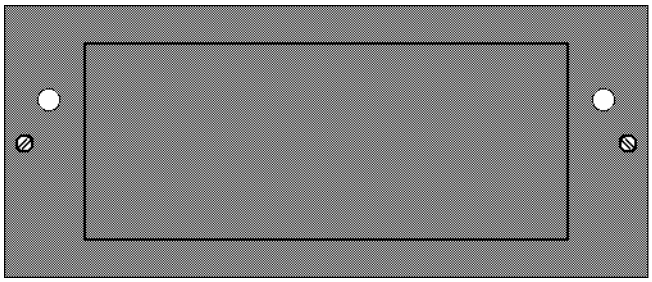
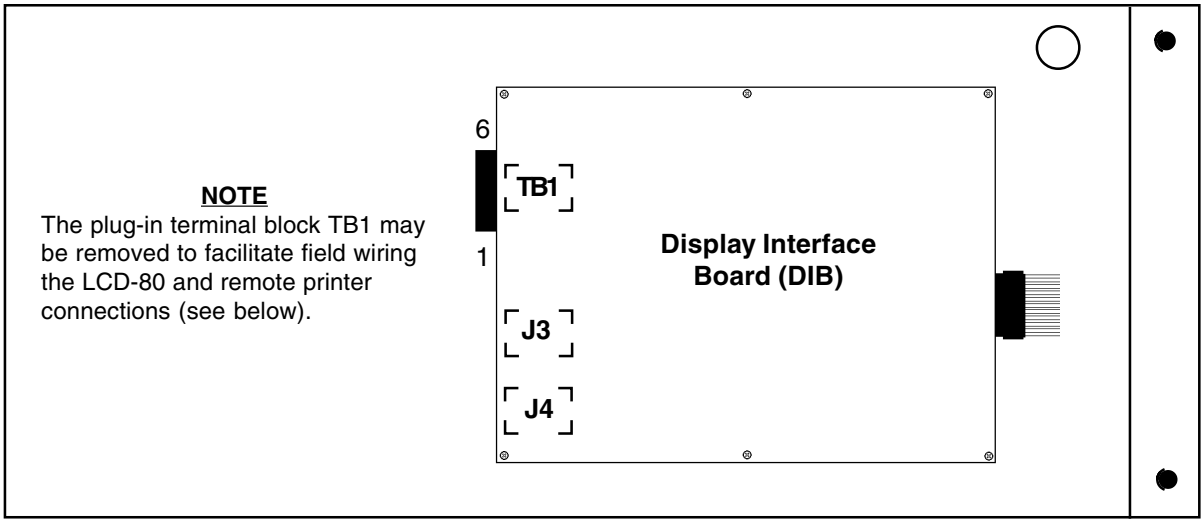


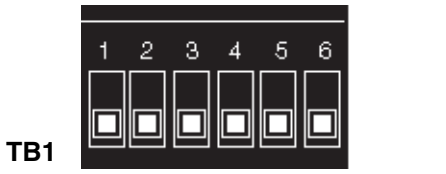
Figure 2.6-1 Intelligent Fire Detection and Alarm System

Section 2.7 Display Interface Connection

DIA-1010 and/or DIA-2020 provide access to the system CPU and the optional SIB, and an EIA-232 unsupervised printer interface (refer to **Figure 2.7-1**). When terminal supervision is not required and the terminal (if present) has no keyboard, the DIA-1010 and/or DIA-2020 provide an EIA-485 interface which may be used to connect an LCD-80 (in Terminal Mode).

Display Interface Assembly (DIA-1010/DIA-2020) viewed from the rear.

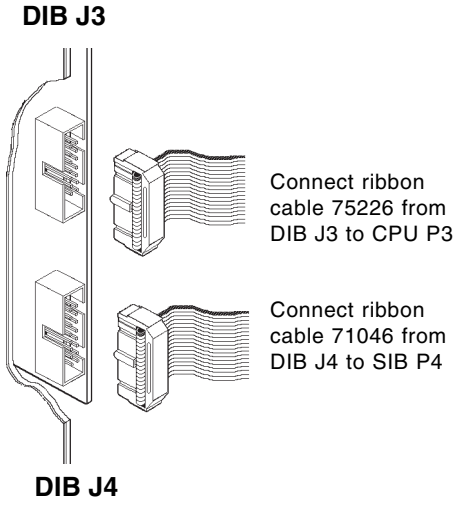


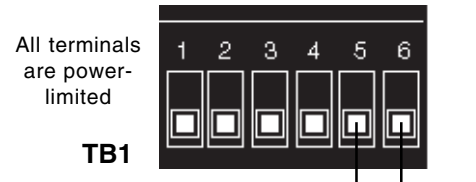


EIA-485 to LCD-80

NOTE

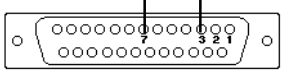
If a supervised CRT or CRT with keyboard has been installed, this interface cannot be used. The CCM-1 Communications Converter Module must be employed to connect the LCD-80 in terminal mode. For details, refer to the LCD-80 Liquid Crystal Display Manual listed in the Related Document Chart in the front of this manual.





EIA-232 to Notifier PRN
or
Keltron Printer #VS4095/5

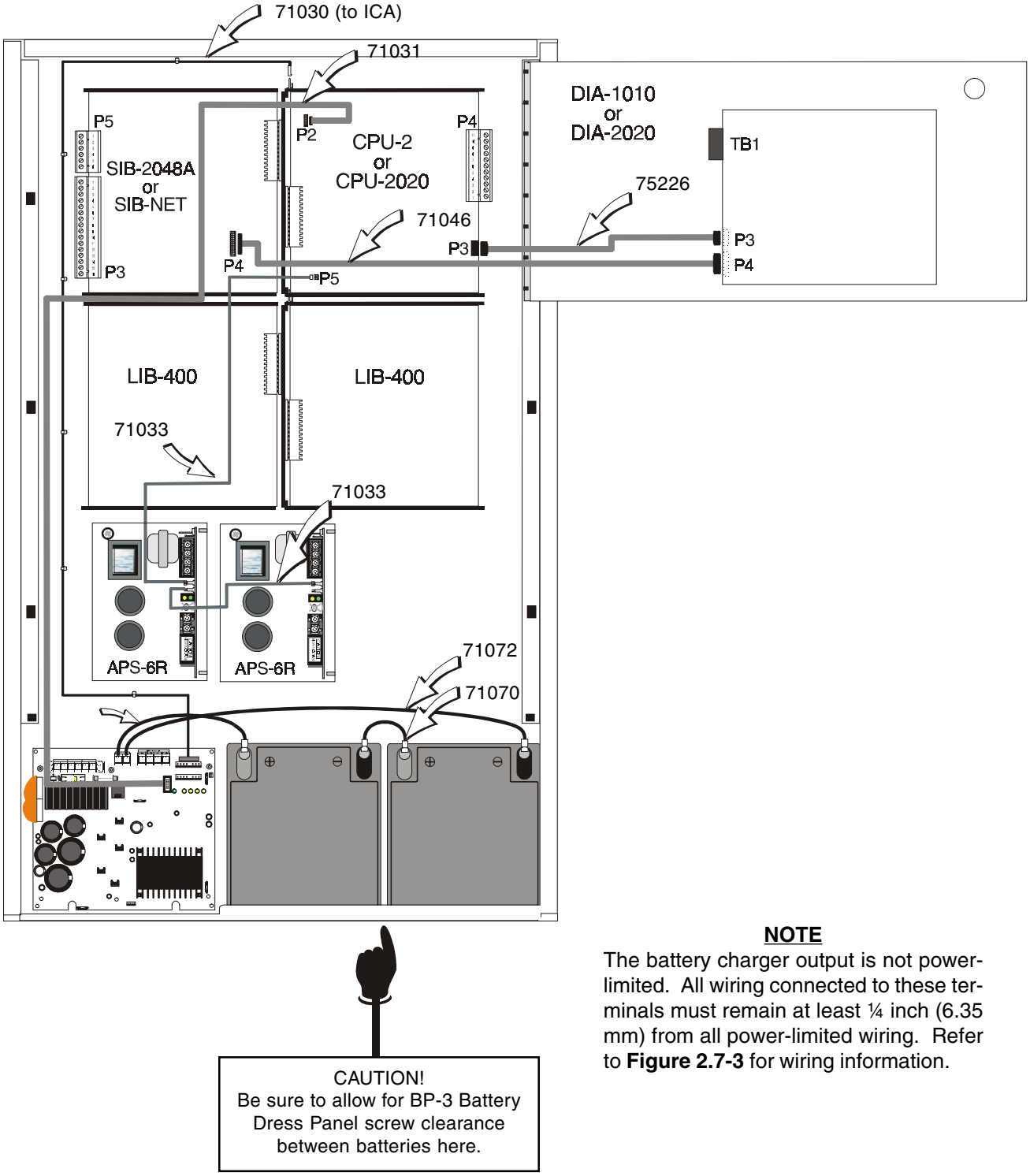
Outputs are power limited, but not supervised nor opto-isolated. Connections must be made with overall foil/braided-shield twisted paired cable suitable for EIA-232 and EIA-485 applications. The printer must be installed in the same room as the control panel. Terminate shield at cabinet entrance only.



Plug this DB-25 connector into the EIA-232 Port of either the PRN printer or the Keltron Printer Number VS4095/5.

Figure 2.7-1 Display Interface Assembly

Figure 2.7-2 depicts typical system cable placement.



NOTE

The battery charger output is not power-limited. All wiring connected to these terminals must remain at least ¼ inch (6.35 mm) from all power-limited wiring. Refer to **Figure 2.7-3** for wiring information.

Figure 2.7-2 Wiring Placement Diagram

Figure 2.7-3 depicts a typical AM2020/AFP1010 installation and is provided as a guide for proper wiring placement. The AC and battery wiring are not power-limited. A separation of at least ¼ inch (6.35 mm) must be maintained between power-limited and nonpower-limited wiring. Install the tie wraps and adhesive squares as indicated in **Figure 2.7-3**.

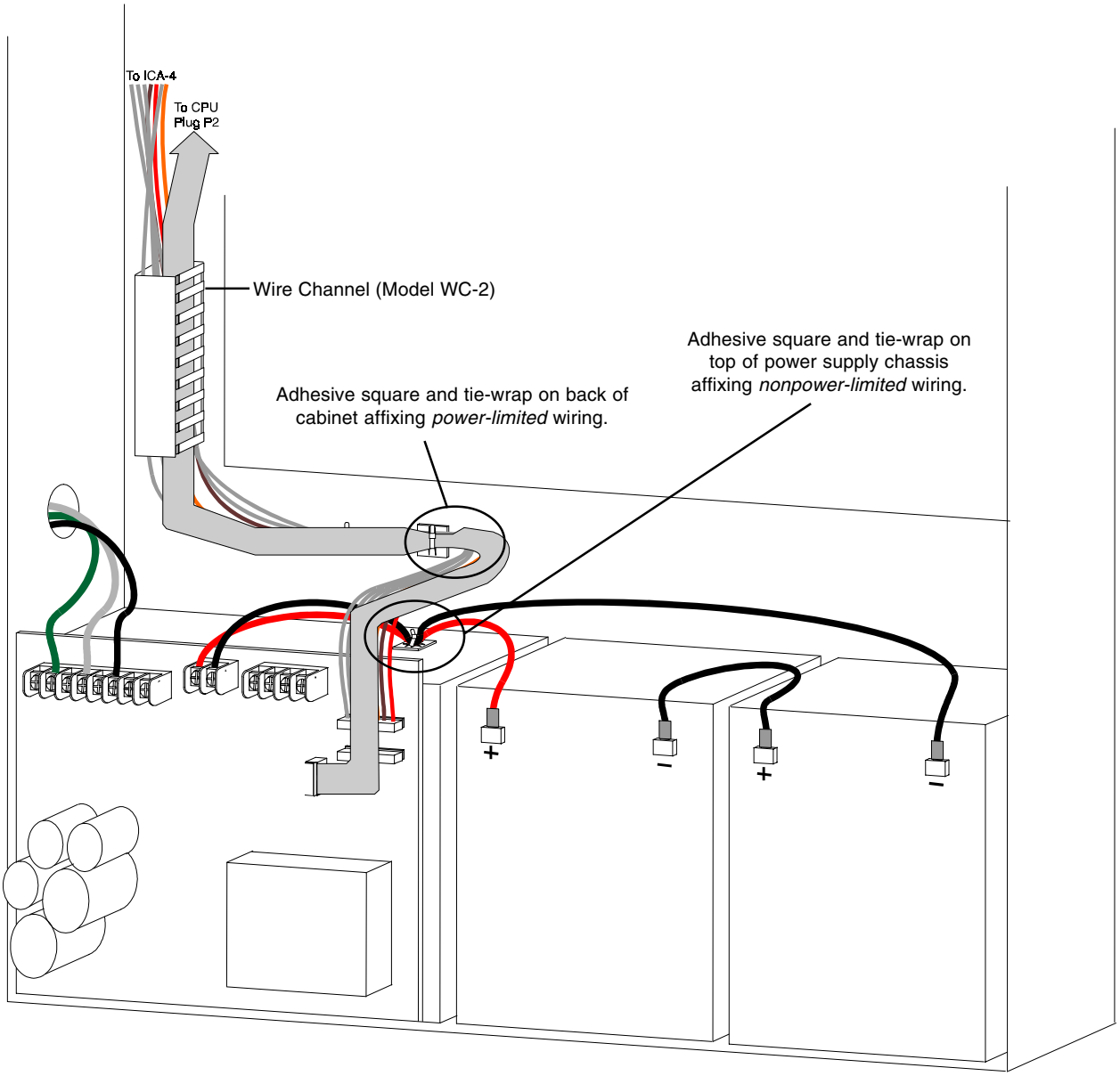


Figure 2.7-3 Power-Limited and Non Power-Limited Wiring

Figure 2.7-4 is provided as a guide for dress panel placement.

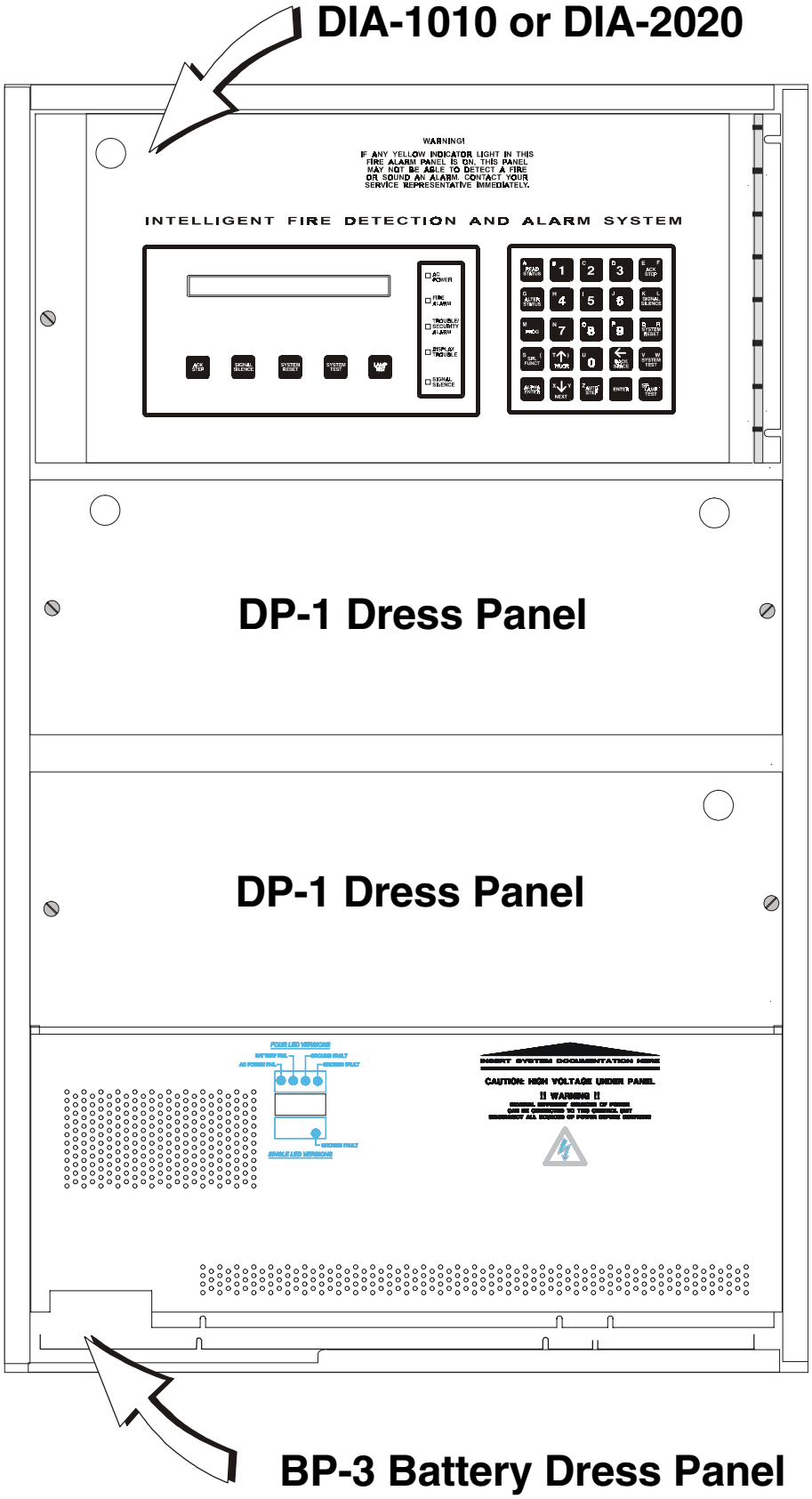


Figure 2.7-4 Dress Panel Placement Diagram

Section 2.8 Mounting the MOD-1 Module Plate

The MOD-1 allows a single MMX-1, MMX-2 or CMX module to mount in a CAB-3. It occupies one of the four positions available in a row on the CHS-4 or CHS-4L Chassis. The following five steps describe how to mount the MOD-1 in a chassis, and **Figure 2.8-1** illustrates the five steps of this installation.

1. Firmly press the module to be installed into the square opening on the MOD-1 until it snaps into place.
2. Secure the module to the MOD-1 with the two screws provided. Make connections to the module at this time.
3. Angle the bottom edge of the MOD-1 into the slot on the bottom of a chassis position. Swing the MOD-1 assembly into the chassis.
4. Secure the assembly to the chassis by tightening the captive screws on the MOD-1.
5. To install the CHS-4L chassis, follow Steps 1 and 2 above. After completing Step 2, screw the two standoffs provided to the upper studs of a CHS-4L chassis position as shown in Step 5 of **Figure 2.8-1**. Then continue on with Steps 3 and 4.

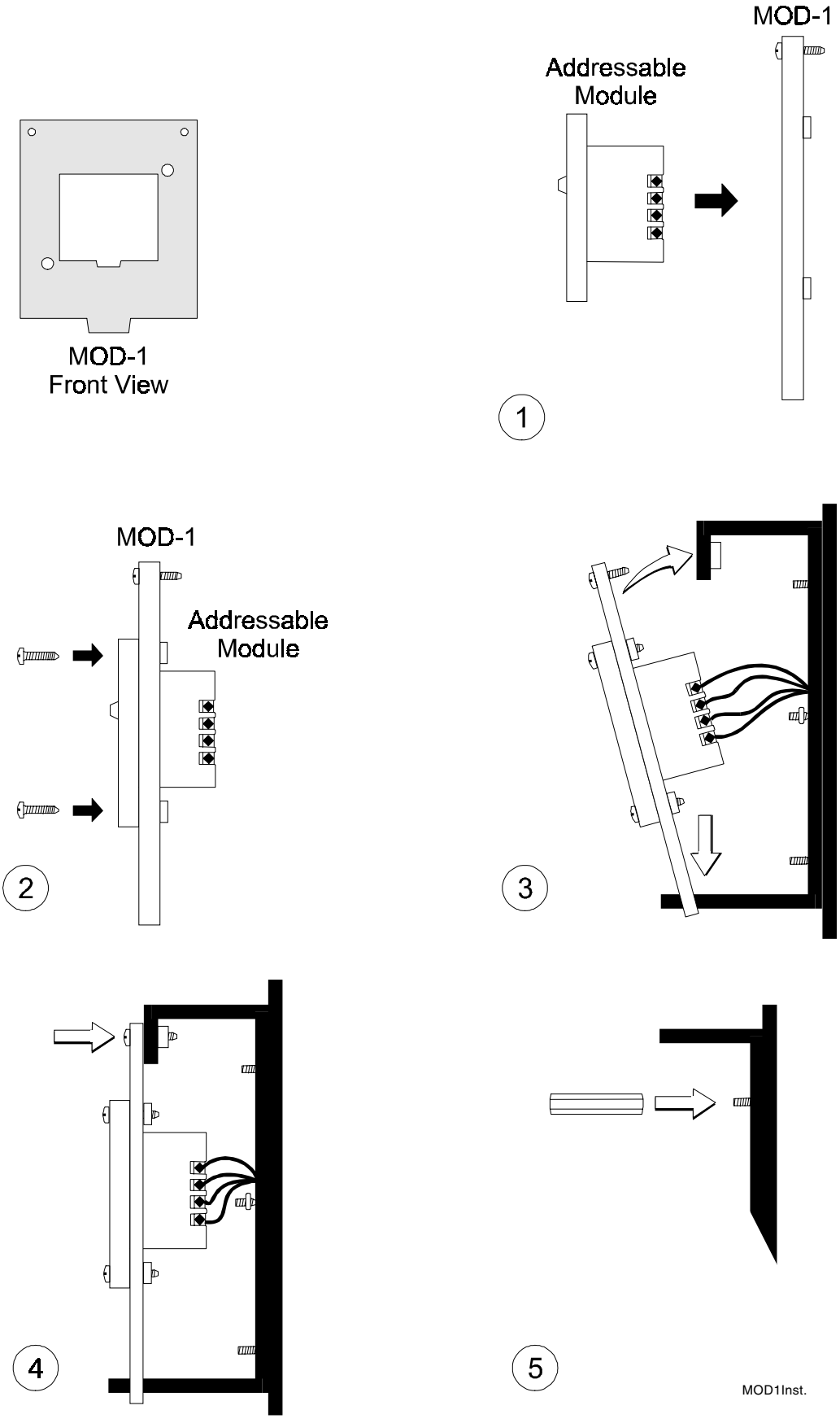


Figure 2.8-1 Mounting the MOD-1 into the CHS-4 and CHS-4L Chassis

Section Three
Power Supplies

Section 3.1 The AC Primary Power Input

The AM2020/AFP1010 requires primary AC power. Connection to the light and power service must be on a dedicated branch circuit and the wiring for this circuit must be installed in conduit. The switch for this circuit must be labeled "Fire Alarm Circuit Control". Access to the switch must be limited to authorized personnel and the location of the switch must be identified inside of the AM2020/AFP1010 cabinet door. No other equipment may be powered from the fire alarm circuit. The AC circuit wire run must run continuously, without disconnect devices, from the power source to the Fire Alarm Control Panel (FACP). Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) as well as local codes. Use 12 AWG (3.25 mm^2) wire with 600 volt insulation for this circuit. Use **Tables 3.1-1** and **3.1-2** to calculate the total amount of current, in amps, that the AC service must be capable of supplying to the system.

Device Type	# of Devices	Multiply by	Current in Amps	Total Current
APS-6R	[ ]	X	2.5	
AA-30	[ ]	X	1.0	
AA-100/AA-120	[ ]	X	1.85	
Main Power Supply (MPS-24A)	[1]	X	1.8	1.8
Sum Column for AC Branch Current Required =				**Amps**

Table 3.1-1 120 VAC Fire Alarm Circuit

Device Type	# of Devices	Multiply by	Current in Amps	Total Current
APS-6R	[ ]	X	1.2	
AA-30E	[ ]	X	0.5	
AA-100E/AA-120E	[ ]	X	0.9	
Main Power Supply (MPS-24AE)	[1]	X	0.9	0.9
Sum Column for AC Branch Current Required =				**Amps**

Table 3.1-2 220/240 VAC Fire Alarm Circuit

Section 3.2 The MPS-24A or MPS-24AE Main Power Supply

The Main Power Supply (MPS-24A or MPS-24AE) provides up to 3.0 amps of filtered current for operating the system in standby (non-fire alarm) and up to 6.0 amps during fire alarms. The MPS-24A or MPS-24AE contains battery charging circuitry and a 1-amp filtered output for powering 4-wire smoke detectors. Each MPS-24A or MPS-24AE also provides filtered, non-resettable 24V DC required for powering ACS Annunciator modules. If a voltmeter and ammeter are required on the MPS-24A or MPS-24AE, order the MPM-2 Main Power Meter.

Note: The battery charging circuitry on the MPS-24A can only operate under the control of the CPU-1010/2020, an XPP-1, or an MPS-TR. Without one of these controlling devices, the batteries will not be charged.

The MPS-24A or MPS-24AE Main Power Supply must be capable of powering all internal system devices (and several external types of devices) continuously during non-fire alarm conditions. Use **Table 3.2-1** to determine the non-fire alarm load on the MPS-24A or MPS-24AE output when primary power is applied. A finite amount of additional current must be provided by the power supply during a fire alarm condition. For the MPS-24A or MPS-24AE, use **Table 3.2-2** to determine 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 in either case.

The following paragraphs provide additional information to the AM2020/AFP1010 System Current Draw Calculation Table (**Table 3.2-1**).

- In the AM2020/AFP1010 System Current Draw Calculation Table (**Table 3.2-1**) the primary power non-fire alarm current and the primary fire alarm current columns are not battery calculations. They are simply current calculations to confirm that the MPS-24A can output enough DC current to support the AM2020/AFP1010 system during non-fire alarm and fire alarm conditions when operating from primary power.

- The word "primary" refers to the FACP's primary source of power, i.e. 120 VAC or 220/240 VAC power. The word "secondary" refers to the FACP's backup batteries (or any other 24 VDC uninterruptable, filtered power supply listed for Fire Protective Signaling and connected in place of the batteries).

Specific columns within **Table 3.2-1** are further defined as follows:

Primary, Non-Fire Alarm Current (amps) This column allows the user to calculate the current that will be drawn from the MPS-24A or MPS-24AE during a non-fire alarm condition, with AC power applied. This current draw cannot exceed 3.0 Amps.

Primary, Fire Alarm Current (amps) This column allows the system designer to determine the output current load that must be supported by the Main Power Supply MPS-24A or MPS-24AE during a fire alarm condition with primary power applied. The total current drawn from the MPS-24A or MPS-24AE during a fire alarm condition cannot exceed 6.0 amps.

Secondary, Non-Fire Alarm Current (amps) The last column of **Table 3.2-1** allows the system designer to calculate the secondary non-fire alarm current. This is the current that will be drawn from the MPS-24A or MPS-24AE power supply in a non-fire alarm condition during AC power loss. This figure is required to complete the standby battery calculations. After adding up all the individual current draws, the total current draw figure is then transferred to **Table 3.2-3**.

NOTES

- Typically, a system should be designed around the capacity to activate all output circuits and relays, and support fire alarms on no less than 10 percent of initiating device circuits (subject to the requirements of the Local Authority Having Jurisdiction (LAHJ).

- **Concerning 4-wire detectors:** In **Table 3.2-1**, the current to be entered for 4-wire smoke detectors is the manufacturer's rated fire alarm current minus the manufacturer's rated non-fire alarm current.

- **Concerning notification appliances:** The MPS-24A or MPS-24AE provides a filtered supply for notification appliance circuits, and is UL Listed as a Special Application power supply. Therefore, only notification appliances listed in the Notifier Device Compatibility Document (15378) should be used with this power supply. (Note: This restriction also applies to the APS-6R and FCPS-24 power supplies). Enter into **Table 3.2-1** the respective current draws of notification appliances and other external devices to be powered by the MPS-24A or MPS-24AE during a fire alarm. Do not add devices to be powered by an auxiliary power supply.

- No more than 3.0 amps of current can be drawn from Terminals 3 and 4 of TB3.

- Security Alarms are treated as trouble (non-fire alarm) conditions in the AM2020/AFP1010.

Category	COLUMN A Primary, Non-Fire Alarm Current (amps) (MPS-24A or MPS-24E output current required when operating from primary power			COLUMN B Primary, Fire Alarm Current (amps)			COLUMN C Secondary, Non-Fire Alarm Current (amps)		
	Qty	X [current draw]=	total	Qty	X [current draw]=	total	Qty	X [current draw]=	total
BE-2020N or BE-1010N (CPU, DIA, & 1 ICA-4L)	1	x [0.162] =	0.162	1	x [0.162]=	0.162	1	x [0.118] =	0.118
MPS-24A MPM-2	1 [ ]	x [0.064]= x [0.006]=	0.064	1 [ ]	x [0.064]= x [0.006]=	0.064	1 [ ]	x [0.104]= x [0.006]=	0.104
ICA-4L	[ ]	x [0.002]=		[ ]	x [0.002]=		[ ]	x [0.002]=	
LIB-200 (10 max.)	[ ]	x [0.078]=		[ ]	x [0.100]=		[ ]	x [0.049]=	
LIB-200A (10 max.)	[ ]	x [0.085]=		[ ]	x [0.085]=		[ ]	x [0.085]=	
LIB-400 (5 max.)	[ ]	x [0.170]=		[ ]	x [0.170]=		[ ]	x [0.170]=	
SIB-232 SIB-2048A SIB-NET	[ ] [ ] [ ]	x [0.050]= x [0.060]= x [0.070]=		[ ] [ ] [ ]	x [0.050]= x [0.060]= x [0.070]=		[ ] [ ] [ ]	x [0.045]= x [0.055]= x [0.070]=	
MIB-W MIB-F MIB-WF	[ ] [ ] [ ]	x [0.035]= x [0.028]= x [0.033]=		[ ] [ ] [ ]	x [0.035]= x [0.028]= x [0.033]=		[ ] [ ] [ ]	x [0.035]= x [0.028]= x [0.033]=	
INA	[ ]	x [0.250]=		[ ]	x [0.250]=		[ ]	x [0.250]=	
RPT-W RPT-WF RPT-F RPT-485W/RPT-485WF	[ ] [ ] [ ] [ ]	x [0.031]= x [0.033]= x [0.028]= x [0.017]=		[ ] [ ] [ ] [ ]	x [0.031]= x [0.033]= x [0.028]= x [0.017]=		[ ] [ ] [ ] [ ]	x [0.031]= x [0.033]= x [0.028]= x [0.017]=	
SDX, CPX & FDX-551, SDX-551TH, FMM-1 IPX-751 FMM-101,FCM-1,BGX-101L CMX-2, NBG-12LX, FAPT-751 FZM-1 - See FZM-1Instructions B601BH B501BH (Horn in Base) DHX-501,DHX-502 See instructions ISO-X	 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	 x [0.00020]= x [0.00035]= x [0.00030]= x [0.00030]= x [ ]= x [0.00100]= x [0.00100]= x [ ]= x [0.00045]=		 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	 x [0.00020]= x [0.00045]= x [0.00043]= x [0.00030]= x [ ]= x [0.00100]= x [0.01500]= x [ ]= x [0.00045]=		 [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	 x [0.00020]= x [0.00035]= x [0.00030]= x [0.00030]= x [ ]= x [0.00100]= x [0.00100]= x [ ]= x [0.00045]=	
4-Wire Smoke Detectors See Device Compatibility Document	[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=	
RM-1/RM-1SA	[ ]	x [0.020]=		[ ]	x (0.066]=		[ ]	x [0.020]=	
AMG-1, AMG-E, ATG-2 FFT-7, FFT-7S	[ ] [ ]	x [0.060]= x [0.060]=		[ ] [ ]	x [0.060]= x [0.120]=		[ ] [ ]	x [0.060]= x [0.060]=	
AA-30/AA-30E AA-30 w/ ACT-2 See Document 51118 AA-100/AA-100E, AA-120/AA-120E APS-6R	NOT APPLICABLE			NOT APPLICABLE			[ ] [ ] [ ]	x[0.045]= x[0.050]= x[0.025]=	
ACM-16AT, ACM-32A AEM-16AT, AEM-32A LCD-80 ACM-8R (see Doc.15342) LDM Series (see Doc.15885) SCS Series (see Doc.15712)	[ ] [ ] [ ] [ ] [ ] [ ]	x[0.040]= x[0.002]= x[0.100]= x[ ]= x[ ]= x[ ]=		[ ] [ ] [ ] [ ] [ ] [ ]	x[0.056]= x[0.018]= x[0.100]= x[ ]= x[ ]= x[ ]=		[ ] [ ] [ ] [ ] [ ] [ ]	x[0.040]= x[0.002]= x[0.050]= x[ ]= x[ ]= x[ ]=	
Current draw per annunciator board when LED's on board are illuminated during non-fire alarm conditions: ACM-16AT, AEM-16AT, ACM-32A, AEM-32A	 [ ] [ ]	 x[0.016]= x[0.016]=		INCLUDED ABOVE			 [ ] [ ]	 x[0.016]= x[0.016]=	
XPP-1 XPM-8 (8 zones) XPM-8 (4 zones) XPM-8L (8 zones) XPC-8 (8 circuits) XPC-8 (4 circuits) XPR-8	[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x[0.023]= x[0.147]= x[0.086]= x[0.085]= x[0.033]= x[0.017]= x[0.004]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x[0.032]= x[0.169]= x[0.108]= x[0.115]= x[0.042]= x[0.026]= x[0.013]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ]	x[0.025]= x[0.147]= x[0.086]= x[0.085]= x[0.033]= x[0.017]= x[0.004]=	
Sum each column for subtotals, then enter in "Subtotals from previous page" row on next page	**Primary, non-alarm subtotal:**			**Primary, alarm subtotal:**			**Secondary, non-fire alarm subtotal:**		

Table 3.2-1 AM2020/AFP1010 System Current Draw Calculations (1 of 2)

Category	COLUMN A Primary, Non-Fire Alarm Current (amps) (MPS-24A or MPS-24E output current required when operating from primary power			COLUMN B Primary, Fire Alarm Current (amps)			COLUMN C Secondary, Non-Fire Alarm Current (amps)		
	Qty	X [current draw]=	Total	Qty	X [current draw]=	Total	Qty	X [current draw]=	Total
XP5 Series Transponders XP5-M XP5-C Relay XP5-C NAC/telephone	 [ ] [ ] [ ]	 x[0.001651]= x[0.000840]= x[0.001481]=		 [ ] [ ] [ ]	 x[0.003000]= x[0.000840]= x[0.001481]=		 [ ] [ ] [ ]	 x[0.001651]= x[0.000840]= x[0.001481]=	
Miscellaneous CCM-1 A77-716B RA-400Z(when on) NIB-96 MBT-1 UZC-256 UDACT	 [ ] [ ] [ ] [ ] n/a [ ] [ ]	 x[0.107]= x[0.020]= x[0.006]= x[0.022]= n/a x[0.035]= x[0.100]=		 [ ] [ ] [ ] [ ] [ ] [ ] [ ]	 x[0.107]= x[0.020]= x[0.006]= x[0.022]= x[0.017]= x[0.090]= x[0.100]=		 [ ] [ ] [ ] [ ] n/a [ ] [ ]	 x[0.107]= x[0.020]= x[0.006]= x[0.022]= n/a x[0.035]= x[0.100]=	
Notification Appliances [1]	NOT APPLICABLE			[ ] [ ]	x[ ]= x[ ]=		NOT APPLICABLE		
Other devices drawing power from MPS-24A terminals TB3-3 and TB3-4	[ ] [ ]	x[ ]= x[ ]=		[ ] [ ]	x[ ]= x[ ]=		[ ] [ ]	x[ ]= x[ ]=	
Subtotals from this page	**Primary, non-alarm subtotal:**			**Primary, alarm subtotal:**			**Secondary, non-fire alarm subtototal:**		
Subtotals from previous page	**Primary, non-alarm subtotal:**			**Primary, alarm subtotal:**			**Secondary, non-fire alarm subtototal:**		
Sum subtotals from each page for totals	**Primary, non-alarm total:** **cannot exceed 3.0 A**			**Primary, alarm total:** **cannot exceed 6.0 A**			**Secondary, non-fire alarm total:** **place this total in table 3.2-3 to determine A.H. requirement**		

[1] Include only those devices to be powered by the main power supply, not an auxiliary supply such as the AVPS-24 or APS-6R. See manufacturer's instructions for applicable power draws.

Table 3.2-1 AM2020/AFP1010 System Current Draw Calculations (2 of 2)

Maximum Secondary Power Fire Alarm Current Draw

Use **Table 3.2-2** to determine the maximum current requirements of the secondary power source during fire alarm conditions. The total obtained in **Table 3.2-2** is the amount of current that the batteries must be capable of supplying. This figure will be used in **Table 3.2-3** to determine the size of the batteries needed to support five minutes of fire alarm operation.

It is presumed, in a fire alarm condition, that the batteries must feed the main power supply and any additional supplies (APS-6R, AA-30, AA-30E, AA-100, AA-100E, AA-120, and AA-120E) with the maximum rated power each supply can provide (**Table 3.2-2**).

NOTE

Due to the maximum rating of 9 amps imposed when using PS-12250 batteries, it may be necessary to calculate the exact requirements of the secondary supply. In that case, add the secondary non-fire alarm load obtained in **Table 3.2-1** to the total fire alarm current draw of all notification appliances in the system and substitute that figure in **Table 3.2-2** for the MPS and any APS-6Rs.

Device Type	# in Alarm (simultaneously)	Multiply by	Current in Amps	Total Current
Main Power Supply (MPS-24A or MPS-24AE)	1	X	6.0	6.0
APS-6R	[ ]	X	6.0	
AA-30 or AA-30E	[ ]	X	3.0	
AA-100 or AA-100E AA-120 or AA-120E	[ ]	X	7.3	
			Sum Column for Secondary Fire Alarm Load * =	**Amps**

* The secondary fire alarm load cannot exceed 9.0 amps with PS-12250 batteries, and 20 amps with PS-12600 batteries.

Table 3.2-2 Maximum Secondary Power Fire Alarm Current Draw

Load Totals		Multiplied by	Time		Equals	Secondary Amp Hour Totals
Enter Secondary Non-fire Alarm Load from Column C of Table 3.2-1	[ ]	X	Enter Required Secondary Non-fire Alarm Standby Time (24 or 60 hours)	[ ]	=	[ ] Non-fire Alarm Secondary Standby Amp Hours
Enter Secondary Fire Alarm Load from Table 3.2-2	[ ]	X	Enter Required Fire Alarm Time (for 5 minutes, enter 0.084) for 15 minutes, enter 0.25)	[ ]	=	[ ] Secondary Fire Alarm Amp Hour Requirement
Sum column for Total Secondary Ampere Hours (AH) Calculated					=	
Multiply by the derating factor x 1.2					=	
Total Secondary Ampere Hours Required					=	

Table 3.2-3 Secondary Power Standby and Fire Alarm Load

Table 3.2-3 sums the non-fire alarm and alarm loads to arrive at the battery size, in Ampere Hours (AH), required to support the AM2020/AFP1010. The MPS-24A or MPS-24AE can charge batteries up to 60 AH in size. Select batteries from **Table 3.2-4** that meet or exceed the total AH calculated :

Battery Size	Voltage Rating	Number Requir-ed	Model Number	Cabinet Size
9.5 AH	6 volts	Four	PS-695	CAB-A3, B3, C3, D3 (AFP1010 Only)
12 AH	12 volts	Two	PS-12120	CAB-A3, B3, C3, D3 (AFP1010 Only)
25 AH	12 volts	Two	PS-12250	CAB-A3, B3, C3, D3
60 AH	12 volts	Two	PS-12600	BB-55 Cabinet (Batteries Only)

Table 3.2-4 Battery Size Requirements

NOTE

NFPA 72 Local and Proprietary Fire Alarm Systems require 24 hours of secondary non-fire alarm power followed by five minutes in alarm. NFPA 72 Auxiliary and Remote Station Fire Alarm Systems require 60 hours of secondary non-fire alarm power followed by five minutes in alarm. NFPA 72 Voice Evacuation Systems require 15 minutes of alarm time.

Battery Testing

You may need to test the standby batteries occasionally. Here are two testing procedures you can use to determine the charge condition and capacity of the batteries in the system.

Quick Test - The quick test is a measure of **charge condition**; it is **not** a battery capacity test. Use it to identify the need to charge or replace the battery before it fails. If the battery has been part of an existing system, test results may indicate a faulty battery or a problem in the charging system.

Follow this procedure:

1. Remove the fully charged battery from the sytem or charging network.
2. Place a load resistor across the terminals that limits the current flow to approximately one amp. For example, use a 12 ohm resistor with a minimum of 12 watts for a single 12 volt battery. If you have two 12 volt batteries connected in series, use a 24 ohm resistor with a minimum of 24 watts.
3. After 15 minutes, measure the voltage across the battery terminals with the resistor still in place. Be sure to use a digital meter. For a 12 volt battery, the meter reading should range between 13.8 to 12.0 VDC. For a 24 volt battery system, the range is 27.6 to 24 VDC.

NOTE

If the readings fall below these ranges, perform the 20-Hour Discharge Test, or replace the battery.

20-Hour Discharge Test - The 20-hour discharge test indicates the battery capacity at its amp hour rating. The advertised amp hour battery rating is based on a 20-hour discharge rate, which is the amount of current it delivers to a load for 20 hours while maintaining its terminal voltage above the levels described in Step 3 of this test.

Follow this procedure:

1. Calculate the load resistor.
   a. Divide the amp hour rating by 20 hours. For the PS-12250 battery, the calculation would be 25/50=1.25 amps.
   b. We need 1.25 amps for 20 hours. Using Ohm's Law, R=E/I, therefore, R=12/1.25, or 9.6 ohms. P= I x E, so P=1.25 x 12, or 15 watts. Therefore we need a load resistor of 9.6 ohms at 15 watts.

2. Measure time of load.
   a. Take a fully charged battery and install the load resistor across the terminals.
   b. Measure the voltage across the battery for a period of 20 hours. If during the test the terminal voltage drops below the minimum acceptable levels (10.2 VDC for a 12 volt battery and 20.4 VDC for a 24 volt battery), note the number of hours that have elapsed when the battery voltage drops below its minimum operational level.
3. Calculate the battery capacity.

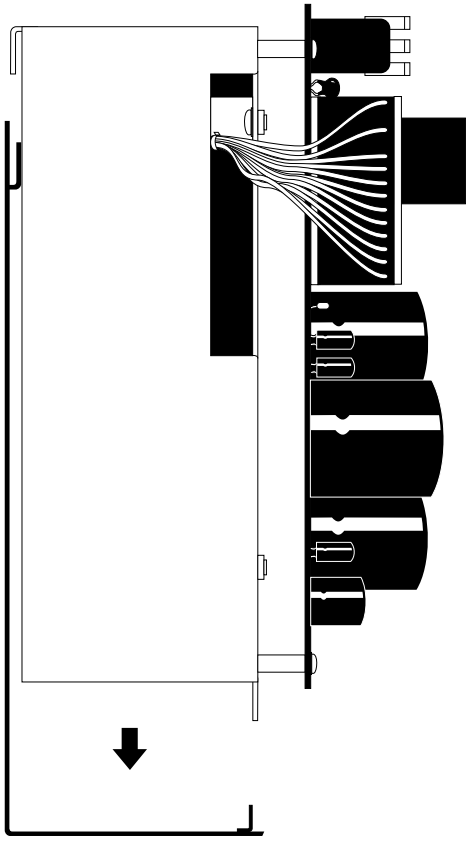
   CAPACITY = TIME x LOAD where:

   TIME (in hours) is equal to the measured duration the terminal voltage remained at the acceptable level and LOAD is equal to the load current value.

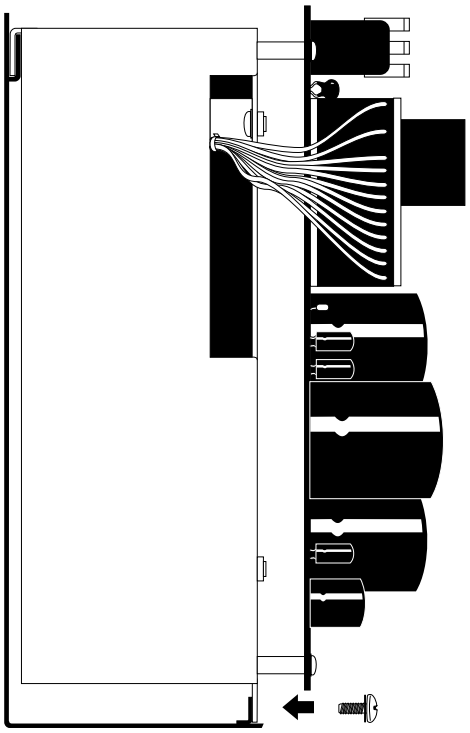
   If the battery maintained its voltage level above its minimum operational level for 15 hours, its capacity would be: 15 x 1.25, or 18.75 amp hours.

Conclusion: The battery has only 18.75 amp hour capacity instead of its rated 25 amp hours.

Figure 3.2-1 depicts the two-step procedure of mounting the main power supply.



Step 1
Position the Main Power Supply over the support bracket in the lower left corner of the cabinet and carefully push the supply down until it engages the bracket securely.



Step 2
Secure the Main Power Supply to the cabinet with the two self-tapping screws provided.

Figure 3.2-1 Mount the Main Power Supply

Test of Ground Fault Detection Circuit

If you have a persistent ground fault and suspect the MPS-24A ground fault detection circuit may be generating a false indication, use this test:

1. Remove the upper right circuit board mounting screw, just to the right of P2.

2. Insert an insulator (a piece of paper will do) between the power supply circuit board and the mounting standoff.

If the ground fault indication remains, the problem is with the MPS-24A.

Monitoring Remote Power Supplies

The MPS-24A depends on the CPU-1010/2020 or the XPP-1 to control its battery charging circuit and to monitor the battery state approximately every four minutes. If you use the MPS-24A in a remote application from the main control panel or a transponder, add the MPS-TR to the power supply to prevent problems keeping the batteries charged. The MPS-TR has a trouble relay that should be monitored by a system monitoring device. Note that the CPU or the XPP-1 can control only one power supply.

Section 3.2.1 The MPS-TR Main Power Supply Monitor

The MPS-TR power supply monitor mounts on any of the MPS series power supplies. This add-on board mounts on the right side of the MPS series supply and it is fastened through the use of two extended length standoffs, making use of threads on the existing standoffs (**Figure 3.2-1**).

The MPS-TR monitor provides supervision for remote power supplies and control of the power supply battery charger when there is no CPU-1010/2020 or XPP-1 to provide these two functions. The board is mounted and secured as described above. P1 on the MPS-TR is connected to P3 on the power supply via a power ribbon cable(part number 71085) supplied with the MPS-TR. The relay common and normally closed contacts of the MPS-TR are connected to a normally closed TROUBLE INPUT on the control panel trouble monitoring circuit.

MPS-TR Installation

1. Remove the upper and lower screws on the right side of the power supply main board.

2. The MPS-TR mounts on these two holes. Thread the new longer screws and the standoff sleeves into the holes formerly occupied by the two screws removed in Step 1.

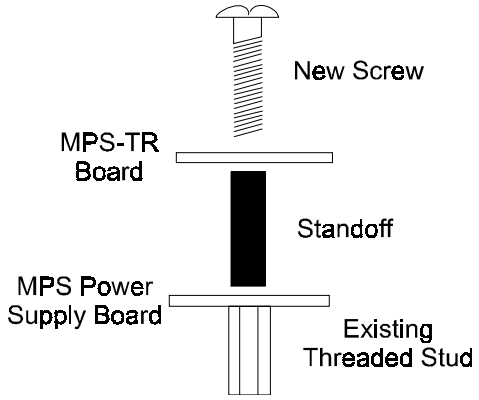


Figure 3.2.1-1 Threading the New Screws

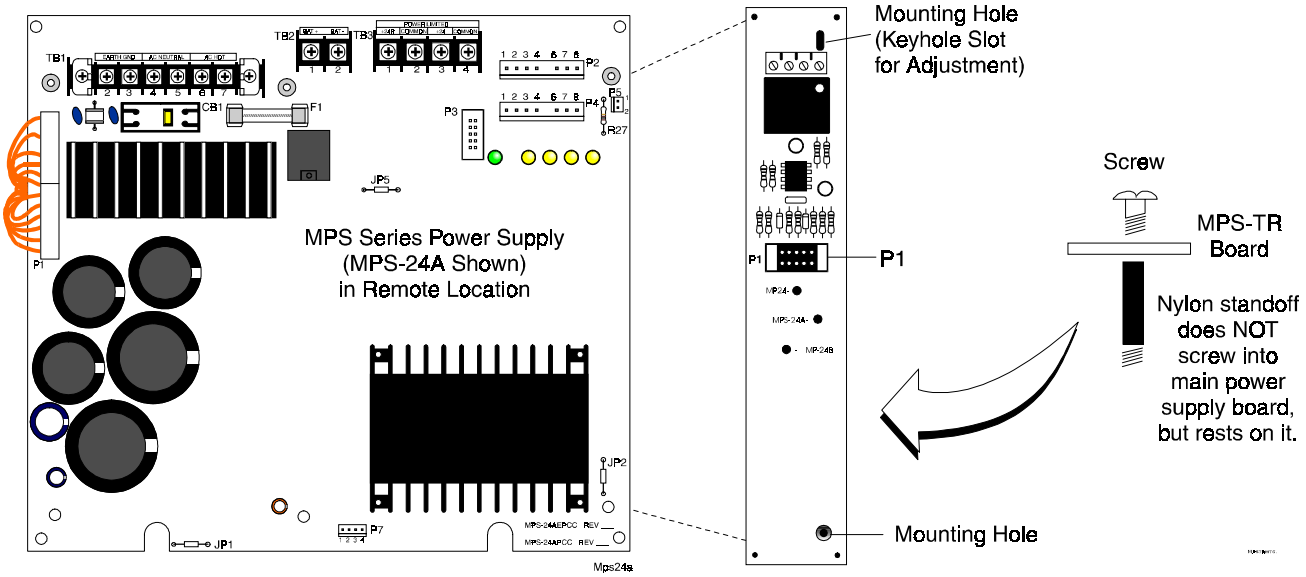
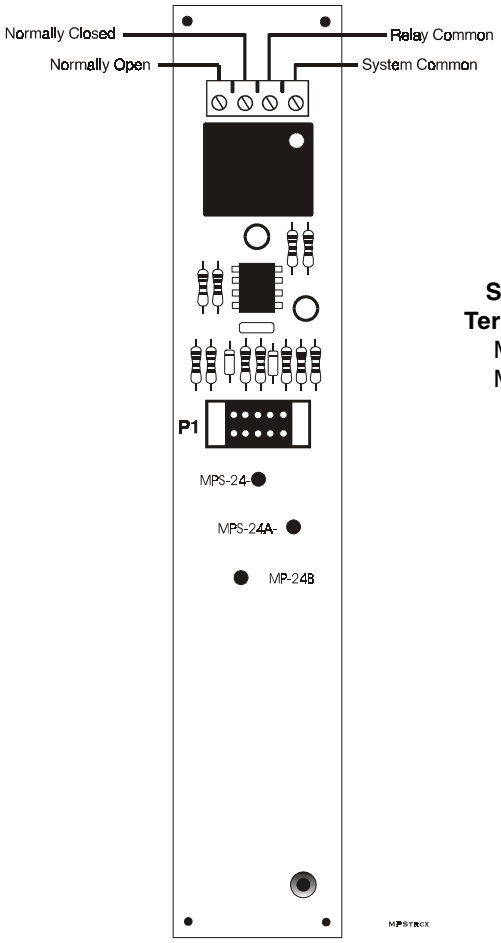


Figure 3.2.1-2 Mounting the MPS-TR



System Common
Terminal Connection
MPS-24A TB3-4
MPS-24B TB2-4

Figure 3.2.1-3 System Common Terminal Connection

NOTE: Relay contacts are specified in the NORMAL (no trouble condition) state.
The MPS-TR connects to any device with a trouble IN and a trouble OUT connector/terminal.

Section 3.3 Connecting the Main Power Supply

Table 3.3-1 provides the maximum output capacity of the MPS-24A or MPS-24AE main power supply. **Figure 3.3-1** illustrates connections for primary and secondary power to the MPS-24A or MPS-24AE, as well as terminal and harness connections for the control panel.

Connecting Primary AC Power
With the circuit breaker at the main AC power distribution panel turned off, remove the plastic insulating cover from Terminal Block TB1 on the MPS-24A and connect the system primary power source. Connect the electrical system earth ground to TB1 Terminal 2 and ground the power supply assembly to the cabinet with a Chassis Ground cable (part number 71073) to TB1 Terminal 3. Connect the primary Neutral line to TB1 Terminal 4 and the primary Hot line (120 VAC for the MPS-24A or 220/240 VAC for the MPS-24AE) to TB1 Terminal 6. Do not route AC wiring in the same conduit with circuits in this control panel. After completion of these connections, reinstall the plastic insulating cover over the terminal strip. Leave the main circuit breaker off until installation of the entire system is complete.

Connecting the Secondary 24V Power Source
Secondary power (usually battery) is required to support the system during loss of primary power. The batteries may reside in the control panel cabinet, or in a separate BB-55 cabinet. When using a 24 VDC filtered power source other than batteries, this source must be of sufficient capacity and be listed for this purpose.

Connect the Battery Positive Cable (part number 71071) to TB2 Terminal 1(+) and the Battery Negative Cable (part number 71072) to TB2 Terminal 2(-). Do not connect the Battery Interconnect Cable (part number 71070) at this time. This connection will be made just prior to initial system power-up.

NOTE
A separate cabinet may be required to house NiCad batteries due to battery size.

Earth Ground Fault Detection
The MPS-24A or MPS-24AE automatically detects ground faults in the system. To disable ground fault detection, cut Resistor R27 (refer to **Figure 3.3-1**).

24V DC Four-Wire Smoke Detector Power
Up to one amp of power for four-wire smoke detectors can be drawn from TB3 Terminals 1(+) and 2(-). Power is removed from these terminals during system reset. This 24V DC filtered source is power-limited but must be supervised via an end-of-line Power Supervision Relay (refer to **Figures 4.6-5 and 4.6-6**).

24V DC Notification Appliance Power
Up to 3 amps of filtered current for powering notification appliances can be drawn from TB3 Terminals 3(+) and 4(-). Power is not removed from these terminals during system reset. If additional 4-wire smoke detector power is required, this circuit can be converted to a two-amp resettable circuit by cutting JP5 on the MPS-24A or MPS-24AE (refer to **Figure 3.3-1**). This 24V DC power is power-limited but must be supervised via an end-of-line Power Supervision Relay.
Note: This power supply is UL listed as a Special Application Power Supply. Therefore, only notification appliances listed in the Device Compatibility Document (15378) should be used with this power supply. (This restriction also applies to the APS-6R and FCPS-24 power supply.)

System Harness Connections
The Power Harness (part number 71030) provides internal power for circuit boards installed in the ICA-4L. Connect this harness from P2 or P4 on the MPS-24A or MPS-24AE to Plug A on the uppermost ICA-4L.

The AM2020/AFP1010 monitor the power supply through connection of a Power Supply Supervision Cable (part number 71031) between MPS-24A or MPS-24AE Connector P3 and Connector P2 on the CPU (refer to **Figure 3.6-1**). If the MPS-24A or MPS-24AE is being used as a remote power supply, this ribbon cable should be plugged into the MPS-TR module. The MPS-TR provides a Form-C trouble contact that can be monitored by a monitor module with an "MTRB" Type ID.

For connection of an MPS-TR, refer to the MPS-TR Product Installation Document listed in the Related Documentation Chart in the beginning of this manual.

NVRAMS

User programming information and critical operating parameters of the AM2020/AFP1010 system are stored in Nonvolatile Random Access Memory (NVRAM). Improper cycling of power to the AM2020/AFP1010 can cause the NVRAMS to become inaccessible. The AM2020/AFP1010 software now verifies the state of the NVRAMs. If a NVRAM problem has been detected, the AM2020/AFP1010 will display one of the following two error messages depending on where the problem is located:

TROUBL CATASTROPHIC CPU NONVOLATILE RAM FAILURE

or

TROUBL CATASTROPHIC DIA NONVOLATILE RAM FAILURE

Other indicators of NVRAM problems by board are:

Board	Trouble Message Displayed	Local Board Indicator
SIB-NET	TROUBL CATASTROPHIC ISIB COMMUNICATIONS FAULT	ATXD LED blinking at 2 second rate.

The correct power down procedure is to remove battery power, then disconnect primary power (AC) at the circuit breaker in the electrical distribution panel, then wait at least one minute before disconnecting or connecting any cables or circuit boards, or reapplying primary power. The correct power up procedure is to connect primary power, then connect the battery, and wait one minute before taking any further actions, especially pressing the acknowledge button, which can cause NVRAM problems if pressed during the first minute after power application.

If this condition occurs, call the factory for immediate assistance.

Condition	Maximum Circuit Load (Per Circuit)	Total of power in columns to the left cannot exceed:	Circuit Type (See Note 1)	Description
Non-Fire Alarm with Battery Charger Enabled	3.0 amps	3.0 amps	Internal	While the power supply can deliver 6 amps, 3 amps of the power supply capacity are reserved for the battery charger when enabled. The remaining 3 amp capacity can be shared between the internal and external circuits during a non-fire alarm condition.
	1.0 amp		External 1	
	3.0 amps nonresettable		External 2	
	2.0 amps resettable			
Non-Fire Alarm with Battery Charger Disabled (See Note 2)	3.0 amps	6.0 amps	Internal	When the Internal MPS-24A/E battery charger is not used, the full 6 amp capacity of the power supply can be shared between the internal and external circuits for up to one hour (4 amps continuously).
	1.0 amp		External 1	
	3.0 amps nonresettable		External 2	
	2.0 amps resettable			
Fire Alarm	1.0 amps	6.0 amps	Internal	During a fire alarm condition, the battery charger is automatically disabled which makes the full 6 amp capacity of the power supply available to be shared between the internal and external output circuits for up to one hour (4 amps continuously).
	3.0 amps		External 1	
	3.0 amps nonresettable		External 2	
	2.0 amps resettable			
Notes:				
1	Internal	This power is used for all internal requirements modules, boards, etc. Connection: Power Harness from MPS-24A/E P2 or P4, to the CPU.		
	External 1	Provides resettable power to 4-wire smoke detectors (and power supervision relays). Connection: TB3 Terminals 1 (+) and 2 (-).		
	External 2	Power for devices (typically notification appliances) listed in the Notifier Device Compatibility Document (15378). Connection: TB3 Terminal 3 (+) and 4 (-).		
2	Remote Battery Charger	JP1 must be cut to install a CHG-120 remote battery charger and disable the MPS-24A/E internal charger.		

Table 3.3-1 MPS-24A or MPS-24AE Main Power Supply Loads

Filtered Supply

Four-Wire Smoke Detector Power

24V DC (200 mV ripple), 1 amp maximum. Filtered and resettable. Power-limited but must be supervised via a Power Supervision Relay.

+ -

Secondary Power

27.6 V DC, supervised and power-limited.
Fast charge = 2 amps, trickle charge = 20 mA.

Battery -

Battery +

+ -

Notification Appliance/ Annunciator Power

Power-limited, filtered, non-resettable, 3 amps (in alarm) maximum. JP5 may be cut to convert this notification appliance power (TB3 Terminals 3 and 4) to a resettable, 2-amp maximum circuit. This output can also be used to power ACS series annunciators (do not cut JP5).

PRIMARY POWER			
Power Supply	AC	HZ	amps
MPS-24A (maximum)	120V	50/60	1.8
MPS-24AE (maximum)	220/240V	50/60	0.9

Neutral Out

Neutral In

Hot In

Hot Out

Power Ribbon Connector

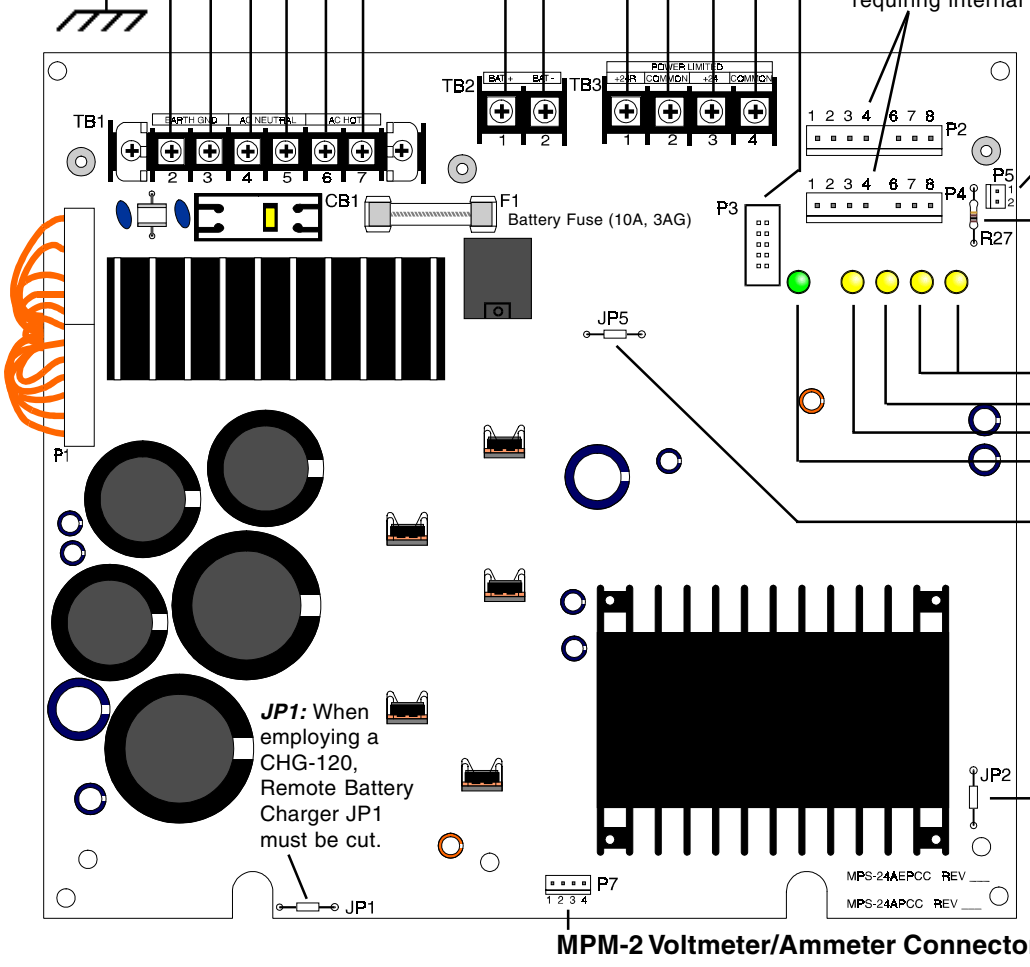
Connect to P2 on the CPU-2020 or CPU-2

Power Harnesses (P2, P4)

Connect to Plug A on the top of the ICA-4/ ICA-4L (3 amps maximum, P2 and P4 combined) or any other module or board requiring internal power.

Earth Ground

Connect to chassis via a Grounding Cable Assembly.



Not used with the AM2020/AFP1010. Make no connection here.

Cut R27 to disable Earth Ground Fault Detection.

LED Indicators

Earth Ground Fault

Battery Fail

AC Power Fail

NiCad High Charge Rate

JP5: Cut to make notification appliance power on TB3 Terminals 3 and 4 a resettable 2-amp maximum circuit.

JP1: When employing a CHG-120, Remote Battery Charger JP1 must be cut.

JP2: must be cut otherwise a short on the notification appliance power circuit (Terminals 3 and 4) would register incorrectly as a loss of primary (AC) power.

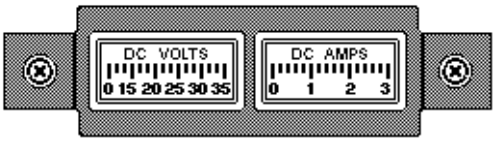
MPM-2 Voltmeter/Ammeter Connector

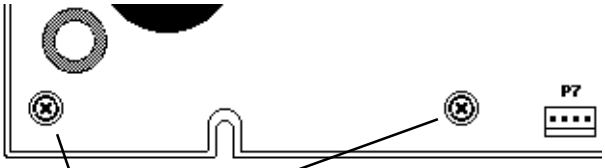
Figure 3.3-1 Field Wiring the MPS-24A or MPS-24AE Power Supply

3 amps maximum non-fire alarm load.
6 amps maximum fire alarm load.
For additional ratings, refer to Appendix A.

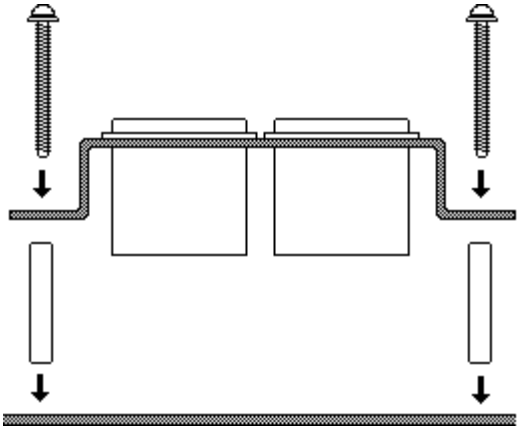
Section 3.4 The Optional Main Power Meter

The optional Main Power Meter (MPM-2) may only be installed on the Main Power Supply, MPS-24A or MPS-24AE (refer to **Figure 3.4-1**).

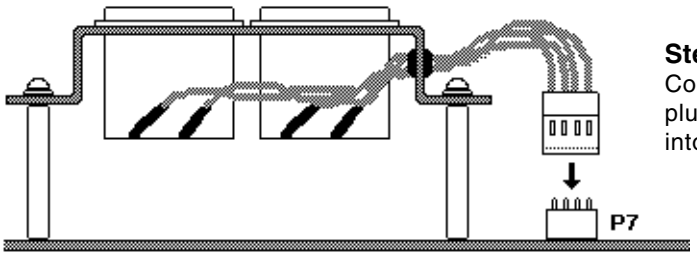




Step 1
Remove the two screws in the bottom left corner of the MPS-24A or MPS-24AE.



Step 2
Thread the two replacement screws through the MPM-2 bracket and through the two standoffs provided. Place the MPM-2 assembly over the MPS-24A or MPS-24AE and secure with the two screws.

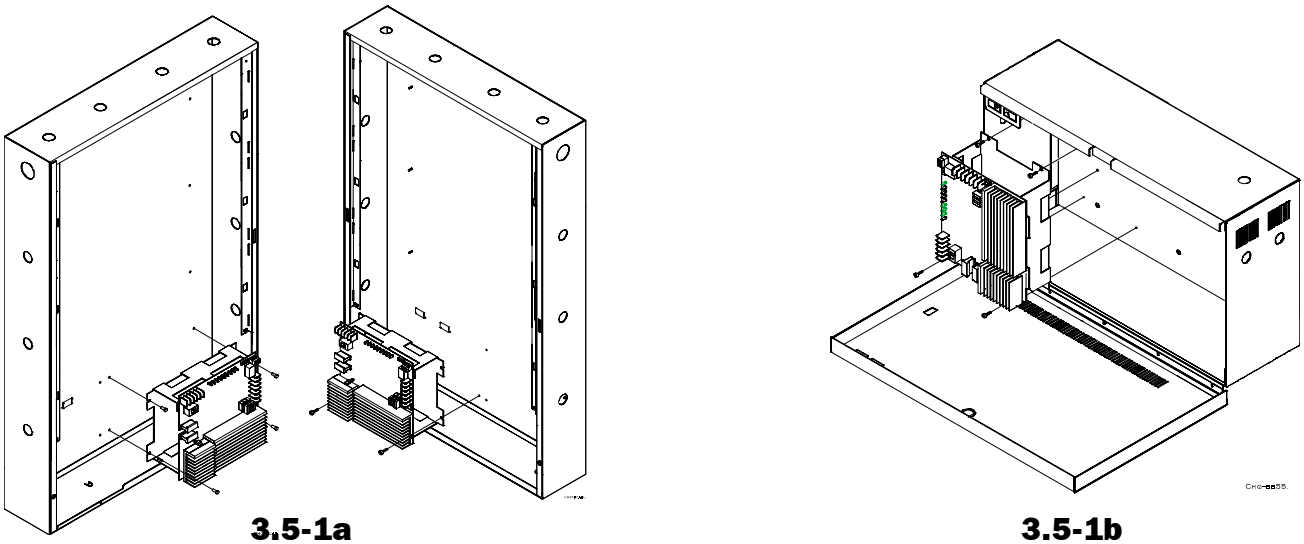


Step 3
Complete the installation of the MPM-2 by plugging the female connector on the meter into Plug P7 on the MPS-24A or MPS-24AE.

Figure 3.4-1 Installation of the Main Power Meter

Section 3.5 The CHG-120 Remote Battery Charger

The **Notifier Remote Battery Charger, CHG-120** is capable of charging 25 to 120 ampere hour batteries. This unit is required if the MPS-24A must deliver more than 3 amps of current when no fire alarm signal is present. Batteries up to 120 AH can be housed with the charger in the BB-55 cabinet: Batteries up to 25 AH can be housed with the charger in cabinets CAB-A3, -B3, -C3, or -D3. Refer to **Figure 3.5-1** for installation positions. The charger can be mounted up to 20 feet (6.096 meters) away from the control panel. To determine the battery size needed in a particular system, refer to the Non-Fire Alarm Power Requirements.



3.5-1a 3.5-1b

Figure 3.5-1 CHG-120 Installation into CAB-3 Series(3.5-1a) and BB-55 (3.5-1b) Cabinets

Connecting the Primary Power Source

With the circuit breaker at the main AC power distribution panel turned off, connect the primary power source to the corresponding terminal on TB1 of the CHG-120. All connections between the AM2020/AFP1010 and the CHG-120 must be made in conduit, using 12 AWG (3.25 mm^2) wire. Do not route AC wiring in the same conduit as other control panel circuits. Leave the main circuit breaker off until installation of the entire system is complete. Refer to **Figure 3.5-2**.

Connecting the Secondary Power Source

Do not apply AC power or batteries until the system is completely wired and ready for testing. Refer to Wiring Diagram and Instructions for the CHG-120 Charger in the CHG-120 Charger Manual (Document 50641) for additional information.

CHG-120
120/240VAC, 50/60 HZ

24V DC (supervised). Maximum charge current for batteries is 4.5 amps (fast charge) or 20mA (trickle charge). Use 12 AWG (3.25 mm²) wire in conduit (20 feet/6.096 meters or less).

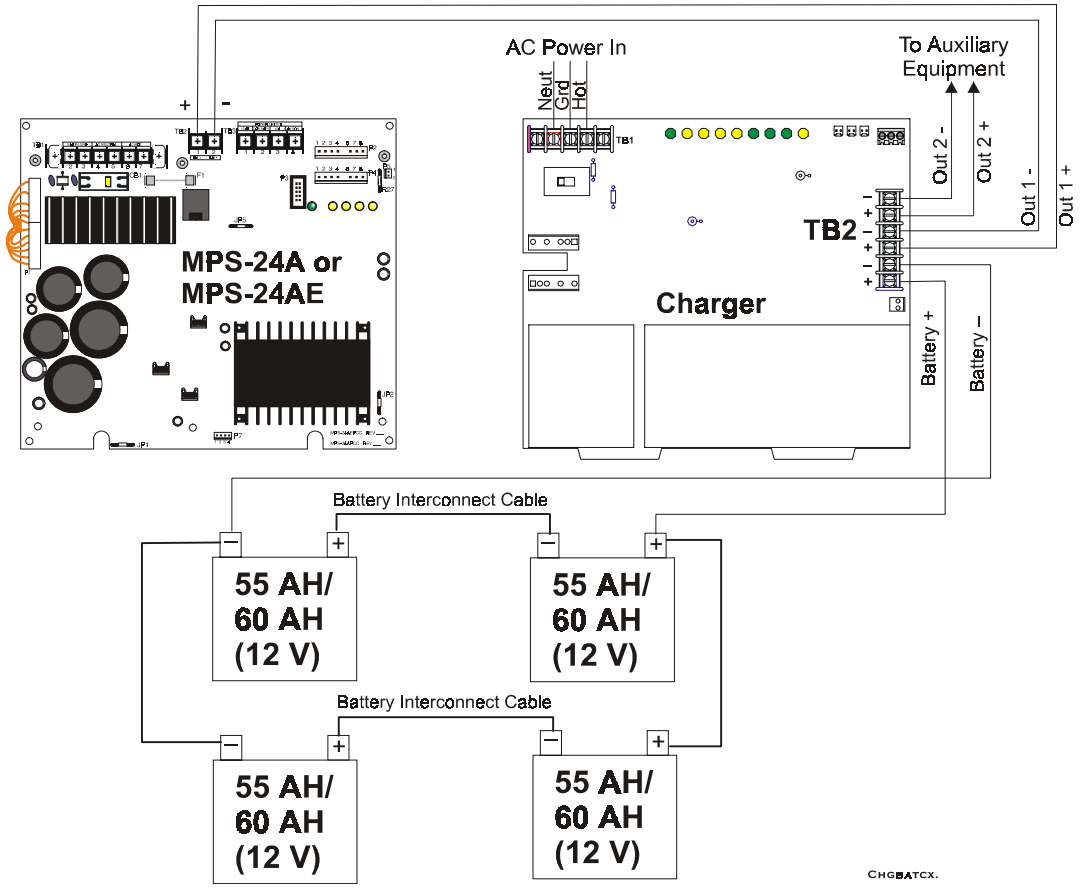


Figure 3.5-2 CHG-120 Connections

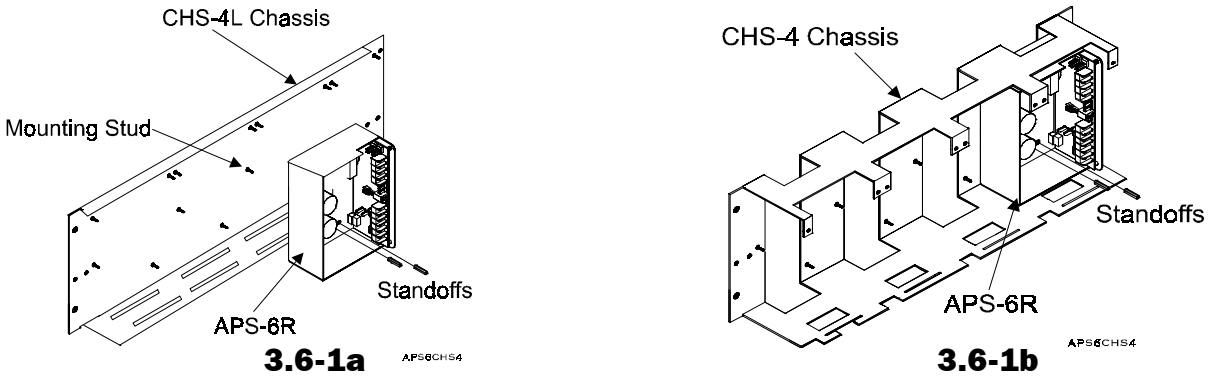
Section 3.6 The APS-6R Auxiliary Power Supply

The APS-6R Auxiliary Power Supply is designed to power devices that require filtered, non-resettable power such as XP Transponder modules, Notification Appliance Circuit modules, and Control modules. It provides two 24 VDC (filtered) output circuits (3 A each, 6 A total, 4 A continuous). For more information on the APS-6R, refer to the APS-6R Manual (Document 50702)

Mounting an APS-6R in a CAB-3 Series Cabinet

An APS-6R can mount to a CHS-4 (**Figure 3.6-1a**) or a CHS-4L (**Figure 3.6-1b)** for use in a CAB-3 Series cabinet (CAB-A3, CAB-B3, CAB-C3, or CAB-D3). To mount the APS-6R, follow these instructions:

- Place the APS-6R onto the mounting studs of the CHS-4 or CHS-4L chassis.
- Insert a standoff through each of the APS-6R mounting slots; then thread each standoff to the mounting stud on the chassis.
- Tighten the standoffs until the APS-6R is securely fastened to the chassis.
- Mount the CHS-4 or CHS-4L to the cabinet backbox.
- Install the APS-6R plastic cover and press-fit terminal block cover over TB1 AC connections. (Refer to **Figure 3.6-2**)



3.6-1a **3.6-1b**

Figure 3.6-1 Mounting the APS-6R to a Chassis

Field Wiring an APS-6R

Figure 3.6-3 shows typical field wiring for an APS-6R

WARNING:

Use extreme caution when working with the APS-6R - high voltage and AC line-connected circuits are present in the APS-6R. Turn off and remove all power sources. To reduce the risk of electric shock make sure to properly ground the APS-6R.

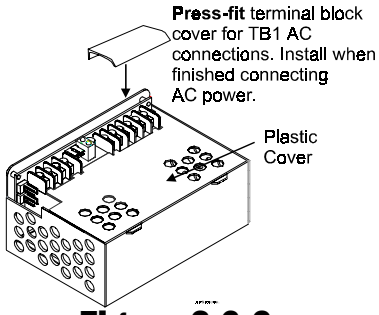


Figure 3.6-2 Cover Installations

Before field wiring, install the APS-6R plastic cover, and install the **press-fit** terminal block cover over TB1 when field wiring is complete **(Figure 3.6-2).**

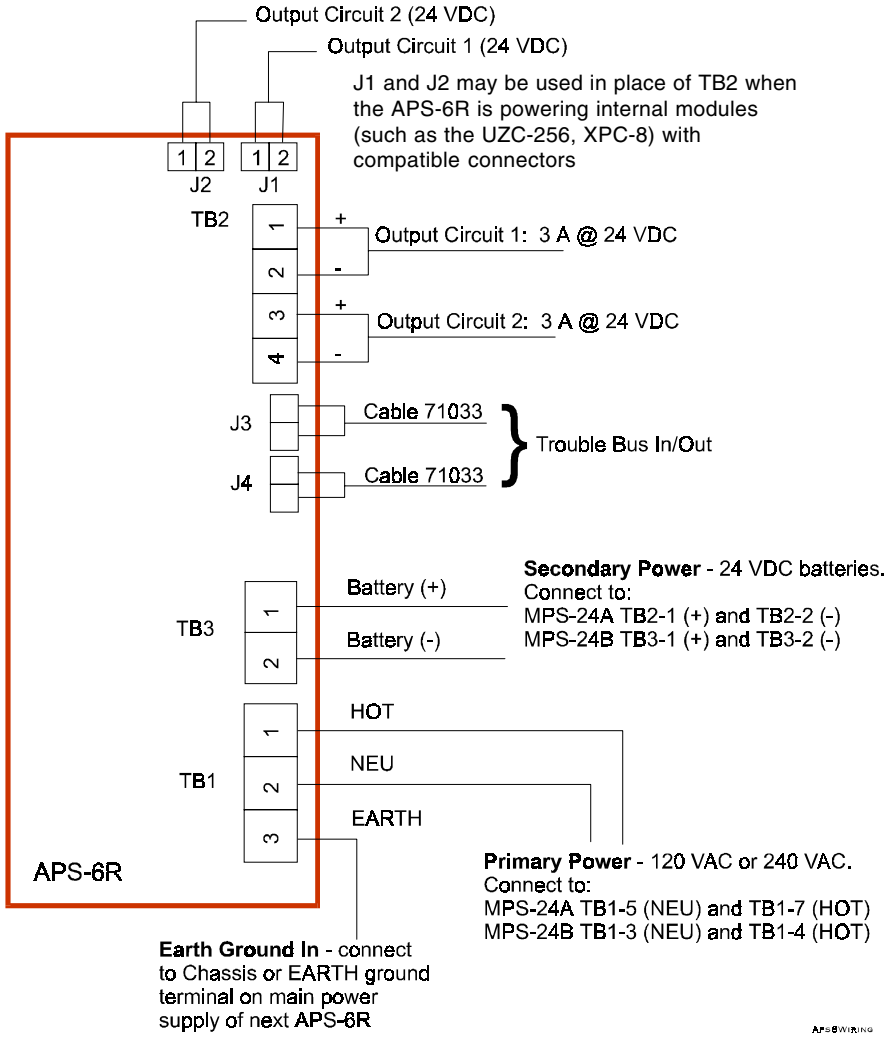


Figure 3.6-3 Typical APS-6R Wiring

Connecting Multiple APS-6R Power Supplies

Figure 3.6-4 shows typical trouble bus connections for multiple APS-6R power supplies using trouble connectors J3 and J4.

Notes:

1. Use Cable 71033 or 75098 (same cables, different lengths) for all wiring.
2. APS-6R J3 and J4 can be interchanged.

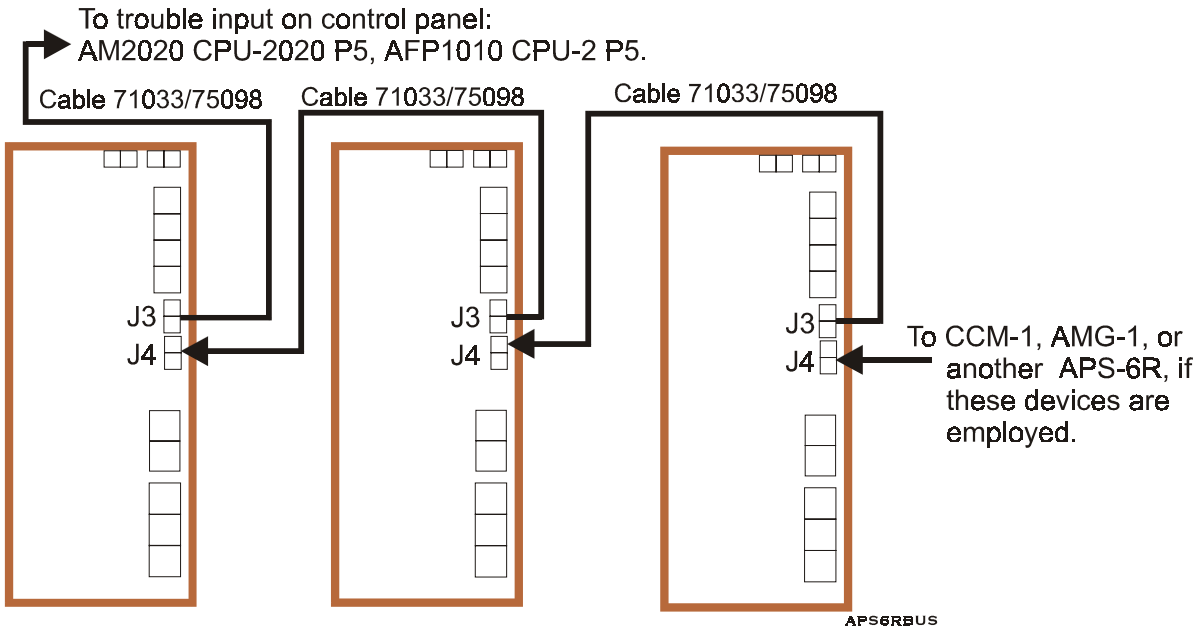


Figure 3.6-4 Trouble Bus Connections for Multiple APS-6R Power Supply Configuration

Section 3.7 The Central Processing Unit (CPU-2020, CPU-2)

The **Central Processing Unit** is the heart of the system (refer to **Figure 3.7-1**). This unit directs all communications between modules and monitors all modules in the system for removal or failure. The CPU maintains all programmable system parameters (except alphanumeric information) in nonvolatile memory to protect the data if primary and secondary power is removed (provided the board and all associated cabling is handled with proper precaution). The CPU executes all control-by-event programs for specific action in response to an alarm condition. A real-time clock provides time annotation on the display(s), history file, and printer. The CPU provides one set of Form-C general alarm contacts and one set of Form-C system trouble contacts. The Form-C general *alarm* contacts will transfer during the presence of one or more fire alarm signals. The Form-C system *trouble* contacts will transfer during any security alarm supervisory signal or trouble condition. The Form-C trouble contacts will not transfer when both primary and secondary power is lost. When such transfer is required, use a separate, listed power supervisory relay. Only one CPU is required per AM2020/AFP1010 system.

Note: Due to the proximity of the alarm and trouble contacts to CPU-based system control functions, only circuits that are unlikely to produce any electrical noise should be connected to the contacts. If a noise-generating device is connected to these contacts, system operation problems might be encountered.

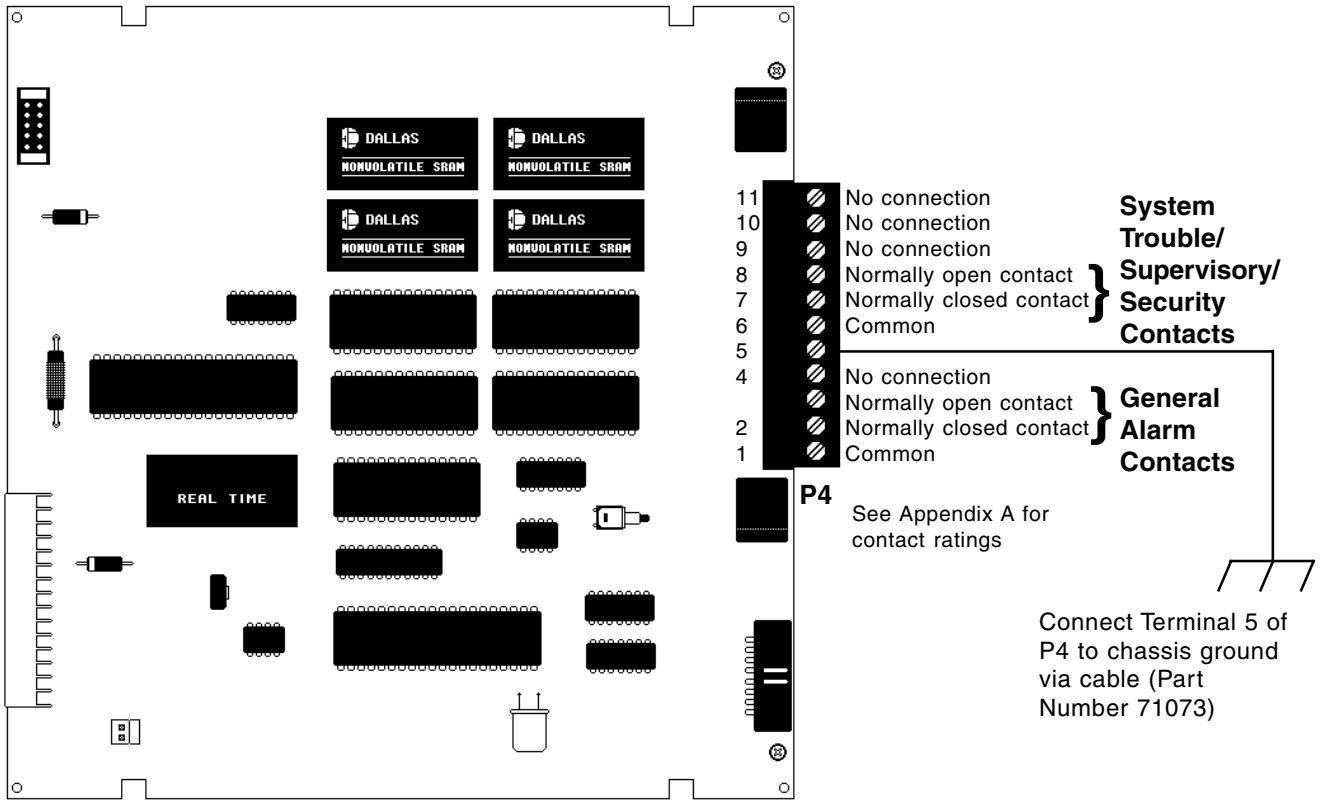


Figure 3.7-1 CPU Alarm and Trouble Contacts

NOTE

Contacts may be connected to power-limited or nonpower-limited sources of power. Refer to the power-limited information label located inside the door of the FACP. All circuits that are connected to nonpower-limited sources of power must be identified on this label.

Section Four Signaling

Section 4.1 The LIB Signaling Line Circuit

The AM2020/AFP1010 communicates with intelligent and addressable initiating, monitor, and control devices through a LIB Signaling Line Circuit (SLC). The Loop Interface Boards, LIB-200 and LIB-200A each control one SLC. The LIB-400 controls two SLC loops. For XP and XP5 Transponders connected to SLCs refer to the respective transponder manual (Refer to the Related Documentation Table in the beginning of this chapter for part numbers).

Isolator Modules and Bases
Isolator Modules (ISO-X) and bases (B524BI(A) and B224BI(A))permit a string of intelligent addressable devices and modules to be electrically "isolated" from the remainder of the SLC, allowing critical loop components to function in the event of a short circuit fault (refer to **Figures 4.5-2, 4.5-3 and 4.10-2**).

Monitor Modules
Addressable Monitor Modules MMX-1 and MMX-101 allow the AM2020/AFP1010 to monitor entire circuits of N.O. contacts, alarm initiating devices, manual pull stations, 4-wire smoke detectors, heat detectors, waterflow, and supervisory devices. In addition, the MMX-2 may be used to provide power to and monitor conventional 2-wire smoke detectors that are listed in the Device Compatibility Document (refer to **Figures 4.6-2** through **4.6-6**). The addressable BGX-101L pull station provides point annunciation of manual pull stations (refer to **Figure 4.8-2**).

Control Modules
Through addressable Control Modules (CMX/XPC), the AM2020/AFP1010 can selectively activate notification appliance circuits and Form-C output relays (refer to **Figures 4.7-2** through **4.7-6**).

XP5-C Control Modules
Each XP5-C Module allows the AM2020/AFP1010 to control a maximum of five individual circuits. The module can be configured as a NAC/telephone or relay circuit. Its function is similar to the function of the control modules described above.

XP5-M Monitor Modules
Each XP5-M Module allows the AM2020/AFP1010 to monitor a maximum of five individual circuits. Its function is similar to the function of the monitor modules described above.

