AFP-400
Analog Fire Panel

Installation Manual

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 this 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 72-1993 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 and at a relative humidity of 85% RH (non-condensing) @ 30°C. However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 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.

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.

Fire Alarm System Limitations
While installing a fire alarm system may make lower insurance rates possible, 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.

Any fire alarm system may fail for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in walls, or 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. Furthermore, all types of smoke detectors - both ionization and photoelectric types, have sensing limitations. No type of smoke detector can sense every kind of fire caused by carelessness and safety hazards like smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.

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.

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.

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.

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.

The most common cause of fire alarm malfunctions, however, is inadequate maintenance. All devices and system wiring should be tested and maintained by professional fire alarm installers following written procedures supplied with each device. System inspection and testing should be scheduled monthly or as required by National and/or local fire codes. Adequate written records of all inspections should be kept.

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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Continued on the next page...

This Fire Alarm Control Panel complies with the following NFPA standards	NFPA 12 CO2 Extinguishing Systems (High Pressure Only) NFPA 12A Halon 1301 Extinguishing Systems NFPA 12B Halon 1211 Extinguishing Systems NFPA 13 Sprinkler Systems NFPA 15 Water Spray Systems NFPA 16 Foam/Water Deluge and Foam/Water Spray Systems NFPA 17 Dry Chemical Extinguishing Systems NFPA 17A Wet Chemical Extinguishing Systems NFPA 72-1993 Central Station Fire Alarm Systems (Automatic, Manual and Waterflow) Protected Premises Unit (requires Notifier UDACT). NFPA 72-1993 Local (Automatic, Manual, Waterflow and Sprinkler Supervisory) Fire Alarm Systems. NFPA 72-1993 Auxiliary (Automatic, Manual and Waterflow) Fire Alarm Systems (requires 4XTM or RTM-8). NFPA 72-1993 Remote Station (Automatic, Manual and Waterflow) Fire Alarm Systems (requires 4XTM or Notifier UDACT). NFPA 72-1993 Proprietary (Automatic, Manual and Waterflow) Fire Alarm Systems (Protected Premises Unit).
The installer should be also familiar with the following documents and standards	NFPA 72-1993 Initiating Devices for Fire Alarm Systems NFPA 72-1993 Inspection, Testing and Maintenance for Fire Alarm Systems NFPA 72-1993 Notification Appliances for Fire Alarm Systems
Underwriters Laboratories	UL 38 Manually Actuated Signaling Boxes UL 217 Smoke Detectors, Single and Multiple Station UL 228 Door Closers - Holders for Fire Protective Signaling Systems UL 268 Smoke Detectors for Fire Protective Signaling Systems UL 268A Smoke Detectors for Duct Applications UL 346 Waterflow Indicators for Fire Protective Signaling Systems UL 464 Audible Signaling Appliances UL 521 Heat Detectors for Fire Protective Signaling Systems UL 864 Standard for Control Units for Fire Protective Signaling Systems UL 1481 Power Supplies for Fire Protective Signaling Systems UL 1971 Visual Signaling Appliances UL 1076 Proprietary Burglar Alarm Systems
Underwriters Laboratories of Canada (ULC)	Standard CAN/ULC-S527-M87
Other	EIA-485 and EIA-232 Serial Interface Standards NEC Article 300 Wiring Methods NEC Article 760 Fire Protective Signaling Systems Applicable Local and State Building Codes Requirements of the Local Authority Having Jurisdiction

Documents associated with the control panel

Document Title	Document No.
The LDM Series Annunciator	15885
The LCD-80 Liquid Crystal Display	15037
The Device Compatibility Document	15378
The NIB-96 Network Interface Board	15666
The ACM-8R Annunciator Control Relay Module	15342
The ACS Series Annunciators	15842
AFP-400 Operations Manual	50260
AFP-400 Programming Manual	50259
The AFM-16A Annunciator	15207
The AM2020/AFP1010 Manual	15088
Veri•Fire 400™ Programming Utility	50376
The UDACT Manual	50050

1. Overview

About this Manual

This manual contains information for installing and testing the AFP-400 Fire Alarm Control Panel and fire alarm system components. For further information on the AFP-400, refer to the following:

For information on...	Refer to...	Part Number
All Features	The AFP-400 Catalog Sheet	DN-5262
Programming	AFP-400 Programming Manual	50259
Operation	AFP-400 Operating Manual	50260

Description

The AFP-400 is a modular, intelligent fire alarm control panel (FACP) with an extensive list of powerful features. The CPU module, power supply module, and cabinet combine to create a complete fire control system for most applications. Optional modules mount to the chassis to provide additional output circuits.

Standard Features and Options

AFP-4OO features and options that affect installation include the following:

- Capacity for installing up to 396 intelligent devices (198 analog detectors and 198 monitor/control modules).
- Four NAC (bell) circuits standard, expandable to 68 total (Class A or B).
- EIA-485 connections for wiring ACS annunciators (including LDM custom graphic annunciators).
- Optional AFP-400 modules include:
  - 4XTM transmitter
  - UDACT Universal Digital Alarm Communicator/Transmitter
  - ACM-8R remote relay module to increase point capacity
  - Audio and voice components
- Auto-Program (learn mode) reduces installation time.
- Five cabinet options (CAB-400A, CAB-3A, CAB-3B, CAB-3C, or CAB-3D) for enclosing system components.
- Optional LCD-80, for monitoring the system, up to 6000 feet from panel.

The AFP-400 system provides 6.0 amps usable output power (standard).

System Limitations

System expansion must comply with:

1) The physical limitations of the cabinet configuration.
2) The electrical limitations of the system power supply.
3) The capacity of the Secondary Power Source (standby batteries).

Refer to "System Components," descriptions of the various optional modules. Refer to Section 2, "Installation" for installation information.

System Diagram

The following figure shows an AFP-400 system diagram with a full complement of installed devices.

SLC Intelligent Loop 1

SDX-751   CPX-751   FDX551   198 devices   BGX-101L   MMX-1   CMX-1   XP Transponder

IDC   NAC

SLC Intelligent Loop 2

SDX-551   CPX-551   FDX-551   198 devices   BGX-101L   MMX-1   CMX-1   XP Transponder

IDC   NAC

LCD-80 Remote Display/Control

Up to 32

RS-485

Up to 68 fully programmable output circuits

RS-485   ACS   640 annunciator control points

ACM-8R Relay Control

ACM/AEM-16AT annunciator

LDM-32 custom graphics

Optional 396-channel UDACT

Dual phone lines to Central Station

RS-232 terminal

RS-232

PRN printer

CRT-2 terminal

AFP-400 – shown in CAB-C3 with voice alarm system

To other FACP

AFP-400 System Diagram

Specifications

AC Power

Component	Values
Basic system	120 VAC, 50/60 Hz, 3.0 A, or 240 VAC, 50/60 Hz, 1.5 A
AVPS-24	120 VAC, 1.0 A each
AA-30	120 VAC, 1.0 A each
AA-100/AA120	120 VAC, 50/60 Hz, 1.85 A each
Wire size	Minimum #14 AWG with 600V insulation

Battery (sealed lead acid only)

Battery Charger	Dual Rate: High Charge	29.1 VDC
	Normal Flat Charge	27.6 VDC
	Charging Current	2.0 A max
		1.5 A typical
Maximum Battery Capacity	55 AH (Batteries larger than 25 AH require Notifier BB-55 or other UL listed battery cabinet.)	
	CAB-400AA	12AH (17AH with BB-17)
	CAB-A3 through CAB-B3	25AH (55AH with BB-55)

Communication (SLC) Loop

Refer to Appendix B for Wire Requirements.

Item	Value
Voltage	24 VDC nominal, 27.6 VDC maximum
Maximum length	10,000 ft. per channel (NFPA Style 4) or 10,000 ft. total twisted-pair length (NFPA Style 6 and 7)
Maximum loop current	250 mA (max short circuit) or 100 mA (normal)
Maximum loop resistance	40 ohms (Supervised and power-limited)

Notification Appliance and Releasing Circuits

Item	Value
Max. wiring voltage drop	2 VDC
Normal operating voltage	24 VDC
Current for all external devices	6.0 A (except devices powered from the AVPS-24 or AA-30 and AA-120, or FCPS-24)
Optional AVPS-24	Additional 3.0 A of NAC power for each AVPS-24 (requires ICM-4 modules)
Maximum signaling current/circuit	2.5 A
End-of-line resistors	MPS-400 (TB-5–TB-8): 2.2K, 1/2 watt ICM-4, ICE-4, VCM-4, CE-4, and DCM-4: 4.7K, 1/2 watt (2 watts on 70 Vrms Audio) CMX Modules: 47K, 1/2 watt

Relays

Relays for Alarm, Trouble, Burglar, and Supervisory on the MPS-400, terminals TB3 to TB6. Contact rating for TB3-TB6 are:

- 2.0 A @ 30 VDC (resistive),

- 0.5 A 30 VAC (resistive) Form-C

Specifications, continued

Four-wire Smoke Detector Power

The MPS-400 provides a total of 6.0 Amps of power, shared by all internal modules and each MPS-400 circuit. For more information, refer to Power Supply Calculation tables in Section 2.

MPS-400 terminals TB2-5 (+) and TB2-6 (–) supply power for four-wire smoke detectors. Specifications for TB2-5 and TB2-6 are:

- Max. ripple voltage: 10 mV$_{RMS}$
- Up to 1.25 A is available for powering four-wire smoke detectors.

24 VDC – Refer to the Device Compatibility Document (Document 15378) for compatible detectors.

Power Outputs

The MPS-400 provides a total of 6.0 Amps of power, shared by all internal modules and each MPS-400 circuit. For power requirements, refer to Power Supply Calculation Tables in this section.

There are two power limited circuits available to power external devices, such as notification appliances and annunciators. Refer to the Device Compatibility Document (Document 15378) for compatible detectors.

Item	Circuit A	Circuit B
Terminals	TB2-1 (+) and TB2-2 (-)	TB2-3 (+) and TB2-4 (-)
Nominal Voltage	24 VDC	24VDC
Max. rated current	1.25 amps DC	1.25 amps DC
Max. ripple voltage	100 mVrms	100 mVrms

Power Limited Circuits

Operating Power

AC Branch Circuit

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

- Label the branch circuit FIRE ALARM.
- Connect the branch circuit to the line side of the main power feed of the protected premises.
- Do not power other equipment from the fire alarm branch circuit.
- Run the branch circuit wire continuously, without any disconnect devices, from the power source to the fire alarm control panel.
- Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes.
- Use #14 AWG wire with 600 volt insulation for this branch circuit.

Connect the "Earth" ground terminal of TB-1 to a solid earth ground (a metallic cold water pipe may be suitable in some installations). This connection is vital to maintaining the control panel's immunity to unwanted transients generated by lightning and electrostatic discharge.

Secondary Power Source (Batteries)

The battery charger is current limited and can recharge sealed lead acid type batteries. The charger shuts off when the AFP-400 is in alarm.

System Components

Basic Equipment

BE-400: Base Equipment includes the CPU module (CPU-400), an MPS-400 power supply, installation instructions, chassis and required hardware. Order cabinets separately.

BE-400AA: Base Equipment for a CAB-400AA mini cabinet – similar to the BE-400 – but for use in the CAB-400AA. The BE-400AA supports one output option module, and includes an MPS-400PCA and transformers.

CPU-400

The CPU-400 provides LED indicators and operational switches. The panel is visible with the cabinet door closed, except for programming switches, which are located behind a flip-down door. Slide-in labels are used for most nomenclature.
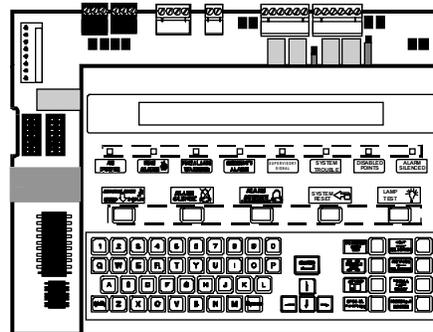
CPU-400 Module

Power Supplies

The AFP-400 uses two types of power supplies: the Main Power Supply (MPS-400) and an optional Audio Visual Power Supply (AVPS-24).

- **MPS-400** – The MPS-400 supplies a total of 6 amps in alarm, used for the following: (a) powering AFP-400 modules; (b) powering a variety of standard UL listed 24 VDC indicating appliances.; and (c) providing up to 1.25 amps of resettable power for four-wire smoke detectors. The MPS-400 contains an integral battery charger, four NAC/Releasing circuits, and four relay outputs (Alarm, Trouble, Supervisory, and Security).

- **AVPS-24 (optional)** – The AVPS-24 Audio/Visual Power Supply provides up to 3 amps of additional Special Purpose Power (unregulated, unfiltered) for output modules. The AVPS-24 mounts to one-fourth of a CHS-4 chassis. In space-critical applications, you can mount an AVPS-24 under system modules on a CHS-4 chassis. Refer to Appendix C for a list of compatible, UL-listed notification appliances.

Audio Amplifiers

The AFP-400 uses three types of audio amplifiers with an installed Voice Alarm System: the AA-30, the AA-100, and the AA-120.

- **AA-30** – The AA-30 Audio Amplifier provides up to 30-watts of audio power for driving speaker circuits. The AA-30 amplifies the audio signal fed in from an Audio Message Generator (AMG-1) and mounts to one-half of a CHS-4L Chassis.

- **AA-100** – The AA-100 Audio Amplifier provides 100 watts of audio power that is compatible with 70 V RMS speakers.

- **AA-120** – The AA-120 Audio Amplifier provides 120 watts of audio power that is compatible with 25V RMS speakers.

System Components

Transformer Assembly and MPS-400PCA

Two 100VA transformers and connectors are used with the MPS-400PCA in the CAB-400AA.
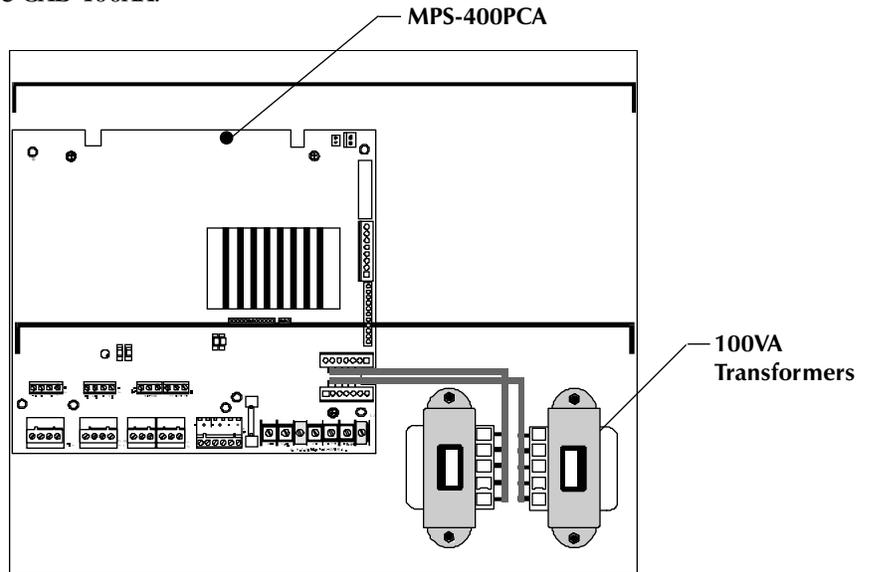
MPS-400PCA Using Two 100VA Transformers

Battery Boxes

The CAB-400AA cabinet provides space for 12 amp hour (AH) batteries. CAB-3 Series cabinets provide space for 25AH (or smaller) batteries. Use external battery boxes if your installation requires larger capacity batteries. Battery boxes mount directly below the main cabinet. Models of battery boxes are:

• BB-17 battery box – for batteries up to 17 AH.

• BB-55 battery box – for batteries up to 55 AH.

System Components

Optional Devices

The following table contains a list of optional components that can be installed in an AFP-400 system.

Option	Description
UDACT	A Universal Digital Alarm Communicator/Transmitter (UDACT) transmits system status to UL Listed Central Station Receivers over a public switched telephone network. The UDACT mounts in the AFP-400 cabinet or mounts remotely in the ABS-8R. The UDACT connects to the EIA-485 annunciator port and 24 volt (nominal) power.
4XTM Transmitter Module	A 4XTM module provides municipal box and remote station transmitters meeting NFPA 72-1993 Auxiliary and Remote Station requirements. Includes a Disable switch and an indicator.
Trim Ring	A gray trim ring is available for semi-flush mounting of the CAB-3 Series cabinet.
Battery Boxes	The AFP-400 can include one of the following battery boxes: • BB-17 battery box – can contain up to two 17AH batteries. • BB-55 battery box – can contain up to two 55AH batteries. Mount a battery box directly below the control panel cabinet.
AVPS-24 Expansion Power Supply	An AVPS-24 provides an additional 3 amps of notification appliance power and runs with an ICM-4 or ICE-4 module.
UZC-256 Universal Zone Coder	A UZC-256 module is a circuit board — used for zone coding applications — that provides three output circuits and up to 256 zone codes.
NIB-96 Network Interface Board	A Network Interface Board (NIB) is a microprocessor-controlled module that connects "slave" control panels to a "master" control panel. The NIB-96 module can be installed in each slave FACP. Each slave FACP can contain as many as 96 input/output points, or as few as eight points.
FCPS-24 Field Charger Power Supply	The FCPS-24 is a compact, cost-effective remote power supply and battery charger. This remote power supply consists of a filtered 24 VDC output that can drive up to four Notification Appliance Circuits.

Optional Devices for the AFP-400

System Components

Intelligent Detectors

Intelligent, addressable detectors provide analog information to the control panel. The control panel continually processes this information to determine the alarm, maintenance, or normal status of each device. The sensitivity of each detector can be set by the programmer. Each detector responds to an address that is set in the head via built-in rotary decimal switches. The following table contains a list of the intelligent detectors that you can use with an AFP-400 system.

Option	Description
BX-501 B710LP B501BH B524RB B524BI	Standard U.S detector base Low Profile base Sounder base Relay base Isolator base
SDX-551/ SDX-551TH* /SDX-751*	An Intelligent Photoelectric Smoke Detector provides analog measurements of the optical smoke level in its chamber to the control panel. Available as SDX-551TH* with 135° thermostat and as SDX-751 low profile photoelectric detector.
CPX-551/ CPX-751*	An Intelligent Ionization Smoke Detector measures the level of combustion products in its chamber using the ionization principle and reports this measurement to the control panel. * Also available as CPX-751 Low Profile detector.
FDX-551	An Intelligent Thermal Sensor (140°F fixed temperature). Also available as an FDX-551R* which is a combination 135°F fixed and 15°F per minute rate of rise.
RA-400	A Remote Single LED Annunciator that can be wired directly off of an addressable detector for annunciation of that detector's alarm status.
DHX-501 DHX-502	Duct Housings for the SDX-551 and CPX-551.

Intelligent Detectors

When used in duct applications, the CPX-551 must be set to high sensitivity.

System Components

Addressable Modules: CMX and MMX Modules

CMX Series Control Modules and MMX Series Monitor Modules provide an interface between the control panel and conventional initiating and notification devices. You can set all CMX and MMX modules to respond to an address with built-in rotary decimal switches. A flashing LED indicates communication between the module and the control panel.   A CMX comes with a thermoplastic cover for mounting to a 4-inch square mounting box.
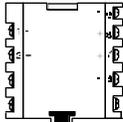
MMX Module
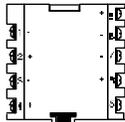
CMX Module
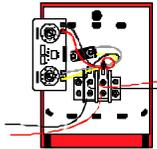
BGX-101L Pull Station

Option	Description
Monitor Modules MMX-1 MMX-2	Addressable Monitor Modules for monitoring conventional initiating devices. The MMX-1 is used for normally open contact alarm initiating devices, such as manual pull stations, four-wire smoke detectors, heat detectors, waterflow, security contacts, and supervisory devices. Use the MMX-2 for specific two-wire smoke detectors in addition to normally open contacts. Wire supervised circuits as NFPA Style B or Style D circuits.
MMX-101	An Addressable Module that is functionally similar to an MMX-1 Monitor Module (Style B circuits only), but offered in a smaller package for mounting directly in the electrical box of the device being monitored. It does not include a blinking LED or a magnetic test switch.
Control Modules CMX-1 CMX-2	Addressable Control Modules used as Notification Circuits to power and supervise compatible, UL listed notification appliances. Wire supervised circuits as NFPA Style Y or Style Z. Breaking the two built-in tabs allows using the CMX as a Form-C control relay. The CMX-2 is rated for higher voltage applications (70.7 V).
Loop Isolator Module (ISO-X)	The ISO-X is an automatic switch that opens the circuit voltage to a communications loop branch(es) whenever a fault is detected on that circuit. The remainder of the communications loop leading up to the ISO-X continues to operate, unaffected by the fault.
BGX-101L	A dual action addressable manual pull station featuring a key-lock reset. The pull station includes an MMX-101 and responds to an address set with built-in rotary decimal switches.

Addressable Modules

System Components

End of Line Devices

The following table contains a list of the end-of-line devices that you can install in an AFP-400 system.

Option	Description	Notes
System Sensor (SSD) A2143-00	A 47K End-Of-Line Resistor (ELR) Assembly ELR used in the supervision of MMX-1 or MMX-101 Monitor and CMX Control Module circuits.	Supplied with MMX or CMX modules.
System Sensor (SSD) A2143-10	The 3.9K End-Of-Line Resistor (ELR) Assembly used with the MMX-2.	Supplied with MMX-2 modules.
N-ELR Resistor Assortment (N-ELR)	An N-ELR, required for Canadian installations, provides a variety of resistor values to mount to a single ELR plate. Resistors can be used for the supervision of an MMX Monitor Module or CMX Control Module circuit. Resistors included: • 120 ohms • 470 ohms • 1.8K • 2.2K • 4.7K • 6.8K • 10K • 27K • 47K	• Use 2.2K for the MPS-400 output; • Use 4.7K for ICM-4, ICE-4, VCM-4, VCE-4, and DCM-4; use 47K for CMX, MMX-1, and MMX-101 modules.
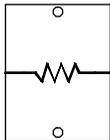
End of Line Devices

System Components

Annunciators

The following lists the annunciators used with the AFP-400 system. For detailed wiring requirements, refer to the appropriate Annunciator manuals.

ACM-16AT/AFM-16AT

The Annunciator Control Module-16AT or AFM-16AT contains 16 red alarm and 16 yellow trouble LEDs, a system trouble LED, an ON LINE/POWER LED, and a local piezo sounder with switches for control panel ACKNOWL-EDGE, SILENCE, RESET, and DRILL.

Module	Function
Annunciator Expander Module (AEM-16AT)	• Expand the ACM-16AT by 16 system points. • Supports up to three expanders, providing a maximum of 64 annunciator points.
Annunciator Fixed Module-16A (AFM-16AT)	• Use in systems that require 16 annunciation points or less. • Use multiple annunciators by setting all annunciators to "Receive Only," except the last AFM-16A in line. • Each annunciator's address is internally fixed at "1" and will not accept expanders.

ACM-32A/AFM-32A

The Annunciator Control Module-32A/AFM-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. The AFM-32A is fixed at address "1," and will not accept expanders.

Module	Function
AEM-32A – Annunciator Expander Module-32A	• Expands the ACM-32A by 32 system points. • Supports one expander module, providing a maximum of 64 points.
ACM-8R – Annunciator Control Module-8R	• Provides eight Form-C relays with 5 A contacts. • Use to track any group of eight zones within the system.

Lamp Driver Annunciator Module – LDM-32

The LDM-32 Lamp Driver Annunciator Module provides 32 alarm lamp driver outputs for connection to a custom graphic annunciator. You can also set the LDM-32 with a DIP switch for 16 alarm, 16 trouble and 16 switch inputs for control of such system functions as Signal Silence and System Reset.

Module	Function
LDM-E32 – Lamp Driver Annunciator Expander Module LDM-E32	Expands the LDM-32 by 32 system points, to a maximum of 64 points.
LDM-R32 – Relay Expander Module LDM-R32	Provides the LDM-32 or LDM-E32 with 32 dry Form-A (normally open) contacts.

System Components

Peripheral Displays and Printers

The following printers and display devices are compatible with the AFP-400 system:
- LCD-80 display
- PRN-4 printer
- Keltron Remote Printer
- CRT-2 Display Terminal

LCD-80 Display

The LCD-80 alphanumeric display module is an AFP-400 ancillary device that provides two modes of operation: **Terminal**, where it acts as a display repeater; and **ACS**, where it acts as an alphanumeric annunciator.
The display features the following:
- 80-character LCD display backlights under normal and alarm conditions.
- Control switches for Acknowledge, Signal Silence, and System Reset.
- Time/date display field.
- ABF-1 package with key switch and phone jack options.
- Mounts up to 6000 feet from the control panel.
- Local piezo sounder with alarm/trouble resound.

PRN-4 Remote Printer

The PRN-4 features the following:
- prints all status changes within the system;
- time-stamps the printout with the current time-of-day and date; and
- provides 80 columns of data on standard 9" x 11" tractor-feed paper.

Keltron Remote Printer

A two-color, 40-column printer that meets UL fire and security requirements. The printer mounts in a separate cabinet next to the control panel. For more information on the Keltron printer, contact the manufacturer (Keltron Corp., Waltham, MA).

CRT Terminal

The CRT terminal provides a video display of status, and a full keyboard for access to status information.

Indicating Circuit and Control Modules

Overview

The AFP-400 supports the following modules:
- Indicating Circuit Module (ICM-4)
- Indicating Circuit Expander (ICE-4)
- Control Relay Module (CRM-4)
- Control Relay Expander (CRE-4)
- Auxiliary Relay Module (ARM-4)

Modules

Module	Function	Circuit Rating
ICM-4	Provides four Notification Appliance Circuits for Style Y or Style Z operation. Circuits are field-programmable to respond to a single initiating zone, a group of zones, or all initiating zones.	Maximum signaling current is 3 amps of total current, limited by the power supply.
ICE-4	Expands the ICM-4 to a total of eight Notification Appliance Circuits (Style Y or Style Z).	Identical to the ICM-4.
CRM-4	Provides four standard dry Form-C relay contacts. Each relay is field-programmable to respond to a single initiating device circuit, a group of circuits, or all initiating device circuits. Each relay features manual On/Off control switches and can be disabled or enabled.	Contacts rated for 5 amps at 120 VAC or 28 VDC (resistive).
CRE-4	Expands the capacity of the Control Relay Module (CRM-4) to eight Form-C alarm relays.	Identical to the CRM-4.
ARM-4	Provides four auxiliary Form-C relays that can be controlled by a CRM-4 or CRE-4 relay module.	Normally-open contacts rated for 20 amps and the normally-closed contacts are rated for 10 amps at 125 VAC and 30 VDC (resistive).

Indicating Circuit and Control Relay Modules

Harnesses and Labels

Indicating Circuit and Control Relay Modules come with the following:

INDICATING
CIRCUIT

GREEN=ON
YELLOW=OFF
ON/OFF

Auxiliary Bell Power Harness. Provided with ICM and CRM modules.

Slide-in Labels Provided with ICM-4 and CRM-4 modules.

Ribbon Connector For connecting the ARM-4 to the driving relay module.

Voice Alarm Equipment

Overview

Voice Alarm equipment provides a manual or automatic supervised paging system for transmitting voice messages (information, instructions, directions) on a **selective** or **all call** basis.

Audio Message Generator (AMG-1)

The heart of a voice evacuation system, the Audio Message Generator (AMG-1) provides a variety of tones, including a slow whoop, yelp, yeow, siren, hi/lo, or steady tone. A built-in microphone allows for paging through speaker circuits. Optionally, you can install up to four digitally-recorded voice messages into the AMG-1: (a) you can order and install two prerecorded VROM voice messages from the factory; and you can produce and install up to two user-defined messages in the AMG-1. With optional VRAM-1 memory chips installed, you can program up to two user-defined messages – up to 24 seconds long – into the AMG-1 (one per VRAM). You can create both user-messages through the built-in microphone, or download user-messages through a standard audio cassette recorder.

Audio Tone Generator (ATG-2)

The ATG-2 Audio Tone Generator is similar to the AMG-1, but provides tones and microphone only (no message). It can provide two simultaneous tones for dual channel application.

Fire Fighters Telephone FFT-7/FFT-7S

The FFT-7 Fire Fighters Telephone provides the Voice Alarm System with fire fighter's telephone capability. With the FFT-7 or FFT-7S, up to seven telephones can hold a simultaneous conversation.

Voice Control Module (VCM-4)

The Voice Control Module-4 provides the system with up to four Style Y or Style Z speaker circuits. Moving a jumper on the VCM-4 configures the module for driving fireman's telephone circuits. When configured for telephone circuits, the VCM-4 accepts its signal directly from an FFT-7 Fire Fighters Telephone. Add an optional VCE-4 Voice Control Expander to the back of the VCM-4 to provide telephone or speaker circuits 5-8.

Dual Channel Module (DCM-4)

The DCM-4 Dual Channel Module provides the system with the capability to select one of two types of audio sources for switching to a specified speaker circuit. The DCM-4 provides up to four circuits.

Cabinet Hardware

Overview

Cabinets also are available in a red finish with navy blue Windows.

The cabinet assembly consists of two basic components – a backbox (SBB) and a door (DR). All cabinets for the AFP-400 are made from 16 gauge steel. Cabinet parts are painted Notifier gray with navy blue windows.

A key-locked door includes a pin-type hinge, a window, two keys, and the necessary hardware to mount the door to the backbox. The backbox contains numerous knockouts to provide easy access to the cabinet and to simplify conduit installation.

Hinges are field-selectable for left or right hand mounting except CAB-400AA. The door opens 180°.

Product Line Information

Cabinets are available in five sizes (AA, A, B, C, D) with the following options:

- A trim ring option (TR) is available for semi-flush mounting (TR-A3N, TR-B3N, TR-C3N, TR-D3N).
- A Wire Channel option (WC) provides a pair of wire trays to neatly route wire between tiers in the cabinet. Order one pair per cabinet tier.

CHS-4M Chassis/Dress Panel Assembly

The CHS-4M contains expansion modules that extend beyond the first row in the system cabinet. One CHS-4M is needed for each additional row of system modules. The CHS-4M includes the CHS-4 Chassis, the MP-1 Module Dress Panel, and the Expander Ribbon.
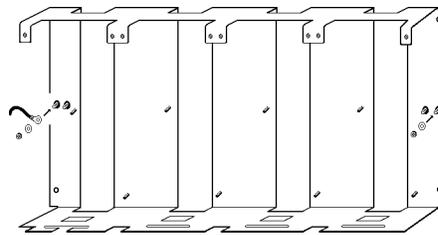
Expander Ribbon

CHS-4 Chassis
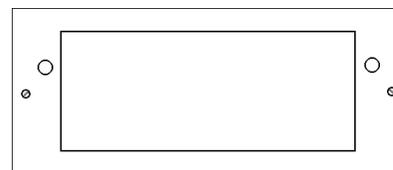
MP-1 Module Dress Panel

CHS-4L Chassis

Use the low-profile CHS-4L chassis to mount AA-30 audio amplifiers, Audio Message Generators, Fire Fighters Telephones, or Audio Visual Power Supplies.
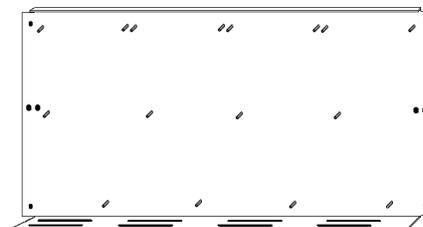
CHS-4L Chassis

CAB-3 Series Cabinets

Overview

This section contains mounting information for CAB-3 Series Cabinets. Each cabinet assembly includes a door and backbox. The following lists each CAB-3 Series cabinet assembly:

- CAB-A3 – one mounting tier
- CAB-B3 – two mounting tiers
- CAB-C3 – three mounting tiers
- CAB-D3 – four mounting tiers

CAB-A3
(one mounting tier)

An optional TR-A3 trim ring is available for use with an "A" size cabinet (24-1/8"W by 22-5/16"H). Replacement parts: DR-A3 door; SBB-A3 backbox.
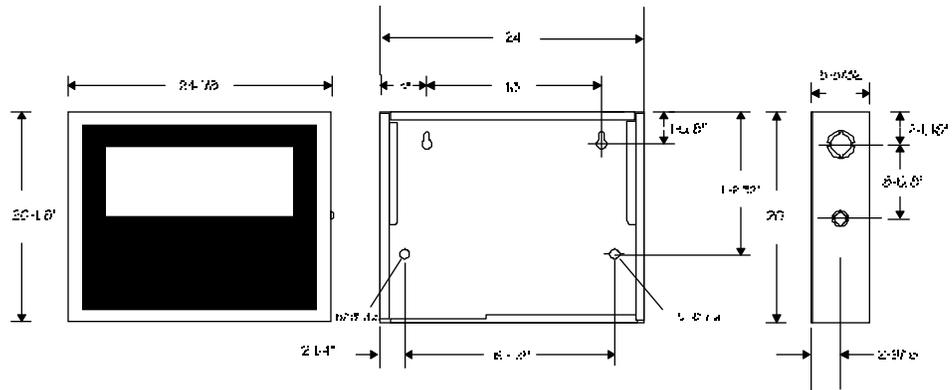
CAB-A3 Mounting Dimensions

CAB-B3
(two mounting tiers)

An optional TR-B3 trim ring is available for use with a "B" size cabinet (24-1/8"W by 30-13/16"H). Replacement parts: DR-B3 door; SBB-B3 backbox.
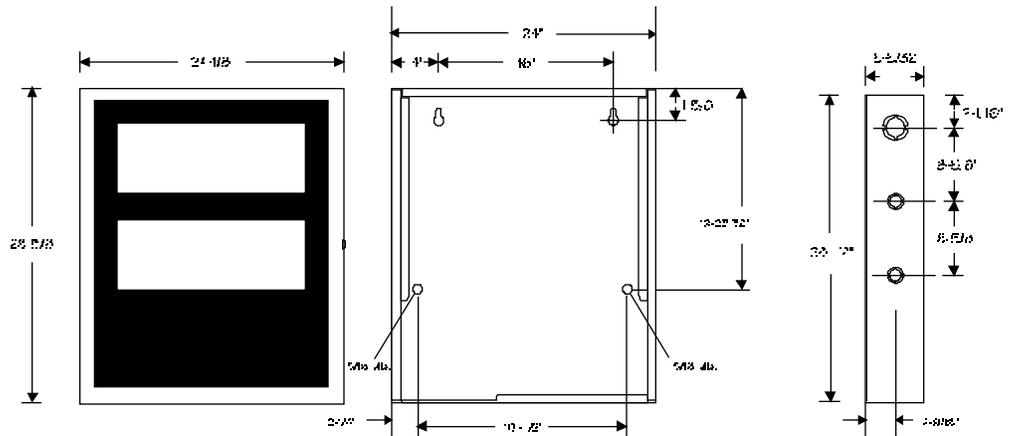
CAB-B3 Mounting Dimensions

Continued on the next page...

CAB-3 Series Cabinets, continued

**CAB-C3
(three mounting tiers)**

An optional TR-C3 trim ring is available for use with a "C" size cabinet (24-1/8"W by 39-7/16"H). Replacement parts: DR-C3 door; SBB-C3 backbox.
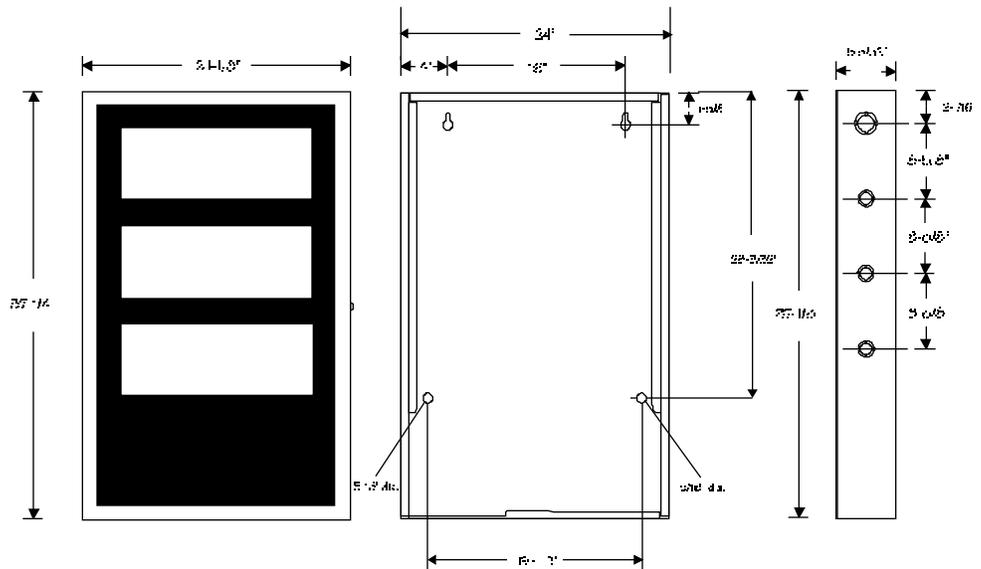
CAB-C3 Mounting Dimensions

**CAB-D3 (four
mounting tiers)**

An optional TR-D3 trim ring is available for use with a "D" size cabinet (24-1/8"W by 48-3/16"H). Replacement parts: DR-D3 door; SBB-D3 backbox.
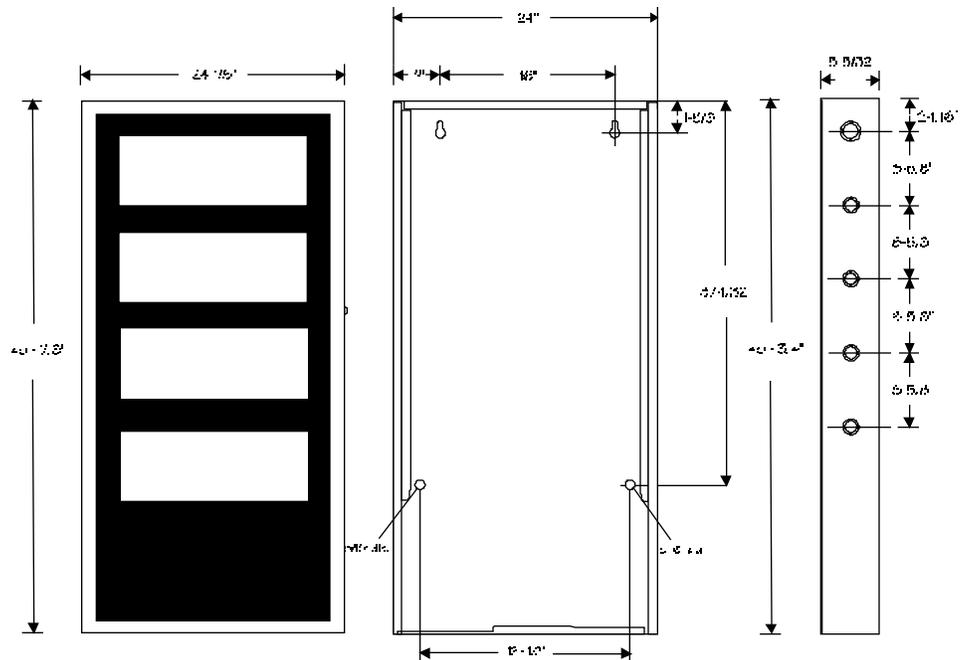
CAB-D3 Mounting Dimensions

CAB-400AA Enclosure

Overview

The CAB-400AA is a backbox and door that can contain a small AFP-400 system. (A small system supports up to twelve NACs and consists of the CPU-400 module and one option module.) Modules mount to rails in the CAB-400AA, eliminating the need for optional chassis assemblies. Mounting methods include surface-mounting or semi-flush mounting on a wall between 16-inch-on-center studs.

Component	Description
BE-400AA (Basic Equipment-400AA)	A package that includes a CPU-400, an MPS-400, a transformer assembly, and a two-position CPU-400 ribbon cable.
CAB-400AA (includes DP-400AA)	A backbox (14.5" wide by 17" tall by 5" deep) and door (14.57" wide by 17.25" tall by 1.5 " deep).
DP-400AA	An inner dress panel for covering the backbox area surrounding the modules.
BM-1	Blank module for covering an unused panel or module.
TR-500	Trim ring that provides for semi-flush mounting of the CAB-400AA cabinet.

The Inner Dress Panel is required for installations in Canada.

CAB-400AA Components and Options

AB-400AA Limitations

- Limited power supply capacity (one AVPS-24 expander).
- Backbox can hold 12 amp-hour batteries only.
- Maximum of one module in addition to the CPU-400.
- No voice evacuation capability.

CAB-400AA Dimensions

Door (05113B)   **Backbox** (05113)   **Side View**
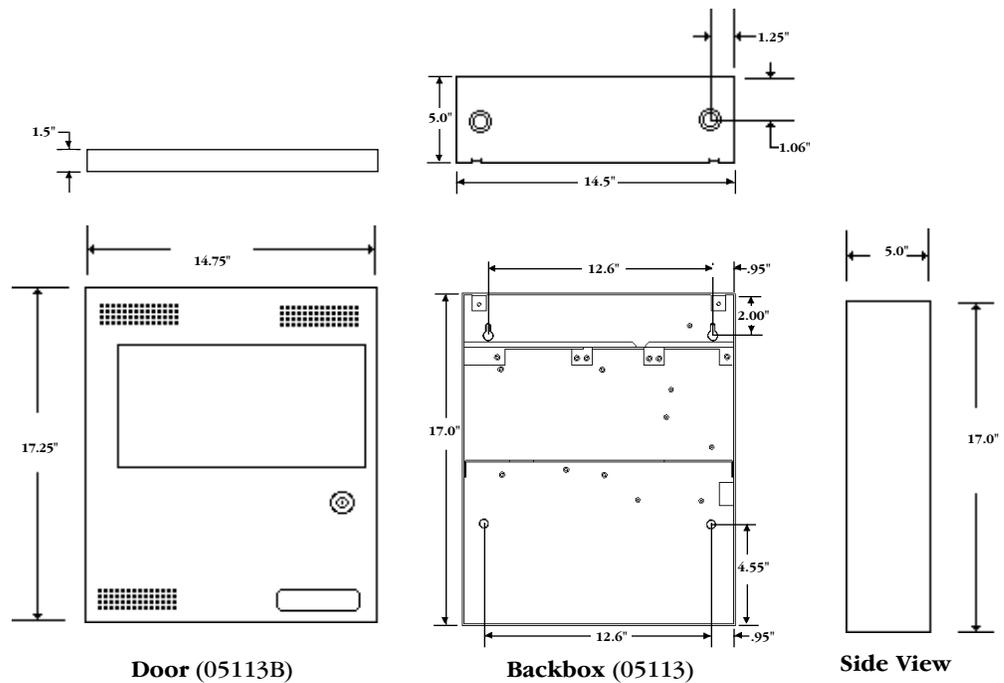
CAB-400AA Backbox and Door Assembly

2. Installation

Unpacking the System
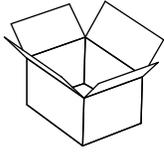
Unpack the system as follows:

Step	Action
1	Carefully unpack the system and inspect for shipping damage.
2	Select a location for the control panel in a clean, dry, vibration-free area with moderate temperature.

Preparing for Installation

Before installing the fire alarm system, read the following:

- Install the system in a readily accessible area with sufficient room to easily install and maintain the control panel.
- Locate the top of the cabinet approximately 5 feet above the floor with the hinge mounting on the left.
- Count the number of conductors needed for all devices and find the appropriate knockouts.
- Review the installation precautions at the front of this manual.
- All wiring must comply with the National and/or Local codes for fire alarm systems.
- Do not draw wiring into the bottom 9 inches of the cabinet, except when using the BB-17 or BB-55. This prevents interference between the power supply and batteries.

Standards and Codes

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

- NEC Article 300 Wiring Methods
- NEC Article 760 Fire Protective Signaling Systems
- Applicable Local and State Building Codes
- Requirements of the Local Authority Having Jurisdiction

Installation Tasks

The following procedures, diagrams, and instructions must be followed precisely to avoid damage to the control panel and other system components. System reliability depends upon proper installation and maintenance.

☐ **Cabinet Door** – Mount the cabinet door hardware (pre-mounted on a CAB-400AA). Refer to "Installing the Cabinet Door."

☐ **Chassis –** Mount all chassis as shown in the installation drawing.

☐ **Main Power Supply** – Mount the Main Power Supply (MPS-400) to the cabinet. *Do not wire anything at this time!*

☐ **Audio Visual Power Supplies** – If installing optional Audio Visual Power Supplies (AVPS-24), mount the AVPS-24 modules to the chassis. Refer to the mounting diagrams.

☐ **Audio Visual Power Supply Cables** – Connect the Trouble Cable(s) and Auxiliary Bell Power Harness to the AVPS-24.

☐ **Auxiliary Relay Modules** – Mount the ARM-4 modules into a chassis.

☐ **Preliminary System Wiring** – Wire the Main Power Supply and any AVPS-24s while the terminals are accessible. Refer to the MPS-400 and AVPS-24 wiring diagrams.

☐ **Module Ribbon Cables** – Connect the 1st Group Ribbon Cable of the CPU-400. For each additional row of modules installed in the cabinet, connect an Expander Row Ribbon Cable to the CPU-400.

☐ **CPU-400** – Install the CPU-400 module in the top left cabinet position. Connect the Power Ribbon and Power Harness between the CPU-400 and the MPS-400/MPS-400PCA.

☐ **Module Expander Boards** – If the system requires expander boards for a module, install as illustrated.

☐ **Modules** – Mount each module in its respective chassis position as illustrated in the drawings. Connect the CPU Row Ribbon Cable and the Expander Row Ribbon to the modules. Field-wire each module, according to its respective wiring diagram.

Installation Tasks

☐ **Check AC power** – Apply AC power to the AFP-400, but do not connect batteries at this time. Silence the audible trouble sounder by pushing the Acknowledge switch on the CPU-400. The AFP-400 should reflect the following status:

Component	Status
The CPU-400	The green AC Power indicator on; System Trouble indicator on because of no battery power.
Each module	The yellow Trouble indicator may come on for approximately 10 seconds after applying AC power. (This only applies to an unconfigured system.)
Each AVPS-24	The yellow Trouble indicator comes on because batteries are not connected.

☐ **Program the AFP-400** – Configure and program the system, refer to the AFP-400 Programming Manual, Document 50259.

Connect Batteries – Once the system is programmed and is functional, connect the batteries. Make sure that all indicators, except AC POWER, are extinguished.

☐ **Test the system** – Fully field test the system by conducting the test procedure in Section 3, "Testing the System."

☐ **Install Dress Panels** – Complete installation of the AFP-400 system by installing all remaining dress panels.

Installing a Cabinet Door

Cabinet Doors

Cabinet doors mount in a left- or right-hand opening configuration, providing easier access for installation and service when two control panels are mounted in a confined area or side-by-side (as shown). The doors can be opened "barn door" style, creating an open work space. Before mounting any equipment in the backbox, make sure to attach the two hinges and the two alignment tabs.

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-hand mounted door   *Right-hand mounted door*
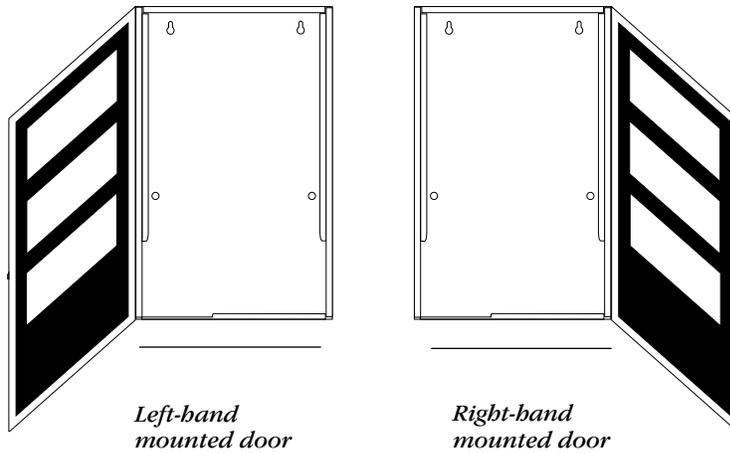
Cabinet Door Mounting Positions

Continued on the next page...

Installing a Cabinet Door

How to Install a Cabinet Door

You can mount hinges on the left or right. The drawings and text refer to a left-mounted example. For right hand mounting, substitute right for left in the instructions. Follow the instructions in the installation table and refer to the drawings.

Placing the door on the lower stud first provides a place for the door to rest while completing the assembly.

Step	Action
1	Insert the door hinges (A) into the top and bottom slots (on the left side in the drawing).
2	Attach the mounting nuts and secure the hinges to the backbox studs so the small hole on the outer tab faces out.
3	Thread the stud (B), from the bottom up, into the bottom hinge first. Place the grounding star washer and the lower corner of the door onto the stud.
4	Align the door on the backbox so the door sits directly under the top hinge. Thread the remaining stud (B) into the top hinge and through the hole in the top of the door. The door should now swing freely.

Cabinet Door Installation Instructions

Installing the Top Hinge
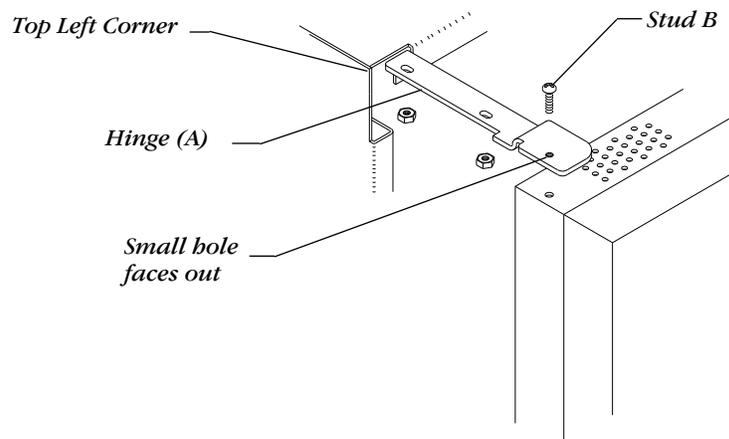
Installing the Bottom Hinge
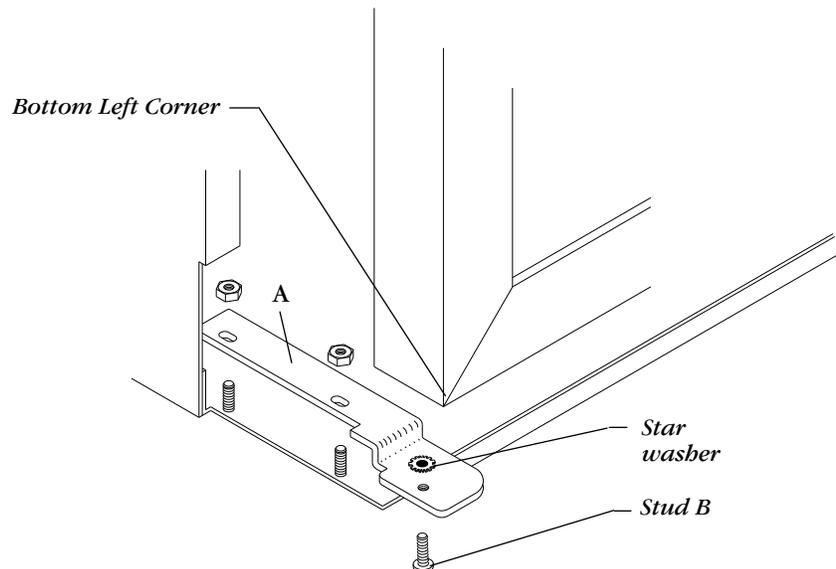
Installing a Cabinet Door

Installing the door Alignment Tabs

1) Install the door alignment tabs (C) in the unused slots on the top and bottom of the backbox. (In this example the door mounts on the left, leaving unused slots on the right). Secure the alignment tab (C) to the top PEM stud with nut provided.

📄 Alignment tabs keep the door lined up with the backbox.

2) Punch out the knockout for the door lock on the side opposite the hinge.

3) Install the lock mechanism.

Alignment tabs (C) ——
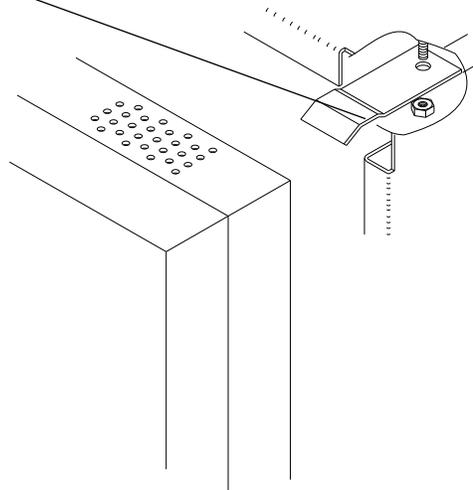
📄 The installation is the same for the top and the bottom right corner of the backbox.

Install the Door Lock

This illustration shows where to install a door lock on a left-mounted door.

Open

Locked

Install the door lock here
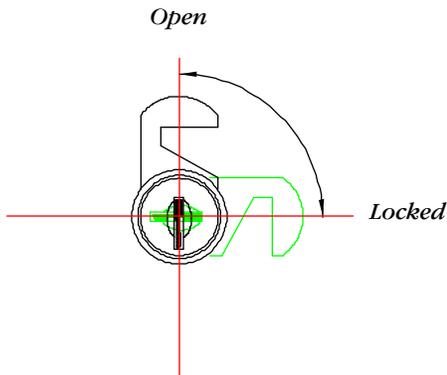
Door Lock *The lock mechanism as viewed on a door that opens to the left. The lock is placed in the right side of the door.*
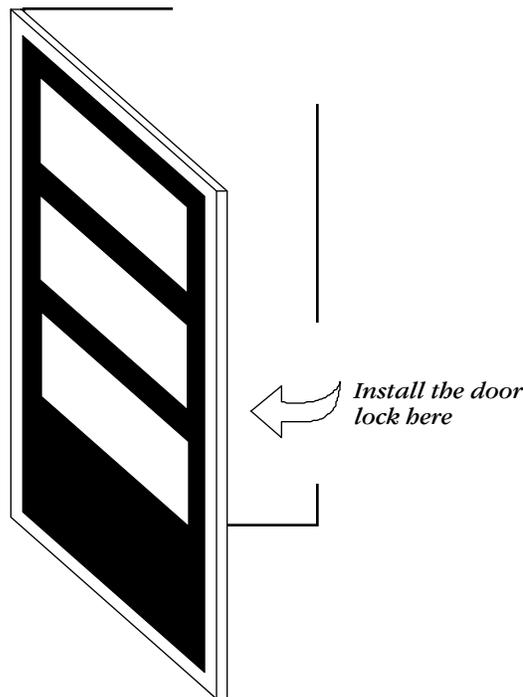
Mounting a Backbox

Overview

Mount a cabinet on a surface in a clean, dry, vibration-free area. To install the cabinet so the center of the control panel keypad measures 60 inches above the finished floor, follow these instructions:

1) Locate the cabinet so that the top edge is 66 inches above the surface of the finished floor.

2) Mount the backbox using the four mounting holes in the back surface of the backbox.

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

Mounting holes 4 places
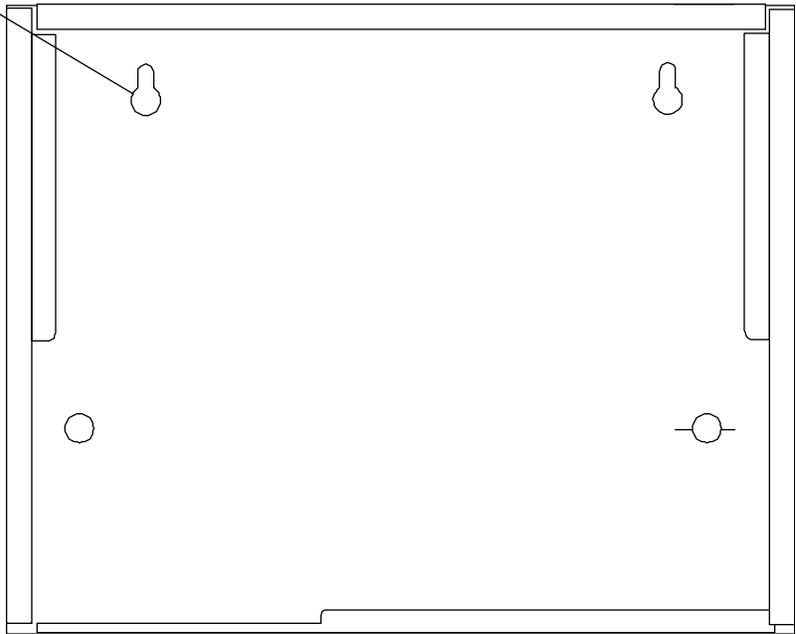
⚠ When removed, place the main PC board in a safe, clean place. Avoid static discharge which can damage the board.

Step	Action
1	Remove the main PC board assembly by unscrewing the four screws in the corners of the board. Two permanent standoffs support the main PC board in the center.
2	Mark and predrill holes for the top two keyhole mounting bolts.
3	Install two upper fasteners in the wall so the screw heads protrude approximately 1/2".
4	Using the upper keyholes, mount the backbox over the two screws.
5	Mark the lower two holes, remove the backbox and drill the mounting holes.
6	Mount the backbox, then install and tighten the remaining fasteners.
7	When the location is dry and free of construction dust, reinstall the main PC board.

Mounting a Cabinet Backbox

Installing a CHS-4 Chassis (Series 3 cabinets)

Installing a CHS-4 Chassis

The following instructions show how to install a CHS-4 chassis into Series 3 cabinets (CAB-3A, CAB-3B, CAB-3C, or CAB-3D).

1) Place the CHS-4 chassis over the screw mounts on the cabinet. Connect a grounding cable (PN 71033) to one of the screw mounts. Secure the assembly with the two nuts provided. Repeat this step for each CHS-4 chassis in the cabinet.