Intelligent Detectors
Through the SLC loop, the AM2020/AFP1010 communicates with intelligent ionization (CPX), photoelectric (SDX), thermal (FDX), and combination (IPX) detectors (refer to **Figure 4.10-1**).

Loop Interface Boards Signaling Line Circuit
The LIB-200 and LIB-200A are single SLC boards. The LIB-400 is a dual SLC board. The capacity of each SLC on a LIB includes up to 99 intelligent detectors, and an additional combination of up to 99 addressable pull stations, and control and monitor modules. The AFP1010 will support a maximum of two LIB-400s (a total of four SLCs). The AM2020 supports up to ten SLCs. One to five LIB-400s, or one to ten LIB-200s or LIB-200As can be employed on the AM2020, depending on system requirements.

NOTE: In Canada, ULC Standard S524, for the installation of fire alarm systems, refers to signaling line circuits as Data Communications Links (DCL). An NFPA Style 4 is equivalent to a DCLB, Style 6 to a DCLA, and Style 7 to a DCLR.

NOTE: If you are experiencing excessive noise on speaker or phone circuits in the IFC-1010/2020, the LIB-200 SLC polling signal may be the source. To reduce noise, connect the SLC shields to main panel power supply system common of the MPS-24A, TB3, terminal 6, or use a LIB-200A/LIB-400.

Section 4.2 The Loop Interface Boards (LIB-200, LIB-200A, and LIB-400)

The Loop Interface Boards (LIBs) allow the AM2020/AFP1010 to communicate with the system's alarm initiating devices and to control the system's output devices.

Through a communications loop (functions in accordance with the requirements for NFPA SLCs or SLC loops), the LIBs allow the control panel to communicate with addressable pull stations, and intelligent ionization, photoelectric, and thermal detectors. Through addressable control modules (CMX/XPC) connected along the communications loop, the control panel may selectively activate notification circuits or Form-C output relays. Through addressable Monitor Modules MMX-1 and MMX-101, the control panel may monitor entire circuits of N.O. contacts, alarm initiating devices such as manual pull stations, 4-wire smoke detectors, heat detectors, waterflow and supervisory devices. MMX-2 may be used to monitor conventional 2-wire smoke detectors. Through Isolator Modules (ISO-X) or isolator/detector mounting base, a string of intelligent addressable devices and modules may be electrically "isolated" from the remainder of the communications loop, permitting critical loop components to function in the event of a short circuit on the loop. The LIB boards are power-limited.

LIB-200

The LIB-200 (refer to **Figure 4.2-1**) is a single signaling line circuit board which supports up to 10,000 feet (3,048 meters) maximum of field wiring for Style 4 and up to 10,000 (3,048) maximum for Styles 6 and 7 on ports A and B. The maximum loop resistance for Style 4 is 40 ohms on ports A and B and 40 ohms total for Styles 6 and 7.

If wiring for the LIB-200 leaves the building, one or more surge suppressors are required. Refer to the Surge Supression portion of this section for information on surge suppressors that are approved for use with this FACP.

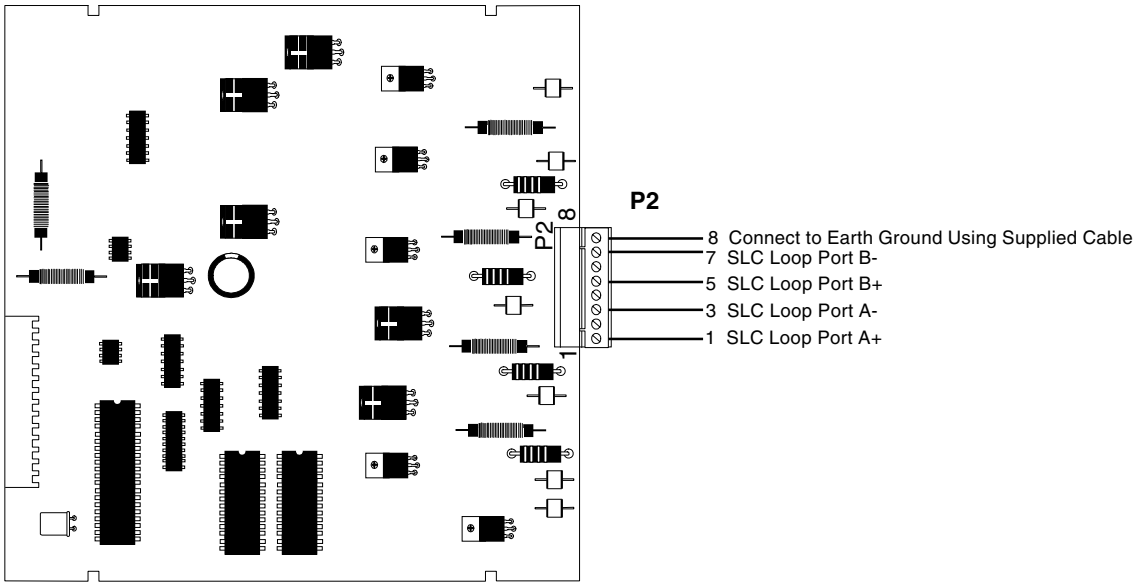


Figure 4.2-1 The LIB-200

LIB-200A

The LIB-200A field wiring is electrically isolated from the rest of the system so that any two ground faults on separate SLCs will not cause invalid replays from devices. A short to any other system circuit will not cause communication loss. The LIB-200A has an earth ground fault detection circuit with selectable high/low sensitivity and disable. Use only the high sensitivity setting as shipped from the factory. Port A and Port B of the LIB 200A can each support up to 12,500 feet (3,810 meters) of SLC wiring for Style 4. For Styles 6 and 7, Port A and Port B together will support 12,500 feet (3,810 meters) SLC wiring in total. The maximum loop resistance for style 4 is 50 ohms on ports A and B and 50 ohms total for Styles 6 and 7. The LIB-200A supports the Local Mode General Alarm Bus, a feature which permits limited alarm function in the unlikely event of a CPU failure. The LIB-200A has two LEDs; yellow displays earth ground fault trouble and red indicates initiated alarm condition during local mode only (refer to **Figure 4.2-2**).

If wiring for the LIB-200A leaves the building, one or more surge suppressors are required. Refer to the Surge Supression portion of this section for information on surge suppressors that are approved for use with this FACP.

LIB-400

The LIB-400 field wiring is electrically isolated from the rest of the system so that any two ground faults on separate SLCs will not cause invalid replays from devices. A short on to any other system circuit will not cause communication loss. The LIB-400 has an earth ground fault detection circuit with selectable high/low sensitivity and disable. Use only the high sensitivity setting as shipped from the factory. Port A and Port B of the LIB 400 can each support up to 12,500 feet (3,810 meters) of SLC wiring for Style 4. For Styles 6 and 7, Port A and Port B together will support 12,500 feet (3,810 meters) SLC wiring in total. The maximum loop resistance for Style 4 is 50 ohms on ports A and B and 50 ohms total for Styles 6 and 7. The LIB-400 supports the Local Mode General Alarm Bus, a feature which permits limited alarm function in the unlikely event of a CPU failure. The LIB-400 has two LEDs per loop; yellow indicates an earth ground fault and red indicates an alarm condition during local mode only (refer to **Figure 4.2-2**).

If wiring for the LIB-400 leaves the building, one or more surge suppressors are required. Refer to the Surge Supression portion of this section for information on surge suppressors that are approved for use with this FACP.

New LIB Features

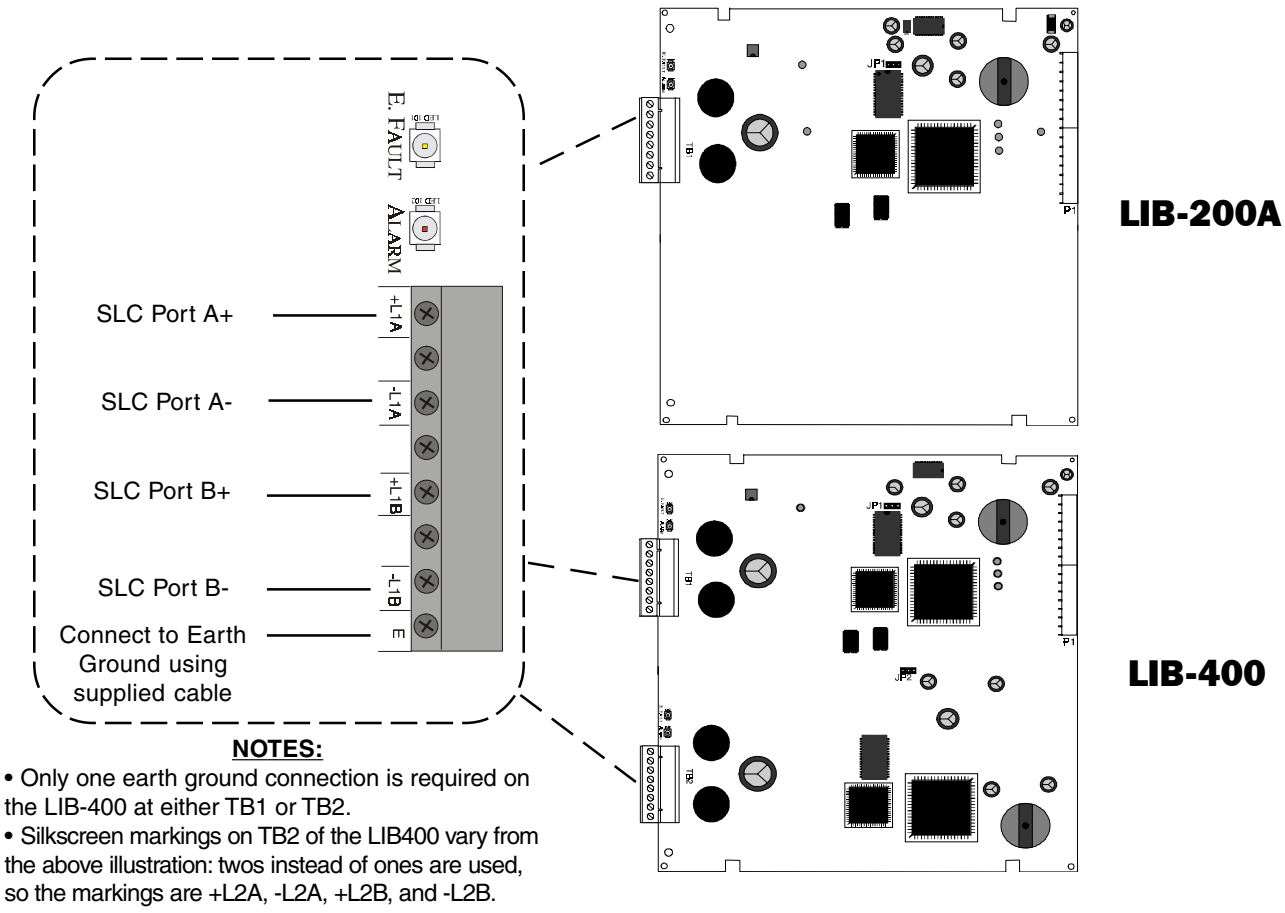
The following features are only present on the LIB-200A and the LIB-400:

- A Noise Control Module (NCM-1) is built in to reduce common mode noise on the SLC.
- Local Mode General Alarm Bus support (during a CPU board failure).

  During a CPU failure, if one of the initiating devices programmed to participate in local mode is activated, the following will occur:

  - The LIB will execute local mode,
    - which turns on the red alarm LED on the LIB-400 or LIB-200A,
    - and signals an alarm state through the general alarm bus (pin 16 of the ICA-4L) to other LIB-400/200As.
  - The LIB is capable of sensing the general alarm bus, and therefore will execute its own local mode action.
  - Reduced RF Emissions

    The use of conduit and shielded cable is no longer required for compliance with FCC Part 15 Class A Radiated Emissions Limits. The use of twisted pair cable is recommended to achieve the maximum wire lengths indicated. The use of shielded cable and/or untwisted cable will reduce the maximum wiring distance.



NOTES:

- Only one earth ground connection is required on the LIB-400 at either TB1 or TB2.
- Silkscreen markings on TB2 of the LIB400 vary from the above illustration: twos instead of ones are used, so the markings are +L2A, -L2A, +L2B, and -L2B.

Figure 4.2-2 Loop Interface Boards

Surge Suppression

There are three (3) primary surge protectors that are approved for use with this FACP.

- **DTK-2LVLP-F** Diversified Technology Group, Inc. 1720 Starkey Rd. Largo, FL 33771 (727) 812-5000
- **SLCP-030** EDCO 1805 N.E. 19th Ave. Ocala, FL 34470 (352) 732-3029
- **PLP-42N** Northern Technologies, Inc. 23123 E. Madison Ave. Liberty Lake, WA 99019 (800) 727-9119

Note: For detailed information refer to the installation documentation that was supplied with the unit.

One primary surge protector must be used with each SLC wiring pair whenever SLC wiring runs outside the building.

- Install primary protection only as shown in this document.
- Refer to NEC Article 800 and local building code requirements.

Additional primary surge suppressors maybe added as required by the NEC. Add these additional suppressors in series with the SLC wiring at the building entry/exit.

Wiring connected to the surge suppressor output must remain within the building while wiring connected to the surge suppressor input may be routed outside the building as shown in “Building Entry/Exit Connections” in **Figure 4.2-3**.

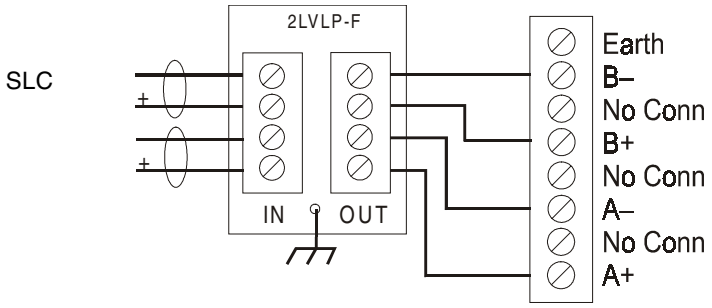
Suppressor Installation

Mounting is inside the FACP enclosure or in a separate enclosure listed for fire protective signalling use. Locate on an available stud and secure with nut.

Unit is connected in series with the SLC Loop to protect the control panel.

Provide a common ground to eliminate the possibility of a differential in ground potentials.

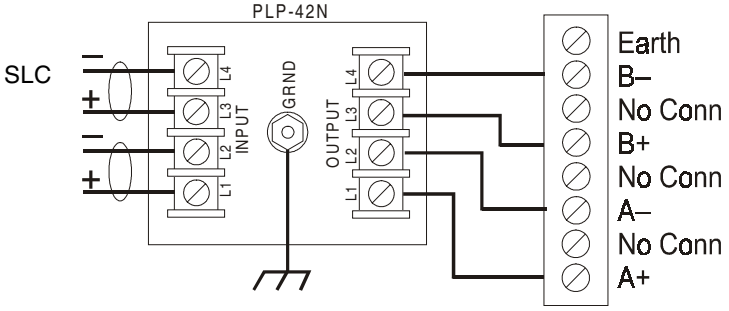
DTK-2LVLP-F Connections



2LVLPconn3.cdr

Note: Do not connect shield to surge protector or fire panel.

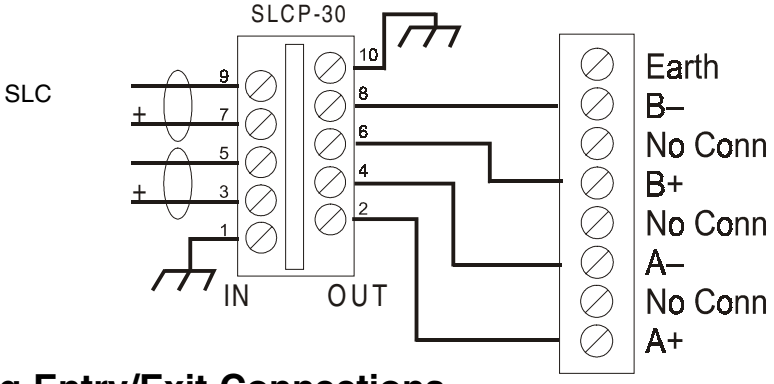
PLP-42N Connections



PLP-Nconn3.cdr

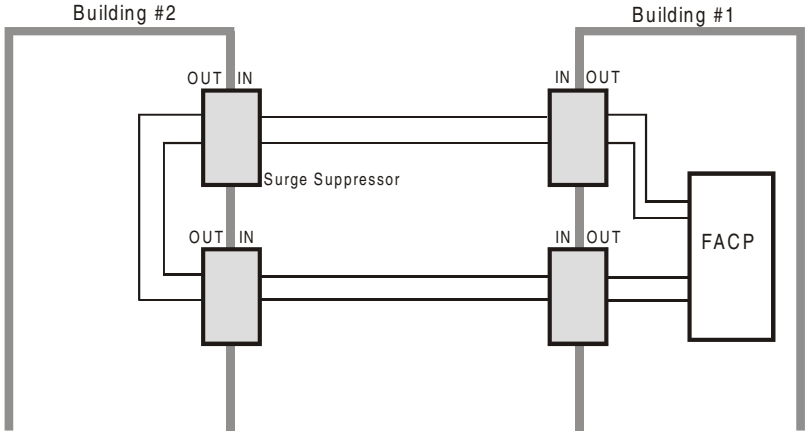
Note: Use 12 AWG (3.25 mm^2) to 18AWG (0.75 mm^2) wire with crimp-on connectors to connect the unit's ground terminal to equipment ground. Wire length must be minimized to provide best protection. Do not connect shield (if present) to surge protector or fire panel.

PLP-42N Connections



SLCP-30conn3.cdr

Building Entry/Exit Connections



SS-building.cdr

Figure 4.2-3 Surge Supressor/FACP Connections

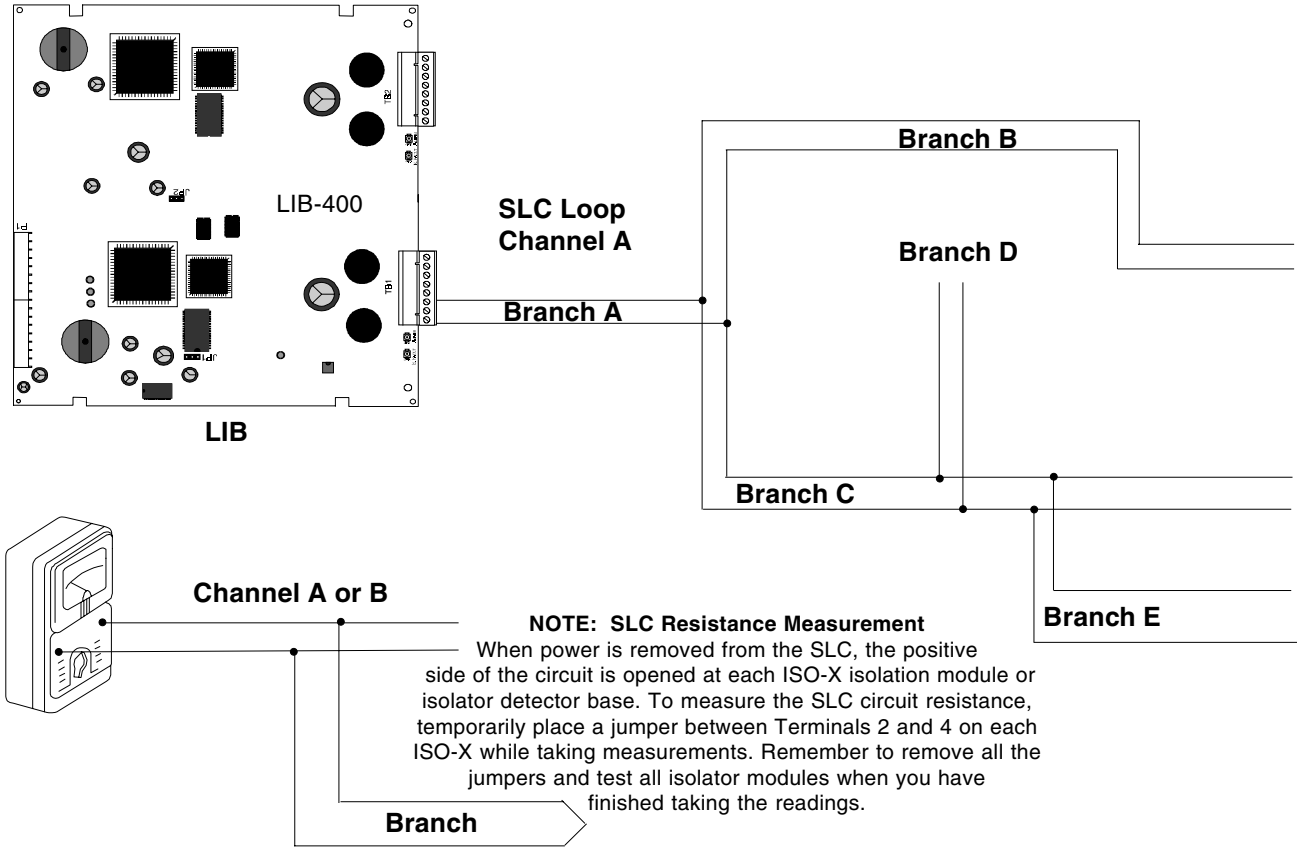
Section 4.3 LIB SLC Loop Wiring Requirements

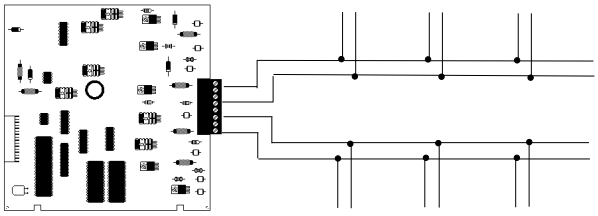
Branch Resistance
With the SLC disconnected from the LIB terminals, short the termination point of one branch at a time and measure the DC resistance **from the beginning of the channel to the end of that particular branch**. The total DC resistance from the LIB-200 panel to branch end cannot exceed 40 ohms. The total DC resistance from the LIB-200A panel or the LIB-400 panel to branch end cannot exceed 50 ohms. Repeat this procedure for all remaining branches. Refer to **Figure 4.3-1** for Style 4 and **Figure 4.3-2** for Style 6.

For each channel
Add the lengths of all the branches on one SLC Loop Channel. On the LIB-200, this sum cannot exceed 10,000 feet (3048 meters)per channel. On the LIB-200A or the LIB-400, this sum cannot exceed 12,500 feet (3810 meters) per channel.

LIB-200:
(Branch A) + (Branch B) + (Branch C) + (Branch D) + (Branch E) = 10,000 feet (3048 meters) or less

LIB-200A or LIB-400:
(Branch A) + (Branch B) + (Branch C) + (Branch D) + (Branch E) = 12,500 feet (3810 meters) or less

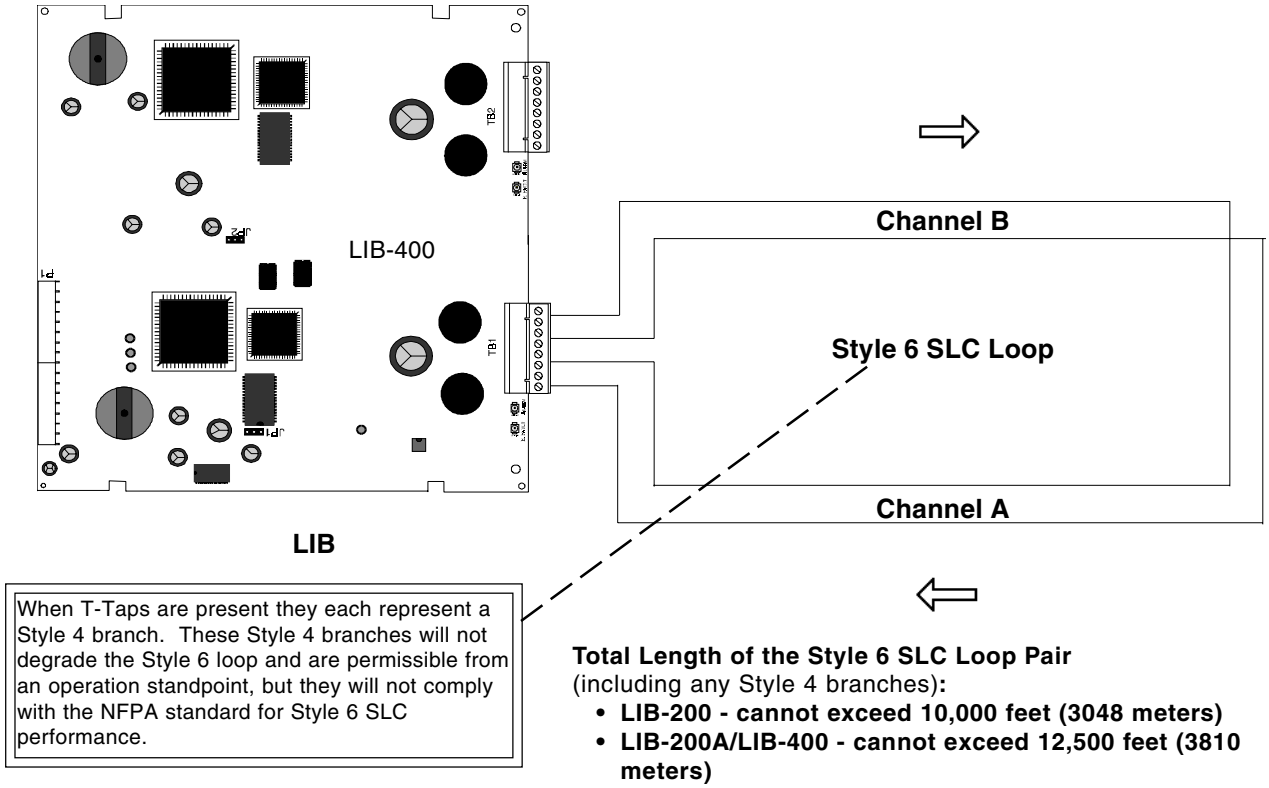




THE TOTAL OF ALL BRANCHES ON CHANNEL B:
LIB-200 must be less than or equal to 10,000 feet (3048 meters)
LIB-200A /LIB-400 must be less than or equal to 12,500 feet (3810 meters)

THE TOTAL OF ALL BRANCHES ON CHANNEL A:
LIB-200 must be less than or equal to 10,000 feet (3048 meters)
LIB-200A /LIB-400 must be less than or equal to 12,500 feet (3810 meters)

Figure 4.3-1 SLC Loop Wiring Requirements (Style 4)

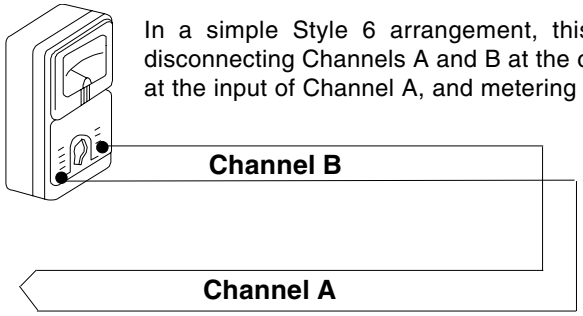


When T-Taps are present they each represent a Style 4 branch. These Style 4 branches will not degrade the Style 6 loop and are permissible from an operation standpoint, but they will not comply with the NFPA standard for Style 6 SLC performance.

Total Length of the Style 6 SLC Loop Pair
(including any Style 4 branches)**:**

- **LIB-200 - cannot exceed 10,000 feet (3048 meters)**
- **LIB-200A/LIB-400 - cannot exceed 12,500 feet (3810 meters)**

The total DC resistance from the LIB-200 panel to branch end cannot exceed 40 ohms.
The total DC resistance from the LIB-200A panel or the LIB-400 panel to branch end cannot exceed 50 ohms.



In a simple Style 6 arrangement, this measurement may be made by disconnecting Channels A and B at the control panel, shorting the two leads at the input of Channel A, and metering the two leads of Channel B.

When Style 4 branches are present, complete the measurement by opening the short which was placed at the input of Channel A and perform the Style 4 measurement shown in **Figure 4.3-1**.

NOTE:
SLC Resistance Measurement

When power is removed from the SLC, the positive side of the circuit is opened at each ISO-X isolation module or isolator detector base. To measure the SLC circuit resistance, temporarily place a jumper between Terminals 2 and 4 on each ISO-X while taking measurements. Remember to remove all the jumpers and test all isolator modules when you have finished taking the readings.

Figure 4.3-2 SLC Loop Wiring Requirements (Style 6)

LIB Signaling Line Circuit (SLC) loops can be wired to meet the requirements of an NFPA Style 4 (refer to **Figure 4.3-3**), Style 6 (refer to **Figure 4.3-4**) or Style 7 (refer to **Figure 4.3-5**) SLC.

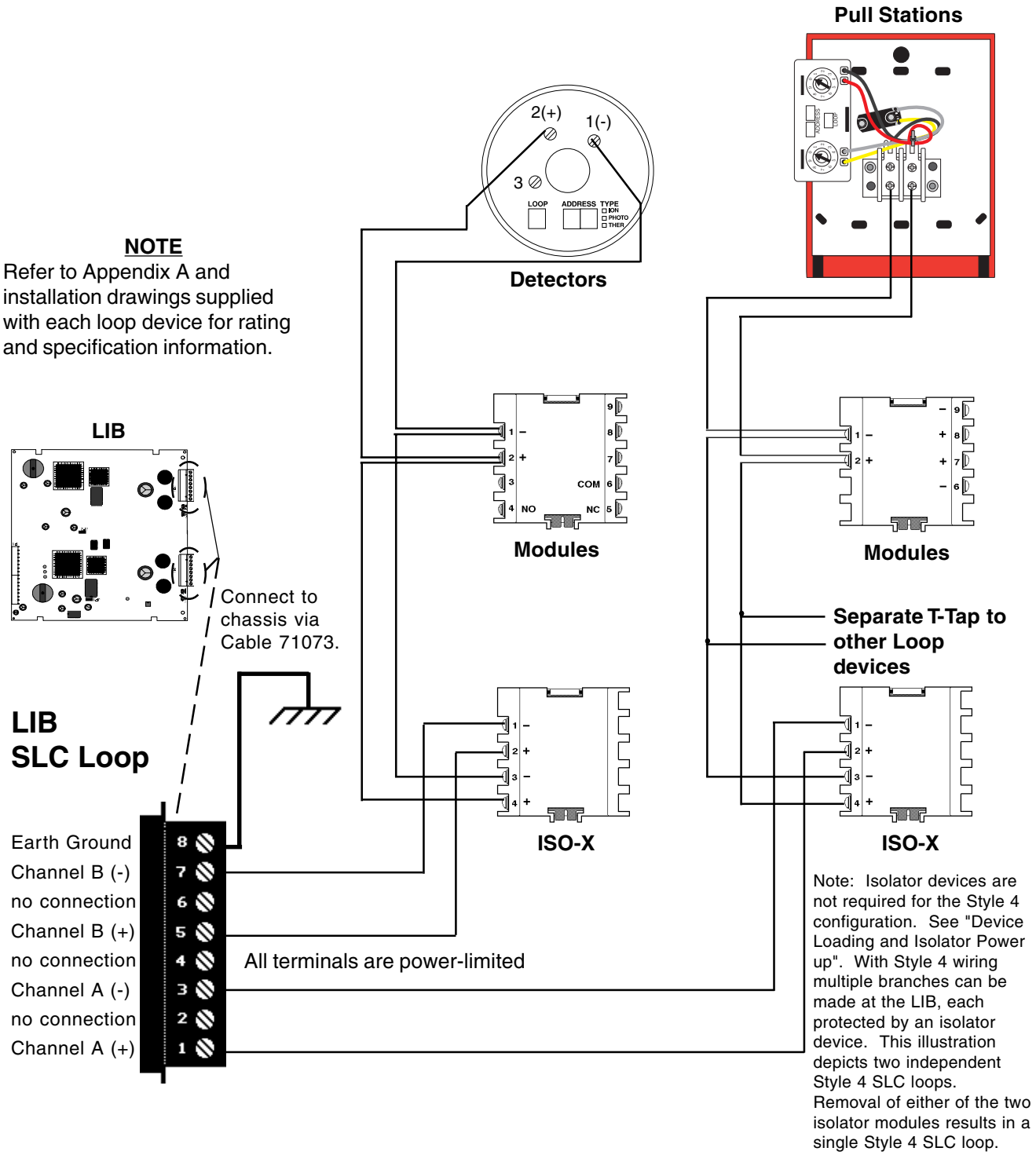


Figure 4.3-3 Typical NFPA Style 4 SLC Loops

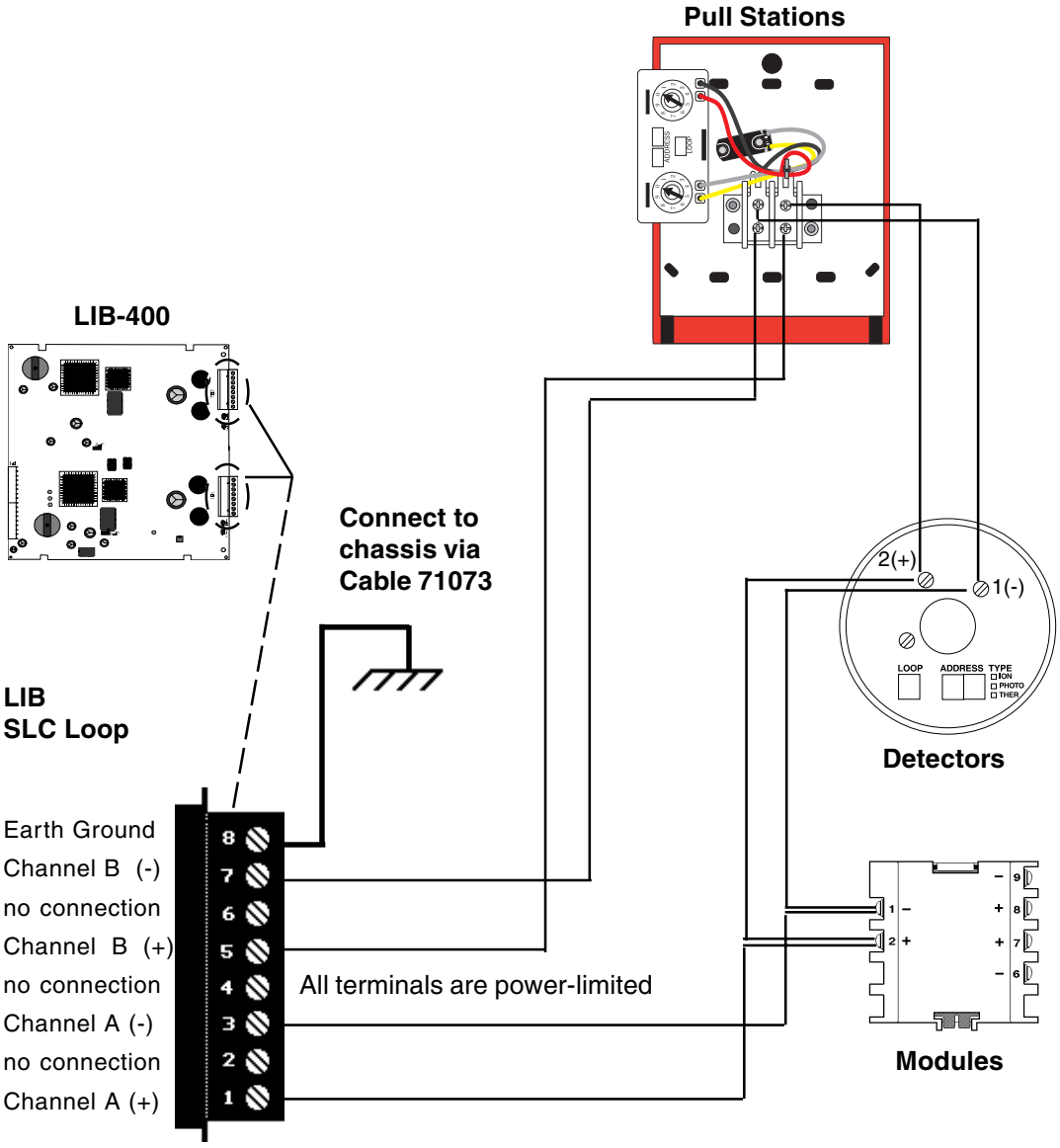


Figure 4.3-4 NFPA Style 6 LIB SLC Loop

Functions in accordance with NFPA Style 6 SLC

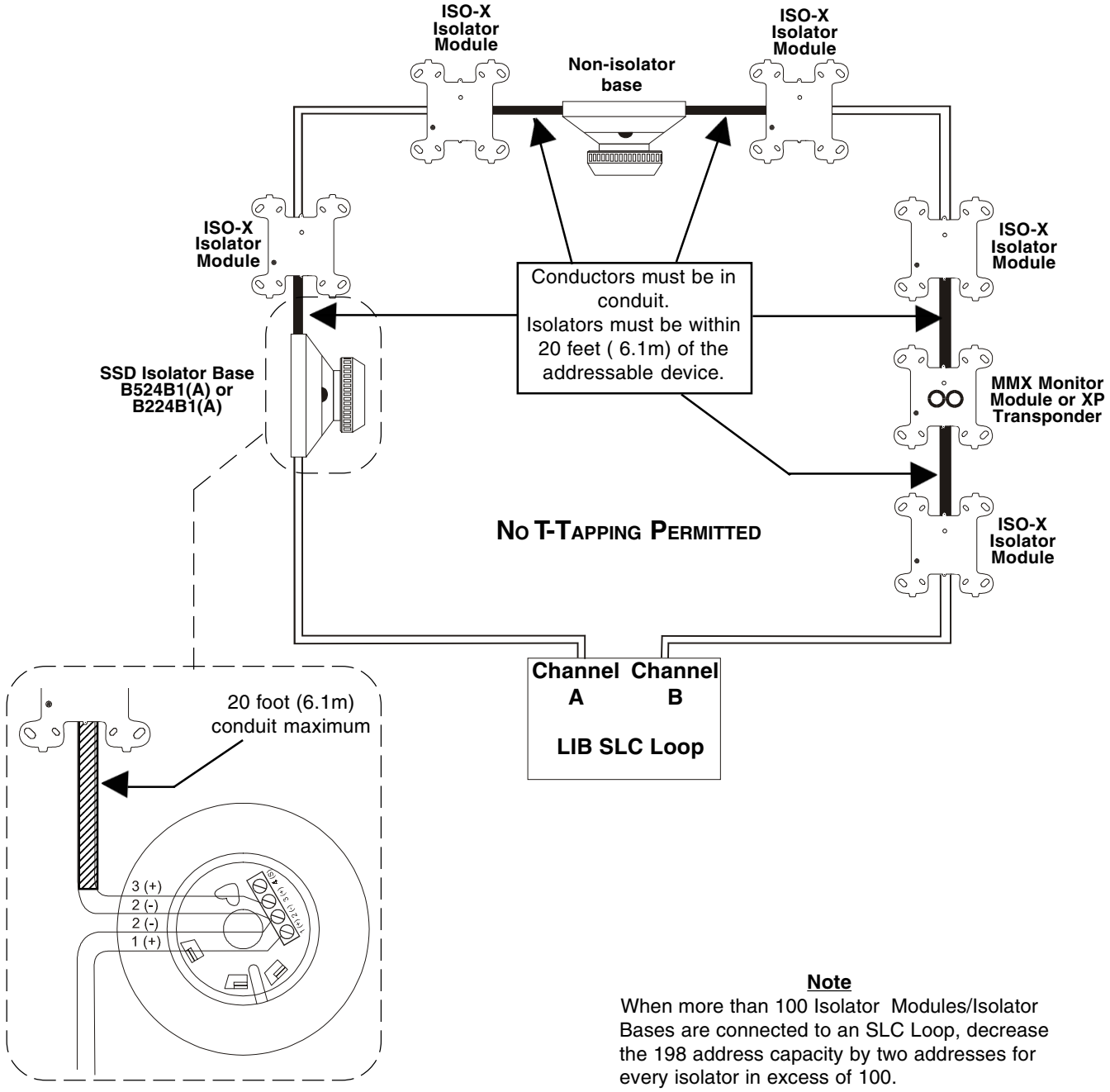
NOTE

Refer to Appendix A and installation drawings supplied with each loop device for rating and specification information.

Style 7 Operation

By flanking each SLC device with ISO-X isolator modules and/or isolator detector bases, each device is protected from an open or short on the SLC. In **Figure 4.3-5** below, the MMX monitor module or XP transponder, the non isolator-based device, and the isolator-based device will continue to function if there is an open or short on the SLC.

The isolator-based device pictured below requires only one ISO-X module, as the isolator bases B524B1(A) and B224B1(A) act as isolators. However, if the short circuit occurs on the wiring connected to terminals 2 and 3 of the isolator base, the smoke detector in that base will not be isolated. Therefore, the conduit and ISO-X is installed on this wiring. Refer to the isolator base wiring diagram in the figure.



Style 7 wiring for SSD Isolator Bases B524B1(A) and B224B1(A)

Note

When more than 100 Isolator Modules/Isolator Bases are connected to an SLC Loop, decrease the 198 address capacity by two addresses for every isolator in excess of 100.

Figure 4.3-5 NFPA Style 7 SLC

Section 4.4 SLC Shield Termination

Shielded twisted pair cable can be used to minimize radiated emissions of radio frequency energy. The use of shielded twisted pair cable is required when using the LIB-200. Terminating shielded twisted pair cable at the cabinet is required for the LIB-200; shielded cable is not recommended for the LIB-200A and LIB-400. Use unshielded twisted pair cable only. Figures 4.4-1 through 4.4-3 illustrate the LIB-200 shield terminations required.

Note: The use of shielded or untwisted cable in the LIB-200A and LIB-400 will result in shorter wire distances. If shielded cable is employed with the LIB-200A and LIB-400, the shield should remain unterminated and non-contiguous at each device for best system performance.

For a LIB-200 SLC Loop that is not contained in any conduit:

Do not allow the shield drain wire to enter the cabinet. Connect the drain wire to the outside of the cabinet via a BX type connector. Maintain the continuity of the shield wire throughout the loop but do not connect to any devices.

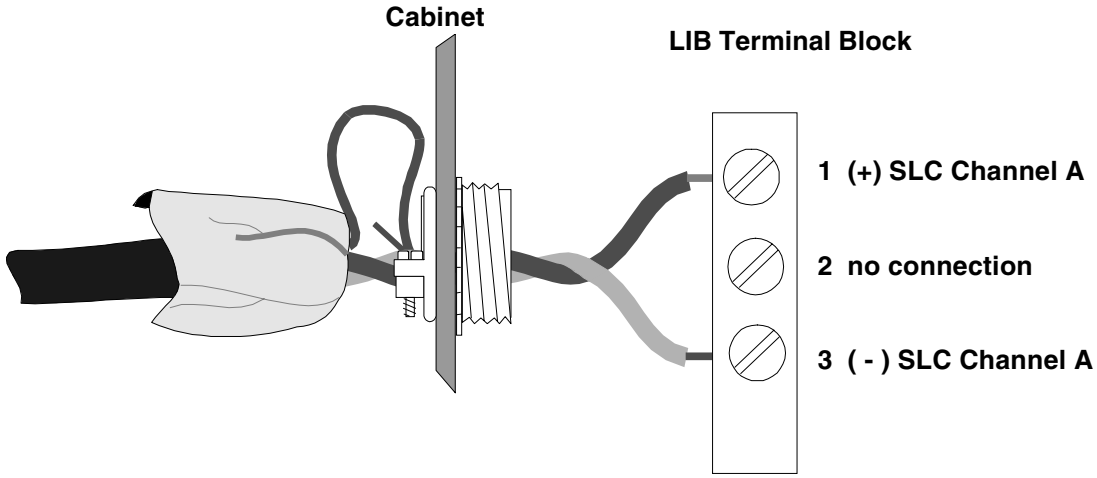


Figure 4.4-1 Shield Termination in No Conduit (LIB-200 only)

For a LIB-200 SLC that is contained entirely in conduit:

The shield drain wire must be connected to the negative (-) side of the SLC. Do not allow the shield drain wire or the shield foil to touch the cabinet. Make no connections to Terminal 2. Note: For NFPA Style 6 field wiring of the SLC, connect each end of the shield to the negative side of the respective Channel. Chain the shield wire throughout the loop but do not connect to any devices.

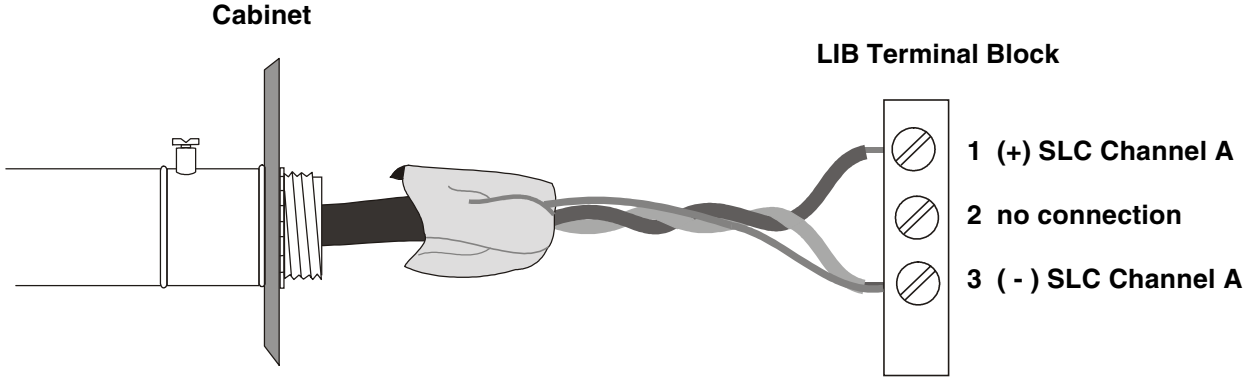
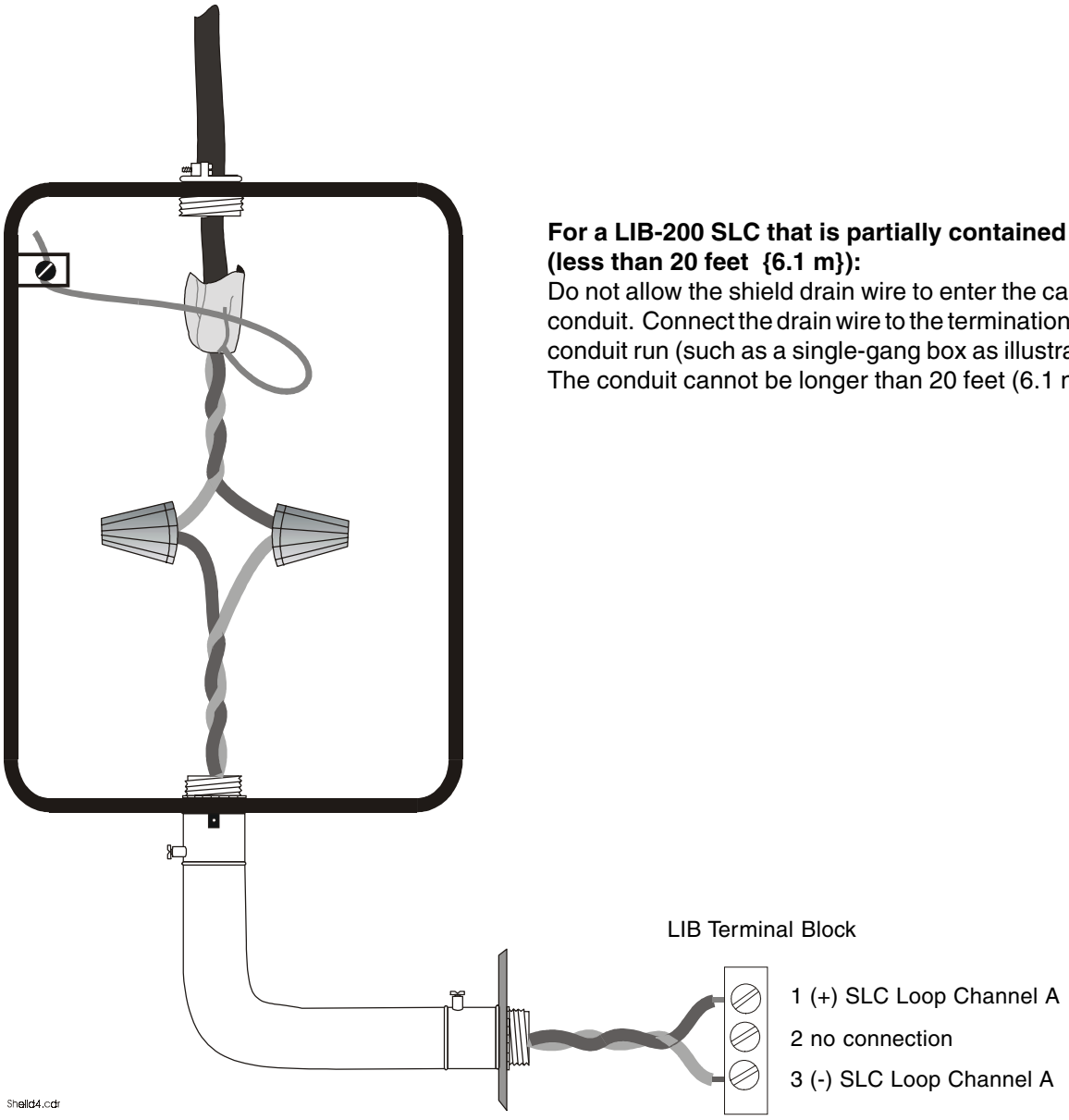


Figure 4.4-2 Shield Termination in Full Conduit (LIB-200 only)



For a LIB-200 SLC that is partially contained in conduit (less than 20 feet {6.1 m}):
Do not allow the shield drain wire to enter the cabinet or the conduit. Connect the drain wire to the termination point of the conduit run (such as a single-gang box as illustrated at left). The conduit cannot be longer than 20 feet (6.1 m) total.

Figure 4.4-2 Shield Termination in Partial Conduit (LIB-200 only)

Section 4.5 The Isolator Module

The Loop Isolator Module, ISO-X (refer to **Figures 4.5-1 through 4.5-3**), is used to protect critical elements of the SLC from short circuit faults on other branches or sections of the loop.

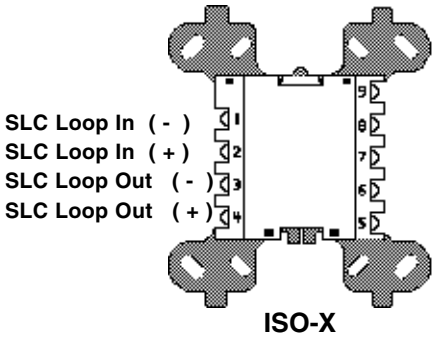
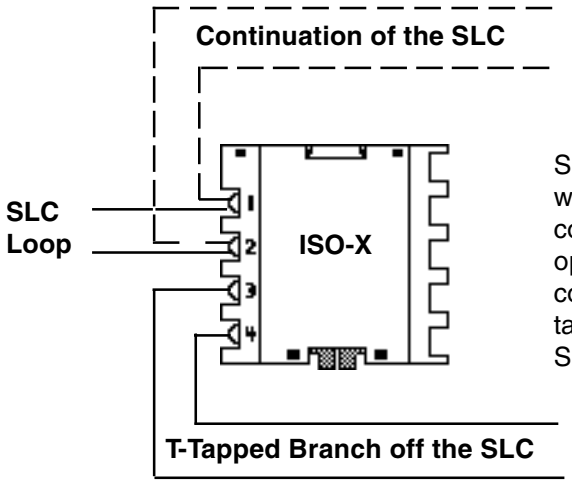


Figure 4.5-1 The Loop Isolator Module (ISO-X)

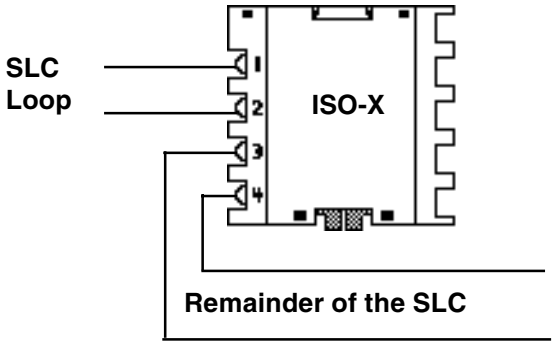
The ISO-X continuously monitors the circuit by pulsing the coil of an integral relay which is latched on at power up.



Shorts on this T-tapped branch of an NFPA Style 4 SLC will be isolated from all devices installed on the SLC connected to terminals 1 and 2 of the ISO-X. A short or open on the T-tapped branch will result in loss of communication to the devices on that branch. The T-tapped branch will be isolated from the remainder of the SLC.

Figure 4.5-2 Isolating a Branch of a Style 4 SLC

The ISO-X sees this short and disconnects the faulted branch, effectively isolating the faulted branch from the remainder of the loop (refer to **Figure 4.5-3**). Once the fault is removed, the ISO-X reapplies power to the loop branch. **Figures 4.5-1** through **4.5-3** illustrate the use of ISO-Xs on Style 4 SLCs. For an example of employing ISO-Xs on Class A SLCs (refer to **Figure 4.3-5**).



Shorts on the remainder of this NFPA Style 4 SLC will be isolated from all devices installed upstream of the ISO-X.

Figure 4.5-3 Isolating the Remainder of a Style 4 SLC

Device Loading and Isolator Power Up

Isolator modules are powered from the SLC. The internal relay is a latching-type relay to limit the isolator's power requirements. The contact will open when power is removed. During power up, the relay contact will close when the SLC voltage rises above 7 volts. If too many addressable devices are connected to one isolator branch (t-tap) or segment (loop), the isolator will never reach 7 volts and thus remain open (activated) on power up.

When no relay or sounder bases are used, a maximum load of 25 addressable devices can be connected to an isolator, or between a pair of isolators and/or isolator bases to insure that the isolators power up correctly. Note that IPX-751 detectors represent an exception, and only two of these detectors constitute a maximum load, not 25. When relay or sounder bases are used between isolator modules or isolator bases, the maximum number of addressable devices in between isolators is seven. Note that the same addressable device restrictions apply to isolator bases.

NOTE

During a short circuit fault condition, the control panel will register a trouble (INVALID REPLY) condition for each device on the isolated SLC branch or loop segment.

Section 4.6 Monitor Modules

The MMX-1, MMX-2 and MMX-101 Monitor Modules are addressable modules that monitor normally open contact, shorting type and alarm initiating devices. The MMX-2 can also monitor conventional two-wire smoke detectors. The MMX-1 and MMX-2 Initiating Device Circuits (IDC) can be wired as an NFPA Style B or Style D Initiating Device Circuits; the MMX-101 Initiating Device Circuits (IDC) can be wired Style B only. There is no limit to the number of contact-type devices installed on a monitor module circuit (See NFPA 72 for possible code imposed limits. See the Device Compatibility document for the maximum number of 2-wire smoke detectors that can be connected to the MMX-2.) Refer to **Figures 4.6-3** and **4.6-4** for MMX-1/MMX-2 wiring diagrams.

The MMX-1 and MMX-2 Monitor Modules (**Figure 4.6-1**)

SLC Loop Connections
Connect the SLC Loop to MMX-1 or MMX-2 terminals 1(-) and 2 (+). The MMX occupies one module address on the SLC Loop. Set the rotary switches on the MMX to the particular SLC address required (each MMX requires a unique module address, 01-99).

NFPA Style B Initiating Device Circuit
Connect the alarm initiating devices to a single two-wire circuit. This circuit cannot be T-Tapped or branched in any fashion, and must be terminated across the last device by a listed ELR. Connect the circuit to MMX-1/MMX-2 terminals 6 (-) and 7 (+).

NFPA Style D Initiating Device Circuit
Connect the normally open contacts of the alarm initiating devices as shown in Figure 4.6-4. This circuit cannot be T-Tapped or branched in any fashion. No external ELR is required for Style D wiring.

MMX-2 Operating Power
The MMX-2 requires connection of a Notifier 24V DC filtered and resettable power supply on Terminals 3(-) and 4(+). This power connection is supervised by the MMX-2. A maximum of 40 MMX-2 modules may be installed on a LIB due to increased power consumption over the MMX-1. Only use 2-wire smoke detectors which are UL compatibility listed. See the Notifier Device Compatibility Document 15378 for a listing of devices.

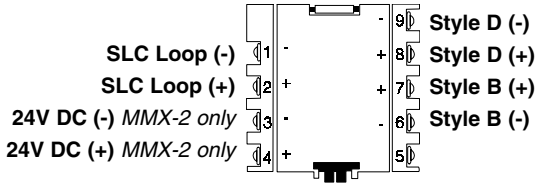
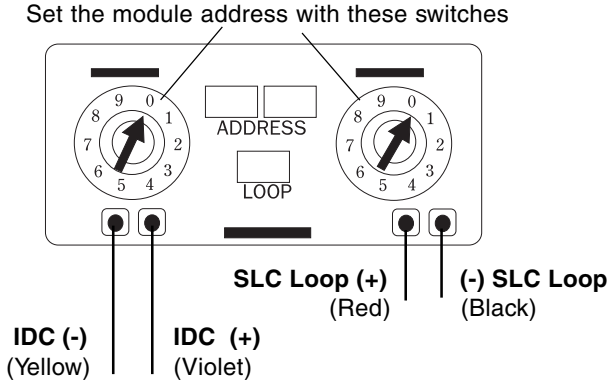


Figure 4.6-1 MMX-1 or MMX-2 Monitor Modules

The MMX-101 Monitor Module (**Figure 4.6-2**)
The MMX-101 Monitor Module is an addressable module that is functionally and electrically identical to an MMX-1 Monitor Module (configured for NFPA Style B), but offered in a smaller package for mounting directly in the electrical box of the contact-type device being monitored. Unlike the MMX-1, the MMX-101 does not have an LED indicating polling or alarm condition.

NOTE
For additional ratings, refer to Appendix A.



NFPA Style B Initiating Device Circuit

Terminate with an End-of-Line Resistor 47K, 1/2-watt (A2143-00)

Figure 4.6-2 MMX-101 Monitor Module

Figure 4.6-3 illustrates an MMX-1 monitoring normally open contact fire alarm initiating devices that do not require power and an MMX-2 monitoring powered two-wire smoke detectors and a normally open contact alarm initiating device. Refer to **Figure 4.6-5** for circuits using four-wire detectors.

NOTES

- For additional ratings, refer to Appendix A.
- For connection of the initiating devices, refer to the manufacturer's installation instructions packaged with each device.
- For more information, refer to the MMX-2 Installation Instructions.

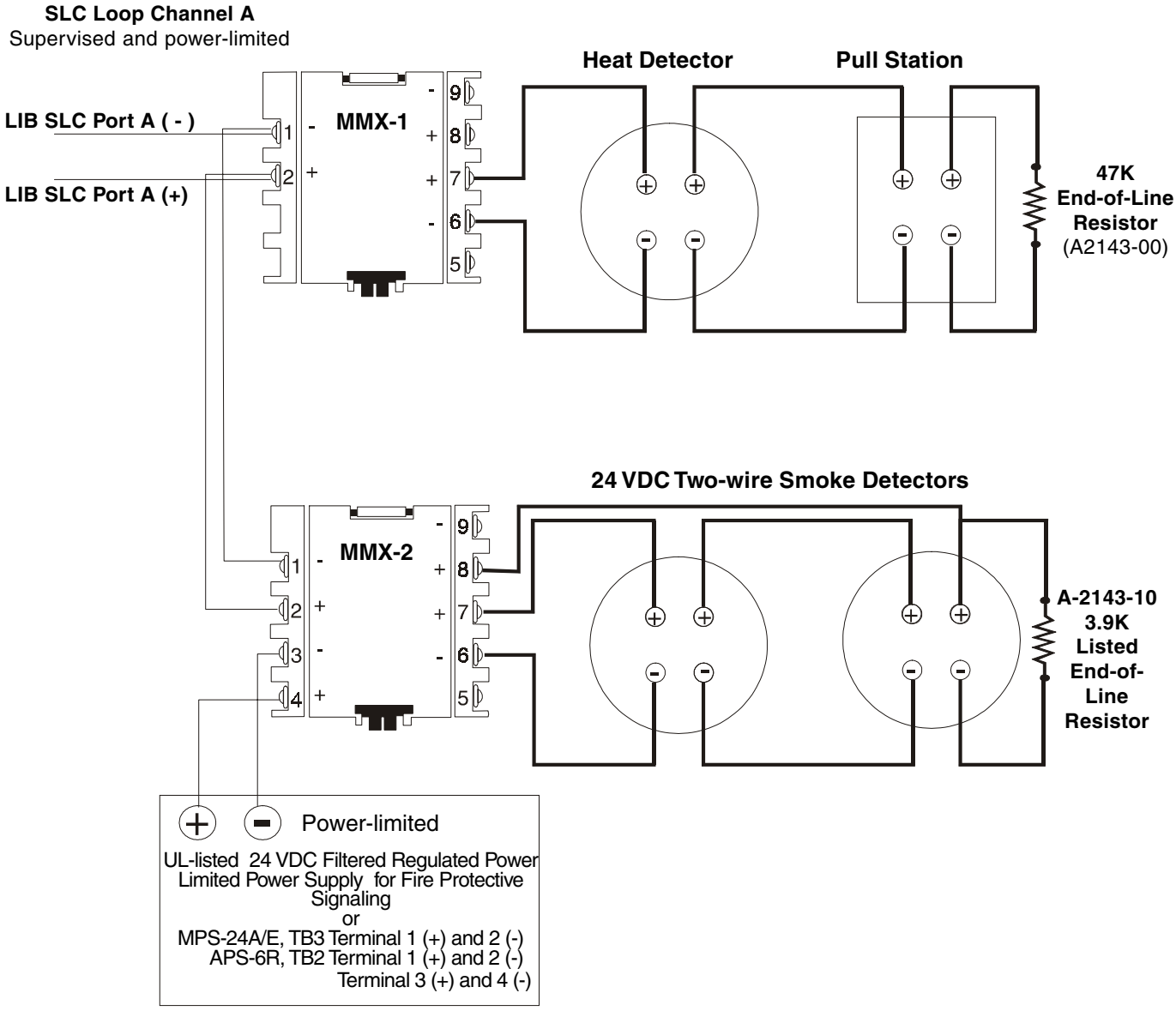


Figure 4.6-3 NFPA Style B Initiating Device Circuit

Figure 4.6-4 illustrates an MMX-1 monitoring normally open contact fire alarm initiating devices that do not require power and an MMX-2 monitoring powered two-wire smoke detectors. Refer to **Figure 4.6-6** for circuits using four-wire detectors.

NOTES

- For additional ratings, refer to Appendix A.
- For connection of the initiating devices, refer to the manufacturer's installation instructions packaged with each device.
- For MMX-2 mount the appropriate ELR across terminals 8 and 9.
- For more information, refer to the MMX-2 Installation Instructions.

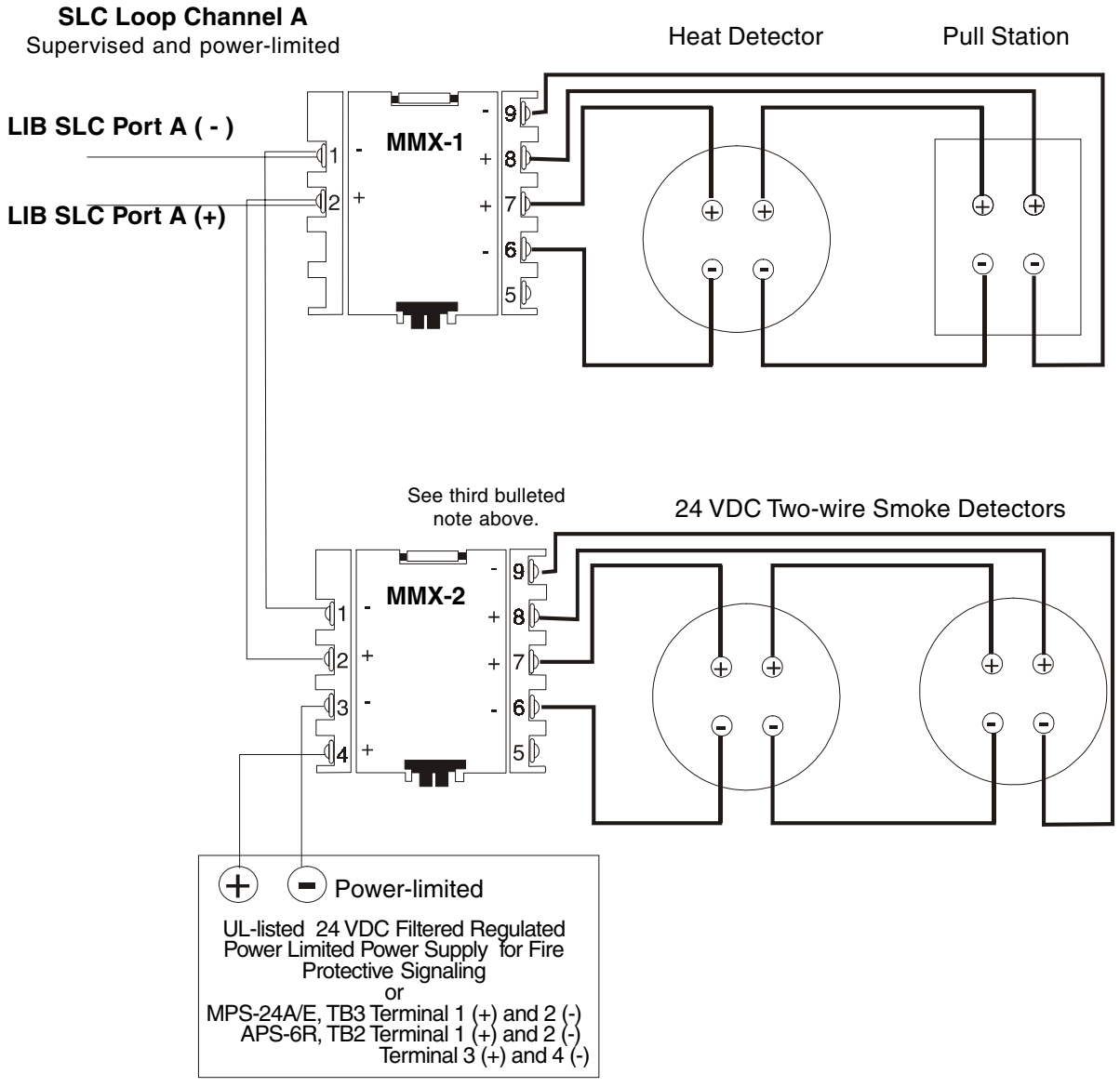
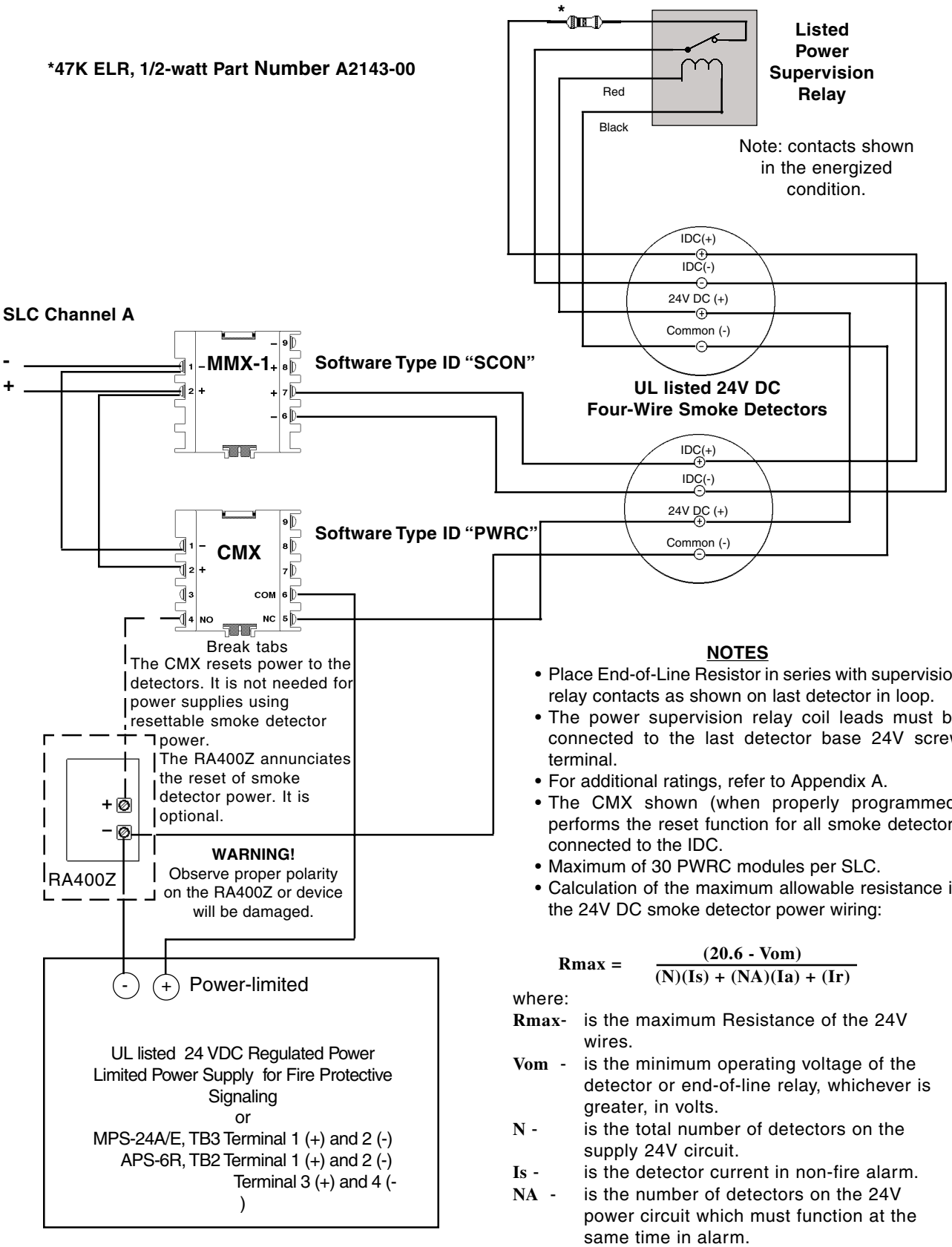


Figure 4.6-4 NFPA Style D Initiating Device Circuit

24V DC Four-Wire Smoke Detector Power

Up to one amp for four-wire smoke detectors can be drawn from TB3 terminals 1(+) and 2(-). Power is removed from these terminals during system reset. This 24V DC regulated source is power-limited but must be supervised via an end-of-line Power Supervision Relay (refer to **Figures 4.6-5 and 4.6-6**).



NOTES

- Place End-of-Line Resistor in series with supervision relay contacts as shown on last detector in loop.
- The power supervision relay coil leads must be connected to the last detector base 24V screw terminal.
- For additional ratings, refer to Appendix A.
- The CMX shown (when properly programmed) performs the reset function for all smoke detectors connected to the IDC.
- Maximum of 30 PWRC modules per SLC.
- Calculation of the maximum allowable resistance in the 24V DC smoke detector power wiring:

$$Rmax = \frac{(20.6 - Vom)}{(N)(Is) + (NA)(Ia) + (Ir)}$$

where:

Rmax- is the maximum Resistance of the 24V wires.

Vom - is the minimum operating voltage of the detector or end-of-line relay, whichever is greater, in volts.

N - is the total number of detectors on the supply 24V circuit.

Is - is the detector current in non-fire alarm.

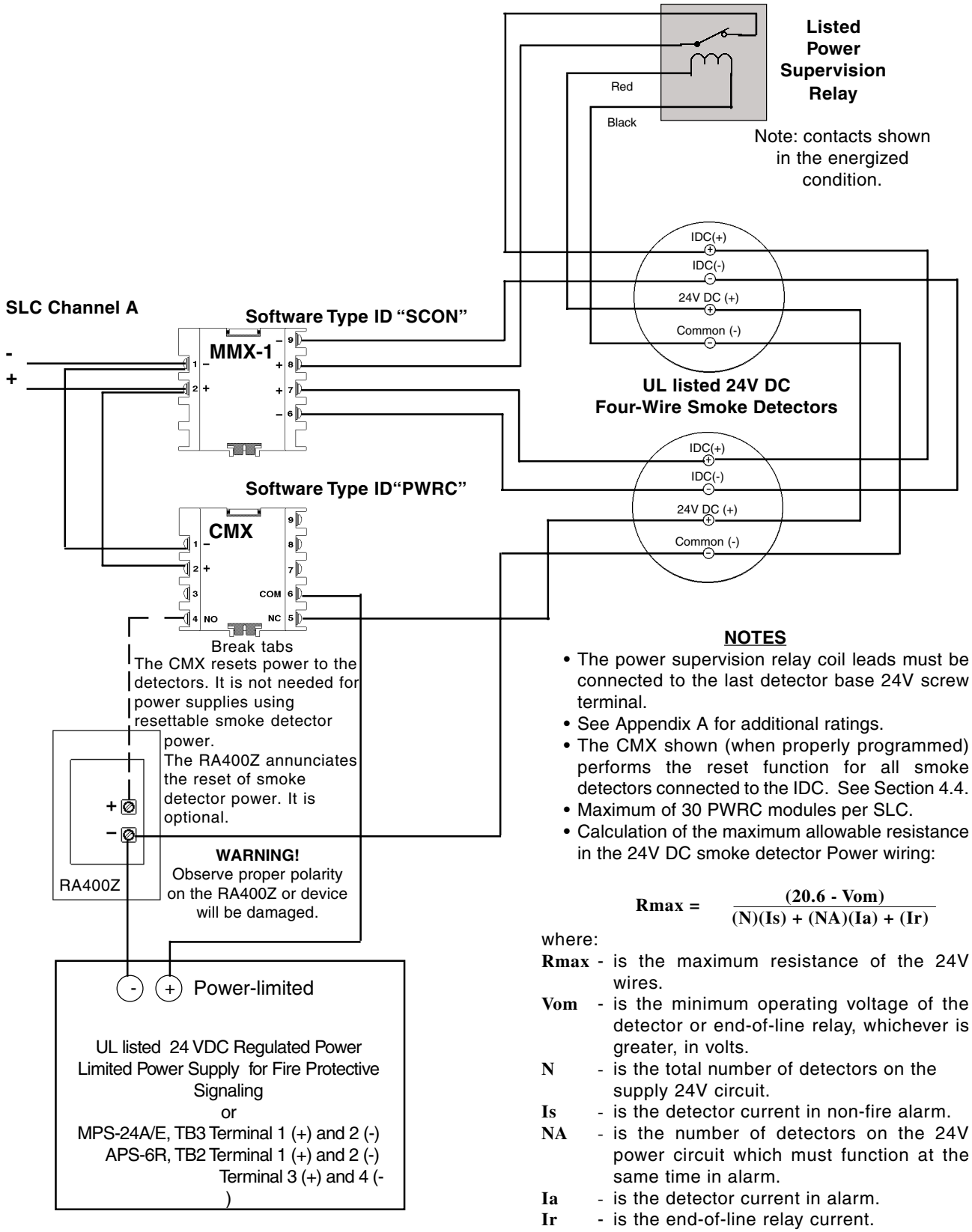
NA - is the number of detectors on the 24V power circuit which must function at the same time in alarm.

Ia - is the detector current in alarm.

Ir- is the end-of-line relay current.

Figure 4.6-5 Employing Four-Wire Smoke Detectors (Style B IDC)

All connections are supervised and power limited



NOTES

- The power supervision relay coil leads must be connected to the last detector base 24V screw terminal.
- See Appendix A for additional ratings.
- The CMX shown (when properly programmed) performs the reset function for all smoke detectors connected to the IDC. See Section 4.4.
- Maximum of 30 PWRC modules per SLC.
- Calculation of the maximum allowable resistance in the 24V DC smoke detector Power wiring:

$$\mathbf{Rmax} = \frac{\mathbf{(20.6 - Vom)}}{\mathbf{(N)(Is) + (NA)(Ia) + (Ir)}}$$

where:

Rmax - is the maximum resistance of the 24V wires.
Vom - is the minimum operating voltage of the detector or end-of-line relay, whichever is greater, in volts.
N - is the total number of detectors on the supply 24V circuit.
Is - is the detector current in non-fire alarm.
NA - is the number of detectors on the 24V power circuit which must function at the same time in alarm.
Ia - is the detector current in alarm.
Ir - is the end-of-line relay current.

Figure 4.6-6 Employing Four-Wire Smoke Detectors (Style D IDC)

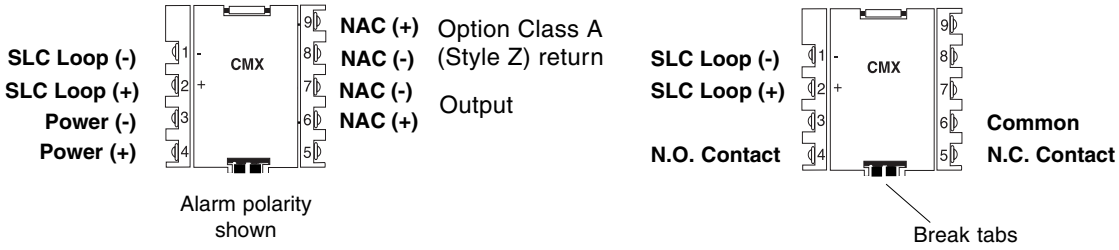
All connections are supervised and power limited

Section 4.7 The Control Module

The CMX Control Module is an addressable module that supervises and switches power to a Notification Appliance Circuit (NAC). The CMX circuit can be wired as an NFPA Style Y or Style Z NAC. Alternately, the CMX can be employed as a Form-C relay (refer to **Figure 4.7-1**). Refer to **Figures 4.7-2** through **4.7-6** for CMX wiring diagrams.

NOTE

The CMX refers either to the CMX-1 or CMX-2 through the remainder of this document, unless otherwise noted.



CMX Control Module (NAC) **CMX Control Module (Form-C Relay)**

Figure 4.7-1 The CMX Control Module

SLC Loop Connections

Connect the SLC Loop to CMX Terminals 1(-) and 2 (+). The CMX occupies one module address on the SLC Loop. Set the rotary switches on the CMX to the particular SLC Loop address required (each CMX must have a unique module address, 01-99).

Breaking Tabs

To configure a CMX as a Form-C relay, the two tabs must be broken off of the module. Use a pair of needle-nose pliers to break off each tab.

WARNING!

The tabs must be broken before the connection of any power source to the Form-C terminals.

Contact Connections

Make connections to the common and the normally-open or normally-closed contacts on the CMX as needed.

(Refer to **Figure 4.7-6** for a wiring diagram.)

Notification appliance power can be supplied to CMX Control Modules by any one of the supplies illustrated in **Figure 4.7-2**. This power is unsupervised and must be connected to a Power Supervision Relay wired to a CMX Control Module (refer to **Figures 4.7-3** through **4.7-5**) or dedicated MMX module using the "MTRB" type ID. When a remote power supply is employed, it must also be supervised.

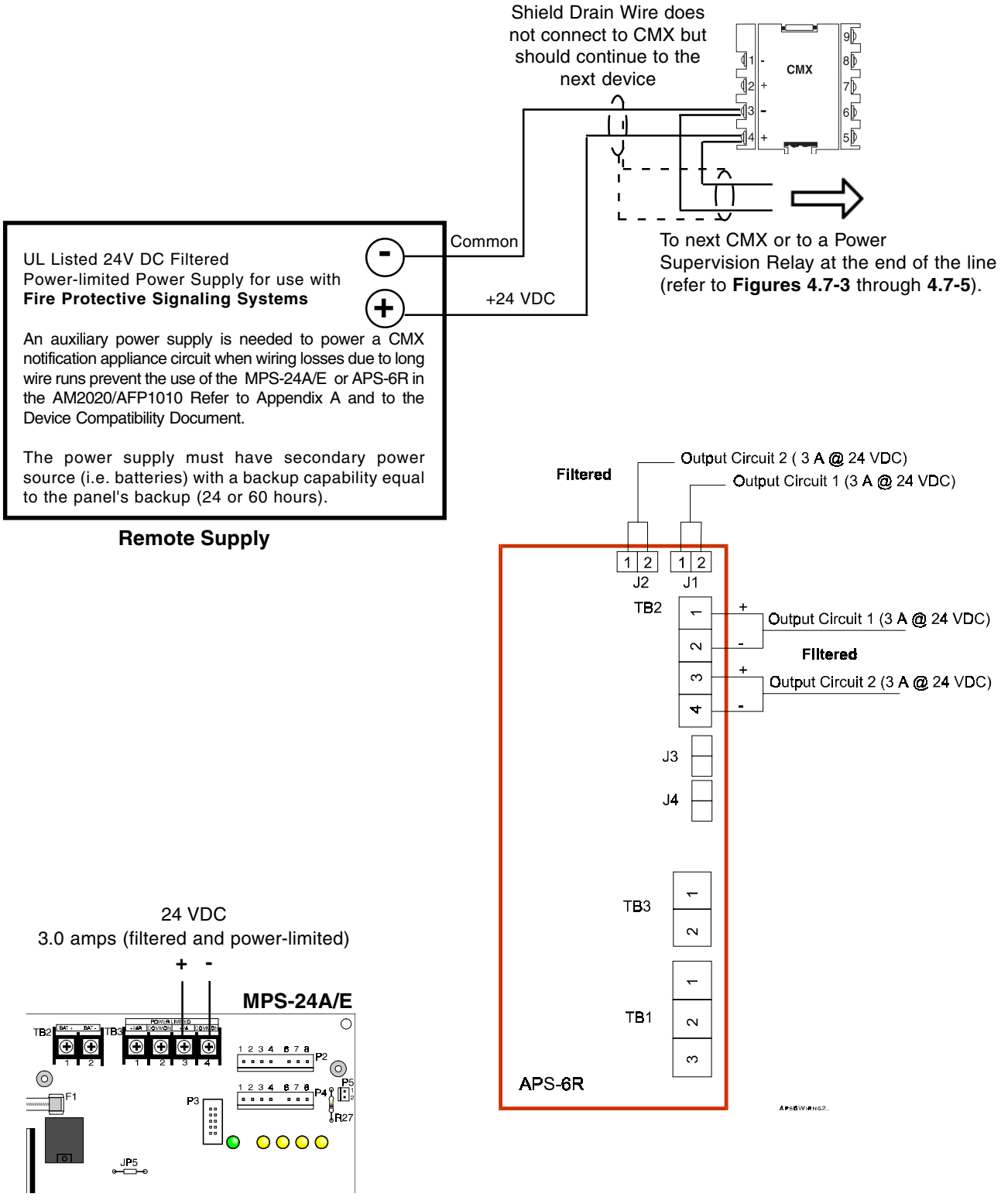
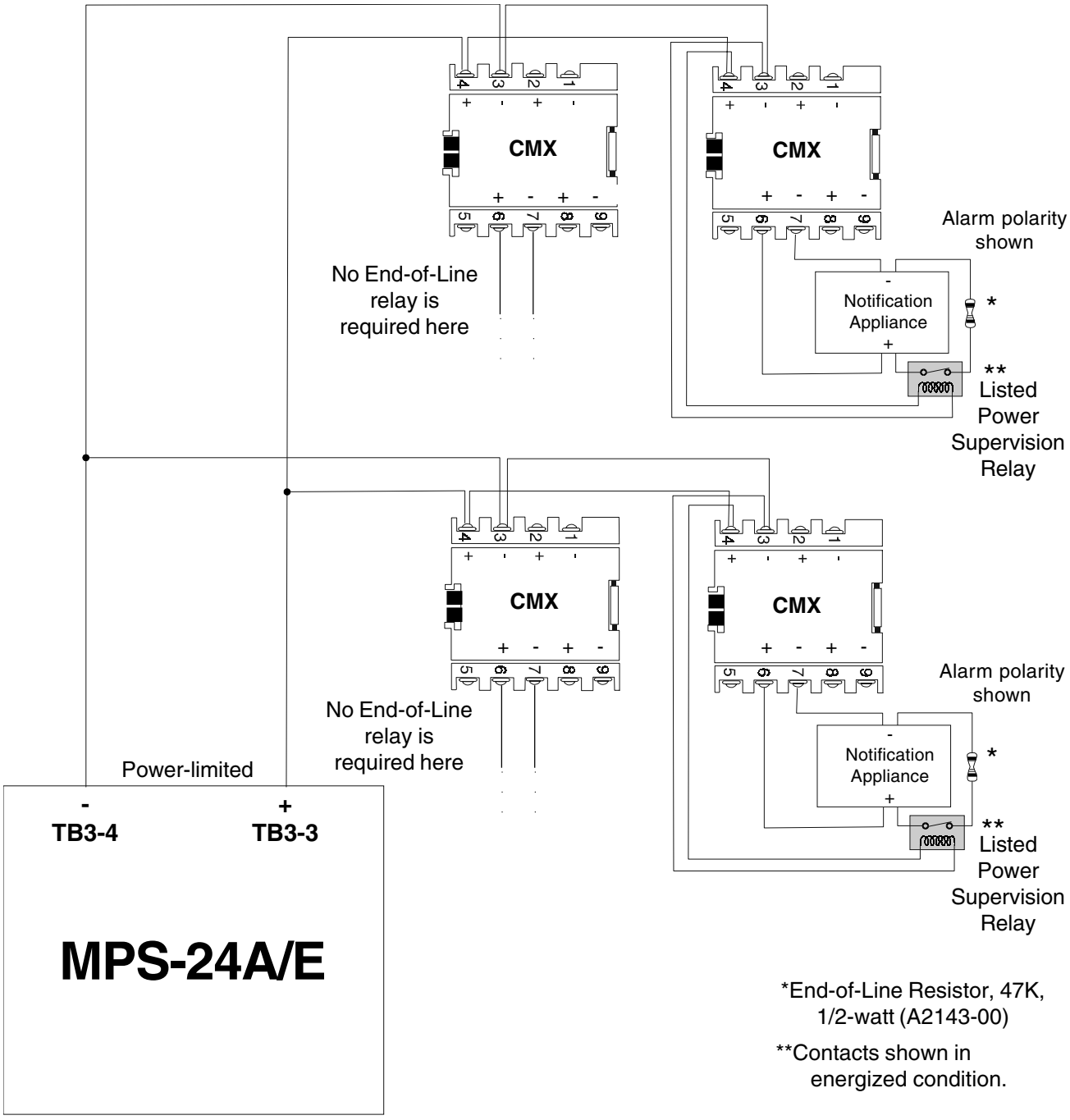
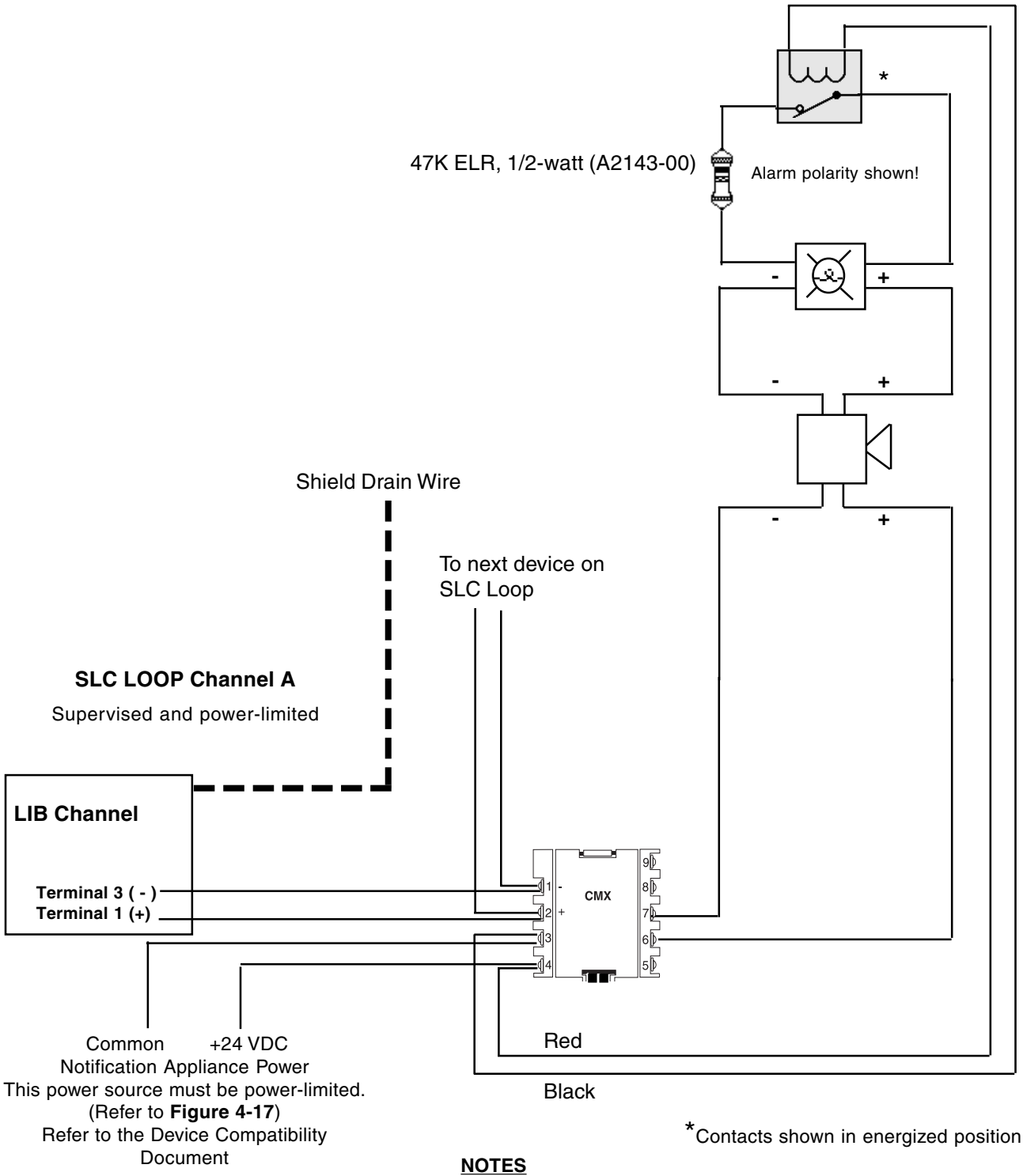


Figure 4.7-2 Providing Power to Control Modules



NOTE: To provide accurate supervision, the power circuit wires should be broken at terminals 3 and 4 of the CMX and not looped under the terminal hold-down clamp. Any time a power circuit is T-tapped, as seen immediately above the MPS-24A power supply, each 24 VDC power circuit branch must end with a listed power supervision relay.

Figure 4.7-3 Power Distribution

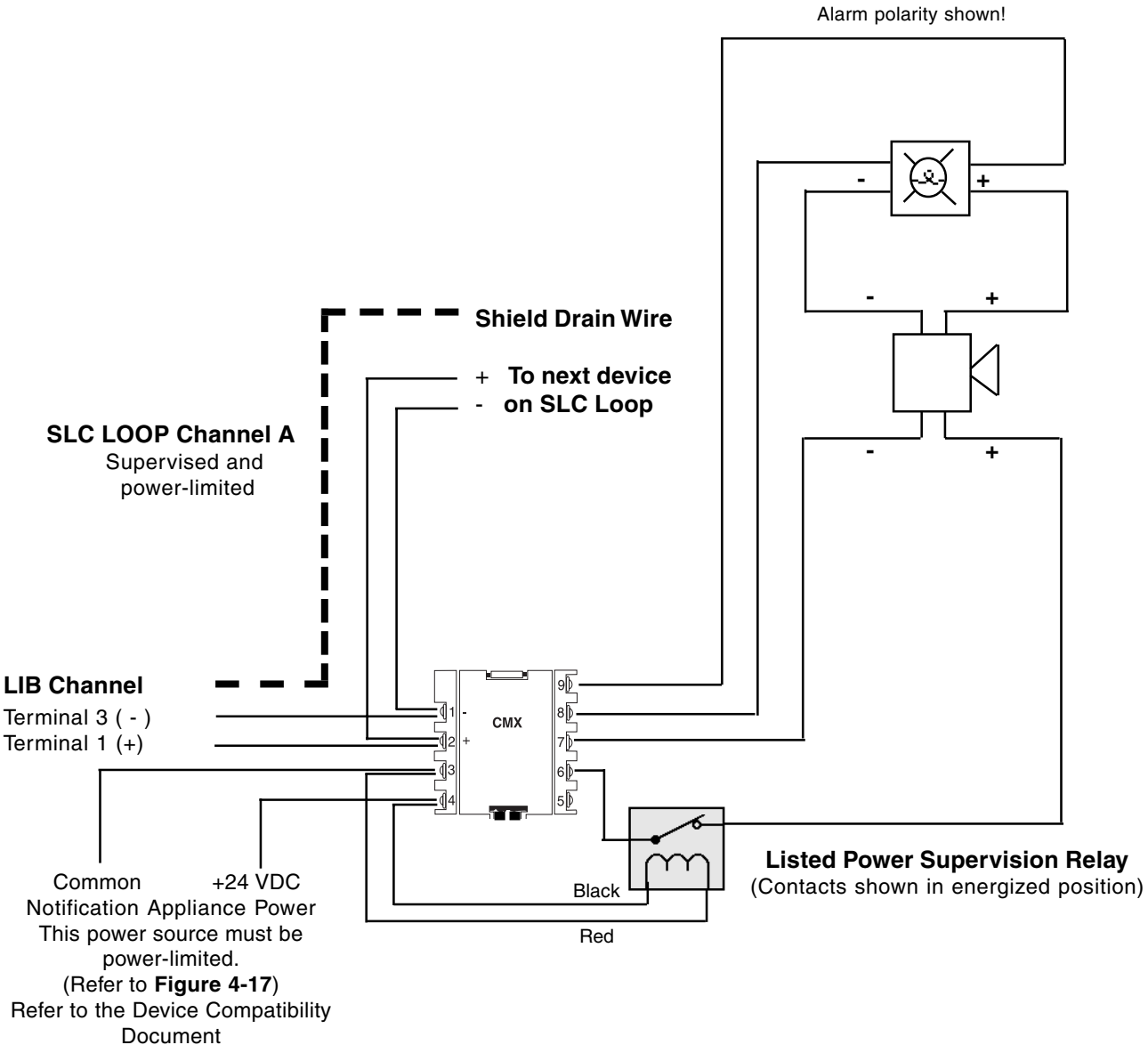


NOTES

- To provide accurate supervision, the power circuit wires should be broken at terminals 3 and 4 of the CMX and not looped under the terminal hold-down clamp. Any time a power circuit is T-tapped, each branch must end with a listed power supervision relay.
- For connection of the notification appliances, refer to the manufacturer's installation instructions packaged with each device.
- For additional ratings, refer to Appendix A.

Figure 4.7-4 NFPA Style Y Notification Appliance Circuit

Supervised and Power-Limited

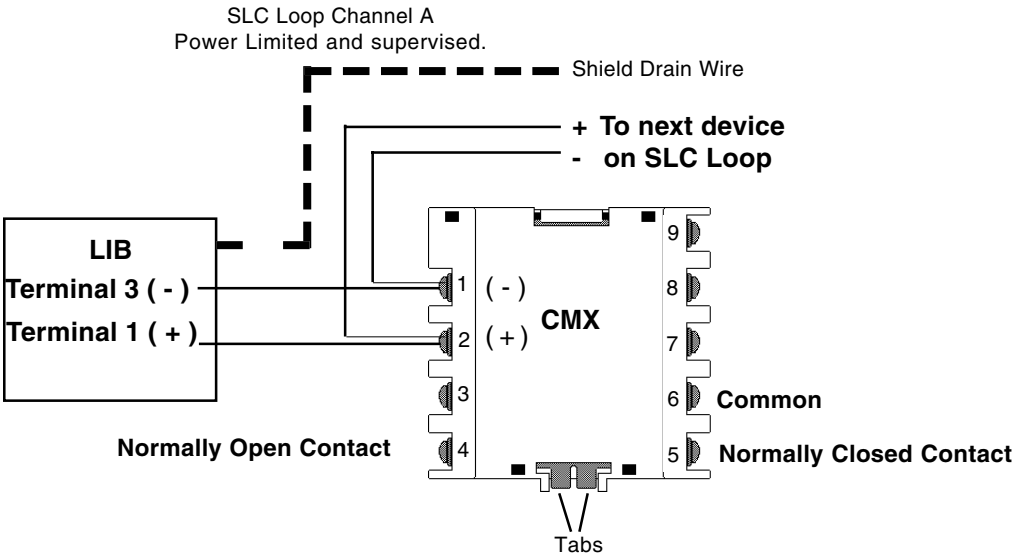


NOTES

- Each audio/visual power loop must be supervised by a separate Power Supervision Relay.
- For connection of the notification appliances, refer to the manufacturer's installation instructions packaged with each device.
- For additional ratings, refer to Appendix A.

Figure 4.7-5 NFPA Style Z Notification Appliance Circuit

Supervised and Power-Limited



Break off both tabs to enable Form-C operation

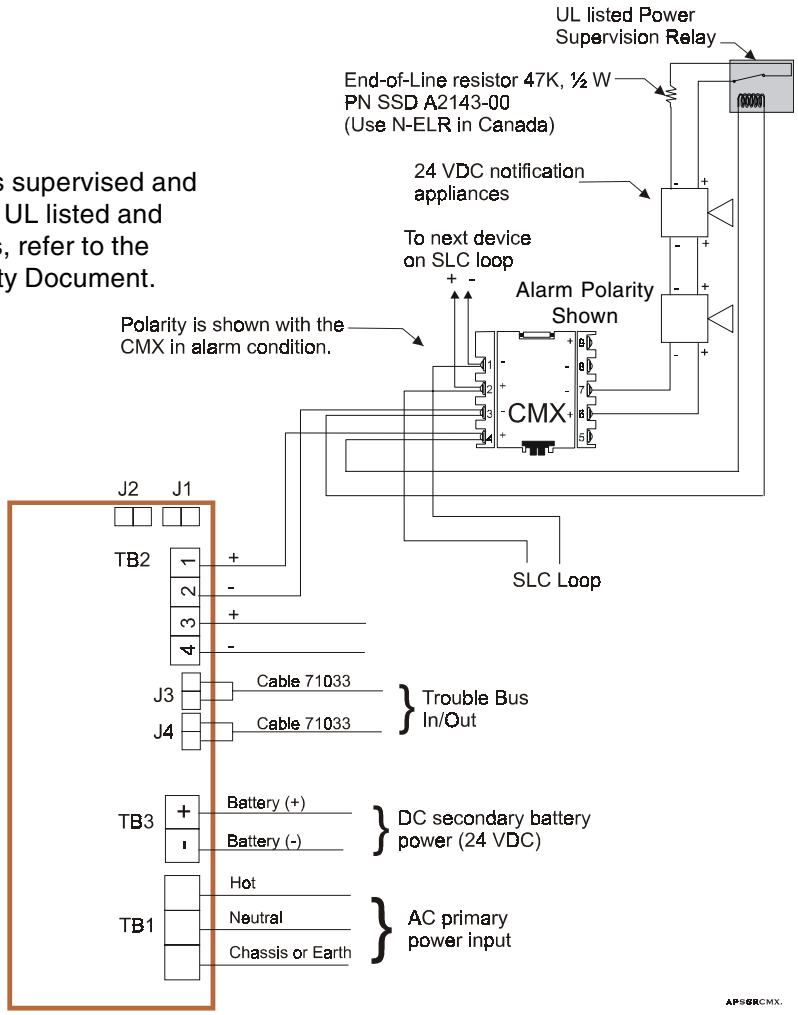
WARNING!

The tabs must be broken before the connection of any power source to the Form-C terminals (this is a permanent modification).

Figure 4.7-6 Using the CMX as a Form-C Relay

See Appendix A for device ratings.

Note: The circuit is supervised and power-limited. For UL listed and compatible devices, refer to the Device Compatibility Document.



Note: contacts shown in the energized condition.

Figure 4.7-7 Typical APS-6R Wiring to a CMX Module

Section 4.8 The Addressable Manual Pull Station

The NBG-12LX and BGX-101L are addressable manual pull stations with a key-lock reset feature (refer to **Figure 4.8-1**).

Figure 4.8-1 Addressable Manual Pull Station

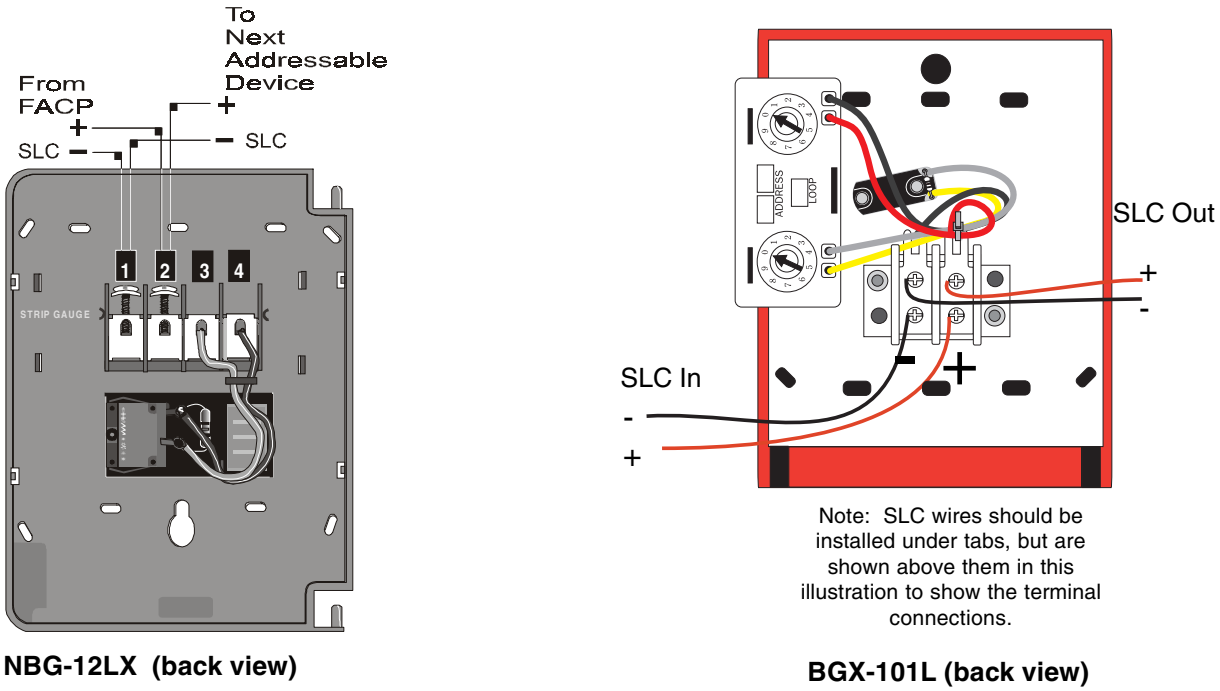
Installation

1) Connect the SLC Loop to the pull station. If additional devices are to be connected to the SLC Loop after the pull station, use the second pair of screw terminals to continue the loop.

2) The NBG-12LX and BGX-101L are factory preset with address "00". Set the address for the pull station by turning or using a screwdriver to turn the rotary address switches on the back of the unit to the appropriate settings. Each pull station must have a unique module address. Refer to **Figure 4.8-2**. Also refer to the NBG-12LX document listed in the related documentation chart at the beginning of this manual.

NOTE

During programming of the AM2020/AFP1010, this module requires software type "MPUL".



NBG-12LX (back view)

Note: SLC wires should be installed under tabs, but are shown above them in this illustration to show the terminal connections.

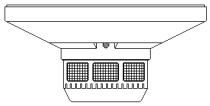
BGX-101L (back view)

Figure 4.8-2 Wiring Addressable Pull Stations

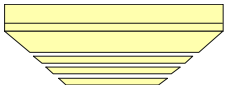
Supervised and power-limited. For SLC Loop ratings, refer to Appendix A.

Section 4.9 Intelligent Detectors

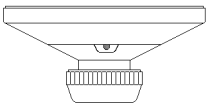
These intelligent, addressable detectors provide analog information to the control panel, which processes this analog information and continually makes decisions on the alarm, maintenance, or normal status of each device. Each detector head mounts to a B501,B710LP or BX-501 Base, B501BH sounder Base, B524BI or B224BI Isolator Base, or B524RB or B224RB Relay Base with sounder for ease of installation or replacement. Each detector responds to an SLC address that is set in the head via built-in rotary switches. An integral LED may be programmed to blink when in communication with the control panel and can be latched on when the unit enters an alarm condition. A different address is required for each detector (01-99) on an SLC. The panel distinguishes between detectors and modules so a detector and a module may be set to the same address without conflict.



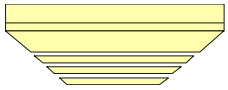
SDX-551/SDX-551TH
An *Intelligent Photoelectric Smoke Detector* that provides analog measurements of the optical smoke level in the chamber to the control panel. The SDX-551TH is an Intelligent Photoelectric Smoke Detector with fixed thermal.



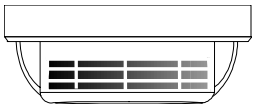
SDX-751
The SDX-751 is a low-profile intelligent photoelectric smoke detector.



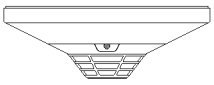
CPX-551
An *Intelligent Ionization Smoke Detector* that measures the level of combustion products in the chamber using the ionization principle and provides this measurement to the control panel.



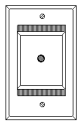
CPX-751
The CPX-751 is a low-profile intelligent ionization smoke detector.



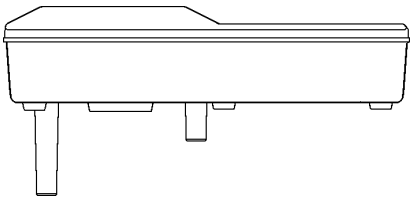
IPX-751
The IPX-751 is an intelligent addressable, multi-sensing, low-profile smoke detector. The AM2020/AFP1010 does not perform drift compensation on this detector.



FDX-551/FDX-551R
The FDX-551 (135 degree Fahrenheit fixed temperature) and the FDX-551R (Rate-of-Rise) Intelligent Thermal Sensors takes the temperature and provides it to the control panel.



RA400Z
A *Remote Single LED Annunciator* that can be wired directly to an addressable detector for annunciation of that detector's alarm status.



DHX-501 and DHX-502
Intelligent Detector Duct Housings designed to sample air currents passing through ducts and allows for detection of smoke in HVAC ducts. They will accommodate either the CPX-551 or the SDX-551. When sufficient smoke is sensed, an alarm signal is initiated at the control panel.

WARNING!
The control panel will only operate with Notifier intelligent addressable devices installed.

Section 4.10 Smoke Detector Installation

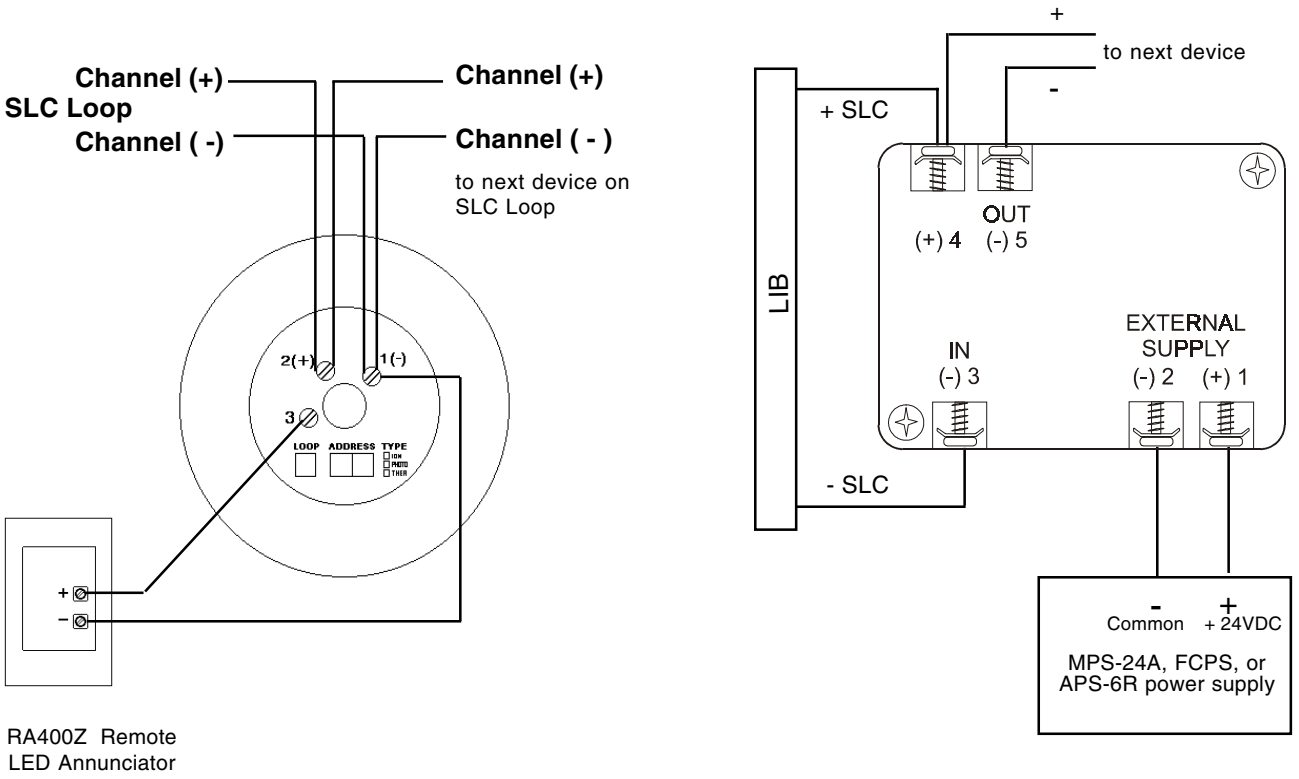
The B501, BX-501, B210LP, and B501BH provide the connection between the control panels SLC Loop and SDX-551/551H/551HT/751, CPX-551/751, the IPX-751 and the FDX-551/551R intelligent detectors.

Installation (refer to **Figure 4.10-1**)

1) Connect the SLC Loop to the base, Terminal 1 (-) and Terminal 2 (+).
2) If employing an RA400Z Remote LED Annunciator, connect the RA400Z positive terminal to base Terminal 3 and the negative terminal to base Terminal 1.
3) Before installing the appropriate intelligent detector head, set a unique detector SLC address on the head with a small flat-blade screwdriver. Mark this address on the base and on the head.
4) Fit the head over the base and applying light pressure, turn the head into the base until connection is made.
5) The sensor base includes a tamper-proof feature that, when activated, prevents the removal of the sensor without the use of a tool. Refer to the installation instructions, included with each base, for further details.

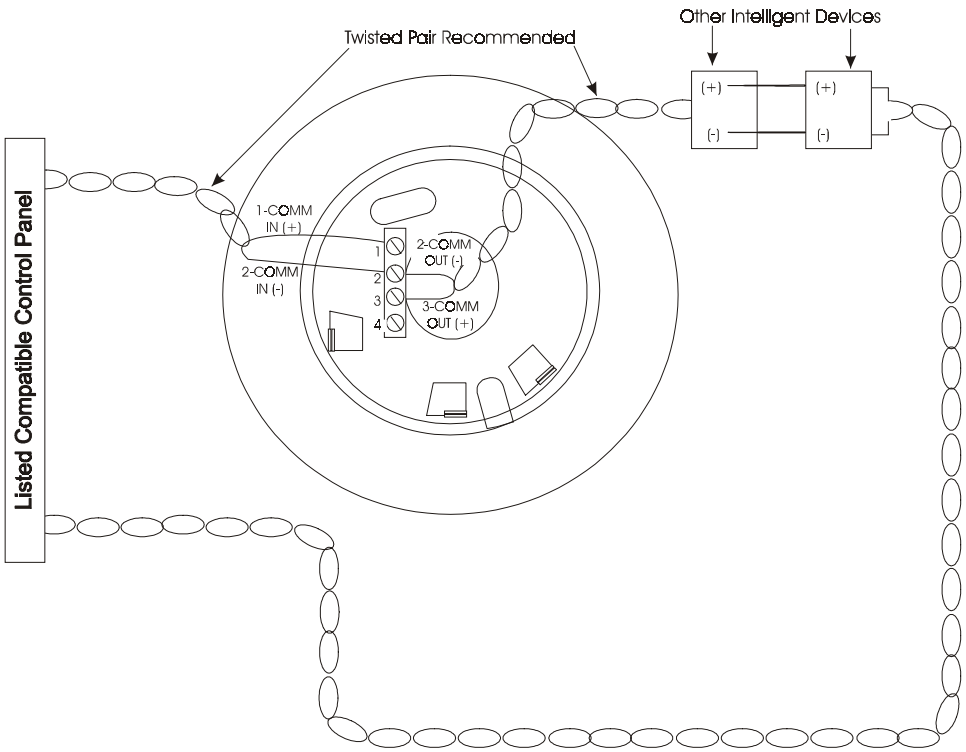
The smoke detector base is supervised and power-limited. Refer to Appendix A for SLC ratings. Wiring examples of the B524BI/B224BI Isolator Base and the B524RB Relay Base are detailed in **Figures 4.10-2** and **4.10-3**, respectively.

When no relay or sounder bases are used between a pair of B524BI(A) and/or B224BI(A) isolator bases, a maximum load of 25 addressable devices can be connected to insure that the isolators power up correctly. When relay or sounder bases are used between isolator bases, the maximum number of addressable devices in between the isolator bases is seven.



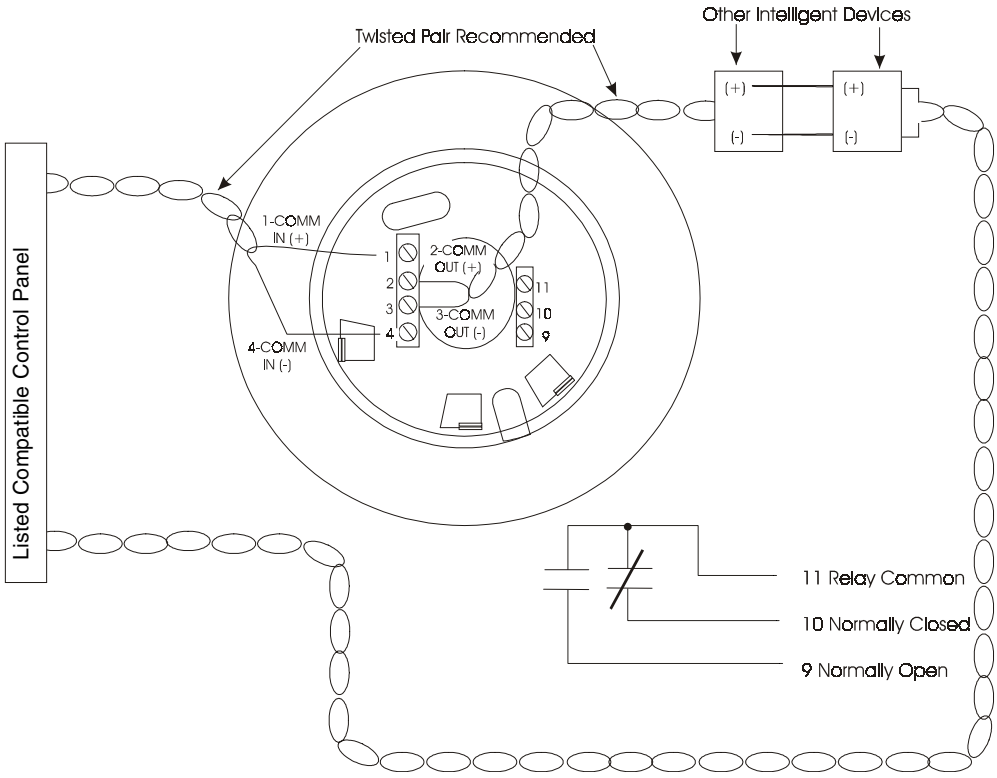
B501 or BX-501 Detector Base **B501BH Detector Base**

Figure 4.10-1 Wiring the Smoke Detector Base



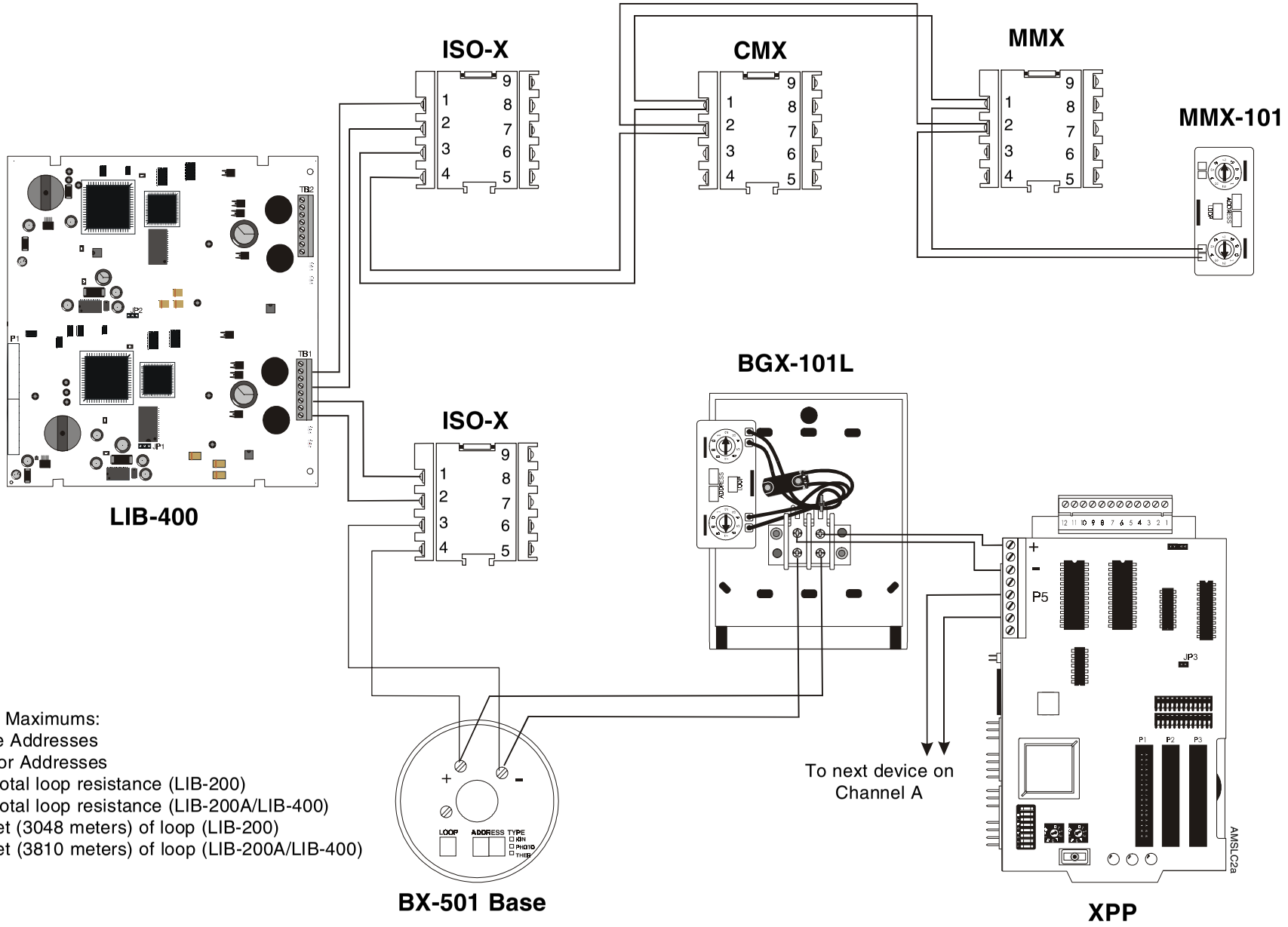
Class A (Style 6)

Figure 4.10-2 Wiring the B524BI(A)/B224BI(A) Isolator Base



Class A (Style 6)

Figure 4.10-3 Wiring the B524RB Relay Base



SLC Loop Maximums:
99 Module Addresses
99 Detector Addresses
40 ohms total loop resistance (LIB-200)
50 ohms total loop resistance (LIB-200A/LIB-400)
10,000 feet (3048 meters) of loop (LIB-200)
12,500 feet (3810 meters) of loop (LIB-200A/LIB-400)

Figure 4.10-4 Two Independent Style 4 SLC Loops

Section 4.11 The XP Series Transponder

The **XP Series Transponder** provides the AM2020/AFP1010 system with an efficient multiplex subsystem capability and stand-alone operation in case of failure. The XP Transponder communicates directly with the control panel's CPU along the LIB communications loop.

The XP Transponders are extremely effective in both high-rise and low-rise buildings where power losses over long wiring distances dictate the use of remote control equipment, amplifiers or audio/visual power supplies. Each XP Transponder may contain up to three expansion modules, each with up to eight initiating or notification circuits, or control relays. Each XP Transponder can occupy up to 27 SLC addressable points (of the module type). To the AM2020/AFP1010, XP Transponder circuits appear as individual monitor or control modules.

BE-XP Transponder Starter Complement (Power-limited)
The BE-XP includes the XPP-1 Transponder Processor Module, an XPDP dress panel (refer to **Figure 4.11-1**), a CHS-4 chassis, all required cables, and instructions. The XPP-1 module provides two field-programmable dual Form-C relays and one programmable addressable monitor point.

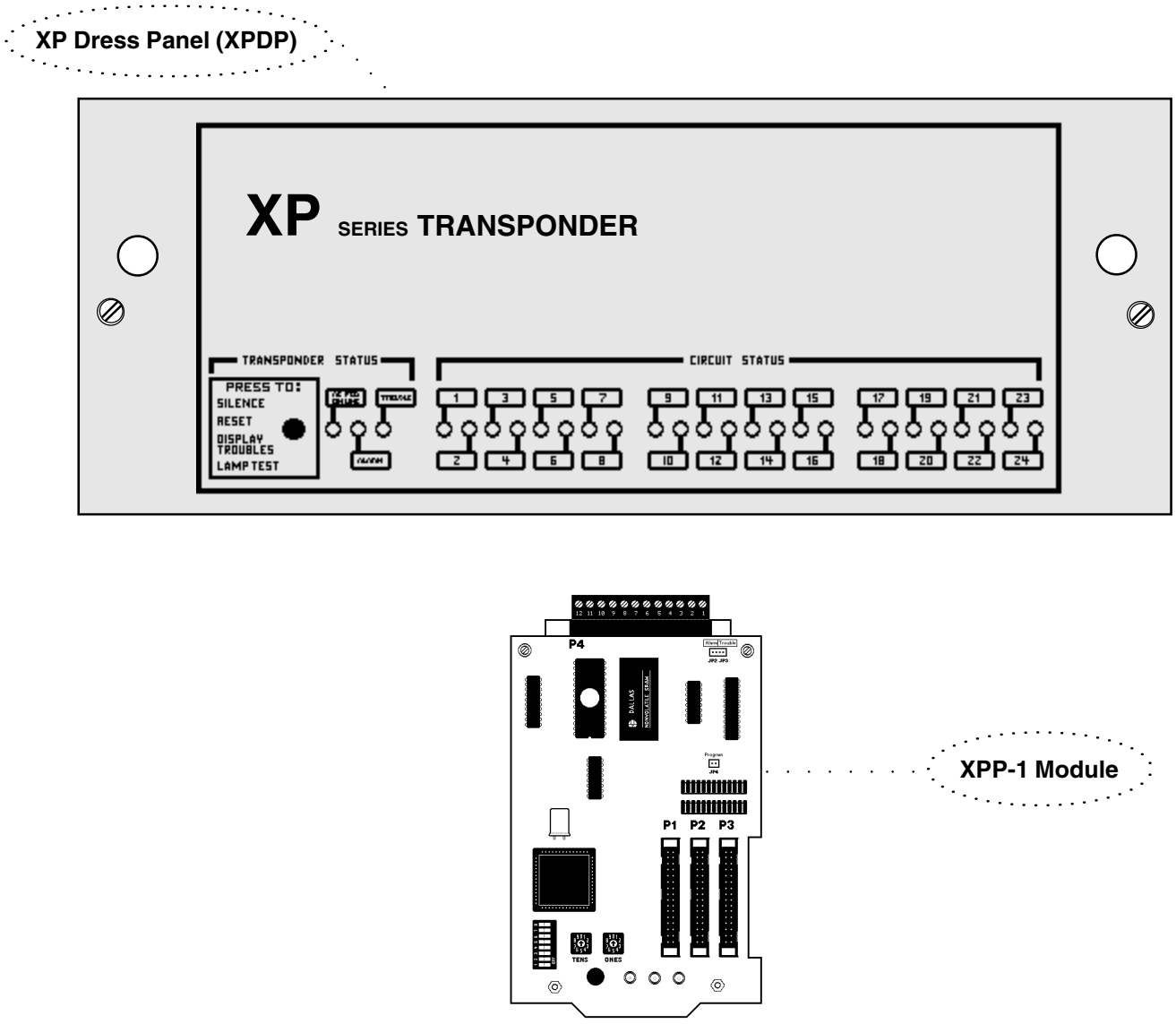


Figure 4.11-1 XP Dress Panel and XPP-1 Module

XPC-8 Control Module (Power-limited)
Provides eight Class B or four Class A notification appliance circuits. For audio evacuation applications, the XPC-8 can drive eight speaker circuits Style Y (Class B) or four Style Z (Class A), or can be alternately configured to drive fireman's telephone circuits.

XPM-8/XPM-8L Monitor Module (Power-limited)
Provides eight Style B (Class B) or four Style D (Class A) initiating device circuits. Supports conventional two wire smoke detectors and normally-open contact devices such as pull stations, waterflow and supervisory switches, and 4-wire smoke detectors; XPM-8L supports contact devices and Style B wiring only.

XPR-8 Relay Module (May be power-limited or nonpower-limited depending on relay connection)
Provides eight form-C relays. The XPR-8 may be configured to provide four dual form-C relays for use in dual channel audio selection applications.

For more information, refer to XP Series Transponder System Manual.

Section Five
Serial Communications

5.1 Optional Serial Interface Boards

The AM2020/AFP1010 uses serial communication to move data between printers, CRT terminals and annunciators. The various components used are described here.

Two optional serial interface boards are available for the AM2020/AFP1010. Only one may be used in the system, and the particular board chosen depends on the specific needs of the installation. Refer to **Figure 5.1-3.**

SIB-2048A
The SIB-2048A has two printer and two terminal serial interfaces. The first printer interface supports a PRN Fire Protective Signaling System Printer. The second printer interface is intended for connection to UL 1950 Safety of Information Technology Equipment printers. The first CRT interface is for use with the CRT or Fire Protective Signaling System listed terminal. The second CRT interface is intended for connection to UL 1950 terminals.
The SIB-2048A ACS interface is electrically isolated. Devices connected to the annunciator control interface may be used to activate modules (points) or display up to 2048 points/zones.

SIB-NET
The SIB-NET contains all of the features of the SIB-2048A. When used with a Media Interface Board (MIB), the SIB-NET can also communicate with **NOTI•FIRE•NET™**. This allows the AM2020/AFP1010 to transmit alarm and trouble events through the network to other network nodes for display and recording. The network allows the NRT/INA to perform reset, acknowledge, and signal silence functions at the AM2020/AFP1010. The SIB-NET replaces SIB-232, SIB-2048, and SIB-2048A in existing systems which later require connection to **NOTI•FIRE•NET™**. The SIB-NET supports all features of the SIB-2048A including ACS annunciators, printers, and CRTs.

WARNING!

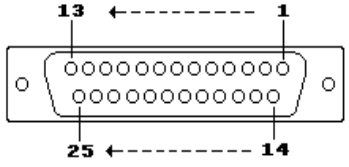
The entire network must contain the same version of **NOTI•FIRE•NET™** software. Improper system operation will result if the versions are not the same.

All software part numbers are not compatible with each other. Improper mixing of software part numbers can compromise life safety functions. If unsure about the compatibility of a particular software combination, consult the factory.

PRN Printers
UL Fire Protective Signaling System listed printer employing EIA-232 serial interface.

CRT Terminals
UL Fire Protective Signaling System listed terminal employing EIA-232 serial interface and Notifier protocol.

Cabling and Connections
Male DB-25 connectors (**Figure 5.1-1**) are supplied with remote printers and display terminals. Use these connectors to wire the interface between the peripherals and the Serial Interface Board (SIB) as illustrated in **Figures 5.2-1, 5.3-1,** and **5.3-2**.



Male DB-25 Connector
(solder-cup view)

Figure 5.1-1 Male DB-25 Connector

Shield Terminations

Wiring to the display monitors, remote annunciators, other peripherals, and printers must be twisted shielded pairs. Refer to **Figure 5.1-2** for pair connections illustrations.

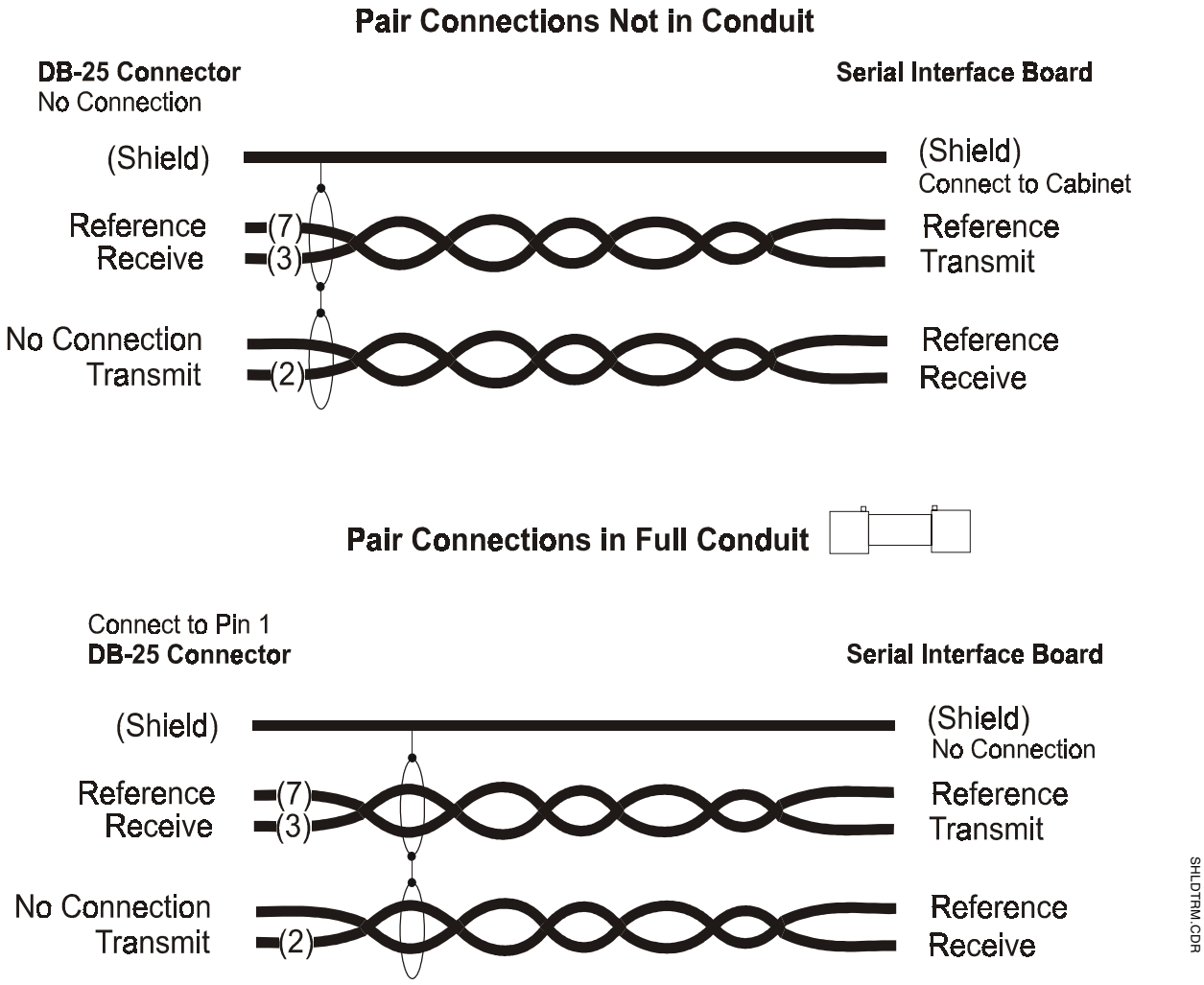
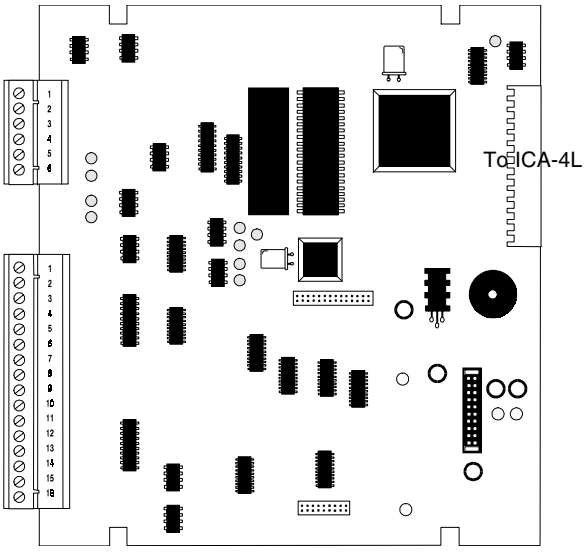
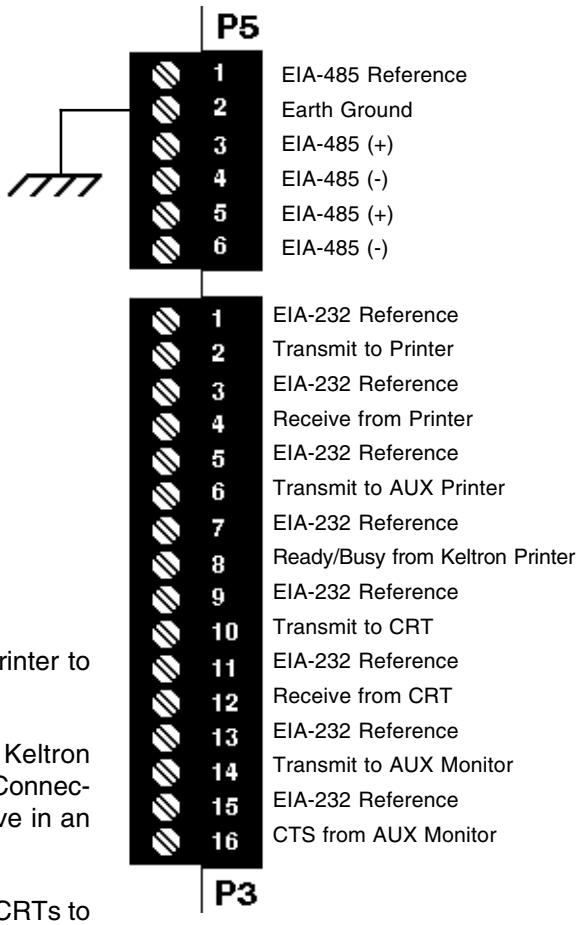


Figure 5.1-2 Guidelines for Terminating the Shield





P3 Connections

Terminals 1-4: Provide wiring for one PRN printer to this unsupervised circuit.

Terminals 5-8: Provide connection to the Keltron VS4095/5 printer or any UL EDP-listed printer. Connection is not supervised. EDP listed printers serve in an ancillary capacity only.

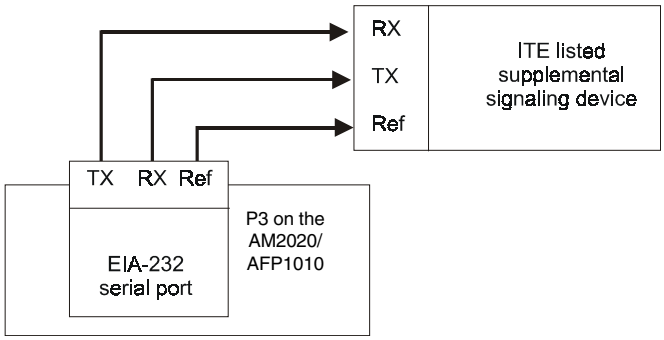
Terminals 9-12: Provide connection for 1–25 CRTs to this supervised circuit.

Terminals 13-16: Provide connection to UL EDP-listed display monitors. Devices are not supervised and serve in an ancillary capacity only.

Figure 5.1-4 SIB-NET/SIB-2048A Terminal Designations

Installing an Ancillary Device on the EIA-232 Communications Circuit

An ITE listed supplemental signaling device such as a printer or the PageNet-1 can be connected to the EIA-232 serial printer port connection on the fire alarm system to provide a supplemental signaling capability. Additionally, sme devices such as PageNet-1 can be actuated by means of dry contacts from the fire alarm system. For more detailed instructions pertaiing to the installation of an ancillary device, refer to the specific device manual.



Section 5.2 The CRT-2 Terminal

The CRT-2 Terminal with keyboard features an 80-column, 25-line display. Function keys allow all control panel commands to be executed from the keyboard. Since the system control function keys (Acknowledge, Signal Silence, and Reset) are not protected against unauthorized use by key switch or password, in order to comply with the UL listing and applicable NFPA standards, the keyboard should be disconnected from the CRT-2 and locked in a secure location when not being used for programming/troubleshooting of the system, or the modem function should be enabled in System Programming to prevent the operation of the system control function keys.. (Refer to the TPI-232 Manual, Document 50372, for additional CRT-2 options.) The keyboard may remain connected when the system is configured and operated in compliance with the NFPA standard on Proprietary Supervising Station Fire Alarm Systems and the CRT-2 is located in the Supervising Station. No keyboard may be connected to any remote CRT-2 unless the modem function is enabled in System Programming.

Primary and Secondary Power
The CRT-2 requires 120-240 VAC, 50/60Hz primary power. A secondary power source (battery backup) is not provided; the use of a separate Uninterruptable Power Supply (UPS), UL listed for Fire Protective Signaling is recommended. A UPS is required for NFPA 72 Proprietary Protected Premises Receiving Unit applications.

Electrical Specifications

	CRT-2
Voltage:	90 - 264 VAC
Frequency:	47 - 63 Hz
Current:	0.5 - 0.2 A

Installation
Connection between the AM2020/AFP1010 and the CRT-2 is provided through an EIA-232 interface on the Serial Interface Board (refer to **Figure 5.2-1**). A custom cable must be assembled for connection to the CRT-2 EIA port. Additional CRT-2s are connected with installer provided cables (AUX on first CRT-2 to EIA port on second CRT-2, etc.). Refer to **Figure 5.3-1** for wiring instructions.

Multiple Terminals
The AM2020/AFP1010 will support up to 25 terminals installed on the EIA-232 circuit of the Serial Interface Board. Each CRT-2 is shipped from the factory with a keyboard. This keyboard is used to program the control panel and can only be used on one CRT-2 installed in the chain. The keyboard must either be removed or locked after programming (except NFPA 72 Proprietary Protected Premises and Central Station Receiving Units, where the keyboard must remain installed and functional) unless the modem function is enabled in System Programming.

NOTE
The CRT-2 is factory programmed.

PAR SER2-AUX SER1-EIA

The PAR (Parallel), AUX, and EIA ports are located on the back of the CRT Monitor.

CRT Function Keys
The function keys on the CRT are labeled with special AM2020/AFP1010 commands. These keys function identical to the keys on the DIA. For a description of these commands, refer to the Operating Chapter.

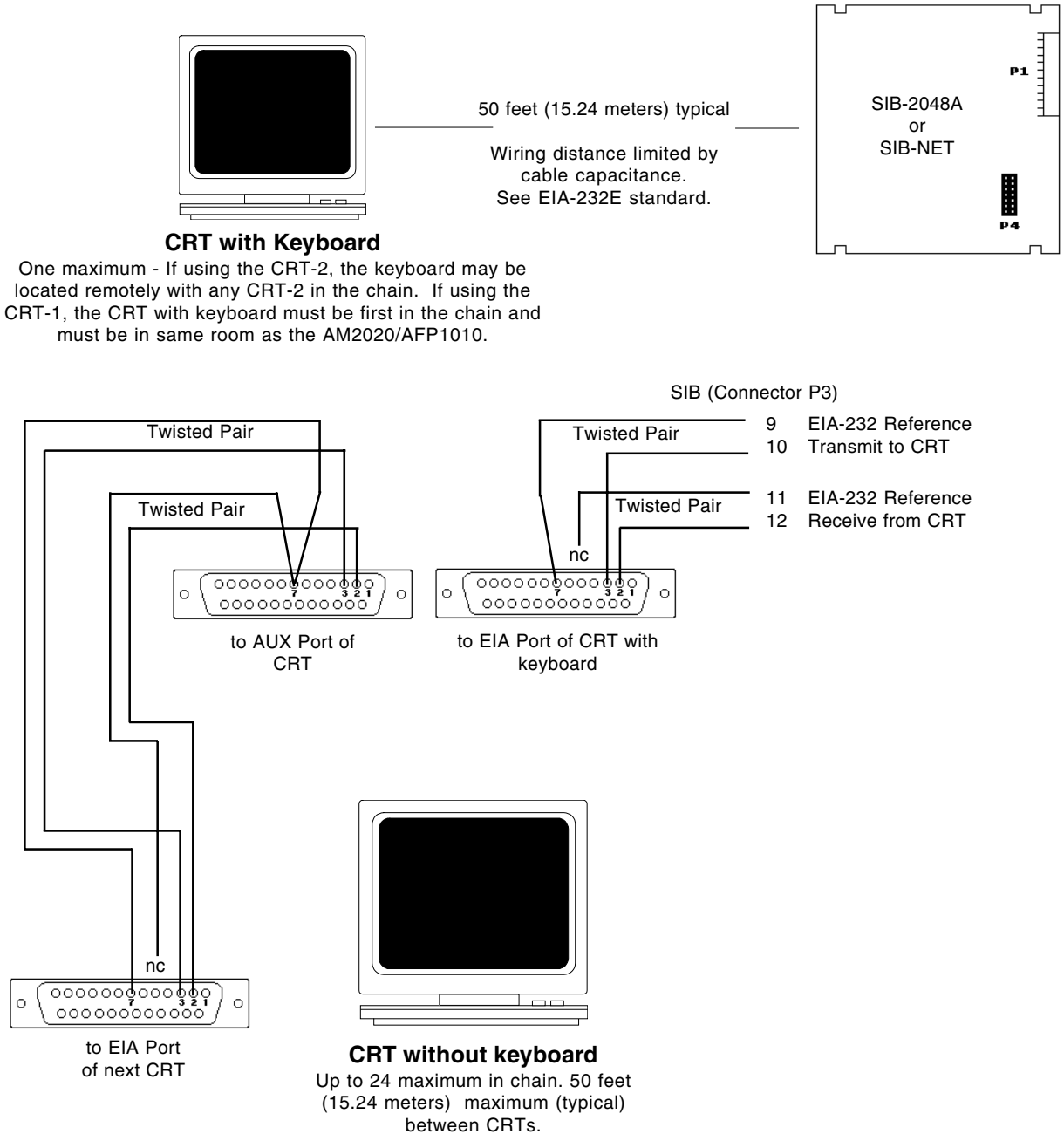


Figure 5.2-1 CRT to SIB Connections

NOTES

- Outputs are power limited (for device/circuit ratings, refer to Appendix A).
- Connections must be made with overall foil/braided-shield twisted pair cable.
- Apply power to the CRTs prior to start-up of the system, beginning with the last CRT in the chain.
- A total of 25 CRTs may be installed. Only one keyboard (shipped with each CRT) may be used in the entire system and it may be installed with any CRT in a chain. For all applications EXCEPT NFPA 72 Proprietary Protected Premises Receiving Units, the keyboard is used only to program the control panel and must be removed or kept in a locked enclosure after programming the system unless the modem function is enabled in System Programming.

Section 5.3 Remote Printers

The AM2020/AFP1010 can employ PRN Remote Printers. This printer provides a hard-copy printout of all status changes within the system and time-stamps the printout with the current time-of-day and date. The PRN provides 80 columns of data on standard 9 inch by 11 inch tractor-feed paper.

Installation

Remote printers require 120 VAC, 50/60Hz primary power. A secondary power source (battery backup) is not provided; the use of a separate Uninterruptable Power Supply (UPS) 50 watt minimum, UL listed for Fire Protective Signaling is recommended. A UPS is required for NFPA 72 Proprietary Protected Premises Receiving Unit applications.

Connection between the control panel and PRN is provided through an EIA-232 interface on the Serial Interface Board. An installer provided cable must be assembled for connection to the printer's EIA-232 port. Refer to **Figure 5.3-2** for wiring instructions.

Using a special print feature, the PRN allows all information programmed into the panel to be printed out (including system configuration and addressable device parameters).

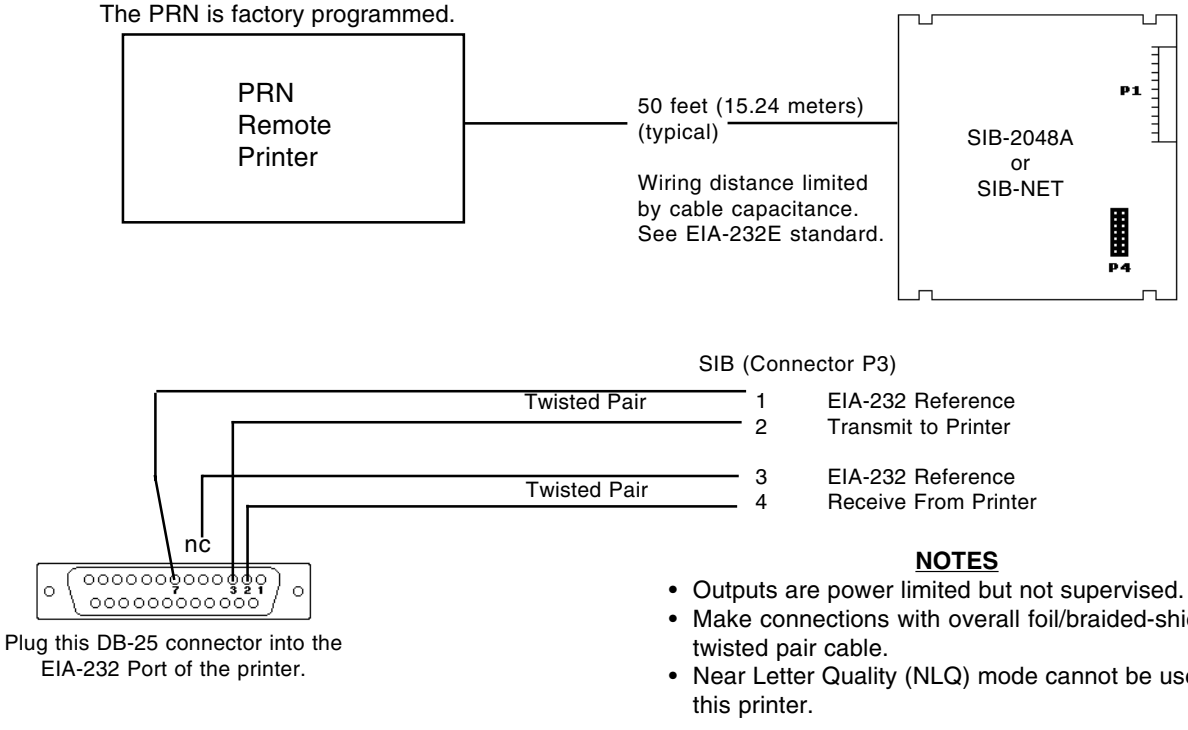
Printer Configuration

Refer to the documentation supplied with the PRN for instructions on the printer's menu controls. Set the printer's options as follows:

L/R ADJUST:	0
FONT:	HS DRAFT
LPI:	6 CPI
ESC CHARACTER:	ESC
BIDIRECTIONAL COPY:	ON
CG-TAB:	GRAPHIC
COUNTRY:	E-USA ASCII
AUTO CR:	OFF
LANGUAGE:	ENGLISH
AUTO TEAR:	1S
COLOR OPTION:	NOT INSTALLED
FORMLEN:	
LINES:	6 LPI=60
STANDARD:	EXECUTIVE 10.5"
CPI:	10 CPI
SKIP:	0.5"
EMULATE:	EPSON
I/O:	
BUFFER:	36K FOR PRN-4 40K FOR PRN-5
SERIAL:	
BAUD:	2400
FORMAT:	7 BIT, EVEN, 1 STOP
PROTOCOL:	XON/XOFF
CHARACTER SET:	STANDARD
S1. ZERO:	ON
AUTO LF:	OFF
MENLOCK:	ALL
PAPER:	
BIN 1:	12/72"
BIN 2:	12/72"
SINGLE:	12/72"
PUSH TRA:	12/72"
PULL TRA:	12/72"
PAP ROLL:	12/72"
PAPOPT:	NO

NOTE

The PRN is factory programmed.



NOTES

- Outputs are power limited but not supervised.
- Make connections with overall foil/braided-shield twisted pair cable.
- Near Letter Quality (NLQ) mode cannot be used on this printer.

Figure 5.3-1 Remote Printer to SIB Connections

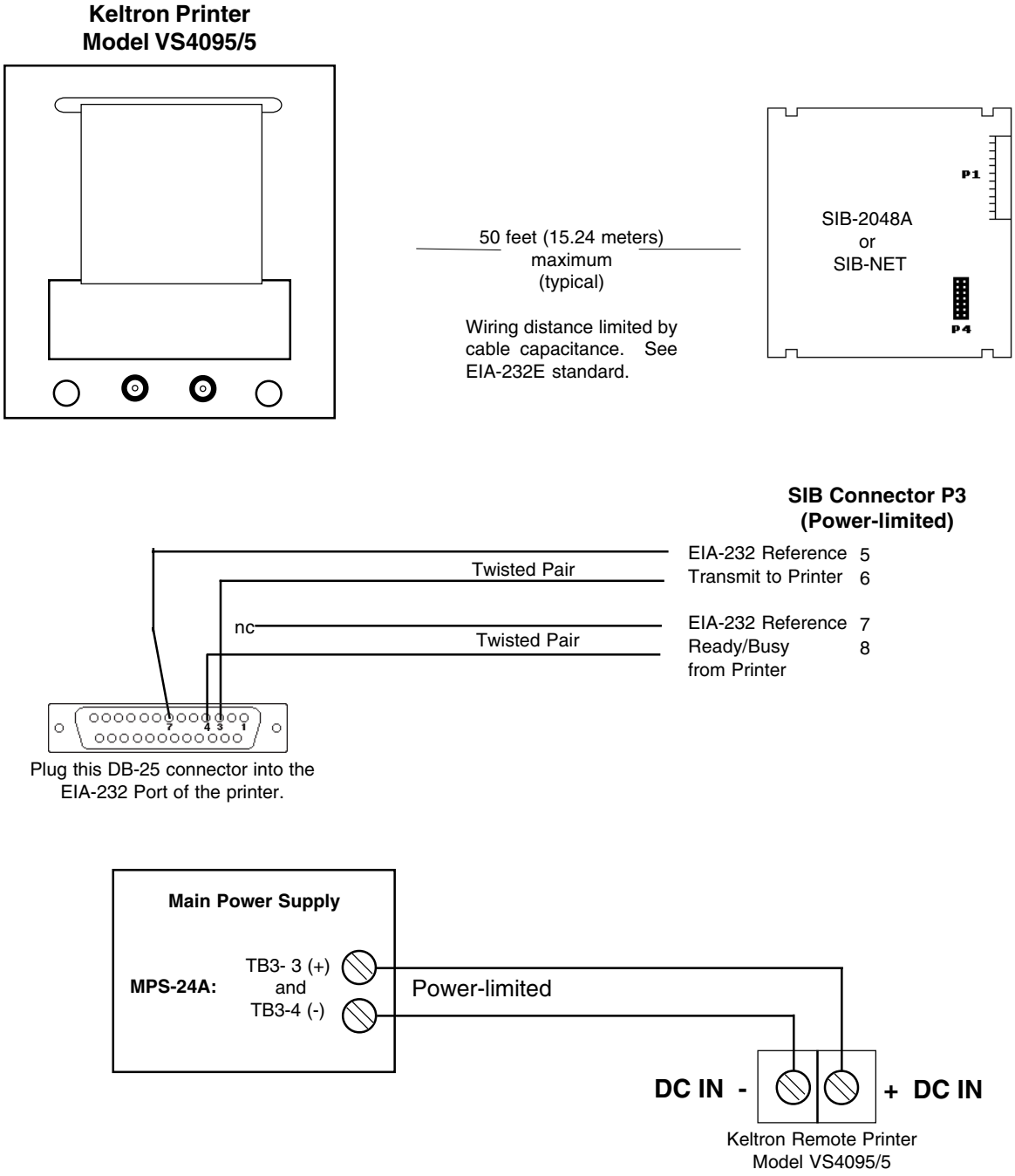


Figure 5.3-2 Keltron Printer Connections

NOTES

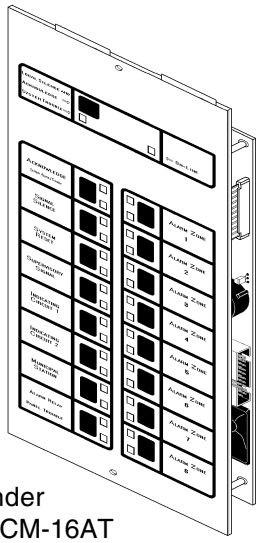
- Outputs are power limited and are not supervised.
- Connections must be made with overall foil/braided-shield twisted paired cable suitable for EIA-232 applications.
- The SIB can employ two printers.
- Set the DIP switches as follows:

SP1-1	OFF	SP2-1	OFF
SP1-2	ON	SP2-2	OFF
SP1-3	OFF	SP2-3	OFF
SP1-4	ON	SP2-4	OFF
SP1-5	OFF	SP2-5	OFF
SP1-6	ON	SP2-6	OFF
SP1-7	ON	SP2-7	ON
SP1-8	OFF	SP2-8	OFF

Section 5.4 Annunciator Modules

ACM-16AT*

The Annunciator Control Module-16AT contains 16 red alarm and 16 yellow trouble LEDs, 16 momentary keypad switches for controlling each point, a system trouble LED, an ON LINE/POWER LED, and a local piezo sounder with a silence/acknowledge switch for audible indication of alarm and trouble conditions at each annunciator.

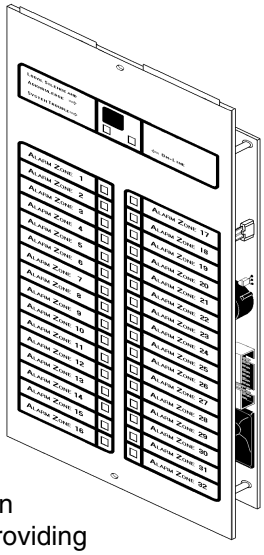


AEM-16AT*

The Annunciator Expander Module 16AT expands the ACM-16AT by 16 annunciator points. Up to three of these expander modules can be supported by an ACM-16AT, to a maximum of 64 annunciator points.

The ACM-32A*

The Annunciator Control Module-32A contains 32 red alarm LEDs, a system trouble LED, an ON LINE/ POWER LED, and a local piezo sounder with a silence/ acknowledge switch for audible indication of alarm and trouble conditions at each annunciator.



AEM-32A*

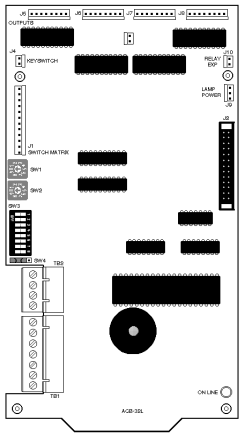
The Annunciator Expander Module-32A expands the ACM-32A by 32 annunciator points. One expander module can be supported by an ACM-32A, providing a maximum of 64 points.

*Additional modules can be supplied by designations for different color LEDs: however, all functions are identical. For consistency, all modules should be designated the same.

For more details on the Annunciator Control System (ACS), refer to the ACS Manual.

The LDM-32

The LDM-32 Lamp Driver Annunciator Module provides 32 alarm or 16 alarm and 16 trouble lamp driver outputs, corresponding to 32 annunciator points which can be connected to external devices such as a custom graphic annunciator. When configured to provide 16 alarm and 16 trouble outputs, 16 switch inputs are available for control of system functions such as signal silence, system reset, and control module activation.



The LDM-E32

The Lamp Driver Annunciator Expander Module LDM-E32 expands the LDM-32 by 32 annunciator points (maximum of 64 points).

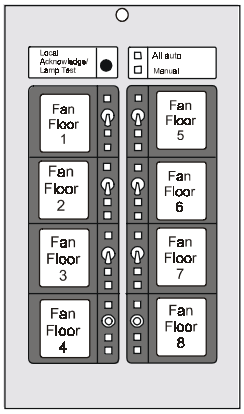
The LDM-R32

The LDM-R32 Relay Expander Module LDM-R32 provides the LDM-32 or LDM-E32 with 32 dry Form-A (normally open) contacts. The relay module replaces the lamp driver outputs with relay outputs; one LDM-R32 for each LDM-32 or LDM-E32.

For more details on the LDM-32 Series Lamp Drivers, refer to the LDM Manual.

SCS-8**

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



SCE-8

The Smoke Control Expander (SCE-8) is used to expand the SCS-8 by an additional eight groups of four annunciator points. Only one expander can be used per SCS-8.

SCS-8L**

The Smoke Control Lamp Driver Station (SCS-8L) module uses eight groups of four annunciator points for fan shutdown control or other heating, ventilation or air conditioning functions. Must be mounted in custom graphic annunciator panel.

SCE-8L

The Smoke Control Expander (SCE-8L) is used to expand the SCS-8L by an additional eight groups of four annunciator points. Only one expander can be used per SCS-8L. Must be mounted in custom graphic annunciator panel.

For more details on the SCS Smoke Control System, refer to the SCS Manual.

** The SCS-8 and SCS-8L firmware has been updated in conjunction with Software Release M2.8. The new SCS firmware is not backward compatible with older revisions of software.

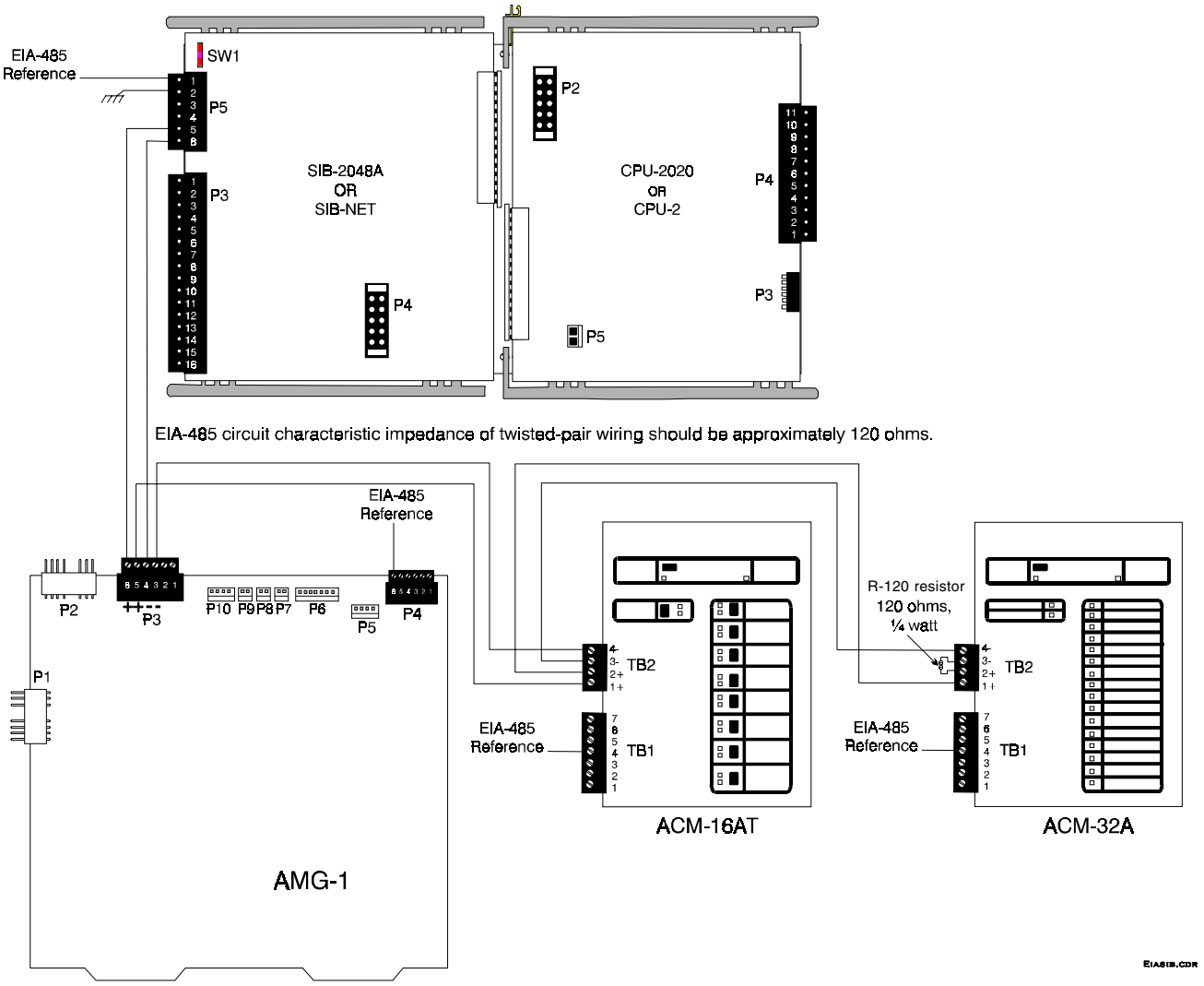


Figure 5.4-1 EIA-485 to SIB Connections

Refer to Appendix A for EIA-485 circuit ratings and limitations.

NOTE

If the SIB is not the first device on the EIA-485 circuit, set SW1 on the SIB to the "out" position.

The EIA-485 Reference (P5-1) for the SIB must be connected to any ACS device which is not within the same cabinet. Connect P5-1 of the SIB to:

- AMG-1 at P4-6
- ACM-16AT at TB1-4
- LDM-32 at TB1-4
- NIB-96 or AMG-1/E using an MPS-24A remote from the SIB, connect to TB2 terminal 2 on the MPS-24A
- SCS-8/L at TB1-4
- LCD-80 at P1-4
- RPT-485W Reference A at TB1-5
- RPT-485W Reference B at TB2-5
- RPT-485WF Reference A at TB1-5

Section Six
Standard-Specific Requirements

The Notifier AM2020/AFP1010 is an expandable multiplex Fire Alarm Control Panel (FACP) designed for use in commercial, industrial, and institutional applications. These panels meet the requirements for service under the National Fire Protection Association (NFPA) and Underwriters Laboratories (UL) Standards outlined in this chapter. The minimum system components required for compliance with the appropriate standard are listed in each section.

Each system requires (at a minimum) the following equipment:

- Cabinet (CAB-3 Series)
- BE Basic Equipment Package (BE-2020N for the AM2020; BE-1010N for the AFP1010) containing the Central Processor Unit (CPU-2020 for the AM2020; CPU-2 for the AFP1010), Display Interface Assembly (the DIA-2020 for the AM2020; DIA-1010 for the AFP1010), Interconnect Assemblies (ICA-4L), BP-3 Battery Panel and cables.
- MPS-24A or MPS-24AE Main Power Supply and batteries (refer to primary power requirements).
- One of the following Loop Interface Boards: LIB-200, LIB-200A, or LIB-400.
- Initiating Devices - MMX Monitor Modules, XP5-M Transponder Modules, manual pull stations, heat detectors, and Intelligent Detectors such as the SDX-551/751, FDX-551, CPX-551/751, and IPX-751.

In addition, each NFPA standard requires the following specific equipment:

UL 916
AM2020/AFP1010 installations requiring UL 916 Signal System Unit Category UDTZ or UL 864 Process Management Category QVAX listings must be installed according to the following requirements:

Connect noncritical process management signals to the AM2020/AFP1010 using shorting or opening contact devices on monitor module points (MMX-1, MMX-101, XPM-8, or XPM-8L). Use software type "MTRB".

NFPA 72 Protected Premises (Local) Fire Alarm Systems
CMX Control Module installed on SLC Loop 1 and set to module address “96.” This unit must be installed as outlined in **Figures 4.7-2** through **4.7-6** (notification appliances).

NFPA 72 Auxiliary Fire Alarm System
MBT-1 Municipal Box Trip. CMX Control Module installed on Loop 1 and set to module address "97." Power Supervision Relay. These items must be installed as outlined in **Figure 6.1-1**.

NFPA 72 Remote Supervising Station Fire Alarm System and
NFPA 72 Central Station Fire Alarm Systems (Protected Premises Unit)
Initiating Devices - MMX Monitor Modules, XP5-M Transponder Modules, manual pull stations, heat detectors, and Intelligent Detectors such as the SDX-551/751, FDX-551, CPX-551/751, and the IPX-751. For applications not requiring security functions, refer to The UDACT Manual. For security applications, refer to Chapter 4 of this document.

NOTE

The use of a DACT (NFPA 72 Supervising Station Fire Alarm Systems) is not permitted when one or more of the following are present in the system: XP Transponder with separate power supply, AA-120/E, AA-100/E, AA-30/E or a second (remote) MPS-24A or MPS-24AE power supply.

NFPA 72 Proprietary Supervising Station Fire Alarm System
PROTECTED PREMISES SYSTEM NUMBER ONE (refer to **Figure 6.4-1**):
Transmitter - Network Interface Board (NIB-96).

PROTECTED PREMISES SYSTEM NUMBER TWO (refer to **Figure 6.4-2**):
The Receiving Unit is an AM2020/AFP1010 with an MMX-1 or MMX-101 Monitor Module for receipt of fire alarms and one MMX-1 or MMX-101 Monitor Module for receipt of trouble signals from the Protected Premises Unit.

PROTECTED PREMISES SYSTEM NUMBER THREE - UDACT (refer to Note 1.)
Transmitter - UDACT. Not suitable for security applications.
(refer to The UDACT Universal Digital Alarm Communicator/Transmitter manual).

NFPA 72 Central Station Receiving and Proprietary Protected Premises Receiving Units (refer to Notes 1. and 2.)
CRT Video Display Terminal with Keyboard, PRN Printer, and an Uninterruptable Power Supply listed for Fire Protective Signaling Use. For use with Systems Number One and Two. For System Number Three applications, refer to The UDACT Manual.

This unit must be installed in accordance with the following requirements:

- Monitor modules located within the protected premises which are responsible for supervising the state of the protected premises control unit may be programmed for Tracking (non-latching) operation. Notification appliances and control relays will "follow" the tracking devices programmed to activate them. Once a tracking device input circuit is restored to normal, the fire alarm condition clears from that device, all output devices assigned to the tracking device will return to their non-fire alarm state. This action will occur without activation of the system reset button.

- The display terminal CRT and printer must be located in the same room as the AM2020/AFP1010.

- The display terminal CRT and printer must be powered by an Uninterruptable Power Supply UL listed for Fire Protective Signaling. This power source must be supervised by the control panel.

- The keyboard connected to the display terminal must not be removed or made inaccessible at any time.

- Loop Interface Board Requirements:

  LIB-200 10,000 feet (3048 meters) at 12 AWG (3.25 mm^2) maximum distance between the Central Station/Receiving Unit and the NIB-96 or MMXs.

  LIB-200A 12,500 feet (3810 meters) at 12 AWG (3.25 mm^2) maximum distance between the Central Station/Receiving Unit and the NIB-96 or MMXs.

  LIB-400 12,500 feet (3810 meters) at 12 AWG (3.25 mm^2) maximum distance between the Central Station/Receiving Unit and the NIB-96 or MMXs.

NOTES

1. The use of a DACT (NFPA-72 Supervising Station Fire Alarm Systems) is not permitted when one or more of the following are present in the system: SIB-NET, XP Transponder with separate power supply, AA-120/E, AA-100/E, AA-30/E or a second (remote) MPS-24A or MPS-24AE power supply.

2. All LIBs are power-limited. If the wiring connected to the LIB-200 leaves the building it must be in conduit. It can not exceed 1000 meters (1093 yards), must not cross any power lines, and must not be in the vicinity of any high voltage. These outdoor wiring restrictions do not apply to the LIB-200A or the LIB-400.
   Refer to Section 4.2 of this chapter and the Device Compatibility Document listed in the Related Documentation Chart of this manual for information on surge suppressors approved for use with this FACP.

Section 6.1 NFPA 72 Auxiliary Fire Alarm Systems

For connection of initiating devices and modules in this system, refer to **Figures 4.6-2** through **4.6-6**. This application is not suitable for separate transmission of sprinkler supervisory or trouble conditions. For additional ratings, refer to Appendix A.

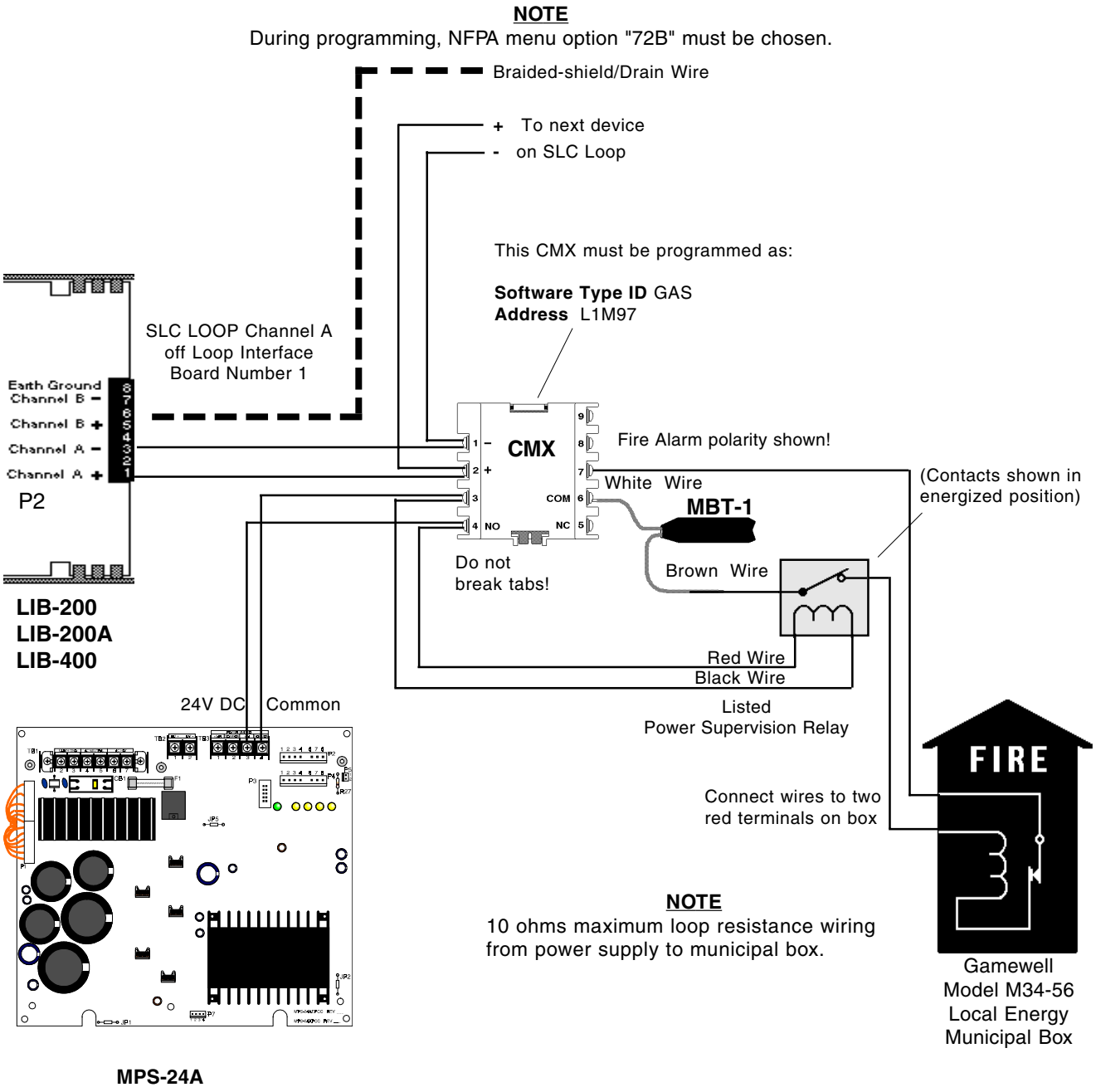


Figure 6.1-1 Auxiliary Fire Alarm System
(Fire Alarm Signal Transmission)

NOTE

Wiring between the MBT-1 and the Municipal Box cannot exceed 1000 meters (1093 yards), it must not cross any power lines and must not be in the vicinity of any high voltage.

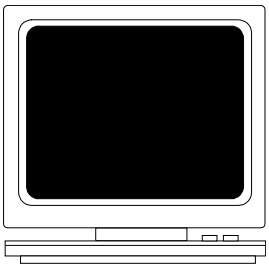
Section 6.2 Generating Event-Pending Signals at a Remote Location

Printer

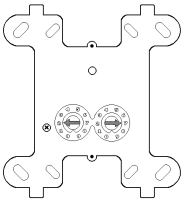
PRN

Uninterruptable Power Supply

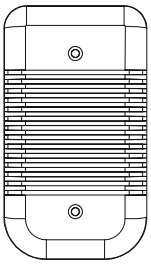
UL Listed for Fire Protective Signaling
Must be supervised by control panel



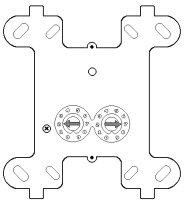
CRT with keyboard. Do NOT remove or lock up keyboard.



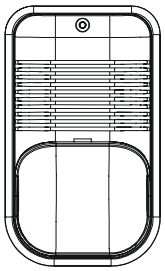
Control Module (CMX) programmed for Software Type ID "TPND". This module will be activated for all pending trouble conditions. The module is silenced upon acknowledgment of all troubles.



Spectralert Horn used to signal a pending trouble condition. Select a sound (via jumper clips) that is separate and distinct from any alarm signal in the installation. The sounder must be installed in the same room as the CRT with keyboard.



Control Module (CMX) programmed for Software Type ID "APND". This module will be activated for all pending alarm conditions. The module is silenced upon acknowledgment of all alarms.



Spectralert Horn/Strobe used to signal a pending alarm condition. Select a sound (via jumper clips) that is separate and distinct from the trouble signal selected above. The sounder must be installed in the same room as the CRT with keyboard.

NOTES

- When terminal supervision has been selected, the terminal itself will beep repeatedly while any state change is awaiting acknowledgment.
- For field wiring, refer to **Figure 4.7-3** Power Distribution for CMX Control Modules.
- Any number of the event-pending module types may be used in the system.
- If individual signals for alarm and trouble are not desired, one control module (CMX) with one listed notification appliance can be used to indicate both alarm and/or trouble pending. Program this module for Software Type ID "GPND".

Section 6.3 Supervising an Uninterruptable Power Supply

All connections are supervised and power limited. The MMX-1 Software Type ID "MTRB" may be used to monitor either normally closed or normally open supervisory contacts, as illustrated in **Figure 6.3-1(A)**. An open or a short condition on the circuit will produce the message "POINT TROUBLE" on the display.

Figure 6.3-1(B) depicts the MMX-1 Software Type ID "MTRB" used to monitor Supervising the Normally Closed Contacts of an Uninterruptable Power Supply with a CRT-2 Terminal.

NOTE
The CRT-2 must be Revision H or Higher.