CHS-4 Chassis

Connecting the grounding cable. *Connect the grounding cable between MPS-400 earth ground terminals and at least one chassis.*
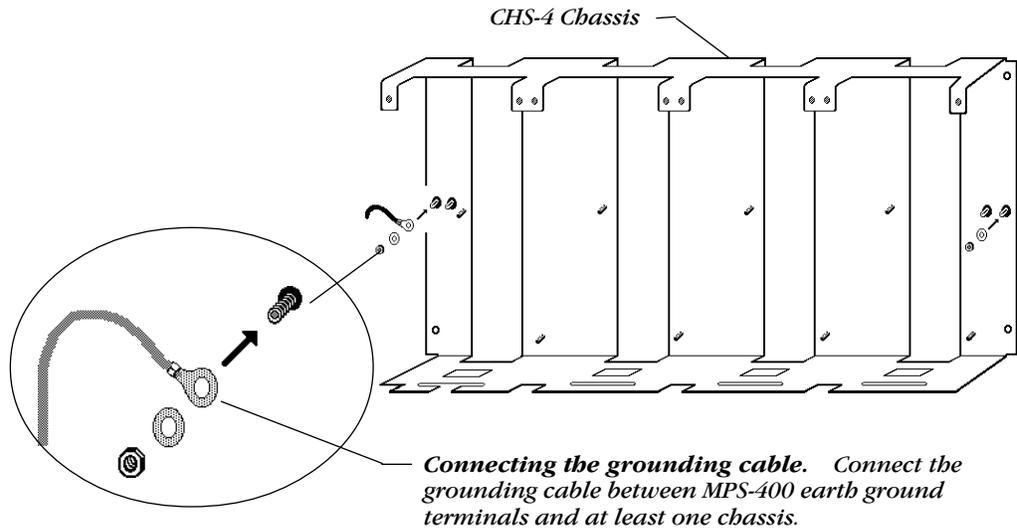
Installing a CHS-4L Chassis

2) Place the CHS-4L over the screw mounts on the cabinet. Connect a grounding cable (PN 71033) to one of the screw mounts. Secure the assembly with two nuts provided. Repeat this step for each CHS-4L chassis in the cabinet.

CHS-4L Chassis *for mounting an AMG-1, FFT-7, or AA-30.*

Connecting the grounding cable. *Connect the grounding cable between MPS-400 earth ground terminals and at least one chassis.*
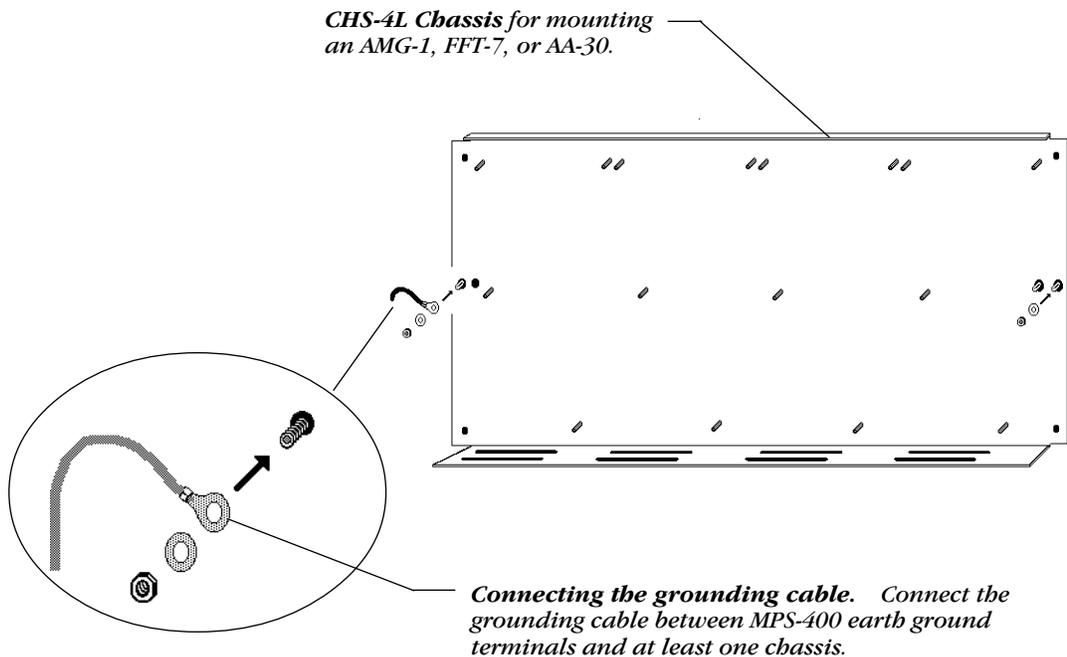
Mounting Modules in the Chassis

To install a module into a chassis, follow these steps.

1) Angle the module into the chassis so that the upper board edge slips into the chassis slots as shown.

Module
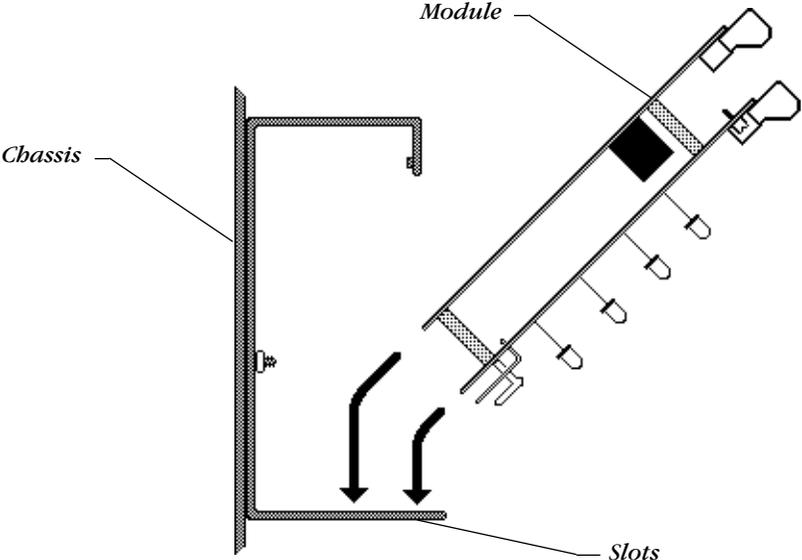
Chassis

Slots

2) Push the upper end of the module into the slots in the chassis. Secure the module to the chassis with the two module screws.

Slots

Chassis

mounting screws
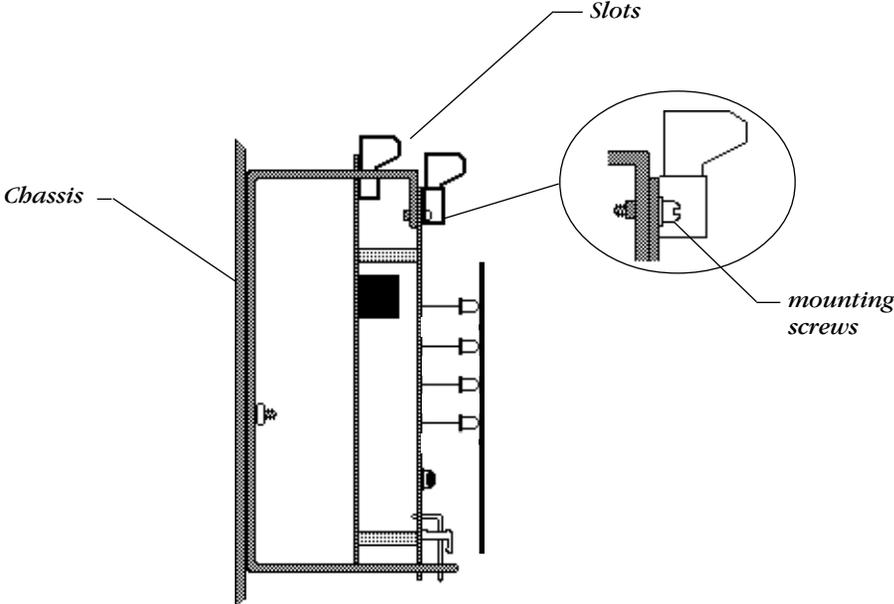
Installing the CPU-400

To install the CPU-400 into a chassis, follow these steps.

1) Insert the two tabs of the CPU-400 module into the two left-most chassis slots, angling the front end of the module into position as shown.

CHS-4 Chassis

CPU-400
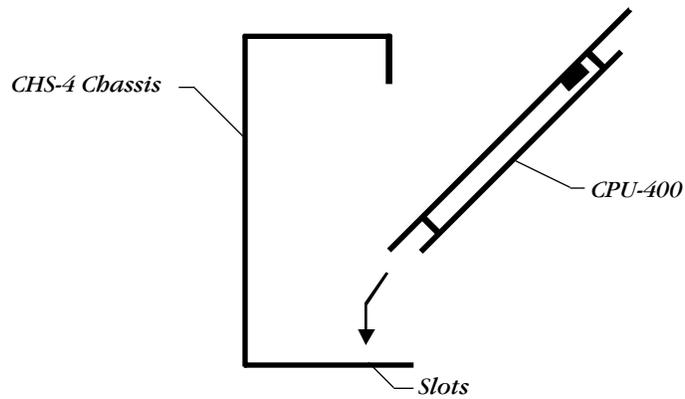
Slots

2) Push the back end of the module down into the cabinet and pull down until the upper board engages the slots on the chassis.

Screw

Slots
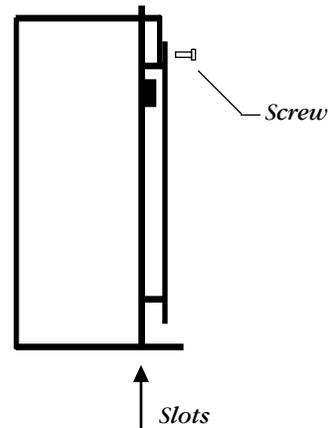
3) Align the module screws with the thread-holes on the chassis and secure in place.

Mounting Power Supply Components into a CAB-400AA

The following illustration shows how to install an MPS-400PCA and two transformer assemblies into an CAB-400AA cabinet. To mount MPS-400 components, follow these steps:

Step	Action
1	Mount the MPS-400PCA PC board into the cabinet using the four mounting screws.
2	Mount the two 100VA transformer assemblies to the cabinet using the four mounting nuts.
3	Connect the transformer assembly wires to plugs P1 and P2 on the MPS-400PCA PC board.
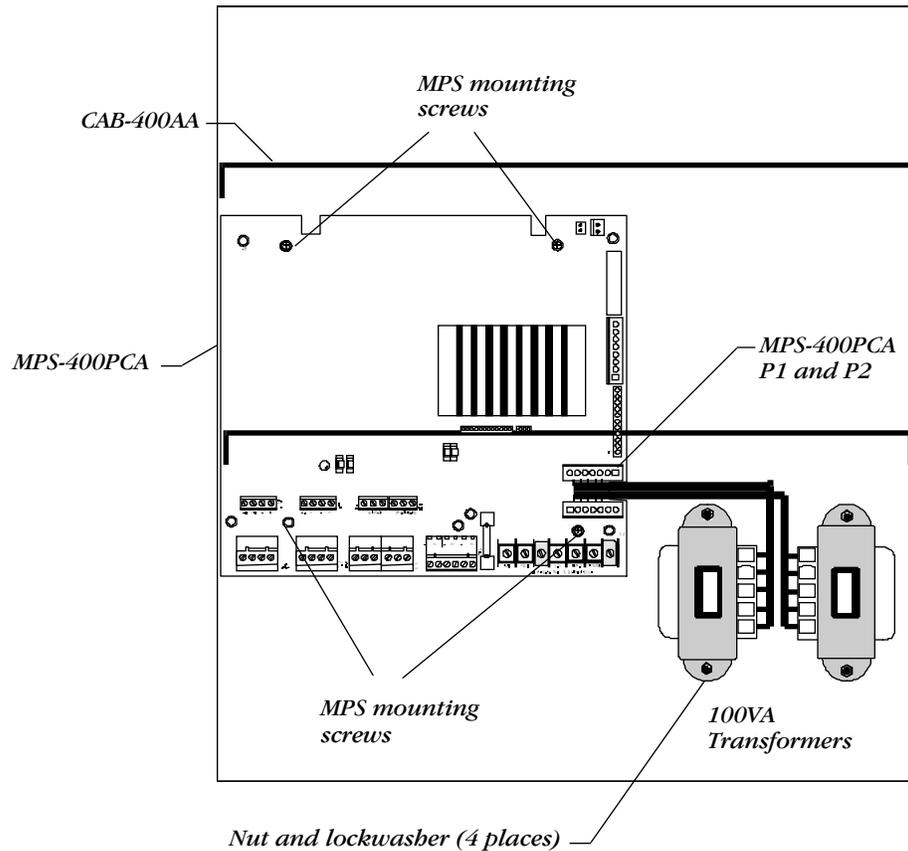
Mounting an MPS-400PCA into a CAB-400AA

Connecting the MPS-400

WARNING:

1) Remove all power sources to equipment while connecting electrical components. Leave the main power breaker off until installation of the entire system is complete.

2) Make sure to set the voltage selector to correct voltage.

MPS-400 Electrical Connections

MPS-400 electrical connections include the following:

- **Primary power source** – 120 VAC, 50/60 Hz, 3.0 amps or 240 VAC, 50/60 Hz, 1.5 amps from line voltage source.

- **Secondary power source** – 24 VDC from batteries, installed in the control panel, provides backup power the system loses primary power. Secondary power (batteries) is required to support the system during loss of primary power.

Connecting the Primary Power Source

 Make sure to set the voltage selector to correct voltage.

Connect primary power to the MPS-400 as follows:

Step	Action
1	Turn off the breaker at the main power distribution panel and remove the plastic insulating cover from TB1.
2	Connect the system primary power source.
3	Connect the service ground to TB1-3 (marked "EARTH").
4	Connect the primary Neutral line to TB1 Terminal 2 and the primary Hot line to TB1-4 (marked "HOT").
5	When finished making connections, reinstall the plastic insulating cover over TB1.

Connecting Primary Power

Connecting the Secondary Power Source

 WARNING: Do not connect the Battery Interconnect Cable (part number 71070) at this time. Make this connection after initial system primary power-up.

Install batteries in the control panel cabinet or in a separate battery cabinet which can be mounted up to 20 feet away from the control panel. Connect the battery as follows:

Step	Action
1	Connect the battery positive terminal to TB1 terminal 6 (+).
2	Connect the battery negative terminal to TB1 terminal 7 (–).

Connecting Batteries

Four-Wire Smoke Detector Power (24 VDC)

MPS-400 TB2 terminals 5 (+) and 6 (–) provide up to 1.25 A of current for four-wire smoke detectors. A system reset removes the 24 VDC power from MPS-400 TB2. 24 VDC regulated four-wire smoke detector power is power-limited but must be supervised. To provide supervision, install an end-of-line listed power supervision relay. Connect the power supervision relay in series with an Initiating Device Circuit. The four-wire power circuit energizes the power supervision relay.

Connecting the MPS-400, continued

Notification Appliance power
24 VDC

On the MPS-400 Bell Power Harness, the fork lugs must be cut off and wires stripped for connection to the MPS-400

Annunciator Power (24 VDC)

You can use any of the NAC outputs, but do not connect an NAC to the output selected for powering the annunciators.

TB2 terminals TB-1 (+) and TB-2 (–) provide up to 1.25 A of regulated current for powering notification appliances. TB3 terminals TB-3 (+) and TB-4 (–) also provide 1.25 A of current. During system reset, power remains at terminals TB2 and TB3.

Power ACS annunciators from the four-wire smoke detector outputs, or from one of the NAC power outputs. All outputs provide the filtered, regulated, power-limited source required by the annunciators. The power run to the annunciators is supervised by the annunciator (for a "Loss of Communications" error). Annunciator wiring must run separate from NAC wiring.

System Harness Connections

Make system connections as follows:

For...	Connect...
Internal system power	The power harness (75396 for CAB-400AA/75395 for CAB 3 series) from J6 on the MPS to J6 on the CPU.
AMG-1 power	A power harness from J1 on the MPS to P1 on the AMG-1. You can feed this same power to other boards or modules that require internal power.
Signaling between the CPU and the MPS	A power ribbon (75398 for CAB-400AA/75394 for CAB 3 series) to J2 on the MPS.

System Harness Connections

System Power Connections

The block diagram shows system power connections between the MPS-400 and system components.
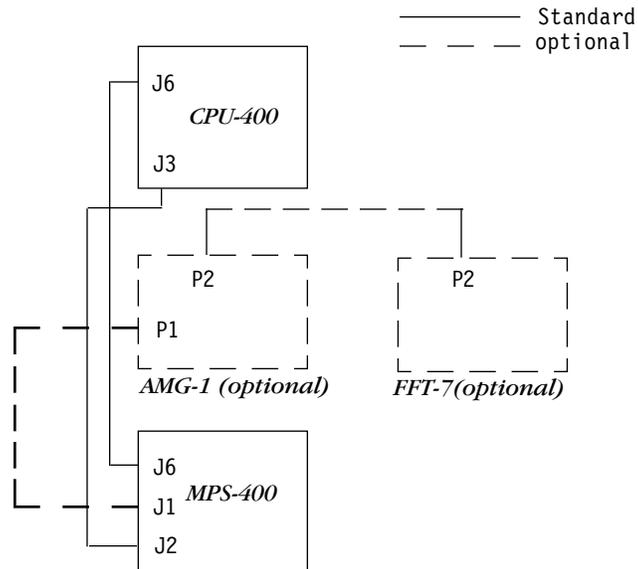
System Power Harness Connections

Installing Row Ribbon Cables for CAB-B3, CAB-C3, and CAB-D3 Cabinets

Overview

The following diagram shows typical wiring connections (using Row Ribbon Cables) to connect the CPU-400 to two rows of expander modules.

Cable Connections

First Row Ribbon (AFP-400) Ribbon Cable (P/N 75361)

Group of modules in 1st cabinet row

J1 – First module row

CPU-400

P3.1–P3.8

P4.1–P4.8

J2 – 2nd module row

Expander Row Ribbon Cable (P/N 71088)

Group of modules in 2nd cabinet row

P5.1–P5.8   P6.1–P6.8   P7.1–P7.8   P8.1–P8.8
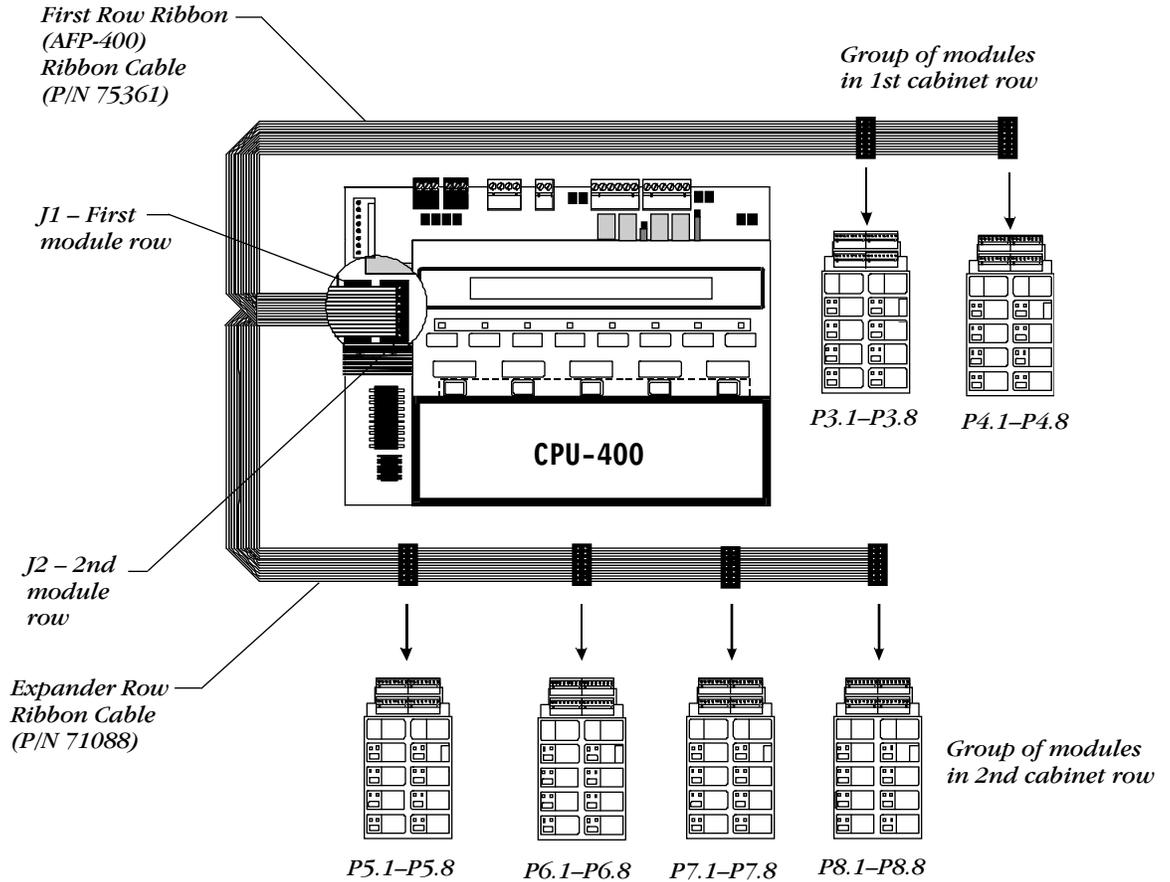
Installing Row Ribbon Cables (CAB-B3, CAB-C3, and CAB-D3)

Installing Row Ribbon Cables for CAB-C3 and CAB-D3 Cabinets

Overview

The following diagram shows typical wiring connections (using Row Ribbon Cables) to connect the CPU-400 to two rows of expander modules.

Cable Connections

Expander Row Ribbon Cable (P/N 71088)

Expander Row Ribbon Cable (P/N 71088)

Group of modules in 2nd cabinet row

P1.1–P1.8   P2.1–P2.8   P3.1–P3.8   P4.1–P4.8

Group of modules in 3rd cabinet row

P5.1–P5.8   P6.1–P6.8   P7.1–P7.8   P8.1–P8.8
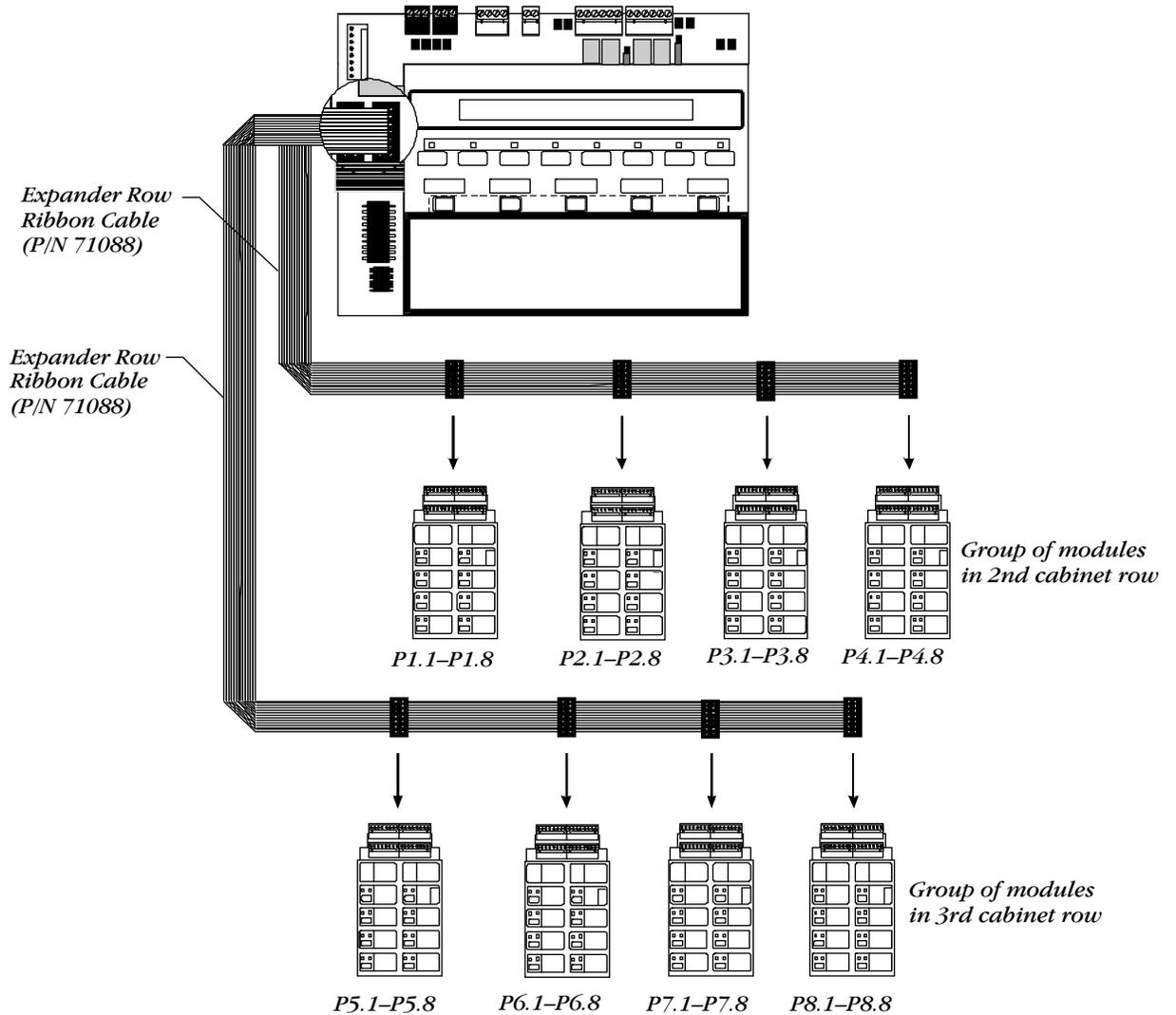
Installing Row Ribbon Cables (CAB-C3 and CAB-D3)

Installing Row Ribbon Cables for a CAB-400AA Cabinet

Overview

The following diagram shows typical wiring connections (using Row Ribbon Cables) to connect the CPU-400 to two rows of expander modules.

Cable Connections

J2 – not used

J1 – module row

*First Expander Row
(CAB-400AA)
Ribbon Cable
(P/N 75397)*

P1.1–P1.8
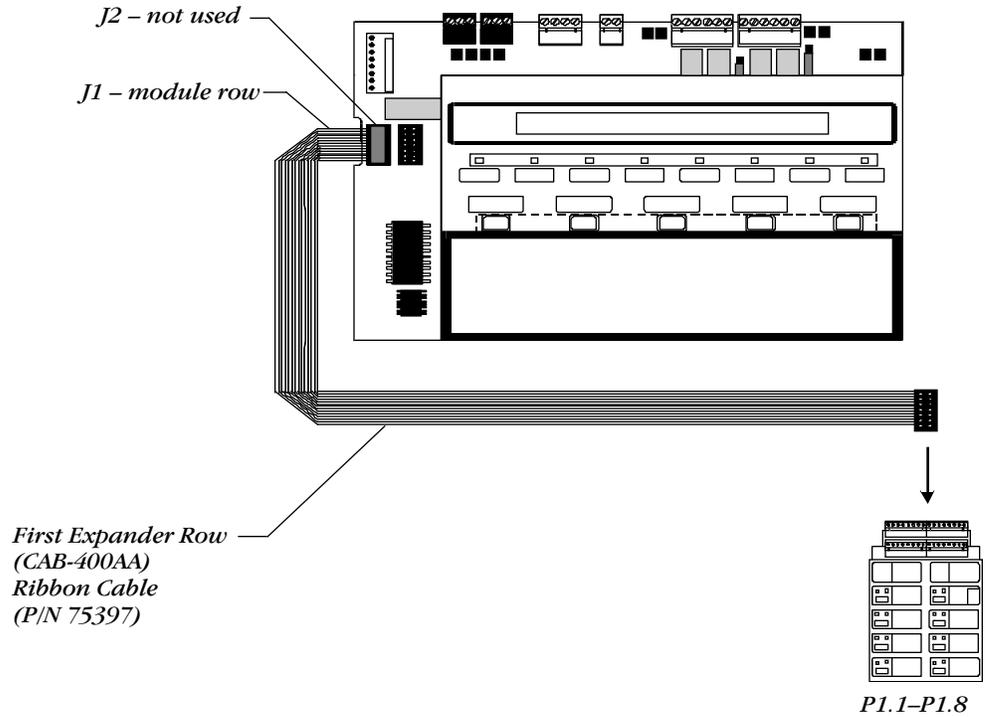
Installing Row Ribbon Cables (CAB-400AA)

Installing Expander Modules (CRE-4, ICE-4, VCE-4) into a Chassis

1) Remove ONE module support screw and set it aside for later use.
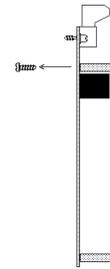
2) Replace screw with one module standoff.
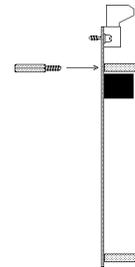
3) Repeat Steps 1 and 2 for the three remaining screws on the module.

4) Insert pins on the Expander Board into connector on the module. Make sure the pins are in line, then press the two boards together until the boards snap into place.

Expander Board

Module
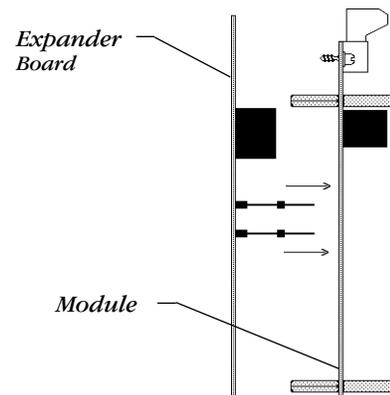
5) Install the four screws removed earlier through the back of the Expander Board and into the standoffs.
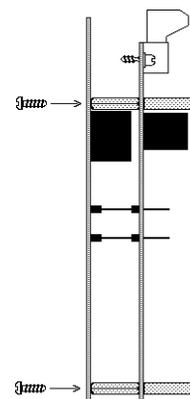
Installing an AVPS-24

Overview

You can mount an AVPS-24 into a CAB-3 series cabinet (on a CHS-4 or CHS-4L chassis) or in the upper right corner of a CAB-400AA. A CRM-4, ICM-4, DCM-4, or VCM-4 can mount above the AVPS-24 as long as you do not use an expander module (CRE-4, ICE-4, or VCE-4).

Installation

To mount an AVPS-24, follow these steps:

Step	Action
1	Place the AVPS-24 module onto the screw mounts on the CHS-4 or CHS-4L chassis as shown in the illustration below.
2	Install the two mounting nuts.
3	Tighten the mounting nuts until the module is secure.

AVPS-24

CHS-4/CHS-4L
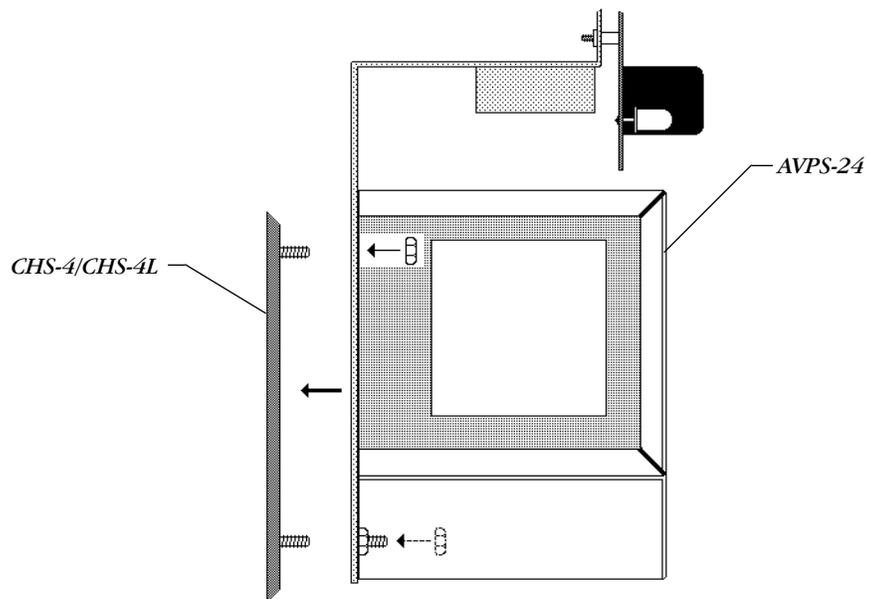
Mounting an AVPS-24

Mounting the MPS-400 into a Cabinet

To install the MPS-400 into cabinets CAB-A3, CAB-B3, CAB-C3, or CAB-D3, follow these steps.

1) Place the MPS-400 into the cabinet. Make sure the upper bracket engages the support bracket on the cabinet.
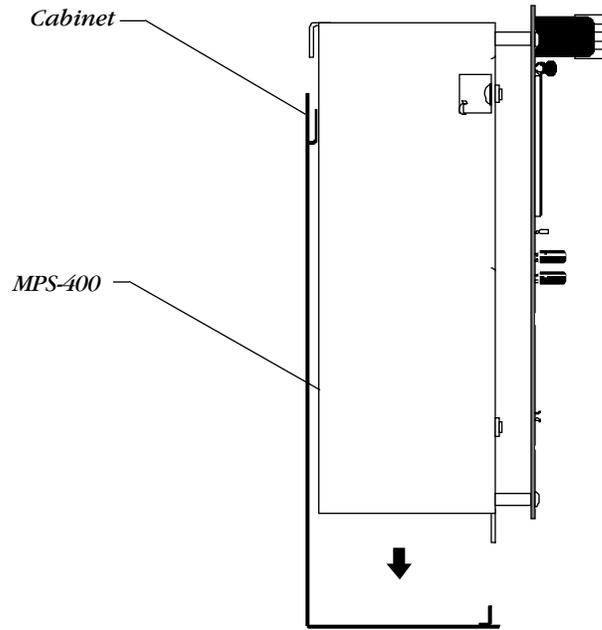
Cabinet

MPS-400

2) Secure the bottom of the MPS-400 to the bottom cabinet support with the mounting screws.

mounting screws
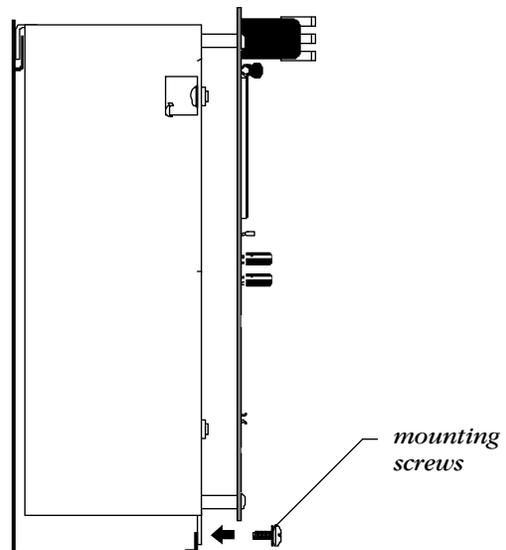
Mounting the ARM-4 Auxiliary Relay Module

Overview

For ease of installation and service, mount the ARM-4 in a dedicated position on the chassis (if available) with no module or expander board above it. The ARM-4 can also mount in the upper right corner of the CAB-400AA.

The ARM-4 module can be driven by either a CRM-4 or a CRE-4. Each ARM-4 can support one CRM-4 OR one CRE-4. If using auxiliary relays for both modules, mount two ARM-4s in separate positions.

Place the module against the chassis in any one of eight positions relative to the CRM-4 or CRE-4. You can also install the ARM-4 directly below the CRM-4 or CRE-4. Select a position on the chassis for the ARM-4:

CRM-4 or CRE-4
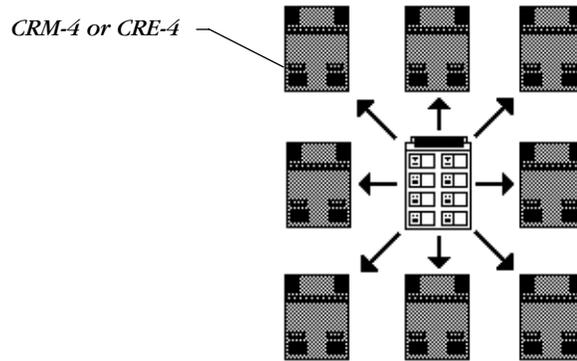
Mounting Positions for the ARM-4

Installing the ARM-4 Module

1) Select a mounting position for the ARM-4.

2) Secure the two loose standoffs to the screw mounts on the chassis at the selected location for the ARM-4. Make sure to install existing standoffs in the locations illustrated.
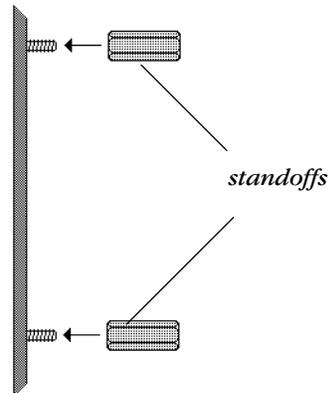
standoffs

Continued on the next page...

Mounting the ARM-4 Auxiliary Relay Module

Installing the ARM-4 Module, continued

3) Position the ARM-4 over the existing standoffs on the chassis and fasten with the two remaining screws.
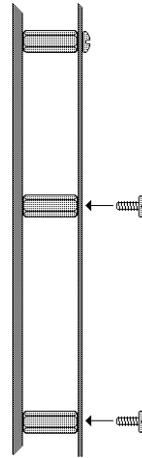
4) Connect one end of the AR-4 cable to Plug P1 on the ARM-4.

ARM-4 Cable Assembly PN 71092

5) Connect the other end of the ARM cable to jumper JP5 on the CRM-4 or CRE-4 driving the ARM-4.
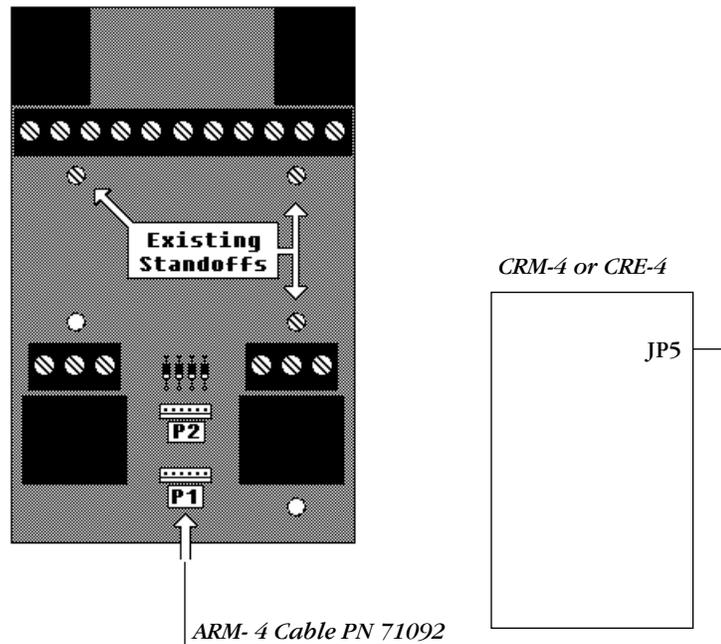
Connecting the ARM-4

Installing a 4XTM Module

Mounting the module
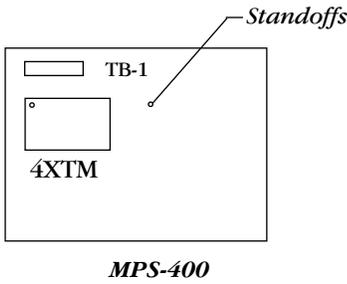
MPS-400

Install the 4XTM module by following these steps.

Step	Action
1	Install the standoffs (provided) into the holes next to TB-1 on the MPS-400 PC board.
2	Carefully align the pins on the MPS-400 board with the connector on the 4XTM board.
3	Press firmly on the 4XTM board until the board locks in place on the standoffs.
4	Screw the 4XTM board to the standoffs.

Mounting a 4XTM Module

Electrical Requirements

The Local Energy Municipal Box Circuit is non-power limited. Maintain at least a 0.25 inch spacing between the Municipal Box Circuit wiring and all power limited circuit wiring.

Electrical requirements for local energy municipal Box service (NFPA 72-1993 Auxiliary Protective Fire Alarm System) are:

Supervisory current	5.0 mA
Trip current	0.35 A (subtracted from NAC power)
Coil voltage	3.65 VDC
Coil resistance	14.6 ohms
Wire resistance (panel and trip coil)	Maximum of 3.0 ohms

Electrical requirements for remote station service (NFPA 72-1993 Remote Station Protective Fire Alarm System) are:

Maximum load for each circuit	10 mA
Reverse polarity output voltage	24 VDC (nominal) 28 VDC (max)

Connecting the Module

Push the disconnect switch down to prevent unwanted activation of the Municipal Box during testing of the control panel.

- The Disconnect LED lights while the Municipal Box is disconnected; and
- The System Trouble LED lights to indicate disconnected and/or open circuit conditions on the Municipal Box.

During trouble conditions, you can transmit a trouble indication (through an open circuit signal) on the Alarm Reverse-Polarity output. Do this by cutting the TBL jumper shown in the following drawing.
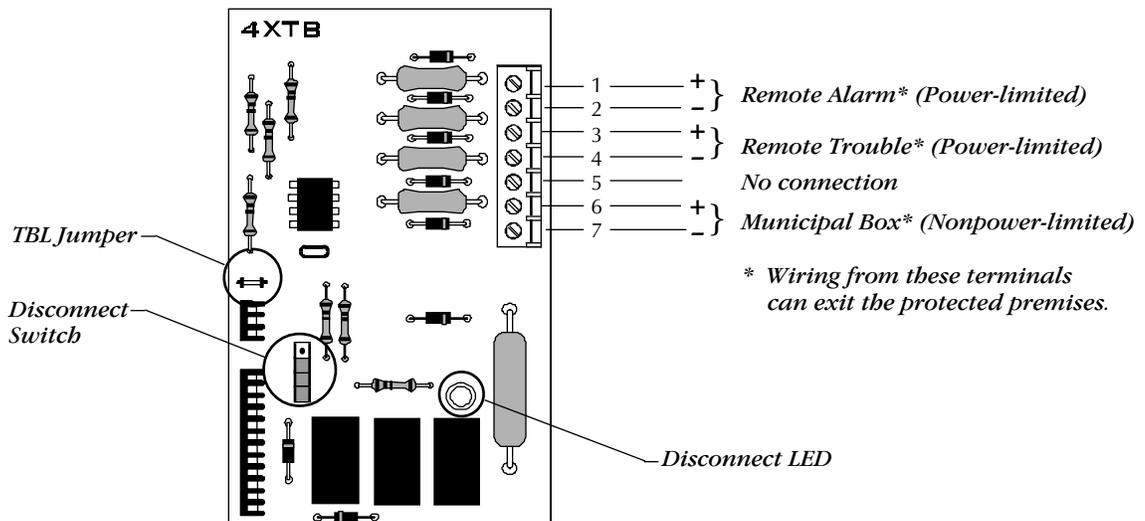
4XTM Transmitter Module
(Polarities shown in activated positions)

Mounting the UZC-256

Overview

The UZC-256 module mounts beneath the third and fourth modules, to the right of the CPU-400. You can also mount the Module to the upper right corner of the CAB-400AA. Install the module as follows:

Step	Action
1	Place the module onto the base of the CHS-4 chassis using the four hex standoffs (which are screwed onto four PEM studs).
2	Attach the module to three of the four standoffs, using the mounting screws (provided).

Install the Standoffs

Install the hex standoffs to the base of the CHS-4 chassis:
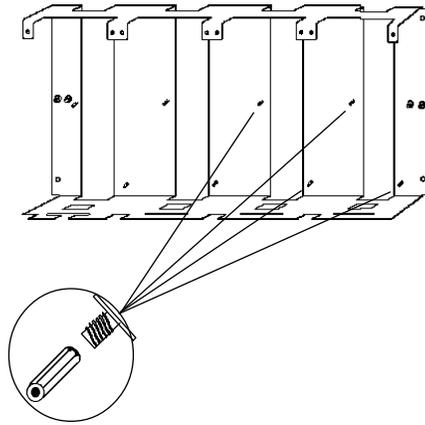
Mount the UZC-256

Mount the UZC-256 to a CHS-4:
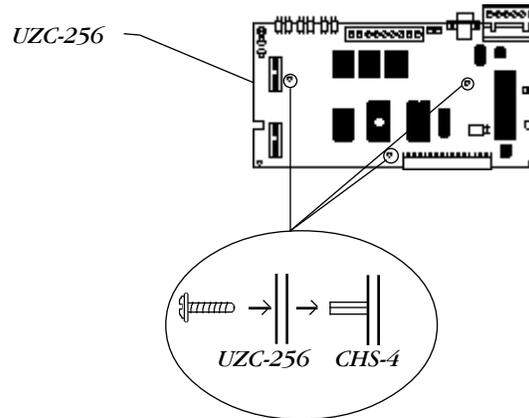
Field Wiring the Modules

Overview

AFP-400 modules feature removable terminal blocks that ease installation and servicing of the control panel. The following three diagrams show conduit wiring methods.

No Conduit Shield Termination

Do not allow the shield drain wire to enter the system cabinet. Connect the drain wire to the outside of the cabinet via a cable connector.

Scrape paint away from the cabinet to make good electrical connections.

Cabinet

Shield Drain Wire
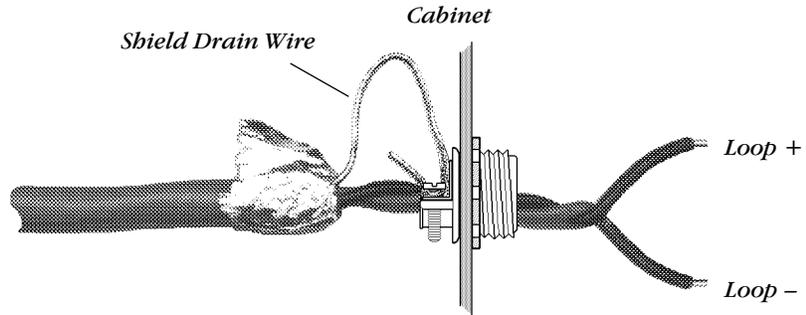
Loop +

Loop –

Full Conduit Shield Termination

The shield drain wire must be connected to the negative (–) side of the loop. Do not let the shield drain wire or the shield foil to touch the system cabinet.

For Style 6 or Style 7 field wiring of the Communications Loop, connect each end of the shield to the negative side of the respective channel.

Cabinet

Loop +

Loop –

Shield Drain Wire: The shield must not be connected to earth ground at any point.
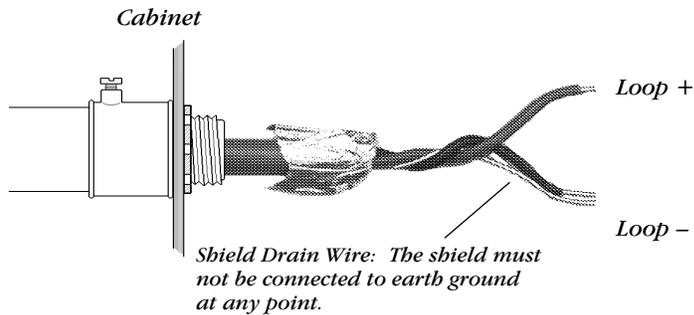
Partial Conduit Shield Termination

Do not allow the shield drain wire to enter the system cabinet or the conduit. Connect the drain wire to the termination point of the conduit run (such as a single-gang box shown below).

The length of a conduit cannot exceed 20 feet.

If using a metal box, you must use a metal conduit.

Shield Drain Wire

Cabinet
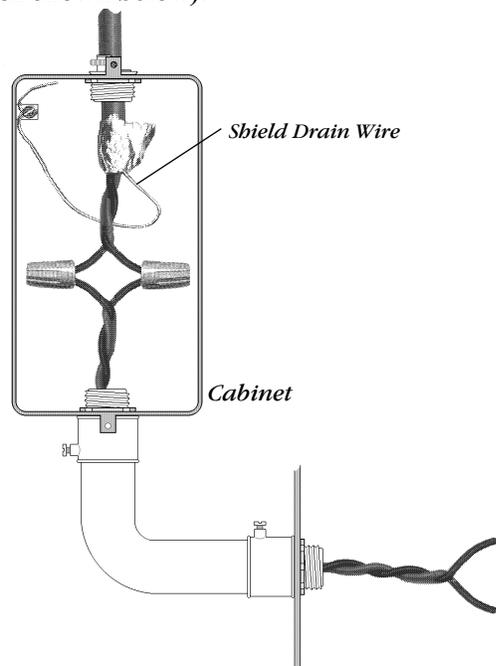
Terminal Assignments for Module Control of the ARM-4

Overview

Relays K1-K4 are installed to control non-power limited circuits. Wiring requirements follow:

- Power limited and nonpower limited circuit wiring must remain separated in the cabinet.
- All power limited circuit wiring must remain at least 0.25 inches away from any nonpower limited circuit wiring.
- All power limited and nonpower limited circuit wiring must enter and exit the cabinet though different knockouts, conduits, or both.

Contact ratings for relays K1-K4 follow.

Resistive Load	Contacts	
	N.O.	N.C.
125 VAC	20A	10A
30 VDC	20A	10A

ARM-4 K1-K4 Contact Ratings

ARM-4 Terminal Assignments

The following illustration shows terminal assignments for module control of the ARM-4 Auxiliary Relay Module
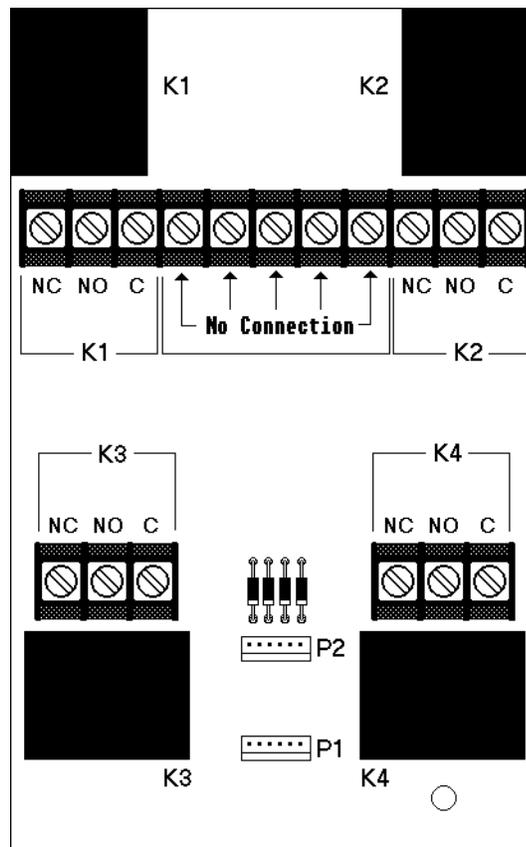
ARM-4 Terminal Assignments

Field Wiring an ICM-4 and an ICE-4 (NFPA Style Y and Z)

ICM-4 and ICE-4 Wiring Guidelines

Guidelines for field wiring include the following:

• Notification circuits are supervised, power limited and can connect to an energy-limited cable.

• Use only the compatible, UL-listed notification appliances listed in Device Compatibility Document.

• Wire notification appliances according to the manufacturer's instructions.

• Maximum current per circuit is 3.0 amps. Maximum current per module depends on the type of power supply (MPS-400 or AVPS).

• Canadian installations require model N-ELR End-of-Line Resistor Assembly (Style Y only).

• Size wiring for no more than a 2-volt drop (loss) at the last device on the circuit.

• For zone coded applications, refer to the UZC-256 manual.

• The ICM-4 is California Code programmable (microprocessor Rev. B or higher). To program for California Code, cut diode D35.

ICM-4 Connections
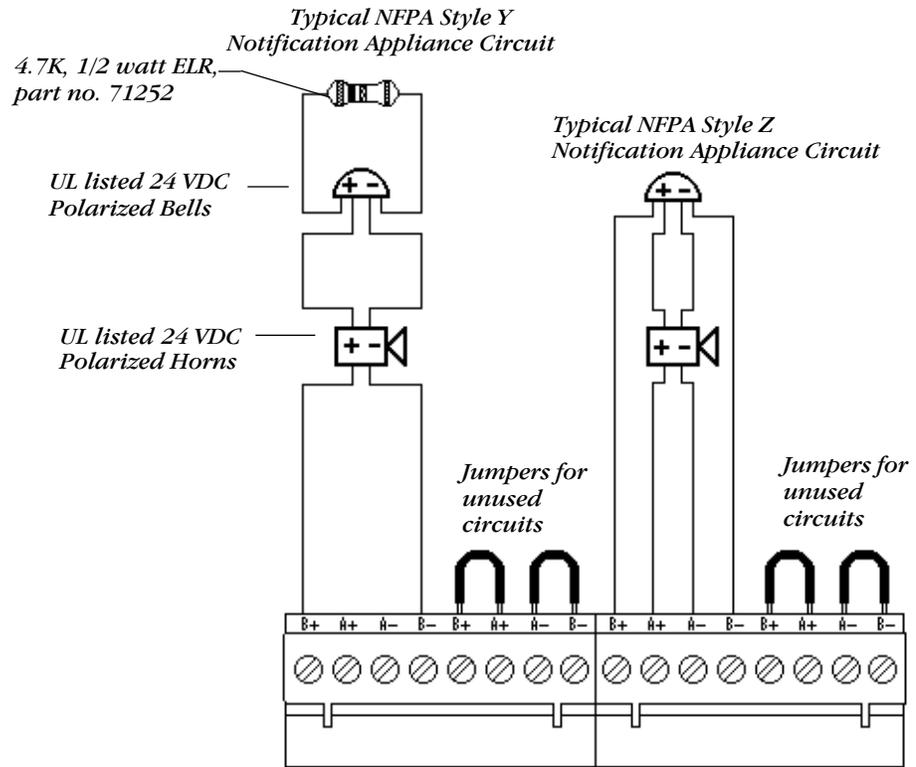
ICE-4 Connections

Positions E, F, G, and H are active only with the ICE-4 installed. You can also install a CRE-4 module on the ICM-4.
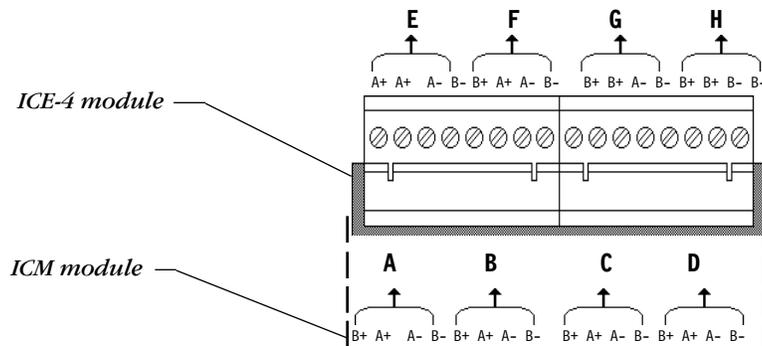
Field Wiring the CRM-4 and the CRE-4

CRM-4 and CRE-4 Wiring Guidelines

- These Form-C silver alloy relay contacts are for medium duty switching or Pilot Duty.
- UL contact ratings are 5 amps @ 125 volts AC (resistive) or 30 volts DC (resistive) and 2 amps @ 125 volts AC (inductive). For more information, refer to Appendix F, "UL Power Limited Wiring Requirements."
- Activation of a CRM-4 or CRE-4 relay occurs automatically when an alarm is detected on a selected (programmed) Initiating Device Circuit.
- Positions E, F, G and H are active only with the CRE-4 board installed.

CRM-4 and CRE-4 Connections
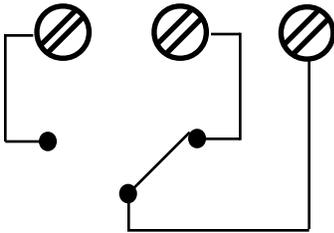
Typical Form-C Control Relay in Standby Position
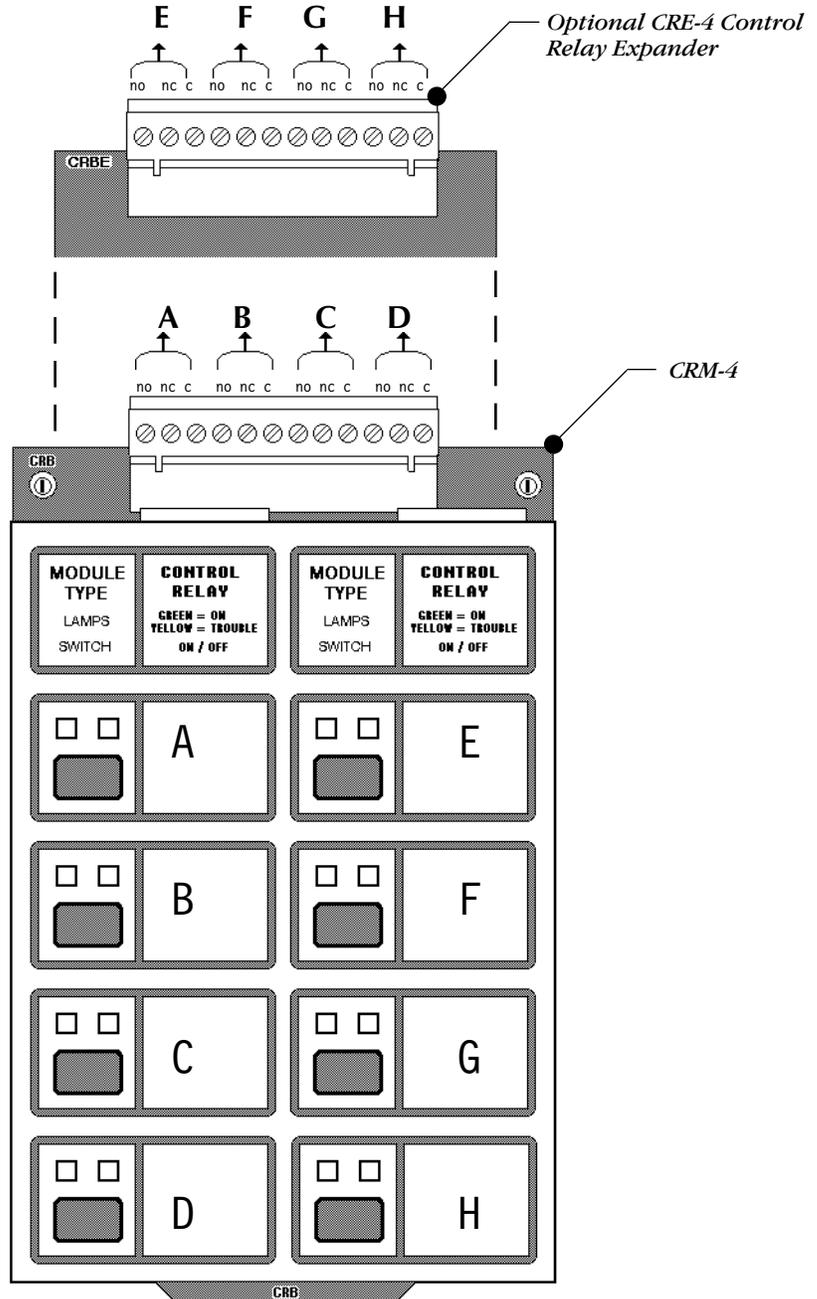
Field Wiring the MPS-400 Power Supply

MPS-400 Terminal Blocks and LEDs

Warning: Before applying AC power, set the 115V/230V Voltage Select switch to the proper voltage.