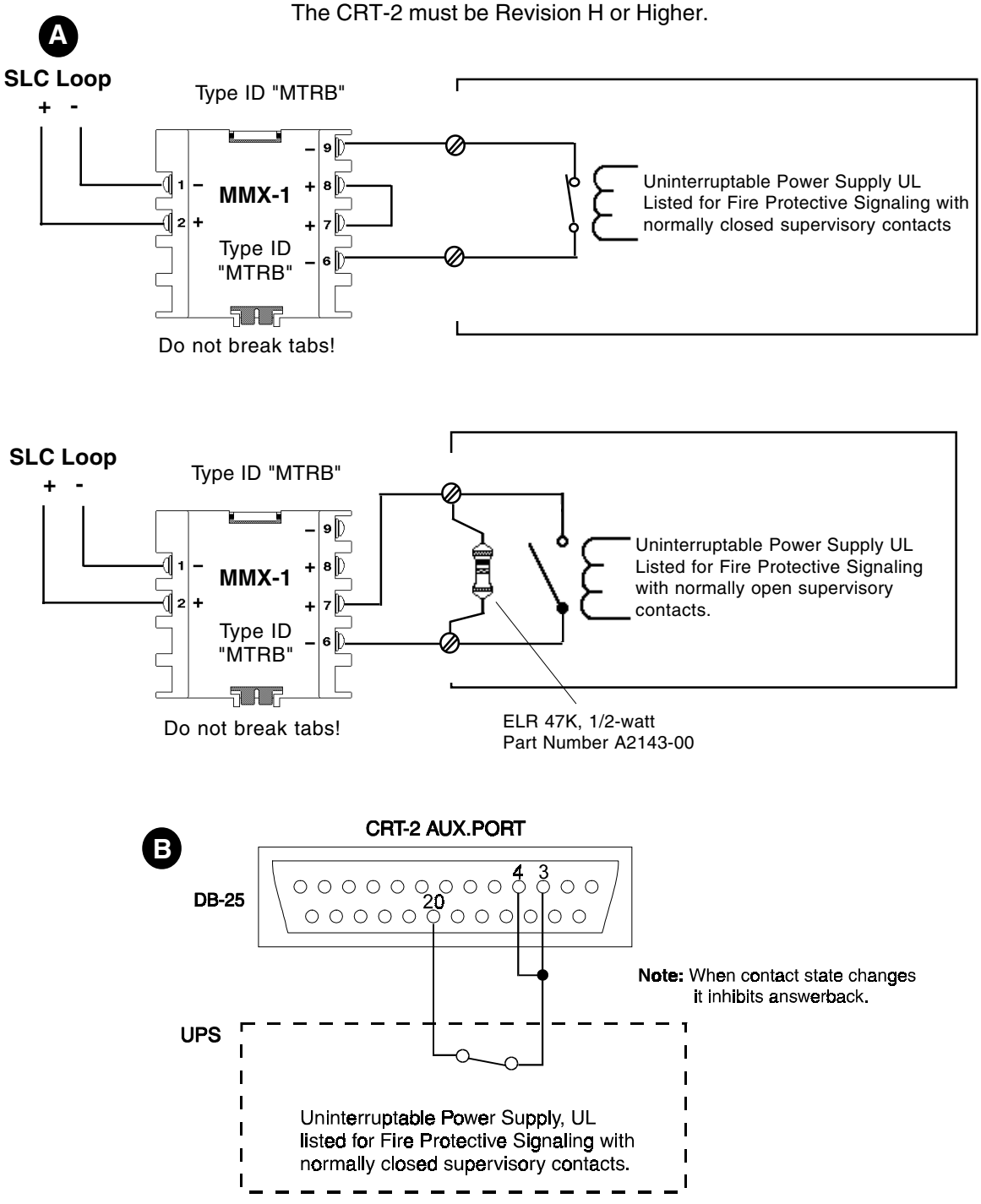


Figure 6.3-1 Uninterruptable Power Supply

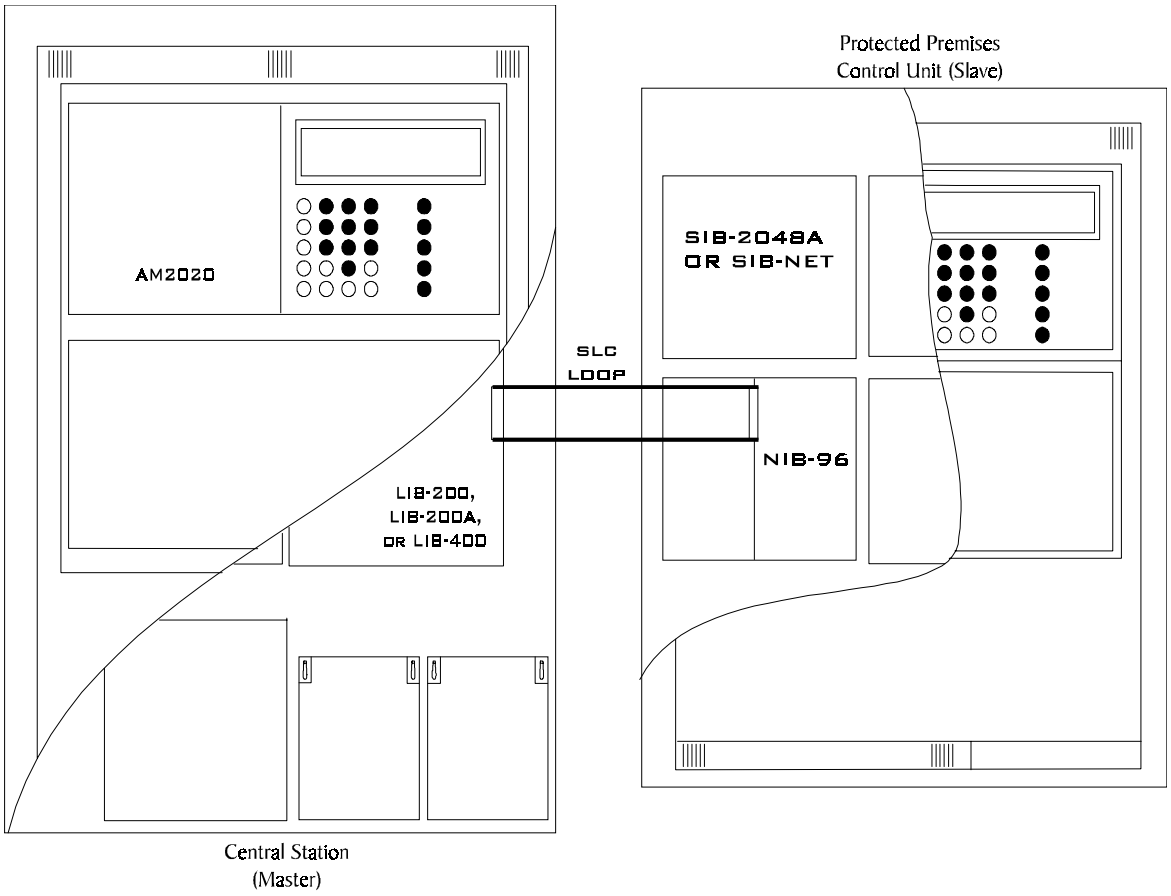
Section 6.4 NFPA 72 Proprietary Supervising Station Fire Alarm Systems

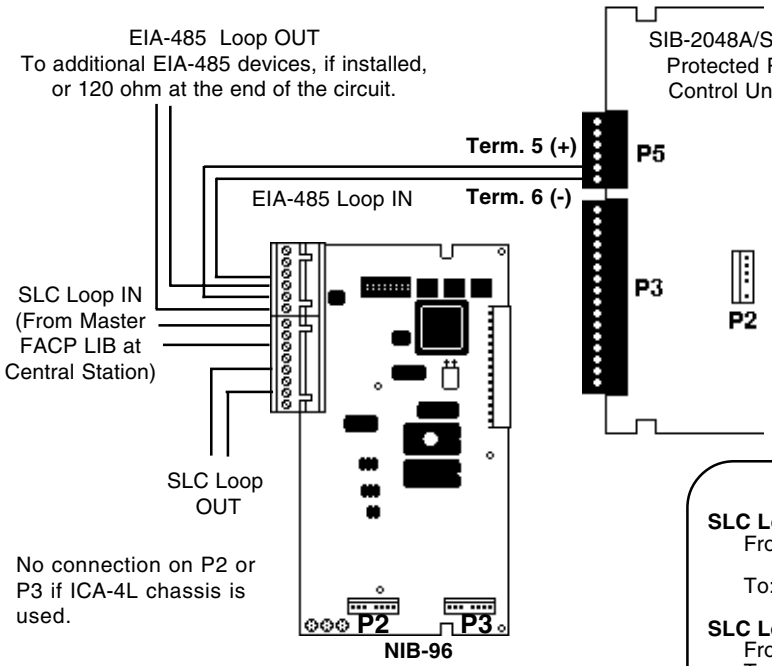
Fire Alarm, Security Alarm, and Trouble Signal Transmission

All LIBs are power-limited. If the wiring connected to the LIB-200 leaves the building it must be in conduit. It can not exceed 1000 meters (1093 yards), must not cross any power lines, and must not be in the vicinity of any high voltage. These outdoor wiring restrictions do not apply to the LIB-200A or the LIB-400. Refer to Section 4.2 of this manual and the Device Compatibility Document listed in the Related Documentation Chart of this manual for information on surge suppressors approved for use with this FACP. Refer to **Figures 6.4-1** and **6.4-2**. **Table 6.4-1** is a minimal configuration for a NIB-96 with base SLC address=01 and may be used when programing the NIB-96. For further information, refer to the NIB-96 Network Interface Board Manual.

Master Software Type ID	Master SLC Address	Slave Annunciator Address	Slave Software Type ID	Function
MON	L1M1	A6P1	AAST	General Trouble
not used	not used	A6P2	AMON	not used
CON	L1M3	A6P3	ARST	Slave Reset
not used	not used	A6P4	AMON	not used
SARM	L1M5	A6P5	AMON	Security Alarm (typical)
SSYM	L1M6	A6P6	AMON	Security Tamper (typical)
NOA	L1M7	A6P7	AMON	Non-alarm Input (typical)
CON	L1M8	A6P8	ACON	Control Output (typical)

Table 6.4-1 NIB-96 (Minimal Configuration)





NOTES

- This arrangement can be employed for Central Station and Proprietary (NFPA 72) service.
- This application is not suitable for separate transmission of sprinkler supervisory conditions.
- For connection of alarm initiating devices, refer to **Figures 4.6-2** through **4.6-6**.
- During system programming, NFPA menu option "72D" must be chosen.

Terminal Assignments

SLC Loop IN:
From: Master LIB-200, LIB-200A, or LIB-400
P2 terminals 1(+) and 3(-)
To: NIB-96 P5 terminals 1(+) and 3(-)

SLC Loop OUT:
From: NIB-96 P5 terminals 5(+) and 7(-)
To: Next device on SLC Loop

EIA-485 Loop IN
From: SIB P5 terminals 5(+) and 6(-)
To: NIB-96 P4 terminals 5(+) and 3(-)

EIA-485 Loop OUT
From: NIB-96 P4 terminals 6(+) and 4(-)
To: Next device on EIA-485 Loop.

Figure 6.4-1 Proprietary Fire Alarm Systems

Fire Alarm and Trouble Signal Transmission

The application provided in **Figure 6.4-2** is not suitable for separate transmission of sprinkler supervisory signals. All circuits are supervised and power limited. 18 AWG (0.75 mm²) is the minimum. There is a maximum loop resistance of 40 ohms for the LIB-200, and 50 ohms for the LIB-200A and LIB-400. The maximum distance between the Central Station/Receiving Unit and the MMXs is 10,000 feet (3048 meters) at 12 AWG (3.25 mm²) for the LIB-200 and 12,500 feet (3841 meters) at 12 AWG (3.25 mm²) for the LIB-200A and LIB-400. For initiating device connections, refer to **Figures 4.6-2** through **4.6-6**.

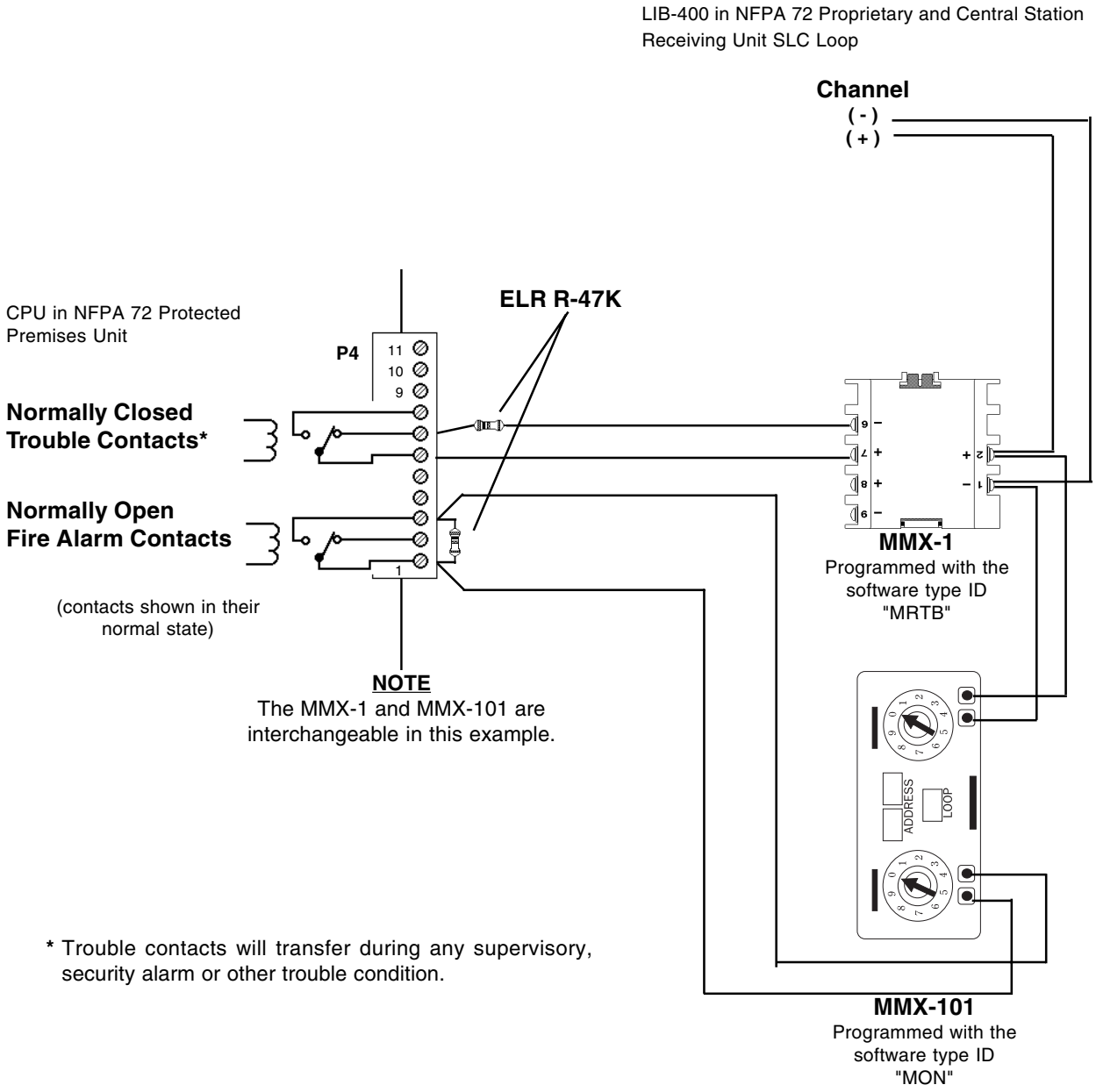


Figure 6.4-2 NFPA 72 Proprietary and Central Station Protected Premises Unit/Proprietary and Central Station Receiving Unit Interface

Section 6.5 Applying/Removing Power to the Fire Alarm System

After completing the proper installation of all boards, cables and components, apply power in the following manner:

- Apply AC power
- Connect the battery/secondary power terminals (refer to Connecting the Main Power Supply, Section 3.3 of this manual).
- Do not take any actions, especially do not activate the acknowledge button, for at least one minute after power is applied.
- Do not connect any releasing devices until the releasing circuits have been tested using simulated loads.
- Test system in accordance with NFPA 72, Chapter 7.

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

- Disconnect any releasing devices
- Remove all EIA-485 connections
- Remove battery/secondary power
- Remove AC power
- Wait 60 seconds

CAUTION!

- Never remove or install boards, internal cables or components with power applied. Failure to follow the procedure outlined above can result in irreparable damage to the system components. This damage may adversely affect the operation of this control unit but its effect may not be readily apparent.

- Both AC and battery power is required for proper operation.

Note

System will not function without power applied.

AM2020
AFP1010

Chapter Two
Operation

Introduction

About the operation of the panel

Use of intelligent and addressable detectors and modules provide the operator with precise information on the location of the alarm or trouble, as well as what type of device is reporting the activity.

WARNING

The AM2020/AFP1010 control panel will only operate with Notifier intelligent addressable devices installed.

All operating power, as well as data communications to and from intelligent and addressable devices, is transmitted on a two-wire LIB Signaling Line Circuit (SLC) that may be wired to meet the requirements of either NFPA Style 4 (Class B) or Style 6 or 7 (Class A)operation. The AM2020 system can be configured with up to 10 LIB SLC Loops and the AFP1010 system with up to 4 Loops, each of which is capable of supporting up to 99 intelligent detectors and up to 99 addressable control or monitor modules.

Note: The term "loop" is used in a general way throughout this document and does not necessarily mean that the circuit is a Class A configuration, unless a reference is made to Style 6, Style 7, Style D, or Style Z circuit performance.

A **fire alarm** in the AM2020/AFP1010 is initiated by activation of any of the following devices:

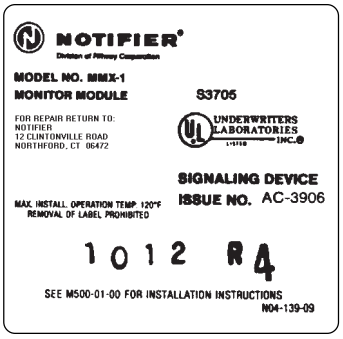
- Intelligent smoke or heat detectors (SDX-551/751, SDX-551-TH, CPX-551/751, FDX-551, or IPX-751, etc.).
- Addressable Manual Pull Stations (BGX).
- Conventional normally-open or normally-closed contact fire alarm initiating devices connected to addressable MMX Monitor Modules (or equivalent XPM or XP5-M circuits) along a LIB SLC.

During an alarm condition, LEDs on as few as six and as many as 99 addressable initiating devices (smoke detectors, heat detectors, MMX modules etc.) and/or output modules may be latched on. A latched-on LED on an initiating device indicates that the device has caused an activation signal to be transmitted to the AM2020/AFP1010. A latched on LED on an output module indicates that the module has been activated. An **activation signal** on the AM2020/AFP1010 includes fire alarms, security alarms, supervisory conditions, or non-alarm inputs.

NOTE

During loss of primary (AC) power, when the AM2020/AFP1010 is operating under secondary power, only LEDs on intelligent detectors (including DHX-501/DHX-502 duct detectors) will be latched on during a fire alarm.

The AM2020/AFP1010 can be programmed to latch the LEDs on up to 99 addressable devices (MMX, CMX, etc.). This software feature can be used only if ALL installed addressable devices are stamped with the code R4 on the product marking label (purchased from Notifier after April 1, 1991.) Use of this feature under any other circumstances can cause the LIB SLC Loops to shut down during a fire alarm condition. RA-400 Remote LEDs are not permitted for use with this feature (excluding those wired to DHX-501/DHX-502 Duct Detectors). Use only the RA-400Z Remote LED when extending the number of latched-on LEDs beyond six. SDX-551 Photoelectric Detectors can also have an H code after their model numbers.



NOTE

Detectors have priority over modules. Detectors that come into alarm will assume LED-latch priority over previously-latched module LEDs.

Output devices (alarm notification appliances, output relays, etc.) are controlled by activation of CMX Control Modules (or equivalent XPC or XPR circuits) connected along the LIB SLC. A control module may serve as a Form-C output relay or as a Notification Appliance Circuit (NAC).

About this Chapter

This chapter covers the operation of the AM2020/AFP1010 Combination Fire/Security Protective Signaling System and the control features available to the operator presented through the perspective of the Display Interface Assembly (DIA-2020 or DIA-1010).

To the right are general terms and their associated specific part numbers as referenced in this manual:

TERM	PART Number
PRN	PRN-4, PRN-5
CRT	CRT-2
MMX	MMX-1 MMX-101 MMX-2
CMX	CMX-1 or CMX-2

This chapter refers to CMX Control Modules and MMX Monitor Modules. If XP or XP5 Series Transponders are used, unless otherwise stated, the following substitutions may be made:

- MMX Monitor Modules can be substituted with XPM or XP5-M circuits.
- CMX Control Modules configured as Form-C contacts (tabs broken), can be substituted with XPR circuits or XP5-C circuits (in relay mode).
- CMX Control Modules not configured as Form-C contacts can be substituted with XPC circuits or XP5-C circuits (in NAC/telephone mode).

NOTE

See warning regarding XP Transponder operation at the beginning of Chapter Three, Section Three. For more information, refer to the XP Series Transponder System Manual.

About the passwords

The AM2020/AFP1010 functions in one of three levels—Operational Level, Level One, and Level Two. In Operational mode, the operator may perform the following keypad or menu-displayed functions:

- Acknowledge alarms, troubles, and restorations (clears)
- View acknowledged alarms, troubles, and restorations
- Silence the sounding of fire alarm notification appliances
- Reset the AM2020/AFP1010 System
- Test all intelligent addressable detectors in the system
- Test the panel's LED indicators, Liquid Crystal Display (LCD), terminal and printer
- Read the status of the entire AM2020/AFP1010 system, including the addressable devices
- Print out a report on the status of the system or access the history buffer

Access to keypad or menu levels one and two require entry of specific passwords. These levels allow an authorized programmer to initialize or alter the programming of the AM2020/AFP1010. Level One and Level Two entry requirements are defined as follows:

Alter Status _____ Level One password required.
Programming_____ Level Two password required.

If the main operator of the system requires access to a function which is password protected, contact the distributor who installed the system for the required password(s). For more information on programming or altering the status of the AM2020/AFP1010, refer to Chapter Three of this manual.

Whenever the operator selects a menu, the AM2020/AFP1010 begins a one-minute timer. If no key is pressed during this minute, the function selected will be aborted and control will return to the state the panel was in prior to selection of that menu.

NOTE

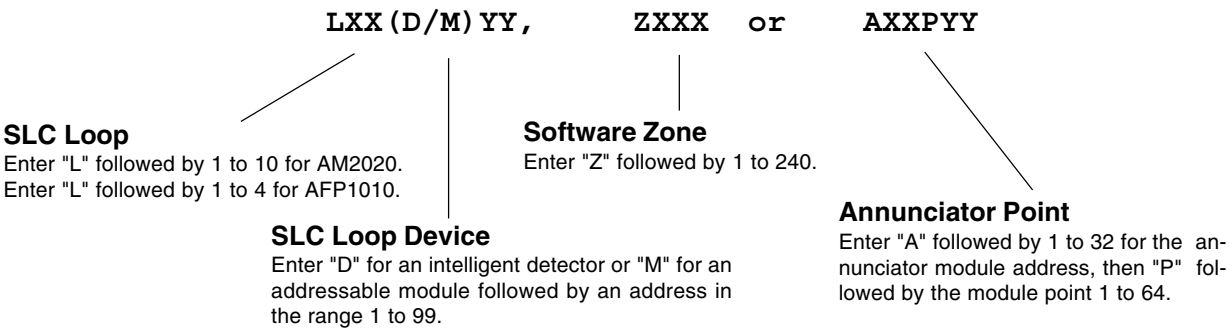
Unacknowledged points must be acknowledged prior to being reprogrammed. Any new trouble or alarm reports reviewed during programming may disrupt the programming process. Do not change the program parameters of any addressable point that is in alarm or trouble.

About the software

Depending on the particular release of software in your system, some menu functions and system features may not be operable. If you attempt to execute a function not operable, the panel will respond with the message "**FUNCTION NOT ENABLED.**"

About addresses

For certain functions such as READ STATUS, the operator must enter a device, software zone, or annunciator point address. Leading zeroes are not required. The address assumes the following format:



For example, ***L3M44*** must be entered as the address for the 44th module on LIB SLC Loop 3.

About the Backspace Key

The backspace key serves two purposes:

1) At a menu prompt: BACK SPACE

```
PRESS 1=SYS,2=PTREAD,3=ALM,4=TBL,5=DIS,
6=MONON,7=CTLON                        :
```

the backspace key "aborts" the selection of that menu.

2) When entering data or making a selection from a menu:

```
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT.
STATUS (BCKSPC TO ABORT)      : L4D3
```

the backspace key erases the last character, or menu choice entered.

About entering alphanumerics

Most of the keys on the DIA keypad serve more than one function. For instance, the **3** key is used to enter the digit **3** or the letter **D** when entering the address of a detector.

The AM2020/AFP1010 toggles which character is displayed on the LCD with each successive keypress of that same key. This allows the operator to press a particular key until the desired character is displayed. That character is entered into the display whenever the next, different, key is pressed. If two of the characters contained on a particular key (for instance, the **D** and the **3**) need to be entered in succession, the ALPHA ENTER key must be used (see example that follows). After the full address has been entered into the display, press ENTER to transfer the display contents to the system for processing.

Example: To enter **L8D3**,

Press 

and the letter **K** will be displayed.

Press 

again and the **K** will change to **L**.

Press 

and the letter **O** is displayed to the right of the displayed letter **L**.

Press 

again to change the letter **O** to the digit **8.**

Press 

and the letter **D** will be displayed to the right of the displayed characters **L8.** The partial address displayed now reads **L8D.**

Press 

to enter the letter **D** into the display.

Press 

and a second letter **D** will be displayed to the right of the displayed characters **L8D**. The partial address displayed now reads **L8DD.**

Press 

again to change the second **D** to the digit **3**. The completed address now reads **L8D3.**

Press 

to transfer the display contents to the AM2020/AFP1010 system for processing.

About Walk Test

The Walk Test function is a service feature that allows one-man testing of devices on any selected LIB. The Walk Test feature will automatically abort after 15 minutes of inactivity if inadvertently left enabled by the service representative.

About the display time
The AM2020/AFP1010 has a separate time field in the display for each event that occurs in the system.

All Systems Normal: During periods of no activity, the time field reflects the *current time.* For AM2020/AFP1010 systems with **NOTI•FIRE•NET**™, the time is synchronized every hour by the network master clock (last AM2020/AFP1010, INA, or NRT node on network to have its time changed).

Single, unacknowledged event: When an event has occurred *but has not been acknowledged*, and no other event has occurred, the CRT terminal and the DIA display the time this event occurred.

Multiple, unacknowledged events: The display will show the actual time that the first unacknowledged event occurred. After the first event is acknowledged, the time shown on the display does not represent the time at which the event occurred, but instead indicates the time at which the event is displayed.

Single/multiple previously acknowledged events: The time shown for an acknowledged event is the time at which that event was last placed in the display by activation of the ack/step key (not the time at which the event occurred).

About the print time
Output from the printer, as well as to the panel's history file, for a particular event (alarm, trouble, acknowledgment, etc.) includes the time the event was sent to the printer, which, in most cases, is identical to the time the event occurred. In extreme cases, when many events have occurred within a few seconds, the time printed for a particular event may differ from the actual event time by up to one minute. After events have been acknowledged, only the event history file (if enabled) and the system printer will provide a record of the time at which events occurred.

About priorities
Every event the AM2020/AFP1010 displays is prioritized. This includes the processing of incoming alarm and trouble events, acknowledging events, the clearing of events, and acknowledging the clearing of events (receiving unit operation only). Security alarms will increment the trouble counter on the terminal status line of the CRT.

NOTE
Security alarms are processed like fire trouble conditions in the AM2020/AFP1010.

The AM2020/AFP1010 processes and displays events under the following priorities, highest priority first:

1) Fire Alarms
2) Security Alarms
3) Supervisory Signals
4) Device Troubles
5) Disabled Zones
6) System Troubles
7) Annunciator Troubles
8) Cleared Fire Alarms
9) Cleared Security Alarms
10) Cleared Supervisory Signals
11) Cleared Device Troubles
12) Cleared Disabled Zones
13) Cleared System Troubles
14) Cleared Annunciator Troubles

In addition, detectors have a higher priority than modules within each detector/module category; the lower the address, the higher the priority (see list below). *The display of certain events can be pre-empted by others at the time they are acknowledged. Pay careful attention to the display when acknowledging events.*

Node 1, Loop 1 Detector 1, Loop 1 Detector 2, Loop 1 Detector 3 … Loop 10 Detector 99
(followed in priority by)
Node 1, Loop 1 Module 1, Loop 1 Module 2, Loop 1 Module 3 … Loop 10 Module 99
(followed in priority by)
Node 1, Zone 1, Zone 2, Zone 3… Zone 240
(followed in priority by)
Node 1, System Trouble Indices (in Hex) T00, T01, T02… TFF
(followed in priority by)
Node 1, Annunciator Trouble Indices (in Hex) N00, N01, N02… NFF

Note: Node numbers are applicable only if the panel is connected to **NOTI•FIRE•NET**™

About System Test

System Test, or "Detector Test" as it is often referred to, is a manually initiated test of all intelligent detectors installed in the system. When the user presses the system test key the fire panel performs a chamber test of each intelligent detector to ensure its proper operation. System test can take up to one minute before displaying its results. There are two types of display:

```
DETECTOR TEST:ALL OK    01+05+00+02+00+80
+25+00+06+00 TOT=119 05:00P 05/22/00
```

Each LIB displays the total number of intelligent devices installed on it, as well as the overall system total.

```
DETECTOR TEST FAIL: 110,119,211,213,605,
617,799,815,015,020+ 05:30 05/22/00
```

Each failed device is represented by a three digit number. The first digit indicates the LIB number (0=10), and the last two the device address. If more than ten devices have failed a "+" is shown after the last detector number. If more than ten detectors failed, the serviceman would have to repair, replace or disable the ten listed, and then rerun System Test in order to locate the remaining ones.

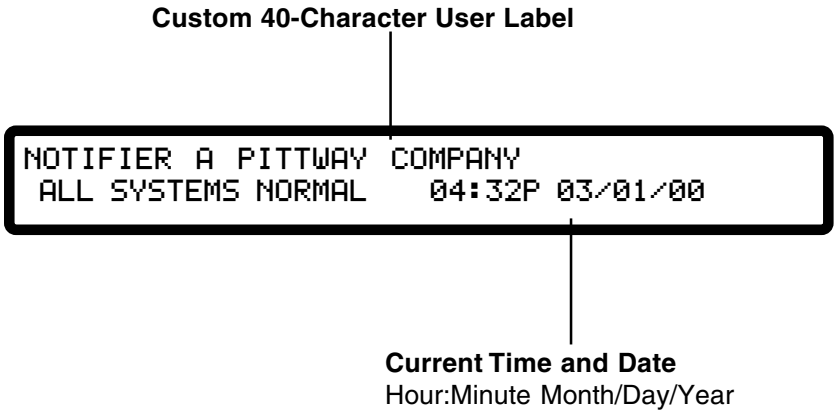
About Periodic Test

The fire panel performs a periodic automatic chamber test of all intelligent detectors installed in the system to ensure their proper operation. When a detector has failed its automatic chamber test, it will generate a trouble message as in Section 5.1 with "DET FAILED TEST" in the type of trouble field. The service man would then have to repair or replace the indicated device.

Section One
The Display Interface Assembly

Section 1.1 Normal Operation

During normal fire alarm operation when no alarms or troubles exist, the system will display the following:



The operator can perform the functions associated with the following keys without having to enter a password:

A
READ STATUS

(a description of the **READ STATUS** and the **SPL FUNCT** keys follows)

S
(
SPL FUNCT

ACK STEP

SIGNAL SILENCE

SYSTEM RESET

SYSTEM TEST

LAMP TEST

PIEZO SOUNDER - The local panel piezo sounder provides an audible indication of the system alarm or trouble conditions. The sounder will pulse to indicate the detection of at least one fire alarm condition in the system, and will sound steadily when the system is in trouble. The sounder is silenced when all conditions have been acknowledged. If the sounder sounds steadily, and it cannot be silenced by the acknowledgment of all system alarm/trouble conditions, CALL YOUR SERVICE REPRESENTATIVE IMMEDIATELY.

80 CHARACTER LIQUID CRYSTAL DISPLAY - The LCD displays the current status of the entire AM2020/AFP1010 system. While programming the AM2020/AFP1010, the LCD provides various system configuration menus and prompts. This display also is illuminated when the AM2020/AFP1010 is under AC power. The display will remain illuminated for one minute after the loss of AC power; any keypad or system activity will re-illuminate the display for one minute.

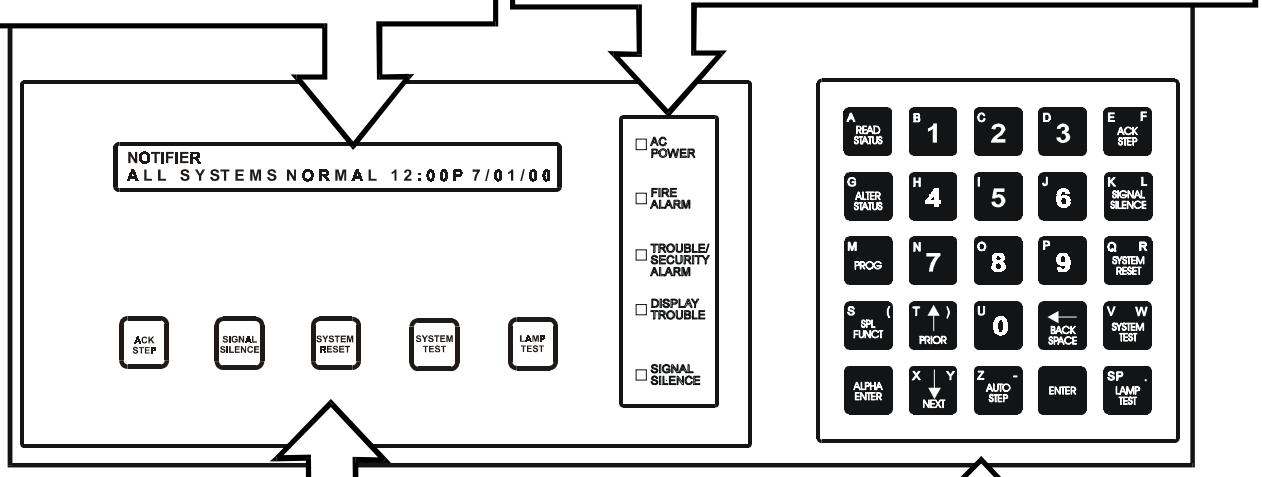
AC POWER - A green LED will illuminate to indicate that the system is operating from the primary power supply.

FIRE ALARM - A red LED will flash to indicate that the panel has detected at least one fire alarm in the system. The red LED will light steadily when all fire alarms have been acknowledged. The panel display will provide detailed information on any alarms received.

TROUBLE/SECURITY ALARM - A yellow LED will flash to indicate any unacknowledged change of status in the system. The panel display will provide detailed information about each change of status signal received. After all change of status conditions have been acknowledged, and while at least one trouble condition still exists, the Trouble/Security Alarm LED will illuminate steadily. Note: Security alarms are treated as fire trouble conditions in this combination fire alarm/security system.

DISPLAY TROUBLE - A yellow LED will illuminate when a trouble condition is detected in the display assembly. If this LED is illuminated the contents of the display must be considered invalid. **Call your service representative immediately.**

SIGNAL SILENCE - A yellow LED will illuminate steadily when all the control modules in the system which can be silenced have been silenced. A flashing yellow LED indicates a partial signal silence condition (some of the control modules that can be silenced have been silenced.)



ACK STEP - This key is used to acknowledge system alarm or trouble conditions. When depressed, the operator acknowledges the new status of the device indicated on the display. Depression of this key will also step the display to the next device in alarm or trouble. After all such system alarm and trouble conditions have been acaknowledged, the ACK STEP key may be used to step the display through the existing system alarm and trouble conditions.

SIGNAL SILENCE - This key, during a fire alarm condition, will deactivate all activated control modules that have been programmed to permit signal silencing.

SYSTEM RESET - This key is used to clear all system alarm and trouble conditions. If an alarm or trouble condition still exists after System Reset, that alarm/trouble condition will resound. **Note**: The function of this key is inhibited until all alarms and troubles have been acknowledged.

SYSTEM TEST - The System Test button is not functional. System testing is automatic.

LAMP TEST - this key is used to perform a test of LEDs on the control panel and to test the panel display. The test will illuminate the panel LEDs in sequence for a timed period and flash the panel display. When the test has been completed, the panel LEDs and the panel display will return to their prior status.

NOTE - These keys and their functions are duplicated on the alphanumeric keypad of the DIA.

AUTO STEP - During READ STATUS, this function key automatically scrolls the display through a list of system conditions such as devices that are in alarm or trouble.

PRIOR, NEXT - During READ STATUS, these keys allow the user to step forward or backward through a list of system conditions such as devices that are in alarm or trouble.

READ STATUS - Allows the status of the entire system to be read, including the status of the Loop Interface Boards, the addressable detectors, and the control and monitor modules.

ALTER STATUS - Provides access to "Level One" functions, such as setting the FACP clock.

PROG - This "Level Two" function key provides access to Programming Mode, for configuring the AM2020/AFP1010.

SPL FUNCT - This key generates system and installed point reports.

ALPHA ENTER - During Programming Mode, pressing ALPHA ENTER stores the character displayed and permits the alternate character on that key to be entered next (see page 2-5).

BACK SPACE - Erases the last alphanumeric keypress, or serves as an "escape" key during programming.

ENTER - Menu selections are entered and programming data is stored in AM2020/AFP1010 memory upon pressing this key.

Section 1.2 Read Status

The Read Status feature of the AM2020/AFP1010 allows the operator to display the status of the entire system. To execute READ STATUS:

Press 

The display will show:

```
PRESS 1=SYS,2=PTREAD,3=ALM,4=TBL,5=DIS,
6=MONON,7=CTLON                      :
```

Enter **1 for Display System Configuration**. This selection provides information on any of the system parameters programmed into the AM2020/AFP1010 - the number and style of the Loop Interface Boards, the AVPS-24s and APS-6Rs, the Software Zone Boundary, the system time delays, annunciator modules installed, etc.

Enter **2 for Point Read**. This selection provides information on the status of any intelligent detector, addressable module, software-defined zone or annunciator point in the system.

Enter **3 for Alarm**. This selection provides information on the lowest addressed device or zone in a fire alarm state.

Enter **4 for Trouble**. This selection provides information on the lowest addressed device or zone in trouble.

Enter **5 for Disable**. This selection provides information on the lowest addressed device or zone disabled.

Enter **6 for Monitor On**. This selection provides information on the lowest addressed non-fire or security monitor module activated.

Enter **7 for Control On**. This selection provides information on the lowest addressed control module activated.

NOTES

Read Status options 3, 4, 5, 6, and 7 use the same format as the Point Read option to display their indicated point information.

For Read Status options 3,4,5,6, and 7, use the ACK/STEP key to view any other devices in the alarm, trouble, disabled, or active state. See *Prior/Next/Autostep* in **Section Two**.

For an AM2020/AFP1010 FACP on the **NOTI•FIRE•NET** system, programming and read status operations should always be performed from a Network Reporting Terminal (NRT).

Never attempt to perform programming or read status operations from a local panel when the NRT is simultaneously attempting to do so.

Display System Configuration

READ STATUS
Menu Option 1

Selecting **1** from the Read Status Menu allows the operator to review the various system parameters entered into the AM2020/AFP1010. The System Configuration Menu:

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,
6=EXTEQ,7=LOCP,8=ISIB,9=PARM, 0=CONT   :
```

Note that when 4 is chosen from the menu, the total number of AVPS and/or APS-6R power supplies will be displayed.

Enter Menu Choice: **Status Displayed:**

1

```
THESE LIB BOARDS ARE INSTALLED:
1=Y,2=Y,3=Y,4=Y,5=N,6=N,7=N,8=N,9=N,10=N
```

Y=installed N=not installed

2

```
THE SLC LOOP STYLES ARE AS FOLLOWS:
1=6,2=6,3=6,4=6,5=4,6=4,7=4,8=4,9=4,10=4
```

The default value for SLC Loops not installed is NFPA Style 4

3

```
VER=60,SIL=045,CUT=0000
```

VER = Alarm Verification Time (in seconds)
SIL = Signal-Silence Inhibit Time (in seconds)
CUT = Signal Cut-out Time (in seconds)

4

```
THERE ARE CURRENTLY 04 AVPS-24 INSTALLED
 IN THE SYSTEM
```

NOTE: The number "04" in the above display represents the total number of AVPS and/or APS-6R power supplies installed in the system.

5

```
  ZONES 001 - 200 ARE FORWARD ACTIVATED
  ZONES 201 - 240 ARE REVERSE ACTIVATED
```

Enter Menu Choice: **Status Displayed:**

6

```
TS=N        SL=N        APM=N,CMR=N,NAR=N,
LEDL=N,PEC=N,BC=N,PTI=N                RPT=N
```

TS = Is the connection to the terminal supervised? (If TS=N, the terminal will not audibly indicate state changes [i.e., no Bell characters will be sent]).
SL = Is the Status Line option enabled?
APM = Is the connection to the auxiliary printer monitored?
CMR = Is control module state reporting enabled?
NAR = Is "NONA"/"NOA" monitor module state reporting enabled?
LEDL = LED latches on more activated addressable devices?
PEC = Continue to transmit under printer error conditions?
BC = Is bidirectional copy enabled?
PTI = Is the primary printer trouble inhibited?
RPT = Are printer reports directed to terminal output?

7

```
DPZ=N,LMD=45,LMM=20,LMC=90,72ABCD,71,RC,
BTYP=N,BCAP=12,BSBY=24,ERM=N,BLN=N,PAL=N
```

DPZ = Is the piezo disabled during programming?
LMD = Local Mode detector address.
LMM = Local Mode monitor module address.
LMC = Local Mode control module address.
72A = Protected premises fire alarm system.
72B = Auxiliary fire alarm service.
72C = Do not use (see Chapter 2, section 1.1.7)
72D = Do not use (see Chapter 2, section 1.1.7)
71 = Do not use (see Chapter 2, section 1.1.7)
RC = Proprietary supervising station or central station receiving unit.
BTYP = Type of battery installed in the system.
BCAP = Ni-cad battery capacity.
BSBY = Ni-cad battery standby time.
ERM = Is event reminder enabled?
BLN = Is device blinking enabled?
PAL = Is pre-alarm option enabled?

8

```
PRESS  1=INSTL,2=ANN,3=XINT,4=DACT
                                    :
```

Option 8 provides you with a Read Status sub-menu for viewing the status of the intelligent SIB, installed annunciators, external interface, or DACT. This menu is described on the next page.

9

```
HIZNDET=Z150,LOZNDET=Z001,DVTCNTR=15
SER=Y,DFT=Y,PGR=Y,MDM=Y,NAM=N,RP=Y,SUP=Y
```

HIZNDET = High zone for day/night detector sensitivity.
LOZNDET = Low zone for day/night detector sensitivity.
DVTCNTR = Detector verification trouble counter limit.
SER = Is "SACM"/"SEQM" monitor module state reporting enabled?
DFT = Is drift compensation enabled?
PGR = Is PAGE-1 enabled?
MDM = Is modem enabled?
NAM = Is the NAM-232 enabled?
RP = Is rapid polling enabled?
SUP = Is supervisory ACS reporting enabled?

0

```
PRESS 1=IDO
```

Option 0 provides you with a Read Status Sub-menu for viewing the status of the International Display Option. Pressing 1 will display IDO=0 for normal display. ID)=Y will be shown when IDO is enabled for countries requiring it (China).

Menu Choice 8:

Enter Option Choice: **Status Displayed:**

1

```
ISIB=Y
```

ISIB = Is the Intelligent Serial Interface Board installed?

NOTE

ISIBs available for the AM2020/AFP1010 system include the SIB-2048A and SIB-NET. For an AM2020/AFP1010 connected to a **NOTI•FIRE•NET™** system however, the only ISIB that can be used is the SIB-NET. If a SIB-NET is not installed, **NOTI•FIRE•NET™** specific functions can not be programmed or read under Read Status (see Chapter One).

2

```
THESE ANNUNCIATORS ARE INSTALLED:
(PRESS ENTER TO CONTINUE UNTIL DONE)
```

Due to its size, the Annunciator Read Status display is separated into two screens, illustrated below. Pressing <ENTER> invokes the next display.

```
 1=Y, 2=N, 3=N, 4=N, 5=Y, 6=Y, 7=N, 8=N,
9=Y,10=N,11=N,12=Y,13=Y,14=Y,15=N,16=N,
```

```
17=Y,18=Y,19=Y,20=N,21=N,22=N,23=N,24=N,
25=N,26=N,27=N,28=N,29=N,30=N,31=N,32=N
```

3

```
UPDN=N,ADDR=010,DBID=BC00D148
MIBA=H,MIBB=H,PORTS=2  ASRD=N   ASRE=N
```

UPDN = Is the ACS Port upload/download enabled?

* ADDR = FACP **NOTI•FIRE•NET™** address.
* DBID = Database identifier.
* MIBA = MIB-W/WF threshold for Channel A. (On the MIB-WF, only the Channel A threshold setting is used.)
* MIBB = MIB-W threshold for Channel B.
* PORTS = Number of data ports monitored.
* ASRD=ACK/SIL/RES disabled at panel.
* ASRE=ACK/SIL/RES re-enabled on LAN Fail

* These items are **NOTI•FIRE•NET™** specific functions and are only displayed when a SIB-NET is installed.

4

```
DACT=01
```

DACT = Base address of the UDACT (blank for none installed).

Point Read

Selecting **2** from the Read Status Menu allows the operator to review the various detector, module, software zone or annunciator point parameters entered into the system. The system prompts the operator for the address of the point to be read:

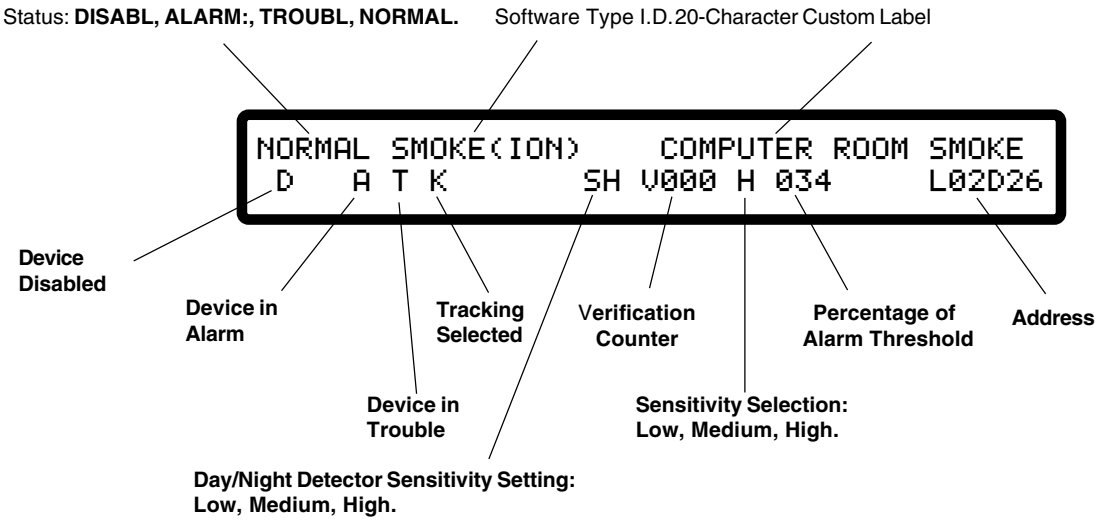
```
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT.
 STATUS (BCKSPC TO ABORT)          :
```

Upon entering the address, the system will display a distinct screen format, depending on the particular type of device being read, as illustrated below:

NOTE

After a one-minute timeout, the Control-By-Event (CBE) and the annunciator point mapped address is displayed for devices and zones. Cooperative Control-By-Event (CCBE) is displayed for reverse zones and are only used as part of the **NOTI•FIRE•NET**™ operation. To display this information immediately, press ENTER after the status line appears.

Detectors



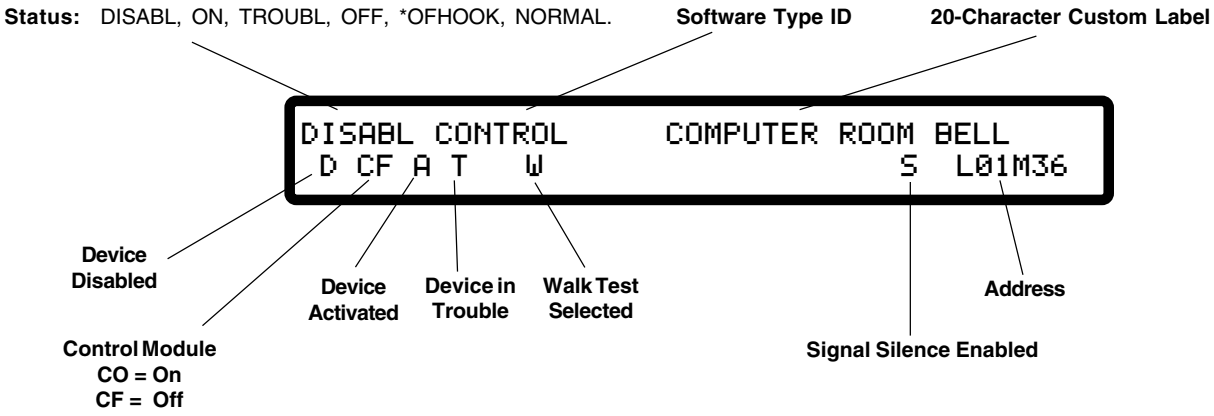
Detector Verification

If verification is enabled for this point, the V indicator appears and the 3-digit counter shows the number of times the verification timer was activated for the point *without going into alarm*. The counter returns to zero when power is cycled to the AM2020/AFP1010 or by following the procedure in the *Resetting Sensor Verification Counters* section of this document. If you disable verification, the counter will retain its last value. If verification is not enabled for this point, the V indicator does not appear; however, the 3-digit number still appears. Note that the counter does not increment unless verification is enabled.

NOTE

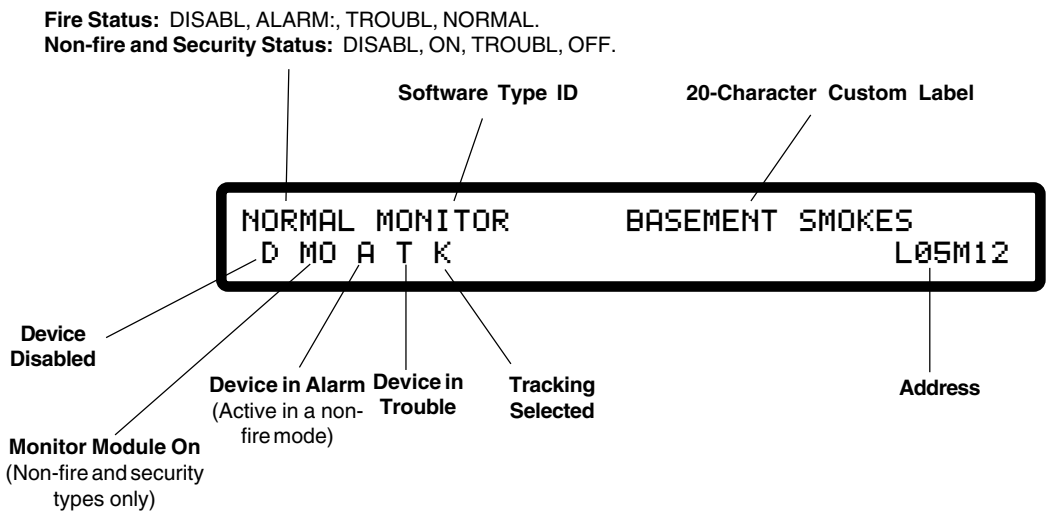
A detector may be in periodic test during a read status. In this case, the detector status will be normal but the percentage of alarm threshold will be greater than 100%. If this happens, wait one minute, then perform another read status.

Control Modules

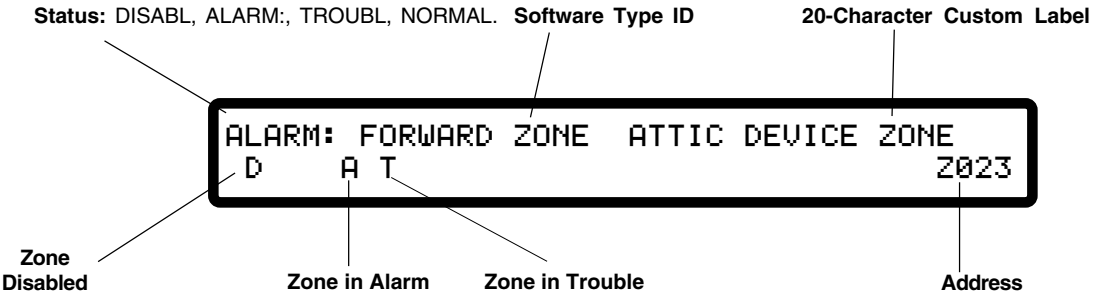


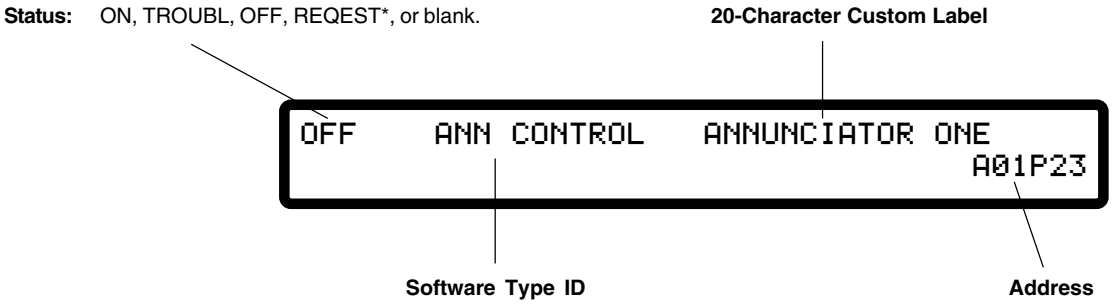
*An OFHOOK status indicates that a telephone off-hook (ring-in) signal has been received, but has not been answered by the operator at the fire fighter telephone ACS switchboard.

Monitor Modules



Software Zones





*A REQEST status indicates that a telephone off-hook (ring-in) signal has been received and answered by the operator at the fire fighter telephone ACS switchboard, but has not been connected to the telephone line.

Special Status

Read Status Menu Options 3 - 7

Option 3 provides information on devices or zones in a fire alarm state. Option 4 provides information on devices or zones in a trouble state. Option 5 provides information on disabled devices or zones. Option 6 provides information on activated non-fire or security monitor modules. Option 7 provides information on activated control modules. Selecting 3, 4, or 5 from the Read Status Menu prompts the operator to choose between zones and devices. The following example performs a search for the lowest device in a fire alarm state.

```
PRESS  1=SYS,2=PTREAD,3=ALM,4=TBL,5=DIS,
6=MONON,7=CTLON                    : 3
```

```
DO YOU WANT ZONE OR DEVICE STATUS?
(Y=ZONE,N=DEVICE (BCKSPC TO ABORT))  : N
```

```
ALARM: SMOKE(ION)   COMPUTER ROOM SMOKE
      A                 M 034     L02D26
```

NOTE

The control-by-event and the annunciator point mapped address is displayed for devices and zones after a one minute timeout. In a **NOTI•FIRE•NET** system, cooperative control-by-event equations are displayed for reverse zones. To display this information immediately, press ENTER after the status line appears.

Section Two
Prior/Next/Auto Step

The Prior, Next, and Autostep keys are used in conjunction with options 2 through 7 of the Read Status Menu. Upon selection of one of these options an address range is defined by the AM2020/AFP1010 for which similar searches can be performed using the Prior, Next and Autostep Keys. These functions enhance and speed up the search process, because they eliminate having to re-enter the Read Status Menu for the same function being repeated.

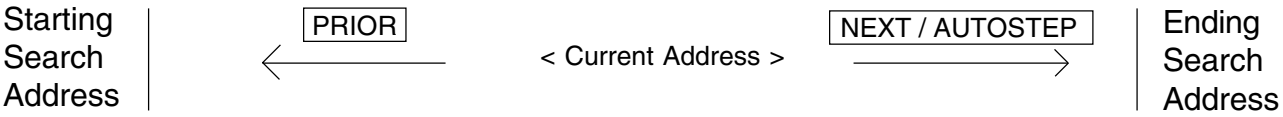
PRIOR - Searches the database in a reverse direction from the current address (refer to note).

NEXT - Searches the database in a forward direction from the current address (refer to note).

AUTOSTEP - Performs an automatic search of the database in the forward direction from the current address with a two second display of status line, followed by a two second display of the CBE and annunciator point mapped address, for each of the points found. (The CCBE equation is displayed for reverse zones on the NOTI•FIRE•NET system.)

NOTE

The control-by-event and the annunciator point mapped address is displayed for devices and zones after a one minute timeout. The cooperative control-by-event is displayed for reverse zones. To display this information immediately, press ENTER after the status line appears.



The Autostep key can be used as an alternate method for generating special reports.

Section Three
Special Function

The Special Function feature of the AM2020/AFP1010 allows the operator to generate AM2020/AFP1010 status reports or view the AM2020/AFP1010 History File.

Press **S SPL FUNCT** The display will show:

```
PRESS 1=RPTS,2=HIS
                                        :
```

Reports

SPL FUNCT Menu Option 1

```
PRESS 1=SYS,2=POINT,3=ALM,4=TBL,5=DIS,
6=MONON,7=CTLON                         :
```

Enter **1** for a **System Configuration** report, **2** for an **Installed Point** report, **3** for a **Fire Alarm** report, **4** for a **Trouble** report, **5** for a **Disable** report, **6** for a **Monitor Module On** report (including non-fire and security monitor modules), or **7** for a **Control Module On** report.

The display will show:

```
PRESS  1=REQUEST,2=ABORT
                                        :
```

Enter **1** to execute the report or **2** to abort a report already in progress.

NOTE

Only one report can be conducted at any one time. The reports are not displayed on the DIA. Reports are either displayed on the CRT and/or printed by the printer depending on whether or not printer reports are redirected to the CRT during programming. An example of a report printout is illustrated in **Figure 3-1**.

The special function report printouts (refer to **Figure 3-1**) assume the same display format as the ***Point Read*** option under ***Read Status***. For a description of the various report fields, refer to ***Point Read***.
Note: APS-6Rs will be counted as AVPSs in the Special Function Report Printout.

```
PRESS 1=RPTS,2=HIS                                                          : 1
PRESS 1=SYS,2=POINT,3=ALM,4=TBL,5=DIS,6=MONON,7=CTLON                       : 1
PRESS 1=REQUEST,2=ABORT                                                     : 1
** SYSTEM CONFIGURATION REPORT BEGIN **                      04:32P 03/01/00
THESE LIB BOARDS ARE INSTALLED:          1=Y,2=N,3=N,4=N,5=N,6=N,7=N,8=N,9=N,10=N
THE SLC LOOP STYLES ARE AS FOLLOWS:      1=4,2=4,3=4,4=4,5=4,6=4,7=4,8=4,9=4,10=4
VER=05,SIL=005,CUT=0504
THERE ARE CURRENTLY 00 AVPS-24 INSTALLED IN THE SYSTEM
ZONES 001 - 200 ARE FORWARD ACTIVATED   ZONES 201 - 240 ARE REVERSE ACTIVATED
TS=N      SL=Y       APM=Y,CMR=Y,NAR=Y, LEDL=N,PEC=N,BC=N,PTI=N            RPT=N
DPZ=N,LMD=20,LMM=20,LMC=20,72ABCD,71,RC,BTYP=N,BCAP=12,BSBY=48,ERM=Y,BLN=Y,PAL=N
ISIB=Y
THESE ANNUNCIATORS ARE INSTALLED:        (PRESS ENTER TO CONTINUE UNTIL DONE)
 1=N, 2=N, 3=N, 4=N, 5=N, 6=N, 7=N, 8=N, 9=N,10=N,11=N,12=N,13=N,14=N,15=N,16=N,
17=N,18=N,19=N,20=N,21=N,22=N,23=N,24=N,25=N,26=N,27=N,28=N,29=N,30=N,31=N,32=N
UPDN=N,ADDR=010,DBID=BC00D148,           MIBA=H,MIBB=H,PORTS=2,ASRD=N,ASRE=N
DACT=01
HIZNDET=Z150,LOZNDET=Z001,DVTCNTR=15     SER=Y,DFT=Y,PGR=Y,MDM=Y,NAM=N,RP=N,SUP=Y
*** SYSTEM CONFIGURATION REPORT END ***                     04:32P 03/01/00
PRESS 1=RPTS,2=HIS                                                          : 1
PRESS 1=SYS,2=POINT,3=ALM,4=TBL,5=DIS,6=MONON,7=CTLON                       : 2
PRESS 1=REQUEST,2=ABORT                                                     : 1
***** INSTALLED POINT REPORT BEGIN *****                    04:32P 03/01/00
ALARM: FORWARD ZONE FIRST FLOOR                A                        Z001
()                                                                      A01P01

DISABL REVERSE ZONE SECOND FLOOR          D     T                        Z202
OR()                                                                    A01P02
OR()

ALARM: SMOKE (ION)  OFFICE AREA                A       SH  V010 H 045   L01D01
(Z01)                                                                   A01P03

TROUBL SMOKE(PHOTO) FACTORY                     T          V000 H 045   L01D02
(Z202)                                                                  A01P03

NORMAL HEAT(ANALOG) MAINTENANCE                            V000 H 045   L01D03
(Z01)                                                                   A01P03

NORMAL MONITOR      FIRST AID                     K                     L01M01
(Z01)                                                                   A01P04

ON     CONTROL      FIRST FLOOR             CO     W                  S L01M02
OR(Z01)                                                                 A01P05

OFF    CONTROL      SECOND FLOOR            CF     W                  S L01M03
OR(Z202)                                                                A01P06

ON     ANN ZONE     BUILDING ONE                                       A01P01
DISABL ANN ZONE     BUILDING ONE                                       A01P02
ON     ANN DETECTOR BUILDING ONE                                       A01P03
OFF    ANN MONITOR  BUILDING ONE                                       A01P04
ON     ANN CONTROL  BUILDING ONE                                       A01P05
OFF    ANN CONTROL  BUILDING ONE                                       A01P06
****** INSTALLED POINT REPORT END ******                    04:32P 03/01/00
```

Figure 3-1 AM2020/AFP1010 Special Function Report Printout

READ STATUS
Menu Option 2

```
PRESS 1=PRINT,2=DISPLAY,3=STEP,4=RANGE/
STATUS                                 :
```

Choices 1, 2, and 3 will prompt the user for the beginning and end of the History File range. The maximum number of events that the system can save in the History File is 400.

Enter "1" to produce a **printed** report of the History File. An example of a History File printout is illustrated in **Figure 3-2**.

Enter "2" to perform an **automatic display** of the History File on the DIA and CRT terminal (if employed).

Enter "3" to perform a **manual display** of the History File on the DIA and CRT. Use the ENTER key (on DIA) or RETURN key (on CRT) to advance the display.

Enter "4" to display the History File **range** (the number of entries contained in the file), and current **status** (active/inactive).

To differentiate between history file printouts (refer to **Figure 3-2**) and system printouts (refer to **Figure 3-1**), the colon (:) in the time field has been replaced by the semicolon (;).

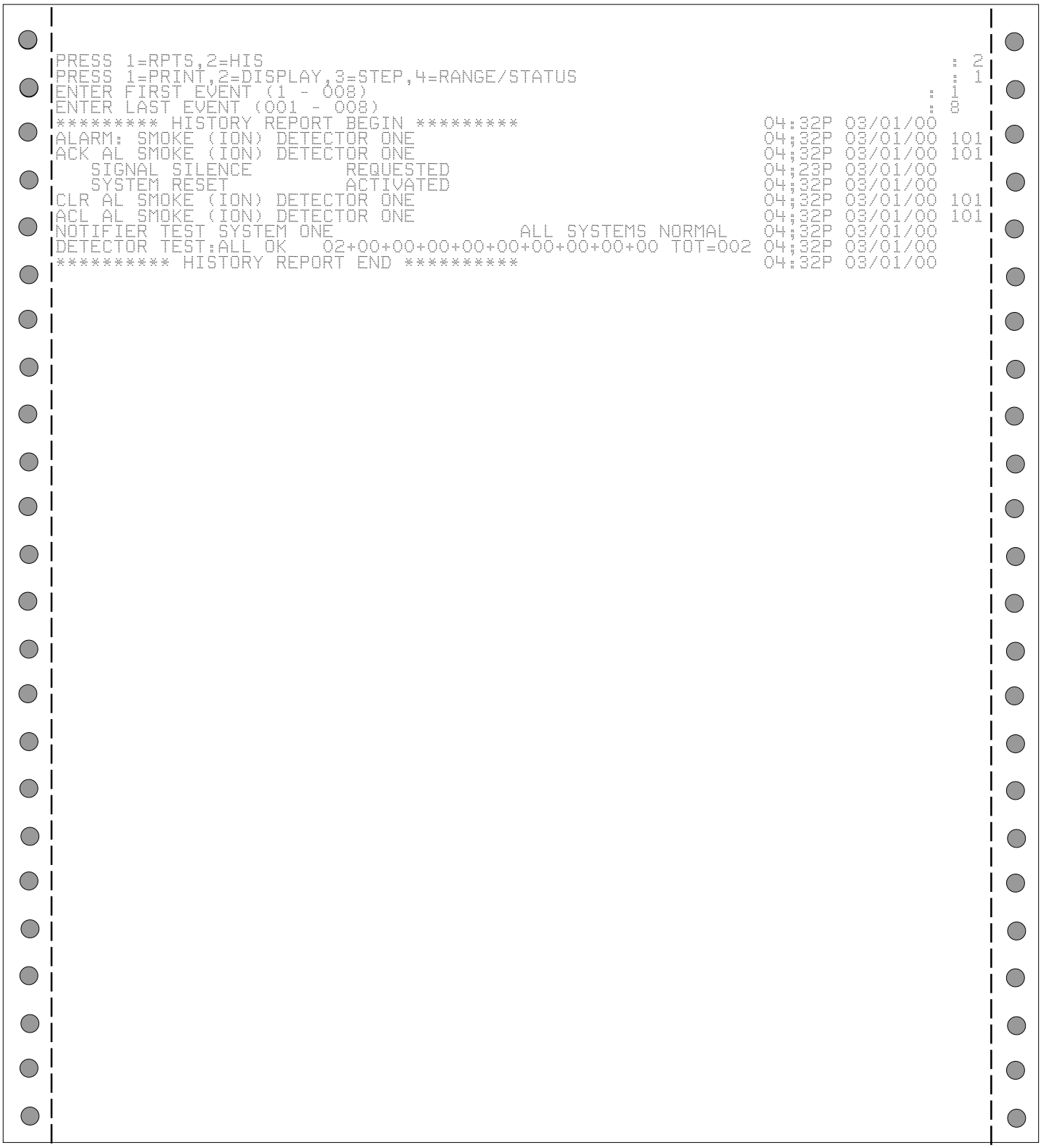
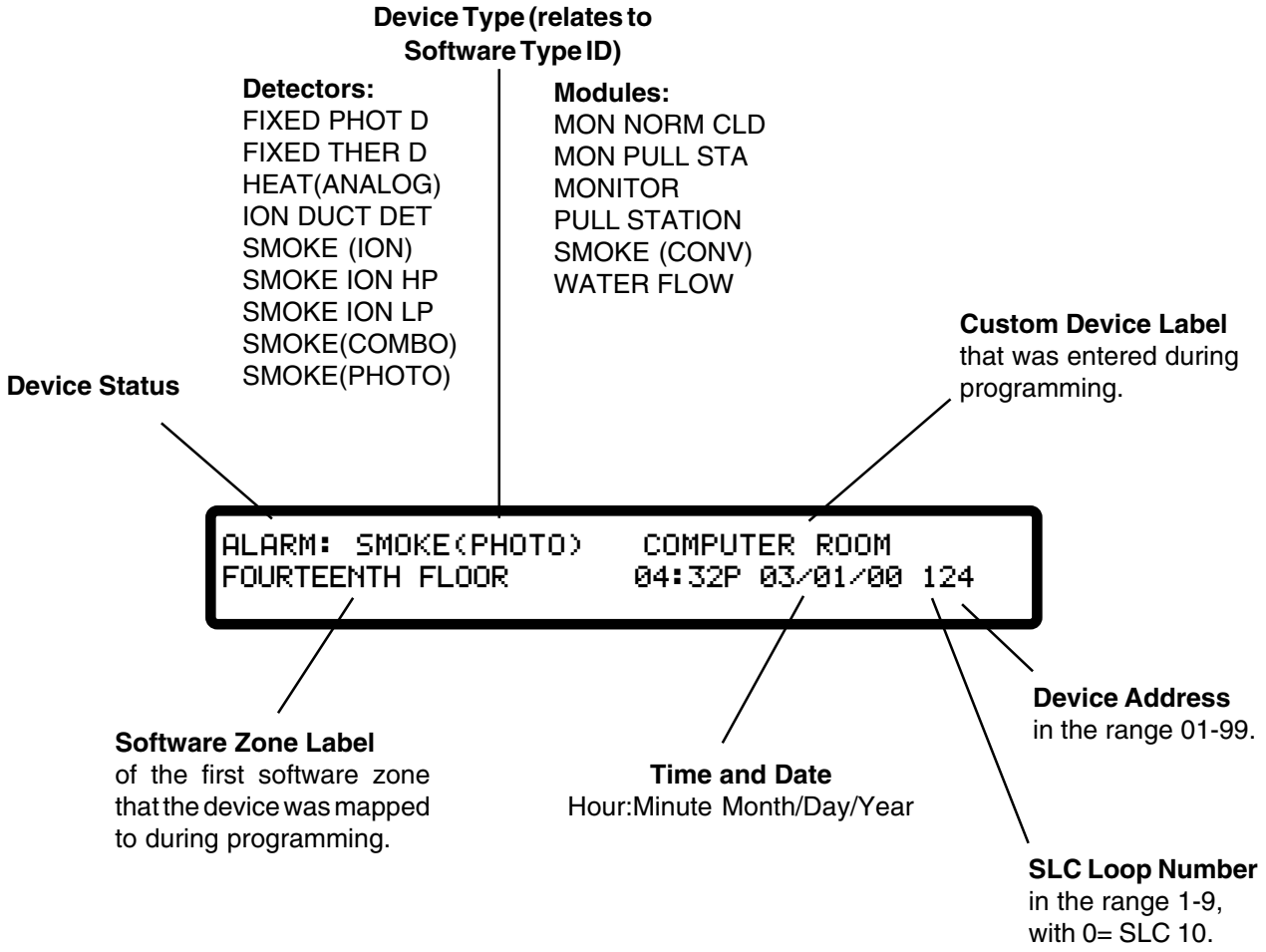


Figure 3-2 AM2020/AFP1010 Special Function History File Printout

Section Four
Fire Alarms

The following example illustrates the system format used to display fire alarm conditions:



NOTE

The piezo sounder will pulse for fire alarm conditions.

Section 4.1 Acknowledging a Fire Alarm

To acknowledge a fire alarm condition at the panel:

Push **ACK STEP** and the **ALARM:** device status will change to **ACK AL** (*Acknowledged Fire Alarm).*

When the fire alarm condition clears (either automatically in the case of devices programmed for *Tracking*, or by depression of the *SYSTEM RESET* key), the panel will display **CLR AL** and the piezo will resound. To acknowledge the clearing of a fire alarm:

Push **ACK STEP** and the **CLR AL** status will change to **ACL AL** *(Acknowledged Clear Fire Alarm).*

When multiple events have occurred, the system will display the first event that occurred (with the exception that the first fire alarm will always override any previous trouble). When the **ACK STEP** key is pushed, the operator will have acknowledged the highest priority event, *not necessarily the event that is being displayed* on the CRT Monitor and DIA. The acknowledged message for the first prioritized event will be displayed for several seconds, followed by display of the next priority unacknowledged event.

NOTES

- The piezo sounder will be silenced only after all events have been acknowledged.
- Security alarms are treated like fire trouble conditions in the AM2020/AFP1010.
- Reset the system using the System Reset Key after all alarms have been investigated and subsequently cleared.
- Alarm signals from devices not selected for tracking need a system reset in order to clear.

For an AM2020/AFP1010 panel on the **NOTI•FIRE•NET** system, acknowledgment of any event may be accomplished from the local fire alarm panel, intelligent network annunciator (INA), or network reporting terminal (NRT). Acknowledging alarms and events from any of these locations automatically provides acknowledgment at all locations. Fire alarm signals are acknowledged individually at the local fire alarm panel, NRT, or INA. If the same event on the same point occurs on multiple nodes, the event on the node with the lowest node address has the highest priority. For more information on priorities and acknowledging events on the **NOTI•FIRE•NET** system, refer to the INA Manual, Document 15092, or the NRT Manual, Document 15090.

Section Five
Troubles

Section 5.1 Trouble ..... with SLC Loop Devices

The following example illustrates the format used to display device trouble conditions:

Device Type (relates to Software Type ID):

Detectors:
FIXED PHOT D
FIXED THER D
HEAT(ANALOG)
ION DUCT DET
SMOKE (ION)
SMOKE ION HP
SMOKE ION LP
SMOKE(COMBO)
SMOKE(PHOTO)

Modules:
ACCESS MONTR
ALARMS PEND
AREA MONITOR
CMX CONTROL
CMX FORM C
CONTROL
DACT CONNECT
EQUIP MONITR
FORMC MANUAL
FORM C RELAY
GENERAL PEND
GN ALARM
GN ALARM EVC
GN ALARM FORC
GN SUPR FORC
GN TRBL FORC
GN WAT FORC
GN WATER FLW
MON NORM CLD
MON PULL STA
MONITOR
MONITOR PAGE
NON ALARM
NON ALM MON
PAGE
POWER (CONV)
PULL STATION
SMOKE (CONV)
SPEAKER
SPRNKLR MNTR
SPRVSRY MNTR
SYSTEM MONTR
TELEPHONE
TRBL MONITOR
TRBLS PEND
TROUBLE
TROUBLE FORC
WATER FLOW

Device Status

Custom Device Label
that was entered during programming.

Software Zone
The first zone that the device was mapped to during programming.

Time and Date
Hour:Minute Month/Day/Year

Device Address
in the range 01-99.

SLC Loop Number
in the range 1-9, with 0=Loop 10.

Type of Trouble:

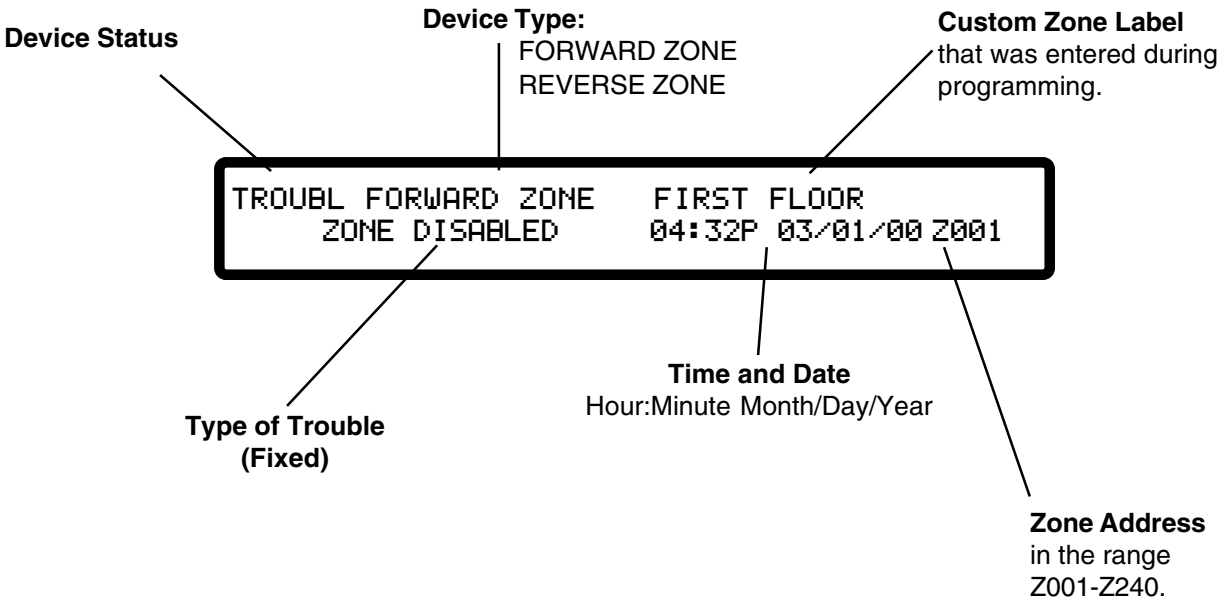
For Detectors:
DET FAILED TEST
DEVICE DISABLED
DRIFT TOLERANCE
INVALID REPLY
LOW CHAMBER VAL
MAINTENANCE REQ
PRE-ALARM ALERT
VER COUNT OVFLW

For Modules:
DEVICE DISABLED
INVALID REPLY
OPEN CIRCUIT
POINT TROUBLE
SECURITY ALARM
SECURITY ALERT
SECURITY NO COM
SECURITY TAMPER
SHORT CIRCUIT
SPRNKLR TROUBLE
SUPRVSRY SIGNAL

NOTE
The piezo sounder will sound steadily for unacknowledged trouble conditions.

Section 5.2 Trouble ..... with Disabled Zones

The following example illustrates the format used to display disabled zone trouble conditions:

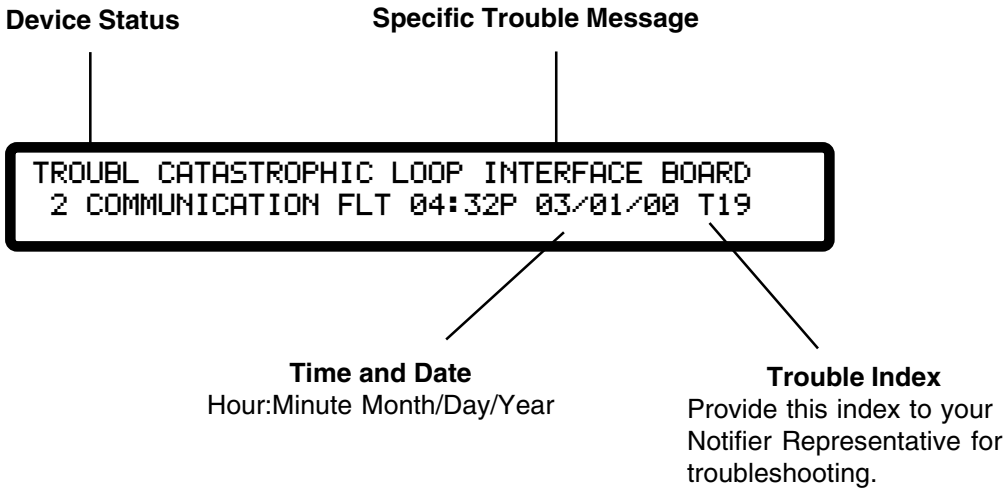


NOTE

The piezo sounder will sound steadily for unacknowledged trouble conditions.

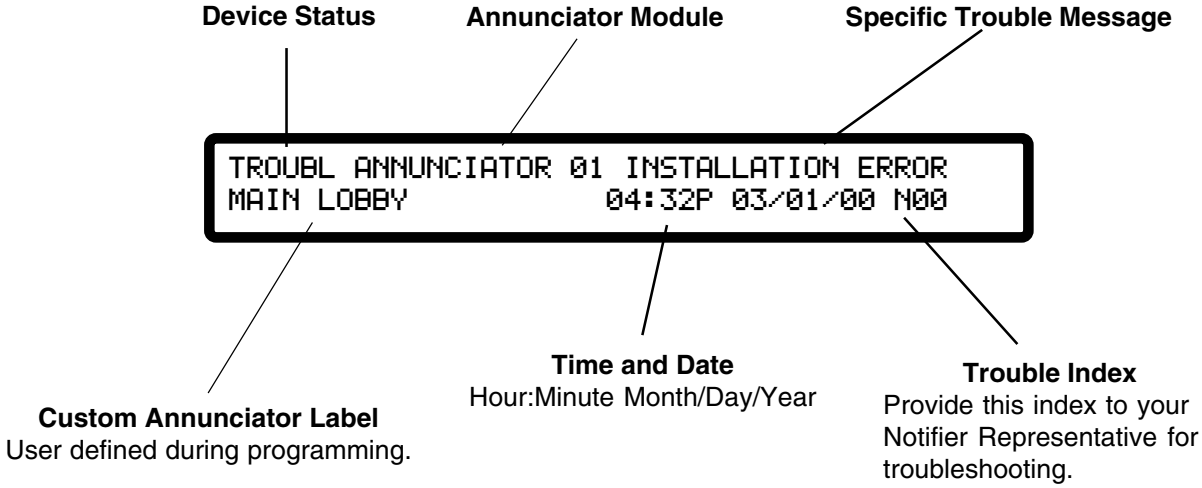
Section 5.3 Trouble .....with the AM2020/AFP1010 System

The following example illustrates the format used to display system trouble conditions. For an explanation of some trouble messages, refer to Section Seven.



Section 5.4 Trouble .....with the Annunciators

The following example illustrates the format used to display trouble conditions with the Annunciator Control System modules. For an explanation of some trouble messages, refer to Section Seven.



NOTE

The piezo sounder will sound steadily for unacknowledged trouble conditions.

Section 5.5 Block Acknowledge

The function of block acknowledge gives the user the ability to acknowledge multiple trouble conditions with a single depression of the ACK STEP key. The AM2020/AFP1010 block acknowledge function is normally enabled. With block acknowledge enabled, the AM2020/AFP1010 will function as follows:

- Fire Alarm conditions including clears (tracking devices only) must be acknowledged individually as described on the preceding pages. Fire Alarm conditions restored by depression of the system reset key do not require acknowledgment.
- All current unacknowledged conditions must be processed by the system before block acknowledge is executed (events will be acknowledged individually until then).
- No acknowledged event messages are recorded for individual troubles once the block acknowledge message has been displayed.
- Trouble clears will be recorded for individual troubles that have not been initiated by a system reset.
- Trouble clears no longer have to be acknowledged.
- Troubles may come and go without being acknowledged.
- Upon completion of block acknowledge the AM2020/AFP1010 will enter its display acknowledged events mode of operation (see displaying current alarms and troubles section).

To disable the block acknowledge function, refer to the local parameters NFPA programming section in Chapter Three of this manual. If the AM2020/AFP1010 block acknowledge function is disabled, the AM2020/AFP1010 will process alarm and trouble conditions in Receiving Unit Mode as described on the preceding and following pages respectively. See caution note below for restrictions.

Push **ACK STEP** to execute block acknowledge. The following message will appear:

CAUTION

For an AM2020/AFP1010 connected to a **NOTI•FIRE•NET** system which also includes an NRT or an AFP-200 panel, receiving mode is not supported and block acknowledge should be enabled. Enabling receiving mode in this situation will prevent the panel from functioning properly and alarms will not be acknowledged. A **NOTI•FIRE•NET** system is not listed for proprietary receiving unit operation.

If no NRT or AFP-200 is present on the network, the AM2020/AFP1010 may be configured for receiving mode or block acknowledge, provided that all other nodes (INAs, AM2020/AFP1010s) on the system are configured in the same manner.

Section 5.5A Acknowledging Troubles in Receiving Unit Mode *(Block Acknowledge Disabled)*

The receiving unit mode of operation is required for all NFPA proprietary supervising station and central station receiving units.

To acknowledge a device, zone, system or annunciator module trouble condition:

Push **ACK STEP** and the **TROUBL** status will change to **ACK TB** *(Acknowledged Trouble).*

When the trouble condition clears, the panel will display **CLR TB** and the piezo will sound again. To acknowledge the clearing of a trouble condition:

Push **ACK STEP** and the **CLR TB** status will change to **ACL TB** *(Acknowledged Clear Trouble).*

When multiple events have occurred, the AM2020/AFP1010 will display the first event that occurred (with the exception that the first fire alarm will always override any previous trouble). When the **ACK STEP** key is pushed, the operator will have acknowledged the highest priority event, *not necessarily the event that is being displayed* on the CRT Monitor and DIA. The acknowledged message for the first prioritized event will be displayed for several seconds, followed by display of the next priority unacknowledged event.

NOTE

The piezo sounder will be silenced only after all events have been acknowledged.

Section 5.6 Displaying Current Alarms and Troubles

To display alarms and troubles that have been acknowledged but not cleared:

Push **ACK STEP** and the next event in AM2020/AFP1010 memory will be displayed on the LCD. All events in memory can be reviewed by repeated depression of the *ACK STEP* key.

Section Six
Remote Peripherals

The AM2020/AFP1010 will support the installation of optional remote Video Display Terminals and printers.

The CRT Terminal
The CRT displays all system information. The CRT can also display system reports if printer reports are redirected to the CRT during programming. The CRT is provided with a keyboard that can be used to program the AM2020/AFP1010.

Local Applications
Since the system function/control keys (acknowledge, signal silence, and reset) on the CRT keyboard are not key lock or password protected against unauthorized use, in order to comply with the UL listing and the NFPA standards, the keyboard may not be connected to the CRT, with the following exceptions:

- during programming and maintenance of the system
- if the system is operated in compliance with the NFPA 72 Proprietary Protective Signaling System configuration and the AM2020/AFP1010 panel is the Primary Supervising Station
- if the modem selection is enabled in System Programming

Refer to the TPI-232 Manual for additional CRT-2 options.

Receiving Unit Applications
If employed under NFPA 72 Proprietary Fire Alarm System (Receiving Unit) applications, the keyboard cannot be removed or locked up. The keyboard must remain connected and operationally functional in the system.

The Printer
The printer can be used to provide a permanent record of all system events. Alarms, troubles, and acknowledgments are recorded as they occur in the system. In addition, the printer can be used to print out status information and system reports.

Section Seven
Trouble Messages

Many of the AM2020/AFP1010 device, zone, system and annunciator trouble messages are self-explanatory. Those messages needing further clarification are listed below. If the system is displaying a message that is not self-explanatory and is not listed here, refer to the AM2020/AFP1010 Trouble-shooting Guide (Document 50432) and/or contact your Notifier distributor. .

CAT. COMM. FAULT
Catastrophic communications failure - the annunciator associated with this message is no longer functioning. The connection may be broken.

CAT. FAIL. INCOMPATIBLE SOFTWARE
OR INVALID CBE
The panel is operating under an earlier version of software after newer software features have been programmed into the system. Contact the factory to establish valid software compatibility. Complete reprogramming of system CBE equations may be required.

CATASTROPHIC LOOP INTERFACE BOARD
"X" COMMUNICATION FLT
Communication has failed between the AM2020/AFP1010 and the LIB Board specified in the "X" field of the message. This failure may be due to several reasons: the LIB Board has failed electronically; the LIB Board is programmed but not installed in the system; the LIB Board is installed but is not programmed into the system; or a poor connection has been made between the CPU and the LIB Board.

COMMUNICATION LINK FAILURE IN PORT A*
Data is not being received on network (MIB) Port A. This trouble is only reported if the node is configured for dual port monitoring.

COMMUNICATION LINK FAILURE IN PORT B*
Data is not being received on network (MIB) Port B. This trouble is only reported if the node is configured for dual port monitoring.

DET FAILED TEST
This detector failed its periodic detector test. The periodic detector test verifies the alarm operation of the detector. This trouble will also be generated when non NOTIFIER devices are detected on the SLC. The detector should be removed and replaced by an authorized service representative.

DRIFT TOLERANCE
This detector's drift compensation value is outside the allowable range. This detector can no longer be compensated and should be replaced.

EXPANDER MODULES
The number of annunciator expander modules for this annunciator is less than the number indicated by its DIP switch settings.

EXT EQP ANN "XX" OR AUDIO/TELEPHON
External equipment connected to the trouble contacts of an annunciator, AMG or FFT-7 has failed.

INSTALL. ERROR
Installation error with an Annunciator Control System module. An annunciator has been physically installed in an AM2020/AFP1010 system, but has not been programmed; or has been programmed, but not installed.

INVALID REPLY
The AM2020/AFP1010 has received either no response or an invalid response from an addressable LIB SLC Loop device. Confirm that the LIB SLC Loop is connected properly to the device and that the device address has been set correctly.

LAN COMMUNICATION FAILURE*
The specific network node (panel) can no longer communicate with the rest of the network, indicating a problem with the network connections.

LOW CHAMBER VAL
The chamber value of the detector is too low for operation. This indicates a malfunction in the detector. The detector must be removed and replaced by an authorized service representative.

MAINTENANCE REQ
The chamber value of the detector has exceeded 80 percent of the Alarm Threshold (determined by the sensitivity selection of Low, Medium, or High), and has remained there for at least a 26-hour period. This condition may be due to a dirty detector. The detector should be inspected and cleaned as necessary by an authorized service representative. Failure to do so may eventually result in false alarms.

MANUAL CONTROL
This annunciator is being controlled manually.

PRE-ALARM ALERT
The chamber value of the detector has exceeded 80% of the alarm threshold (determined by the sensitivity selection of Low, Medium or High), and has remained there for at least a 60-second period. This condition may be due to a dirty detector. The detector should be inspected and cleaned as necessary by an authorized service representative. Failure to do so may eventually result in false alarms.

POINT TROUBLE
A monitor module dedicated to monitoring trouble conditions has been activated.

SECURITY ALARM
A security device programmed as SARM has been activated indicating a burglary or security violation. This condition should be checked immediately.

SECURITY ALERT
A security device programmed as SACM has been activated indicating that a monitored event has occurred.

SECURITY TAMPER
A security device programmed as SSYM or SEQM has been activated indicating that monitored equipment has been tampered with. This condition should be checked immediately for a SSYM device because it may be due to a burglary or security violation.

SECURITY NO COM
The AM2020/AFP1010 has received either no response or an invalid response from an addressable SLC loop device programmed for security operation. This may be the result of a burglary, other security violation, the failure of a device, an improperly addressed device, or failure of the field wiring.

SPRNKLR TROUBLE
A supervisory condition that indicates sprinkler equipment supervised by a monitor module is in an abnormal state (i.e. a sprinkler valve has been closed). Note that a break in the wiring of a supervisory circuit is a trouble condition that yields OPEN CIRCUIT, not SPRNKLR TROUBLE.

SUPRVSRY SIGNAL
A supervisory condition that indicates equipment supervised by a monitor module is in an abnormal state (i.e. low pressure indication). Note that a break in the wiring of a supervisory circuit is a trouble condition that yields OPEN CIRCUIT, not SUPRVSRY SIGNAL.

VER COUNT OVFLW
This detector has exceeded the allowed detector verification limit. This condition may be due to a dirty detector. The detector should be inspected and cleaned as necessary by an authorized service representative. Failure to do so may eventually result in false alarms.

* **NOTI•FIRE•NET**-specific trouble messages

Section Eight
Drift Compensation

Drift Compensation
AM2020/AFP1010 software is designed to automatically compensate for chamber sensitivity drift due to detector contamination in SDX-551/751 photo detectors and CPX-551/751 ion detectors. This software-based compensation meets NFPA 72, Chapter 7 "Inspection, Testing, and Maintenance" periodic sensitivity testing and maintenance requirements without removing and testing each smoke detector in an installed system. This does not eliminate the need for visual inspection or testing for smoke entry.

Alarm sensitivity in a detector chamber tends to increase over time. This increase is caused by chamber contamination. In time, if the clean air level exceeds the alarm threshold a false alarm occurs. Drift compensation eliminates this problem by increasing the alarm threshold as needed to maintain constant sensitivity. When the detector is too dirty to compensate, a trouble is indicated automatically.

No additional programming is required for drift compensation. Every detector has three sensitivity levels: low, medium, and high. These levels assign specific "percent obscuration per foot" values for each device.

	Low Sensitivity (% obscuration per foot)	**Medium Sensitivity** (% obscuration per foot)	**High Sensitivity** (% obscuration per foot)
Photo Detector	2.0	1.5	1.0
Ion Detector	3.0	1.5	1.0
IPX-751	2.9 - 3.6%	2.2 - 2.9%	0.8 - 1.5%
FAPT-751	2 - 4%	2 - 4%	1 - 2%

Drift compensation is executed when:

- The system powers up.
- A non-communication INVALID REPLY clears.
- Every 120 hours based on at least four samples.

Whenever a detector is replaced, an immediate compensation must be forced. The installer should remove the existing detector, wait for at least three minutes, and then install the new detector.

After servicing a system containing drift compensation software, some detectors may cause a drift compensation trouble indication within 15 minutes after reapplication of power. These detectors may have undergone several drift sensitivity adjustments in the past and may not be properly compensated during power up compensation. A second compensation may be required before the trouble condition clears. This second compensation will be completed automatically after 120 hours. If a trouble condition for a detector still exists after a second compensation, clean and/or replace it.

If power has not been removed and reapplied recently and drift compensation trouble is indicated for a particular device, clean and/or replace the detector immediately.

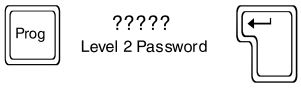
AM2020
AFP1010

Chapter Three
Programming

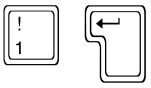
Introduction

This chapter covers the programming options of the AM2020/AFP1010 Combination Fire/Security Protective Signaling System and the features available to the operator. This chapter is presented through the perspective of the CRT-2 Monitor. The prompts are displayed on the CRT screen in the order that they appear (top to bottom) on the pages that follow. For programming the control panel from the built-in keypad, an overview of the panel's Display Interface Assembly (DIA-2020 or DIA-1010) is illustrated in Chapter Two, Operation. Installation information for the CRT is located in Chapter 1.

Menus
At the top of each sub-menu in this programming guide, a string of keys are displayed to illustrate the sequence of keys needed to reach a particular menu. For example:

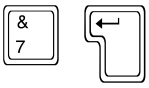


Select Programming Mode



Select Partial Point Programming

OR



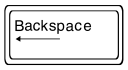
Select MESSAGE option to change Custom User Label.

Passwords
Access to keypad or menu levels one and two require entry of specific passwords. These levels allow an authorized programmer to initialize or alter the programming of the AM2020/AFP1010. Level One and Level Two entry requirements are defined as follows:

Alter Status _____ Level One password required.
Programming _____ Level Two password required.

If the main operator of the system requires access to a function which is password protected, contact the distributor who installed the system for the required password(s). The AM2020 and AFP1010 are shipped with initial Level One and Level Two passwords of five zeroes (00000).

NOTE
Unacknowledged points must be acknowledged prior to being reprogrammed.

Backspace key 

The Backspace key serves several purposes. At a menu prompt, the Backspace key aborts the selection of that option:

```
ENTER 40 CHARACTER USER LABEL:
```

When entering data, the Backspace key erases the last character or digit entered:

```
ENTER 40 CHARACTER USER LABEL: NOTIFIER
```

At certain points during operator or programming functions, the Backspace key aborts all the data just entered. For instance, during Full Point Programming, a particular point must be fully programmed before the control panel can use the information. If the Backspace key is pressed at a prompt (:) before all parameters (i.e. address, Type ID, equation, etc.) for that point are entered into the control panel, then all previous entries for that point will be ignored.

About Transponder Rapid All-Call
When the All Call button is pressed on an AMG connected to an AM2020/AFP1010 panel, an All Call activation signal is received by the panel. Upon receipt of the All Call signal, the AM2020/AFP1010 panel will immediately activate all specially programmed XP Transponder "SPKR" (programmed Software Type ID) circuits. Programming is performed in the XP Transponder using the XRAM-1 (see XP Transponder System Manual).

About SIB-NET

The SIB-2048A and SIB-NET serial communications boards are available for use on the AM2020/AFP1010 system (see Chapter One). For the AM2020/AFP1010 with **NOTI•FIRE•NET™** system, only the SIB-NET may be used. If a SIB-NET board is not installed, specific **NOTI•FIRE•NET** functions can not be programmed or viewed under Read Status.

NOTES

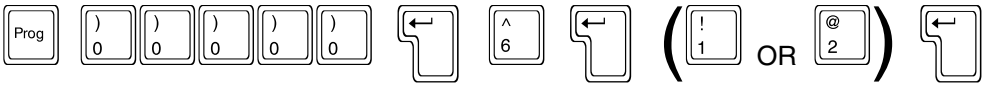
When a Network Reporting Terminal (NRT) is present on the **NOTI•FIRE•NET**, programming and read status operations should always be performed from the NRT . If an INA is present on the **NOTI•FIRE•NET** and no NRT is employed, programming and read status operations should be performed from the INA. Never attempt to perform programming or read status operations from the local panel when the same operations are being performed from the NRT or INA. For more information on performing read status operations on the NRT or INA, refer to the NRT manual, Document 15090 and the INA manual, Document 15092.

When changing system programming on **NOTI•FIRE•NET**, it may be necessary to power down the control panel to synchronize the network.

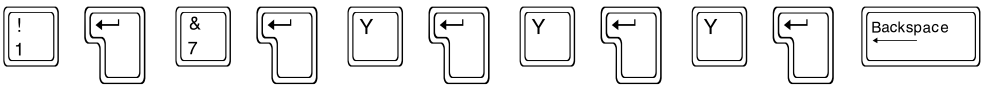
The Initial Programming Outline

For initial programming of the AM2020 or AFP1010, or for major changes and additions, the following basic procedure is recommended to prevent errors resulting in reprogramming and wasted time.

- Make copies of the Program Work Sheets (contained in the Glossary) in the back of this manual.
- Use these Work Sheets to record the exact information for every detector, module, annunciator point and software zone in the system. Pay special attention to the Software Type IDs listed in Section Three. For voice systems, pay close attention to AMG annunciator point commands as described in Voice Alarm Multiplex-2020 manual.
- If a CRT is to be used, configure it as described in Chapter 1.
- Assemble and apply power to the control panel as described in the Installation Chapter (also the VAM-2020 manual, if appropriate). All system boards (including all LIBs) *must be physically installed*.
- The Level 1 and Level 2 passwords can be changed. The AM2020/AFP1010 is delivered from the factory with passwords of 00000. Write down or memorize your passwords! To change the passwords, enter the following:



- If the control panel is to be programmed before installation of LIB SLC Loop devices, the panel will exit programming and sound the piezo when each programmed device is not detected. To avoid the piezo from sounding, use the following key sequence (after entering the password):



  When the first device has been programmed into the system, the control panel will report a trouble condition and will exit programming mode. *Important: Do not acknowledge this trouble*. Reenter programming mode and the control panel will no longer exit programming or sound the piezo for subsequent trouble conditions. (When programming is complete, remember to enable the piezo sounder for normal system operation.)

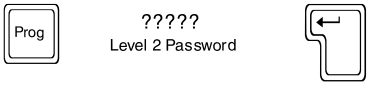
- For initial system programming, read Full System Programming and answer all the questions in that section before entering programming mode. Then, enter Full System Programming and load all the answers into the control panel.
- Enter Full Point Programming. Use the work sheets developed in the second step of this outline and enter information on all points in the system. Program points in the following order:

  1) Annunciator Points 2) Zones 3) Detector Points 4) Module Points

- When devising Control-By-Event equations for a particular device, remember that the label of the first software zone in the equation will appear on the panel display, along with the label of the device, when an alarm condition occurs. See *Label* option in *Partial Point Programming* section for more information.
- Enter the System Message.
- Install all devices and thoroughly test the entire system. The Walk Test feature can be used to test devices and their programming.
- Make a hard-copy record of the program on the printer.
- If desired, upload the program to store on an external device (computer hard drive or floppy), see *Intelligent Serial Interface Board Programming*.

Section One
Main Programming

The Programming Mode is accessed by entering the following (level 2 password required):



After entering the Programming Mode, the display will show the Main Programming menu:

```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                    :
```

The Main Programming menu has eight options, where:

1=PSYS **Partial System Programming** - Selective programming of system-wide functions (number of LIBs, AVPS-24/AVPS-24E*, ISIB, Signal-Silence Inhibit and Cut-out, Alarm Verification, number of annunciator modules, etc.).

2=FSYS **Full System Programming** - Complete programming of system-wide functions (number of LIBs, AVPS-24/AVPS-24E*, ISIB, Signal-Silence Inhibit and Cutout, Alarm Verification, number of annunciator modules, etc.).

3=PPRG **Partial Point Programming** - Selectively altering the operating parameters of LIB SLC Loop devices, software-defined zones and annunciator points.

4=FPRG **Full Point Programming** - Complete programming of addressable LIB SLC Loop devices, software-defined zones, annunciator points and their respective operating parameters.

5=REMV **Remove** - Permits the selective removal (from control panel memory) of any of the system's addressable SLC Loop devices, software-defined zones or annunciator points.

6=PSWD **Password** - Allows the programmer to assign custom five-digit Level One and Level Two passwords.

7=MSG **Message** - Allows the Level Two programmer to define the custom 40-Character User Label displayed on the CRT Monitor and the panel's Liquid Crystal Display (LCD).

8=HIS **History** - Allows the programmer to enable or disable storage of events and the clearing of stored events.

* The number of APS-6R power supplies should be included in the AVPS count.

The Main Programming Menu flow chart is located in **Figure 1-1**. Detailed information on the Main Programming options follows.

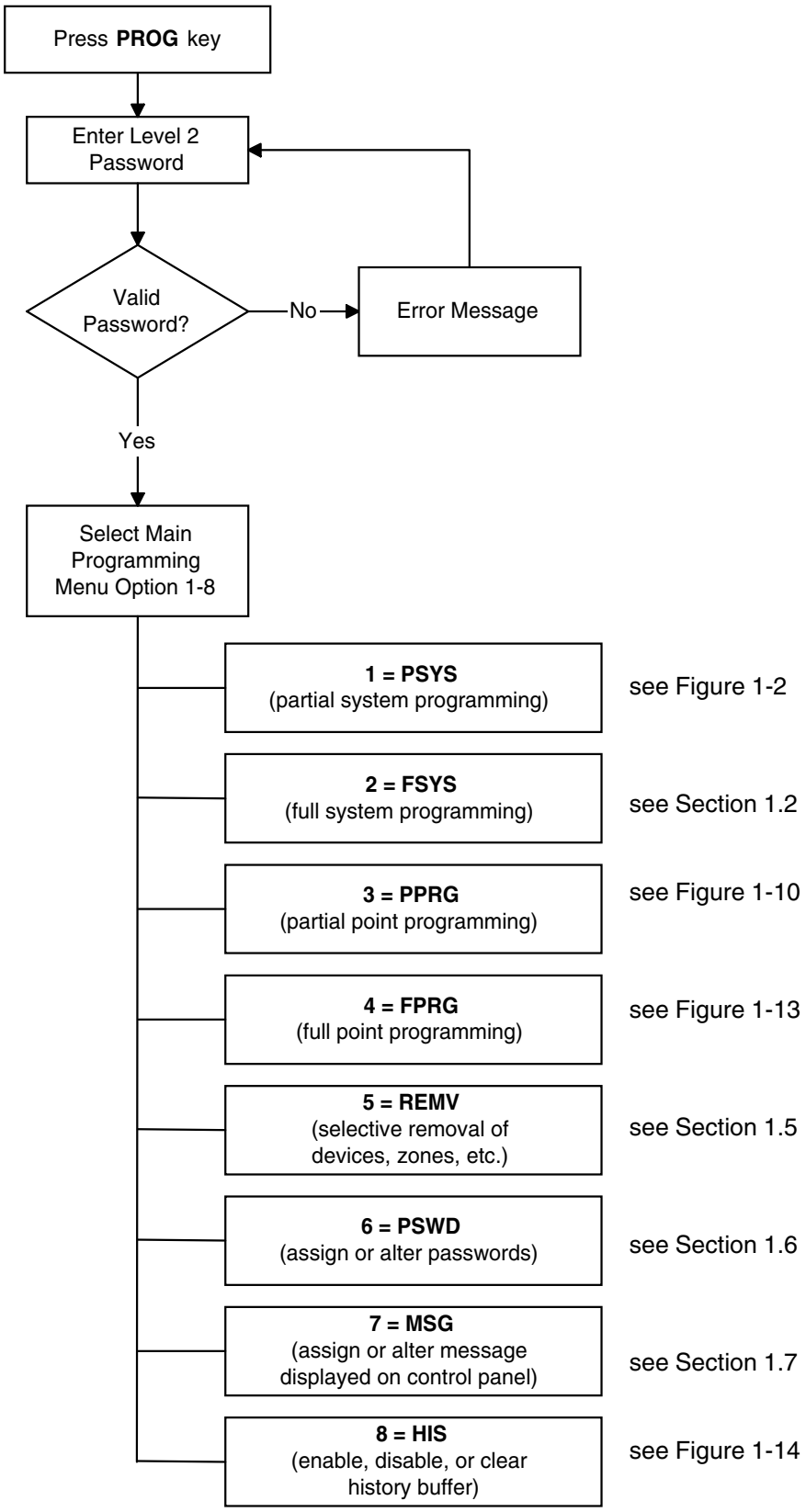
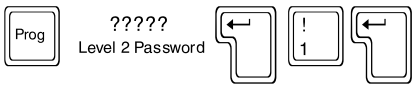


Figure 1-1 Main Programming Menu Flow Chart

Section 1.1 Partial System Programming



1=PSYS

Option 1 from the Main Programming menu allows the programmer to change the programming of system-wide functions such as Alarm Verification of detectors, Signal-Silence Inhibit, Signal Cut-out, disabling the piezo sounder, enabling Rapid Polling, and enabling supervision of peripheral equipment in the system. Additional system parameters, such as the number of APS-6R, LIBs, Annunciators and ISIB in the system. The LIB SLC Loops can also be changed in Partial System Programming.

After selecting option 1 from the Main Programming menu, the display will show the Partial System Programming submenu:

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          :
```

NOTE: Submenu option 4 includes APS-6R as well as AVPS power supplies.

The Partial System Programming submenu has nine options, where:

1=INST **Installation -** Installation or removal of the Loop Interface Boards from memory.

2=STY **Style -** Changing (in memory) the NFPA style of the SLC Loops.

3=TDLY **Time Delays -** Setting the time delays for Alarm Verification, Signal-Silence Inhibit, and Signal Cut-Out.

4=AVPS **Audio/Visual Power Supplies -** Telling the AM2020/AFP1010 how many Audio/Visual Power Supplies and APS-6R Auxiliary Power Supplies are installed in the system.

5=ZBND **Zone Boundary -** Setting the zone boundary for the software memory map.

6=EXTEQ **External Equipment -** Changing the external equipment options, such as electrical supervision of the CRT Monitor.

7=LOCP **Local Parameters -** Setting local parameters, such as enabling or disabling the piezo sounder during point programming of SLC Loop devices, LIB Local Mode and NFPA programming.

8=ISIB **Intelligent Serial Interface Board -** Installation or removal of the Intelligent Serial Interface Board (SIB-2048A or SIB-NET) or annunciator modules (see Chapter One, *Serial Communications*, for a description of annunciator modules). Also used to enable the external interface for upload/download, and Universal Digital Alarm Communicator Transmitter selection.

9=PARM **Additional System Parameters -** Selection of additional system parameters such as the detector day/night sensitivity settings, rapid polling, etc.

The Partial System Programming Menu flow chart is located in **Figure 1-2**. Detailed information on the Partial System Programming options follows.

NOTES

When removing loop interface boards, all installed points on the affected LIBs are automatically removed upon cycling power to the system. Programming information for installed points can be stored in a VeriFire™ database prior to removal of the LIB. Use of the VeriFire™ application for the reprogramming of previously removed points is highly recommended.

When removing annunciator modules, all installed points on the affected annunciators must be removed first for proper system operation.

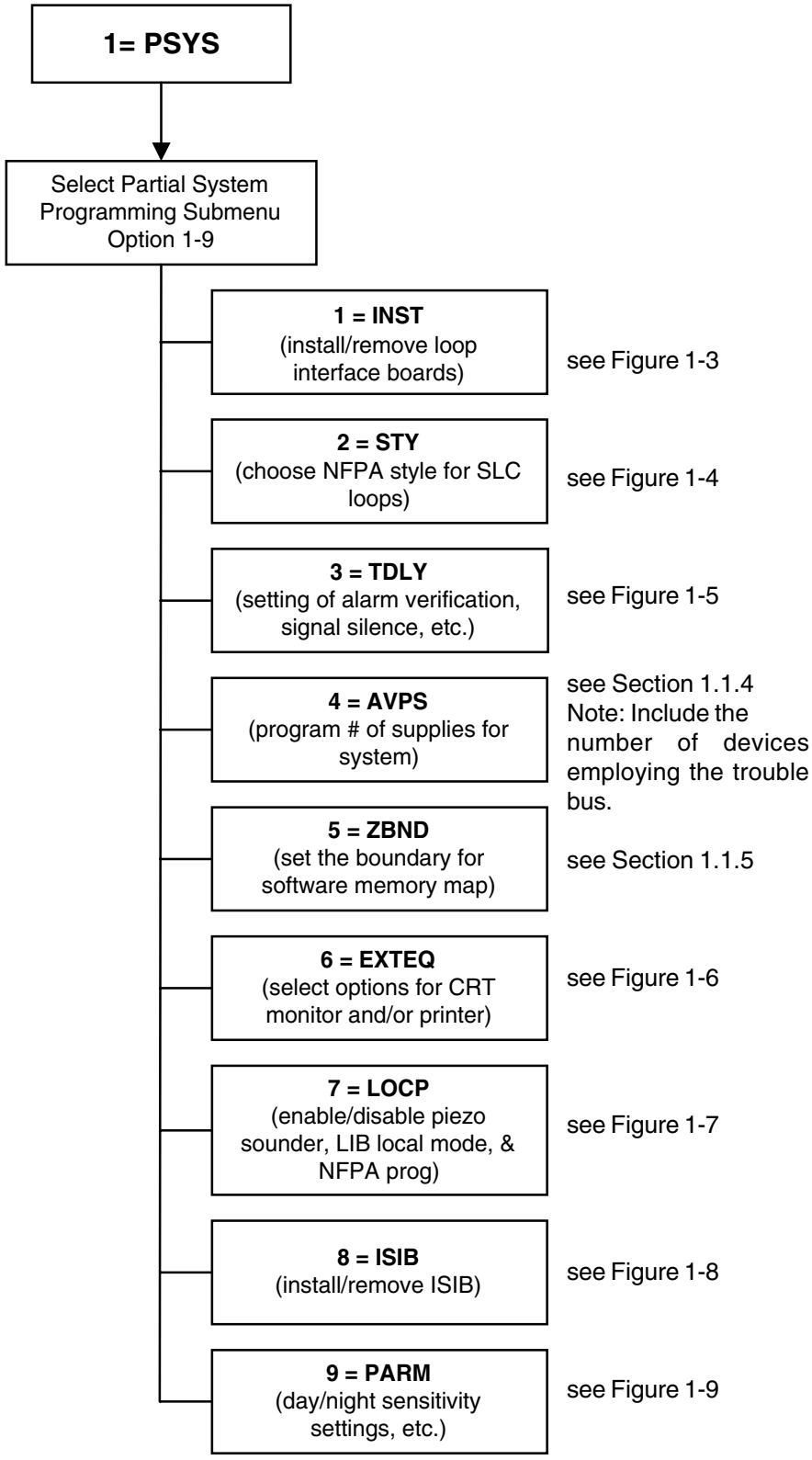
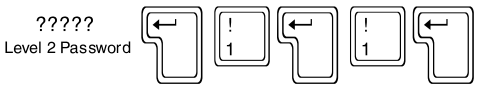


Figure 1-2 Partial System Programming Submenu Flow Chart

Section 1.1.1 LIB Installation



1=INST

Option 1 from the Partial System Programming submenu allows the installation or removal of LIB SLC Loops from memory. The LIB boards must still be physically installed or removed from the system to prevent a system trouble condition. The Installation Option flow chart is located in Figure 1-3.

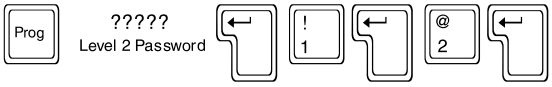
> The AM2020 is capable of a maximum of ten LIB Signaling Line Circuits (1980 devices total in the system).
> The AFP1010 is capable of a maximum of four LIB Signaling Line Circuits (792 devices total in the system).

The following programming example illustrates the installation of Loop Interface Board number 3.

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          : 1
ENTER THE LIB BOARD NUMBER TO CHANGE (1 - 10)                               : 3
IS LIB BOARD 03 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)                     : Y
ENTER THE STYLE OF SLC LOOP 03 (6 OR 4)                                     : 6
DO YOU WANT TO CHANGE ANOTHER LIB BOARD? (Y=YES,N=NO)                       : N
PROGRAMMING COMPLETE  -  POWER DOWN TO MAKE APPROPRIATE CHANGES
```

Refer to Chapter One of this manual for information on LIB-400 and its correct slot address. See notes in Section 1.1, Partial System Programming.

Section 1.1.2 LIB SLC Loop Style



2=STY

Option 2 from the Partial System Programming submenu allows the programmer to change in AM2020/ AFP1010 memory the NFPA style for the Signaling Line Circuit (SLC) connected to each LIB. The SLC must still be field wired in accordance with the style set in memory (Chapter One-Installation). The Style Option flow chart is located in Figure 1-4.

The following programming example illustrates setting SLC Loop number 5 as an NFPA Style 6 circuit. The CRT screen prompts are displayed in the priority that they appear (top to bottom).

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          : 2
ENTER THE SLC LOOP NUMBER TO CHANGE (1 - 10)                                : 5
ENTER THE STYLE OF SLC LOOP 05 (6 OR 4)                                     : 6
DO YOU WANT TO CHANGE ANOTHER SLC LOOP? (Y=YES,N=NO)                        : N
```

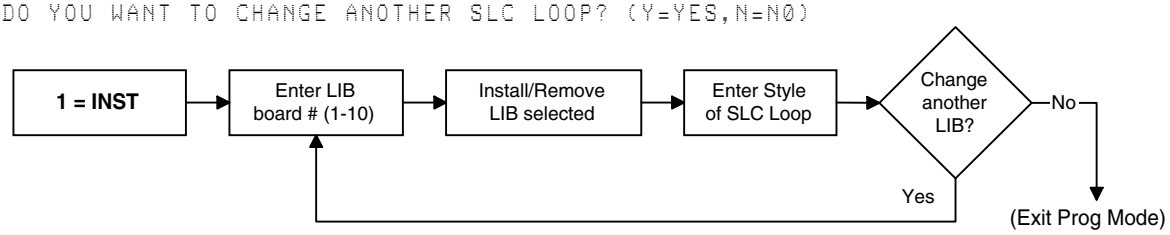


Figure 1-3 Install Option Flow Chart

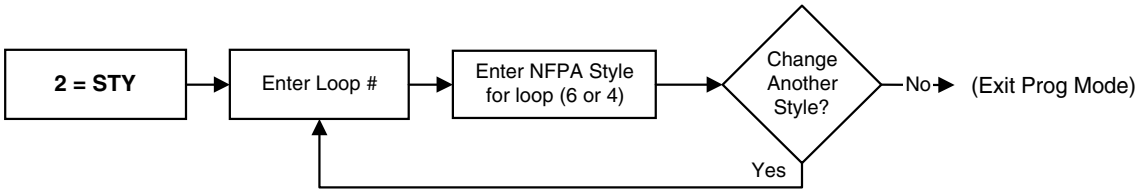
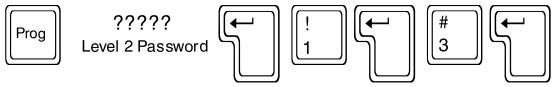


Figure 1-4 Style Option Flow Chart

Section 1.1.3 Time Delays



3=TDLY

Option 3 from the Partial System Programming submenu allows the programmer to enable/disable Alarm Verification of detectors, Signal-Silence Inhibit and Signal Cut-out for control modules, as well as setting the appropriate time delays for these functions. For a full description of these functions, see the *Glossary of Terms and Abbreviations* at the end of this manual.

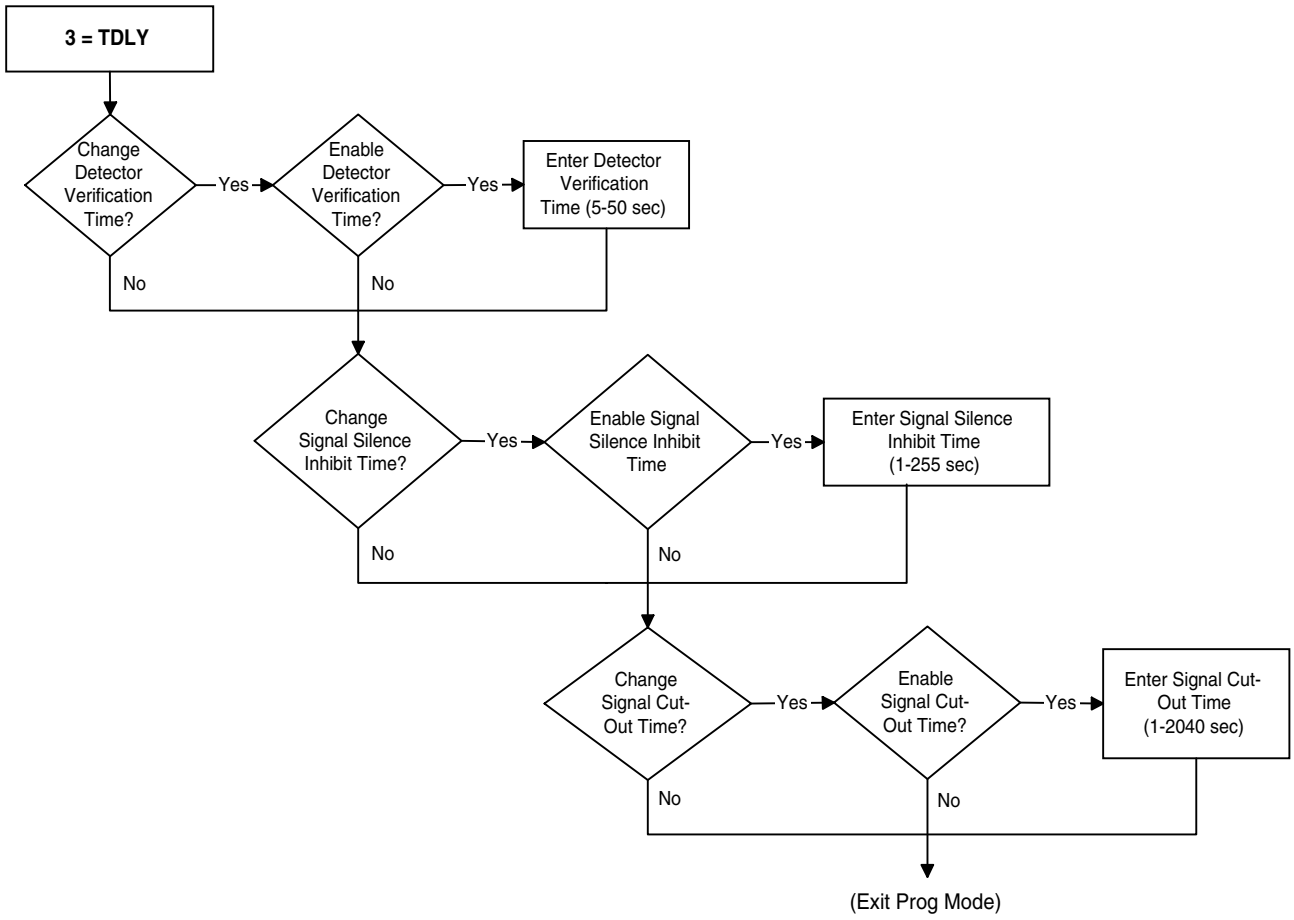


Figure 1-5 Time Delay Option Flow Chart

The following programming example illustrates enabling all three functions:

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          : 3
DO YOU WANT TO CHANGE THE DETECTOR VERIFICATION TIME? (Y=YES,N=NO)            : Y
DO YOU WANT THE DETECTOR VERIFICATION TIME ENABLED? (Y=YES,N=NO)              : Y
ENTER THE DETECTOR VERIFICATION TIME (5 - 50 IN 1 SECOND INCREMENTS)        : 35
DO YOU WANT TO CHANGE THE SIGNAL SILENCE INHIBIT TIME? (Y=YES,N=NO)           : Y
DO YOU WANT THE SIGNAL SILENCE INHIBIT TIME ENABLED? (Y=YES,N=NO)             : Y
ENTER THE SIGNAL SILENCE INHIBIT TIME (1 - 255 IN 1 SECOND INCREMENTS)      : 240
DO YOU WANT TO CHANGE THE SIGNAL CUT-OUT TIME? (Y=YES,N=NO)                   : Y
DO YOU WANT THE SIGNAL CUT-OUT TIME ENABLED? (Y=YES,N=NO)                     : Y
ENTER THE SIGNAL CUT-OUT TIME (1 - 2040 IN 1 SECOND INCREMENTS)             : 600
```

General Considerations
The capability of the control panel to provide the functions of Alarm Verification, Signal Cut-out, and Signal-Silence Inhibit can be enabled/disabled by the programmer in both Full and Partial System Programming. However, to make use of these functions, the Signal Silence option (for silenceable control modules) and the Alarm Verification option (for addressable detectors) must still be enabled/disabled individually for each SLC Loop device under Full or Partial Point Programming.

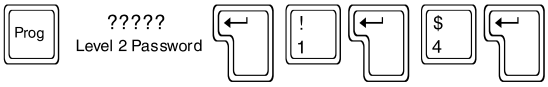
For instance, when programming Alarm Verification:

- Under Full or Partial System Programming, the programmer turns Alarm Verification ON and sets the verification time period.
- Under Full or Partial Point Programming, the programmer individually selects Alarm Verification for each detector:

  Detector 1 = YES
  Detector 2 = NO
  Detector 3 = YES
  Detector 4 = YES
  and so forth for each detector in the system.

For signal cut-out, the data can be entered in one second increments: however, the AM2020/AFP1010 will round up to the nearest value/increment of 8. For example, if 7 is entered, the displayed value will be 8. If 9 or 15 is entered, the displayed value is 16. If 60 is entered, the value is 64.

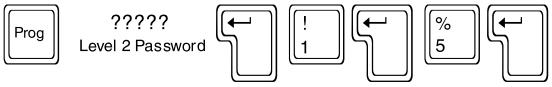
Section 1.1.4 Enabling the Trouble Bus



4=AVPS
The presence of auxiliary power supplies (formerly the AVPS-24) and other optional devices employing the trouble bus connector at P5 on the CPU must be programmed into memory by selecting option 4 from the Partial System Programming submenu. At the prompt "ENTER THE NUMBER OF AVPS-24 INSTALLED IN THE SYSTEM (0-16)", enter the total number of devices employing the trouble bus. The devices must be physically installed and connected to P5 on the CPU to prevent creating a system trouble condition. The example below illustrates the software installation of two AA-30 amps, one AA-120 amp, and two APS-6R power supplies.

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          : 4
ENTER THE NUMBER OF AVPS-24 INSTALLED IN THE SYSTEM (0 - 16)          : 5
```

Section 1.1.5 Zone Boundary



5=ZBND
The AM2020/AFP1010 can make use of up to 240 software-defined “zones.” These zones can be either forward–activated (FZON) or reverse–activated (RZON), depending upon the particular installation requirements. These forward and reverse zones must be grouped separately, with the forward group always preceding the reverse group. The highest forward-activated zone in the system is the Zone Boundary, which must be in the range of Z001 - Z239. For a full description of *Forward* and *Reverse Activating Software Zone*, see the *Glossary of Terms and Abbreviations* at the end of this manual.

Unless the use of complex Control-By-Event or Cooperative Control-By-Event Equations is required in the system, set the Zone Boundary to Z200 (default). (For more information, see *Control-By-Event Programming and Cooperative Control-By-Event Programming*).

The following programming example illustrates setting the Zone Boundary for zone 200.

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM          : 5
ENTER ZXXX OF HIGHEST FORWARD ACTIVATED ZONE IN SYSTEM                  : Z200
```

Section 1.1.6 External Equipment

6=EXTEQ

Option 6 from the Partial System Programming Menu allows the changing of any optional features associated with the CRT Monitor or Printer(s).

Terminal Supervision - Electrical supervision of the CRT Monitor. Unless terminal supervision is selected, the CRT will not beep (i.e., no bell characters will be sent) when unacknowledged troubles or unacknowledged alarms are present.

Terminal Status Line - The bottom line of the CRT will display the number of unacknowledged alarms and troubles, and the total number of alarms and troubles in the system. The Terminal Status Line appears on the CRT display only.

Auxiliary Printer Monitoring - The AM2020/AFP1010 will monitor the auxiliary printer's Ready/Busy line for error conditions. Note: The P40 is a special internal 40-column printer. This option should not be enabled for external 80-column printers.

Control Module Reporting - Control module state changes will be printed out.

NONA/NOA Module Reporting - Module state changes for modules with the Software Type ID NONA or NOA will be printed out. See *Software Type IDs* for further information on all Software Type IDs.

LED LATCH - Enables 99-device LED latching. See restrictions under LED Latching.

Printer Error Continue - Data will be transmitted to the printer under *Printer Error* conditions (*Paper Out* or *Printer Off Line* generates an error condition under which data may be lost). *Enable for special applications only.*

Bidirectional Copy - The CRT will process data received through its AUX port. *Enable for special applications only (see the CCM-1 Product Installation Document).*

Printer Trouble Inhibit - The AM2020/AFP1010 monitors the primary printer's Rx line for error conditions. This option inhibits the generation of a trouble message for *Paper Out* or *Printer Off Line*. *Enable for special applications only (see the VGAS Installation manual).*

Printer Reports Redirected to CRT- System reports will be echoed to the CRT interface. *Enable for special applications only (see the VGAS Installation Manual and the NAM-232 For Use With AM2020/AFP1010 Manual, Document 50424).*

The External Equipment Option flow chart is located in Figure 1-6.

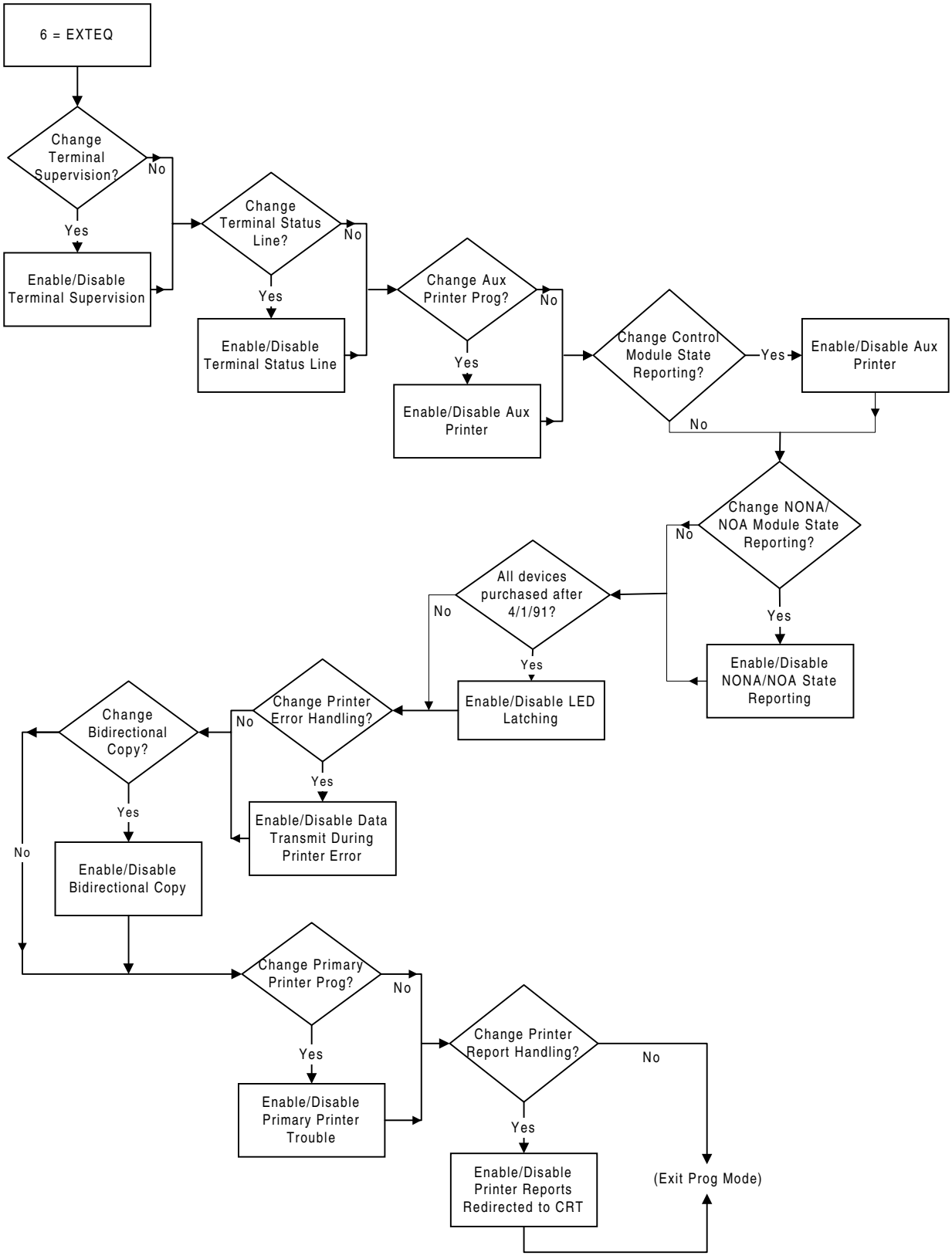


Figure 1-6 External Equipment Option Flow Chart

The following programming example illustrates enabling of all external equipment functions except transmit of data during printer error conditions, bidirectional copy, primary printer trouble error reporting, and redirecting printer reports to the CRT.

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM        : 6
DO YOU WANT TO CHANGE THE TERMINAL SUPERVISION? (Y=YES,N=NO)                : Y
DO YOU WANT THE TERMINAL SUPERVISION ENABLED? (Y=YES,N=NO)                  : Y
DO YOU WANT TO CHANGE THE TERMINAL STATUS LINE? (Y=YES,N=NO)                : Y
DO YOU WANT THE TERMINAL STATUS LINE ENABLED? (Y=YES,N=NO)                 : Y
DO YOU WANT TO CHANGE THE AUXILIARY PRINTER PROGRAMMING? (Y=YES,N=NO):      ; Y
DO YOU WANT THE AUXILIARY PRINTER ENABLED? (Y=YES,N=NO)                     : Y
DO YOU WANT TO CHANGE THE CONTROL MODULE STATE REPORTING? (Y=YES,N=NO)      : Y
DO YOU WANT TO REPORT CONTROL MODULE STATE CHANGES? (Y=YES,N=NO)            : Y
DO YOU WANT TO CHANGE THE "NONA"/NOA" MODULE STATE REPORTING? (Y=YES,N=NO)  : Y
DO YOU WANT TO REPORT "NONA"/NOA" MODULE STATE CHANGES? (Y=YES,N=NO)        : Y
WERE ALL ADDRESSABLE DEVICES FACTORY-PURCHASED AFTER 4/1/1? (Y=YES,N=NO)    : Y
DO YOU WANT TO ENABLE "LED LATCHING" FOR MORE DEVICES? (Y=YES,N=NO)         : Y
DO YOU WANT TO CHANGE THE PRINTER ERROR HANDLING? (Y=YES,N=NO)              : Y
DO YOU WANT TO TRANSMIT DATA UNDER PRINTER ERROR CONDITIONS? (Y=YES,N=NO)   : N
DO YOU WANT TO CHANGE BIDIRECTIONAL COPY PROGRAMMING? (Y=YES,N=NO)          : Y
DO YOU WANT BIDIRECTIONAL COPY ENABLED? (Y=YES,N=NO)                        : N
DO YOU WANT TO CHANGE THE PRIMARY PRINTER PROGRAMMING? (Y=YES,N=NO)         : Y
DO YOU WANT THE PRIMARY PRINTER TROUBLE INHIBITED? (Y=YES,N=NO)             : N
DO YOU WANT TO CHANGE THE PRINTER REPORT HANDLING? (Y=YES,N=NO)             : Y
DO YOU WANT TO REDIRECT PRINTER REPORTS TO THE TERMINAL? (Y=YES,N=NO)       : N

NEW ALM: 0000   TOT ALM: 0000   NEW TBL: 0000   TOT TBL: 0000
```

Terminal Status Line

The terminal status line also displays signal silence information in the same manner as the Signal Silence LED. The Signal Silence field displays the messages ALL SILENCED, PARTIAL SILENCE or is blank for a non-silenceable system.

```
ALARM: SMOKE(PHOTO) COMPUTER ROOM                          03:58P 03/01/00 101
   SIGNAL SILENCE        REQUESTED                         03:58P 03/01/00 101
NEW ALM: 0001   TOT ALM: 0001   NEW TBL: 0000   TOT TBL: 0000   ALL SILENCED
```

LED Latching

The AM2020/AFP1010 offers an LED-latching option:

```
DO YOU WANT TO ENABLE "LED LATCHING" FOR MORE DEVICES? (Y=YES,N=NO)          :
```

If you respond N for no, the control panel will employ a default latching algorithm, which limits the number of addressable device LEDs that will illuminate when the device is in alarm. With this option programmed NO, after six alarm initiating addressable devices are in alarm any additional devices going into alarm will not light their integral LED, nor any remote annunciator such as the RA400Z. This situation could impact system operation if DHX-501 duct detectors are configured to control fan systems or other building equipment from their integral relay because the relay is controlled by the detector's LED. If the duct detector is not one of the first six addressable devices reporting an alarm, then it can not control its integral relay. However, if the programming option is set YES, then their integral LED will light when the duct detector is in alarm and the relay will transfer. If you respond Y for yes, optional latching for more devices will be employed.

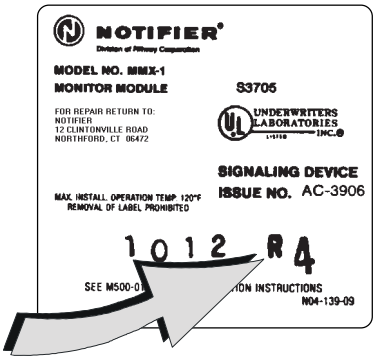
Default Latching

- Maximum of six devices can be latched at once (five modules maximum).
- Detectors have priority over modules. After six devices have been latched, detectors that come into alarm will assume LED-latch priority over previously-latched module LEDs.
- Under secondary (DC) power, only intelligent detectors (including DHX-501 Duct Detectors) will be latched.

Optional Latching for More Devices

- The control panel will latch up to 99 devices, subject to the limitations outlined below.
- All devices in the system must be of the R4 variety (see below).
- No RA-400 Remote LEDs can be installed on any device, excluding the DHX-501 Duct Detectors.
- Due to a finite amount of 24 VDC power available for devices on each SLC Loop, illumination of only a certain quantity of LEDs will actually be visible under conditions where large numbers of LEDs have been latched on. Note that remote LEDs off of DHX-501 Duct Detectors will always illuminate since they are powered from a source other than the SLC Loop.
- Under primary (AC) power, 99 devices can be latched.
- Detectors have priority over modules. After 99 devices have been latched, detectors that come into alarm will assume LED-latch priority over previously-latched module LEDs.
- Under secondary (DC) power, only intelligent detectors (including DHX-501 Duct Detectors) will be latched.
- Due to a finite amount of 24 VDC power available for devices on each SLC Loop, illumination of only a certain quantity of LEDs will actually be visible under conditions where large numbers of LEDs have been latched on. Note that remote LEDs off of DHX-501 Duct Detectors will always illuminate since they are powered from a source other than the SLC Loop.

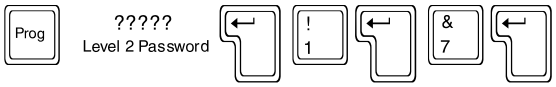
MORE LED latching can only be employed if *ALL* installed addressable devices were purchased from the Notifier factory after April 1, 1991. Use of this feature under any other circumstances can cause the SLC Loops to shut down. Devices compatible with more LED latching will have the code R4 stamped on the product marking label. SDX-551/751 Photoelectric detectors can also have an H code after the model number.



NOTES

- Modules refer to monitor and control modules, and XP Transponder circuits. Devices are defined as intelligent detectors and modules.
- Software Type IDs PWRC, NCMN, SCON and NOA will never latch under Default Latching.

Section 1.1.7 Local Parameters



7=LOCP

Option 7 of the Partial System Programming Menu allows the changing of Local Parameters, such as enabling/disabling the panel's piezo sounder (for trouble conditions while programming SLC Loop devices into memory), LIB Local Mode, NFPA listings, battery parameters, event reminder, device blink, and pre-alarm programming.

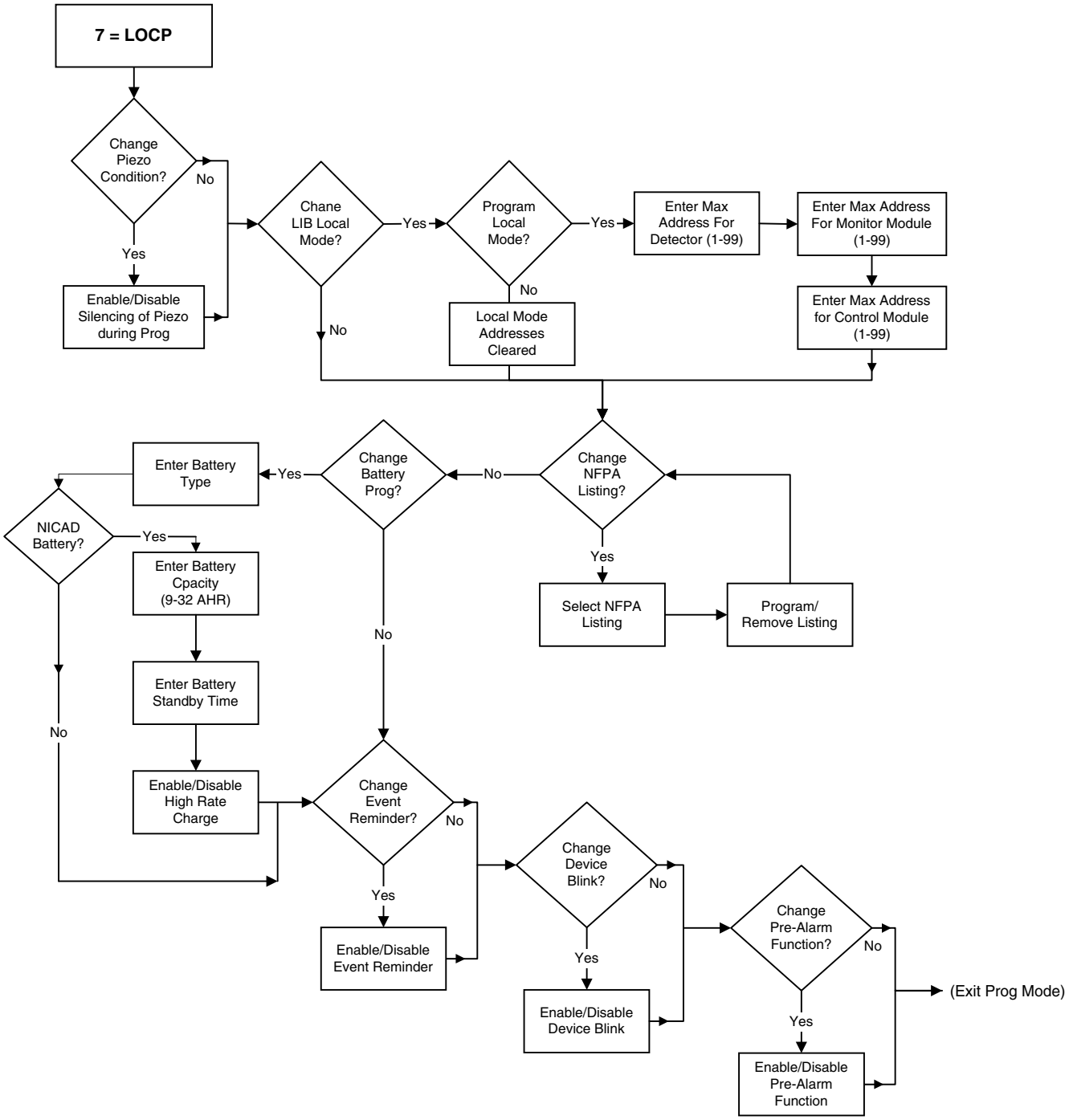


Figure 1-7 Local Parameter Option Flow Chart

The following programming example illustrates the disabling of the panel's piezo sounder, programming LIB Local Mode, modifying NFPA listings, programming the battery parameters, changing the event reminder, device blink and pre-alarm programming.

NOTE

The sounder must be enabled upon completion of programming!

```
PRESS 1=INST,2=STY,3=TDLY,4=AVPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM   : 7
DO YOU WANT TO CHANGE THE PIEZO TROUBLE CONDITION? (Y=YES,N=NO)        : Y
DO YOU WANT THE PIEZO SOUNDER SILENCED WHILE PROGRAMMING? (Y=YES,N=NO) : Y
DO YOU WANT TO CHANGE THE LIB LOCAL MODE PARAMETERS? (Y=YES,N=NO)      : Y
DO YOU WANT TO PROGRAM LOCAL MODE? (Y=YES,N=NO)                        : Y
ENTER MAXIMUM ADDRESS FOR DETECTOR LOCAL MODE (1 - 99)                : 99
ENTER MAXIMUM ADDRESS FOR MONITOR MODULE LOCAL MODE (1 - 99)          : 99
ENTER MAXIMUM ADDRESS FOR CONTROL MODULE LOCAL MODE (1 - 99)          : 99
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                      : Y
SELECT NFPA LISTING - 1=72A,2=72B,3=72C,4=72D,5=71,6=RCV               : 1
DO YOU WANT TO PROGRAM OR REMOVE THIS LISTING? (Y=PRG,N=RMV)           : Y
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                      : Y
SELECT NFPA LISTING - 1=72A,2=72B,3=72C,4=72D,5=71,6=RCV               : 2
DO YOU WANT TO PROGRAM OR REMOVE THIS LISTING? (Y=PRG,N=RMV)           : Y
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                      : N
DO YOU WANT TO CHANGE THE BATTERY PROGRAMMING? (Y=YES,N=NO)            : Y
ENTER THE TYPE OF BATTERY INSTALLED (L=LEAD-ACID,N=NICAD)              : N
DO YOU WANT TO CHANGE THE BATTERY CAPACITY? (Y=YES,N=NO)               : Y
ENTER THE BATTERY CAPACITY (9 - 32 IN 1 AHR INCREMENTS)               : 12
DO YOU WANT TO CHANGE THE BATTERY STANDBY TIME? (Y=YES,N=NO)           : Y
ENTER THE BATTERY STANDBY TIME (4, 24, 48 OR 60 HR)                   : 48
DO YOU WANT 24 HOUR HIGH RATE CHARGE FOR BATTERY? (Y=YES,N=NO)         : Y
DO YOU WANT TO CHANGE THE EVENT REMINDER PROGRAMMING? (Y=YES,N=NO)     : Y
DO YOU WANT THE EVENT REMINDER ENABLED? (Y=YES,N=NO)                   : Y
DO YOU WANT TO CHANGE THE DEVICE BLINK? (Y=YES,N=NO)                   : Y
DO YOU WANT THE DEVICE BLINK ENABLED? (Y=YES,N=NO)                     : Y
DO YOU WANT TO CHANGE THE PRE-ALARM FUNCTION? (Y=YES,N=NO)             : Y
DO YOU WANT THE PRE-ALARM FUNCTION ENABLED? (Y=YES,N=NO)               : Y
```

General Operation of the Piezo Sounder

- The piezo sounder provides feedback each time a key is pressed on the DIA.
- The piezo sounder sounds for unacknowledged alarm conditions.
- The piezo sounder sounds steadily for unacknowledged trouble or supervisory conditions.
- The piezo sounder chirps periodically (approximately every 12 seconds) for acknowledged conditions remaining in the system upon selection of the Event Reminder option.

Local Mode Operation
Local Mode operation allows the LIB-200, LIB-200A, and LIB-400 boards to run independently of the CPU if CPU to LIB communications should fail.
Local Mode is programmed in the Local Parameters portion of System Programming. The programmer identifies all of the SLC addressable control points (modules and transponder points) at and below the boundary address programmed, that are to be activated upon alarm. Detector and monitor module Local Mode addresses are no longer supported. All detectors and monitor modules participate in Local Mode. The programmer should enter 99 for detector and monitor module Local Mode Addresses.

All LIB boards use the same control-by-event, with the following format:

IF Any intelligent detector with an address less than or equal to the maximum detector Local Mode address is in alarm.

AND/OR Any monitor module with an address less than or equal to the maximum monitor module Local Mode address is in alarm.

THEN All control modules with an address less than or equal to the maximum control module Local Mode address will be activated.

Extended Local Mode Operation
Devices local to each individual LIB are divided into Local Mode categories based on Software Type IDs. All devices within the Local Mode address range will participate in Local Mode. Below is a description of each Local Mode category and a table showing which device types reside in each category. For complete definitions of Software Type IDs, refer to *Section Three, Software Type IDs.*

1	2	3	4	5	6	7	8	9	A	B
PHOT	MTRB	SPSU	WAT	CON	TPND	TELE	APND	WFS	SSC	PWRC
ION	MPAG	SUPR		SPKR	GPND	PAGE	EVGA	WFC		
THER	NOA			FORC	GTC		GAS			
MON	SARM			CMXS	TRS		GAC			
PULL	SSYM			CMXC	TRC					
FTHR	SACM			FRCM	DACT					
WAT	SEQM									
SCON										
NCMN										
NONA										
FPHT										
MPUL										
IOND										
IONH										
IONL										
CMBO										

CATEGORY	DESCRIPTION
1	If any of the participating standard inititating devices in Category 1 become active, then at a minimum all participating indicating devices in Category 5 will be activated (other indicating devices may activate as a side effect of standard initiating device activation.)
2	These initiating devices are never acted on by local mode and have no side effects for other devices.
3	If these initiating devices become active, Type ID SSC will activate.
4	If these initiating devices become active, Type IDs WFS and WFC will activate.
5	If any of the participating standard initiating devices in Category 1 become active, then all participating standard indicating devices in Category 5 become active.
6	During local mode these indicating devices are always active.
7	These indicating devices will activate if they participate in local mode.
8	These indicating devices will activate if any participating or nonparticipating alarm input is active.
9	These indicating devices will activate if any initiating module with Type ID WAT is active.
A	These indicating devices will activate if any initiating module with Type ID SPSU or SUPR is active.
B	These devices deactivate temporarily upon system reset to remove power to conventional devices allowing them to reset.

Table 1-1 Extended Local Mode Categories and Software Type IDs

NFPA Listings
NFPA listing allows the programmer to change the operation of the panel based on the NFPA listings selected. Each listing will select one or more mandatory modules.

	Listing	Software ID	Address
*	**NFPA 72 (72A) Local Fire Alarm Systems**	EVGA	L1M96
	NFPA 72 (72B) Auxiliary Fire Alarm Systems	GAS	L1M97
**	**NFPA 72 (72C) Remote Station Fire Alarm Systems**	GAC GAC	L1M98 L1M99
**	**NFPA 72 (72D) Proprietary Fire Alarm Systems**	*n/a*	*n/a*
**	**NFPA 72 (71) Central Station Fire Alarm Systems**	*n/a*	*n/a*
	Receiving Unit (RCV) and Central Station Unit	*n/a*	*n/a*

* Fire alarm input devices automatically default to latching operation when the 72A listing is selected.
** NFPA 72 (72C), (72D), and (71) are no longer required and should not be selected during programming.

Once a module is programmed by an NFPA Listing selection, that module can only be removed from the system by de-selection of that same listing. Selection of RCV disables the block acknowledge function. RCV must be enabled for all Central Station Receiving and Proprietary and Protected Premises receiving units. RCV is not supported by **NOTI•FIRE•NET™** systems that contain an NRT or AFP-200 panel.

NOTES

- Modules must be connected on the LIB SLC Loop with the appropriate address(es) set in order to avoid trouble conditions.
- NFPA modules selected must be in their normal state or acknowledged prior to de-selection otherwise trouble conditions may not clear from the panel memory.

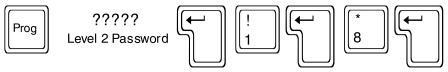
Pre-Alarm Function
The pre-alarm function causes the FACP to generate a trouble message when the chamber value of the detector has exceeded 80% of the alarm threshold (determined by the sensitivity selection of low, medium, high).

- With pre-alarm enabled, the 80% condition must be present for at least a 60 second period and will indicate a "PRE-ALARM ALERT" message on the FACP after that period.
- With pre-alarm disabled the 80% condition must be present for at least a 26 hour period and will indicate a "MAINTENANCE REQ" message on the FACP after that period.

NOTE

This condition (detector exceeding 80% of alarm threshold) may be due to a dirty detector. The detector should be inspected and cleaned as necessary by an authorized service representative. Failure to do so may result in a false alarm.

Section 1.1.8 Intelligent Serial Interface Board Programming



8=ISIB

Option 8 from the Partial System Programming Menu allows the programmer to change parameters associated with an Intelligent Serial Interface Board (ISIB). ISIB Programming has four submenu options, ISIB Installation, Annunciator Installation, External Interface Parameters and UDACT Selection. Detailed descriptions of the four ISIB programming options are located on the pages that follow. The SIB-2048A and SIB-NET ISIBs are available for use with the AM2020/AFP1010. For AM2020/AFP1010 with **NOTI•FIRE•NET™** the SIB-NET is the only ISIB available. Refer to Chapter One, *Serial Communications*, for a description of available intelligent serial interface boards.

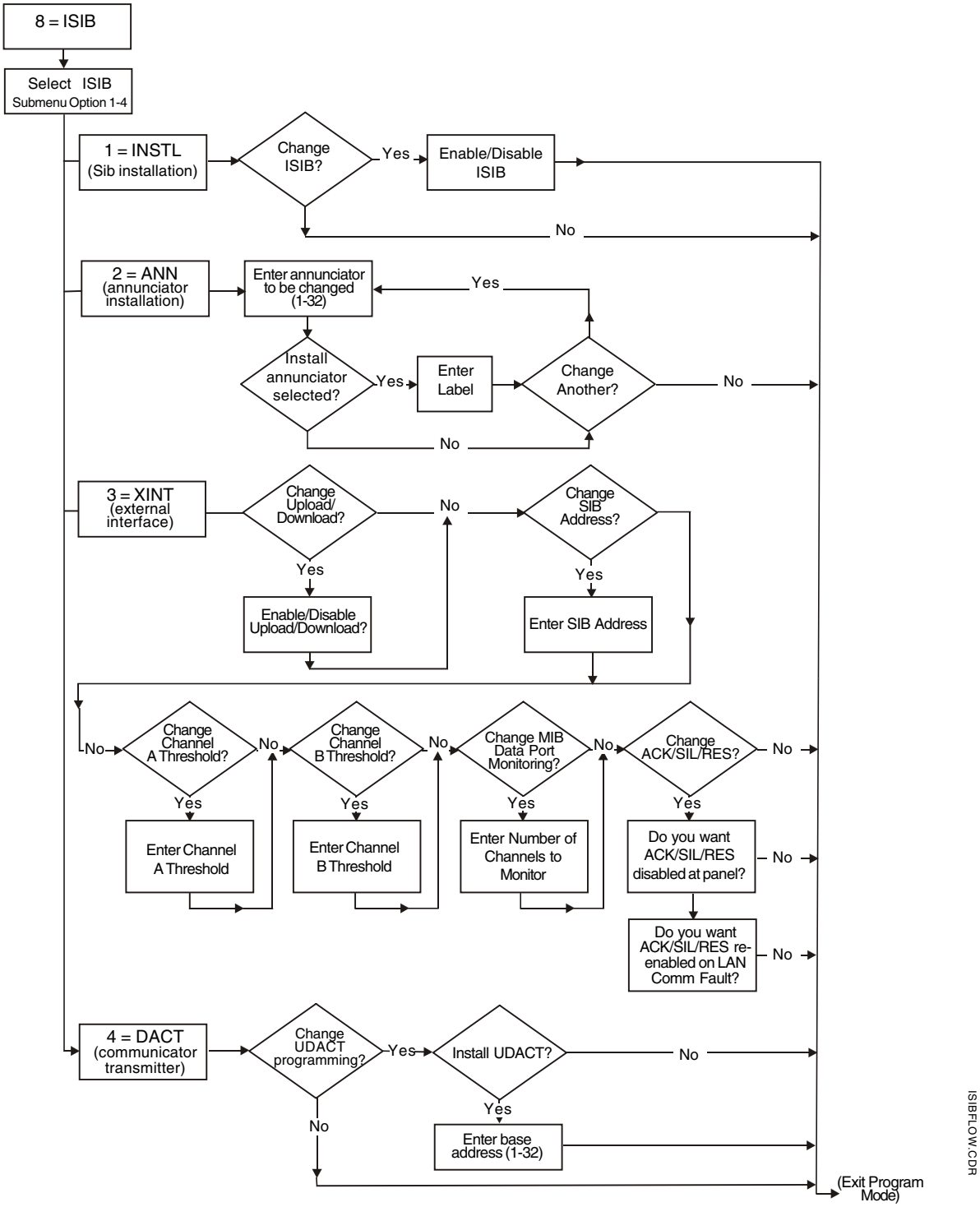
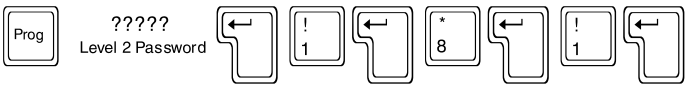


Figure 1-8 Intelligent Serial Interface Board Option Flow Chart

After entering option 8 from the Partial System Programming submenu, the display will show the ISIB submenu:

```
PRESS 1=INSTL,2=ANN,3=XINT,4=DACT                                              :
```

1=INSTL - ISIB Installation

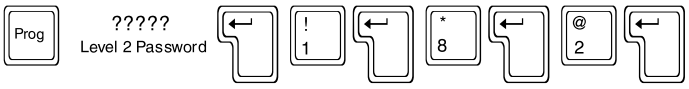


This option allows the installation or removal of the Intelligent Serial Interface Board from control panel memory. The board must still be physically installed or removed from the system to prevent a system trouble condition. The following programming example illustrates the installation of the Intelligent Serial Interface Board.

```
PRESS 1=INSTL,2=ANN,3=XINT,4=DACT                                              : 1
DO YOU WANT TO CHANGE THE INTELLIGENT SIB? (Y=YES,N=NO)                         : Y
DO YOU WANT THE INTELLIGENT SIB ENABLED? (Y=YES,N=NO)                          : Y
PROGRAMMING COMPLETE  -  POWER DOWN TO MAKE APPROPRIATE CHANGES
```

See notes in Section 1.1, Partial System Programming.

2=ANN - Annunciator Installation

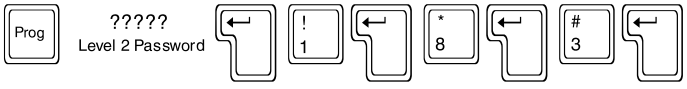


This option allows the installation or removal of annunciators (EIA-485 devices) from the AM2020/AFP1010 memory. The modules must still be physically installed or removed from the system to prevent a system trouble condition. The following programming example illustrates the installation of annunciator module 1.

```
PRESS 1=INSTL,2=ANN,3=XINT,4=DACT                                              : 2
ENTER THE ANNUNCIATOR NUMBER TO CHANGE (1 - 32)                                : 1
IS ANNUNCIATOR 01 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)                      : Y
ENTER 20 CHARACTER CUSTOM LABEL                          : ANNUNCIATOR ONE
DO YOU WANT TO CHANGE ANOTHER ANNUNCIATOR? (Y=YES,N=NO)                        : N
PROGRAMMING COMPLETE  -  POWER DOWN TO MAKE APPROPRIATE CHANGES
```

* The SCS-8 and SCS-8L firmware has been updated in conjunction with Software Release 2.8. The new SCS firmware is not backward compatible with older revisions of software.

3=XINT - External Interface Parameters



This option allows the programmer to change the parameters associated with the external interface port. The following example illustrates enabling all associated parameters.

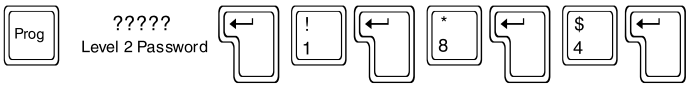
```
  PRESS 1=INSTL,2=ANN,3=XINT,4=DACT                                            : 3
* DO YOU WANT TO CHANGE THE ACS    PORT UPLOAD/DOWNLOAD? (Y=YES,N=NO)          : Y
* DO YOU WANT THE ACS    PORT UPLOAD/DOWNLOAD ENABLED? (Y=YES,N=NO)           : Y
* DO YOU WANT TO CHANGE THE INTELLIGENT SIB ADDRESS? (Y=YES,N=NO)              : Y
* ENTER THE INTELLIGENT SIB ADDRESS (0 - 249)                                : 249
* DO YOU WANT TO CHANGE THE MIB-W THRESHOLD FOR CHANNEL A? (Y=YES,N=NO)       : Y
* ENTER THE MIB-W VALUE THRESHOLD FOR CHANNEL A (H=HIGH,L=LOW)               : L
* DO YOU WANT TO CHANGE THE MIB-W THRESHOLD FOR CHANNEL B? (Y=YES,N=NO)       : Y
* ENTER THE MIB-W VALUE THRESHOLD FOR CHANNEL B (H=HIGH,L=LOW)               : H
  DO YOU WANT TO CHANGE MIB DATA PORT USAGE? (Y=YES,N=NO)                     : Y
  DO YOU WANT TO USE BOTH MIB DATA PORTS? (Y=YES,N=NO)                        : Y
  DO YOU WANT TO CHANGE ACK/SIL/RES LOCKOUT SETTINGS? (Y=YES,N=NO)            : Y
* DO YOU WANT ACK/SIL/RES LOCKED OUT AT THE PANEL? (Y=YES,N=NO)               : Y
* DO YOU WANT ACK/SIL/RES RE-ENABLED DURING LAN COMM FAULT? (Y=YES,N=NO)      : Y
```

* These items are **NOTI•FIRE•NET™** specific functions and are only programmed when a SIB-NET is used.

NOTES

- During an upload/download, the fire protection capability of the AM2020/AFP1010 is enabled (it is limited for download). To reduce the risk of incompatible databases, the programmer should *NEVER* program any parameters into the control panel while an upload/download is in progress.
- To communicate over the external interface, the annunciator modules *MUST* first be disconnected since both functions use the same serial port.
- When an Intelligent SIB Board is changed from one address to another, the CCBE is lost. If the address is changed back to the previous address, CCBE will return.

4=DACT - UDACT Installation



This option allows the installer to program a Notifier UDACT (Universal Digital Alarm Communicator Transmitter) and specify its base annunciator protocol address in the system. The example below illustrates programming a UDACT.

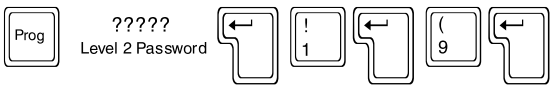
Before programming a UDACT into an AM2020/AFP1010 system, the number of annunciator addresses required must be determined. First, take the number of annunciator points in the system and add 8 points (for the UDACT). Then, divide the total by 64 to obtain the number of annunciator addresses required (round up to next whole number if decimal).

```
PRESS 1=INSTL,2=ANN,3=XINT,4=DACT                              : 4
DO YOU WANT TO CHANGE THE UDACT PROGRAMMING? (Y=YES,N=NO)       : Y
DO YOU WANT A UDACT INSTALLED? (Y=YES,N=NO)                    : Y
ENTER THE BASE ADDRESS FOR UDACT OPERATION (1 - 32)            : 1
```

NOTES

- The UDACT can only be programmed into or removed from the system through the Partial System Programming Menu.
- The UDACT must be programmed at an installed annunciator address. Once programmed, the first 8 annunciator protocol points (base address only) automatically become unique fire panel status indicators (see UDACT Manual). These 8 functions required by the UDACT override any previous AM2020/AFP1010 annunciator point programming. When a UDACT is installed, the first 8 AM2020/AFP1010 annunciator points associated with the UDACT base address cannot be reprogrammed/removed and have no read status functionality.
- Answering "NO" for the question, "Do you want a UDACT installed?" disables the automatic 8 point UDACT programming and restores these points to their original annunciator point programming.
- Multiple annunciator addresses may need to be programmed depending upon the range specified by the UDACT annunciator address switches.
- The UDACT cannot be used in systems containing an AVPS-24/AVPS-24E, AA-30/AA-30E, AA-120, AA-120E or XP Transponder since a primary power failure signal transmission will not be delayed as required for this application.
- When using the UDACT in a system with a NIB-96, use care to ensure that the EIA-485 addresses selected do not overlap with those of the NIB-96.
- When a UDACT is programmed into the system, both the red and yellow LEDs will illuminate on an annunciator point mapped to a supervisory input during the presence of a supervisory signal for that point, unless the supervisory ACS reporting option has been enabled.
- Off-premises transmission of security alarms using the UDACT must be made by mapping input points with the Software Type ID SACM and SEQM to annunciator points within the range of the UDACT. Use of other security Type IDs for this purpose will result in simultaneous transmission of a trouble signal.
- Multiple UDACT usage per AM2020/AFP1010 system is not permitted.

Section 1.1.9 Additional System Parameters



9=PARM

This option allows the programmer to enable/disable additional system parameters such as the day/night sensitivity of detectors or rapid polling. For a full description of these functions, see the *Glossary of Terms and Abbreviations* at the end of this manual.

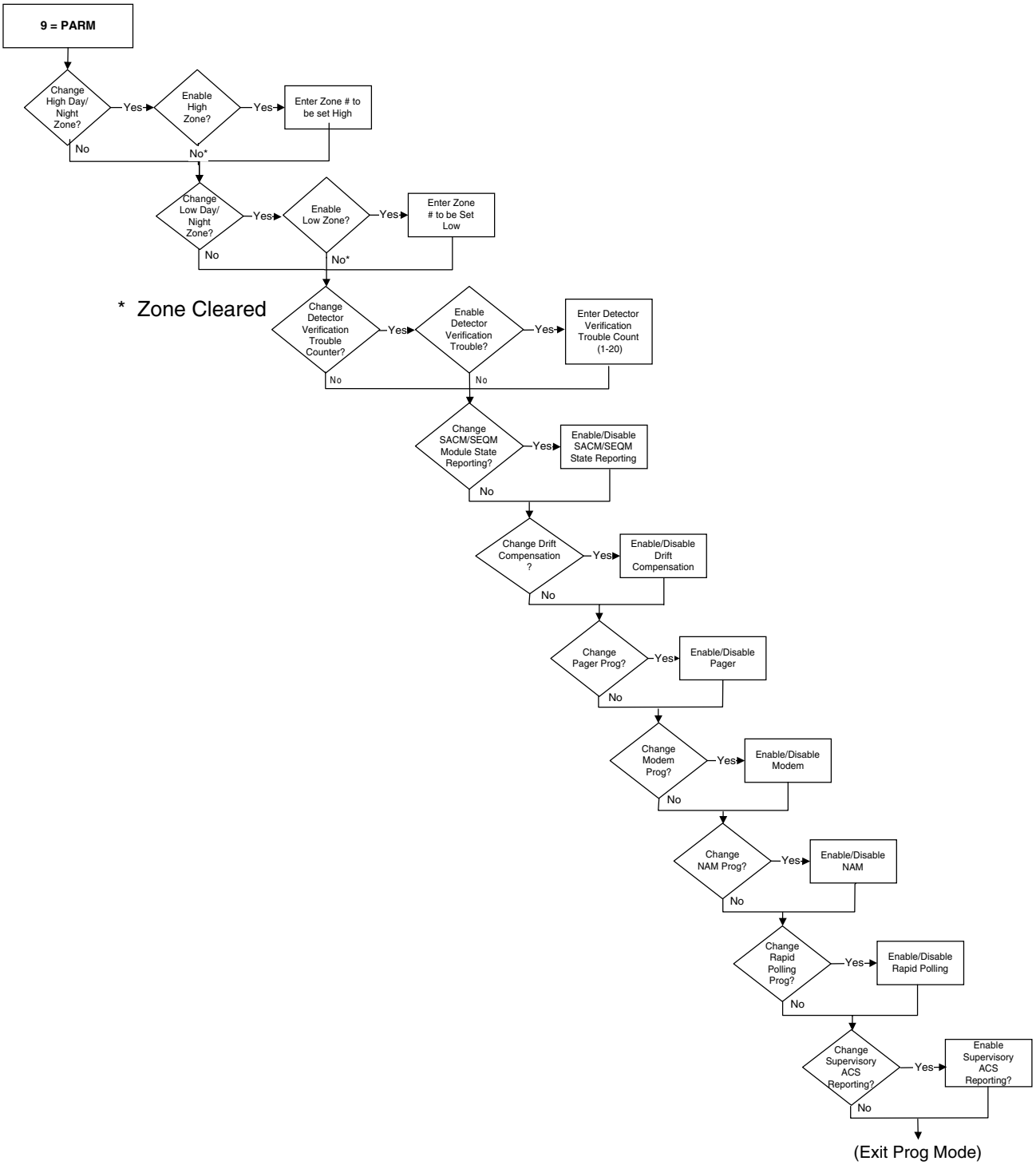


Figure 1-9 Additional System Parameters Option Flow Chart

The following programming example illustrates enabling these functions.

```
PRESS 1=INST,2=STY,3=TDLY,4=AUPS,5=ZBND,6=EXTEQ,7=LOCP,8=ISIB,9=PARM       : 9
DO YOU WANT TO CHANGE THE HIGH DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)   : Y
DO YOU WANT A HIGH DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)               : Y
ENTER HIGH DAY/NIGHT SENSITIVITY ZONE (ZXXX)                          : Z150
DO YOU WANT TO CHANGE THE LOW DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)    : Y
DO YOU WANT A LOW DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)                : Y
ENTER LOW DAY/NIGHT SENSITIVITY ZONE (ZXXX)                           : Z1
DO YOU WANT TO CHANGE THE  DETECTOR  VER. TROUBLE  COUNTER? (Y=YES,N=NO)   : Y
DO YOU WANT THE  DETECTOR  VERIFICATION  TROUBLE  ENABLED? (Y=YES,N=NO)    : Y
ENTER DETECTOR  VERIFICATION  TROUBLE  COUNT (1 - 20                   : 15
DO YOU WANT TO CHANGE "SACM"/"SEQM" MODULE STATE REPORTING? (Y=YES,N=NO)   : Y
DO YOU WANT TO REPORT "SACM"/"SEQM" MODULE STATE CHANGES? (Y=YES,N=NO)     : Y
DO YOU WANT TO CHANGE THE DRIFT COMPENSATION OPERATION? (Y=YES,N=NO)       : Y
DO YOU WANT DRIFT COMPENSATION ENABLED? (Y=YES,N=NO)                       : Y
DO YOU WANT TO CHANGE THE PAGER PROGRAMMING? (Y=YES,N=NO)                  : Y
DO YOU WANT THE PAGER ENABLED? (Y=YES,N=NO)                                : Y
DO YOU WANT TO CHANGE THE MODEM PROGRAMMING? (Y=YES,N=NO)                  : Y
DO YOU WANT THE MODEM ENABLED? (Y=YES,N=NO)                                : Y
DO YOU WANT TO CHANGE THE NAM PROGRAMMING? (Y=YES,N=NO)                    : Y
DO YOU WANT THE NAM ENABLED? (Y=YES,N=NO)                                  : N
DO YOU WANT TO CHANGE THE RAPID POLLING PROGRAMMING? (Y=YES,N=NO)          : Y
DO YOU WANT RAPID POLLING ENABLED? (Y=YES,N=NO)                            : Y
DO YOU WANT TO CHANGE THE SUPERVISORY MODULE ACS REPORTING? (Y=YES,N=NO)   : Y
DO YOU WANT SUPERVISORY MODULES TO ILLUMINATE ACTIVE LED? (Y=YES,N=NO)     : Y
```

Day/Night Sensitivity

The function of Day/Night sensitivity is to force intelligent detectors into high or low sensitivity when the appropriate zones are active, regardless of the detectors normal sensitivity setting. If both the high and low zones are active, the system is forced to high sensitivity. The Day/Night high and low sensitivity zones may be individually activated by control-by-event (CBE) equations written for this purpose or through the use of control-by-time equations.

The capability of the control panel to provide the function of day/night sensitivity can be enabled/disabled in both Full and Partial System Programming. However, the day/night sensitivity option (for addressable detectors) must be enabled/disabled individually for each SLC Loop device.

The following must be performed when programming Day/Night Detector Sensitivity:

- Enable the Day/Night Sensitivity and set the zone number. This is a global setting.
- Select Day/Night Sensitivity for each individual detector. For example:

  Detector 1 = YES
  Detector 2 = NO
  Detector 3 = YES
  Detector 4 = YES

Detector Verification Trouble

If set, the control panel will generate a trouble for each intelligent detector which exceeds the verification counter trouble limit. This feature can be used to isolate those devices which excessively go into detector verification before causing false alarm conditions in the panel. To clear this condtion reset the detector verification counters as described in Section 2.6.

SACM/SEQM Module Reporting

If selected for reporting, module state changes for modules with the Software Type ID SACM or SEQM will be printed out. See *Software Type IDs* for further information on all Software Type IDs.

Drift Compensation

If set, the addressable detectors will automatically compensate for environmental contaminants and other factors over time, until the drift tolerance value has been exceeded. When the drift tolerance value has been exceeded, the control panel will signal a maintenance alert for the apropriate detector.

Pager
The Pager mode must be enabled when a compatible pager is connected to the auxiliary printer port.

Modem
If enabled, the following remote device (CRT) functions are inhibited: ACK STEP, SIGNAL SILENCE, SYSTEM RESET, PROGRAMMING, and ALTER STATUS. This option must be employed when a modem is used to receive signals from an off-premise device or when the keyboard is to remain attached to the CRT in a system that is not configured and operated as a Proprietary Fire Alarm System. See the TPI-232 manual.

NAM
The NAM-232 is used to tie a remote FACP to the **NOTI•FIRE•NET™** via telephone lines. If the NAM is enabled, the following options are automatically programmed as indicated:

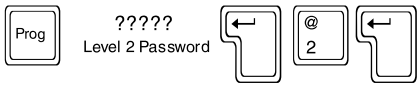
- Terminal Supervision = Enabled
- Terminal Status Line = Enabled
- Receiving Unit Mode = Enabled
- Event Reminder = Disabled
- Reports Redirected to Terminal = Enabled
- Modem = Disabled

This special application only supports the ACKNOWLEDGE, SIGNAL SILENCE, and SYSTEM RESET network functions and is intended for Protected Premises Fire Alarm System (Local) use only. Local use of a CRT, printer or other 232 device from the remote FACP is prohibited. No other system network functions can be implemented due to system contraints. For more information refer to the *NAM-232 for Use With AM2020/AFP1010* Manual, Document 50424.

Rapid Polling
The AM2020/AFP1010 has the option to utilize a rapid polling algorithm to process certain monitor modules on a priority basis. When used properly, this can result in a much faster response from fire alarm call points (pull stations) and security devices. If Rapid Polling is enabled, the first 20 module addresses on each LIB SLC loop are polled more frequently than the other addresses and should be used for high priority input devices when using this feature. However, as a consequence all other SLC addresses will be polled less frequently. XPM-8 circuits and output devices (CMX and XPC-8 circuits) should not be assigned addresses in the rapid polling range.

Supervisory Module ACS Reporting
If selected for reporting, activation of modules with the Software Type ID SUPR or SPSU will cause the primary (top) LED to light instead of the secondary (bottom) LED for an ACS Annunciator Point. This feature must be enabled for proper transmission of supervisory signal transmission with ADEMCO contact ID mode on a UDACT communicator.

Section 1.2 Full System Programming



2=FSYS

Option 2 from the Programming Menu walks the programmer through complete initial programming of system-wide functions. Alarm Verification, Signal-Silence Inhibit, Signal Cut-Out, and the supervision of peripherals are all programmed under this option, as well as the number of AVPS, APS-6R, LIBs, ISIB and Annunciator Modules in the system, and SLC Loop styles. The following CRT display illustrates the screen prompts during the installation of three SLC loops, four Annunciator Modules and the enabling of all optional functions. Refer to Chapter One of this manual for information on LIB-400 and its correct slot address.

For information on the parameters programmed here, refer to Partial System Programming.

```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                  : 2
IS LIB BOARD 01 TO BE INSTALLED IN SYSTEM?                                  : Y
ENTER THE STYLE OF SLC LOOP 01 (6 OR 4)                                     : 6
IS LIB BOARD 02 TO BE INSTALLED IN SYSTEM?                                  : Y
ENTER THE STYLE OF SLC LOOP 02 (6 OR 4)                                     : 4
IS LIB BOARD 03 TO BE INSTALLED IN  SYSTEM?                                 : Y
ENTER THE STYLE OF SLC LOOP 03 (6 OR 4)                                     : 6
IS LIB BOARD 04 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 05 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 06 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 07 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 08 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 09 TO BE INSTALLED IN SYSTEM?                                  : N
IS LIB BOARD 10 TO BE INSTALLED IN SYSTEM?                                  : N
DO YOU WANT THE DETECTOR VERIFICATION TIME ENABLED? (Y=YES,N=NO)             : Y
ENTER THE DETECTOR VERIFICATION TIME (5 - 50 IN 1 SECOND INCREMENTS)       : 45
DO YOU WANT THE SIGNAL SILENCE INHIBIT TIME ENABLED? (Y=YES,N=NO)            : Y
ENTER THE SIGNAL SILENCE INHIBIT TIME (1 - 255 IN 1 SECOND INCREMENTS)    : 60
DO YOU WANT THE SIGNAL CUT-OUT TIME ENABLED? (Y=YES,N=NO)                    : Y
ENTER THE SIGNAL CUT-OUT TIME (1 - 2040 IN 1 SECOND INCREMENTS)          : 1200
ENTER THE NUMBER OF AVPS-24 INSTALLED IN THE SYSTEM (0 - 16)                : 4
ENTER ZXXX OF HIGHEST FORWARD ACTIVATED ZONE IN SYSTEM                    : Z200
DO YOU WANT THE TERMINAL SUPERVISION ENABLED? (Y=YES,N=NO)                   : Y
DO YOU WANT THE TERMINAL STATUS LINE ENABLED? (Y=YES,N=NO)                   : Y
DO YOU WANT THE AUXILIARY PRINTER ENABLED? (Y=YES,N=NO)                      : Y
DO YOU WANT TO REPORT CONTROL MODULE STATE CHANGES? (Y=YES,N=NO)             : Y
DO YOU WANT TO REPORT "NONA"/"NOA" MODULE STATE CHANGES? (Y=YES,N=NO)        : Y
WERE ALL ADDRESSABLE DEVICES FACTORY-PURCHASED AFTER 4/1/91? (Y=YES,N=NO)  : Y
DO YOU WANT TO ENABLE "LED LATCHING" FOR MORE DEVICES? (Y=YES,N=NO)          : Y
DO YOU WANT TO TRANSMIT DATA UNDER PRINTER ERROR CONDITIONS? (Y=YES,N=NO)   : N
DO YOU WANT BIDIRECTIONAL COPY ENABLED? (Y=YES,N=NO)                         : Y
DO YOU WANT THE PRIMARY PRINTER TROUBLE INHIBITED? (Y=YES,N=NO)              : Y
DO YOU WANT TO REDIRECT PRINTER REPORTS TO THE TERMINAL? (Y=YES,N=NO)        : N
DO YOU WANT TO PROGRAM LOCAL MODE? (Y=YES,N=NO)                              : Y
ENTER MAXIMUM ADDRESS FOR DETECTOR LOCAL MODE (1 - 99)                     : 45
ENTER MAXIMUM ADDRESS FOR MONITOR MODULE LOCAL MODE (1 - 99)               : 26
ENTER MAXIMUM ADDRESS FOR CONTROL MODULE LOCAL MODE (1 - 99)               : 19
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                            : Y
SELECT NFPA LISTING - 1=72A,2=72B,3=72C,4=72D,5=71,6=RCV                     : 1
DO YOU WANT TO PROGRAM OR REMOVE THIS LISTING? (Y=PRG,N=RMV)                 : Y
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                            : Y
SELECT NFPA LISTING - 1=72A,2=72B,3=72C,4=72D,5=71,6=RCV                     : 2
DO YOU WANT TO PROGRAM OR REMOVE THIS LISTING? (Y=PRG,N=RMV)                 : Y
DO YOU WANT TO MODIFY NFPA LISTINGS? (Y=YES,N=NO)                            : N
ENTER THE TYPE OF BATTERY INSTALLED (L=LEAD-ACID,N=NICAD)                    : N
ENTER THE BATTERY CAPACITY (9 - 32 IN 1 AHR INCREMENTS)                    : 32
ENTER THE BATTERY STANDBY TIME (4, 24, 48 OR 60 HR)                        : 4
DO YOU WANT 24 HOUR HIGH RATE CHARGE FOR BATTERY? (Y=YES,N=NO)               : Y
```

AM2020 only

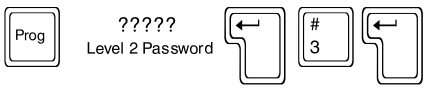
Include number of devices employing the trouble bus here.

```
    DO YOU WANT THE EVENT REMINDER ENABLED? (Y=YES,N=NO)                    : Y
    DO YOU WANT THE DEVICE BLINK ENABLED? (Y=YES,N=NO)                      : Y
    DO YOU WANT THE PRE-ALARM FUNCTION ENABLED? (Y=YES,N=NO)                : Y
    DO YOU WANT THE INTELLIGENT SIB ENABLED? (Y=YES,N=NO)                   : Y
    IS ANNUNCIATOR 01 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : Y
    ENTER 20 CHARACTER CUSTOM LABEL                          : ANNUNCIATOR 1
    IS ANNUNCIATOR 02 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 04 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 05 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 06 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 07 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 08 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 09 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 10 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 11 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 12 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : Y
    ENTER 20 CHARACTER CUSTOM LABEL                          : ANNUNCIATOR 12
    IS ANNUNCIATOR 13 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 14 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 15 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 16 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 17 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 18 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : Y
    ENTER 20 CHARACTER CUSTOM LABEL                          : ANNUNCIATOR 18
    IS ANNUNCIATOR 19 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 20 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 21 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 22 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 23 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 24 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 25 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 26 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 27 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 28 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 29 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 30 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : N
    IS ANNUNCIATOR 31 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)               : Y
    ENTER 20 CHARACTER CUSTOM LABEL                          : ANNUNCIATOR 31
    IS ANNUNCIATOR 32 TO BE INSTALLED IN SYSTEM? (Y=YES,N=NO)                : N
*   ENTER THE INTELLIGENT SIB ADDRESS (0 - 249)                             :160
*   ENTER THE MIB-W VALUE THRESHOLD FOR CHANNEL A (H=HIGH,L=LOW)             : H
*   ENTER THE MIB-W VALUE THRESHOLD FOR CHANNEL B (H=HIGH,L=LOW)             : H
*   DO YOU WANT TO USE BOTH MIB DATA PORTS? (Y=YES,N=NO)                     : Y
*   DO YOU WANT ACK/SIL/RES LOCKOUT SETTINGS? (Y=YES,N=NO)                   : Y
*   DO YOU WANT ACK/SIL/RES RE-ENABLED DURING LAN COMM FAULT? (Y=YES,N=NO)   : Y
    DO YOU WANT A HIGH DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)              : Y
    ENTER HIGH DAY/NIGHT SENSITIVITY ZONE (ZXXX)                      : Z200
    DO YOU WANT A LOW DAY/NIGHT SENSITIVITY ZONE? (Y=YES,N=NO)               : Y
    ENTER LOW DAY/NIGHT SENSITIVITY ZONE (ZXXX)                       : Z201
    DO YOU WANT THE DETECTOR VERIFICATION TROUBLE ENABLED? (Y=YES,N=NO)      : Y
    ENTER DETECTOR VERIFICATION TROUBLE COUNT                               :15
    DO YOU WANT TO REPORT "SACM"/"SEQM" MODULE STATE CHANGES? (Y=YES,N=NO)   : Y
    DO YOU WANT DRIFT COMPENSATION ENABLED? (Y=YES,N=NO)                     : Y
    DO YOU WANT THE PAGER ENABLED? (Y=YES,N=NO)                              : Y
    DO YOU WANT THE MODEM ENABLED? (Y=YES,N=NO)                              : Y
    DO YOU WANT THE NAM ENABLED? (Y=YES,N=NO)                                : N
    DO YOU WANT RAPID POLLING ENABLED? (Y=YES,N=NO)                          : Y
    DO YOU WANT SUPERVISORY MODULES TO ILLUMINATE ACTIVE LED? (Y=YES,N=NO)   : Y
    PROGRAMMING COMPLETE  -  POWER DOWN TO MAKE APPROPRIATE CHANGES
```

* These items are **NOTI•FIRE•NET™** specific functions and are only programmed when a SIB-NET is used.

See notes in Section 1.1, Partial System Programming.

Section 1.3 Partial Point Programming



3=PPRG

Option 3 from the Programming Menu allows the programmer to change the operational parameters of SLC Loop devices, software-defined zones, and annunciator points.