The following drawing shows the terminal blocks used to wire the MPS-400 power supply. The drawing also identifies relay switches (S4 and S5) and LEDs for ground fault, AC power on, and Notification Appliance Circuits 1-4. The following table lists the functions for the terminal blocks.

Terminal	Function
TB1	Power Input 120/240VAC,50/60 Hz.
TB2	24 VDC Power out – the total available power limited by power supply.
TB3–TB6	Relays (dry contacts): TB3 (Alarm); TB4 (Trouble); TB5 (Supervisory); TB6 (Security). Use SW4 or SW5 to select relay functions. (Refer to "Output Circuits.")
TB7–TB10	NAC/Releasing circuits: TB7 – NAC1; TB8 – NAC3; TB9 – NAC 2; TB10 – NAC 4. The labels shown for TB7 and TB9 apply to all four NAC circuits.

Refer to "Power Connections" and "Output Circuits" for more information on MPS-400 connections.
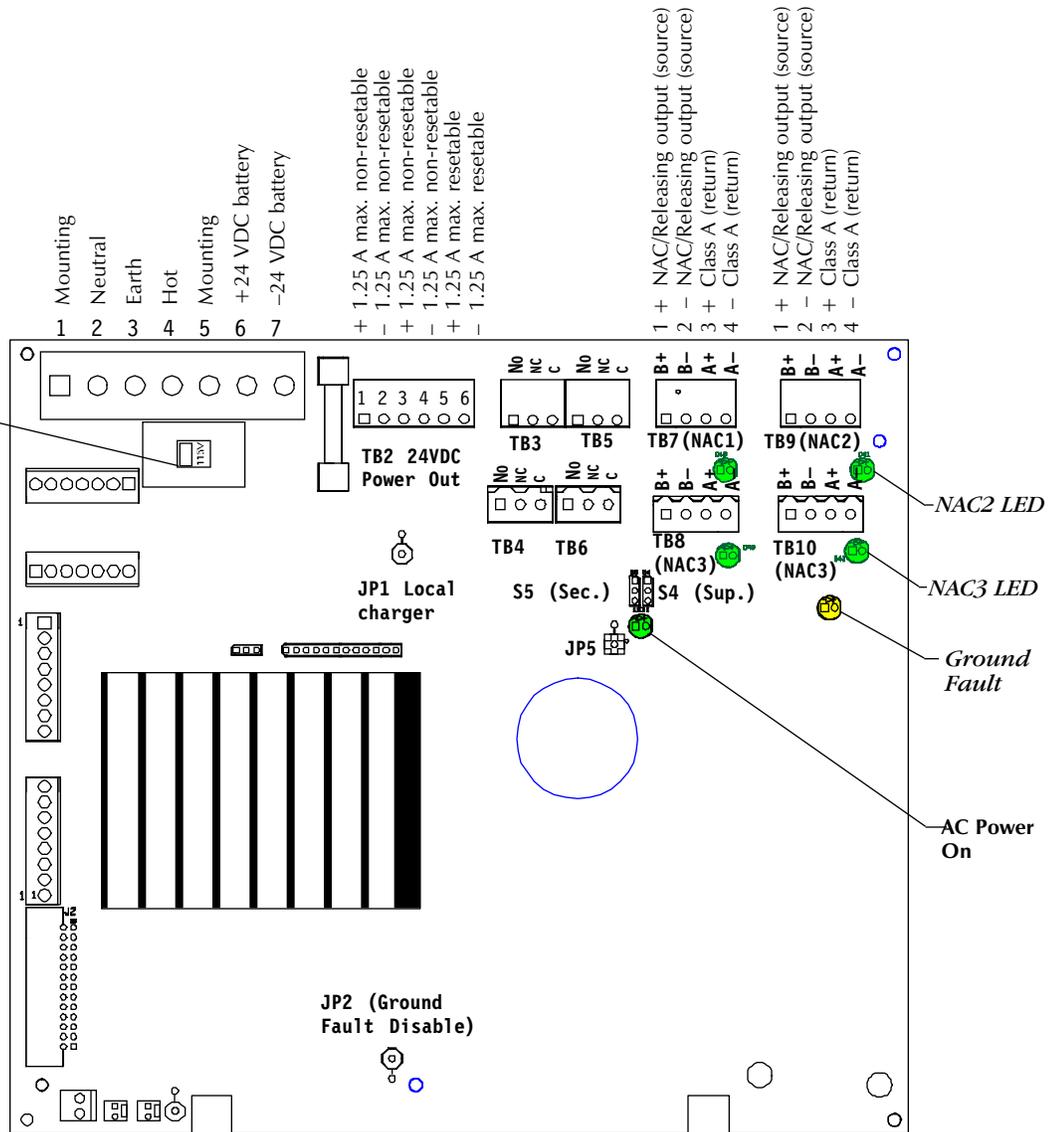
MPS-400 Power Supply Board

Connecting the CPU-400 to the MPS-400

Overview

Connect the CPU-400 to the MPS-400 as shown in the wiring diagram. Use the following cable assemblies.

Cable and Part Number		Cable Assembly
Power Harness		
CAB-400AA	75396	
CAB 3	75395	
Power Ribbon		
CAB-400AA	75398	
CAB 3	75394	

Power Cables

CPU-400 to MPS-400 Wiring Diagram

CPU Power *J6*

J3

J6

J2

Signal

J4 – Auxiliary Trouble Cable

J5 – Security Tamper Switch (jumper on non-security systems)

Zone Coder input
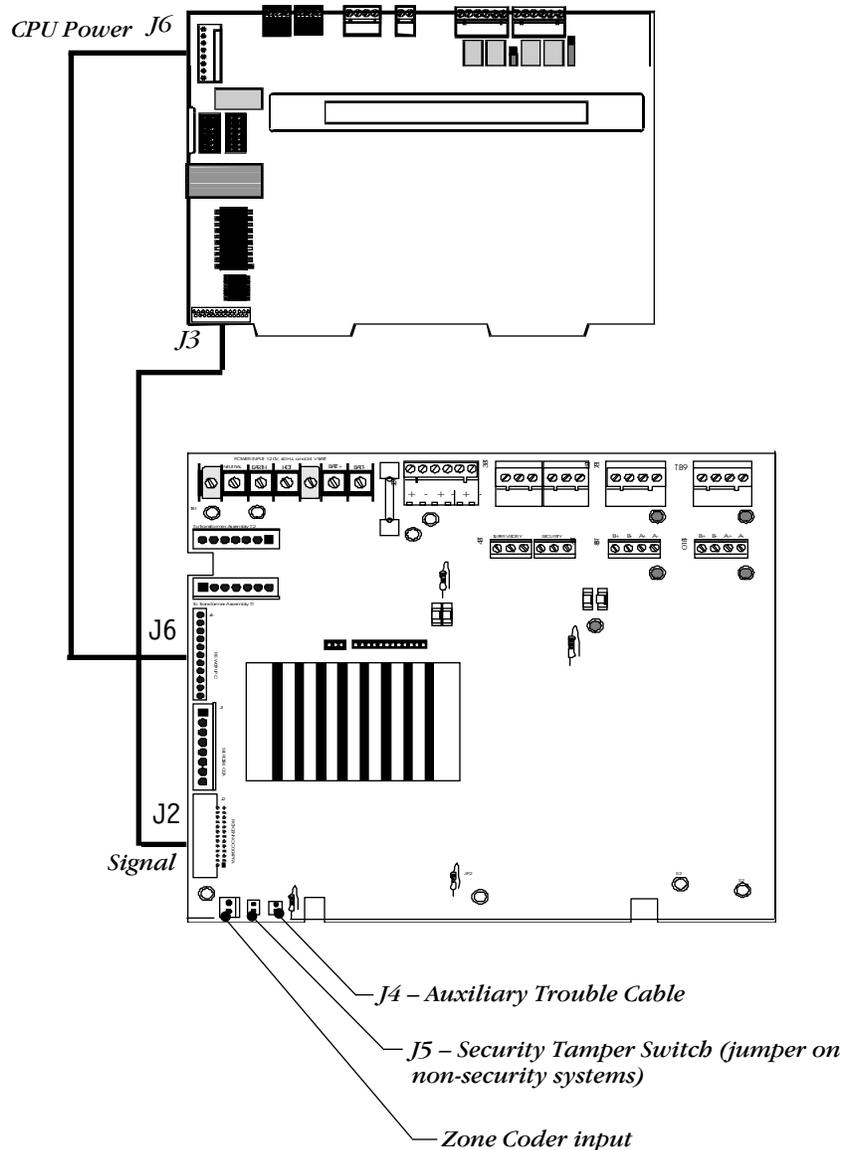
Field Wiring an Optional AVPS-24

AVPS-24 Wiring Overview

This section covers wiring an AVPS-24. Use the Auxiliary Bell Power Harness to provide power to indicating circuit modules. Use TB2 terminals for a power circuit run to CMX Control Modules. Refer to the following table for connections between the AVPS-24 and the MPS-400.

Pin	Function	Connect to MPS-400...
TB1-1	Earth ground in	chassis or earth ground terminal
TB1-2	secondary power (24 VDC) positive (+) connection	TB1-6 (+)
TB1-3	secondary power (24 VDC) negative (–) connection	TB1-7 (–)
TB1-4	primary power (120 VAC) neutral connection	TB-2 (neutral)
TB1-5	primary power (120 VAC) hot connection	TB1-4 (hot)
TB1-6	Earth ground out	TB1-3 (earth ground)

AVPS-24 to MPS-400 Connections

Connecting an AVPS-24 to an ICE-4 or an ICM-4

Plug the Auxiliary Bell Power Harness to the connector J5 on the ICM-4 or the ICE-4.

The Auxiliary Bell Power Harness provides 24 VDC special purpose power (unfiltered, unregulated, power-limited (3.0 amps maximum) to indicating circuit modules.
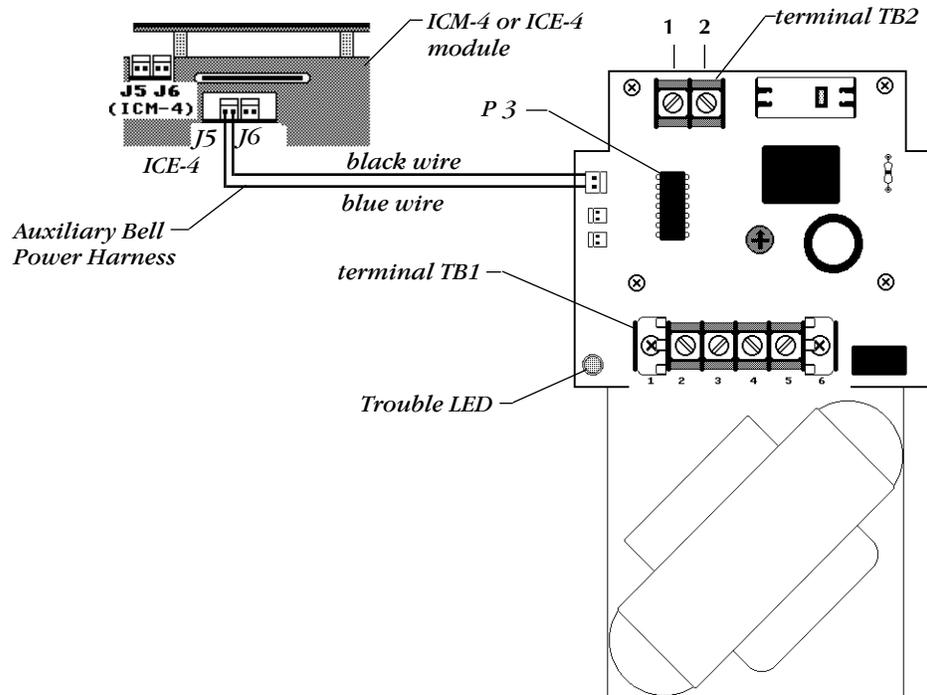
Connecting Multiple Audio Visual Power Supplies
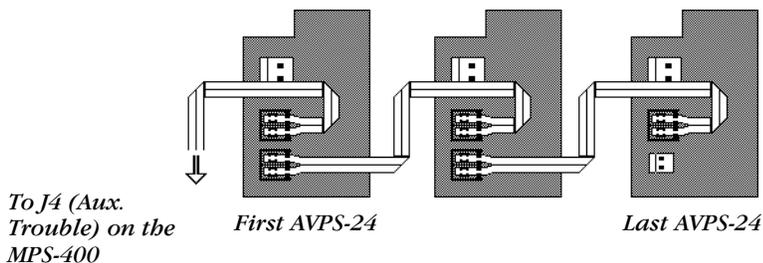
Wiring Four-Wire Smoke Detectors

Overview

Wire initiating devices which require 24 VDC operating power as shown in the wiring diagrams below. Refer to the Device Compatibility Document 15378 for detector and power supervision relays.

Field Wiring

1) Connect the Power Supervision Relay coil leads to the last detector base 24 VDC screw terminal.
2) Calculate the maximum allowable resistance in the 24 VDC detector power wiring as follows:

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

Where: Rmax   the maximum resistance of the 24 VDC wires
Vom   the minimum operating voltage of the detector or end of line relay – whichever is greater – in volts.
N   the total number of detectors on the 24 VDC supply loop.
Is   the detector current in standby.
NA   the number of detectors on the 24 VDC power loop which must function at the same time in alarm.
Ia   the detector current in alarm.
Ir   the end of line relay current.

Style D Wiring Diagram

All connections are supervised and power limited
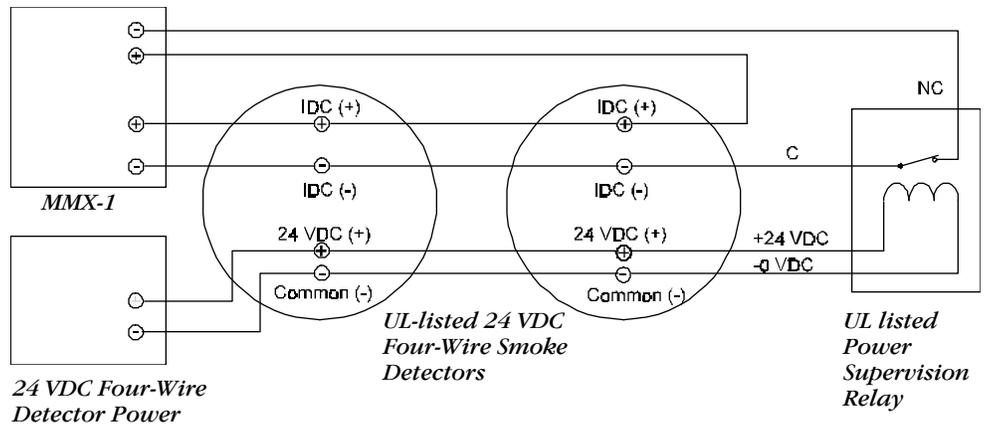
Wiring Four-Wire Smoke Detectors (Style D)

Style B Wiring Diagram

All connections are supervised and power limited
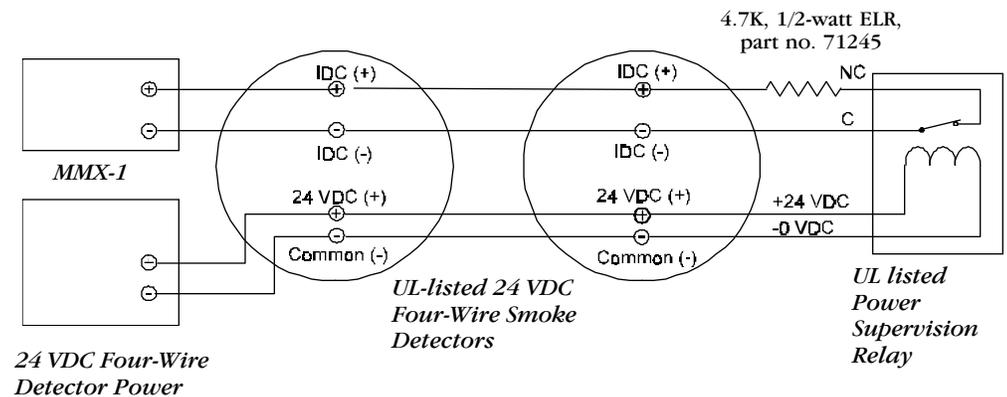
Wiring Four-Wire Smoke Detectors (Style B)

Notification Appliance Circuit Current Configuration

Overview

📑 "Total" in these figures assumes that no notification appliance power is drawn for any other purpose.

The total current available from any group of Notification Appliance Circuits cannot exceed the following:

- 3.0 A when powered from the AVPS-24; or
- 1.25 A when powered from an MPS-400 output.

The following figure shows the bottom wire connections of the ICM-4 and the ICE-4 modules.

blue wire

black wire

MPS Bell Power Harness (71093)

J5 J6
(ICM-4)

J5 J6
(ICE-4)

connector orientation
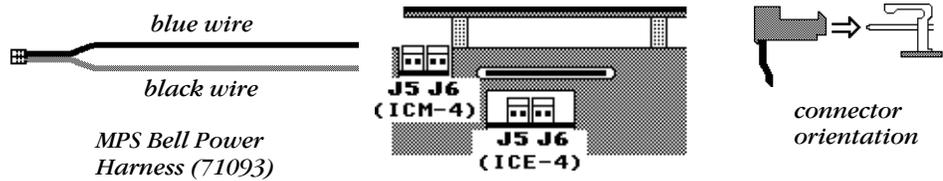
Typical Supply/ Notification Circuit Configurations

The following figures show typical power supply to Notification Appliance Circuit configurations.

TB2-1 and TB2-2 1.25 A

MPS-400 → J5 ICM-4 / J6

ICE-4 J5

These eight NAC Circuits share 1.25 A.

TB2-1 and TB2-2 1.25 A

MPS-400 → J5 ICM-4 / J6

These two NAC circuits share 1.25 A from MPS-400 TB2-1 and TB2-2.

These two NAC circuits share 1.25 A from MPS-400 TB2-3 and TB2-4.

TB2-3 and TB2-4 1.25 A

TB2-1 and TB2-2 1.25 A

MPS-400 → J5 ICM-4

These NAC circuits share 1.25 A from MPS-400 TB2-1 and TB2-2.

J5 ICM-4

These NAC circuits share 1.25 A from MPS-400 TB2-3 and TB2-4.

TB2-3 and TB2-4 1.25 A
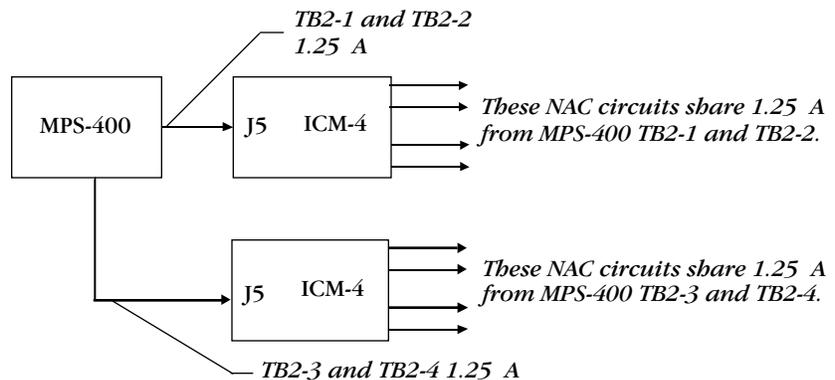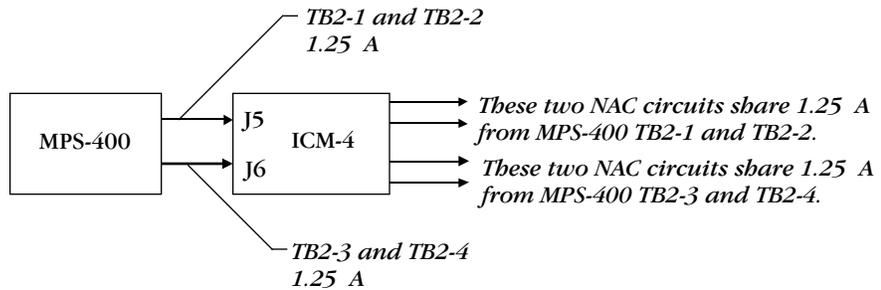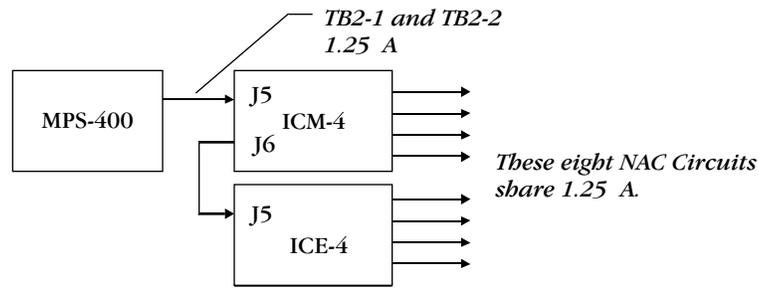
Notification Appliance Circuits Current Configuration

**Typical Supply/
Notification Circuit
Configurations**

AVPS-24 #1	→	J5 ICM-4 → → → →	*These four NACs share 3 amps of one AVPS-24 (#1).*

AVPS-24 #2	→	J5 ICM-4 J6 → → → →	*These eight NACs share the total 3 amps of the second AVPS-24 (#2).*
		J5 ICE-4 → → → →	

AVPS-24 #1	→	J5 ICM-4 → → → →	*These four NACs share 3 amps of one AVPS-24 (#1).*

AVPS-24 #2	→	J6 ICE-4 → → → →	*These four NACs share 3 amps of one AVPS-24 (#2).*
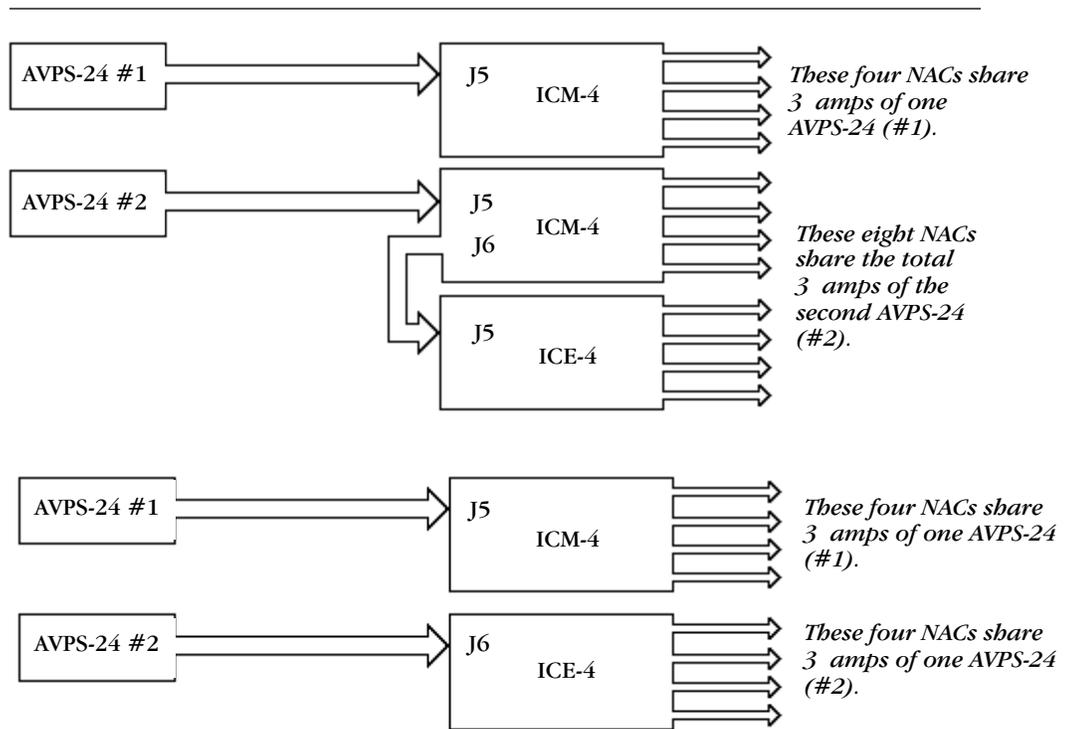
For this configuration (using two AVPS-24 supplies to power an ICM-4 or ICE-4), cut jumper JP1 located above J5 and J6.

JP1

J5   **J6**

ICM-4 or ICE-4

AVPS-24 #1	→	J5 ICM-4 → →	*These two circuits share 3 amps of one AVPS-24 (#1).*
AVPS-24 #2	→	J6 → →	*These two circuits share 3 amps of one AVPS-24 (#2).*
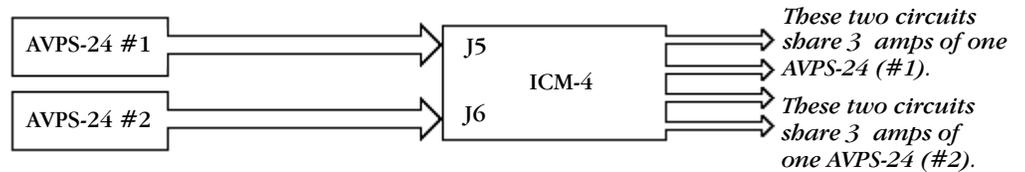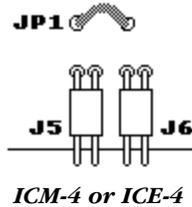
Power Supply Calculations

AC Branch Circuit Current

Follow these guidelines when wiring the AC branch circuit current :

- The control panel requires connection to a separate dedicated AC fire alarm circuit, which must be labeled "FIRE ALARM."
- The AC power circuit must connect to the line side of the main power feed of the protected premises.
- No other equipment can be powered from the fire alarm circuit.
- The AC power circuit wiring must run continuously, without any disconnect devices, from the power source to the fire alarm control panel.
- Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code as well as local codes.
- Use #12 AWG wire with 600-volt insulation for this circuit.

Use the following table to determine the total amount of current, in AC amps, that a 120V, 50/60 Hz service must be capable of supplying to the system. Devices rated for 240 VAC operation will draw one half the current listed in Table 2-1.

Device Type	No. of Devices		Current (amps)		Total Current
AVPS-24	[ ]	X	1.00	=	
AA-30	[ ]	X	1.00	=	
AA-120	[ ]	X	1.85	=	
MPS-400	[ ]	X	3.00	=	
Remote Battery Charger	NR45-24	X	1.0	=	
Sum column for AC Branch Current required				=	amps

Table 2-1 120 VAC Fire Alarm Circuit

The Main Power Supply (MPS-400)

The MPS-400 must be capable of powering all internal system devices (and several external types of devices) continuously during non-fire alarm conditions. Use calculation column 1 in Table 2-2 to determine the Non-Fire Alarm Load on the MPS-400 regulator when applying primary power. The MPS-400 must provide a finite amount of additional current during a fire alarm condition. Use calculation column 2 in Table 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 MPS-400 in either case.

The MPS-400 can provide the following:

- a total of 3 amps at 24 VDC during Standby; and
- 6 amps at 24 VDC during alarm.

Continued on the next page...

Calculating the System Current Draw

How to Use Table 2-2

Throughout these current calculation tables, "Primary" refers to the FACP primary source of AC power. "Secondary" refers to the FACP backup batteries (or any other 24 VDC uninterruptable, regulated power supply listed for Fire Protective Signaling and connected in place of the batteries).

The Primary Power Source Non-Alarm Current and Alarm Current columns of Table 2-2 are current calculations. These calculations confirm that the MPS-400 can supply enough current to support the system during Primary Non-Fire Alarm and Fire Alarm conditions.

Column 1 (Primary, Non-Fire Alarm Current in amps**)** – Sum column 1 of Table 2-2 to get the current drawn from the MPS-400 during a non-alarm condition, with AC power applied. This current draw cannot exceed 3 amps.

Column 2 *(*Primary, Fire Alarm Current in amps) – Calculation column 2 of Table 2-2 lets the system designer determine the current load that the MPS-400 must support during a fire alarm. The total current drawn from the MPS-400 during a fire alarm cannot exceed 6 amps.

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

- *If using four-wire detectors* – In Table 2-2, the primary fire alarm current to be entered for four-wire smoke detectors equals the manufacturer's rated fire alarm current minus the manufacturer's rated non-fire alarm current.

- *If using notification appliances* – The MPS-400 provides a regulated supply for Notification Appliance Circuits, allowing the use of any 24 VDC notification appliances UL listed for Fire Alarm Systems.

Column 3 [Secondary (Battery) Non-Alarm Current] – The last column of Table 2-2 lets the system designer calculate the secondary non-fire alarm current. This is the current drawn from the secondary source in a non-fire alarm condition during AC power loss. This figure is required to complete the standby battery calculations. After summing all current draws, insert the total figure in Table 2-3.

Calculation Columns for Table 2-2

No more than 6 amps of current can be drawn from the MPS-400 during an alarm condition.

Calculating the System Current Draw

How to Use Table 2-2, continued

1) For the MPS-400, enter the total notification appliance draw from the MPS-400, excluding the current from AVPS-24 supplies.
2) The total regulated load current supplied to four-wire smoke detector and power supervision relays cannot exceed 1.25 amps.
3) TB-2 contains three power outputs. The load on a power output cannot exceed 1.25 amps.
4) The total regulator load cannot exceed 6 amps in alarm and 3 amps in standby.

Category	Calculation Column 1 Primary, Non-Fire Alarm Current (amps)			Calculation Column 2 Primary, Fire Alarm Current (amps)			Calculation Column 3 Secondary, Non-Fire Alarm Current (amps)		
	Qty	X [current draw]=	total	Qty	X [current draw]=	total	Qty	X [current draw]=	total
Basic system (CPU-400 + MPS-400)	1	x [ ] = x [ ] =	0.225	1	x [ ] = x [ ] =	0.420	1	x [ ] = x [ ] =	0.170
AVPS-24	[ ]	x [0.009]=		[ ]	x [0.009]=		[ ]	x [0.009]=	
ICM-4, CRM-4 ICE-4 CRE-4 DCM-4 VCE-4 VCM-4	[ ] [ ] [ ] [ ] [ ] [ ]	x [0.007]= x [0.001]= not applicable x [0.008]= x [0.001]= x [0.007]=		[ ] [ ] [ ] [ ] [ ] [ ]	x [0.072]= x [0.065]= x [0.065]= x [0.080]= x [0.040]= x [0.040]=		[ ] [ ] [ ] [ ] [ ] [ ]	x [0.007]= x [0.001]= not applicable x [0.008]= x [0.001]= x [0.007]=	
AFM-16AT, AFM-32A ACM-16AT, ACM-32A AEM-16AT, AEM-32A AFM-16A LCD-80, LCD-80TM ACM-8R (refer to Doc. 15342) LDM (refer to Doc. 15885) UZC-256 NIB-96	[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.040]= x [0.040]= x [0.002]= x [0.025]= x [0.100]= x [ ]= x [ ]= x [0.035]= x [0.022]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.056]= x [0.056]= x [0.018]= x [0.065]= x [0.100]= x [ ]= x [ ]= x [0.085]= x [0.		[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	x [0.040]= x [0.040]= x [0.002]= x [0.025]= x [0.050]= x [ ]= x [ ]= x [0.035]= x [0.022]=	
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-120	NOT APPLICABLE						[ ] [ ]	x [0.045]= x [0.050]=	
2-Wire Smoke Detectors (refer to the Device Compatibility Document for current draws)	[ ] [ ] [ ] [ ]	x [ ]= x [ ]= x [ ]= x [ ]=		[ ] [ ] [ ] [ ]	x [ ]= x [ ]= x [ ]= x [ ]=		[ ] [ ] [ ] [ ]	x [ ]= x [ ]= x [ ]= x [ ]=	
RPT-W, RPT-WF, RPT-F RPT-485W RPT-485WF	[ ] [ ] [ ]	x [0.017]= x [0.017]= x [0.017]=		[ ] [ ] [ ]	x [0.017]= x [0.017]= x [0.017]=		[ ] [ ] [ ]	x [0.017]= x [0.017]= x [0.017]=	
SDX, CPX & FDX-551, SDX-551TH MMX-1, MMX-101, CMX-1 BGX-101L CMX-2 MMX-2 (see Doc. M500-03-00) B601BH B501BH (Horn in base) DHX-501, DHX-502 (see instructions) ISO-X	[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	X [0.00020]= X [0.00030]= X [0.00030]= X [ ]= X [0.00100]= X [0.00100]= X [ ]= X [0.00045]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	X [0.00020]= X [0.00030]= X [0.00030]= X [ ]= X [0.00100]= X [0.00100]= X [ ]= X [0.00045]=		[ ] [ ] [ ] [ ] [ ] [ ] [ ] [ ]	X [0.00020]= X [0.00030]= X [0.00030]= X [ ]= X [0.00100]= X [0.00100]= X [ ]= X [0.00045]=	
UDACT Communicator	[ ]	x [0.040]=		[ ]	x [0.100]=		[ ]	x [0.040]=	
Notification Appliance powered from MPS-400 (see note 1)	Not Applicable			[ ] [ ]	x [ ]= x [ ]=		Not Applicable		
4-Wire Smoke Detectors (see note 2)	[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=	
Power Supervision Relays (see note 2)	[ ]	x [ ]=		[ ]	x [ ]=		[ ]	x [ ]=	
Other devices drawing power from MPS-400 TB2 excluding smoke detectors (see note 3)	[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=		[ ] [ ]	x [ ]= x [ ]=	
Remote Station Circuits	[ ]	x [0.018]=		[ ]	x [0.018]=		[ ]	x [0.018]=	
Sum each column for totals	Primary, non-alarm total:			Primary, alarm total:			Secondary, alarm total:		

Table 2-2 AFP-400 System Current Draw Calculations

Calculating the Maximum Secondary Power Fire Alarm Current Draw

How to Use Table 2-3

The Secondary Fire Alarm Load cannot exceed the following:

- 9.0 amps with PS-12120 batteries; and
- 12 amps with PS12250 or PS-12550 batteries.

Use Table 2-3 to determine the maximum current requirements of secondary power source during fire alarm conditions. The total obtained in Table 2-3 is the amount of current that the batteries must be capable of supplying. Use this figure in Table 2-4 to determine the size of the batteries needed for the fire alarm system.

Figures taken from Table 2-3 assume that, while in a fire alarm condition, batteries must feed the main power supply (and any additional supplies such as the AVPS-24 and AA-30) with the maximum rated power each supply can provide.

On a system with a power supply having a small load, you can calculate the exact alarm current requirements of the secondary supply. To do so, add the secondary Non-Fire Alarm Load (from Table 2-2) to the total fire alarm current draw of all Notification Appliances in the system. Use this value in Table 2-4.

Device	No. in Alarm (Simultaneously)	Multiply by	Current (in amps)	Total Current/Type
MPS-400	1	X	6	
AVPS-24	[ ]	X	3	
AA-30	[ ]	X	3	
AA-120	[ ]	X	7.3	
Sum Column for Secondary Fire Alarm Load =				

Table 2-3 *Maximum Secondary Power Fire Alarm Current Draw*

Calculating the Secondary Power

Secondary Non-Fire Alarm (current from last column in Table 2-2)	X	Required Secondary Non-Fire Alarm Standby Time (24 or 60 hours)	=	Non-Fire Alarm Secondary Amp Hours
Secondary Fire Alarm Load (from Table 2-3)	X	Required Fire Alarm Standby Time (for 5 minutes, enter 0.084; for 15 minutes, enter 0.25)	=	Secondary Fire Alarm Amp Hour Requirement
Sum Column for Total Secondary Amp Hours calculated =				
Multiply by the derating factor x 1.2 =				
Total Secondary Amp Hours Required				AH

Table 2-4 Secondary Power Standby and Fire Alarm Load

Notes:
1) NFPA 72 Local, Proprietary, and Central Station systems require 24 hours of standby power followed by 5 minutes in alarm.
2) NFPA Auxiliary and Remote Station Systems require 60 hours of standby power followed by 5 minutes in alarm.
3) Batteries installed in a system powered by a generator need to provide at least 4 hours of standby power.
4) Factory Mutual requires 90 hours of standby for deluge-preaction systems.
5) Emergency voice/Alarm communications systems require 2 hours of operation in the alarm condition, however, due to the sporadic nature of voice operation, NFPA 72 permits 15 minutes of operation at maximum connected load to be considered the equivalent of 2 hours of normal use.
6) If the total exceeds 25 AH, the system requires a BB-55. If the total exceeds 55 AH, an Uninterruptable Power Supply with sufficient amp-hour capacity is needed. The Uninterruptable Power Supply must be listed for Fire-Protective Signaling.

Calculating the Battery Size

Table 2-5 sums the standby and alarm loads to determine the battery size, in amp-hours, needed to support the system. Select batteries that meet or exceed the Total Amp-Hours calculated and that are within the acceptable charger range. Write the amp-hours requirements on the Protected Premises label located on the AFP-400.

Battery charger amp-hour range: 12-55AH

Battery Size	Voltage Rating	Number Required	Part Number	Cabinet Size
12 AH	12 volts	two	PS-12120	CAB-A3, B3, C3, D3
25AH	12 volts	two	PS-12250	CAB-A3, B3, C3, D3
55AH	12 volts	two	PS-12550	BB-55

Table 2-5 Selecting the Battery Size

Power Connections

DC Power Output Connections

⚠

CAUTION: Several different sources of power can be connected to this panel. Disconnect all sources of input power before servicing. While energized, the control panel and associated equipment can be damaged by removing and/or inserting cards, modules, or interconnecting cables.

📄 All DC power outputs are power-limited.

Non-resettable Power Circuit 1   *Non-resettable Power Circuit 2*   *4-Wire Smoke Detector Power*

1   2   3   4   5   6

TB2 DC Outputs
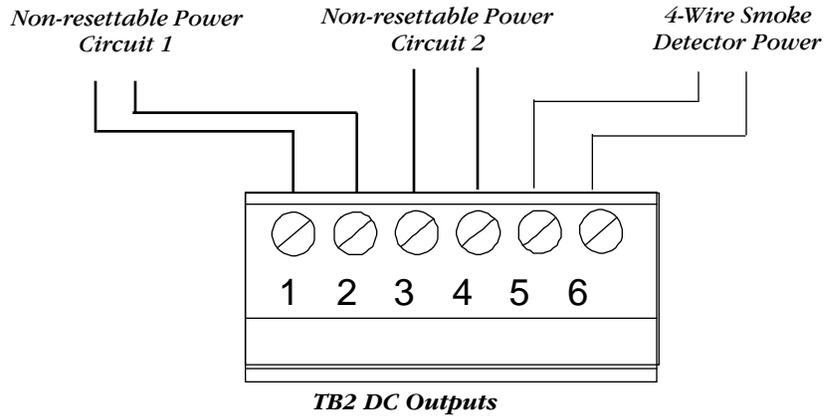
Non-resettable Power (Circuits 1 and 2) – Two 24 VDC filtered, regulated, non-resettable power, 1.25 amp circuits. Use these circuits to power notification appliances, annunciators, and other devices requiring regulated 24 VDC power.

4-Wire Smoke Detector Power – 24 VDC filtered, regulated, resettable power for four-wire smoke detectors can be obtained from TB1 terminals 5 (+) and 6 (–).

AC and Battery Power Connections

⚠

CAUTION: Battery contains sulfuric acid which can cause severe burns to the skin and eyes, and can destroy fabrics. If contact is made with sulfuric acid, immediately flush skin or eyes with water for 15 minutes and seek immediate medical attention.

Primary power required for the control panel is 120 VAC or 240 VAC, 50/60 Hz, 3 amps. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Code (NEC) and/or local codes. Use #14 AWG or larger wire with 600 volt rating.

Observe polarity when connecting batteries. Connect the battery cable to TB1 on the power supply board. Refer to "Power Supply Calculations" for information on determining the correct battery rating. AC and battery wiring are not power limited. Maintain at least 0.25 in. between power limited and nonpower limited wiring.

📄 For more information, refer to Appendix F, "UL Power Limited Wiring Requirements."

NEUT. EARTH HOT   BAT+ BAT-
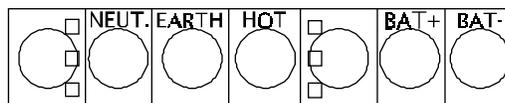
MPS-400 – Terminal TB1

Output Circuits

Notification Appliance Circuits

The control panel provides four Notification Appliance (bell) Circuits (Style Y or Z). Each circuit can provide 2.5 amps of current. Total current drawn from the MPS-400 cannot exceed 6.0 amps (refer to Table 2-2). Use UL listed 24 VDC notification appliances only.
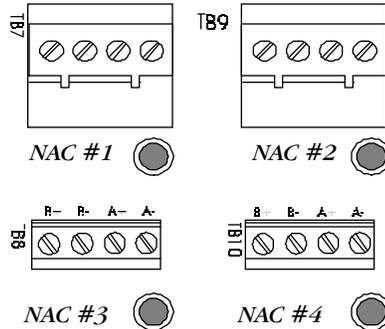
TB7–TB10 – NAC/Releasing
1 + NAC/Releasing output (source)
2 – NAC/Releasing output (source)
3 + Class A (return)
4 – Class A (return)

- *Each circuit is power limited and supervised.*
- *Polarity shown in alarm.*

ELR 2.2K, 1/2 W (supplied with the MPS-400)

Unused Circuits

Style Y (Class B) Connection

Style Z (Class A) Connection
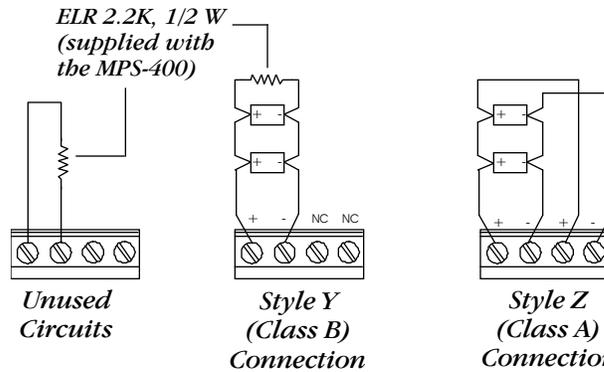
Notification Appliance/Releasing Circuit Connections

Releasing Circuits

You can program any Notification Appliance Circuit as a releasing circuit. Refer to "Releasing Circuits" in the AFP-400 Programming Manual. Refer to the Notifier Device Compatibility Document 15378, for a list of compatible releasing devices.

Standard Relays

The control panel provides a set of Form-C alarm and a set of Form-C trouble contacts rated for 2.0 amps @ 30VDC (resistive). The panel also provides a Form-C *Supervisory* contact and Form-C *Security* contact rated for 2.0 amps @ 30VDC (resistive). (Supervisory and Security contacts can be set to Alarm contacts using switches SW4 and SW5.)

MPS-400

ALARM CONTACTS   TROUBLE CONTACTS
TB3   NO   NC   C   NO   NC   C   TB5

SUPERVISORY   SECURITY
TB4   NO   NC   C   NO   NC   C   TB6

SW4 set to Supervisory
SW5 set to Securtiy

SW5   ALARM / SECURITY
SW4   ALARM / SUPERVISORY
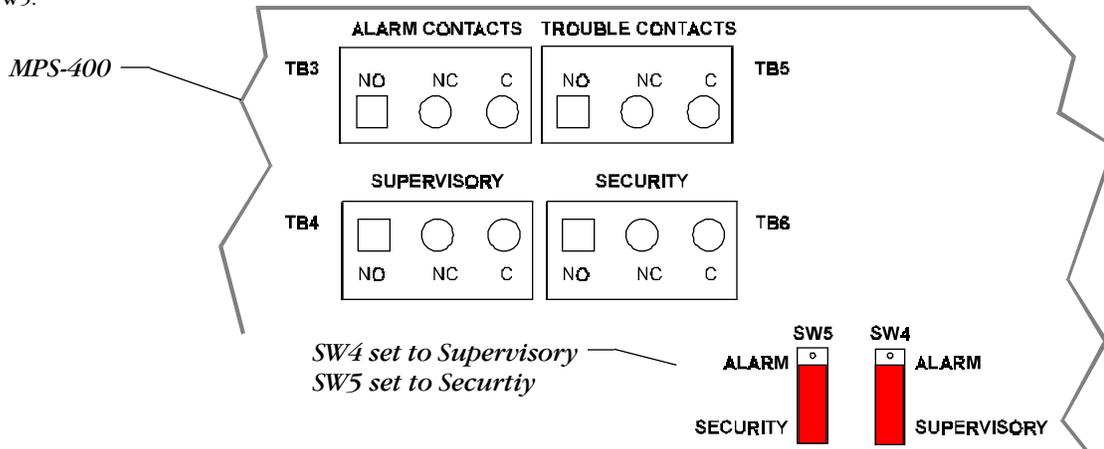
Relay Connections

Remote Printers and CRTs

Remote Printers

📝 You can also use the EIA-232 printer interface with EDP-listed equipment, such as personal computers, to monitor the control panel for supplementary purposes.

The PRN-4 remote printer prints a copy of all status changes within the AFP-400 and time-stamps the printout with current time of day and date. The PRN-4 provides 80 columns of data on standard 9" by 11" tractor-feed paper. This section contains information for setting the printer options and connecting a printer to the AFP-400 control panel.

Setting PRN-4 Options

Refer to the documentation supplied with the PRN-4 for instructions on using the printer menu controls. Set the printer options (under the menu area) as listed in the following table.

DIP Switches			System Status	NAC 1 (B01)	Function
6	7	8			
X	X	X	No Alarm	OFF	Standby
OFF	OFF	OFF	No Alarm	ON	1000 Hz 1/2 sec on, 1/2 sec off
OFF	OFF	OFF	Alarm	X	Slow whoop
OFF	OFF	ON	No Alarm	ON	Horn
OFF	OFF	ON	Alarm	X	120ppm
OFF	ON	OFF	No Alarm	ON	Horn
OFF	ON	OFF	Alarm	X	Yelp
OFF	ON	ON	No Alarm	ON	Yelp
OFF	ON	ON	Alarm	X	Wail
ON	OFF	OFF	No Alarm	ON	3 slow whoops, VRAM-B
ON	OFF	OFF	Alarm	X	3 slow whoops, VRAM-A
ON	OFF	ON	No Alarm	ON	VROM B
ON	OFF	ON	Alarm	X	VROM A
ON	ON	OFF	No Alarm	ON	20 ppm
ON	ON	OFF	Alarm	X	VROM A & B
ON	ON	ON	No Alarm	ON	Horn
ON	ON	ON	Alarm	X	NFPA Uniform Code 3 temporal pattern fast whoop
X = Indicates that Switch or Control Point may be either "ON" or "OFF"					

PRN-4 Setup Options

Continued on the next page...

Remote Printers and CRTs

**Connecting a PRN-4
Remote Printer**

Remote printers require a 120 VAC, 50/60 Hz primary power source and a secondary power source (battery backup). Because a secondary power source is not provided, use a separate Uninterruptable Power Supply (UPS), which is UL listed for Fire Protective Signaling. Install the remote printer to the control panel as follows:

1) Assemble a custom cable for connection to the printer EIA-232 port.

PRN (EIA-232)		CPU-400 (TB1)
TX (Pin 3)	———————	TB1-1
RX (Pin 2)	———————	TB1-2
REF (Pin 7)	———————	TB1-3

Printer Cable Pinouts

2) Connect the cable between the CPU-400 and the PRN-4 through an EIA-232 interface as shown in the figure below.

Plug the DB-25 connector into the EIA-232 port of the printer/PRN-4.

PRN-4
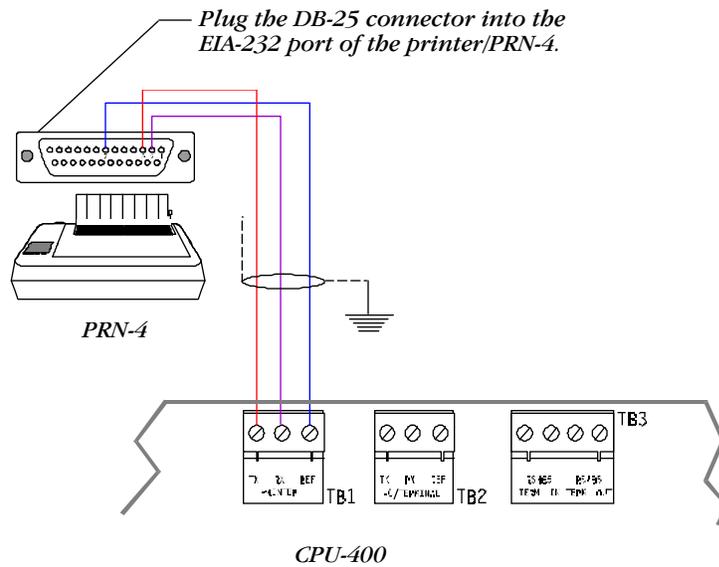
CPU-400

Remote Printer Connections

Remote Printers and CRTs

Connecting a Keltron Printer

Connect a Keltron printer to the CPU-400 as follows:

1) Connect the printer cable to terminal TB1 on the CPU-400.
2) Connect the DB-25 connector to the EIA-232 port of the Keltron printer.
3) Connect DC power from terminal TB2 on the MPS-400.

📄 Outputs are power limited but are not supervised.
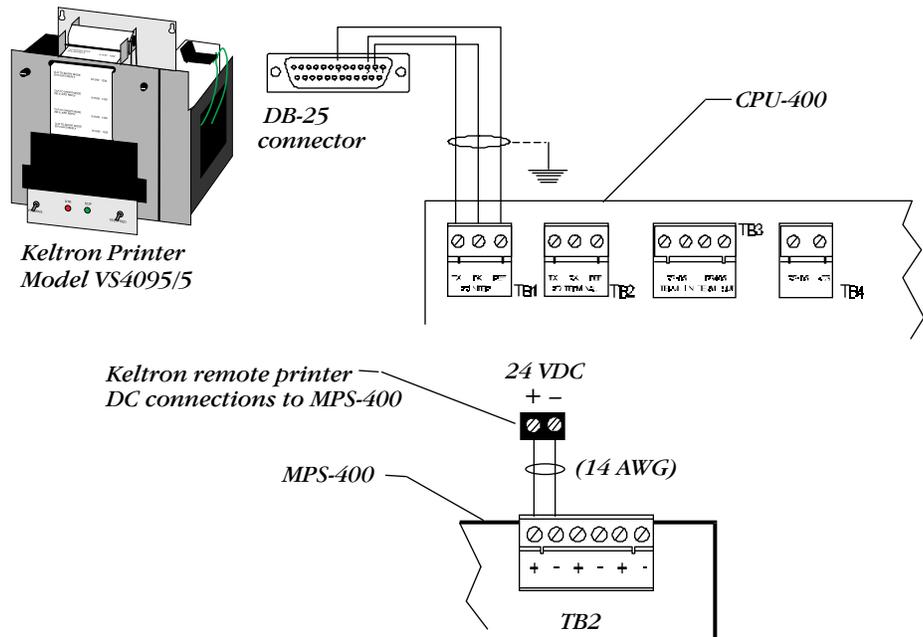
Keltron Printer Connections

Setting up the Printer

1) Connect the printer with overall foil/braided-shield twisted paired cable suitable for EIA-232 applications. Typically 50 feet maximum between printer and control panel.
2) The printer communicates using the following protocol:

Set the...	To...
Baud rate	2400
Parity	Even
Data Bits	7

3) Set the DIP switches SP1 and SP2 according to the tables below.

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

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

Remote Printers and CRTs

Connecting a CRT

Connect a CRT to the CPU-400 as follows:

1) Connect one end of the cable to terminal TB2 on the CPU-400.

Connect	To CPU terminal...
TX (pin 3)	TB2-1
RX (pin 2)	TB2-2
REF (pin 7)	TB2-3

For terminal interface and protocol information, refer to Appendix E.

2) Plug the DB-25 connector to the EIA-232 port of the CRT.
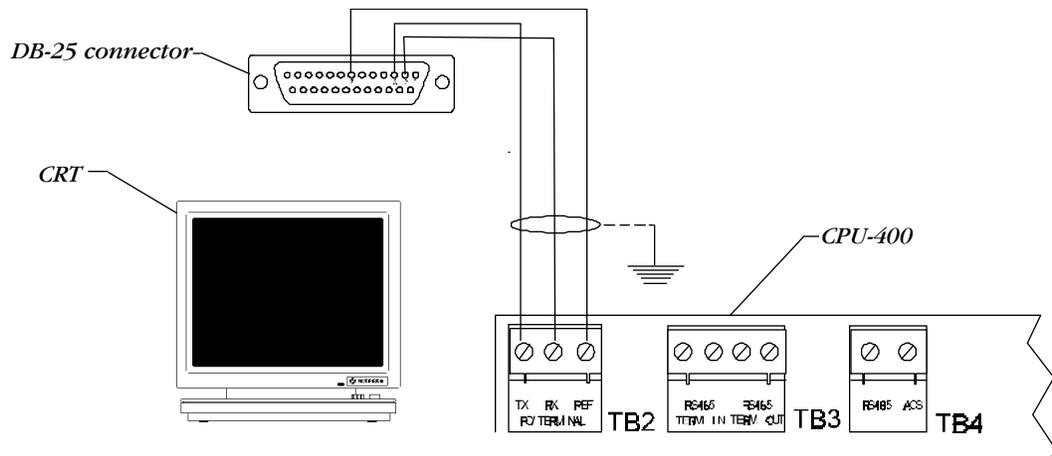
Connecting a CRT

Connecting Multiple Printers, CRTs, or CRT/PRN Combination

Connecting Multiple Printers, CRTs, or Combination requires changing the CRT-2 setup using the F1 (Quick) menu:

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

Connect multiple devices as shown in the following diagram.

For complete information on setting up the CRT-2, refer to Appendix E, "Terminal Interface Protocol."
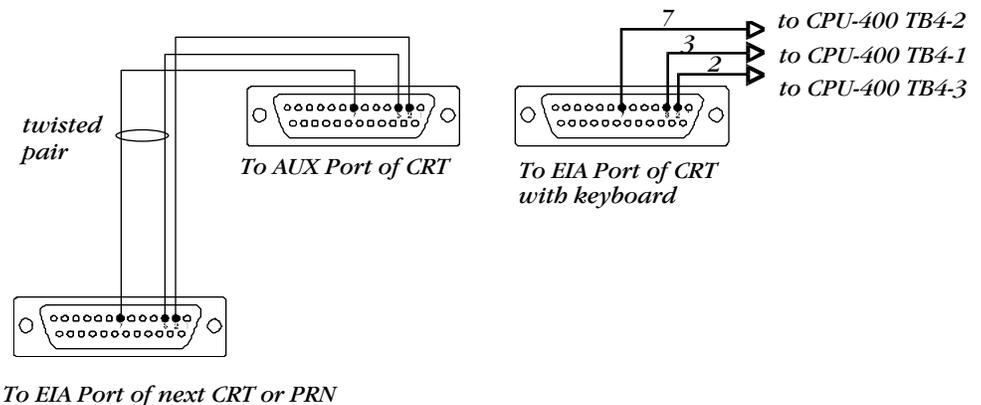
Connecting Multiple Printers, CRTs, or CRT/PRN Combinations

Wiring a Signaling Line Circuit (SLC)

SLC Overview

Communication with intelligent and addressable initiating, monitor and control devices occurs through a Signaling Line Circuit (SLC) Loop. You can wire an SLC loop to meet the requirements of NFPA Style 4, Style 6, or Style 7 circuits. The following table covers the types of devices that you can use in SLC circuits.

Type of Device	SLC Function
Isolator Modules (ISO-X)	Allows a zone of detectors and modules to be electrically isolated from the remainder of the loop, which lets critical loop components function if a circuit fails. ISO-X modules are required for NFPA Style 7 circuits.
Addressable Monitor Modules (MMX series)	Allows the control panel to monitor entire circuits of conventional, alarm initiating devices, such as manual pull stations, detectors, waterflow and supervisory devices. The BGX-101L (a type of monitor module) provides point annunciation of manual pull stations.
Control Modules	Allows the control panel to selectively activate notification circuits or Form-C output relays.
Intelligent Detectors	Allows the control panel to communicate with intelligent ionization, photoelectric, and thermal detectors on the loop.

Device Capacity

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

Control panel capacity includes up to 198 intelligent detectors, and an additional combination of up to 198 addressable pull stations, control modules and monitor modules. In addition, the control panel also supports four Notification Appliance Circuits and up to 99 programmable relays.

Loop Performance

Loop performance depends on the type of circuit: Style 4, Style 6, or Style 7. The "Communications Loop Performance" table lists the trouble conditions that result when a fault exists on a communications loop. The following notes apply to the table.

- "Trouble" indicates a trouble signal will be generated at the control panel during the abnormal condition.
- "Alarm/Trouble" indicates an alarm signal can be transmitted to the control panel during the abnormal condition.
- Loop operation meeting Style 7 requirements isolates entire physical zones on the communications loop from faults that occur within other areas of the communications loop.