After selecting option 3 from the Main Programming menu, the display will show the Partial Point Programming submenu:

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                    :
```

The Partial Point Programming submenu has six options, where:

1=TYPID **Type ID -** Changing the Software Type ID of SLC Loop devices, zones and annunciator points.

2=CBE **Control-By-Event -** Redefining the Control-By-Event associated with each detector, module, or zone.

3=LBL **Label -** Renaming the custom user label for any detector, module, or zone.

4=OPTNS **Options -** Selecting the optional features associated with any detector or module.

5=AMAP **Annunciator Point Mapping -** Selecting Annunciator Point Mapping for any detector, module, or zone.

6=CCBE **Cooperative Control-By-Event -** Edit the CCBE associated with reverse activated zones for **NOTI•FIRE•NET**.

The Partial Point Programming flow chart is located in Figure 1-10. Detailed information on the Partial Point Programming options follows.

NOTE

Each option under Partial Point Programming prompts the programmer to enter the address of the detector, module, zone, or annunciator point to be affected. Leading zeros are not required. The address assumes the following format:

LXX(D/M)YY (for devices) or **ZXXX** (for zones) or **AXXPYY** (for annunciator points)

SLC Loop 1 to 10 (AM2020), 1 to 4 (AFP1010)

Addressable Detector or Module followed by an address in the range 1 to 99

Software-defined Zone Z1 to Z240

Annunciator Module 1 to 32

Annunciator Point 1 to 64

Example: For the 44th module on SLC Loop 3, enter **L3M44**

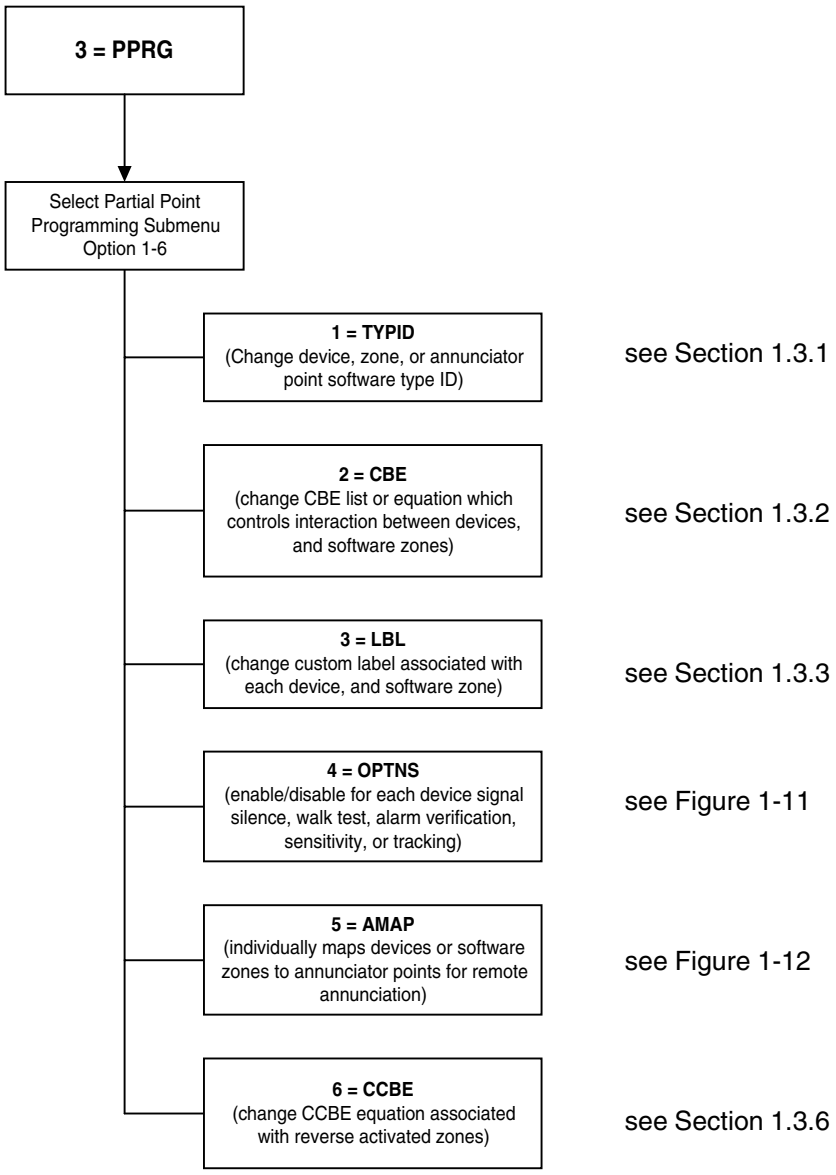
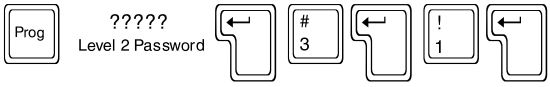


Figure 1-10 Partial Point Programming Flow Chart

Section 1.3.1 Type ID



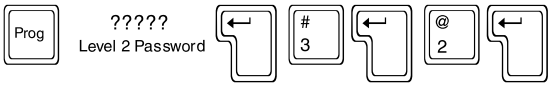
1=TYPID

Option 1 of the Partial Point Programming Menu allows the programmer to change the Software Type ID of any detector, module, zone or annunciator point. This pre-setting of all devices in the system gives the control panel the ability to execute specific functions for each device type. The following CRT display illustrates the assignment of the Software Type ID SCON to the 14th monitor module on SLC Loop 3.

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                    : 1
ENTER LXX(D/
M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)      : L3M14
ENTER TYPE ID                                                     : SCON
```

For a complete description of the various Software Type IDs, see *Software Type IDs*.

Section 1.3.2 Control-By-Event



2=CBE

Option 2 of the Partial Point Programming Menu allows the programmer to change the Control-By-Event (CBE) for any detector, module or software zone. The panel maintains a CBE for each device and zone installed in the system.

NOTE

A software zone is not a physical zone, but rather a software grouping in control panel memory.

When programming a particular device, the control panel prompts the programmer with:

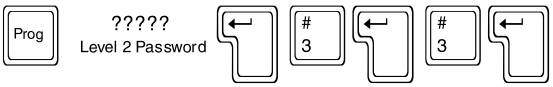
```
ENTER CONTROL-BY-EVENT                                                    :
```

The following CRT screen display illustrates CBE programming for smoke detector number 23 on SLC Loop 2 to activate software zones 15 and 29.

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                           : 2
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)     : L2D23
ENTER CONTROL-BY-EVENT                                                    :
(Z15 Z29)
```

For a complete description of the types, parameters, limitations, and guidelines of CBE programming, see *Control-By-Event Programming* in Section Four.

Section 1.3.3 Label



3=LBL

Option 3 of the Partial Point Programming Menu allows the programmer to change the 20-character custom label associated with each detector, module, or software zone in the system. Acceptable characters for device or zone labels are as follows:

Letters A through Z, digits 0 through 9, periods (.), dashes (-), and spaces.

The following CRT display illustrates renaming control module 21 on SLC Loop 1.

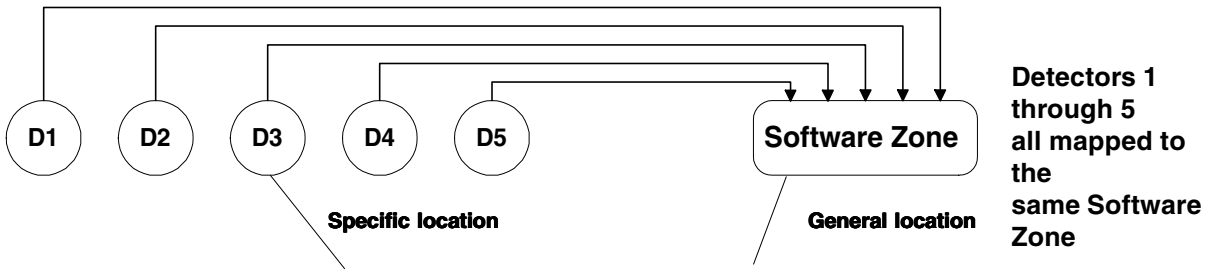
```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                           : 3
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)     : L1M21
ENTER 20 CHARACTER CUSTOM LABEL                          : MAIN LOBBY BELLS
```

Programming Tip:

Creative use of the custom label feature allows the programmer to be extremely specific in naming each SLC device. For instance, for a group of addressable devices congregated in a particular area (such as a floor or a section of a building), map each device to the same software zone and label the zone to serve as an additional 20 characters of information to the individual device labels. Assume Detector 3 initiates an alarm.

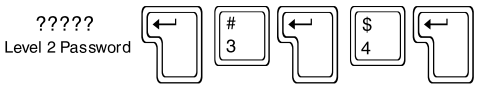
Only the first zone listed in the control-by-event (CBE) list of the initiating devices will display the 20-character label, along with the label of the initiating devices itself when in alarm.

Note: Since Annunciator points do not have individual custom labels, Annunciator addresses are invalid entries on this menu.



The result is a 40-character label that characterizes a particular addressable device.

Section 1.3.4 Optional Features



4=OPTNS

Option 4 of the Partial Point Programming Menu allows the programmer to individually enable or disable, per device, the functions of Signal Silence and Walk Test (for control modules), Alarm Verification and Sensitivity (for addressable detectors), and Tracking (addressable detectors and monitor modules). These functions must still be enabled or disabled, as appropriate, for the entire system (see *Partial System Programming*). For an explanation of the functions of Signal Silence, Alarm Verification, Sensitivity, and Tracking, see the *Glossary of Terms and Abbreviations* at the end of this manual. The Optional Features flow chart is located in Figure 1-11.

NOTE: The AM2020/AFP1010 will not permit Signal Silence programming for control modules with Software Type IDs, TELE, PWRC, APND, TPND, and GPND. See *Software Type IDs* for an explanation of all Software Type IDs.

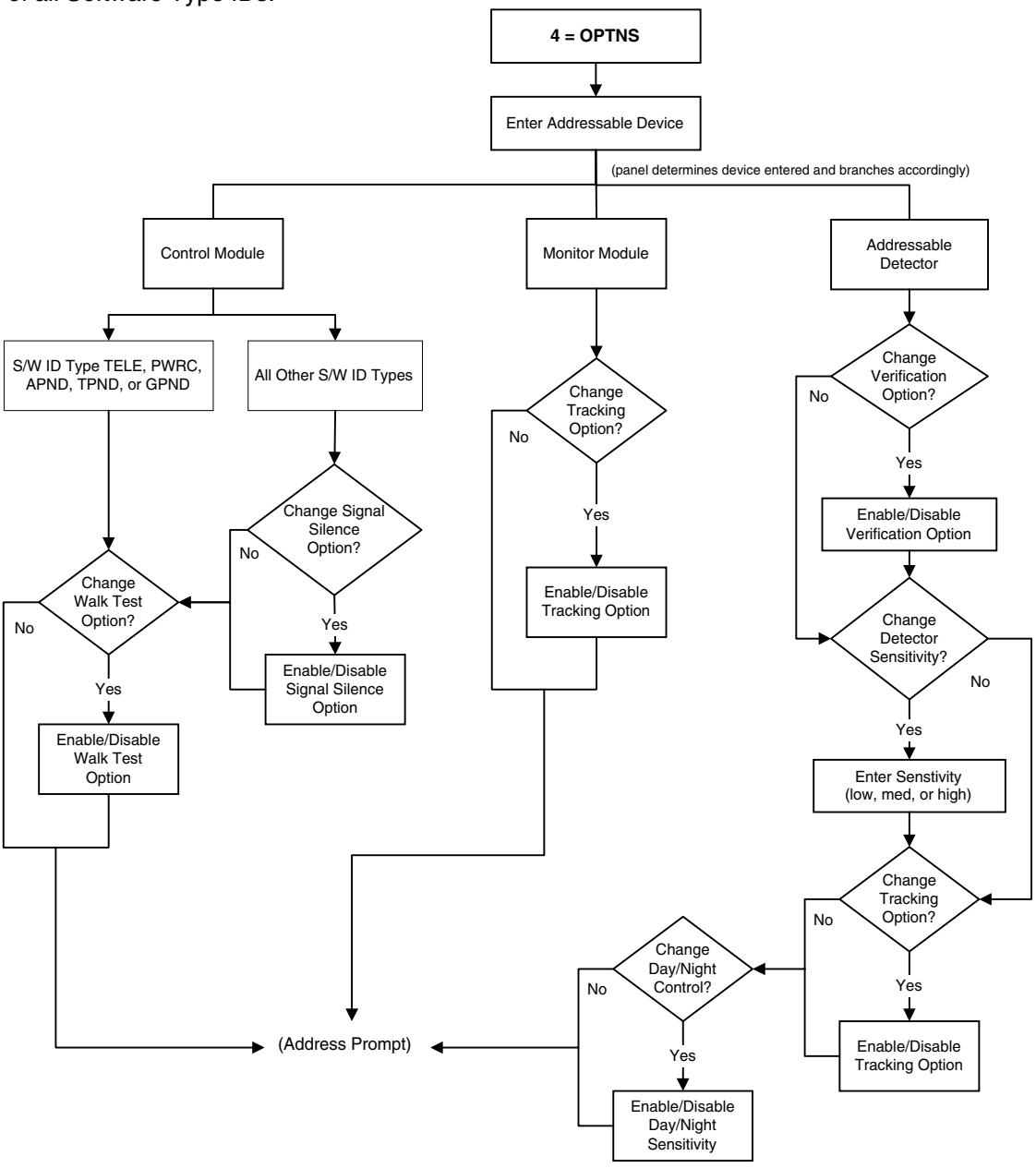


Figure 1-11 Optional Features Flow Chart

A control module example:

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                              : 4
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)       : L3M20
DO YOU WANT TO CHANGE THE SIGNAL SILENCE OPTION FOR THIS DEVICE? (Y=YES,N=NO): Y
IS THE SIGNAL SILENCE OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)     : Y
DO YOU WANT TO CHANGE THE WALK TEST OPTN FOR THIS DEVICE? (Y=YES,N=NO)       : Y
IS THE WALK TEST OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)          : Y
```

A monitor module example:

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                              : 4
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)       : L5M13
DO YOU WANT TO CHANGE THE TRACKING OPTN FOR THIS DEVICE? (Y=YES,N=NO)        : Y
IS THE TRACKING OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)           : Y
```

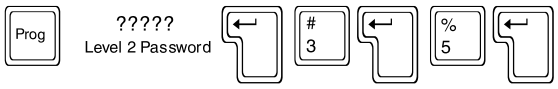
An addressable smoke detector example:

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                              : 4
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)       : L5D17
DO YOU WANT TO CHANGE THIS DETECTORS VERIFICATION OPTION? (Y=YES,N=NO)       : Y
IS THE DETECTOR VERIFICATION OPTN TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO): Y
DO YOU WANT TO CHANGE THIS DETECTORS SENSITIVITY SELECTION? (Y=YES,N=NO)     : Y
ENTER THE DETECTOR SENSITIVITY SELECTION FOR THIS DEVICE (L=LOW,M=MED,H=HIGH): M
DO YOU WANT TO CHANGE THE TRACKING OPTN FOR THIS DEVICE? (Y=YES,N=NO)        : Y
IS THE TRACKING OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)           : Y
DO YOU WANT TO CHANGE THE DAY/NIGHT CONTROL FOR THIS DEVICE? (Y=YES,N=NO)    : Y
IS THERE DAY/NIGHT SENSITIVITY CONTROL FOR THIS DEVICE? (Y=YES,N=NO)         : Y
```

NOTE

Control modules that activate monitor modules via physical connections must not have the walk test option enabled.

Section 1.3.5 Annunciator Mapping



5=AMAP

Option 5 of the Partial Point Programming Menu allows the programmer to individually map devices or zones to annunciator points for remote annunciation. The Annunciator Point Mapping Option Flow Chart is located in Figure 1-12.

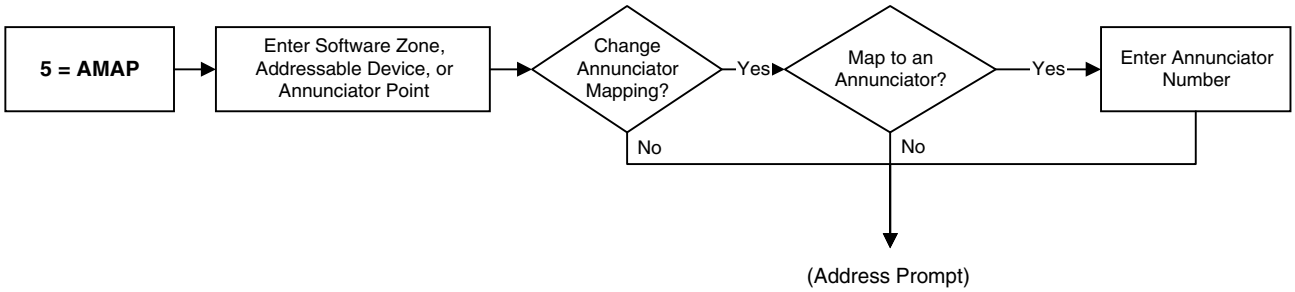


Figure 1-12 Annunciator Mapping Option Flow Chart

The following CRT display illustrates mapping monitor module 11 on SLC Loop 1 to Annunciator Module 1, Point 1.

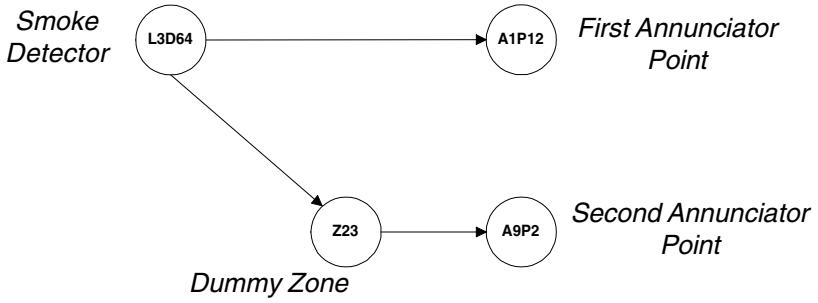
```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                              : 5
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT)    : L1M11
DO YOU WANT TO CHANGE THE ANNUNCIATOR MAPPING FOR THIS POINT? (Y=YES,N=NO)   : Y
DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)               : Y
ENTER AXXPYY FOR ANNUNCIATOR POINT MAPPING                                : A1P1
```

If an annunciator point has more than one control point mapped to it, then all the control points must have identical control-by-event and signal silence programming. Each telephone point must have its own distinct annunciator point for telephone "ring-signal" to function. Each annunciator point must be installed through Full Point Programming before a device, module, or software zone may be mapped to it.

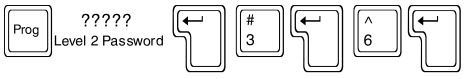
NOTE

Each detector, module or zone may only be mapped to one annunciator point. Therefore, if it is desired to map a detector, module or zone to more than one annunciator point; the detector, module or zone may be mapped to a dummy zone and the dummy zone may be mapped to an annunciator point. This is for annunciation purposes only. If control is desired from both annunciators, then custom shadow annunciator software must be used. Contact Notifier for further information.

For annunciator point mapping information on an AM2020/AFP1010 with **NOTI•FIRE•NET**, refer to Chapter Two, *Operation*, in the INA manual, document 15092.



*Section 1.3.6 Cooperative Control-By-Event



6=CCBE

Option 6 of the Partial Point Programming Menu allows the programmer to change the Cooperative Control-By-Event (CCBE) for any reverse activated zone when using the AM2020/AFP1010 with the **NOTI•FIRE•NET.**

NOTE

A software zone is not a physical zone, but rather a software grouping in control panel memory.

When programming a particular reverse zone, the control panel prompts the programmer with:

```
ENTER COOPERATIVE CONTROL-BY-EVENT                                           :
```

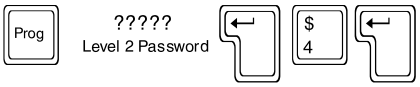
The following CRT screen display illustrates CCBE programming for reverse zone number 220 to activate other zones on **NOTI•FIRE•NET** network nodes.

```
PRESS 1=TYPID,2=CBE,3=LBL,4=OPTNS,5=AMAP,6=CCBE                              : 6
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT)     : Z220
ENTER COOPERATIVE CONTROL-BY-EVENT                                           :
OR(N8Z1 N8Z2 N8Z3 N8Z4 AND(N9Z1 N9Z2 N9Z3 N9Z4) AND(N10Z1 N10Z2 N10Z3 N10Z4))
```

For a complete description of the types, parameters, limitations, and guidelines of CCBE programming, see *Control-By-Event Programming* in Section Four.

*This item is a **NOTI•FIRE•NET** specific function and is only programmed if a SIB-NET is used.

Section 1.4 Full Point Programming



4=FPRG

Option 4 from the Programming Menu allows the programmer to completely program of all the addressable detectors, modules, software-defined zones and annunciator points in the AM2020/AFP1010 system. The programming examples illustrate the CRT screen prompts displayed during Full Point Programming.

For a description of each of the parameters programmed here, refer to *Partial Point Programming.*

NOTE

The control panel continuously loops back through the Full Point Programming routine, allowing the programmer to enter devices, software zones or annunciator points one after the other. Use the Backspace key to exit Full Point Programming.

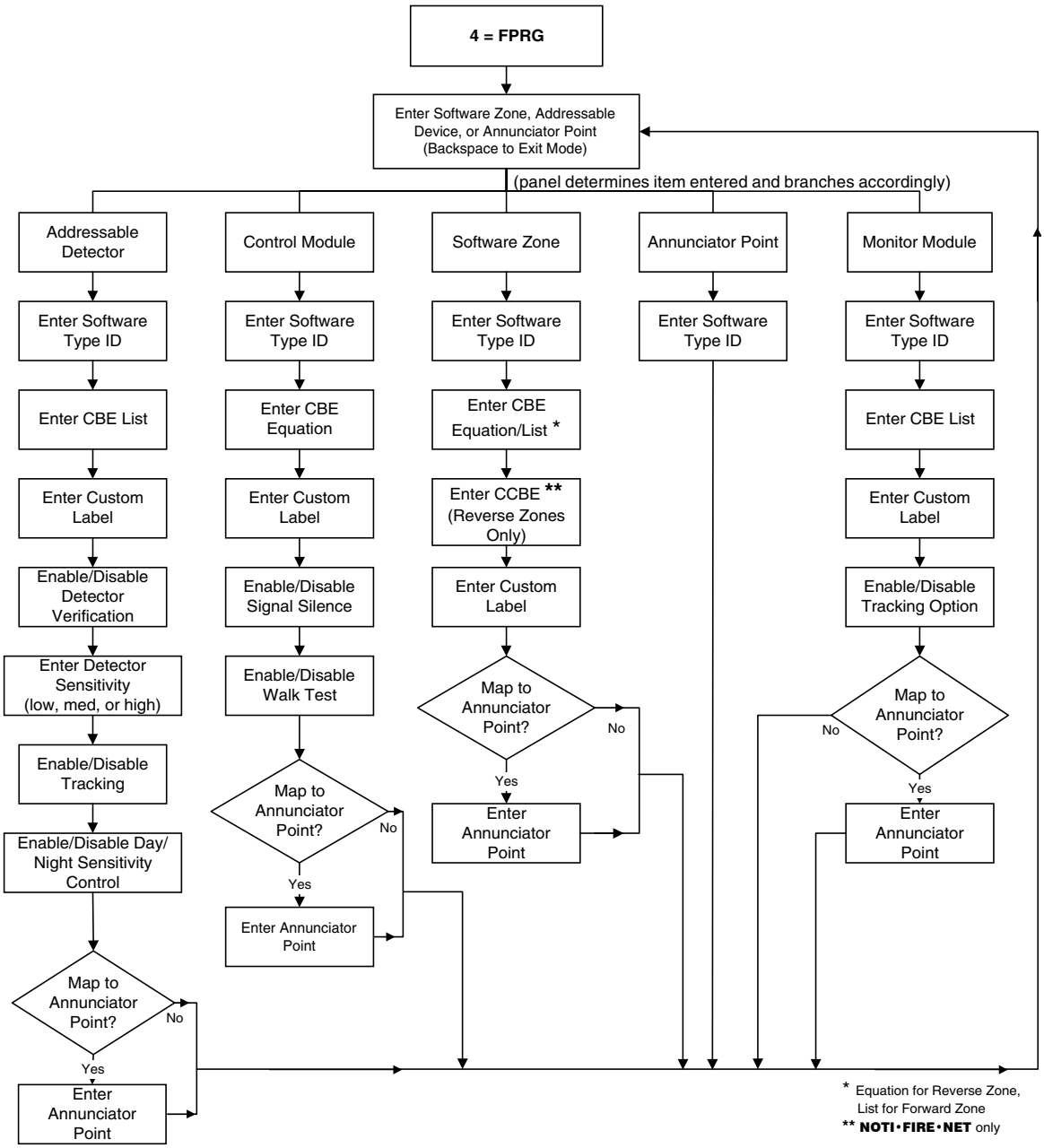


Figure 1-13 Full Point Programming Flow Chart

Example: Programming Addressable Detectors
Photoelectric Smoke Detector on SLC LOOP 2 programmed to activate two software zones (Z13, Z29) and a control module (L2M19), and also mapped to annunciator module address "02" point "02".

```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                    : 4
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT     : L2D23
ENTER TYPE ID                                                          : PHOT
ENTER CONTROL-BY-EVENT                                                    :
(Z13 Z29 L2M19)
ENTER 20 CHARACTER CUSTOM LABEL                          : MAIN LOBBY DETECTOR
IS THE DETECTOR VERIFICATION OPTN TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO): Y
ENTER THE DETECTOR SENSITIVITY SELECTION FOR THIS DEVICE (L=LOW,M=MED,H=HIGH): H
IS THE TRACKING OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)            : Y
IS THERE DAY/NIGHT SENSITIVITY CONTROL FOR THIS DEVICE? (Y=YES,N=NO)      : Y
DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)             : Y
ENTER AXXPYY FOR ANNUNCIATOR POINT MAPPING                             : A2P2
```

Example: Programming Annunciator Points
Installation of individual annunciator points.

```
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT)  : A12P10
ENTER TYPE ID                                                          : ADET
```

Example: Programming Monitor Modules
Monitor Module on SLC Loop 3 programmed to monitor a full zone of conventional 4-wire smoke detectors, and activate a software zone (Z13), and also mapped to annunciator module address "02" point "03".

```
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT.INSTALL (BCKSPC TO ABORT)    : L3M15
ENTER TYPE ID                                                          : SCON
ENTER CONTROL-BY-EVENT                                                    :
(Z13)
ENTER 20 CHARACTER CUSTOM LABEL                        : BASEMENT DETECTORS
IS THE TRACKING OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)           : N
DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)                : Y
ENTER AXXPYY FOR ANNUNCIATOR POINT MAPPING                             : A2P3
```

Example: Programming Control Modules
Control Module on SLC Loop 2 programmed to turn on in response to an alarm condition on either of two software zones (Z13 or Z29), and also mapped to annunciator module address "02" point "04".

```
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT)   : L2M19
ENTER TYPE ID                                                          : CON
ENTER CONTROL-BY-EVENT                                                    :
OR(Z13 Z29)
ENTER 20 CHARACTER CUSTOM LABEL                        : MAIN LOBBY BELLS
IS THE SIGNAL SILENCE OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)     : Y
IS THE WALK TEST OPTION TO BE ENABLED FOR THIS DEVICE? (Y=YES,N=NO)          : Y
DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)                : Y
ENTER AXXPYY FOR ANNUNCIATOR POINT MAPPING                             : A2P4
```

NOTE

Control modules that activate monitor modules via physical connections must not have the walk test option enabled.

Example: Programming Software Zones
Software Zone 13 programmed as a forward zone to activate two other software zones (Z15 and Z29), and also mapped to annunciator module address "02" point "05".

```
   ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT)      : Z13
   ENTER TYPE ID                                                         : FZON
   ENTER CONTROL-BY-EVENT                                                   :
   (Z15 Z29)
   ENTER 20 CHARACTER CUSTOM LABEL                                : FIRST FLOOR
   DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)             : Y
   ENTER AXXPYY FOR ANNUNCIATOR POINT MAPPING                            : A2P5
```

Reverse zones on an AM2020/AFP1010 system with **NOTI•FIRE•NET** can be programmed with both CBE and CCBE equations. Below is an example of Zone 220 programmed as a reverse zone to activate zones on other network nodes.

```
   ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. INSTALL (BCKSPC TO ABORT)     : Z220
   ENTER TYPE ID                                                         : RZON
   ENTER CONTROL-BY-EVENT                                                   :
   ( )
 * ENTER COOPERATIVE CONTROL-BY-EVENT                                      :
 * OR(N8Z1 N8Z2 N8Z3 N8Z4 AND(N9Z1 N9Z2 N9Z3 N9Z4) AND(N10Z1 N10Z2 N10Z3 N10Z4))
   ENTER 20 CHARACTER CUSTOM LABEL                          : LIBRARY
   DO YOU WANT THIS POINT MAPPED TO AN ANNUNCIATOR? (Y=YES,N=NO)             : N
```

* This item is a **NOTI•FIRE•NET** specific function and is only programmed when a SIB-NET is used.

Section 1.5 Remove

5=REMV

Option 5 from the Programming Menu allows the programmer to remove (from control panel memory) SLC Loop devices, software-defined zones or annunciator points. The devices can still be installed in the system, but the AM2020/AFP1010 will stop looking for these devices by not addressing them.

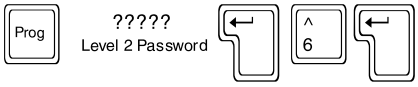
NOTES

- Devices that are removed from the system's program will not function in any capacity until reinstalled under Full Point Programming. *CAUTION - devices that have had their LEDs latched ON must be returned to their normal state before removal (execute System Reset for detectors or control OFF for modules).*
- Unacknowledged points must be acknowledged prior to removal.

The programming example below illustrates the CRT screen prompts during removal of an SLC Loop device (smoke detector 34 on SLC Loop 10).

```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                    : 5
ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. REMOVAL (BCKSPC TO ABORT)   : L10D34
```

Section 1.6 Password



6=PSWD

Option 6 from the Programming Menu allows the programmer to change the Level One and Level Two passwords for the AM2020/AFP1010.

NOTES

- The AM2020/AFP1010s are shipped with initial Level One and Level Two passwords of 00000. As a security measure, the control panel does not echo password digits to the DIA and CRT screen. Rather, it displays an asterisk (*) for each digit entered. After entering five password digits, pressing ENTER (on the DIA) or RETURN (on the CRT) places the new password into operation.
- Acceptable characters for a password are the digits 0-9.

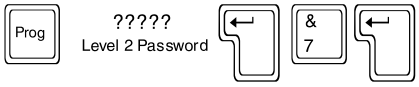
```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                    : 6
PRESS 1=LEVEL ONE,2=LEVEL TWO                                                  : 2
     ENTER LEVEL TWO PASSWORD: *****
```

A Forgotten Password?

If a Level One or Level Two password is incorrectly entered, the panel will respond by displaying a special code word and prompt the programmer to reenter the password. If the password has been forgotten, record this code word and contact NOTIFIER. After proper authentication, the original password can be determined from deciphering the code word. An example of this code word follows:

```
  ENTER LEVEL ONE PASSWORD: *****
 INVALID PASSWORD:       7129406          REENTER PASSWORD:
```

Section 1.7 Message

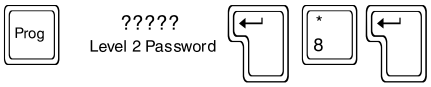


7=MSG

Option 7 from the Programming Menu allows the programmer to change the 40-Character Custom User Label for the system. Acceptable characters for the label include Letters A though Z, digits 0 through 9, periods (.), dashes (-), and spaces.

```
PRESS 1=PSYS,2=FSYS,3=PPRG,4=FPRG,5=REMV,6=PSWD,7=MSG,8=HIS                    : 7
ENTER 40 CHARACTER CUSTOM USER LABEL  : NOTIFIER
```

Section 1.8 History Mode



8=HIS

Option 8 from the Programming Menu allows the programmer to change the parameters associated with History Mode. Once the History option is enabled, the AM2020/AFP1010 has the capability to store the most recent 400 system events.

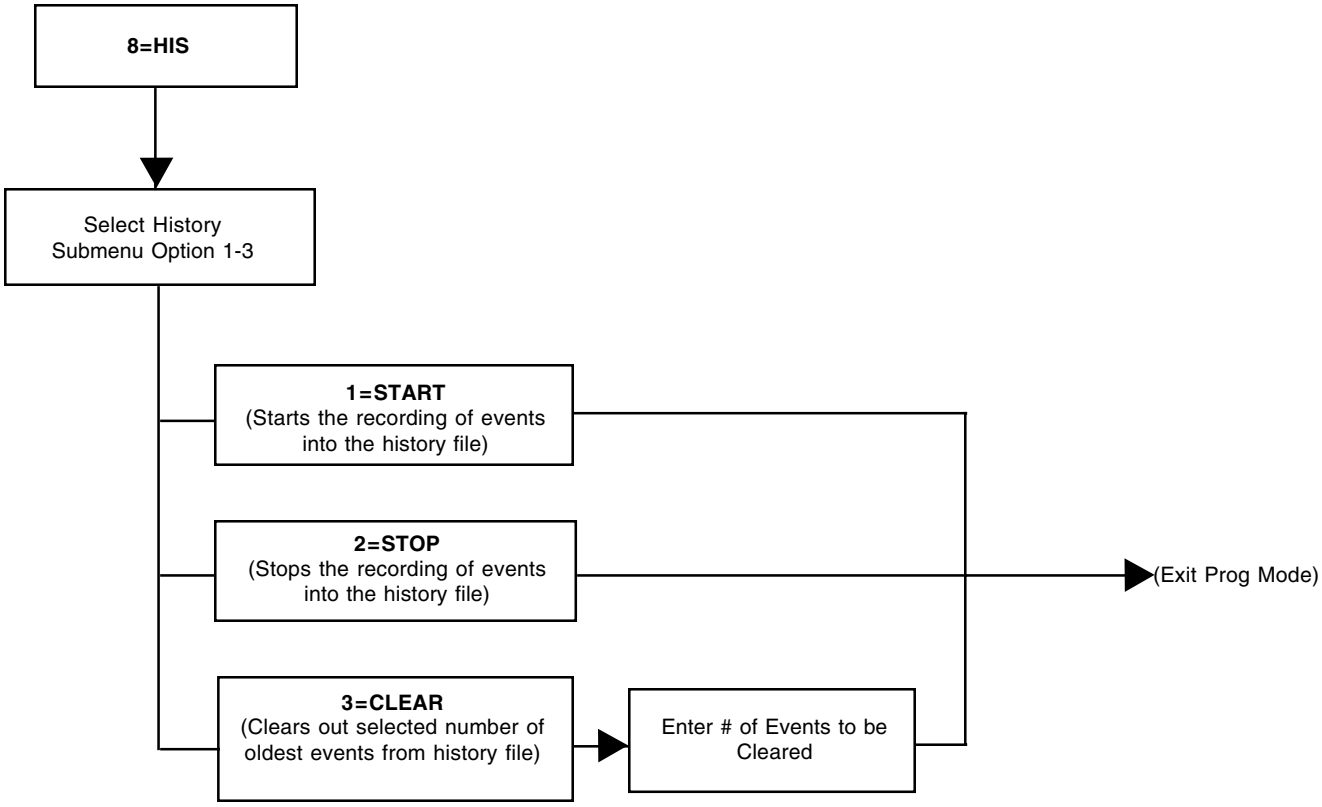


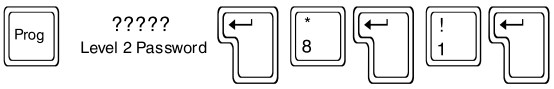
Figure 1-14 History File Option Flow Chart

After selecting option 8 from the Main Programming menu, the display will show the History Mode Programming submenu:

```
PRESS 1=START,2=STOP,3=CLEAR                                    :
```

The History Mode Programming submenu has three options as described below:

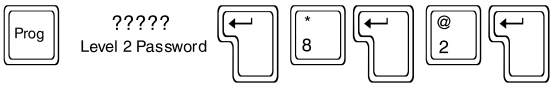
1=START



This option allows the programmer to start storing events into the panel's history file. The following example enables history mode:

```
PRESS 1=START,2=STOP,3=CLEAR                                    : 1
```

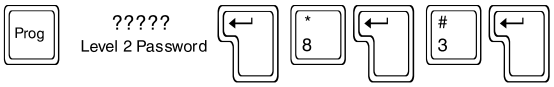
2=STOP



This option allows the programmer to stop storing events into the panel's history file. The following example disables history mode:

```
PRESS 1=START,2=STOP,3=CLEAR                                    : 2
```

3=CLEAR

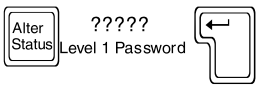


This option allows the programmer to clear out of history file memory a selected number (1-N, where N represents the number of stored events) of the oldest history events recorded. The following example illustrates this by clearing out the entire history file.

```
PRESS 1=START,2=STOP,3=CLEAR                                    : 3
ENTER NUMBER ENTRIES TO CLEAR (1 - 400)                       : 400
```

Section Two
The Alter Status Menu

The Alter Status Mode is accessed by entering the following (level 1 password required):



After entering the Alter Status Mode, the display will show the Alter Status menu:

```
PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    :
```

The Alter Status menu has six options, where:

1=DIS **Disable** - Disabling or enabling any individual addressable detector, module, or software zone in the system.

2=CTL **Control** - Manually turning on and off a control module.

3=DSEN **Detector Sensitivity** - Altering the sensitivity of any of the addressable detectors in the system.

4=TIME **Time** - Resetting the system time/date clock.

5=DIAG **Diagnostics** - Performing system diagnostics.

6=WALK **Walk Test** - Allows the programmer to select which Loop Interface Boards will participate in walk test and generates the walk test reports.

7=GZON **Group Zone** - Allows the programmer to select which zone (and its associated points) to be disabled or enabled as a group.

The Alter Status Menu flow chart is located in Figure 2-1. Detailed information on the Alter Status options follows.

NOTE

When an AM2020/AFP1010 with **NOTI•FIRE•NET** is in walk test mode, a trouble condition will appear for that AM2020/AFP1010 node at the INA and/or NRT.

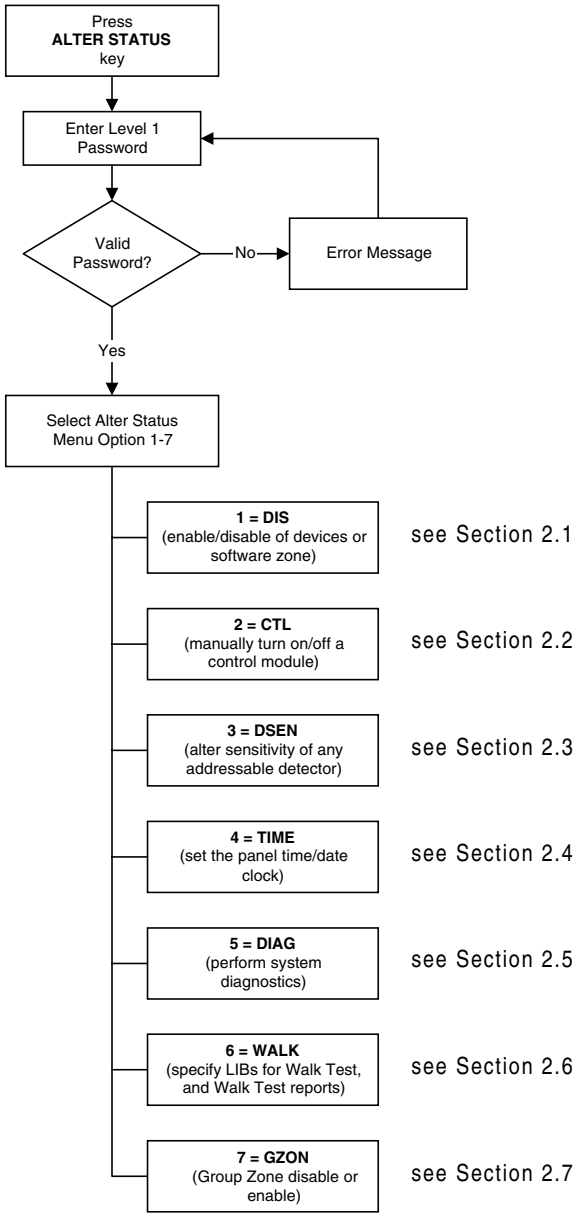
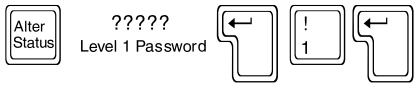


Figure 2-1 Alter Status Menu Flow Chart

Section 2.1 Disable Point



1=DIS

Option 1 from the Alter Status Menu allows the programmer to disable and subsequently re-enable individual devices or zones. When a device is disabled, it is no longer polled by the AM2020/AFP1010.

The following example illustrates disabling monitor module 4 on SLC Loop 1.

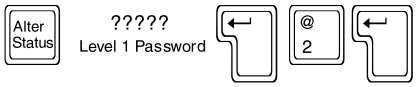
NOTE

The programmer should NEVER disable a point that is in alarm.
The programmer should never turn on (using option 2 of the Alter Status Menu) or program a disabled point.
Telephone (TELE) and remote page (PAGE) Type IDs can not be disabled.

```
  PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    : 1
* ENTER LXX(D/M)YY, ZXXX OR AXXPYY FOR PT. CHANGE (BCKSPC TO ABORT): L1M4
  DO YOU WANT THIS POINT DISABLED? (Y=YES,N=NO)                           : Y
```

* Note: Disable does not affect annunciator points.

Section 2.2 Control Module

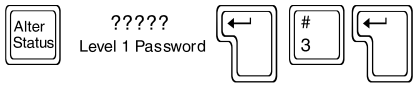


2=CTL
Option 2 from the Alter Status Menu allows the programmer to selectively turn on or off control modules from the control panel.

The following example illustrates turning on control module 22 on SLC Loop 1.

```
PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    : 2
ENTER LXXMYY FOR CONTROL MODULE CHANGE (BCKSPC TO ABORT)              : L1M22
DO YOU WANT POINT TO BE ON OR OFF? (Y=ON,N=OFF)                         : Y
```

Section 2.3 Detector Sensitivity

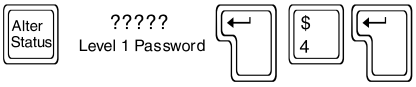


3=DSEN
Option 3 from the Alter Status Menu allows the programmer to alter the sensitivity of any addressable detector. The sensitivity of a detector can be set at one of three levels - *low, medium and high.* Refer to Chapter Two, Section 8 of this manual for information on sensitivity levels and drift compensation.

The following example illustrates setting a high sensitivity for Detector 14 on SLC Loop 3.

```
PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    : 3
ENTER LXXDYY FOR DETECTOR TO CHANGE (BCKSPC TO ABORT)                 : L3D14
ENTER THE DETECTOR SENSITIVITY SELECTION FOR THIS DEVICE (L=LOW,M=MED,H=HIGH): H
```

Section 2.4 Time



4=TIME
Option 4 from the Alter Status Menu allows the programmer to reset the time/date system clock.

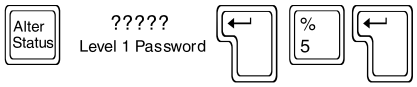
```
PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    : 4
ENTER THE MONTH (1 - 12)                                                : 3
ENTER THE DAY-OF-MONTH (1 - 31)                                         : 1
ENTER THE YEAR (0 - 99)                                                : 93
ENTER THE DAY-OF-WEEK (1=SUN,...,7=SAT)                                 : 2
ENTER THE HOURS IN MILITARY TIME (0 - 23)                              : 15
ENTER THE MINUTES (0 - 59)                                             : 37
NOTIFIER                          ALL SYSTEMS NORMAL  03:37P 03/01/97
```

NOTES

- Military time and conventional time are the same for the hours of 1:00 am to noon. To convert conventional time to military time for the hours of 1:00 pm to midnight remove the colon from the conventional time and add the resulting number to 1200. *Example: 1:34 pm conventional time is 134 + 1200 = 1334 hours military time (13 hours and 34 minutes).*

- On the **NOTI•FIRE•NET** system, the time and date are synchronized every hour by the master clock node on the network. The last AM2020/AFP1010, INA, or NRT on the network where the time and date were manually programmed is the master clock node.

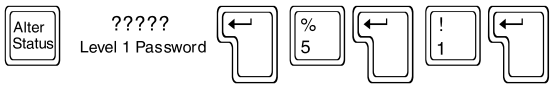
Section 2.5 Diagnostics



5=DIAG
Option 5 from the Alter Status Menu allows the programmer to perform system diagnostics.

The Diagnostics Option submenu is shown below:

```
PRESS 1=RVER                                                                    :
```



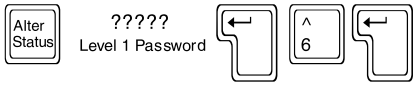
1=RVER - Reset Detector Verification Counters

This option allows the programmer to reset the detector verification counters for all installed intelligent detectors and clear all detector verification error conditions.
The detector verification counter associated with each detector indicates how many times that detector has entered the alarm verification routine without producing a valid fire alarm.

The following example illustrates the execution of this option:

```
PRESS 1=RVER                                                                    : 1
DO YOU WANT TO RESET THE DETECTOR VERIFICATION COUNTERS? (Y=YES,N=NO)            : Y
```

Section 2.6 Walk Test



6=WALK
Option 6 from the Alter Status Menu allows the programmer to select which LIBs will participate in walk test. Upon completion of walk test, the programmer will be able to choose from the optional walk test reports.

After Selecting option 6 from the Alter Status menu, the display will show the Walk Test submenu:

```
PRESS 1=SEL,2=UNP,3=UNI,4=TEST,5=UNTST,6=EXIT                                   :
```

The Walk Test submenu has six options, where:

1=SEL **Select** - Select which LIB boards will participate in Walk Test.

2=UNP **Unprogrammed Device Report** - Allows the programmer to generate a report for unprogrammed devices in the area designated for Walk Test that are connected to the SLC but not defined in the panel database.

3=UNI **Uninstalled Device Report** - Allows the programmer to generate a report for uninstalled devices in the area designated for Walk Test that have been defined in the panel data base but not physically installed on the SLC.

4=TEST **Tested Devices Report** - Allows the programmer to generate a report for tested devices in the area designated for Walk Test.

5=UNTST **Untested Device Report** - Allows the programmer to generate a report for untested devices in the area designated for Walk Test.

6=EXIT **Exit Walk Test** - Allows the programmer to exit/abort the Walk Test Mode.

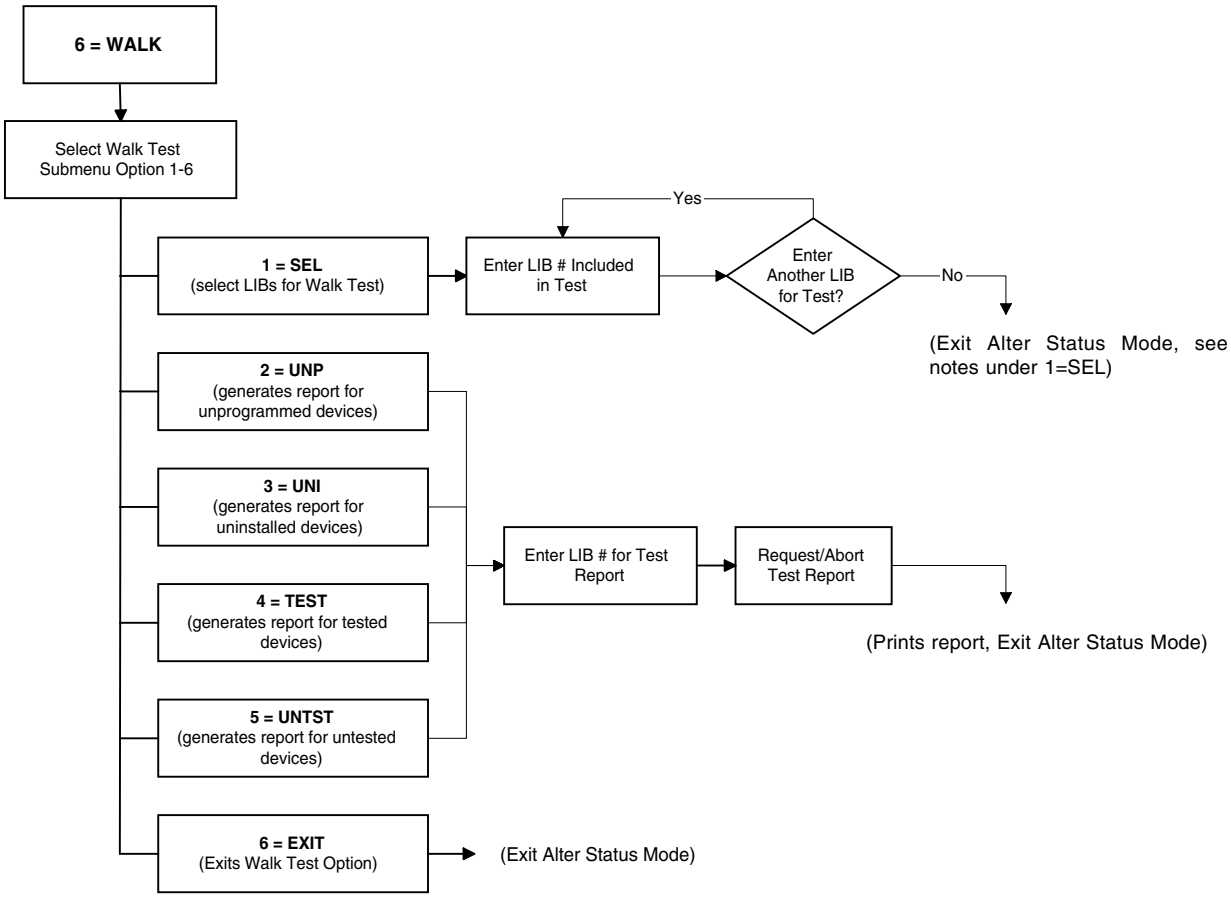
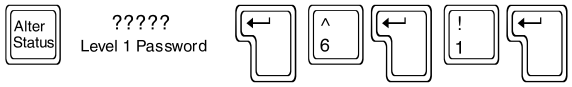


Figure 2-2 Walk Test Option Flow Chart

1=SEL - Select

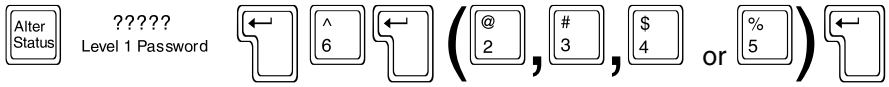


This option allows the programmer to select which LIBs will participate in Walk Test. The following example selects LIBs 1 and 3 for Walk Test:

```
PRESS 1=SEL,2=UNP,3=UNI,4=TEST,5=UNTST,6=EXIT                    : 1
ENTER LIB NUMBER TO BE INCLUDED IN WALK TEST (1 - 10)            : 1
DO YOU WANT TO ENABLE MORE LIBS FOR WALK TEST? (Y=YES,N=NO)      : Y
ENTER LIB NUMBER TO BE INCLUDED IN WALK TEST (1 - 10)            : 3
DO YOU WANT TO ENABLE MORE LIBS FOR WALK TEST? (Y=YES,N=NO)      : N
```

NOTES

- Upon completion of the walk test LIB selection, a system trouble is generated to indicate the control panel is operating under limited fire protection. Only the LIBs selected for walk test are affected.
- Each LIB collects information immediately after it is selected. The programmer should not generate a walk test report until 20 seconds after LIB selection or the report will be missing data and should be considered invalid. If this happens, abort the walk test and start again.
- If one or more LIBs have been selected for walk test, additional LIBs cannot be selected without exiting walk test.
- For every intelligent addressable device activated during walk test, a walk test count message is sent to the printer.
- Conventional devices attached to an addressable device with a Software Type ID of SCON (or equivalent) can not be individually tested with walk test, because walk test does not perform a reset on PWRC (or equivalent) devices. *Do not perform a System Reset during a Walk Test. System Reset does not function properly while in Walk Test mode of operation and may result in unwanted activation of various output modules. If a system reset occurs during a Walk Test, exit Walk Test mode and re-enter.*
- Walk Test will automatically abort if no devices are tested for 15 minutes.



2=UNP - Unprogrammed Device Report
3=UNI - Uninstalled Device Report
4=TEST - Tested Device Report
5=UNTST - Untested Device Report

These options allow the programmer to generate the desired Walk Test report. These reports are generated on a LIB basis. They use the same display format as the Point Read option under Read Status except for the status field which is report-specific (no Control-by-Event or annunciator point mapping is reported). The results of the report are not displayed on the CRT screen but are printed out on the printer.

1=REQUEST	Begins the selected report.
2=ABORT	Aborts the selected report in progress.

NOTE

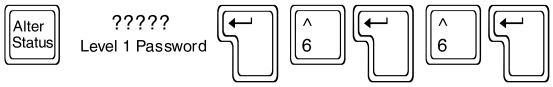
Only one report can be conducted at any one time.

WARNING: *Do not reset the Control Panel while in Walk Test mode. Execution of a System Reset during a Walk Test may cause unwanted activation of various output modules (CMX, XPC, etc.). If a System Reset occurs during a Walk Test, exit Walk Test Mode and re-enter.*

The following CRT screen illustrates conducting a Tested Device Report. The printout of this test is illustrated in **Figure 2-3.**

```
PRESS 1=SEL,2=UNP,3=UNI,4=TEST,5=UNTST,6=EXIT                              : 4
ENTER LIB NUMBER FOR WALK TEST REPORT (1 - 10)                             : 1
PRESS 1=REQUEST,2=ABORT                                                    : 1
LIB 01 TESTED DEVICE REPORT BEGIN                          04:32P 03/01/00
NOTIFIER                          ALL SYSTEMS NORMAL       04:32P 03/01/00
LIB 01 TESTED DEVICE REPORT END                            04:32P 03/01/00
NOTIFIER                          ALL SYSTEMS NORMAL       04:32P 03/01/00
```

6=EXIT - Exit Walk Test



This option allows the programmer to exit/abort Walk Test. In order to exit/abort Walk Test Mode, reenter Alter Status Mode and choose option 6 from the Walk Test submenu.

The following example demonstrates exiting/aborting Walk Test:

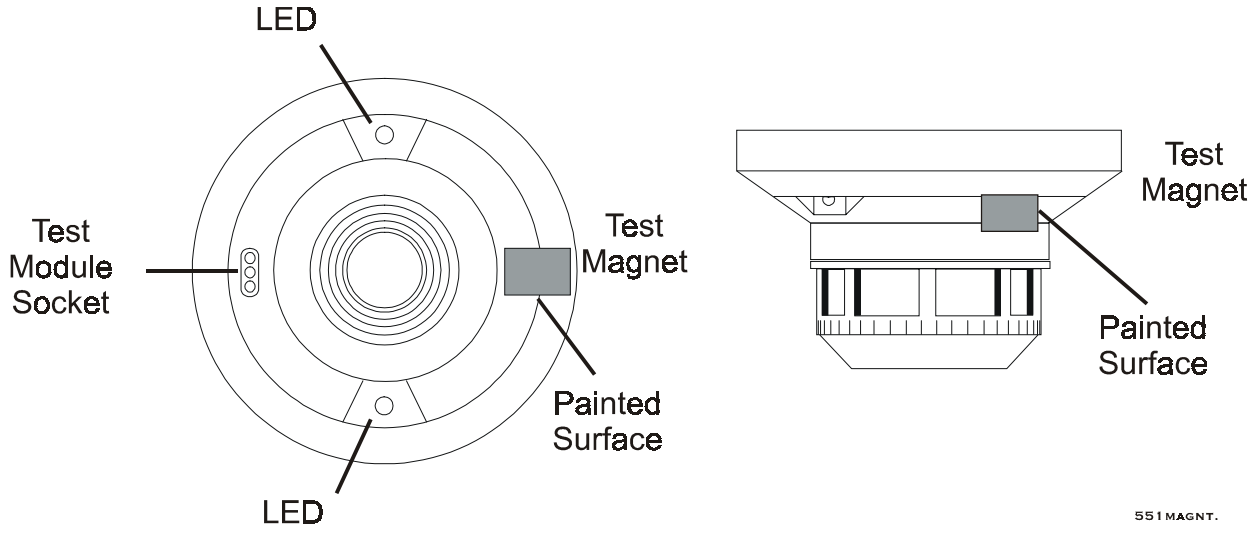
```
PRESS 1=SEL,2=UNP,3=UNI,4=TEST,5=UNTST,6=EXIT                              : 6
```

NOTE

Upon exiting/aborting Walk Test, the Walk Test system trouble is cleared and the AM2020/AFP1010 resumes full fire protection.

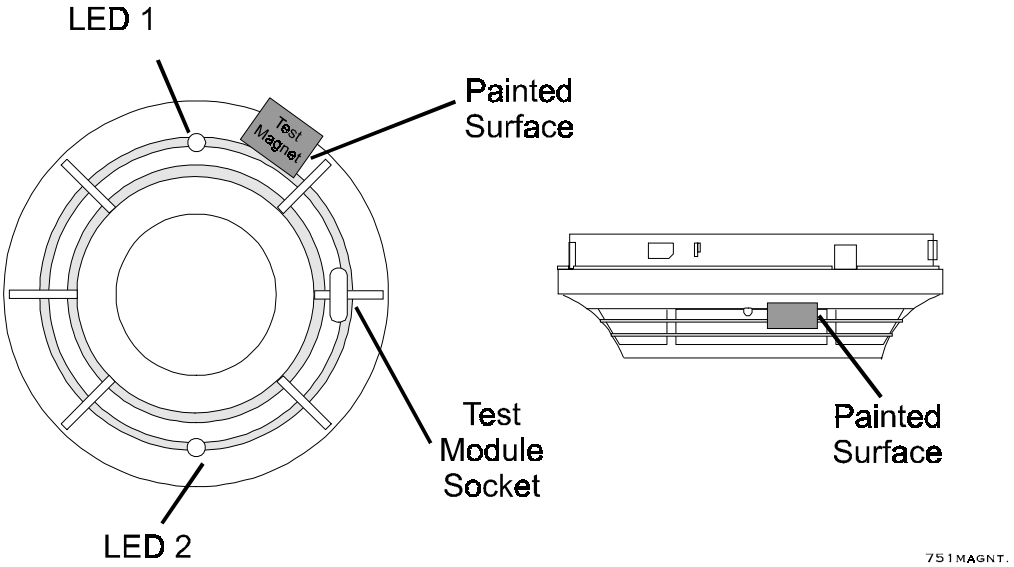
Smoke Detector Activation During Walk Test

Activation of smoke detectors during Walk Test for the Series 500 smoke detectors can be accomplished by placing the optional Test Magnet (System Sensor model number M02-24) against the cover opposite the test module socket, as shown below:



The LEDs should track within 10 seconds indicating alarm and annunciating the panel. (The LEDs will turn off when the magnet is removed.) If Alarm Verification is enabled for the detector, the magnet will have to be held in place for a longer time until the system verification is completed.

The Series 700 smoke detectors can be activated during Walk Test by placing the Test Magnet against the cover between LED 1 and the test module socket in the area shown below:



The LEDs should track within 30 seconds, indicating an alarm and annunciating the panel. (The LEDs will turn off when the magnet is removed.)

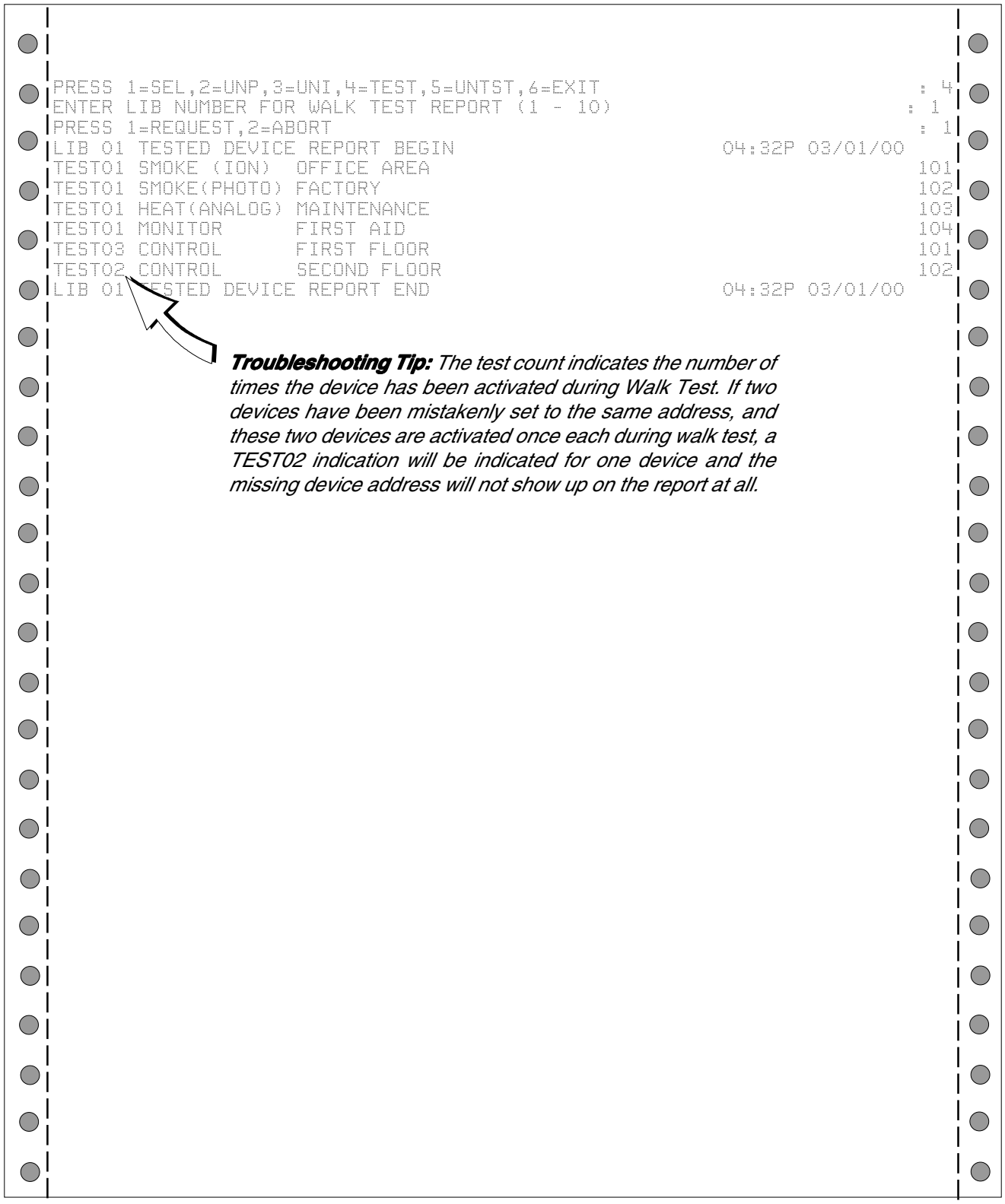
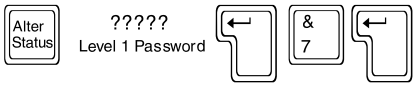


Figure 2-3 Printout of an AM2020/AFP1010 Walk Test Report

Section 2.7 Group Zone Disable



7=GZON

Option 7 from the Alter Status Menu allows the programmer to disable and subsequently re-enable all appropriately mapped points (input devices and zones) associated with a particular software zone. When a point is disabled, it is no longer polled by the AM2020/AFP1010.

When a zone is disabled using this feature, a trouble message is generated for this zone. Then the entire CBE database is searched for all input devices and zones, looking for this "group" zone to be the first zone in each point's individual CBE. A trouble message will be generated for each point (input device or zone) matching the above criteria as it is found and disabled. During the search process the user interface is locked out.

The following example illustrates group disabling Zone 2.

NOTE:
The programmer should never program a disabled point.

```
PRESS 1=DIS,2=CTL,3=DSEN,4=TIME,5=DIAG,6=WALK,7=GZON                    : 7
ENTER ZXXX FOR   GROUP   ZONE   CHANGE                                 : Z2
DO YOU WANT THIS GROUP ZONE DISABLED? (Y=YES,N=NO)                      : Y
```

Example:

Point	CBE
Z1	( )
Z2	( )
Z3	( )
L1D1	(Z1)
L1D2	(Z2)
L1D3	(Z3)
L1M1	(Z1)
L1M2	(Z2)
L1M3	(Z3)

As a result of disabling Z2 using the group zone disable function, L1D2 and L1M2 will automatically be disabled as well.

The "first zone" does not necessarily mean being the first operand in a CBE. A zone can be located anywhere within the CBE. The following CBE examples all have the same effect for group zone functions:

(Z1)
(Z1 L1M1)
(L1M1 Z1)
(L1M1 L1M2 Z1 Z2)

Z1 is the first zone found in each individual CBE.

Section Three
Software Type IDs

All point addresses for devices, software zones, and annunciator points must be programmed with an appropriate Software Type identification. Software Type IDs allow the AM2020/AFP1010 to identify the type and configuration of specific devices, zones, and annunciator points associated with the panel.

Each Type ID is categorized by groups. There are 18 separate groups of Software Type IDs which are defined in the tables on the following pages. Each table consists of the following format.
Type ID - This is the software type entered by the programmer for a particular point.

Display Label - The characters displayed for addressable devices, zones, and annunciator points on the control panel during alarm, trouble, and read status conditions.

Type of Device - Type of devices compatible with, and/or description of operating parameters for, the particular Type ID

The control panel will not permit the changing of a Software Type ID in one group to a Software Type ID in another group. To accomplish this, the device must be reinstated with the Software Type ID of the desired group by using the ***Full Point Programming*** option of the Main Programming Menu.

NOTE: The XP Transponder will revert to Local Mode program operation upon loss of communications with the AM2020/AFP1010. Therefore, use extreme care when assigning Software Type IDs to XP Transponder circuits. For instance, an XP circuit assigned Software Type ID SPSU will initiate a supervisory condition under communication with the AM2020/AFP1010, but will result in an alarm condition under local XP operation.

Group 1: ***Addressable Detectors***

Type ID	Display Label	Type of Device
CMBO	**SMOKE(COMBO)**	**IPX-751** Intelligent Combination Ionization/Photoelectric/Thermal Detector. **FAPT-751** Acclimate™ Multi-sensor (Photo-Thermal)
FPHT	**FIXED PHOT D**	**SDX-551/751 Intelligent Photoelectric Smoke Detector** with a fixed sensitivity level. (This software type is obsolete and should not be used).
FTHR	**FIXED THER D**	**FDX-551 Intelligent Thermal Sensor** with a fixed sensitivity level. (This Software Type ID can only be used in Canadian applications and does not meet UL sensitivity requirements for use in the U.S.).
ION	**SMOKE(ION)**	**CPX-551/751 Intelligent Ionization Smoke Detector.**
IOND	**ION DUCT DET**	**CPX-551-751 Intelligent Ionization Smoke Detector** with a fixed sensitivity level. (The sensitivity of this detector can not be adjusted. All other detector functions will be equivalent to type ION). This detector is used in conjunction with the DHX-501 or DHX-502 duct detector housing.
IONL	**SMOKE ION LP**	**CPX-751 Intelligent Ionization Smoke Detector**. (This Software Type ID can only be used in Canadian applications and has the same programming options as type ION).
IONH	**SMOKE ION HP**	**CPX-551 Intelligent Ionization Smoke Detector**. (This Software Type ID can only be used in Canadian applications and has the same programming options as type ION).
IONV	**SMOKE (IONV)**	**Same as ION.** This software type is to be used in elevator lobbies where a Supervisory conditon is to be reported while an alarm is being verified via detector verification.
PHOT	**SMOKE(PHOTO)**	**SDX-551/751 Intelligent Photoelectric Smoke Detector.**The SDX-551/751 photo detector does not require a different Software Type ID when used with the DHX-501 or DHX-502 duct detector housing.
PHOV	**SMOKE (PHOTV)**	**Same as PHOT.** This software type is to be used in elevator lobbies where a Supervisory conditon is to be reported while an alarm is being verified via detector verification.
THER	**HEAT(ANALOG)**	**FDX-551 or FDX-551R Intelligent Thermal Sensor.**

Group 2: ***Output Modules***

- These Software Type IDs cannot be programmed for Signal Silence.
- These Software Type IDs do not have any control-by-event programming.
- If the Software Type ID requires Form-C relay function, the two tabs on the CMX must be broken. Otherwise, the tabs must not be broken.

Type ID	Display Label	Type of Device
APND	**ALARMS PEND**	**CMX Control Module**, an **XPC-8 circuit**, or an **XP5-C (in NAC mode)** that will activate upon receipt of an alarm condition, and remain in the ON state until all alarms have been ACKNOWLEDGED.
DACT	**DACT CONNECT**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay,** or an **XP5-C (in relay mode)** that will delay the reporting of AC power loss. Any other trouble condition will be reported immediately. This module is used in conjunction with a digital alarm communicator.
GAC	**GN ALRM FORC**	**CMX Control Module** configured as a Form-C relay,an **XPR-8 relay,** or an **XP5-C (in relay mode)** to switch power to a Reverse Polarity Trip Device for NFPA 72 Remote Station Fire Alarm Systems applications (RPT-680 required). *This type can also be used for general alarm activation.*
GAS	**GN ALARM**	**CMX 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 (MBT-1 required). *This Type ID can also be used for general alarm activation.*
GPND	**GENERAL PEND**	**CMX 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.
GTC	**GN TRBL FORC**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay,** or an **XP5-C (in relay mode)** activated under any System Trouble condition.
PAGE	**PAGE**	**CMX Control Module,** an **XPC-8 circuit,** or an **XP5-C (in NAC mode)** configured for remote paging (RPJ-1 required).
PWRC	**POWER (CONV)**	**CMX Control Module** configured as a Form-C relay or an **XP5-C (in relay mode)** used to momentarily interrupt power (during system reset) to conventional 4-wire smoke detectors powered from a remote main power supply.
SSC	**GN SUPR FORC**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay,** or an **XP5-C (in relay mode)** activated under any Supervisory condition (includes sprinkler type).
TELE	**TELEPHONE**	**CMX Control Module,** an **XPC-8 circuit,** or an **XP5-C (in NAC mode)** configured for telephone operation. *Note: The CMX and XP5-C will not provide a ring-back signal when a call is placed.*
TPND	**TRBLS PEND**	**CMX 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.
TRC	**TROUBLE FORC**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay**, or an **XP5-C (in relay mode)** that will activate upon receipt of a trouble condition(s) and remain in the ON state until the trouble(s) clear(s).
TRS	**TROUBLE**	**CMX Control Module**, an **XPC-8 circuit,** or an **XP5-C (in NAC mode)** that will activate upon receipt of a trouble condition(s) and remain in the ON state until the trouble(s) clear(s).
WFC	**GN WAT FORC**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay,** or an **XP5-C (in relay mode)** activated under any Water Flow condition.
WFS	**GN WATER FLW**	**CMX Control Module**, an **XPC-8 circuit,** or an **XP5-C (in NAC module mode)** configured as a Notification Appliance Circuit, activated under any Water Flow alarm condition.

Group 3: ***Software Zones***

Type ID	Display Label	Type of Device
FZON **RZON**	**FORWARD ZONE** **REVERSE ZONE**	A software-defined zone that is *forward-activating*. A software-defined zone that is *reverse-activating.*

- A Forward-Activating Zone is a software zone in control panel memory which once activated by an addressable input device or other forward zone may in turn activate other zones and/or addressable output devices directly. Zones and output devices activated by a forward zone are contained in the CBE List of that forward zone, or the zone may be listed in the CBE of the addressable output device.

- A Reverse-Activating Zone is a software zone in control panel memory which if not activated directly by an addressable input device or forward zone may be activated through an associated CBE equation. A Reverse Zone may be listed in other CBE Equations.

Group 4: ***Alarm Initiation Modules***

Type ID	Display Label	Type of Device
MON	**MONITOR**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** used to monitor *normally-open* contact, shorting-type devices other than 4-wire smoke detectors (i.e. conventional heat detectors, pull stations, etc.).
MPUL	**MON PULL STA**	**BGX-101L Addressable Manual Pull Station.**
NCMN	**MON NORM CLD**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** used to monitor *normally-closed* contact, opening-type devices.
NOA	**NON ALARM**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** that functions identically to Software Type ID NONA with one exception - subsequent alarms from this Type ID will not reactivate silenced output devices - once silenced, outputs will remain silenced until reactivated by another Software Type ID (or cleared by System Reset and reactivated).
NONA	**NON ALM MON**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** used to monitor normally-open contact, shorting-type non-alarm devices. Activation of a module with Software Type ID NONA will not initiate a fire alarm condition: • System Alarm LED will not illuminate. • Does not activate alarm status line count on a CRT. • No affect on modules programmed as APND (alarm pending) or GPND (general event pending). • Alarm, clear alarm, or acknowledgments are not reported for this type.
PULL	**PULL STATION**	**BGX-10 Addressable Manual Pull Station.**
SCON	**SMOKE (CONV)**	**MMX Monitor Module** or an **XP5-M circuit** used to monitor conventional 4-wire smoke detectors. This module has a longer reset period than modules programmed as MON.
WAT	**WATER FLOW**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** dedicated to a Water Flow Alarm device.

Group 5: ***Output Modules***

Type ID	Display Label	Type of Device
CMXC	**CMX FORM C**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay,** or an **XP5-C (in relay mode)**.
CMXS	**CMX CONTROL**	**CMX Control Module**, an **XPC-8 circuit**, or an **XP5-C (in NAC mode)** configured as a Notification Appliance Circuit.
CON	**CONTROL**	**CMX Control Module**, an **XPC-8 circuit,** or an **XP5-C (in NAC mode)** configured as a Notification Appliance Circuit.
FORC	**FORM C RELAY**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay**, or an **XP5-C (in relay mode)**
FRCM	**FORMC MANUAL**	**CMX Control Module** configured as a Form-C relay, an **XPR-8 relay**, or an **XP5-C (in relay mode)**. This device is not deactivated when a system reset occurs. This module can be used for some fan control applications and can be mapped only to an AFCM annunciator point.
SPKR	**SPEAKER**	**CMX Control Module**, an **XPC-8 circuit,** or an **XP5-C (in NAC mode)** configured as a speaker circuit.

Note: Each Type ID listed above is prompted for Signal Silence during programming. If the silence option has been programmed for these addressable devices, they can be turned off using the Control OFF function under the Alter Status Menu or by pushing the appropriate annunciator point switch. Of the above Type IDs, only CON, FORC, and SPKR can be silenced by pressing the Signal Silence button, initiating a partial signal silence. If the Software Type ID requires Form-C relay function, the two tabs on the CMX must be broken. Otherwise, the tabs must not be broken.

Group 6: ***Supervisory/Security Modules***

Type ID	Display Label	Type of Device
SACM	**ACCESS MONTR**	**MMX Monitor Module** or an **XP5-M circuit** used to monitor a security device. This module will be activated by an open or a short condition. Activation of a module with this Software Type ID will not initiate a security alarm condition: • Security Alarm LED will not illuminate. • Does not activate trouble status line count on a CRT. • No effect on modules programmed as TPND (trouble pending) or GPND (general event pending). • Trouble, clear trouble or acknowledgments are not reported for this type.
SARM	**AREA MONITOR**	**MMX Monitor Module** or an **XP5-M circuit** used to monitor a security device. This module will be activated by either an open or a short condition and produces a SECURITY ALARM message in the display.
SEQM	**EQUIP MONITR**	**MMX Monitor Module** or an **XP5-M circuit** that functions identically to Type ID SACM.
SPSU	**SPRNKLR MNTR**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** dedicated to a normally open sprinkler supervisory switch. Activation of a module with Software Type ID SPSU will generate a trouble condition (produces a SPRNKLR TROUBLE message) not an alarm. The option of **Tracking** (troubles self-restore) is automatically selected for this software type.
SSYM	**SYSTEM MONTR**	**MMX Monitor Module** or an **XP5-M circuit** used to monitor a security device. This module will be activated by either an open or a short condition and produces a SECURITY TAMPER message in the display.
SUPR	**SPRVSRY MNTR**	**MMX Monitor Module**, an **XPM-8 circuit,** or an **XP5-M circuit** dedicated to a normally open supervisory switch. Activation of a module with Software Type ID SUPR will generate a trouble condition (produces a SUPRVSRY SIGNAL message) not an alarm.

Group 7: ***Evacuation Modules***

Type ID	Display Label	Type of Device
EVGA	**GN ALARM EVC**	**CMX Control Module**, an **XPC-8 circuit, or an XP5-M circuit (in NAC mode)** configured as a Notification Appliance Circuit, activated on General Alarm, for NFPA 72 Local Fire Alarm Systems applications.
Note: This software type cannot be silenced if a module of Software Type ID WAT (Water Flow) has been activated.		

Group 8: ***Annunciator Control***

Type ID	Display Label	Type of Device
AAST	**ANN ACK/STEP**	**Annunciator Point** used to execute ACKNOWLEDGE/STEP.
ALMP	**ANN LAMP TST**	**Annunciator Point** used to execute LAMP TEST.
ARES	**ANN RESET**	**Annunciator Point** used to execute SYSTEM RESET.
ASGS	**ANN SIG SIL**	**Annunciator Point** used to execute SIGNAL SILENCE.

Group 9: ***Annunciator Zone***

Type ID	Display Label	Type of Device
AZON	**ANN ZONE**	**Annunciator Point** that indicates the state of any software zone mapped to it.

Group 10: ***Annunciator Detector***

Type ID	Display Label	Type of Device
ADET	**ANN DETECTOR**	**Annunciator Point** that indicates the state of any intelligent detector mapped to it.

Group 11: ***Annunciator Module***

Type ID	Display Label	Type of Device
AMON	**ANN MONITOR**	**Annunciator Point** that indicates the state of any MMX Monitor Module, XPM-8 circuit, or XP5-M circuit mapped to it.

Group 12: ***Annunciator Input***

Type ID	Display Label	Type of Device
AINP	**ANN INPUT**	**Annunciator Point** that indicates the state of any generic input (software zone, intelligent detector, monitor module, XPM-8 circuit or XP5-M circuit) mapped to it.
Note: Items in groups 9,10 and 11 may be re-mapped to group 12 only.		

Group 13: ***Annunciator Output***

Type ID	Display Label	Type of Device
ACON	**ANN CONTROL**	**Annunciator Point** that indicates the state of any CMX Control Module, XPC-8 circuit, XPR-8 relay, or XP5-C circuit mapped to it. This annunciator point can also be used for manual control of relays, speaker and notification circuits.
AFCM	**ANN FORC MAN**	**Annunciator Point** that is not deactivated upon system reset. Used for fan control and similar applications only with an FRCM control device.

Group 14: ***Annunciator Telephone***

Type ID	Display Label	Type of Device
ATEL	**ANN TELEPHON**	**Annunciator Point** that indicates the state of any CMX Control Module or XPC-8 or XP5-C circuit configured for telephone operation. This annunciator point can also control the state (connect/disconnect) of the circuit.

Group 15: ***Annunciator Supervisory***

Type ID	Display Label	Type of Device
ASUP	**ANN SUPRVSRY**	**Annunciator Point** that indicates the state of any SPSU or SUPR module mapped to it.

Group 16: ***Trouble Module***

Type ID	Display Label	Type of Device
MTRB	**TRBL MONITOR**	**MMX Monitor Module**, an **XPM-8 circuit, or an XP5-M circuit** used to monitor any trouble contacts external to the system. This module will be activated by either an open or a short condition, and produces a POINT TROUBLE message in the display. A Control-By-Event equation need not be entered for this type since it only produces a trouble signal, not an alarm.
Note: This software type can be used to monitor power from an Uninterruptable Power Supply (UPS) under NFPA 72 Proprietary Fire Alarm Systems applications or to monitor remote Main Power Supply in XP Transponder systems.		

Group 17: ***Page Module***

Type ID	Display Label	Type of Device
MPAG	**MONITOR PAGE**	**MMX Monitor Module** or an **XPM-8 circuit** or **XP5-M circuit** dedicated to a normally open switch. Activation of a module with Software Type ID MPAG connects the remotely located Fire Fighter's Telephone handset to the paging system. This Type ID is used in conjunction with the PAGE Type ID (RPJ-1 required).

Group 18: ***Annunciator Manual Mode***

Type ID	Display Label	Type of Device
AMAN	**ANN MANUAL**	**Annunciator Point** that indicates manual mode for an annunciator module. The annunciator point can also turn the manual mode off or on. This Type ID is used in conjunction with INA ACS or FACP shadow point programming.

Section Four
Control-By-Event Programming

4.1 Control-By-Event Programming

Introduction
Control-By-Event (CBE) Programming is used to provide a variety of responses based on various combinations of events (initiating conditions). The Control-By-Event Programming controls the interaction between the alarm initiating devices, the internal software zones, and the alarm notification appliances associated with an AM2020/AFP1010.

NOTE
A software zone is not a physical zone, but rather a software grouping in control panel memory.

Software Zones
The AM2020/AFP1010 contains 240 software zones to be used in CBE programming. These software zones are broken into two types, Forward-Activating Zones (FZON) and Reverse-Activating Zones (RZON). These forward and reverse zones must be grouped separately in the system's programming, with the forward group always preceding by lower zone number the reverse group. This is accomplished by setting the Zone Boundary (see Section 1.1.5, *Zone Boundary*, for more information on setting the zone boundary). Once the boundary is set, all software zone numbers above the Zone Boundary are RZONs and all software zones below and including the Zone Boundary are FZONs.

Forward-Activating Zones
FZONs are used to activate addressable output devices and/or other software zones. The software zones that can be activated, however, must have a higher zone number than the FZON being utilized.

Reverse Activating Zones
RZONs are activated from addressable input devices and/or other software zones. The software zones that can be used to activate a reverse zone must have a lower zone number than the RZON being activated.

Lists and Equations
Control-By-Event Programming can be accomplished in two ways, via the *List* and the *Equation.* Lists are used for addressable initiating devices (detectors and monitor modules) and forward activating zones, where as, Equations are used for addressable output devices (control modules) and reverse activating zones.

When an addressable initiating device or forward-activating zone is programmed with a List, the AM2020/AFP1010 activates all the items, called *Operands*, in the list when activation of the device or zone occurs. The operands listed for an addressable initiating device can be notification modules and/or software zones (forward or reverse activating). For a forward activating zone, the operands can be forward zones that are higher than its address, reverse activating zones and/or addressable control modules.

Example:

A photoelectric detector has a List of (L1M1 L2M2), where L1M1 and L2M2 are control modules. When the detector is in alarm, all the items in the Control-By-Event List are enabled so both control modules are activated.

The real power of the CBE Programming comes from the equation, which is evaluated by the control panel to determine a variety of alarm initiating conditions. The equation provides the real decision-making ability through the use of an operator acting on a set of operands. The operands for an output module can be addressable initiating devices, software zones (forward or reverse-activating), or addressable control modules assigned an address lower than its own. For a reverse-activating zone, the operands can be addressable initiating devices, forward zones, or reverse zones that are lower than its address.

The format for an equation is shown below, where the operators are OR, AND, NOT, XZONE, DEL, SDEL, and TIM; and the operands are groupings of initiating devices and/or software zones, as well as information specific to the format of individual operators.

*Operator**(**- - - - Operands - - - -**)***

Examples:
OR(Z9 Z15 Z23)
AND(L1D1 Z3 L1D35 L1D72)
NOT(Z23)
XZONE(Z23)
DEL(HH.MM.SS HH.MM.SS (L1M1))
SDEL(HH.MM.SS HH.MM.SS (Z1))
TIM(SU MO TU WE TR FR SA HH.MM HH.MM)

All of the operator formats above are explained in detail on the following pages.

Control-By-Event Programming Constraints

- There can only be one DEL or SDEL operator in a control-by-event equation, not both.
- If there is no duration time field in a DEL or SDEL, the equation will always be activated.
- The maximum value of DELAY TIME + DURATION TIME is 255:59:59.
- If either the day, month or year field is omitted, that field is assumed to be all allowable values of the field omitted. Example: 12--90 is equivalent to any day in December 1990.
- The HH.MM field for START TIME and STOP TIME uses military time.
- The HH.MM field for STOP TIME must be greater than the START TIME.
- The maximum value of START TIME or STOP TIME is 24:00.
- If an alarm condition occurs, all active TIM devices will be deactivated. All TIM equations will be ignored until all alarms are restored, at which point all TIM devices will return to their proper state.

See **Section 4.3, Size Limitations** for the constraints on the size, in bytes, of the CBE.

4.2 Operators

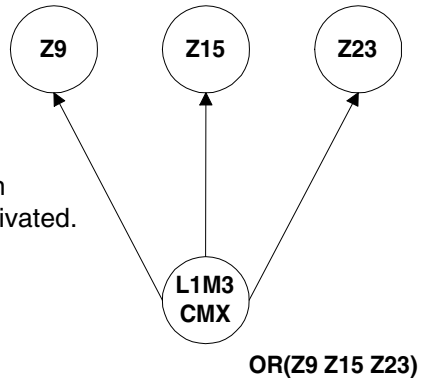
OR

Operator: The first (and most useful) operator is **OR.**

Equation: **OR(Z9 Z15 Z23)**

If **ANY** one of the three operands in the equation are in alarm, then the control module will be activated.

IF Software Zone 9 is in alarm **OR**
IF Software Zone 15 is in alarm **OR**
IF Software Zone 23 is in alarm**,**
THEN this control module will be activated.



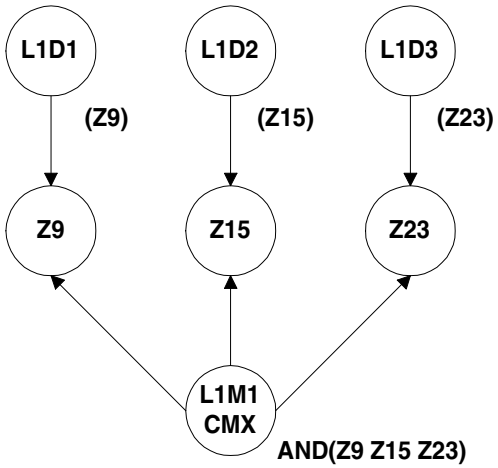
AND

Operator: The **AND** operator requires that each operand be in alarm**.**

Equation: **AND(Z9 Z15 Z23)**

ALL three operands in the equation **MUST** be in alarm for the control module to be activated.

IF Software Zone 9 is in alarm **AND**
IF Software Zone 15 is in alarm **AND**
IF Software Zone 23 is in alarm,
THEN this control module will be activated.



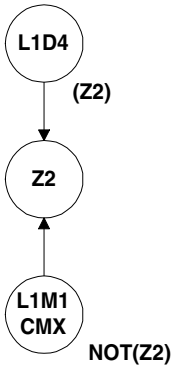
NOT

Operator: The **NOT** operator inverts the state of the operand (activated to deactivated OR deactivated to activated).

Equation: **NOT(Z2)**

The control module will remain activated **UNTIL the** operand comes into alarm.

IF Software Zone 2 is in alarm,
THEN this control module will be deactivated.

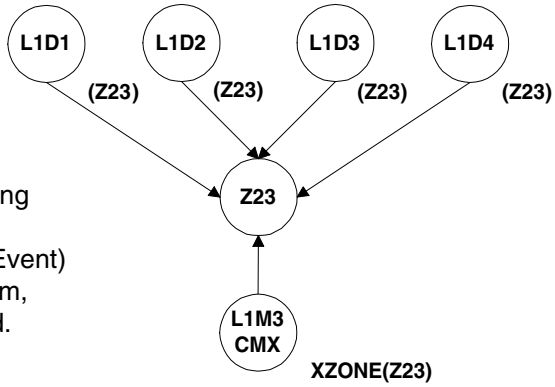


XZONE

Operator: For *Cross Zone* operation, the **XZONE** counting operator may be used.

Equation: **XZONE(Z23)**

IF ANY combination of **two** or more initiating devices (L1D1, L1D2, L1D3, L1D4) that have been programmed (Control-By-Event) to this software zone (Z23) come into alarm, **THEN** this control module will be activated.



DEL

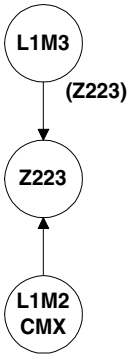
Operator: For delayed operation, the **DEL** operator is used.

Equation: **DEL(HH.MM.SS HH.MM.SS (Z1))**

Delay — Duration *(optional)* — Internal Equation

Example: L1M3 activates Forward Activating Zone 223 (Z223).
L1M2 CBE is: DEL(00.00.30 00.01.30 (Z223))

IF Z223 has been active for 30 seconds
THEN L1M2 will become active. L1M2 will stay active for 1 minute and 30 seconds provided that Zone Z223 remains active.



Time line

0:00 **0:30** 1:00 1:30 **2:00** 2:30

+————+————+————+————+————+

Z223 active — L1M2 active — L1M2 inactive

DEL(00.00.30 (Z223)) **00.01.30**

NOTES

- The entire DEL equation consumes at least 11 bytes (including a 3-byte internal equation). The internal equation can be a complex equation many bytes in size.
- If a delay of zero is entered (00.00.00), the equation will evaluate true as soon as the internal equation 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.

SDEL

Operator: The **SDEL** operator is also used for delayed operation. This is a latched version of the DEL operator. Once the equation evaluates True, it remains activated until a reset, even if the internal equation becomes false.

Equation: **SDEL(HH.MM.SS HH.MM.SS (Z1))**

Delay — Duration *(optional)* — Internal Equation

Example: **If Z223 CBE is: SDEL(00.00.30 00.01.30 (L1M1))**
IF L1M1 has been active for 30 seconds
THEN Z223 will become active. Z223 will stay active for 1 minute and 30 seconds.

Time line

0:00	**0:30**	1:00	1:30	**2:00**	2:30
L1M1 active	Z223 active			Z223 inactive	

NOTES

- The entire SDEL equation consumes at least 11 bytes (including a 3-byte Internal Equation). The Internal Equation can be a complex equation many bytes in size.
- If a delay of zero is entered (00.00.00), the equation will evaluate true as soon as the Internal Equation evaluates True and will remain that way for the specified duration.
- If no duration is specified, then the device will not deactivate until reset.

TIM

Operator: The **TIM** operator is used to specify activation on specific days of the week or year.

Equation: *(Type 1)* **TIM(SU MO TU WE TR FR SA HH.MM HH.MM)**

Activation Day *(optional)* — Start Time *(optional)* — Stop Time *(optional)*

Example: **If Z221 CBE is: TIM(SA SU 7.30 13.59)**
Zone Z221 will be active on Saturdays and Sundays from 7:30AM to 1:59PM.

Equation: *(Type 2)* **TIM(MM-DD-YY HH.MM HH.MM)**

Activation Date *(optional)* — Start Time *(optional)* — Stop Time *(optional)*

Examples: **If Z222 CBE is: TIM(7-4-)**
Zone Z222 will be active on July 4th for every year.

If Z222 CBE is: TIM(12-25- 9.00 17.00)
Zone Z222 will be active on December 25th for every year from 9:00AM to 5:00PM.

4.3 Size Limitations

Each Control-By-Event has a physical size limitation of 14 bytes in control panel memory.

For initiating devices, the Control-By-Event size can be calculated by the following formula:

Size in bytes = 2 + (Number of Zones) + (Number of Control Modules X 3)

Example: The following Control-By-Event takes up 11 bytes in memory.

(Z1 Z6 Z12 L2M4 L7M15)

Size in bytes 2 + (3) + (2 X 3) = 11

For notification devices, the Control-By-Event size can be calculated by adding the components involved using the following values:

(= 1 byte
) = 1 byte
OR(= 1 byte
AND(= 1 byte
NOT(= 1 byte
XZONE(= 1 byte
DEL(= 1 byte
TIM(= 1 byte
SDEL(= 1 byte

Zones = 1 byte each
Initiating devices = 3 bytes each

The **time specifications** for the **DEL, TIM,** and **SDEL** operators = 6 bytes

Examples:

1) The following Control-By-Event takes up 13 bytes in memory:

OR(Z1 Z4 Z9 Z16 Z23 LID3 L2M7)

Size in bytes 1 + 1 + 1 + 1 + 1 + 1 + 3 + 3 + 1 = 13

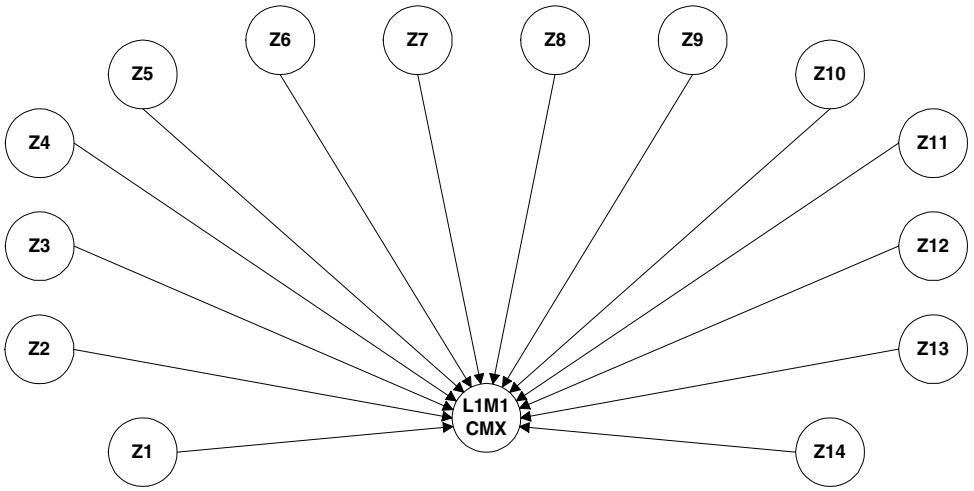
2) The following CBE takes up 11 bytes in memory:

DEL(00.00.30 00.01.30 (Z1))

Size in bytes 1 + 6 + 1 + 1 + 1 + 1 = 11

Due to the 14-byte size limitation, it may be necessary to use more than one equation or list to accomplish a desired result. Through the use of reverse activating zones, an equation which normally would contain too many bytes can be broken up into several smaller equations.

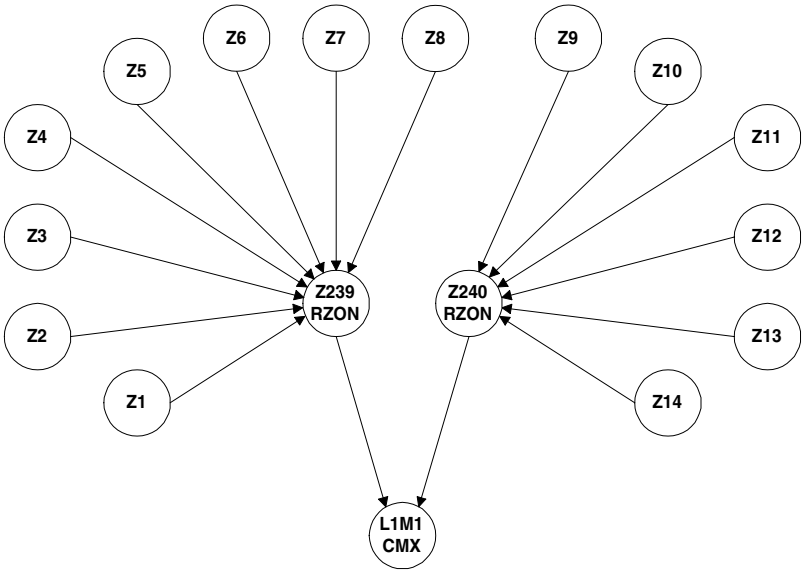
In the example below, a control module (CMX) is to be activated by any one of 14 software zones:



CBE Equation for **L1M1**:
OR(Z1 Z2 Z3 Z4 Z5 Z6 Z7 Z8 Z9 Z10 Z11 Z12 Z13 Z14)

1 + 1 +1 +1 +1 +1 +1 + 1+1 + 1 + 1 + 1 + 1 + 1 + 1 + 1 = **16 Bytes (too many)**

By using two reverse-activating zones, the equation with 16 bytes is broken into two smaller equations and the CBE for the control module uses the two reverse-activating zones as its operands.



CBE Equation for **Z239**:
OR(Z1 Z2 Z3 Z4 Z5 Z6 Z7 Z8)
= 10 Bytes

CBE Equation for **Z240**:
OR(Z9 Z10 Z11 Z12 Z13 Z14)
= 8 Bytes

CBE Equation for **L1M1**:
OR(Z239 Z240) = 4 Bytes

4.4 Cooperative Control-By-Event

Cooperative Control-By-Event equations pertain to reverse activated software zones on the AM2020/AFP1010 NOTI•FIRE•NET system only.

CCBE, like Control-By-Event (CBE), is used to provide a variety of responses based on various combinations of events (initiating conditions). Where CBE programming controls the interaction between devices and software zones within one AM2020/AFP1010, CCBE programming controls events between multiple panels on a **NOTI•FIRE•NET** system. For example, an addressable initiating device in one panel turning on an addressable output device of another panel through a reverse activated software zone. The formats and uses for CBE and CCBE are similar in many ways with the following exceptions:

- Only reverse activating software zones can be programmed with a CCBE equation.
- CCBE equations can only be programmed for software zones from the AM2020/AFP1010 node that the zones reside in. For instance, if a CCBE equation is to be programmed for software zone 23 of node 10 the user must program the equation on the AM2020/AFP1010 that is declared as node 10.
- CCBE can only use the **AND(**, **OR(**, and **NOT(** operands.
- CCBE equations have a size limitation of 80 characters.

NOTE

Forward activating software zones **can not** have CCBE equations but can be used as operands in other CCBE equations.

Each AM2020/AFP1010 has 240 software zones for both CBE and CCBE programming. Although there are 240 software zones, only zones 2-240 can have CCBE equations associated with them. Since a zone boundary must be declared, at least one of the software zones will be a forward activating zone and can not have a CCBE equation associated with it. If Zone 1 is used as the zone boundary, then there are only 239 zones left for CCBE programming.

It is possible for a reverse-activated software zone to have both a CBE and CCBE equation associated with it. If this occurs, the software zone will become active if either equation becomes active. The format for a CCBE equation is the same as a CBE equation. The operators for CCBE can only be AND(, OR(, and NOT(. The operands for CCBE are most often a zone with the format N(XXX)Z(YYY), where XXX is the node number for the particular panel on the network and YYY is one of the 240 software zones available to CCBE programming.

4.5 The Null Control-By-Event

The simplest type of Control-By-Event is the **Null,** which means empty. **For initiating devices,** the Null is denoted by entering **( )** as the Control-By-Event. In response to an alarm on an addressable alarm initiating device programmed with a Null Control-By-Event, the AM2020/AFP1010 will do the following:

- **Initiate a System Alarm condition** (Alarm LED flashes, piezo sounds and the Form-C alarm contacts on the CPU will be activated).
- **Activate no control modules or software zones** (no notification appliances will sound and no output relays will be activated due to the fact that there are no entries in the Control-By-Event for this initiating device).

For Addressable Output Devices, the Null is denoted by entering **OR( )** or **( )**. *Note: Entering **(** is equivalent to entering **OR(.*** A control module programmed with a Null Control-By-Event will not be activated unless it is included in the Control-By-Event of a software zone or initiating device.

Example - Resetting 4-wire Smoke Detectors

A control module is needed to reset power to 4-wire smoke detectors in an AM2020 or AFP1010 system unless the resettable power output (TB3 terminals 1 and 2) from the MPS-24A is used. This module must **not** be activated in response to an alarm condition. Rather, this module must only be activated during system reset. This can be accomplished by assigning the module a Null Control-By-Event and the Software Type ID **PWRC** (the control panel automatically resets modules with Type ID PWRC upon system reset).

4.6 Programming Examples

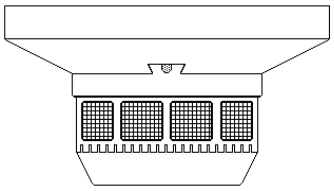
Options

The example below illustrates three ways to accomplish the simple programming task of programming a Notification Appliance (control module) on SLC Loop 1 to indicate activation of an Initiating Device (smoke detector) also on SLC Loop 1.

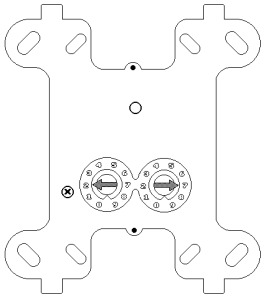
Solution A

Program the smoke detector with the Control-By-Event:

(Z1)



Software Zone Z1
Type: FZON

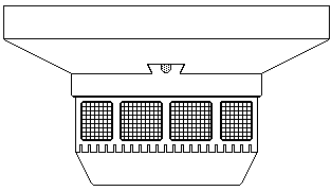


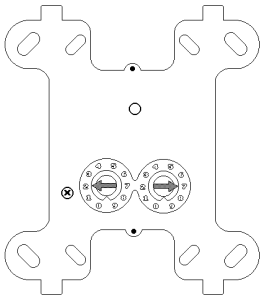
Program the control module with the Control-By-Event

OR(Z1)

Solution B

No Control-By-Event required for the smoke detector.





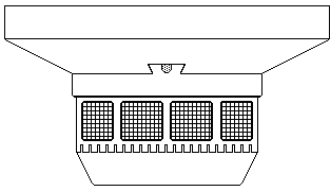
Program the control module with the Control-By-Event

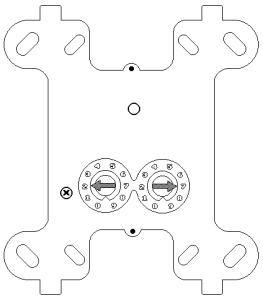
OR(L1D1)

Solution C

Program the smoke detector with the Control-By-Event:

(L1M1)

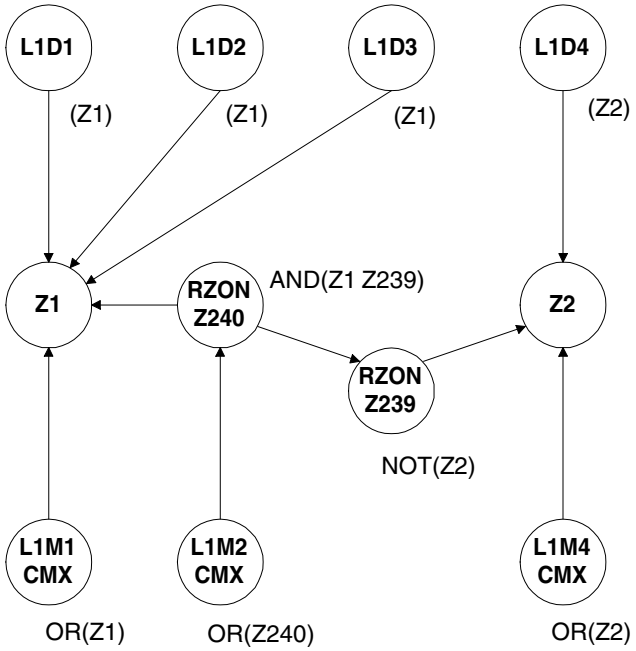




No Control-By-Event required for the control module.

Example # 1: Combinational Logic

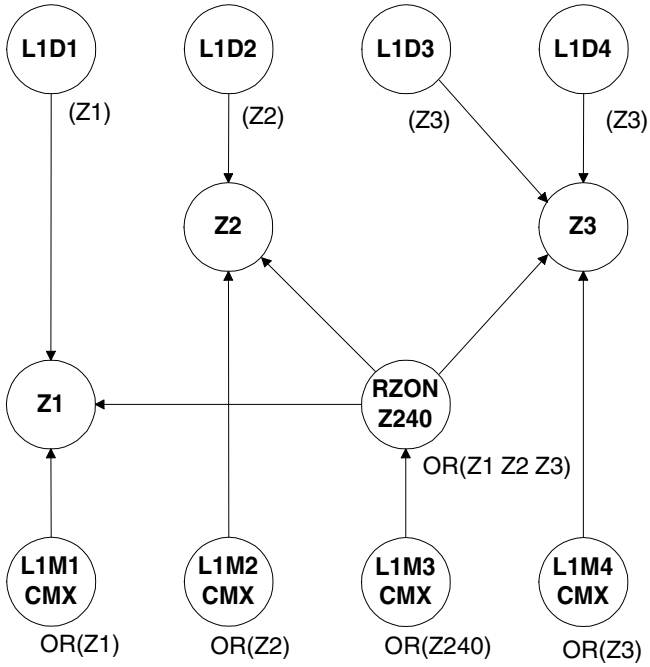
L1D1, **L1D2**, and **L1D3** activate **Z1**. **L1D4** activates **Z2**. If **Z1** activates, **L1M1** will activate. If **Z2** activates then **L1M4** will activate. The equation **AND(Z1 Z239)** requires both to be active for an output. Because reverse zone 239 has a NOT operand, it is active as long as **L1D4** is inactive.



Example # 2: General Alarm

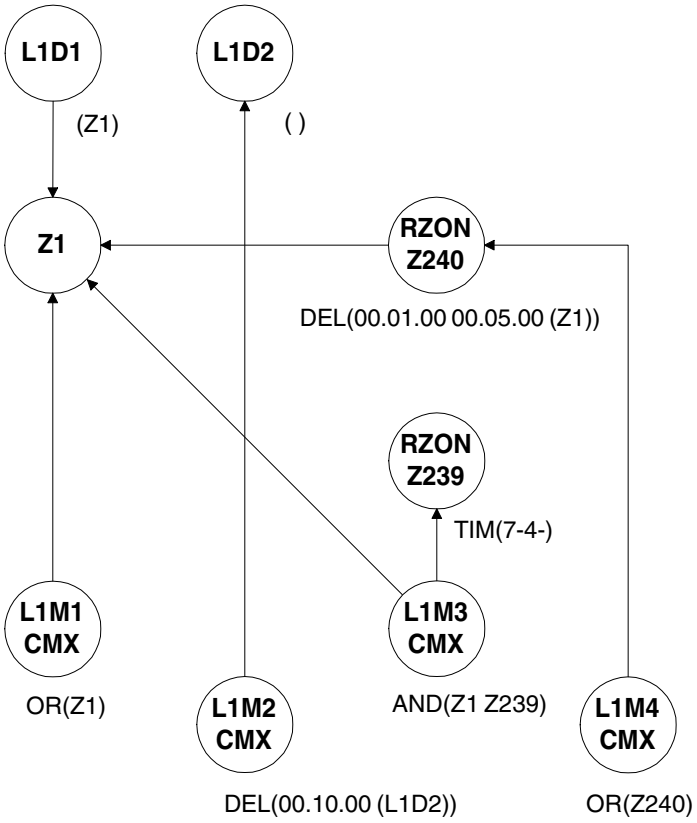
L1D1 activates **L1M1** through **Z1**. **L1D2** activates **L1M2** through **Z2**. **L1D3** and **L1D4** activate **L1M4** through **Z3**. **L1M3** will activate when reverse zone 240 is activated. **Z240** will activate when **Z1**, **Z2** or **Z3** are activated.

Notification Appliance **L1M3** serves as the General Alarm device. It will be activated whenever an alarm occurs on any addressable initiating device in the system, due to the fact that all initiating devices activate a Software Zone, and activation of any zone activates software zone **Z240**.



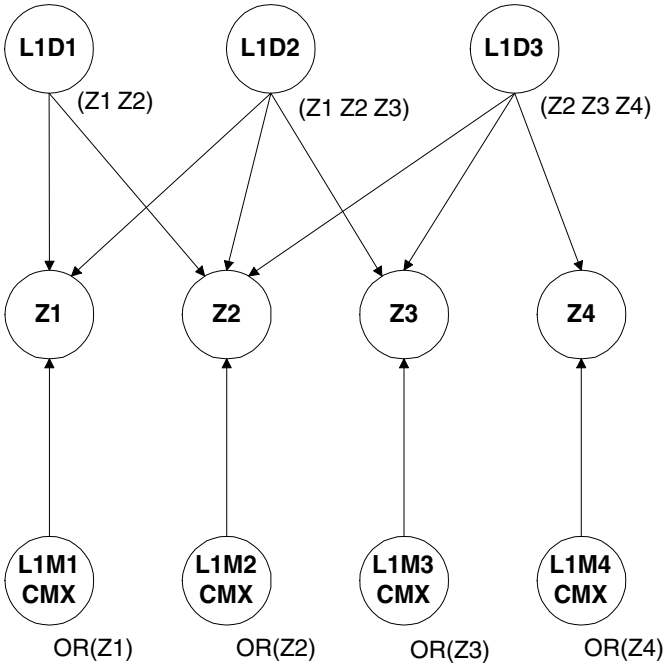
Example # 3: Delay and Time

L1D1 activates **Z1**. **L1M1** turns on when **Z1** is active. **L1D2** is a null equation. **L1M2** activates with **L1D2** after a ten minute delay. **Z239** is active July 4th of every year. **L1M3** will activate when **Z1** and **Z239** are active. **Z240** is active when **Z1** is on after a one minute delay and will stay on for 5 minutes. **L1M4** turns on when **Z240** is active.



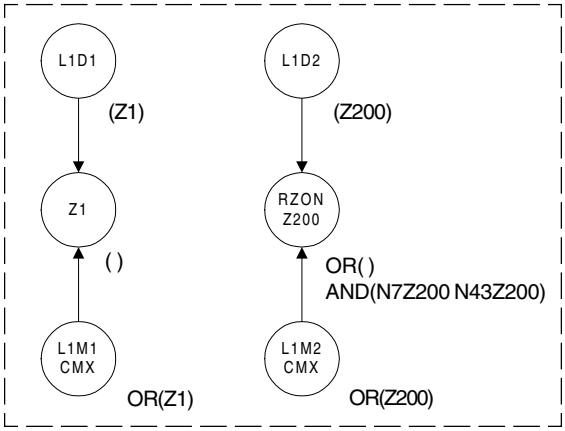
Example # 4:
Fire Floor, Floor Above, Floor Below

L1D1 activates **Z1** and **Z2**. **L1D2** activates **Z1**, **Z2** and **Z3. L1D3** activates **Z2**, **Z3** and **Z4**. **L1M1** will activate when **Z1** is active. **L1M2** will activate when **Z2** is active. **L1M3** will activate when **Z3** is active. **L1M4** will activate when **Z4** is active.

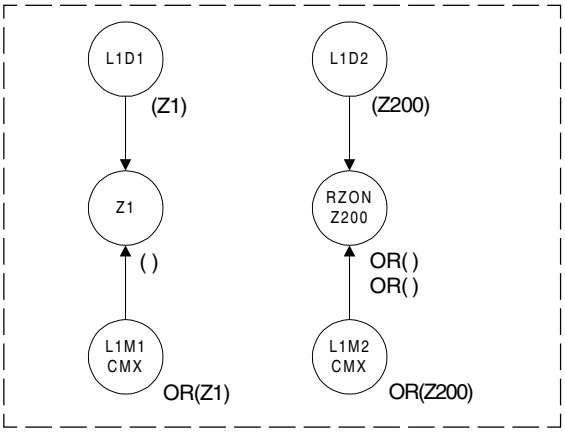


Example # 5: CCBE for NOTI•FIRE•NET

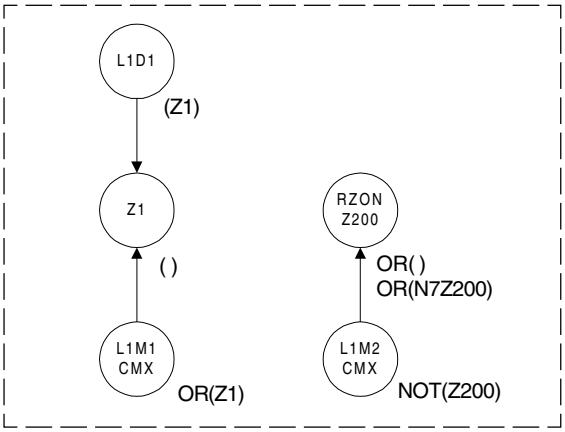
Node 1 will activate **L1M1** if **Z1** is active locally**. Node 1** will activate **L1M2** if **Z200** is active locally or in both **Nodes 7** and **43** simultaneously. **Node 43** will activate **L1M2** if **Z200** is not active locally and not activated in **Node 7**.



NODE 1



NODE 7



NODE 43

Section Five
Dual Stage Alert/Evacuation

Programming for Dual Stage Alert/Evacuation operation (for use in Canada only)

An XPC-8 Notification Appliance Circuit module can be configured for Dual Stage Alert/Evacuation operation. Under this mode of operation each circuit operates in one of two stages: alert or evacuation. When configured this way, each notification appliance circuit has two addresses associated with it. Refer to the XP Series Transponder Manual for additional information.

The first address is the control address. Activating this point (through its Control-By-Event programming) will turn the notification appliance circuit on. This point uses the Software Type ID CON.

The second address is the stage selection address. This point decides what state an active notification appliance circuit will be in. Activating this point will put the notification appliance circuit into evacuation mode. If this point is not activated the circuit will be in alert mode. This point uses the Software Type ID FORC.

NOTE

If an unacknowledged circuit is in alert mode for more than five minutes, all activated circuits on the XPC-8 will change to the evacuation pulse rate.

AM2020
AFP1010

Chapter Four
Security

Section One
Installing and Programming Combination Fire/Security Fire Alarm Systems

1.1 Introduction

The AM2020/AFP1010 is suitable for use as a Grade AA, Grade A, or Grade B Central Station and Proprietary Burglar Alarm Protected Premises and Receiving Unit when the installation and programming requirements outlined in this section are followed. Such an installation meets the requirements of Standards UL1076 (Proprietary Burglar Alarm Units and Systems) and UL1610 (Central Station Burglar Alarm Units). A Fire/Security Protective Signaling System includes one or more of the following:

- Protected Premises.
- Central Stations.

Security devices in such a system must be configured so unauthorized activity in an area within the Protected Premises is communicated to the Central Station. This communication will be handled in one of two ways, depending on the characteristics of the location:

- When the system consists of a single AM2020/AFP1010, the system must reside in the Central Station. Security devices are grouped together in logical areas, and when activated, signal the operator at the Central Station.
- When the system consists of more than one AM2020/AFP1010, a Protected Premises Unit (PPU) AM2020/AFP1010 equipped with a Network Interface Board (NIB-96) facilitates signaling over an SLC loop to the AM2020/AFP1010 control unit at the Central Station.

NOTE The INA and NRT are not suitable for Central Station or Proprietary supervising station use.

This section outlines security requirements for installations using a single AM2020/AFP1010 and installations using multiple AM2020/AFP1010 units, including optional features. Sample system configuration diagrams are also included. Programming must be performed by an installer who is proficient in programming the AM2020/AFP1010. The table below lists monitor and control module codes used in the system configuration diagrams, and lists the specific part numbers that are defined by the codes.

General Term	Code used in Security Diagrams	Specific Part Numbers
Monitor Module	MM	MMX-1, MMX-101, XP5-M,
Control Module	CM	CMX-1, CMX-2, XP5-C,

Table 1.1-1 Monitor and Control Module Codes

Note: The installation will comply with the UL security listings when it is installed as detailed in this manual. The UL listing does not automatically apply to any configuration of security equipment that is not detailed in this document.

1.2 General Security Requirements

The following security requirements must be met:

- The MPS-24 or MPS-24E power supply cannot be employed; an MPS-24A or MPS-24AE must be used.
- Shielded cable must be used on all input/output wiring associated with security functions.
  - SLC Loop Shielding (refer to Chapter One Installation, Section 4.4, SLC Loop Shield Termination).
  - Security Module I/O Circuit Shielding — terminate the shield at earth ground at the junction box containing the module.
- When employed as a Protected Premises Unit, the AM2020/AFP1010 cabinet door must be wired with an STS-1 Tamper Switch that is monitored by the control panel.
- If the system has arming and disarming capability, a ringback signal from the Central Station to the arming location is required for Grade AA or Grade A operation. The ringback signal informs the Protected Premises Control Panel that the signal to arm/disarm has been received by the Central Station.
- A single SLC loop may be used for both Fire and Security Device Connections.

There are four software type IDs associated with security operation; Security Access Monitor (SACM), Security Area Monitor (SARM), Security Equipment Monitor (SEQM), and Security System Monitor (SSYM). There is also one software function, Security Delay (SDEL). These software elements are essential to all aspects of security operation, including Control-By-Event (CBE) programming. Devices with the type IDs SACM and SEQM do not automatically display at the LCD or require state change acknowledgment. State changes in devices with these software types may be output at a printer. Refer to Chapter Three Programming for more information about the characteristics of software type IDs.

WARNING!
XP Transponder circuits (XPP-1, XPM-8, XPC-8, XPR-8, XPM-8L) are not suitable for security applications.

1.3 Security Configuration-Specific Requirement

Placement of Security Devices

Security devices are placed in two main areas: the building perimeter and the interior spaces. Take care to select a device appropriate to the area you install it in. The device should be sensitive enough to detect an intruder but not so sensitive that normal variations in the surrounding environment cause false alarms.

Building Perimeters

Table 1.3-1 lists some common types of security devices used on the building perimenter, and a brief description and application notes for each type. This is meant only as a guide when selecting which types of devices you need; follow manufacturer's recommendations for installation and maintenance.

Type	Description	Application Notes
Magnetic Contacts	A reed switch and a magnet usually used in doors and windows. The switch is mounted in the frame, the magnet directly opposite in the door or window. When the door or window opens, the magnet is moved away from the switch, causing an alarm. Also available in a balanced/high security version, which has a second biasing magnet built into the switch portion to prevent the contact from being defeated by an external magnet.	Usually installed on all perimeter doors and any moveable surface on the perimeter of the building (i.e., windows, loading chutes, overhead doors, etc.). Often installed on some interior doors to create internal traps. Normall installed on the upper edge of a door two inches from the opening side. Install contacts on concealed inside surface if possible. Consider using balanced/high security version in high-risk situations or when the contacts are easily accessible. Make sure that the barrier the contacts protect is in good repair and that the contacts are installed according to the manufacturer's instructions.
Mechanical Contacts	Spring-loaded contact held closed by the door or window. When the door or window is opened, the contact springs open, causing an alarm.	Usually installed on all perimeter doors and any moveable surface on the perimeter of the building (i.e., windows, loading chutes, overhead doors, etc.). Often installed on some interior doors to create internal traps. Make sure that the barrier the contacts protect is in good repair and that the contacts are installed according to the manufacturer's instructions.
Foil	A thin, fragile strip of conductive metallic foil fastened with adhesive to glass, wood, or other insulating material. When the material it is fastened to breaks, the foil also breaks, interrupting the current and causing an alarm.	Foil is easily scratched and damaged by animals and humans. If installed on windows, frost can cause the foil to separate from the glass and break. These breaks can be extremely difficult to locate and repair. A good foil installation can also be time-consuming and requires periodic maintenance to prevent problems.
Glass Breakage Detectors	Surface mounted: A small, plastic-encased device fastened to the glass surface, which detects high frequency sounds generated when a large piece of glass breaks. Accoustical: A device that mounts on wall or ceiling adjacent to glass and is attuned to the frequency of sound made by glass breaking.	Surface mounted detectors typically cover about 30 square feet of glass, but check manufacturer's recommendations. They tend to be more reliable and easier to mount than foil. Since the sound is transmitted through the glass, they are not subject to false alarm by high frequencey sounds transmitted through the air. Acoustical detectors generally cover a larger area than surface types, but check manufacturer's recommendations. Offices with partitions, dividers, or sound absorbing or deadening material will decrease their effectiveness.
Screens/ Lacing Wire	Screens and lacing wire cover openings such as ductwork, skylights, and vents. Screens are an array of wooden dowels with a small-gauge wire embedded in each. If the dowels are cut or broken, the wires are severed, causing an alarm. Lacing wire, a fine insulated wire carrying normal alarm current, runs across the opening in many directions. When the wire is broken or cut, current will be interrupted, causing an alarm.	Screens must usually be custom ordered. They are not aesthetically pleasing, so they are typically used in applications where appearances are not important, such as warehouses and factories. Lacing wire should be run so that a person must cut the wire to gain access.

Table 1.3-1 Building Perimeter Security Devices

Interior Spaces

Table 1.3-2 contains some common types of devices used in interior spaces, and a brief description and application notes for each type. This is meant only as a guide when selecting which types of devices you need; follow manufacturer's recommendations for installation and maintenance.

Type	Description	Application Notes
Ultrasonic Motion Detector	Consists of a transmitter and a receiver. Transmitter produces a high frequency sound (26,500 Hz) which is reflected off surrounding objects and walls. Receiver detects these reflected sounds and compares them to the transmitted sounds. If an object or person is moving, the reflected sound energy will have a different frequency than the transmitted sound due to the Doppler effect.	Consider environmental conditions before deciding to use ultrasonic motion detectors. Air turbulence or moving objects may cause false alarms. Many systems use signal processing to eliminate random motion by only going into alarm if the source of motion continually approaches or recedes, so place the detector in an area where an intruder would have to walk directly toward or away from it. This increases the chance of detection. Be sure to adjust the detector so it is pointed away from possible sources of false alarms such as other motion detectors, fans, hanging displays, loose overhead doors, or hanging plants. Be aware that the sensitivity ultrasonic of motion detection varies with temperature and humidity. Also, areas that contain highly sound-absorbent materials will reduce the detector's effectiveness, while areas with highly reflective surfaces will increase its effectiveness. The energy used to detect intruders is easily contained by walls and partitions. This allows individual areas to be protected independently.
Microwave Motion Detector	Operates on same principle as ultrasonic detectors. Uses microwave energy transmitted at about 10.525 GHz modulated at approximately 915 MHz, then projected into the protected area.	Microwave energy can penetrate glass, paneling, and other interior partitions. Make sure the beam is blocked by the floor or a brick/concrete wall with no windows. Otherwise, the detector could report false alarms by sensing motion far beyond the protected area. Metal reflects microwave energy, so metal columns, walls, flat metal objects, or moving metal objects could cause unexplainable false alarms. Never use microwave detectors in metal buildings. Sometimes radiation from fluorescent lights can cause false alarms, so make sure they are not in the detector's field of view. Radio transmitters and AC transients can also cause false alarms. Detectors covering adjacent areas should have slightly different frequencies. This prevents them from interfering with one another and causing false alarms.
Passive Infrared Motion Detectors	Detects a change in the infrared energy (emitted by all objects) in the surrounding environment using thermistors, thermopiles, or pyroelectrics.	Best used in small- to medium-sized areas. Should be installed so their field of view does not include heat sources such as vents, radiators, open flames, or direct sunlight, or moving light sources such as headlights.
Photoelectric Beams	Uses an LED to project an invisible modulated or pulsed light source across a protected area to a receiver. If the source is blocked, or if it is received at a different modulation, it causes an alarm.	Arrange beams so they form a complicated array across the protected area. When used in long hallways or large open areas, do not follow the shape of the area or run parallel to it; instead, skew the beams across the area. Additional receivers or mirrors can be used to increase the number of times the beam crosses the area, but be aware that using a mirror reduces the range to as much as half the original distance. Also, dirt/dust on the mirror reduces reliability and increases the number of false alarms.
Audio Detection	Active: Same principle as ultrasonic motion detectors except using audible sound. Passive: Microphones throughout a protected area connected to a controlling device that uses logic to detect the types of noises that would be produced by an intruder.	Active: Same characteristics and limitations as ultrasonic detectors. Passive: Trucks, buses, or low-flying aircraft can create false alarms. Also an intruder may not make enough noise to set the detector off until substantial loss has occurred. Usually used in applications where vandalism is the main concern, such as schools or general office areas.
Stress Detectors	Operates on the principle that intruders cause small amounts of stress on a building's structure, especially on floor supports and joists. Sensors that use crystals, which produce a small amount of current when deformed or stressed, are strapped to these supports and joists. This current is sent to a control unit, which causes an alarm.	Sensitivity varies with the weight of the intruder. Since the sensors detect only momentary changes in stress, they can be used in areas where the amount of weight in an area will vary from day to day. These systems do not work on structures with a low flexure such as concrete floors, stairs, or beams, heavy steel beams, or stone floors. Make sure the sensors are securely fastened to the structure and that the structure is of the proper material.

Table 1.3-2 Interior Space Security Devices

To make locating alarms easier, each monitor module should monitor devices in one specific area. If possible, these devices should all be of similar types. This helps the operator to determine the cause of the alarm, as well as allowing the operator to identify and repair detectors causing false alarms quickly. Interior motion detectors should be placed on a separate supervisory circuit whenever possible, since they have a higher failure rate than other devices. This way, even if the operator has to disconnect that circuit to repair a device, the other security devices in the area (door contacts, photoelectric beams, etc.) would still protect the area.

Zone Numbering

To facilitate the application engineering process, this document refers to the zone number as a Z followed by one or two lower case letters. This is done because the numerical order in which the zones are assigned is an important design consideration. Convert the lower case letters used in this document to numbers using the following rules:

- Use the same number for each abbreviation. For example, if you decide to program Zone Za as Z05, make sure to use Z05 anywhere else the abbreviation Za appears in that application.

- When programming zones that have two letter abbreviations, the first letter represents the area that zone is associated with. This first letter does not represent a number; it is just a way to categorize which Protected Premise the zone is associated with. For example, if an application has one area identified as Tenant A and one as Tenant B, the zone abbreviations for the first zone in each would be Zaa and Zba, respectively. You could assign Zone Number Z05 to Zaa and Zone Number Z06 to Zba. See Table 1.3-3.

- Assign zone numbers in ascending order following the alphabetical order of the last lower case letter in the abbreviation, with a being the lowest number. Zones with different first letters (for example, Zac and Zbc) do not have to be in any particular order as long as they are in order within their first-letter groups. For example, Zad would not have to have a higher number than Zbc, but Zad would have to have a higher number than Zac.

Table 1.3-3 and 1.3-4 provide examples of how zone numbers can be assigned in place of the zone letters used in this document.

Letter	Zaa	Zab	Zac	Zad	Zae	Zaf	Zag	Zah	Zai	Zaj
Number	Z05	Z12	Z22	Z180	Z188	Z190	Z198	Z200	Z208	Z210

Zone boundary greater than or equal to Z22 and less than Z180

Table 1.3-3 Zone Numbers - One Set of Zones

Letter	Zaa	Zab	Zac	Zad	Zae	Zaf	Zag	Zah	Zai	Zaj
Number	Z05	Z12	Z22	Z180	Z188	Z190	Z198	Z200	Z208	Z210
Letter	Zba	Zbb	Zbc	Zbd	Zbe	Zbf	Zbg	Zbh	Zbi	Zbj
Number	Z06	Z07	Z21	Z100	Z102	Z108	Z187	Z191	Z193	Z215

Zone boundary greater than or equal to Z22 and less than Z100

Table 1.3-4 Zone Numbers - Two Sets of Zones

The reason this document uses letters instead of numbers is to give you some flexibility in assigning zone numbers to your security applications. However, the rules above must be adhered to when assigning numbers to the letter abbreviations. Otherwise,your security system may not work as it is intended due to the system scanning order and other Control-By-Event-interlock statement programming considerations.

Security System Diagrams and Programming Keys

The following figures illustrate the minimum system requirements for various configurations of the AM2020/ AFP1010 and associated peripherals.

Refer to Table 1.1-1 in the introduction to this chapter for monitor and control module information. Refer to the XP5 Series Transponder Manual listed in the Related Documentation Chart of this manual for connection information for the XP5 modules. Refer as well to the Product Installation Documents 15984 (RKS-S Remote Keyswitch) and 15456 (STS-1 Security Tamper Switch) for connection information on these devices.

Refer to the Glossary section of this manual for descriptions of the terms used in this section.
The following system requirements are illustrated in **Figure 1.3-1.** See Table 1.1-1 the introduction to this section for other monitor module options.

- One AM2020/AFP1010 Control Panel
- One Security Supervisory Protected Area
- One Protected Premises
- One MMX-1 or MMX-101 Monitor Module, Security Devices (minimum security equipment).

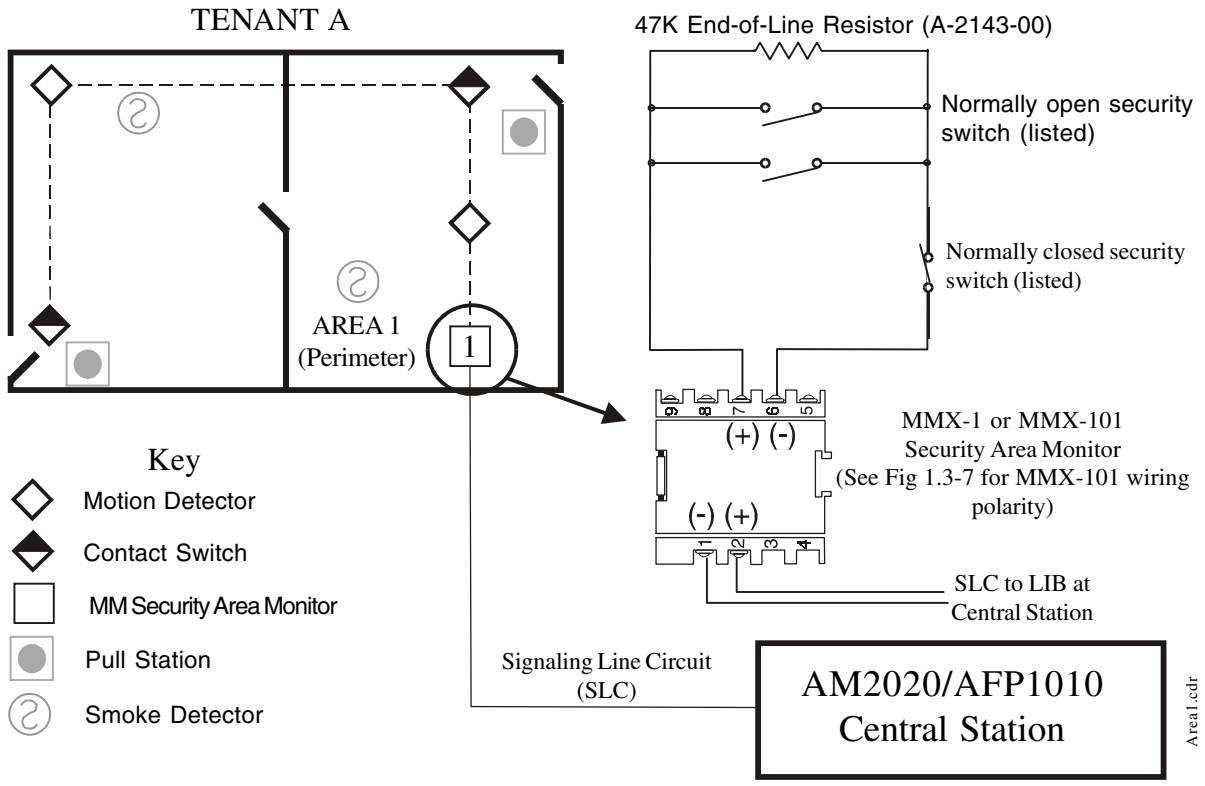


Figure 1.3-1 Simplest Security System

Programming Key for Figure 1.3-1

MM Security Area Monitor:

Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Specified (describe location of module).
Tracking: Yes - Results in required acknowledgment at Central Station for every unsecured state. Restoral is automatic.
No - Results in required acknowledgment at Central Station for first unsecured state only (until reset at Central Station - short condition only).
Annunciator: No (not required).
Yes (if annunciator mapping desired)
Annunciator Point Mapping (Optional): AxxPyy

The following system requirements are illustrated in **Figure 1.3-2**. See Table 1.1-1 in the introduction to this section for monitor module options.

- One AM2020/AFP1010 Control Panel
- Multiple Security Supervisory Protected Areas
- One Protected Premises
- One Monitor Module per protected area, Security Devices (minimum security equipment).

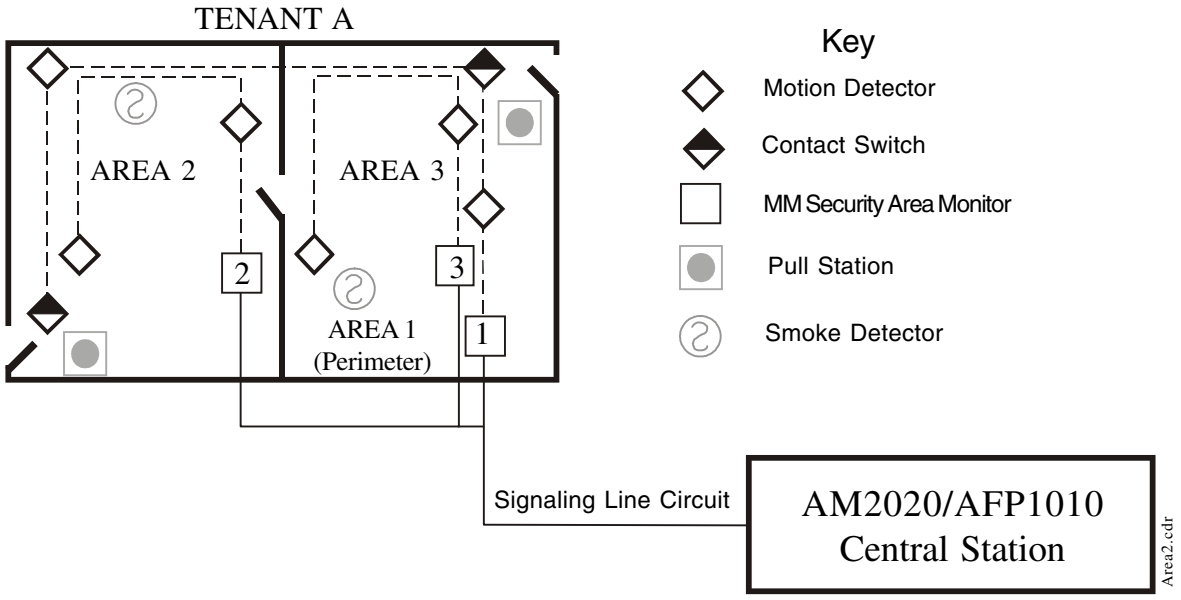


Figure 1.3-2 Multiple Tenant Simple Security System

Programming Key for Figure 1.3-2

MM Security Area Monitor:

Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Specified (describe location of module).
Tracking: Yes - Results in required acknowledgment at Central Station for every unsecured state. Restoral is automatic.
No - Results in required acknowledgment at Central Station for first unsecured state only (until reset at Central Station - short condition only).
Annunciator: No (not required).
Yes (if annunciator mapping desired)
Annunciator Point Mapping (Optional): AxxPyy

The following system requirements are illustrated in **Figure 1.3-3**. See Table 1.1-1 in the introduction to this section for monitor module options.

- One AM2020/AFP1010 Control Panel
- Multiple Security Supervisory Protected Areas
- Multiple Protected Premises
- One Monitor Module per protected area, Security Devices (minimum security equipment).

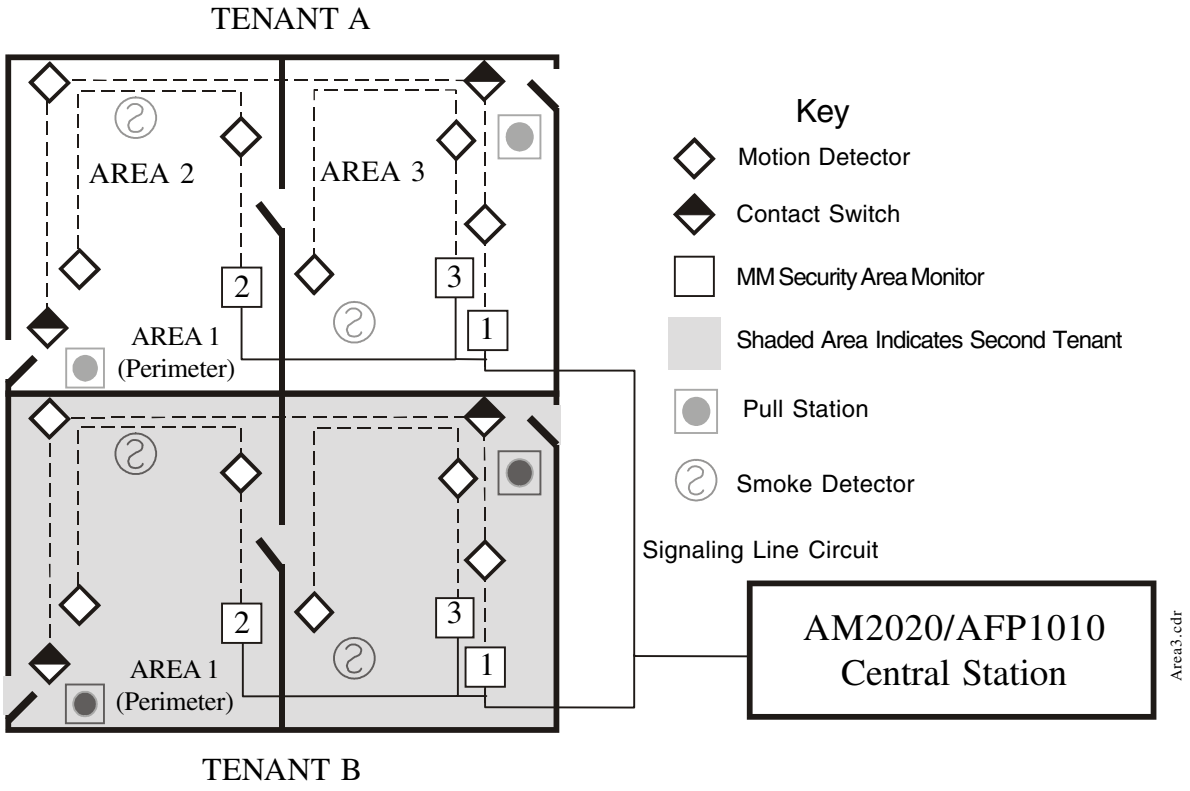


Figure 1.3-3 Multiple Tenant Simple Security System

Programming Key for Figure 1.3-3

MM Security Area Monitor:

Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Specified (describe location of module).
Tracking: Yes - Results in required acknowledgment at Central Station for every unsecured state. Restoral is automatic.
No - Results in required acknowledgment at Central Station for first unsecured state only (until reset at Central Station - short condition only).
Annunciator: No (not required).
Yes (if annunciator mapping desired)
Annunciator Point Mapping (Optional): AxxPyy

The following system requirements are illustrated in **Figure 1.3-4**. See Table 1.1-1 in the introduction to this section for other monitor and control module options.

- One AM2020/AFP1010 Control Panel
- Multiple Security Supervisory Circuits Reporting to Central Station as a Single Area
- Single Protected Premises
- The minimum security equipment required is as follows:
  - — Multiple MMX-1 or MMX-101 Monitor Modules per protected area
  - — one group interface consisting of a CMX and an MMX-1 or MMX-101 module.
  - — security devices

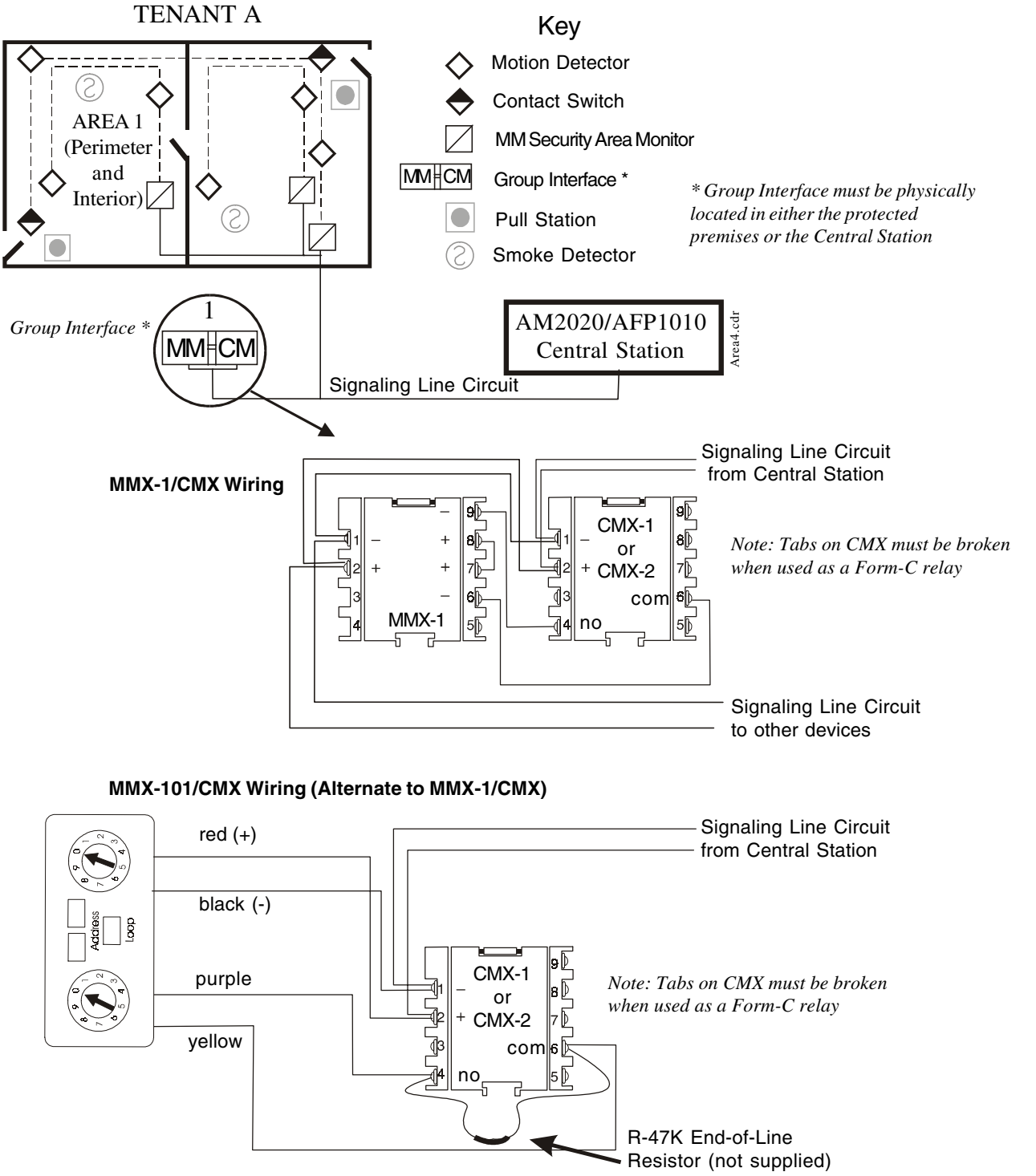


Figure 1.3-4 Single Tenant Consolidated Security System

Programming Key for Figure 1.3-4

MM Security Access Monitor:

Address: LXXMYY (Installer specified).
Type ID: SACM
Control-By-Event: (Za*)
Custom Label: Installer Option (describe specific location of module).
Tracking: Yes - Each unsecured state and restoral will be printed when the print option is enabled.
No - the first unsecured state will be printed when the print option is enabled (restorals will not print until reset at Central Station - short condition only).
Annunciator: No (Not required).
Yes (if annunciator mapping desired)
Annunciator Point Mapping (Optional): AxxPyy

*'a' is an installer specified number. In this example, all modules must be assigned the same zone number.

MM = CM **Group Interface:**

A: CM programming:
Address: LXXMYY (Installer specified).
Type ID: CMXC
Control-By-Event: (Za*)
Custom Label: Security Group Output
Signal Silence: No
Walk Test: Yes/No (Installer Specified).
Annunciator: No (Not required).

B: MM programming:
Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Option (describe location of module).
Tracking: Yes - Results in required acknowledgment at Central Station for every unsecured state. Restoral is automatic.
No - Results in required acknowledgment at Central Station for first unsecured state only (until reset at Central Station - short condition only).
Annunciator: No (Not required).
Yes (if annunciator mapping desired)
Annunciator Point Mapping (Optional): AxxPyy

The following system requirements are illustrated in **Figure 1.3-5**. See Table 1.1-1 in the introduction to this section for monitor and control module options.

- One AM2020/AFP1010 Control Panel
- Multiple Security Supervisory Circuits Reporting to Central Station as a Single Area
- Multiple Protected Premises
- The minimum security equipment required is as follows:
  - — Multiple Monitor Modules per protected area
  - — one group interface per grouped area
  - — security devices

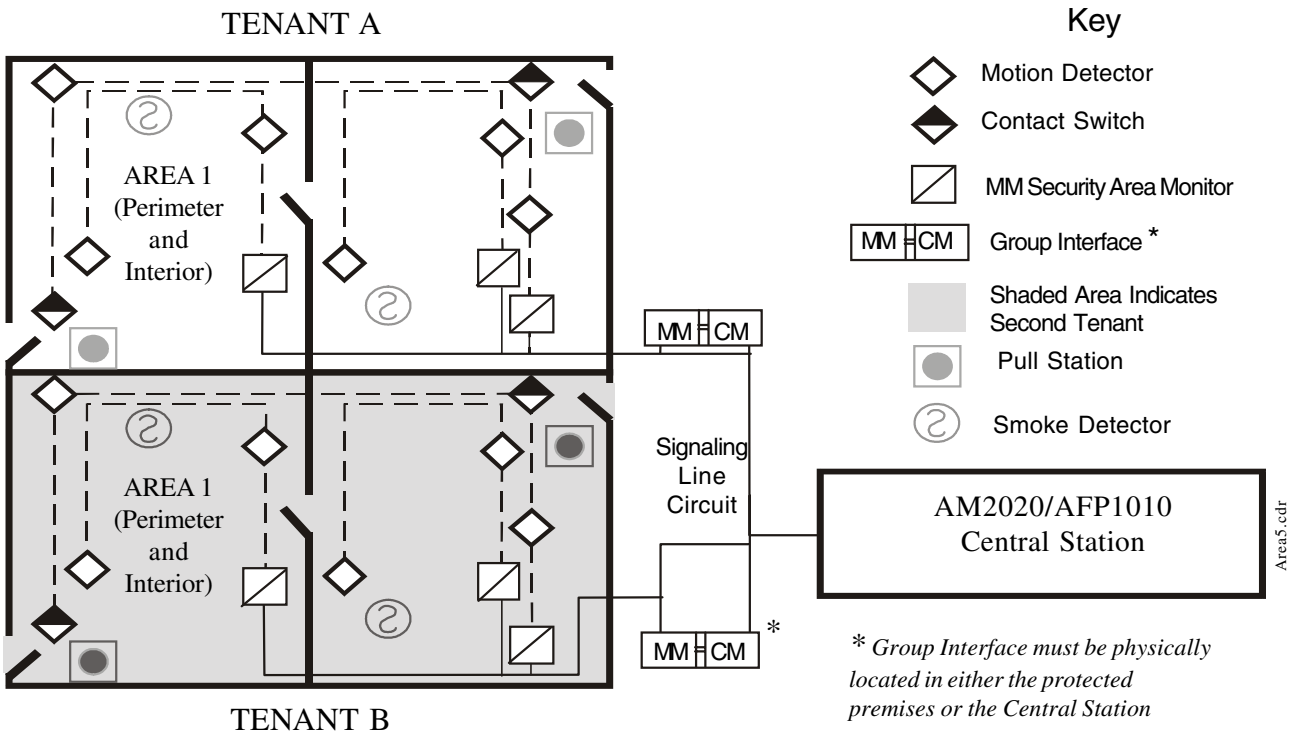


Figure 1.3-5 Multiple Tenant Consolidation Security System

Programming Key for Figure 1.3-5

Programming relating to **Figure 1.3-5** is essentially the same as **Figure 1.3-4**. The only difference in programming is that (Za) Control By Event value for Tenant A and (Zb) Control By Event value for Tenant B must be used, where Za is a zone number and Zb is a different zone number.

The following system requirements are illustrated in **Figure 1.3-6**. See Table 1.1-1 in the introduction to this section for monitor and control module options.

- One AM2020/AFP1010 Control Panel
- One Security Supervisory Protected Area
- One Protected Premises
- System Arm/Disarm Capability with Central Station Ringback Signal
- The minimum security equipment required is as follows:
  - — Monitor Module for Protected Area
  - — Contact Switch for Entry/Exit Door
  - — RKS-S Remote Keyswitch
  - — Monitor Modules
  - — One Group Interface
  - — ACM-16AT or ACM-32A Remote Annunciator for Entry/Exit Door
  - — Security Devices
  - — One Group Interface

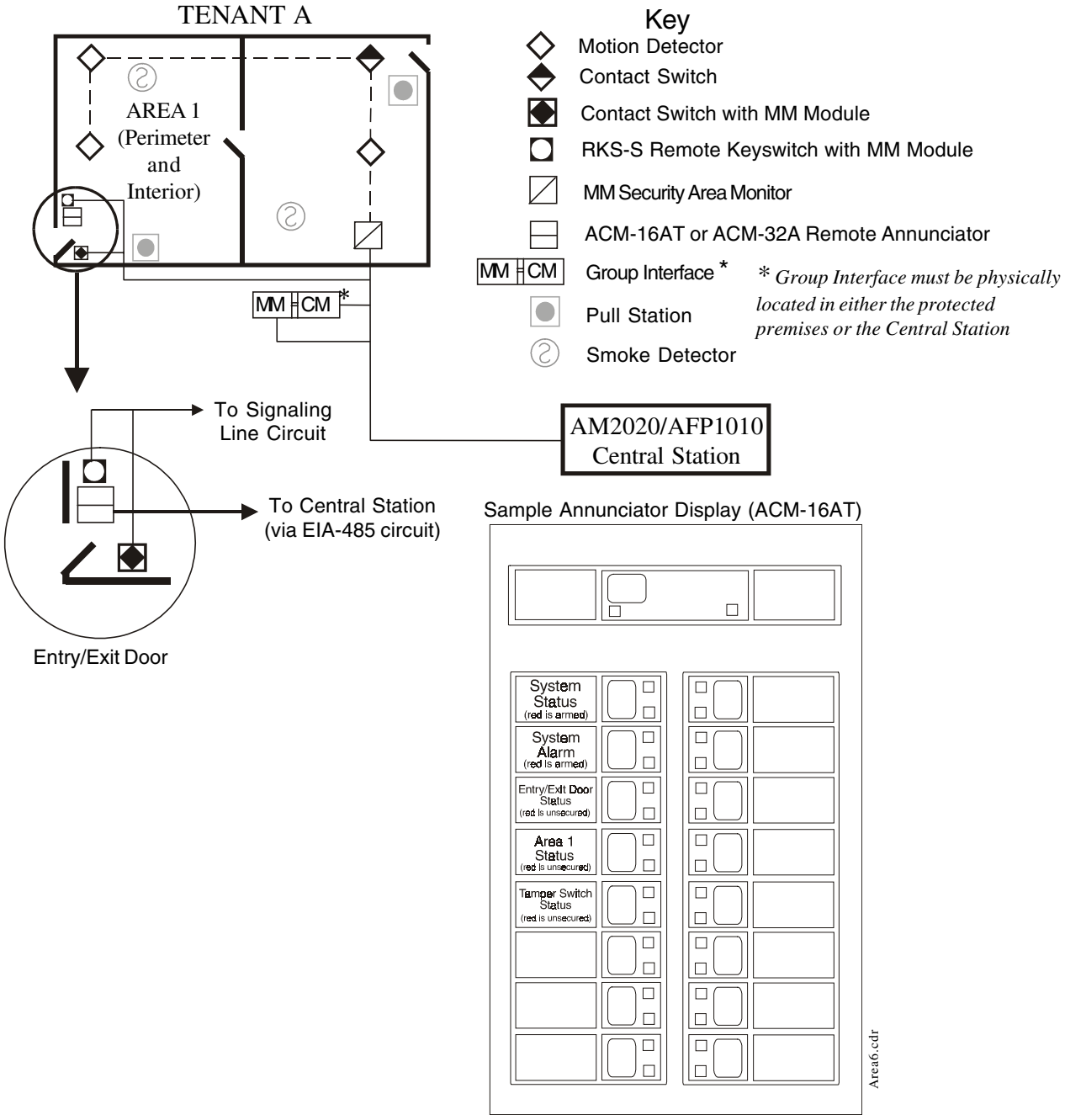


Figure 1.3-6 Single Tenant Security System with Entry/Exit Delay

Programming Key for Figure 1.3-6

Contact Switch w/MM Module:
Address: LXXMYY (Installer Specified).
Type ID: SACM
Control-By-Event: (Zac*)
Custom Label: Entry/Exit Door
Tracking: Yes
Annunciator: Yes
Annunciator Point: AXXP3

RKS-S Remote Keyswitch w/MM Module:
Address: LXXMYY (Installer Specified).
Type ID: NOA
Control-By-Event: (Zab*)
Custom Label: Arming Switch
Tracking: Yes
Annunciator: Yes
Annunciator Point: AXXP1

Programming Key for Figure 1.3-6 (Cont)

ACM-16AT/-32A Annunciator:

Annun. Pt.	Type ID
AXXP1	AMON
AXXP2	AZON
AXXP3	AMON
AXXP4	AMON

MM Security Access Monitor:

Address: LXXMYY (Installer specified).
Type ID: SACM
Control-By-Event: (Zaa*)
Custom Label: Installer Option (describe specific location of module).
Tracking: Yes—Each unsecured state will be printed when the print option is enabled.
No—The first unsecured state will be printed when the print option is enabled (restorals will not print until reset at Central Station - short condition only).
Annunciator: Yes
Annunciator Point: AXXP4

MM = CM **Group Interface:**

A: CM programming:
Address: LXXMYY (Installer specified).
Type ID: CMXC
Control-By-Event: (Zaj*)
Custom Label: Security Group Output
Signal Silence: No
Walk Test: Yes/No (Installer Specified).
Annunciator: No (Not required).

B: MM programming:
Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Specified.
Tracking: Yes—Results in required acknowledgment at Central Station for every unsecured state. Restoral is automatic.
No—Results in required acknowledgment at Central Station for first unsecured state only (until reset at Central Station - short condition only).
Annunciator: No (Not required).

Zone Programming

1. Zone Boundary: Must be less than Zad* and greater than or equal to Zac*.

2. Zone to Which All Instant Security Modules Are Mapped
Zone: Zaa*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Instant Group
Annunciator: No

3. Zone Activated Upon Arming System
Zone: Zab*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Arming Zone
Annunciator: Yes
Annunciator Point: AXXP2

4. Zone Activated When Entry/Exit Door Is Open
Zone: Zac*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Tenant A Entry/Exit
Annunciator: No (Not required).

5. Zone Activated When Any Instant Module Is Violated and the System Is Armed
Zone: Zad*
Type ID: RZON
Control-By-Event: AND(Zaa* Zab*)
Custom Label: Installer Specified.
Annunciator: No (Not required).

6. Zone Active for 30 Sec., 30 Sec. After Opening Entry/Exit Door (Not Dependent on Door Closure)
Zone: Zae*
Type ID: RZON
Control-By-Event: SDEL(00.00.30 00.00.30 (Zac*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

7. Zone Active 1 Min. After Entry/Exit Door Is Opened and Left Open
Zone: Zaf*
Type ID: RZON
Control-By-Event: DEL(00.01.00 (Zac*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

Programming Key for Figure 1.3-6 (Cont)

Zone Programming (continued)

8. Zone Active 1.5 Min. After Arming System
Zone: Zag*
Type ID: RZON
Control-By-Event: DEL(00.01.30 (Zab*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

9. Zone Providing 30 Sec. Entry/Exit Delay (Entry/Exit Door Only) When System Is Armed
Zone: Zah*
Type ID: RZON
Control-By-Event:
OR(AND(Zab* Zag* Zae*) AND(Zab* Zaf*))

causes Zone Zah* to activate if entry/exit time is exceeded.

causes Zone Zah* to activate if entry/exit door is left open.

Custom Label: Installer Specified.
Annunciator: No (Not required).

10. Zone Active a Minimum of 30 Sec. if Entry/Exit Delay Is Violated (Entry/Exit Door Only) When System Is Armed
Zone: Zai*
Type ID: RZON
Control-By-Event:
AND(Zab* SDEL(00.00.00 00.00.30 (Zah*)))
Custom Label: Installer Specified.
Annunciator: No (Not required).

11. Zone Active at Least 30 Sec. for Any Security Breach While System Is Armed
Zone: Zaj*
Type ID: RZON
Control-By-Event: OR(Zad* Zah* Zai*)
Custom Label: Installer Specified.
Annunciator: No (Not required).

Notification Appliance with a Control Module

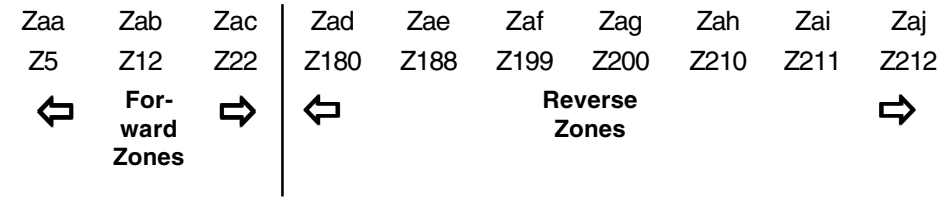
When using an optional control module for Notification Appliances intended to indicate a security violation, this control module may be programmed with the following Control-By-Event equation:

AND(Zab* SDEL(00.00.00 00.15.00 (Zaj*)))

resulting in 15 minutes of Notification Appliance activation after a security violation.

*Zaa through Zaj are each unique installer-specified zone numbers. Zaa is the lowest specified zone number (highest priority) and Zaj is the highest specified zone number (lowest priority).

Example:



Zone Boundary greater than or equal to Z22 and less than Z180.

1.3.1 Connecting an RKS-S Remote Keyswitch

The RKS-S Remote Keyswitch arms and disarms the system. It can be mounted in a UL listed single-gang electrical box. Both the MMX-1/MMX-101 (as shown below) or other monitor module (see Table 1.1-1 for module options) and RKS-S must be mounted within the protected area. **Figures 1.3-7** and **1.3-8,** respectively, depict the connection of an MMX-101 or an MMX-1 module to the RKS-S.

WARNING!

XP Transponder circuits (XPP-1, XPM-8, XPC-8, XPR-8, XPM-8L) are not suitable for security applications.

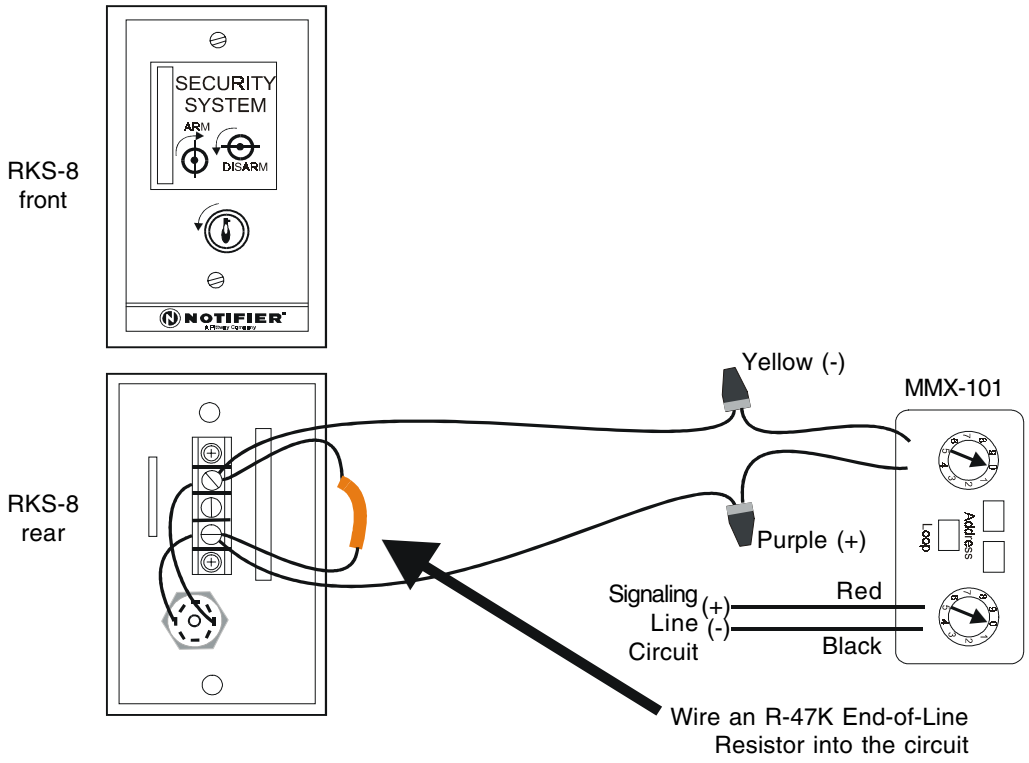


Figure 1.3-7 Connecting an MMX-101 Module to the RKS-S

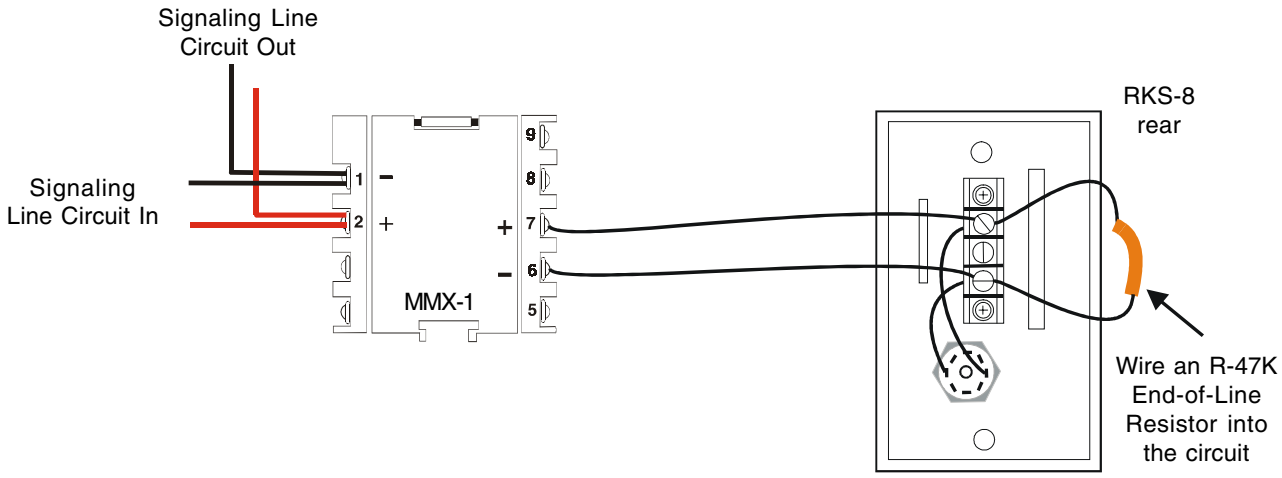


Figure 1.3-8 Connecting an MMX-1 Module to the RKS-S

The following system requirements are illustrated in **Figure 1.3-9**. See Table 1.1-1 in the introduction to this section for monitor and control module options.

- One AM2020/AFP1010 Control Panel
- Multiple Security Supervisory Circuits Reporting to Central Station as a Single Area
- Multiple Protected Premises, each with System Arm/Disarm Capability and Central Station Ringback Signal
- The minimum security equipment required is as follows:
  - — Multiple MM Monitor Modules per Protected Area
  - — One Group Interface per Grouped Area
  - — Contact Switch for Each Entry/Exit Door
  - — RKS-S Keyswitch
  - — MM Monitor Modules
  - — ACM-16AT or ACM-32A Remote Annunciator for Each Entry/Exit Door
  - — Security Devices

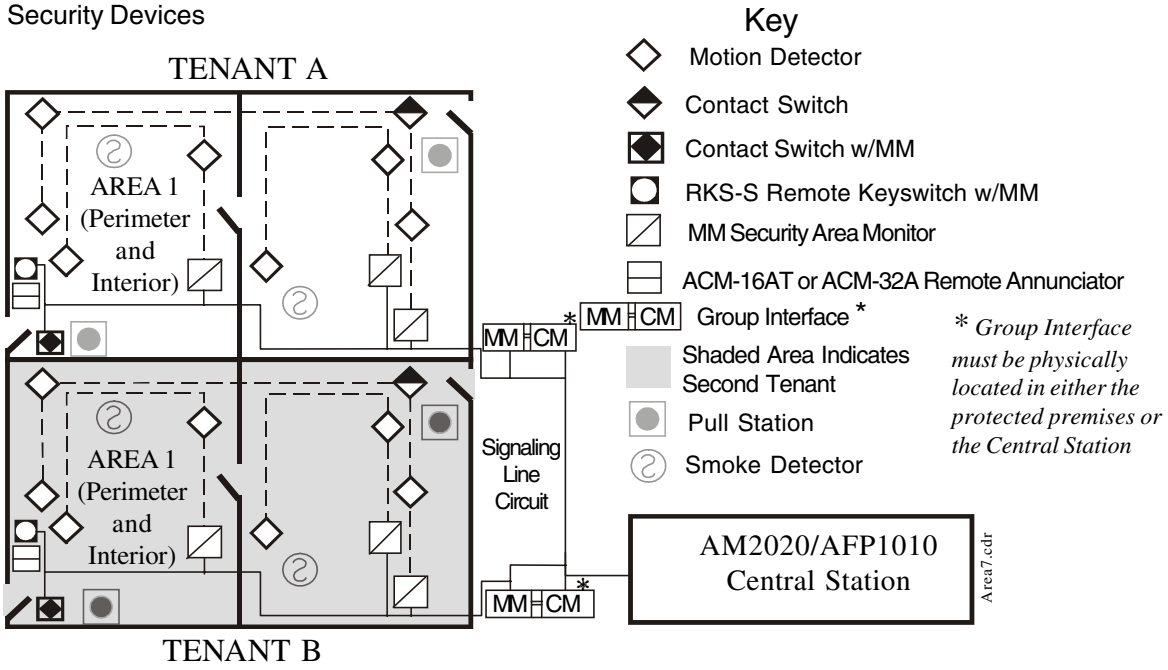


Figure 1.3-9 Multiple Tenant Security System with Entry/Exit Delay

Zone Programming Notes for Figure 1.3-9

MM Security Access Monitor
Provide a unique annunciator point for each Security Access Monitor installed.

Notification Appliance w/CM Module
When using an optional control module for Notification Appliances intended to indicate a security violation, the control module intended for Tenant A may be programmed with the following Control-By-Event equation:

AND(Zab* SDEL(00.00.00 00.15.00 (Zaj*)))

and Tenant B may be programmed with the following Control-By-Event equation:

AND(Zbb* SDEL(00.00.00 00.15.00 (Zbj*)))

resulting in 15 minutes of Notification Appliance activation after a security violation.

Program Tenant A using zone numbers Zaa through Zaj as in Figure 1-6. Program Tenant B as in Figure 1-6, but substitute Zba through Zbj for Zaa through Zaj respectively. *Zaa through Zaj are each unique installer-specified zone numbers. Zaa is the lowest specified zone number (highest priority) and Zaj is the highest specified zone number (lowest priority).

Example:

Zone Boundary greater than or equal to Z22 and less than Z100.

Zaa	Zab	Zac	Zad	Zae	Zaf	Zag	Zah	Zai	Zaj
Z5	Z12	Z22	Z180	Z188	Z199	Z200	Z210	Z211	Z212
Zba	Zbb	Zbc	Zbd	Zbe	Zbf	Zbg	Zbh	Zbi	Zbj
Z6	Z7	Z21	Z100	Z102	Z108	Z187	Z191	Z193	Z215

⇦ **Forward Zones** ⇨ ⇦ **Reverse Zones** ⇨

The following system requirements are illustrated in **Figure 1.3-10**. See Table 1.1-1 in the introduction to this section for monitor and control module options.

- One AM2020/AFP1010 Protected Premises Unit (PPU)
- One AM2020/AFP1010 Central Station Unit
- One Security Supervisory Protected Area
- One Protected Premises
- System Arm/Disarm Capability with Central Station Ringback Signal
- The minimum security equipment required is as follows:
  - SIB-2048A or SIB-NET Interface
  - NIB-96 Network Interface
  - STS-1 Security Tamper Switch
  - Monitor Modules
  - RKS-S Remote Keyswitch
  - ACM-16AT or ACM-32A Remote Annunciator for Entry or Exit Door
  - Control Module
  - RA400Z Remote Annunciator
  - Security Devices
  - One Group Interface

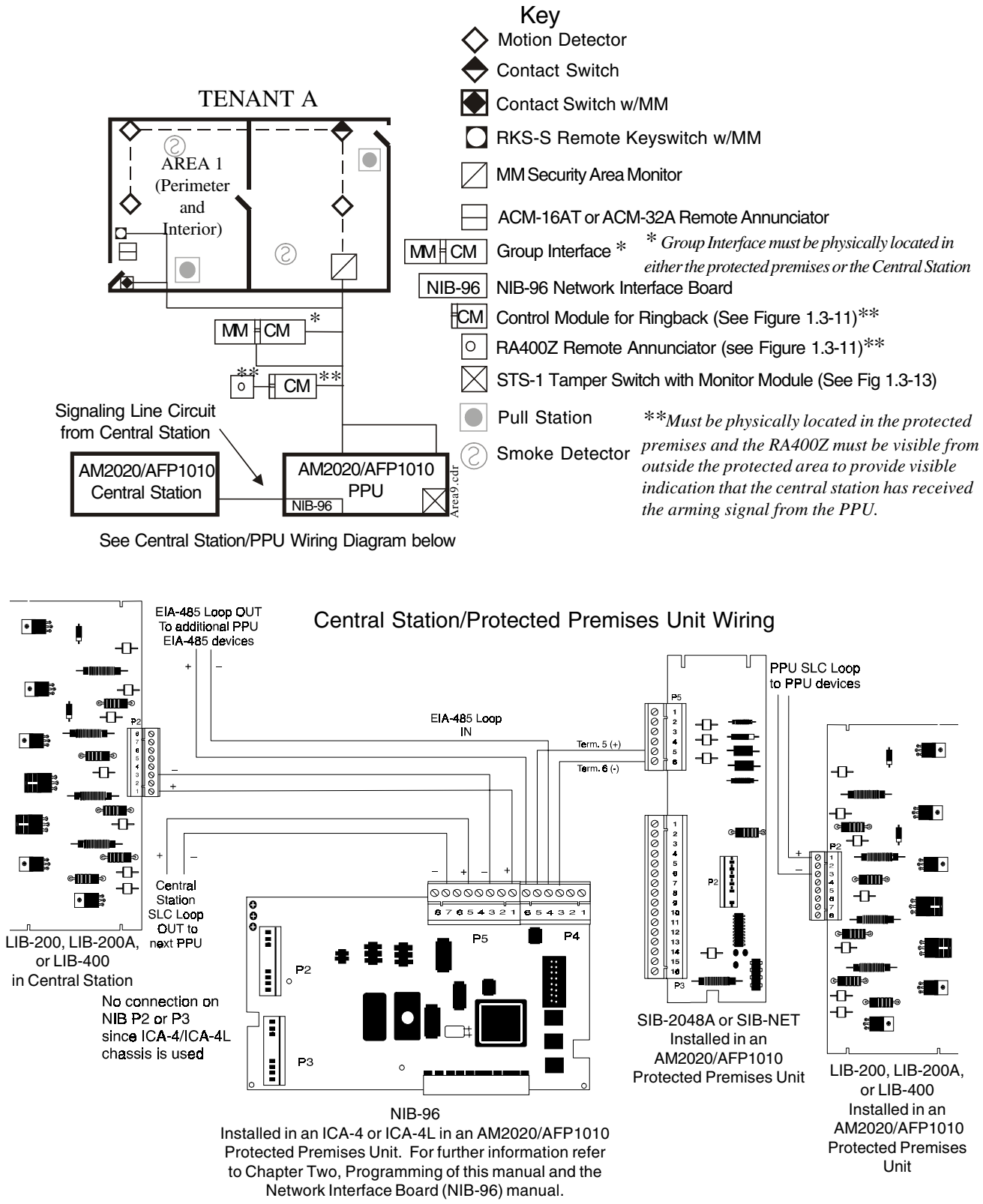


Figure 1.3-10 Single Tenant Security System with Ringback

The following programming key relates to **Figure 1.3-10**:

Contact Switch w/Monitor Module:
Address: LXXMYY (Installer Specified).
Type ID: SACM
Control-By-Event: (Zac*)
Custom Label: Entry/Exit Door
Tracking: Yes
Annunciator: Yes
Annunciator Point: ArrP3

RKS-S Remote Keyswitch w/Monitor Module:
Address: LXXMYY (Installer Specified).
Type ID: NOA
Control-By-Event: (Zab*)
Custom Label: Arming Switch
Tracking: Yes
Annunciator: Yes
Annunciator Point: AssPI**

Security Access Monitor Module:
Address: LXXMYY (Installer specified).
Type ID: SACM
Control-By-Event: (Zaa*)
Custom Label: Installer Option (describe specific location of module).
Tracking: Yes - Each unsecured state and restoral will be printed on the PPU printer when the print option is enabled.
No - The first unsecured state will be printed on the PPU printer when the print option is enabled (restorals will not print on the PPU printer until the PPU is reset locally or at the Central Station - short condition only).
Annunciator: Yes
Annunciator Point: ArrP4

Figure 1.3-10 Programming Key (continued):

ACM-16AT/-32A Annunciator:

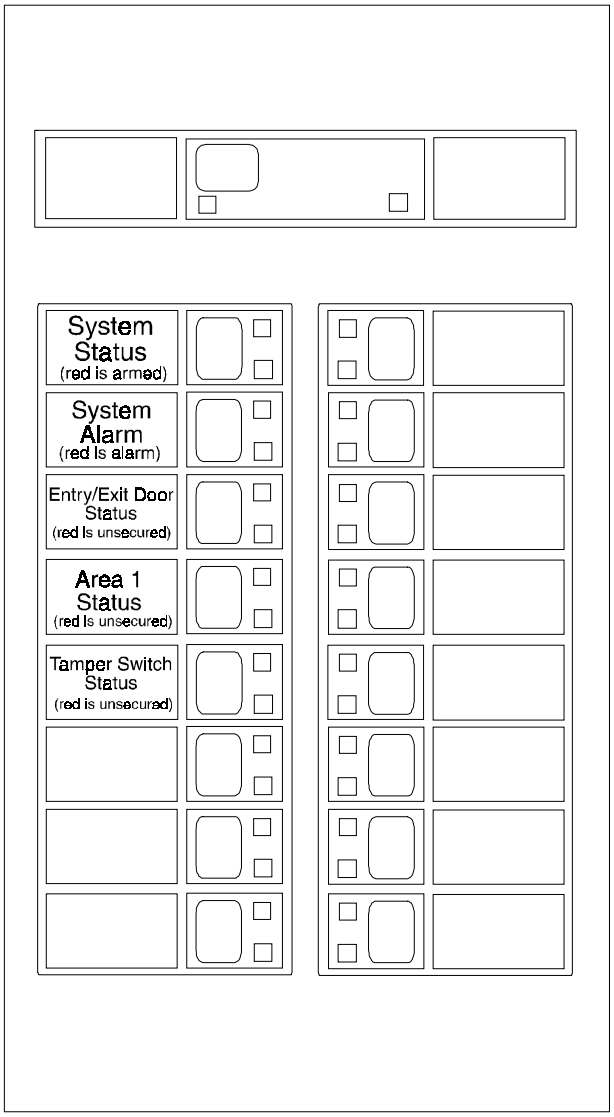
Annun. Pt.	Type ID
ArrP1	AZON
ArrP2	AZON
ArrP3	AMON
ArrP4	AMON
ArrP5	AZON

MM = CM **Group Interface:**

A: CM programming
Address: LXXMYY (Installer specified).
Type ID: CMXC
Control-By-Event: (Zaj*)
Custom Label: Security Group Output
Signal Silence: No
Walk Test: Yes/No (Installer Specified).
Annunciator: No (Not required).

B: MM programming:
Address: LXXMYY (Installer specified).
Type ID: SARM
Control-By-Event: ( )
Custom Label: Installer Specified.
Tracking: Yes - Results in required acknowledgment at the Protected Premises Unit for every unsecured state when the system is armed as long as the event is present. Restoral at the Protected Premises Unit is automatic.
No - Results in required acknowledgment at the Protected Premises Unit for first unsecured state only (system armed). The system must be manually reset at the Protected Premises Unit or at the Central Station - short condition only.
Annunciator: Yes
Annunciator Point: AssPp**

Sample Annunciator Display (ACM-16AT)



AMSECANN.CDR

STS-1 Tamper Switch w/MM Module:
Address: LXXMYY (Installer specified).
Type ID: SEQM - Results in no indication at Protected Premises Unit display. Indication at Central Station only.
SSYM - When activated, results in indication at PPU display and at Central Station.
Control-By-Event: (Zaa* Zal*)
Custom Label: Installer Specified.
Tracking: Yes
Annunciator: Yes
Annunciator Point: AssPn**

= CM **CM Control Module for Ringback:**
Address: LXXMYY (Installer specified).
Type ID: CMXC
Control-By-Event: ( )
Custom Label: Installer Specified.
Signal Silence: Yes
Walk Test: Yes/No (Installer Specified).
Annunciator: Yes
Annunciator Point: AssPm**

Figure 1.3-10 Programming Key (continued):

NIB-96 **NIB-96 Network Interface Board**

Protected Premises Unit (Slave)	**Point**	**Central Station** (Master)
Annunciator Point: AssP1 **Type ID:** AAST The first point of the NIB-96 interface reports any trouble condition in the Protected Premises to the Central Station. If the installer fails to program the Protected Premises Unit properly, leaving fire alarm initiation devices without a corresponding NIB point, an alarm from such an initiating device will cause the first NIB point to indicate a default fire alarm condition at the Central Station.	1	**Monitor Module Point** **Address**: LXXMYY **Type ID**: MON **Control-By-Event**: (Installer Specified) **Custom Label**: Installer Specified. **Tracking**: Yes - Default fire alarm conditions will restore automatically at the Central Station after reset at the Protected Premises. No - Default fire alarm conditions will latch in the Central Station until reset at the Central Station and at the Protected Premises if the NIB has been configured to prevent reset from the Central Station - short condition only. **Annunciator:** Optional.
Annunciator Point: AssP2 **Type ID:** AMON	2	Assign no device to this corresponding point.
Annunciator Point: AssP3 **Type ID**: ARES - Select the ARES Type ID if reset of the Protected Premises Unit is to be permitted at the Central Station. AMON - Select the AMON Type ID if reset of the Protected Premises Unit is not to be permitted at the Central Station.	3	**Control Module Point** **Address:** LXXMYY **Type ID:** CON **Control-By-Event:** ( ) **Custom Label:** Installer Specified. **Signal Silence:** Yes **Walk Test:** No **Annunciator:** No
Annunciator Point: AssP4 **Type ID:** AMON	4	Assign no device to this corresponding point.

Figure 1.3-10 Programming Key (continued):

NIB-96 **NIB-96 Network Interface Board (continued)**

Protected Premises Unit (Slave)	**Point**	**Central Station** (Master)
Arming Switch **Annunciator Point:** AssPl** **Type ID:** AMON	l**	**Monitor Module Point (PPU Arming Switch)** **Address:** LXXMYY **Type ID:** SACM **Control-By-Event:** (Zc) Unique Zone Number **Custom Label:** Installer Specified. **Tracking:** Yes **Walk Test:** No **Annunciator:** Yes - Provides visual indication of Protected Premises Arm/Disarm status at the Central Station. No - does not provide visual indication of Protected Premises Arm/Disarm status. **Annunciator Point:** AXXPYY (if used).
Central Station RIngback **Annunciator Point:** AssPm** **Type ID:** ACON	m**	**Control Module Point (Ringback)** **Address:** LXXMYY **Type ID:** CMXS **Control-By-Event:** (Zc) (Same as Point I) **Custom Label:** Installer Specified. **Signal Silence:** No **Walk Test:** No **Annunciator:** No (Not required).
Tamper Switch **Annunciator Point:** AssPn** **Type ID:** AMON	n**	**Monitor Module Point (PPU Tamper Switch)** **Address**: LXXMYY **Type ID**: SSYM **Control-By-Event**: (Installer Specified) **Custom Label**: Installer Specified. **Tracking:** Yes - Security tamper conditions will restore automatically at the Central Station after restoral at the Protected Premises. No - Security tamper conditions will latch in the Central Station until reset at the Central Station - short condition only. **Annunciator:** No (Not required).