Fault in Loop	Style 4	Style 6	Style 7
Open	Trouble	Alarm/Trouble	Alarm/Trouble
Ground	Alarm/Trouble	Alarm /Trouble	Alarm/Trouble
Short	Trouble	Trouble	Alarm/Trouble
Short and open	Trouble	Trouble	Trouble
Short and ground	Trouble	Trouble	Alarm/Trouble
Open and ground	Trouble	Alarm /Trouble	Alarm/Trouble
Communications loss	Trouble	Trouble	Trouble

Communications Loop Performance

Wire Requirements for a Two-Wire SLC Circuit

Loop Resistance

📄 For detailed wiring requirements, refer to Appendix B.

The total DC resistance from panel to branch end cannot exceed 40 ohms. Measure DC resistance as follows:

1) Short the termination point of one branch at a time. Measure the DC resistance *from the beginning of the loop to the end of that particular branch.*
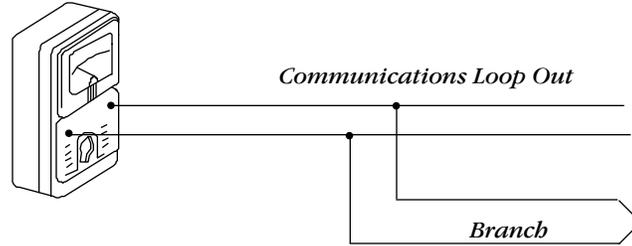
2) Repeat this procedure for all remaining branches in the SLC loop.

Wiring a Two-wire SLC Loop

The total length of wire (12 AWG) in a two-wire loop cannot exceed 10,000 feet. Find the total length of wire in the loop by summing the wire lengths on each loop. The following wiring diagram shows how to find the total length wire in a typical SLC loop.

```
      (Branch A)
  +   (Branch B)
  +   (Branch C)
  +   (Branch D)
  +   (Branch E)
  =   10,000 feet or less
```
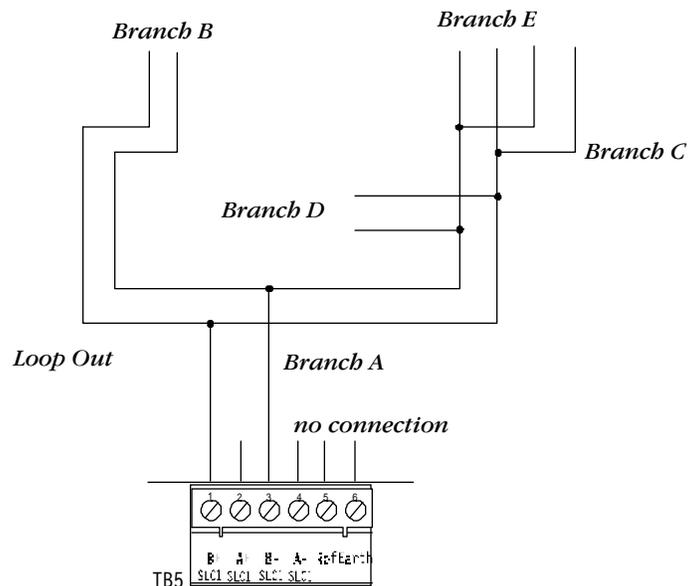

Finding the Total Length of Wire in a Two-Wire SLC Circuit

Wire Requirements for a Four-Wire SLC Circuit

Loop Resistance

📄 For detailed wiring requirements, refer to Appendix B.

The total DC resistance of the communications loop pair cannot exceed 40 ohms. Measure DC resistance as follows:

1) Disconnect the Loop Out and Loop Return at the control panel.

2) Short the two leads of Communications Loop Return.

3) Measure the resistance across the Loop Out leads.

Loop Out

Loop Return
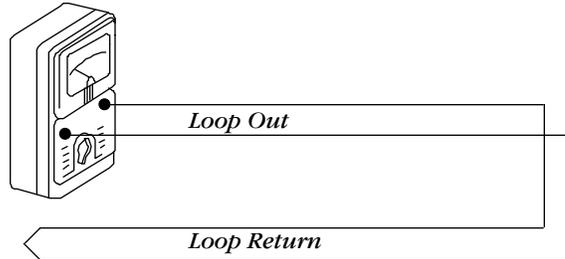
Measuring DC Resistance of a Four-Wire SLC Loop

Wiring a Four-wire SLC Loop

📄 T-Tapping is not allowed on a four-wire SLC loop.

The total length of wire (12 AWG) in a four-wire loop cannot exceed 10,000 feet. Find the total length of wire in the loop by summing the wire lengths on each loop. The following wiring diagram identifies the output and return loops from SLC terminal TB5 on the CPU-400.

Loop A (return loop)

Loop B (output loop)

no connection

CPU-400

TB5   B+   A+   B-   A-   RefEarth
      SLC1 SLC1 SLC1 SLC1

TB6   B+   A+   B-   A-   RefEarth
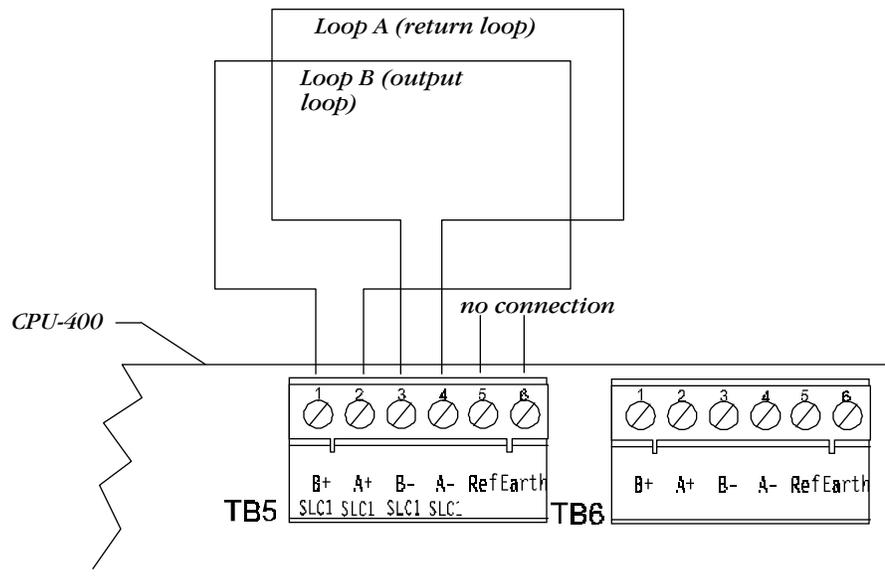
Four-Wire SLC Circuit Loop

Two-Wire SLC Communications Loop

The following is a typical wiring diagram of a supervised and power-limited two-wire SLC communications loop that meets NFPA 72-1993 Style 4 requirements. The following table contains loop connections for the SLC loop in the wiring diagram.

ISO-X devices are not required to meet NFPA Style 4. You can install a maximum of 25 devices, detectors, or modules between isolator modules.

Connection	Loop 1	Loop 2
Loop Out	TB5-1 (+) TB5-3 (–)	TB6-1 (+) TB6-3 (–)
Loop Return	TB5-2 (+) TB5-4 (–)	TB6-2 (+) TB6-4 (–)

BX-501 Base – For use with SDX, CPX and FDX Series Intelligent Detectors
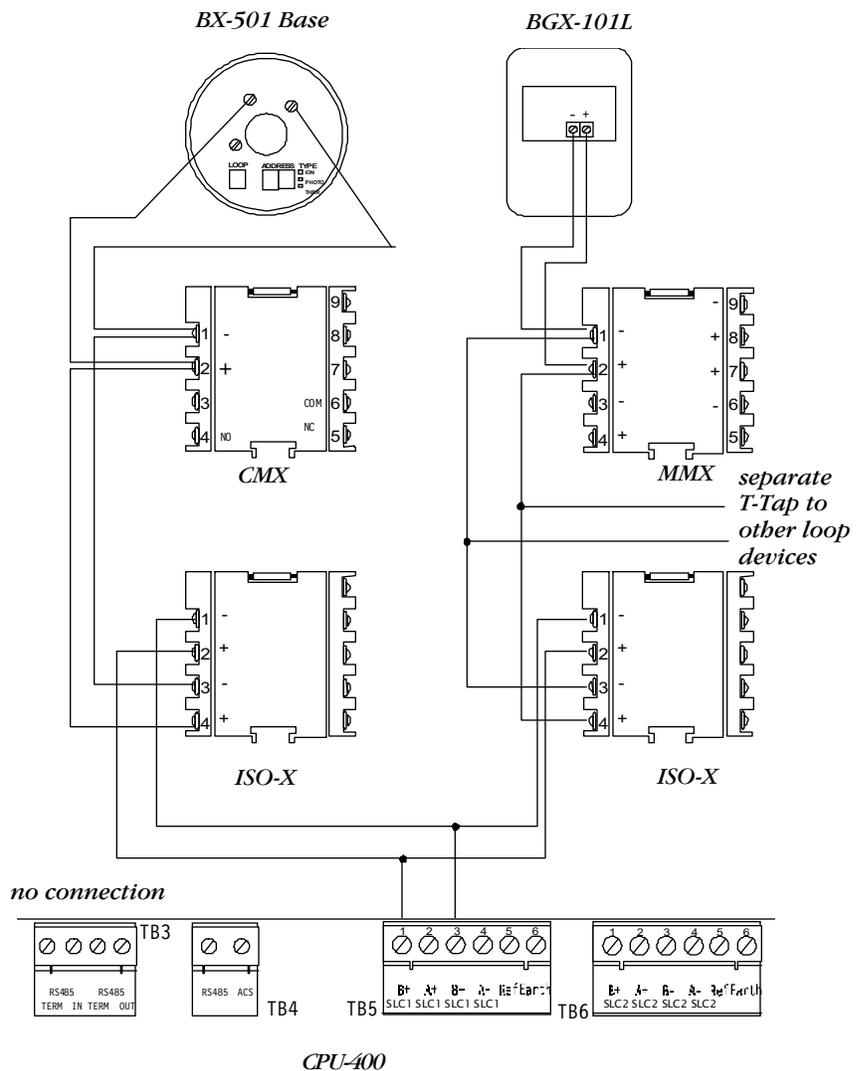
Two-Wire SLC Communications Loop (NFPA 72-1993 Style 4)

Four-Wire SLC Communications Loop (NFPA Style 6)

Style 6 Overview

The following is a typical wiring diagram of a supervised and power-limited four-wire SLC communications loop that meets NFPA 72-1993 Style 6 requirements. The following table contains the SLC loop connections for this circuit.

Connection	Loop 1	Loop 2
Loop Out	TB5-1 (+) TB5-3 (–)	TB6-1 (+) TB6-3 (–)
Loop Return	TB5-2 (+) TB5-4 (–)	TB6-2 (+) TB6-4 (–)

Style 6 Wiring Diagram

BX-501 Base – For use with SDX, CPX and FDX Series Intelligent Detectors.
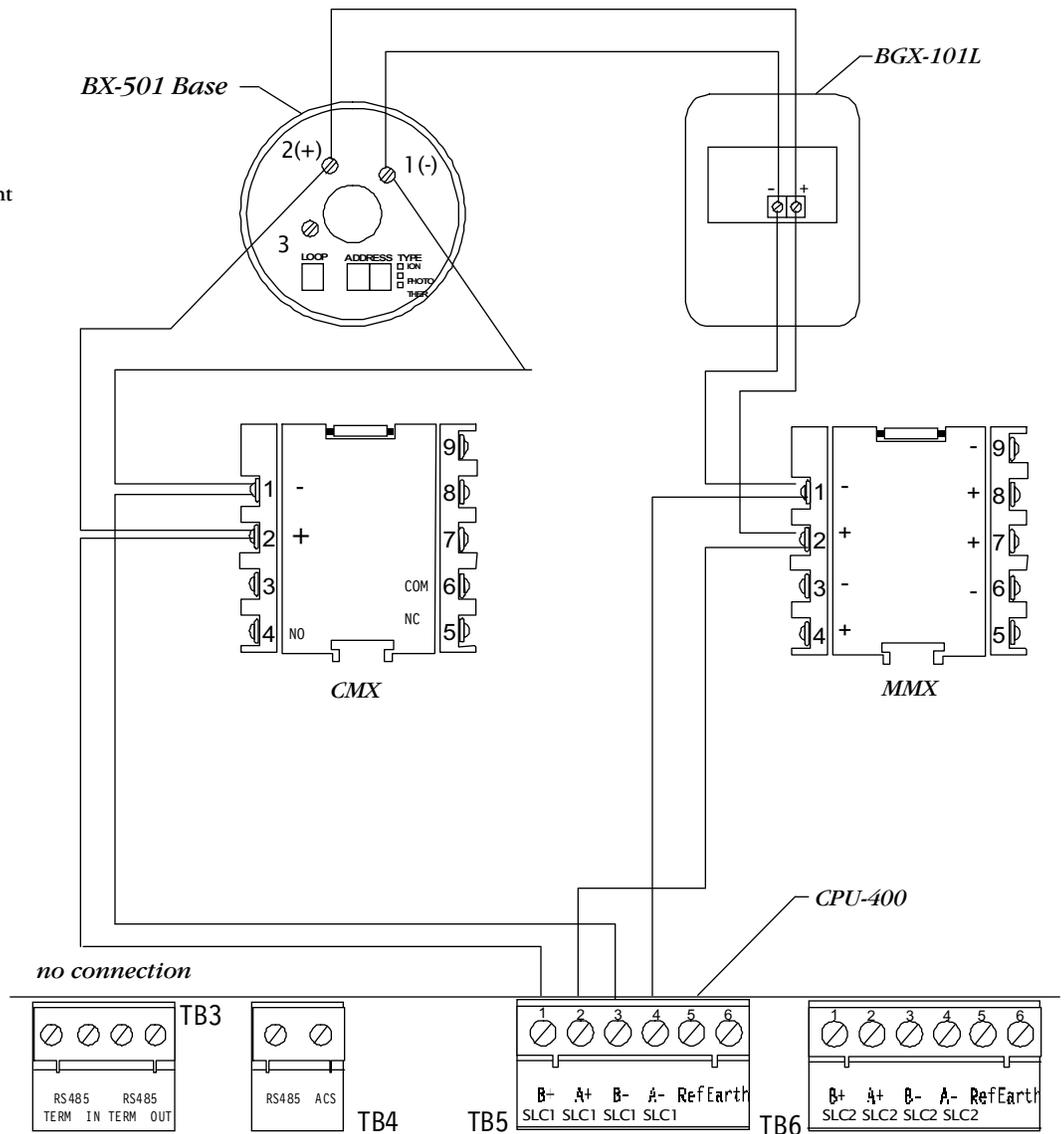
Style 6 Four-Wire SLC Communications Loop

Four-Wire SLC Communications Loop (NFPA 72-1993 Style 7)

Style 7 Overview

Obtain Style 7 operation by using Isolator Bases (B524BI or B224BI) with each detector "flanking" monitor modules with ISO-X modules (see the wiring diagram below). Wire-to-wire shorts on the communication loop do not prevent the control panel from receiving alarm signals.

Do not T-Tap or branch a Style 7 four-wire SLC communications loop. Ratings and characteristics are identical to a NFPA Style 6 four-wire SLC communications loop. Connections between the loop and CPU-400 SLC terminal TB-5 follow.

Connect...	To...
Loop Out	TB5-1 (+) TB5-3 (-)
Loop Return	TB5-2 (+) TB5-4 (-)

SLC Loop to CPU-400 Connections

Style 7 Wiring Diagram

The following diagram shows typical wiring for a Style 7 SLC loop.

Install all wiring between a manual pull station and ISO-X modules in conduit.
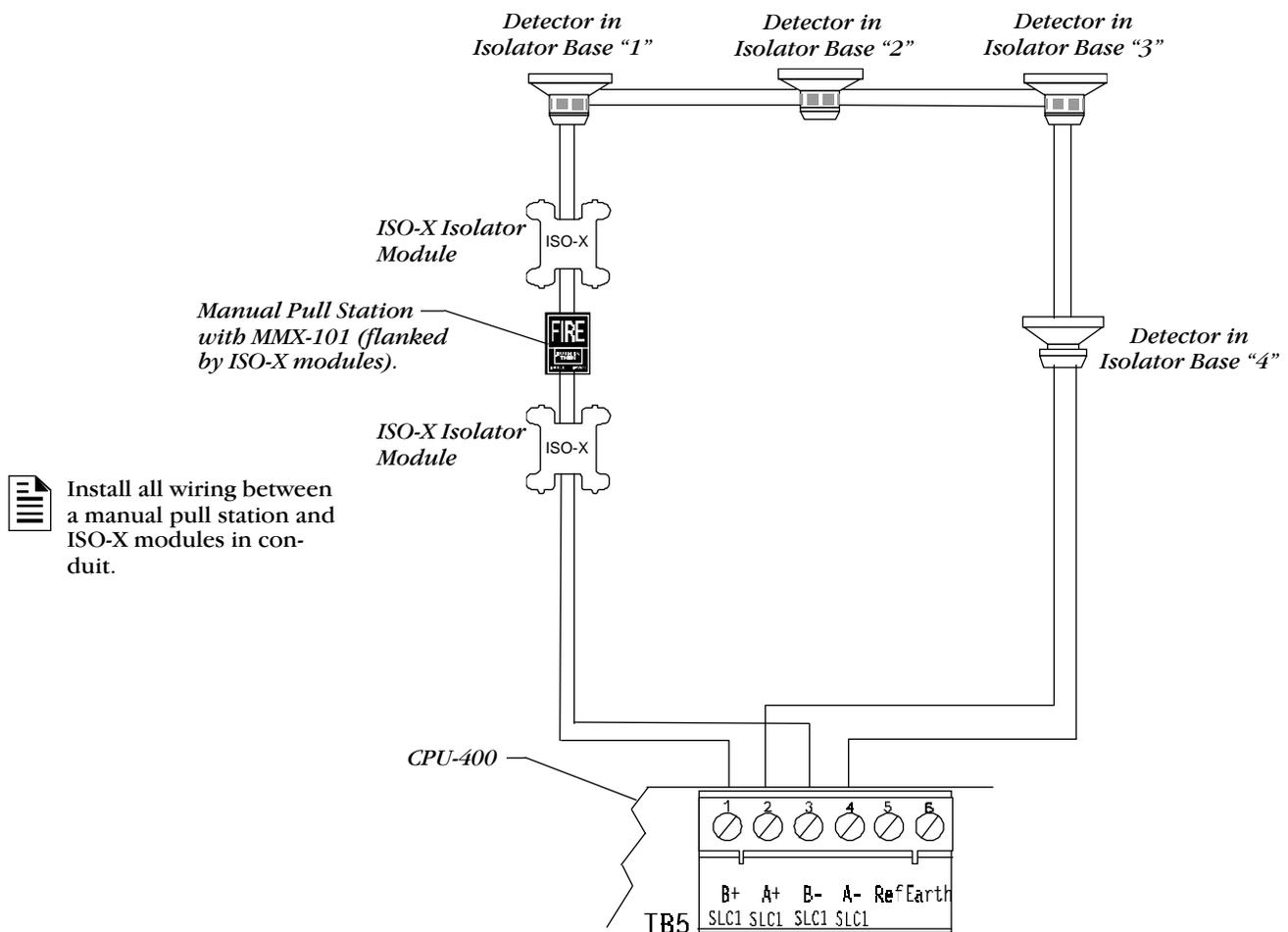
Style 7 Four-Wire SLC Communications Loop

Wiring an Isolator Module (ISO-X)

ISO-X Overview

Use a loop Isolator Module (ISO-X) to protect critical elements of the communications loop from faults on other branches or sections of the loop. The ISO-X continuously monitors the circuit connected to terminals 3 (–) and 4 (+). Upon power-up, an integral relay latches. The ISO-X periodically pulses the coil of this relay. A short circuit on the loop resets the relay. The ISO-X sees this short and disconnects the faulted branch by opening the positive side of the loop (terminal 4). This isolates the faulty branch from the remainder of the loop. Once the fault is removed, the ISO-X automatically reapplies power to the communications loop branch.

You can connect a maximum of 25 devices between isolator modules. During a fault condition, the control panel registers a trouble condition for each zone mapped to the isolated loop branch.

Loop In (-)
Loop In (+)
Loop Out (-)
Loop Out (+)
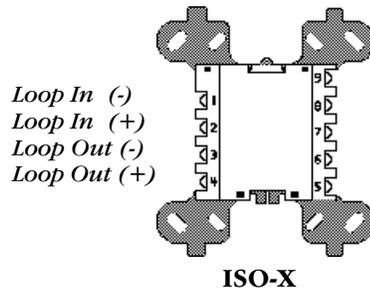
ISO-X

Isolating Two-Wire SLC Communications Loops

Shorts on this branch of an isolated communications loop (NFPA Style 4) are isolated from all devices installed before the ISO-X and on the continuation of the loop (shown as dotted line).

Continuation of the Communications Loop

communications loop

ISO-X

T-Tapped branch off the communications loop
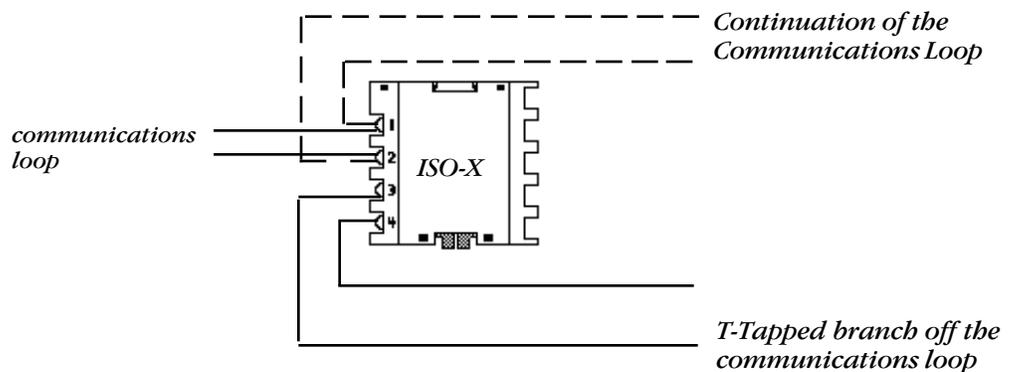
Wiring an ISO-X

Wiring MMX Monitor Modules

The MMX-1/MMX-2 Monitor Module is an addressable module that monitors conventional, alarm initiating devices. It includes a magnetic test switch located near the center front of the module. You can wire the supervised MMX circuit as an NFPA Style B or Style D Initiating Device Circuit. (Refer to the MMX-1 wiring diagrams in this section.) MMX-2 addressable modules monitor conventional, two-wire smoke detectors. Wire MMX modules according to the following:

• Communications Loop Connections – Connect the Communications Loop to MMX terminals 1 (-) and 2 (+). The MMX takes one module address on the Loop. Use the rotary switches on the MMX to set the module to the required loop address.

• NFPA Style B Initiating Device Circuit – Connect as shown in the connection diagrams

• NFPA Style D Initiating Device Circuit – Connect as shown in the connection diagrams.

• Power – The MMX-2 requires an additional connection of 24 VDC filtered, regulated and resettable power on MMX-2 Terminals 3(–) and 4(+).

MMX Monitor Modules

MMX-1 and MMX-101 Modules

The MMX-101 Monitor Module is an addressable module that is functionally and electrically identical to an MMX-1 Monitor Module (Style B circuits only), but offered in a smaller package for mounting directly in the electrical box of the monitored contact-type device. When installing MMX-1 and MMX-101 modules, note the following:

1) The Initiating Device Circuit is supervised and current-limited to 210 microamps @ 24 VDC (nominal).
2) The Initiating Device Circuit provides the following services (do not mix):
   a) Fire Alarm Service.
   b) Automatic/Manual Waterflow Alarm Service with normally open contact devices.
   c) Sprinkler Supervision with normally open contact devices.
   d) Security Service.
3) Maximum IDC loop resistance due to wiring is 20 ohms.

Terminate with a SSD A2143-00 ELR (N-ELR in Canada).

Rotary Switches
Set the module
address with these
switches

ADDRESS

LOOP

IDC (–)
(Yellow)

IDC (+)
(Violet)

Loop (+)
(Red)

Loop (–)
(Black)
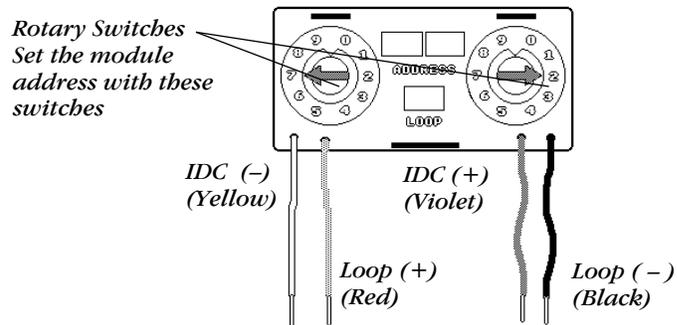
Setting the MMX-1 and MMX-101 Module Address

MMX-2 Modules

Reference the Device Compatibility Document for compatible two-wire smoke detectors.

The MMX-2 Monitor Module is an addressable module used to monitor a single Initiating Device Circuit of smoke detectors. Wire a monitored circuit as NFPA Style B (Class B) or Style D (Class A).

SLC Wiring with MMX Monitor Modules

MMX-1 – Wiring an NFPA Style B Initiating Device Circuit

Refer to the Device Compatibility Document 15378 for detector and power supervision relays.

You can install MMX-1 modules in an SLC loop as shown in the wiring diagram. Maximum initiating device circuit resistance is 20 ohms. SLC wiring connections to the MPS-400 and CPU-400 follow:

Module	Connect...
MPS-400	24V (+) to TB2-5 24V (−) to TB2-6
CPU-400	SLC (+) to TB5-1 SLC (−) to TB5-3

MPS-400 and CPU-400 SLC Connections

MMX-1 Wiring Diagram

The wiring diagram shows typical wiring for an NFPA Style B initiating device circuit which is supervised and power limited.
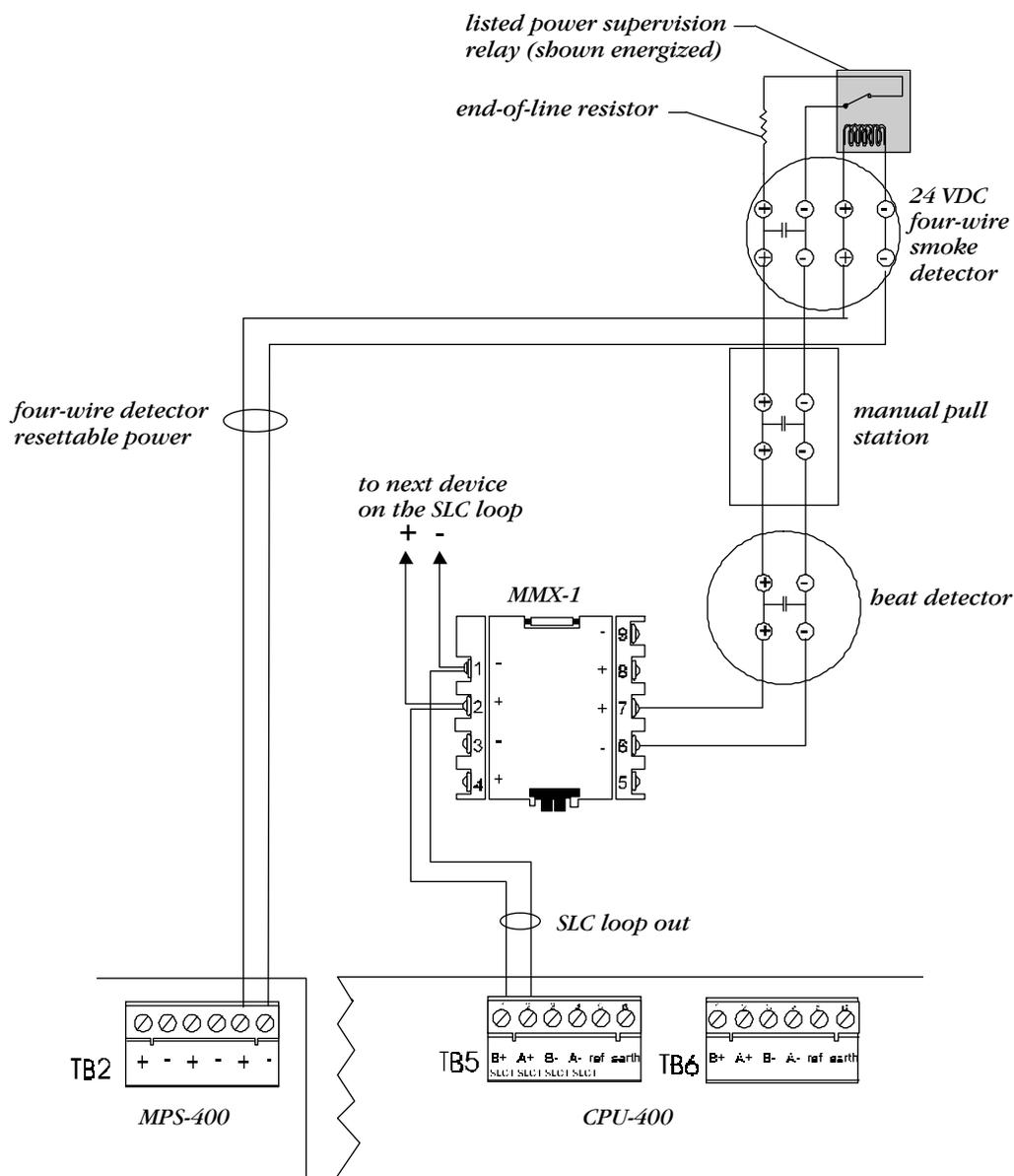
MMX-1 Wiring – NFPA Style B (Class B) Initiating Device Circuit

SLC Wiring with MMX Monitor Modules

MMX-2 – Wiring an NFPA Style B Initiating Device Circuit

You can install MMX-2 modules in an SLC loop as shown in the wiring diagram. Wiring guidelines are:

- Maximum initiating device circuit resistance is 25 ohms.
- Maximum alarm current is 90 mA.
- Maximum detector standby current is 2.4 mA.

The following table contains SLC wiring connections to the MPS-400 and the CPU-400:

📑 Refer to the Device Compatibility Document 15378 for detector and power supervision relays. For more information, refer to the MMX-2 Installation Instructions, Document M500-03-00.

Module	Connect...
MPS-400	24V (+) to TB2-5 24V (–) to TB2-6
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

MMX-2 Wiring Diagram

The block diagram shows typical MMX-2 wiring for a supervised and power limited NFPA Style B initiating device circuit.

3.9K ELR – supplied with MMX-2 module.

to the next device on the loop

compatible two-wire smoke detectors
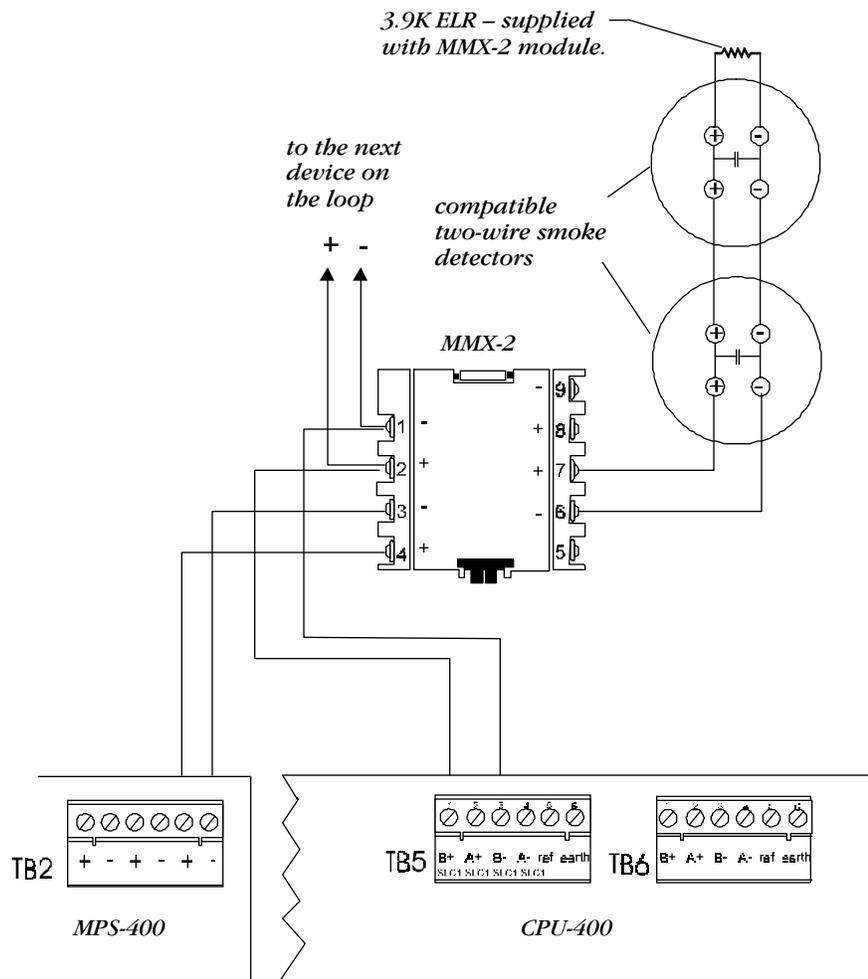
MMX-2 Wiring – NFPA Style B (Class B) Initiating Device Circuit

SLC Wiring with MMX Monitor Modules

MMX-1 – Wiring a NFPA Style D Initiating Device Circuit

You can install MMX-1 modules in an SLC loop as shown in the wiring diagram. Maximum initiating device circuit resistance is 20 ohms. The wiring diagram below shows typical MMX-1 wiring for a supervised and power limited NFPA Style D initiating device circuit. The following table contains SLC wiring connections to the MPS-400 and the CPU-400.

Refer to the Device Compatibility Document 15378 for detector and power supervision relays.

Module	Connect...
MPS-400	24V (+) to TB2-5 24V (–) to TB2-6
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical MMX-1 Wiring Diagram
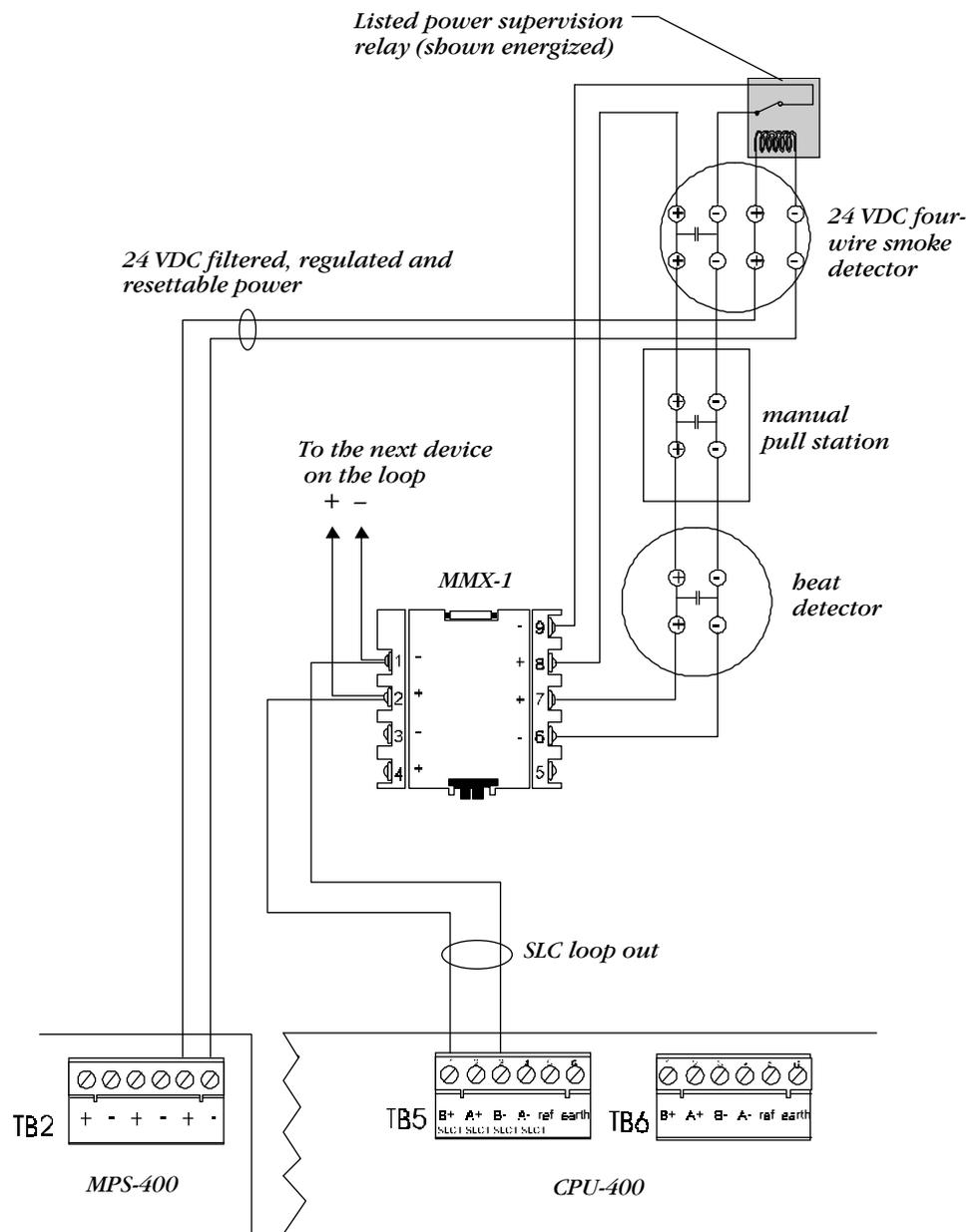
MMX-1 Wiring – NFPA Style D (Class A) Initiating Device Circuit

SLC Wiring with MMX Monitor Modules

MMX-2 – Wiring a NFPA Style D Initiating Device Circuit

📄 For more information, refer to the MMX-2 Installation Instructions, Document M500-03-00.

For compatible devices, reference the Device Compatibility Document, 15378.

The following table lists the electrical specifications for a Style D indicating device circuit:

The Maximum	is...
Circuit resistance	25 ohms
Alarm current	90 mA
Detector standby current	2.4 mA.

Style D Electrical Specifications

The wiring diagram below shows a Style D circuit using an MMX-2 module. The following table contains SLC wiring connections to the MPS-400 and the CPU-400 as shown in the wiring diagram.

Module	Connect...
MPS-400	24V (+) to TB2-5 24V (–) to TB2-6
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical MMX-2 Style D Wiring Diagram

📄 The circuit is supervised and power-limited

to next device on loop
+ –

compatible two-wire smoke detectors

3.9K listed ELR

MMX-2

24 VDC filtered, regulated, and resettable power

TB5   TB6

MPS-400   *CPU-400*
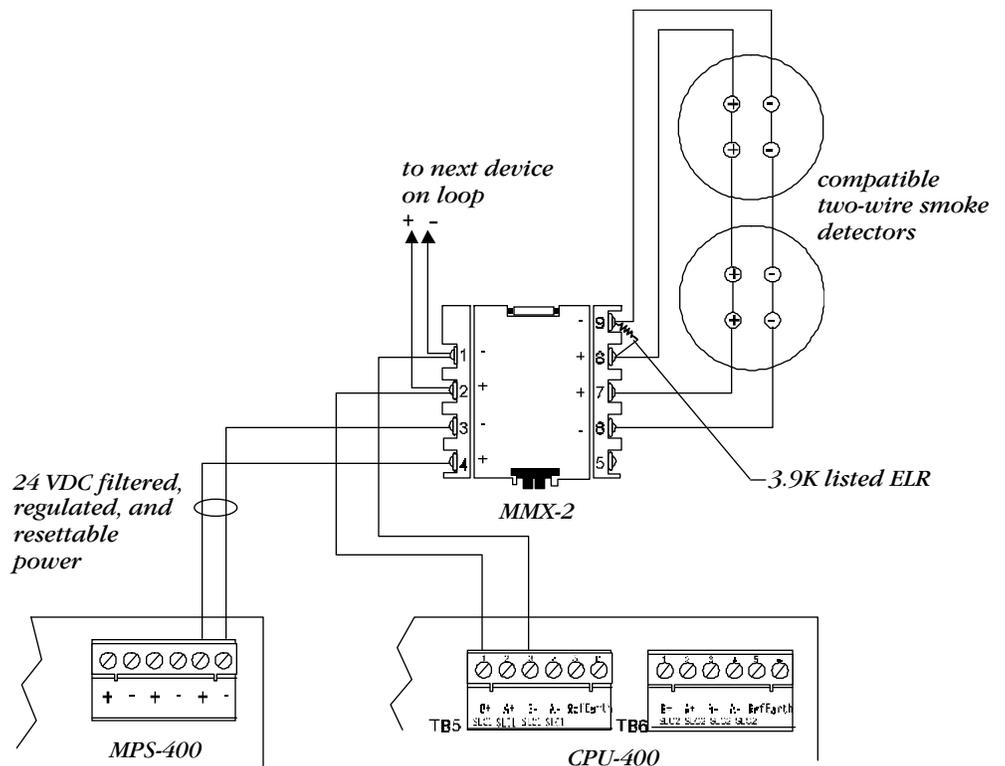
NFPA Style D (Class A) Initiating Device Circuit

SLC Wiring with CMX Control Modules

CMX Module Overview

The CMX Control Module is an addressable module that supervises and switches power to a Notification Appliance Circuit. CMX-1 and CMX-2 modules are identical, but a CMX-2 has a higher voltage rating (70.7) at full current. You can wire a CMX as an NFPA Style Y or Style Z Notification Appliance Circuit or use a CMX module as a Form-C control relay.
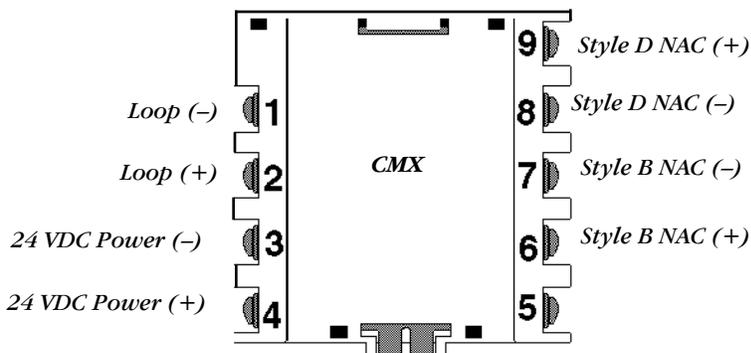
CMX Control Module (configured for NAC operation)

The following table contains instructions for connecting a CMX module.

CMX Connections

For the following...	Connect...
Communications (SLC) Loop Connections	The communications loop to CMX terminals 1(–) and 2 (+). The CMX takes one module address on the loop. Set the rotary switches on the CMX to the requiered loop address.
NFPA Style Y Notification Appliance Circuit	Polarized alarm notification appliances to a two-wire circuit. Do not T-tap or branch a Style Y circuit and terminate the circuit across the last device using a 47K, 1/2-watt ELR (P/N ELR-47K). Connect the two-wire circuit to CMX terminals 6 (+) and 7 (–).
NFPA Style Z Notification Appliance Circuit	Polarized alarm notification appliances to a single two-wire circuit. Do not T-tap or branch a Style Z circuit. No external ELR is required for Style Z wiring. Connect the four-wire circuit to CMX terminals 6 (+) and 9 (+), then 7 (–) and 8 (–).
Notification Appliance Power	Notification appliance power to CMX terminal 3 (common) and terminal 4 (+24 VDC). This power must be supervised by a compatible listed Power Supervision Relay. Alternate power arrangement – Power the module (terminals 3 and 4) from one of the NACs on the MPS and supervise this current with a 2.2K 1/2W resistor (P/N ELR-2.2K). Program the NAC to activate on a general alarm (map to zone F0).

CMX Module Connections

CMX Module Test Switch

The CMX module contains a magnetic test switch located on the front of the module. Activate the test switch by placing a magnet over the CMX plastic cover. Test switch activation causes a short circuit indication on a Style B or Style D loop.

SLC Wiring with CMX Control Modules

Using a CMX Control Module as a Form-C Relay

The following drawing shows a CMX module wired to the CPU-400 as a Form-C relay.
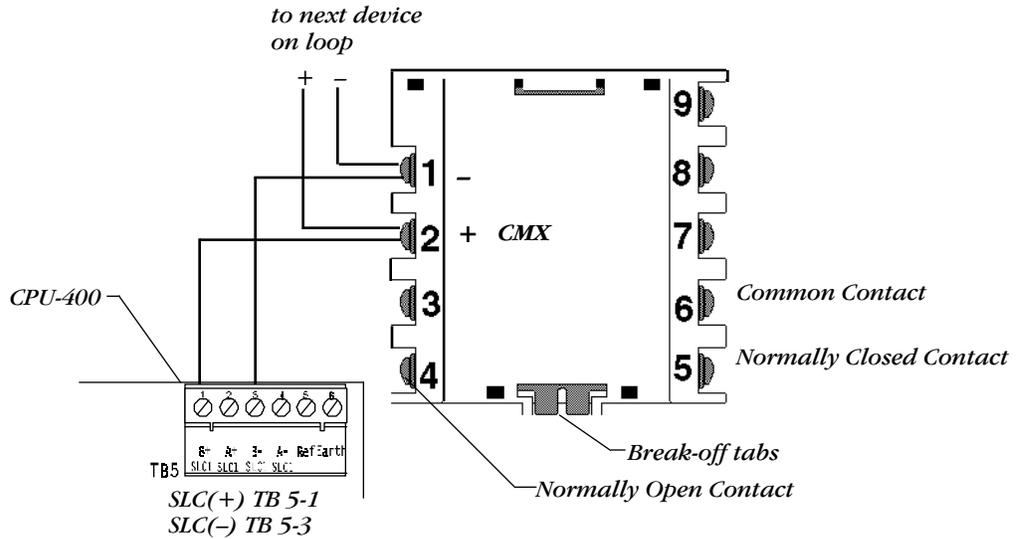
CMX Control Module (Form-C Relay)

Contacts are not rated for motor loads. Refer to the installation instruction sheet supplied with the module for additional information.

Control Module	Resistive	Inductive
CMX-1	2 amps @ 30 VDC	1 amp @ 30 VDC (0.6 pf) 0.3 amps @ 120 VDC (0.35 pf)
CMX-2	2 amps @ 30 VDC	1 amp @ 30 VDC (0.6pf) Pilot Duty: 0.6 amps @ 30 VDC (0.35pf)

CMX Contact Ratings

Installing a CMX Module as a Form-C Relay

Install a CMX module as a Form-C relay by following the instructions in the following table.

Do not power the system if the tabs are not broken on all CMX modules used as Form-C relays.

Step	Action
1	Configure a CMX as a Form-C relay: Use a pair of needle-nose pliers to break off the two tabs of the module (see drawing above).
2	Connect the communications loop to CMX terminals 1(–) and 2 (+).
3	Set the rotary switches on the CMX to the required loop address. (The CMX takes one module address on the loop.)
4	Wire the common and the normally-open or normally-closed contacts to the CMX.

Installing a CMX Module as a Form-C Relay

SLC Wiring with CMX Control Modules

Style Y Circuits

The CMX module can control 2 amps of resistive load (on electronic devices) or 1 amp of inductive load (on mechanical bells and horns). If more than one CMX Notification Appliance Circuit is provided, install the power supervision relay after the last CMX. Refer to Device Compatibility Document 15378 for compatible notification appliances and relays.

The wiring diagram below shows an NFPA Style Y Notification Appliance Circuit (all circuits are supervised and power-limited) using a CMX module. The following table contains SLC wiring connections to the MPS-400 and CPU-400 as shown in the wiring diagram.

Do not loop wiring under any terminals. Break wire run to maintain supervision.

Module	Connect...
MPS-400	24V (+) to TB2-1 24V (−) to TB2-2
CPU-400	SLC (+) to TB5-1 SLC (−) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical Style Y Wiring Diagram

Listed Power Supervision Relay

End-of-Line Resistor 47K, 1/2-watt part number SSD A2143-00 (N-ELR in Canada)

24 VDC Notification Appliance

to next device on loop

CMX

Loop out

MPS-400

CPU-400
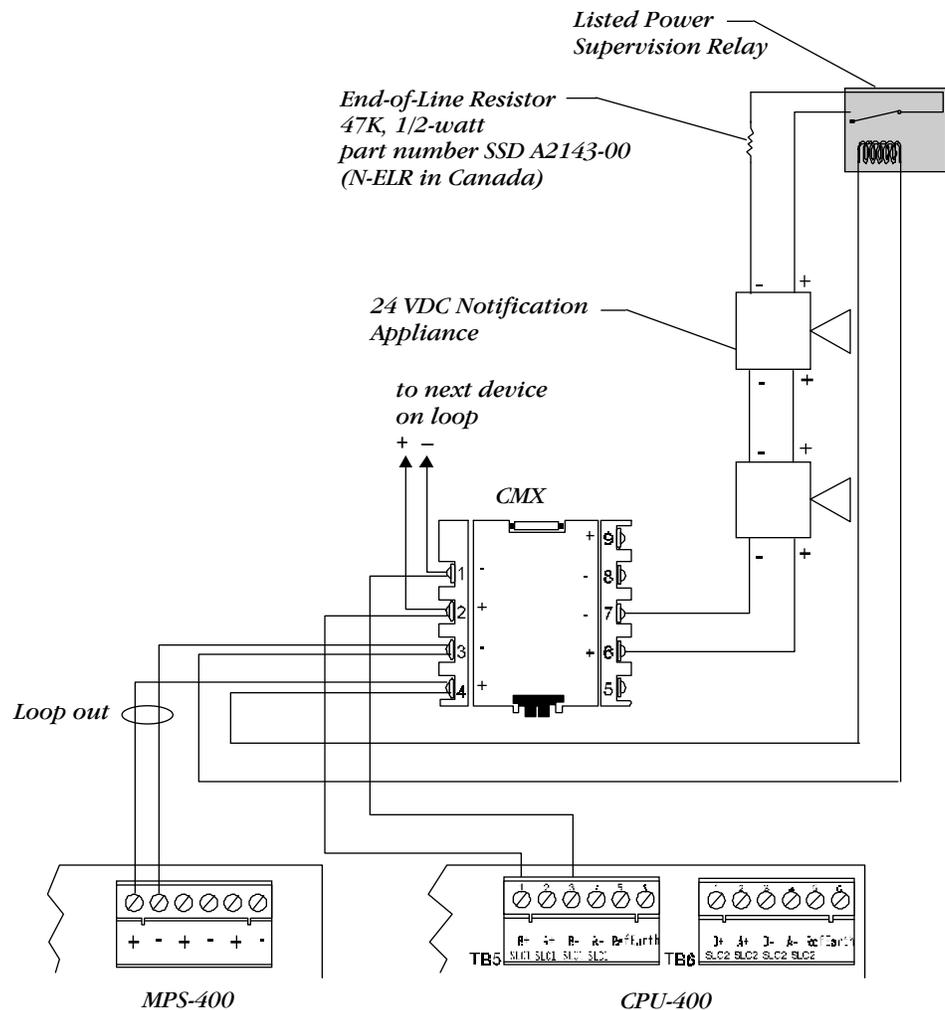
Typical NFPA Style Y Notification Appliance Circuit

SLC Wiring with CMX Control Modules

Style Z Circuits

📄 Refer to Device Compatibility Document 15378 for compatible notification appliances.

When an MPS-400 Notification Appliance Circuit supplies power to CMX modules:

1) The CMX module outputs are coded if the MPS-400 Notification Appliance Circuit is coded.

2) Program the MPS-400 Notification Appliance Circuit for general alarm.

3) Terminate the power feed to the CMX module with a 2.2K ELR (P/N R-2.2K) or make the power feed a return to the MPS-400 NAC terminals 3 and 4).

The wiring diagram shows an NFPA Style Z Notification Appliance Circuit (all circuits are supervised and power-limited) using a CMX module. The following table contains SLC wiring connections to the MPS-400 and CPU-400 as shown in the wiring diagram.

Module	Connect...
MPS-400	24V (+) to TB* terminal 1 24V (–) to TB* terminal 2 * NAC TB7, TB8, TB9, or TB10
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical Style Z Wiring Diagram

📄 Do not loop wiring under any terminals. Break wire run to maintain supervision.

ELR – End-of-Line Resistor 47K, 1/2-watt part number SSD A2143-00 (N-ELR in Canada)

NFPA Style Y Notification Appliance Circuit

SLC Wiring with CMX Control Modules

Style Z Circuits

The wiring diagram below shows an NFPA Style Z Notification Appliance Circuit (all circuits are supervised and power-limited) using a CMX module. The following table contains SLC wiring connections to the MPS-400 and CPU-400 as shown in the wiring diagram.

Refer to Device Compatibility Document 15378 for compatible notification appliances.

Module	Connect...
MPS-400	24V (+) to TB2-1 24V (–) to TB2-2
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical Style Z Wiring Diagram

Do not loop wiring under any terminals. Break wire run to maintain supervision.

NFPA Style Y Notification Appliance Circuit

SLC Wiring with CMX Control Modules

Style Z NAC Circuits

When an MPS-400 Notification Appliance Circuit supplies power to CMX modules:

1) The CMX module outputs are coded if the MPS-400 Notification Appliance Circuit is coded.

2) Program the MPS-400 Notification Appliance Circuit for general alarm.

The wiring diagram below shows an NFPA Style Z Notification Appliance Circuit (all circuits are supervised and power-limited) using a CMX module. The following table contains SLC wiring connections to the MPS-400 and CPU-400 as shown in the wiring diagram.

📄 Refer to Device Compatibility Document 15378 for compatible notification appliances.

Module	Connect...
MPS-400	24V (+) to TB* terminal 1 24V (–) to TB* terminal 2 * NAC TB7, TB8, TB9, or TB10
CPU-400	SLC (+) to TB5-1 SLC (–) to TB5-3

MPS-400 and CPU-400 SLC Connections

Typical Style Z Wiring Diagram

NFPA Style Z Notification Appliance Circuit

SLC Wiring with a BGX-101L Addressable Manual Pull Station

BGX-101L Overview

The BGX-101L is an addressable manual pull station with a key-lock reset feature.

1) Connect the communications loop to terminal screws (+) and (–).

2) Connect the BGX-101L to the CPU-400 as listed in the table below.

Connection	Loop 1	Loop 2
Loop Out	TB5-1 (+) TB5-3 (–)	TB6-1 (+) TB6-3 (–)
Loop Return	TB5-2 (+) TB5-4 (–)	TB6-2 (+) TB6-4 (–)

3) The BGX-101L factory preset is address 00. To set the address for the pull station, use a screwdriver to turn the rotary address switches on the back of the BGX-101L to the appropriate settings.
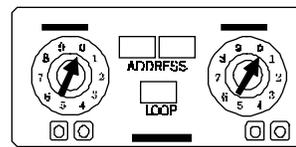
BGX-101L Rotary Switches

BGX-101L Wiring Connections
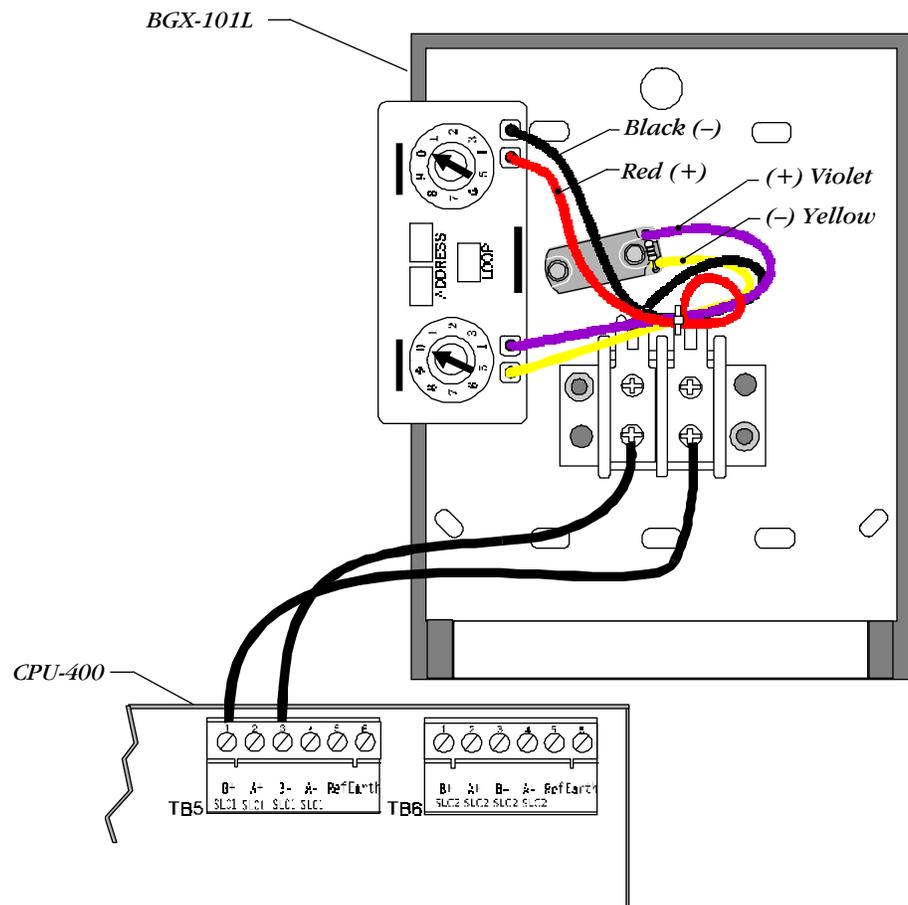
Back View of the BGX-101L Pull Station

SLC Wiring with an Intelligent Detector

Overview for Wiring Intelligent Detectors

The BX-501 base provides the connection between the Communications Loop and SDX–551, SDX-551TH, SDX-751, CPX-551, CPX-751, FDX-551R, and FDX-551 intelligent detectors.

1) Connect the communications loop to terminal 1 (–) and terminal 2 (+) on the BX–501, B501, and B71-LP.

2) If using an RA-400Z Remote LED Annunciator: (a) connect the RA-400Z positive terminal to BX-501, B501, or B71-LP terminal 3; and (b) connect the RA-400Z negative terminal to BX-501 terminal 1.

3) Set the detector's address on the head with a small, slotted screwdriver. Mark this address on the base and on the head.

4) Install the appropriate intelligent detector head.

Wiring a BX-501 Detector to an SLC Loop

The following diagram shows typical wiring of a BX-501 detector (wired to a RA400Z remote annunciator) connected to an SLC loop.
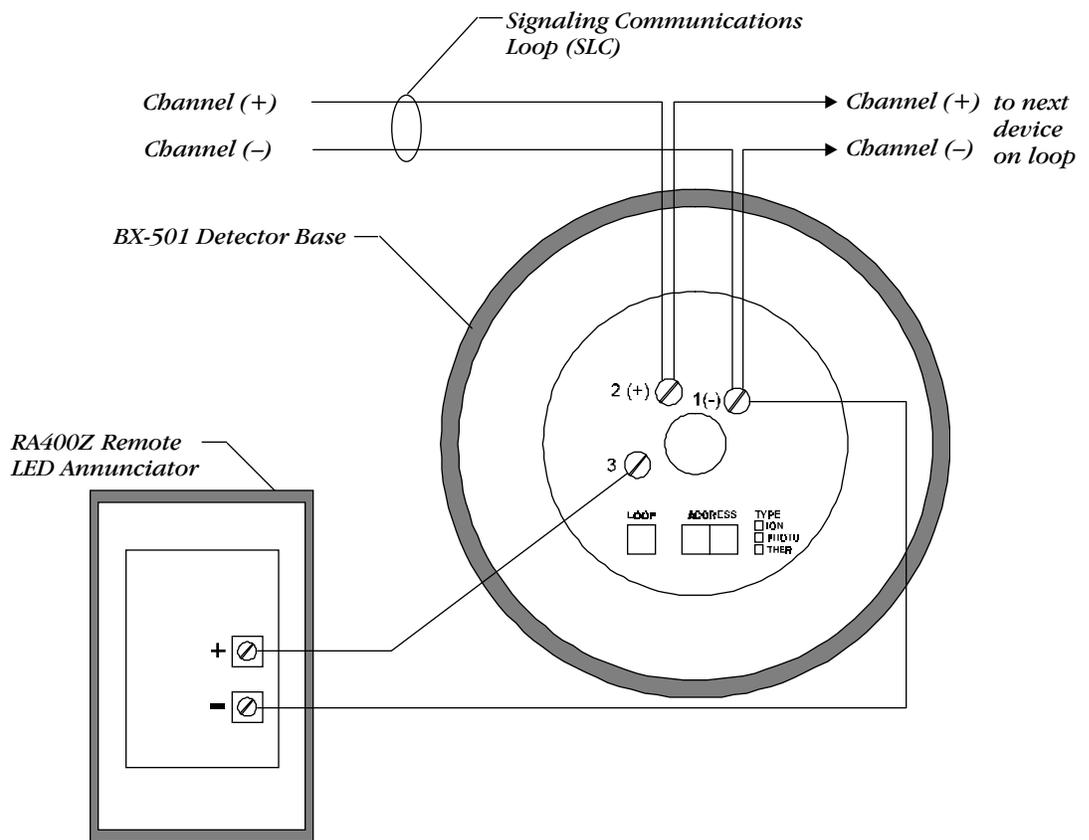
Typical Wiring of a BX-501 Detector to an SLC Loop

3. Testing the System

Acceptance Test

When finished with the original installation and all modifications, conduct a complete operational test on the entire installation to verify compliance with applicable NFPA standards. Testing should be conducted by a factory-trained distributor in the presence of a representative of the Authority Having Jurisdiction and the owner's representative. Follow procedures outlined in NFPA Standard 72-1993, Chapter 7, "Inspection, Testing and Maintenance."

Periodic Testing and Service

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

- NFPA Standard 72-1993, Chapter 7, "Inspection, Testing and Maintenance."

- Service manuals and instructions for the peripheral devices installed in your system. Correct any trouble condition or malfunction immediately.

Operational Checks

Between formal periodic testing and servicing intervals, the following operation checks should be performed monthly, or more frequently when required by the Authority Having Jurisdiction.

☐ Check that the green "AC POWER" LED lights.

☐ Check that all yellow LEDs are off.

☐ Press and hold the "LAMP TEST" switch. Verify that all AFP-400 LEDs and all LCD display segments work.

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

☐ Activate an initiating device circuit using an alarm initiating device and check that all active notification appliances function. Reset the alarm initiating device, the control panel, and any other associated equipment. In voice alarm applications, confirm that the proper tone(s) and/or messages sound during alarm conditions. Select the paging function and confirm that the message can be heard in the affected fire zones. Repeat the above step with each initiating device circuit.

☐ On systems equipped with a fire fighters telephone circuit, make a call from a telephone circuit and confirm a ring tone. Answer the call and confirm communication with the incoming caller. End the call and repeat for each telephone circuit in the system.

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

☐ Remove AC power, activate an initiating device circuit through an alarm initiating device and check that active notification appliances sound, and alarm indicators illuminate. Measure the battery voltage with notification appliances active. Replace any battery with a terminal voltage less than 21.6 volts and reapply AC Power.

☐ Enable any disabled Notification Appliance Circuits.

☐ Check that all yellow LEDs are off and the green "AC POWER" LED is on.

☐ Notify fire, central station and/or building personnel when you finish testing the system.

Testing the System

Battery Checks and Maintenance

Maintenance-free sealed lead-acid batteries used in the system do not require the addition of water or electrolyte. These batteries are charged and maintained in a fully charged state by the main power supply's float charger during normal system operation. A discharged battery typically charges at 1.5 amps and reaches the float voltage of 27.6 volts within 48 hours.

Replace any leaking or damaged battery. You can get replacement batteries from the manufacturer. Minimal replacement battery capacity is indicated on the AFP-400 marking label.

▲
◇ DANGER ◇
▼

Batteries contain Sulfuric Acid which can cause severe burns to the skin and eyes and damage to fabrics.
- **If a battery leaks and contact is made with the Sulfuric Acid, immediately flush skin and/or eyes with water for at least 15 minutes. Water and household baking soda provides a good neutralizing solution for Sulfuric Acid.**
- **If Sulfuric Acid gets into eyes, seek immediate medical attention.**
- **Ensure proper handling of the battery to prevent short-circuiting.**
- **Take care to avoid accidental shorting of the leads from uninsulated work benches, tools, bracelets, rings, and coins.**
Shorting the battery leads can damage the battery, equipment, and could cause injury to personnel.

4. Voice Modules

Overview

This section contains instructions for installing and wiring modules that can be used in an AFP-400 voice alarm system. These modules include the following:

- AMG modules
- FFT-7 and FFT-7S modules
- AA-30, AA-100, and AA-120 modules
- Voice Alarm Modules (VCM-4, VCE-4, and DCM-4)

Following the installation sections are system configuration drawings, wiring diagrams, and speaker circuit configurations.

Installing an AMG Module

The following table contains instructions for installing an AMG module into a CHS-4L chassis.

Step	Action
1	Put a standoff on the first and fourth studs from the top-left corner of the CHS-4L chassis.
2	Angle the bottom edge of the module into the bottom slot of the CHS-4L.
3	Secure the module to the CHS-4L with the captive screws.
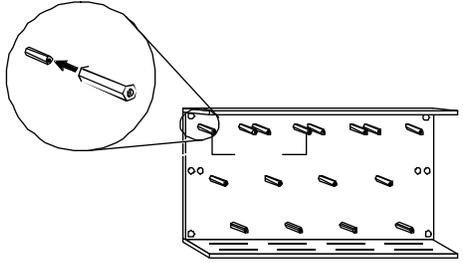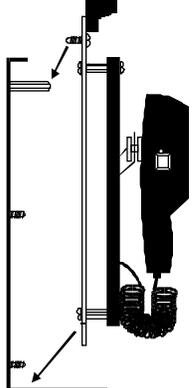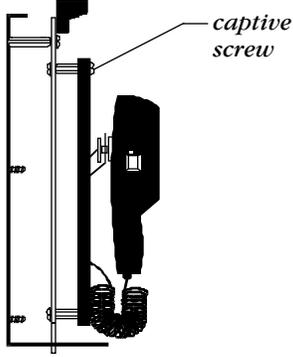
Installing an AMG Module

AMG-1 Terminal Connections

Input/Ouput	Plug	Used to...
Trouble Input Cable (normally open trouble contacts)	P9	Transmit trouble signals to another device in the system. (Connect the other end to the Trouble Input of the other device in the system or to J4 (Aux Trouble Input) on the MPS-400.)
Trouble Output Cable (normally open trouble contacts)	P8	Transmit trouble signals to another device in the system.
Power Harness Out	P2	Connect to another device in the power supply chain.
Power Harness In	P1	Provides power for the AMG-1 from the Main Power Supply. (Connect the other end to J1 on the MPS-400.)
AMG-1 Interconnect Cable	P10	Connect from the Trouble Output contacts on another device. A closure signals the AMG-1 that the connected device is in trouble.
EIA-485 Connections	P3	Lets the AFP-400 communicate with the AMG-1 through the ACS mode EIA-485 port.
No connection	P7	N/A
Audio Signal Connections	P5	Allow harnessing the audio signal from the AMG-1 to Audio Amplifiers in the same cabinet via P5, or wired to amplifiers in remote cabinets via P4.
Control Harness	P6	Connect to P4 on a Fire Fighters Telephone (FFT-7) or cable from the AVL-1.
Low Level Audio	P4	**Connector** **From...** **To...** Low Level Audio Output P4-5 P3-5 to first amplifier P4-4 P3-4 Low Level Audio Output P4-2 P3-2 Return to last amplifier P4-1 P3-1 (optional)

AMG-1 Terminal Connections

Low-Level Audio Distribution (Hardwired Connections)

Installing an AMG

An AMG appears as an annunciator to the AFP-400 and operates on address "01." Installing an AMG requires programming the AFP-400 and setting an annunciators switch. The following table contains AMG programming and switch settings:

You can set an AMG to "receive only" (DIP 3) but you cannot use the ALL-CALL switch.

For	Set
Single-channel applications	AMG-E RECEIVE ONLY switch to "Off."
Dual-channel applications	1) AMG-1 Evacuation channel RECEIVE ONLY switch to "Off"; and 2) AMG-E Alert channel RECEIVE ONLY switch to "On."
Optional four-wire return	AMG-1 DIP switch to "On."

AMG Programming and Switch Settings
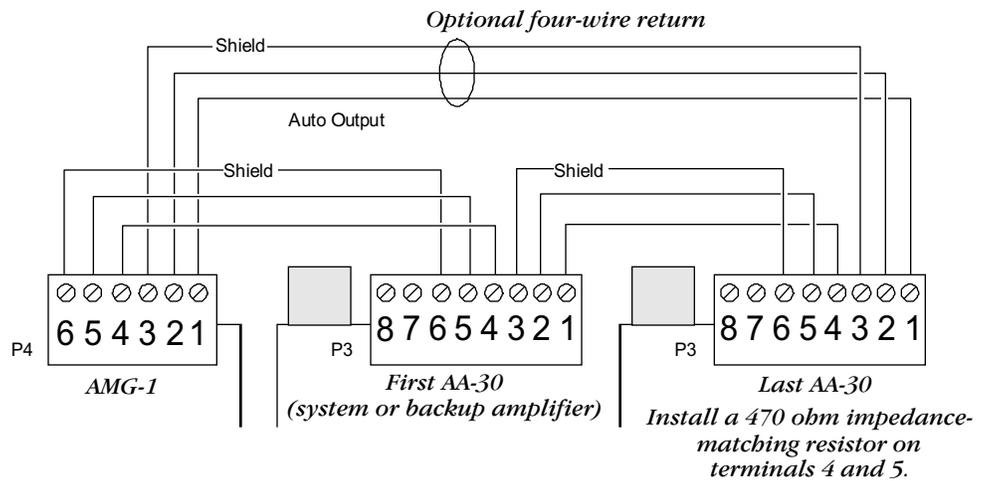
Typical Wiring for an AMG-1

Setting the AMG-1 DIP Switch

Refer to the settings in the table to set the AMG-1 DIP switch. To set a switch, press the rocker to the On or Off position.
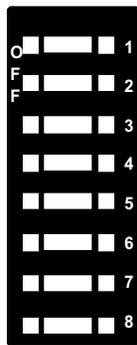
AMG-1 DIP Switch

Pin	Function	Setting
1	Four-wire audio supervision	On Off
2	Tone/Message Select	Table 1 – Off Table 2 – On
3	Receive Only	Refer to "Installing an AMG."
4	VRAM Write Protect 1	Refer to "Voice Message Options."
5	VRAM Write Protect 2	Refer to "Voice Message Options."
6	Message Select	Refer to Table 4-1 and Table 4-2.
7	Message Select	
8	Message Select	

AMG-1 and AMG-E Tone/Message Selections (SW2=Off)

Table 4-1 lists the tone and message selections available when DIP switch 2 (Tone/Message Switch) is "Off."

DIP Switches			System Status	NAC 1 (B01)	Function
6	7	8			
X	X	X	No Alarm	OFF	Standby
OFF OFF	OFF OFF	OFF OFF	No Alarm Alarm	ON X	1000 Hz 1/2 sec on, 1/2 sec off Slow whoop
OFF OFF	OFF OFF	ON ON	No Alarm Alarm	ON X	Horn 120ppm
OFF OFF	ON ON	OFF OFF	No Alarm Alarm	ON X	Horn Yelp
OFF OFF	ON ON	ON ON	No Alarm Alarm	ON X	Yelp Wail
ON ON	OFF OFF	OFF OFF	No Alarm Alarm	ON X	3 slow whoops, VRAM-B 3 slow whoops, VRAM-A
ON ON	OFF OFF	ON ON	No Alarm Alarm	ON X	VROM B VROM A
ON ON	ON ON	OFF OFF	No Alarm Alarm	ON X	20 ppm VROM A & B
ON ON	ON ON	ON ON	No Alarm Alarm	ON X	Horn NFPA Uniform Code 3 temporal pattern fast whoop
X = Indicates that Switch or Control Point may be either "ON" or "OFF"					

Table 4-1 AMG Tone/Message Selections

1) Indicating circuit 1 may be manually selected to produce the desired tone or may be activated by a non-alarm input.
2) If making a VROM or VRAM selection, and a VROM or VRAM chip is not installed, a trouble indication appears at the AMG-1 when the message is due to begin.

AMG-1 and AMG-E Tone/Message Selections (SW2=On)

Table 4-2 lists the tone and message selections available when DIP switch 2 (Tone/Message Switch) is "On."

DIP Switches			System Status	NAC # 1 (B01)	Function
S6	S7	S8			
X	X	X	No Alarm	OFF	Standby
OFF	OFF	OFF	No Alarm	ON	Horn
OFF	OFF	OFF	Alarm	OFF	1000 Hz 1/2 sec on, 1/2 sec off for 5 min then slow whoop
OFF	OFF	ON	No Alarm	ON	Horn
OFF	OFF	ON	Alarm	OFF	20 ppm for 5 min., then 120 ppm
OFF	OFF	ON	Alarm	ON	120 ppm
OFF	ON	OFF	No Alarm	ON	VROM B
OFF	ON	OFF	Alarm	OFF	444, pause, VROM A
OFF	ON	OFF	Alarm	ON	Boston Code
OFF	ON	ON	No Alarm	ON	VROM B
OFF	ON	ON	Alarm	OFF	Fast Whoop
OFF	ON	ON	Alarm	ON	3 Fast Whoops, pause, VROM A
ON	OFF	OFF	No Alarm	ON	Beep
ON	OFF	OFF	Alarm	OFF	Fast Whoop
ON	OFF	OFF	Alarm	ON	3 Fast Whoops, pause, VROM A + B
ON	OFF	ON	No Alarm	ON	Beep
ON	OFF	ON	Alarm	OFF	3 Slow Whoops, pause, VROM A
ON	OFF	ON	Alarm	ON	3 Slow Whoops, pause, VROM A + B
ON	ON	OFF	No Alarm	ON	Wail
ON	ON	OFF	Alarm	OFF	3 Hi-Low Tones, pause, VROM A
ON	ON	OFF	Alarm	ON	3 Hi-Low, pause, VROM A + B
ON	ON	ON	No Alarm	ON	Hi-Low
ON	ON	ON	Alarm	OFF	20 ppm
ON	ON	ON	Alarm	ON	3 Slow Whoops, pause, VROM A

X = Indicates that Switch or Control Point may be either "ON" or "OFF"

Table 4-2 AMG-1 and AMG-E Tone/Message Selections

1) Indicating circuit "1" may be manually selected to produce the desired tone or may be activated by a non-alarm input.

2) If a VROM or VRAM selection is made and the chip is not installed, a trouble will be generated at the AMG-1.

3) Boston Code (Order VROM 9, which must be installed in VROM-B position) – 900 Hz alert tone pulsed to produce one round of code 4 at approximately one second intervals, followed by female voice message "ATTENTION PLEASE. THE SIGNAL TONE YOU HAVE JUST HEARD INDICATES A REPORT OF AN EMERGENCY IN THIS BUILDING. IF YOUR FLOOR EVACUATION SIGNAL SOUNDS AFTER THIS MESSAGE, WALK TO NEAREST STAIRWAY AND LEAVE THE FLOOR. WHILE THE REPORT IS BEING VERIFIED, OCCUPANTS ON OTHER FLOORS SHOULD AWAIT FURTHER INSTRUCTIONS." This message will be repeated. The evacuation signal shall be slow-whoop tone. Ascending tone commencing at approximately 600 Hz and terminating at approximately 1100 Hz with a duration of approximately 3-1/2 seconds and an interruption between tones of approximately 1/2 second.

ATG-2 Terminal Connections
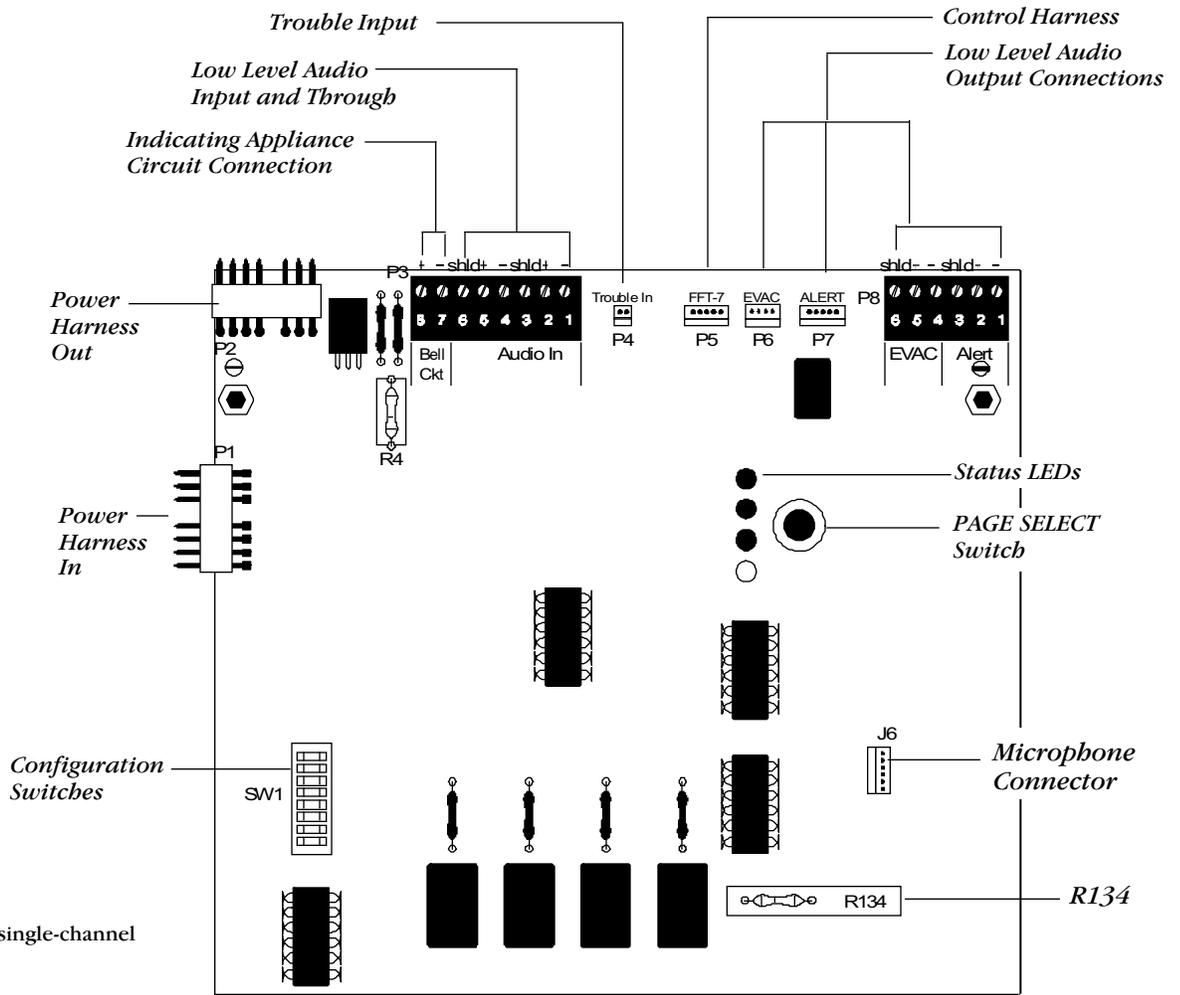
Cut R134 for single-channel operation.

Input/Ouput	Connection	Used for
Trouble Input	P4	Connecting trouble output contacts from the AA-30/AA-120. A closure signals the ATG-2 when a device is in trouble. The trouble signal is relayed through the Notification Appliance Circuit connection.
Low Level Audio Input and Through	P3-1 to P3-6	AMG-1 output to other device when using the ATG-2 for remote paging.
Notification Appliance Circuit	P3-7 P3-8	Connecting 24 VDC regulated power if using Notification Appliance Circuits.
Power Harness In	P1	Connecting to the MPS-400 (J1) for providing power to the ATG-2.
Control Harness	P5	Connecting to P4 on a Fire Fighters Telephone (if installed).
Low Level Audio Output Connections	P5 - FFT7 P6 - EVAC P7 - ALERT	Harnessing the ATG-2 audio signal to the AA-30/AA-120s in the same cabinet through P6 or P7; or wired to the AA-30/AA-120s in other cabinets through P8.
Power Harness Out	P2	Connecting to another device in the power supply chain.

ATG-2 Terminal Connections

Installing a Fire Fighter Telephone (FFT-7 and FFT-7S)

Overview

The FFT-7 and the FFT-7S modules mount on designated studs on the CHS-4L chassis. The module installation kit includes standoffs to secure the module to the studs on the CHS-4L. The following illustration shows the location of the mounting studs.

Mounting an FFT-7/FFT-7S

The following instructions show how to mount an FFT-7 or FFT-7S to a CHS4-L chassis.
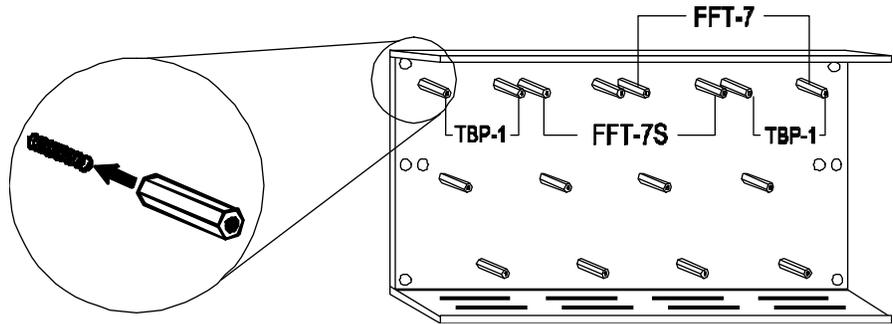
CHS4-L Chassis Mounting Studs

Step	Action
1	Mount the FFT-7S in the middle of a CHS-4L chassis.
2	Put a standoff on the third and sixth studs from the left corner of the CHS-4L Chassis.
3	Install the two TB-1 blank panels, by putting standoffs on the first, second, seventh, and eighth studs.
4	Mount the dress panels (TBP-1) on either side of the FFT-7S.

Mounting an FFT-7

Step	Action
1	Mount the FFT-7 on the right side of a CHS-4L chassis.
2	Put a standoff on the fifth and eighth studs from the left corner of the CHS-4L chassis.
3	Cover the AMG-1/ATG-2/FFT-7 assembly with a dress panel.

Mounting an FFT-7S

Installing a Fire Fighter Telephone

Mounting an FFT-7/FFT-7S, continued

Install the FFT-7 into the CHS-4L chassis by following the steps in the table.

Step	Action
1	Angle the bottom of the FFT-7/FFT-7S module into the bottom slot of the CHS-4L chassis. *CHS-4L* — *FFT-7 or FFT-7S*
2	Secure the module to the chassis with the captive screws. *Captive screw (2 places)*
3	Mount the dress panels. *Mounted FFT-7S with Dress Panels* *Mounted FFT-7 with Dress Panels*

Installing an FFT-7/FFT-7S

FFT-7/FFT-7S Terminals and Connections

Overview

This section shows FFT-7/FFT-7S terminals and connections to other devices in the system. Follow the instructions in the table below to connect an FFT-7 or FFT-7S to an AFP-400 system.

How to Connect an FFT-7/FFT-7S
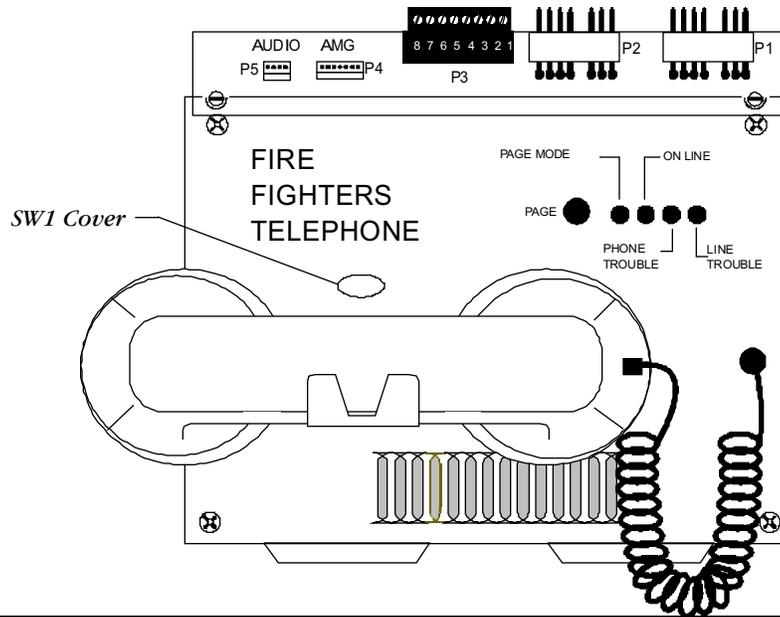
Component	Function	Use to
P1	Plug for power harness out (75099)	Connect a harness to another device in the chain.
P2	Plug for power harness in (75099)	Connect a harness between FFT-7 and MPS-400 to power FFT-7 from the MPS-400.
P3	Telephone signal loop	Make connections to a telephone circuit. P3 pin assignments are:

Pin	Connection	Instructions
1	no connection	N/A
2	Style Z return (–)	Connect to J6 on last
3	Style Z return (+)	VCM-4 on circuit.
4	Shield	N/A
5	Telephone output (–)	Connect to J5 on first
6	Telephone output (+)	VCM-4.
7	no connection	N/A
8	no connection	N/S

Component	Function	Use to
P4	FFT-7/AMG control harness (75097)	Connect to plug P6 on the AMG.
P5	no connection	N/A
SW1	Two-wire/four-wire selector switch	Set the AFP-400 for four-wire operation: 1) Remove switch cover. 2) Set SW1 for four-wire operation.

FFT-7/FFT-7S Terminals and Connections

Installing Audio Amplifiers

**AA-30 Installation
Overview**

The AA-30 mounts in a CHS-4L chassis, which can hold two AA-30s placed side by side. In addition to mounting, do the following:
- Connect primary (AC) and secondary (24 VDC battery) power source to each AA-30.
- Provide an external device for charging the batteries (such as an MPS-400).

Mounting the AA-30

Mount an AA-30 into a CHS-4L chassis by following these steps.

Step	Action	
1	Put the bottom end of the AA-30 assembly into the slot in the bottom of the CHS-4L chassis. Swing the assembly into the chassis.	*AA-30* *CHS-4L*
2	Secure the AA-30 to the chassis with the washers and retaining nuts.	*Washer and retaining nut (4 places)*
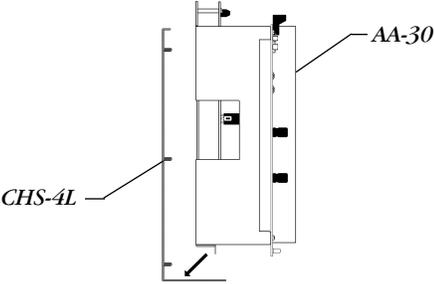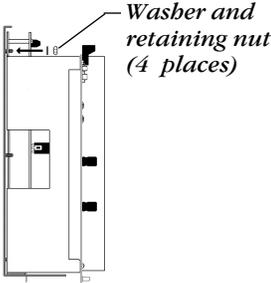
Mounting an AA-30 into a Chassis

Installing Audio Amplifiers

AA-100/AA-120 Overview

The AA-100/AA-120 mounts directly to the cabinet backbox. In addition to mounting, do the following:
- Connect primary (AC) and secondary (24 VDC battery) power source to each audio amplifier.
- Provide an external device for charging the batteries (such as an MPS-400).

Mounting an AA-100/ AA-120 to the Cabinet

AA-120 audio amplifiers mount directly to the backbox. To do so, follow the steps in the following table.

Step	Action
1	Mount the AA-100 onto the PEM studs on the cabinet backbox (in the same way as the CHS-4 and CHS-4L chassis).
2	Install the two #8 nuts and lockwashers onto the PEM studs and tighten until secure.

Mounting an AA-100/AA-120

PEM Studs (2 places)

#8 Lockwasher

Partial front view of an AA-120
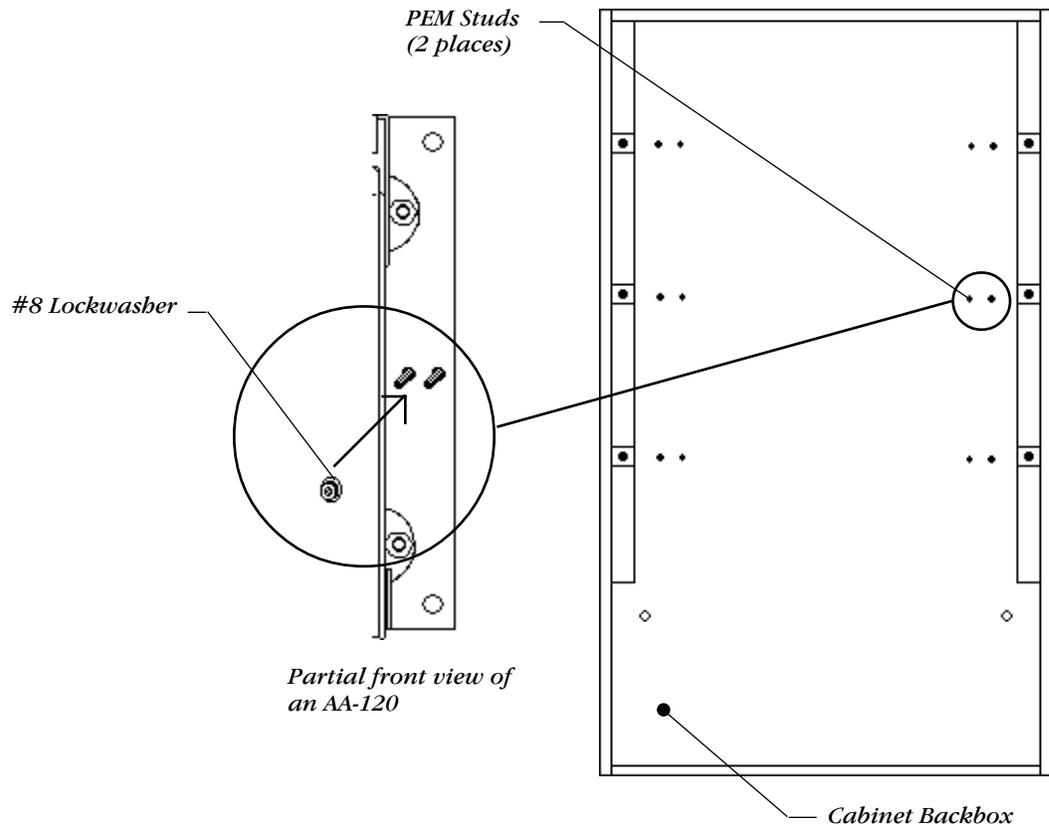
Cabinet Backbox

Mounting an AA-100/AA-120 into a Cabinet Backbox

AA-30 Terminals and Connectors

AA-30 Overview

- The low-level input and high-level output "P" connectors are primarily for in-cabinet applications where the wiring to or from the AA-30 remains in the cabinet. For "multiple-cabinet" applications, hard-wire the system using the terminal blocks P3 and P8.

- Cut resistors R8 and R9 when using high-level audio in four-wire mode.

- For information on the ACT-1 refer to "ACT-1 Audio Coupling Transformer" in this section.

AA-30 Lower Board Connections
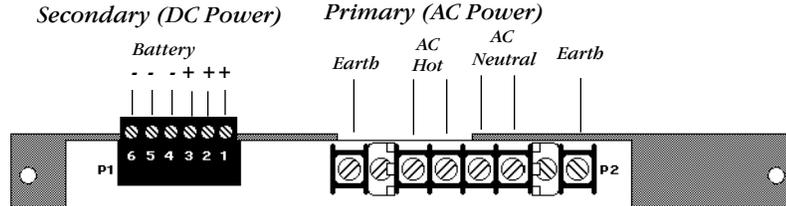
AA-30 Lower Board Connections (nonpower-limited)

AA-30 Upper Board Connections
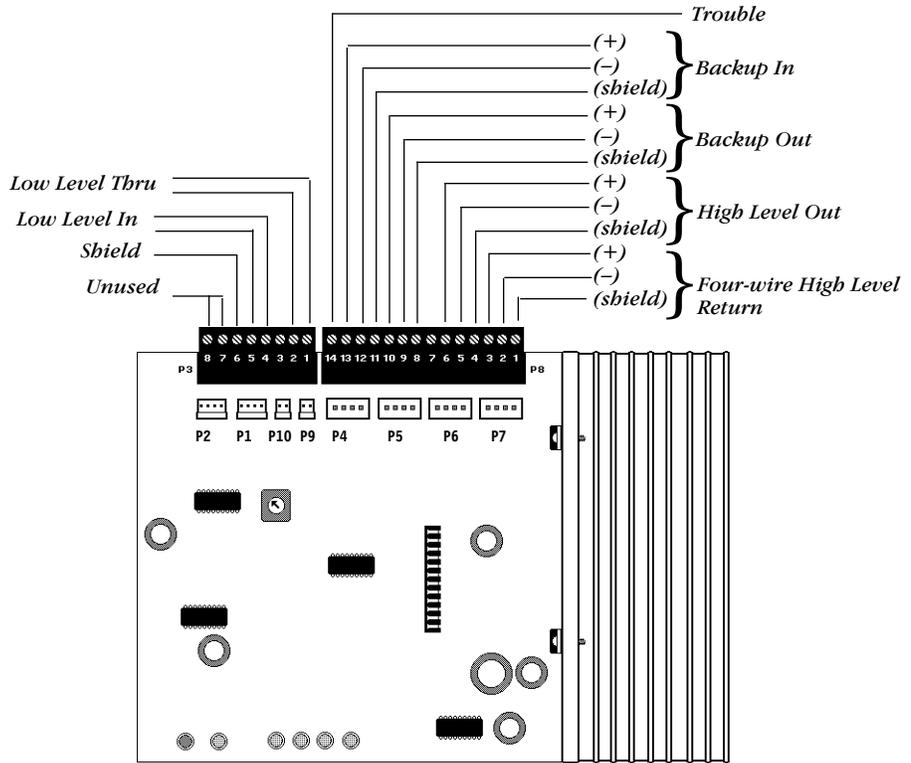
Plug	Function
P1	Low Level Thru
P2	Low Level In
P4	Backup Audio In
P5	Backup Audio Out
P6	High Level Audio Out
P7	Four-Wire High Level Audio Return
P9	Trouble Out
P10	Trouble In

AA-30 Upper Board Connections (Power-limited)

AA-100/AA-120 Terminals and Connectors

AA-100/AA-120 Overview

Low-level input and high-level output connectors are primarily for in-cabinet applications where the wiring to or from the AA-30 remains in the cabinet. For "multiple-cabinet" applications, use the terminals.

AA-100/AA-120 Lower Board Connections

Secondary (DC Power)   *Primary (AC Power)*

Battery   *AC*   *AC*
– – + +   *Earth*   *Hot*   *Neutral* *Earth*

P1 P2

AA-100/AA-120 Lower Board Connections

AA-100/AA-120 Upper Board Connections

Low Level Audio In   *Earth*

Shield   *70.7 V Output*

Low Level Audio Through   *(+)*
                                              (-)   } *High Level Out*
                                              (shield)
Shield   *(+)*
Common   *(-)*   } *Four-wire High Level Return*
Trouble {   *(shield)*

12 11 10 9 8 7 6 5 4 3 2 1   *T-70 Connection*   P7   10 9 8 7 6 5 4 3 2 1 P8

P10 P9 P2 P1   P4   P5   P6
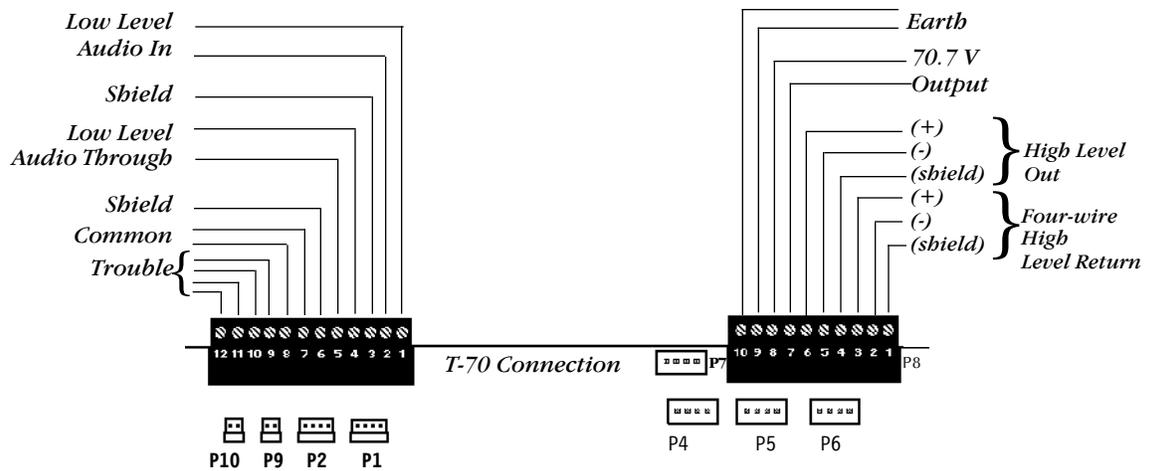
Plug	Function
P1	Audio Through
P2	Audio In
P4	Backup In
P5	Backup Out
P6	High Level Audio Out
P7	T-70 Connection
P9	Trouble Out
P10	Trouble In

AA-100/AA-120 Upper Board Connections

System Configuration Drawings

Installing a Backup Amplifier

Use an AA-30, AA-100 or AA-120 Audio Amplifier to back up one or more amplifiers. If an amplifier fails, backup amplifier switching is automatic. To connect amplified audio output:

- use P6 for connection to VCM-4/VCE-4; or
- use P8 for connection to CMX modules.

AMG-1

Field wiring to speaker circuits

AUDIO MESSAGE GENERATOR

Cable 75110

VCM-4   VCM-4

Cable 75109

System Amplifier #2

Audio output

Unamplified AMG-1/ ATG-2 output tone or voice message

P4 P5 P6

Cable 75108

Cable 75110

Cables must enter from top of the plug.

System Amplifier #1

P4 P5 P6

Cable 75110

Cable 75108

Shield

Backup Amplifier

Optional supervision

P4 P5 P6
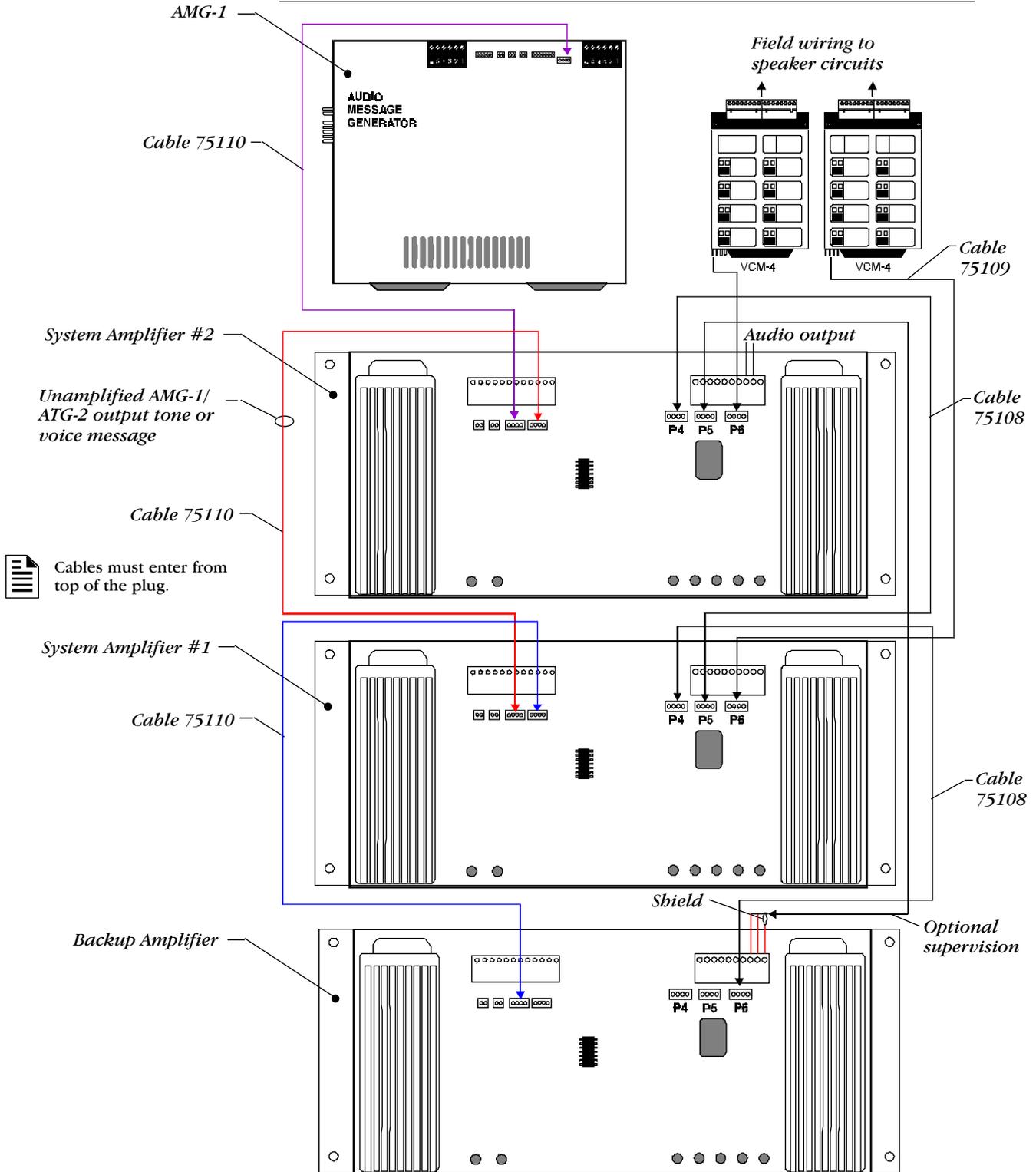
Voice Alarm Modules

Overview

Voice alarm modules for the AFP-400 feature removable terminal blocks that simplify installation and servicing of the control panel. These modules include the Voice Control Module (VCM-4), the Voice Control Expander (VCE-4), and the Dual Channel Module (DCM-4).

Module Descriptions

The following table contains descriptions of the voice alarm modules and the components that come with each module.

Module	Description	Components
Voice Control Module-4 (VCM-4) *VCM-4*	A board that provides the AFP-400 with up to four Style Y or Style Z speaker circuits. Moving a jumper on the VCM-4 sets the VCM-4 to drive telephone (FFT-7/FFT-7S) circuits. When set for telephone operation, a VCM-4 accepts its signal directly from an FFT-7/FFT-7S.	• VCM-4 board • four end-of-line resistors (71252) • four dummy load resistors (71245) • one 24-inch cable assembly (71091) for interboard connection • a set of slide-in speaker labels • a set of slide-in telephone labels
Voice Control Expander-4 (VCE-4) *VCE-4*	A board that plugs into the back of the VCM-4. This expands the voice unit up to eight Style Y or Style Z speaker circuits. When set for telephone circuit operation, the VCE-4 provides expansion for up to eight Style Y or four Style Z fire fighter's telephone circuits.	• VCE-4 board • four end-of-line resistors (71252) • four dummy load resistors (71245) • one 24-inch cable assembly (71091) • three 1-1/4 inch cables (75106)
Dual Channel Module (DCM-4) *DCM-4* *VCE-4*	A two-board assembly (DCM-4 and VCE-4) that provides the AFP-400 with capability to select one of two audio sources for switching to a selected speaker circuit. The DCM-4 can use up to four circuits.	• DCM-4 board • VCE-4 board • four end-of-line resistors (71252) • four dummy load resistors (71245) • one 24-inch cable assembly (71091) • four 24-inch cable assemblies (71091) for interboard connection • six 54 inch cable assemblies (75071) for connecting a DCM-4 to an AMG-1 and AA-30/AA-120s • a slide-in label set (15831)
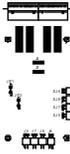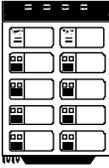
Voice Alarm Modules

Cables and Harnesses

4.7K, 1/2 watt End-of-Line Resistor

4.7K, 1/2 watt Dummy Load Resistor

24" Audio Cable Assembly

Connecting VCM-4 Speaker Circuits

Overview

Follow these guidelines when connecting VCM-4 speaker circuits:

1) Speaker circuits are supervised and power-limited.
2) Use twisted-pair cable for wiring speaker circuits.
3) Maximum speaker circuit wire resistance depends on wattage required for each speaker.
4) Use only UL Listed speakers rated for 25 Vrms.
5) For systems with AA-100 amplifiers, you can use 70.7 Vrms speakers. Use 4.7K, 2W ELRs with 70.7 Vrms speakers.
6) Install End of Line resistors according to the table below:

For ELR connection to devices...	Use resistor part number...
with terminals	71252
with flying leads	71245
installed in Canada	N-ELR

Resistor Requirements

Wiring Diagram

Optional Voice Control Expander Speaker Circuits (provides positions E, F, G, and H

VCM-4 Speaker Circuits positions A, B, C, and D

Speaker Power Polarity

VCM-4

NFPA Style Y
4.7K, 1/2 watt ELR
part no. 71252

NFPA Style Z

Speakers

Speakers

End each unused circuit with a 4.7K ELR part no. 71245

VCM-4 or VCE-4 Speaker Circuits

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

Typical Speaker Circuits
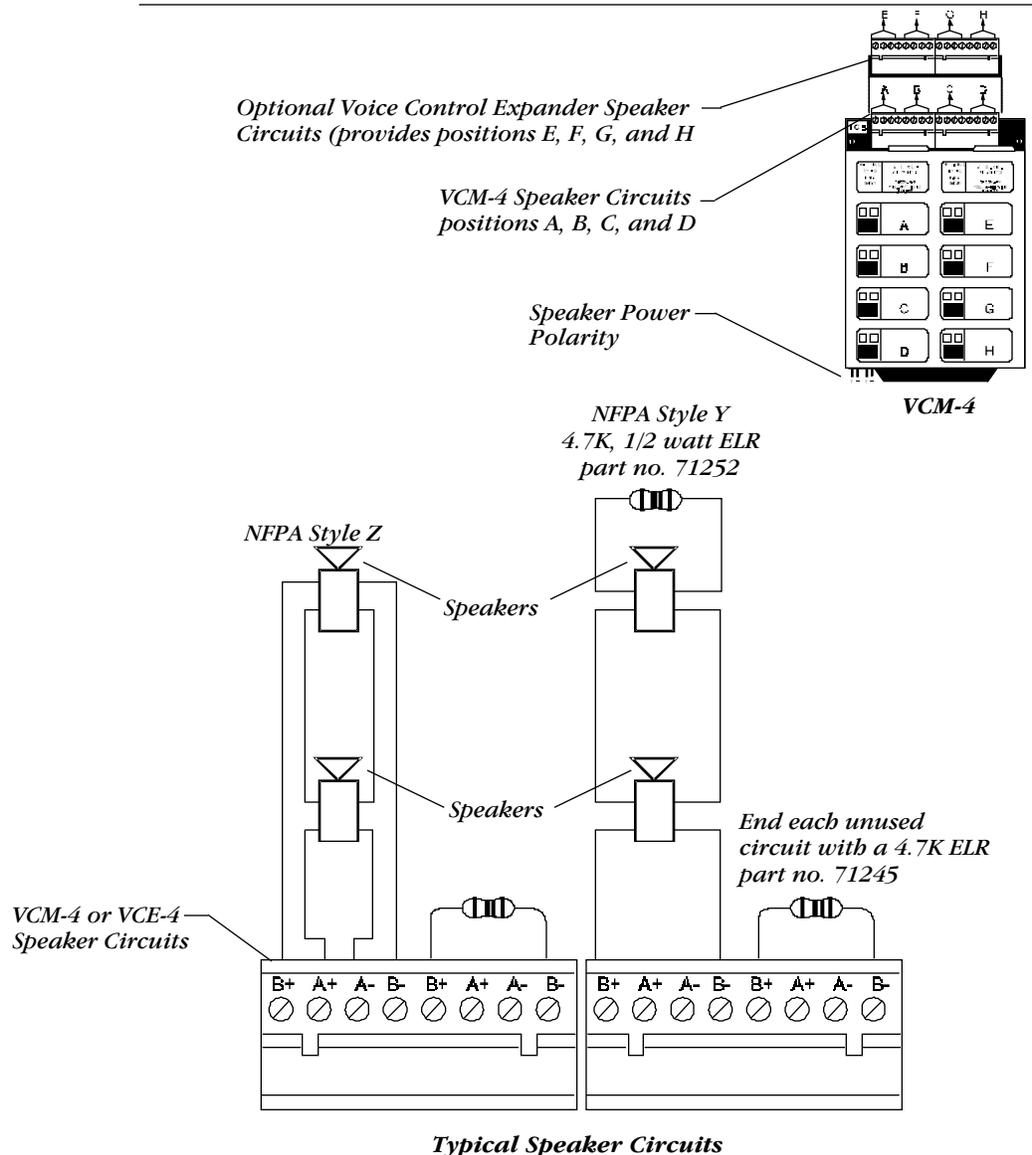
Connecting VCM-4 Telephone Circuits

Overview

Follow these guidelines when connecting VCM-4 telephone circuits:

1) Telephone circuits are supervised and power-limited.
2) Use twisted-pair cable for telephone circuit wiring.
3) Maximum telephone circuit wire resistance is 40 ohms.
4) Install End of Line Resistors according to the table below:

For ELR connection to devices...	Use resistor part number...
with terminals	71252
with flying leads	71245
installed in Canada	N-ELR

Resistor Requirements

Wiring Diagram

End each unused VCM-4 circuit with a 4.7K ELR (part no. 71245)

Optional Telephone Expander Circuits *(provides positions E, F, G, and H)*

Telephone Circuits *positions A, B, C, and D*

Connections *to FFT-7*
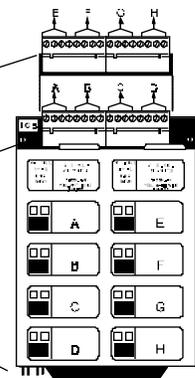
VCM-4 *(configured for Telephone operation)*

Four-wire Telephone Circuit 4.7K, 1/2 watt ELR Part no. 71252

Four-wire Circuit

Telephone Stations

4.7K ELR part no. 71245

VCM-4 or VCE-4 Telephone Circuits

| B+ | A+ | A- | B- | B+ | A+ | A- | B- | B+ | A+ | A- | B- | B+ | A+ | A- | B- |
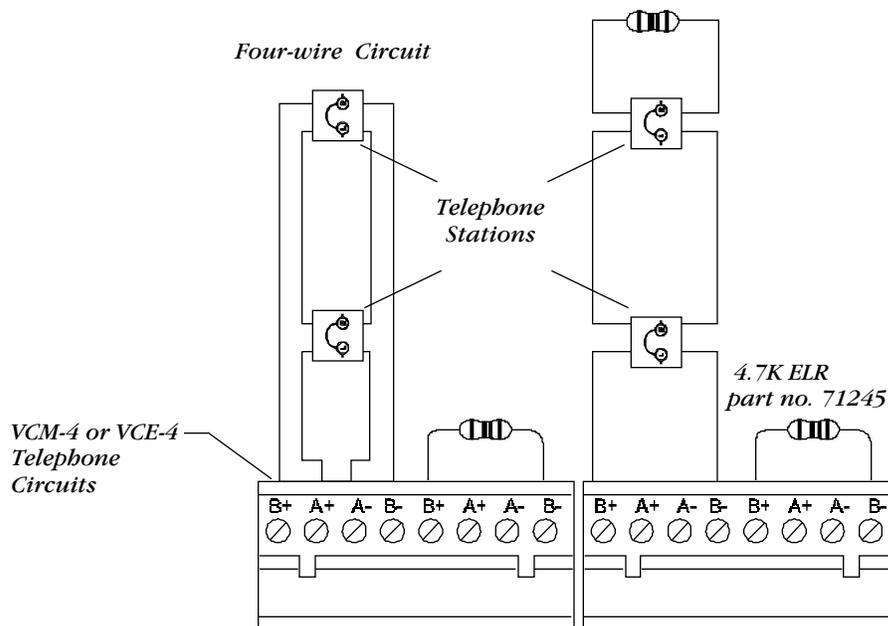
Typical Telephone Circuits

Setting the VCM-4 to Speaker or Telephone Mode

Overview

The VCM-4 comes with a factory-installed jumper plug on JP3. Use the jumper to select the operating mode of the entire module (VCM-4 plus optional VCE-4). Select Speaker or Telephone mode as follows:

📄 Do not mix speaker and telephone circuits on the same module.

Select...	Do this...
Speaker mode (factory setting)	Leave the jumper in JP3.
Telephone mode	1) Remove jumber from JP3. 2) Install jumper in JP4.

Selecting Telephone and Speaker Mode

JP3 – *Speaker mode*

JP4 – *Telephone Mode*
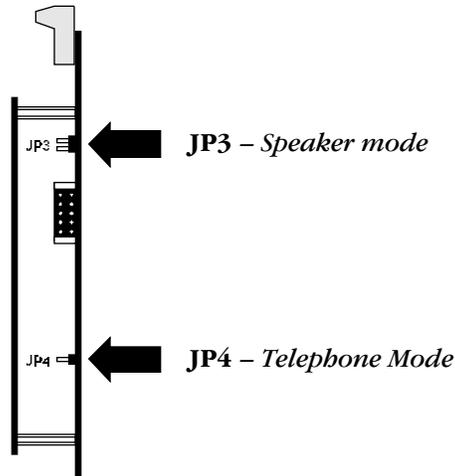
Selecting VCM-4 Mode

Connecting a CMX-2 Module to Speaker Circuits

The following diagram shows typical wiring connections for a CMX-2 module when installed with speaker circuits. All wiring shown is supervised and powr limited. When making connections, note the following:

📄 Use shielded twisted pair wire on SLC wiring.

Do not use terminal 5 on the CMX-2 module.

- *Audio Branch Circuit* – Do not loop wire on terminals 3 and 4. Break the wire run to provide supervised connections. Audio circuits require twisted pair wire as a minimum.
- *Speaker Switching Circuit* – Only use speakers listed for fire protection. Maximum speaker load: 43.75 watts, up to 70.7 Vrms (.35 power factor).
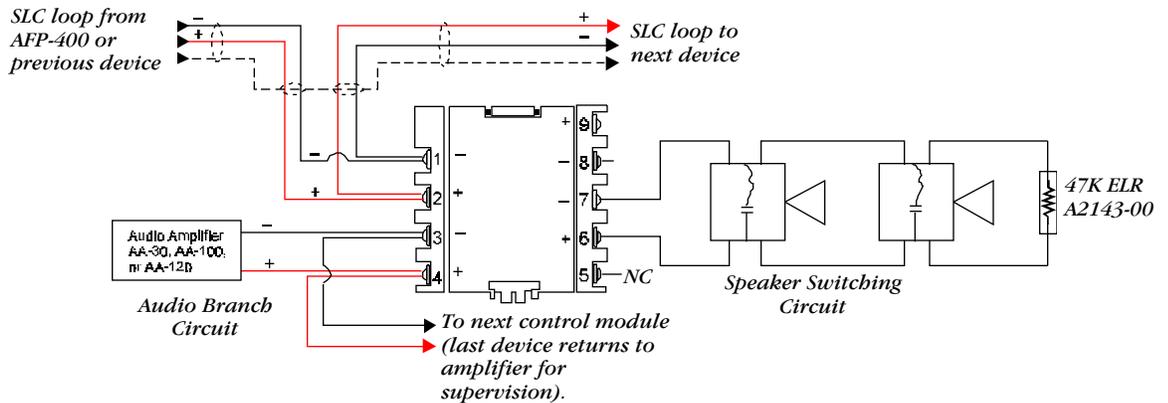
Typical CMX-2 Wiring Connections to Speaker Circuits

Connecting Dual Channel Module Circuits

Overview

For systems with AA-100 amplifiers, you can use 70.7 Vrms speakers. Also, use 4.7K, 2W ELRs with 70.7 Vrms speakers.