**Indicates installer-specified NIB point.

Figure 1.3-10 Programming Key (continued):

NIB-96 **NIB-96 Network Interface Board (continued)**

Protected Premises Unit (Slave)	**Point**	**Central Station** (Master)
Group Interface MM **Annunciator Point:** AssPp** **Type ID:** AMON	p**	**Monitor Module Point (PPU Security Alarm Input)** **Address:** LXXMYY **Type ID:** SARM **Control-By-Event:** (Installer Specified) **Custom Label:** Installer Specified. **Tracking:** Yes - Security alarm conditions will restore automatically at the Central Station after restoral at the Protected Premises. No - Security alarm conditions will latch in the Central Station until reset at the Central Station and the Protected Premises Unit if the NIB-96 has been configured to prevent reset from the Central Station - short condition only. **Annunciator:** No (Not required).

**Indicates installer-specified NIB point.

PPU Zone Programming

1. Zone Boundary: Must be less than Zad* and greater than or equal to Zac*.

2. Zone to Which All Instant Security Modules Are Mapped
Zone: Zaa*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Instant Group
Annunciator: No (Not Required).

3. Zone Activated Upon Arming System
Zone: Zab*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Arming Zone
Annunciator: Yes
Annunciator Point: ArrP1

4. Zone Activated When Entry/Exit Door Is Open
Zone: Zac*
Type ID: FZON
Control-By-Event: ( )
Custom Label: Tenant A Entry/Exit
Annunciator: No (Not required).

5. Zone Activated When Any Instant Module Is Violated and the System Is Armed
Zone: Zad*
Type ID: RZON
Control-By-Event: AND(Zaa* Zab*)
Custom Label: Installer Specified.
Annunciator: No (Not required).

6. Zone Active for 30 Sec., 30 Sec. After Opening Entry/Exit Door (Not Dependent on Door Closure)
Zone: Zae*
Type ID: RZON
Control-By-Event: SDEL(00.00.30 00.00.30 (Zac*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

7. Zone Active 1 Min. After Entry/Exit Door Is Opened and Left Open
Zone: Zaf*
Type ID: RZON
Control-By-Event: DEL(00.01.00 (Zac*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

Figure 1.3-10 Programming Key (continued):

8. Zone Active 1.5 Min. After Arming System
Zone: Zag*
Type ID: RZON
Control-By-Event: DEL(00.01.30 (Zab*))
Custom Label: Installer Specified.
Annunciator: No (Not required).

9. Zone Providing 30 Sec. Entry/Exit Delay (Entry/Exit Door Only) When System Is Armed
Zone: Zah*
Type ID: RZON
Control-By-Event:
OR(AND(Zab* Zag* Zae*) AND(Zab* Zaf*))

causes Zone Zah* to activate if entry/exit time is exceeded.

causes Zone Zah* to activate if entry/exit door is left open.

Custom Label: Installer Specified.
Annunciator: No (Not required).

10. Zone Active for a Minimum of 30 Sec. if Entry/Exit Delay Is Violated (Entry/Exit Door Only) When System Is Armed
Zone: Zai*
Type ID: RZON
Control-By-Event:
AND(Zab* SDEL(00.00.00 00.00.30 (Zah*)))
Custom Label: Installer Specified.
Annunciator: No (Not Required).

11. Zone Active at Least 30 Sec. for Any Security Breach While System Is Armed
Zone: Zaj*
Type ID: RZON
Control-By-Event: OR(Zad* Zah* Zai*)
Custom Label: Installer Specified.
Annunciator: No (Not required).

12. Zone which remains Active until Reset when security violation occurs and the System is Armed.
Zone: Zak*
Type ID: RZON
Control-By-Event: SDEL(00.00.00 (Zaj*))
Custom Label: Installer Specified.
Annunciator: Yes
Annunciator Point: ArrP2

13. Zone Active when Tamper Switch Is Active
Zone: Zal*
Type ID: RZON
Control-By-Event: ( )
Custom Label: Installer Specified.
Annunciator: Yes
Annunciator Point: ArrP5

Notification Appliance w/CM Control Module

When using an optional Control Module for Notification Appliances intended to indicate a security violation, this CM may be programmed with the following Control-By-Event equation:

AND(Zab* SDEL(00.00.00 00.15.00 (Zaj*)))

resulting in 15 minutes of Notification Appliance activation after a security violation.

*Zaa through Zal are each unique installer-specified zone numbers. Zaa is the lowest specified zone number (highest priority) and Zal is the highest specified zone number (lowest priority).

Example:

Zaa	Zab	Zac	Zad	Zae	Zaf	Zag	Zah	Zai	Zaj	Zak	Zal
Z5	Z12	Z22	Z180	Z188	Z199	Z200	Z210	Z211	Z212	Z216	Z218
⇦	**Forward Zones**	⇨	⇦		**Reverse Zones**				⇨		

Zone Boundary greater than or equal to Z22 and less than Z180.

CM

The CMX control module for ringback is illustrated in **Figure 1.3-11**.

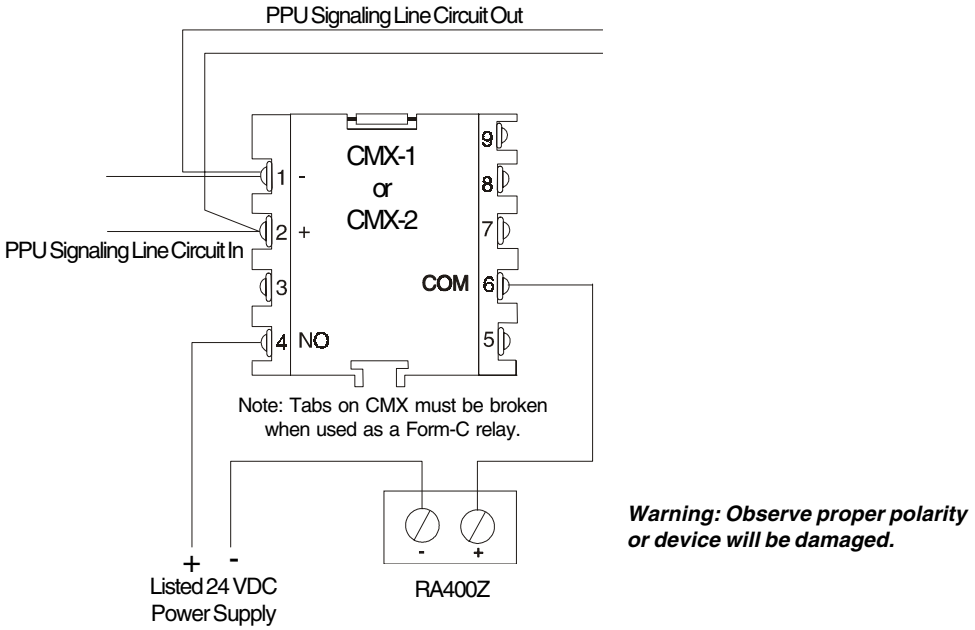


Figure 1.3-11 CMX Control Module for Ringback

An STS-1 Security Tamper Switch installation is illustrated in **Figure 1.3-12** through **1.3-14**.

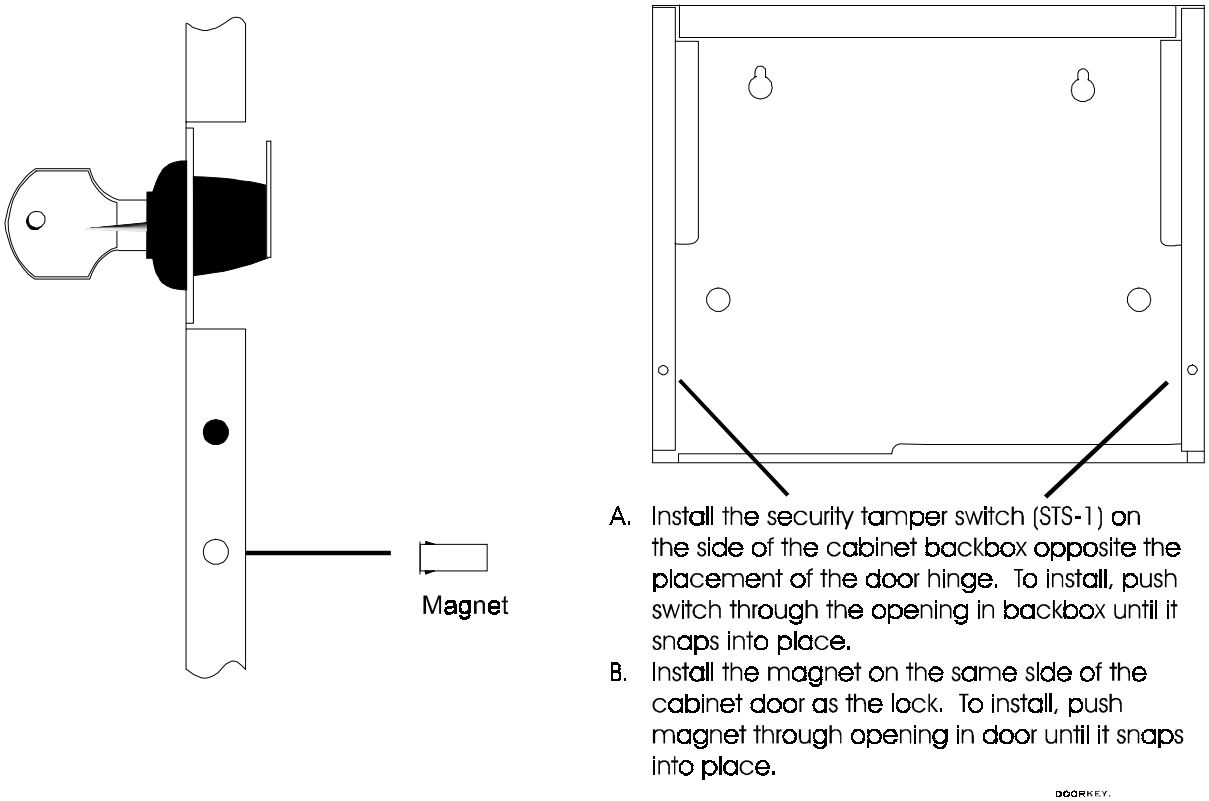


Figure 1.3-12 Installing an STS-1 Security Tamper Switch

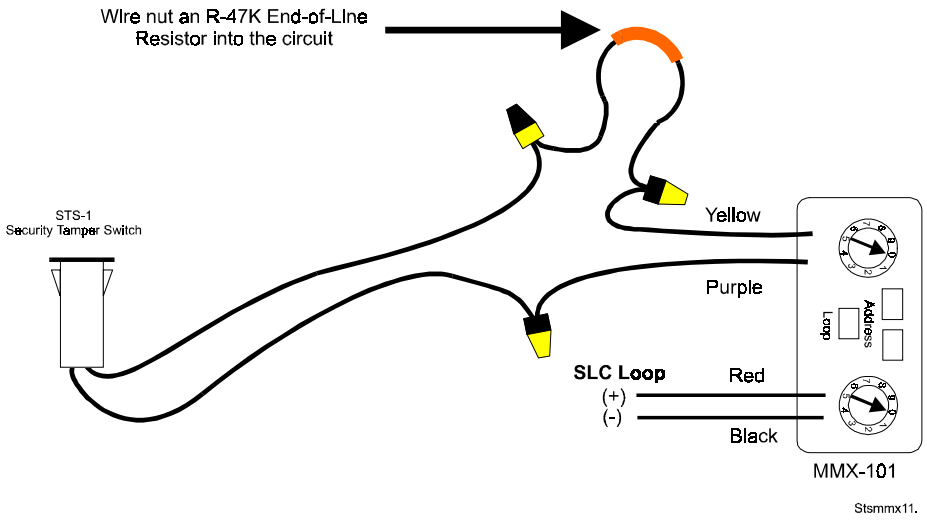


Figure 1.3-13 Connecting an STS-1 Switch to an MMX-101 Monitor Module

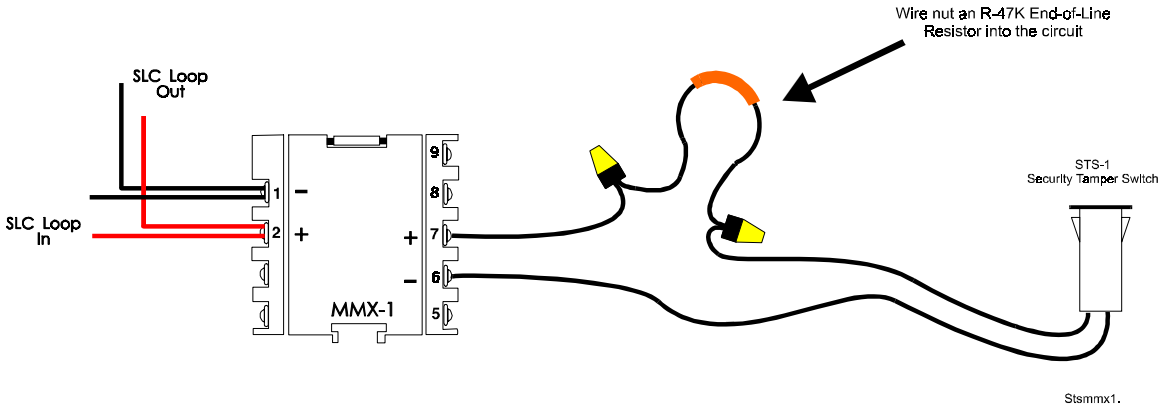


Figure 1.3-14 Connecting an STS-1 Switch to an MMX-1 Monitor Module

The following system requirements are illustrated in **Figure 1.3-15**. See Table 1.1-1 in the introduction to this section for monitor and control module options.

- Multiple AM2020/AFP1010 PPUs
- One AM2020/AFP1010 Central Station Unit
- Multiple Supervisory Security Circuits Reporting to Central Station as Single Area
- Multiple Protected Premises with System Arm/Disarm Capability and Central Station Ringback Signal
- The minimum security equipment required is as follows:
  - — Each AM2020/AFP1010 PPU must be equipped with a SIB-2048A or SIB-NET Interface
  - — NIB-96 Network Interface
  - — STS-1 Security Tamper Switch
  - — MM Monitor Modules for Protected Area
  - — ACM-16AT or ACM-32A Remote Annunciator for Each Entry and Exit Door
  - — RKS-S Remote Keyswitch
  - — Security Devices
  - — One Group Interface

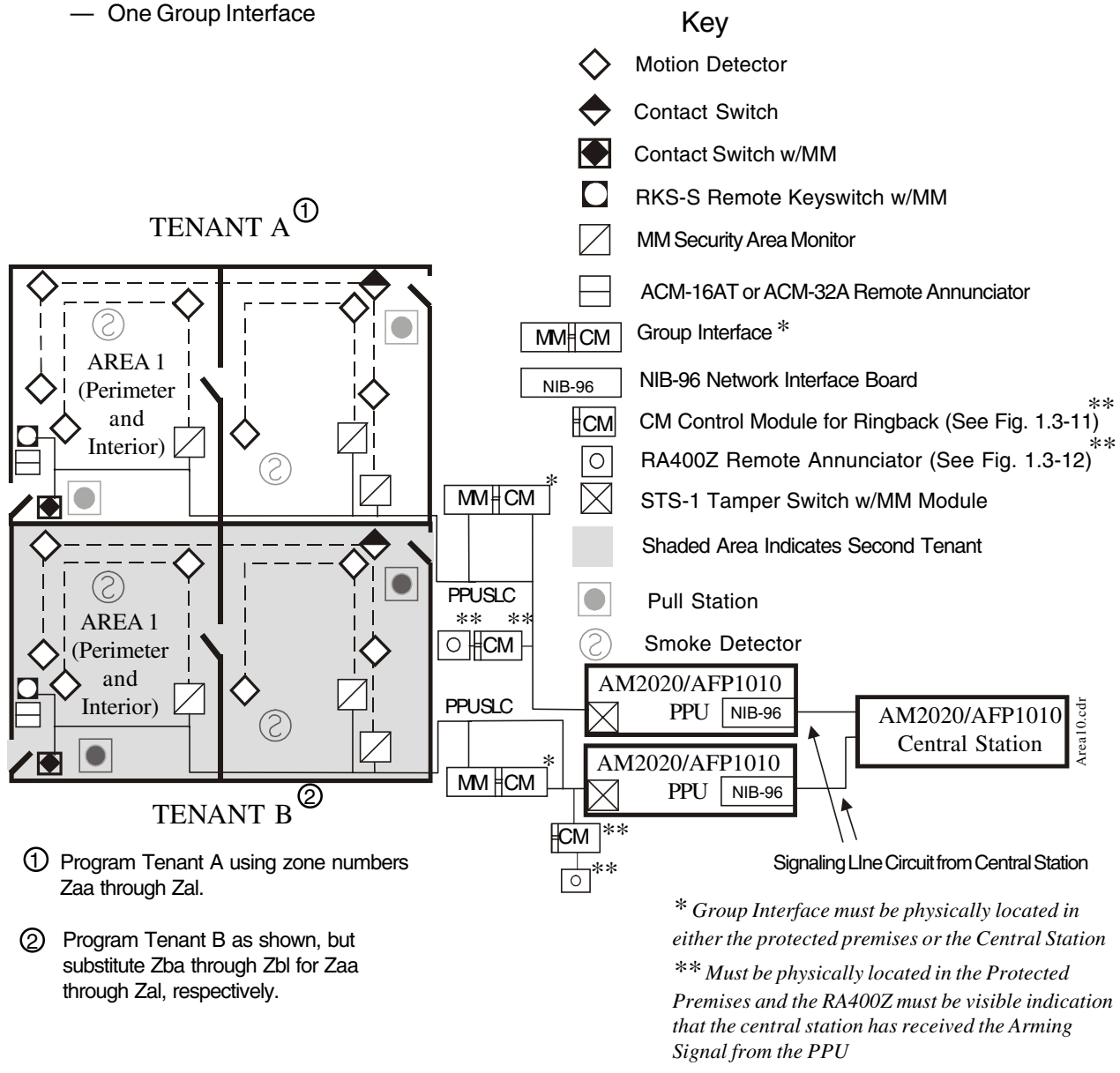
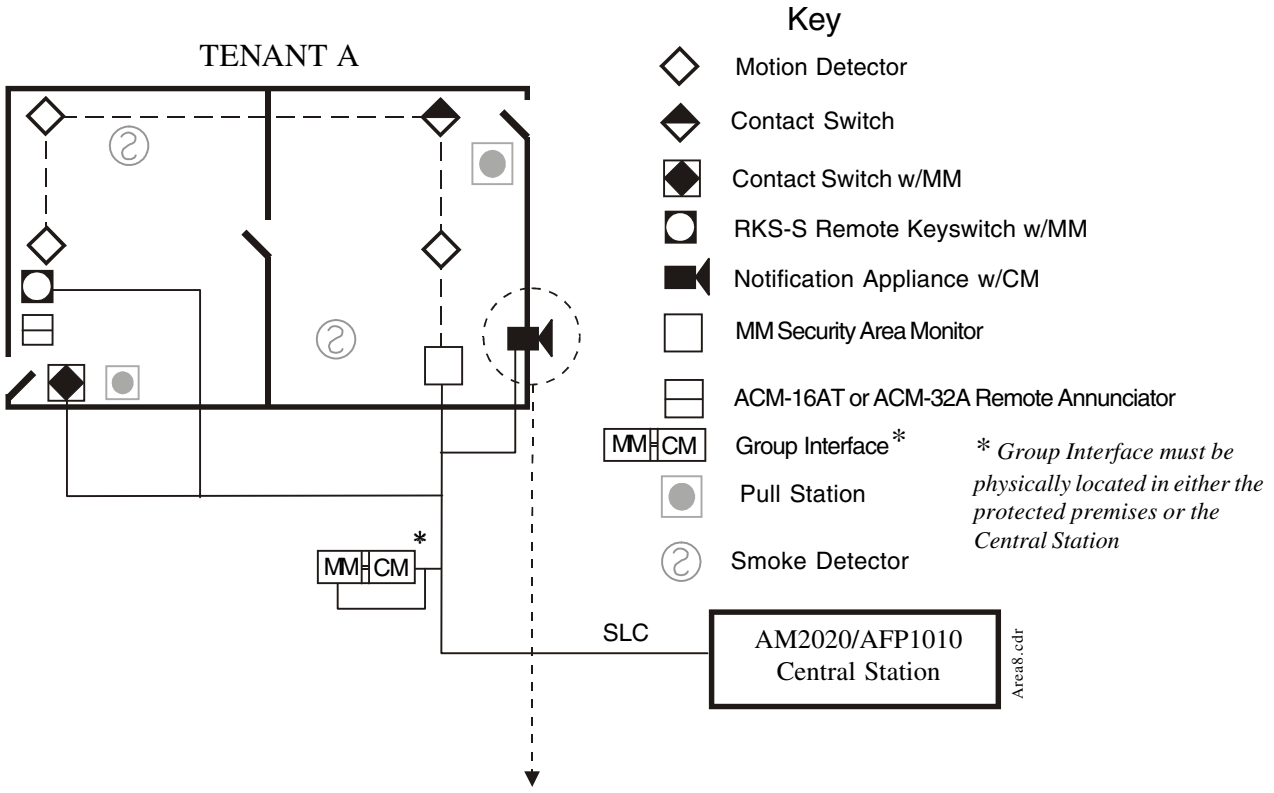
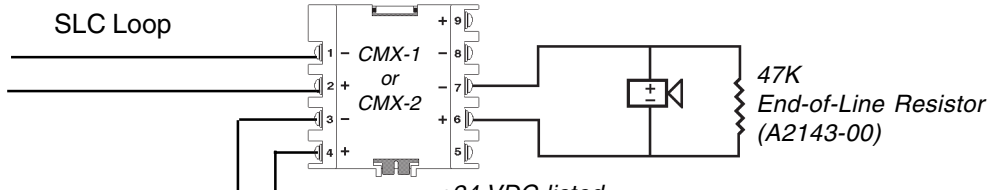


Figure 1.3-15 Multiple Tenant Security System with Ringback

Refer to **Figure 1.3-16** for the wiring of security notification appliances (supplementary use only in UL listed systems). See Table 1.1-1 in the introduction to this section for monitor and control module options.





CMX-1 or CMX-2

(activated polarity shown)

Configured as a Notification Appliance Circuit (do not break tabs) and programmed in the Protected Premises Unit.

NOTE

The CMX may also control audio speakers in an audio application. In such an installation, fire alarm conditions must have priority over security conditions in the AMG-1 (refer to the Voice Alarm Multiplex Manual).

- +

Listed 24 VDC Power Supply.

Figure 1.3-16 System Requirements

NOTES...

AM2020
AFP1010

APPENDICES

APPENDIX A
CIRCUIT/DEVICE RATINGS

GENERAL

Appendix A outlines the various circuits and devices that can be employed with the AM2020/AFP1010.

SECTION A.1 DESIGN CONSIDERATIONS

Each of the various types of circuits within an AM2020/AFP1010 Fire Alarm Control System has a specific type of wire that must be used in order to ensure proper operation. In addition, the wire gauge of a particular circuit is contingent on the length of that circuit. To determine the specific wiring requirements for each circuit, refer to **Table A-1**.

NOTES

- If the SLC Loop is to be run in conduit with Notification Appliance Circuits, the risk of encountering problems can be greatly reduced by using the LIB-200A or LIB-400 or exclusively employing electronic sounders instead of more electronically noisy notification appliances such as electromechanical bells or horns.
- In order to comply with the Federal Communications Commission (FCC) regulations on electrical energy radiation when using the LIB-200, any wire entering or exiting the AM2020/AFP1010 cabinet that is not in conduit must be of the twisted-shielded type. For termination of the LIB-200 SLC Loop shield, refer to the Installation section of the manual originally supplied with the LIB-200.

Circuit Type	Circuit Functions	Wire Requirements	Distance (feet/meters)	Typical Wire Type
LIB-200 SLC loop	Connects to Intelligent Detectors and Addressable Modules, and to XP Transponders	Twisted-shielded pair, 12 to 18 AWG (3.25 to 0.75 mm†). 40 ohms max per length of Style 6 and 7 loops. 40 ohms per branch max for Style 4 loops.	10,000/3048 8,000/2438 4,875/1485.9 3,225/982.98	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
LIB-200A or LIB-400 SLC loop	Connects to Intelligent Detectors and Addressable Modules, to XP Transponders, and XP5 Transponders	Twisted unshielded pair, 12 to 18 AWG (3.25 to 0.75 mm†). 50 ohms max per length of Style 6 and 7 loops. 50 ohms per branch max for Style 4 loops	12,500/3810 9,500/2895.6 6,000/1828.8 3,700/1127.76	Belden 9582, West Penn 998 (12 AWG/3.25 mm²) Belden 9580, West Penn 994 (14 AWG/2.00 mm²) Belden 9572, West Penn 990 (16 AWG/1.30 mm²) Belden 9571, West Penn 980 (18 AWG/0.75 mm²)
EIA-485	Connects to LCD-80, AMG-1 and to Annunciator Control System Modules	Twisted-shielded pair with a characteristic impedance of approximately 120 ohms. 18 AWG (0.75 mm†) minimum.	6,000/1828.8 6,000/1828.8 6,000/1828.8 4,000/1219.2	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
EIA-232	Connects to CRTs and remote printers	Twisted-shielded pair. 18 AWG (0.75 mm†) minimum.	See EIA-232D Standard	Belden 9583, West Penn 999 Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
MMX XPM-8	Initiating Device Circuit	12 to 18 AWG(3.25 to 0.75 mm†). Maximum loop wire resistance is 20 ohms (MMX-1, MMX-101) or 100 ohms (XPM-8).	5,000/1524 4,000/1219.2 2,438/743.1 1,613/491.64	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
CMX XPC-8	Notification Appliance Circuit	12 to 18 AWG (3.25 to 0.75 mm†). MPS-24A: At alarm current level, no more than a 1.2 volt drop at the end of the circuit.	Installer Calculations Required	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
Power Runs	To CMXs, XPC-8s, and XP5-Cs	12 to 18 AWG (3.25 to 0.75 mm†). Size wire so that no more than 1.2 volt drop across wire run from supply source to end of any branch.	Installer Calculations Required	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)
Power Runs	To annunciators	12 to 18 AWG (3.25 to 0.75 mm†). Size wire so that no more than 2.4 volts drop across wire run from supply source to end of any branch.	Installer Calculations Required	Belden 9583, West Penn 999, Belden B5020FL (12 AWG/3.25 mm²) Belden 9581, West Penn 995 (14 AWG/2.00 mm²) Belden 9575, West Penn 991 (16 AWG/1.30 mm²) Belden 9574, West Penn 975 (18 AWG/0.75 mm²)

Table A-1 Wiring Selection Chart

Type of Circuit	Devices/Ratings	Circuit Ratings	Connections
Main Supply Circuit A dedicated branch of the AC service that supplies primary AC power to the Fire Alarm Control Panel.	MPS-24A Main Power Supply	120 VAC, 50/60 Hz, 1.8 amps	TB1: Term. 2 + 3 (Ground) Term 4 + 5 (Neutral) Term 6 + 7 (Hot)
	MPS-24B Main Power Supply	120 VAC, 50/60 Hz, 1.8 amps	TB1: Term. 2 (Ground) Term 3 (Neutral) Term 4 (Hot)
	APS-6R Auxiliary Power Supply	120 VAC, 60 Hz, 2.5 amps	TB1: Term.1 (Hot) Term. 2 (Neutral) Term. 3 (Ground)
	AA-30 Audio Amplifier	120 VAC, 50/60 Hz, 1.0 amps	Plug P2: Term. 1 + 8 (Ground) Term 3 + 4 (Neutral) Term 5 + 6 (Hot)
	AA-100/AA-120 Audio Amplifier	120 VAC, 50/60 Hz, 1.85 amps	Plug P2: Term. 1 + 8 (Ground) Term 5 + 6 (Neutral) Term3 +4 (Hot)
Main Supply Circuit A dedicated branch of the AC service that supplies primary AC power to the Fire Alarm Control Panel	MPS-24AE Main Power Supply	220/240 VAC, 50/60 Hz, 0.9 amps	TB1: Term. 2 + 3 (Ground) Term 4 + 5 (Neutral) Term 6 + 7 (Hot)
	MPS-24BE Main Power Supply	220/240 VAC, 50/60 Hz, 0.9 amps	TB1: Term. 2 (Ground) Term 3 (Neutral) Term 4 (Hot)
	APS-6R Auxiliary Power Supply	240 VAC, 50 Hz, 1.2 amps	TB1: Term.1 (Hot) Term. 2 (Neutral) Term. 3 (Ground)
	AA-30E Audio Amplifier	220/240 VAC, 50/60 Hz, 0.5 amps	Plug P2: Term. 1 + 8 (Ground) Term 3 + 4 (Neutral) Term 5 + 6 (Hot)
	AA-100E/AA-120E Audio Amplifier	220/240 VAC, 50/60 Hz, 0.9 amps	Plug P2: Term. 1 + 8 (Ground) Term 5 + 6 (Neutral) Term3 +4 (Hot)
Battery Charger Circuit Charges and maintains the secondary supply during non-fire alarm conditions.	MPS-24A and MPS-24E Main Power Supplies	27.6 VDC. Float type battery charger 2.0A Max. Supervised and power-limited.	TB2: Term. 1 (+), Term 2 (-)
	MPS-24B and MPS-24BE Main Power Supplies	27.6 VDC. Float type battery charger (750 mA max). Supervised and power-limited.	TB2: Term. 5 (+), Term 6 (-)
	CHG-120 Battery Charger	27.6 VDC. Float type battery charger (4.5 amps max). Supervised and power-limited	TB2: Term. 5 (-), Term. 6 (+)
Battery Discharge Circuit or Secondary Power Input Supplies power to the Fire Alarm Control Panel during loss of primary AC power.	AA-30 or AA-30E Audio Amplifier	3.0 amps max. draw in alarm. 25.0 amp max. screw terminal contact rating. Supervised. Battery leads are not power-limited.	Plug P1: Term. 1 (+), Term 4 (-)
	AA-100/AA-120 or AA-100E/AA-120E Audio Amplifier	7.3 amps max. draw in alarm. 25.0 amp max. screw terminal contact rating. Supervised. Battery leads are not power-limited.	Plug P1: Term. 3 + 4 (+), Term 1 + 2 (-)
	APS-6R Auxiliary Power Supply	6.0 amp max. draw in alarm. Battery leads are not power-limited.	TB3-1 (+) TB3-2 (-)
	MPS-24A or MPS-24AE Main Power Supply	6.0 amps max. draw in alarm. 25.0 amp max. screw terminal contact rating. Supervised. Battery leads are not power-limited.	TB2: Term. 1 (+), Term 2 (-)
	MPS-24B or MPS-24BE Main Power Supply	2.9 amps max. draw in alarm. 25.0 amp max. screw terminal contact rating. Supervised. Battery leads are not power-limited.	TB2: Term. 5 (+), Term 6 (-)
Notification Appliance Power Provides power for Notification Appliance Circuits and remote signaling devices. Refer to the Device Compatibility Document.	MPS-24A or MPS-24AE Main Power Supply: use with any UL listed 24 VDC fire alarm Notification Appliance.	24 VDC (3.0 amps max.) Power-limited and supervised.	TB3: Term. 3 (+), Term 4 (-)
	MPS-24B or MPS-24BE Main Power Supply: use with any UL listed 24 VDC fire alarm Notification Appliances.	24 VDC (2.0 amps max. of regulated current available in alarm only) Power-limited and supervised with a UL listed relay.	TB2: Term. 3 (+), Term 4 (-)
	APS-6R Auxiliary Power Supply	24 VDC 3.0 amps max. per circuit (6.0 amps total) in alarm only. Power-limited and supervised with a UL listed relay.	TB2: Output Circuit 1, 1+, 2- Output Circuit 2, 3+,4-
External Resettable Power	MPS-24A or MPS-24AE Main Power Supply	24 VDC (200 mV ripple). 1.0 amps max. (draws from the total of 3.0 amps of MPS-24A regulated current available in standby or 6.0 amps available in alarm). Power-limited and supervised with an A77-716 relay.	TB3: Term. 1 (+), Term 2 (-)
		24 VDC (200 mV ripple). 2.0 amps max. (draws from the total of 3.0 amps of MPS-24A regulated current available in standby or 6.0 amps available in alarm). Power-limited and supervised with an A77-716 relay. Note: Optional jumper selectable.	TB3: Term. 3 (+), Term 4 (-)
	MPS-24B or MPS-24BE Main Power Supply	24 VDC (200 mV ripple). 200 mA max. (draws from the total of 750 mA of regulated current available in standby and alarm. Power-limited and supervised with a UL listed relay.	TB2: Term. 1 (+), Term 2 (-)

Table A-2 Circuit Ratings/Connections

Table A-2 (Continued)

Type of Circuit	Devices/Ratings	Circuit Ratings	Connections
Municipal Box Circuit	CMX Control Module or XP5-C Transponder Module with an MBT-1 Municipal Box Trip device and an A77-716 power supervision relay.	Local Energy Municipal Box connection. Supervised and power-limited. (3.65 VDC nominal). (10 ohms max. loop resistance. Trip current = 250 mA.	Refer to Supervising an Uninterruptable Power Supply in the AM2020/AFP1010 Manual.
	XP Transponder XPC-8 module with an MBT-1 Municipal Box Trip device.	Local Energy Municipal Box connection. Supervised and power-limited. (3.65 VDC nominal). 10 ohms max. loop resistance. Trip current = 250 mA.	Refer to Appendix A of the XP Series Transponder Manual.
24 VDC Notification Appliance Circuit A circuit or path directly connected to a 24 VDC notification appliance.	CMX Control Module fed from an MPS-24A/MPS-24AE, MPS-24B/MPS-24BE, APS-6R or other 24 VDC power supplies listed for Fire Protective Signaling.	Operating voltage supplied dependent on the signal power source employed. ELR=47K, 1/2 watt, Part #47K (N-ELR) in Canada. NFPA Style Y or Style Z field wiring. Max Load is 2 amps Resistive @ 24 VDC. Most Notification Appliances are resistive. Certain electromechanical devices exhibit inductive loading characteristics. For these types of devices, derate the outputs to 1 amp @ 30 VDC (0.6pf). Size wiring for no more than 1.2 volt drop at last device on circuit. Supervised. Power limiting is a function of the power source.	NFPA Style Y Activated Polarity CMX Terminal 6 (+), 7 (-). NFPA Style Z Activated Polarity CMX Terminals 6, 9 (+); 7,8 (-).
	XP5-C Transponder Circuit fed from an MPS-24A/MPS-24AE, MPS-24B/MPS-24BE, APS-6R, or other 24 VDC listed power supply.	Operating voltage supplied dependent on the signal power source employed. ELR=47K, 1/2 watt, Part #47K (N-ELR) in Canada. NFPA Style Y field wiring. Total current to all notification applicances cannot exceed 3A(non-coded DC), 2A (DC). Most Notification Appliances are resistive. Certain electromechanical devices exhibit inductive loading characteristics. For these types of devices, derate the outputs to 1 A, 30 VDC, inductive (L/R=2 ms) coded. 0.5A, 30 VDC, inductive (L/R=5 ms) coded. Size wiring for no more than 1.2 volt drop at last device on circuit. Supervised. Power limiting is a function of the signaling power source.	NFPA Style Y Activated Polarity (5 circuits on XP5-C) TB1-TB5: B-, B+
	XP Transponder XPC-8 module fed from an MPS-24A/MPS-24AE, MPS-24B/MPS-24BE, APS-6R or other 24VDC listed power supply.	Operating voltage supplied dependent on the signal power source employed. ELR=47K, 1/2 watt, Part #47K (N-ELR) in Canada. NFPA Style Y and Style Z field wiring. Max Load is 2 amps Resistive @ 24 VDC. Most Notification Appliances are resistive. Certain electromechanical devices exhibit inductive loading characteristics. For these types of devices, derate the outputs to 1 amp @ 30 VDC (0.6pf). Size wiring for no more than 1.2 volt drop at last device on circuit. Supervised. Power limiting is a function of the power source.	NFPA Style Y Activated Polarity (8 zones on XPC-8 P2): Term.1 (+),2(-); 3(+), 4(-); 5(+), 6(-); 7(+), 8(-); 9(+),10(-); 11(+),12(-); 13(+), 14 (-); 15(+), 16(-). NFPA Style Z Activated Polarity (4 zones on XPC-8 P2): Term. 1,3(+), 2,4 (-); 5,7 (+), 6,8 (-), 9,11 (+), 10,12 (-); 13,15 (+), 14,16 (-).
Speaker Notification Appliance Circuits	CMX-1 Control Module fed from an AA-30/AA-30E, AA-100/AA-100E or AA-120/AA-120E.	Operating voltage dependent on amplifier employed. Max of 40 mA total speaker leakage current due to coupling capacitors. 48 watts max @ 25 VRMS max. ELR=47K, 1/2 watt, Part # A2143-20 (N-ELR in Canada). Max. line resistance dependent upon wattage required at each speaker. NFPA Style Y field wiring. Supervised. Power limiting is a function of the signaling power source.	NFPA Style Y supervised polarity CMX Terminals 7(+), 6(-).
	CMX-2 Control Module fed from an audio amplifier. Model A2143-20 coupling capacitor (10uA leakage max.) is required for NFPA Style Z connection. Refer to the CMX-2 installation instructions for more details.	Operating voltage dependent on amplifier employed. 43.75 watts max., up to 70.7 VRMS. Max of 40 uA total speaker leakage current due to coupling capacitors. ELR=47K, 1/2 watt, Part # A2143-00 (N-ELR in Canada). Max. line resistance dependent upon wattage required at each speaker. NFPA Style Y and Z field wiring. Supervised. Power limiting is a function of the signaling power source.	NFPA Style Y supervised polarity: CMX Terminals 7 (+), 6(-). NFPA Style Z supervised polarity: CMX Terminals 7,8 (+); 6,9 (-).
	XP Transponder XPC-8 module fed from an audio amplifier.	Operating voltage dependent on amplifier employed. 50 watts max @ 25 Vrms, 70 watts@ 70.7 Vrms max. ELR=47K, 1/2 watt, Part # R-47K (N-ELR in Canada). Max line resistance dependent upon wattage required at each speaker. NFPA Style Y or Style Z field wiring. Supervised. Power-limiting is a function of the signal source.	NFPA Style Y supervised polarity (8 zones on XPC-8 P2):Term.1(-), 2(+); 3(-), 4(+);5(-),6(+); 7(-), 8(+); 9(-), 10(+); 11(-), 12(+); 13(-), 14(+); 15 (-), 16(+). NFPA Style Z supervised polarity (4 zones on XPC-8 P2): Term. 1,3 (-),2,4,(+); 5,7 (-),6,8(+); 9,11 (-), 10,12 (+);13,15 (-), 14,16 (+).
	XP5-C Transponder circuit fed from an audio amplifier.	Operating voltage dependent on amplifier employed. 75 watts max @ 25 Volts, 64 watts max @ 70.7 Vrms max. ELR=47K, 1/2 watt, Part # R-47K (N-ELR in Canada). Max line resistance dependent upon wattage required at each speaker. NFPA Style Y field wiring. Supervised. Power-limiting is a function of the signal source.	NFPA Style Y supervised polarity (5 circuits on XP5-C) TB1 - TB5; B-, B+
Speaker Power (High-level Audio)	AA-30/AA-30E, AA-100/AA-100E or AA-120/AA-120E Audio Amplifier feeding signal to a CMX Control Module, an XP Transponder XPC-8 Module, or an XP5-C transponder circuit. Use only UL listed speakers rated for a minimum 25 VRMS (30 watts max with AA-30/AA-30E, 120 watts max with AA-120/AA120E) or 70.7 VRMS min. when using the AA-100/AA-100E. (100 watts max.).	25 Vrms audio amplifier output (70.7 Vrms for AA-100/AA-100E). AA-30/AA-30E: 30 watts max. AA-120/AA-120E: 120 watts max. AA-100/AA-100E 100 watts max. Frequency response: 800 Hz to 2800 Hz. Two wire high level audio circuit is not supervised. Four-wire high level audio circuit is supervised. AA-30/AA-30E, AA-100/AA-100E and AA-120/AA-120E are power-limited. Maximum wiring distance limited by wattage required at each speaker.	AA-30/AA-30E, AA-100/AA-100E and AA-120/AA-120E Connector P6 to XP5-C (TB1-TB5), XPC-8 Connector P3: AA-30/AA-30E Connector P6 (or P8.5 (-) and P8.6(+)) to CMX Term 3(-) and 4(+). Wire optional supervisory return loop from CMX Term 3(-) and 4(-) to AA-30/AA-30E Connector P7 or P8.2(-), P8.3(+) or AA-120/AA-120E P8.2(-),P8.3(+). AA-100/AA-100E: connnect 25 VRMS output P7.3 and P7.4 to a transformer input P7.1 and P7.2 to obtain 70.7 VRMS output at P8.7 and P8.8. Connection not supervised.

Table A-2 (Continued)

Type of Circuit	Devices/Ratings	Circuit Ratings	Connections
Common Telephone Riser (FFT to XPC or XP5-C)	FFT-7/FFT-7S Fire Fighter's Telephone to an XP Transponder XPC-8 module or an XP5-C Transponder circuit.	24 VDC (nominal), 1-Vrms max. 800 Hz to 2800 Hz. Seven (7) telephone handsets active at one time max including Master Telephone. Supervised/power-limited. Two-wire circuit supervised via 27K ELR, Part # R-27K (N-ELR for Canada). Optional return loop for 4-wire circuit. Max wiring resistance (including individual telephone zone to last handset) permitted is 40 ohms. 10,000 ft. (3048 m) max wiring distance at 12 AWG (3.25 mm^2) to last handset.	FFT-7/FFT-7S Connector P3 Term. 3(+) and 2 (-): to **XPC-8** Connector P3.2 (+), P3.1(-), and/or P4.2 (+) P4.1 (-), P5.2 (+) P5.1(-), P6.2 (+) P6.1(-), P7.2(+) P7.1(-), P8.2 (+) P8.1(-), P9.2(+) P9.1(-), P10.2(+) P10.1(-); to **XP5-C**,TB1-TB5, EXT-, EXT+ or J1A-J5A. Optional four-wire redundant return to FFT-7/FFT-7S Connector P3 Term. 6(+) and 5(-) to **XPC-8** Connector P10; to **XP5-C**,TB1-TB5, EXT-, EXT+ or J1A-J5A.
Individual Telephone Notification Appliance Circuits (XPC to Telephone Jacks)	XP Transponder XPC-8 module fed from an FFT-7/FFT-7S: employs phone jacks APJ-1 and FPJ; Fireman's Handset FHS-1; Fireman's Handset Enclosures FHE-F and FHE-S.	No telephone jack maximum per circuit. Two-wire circuit supervised via a 47K ELR, Part # R-47K (N-ELR in Canada). No outboard ELR for four-wire supervised circuit. Max resistance due to wiring is 40 ohms from FFT-7 to termination of the telephone circuit. Power limitation is a function of the signal source employed. Telephone handset ring signal is provided with this module.	Two-wire circuits (8 telephone circuits on XPC-8 P2): Term 1 (-), 2 (+); 3(-), 4 (+); 5 (-), 6 (+), 7 (-), 8 (+); 9(-), 10 (+); 11 (-), 12 (+); 13 (-), 14 (+); 15 (-), 16 (+). Four-wire circuits (4 telephone circuits on XPC-8 P2): Term. 1,3 (-), 2,4 (+); 5,7 (-), 6,8 (+); 9,11 (-), 10,12 (+); 13,15 (-), 14,16 (+).
Individual Telephone Notification Appliance Circuits (XP5-C to Telephone Jacks)	XP5-C Transponder circuit fed from an FFT-7/FFT-7S: employs phone jacks APJ-1 and FPJ; Fireman's Handset FHS-1; Fireman's Handset Enclosures FHE-F and FHE-S.	No telephone jack maximum per circuit. Two-wire circuit supervised via a 47K ELR, Part# R-47K (N-ELR in Canada). Max resistance due to wiring is 40 ohms from FFT-7 to termination of the telephone circuit. Power limitation is a function of the signal source employed. Telephone handset ring signal is not provided with this module.	Two-wire circuits (5 telephone circuits) on : TB1-TB5, B-, B+
Low level Audio Riser	ACT-2 output to AA-30/AA-30E, AA-100/AA-100E, or AA-120/AA-120E input.	NFPA Class B circuit, power-limited 3.5 VRMS max., 50 mA max.. Monitored for integrity at destination (listed amplifier). Maximum wiring distance 200 ft (61 m) at 18 to 12 AWG (0.75 to 3.25 mm^2) gauge wire. Twisted and shielded wiring recommended when connecting to more than one amplifier.	ACT-2 pins 3,2, and 1 plug directly into P3.3, P3.2, and P3.1 respectively of an AA-30/AA-30E, or AA-120/AA-120E. Additional AA series amplifiers feed from the first amplifier P3.6 (shield), P3.5, and P3.4 to additional amplifier P3.3, P3.2, and P3.1 respectively.
	RM-1/RM-1SA output to AA-30/AA-30E, AA-100/AA-100E, or AA-120/AA-120E input.	NFPA Class B circuit, power-limited 3.5 VRMS max., 50 mA max.. Monitored for integrity at destination (listed amplifier). Maximum wiring resistance from AMG or ACT-2 low-level source connected at input of RM-1/RM-1SA to farthest AA series amplifier at output of RM-1/RM1-SA is 40 ohms. Twisted and shielded wiring recommended when connecting output to more than one amplifier.	RM-1/RM-1SA TB5 shield out, TB5 - out, and TB5 + out to AA series amplifier P3.3, P3.2, and P3.1 respectively or another RM-1/RM-1SA on TB4 shield in, - in, and + in respectively.
	AMG-1/E output to AA-30/AA-30E, AA-100/AA-100E, AA-120/AA-120E, ACT-1 or RM-1/RM-1SA input	Power-limited/supervised, 40 ohm maximum resistance. 10,000 feet (3048 m) maximum distance at 12 AWG (3.25 mm^2) gauge wire. Twisted and shielded wiring recommended. Connect shield to REF A audio source.	Internal two-wire: AMG-1 P5 to AA Series Amplifier P2. External two-wire: AMG-1 P4, Terminals 4 (-) and 5 (+) to AA Series Amplifier P3, Terminals 4 (-) and 5 (+). External four-wire connection: include return from AA-30 P8, Terminals 5 (-) and 6 (+) to AMG-1 P4, Terminals 1 (-) and 2 (+). Connect AMG-1 P4 terminals 4 (-) and 5(+) to ACT-2 AUDIO IN terminals (not polarity sensitive). Connect AMG-1 P4 Terminals 4(-) and 5(+) to RM-1/RM-1SA TB4 "IN" terminals (not polarity sensitive) Use of twisted shielded cable is recommended.
High level Audio Riser	AA-30/AA-30E output to ACT-2 input	Power-limited, 25VRMS, 30 W max., frequency response 800 Hz to 2800 Hz, two-wire circuit must be monitored for integrity at destination equipment (listed amplifiers), four-wire circuit is monitored for integrity at AA-30/AA-30E, 40 ohm maximum wire resistance.	Two-wire: AA-30/AA-30E P8, Terminals 6 and 5 to ACT-2 "Audio In" terminals (not polarity sensitive). AA-30/AA-30E Terminal 4 (shield) to ACT-2 "S". Optional 4-wire return: ACT-2 "Thru" terminals to AA-30/AA-30E P8, Terminals 3 and 2 (not polarity sensitive).
Form-C Dry Contacts	XP Transponder XPP-1; Dual Form-C Alarm and Trouble Relays	2 amps resistive @ 30 VDC. One amp inductive (0.6 pf) @ 24 VDC. Not supervised. Power limitation is a function of the signal source applied.	Refer to the XPP-1 in the XP Series Transponder System Manual.
	XP Transponder XPR-8: Eight Form-C relays or four Dual Form-C relays.	2 amps resistive @ 30 VDC. One amp inductive (0.6 pf) @ 24 VDC. Not supervised. Power limitation is a function of the signal source applied.	Refer to the XPR-8 in the XP Series Transponder System Manual.
	CMX-1: One Form-C relay	2 amps resistive @ 30 VDC. One amp inductive (0.6 pf) @ 30 VDC.	Power: Term 2 (+), Term 1 (-) Normally Open contacts use Term 4; normally closed contact use Term 5: common use Term 6. Break tabs for Form-C relay.
	CMX-2: One Form-C relay	2 amps resistive @ 30 VDC. One amp inductive (0.6 pf) @ 30 VDC. Pilot duty: 0.6 amps @ 30 VDC (0.35pf); 0.3 amps @ 110 VDC (0.35 pf);0.3 amps @ 120 VAC (0.365 pf).	Power: Term 2 (+), Term 1 (-) Normally Open contacts use Term 4; normally closed contact use Term 5: common use Term 6. Break tabs for Form-C relay.
	XP5-C Transponder: 5 Form-C relays	3 A @ 30 VDC, resistive, non-coded. 2 A @ 30 VDC, resistive, coded. 0.9 A, 110 VDC, resistive, non-coded. 0.9 A, 125 VAC, resistive, non-coded. 0.5 A, 30 VDC, inductive (L/R=5ms), coded. 1.0 A, 30 VDC, inductive (L/R=2ms), coded. 0.5A, 125 VAC, inductive (PF=.35), non-coded.	TB1-TB5, com, N/O, N/C.

Table A-2 (Continued)

Type of Circuit	Devices/Ratings	Circuit Ratings	Connections
LIB-200 SLC Loop A circuit or path directly over which multiple signals are transmitted and received.	LIB-200 Board: Employs intelligent detectors and addressable modules - SDX-551,SDX-551TH,SDX-751, FDX-551,CPX-551,CPX-751,IPX-751,MMX--1, MMX-2, MMX-101,XP5-M, XP5-C, CMX-1, CMX-2, NBG-12LX, BGX-10L, XPP-1, ISO-X.Ten SLC Loops max per AM2020 system,4 per AFP1010. When more than 100 Isolator Modules/Isolator Bases are connected to an SLC Loop, decrease the 198 address capacity by two addresses for every isolator in excess of 100.	24 Volts DC nominal, 27.6 volts DC maximum. Maximum length is 10,000 ft. (3048 m) per channel (NFPA Style 4) or 10,000 ft. (3048 m) total twisted-shielded pair length (NFPA Style 6 and 7). Maximum loop current is 200mA (short circuit) or 100 mA (normal). Maximum loop resistance is 40 ohms. Supervised and power-limited.	NFPA Style 4: LIB-200 Channel A - Term. 1 (+), 3 (-); Channel B - Term. 5 (+), 7 (-). NFPA Style 6, 7: LIB-200 Term. 1, 5 (+); 3,7 (-).
LIB-200A or LIB-400 SLC Loop A circuit or path directly over which multiple signals are transmitted and received.	LIB-200A/LIB-400 Board: Employs 99 intelligent detectors and 99 addressable modules - SDX-551, SDX-551TH, SDX-751, FDX-551, CPX-551, CPX-751, IPX-751, MMX-1, MMX-2, MMX-101, XP5-M, XP5-C, CMX-1, CMX-2, NBG-12LX, BGX-10L, XPP-1, ISO-X. Ten SLC Loops max per AM2020 system, four per AFP1010. When more than 100 Isolator Modules/Isolator Bases are connected to an SLC Loop, decrease the 198 address capacity by two addresses for every isolator in excess of 100.	24 Volts DC nominal, 27.6 volts DC maximum. Maximum length is 12,500 ft. (3810 m) per channel (NFPA Style 4) or 12,500 ft. (3810 m) total twisted pair length (NFPA Style 6 and 7). Maximum loop current is 200mA (short circuit) or 100 mA (normal). Maximum loop resistance is 50 ohms. Supervised and power-limited.	NFPA Style 4: LIB-200A/LIB-400 Channel A - Term. 1 (+), 3 (-); Channel B - Term. 5 (+), 7 (-). NFPA Style 6, 7: LIB-200A/LIB-400 Term. 1, 5 (+); 3,7 (-).
NOTI FIRE NET SLC A series of modules and products which allow a group of Fire Alarm Control Panels (FACPs) and other control equipment to connect, forming a true peer-to-peer network	MIB-W: Media Interface Board used to connect nodes with twisted-pair wire	NFPA Style 4 (Class B). 312.5 Kbaud transmission rate. Refer to the NOTI FIRE NET Manual, Document 50257 for distance limits.	Port A - TB1 - 1 and 2 Port B - TB1 - 3 and 4
	MIB-F: Media Interface Board used to connect nodes with fiber-optic cable	NFPA Style 4 (Class B). Fiber Type: 62.5/125 micrometers. Wavelength: 820 nanometers. Maximum Attenuation: 10 dB. 312.5 Kbaud transmission rate	Port A - U1 (Tx), U5 (Rx) Port B - U2 (Tx), U3 (Rx)
	MIB-WF: Media Interface Board used to connect from twisted-pair wire to fiber or fiber to twisted-pair wire at any network node.	NFPA Style 4 (Class B). 312.5 Kbaud transmission rate. Port A - refer to the NOTI FIRE NET manual, Document 50257 for distance limits. Port B - Fiber Type: 62.5/125 micrometers, Wavelength: 820 nanometers, Maximum Attenuation: 10 dB.	Port A (wire) - TB1 - 1 and 2 Port B (fiber) - U2 (Tx), U3 (Rx)
	RPT-W: Repeater used to boost the data signal between network nodes supporting twisted-pair wire only.	NFPA Style 4 (Class B). 312.5 Kbaud transmission rate. Refer to the NOTI FIRE NET Manual, Document 50257 for distance limits.	Port A: TB1- 1 and 2 Port B: TB1- 3 and 4
	RPT-F: Repeater used to boost the data signal between network nodes supportingh fiber-optic cable	NFPA Style 4 (Class B). Fiber Type: 62.5/125 micrometers. Wavelength: 820 nanometers. Maximum Attenuation: 10 dB. 312.5 Kbaud transmission rate	Port A: U14 (Tx), U11 (RX) Port B: U15 (Tx), U12 (RX)
	RPT-WF: Repeater used to boost the data signal between network nodes supporting both twisted-pair wire and fiber-optic cable	NFPA Style 4 (Class B). 312.5 Kbaud transmission rate. Port A - refer to the NOTI FIRE NET manual, Document 50257 for distance limits. Port B - Fiber Type: 62.5/125 micrometers, Wavelength: 820 nanometers, Maximum Attenuation: 10 dB.	Port A (wire) TB1- 1 and 2 Port B (fiber) U15 (Tx), U12 (RX)
	NAM-232W: Network Adapter Module functioning as an interface between the AFP200 FACP and the NOTI FIRE NET with twisted-pair wire	NFPA Style 4 (Class B). 312.5 Kbaud transmission rate. Refer to the NOTI FIRE NET Manual, Document 50257 for distance limits.	PortA: TB2 - 1 and 2 Port B: TB2 - 3 and 4
	NAM232F: Network Adapter Module functioning as an interface between the AFP200 FACP and the NOTI FIRE NET with fiber-optic cable	NFPA Style 4 (Class B). Fiber Type: 62.5/125 micrometers. Wavelength: 820 nanometers. Maximum Attenuation: 10 dB. 312.5 Kbaud transmission rate	Port A: J2 (Tx), J1 (RX) Port B: J4 (Tx), J3 (RX)

Table A-2 (Continued)

Type of Circuit	Devices/Ratings	Circuit Ratings	Connections
Polarity Reversal For connection to a polarity reversal circuit of a remote station receiving unit	CMX Control Module (two required) with an RPT-680 Reverse Polarity Trip device:	Supervised/power-limited. Maximum distance and line impedance limited by Receiving Unit Ratings.	See Chapter One of the AM2020/AFP1010 Manual, Supervising an Uninterruptable Power Supply.
	XP Transponder XPP-1 module with two RPT-680 Reverse Polarity Trip devices	Supervised/power-limited. Maximum distance and line impedance limited by Receiving Unit Ratings.	See the XP Transponder Manual.
EIA-485 Interface and EIA-232 Interface	SIB-2048A and SIB-NET Serial Interface Board: Employs AMG-1 Audio Message Generator and annunciator modules - ACM-16AT (AEM-16AT), ACM-32A (AEM-32A).	+/- 5 volts peak-to-peak. Supervised and power-limited. 6000 ft. (1828.8 m) max distance. Terminating resistor = 120 ohms, 1/4-watt (Part # 71244). Characteristic impedance of the wiring is 120 ohms.Transmission rate = 20.833 Kbps	See Chapter One, Figures 5.1-2 and 5.4-1 of the AM2020/AFP1010 Manual
	SIB-2048A and SIB-NET Serial Interface Boards: Employs CRT-2	+/- 12 volts peak-to-peak. Supervised and power-limited. Max distance limited by capacitance of wire (refer to EIA-232E Standard). Transmission rate of 2400 bps.	See Chapter One, Figures 5.1-2 and 5.2-1 of the AM2020/AFP1010 Manual.
	SIB-2048A and SIB-NET Serial Interface Boards: Employs PRN-4, PRN-5, and Keltron 40-column printers.	+/- 12 volts peak-to-peak. Power-limited but not supervised. Max distance limited by capacitance of wire (refer to EIA-232E Standard). Transmission rate of 2400 bps.	See Chapter One, Figures 5.1-2, 5.3-1, and 5.3-2 of the AM2020/AFP1010 Manual.
	SIB-2048A and SIB-NET Serial Interface Boards: Employs UL EDP listed equipment (display monitors and printers).	+/- 12 volts peak-to-peak. Power-limited but not supervised. Max distance limited by capacitance of wire (refer to EIA-232E Standard). Transmission rate of 2400 bps	See Chapter One, Figure 5.1-2 of the AM2020/AFP1010 Manual.
Initiating Device Circuit A circuit to which automatic or manual signal-initiating devices are connected where the signal received does not identify the individual device being operated.	MMX-1 Monitor Module: Employs contact-type devices only - manual pull stations, heat detectors, supervisory or waterflow switches, and 4-wire smoke detectors.	ELR = 47K, 1/2, Part # A2143-20 (N-ELR in Canada). NFPA Style B or Style D field wiring. 20 ohms max loop resistance. Supervised and power-limited (210 uA).	NFPA Style B: MMX-1 Terminals 7 (+), 6 (-) NFPA Style D: MMX-1 Terminals 7,8 (+), 6,9 (-)
	MMX-101 Monitor Module: Employs contact-type devices only - manual pull stations, heat detectors, supervisory or waterflow switches, and 4-wire smoke detectors.	ELR = 47K, 1/2, Part # A2143-20 (N-ELR in Canada). NFPA Style B or Style D field wiring. 20 ohms max loop resistance. Supervised and power-limited (210 uA).	NFPA Style B: MMX-101 Red Wire (+), White Wire (-)
	XP Transponder XPM-8 module: Employs 2-wire smoke detectors and contact-type devices - manual pull stations, heat detectors, supervisory or waterflow switches, and 4-wire smoke detectors.	24 VDC (nominal), 200mV ripple. ELR = 2.2K, 1/2 watt, Part #R-2.2K (N-ELR in Canada). NFPA Style B or Style D field wiring. 100 ohms max loop resistance. Supervised and power-limited (50 uA). See Notifier Device Compatibility Document, 15378, for a list of compatible 2-wire detectors.	NFPA Style B (8 zones on XPM-8 P2): NFPA Style D (4 zones on XPM-8 P2):.
	XP Transponder XPM-8L module: Employs dry-contact type devices only - manual pull stations, heat detectors, supervisory or waterflow switches, and 4-wire smoke detectors.	24 VDC. ELR=10K, 1/2 watt, Part # R-10K (N-ELR in Canada). NFPA Style B field wiring. 1000 ohms max loop resistance. Supervised and power-limited.	NFPA Style B (8 zones on XPM-8L P2)
	MMX-2 Monitor Module: Maximum of 40 MMX-2 modules per LIB. Employs 2-wire smoke detectors.	24VDC Input 12-18 AWG (3.25-0.75 mm†). See Document M500-03-00 for limits. Supervised. Power limiting is a function of the 24 VDC source.	MMX-2 Terminal 3(-) and 4(+)
		NFPA Style B or D Initiating Device Circuit 12-18 AWG (3.25-0.75 mm†) 25 ohms max (including 24VDC input wiring above). Supervised and power limited (90mA). 3.9K, 1/2 W end-of-line resistor required at terminals 8 and 9 for NFPA Style D operation. See Document M500-03-00 for additional limits. See Notifier Device Compatibility Document for a list of compatible 2-wire detectors.	NFPA Style B MMX-2 Terminal 6(-) and 7(+) NFPA Style D MMX-2 Terminals 6,9(-) and 7, 8(+)
	XP5-M Transponder monitors 5 dry-contact type Class B initiating device circuits, (manual pull stations, heat detectors, four-wire smoke detectors, etc.)	ELR Model R-47K, 1/2 watt (N-ELR in Canada) NFPA Style B field wiring. 1200 ohms max loop resistance. Supervised and power-limited. Normal 1.7 mA, activated 3.0 mA.	NFPA Style B, TB1-TB5: B-, B+

APPENDIX B LISTED EQUIPMENT

SECTION B.1 UNDERWRITER'S LABORATORIES

Equipment listed by **Underwriter's Laboratories (UL)** as compatible with the AM2020/AFP1010:

Notifier

A2143-00 47K ELR, 1/2 watt resistor
AA-30/AA-30E 30-Watt Audio Amplifier
AA-100/AA-100E 100-Watt Audio Amplifier
AA-120/AA-120E 120-Watt Audio Amplifier
ABF-1 Annunciator Flush Box
ABF-1D Annunciator Flush Box
ABF-2 Annunciator Flush Box
ABF-2D Annunciator Flush Box
ABF-4 Annunciator Flush Box
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ABS-1T Annunciator Surface Box
ABS-2 Annunciator Surface Box
ABS-8R Surface Box for ACM-8R or UDACT
ACM-16AT Annunciator Control Module
ACM-32A Annunciator Control Module
ACM-8R Annunciator Control Module
ACT-1 Audio Coupling Transformer
ACT-2 Audio Coupling Transformer
ADP-4 Annunciator Dress Panel
AEM-16AT Annunciator Expander Module
AEM-32A Annunciator Expander Module
AKS-1 Annunciator Key Switch
AMG-1 Audio Message Generator
AMG-E Audio Message Generator
APS-6R Auxiliary Power Supply
ATG-2 Audio Tone Generator
AVPS-24 Audio Visual Power Supply
B224RB Intelligent Relay Base
B224BI Intelligent Isolator Base
B501 Flangeless Detector Base
B501BH Sounder Base
B524BI Isolator Base
B524RB Relay Base
B710 LP Standard Low ProfileDetector Base
BGX-101L Addressable Manual Pull Station
BP-3 Battery Dress Panel
BX-501 Base for all Intelligent Detectors/Sensors
CCM-1 Communication Converter Module
CHG-120 Battery Charger
CHS-4 Chassis
CHS-4L Chassis
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU-2 Central Processing Unit
CPU-2020 Central Processing Unit
CPX-551 Intelligent Ionization Smoke Detector
CPX-751 Intelligent Ionization Smoke Detector
CRT-2 Video Display Monitor with Keyboard
DIA-1010 Display Interface Assembly
DIA-2020 Display Interface Assembly
DP-1 Dress Panel
DPDW-1 Double Well Dress Panel
DPSW-1 Single Well Dress Panel
DR-A3 A-size Door
DR-B3 B-size Door
DR-C3 C-size Door
DR-D3 D-size Door
ELR-10K Resistor
FAPT-751 Acclimate™ Multi-sensor Photo-thermal
FDX-551 Intelligent Thermal Sensor
FDX-551R Intelligent Thermal Sensor
FFT-7 Fire Fighters Telephone
FFT-7S Fire Fighters Telephone
FHS Fireman's Handset
FPJ Fireman's Phone Jack
ICA-4 and ICA-4L Interconnect Assemblies
INA Intelligent Network Annunciator
IPX-751 Combination Ionization/Photoelectric/ Thermal Detector
ISO-X Loop Fault Isolator Module
L20-300-BX Enclosure; recessed mount
L20-310-BX Enclosure; surface mount
LCD-80 Liquid Crystal Display Module
LCD-80TM Liquid Crystal Display
LDM-32 Lamp Driver Module
LDM-E32 Lamp Driver Module
LDM-R32 Lamp Driver Module
LIB-200 Loop Interface Board
LIB-200A Loop Interface Board
LIB-400 Loop Interface Board
MBT-1 Municipal Box Trip device
MIB-F Media Interface Board for **Noti•Fire•Net™**
MIB-W Media Interface Board for **Noti•Fire•Net™**
MIB-WF Media Interface Board for **Noti•Fire•Net™**
MMX-1 Addressable Monitor Module
MMX-2 Addressable Monitor Module
MMX-101 Addressable Mini Monitor Module
MON-17 17-inch Monitor
MON-19 19-inch Monitor
MON-21 21-inch Monitor
MPM-2 Main Power Meter-2
MPS-24A/MPS-24AE Main Power Supply
MPS-TR Trouble Relay
N-ELR Assortment Pack with Mounting Plate
NBG-12LX Addressable Pull Station
NIB-96 Network Interface Board
NR45-24/NR45-24E Remote Battery Charger
NRT-586T Network Reporting Terminal
PageNet-1 Ancillary Paging Device
PRN-4 80-Column Printer
PRN-5 Printer
PS-12250 Battery 12-volt, 25 amp-hour
R-10K 10K End-of-Line Resistor, 1/2 watt
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-470K 470K End-of-Line Resistor
R-47K 47K End-of-Line Resistor
RM-1 Remote Microphone
RM-1SA Remote Microphone
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
RPT-W Repeater for **Noti•Fire•Net™**
RPT-WF Repeater for **Noti•Fire•Net™**
SBB-A3 A-size Backbox
SBB-B3 B-size Backbox
SBB-C3 C-size Backbox
SBB-D3 D-size Backbox
SCS Series Smoke Contol Station
SDX-551 Intelligent Photoelectric Detector
SDX-551TH Intelligent Photoelectric Detector
SDX-751 Intelligent Photoelectric Detector
SIB-2048 Serial Interface Board
SIB-2048A Serial Interface Board
SIB-232 Serial Interface Board
SIB-NET Serial Interface Board for **Noti•Fire•Net™**
STS-1 Security Tamper Switch
TPI-232 Modem
XP5-C Transponder Output Module
XP5-M Transponder Input Module
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

Refer to the Device Compatibility Document 15378 for additional compatible equipment.

SECTION B.2 FACTORY MUTUAL

Equipment suitable for use in **Factory Mutual (FM) Systems** as compatible with the AM2020/AFP1010:

ABF-1 Annunciator Flush Box
ABF-2 Annunciator Flush Box
ABF-4 Annunciator Flush Box
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ABS-1T Annunciator Surface Box
ABS-2 Annunciator Surface Box
ACM-16AT Annunciator Control Module
ACM-32A Annunciator Control Module
ACM-8R Annunciator Control Module
ADP-4 Annunciator Dress Panel
AEM-16AT Annunciator Expander Module
AEM-32A Annunciator Expander Module
AKS-1 Annunciator Key Switch
AVPS-24 Audio/Visual Power Supply
BGX-101L Addressable Manual Pull Station
BP-3 Battery Dress Panel
CHS-4 Chassis
CHS-4L Chassis
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU-2 Central Processing Unit
CPU-2020 Central Processing Unit
CPX-551 Intelligent Ionization Smoke Detector
CRT-2 Video Display Monitor with Keyboard
DIA-1010 Display Interface Assembly
DIA-2020 Display Interface Assembly
DP-1 Dress Panel
DR-A3 A-size Door
DR-B3 B-size Door
DR-C3 C-size Door
DR-D3 D-size Door
FDX-551 Intelligent Thermal Sensor
ICA-4 and ICA-4L Interconnect Assemblies
ISO-X Loop Fault Isolator Module
LCD-80 Liquid Crystal Display Module
LDM-32 Lamp Driver Module
LDM-E32 Lamp Driver Module
LDM-R32 Lamp Driver Module
LIB-200 Loop Interface Board
MBT-1 Municipal Box Trip device
MMX-1 Addressable Monitor Module
MMX-101 Addressable Mini Monitor Module
MPM-2 Main Power Meter-2
MPS-24A Main Power Supply
MPS-TR Trouble Relay
NIB-96 Network Interface Board
PRN-4 Printer
PS-12250 Battery 12-volt, 25 amp-hour
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-470K 470K End-of-Line Resistor
R-47K 47K End-of-Line Resistor
REL-47K EOL for Releasing Service
SBB-A3 A-size Backbox
SBB-B3 B-size Backbox
SBB-C3 C-size Backbox
SBB-D3 D-size Backbox
SDX-551 Intelligent Photoelectric Detector
SDX-551TH Intelligent Photoelectric Detector
SIB-2048 Serial Interface Board
SIB-232 Serial Interface Board

System Sensor

A77-716B EOL Power Supervision Relay
MA-24 Electronic Sounder, 24 VDC
MA/SS-24I Electronic Sounder/Strobe, 24 VDC
SS-24 Strobe, 24 VDC

Wheelock

7002T-24 Horn with strobe, 24 VDC

SECTION B.3 LLOYD'S REGISTER

Equipment listed by **Lloyd's Register** as compatible with the AM2020/AFP1010:

AA-30 Audio Amplifier
AA-120 Audio Amplifier
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ACM-16AT Annunciator Control Module
ACM-32A Annunciator Control Module
ADP-4 Annunciator Dress Panel
AEM-16AT Annunciator Expander Module
AEM-32A Annunciator Expander Module
AMG-1 Audio Message Generator
AVPS-24 Audio/Visual Power Supply
B501 Flangeless Base
BGX-101L Addressable Manual Pull Station
BP-3 Battery Dress Panel
CAB-AM Cabinet for Marine Applications
CAB-BM Cabinet for Marine Applications
CHS-4L Chassis
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU-2 Central Processing Unit
CPU-2020 Central Processing Unit
CPX-551 Intelligent Ionization Smoke Detector
CPX-751 Intelligent Ionization Smoke Detector
DIA-1010 Display Interface Assembly
DIA-2020 Display Interface Assembly
ET-1010-R Speaker
FDX-551 Intelligent Thermal Sensor
ICA-4L Interconnect Assemblies
ISO-X Loop Fault Isolator Module
LCD-80 Liquid Crystal Display Module
LIB Loop Interface Board
MMX-1 Addressable Monitor Module
MMX-2 Addressable Monitor Module
MPS-24A Main Power Supply
MPS-TR Trouble Relay
NIB-96 Network Interface Board
PS-12250 Battery 12-volt, 25 amp-hour
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-470K 470K End-of-Line Resistor
R-47K 47K End-of-Line Resistor
SB-10 Surface Backbox
SMB-500 Surface Mount Box
SBB-B3 B-size Backbox
SDX-551 Intelligent Photoelectric Detector
SDX-751 Intelligent Photoelectric Detector
SIB-2048 Serial Interface Board
XPC-8 Transponder Control Module
XPM-8 Transponder Monitor Module
XPP-1 Transponder Processor

System Sensor

MA/SS-24D Electronic Sounder/Strobe, 24 VDC

SECTION B.4 UNITED STATES COAST GUARD

Equipment suitable for use in marine and shipyard applications as compatible with the AM2020/AFP1010:

AA-120 120-Watt Audio Amplifier
AA-30 30-Watt Audio Amplifier
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ACM-16AT Annunciator Control Module
ACM-32A Annunciator Control Module
ACM-8R Annunciator Control Module
ACT-1 Audio Coupling Transformer
AEM-16AT Annunciator Expander Module
AEM-32A Annunciator Expander Module
AMG-1 Audio Message Generator
AMG-E Audio Message Generator
ATG-2 Audio Tone Generator
AVPS-24 Audio/Visual Power Supply
BGX-101L Addressable Manual Pull Station
BP-3 Battery Dress Panel
BX-501 Base for all Intelligent Detectors/Sensors
CAB-AM Cabinet for Marine Applications
CAB-BM Cabinet for Marine Applications
CHS-4 Chassis
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU-2020 Central Processing Unit
CPX-551 Intelligent Ionization Smoke Detector
CPX-751 Intelligent Ionization Smoke Detector
CRT-2 Video Display Monitor with Keyboard
DIA-1010 Display Interface Assembly
DIA-2020 Display Interface Assembly
DP-1 Dress Panel
FDX-551 Intelligent Thermal Sensor
ICA-4 and ICA-4L Interconnect Assemblies
ISO-X Loop Fault Isolator Module
L20-300-BX Enclosure; recessed mount
L20-310-BX Enclosure; surface mount
LCD-80 Liquid Crystal Display Module
LDM-32 Lamp Driver Module
LDM-E32 Lamp Driver Module
LDM-R32 Lamp Driver Module
LIB-200 Loop Interface Board
MBT-1 Municipal Box Trip device
MMX-2 Addressable Monitor Module
MMX-101 Addressable Mini Monitor Module
MPM-2 Main Power Meter-2
MPS-24A Main Power Supply
MPS-TR Trouble Relay
N-ELR Assortment Pack with Mounting Plate
NIB-96 Network Interface Board
PRN-4 Printer
PS-12250 Battery 12-volt, 25 amp-hour
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-470K 470K End-of-Line Resistor
R-47K 47K End-of-Line Resistor
SBB-A3 A-size Backbox
SBB-B3 B-size Backbox
SBB-C3 C-size Backbox
SBB-D3 D-size Backbox
SDX-551 Intelligent Photoelectric Detector
SDX-751 Intelligent Photoelectric Detector
SIB-2048 Serial Interface Board
SIB-232 Serial Interface Board
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

System Sensor

A2143-00 End-of-Line Resistor Assembly
A77-716B EOL Power Supervision Relay
MA-24 Electronic Sounder, 24 VDC
MA/SS-24I Electronic Sounder/Strobe, 24 VDC
RA400Z Remote LED Assembly
SS-24 Strobe, 24 VDC

SECTION B.5 OPTIONAL SYSTEM COMPONENTS

Following is a list of optional equipment which may be used with the Notifier AM2020/AFP1010:

Annunciators
- ACM-16AT, AEM-16AT, ABM-16AT
- ACM-32A, AEM-32A, ABM-32A
- LDM-32, LDM-E32, LDM-R32
- LCD-80 Liquid Crystal Display
- ACM-8R, UDACT[1]

APS-6R Auxiliary Power Supply
- CPU to APS-6R Cable (71033/75098)

Cabinets CAB-A3, B3, C3, D3 (backbox and door)
CCM-1 Communication Converter Module[1]
CHG-120 Remote Battery Charger
CHS-4 Chassis
CHS-6 Chassis
CRT Terminal
DP-1 Dress Panel
ICA-4/ICA-4L Interconnect Chassis Assemblies
LIB-200 Loop Interface Board *
LIB-200A Loop Interface Board*
LIB-400 Loop Interface Board*
MPM-2 Voltmeter and Ammeter
MPS-24A/MPS-24AE Main Power Supply *
- Battery Connector Cables: Pos. (71071), Neg. (71072), Interconnect (71070).

MPS-TR Power Supply Remote Trouble Relay
NIB-96 Network Interface Board
PRN-4 Printer
PRN-5 Printer
RKS-S Security Switch
SCS-8/SCE-8, SCS-8L/SCE-8L Smoke Control System
SIB-NET or SIB-2048A Serial Interface Board*
- DIB to SIB Cable (71046)

SLC Loop Addressable Modules:
- Addressable MMX-1, MMX-2, MMX-101 Monitor Modules
- Addressable CMX-2 Control Module
- ISO-X Loop Isolator Module

NBG-12LX Addressable Pull Station
BGX-101L Addressable Pull Station
- SMB-500 Surface Mount box for Control and Monitor Modules
- XP5-C Control/Relay Transponder
- XP5-M Monitor Transponder

NOTI•FIRE•NET™[1]
- SIB-NET Serial Interface Board
- MIB-W Media Interface Board
- MIB-WF Media Interface Board
- MIB-F Media Interface Board
- RPT-W Repeater
- RPT-WF Repeater
- NRT-586 Network Reporting Terminal
- INA Intelligent Network Annunciator
- MON-20 20-Inch Monitor
- MON-17 17-Inch Monitor

SLC Loop Intelligent Detectors:
- SDX-551, SDX-551B Photoelectric Detector
- SDX-751 Low Profile Photoelectric Detector
- SDX-551TH Photoelectric Detector with Fixed Thermal Element
- CPX-551 Ionization Detector
- CPX-751 Low Profile Ionization Detector
- FDX-551 Thermal (heat) Detector
- FDX-551R Thermal (heat) with Rate-of-Rise
- IPX-751 Combination Ionization/Photoelectric/Thermal Detector
- SMK400 Surface Mount Kit for Flangeless Base
- B501 Flangeless Base for Intelligent Detectors
- B501BH Flangeless Intelligent Detector Base w/ Sounder
- B601BH Sounder for Flangeless Base
- B710LP Low Profile Flanged Base
- BX-501 Standard Base for Intelligent Detectors
- DHX-501 Addressable Duct Housing with Relay
- DHX-502 Addressable Duct Housing
- F110 Retrofit replacement flange for B501B
- SMB-600 Surface Mount box for Detectors and Sounder Bases
- B224BI Isolator Base
- B224RB Relay Base
- B524BI Isolator Base
- B524RB Relay Base

UZC-256 Universal Zone Coder (refer to the UZC-256 Manual)
Voice Alarm Multiplex Equipment (Refer to the VAM-2020 Manual)
- Audio Message Generators (AMG-1 or AMG-E)
- Audio Tone Generator (ATG-2)
- Fire Fighter's Telephones (FFT-7 or FFT-7S)
- Telephone Control Center (TCC-1)
- Audio Amplifiers (AA-30/AA-30E, AA-100/AA-100E and AA-120/AA-120E)
- Low-Profile Chassis (CHS-4L)
- ACT-1 Audio Coupling Transformer
- ACT-2 Audio Coupling Transformer
- RM-1 Remote Microphone
- RM-1SA Remote Microphone

VP-2 Dress Panel for upper 2" of Cab-3 series cabinets
XP Transponder Series (Refer to the XP Transponder Installation Manual)
- XPP-1 Processor Module
- XPM-8 Initiating Circuit Module
- XPM-8L Initiating Circuit Module
- XPC-8 Notification Appliance Circuit Module
- XPR-8 Relay Module
- XRAM-1 Non-Volatile Memory
- XPDP Transponder Dress Plate

Miscellaneous:
- A77-716B Power Supervision Relay
- RA400Z Remote LED Annunciator
- A2143-20 End-Of-Line Resistor Assembly
- MBT-1 Municipal Box Trip Device
- N-ELR Mounting Plate
- NCM-1 Noise Control Module
- CAP-1 0.1uF 500V Capacitor
- WC-2 Wire Channel
- CAB-AM/BM: Cabinets for Marine Applications
- PL-AM/BM: Mounting Plates for Marine Cabinets
- MA/SS Series Strobe
- Spectralert Series Horns, Strobes, Horn/Strobes
- ET-1010-R Speaker
- TPI-232 Modem

** Assembly includes Grounding Cable (71073)*
1 Software must be compatible. Contact the Factory.

SECTION B-6 CITY OF NEW YORK

The equipment or material acceptable for use in accordance with the Report of Materials and Equipment Acceptance (MEA) Division be accepted under the following conditions:

a. When used with central office communicator or transmitter, the installation and operation of the equipment and devices listed herein shall comply with Fire Department rule #3-RCNY 17-01, NFPA 72, and shall have the capability of transmitting separate and distinct signals to indicate manual pull station alarm, sprinkler waterflow alarm, supervisory signal indications and trouble indications.

b. LCD-80TM which can be remotely located up to 3000 feet from the control panel has a remote acknowledge, silence, and reset features which can affect the control panel from remote locations. These features are not to be employed in any installation in New York City.

c. Smoke Control station and expander (SCS-8 and SCE-8) are to be used in conjunction only with Notifier models AM2020/AFP1010 fire alarm control panels when configured for smoke control. The SCS-8 must be mounted in a separately listed model CAB-3 or ABS-4D enclosure which provides mounting for the SCS-8 and limited access to the manual override switches. These smoke controls shall be arranged such that controls may only be operated by use of or given access to by means of a fire department '1620' key.

d. AM2020/AFP1010 control panels shall provide either redundant processors or Class A redundant SLC loops as needed to positively assure the fail safe control of door locks, ventilation fans, elevator recall and evacuation signalling which will not be rendered inoperable in the event of a fire alarm condition when installed in any building which is required by code to have a Fire Command Station.

f. HVAC systems shall not be arranged to automatically restart upon the reset of a smoke detector or control board.

g. The AM2020/AFP1010 is intended to be used as a Central Station Protected Premise Unit, it is to be connected to a listed Ademco Model 678UL-F which in turn is connected to a Listed Ademco Model 685 receiver.

h. To provide service as a central station protected premises unit utilizing digital alarm communication techniques, the AM2020/AFP1010/ control unit is intended to be interconnected to a Listed FireLite Model Notifier 911C/911AC digital alarm communicator transmitter or employ the listed FireLite Model Notifier 911/911A subassembly.

i. The control units (AM2020/AFP1010/) may also be connected to the separately listed model UDACT to provide remote station or central station service.

j. When the AM2020 control panel is intended for use as a proprietary receiving unit, the system must utilize the CRT-1 terminal keyboard and Models P-80, PRN-2, PRN-3, or PRN-4 printers as the operators terminal station. Both the CRT-1 and Model P-80, PRN-2, PRN-3, or PRN-4 must be located next to the AM2020 control unit.

k. The LCD-80TM remote annunciator shall only be used with the AM2020, AFP1010, and AFP-200 control units.

All shipments and deliveries of such equipment shall be provided with a metal tag suitably placed, certifying that the equipment shipped or delivered is equivalent to that tested and accepted for use, as provided for in Section 27-131 of the Building Code.

AM2020
AFP1010

Programming Sheets & Glossary

System Inputs

Address (LxxDyy) or (LxxMyy)	Model	Type I.D.	Control-by-Event List	Alphanumeric Label (20 Characters Max)	Alarm Verify (Yes/No)	Det. Sens. (L/M/H)	Tracking (Yes/No)	Day/Night Det.Sens. (Yes/No)	Annunciator Mapping (AxxPyy)

Job Name: ____________________________________ Sheet ___ of ___
Completed by: ________________________________ Date: _________
Engineer: ____

Job Takeoff Form:

System Outputs							
Address (LxxMyy)	**Model**	**Type I.D.**	**Control-by-Event Equation**	**Alphanumeric Label (20 Characters Max)**	**Signal Silence (Yes/No)**	**Walk Test (Yes/No)**	**Annunciator Mapping (AxxPyy)**

Job Name: ________________________ Sheet ___ of ___
Completed by: ________________________ Date: _________
Engineer: ________________________

Job Takeoff Form:

System Software Zones

Address (Zxxx)	Type I.D.	Control-by-Event	Cooperative Control-by-Event	Alphanumeric Label (20 Characters Max)	Annunciator Mapping (AxxPyy)	Notes

Job Name: ____ Sheet ___ of ___
Completed by: ______________________________________ Date: _________
Engineer: ____

Job Takeoff Form:

System Annunciator Points

Address (AxxPyy)	Model	Type I.D.	Alphanumeric Label (20 Characters Max)	Notes

Job Name: ____________________________________ Sheet ___ of ___
Completed by: _________________________________ Date: _________
Engineer: ____

Job Takeoff Form:

Glossary of Terms and Abbreviations

Alarm Verification - A method of reducing false alarms incorporating time delays up to 50 seconds in length.

APS-6R - Auxiliary Power Supply. Used to supply filtered, non-resettable power to compatible devices.

Central Station - Main AM2020/AFP1010 panel and any associated annunciators and printers.

Control-by-Event (CBE) Programming - A method of providing a variety of output responses based on various initiating conditions (events).

Cooperative Control-by-Event (CCBE) Programming - A method of providing a variety of output responses on the **NOTI•FIRE•NET™** network based on various initiating conditions.

Day/Night Sensitivity - A way to force intelligent detectors into high or low sensitivity using the High and/or Low Sensitivity Zones.

Detector Sensitivity - The responsiveness of a detector to stimuli associated with fire (i.e. smoke, heat).

DIA - Display Interface Assembly (keypad, system status LEDs and the 80-character LCD).

Display Abbreviations:

ACK AL	Acknowledged Alarm
ACK TB	Acknowledged Trouble
ACL AL	Acknowledged Clear Alarm
ACL TB	Acknowledged Clear Trouble
ADDR	ISIB **NOTI•FIRE•NET** Address
APM	Auxiliary Printer Monitoring
BC	Bidirectional Copy
BCAP	Battery Capacity
BLN	Device Blink
BSBY	Battery Standby Time
BTYP	Battery Type
CLR AL	Clear Alarm
CLR TB	Clear Trouble
CMR	Control Module Reporting
CUT	Signal Cutout
DBID	Database Identification
DFT	Drift Compensation
DPZ	Disabled Piezo
DVTCNTR	Detector Verification Trouble Counter Limit
ERM	Event Reminder
HIZNDET	High Zone Day/Night Sensitivity
ISIB	Intelligent Serial Interface Board
LEDL	LEDs latched on activated devices
LMC	Local Mode Control Module Address
LMD	Local Mode Intelligent Detector Address
LMM	Local Mode Monitor Module Address
LOZNDET	Low Zone Day/Night Sensitivity
MDM	TPI-232
MIBA	MIB-W/WF Threshold Channel A
MIBB	MIB-W Threshold Channel B
NAM	NAM-232
NAR	Non-Alarm Monitor Module Reporting
PAL	Pre-Alarm
PEC	Printer Error Continue (transmit)
PGR	PAGE-1
PORTS	MIB Data Port Usage
PTI	Primary Printer Trouble Inhibit
RP	Rapid Polling
RPT	Reports Redirected to CRT
SER	Security Monitor Module Reporting
SIL	Signal Silence Inhibit
SL	Status Line (CRT Terminal)
SUP	Supervisory ACS Reporting
TS	Terminal Supervision
UDACT	Universal Digital Alarm Communicator Transmitter
UPDN	Upload/Download
VER	Alarm Verification
XINT	External Interface

Download - To retrieve the system configuration program data from a file on an IBM PC (personal computer) and store it permanently in the AM2020/AFP1010 system.

Drift Compensation - An algorithm which permits the maintenance of a constant smoke detector sensitivity by accounting for environmental contaminants and other factors.

Entry/Exit Time - A short delay in alarm reporting from the entry/exit door that allows authorized personnel to enter the building through the entry/exit door and disarm the system or exit the building after arming the system without setting off the alarm. (Arm/disarm applications only).

External Interface - EIA-485 bidirectional serial port used for Upload/Download.

Forward Zone - A software zone which once activated by an input device or other forward zone may in turn activate other zones and/or output devices directly. Zones and output devices activated by a forward zone are contained in the forward zone control-by-event list.

Group Interface - Monitor module with Type ID SARM wired to a control module with TYPE ID CMXC that reports alarms from a protected premise.

ISIB - Intelligent Serial Interface Board. Used for communication with ACS Annunciators (SIB-2048A, SIB-NET).

LIB-200, LIB-200A, and LIB-400 - Loop Interface Board. The electronics powering and communicating with each SLC Loop.

Local Mode - The independent operation of a LIB board when CPU to LIB communications fail. Three cutoff addresses are programmed by the user into system memory for local mode operation (one address for intelligent detectors, one for monitor modules, and one for control modules). If communications between a LIB and the CPU board break down, local mode will perform the following function: If an alarm occurs on a detector or a monitor module at or below their respective cutoff addresses for that type of device, the LIB will automatically activate all control modules at and below the control module cutoff address. Refer to *Extended Local Mode Operation* in Chapter Three of this manual.

Local Mode General Alarm Bus - The LIB-200A and the LIB-400 incorporate local mode operation. In addition, when installed in an ICA-4L chassis, an alarm detected on any LIB-200A or LIB-400 will cause the other LIB-200A and LIB-400 boards to automatically activate all control modules at and below the control module cutoff address. Refer to *Extended Local Mode Operation* in Chapter Three of this manual.

Point - The occupation of a system memory address by an addressable SLC Loop device, software zone or annunciator point.

Protected Premises Unit - A remote AM2020/AFP1010 panel located inside the protected premises and reporting back to the central station via a NIB-96.

Protected Premise - An area in a building monitored by either a security area monitor or a group interface and reporting to the central station or PPU as a Security Alarm trouble report.

Reverse Zone - A software zone which if not activated directly by an input device or forward zone may be activated through an associated control-by-event equation. A reverse zone may be referenced in other control-by-event equations. Reverse zones on a **NOTI•FIRE•NET** system may also contain cooperative control-by-event equations.

Ringback - An indication from the central station to the protected premises indicating whether the system is armed. Can be at an annunciator or a PPU (if used). (Arm/disarm applications only.)

Security Access Monitor - Monitor module on the SLC programmed with software Type ID SACM and monitoring various security devices in a security supervisory protected area. When activated, it generates a Security Alert.

Security Area Monitor - Monitor module on the SLC programmed with software Type ID SARM and monitoring various security devices in a security supervisory protected area or protected premise. When activated, it generates a Security Alarm.

Signal Cutout- -A feature of the system which causes the signal silence function to activate automatically after a programmed time period following a fire alarm. This option has a resolution of eight seconds.

Security Supervisory Circuits - Circuit connecting various security devices to the security area monitor or security access monitor.

Security Supervisory Protected Area - An area in a building monitored by security access monitor and reporting to the central station or PPU as a Security Alert trouble report.

Signal Silence - A function which causes participating fire alarm activated notification appliances or other outputs to deactivate without otherwise affecting the state of the system.

Signal Silence Inhibit - A feature of the system which blocks the signal silence function for a programmed time period immediately after a fire alarm.

SLC Loop - Signaling Line Circuit. The physical connection along which addressable devices and equipment may communicate.

Software Zone - A label internal to the system which may be assigned to addressable devices to form a group.

Tracking - Attribute of an input device which prevents the latching of active (i.e. alarm, supervisory) states.

Upload - To make a copy of the AM2020/AFP1010 system configuration program data and store it in a file on an IBM compatible PC (personal computer).

Zone Boundary - The highest forward activated software zone in the system. This represents the division between forward and reverse activated zones/devices.

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