1) All speaker circuits are supervised and power-limited.

2) Twisted-pair cable should be used for speaker circuit wiring.

3) Maximum speaker circuit wire resistance is dependent upon wattage required at each speaker.

4) Refer to the table, "Resistor Requirements," for resistor values.

5) Use only UL Listed speakers rated for 25 V_{RMS}.

For ELR connection to devices...	Use resistor part no.
with terminals	71252
with flying leads	71245
installed in Canada	N-ELR

Resistor Requirements

Wiring Diagram

DCM-4 Speaker Circuits positions 1, 2, 3, and 4

Speaker Channels A and B

DCM-4

NFPA Style Y
4.7K, 1/2 watt ELR
Part no. 71252
(Note 4)

NFPA Style Z

Speakers

Speakers

End each unused circuit with a 4.7K ELR Part no. 71245

Typical Speaker Circuits
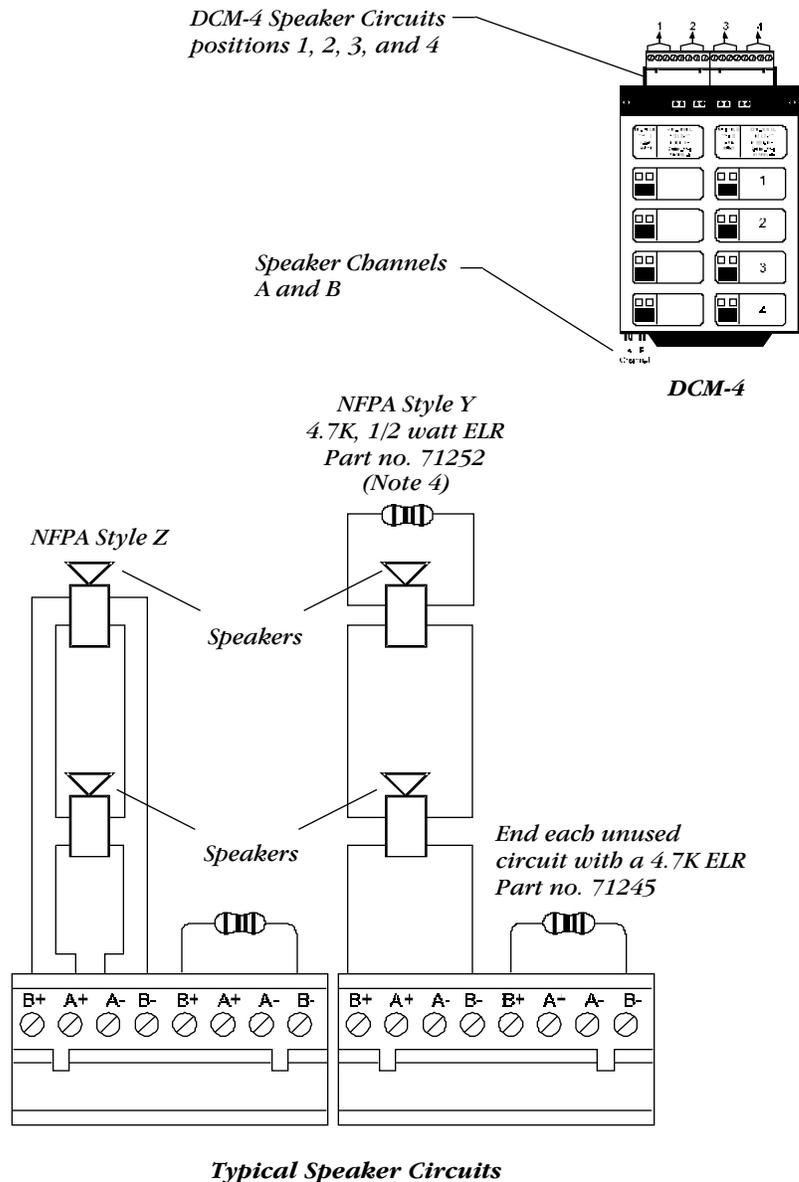
System Configuration Drawings, Distribution of Internal Power

Wiring Diagram

Power ribbon cable
CAB-3   75394
CAB-400AA   75398

Power Cable:
CAB-3   75395
CAB-400AA   75396

VCM-4   VCM-4

Cable 75088 (Included with FFT-7)

*Cable 75396
or 75100*

P1

P2   P3   P4   P3   P2   P1
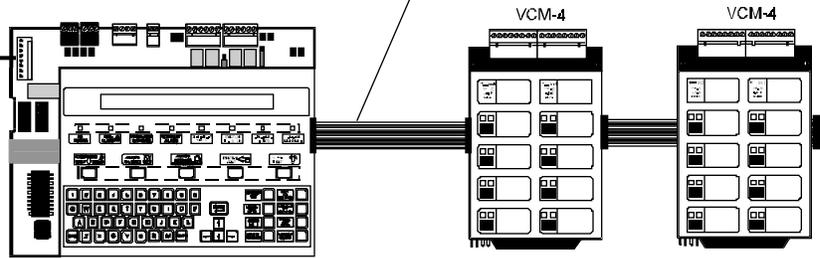
AMG-1   FFT-7
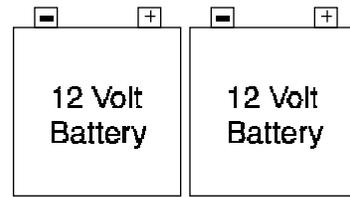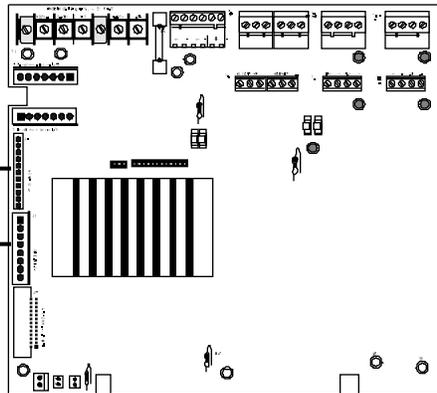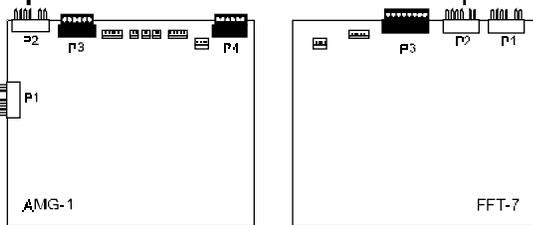
P1 and P2 on the AMG-1 and the FFT-7 are interchangeable.

12 Volt Battery   12 Volt Battery

Block Diagram

J1   P2   P2   P2

MPS-400   P1   AMG-1   P1   AMG-1   FFT-7   CPU-400
               or ATG-2

J6   J6
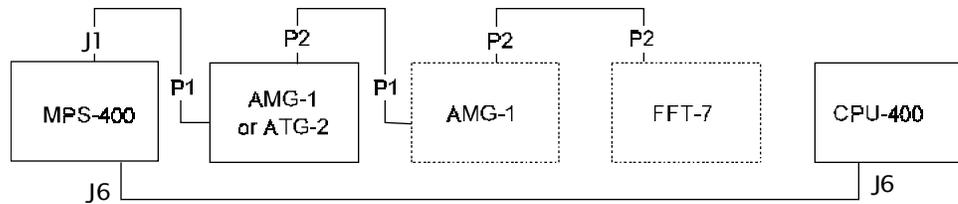
Distribution of Internal Power Block Diagram

System Configuration Drawings

AFP-400 EIA-485 Connections

Wiring Diagram

📄 Use 18AWG to 12AWG twisted-pair cable for EIA-485 connections.

📄 120-ohm end-of-line resistors required on the last RS-485 device.

CPU-400

ACM-16AT *ACM-32A*

Remotely mounted serial annunciators

AMG-1
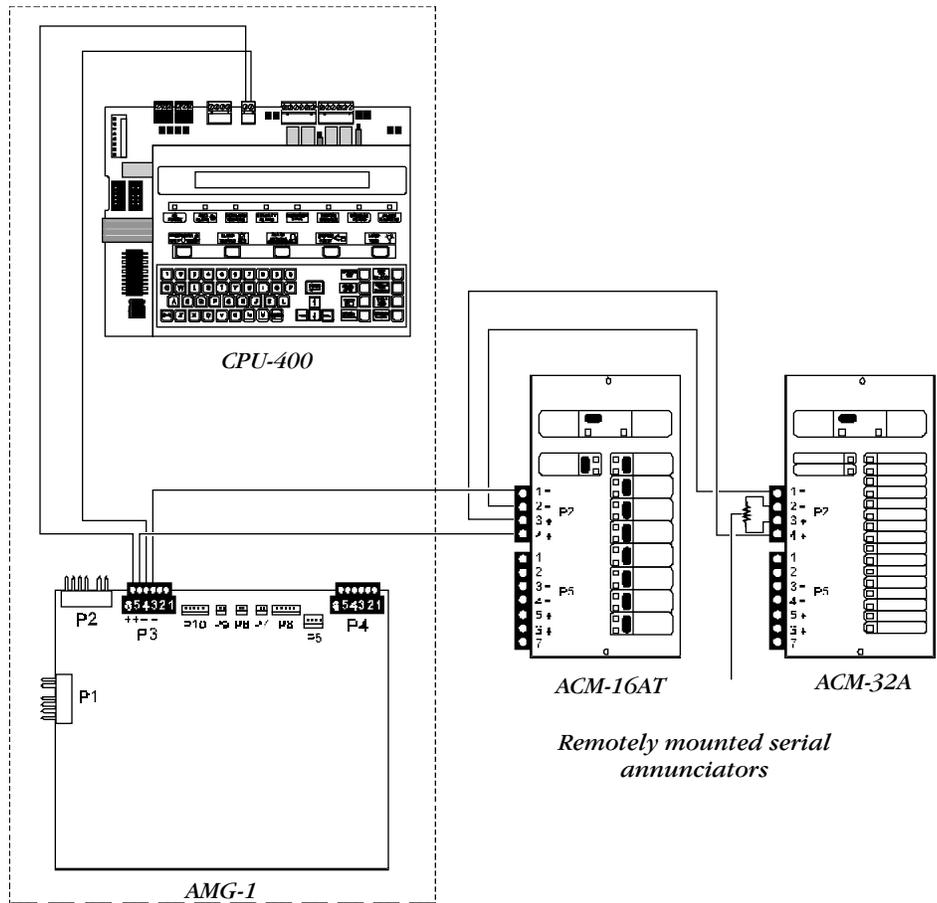
AFP-400 EIA-485 Connections
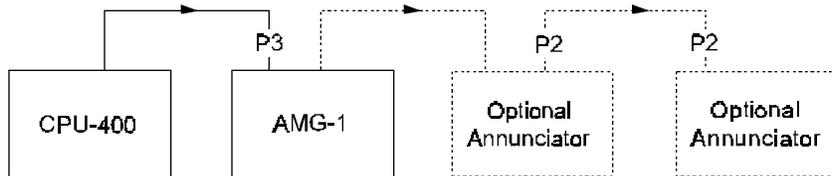
Block Diagram

Block Diagram for Distribution of EIA-485

System Configuration Drawings

Wiring an AFP-400 Audio Signal without a Backup Amplifier

These drawings illustrate the use of two AA-30 Audio Amplifiers without backup. The first two speaker circuits share 30 watts from one AA-30; the third and fourth speaker circuits share 30 watts from the second AA-30.

1) Set FFT-7 SW1 for four-wire operation (down position).

2) Mount an R470 resistor across P3-4 and P3-5 on the last amplifier.

Use 18AWG to 12AWG twisted-pair cable for EIA-485 connections.

This wiring diagram applies to AA-30, AA-100, and AA-120 audio amplifiers. Connections to plugs P1, P2, P4, P5, P6, P7, P9, and P10 are identical.

Item	Supplied with	Part Number
Low level Audio cable	AA-30, AA-100, AA-120	75100
Telephone cable	VTCC-1 package	75121
25-volt Audio cable	AA-30, AA-100, AA-120	75109
Cable	FFT-7	75097
470 ohm resistor	AMG-1	R470

Wiring Inventory

Wiring Diagram

Wiring an Audio Signal without a Backup Amplifier

Resistor R470 mounted across terminals 4 and 5 on the last Audio Amplifier.

Block Diagram

Distribution for Audio Block Diagram

System Configuration Drawings

AFP-400 Audio Signal Wiring Using a Backup Amplifier

This drawing illustrates the use of two AA-30 Audio Amplifiers with a backup AA-30. These four speaker circuits share 30 watts from one AA-30. The AA-30 on the left serves as the backup.

1) Set FFT-7 SW1 for Four-wire operation (down position).

2) Mount resistor R470 across P3-4 and P3-5 on the last amplifier.

Use 18AWG to 12AWG twisted-pair cable for EIA-485 connections.

This wiring diagram applies to AA-30, AA-100, and AA-120 audio amplifiers. Connections to plugs P1, P2, P4, P5, P6, P7, P9, and P10 are identical.

Item	Supplied with	Part Number
Low level Audio cable	AA-30, AA-100, AA-120	75100
Telephone cable	VTCC-1 package	75121
25-volt Audio cable	AA-30, AA-100, AA-120	75109
Cable	FFT-7	75097
470 ohm resistor	AMG-1	R470

Wiring Inventory
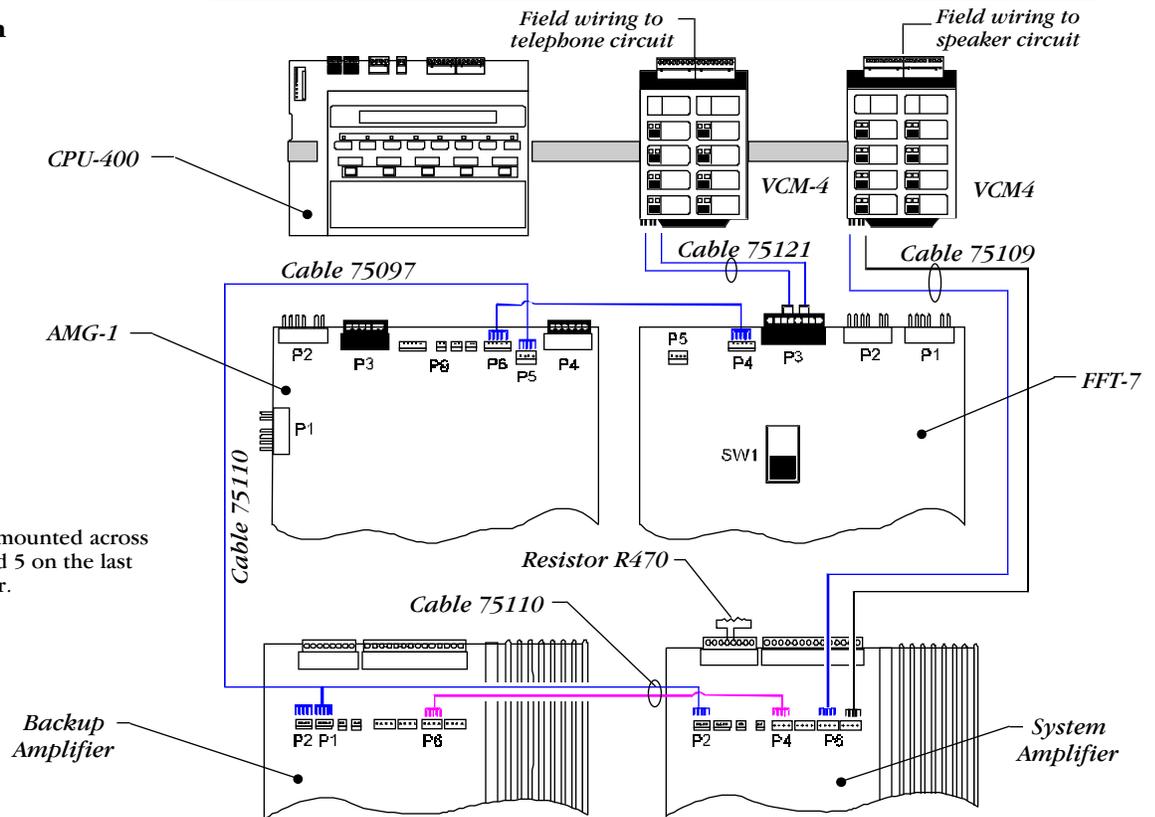
Wiring Diagram

Resistor R470 mounted across terminals 4 and 5 on the last audio amplifier.

Wiring an Audio Signal with a Backup Amplifier

Block Diagrams

One backup amplifier per system or group of amplifiers

One backup amplifier for each system amplifier.

Backup Amplifier Block Diagrams

System Configuration Drawings

AFP-400 Trouble Bus Connections

When connecting the AFP-400 Trouble bus, note the following:

1) P9 and P10 on audio amplifiers (AA-30, AA-100, and AA-120) and P1 and P2 on the AVPS-24 are interchangeable.

2) Trouble cable part numbers are: 75098 (24-inch) or 71033 (60-inch).

Wiring Diagram

AFP-400 Trouble Bus Connections

Block Diagram

Trouble Bus Block Diagram

30 Watt/Four and Eight Speaker Circuits

Overview

1) The AA-30 supplies audio power through plug P6, or terminals 5 and 6 on terminal block P8. This audio power run is not supervised. If using the optional supervised return, a loss of audio power (due to a break in the wiring) generates a trouble signal at the AA-30.

2) If using an optional supervised return, cut resistors R8 and R9, located directly under plug P6 on the AA-30.

3) Each circuit can share a maximum of 30 watts.

Wiring Diagrams

30 Watts
These four circuits share 30 watts

Optional supervised Return (note 2)
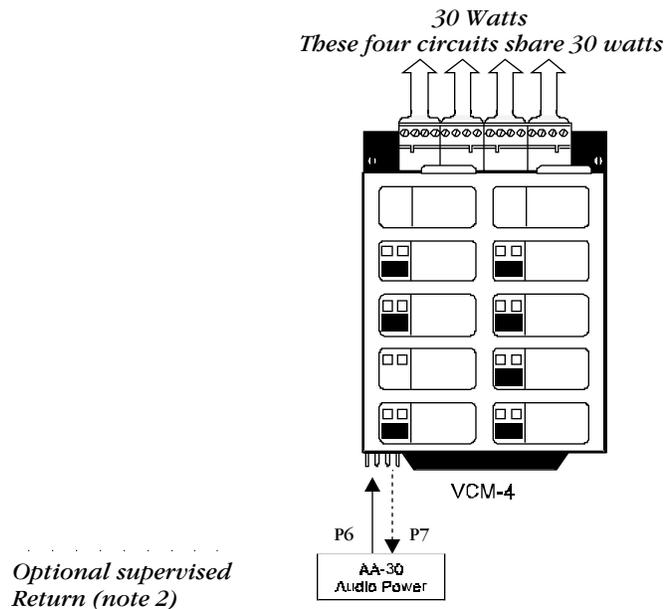
Typical 30 Watt, Four-Speaker Circuit

30 Watts
These eight circuits share 30 watts

Optional supervised Return (Note 2)
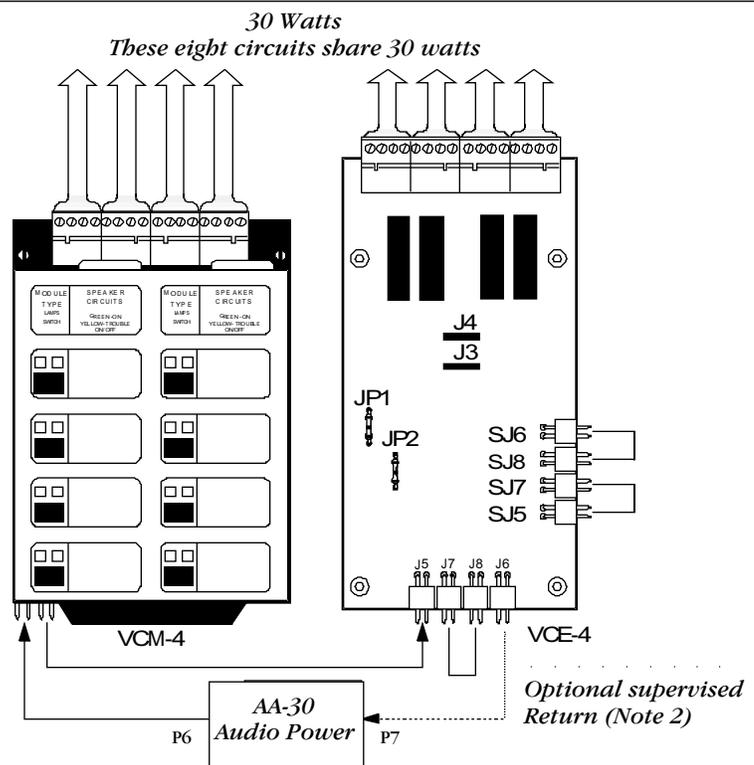
Typical 30 Watt, Eight-Speaker Circuit

120 Watt/Four and Eight Speaker Circuits

Overview

1) The AA-120 draws audio power from plug P6, or terminals 5 and 6 of terminal block P8. This audio power run is not supervised. If using the optional supervised return, a loss of audio power (due to a break in the wiring) generates a trouble signal at the AA-120.

2) If using an optional supervised return, cut resistors R107 on the AA-120.

3) Each circuit can handle a maximum of 30 watts.

Wiring Diagrams

120 Watts
These four circuits share 120 watts with
a maximum of 30 watts per circuit.
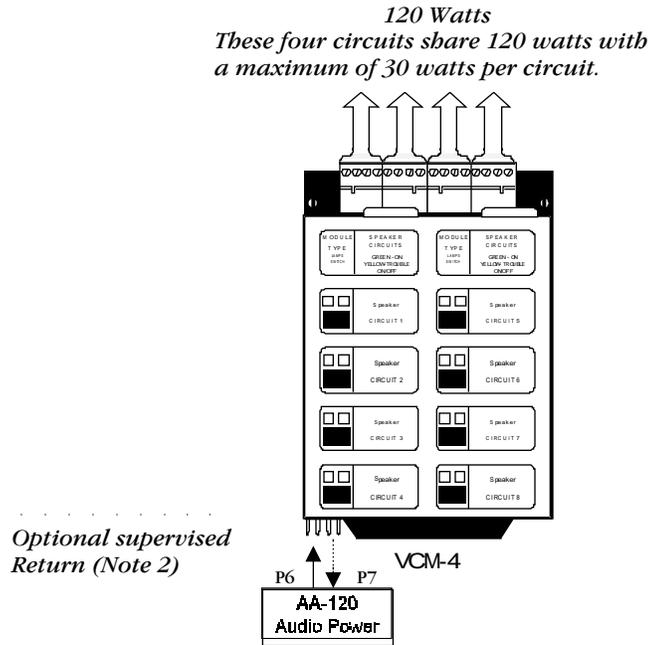
Typical 120 Watt, Four-Speaker Circuit

120 Watts
These eight circuits share 120 watts with
a maximum of 30 watts per circuit.
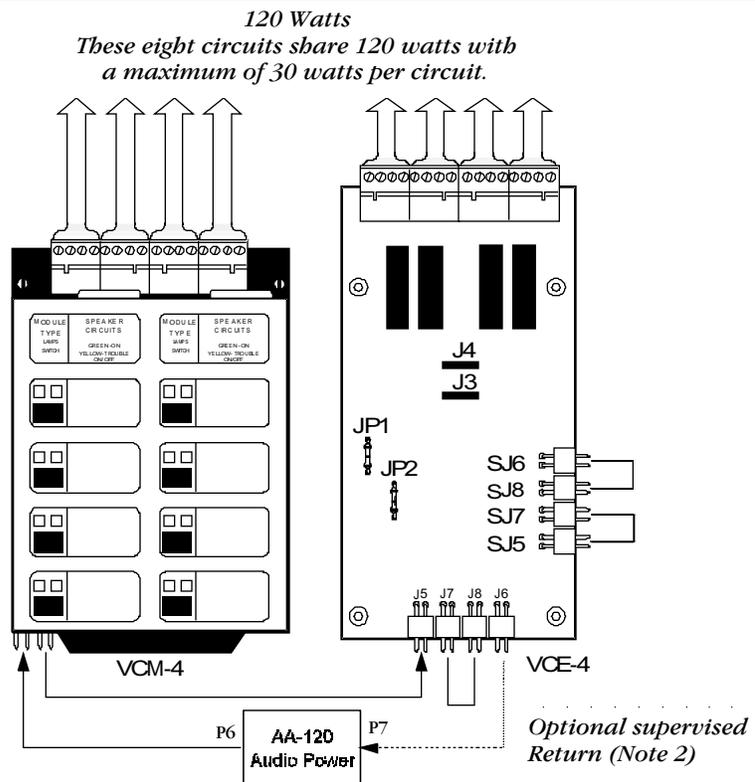
Typical 120 Watt, Eight-Speaker Circuit

90 Watt/Eight Speaker Circuit Configuration

Overview

1) The AA-30 supplies audio power through plug P6, or terminals 5 and 6 on terminal block P8. (This audio power run is not supervised.) If using the optional supervised return, a loss of audio power (due to a break in the wiring) will generate a trouble signal at the AA-30.

2) If using an optional supervised return, cut resistors R8 and R9, located directly below plug P6 on the AA-30.

3) Each circuit can handle a maximum of 30 watts.

4) In the configuration shown below, cut VCE-4 jumpers JP1 and JP2.

Wiring Diagram

The following diagram shows typical wiring for a 90-watt, eight-speaker circuit. The VCM-4 provides 30 watts and the VCE-4 provides 60 watts for a total of 90 watts.
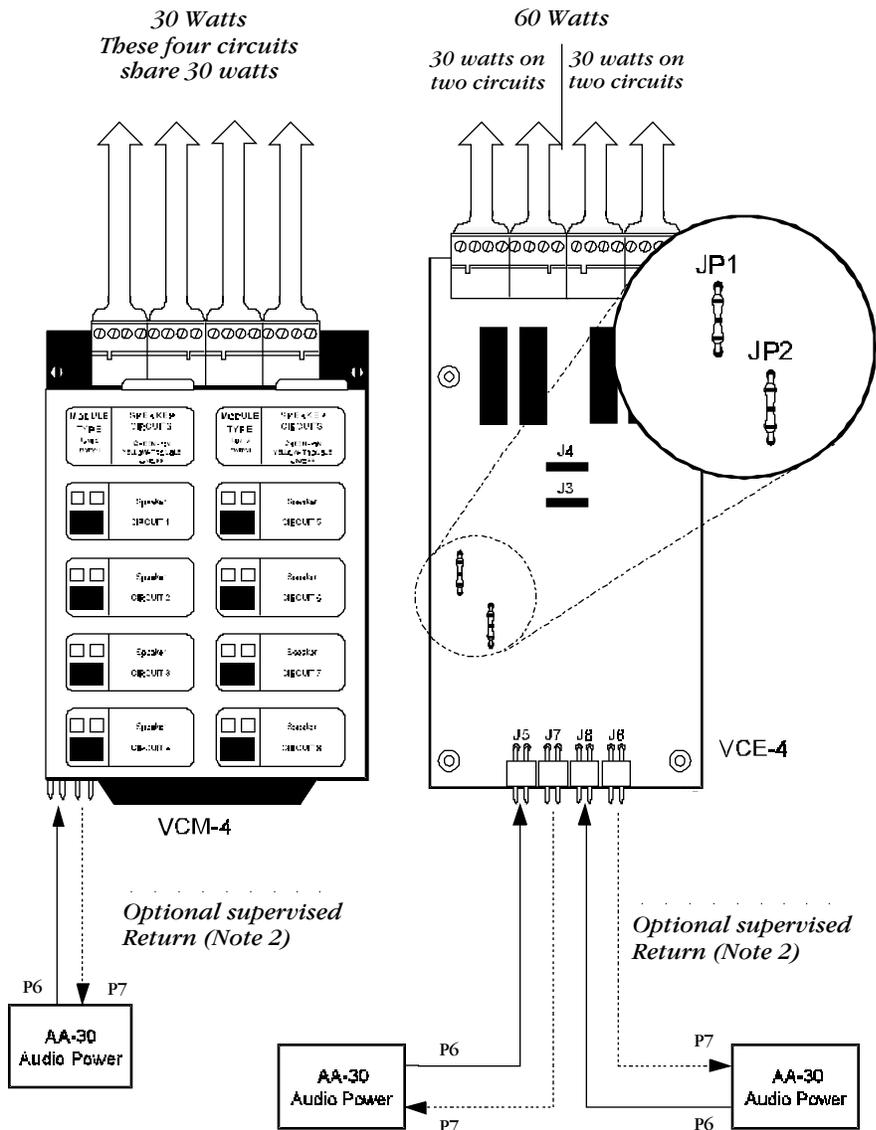
Typical 90 Watt, Eight-Speaker Circuit

240 Watt/Eight Speaker Circuit Configuration

Overview

1) The AA-120 draws audio power from plug P6, or terminals 5 and 6 of terminal block P8. This audio power run is not supervised. If using the optional supervised return, a loss of audio power (due to a break in the wiring) will generate a trouble signal at the AA-120.

2) If using an optional supervised return, cut resistors R107 on the AA-120.

3) Each circuit can handle a maximum of 30 watts.

Wiring Diagram
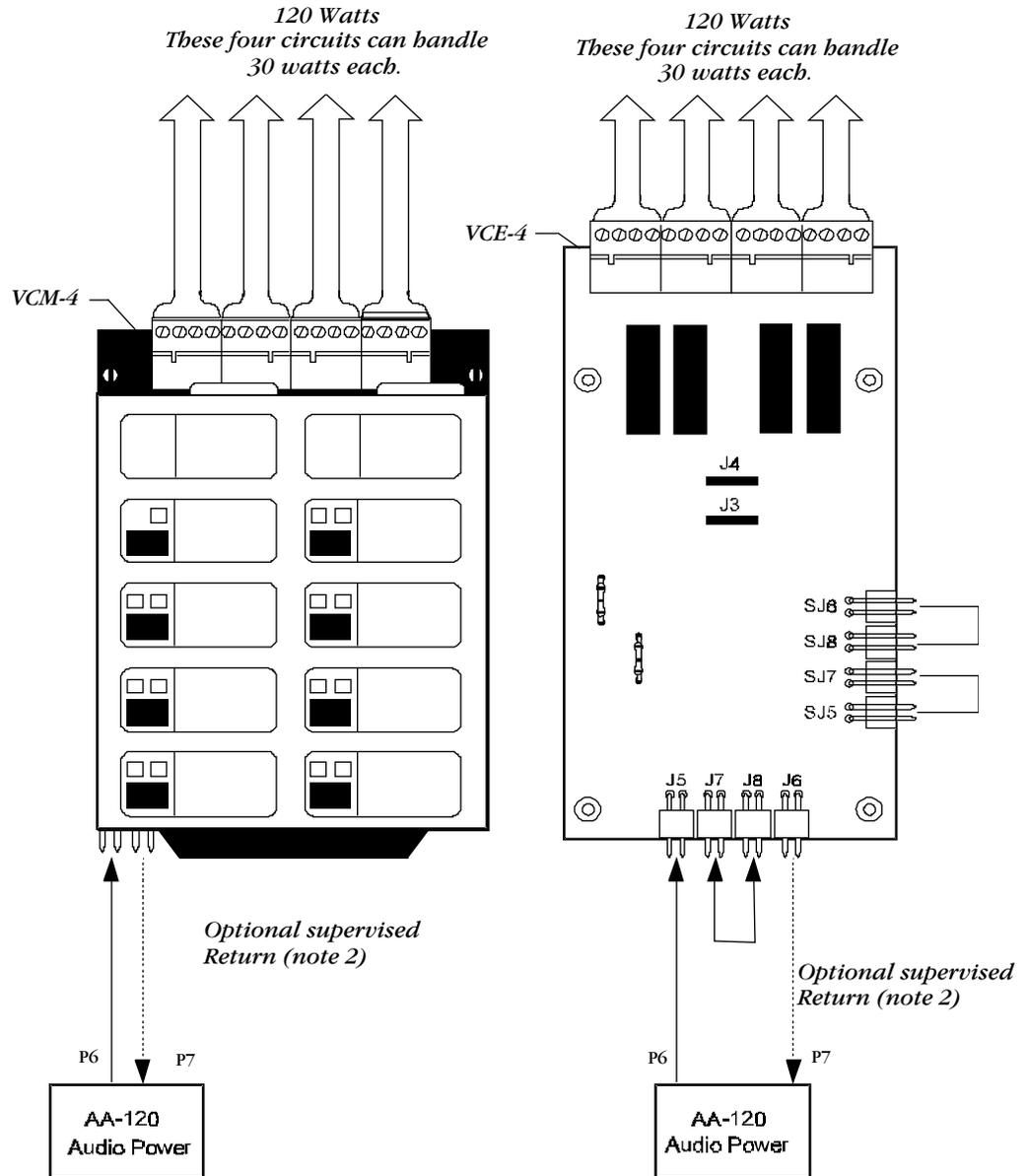
Typical 240 Watt, Eight-Speaker Circuit

180 Watt/Eight Speaker Circuit Configuration

Overview

1) AA-30 audio power is drawn from plug P6 or terminals 6 and 7 of terminal block P8. This audio power run is not supervised. If using the optional supervised return (plug P7 or terminals 2 and 3 of block P8), a loss of audio power due to a break in the wiring will generate a trouble signal at the AA-30.

2) If using an optional supervised return, cut resistors R8 and R9 (located directly below plug P6 on the AA-30).

3) Each circuit can handle a maximum of 30 watts.

4) In this configuration, cut VCE-4 and VCM-4 jumpers JP1 and JP2.

Wiring Diagram
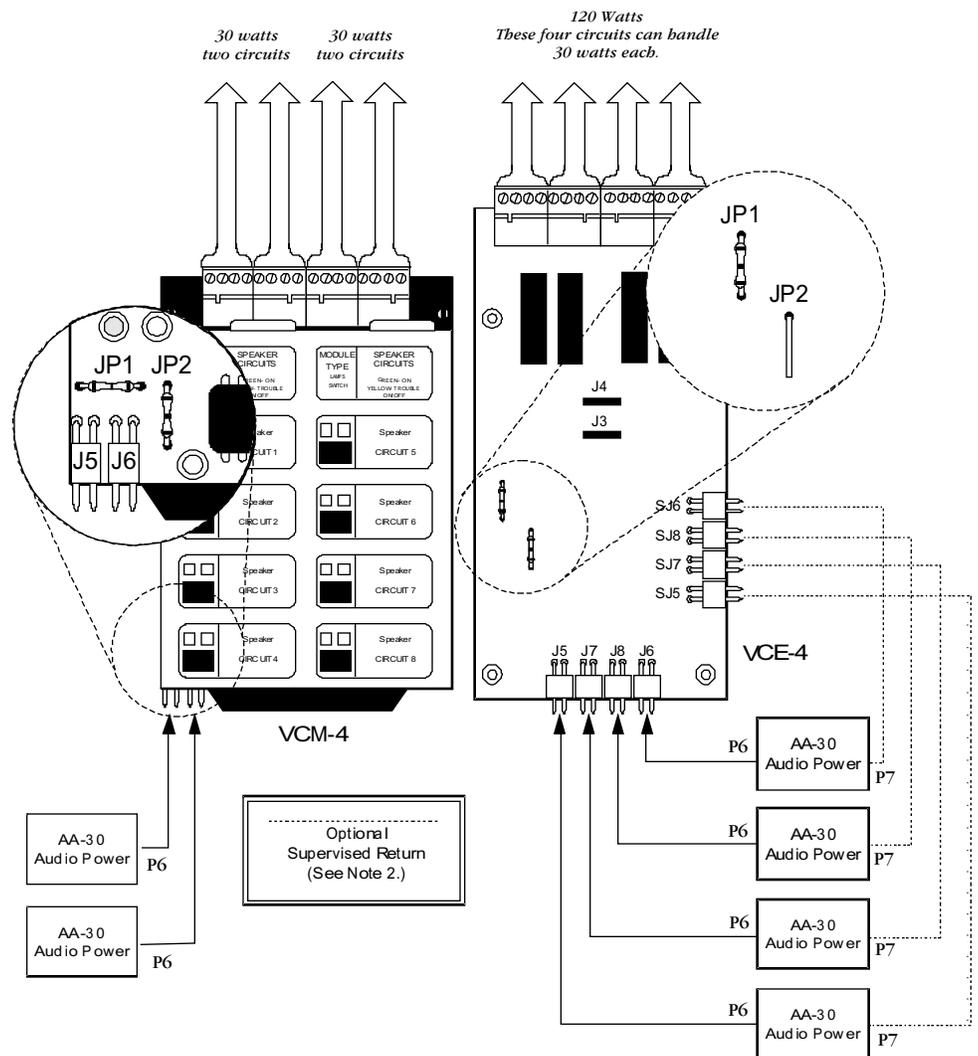
Typical 180 Watt, Eight-Speaker Circuit

30 Watt Dual Channel Configuration

Overview

1) Plug P6 or terminals 5 and 6 of terminal block P8 provide AA-30 audio power. This audio power run cannot be supervised in this configuration.

2) Maximum power is 30 watts per circuit.

3) In the diagram shown below, cut VCE-4 jumpers JP1 and JP2.

Wiring Diagram
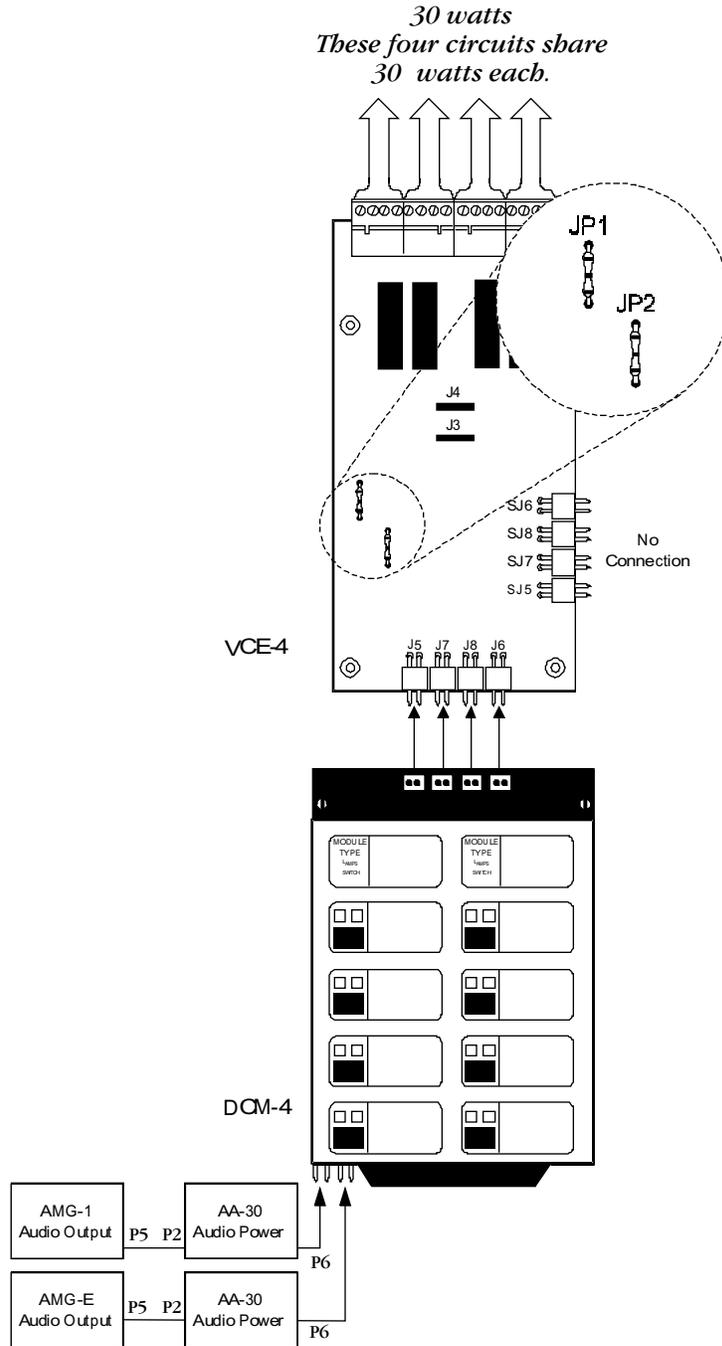
Typical 30 Watt Dual Channel Configuration

120 Watt Dual Channel Configuration

Overview

1) AA-30 audio power is drawn from plug P6 or terminals 6 and 7 of terminal block P8. (This audio power run is not supervised.) If using the optional supervised return (plug P7, or terminals 2 and 3 of terminal block P8), loss of audio power due to a break in the wiring generates a trouble signal at the AA-30.

2) If using an optional supervised return, cut resistors R8 and R9 on AA-30.

3) Maximum power per circuit equals 30 watts.

4) In the configuration shown below, cut VCE-4 jumpers JP1 and JP2.
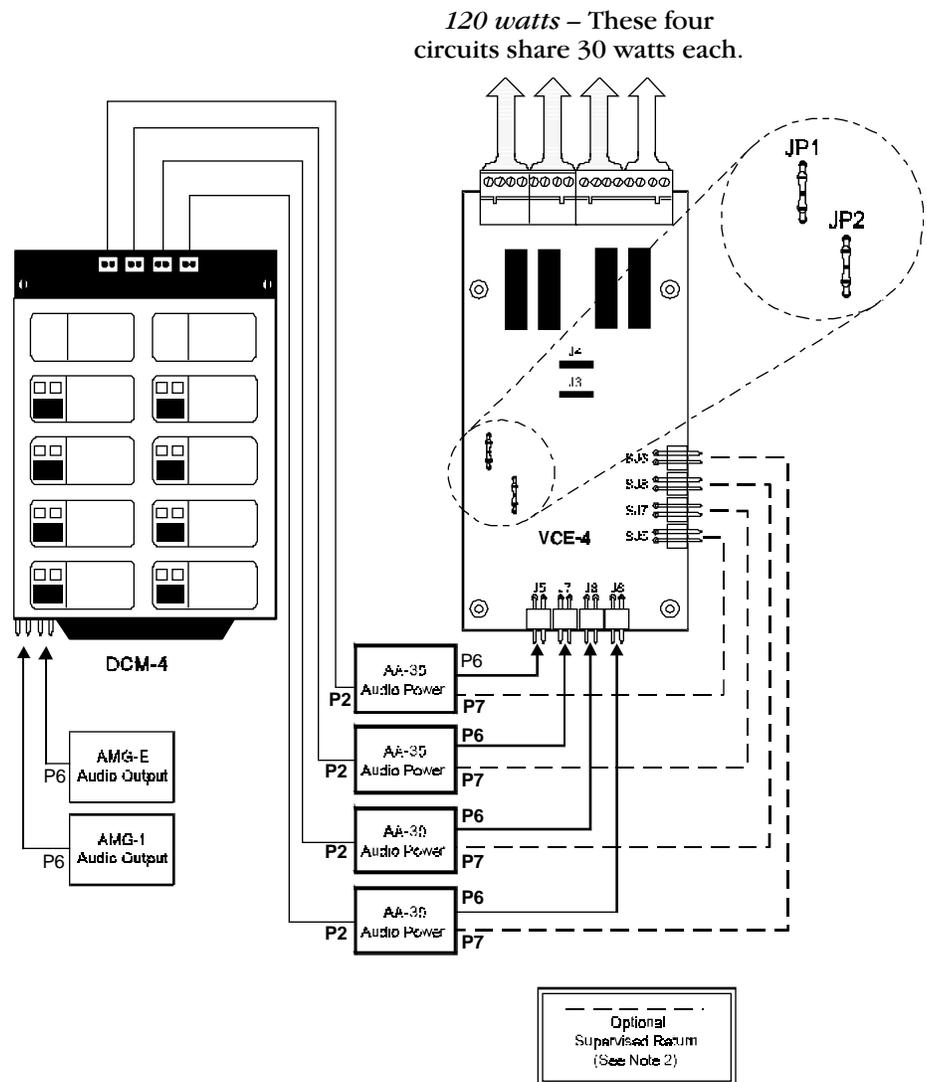
Wiring Diagram

120 watts – These four circuits share 30 watts each.

Typical 120 Watt Dual Channel Configuration

120 Watt Dual Channel Configuration

Overview

1) AA-120 audio power is drawn from plug P6 or terminals 5 and 6 of terminal block P8. This audio power run cannot be supervised in this configuration.

2) Each circuit can handle a maximum of 30 watts.

3) In this configuration, cut VCE-4 jumpers JP1 and JP2.

Wiring Diagram

120 Watts
These four circuits can
handle 30 watts each.

Typical 120 Watt Dual Channel Configuration
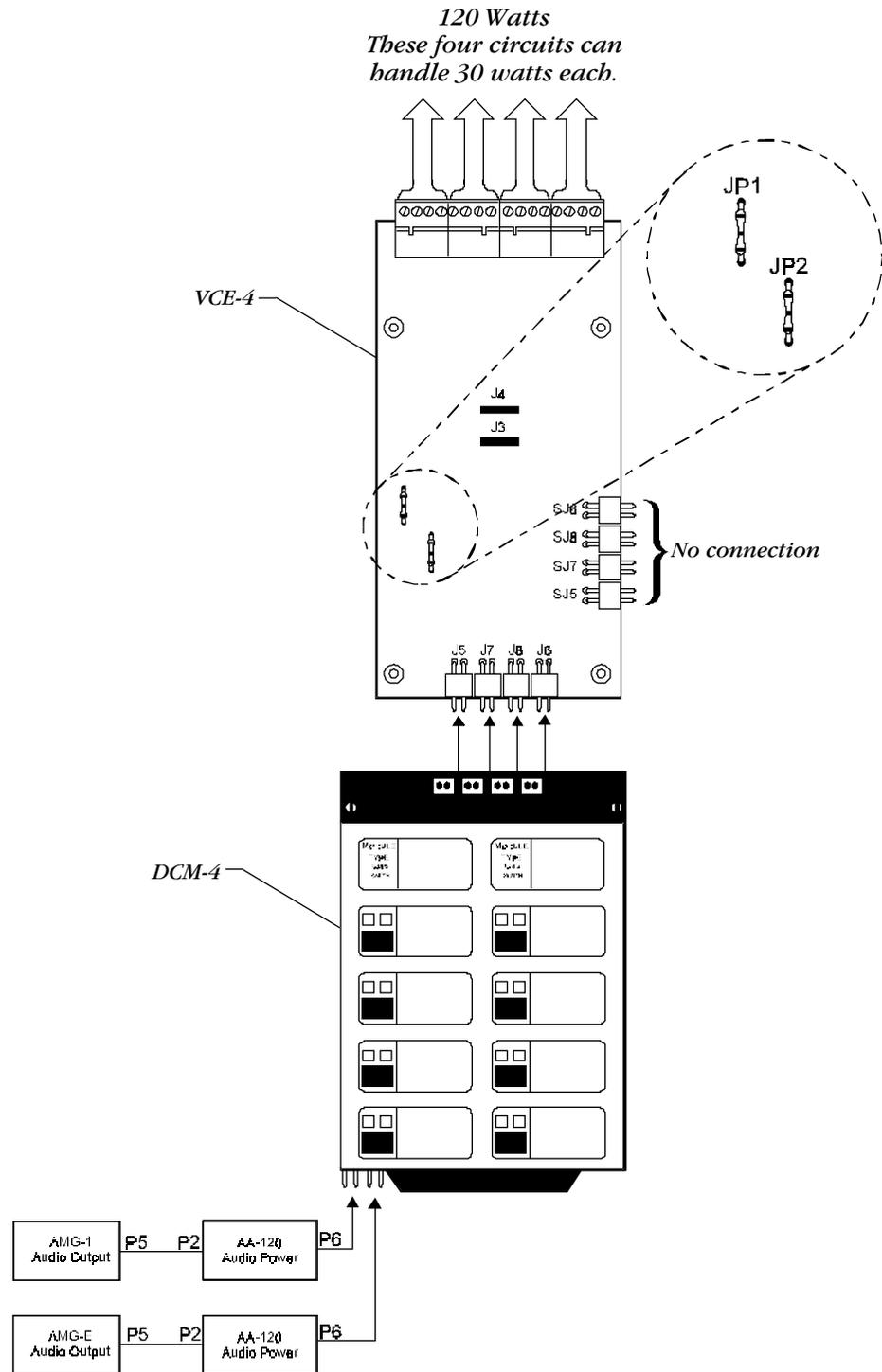
Voice Message Options

Overview of VROM and VRAM

VROM – A nonvolatile memory chip containing a factory-programmed evacuation message (up to 24 seconds). You can install one or two VROMs into an AMG-1. Refer to Document 15945 for contents of available VROMs.

VRAM – A programmable memory chip that contains a user-created evacuation message up to 24 seconds long. Create a message from the AMG-1 microphone or a cassette tape. You can install one or two VRAMs into an AMG-1.

Installing VROM and VRAM

⚠

Caution: Remove AC power at the main service circuit breaker (not the circuit breaker on the main power supply).

To install VROM and VRAM chips, follow these steps:

Step	Action
1	Remove battery power, then remove AC power from the AFP-400.
2	Remove dress panel covering the AMG-1.
3	Remove the fours screws that hold the AMG1 dress plate to the component board as shown below. Remove the dress plate and disconnect the microphone connector.
4	Install the VROM or VRAM chips in their respective positions as shown below.

To assemble the AMG-1, reverse these instructions.

AMG-1 Front Panel

AMG-1 Circuit Board

Microphone Connector

Voice Message #1 (VROM "A") Factory Programmed EPROM

Voice Message #2 (VROM "B") Factory Programmed EPROM

Voice Message #4 (VRAM "B") User-Programmed RAM

Voice Message #3 (VRAM "A") User-Programmed RAM
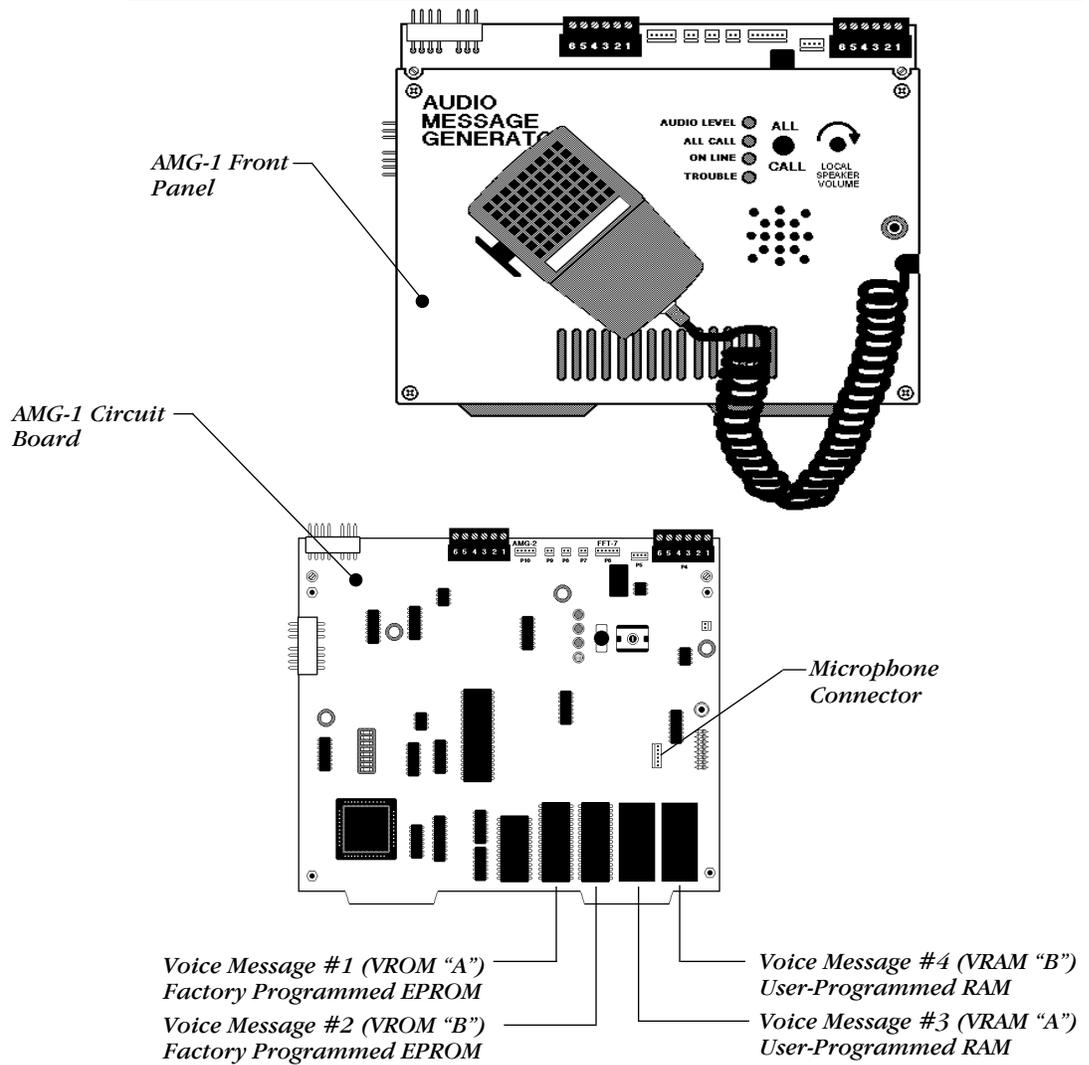
AMG-1 Front Panel and Circuit Board

ACT-1 Audio Coupling Transformer

Overview

The ACT-1 Audio Coupling Transformer couples low-level audio to audio amplifiers or other audio inputs, such as the ATG-2. An ACT-1 can be used to couple a low-level audio signal to up to eight devices in the same cabinet. It provides electrical isolation between low level audio riser and equipment to which the signal is to be fed (amplifiers or the ATG-2). Also, the ACT-1 provides common mode noise rejection (CMNR), greatly reducing crosstalk from signaling line circuits.

You can install the ACT-1 in any application that uses AA-30 or AA-120 audio amplifiers, subject to the following restrictions:

- The amplifiers must mount remotely from the source of low level audio devices, such as an AMG or ATG.
- The power supplies in the main control panel cabinet and the remote cabinets must share the same common.
- Ground fault is enabled on each power supply.

Isolated power supplies, each with respective ground fault detection circuits enabled, are often used to aid the quick location of ground faults in large systems. This task is more difficult if the entire system (main and all remote devices) share the same common and the power supply in the main control panel cabinet provides ground fault detection.

In larger systems, capacitance becomes a critical factor in creating sporadic and difficult-to-find ground faults along a single common connection. In these systems—as in systems that expand—use an ACT-1 if possible.

Isolating Power Supplies

For example, a system consisting of a remote annunciator powered from a local supply within the same cabinet—but connected through an EIA-485 circuit—to the main control panel. (See the figure below.) A common connection occurs (although a poor one) along the EIA-485 interface. Therefore the supplies in this system are not adequately isolated and problems will occur. In this case, the earth fault detection of the remote power supply must be disabled and a good common connection must be made between the two systems.

An ACT-1 is not required for amplifiers mounted in this remote cabinet but installation of an ACT-1 can reduce CMN from the SLC loop.

Remote Cabinet   *Main Cabinet*
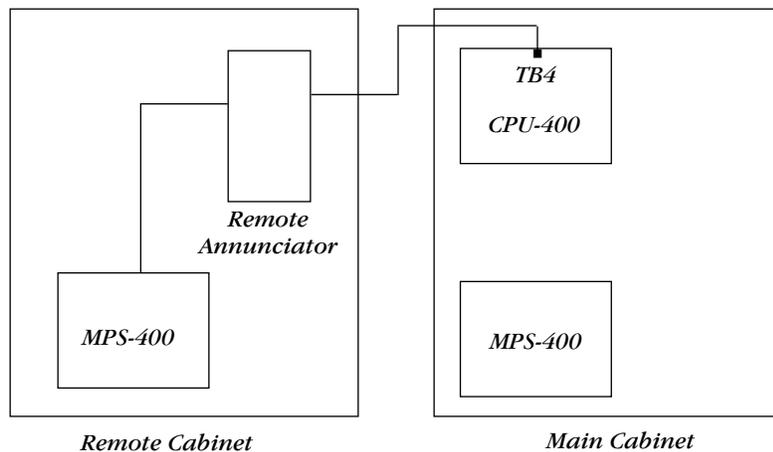
Remote Annunciator Powered from a Local Power Supply

ACT-1 Audio Coupling Transformer

Installation

The ACT-1 connects to one of up to eight amplifiers on a given channel. Multiple ACT-1s are required for amplifiers on multiple channels.

Install an ACT-1 by following these steps:

1) Connect the low level audio loop to the terminal block on the ACT-1.

2) Connect the ACT-1 to the first amplifier in the chain.

Terminal Designation on the ACT-1

8)	*Com*
7)	*Earth*
6)	*S*
5, 4)	*Thru*
3)	*S*
2,1)	*Audio in*
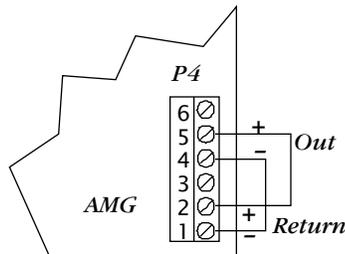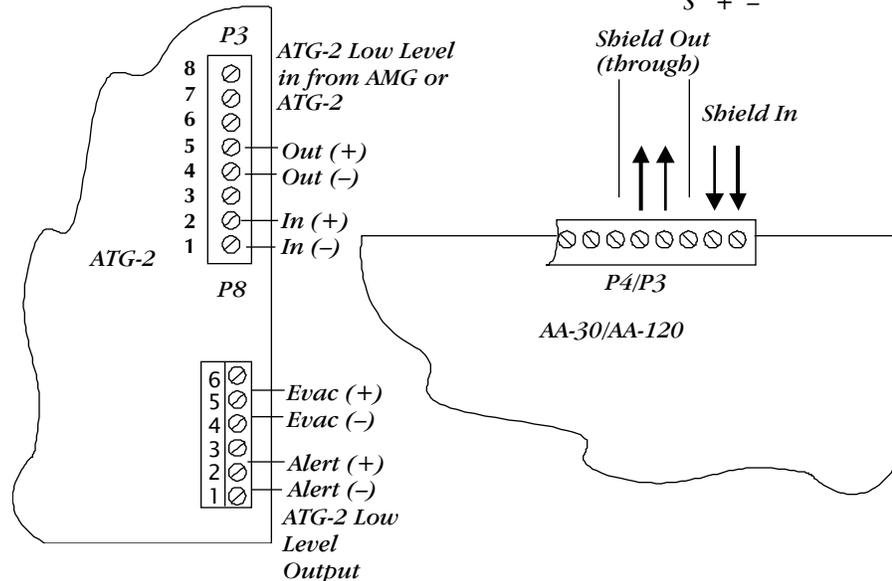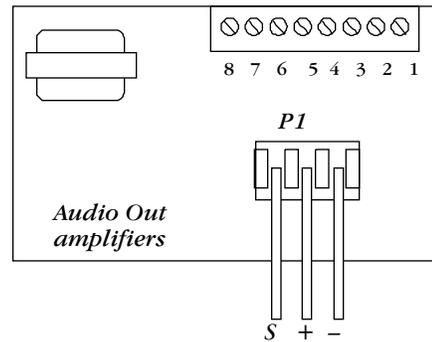
ACT-1 Connections

1) Using the supplied cable, connect the Earth ground terminal on each ACT-1 to P8 on the AA-120 or to a screw on the upper left corner of the AA-30. The "COMN" terminal is intended for optional shielding of the secondary side of the ACT-1 (low level audio from the ACT-1 through each amplifier). To use shield, connect to the common of the local power supply but do not, at any point, connect this shield to the shield from the primary side of the ACT-1.

2) Daisy chain the secondary side of the ACT-1 (low level audio) up to a maximum of eight amplifiers.

3) Draw additional low-level audio risers (isolated from the main riser).

---

5. Applications

Central or Remote Station Fire Alarm System

The following shows typical wiring diagram for a NFPA 72-1993 Central Station Fire Alarm System (Protected Premises Unit) or a Remote Station Fire Alarm System (Protected Premises Unit) using the UDACT and AFP-400.

Installation

📄 NFPA 72 Central Station and NFPA 72 Remote Station require 60 hours of standby power.

Connect the Universal Digital Alarm Communicator/Transmitter (UDACT) according to the directions given in the UDACT Manual.

The following lists a typical configuration that assumes no other devices are operating in the Receive/Transmit mode on addresses 1 and 2. Refer to the UDACT manual for further information. Configure the system as follows:

Step	Action	
1	Configure the UDACT	a) Set the ACS terminal switch to the ACS position. b) Set the UDACT Start Monitor address to 1. c) Set the UDACT Stop Monitor address to 2. d) Set the UDACT for Receive/Transmit operation.
2	Configure the AFP-400 program	a) Program ACS annunciation address 1 for selection group 1. b) Program ACS annunciation address 2 for selection group 2.

Configuring the UDACT and AFP-400

Wiring Diagram

📄 Install 120 watt EOL resistor (PN: 71244) on TB1 terminals 3 and 4 if last or only device on EIA-485 line
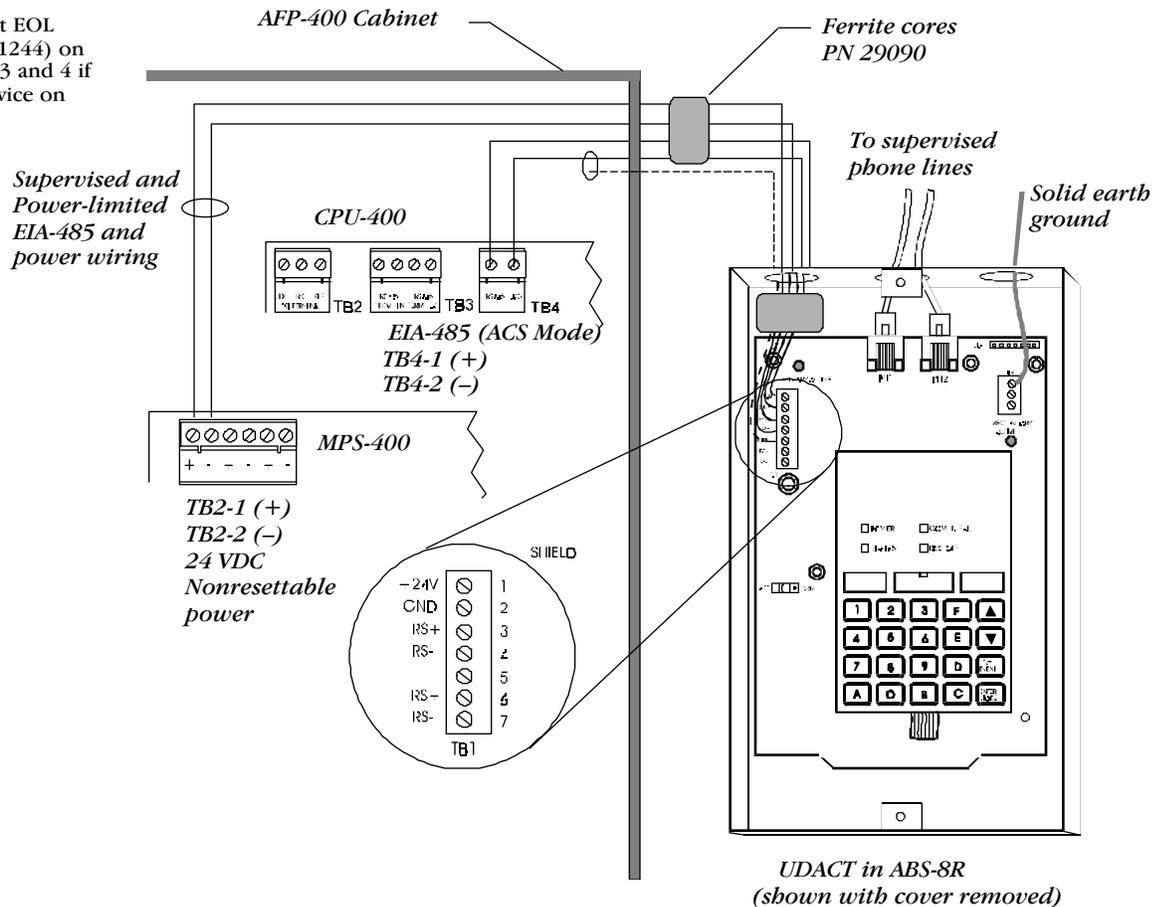
Typical Wiring Diagram for a Central Station Fire Alarm System

Auxiliary Fire Alarm System

Overview

The following diagram shows typical wiring for an Auxiliary Fire Alarm System (*Municipal Box connected to a 4XTM*). Note the following:

1) All connections are power limited and supervised.

2) Municipal Box wiring can leave the building.

3) Maximum loop resistance allowed for wiring from the control panel to the municipal box is 3 ohms. Electrical values for the Auxiliary Fire Alarm System are:

NFPA 72 Auxiliary requires 60 hours of standby power.

Item	Value
Supervisory current	5.0 mA
Trip current	0.35 A (subtracted from notification appliance power)
Coil voltage	3.65 VDC
Coil resistance	14.6 ohms

Electrical Values

The Local Energy Municipal Box circuit is nonpower limited. Maintain at least a 0.25-inch space between the Municipal Box Circuit wiring and all power limited circuit wiring.

Wiring Diagram
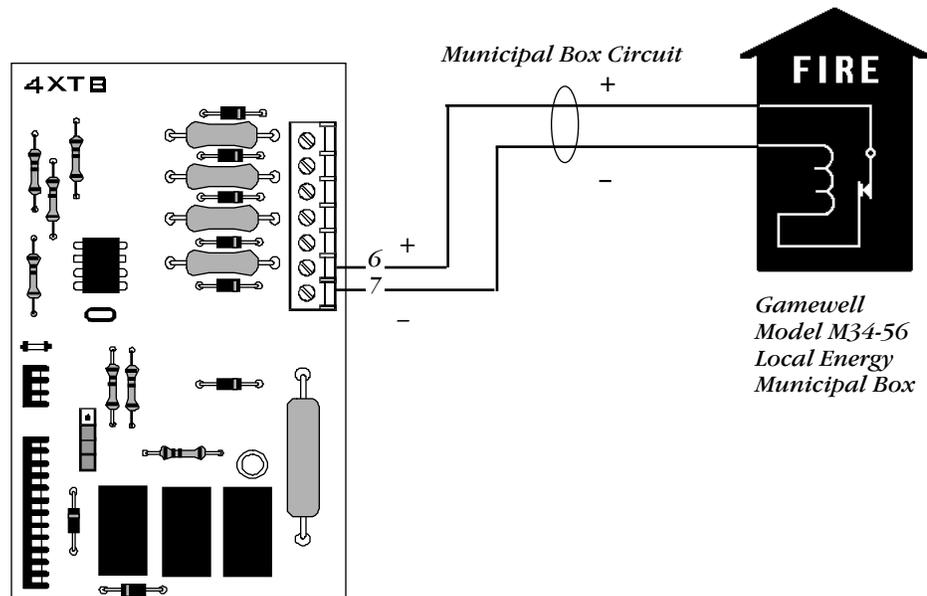
*4XTM Transmitter Module
(activated position shown)*

Gamewell Model M34-56 Local Energy Municipal Box

NFPA 72-1993 Auxiliary Fire Alarm System

NFPA 72-1993 Remote Station Fire Alarm System

Overview

The diagram shows typical wiring for NFPA 72-1993 Remote Station Fire Alarm System (Fire•Lite RS82 Remote Station Receiver). Note the following:

1) This application is intended for connection to a polarity reversal circuit of a remote station receiving unit having compatible ratings.

2) All connections are power limited and supervised with the exception of the reverse polarity loop.

3) Loop supervision is the responsibility of the receiver.

4) Remote Alarm and Remote Trouble wiring can leave the building.

5) Maximum load for each circuit: 10 mA; Reverse polarity output voltage: 24 VDC (nominal) or 28 VDC (max).

Wiring Diagram

Fire•Lite RS82 Remote Station Receiver UL listed. Refer to Fire•Lite Alarms, Inc., Instruction Manual for Remote Station Receiver Model RS-82.
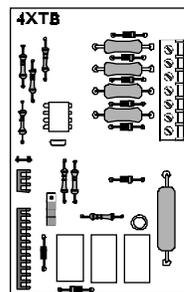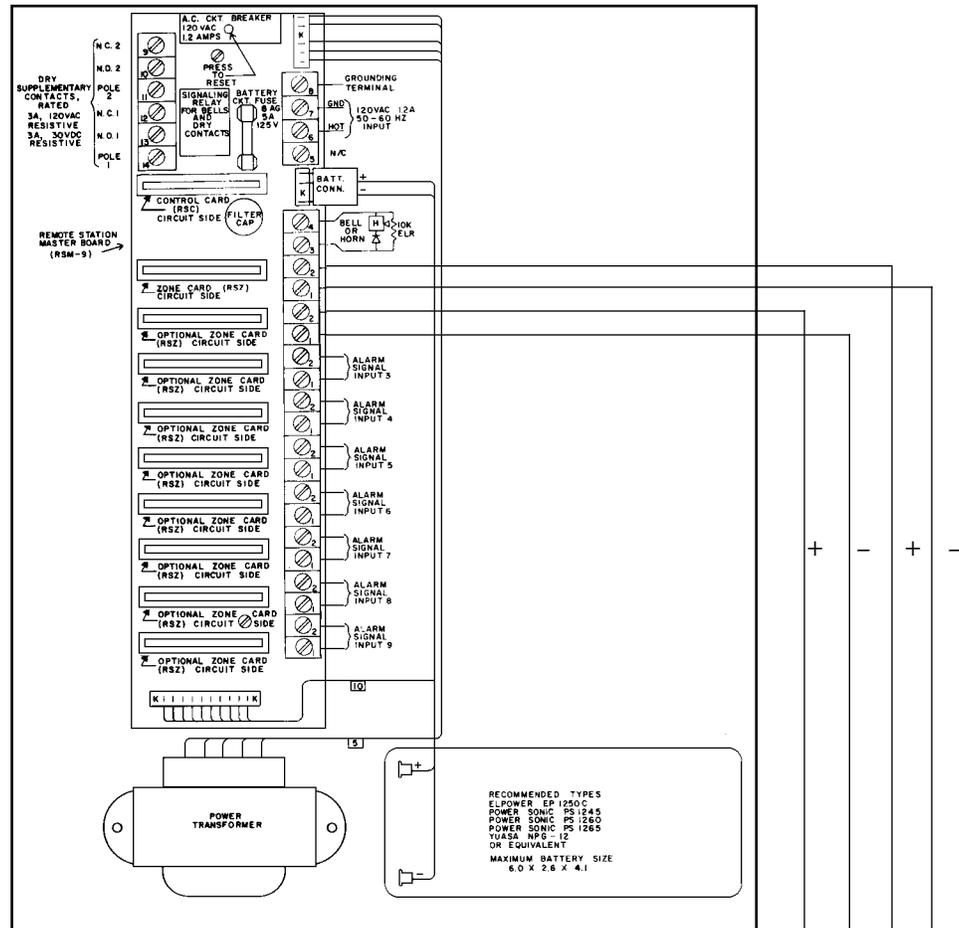
4XTM
Transmitter Module
(activated polarities shown)

Remote Station Connection Using 4XTM Module

NFPA 72-1993 Proprietary Fire Alarm Systems

Overview

The AFP-400 will automatically transmit General Alarm, General Trouble, and General Supervisory signals, and will receive Acknowledge, Silence, and Reset commands automatically from the AM-2020. To transmit zone alarm and zone trouble information, program the AFP-400 points to software zones 1 through 99.

For information on installing and programming the Receiving unit, refer to the AM-2020 and NIB-96 manuals.

Wiring Diagram

AM-2020/AFP-1010 Receiving Unit

SLC Loop

AFP-400 Protected Premises Unit

NIB-96

AFP-400

SLC Loop

NIB-96

AFP-400 Protected Premises Unit

LIB-200

AM-2020
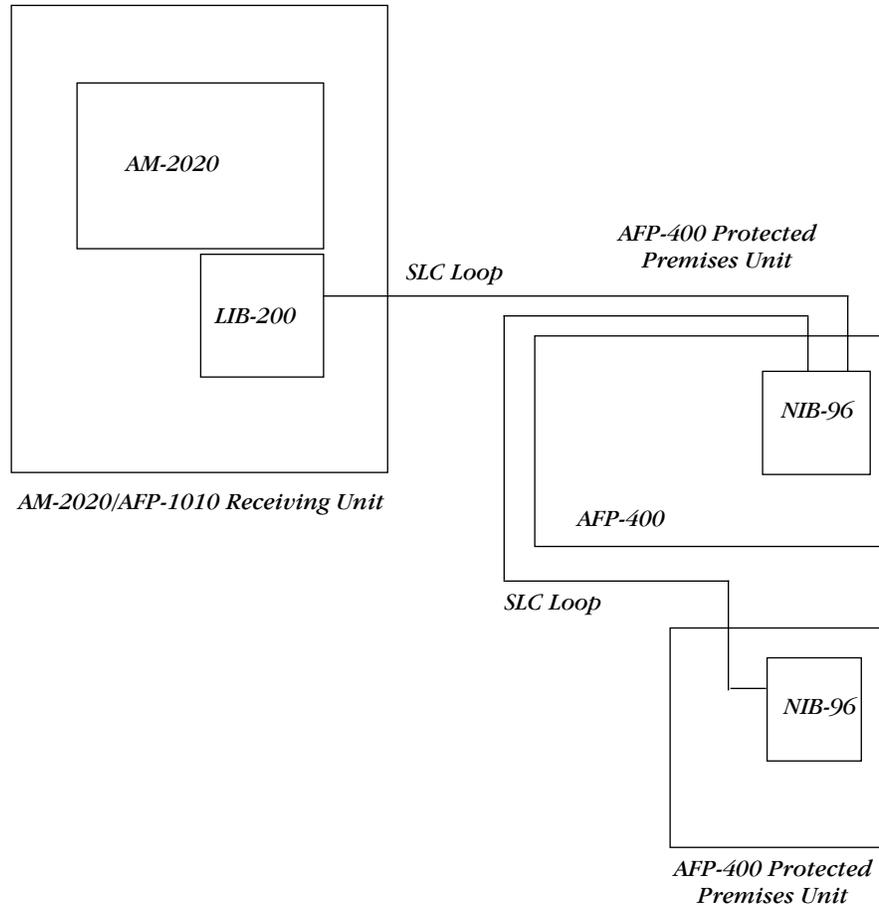
Typical Proprietary Fire Alarm Systems Wiring Connections

Network Interface Board

Overview

The Network Interface Board (NIB-96) is a microprocessor-controlled module that connects "slave" fire alarm control panels to a "master" fire control panel. Usually, NIB-96 modules are physically located in each slave control panel, which can contain 8-96 input/output points. This section contains board and wiring information for connecting an NIB-96 to an AFP-400 control panel.

Circuit	Requirements
Power	24 VDC power limited
Standby	22 mA
Alarm	22 mA

NIB-96 Power Requirements

NIB-96 Assembly
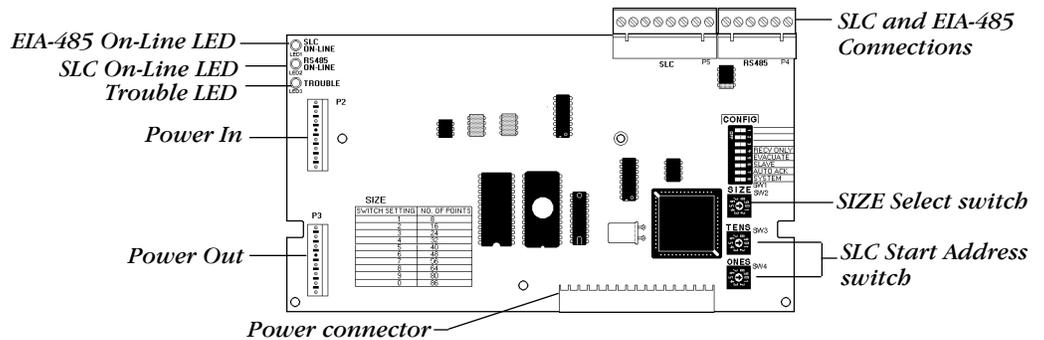
Network Interface Board

NIB-96 Components

Item	Description
Trouble LED	Yellow LED lights during loss of communications on EIA-485 or SLC loop.
EIA-485 On Line LED	Green LED blinks during communication with the slave FACP.
SLC On line LED	Green LED blinks during communication with the master FACP.
SLC and EIA-485 connections	All connections are power-limited and supervised. See Sections 3, 4 and 5 for details on connection requirements. See diagram below for terminal assignment
Power In	Connects NIB to the Main Power Supply (if not mounted in an ICA-4/L).
Power Out	Connection to other equipment.
Power connector	Power connection for the AM2020/AFP1010 slave.
SLC Start Address switch	Set to 01 through 99. (Note that the sum of ADDRESS and SIZE cannot exceed 99.)
SIZE Select switch	Switch that lets you select the number of points (select 1-8) monitored on the slave panel.

Network Interface Board Components

Network Interface Board, continued

SLC and EIA-485 Connections

The EIA-485 circuit requires a serial connection. Connect only one wire to each screw terminal.
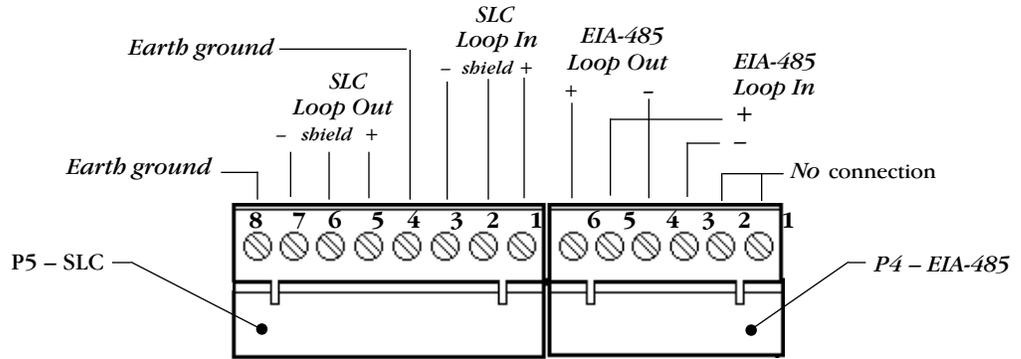
SLC and EIA-485 Connections

Wiring Specifications

Circuit	Wiring Specifications
SLC Loop	• supervised and power limited • maximum wiring distance: 10,000 feet at 12 AWG • maximum loop current: 200mA (short circuit) or 100mA (normal) • maximum loop resistance: 40 ohms
RS-485	• supervised and power limited • ±5 volts peak-to-peak • maximum wiring distance: 4000 feet at 14 AWG • characteristic impedance of wiring: 40 ohms • transmission rate: 2400 baud

Wiring Specifications

UZC-256 Board Description

Overview

The UZC-256 is used for zone coding, providing up to 256 software zone codes. This section contains descriptions of the UZC-256 board and instructions for installing the board.

UZC-256 Components
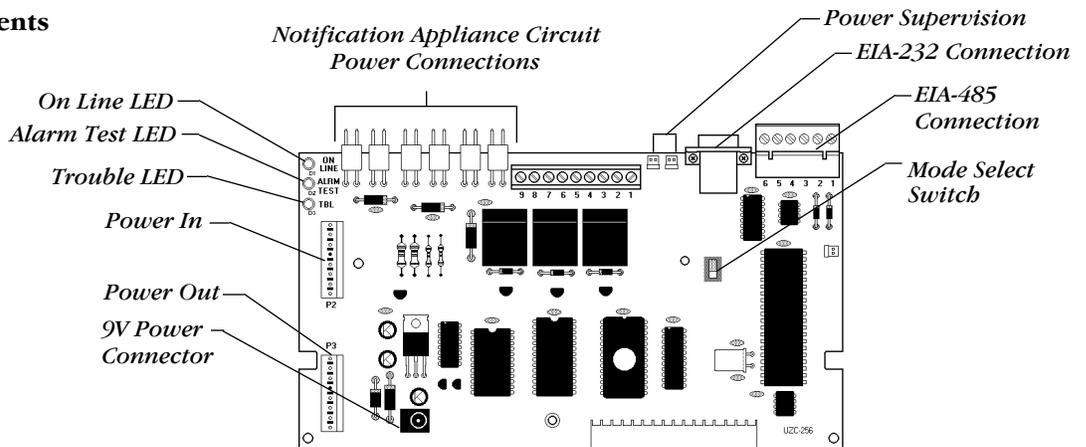
Item	Description
Trouble LED	Yellow LED lights when one or more trouble conditions occur.
Alarm Test LED	A red LED that lights according to the main coded output.
On Line LED	A green LED that blinks during communication with the master control panel.
Notification Appliance Circuits	Power connections for NAC ouputs.
Power Out	Output for providing power to the next device in power chain.
Power In	Provides main connection to power supply. (Use a power limited power supply.)
9V Power Connector	Input for 9-volt power for remote UZC-256 programming.
Power Supervision	Connections for power supervision wiring.
Mode Select Switch	Switch to toggle the UZC-256 between Normal and Programming mode.
EIA-232 Connection	Female DB-9 connector for programming from an IBM-compatible computer.
EIA-485 Connection	All connections are power limited and supervised. See diagram below for terminal assignment.

UZC-256 Board Components

UZC-256 NAC Power Connections
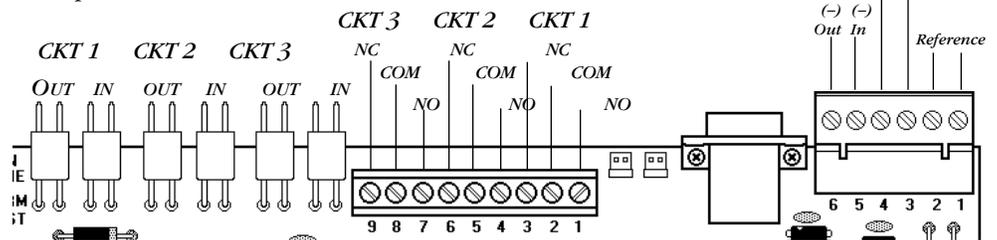
Power Connections for Notification Appliance Circuits

Using the XP Transponder with the AFP-400

Overview

The *XP Series Transponder* is a multiplex subsystem that communicates directly with the CPU-400 through one of the SLC loops. If the CPU fails or loses power, the XP can operate in a degraded stand-alone mode. To the AFP-400, XP Transponder circuits appear as individual addressable monitor or control modules. For more information, refer to the XP Transponder manual.

Wiring Diagram

The diagram shows typical wiring for an XP Series Transponder to the CPU-400.

*SLC Loop
Terminal 1 (+)
Terminal 3 (−)*

XPP-1
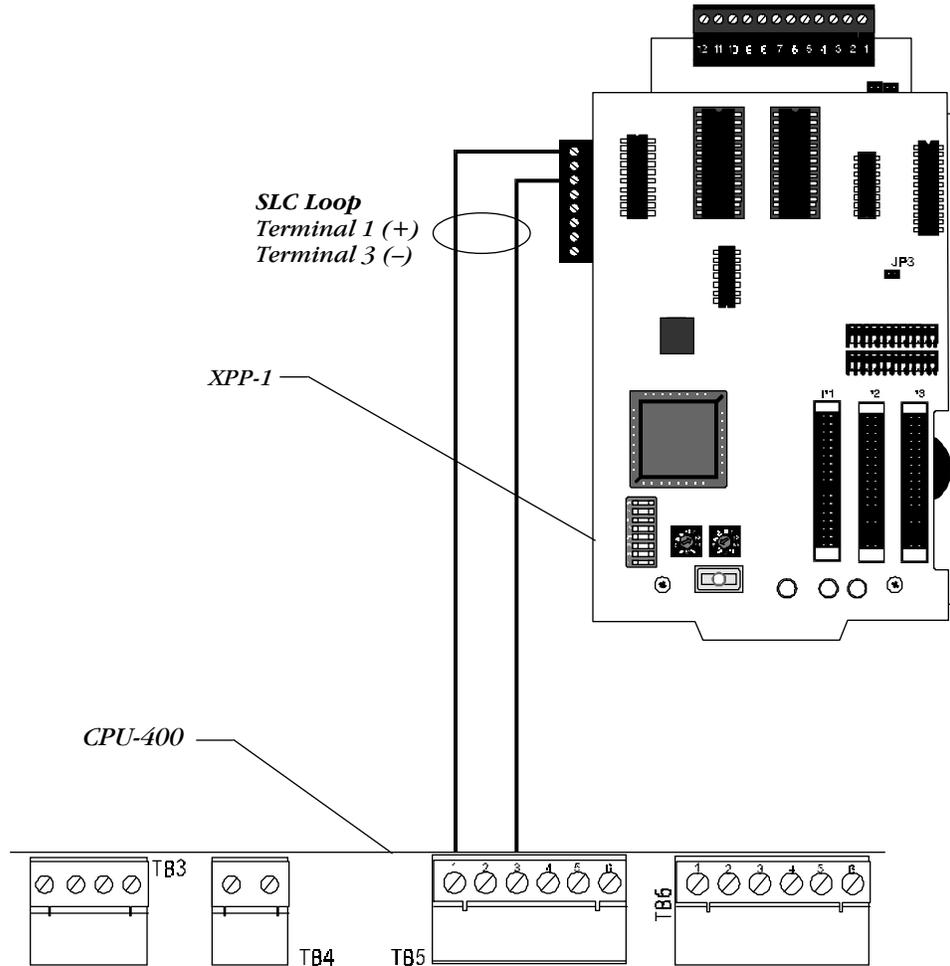
CPU-400

Using the XP Transponder with the CPU-400

Combination Fire/Burglary Applications

Overview

You can use the control panel as a combination Fire/Burglary and Burglary system when operated according to the instructions in this section.

General Operation

For security applications, program one or more monitor modules with the "BURGLAR ALA" type code, and wire as described in this section. Activating this type of monitor module lights the Security LED, and displays a burglar alarm condition on the control panel LCD. The piezo will sound until you press <Acknowledge>. You can also program additional sounders or output devices to activate with the burglar alarm initiating device. The BURGLAR ALA type circuit is designed to indicate an alarm as follows: (a) on an open or short circuit; or (b) on a ±50% change in resistance value from the EOL resistor value.

A tamper switch installed in the cabinet also indicates a security alarm whenever the door is open. If the panel indicates a BURGLAR ALA or DOOR TAMPER condition, you can acknowledge, silence, or reset the condition from the panel.

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

For bypass of security zones, use the DISABLE routine (covered in the "STATUS CHANGE" section of the AFP-400 Operations Manual) for BURGLAR ALA type devices.

Installing a Security Tamper Switch

Wire the cabinet with a security tamper switch kit (see illustration below). CAB-400AA cabinets require Tamper Switch model STS-200; CAB-3 cabinets require model STS-1.

Installing a Security Tamper Switch into the CAB-400AA

1) Install the STS-200 tamper switch onto the CAB-400AA as shown below.
2) Connect the STS-200 connector to J5 ("Tamper") on the MPS-400.

MPS-400

STS-200 Tamper Switch

MPS-400 J5 "Tamper"
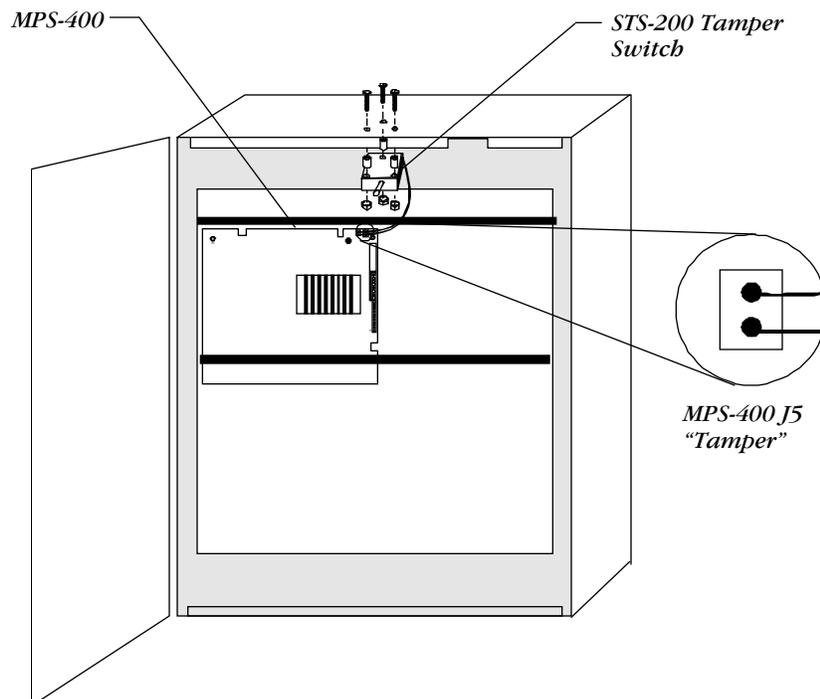
Installing the STS-200 Tamper Switch

Combination Fire/Burglary Applications, continued

Installing a Security Tamper Switch into the CAB-3

1) Install the STS-1 tamper switch onto the side of the CAB-3 series on side of backbox opposite the door hinge.
2) Push the STS-1 switch through the opening in the backbox until the switch snaps into place.
3) Install the magnet on the same side on the cabinet door as the lock. Push the magnet through the opening in the door until the magnet snaps into place.
4) Connect the STS-1 switch connector to J5 ("Tamper") on the MPS-400.

CAB-3 Series Cabinet

Mounting location (side opposite to door hinges)

STS-1 Tamper Switch

MPS-400

MPS-400 J5 "Tamper"
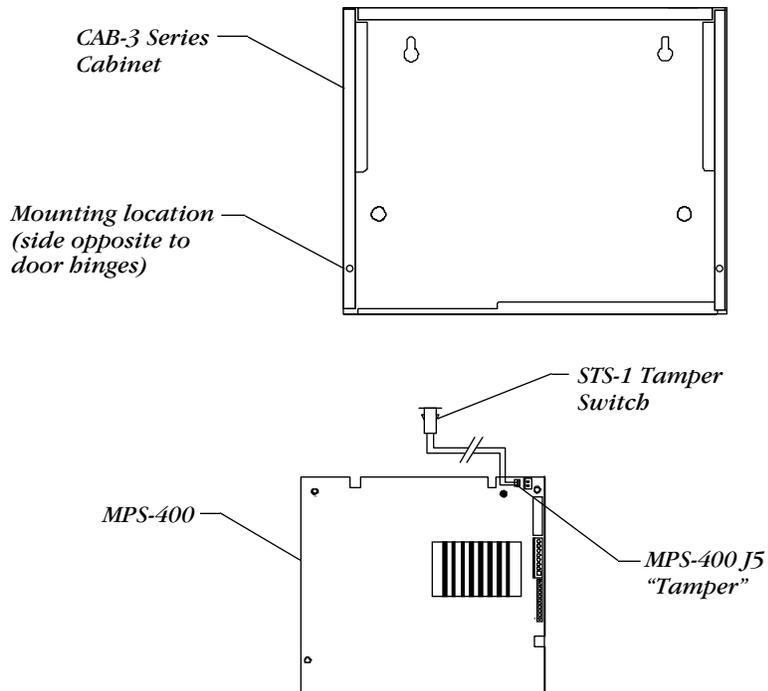
Installing the STS-1 Security Tamper Switch

Receiving Unit

For applications requiring transmission of burglary alarm information to a central receiving unit, the control panel may be connected to an AM-2020 or AFP-1010 provided with a NIB-96 network interface board. (For wiring information, refer to Appendix B.) Configure the AM-2020/AFP-1010 for Combination Fire/Security applications as outlined in the installation section of the AM-2020/AFP-1010 manual. Burglar alarm zones are reported to the AM-2020 through the NIB-96. Program AM-2020 networked monitor points as a "SARM" type code (security alarm).

Programming

Refer to the AFP-400 Programming Manual for detailed instructions.

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

1) Select the address of the monitor module(s) to be used for security; and
2) Set the type code to BURGLAR ALA.

Circuit Wiring

Wire security monitoring devices as shown the "Wiring Diagram for Proprietary Burglar Alarm Applications" on the next page.

Combination Fire/Burglary Applications, continued

Wiring

The following diagram shows a typical wiring diagram for proprietary burglar alarm applications with a CMX configured as an Notification Appliance Circuit. Note the following:

1) The CMX is configured as an Notification Appliance Circuit (do not break tabs) and programmed in the Protected Premises Unit.

2) Supplementary use only in UL Listed Systems.

Refer to Device Compatibility Document 15378 for compatible Notification Appliance Circuits.

MMX-1s are programmed with software type "BURGLAR ALA."

Wiring Diagram

AFP-400 Protected Premises Unit
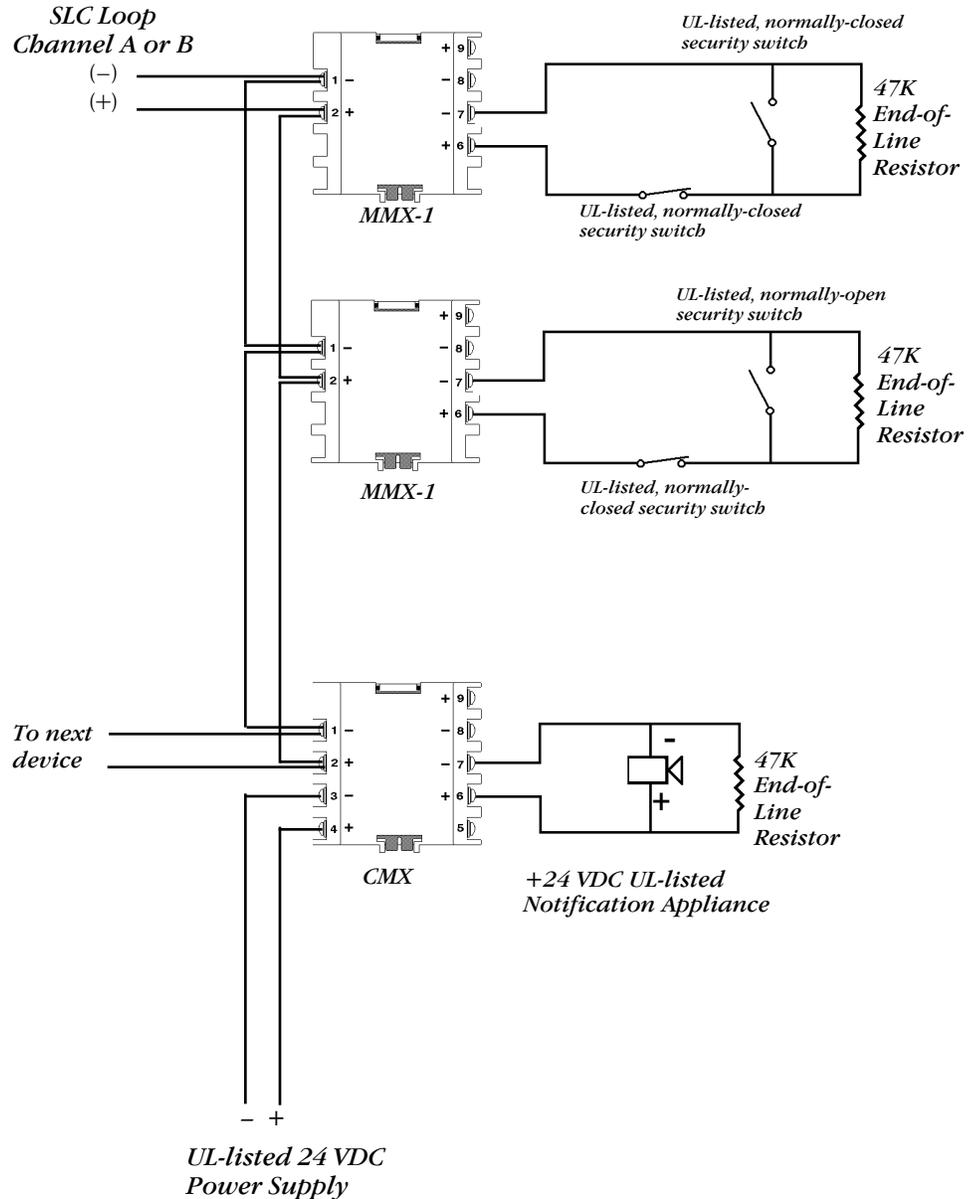
Wiring Diagram for Proprietary Burglar Alarm Applications

Zone Coding with the UZC-256

Overview

You can use the Notifier UZC-256 Universal Zone Coder for zone coding an AFP-400 system. The UZC-256 monitors system status through the CPU-400 ACS annunciator port and outputs pre-programmed codes in response to signals it receives. Refer to the UZC-256 manual for additional information.

Installing the UZC-256 into a CAB-400AA Cabinet

The UZC-256 mounts in the top right corner of the CAB-400AA. Fasten the module to the back of the cabinet using the standoffs and screws. Refer to the installation diagram below.
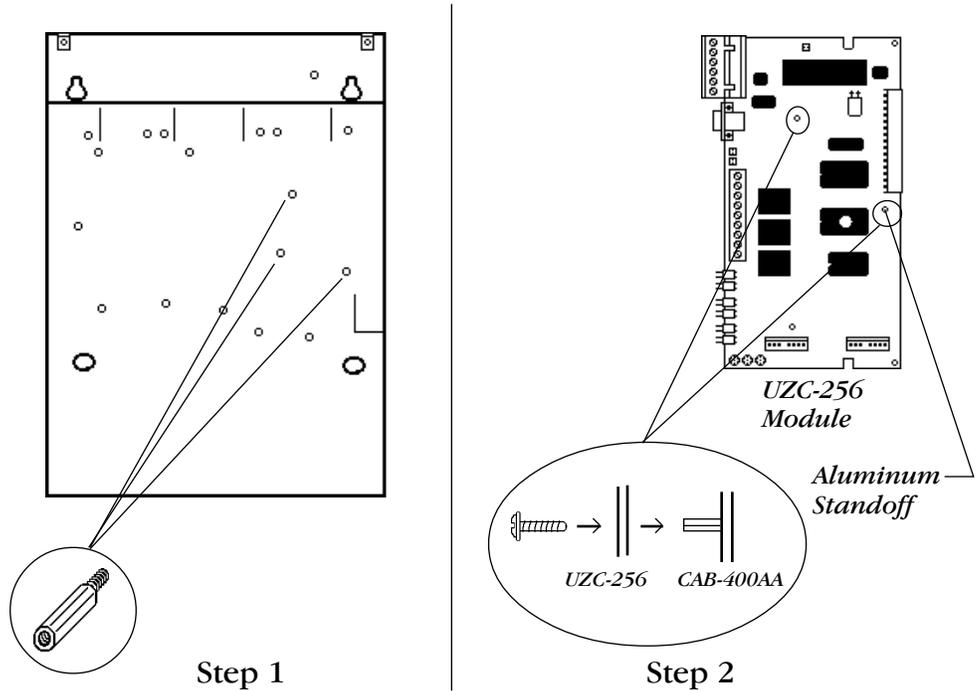
Mounting the UZC-256 in a CAB-400AA Cabinet

Installing the UZC-256 into a CAB-3 Cabinet

Mount UZC-256 mounts to the right of the CPU-400. Fasten the UZC-256 to the base of the CHS-4 chassis using the four hex standoffs (provided), screwed onto four PEM studs. Attach the UZC-256 to three of the four standoffs using the mounting screws provided (see the illustration below).
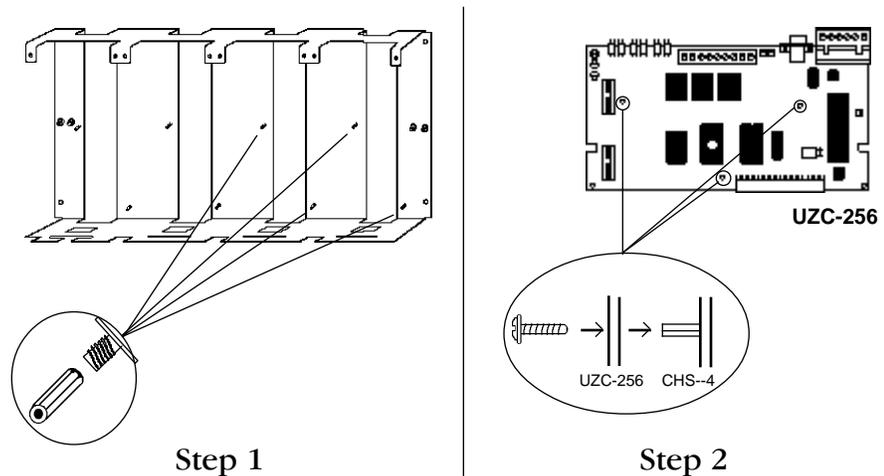
Mounting the UZC-256 in a CAB-3 Cabinet

Zone Coding, continued

Electrical Connections

To make electrical connections, follow these steps:

1) Connect the main power harness (PN 75100, provided with the UZC-256) from MPS-400 connector J1 to UZC-256 connector P2.

2) Connect the EIA-485 ACS annunciator port as follows:

    • CPU-400, TB4-1 to UZC-256 TB2-3
    • CPU-400, TB4-2 to UZC-256 TB2-5

    (UZC-256 terminals are numbered from right to left.)

3) Connect notification appliance power devices as shown in the wiring diagram below.

Refer to Device Compatibility Document 15378 for compatible relays and devices.

Wiring Diagram

UL listed Power Supervision Relays

System Sensor A2143-00 (Canada: N-ELR) End-of-Line Resistor, 47K, .5 watts, supervised and power-limited

24 VDC Notification Appliances

To next device on loop
+ –

CMX

Loop Out

CPU-400

UZC-256

TB5

Connect to CPU-400 TB5 as follows:
• (+) to TB5-1
• (–) to TB5-3

TB1 UZC-256

MPS-400 TB2-1 (+) and TB2-2 (–), or
AVPS-24 TB2-1 (+) and TB2-2 (–), or
UL listed 24 VDC power limited, resettable power supply for Fire Protective Signaling.

UZC-256 Connections to CMX Modules

Zone Coding, continued

Wiring 12 Coded Notification Appliance Circuits (NACs)

This section contains information for wiring modules for 12 coded Notification Appliance Circuits (NACs). The connection table contains a list of connections between the modules and the UZC-256. (All cables are PN 71091, except the cable between the MPS-400 and the UZC-256.) Refer to the block diagram for typical connections. Make sure to mate all connectors (except MPS-400, J3) as shown in the figure to the left of the block diagram.

Module	Connector	Connects to UZC-256...
AVPS-24 #1	P3	P11
AVPS-24 #1	P3	P9
ICM-4	J5	P10
ICE-4	J5	P8
MPS-400	J3	TB1-8 (black wire) TB1-7

12-Zone Code Connection Table

Block Diagram

These four coded Notification Appliance Circuits are powered from the MPS-400. The combined alarm load on the MPS-400 cannot exceed 6 amps. Each NAC is rated at 2.5 amps maximum.
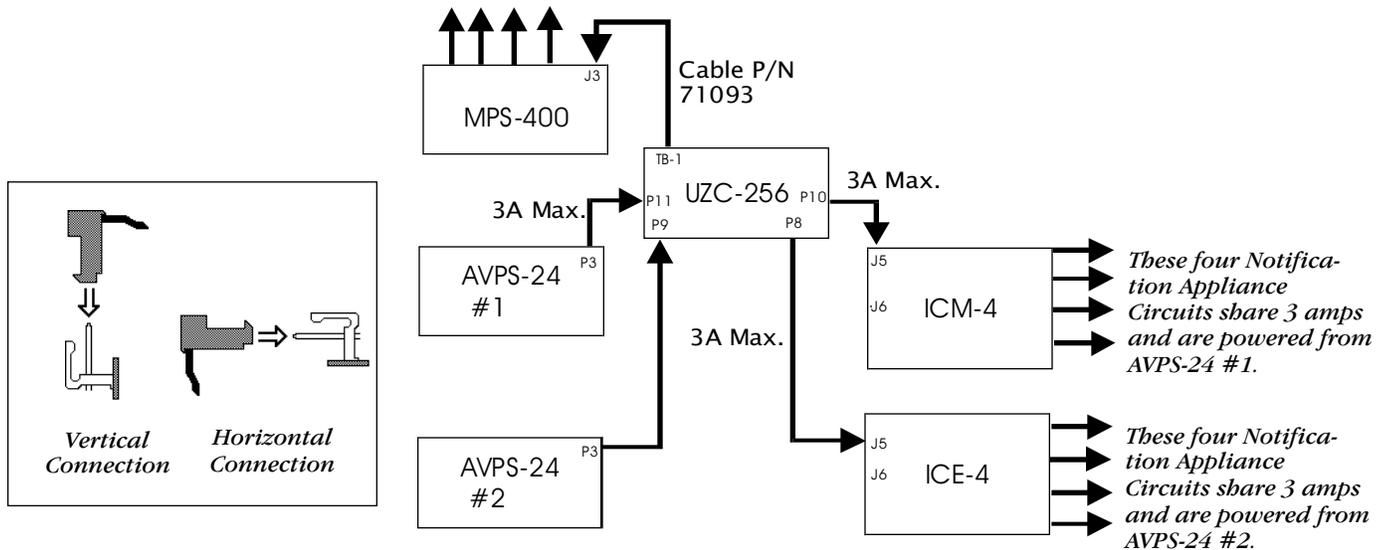
Typical Wiring for 12 Zone Codes

Zone Coding, continued

Wiring 20 Coded Notification Appliance Circuits (NACs)

This section contains information for wiring modules for 20 coded Notification Appliance Circuits (NACs). The connection table contains a list of connections between the modules and the UZC-256. (All cables are PN 71091, except the cable between the MPS-400 and the UZC-256.) Refer to the block diagram for typical connections. Make sure to mate all connectors (except MPS-400, J3) as shown in the figure to the left of the block diagram.

Module	Connector	Connects to...
AVPS-24 #1	P3	UZC-256 P11
AVPS-24 #1	P3	UZC-256 P9
ICM-4	J5 J6	UZC-256 P10 ICE-4 J5
ICM-4	J5 J6	UZC-256 P8 ICE-4 J5
MPS-400	J3	UZC-256 TB1-8 (black wire) (UZC-256 TB1-7

20-Zone Code Connection Table

Block Diagram

Typical Wiring for 20 Zone Codes

Releasing Applications

Standards

This control panel can be used as a control panel for agent release or preaction/deluge control applications. When used with compatible, listed actuating and initiating devices, the system meets the requirements of the following standards:

Standard	Covers
NFPA 12	CO2 Extinguishing Systems (high pressure only)
NFPA 12A	Halon 1301 Extinguishing Systems
NFPA 12B	Halon 1211 Extinguishing Systems
NFPA 13	Sprinkler Systems
NFPA 15	Water Spray Systems
NFPA 16	Foam-water Deluge and Foam-water Spray Systems
NFPA 17	Dry Chemical Extinguishing Systems
NFPA 17A	Wet Chemical Extinguishing Systems
NFPA 2001	Clean Agent Fire Extinguishing Systems

NFPA Standards

Programming

The AFP-400 supports a maximum of ten releasing circuits. You can divide the releasing circuits between the MPS-400 releasing outputs, the ICM-4, ICE-4, and CMX modules. For more information, refer to the AFP-400 Programming manual.

Connecting Releasing Devices

This section contains diagrams that show how to connect the following:

- Connect a Releasing Device to the MPS-400.
- Connect a Releasing Device to an ICM-4/ICE-4 Module.
- Connect a Releasing Device to a CMX Module.
- Connect an N-ARA-10 Agent Release-Abort Station.

Connecting Releasing Devices, continued

Connecting a Releasing Device to the MPS-400

1) The control panel provides four NAC/Releasing Circuits (Style Y or Z). Each circuit can provide 2.5 amps. Total current drawn from the MPS-400 cannot exceed 6 amps (refer to Table 2-2). Use UL listed 24V appliances only.

2) Circuits are supervised and power limited. For more information, refer to the Notifier Compatibility Document.

3) For NFPA 13 and 15 applications, disable the Soak Timer; for NFPA 16 applications, set the Soak Timer to 10 or 15 minutes.

4) *In applications not requiring power limiting* – a) End-of-Line devices (PN REL-2.2K) are not required; however, the releasing device circuit is not supervised against shorts; b) Limited energy cable cannot be used for wiring of a releasing device circuit; c) Maintain a 1/4 spacing between the releasing circuit device wiring and any power limited circuit wiring; and d) Program the releasing circuit for type code "RELEASE CKT."

Typical Releasing Device Connections

REL-2.2K

Red *Brown* +

−

TB7–TB10 – NAC/Releasing
1) + NAC/Releasing output (source)
2) – NAC/Releasing output (source)
3) + Class A (return)
4) – Class A (return)

TB7 TB9

Each circuit is power limited and supervised.

TB8 TB10

Program releasing circuits with type code "REL CKT ULC."
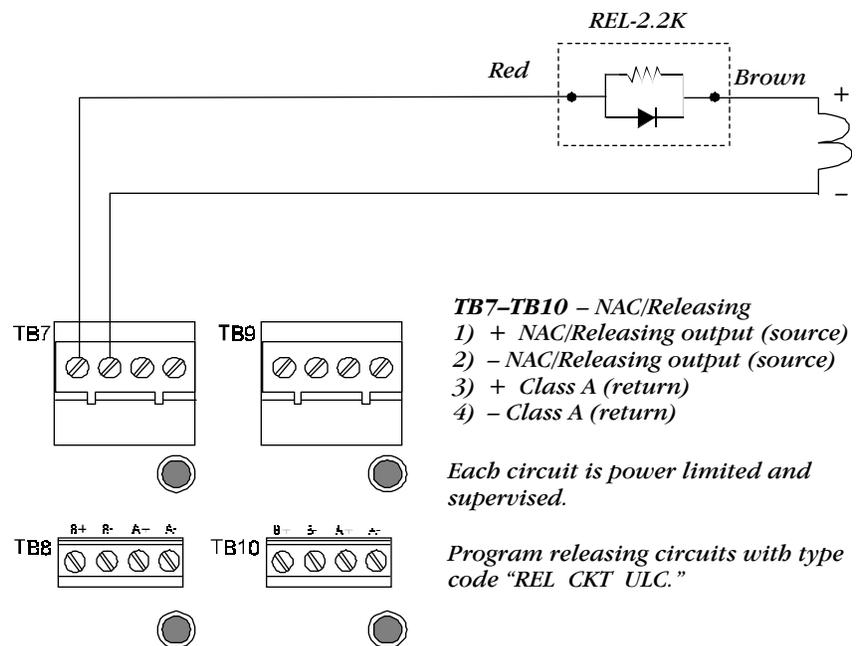
Typical Connection of a Releasing Device to the MPS-400

Connecting Releasing Devices, continued

Connecting a Releasing Device to an ICM-4/ICE-4 Module

1) The ICM-4 and ICE-4 provides four NAC/Releasing Circuits (Style Y or Z). Each circuit can provide 3 amps of current. Make sure to keep total system current within the limits of the power supply. Use UL listed 24V appliances only.

2) Circuits are supervised and power limited. For more information, refer to the Notifier Compatibility Document.

3) For NFPA 13 and 15 applications, disable the Soak Timer; for NFPA 16 applications, set the Soak Timer to 10 or 15 minutes.

4) I*n applications not requiring power limiting* – a) End-of-Line devices (PN REL-4.7K) are not required; however, the releasing device circuit is not supervised against shorts; b) Limited energy cable cannot be used for wiring of a releasing device circuit; c) Maintain a 1/4 spacing between the releasing circuit device wiring and any power limited circuit wiring; and d) Program the releasing circuit for type code "RELEASE CKT."

Typical Connections

Typical Connection of Releasing Device to an ICM-4/ICE-4 Module

Connecting Releasing Devices, continued

Connecting a Releasing Device to a CMX Module

You can use CMX modules for releasing circuits. Each module can control 1 amp of current. Make sure to keep total system current within the limits of the power supply. You can power the CMX from the MPS-400 or any UL listed 24V power limited power supply for Fire Protective Signaling. For more information, refer to the Notifier Compatibility Document.

1) For NFPA 13 and 15 applications, disable the Soak Timer; for NFPA 16 applications, set the Soak Timer to 10 or 15 minutes.

2) *In applications not requiring power limiting* – a) End-of-Line devices (PN REL-47K) are not required; however, the releasing device circuit is not supervised against shorts; b) limited energy cable cannot be used for wiring of a releasing device circuit; c) Maintain a 1/4 spacing between the releasing circuit device wiring and any power limited circuit wiring; and d) Program the releasing circuit for type code "RELEASE CKT."

3) Each circuit is power limited and supervised.

4) Program the CMX for type code "REL CKT ULC."

Typical Connections
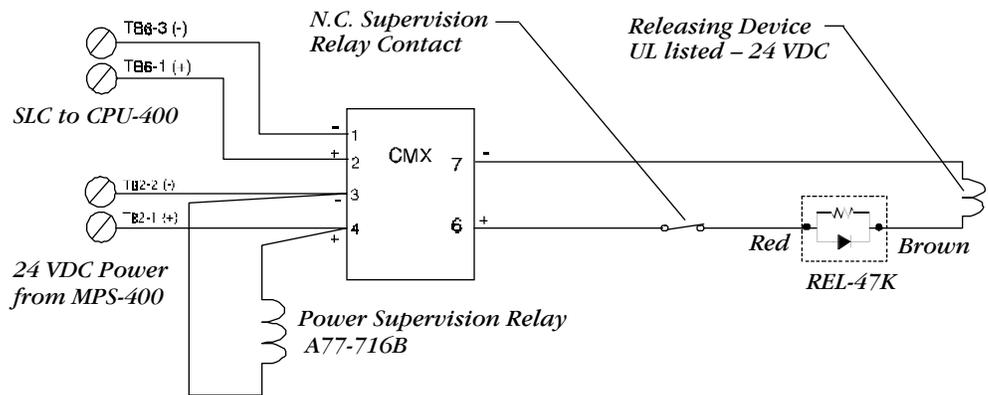
Typical Connection of a 24 VDC Releasing Device to a CMX Module

Connecting Releasing Devices, continued

**Connecting an
N-ARA-10 Agent
Release-Abort Station**

1) For releasing applications, use an end-of-line device (PN REL-47K available from Notifier) with the CMX module. Use an end-of-line device (PN REL-4.7K available from Notifier) with the control panel releasing circuit (one of the four notification circuits).

2) All wiring for releasing circuits is supervised against open and shorts.

3) Connect the end-of-line device as shown in the diagram.

4) Program the module or notification circuit for REL CKT ULC type code.

5) For NFPA 13 and 15 applications, disable the Soak Timer; for NFPA 16 applications, set the Soak Timer to 10 or 15 minutes.

6) *In applications not requiring power limiting* – a) ELRs (PN 47K) are not required; however, the releasing device circuit is not supervised against shorts; b) Limited energy cable cannot be used for wiring of a releasing device circuit; c) Maintain a 1/4 spacing between the releasing circuit device wiring and any power limited circuit wiring; and d) Program the releasing circuit for type code "RELEASE CKT."

Typical Connections
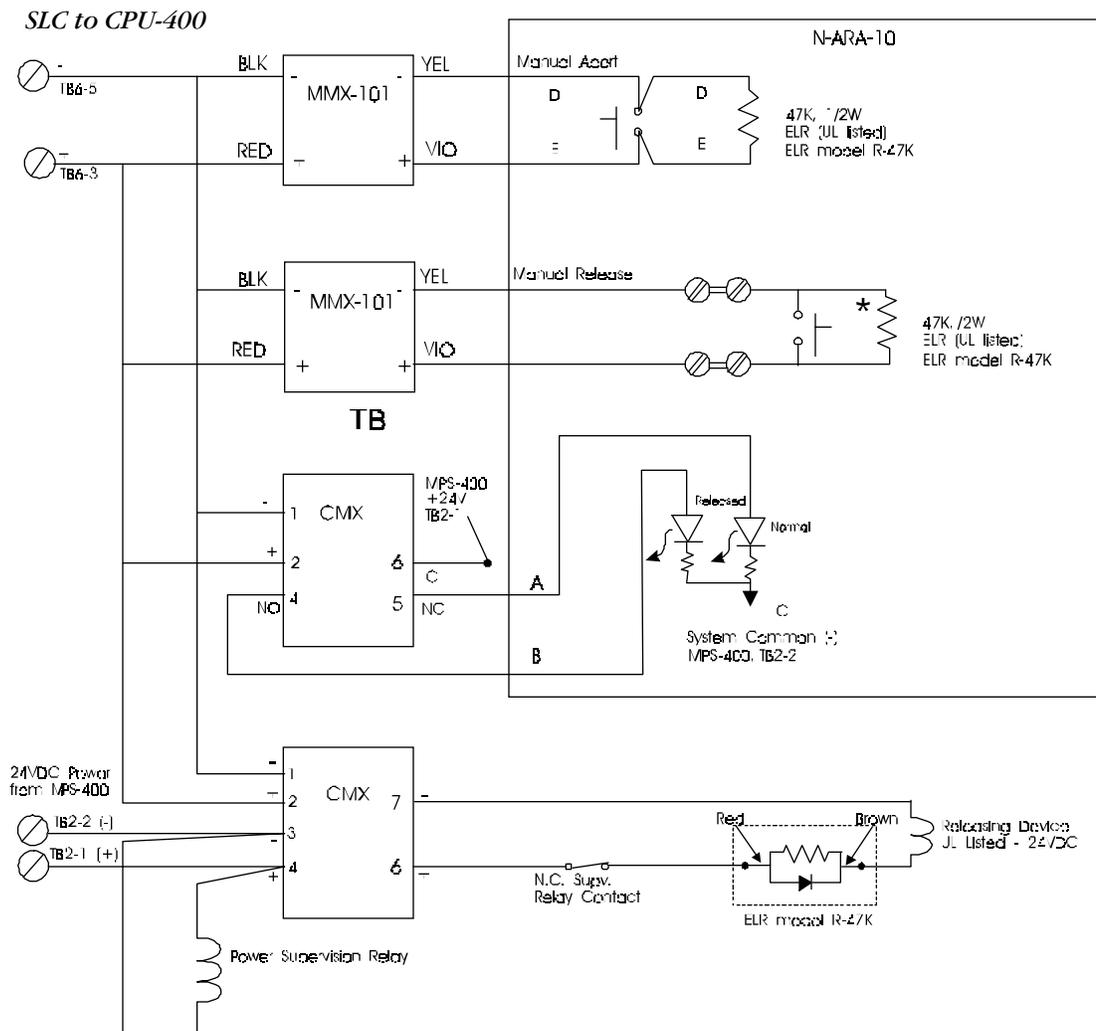
Typical Connections for an N-ARA-10 Agent Release-Abort Station

Appendix A: Annunciators

Overview

Appendix A contains the following information:

• Tables necessary for configuring the annunciator display; and

• Typical annunciator wiring diagrams.

Note that Appendix A contains information specific to the AFP-400 only. For complete annunciator installation information, refer to the respective annunciator manual.

Annunciator Interfaces

The AFP-400 provides Terminal Mode (LCD-80) and ACS Mode Interfaces that provide high speed, two-way communication link to multiple annunciators. You can locate annunciators up to 6000 feet from the control panel.

Terminal Mode (LCD-80)

Use the Terminal Mode Interface for communicating with LCD-80 Annunciators operating in Terminal Mode. In Terminal Mode, each LCD-80 display reflects the AFP-400 front panel display. Each LCD-80 displays the complete status of the fire alarm system and lets you do ACKNOWLEDGE, SILENCE and RESET functions for the control panel from a remote location.

ACS Mode

Use the ACS Mode Interface for communicating with the following LED/Lamp type annunciators: ACM-16AT, AEM-16AT, ACM-32A, AEM-32A, AFM-16A, AFM-32A, AFM-16AT, LDM-32, LDM-E32, and LDM-R32. The ACS interface also communicates with the AMG-1 Audio Message Generator, the UZC-256 Universal Zone Coder, the NIB-96 Network Interface Board, the LCD-80 Annunciators operating in the ACS Mode and the ACM-8R Relay Annunciator Module.

The ACM-8R Relay Module provides relays for controlling equipment located at remote locations. The ACM-8R greatly increases the relay control capabilities of the control panel. You can assign the ACM-8R to any of the 576 panel annunciation points. Each ACM-8R module covers continuous groups of eight panel points.

The ACS Mode Interface can annunciate CPU-400, zone, detector, module, and circuit status. The 576 panel annunciation points are divided into nine groups of 64 points, as shown in Tables A1 to A9. Each group can be assigned to one or more of the ten annunciator addresses supported by the AFP-400.

The AFP-400 uses ACS Annunciator addresses 1 to 10. Each address can communicate with one receive/transmit device. Configure other devices on the same address as "Receive Only." You can connect up to 32 devices to the ACS output, all addresses combined.

Use ACS Mode Interface to ACKNOWLEDGE, SILENCE, DRILL and RESET the control panel from a remote location. The ACS Mode Interface can also activate output circuits and control modules from remote locations.

ACS Annunciator Selection Group 1

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input	System Alarm	System Trouble	Acknowledge	
2	Output	Not Used	Signal Silenced	Signal Silence	
3	Output	Not Used	Program Mode	System Reset	
4	Output	Not Used	Supervisory	Drill	
5	Output	NAC #1 Active	NAC Trouble	Control NAC #1	
6	Input	Not Used	PA/Maint Alert	Not Used	
7	Input	Not Used	Low Battery	Not Used	
8	Input	Not Used	AC Fail	Not Used	
9	Input	Zone 1 Active	Zone 1 Trouble	Not Used	
10	Input	Zone 2 Active	Zone 2 Trouble	Not Used	
11	Input	Zone 3 Active	Zone 3 Trouble	Not Used	
12	Input	Zone 4 Active	Zone 4 Trouble	Not Used	
13	Input	Zone 5 Active	Zone 5 Trouble	Not Used	
14	Input	Zone 6 Active	Zone 6 Trouble	Not Used	
15	Input	Zone 7 Active	Zone 7 Trouble	Not Used	
16	Input	Zone 8 Active	Zone 8 Trouble	Not Used	
17	Input	Zone 9 Active	Zone 9 Trouble	Not Used	
18	Input	Zone 10 Active	Zone 10 Trouble	Not Used	
19	Input	Zone 11 Active	Zone 11 Trouble	Not Used	
20	Input	Zone 12 Active	Zone 12 Trouble	Not Used	
21	Input	Zone 13 Active	Zone 13 Trouble	Not Used	
22	Input	Zone 14 Active	Zone 14 Trouble	Not Used	
23	Input	Zone 15 Active	Zone 15 Trouble	Not Used	
24	Input	Zone 16 Active	Zone 16 Trouble	Not Used	
25	Input	Zone 17 Active	Zone 17 Trouble	Not Used	
26	Input	Zone 18 Active	Zone 18 Trouble	Not Used	
27	Input	Zone 19 Active	Zone 19 Trouble	Not Used	
28	Input	Zone 20 Active	Zone 20 Trouble	Not Used	
29	Input	Zone 21 Active	Zone 21 Trouble	Not Used	
30	Input	Zone 22 Active	Zone 22 Trouble	Not Used	
31	Input	Zone 23 Active	Zone 23 Trouble	Not Used	
32	Input	Zone 24 Active	Zone 24 Trouble	Not Used	
33	Input	Zone 25 Active	Zone 25 Trouble	Not Used	
34	Input	Zone 26 Active	Zone 26 Trouble	Not Used	
35	Input	Zone 27 Active	Zone 27 Trouble	Not Used	
36	Input	Zone 28 Active	Zone 28 Trouble	Not Used	
37	Input	Zone 29 Active	Zone 29 Trouble	Not Used	
38	Input	Zone 30 Active	Zone 30 Trouble	Not Used	
39	Input	Zone 31 Active	Zone 31 Trouble	Not Used	
40	Input	Zone 32 Active	Zone 32 Trouble	Not Used	
41	Input	Zone 33 Active	Zone 33 Trouble	Not Used	
42	Input	Zone 34 Active	Zone 34 Trouble	Not Used	
43	Input	Zone 35 Active	Zone 35 Trouble	Not Used	
44	Input	Zone 36 Active	Zone 36 Trouble	Not Used	
45	Input	Zone 37 Active	Zone 37 Trouble	Not Used	
46	Input	Zone 38 Active	Zone 38 Trouble	Not Used	
47	Input	Zone 39 Active	Zone 39 Trouble	Not Used	
48	Input	Zone 40 Active	Zone 40 Trouble	Not Used	
49	Input	Zone 41 Active	Zone 41 Trouble	Not Used	
50	Input	Zone 42 Active	Zone 42 Trouble	Not Used	
51	Input	Zone 43 Active	Zone 43 Trouble	Not Used	
52	Input	Zone 44 Active	Zone 44 Trouble	Not Used	
53	Input	Zone 45 Active	Zone 45 Trouble	Not Used	
54	Input	Zone 46 Active	Zone 46 Trouble	Not Used	
55	Input	Zone 47 Active	Zone 47 Trouble	Not Used	
56	Input	Zone 48 Active	Zone 48 Trouble	Not Used	
57	Input	Zone 49 Active	Zone 49 Trouble	Not Used	
58	Input	Zone 50 Active	Zone 50 Trouble	Not Used	
59	Input	Zone 51 Active	Zone 51 Trouble	Not Used	
60	Input	Zone 52 Active	Zone 52 Trouble	Not Used	
61	Input	Zone 53 Active	Zone 53 Trouble	Not Used	
62	Input	Zone 54 Active	Zone 54 Trouble	Not Used	
63	Input	Zone 55 Active	Zone 55 Trouble	Not Used	
64	Input	Zone 56 Active	Zone 56 Trouble	Not Used	

Table A-1 ACS Annunciator Selection Group 1

ACS Annunciator Selection Group 2

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input	Zone 57 Active	Zone 57 Trouble	Not Used	
2	Input	Zone 58 Active	Zone 58 Trouble	Not Used	
3	Input	Zone 59 Active	Zone 59 Trouble	Not Used	
4	Input	Zone 60 Active	Zone 60 Trouble	Not Used	
5	Input	Zone 61 Active	Zone 61 Trouble	Not Used	
6	Input	Zone 62 Active	Zone 62 Trouble	Not Used	
7	Input	Zone 63 Active	Zone 63 Trouble	Not Used	
8	Input	Zone 64 Active	Zone 64 Trouble	Not Used	
9	Input	Zone 65 Active	Zone 65 Trouble	Not Used	
10	Input	Zone 66 Active	Zone 66 Trouble	Not Used	
11	Input	Zone 67 Active	Zone 67 Trouble	Not Used	
12	Input	Zone 68 Active	Zone 68 Trouble	Not Used	
13	Input	Zone 69 Active	Zone 69 Trouble	Not Used	
14	Input	Zone 70 Active	Zone 70 Trouble	Not Used	
15	Input	Zone 71 Active	Zone 71 Trouble	Not Used	
16	Input	Zone 72 Active	Zone 72 Trouble	Not Used	
17	Input	Zone 73 Active	Zone 73 Trouble	Not Used	
18	Input	Zone 74 Active	Zone 74 Trouble	Not Used	
19	Input	Zone 75 Active	Zone 75 Trouble	Not Used	
20	Input	Zone 76 Active	Zone 76 Trouble	Not Used	
21	Input	Zone 77 Active	Zone 77 Trouble	Not Used	
22	Input	Zone 78 Active	Zone 78 Trouble	Not Used	
23	Input	Zone 79 Active	Zone 79 Trouble	Not Used	
24	Input	Zone 80 Active	Zone 80 Trouble	Not Used	
25	Input	Zone 81 Active	Zone 81 Trouble	Not Used	
26	Input	Zone 82 Active	Zone 82 Trouble	Not Used	
27	Input	Zone 83 Active	Zone 83 Trouble	Not Used	
28	Input	Zone 84 Active	Zone 84 Trouble	Not Used	
29	Input	Zone 85 Active	Zone 85 Trouble	Not Used	
30	Input	Zone 86 Active	Zone 86 Trouble	Not Used	
31	Input	Zone 87 Active	Zone 87 Trouble	Not Used	
32	Input	Zone 88 Active	Zone 88 Trouble	Not Used	
33	Input	Zone 89 Active	Zone 89 Trouble	Not Used	
34	Input	Zone 90 Active	Zone 90 Trouble	Not Used	
35	Input	Zone 91 Active	Zone 91 Trouble	Not Used	
36	Input	Zone 92 Active	Zone 92 Trouble	Not Used	
37	Input	Zone 93 Active	Zone 93 Trouble	Not Used	
38	Input	Zone 94 Active	Zone 94 Trouble	Not Used	
39	Input	Zone 95 Active	Zone 95 Trouble	Not Used	
40	Input	Zone 96 Active	Zone 96 Trouble	Not Used	
41	Input	Zone 97 Active	Zone 97 Trouble	Not Used	
42	Input	Zone 98 Active	Zone 98 Trouble	Not Used	
43	Input	Zone 99 Active	Zone 99 Trouble	Not Used	
44	Output	Zone F1 Active	Zone F1 Trouble	Not Used	
45	Output	Zone F2 Active	Zone F2 Trouble	Not Used	
46	Output	Zone F3 Active	Zone F3 Trouble	Not Used	
47	Output	Zone F4 Active	Zone F4 Trouble	Not Used	
48	Output	Zone F5 Active	Zone F5 Trouble	Not Used	
49	Output	Zone F6 Active	Zone F6 Trouble	Not Used	
50	Output	Zone F7 Active	Zone F7 Trouble	Not Used	
51	Output	Zone F8 Active	Zone F8 Trouble	Not Used	
52	Output	Zone F9 Active	Zone F9 Trouble	Not Used	
53	Release Ckt # 0	Zone R0 Active	Zone R1 Trouble	Not Used	
54	Release Ckt # 1	Zone R1 Active	Zone R2 Trouble	Not Used	
55	Release Ckt # 2	Zone R2 Active	Zone R3 Trouble	Not Used	
56	Release Ckt # 3	Zone R3 Active	Zone R4 Trouble	Not Used	
57	Release Ckt # 4	Zone R4 Active	Zone R5 Trouble	Not Used	
58	Release Ckt # 5	Zone R5 Active	Zone R6 Trouble	Not Used	
59	Release Ckt # 6	Zone R6 Active	Zone R7 Trouble	Not Used	
60	Release Ckt # 7	Zone R7 Active	Zone R8 Trouble	Not Used	
61	NAC Output	NAC P0.1 Active	NAC P0.1 Trouble	Controls NAC P0.1	
62	NAC Output	NAC P0.2 Active	NAC P0.2 Trouble	Controls NAC P0.2	
63	NAC Output	NAC P0.3 Active	NAC P0.3 Trouble	Controls NAC P0.3	
64	NAC Output	NAC P0.4 Active	NAC P0.4 Trouble	Controls NAC P0.4	

Table A-2 ACS Annunciator Selection Group 2

ACS Annunciator Selection Group 3

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input or Output	Module 101 Active	Module 101 Trouble	Controls Output Module	
2	Input or Output	Module 102 Active	Module 102 Trouble	Controls Output Module	
3	Input or Output	Module 103 Active	Module 103 Trouble	Controls Output Module	
4	Input or Output	Module 104 Active	Module 104 Trouble	Controls Output Module	
5	Input or Output	Module 105 Active	Module 105 Trouble	Controls Output Module	
6	Input or Output	Module 106 Active	Module 106 Trouble	Controls Output Module	
7	Input or Output	Module 107 Active	Module 107 Trouble	Controls Output Module	
8	Input or Output	Module 108 Active	Module 108 Trouble	Controls Output Module	
9	Input or Output	Module 109 Active	Module 109 Trouble	Controls Output Module	
10	Input or Output	Module 110 Active	Module 110 Trouble	Controls Output Module	
11	Input or Output	Module 111 Active	Module 111 Trouble	Controls Output Module	
12	Input or Output	Module 112 Active	Module 112 Trouble	Controls Output Module	
13	Input or Output	Module 113 Active	Module 113 Trouble	Controls Output Module	
14	Input or Output	Module 114 Active	Module 114 Trouble	Controls Output Module	
15	Input or Output	Module 115 Active	Module 115 Trouble	Controls Output Module	
16	Input or Output	Module 116 Active	Module 116 Trouble	Controls Output Module	
17	Input or Output	Module 117 Active	Module 117 Trouble	Controls Output Module	
18	Input or Output	Module 118 Active	Module 118 Trouble	Controls Output Module	
19	Input or Output	Module 119 Active	Module 119 Trouble	Controls Output Module	
20	Input or Output	Module 120 Active	Module 120 Trouble	Controls Output Module	
21	Input or Output	Module 121 Active	Module 121 Trouble	Controls Output Module	
22	Input or Output	Module 122 Active	Module 122 Trouble	Controls Output Module	
23	Input or Output	Module 123 Active	Module 123 Trouble	Controls Output Module	
24	Input or Output	Module 124 Active	Module 124 Trouble	Controls Output Module	
25	Input or Output	Module 125 Active	Module 125 Trouble	Controls Output Module	
26	Input or Output	Module 126 Active	Module 126 Trouble	Controls Output Module	
27	Input or Output	Module 127 Active	Module 127 Trouble	Controls Output Module	
28	Input or Output	Module 128 Active	Module 128 Trouble	Controls Output Module	
29	Input or Output	Module 129 Active	Module 129 Trouble	Controls Output Module	
30	Input or Output	Module 130 Active	Module 130 Trouble	Controls Output Module	
31	Input or Output	Module 131 Active	Module 131 Trouble	Controls Output Module	
32	Input or Output	Module 132 Active	Module 132 Trouble	Controls Output Module	
33	Input or Output	Module 133 Active	Module 133 Trouble	Controls Output Module	
34	Input or Output	Module 134 Active	Module 134 Trouble	Controls Output Module	
35	Input or Output	Module 135 Active	Module 135 Trouble	Controls Output Module	
36	Input or Output	Module 136 Active	Module 136 Trouble	Controls Output Module	
37	Input or Output	Module 137 Active	Module 137 Trouble	Controls Output Module	
38	Input or Output	Module 138 Active	Module 138 Trouble	Controls Output Module	
39	Input or Output	Module 139 Active	Module 139 Trouble	Controls Output Module	
40	Input or Output	Module 140 Active	Module 140 Trouble	Controls Output Module	
41	Input or Output	Module 141 Active	Module 141 Trouble	Controls Output Module	
42	Input or Output	Module 142 Active	Module 142 Trouble	Controls Output Module	
43	Input or Output	Module 143 Active	Module 143 Trouble	Controls Output Module	
44	Input or Output	Module 144 Active	Module 144 Trouble	Controls Output Module	
45	Input or Output	Module 145 Active	Module 145 Trouble	Controls Output Module	
46	Input or Output	Module 146 Active	Module 146 Trouble	Controls Output Module	
47	Input or Output	Module 147 Active	Module 147 Trouble	Controls Output Module	
48	Input or Output	Module 148 Active	Module 148 Trouble	Controls Output Module	
49	Input or Output	Module 149 Active	Module 149 Trouble	Controls Output Module	
50	Input or Output	Module 150 Active	Module 150 Trouble	Controls Output Module	
51	Input or Output	Module 151 Active	Module 151 Trouble	Controls Output Module	
52	Input or Output	Module 152 Active	Module 152 Trouble	Controls Output Module	
53	Input or Output	Module 153 Active	Module 153 Trouble	Controls Output Module	
54	Input or Output	Module 154 Active	Module 154 Trouble	Controls Output Module	
55	Input or Output	Module 155 Active	Module 155 Trouble	Controls Output Module	
56	Input or Output	Module 156 Active	Module 156 Trouble	Controls Output Module	
57	Input or Output	Module 157 Active	Module 157 Trouble	Controls Output Module	
58	Input or Output	Module 158 Active	Module 158 Trouble	Controls Output Module	
59	Input or Output	Module 159 Active	Module 159 Trouble	Controls Output Module	
60	Input or Output	Module 160 Active	Module 160 Trouble	Controls Output Module	
61	Input or Output	Module 161 Active	Module 161 Trouble	Controls Output Module	
62	Input or Output	Module 162 Active	Module 162 Trouble	Controls Output Module	
63	Input or Output	Module 163 Active	Module 163 Trouble	Controls Output Module	
64	Input or Output	Module 164 Active	Module 164 Trouble	Controls Output Module	

Table A3 ACS Annunciator Selection Group 3

ACS Annunciator Selection Group 4

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input or Output	Module 201 Active	Module 201 Trouble	Controls Output Module	
2	Input or Output	Module 202 Active	Module 202 Trouble	Controls Output Module	
3	Input or Output	Module 203 Active	Module 203 Trouble	Controls Output Module	
4	Input or Output	Module 204 Active	Module 204 Trouble	Controls Output Module	
5	Input or Output	Module 205 Active	Module 205 Trouble	Controls Output Module	
6	Input or Output	Module 206 Active	Module 206 Trouble	Controls Output Module	
7	Input or Output	Module 207 Active	Module 207 Trouble	Controls Output Module	
8	Input or Output	Module 208 Active	Module 208 Trouble	Controls Output Module	
9	Input or Output	Module 209 Active	Module 209 Trouble	Controls Output Module	
10	Input or Output	Module 210 Active	Module 210 Trouble	Controls Output Module	
11	Input or Output	Module 211 Active	Module 211 Trouble	Controls Output Module	
12	Input or Output	Module 212 Active	Module 212 Trouble	Controls Output Module	
13	Input or Output	Module 213 Active	Module 213 Trouble	Controls Output Module	
14	Input or Output	Module 214 Active	Module 214 Trouble	Controls Output Module	
15	Input or Output	Module 215 Active	Module 215 Trouble	Controls Output Module	
16	Input or Output	Module 216 Active	Module 216 Trouble	Controls Output Module	
17	Input or Output	Module 217 Active	Module 217 Trouble	Controls Output Module	
18	Input or Output	Module 218 Active	Module 218 Trouble	Controls Output Module	
19	Input or Output	Module 219 Active	Module 219 Trouble	Controls Output Module	
20	Input or Output	Module 220 Active	Module 220 Trouble	Controls Output Module	
21	Input or Output	Module 221 Active	Module 221 Trouble	Controls Output Module	
22	Input or Output	Module 222 Active	Module 222 Trouble	Controls Output Module	
23	Input or Output	Module 223 Active	Module 223 Trouble	Controls Output Module	
24	Input or Output	Module 224 Active	Module 224 Trouble	Controls Output Module	
25	Input or Output	Module 225 Active	Module 225 Trouble	Controls Output Module	
26	Input or Output	Module 226 Active	Module 226 Trouble	Controls Output Module	
27	Input or Output	Module 227 Active	Module 227 Trouble	Controls Output Module	
28	Input or Output	Module 228 Active	Module 228 Trouble	Controls Output Module	
29	Input or Output	Module 229 Active	Module 229 Trouble	Controls Output Module	
30	Input or Output	Module 230 Active	Module 230 Trouble	Controls Output Module	
31	Input or Output	Module 231 Active	Module 231 Trouble	Controls Output Module	
32	Input or Output	Module 232 Active	Module 232 Trouble	Controls Output Module	
33	Input or Output	Module 233 Active	Module 233 Trouble	Controls Output Module	
34	Input or Output	Module 234 Active	Module 234 Trouble	Controls Output Module	
35	Input or Output	Module 235 Active	Module 235 Trouble	Controls Output Module	
36	Input or Output	Module 236 Active	Module 236 Trouble	Controls Output Module	
37	Input or Output	Module 237 Active	Module 237 Trouble	Controls Output Module	
38	Input or Output	Module 238 Active	Module 238 Trouble	Controls Output Module	
39	Input or Output	Module 239 Active	Module 239 Trouble	Controls Output Module	
40	Input or Output	Module 240 Active	Module 240 Trouble	Controls Output Module	
41	Input or Output	Module 241 Active	Module 241 Trouble	Controls Output Module	
42	Input or Output	Module 242 Active	Module 242 Trouble	Controls Output Module	
43	Input or Output	Module 243 Active	Module 243 Trouble	Controls Output Module	
44	Input or Output	Module 244 Active	Module 244 Trouble	Controls Output Module	
45	Input or Output	Module 245 Active	Module 245 Trouble	Controls Output Module	
46	Input or Output	Module 246 Active	Module 246 Trouble	Controls Output Module	
47	Input or Output	Module 247 Active	Module 247 Trouble	Controls Output Module	
48	Input or Output	Module 248 Active	Module 248 Trouble	Controls Output Module	
49	Input or Output	Module 249 Active	Module 249 Trouble	Controls Output Module	
50	Input or Output	Module 250 Active	Module 250 Trouble	Controls Output Module	
51	Input or Output	Module 251 Active	Module 251 Trouble	Controls Output Module	
52	Input or Output	Module 252 Active	Module 252 Trouble	Controls Output Module	
53	Input or Output	Module 253 Active	Module 253 Trouble	Controls Output Module	
54	Input or Output	Module 254 Active	Module 254 Trouble	Controls Output Module	
55	Input or Output	Module 255 Active	Module 255 Trouble	Controls Output Module	
56	Input or Output	Module 256 Active	Module 256 Trouble	Controls Output Module	
57	Input or Output	Module 257 Active	Module 257 Trouble	Controls Output Module	
58	Input or Output	Module 258 Active	Module 258 Trouble	Controls Output Module	
59	Input or Output	Module 259 Active	Module 259 Trouble	Controls Output Module	
60	Input or Output	Module 260 Active	Module 260 Trouble	Controls Output Module	
61	Input or Output	Module 261 Active	Module 261 Trouble	Controls Output Module	
62	Input or Output	Module 262 Active	Module 262 Trouble	Controls Output Module	
63	Input or Output	Module 263 Active	Module 263 Trouble	Controls Output Module	
64	Input or Output	Module 264 Active	Module 264 Trouble	Controls Output Module	

Table A-4 ACS Annunciator Selection Group 4

ACS Annunciator Selection Group 5

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input or Output	Module 165 Active	Module 165 Trouble	Controls Output Module	
2	Input or Output	Module 166 Active	Module 166 Trouble	Controls Output Module	
3	Input or Output	Module 167 Active	Module 167 Trouble	Controls Output Module	
4	Input or Output	Module 168 Active	Module 168 Trouble	Controls Output Module	
5	Input or Output	Module 169 Active	Module 169 Trouble	Controls Output Module	
6	Input or Output	Module 170 Active	Module 170 Trouble	Controls Output Module	
7	Input or Output	Module 171 Active	Module 171 Trouble	Controls Output Module	
8	Input or Output	Module 172 Active	Module 172 Trouble	Controls Output Module	
9	Input or Output	Module 173 Active	Module 173 Trouble	Controls Output Module	
10	Input or Output	Module 174 Active	Module 174 Trouble	Controls Output Module	
11	Input or Output	Module 175 Active	Module 175 Trouble	Controls Output Module	
12	Input or Output	Module 176 Active	Module 176 Trouble	Controls Output Module	
13	Input or Output	Module 177 Active	Module 177 Trouble	Controls Output Module	
14	Input or Output	Module 178 Active	Module 178 Trouble	Controls Output Module	
15	Input or Output	Module 179 Active	Module 179 Trouble	Controls Output Module	
16	Input or Output	Module 180 Active	Module 180 Trouble	Controls Output Module	
17	Input or Output	Module 181 Active	Module 181 Trouble	Controls Output Module	
18	Input or Output	Module 182 Active	Module 182 Trouble	Controls Output Module	
19	Input or Output	Module 183 Active	Module 183 Trouble	Controls Output Module	
20	Input or Output	Module 184 Active	Module 184 Trouble	Controls Output Module	
21	Input or Output	Module 185 Active	Module 185 Trouble	Controls Output Module	
22	Input or Output	Module 186 Active	Module 186 Trouble	Controls Output Module	
23	Input or Output	Module 187 Active	Module 187 Trouble	Controls Output Module	
24	Input or Output	Module 188 Active	Module 188 Trouble	Controls Output Module	
25	Input or Output	Module 189 Active	Module 189 Trouble	Controls Output Module	
26	Input or Output	Module 190 Active	Module 190 Trouble	Controls Output Module	
27	Input or Output	Module 191 Active	Module 191 Trouble	Controls Output Module	
28	Input or Output	Module 192 Active	Module 192 Trouble	Controls Output Module	
29	Input or Output	Module 193 Active	Module 193 Trouble	Controls Output Module	
30	Input or Output	Module 194 Active	Module 194 Trouble	Controls Output Module	
31	Input or Output	Module 195 Active	Module 195 Trouble	Controls Output Module	
32	Input or Output	Module 196 Active	Module 196 Trouble	Controls Output Module	
33	Input or Output	Module 265 Active	Module 265 Trouble	Controls Output Module	
34	Input or Output	Module 266 Active	Module 266 Trouble	Controls Output Module	
35	Input or Output	Module 267 Active	Module 267 Trouble	Controls Output Module	
36	Input or Output	Module 268 Active	Module 268 Trouble	Controls Output Module	
37	Input or Output	Module 269 Active	Module 269 Trouble	Controls Output Module	
38	Input or Output	Module 270 Active	Module 270 Trouble	Controls Output Module	
39	Input or Output	Module 271 Active	Module 271 Trouble	Controls Output Module	
40	Input or Output	Module 272 Active	Module 272 Trouble	Controls Output Module	
41	Input or Output	Module 273 Active	Module 273 Trouble	Controls Output Module	
42	Input or Output	Module 274 Active	Module 274 Trouble	Controls Output Module	
43	Input or Output	Module 275 Active	Module 275 Trouble	Controls Output Module	
44	Input or Output	Module 276 Active	Module 276 Trouble	Controls Output Module	
45	Input or Output	Module 277 Active	Module 277 Trouble	Controls Output Module	
46	Input or Output	Module 278 Active	Module 278 Trouble	Controls Output Module	
47	Input or Output	Module 279 Active	Module 279 Trouble	Controls Output Module	
48	Input or Output	Module 280 Active	Module 280 Trouble	Controls Output Module	
49	Input or Output	Module 281 Active	Module 281 Trouble	Controls Output Module	
50	Input or Output	Module 282 Active	Module 282 Trouble	Controls Output Module	
51	Input or Output	Module 283 Active	Module 283 Trouble	Controls Output Module	
52	Input or Output	Module 284 Active	Module 284 Trouble	Controls Output Module	
53	Input or Output	Module 285 Active	Module 285 Trouble	Controls Output Module	
54	Input or Output	Module 286 Active	Module 286 Trouble	Controls Output Module	
55	Input or Output	Module 187 Active	Module 287 Trouble	Controls Output Module	
56	Input or Output	Module 288 Active	Module 288 Trouble	Controls Output Module	
57	Input or Output	Module 289 Active	Module 289 Trouble	Controls Output Module	
58	Input or Output	Module 290 Active	Module 290 Trouble	Controls Output Module	
59	Input or Output	Module 291 Active	Module 291 Trouble	Controls Output Module	
60	Input or Output	Module 292 Active	Module 292 Trouble	Controls Output Module	
61	Input or Output	Module 293 Active	Module 293 Trouble	Controls Output Module	
62	Input or Output	Module 294 Active	Module 294 Trouble	Controls Output Module	
63	Input or Output	Module 295 Active	Module 295 Trouble	Controls Output Module	
64	Input or Output	Module 296 Active	Module 296 Trouble	Controls Output Module	

Table A-5 ACS Annunciator Selection Group 5

ACS Annunciator Selection Group 6

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input	Detector 101 Alarm	Detector 101 Trouble	Not Used	
2	Input	Detector 102 Alarm	Detector 102 Trouble	Not Used	
3	Input	Detector 103 Alarm	Detector 103 Trouble	Not Used	
4	Input	Detector 104 Alarm	Detector 104 Trouble	Not Used	
5	Input	Detector 105 Alarm	Detector 105 Trouble	Not Used	
6	Input	Detector 106 Alarm	Detector 106 Trouble	Not Used	
7	Input	Detector 107 Alarm	Detector 107 Trouble	Not Used	
8	Input	Detector 108 Alarm	Detector 108 Trouble	Not Used	
9	Input	Detector 109 Alarm	Detector 109 Trouble	Not Used	
10	Input	Detector 110 Alarm	Detector 110 Trouble	Not Used	
11	Input	Detector 111 Alarm	Detector 111 Trouble	Not Used	
12	Input	Detector 112 Alarm	Detector 112 Trouble	Not Used	
13	Input	Detector 113 Alarm	Detector 113 Trouble	Not Used	
14	Input	Detector 114 Alarm	Detector 114 Trouble	Not Used	
15	Input	Detector 115 Alarm	Detector 115 Trouble	Not Used	
16	Input	Detector 116 Alarm	Detector 116 Trouble	Not Used	
17	Input	Detector 117 Alarm	Detector 117 Trouble	Not Used	
18	Input	Detector 118 Alarm	Detector 118 Trouble	Not Used	
19	Input	Detector 119 Alarm	Detector 119 Trouble	Not Used	
20	Input	Detector 120 Alarm	Detector 120 Trouble	Not Used	
21	Input	Detector 121 Alarm	Detector 121 Trouble	Not Used	
22	Input	Detector 122 Alarm	Detector 122 Trouble	Not Used	
23	Input	Detector 123 Alarm	Detector 123 Trouble	Not Used	
24	Input	Detector 124 Alarm	Detector 124 Trouble	Not Used	
25	Input	Detector 125 Alarm	Detector 125 Trouble	Not Used	
26	Input	Detector 126 Alarm	Detector 126 Trouble	Not Used	
27	Input	Detector 127 Alarm	Detector 127 Trouble	Not Used	
28	Input	Detector 128 Alarm	Detector 128 Trouble	Not Used	
29	Input	Detector 129 Alarm	Detector 129 Trouble	Not Used	
30	Input	Detector 130 Alarm	Detector 130 Trouble	Not Used	
31	Input	Detector 131 Alarm	Detector 131 Trouble	Not Used	
32	Input	Detector 132 Alarm	Detector 132 Trouble	Not Used	
33	Input	Detector 133 Alarm	Detector 133 Trouble	Not Used	
34	Input	Detector 134 Alarm	Detector 134 Trouble	Not Used	
35	Input	Detector 135 Alarm	Detector 135 Trouble	Not Used	
36	Input	Detector 136 Alarm	Detector 136 Trouble	Not Used	
37	Input	Detector 137 Alarm	Detector 137 Trouble	Not Used	
38	Input	Detector 138 Alarm	Detector 138 Trouble	Not Used	
39	Input	Detector 139 Alarm	Detector 139 Trouble	Not Used	
40	Input	Detector 140 Alarm	Detector 140 Trouble	Not Used	
41	Input	Detector 141 Alarm	Detector 141 Trouble	Not Used	
42	Input	Detector 142 Alarm	Detector 142 Trouble	Not Used	
43	Input	Detector 143 Alarm	Detector 143 Trouble	Not Used	
44	Input	Detector 144 Alarm	Detector 144 Trouble	Not Used	
45	Input	Detector 145 Alarm	Detector 145 Trouble	Not Used	
46	Input	Detector 146 Alarm	Detector 146 Trouble	Not Used	
47	Input	Detector 147 Alarm	Detector 147 Trouble	Not Used	
48	Input	Detector 148 Alarm	Detector 148 Trouble	Not Used	
49	Input	Detector 149 Alarm	Detector 149 Trouble	Not Used	
50	Input	Detector 150 Alarm	Detector 150 Trouble	Not Used	
51	Input	Detector 151 Alarm	Detector 151 Trouble	Not Used	
52	Input	Detector 152 Alarm	Detector 152 Trouble	Not Used	
53	Input	Detector 153 Alarm	Detector 153 Trouble	Not Used	
54	Input	Detector 154 Alarm	Detector 154 Trouble	Not Used	
55	Input	Detector 155 Alarm	Detector 155 Trouble	Not Used	
56	Input	Detector 156 Alarm	Detector 156 Trouble	Not Used	
57	Input	Detector 157 Alarm	Detector 157 Trouble	Not Used	
58	Input	Detector 158 Alarm	Detector 158 Trouble	Not Used	
59	Input	Detector 159 Alarm	Detector 159 Trouble	Not Used	
60	Input	Detector 160 Alarm	Detector 160 Trouble	Not Used	
61	Input	Detector 161 Alarm	Detector 161 Trouble	Not Used	
62	Input	Detector 162 Alarm	Detector 162 Trouble	Not Used	
63	Input	Detector 163 Alarm	Detector 163 Trouble	Not Used	
64	Input	Detector 164 Alarm	Detector 164 Trouble	Not Used	

Table A-6 ACS Annunciator Selection Group 6

ACS Annunciator Selection Group 7

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input	Detector 201 Alarm	Detector 201 Trouble	Not Used	
2	Input	Detector 202 Alarm	Detector 202 Trouble	Not Used	
3	Input	Detector 203 Alarm	Detector 203 Trouble	Not Used	
4	Input	Detector 204 Alarm	Detector 204 Trouble	Not Used	
5	Input	Detector 205 Alarm	Detector 205 Trouble	Not Used	
6	Input	Detector 206 Alarm	Detector 206 Trouble	Not Used	
7	Input	Detector 207 Alarm	Detector 207 Trouble	Not Used	
8	Input	Detector 208 Alarm	Detector 208 Trouble	Not Used	
9	Input	Detector 209 Alarm	Detector 209 Trouble	Not Used	
10	Input	Detector 210 Alarm	Detector 210 Trouble	Not Used	
11	Input	Detector 211 Alarm	Detector 211 Trouble	Not Used	
12	Input	Detector 212 Alarm	Detector 212 Trouble	Not Used	
13	Input	Detector 213 Alarm	Detector 213 Trouble	Not Used	
14	Input	Detector 214 Alarm	Detector 214 Trouble	Not Used	
15	Input	Detector 215 Alarm	Detector 215 Trouble	Not Used	
16	Input	Detector 216 Alarm	Detector 216 Trouble	Not Used	
17	Input	Detector 217 Alarm	Detector 217 Trouble	Not Used	
18	Input	Detector 218 Alarm	Detector 218 Trouble	Not Used	
19	Input	Detector 219 Alarm	Detector 219 Trouble	Not Used	
20	Input	Detector 220 Alarm	Detector 220 Trouble	Not Used	
21	Input	Detector 221 Alarm	Detector 221 Trouble	Not Used	
22	Input	Detector 222 Alarm	Detector 222 Trouble	Not Used	
23	Input	Detector 223 Alarm	Detector 223 Trouble	Not Used	
24	Input	Detector 224 Alarm	Detector 224 Trouble	Not Used	
25	Input	Detector 225 Alarm	Detector 225 Trouble	Not Used	
26	Input	Detector 226 Alarm	Detector 226 Trouble	Not Used	
27	Input	Detector 227 Alarm	Detector 227 Trouble	Not Used	
28	Input	Detector 228 Alarm	Detector 228 Trouble	Not Used	
29	Input	Detector 229 Alarm	Detector 229 Trouble	Not Used	
30	Input	Detector 230 Alarm	Detector 230 Trouble	Not Used	
31	Input	Detector 231 Alarm	Detector 231 Trouble	Not Used	
32	Input	Detector 232 Alarm	Detector 232 Trouble	Not Used	
33	Input	Detector 233 Alarm	Detector 233 Trouble	Not Used	
34	Input	Detector 234 Alarm	Detector 234 Trouble	Not Used	
35	Input	Detector 235 Alarm	Detector 235 Trouble	Not Used	
36	Input	Detector 236 Alarm	Detector 236 Trouble	Not Used	
37	Input	Detector 237 Alarm	Detector 237 Trouble	Not Used	
38	Input	Detector 238 Alarm	Detector 238 Trouble	Not Used	
39	Input	Detector 239 Alarm	Detector 239 Trouble	Not Used	
40	Input	Detector 240 Alarm	Detector 240 Trouble	Not Used	
41	Input	Detector 241 Alarm	Detector 241 Trouble	Not Used	
42	Input	Detector 242 Alarm	Detector 242 Trouble	Not Used	
43	Input	Detector 243 Alarm	Detector 243 Trouble	Not Switch	
44	Input	Detector 244 Alarm	Detector 244 Trouble	Not Used	
45	Input	Detector 245 Alarm	Detector 245 Trouble	Not Used	
46	Input	Detector 246 Alarm	Detector 246 Trouble	Not Used	
47	Input	Detector 247 Alarm	Detector 247 Trouble	Not Used	
48	Input	Detector 248 Alarm	Detector 248 Trouble	Not Used	
49	Input	Detector 249 Alarm	Detector 249 Trouble	Not Used	
50	Input	Detector 250 Alarm	Detector 250 Trouble	Not Used	
51	Input	Detector 251 Alarm	Detector 251 Trouble	Not Used	
52	Input	Detector 252 Alarm	Detector 252 Trouble	Not Used	
53	Input	Detector 253 Alarm	Detector 253 Trouble	Not Used	
54	Input	Detector 254 Alarm	Detector 254 Trouble	Not Used	
55	Input	Detector 255 Alarm	Detector 255 Trouble	Not Used	
56	Input	Detector 256 Alarm	Detector 256 Trouble	Not Used	
57	Input	Detector 257 Alarm	Detector 257 Trouble	Not Used	
58	Input	Detector 258 Alarm	Detector 258 Trouble	Not Used	
59	Input	Detector 259 Alarm	Detector 259 Trouble	Not Used	
60	Input	Detector 260 Alarm	Detector 260 Trouble	Not Used	
61	Input	Detector 261 Alarm	Detector 261 Trouble	Not Used	
62	Input	Detector 262 Alarm	Detector 262 Trouble	Not Used	
63	Input	Detector 263 Alarm	Detector 263 Trouble	Not Used	
64	Input	Detector 264 Alarm	Detector 264 Trouble	Not Used	

Table A-7 ACS Annunciator Selection Group 7

ACS Annunciator Selection Group 8

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Input	Detector 165 Alarm	Detector 165 Trouble	Not Used	
2	Input	Detector 166 Alarm	Detector 166 Trouble	Not Used	
3	Input	Detector 167 Alarm	Detector 167 Trouble	Not Used	
4	Input	Detector 168 Alarm	Detector 168 Trouble	Not Used	
5	Input	Detector 169 Alarm	Detector 169 Trouble	Not Used	
6	Input	Detector 170 Alarm	Detector 170 Trouble	Not Used	
7	Input	Detector 171 Alarm	Detector 171 Trouble	Not Used	
8	Input	Detector 172 Alarm	Detector 172 Trouble	Not Used	
9	Input	Detector 173 Alarm	Detector 173 Trouble	Not Used	
10	Input	Detector 174 Alarm	Detector 174 Trouble	Not Used	
11	Input	Detector 175 Alarm	Detector 175 Trouble	Not Used	
12	Input	Detector 176 Alarm	Detector 176 Trouble	Not Used	
13	Input	Detector 177 Alarm	Detector 177 Trouble	Not Used	
14	Input	Detector 178 Alarm	Detector 178 Trouble	Not Used	
15	Input	Detector 179 Alarm	Detector 179 Trouble	Not Used	
16	Input	Detector 180 Alarm	Detector 180 Trouble	Not Used	
17	Input	Detector 181 Alarm	Detector 181 Trouble	Not Used	
18	Input	Detector 182 Alarm	Detector 182 Trouble	Not Used	
19	Input	Detector 183 Alarm	Detector 183 Trouble	Not Used	
20	Input	Detector 184 Alarm	Detector 184 Trouble	Not Used	
21	Input	Detector 185 Alarm	Detector 185 Trouble	Not Used	
22	Input	Detector 186 Alarm	Detector 186 Trouble	Not Used	
23	Input	Detector 187 Alarm	Detector 187 Trouble	Not Used	
24	Input	Detector 188 Alarm	Detector 188 Trouble	Not Used	
25	Input	Detector 189 Alarm	Detector 189 Trouble	Not Used	
26	Input	Detector 190 Alarm	Detector 190 Trouble	Not Used	
27	Input	Detector 191 Alarm	Detector 191 Trouble	Not Used	
28	Input	Detector 192 Alarm	Detector 192 Trouble	Not Used	
29	Input	Detector 193 Alarm	Detector 193 Trouble	Not Used	
30	Input	Detector 194 Alarm	Detector 194 Trouble	Not Used	
31	Input	Detector 195 Alarm	Detector 195 Trouble	Not Used	
32	Input	Detector 196 Alarm	Detector 196 Trouble	Not Used	
33	Input	Detector 265 Alarm	Detector 265 Trouble	Not Used	
34	Input	Detector 266 Alarm	Detector 266 Trouble	Not Used	
35	Input	Detector 267 Alarm	Detector 267 Trouble	Not Used	
36	Input	Detector 268 Alarm	Detector 268 Trouble	Not Used	
37	Input	Detector 269 Alarm	Detector 269 Trouble	Not Used	
38	Input	Detector 270 Alarm	Detector 270 Trouble	Not Used	
39	Input	Detector 271 Alarm	Detector 271 Trouble	Not Used	
40	Input	Detector 272 Alarm	Detector 272 Trouble	Not Used	
41	Input	Detector 273 Alarm	Detector 273 Trouble	Not Used	
42	Input	Detector 274 Alarm	Detector 274 Trouble	Not Used	
43	Input	Detector 275 Alarm	Detector 275 Trouble	Not Used	
44	Input	Detector 276 Alarm	Detector 276 Trouble	Not Used	
45	Input	Detector 277 Alarm	Detector 277 Trouble	Not Used	
46	Input	Detector 278 Alarm	Detector 278 Trouble	Not Used	
47	Input	Detector 279 Alarm	Detector 279 Trouble	Not Used	
48	Input	Detector 280 Alarm	Detector 280 Trouble	Not Used	
49	Input	Detector 281 Alarm	Detector 281 Trouble	Not Used	
50	Input	Detector 282 Alarm	Detector 282 Trouble	Not Used	
51	Input	Detector 283 Alarm	Detector 283 Trouble	Not Used	
52	Input	Detector 284 Alarm	Detector 284 Trouble	Not Used	
53	Input	Detector 285 Alarm	Detector 285 Trouble	Not Used	
54	Input	Detector 286 Alarm	Detector 286 Trouble	Not Used	
55	Input	Detector 187 Alarm	Detector 287 Trouble	Not Used	
56	Input	Detector 288 Alarm	Detector 288 Trouble	Not Used	
57	Input	Detector 289 Alarm	Detector 289 Trouble	Not Used	
58	Input	Detector 290 Alarm	Detector 290 Trouble	Not Used	
59	Input	Detector 291 Alarm	Detector 291 Trouble	Not Used	
60	Input	Detector 292 Alarm	Detector 292 Trouble	Not Used	
61	Input	Detector 293 Alarm	Detector 293 Trouble	Not Used	
62	Input	Detector 294 Alarm	Detector 294 Trouble	Not Used	
63	Input	Detector 295 Alarm	Detector 295 Trouble	Not Used	
64	Input	Detector 296 Alarm	Detector 296 Trouble	Not Used	

Table A-8 ACS Annunciator Selection Group 8

ACS Annunciator Selection Group 9

ACS Point Number	Point Type	Red LED Indicates	Yellow LED Indicates	Switch Function	Comments
1	Output	Module P1.1 Active	Module P1.1 Trouble	Controls Module P1.1	
2	Output	Module P1.2 Active	Module P1.2 Trouble	Controls Module P1.2	
3	Output	Module P1.3 Active	Module P1.3 Trouble	Controls Module P1.3	
4	Output	Module P1.4 Active	Module P1.4 Trouble	Controls Module P1.4	
5	Output	Module P1.5 Active	Module P1.5 Trouble	Controls Module P1.5	
6	Output	Module P1.6 Active	Module P1.6 Trouble	Controls Module P1.6	
7	Output	Module P1.7 Active	Module P1.7 Trouble	Controls Module P1.7	
8	Output	Module P1.8 Active	Module P1.8 Trouble	Controls Module P1.8	
9	Output	Module P2.1 Active	Module P2.1 Trouble	Controls Module P2.1	
10	Output	Module P2.2 Active	Module P2.2 Trouble	Controls Module P2.2	
11	Output	Module P2.3 Active	Module P2.3 Trouble	Controls Module P2.3	
12	Output	Module P2.4 Active	Module P2.4 Trouble	Controls Module P2.4	
13	Output	Module P2.5 Active	Module P2.5 Trouble	Controls Module P2.5	
14	Output	Module P2.6 Active	Module P2.6 Trouble	Controls Module P2.6	
15	Output	Module P2.7 Active	Module P2.7 Trouble	Controls Module P2.7	
16	Output	Module P2.8 Active	Module P2.8 Trouble	Controls Module P2.8	
17	Output	Module P3.1 Active	Module P3.1 Trouble	Controls Module P3.1	
18	Output	Module P3.2 Active	Module P3.2 Trouble	Controls Module P3.2	
19	Output	Module P3.3 Active	Module P3.3 Trouble	Controls Module P3.3	
20	Output	Module P3.4 Active	Module P3.4 Trouble	Controls Module P3.4	
21	Output	Module P3.5 Active	Module P3.5 Trouble	Controls Module P3.5	
22	Output	Module P3.6 Active	Module P3.6 Trouble	Controls Module P3.6	
23	Output	Module P3.7 Active	Module P3.7 Trouble	Controls Module P3.7	
24	Output	Module P3.8 Active	Module P3.8 Trouble	Controls Module P3.8	
25	Output	Module P4.1 Active	Module P4.1 Trouble	Controls Module P4.1	
26	Output	Module P4.2 Active	Module P4.2 Trouble	Controls Module P4.2	
27	Output	Module P4.3 Active	Module P4.3 Trouble	Controls Module P4.3	
28	Output	Module P4.4 Active	Module P4.4 Trouble	Controls Module P4.4	
29	Output	Module P4.5 Active	Module P4.5 Trouble	Controls Module P4.5	
30	Output	Module P4.6 Active	Module P4.6 Trouble	Controls Module P4.6	
31	Output	Module P4.7 Active	Module P4.7 Trouble	Controls Module P4.7	
32	Output	Module P4.8 Active	Module P4.8 Trouble	Controls Module P4.8	
33	Output	Module P5.1 Active	Module P5.1 Trouble	Controls Module P5.1	
34	Output	Module P5.2 Active	Module P5.2 Trouble	Controls Module P5.2	
35	Output	Module P5.3 Active	Module P5.3 Trouble	Controls Module P5.3	
36	Output	Module P5.4 Active	Module P5.4 Trouble	Controls Module P5.4	
37	Output	Module P5.5 Active	Module P5.5 Trouble	Controls Module P5.5	
38	Output	Module P5.6 Active	Module P5.6 Trouble	Controls Module P5.6	
39	Output	Module P5.7 Active	Module P5.7 Trouble	Controls Module P5.7	
40	Output	Module P5.8 Active	Module P5.8 Trouble	Controls Module P5.8	
41	Output	Module P6.1 Active	Module P6.1 Trouble	Controls Module P6.1	
42	Output	Module P6.2 Active	Module P6.2 Trouble	Controls Module P6.2	
43	Output	Module P6.3 Active	Module P6.3 Trouble	Controls Module P6.3	
44	Output	Module P6.4 Active	Module P6.4 Trouble	Controls Module P6.4	
45	Output	Module P6.5 Active	Module P6.5 Trouble	Controls Module P6.5	
46	Output	Module P6.6 Active	Module P6.6 Trouble	Controls Module P6.6	
47	Output	Module P6.7 Active	Module P6.7 Trouble	Controls Module P6.7	
48	Output	Module P6.8 Active	Module P6.8 Trouble	Controls Module P6.8	
49	Output	Module P7.1 Active	Module P7.1 Trouble	Controls Module P7.1	
50	Output	Module P7.2 Active	Module P7.2 Trouble	Controls Module P7.2	
51	Output	Module P7.3 Active	Module P7.3 Trouble	Controls Module P7.3	
52	Output	Module P7.4 Active	Module P7.4 Trouble	Controls Module P7.4	
53	Output	Module P7.5 Active	Module P7.5 Trouble	Controls Module P7.5	
54	Output	Module P7.6 Active	Module P7.6 Trouble	Controls Module P7.6	
55	Output	Module P7.7 Active	Module P7.7 Trouble	Controls Module P7.7	
56	Output	Module P7.8 Active	Module P7.8 Trouble	Controls Module P7.8	
57	Output	Module P8.1 Active	Module P8.1 Trouble	Controls Module P8.1	
58	Output	Module P8.2 Active	Module P8.2 Trouble	Controls Module P8.2	
59	Output	Module P8.3 Active	Module P8.3 Trouble	Controls Module P8.3	
60	Output	Module P8.4 Active	Module P8.4 Trouble	Controls Module P8.4	
61	Output	Module P8.5 Active	Module P8.5 Trouble	Controls Module P8.5	
62	Output	Module P8.6 Active	Module P8.6 Trouble	Controls Module P8.6	
63	Output	Module P8.7 Active	Module P8.7 Trouble	Controls Module P8.7	
64	Output	Module P8.8 Active	Module P8.8 Trouble	Controls Module P8.8	

Table A-9 ACS Annunciator Selection Group 9

LCD-80 Terminal Mode EIA-485 Connection

Connection Guidelines

- EIA-485 circuits are power limited and supervised.

- Maximum distance between the control panel and the first or last LCD-80 and between each LCD-80: 6000 feet (@16 AWG).

- Use overall foil/braided-shield twisted pair cable suitable for EIA-485 applications.

- An EIA-485 circuit is rated at 5.5 VDC max., 60 mA max.

- For non-English language systems, LCD-80 standby current equals the alarm current (100 mA).

- Refer to the LCD-80 Manual for additional information.

- Each LCD-80 must connect to regulated 24 VDC power. Power an LCD-80 from the MPS-400 power supply or a separate listed power supply. (See Figure A-3 for power connections.)

Connecting LCD-80s in Terminal Mode

Set LCD-80 DIP switches as follows:

1) Install R-120 resistors across the IN and OUT terminals of each LCD-80.
2) Set SW4 and SW5 on the LCD-80 to the "TERM" position: SW1-7 ON.
3) Set DIP Switch SW3-1 and SW3-2 to "OFF" on all LCD-80s except the last LCD-80.
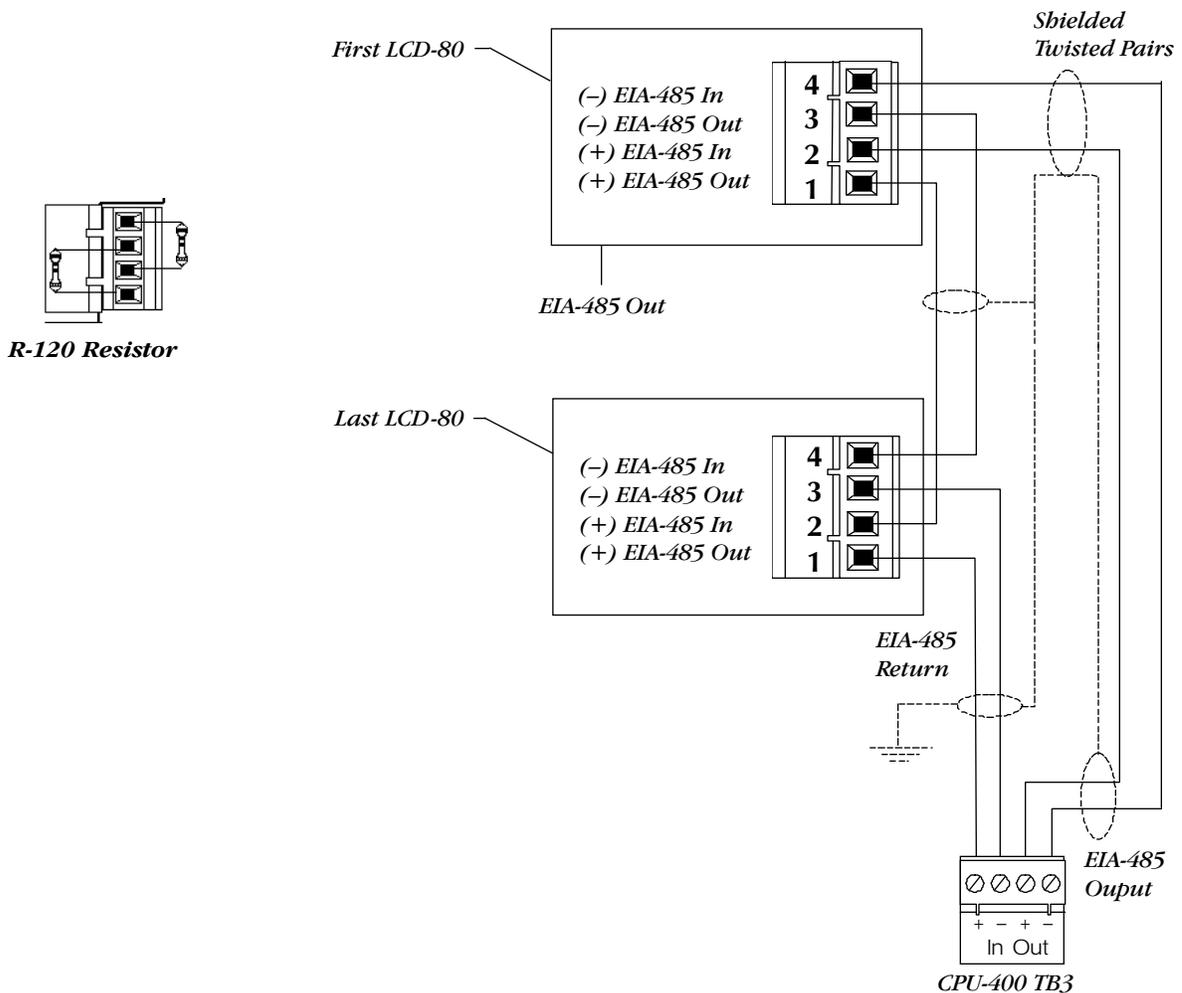4) Set SW3-1 and SW3-2 to "ON" on the last LCD-80.

Figure A-1 Terminal Mode EIA-485 Connection

LCD-80 ACS Mode EIA-485 Connection

Connection Guidelines

- EIA-485 circuits are power limited and supervised.
- LCD-80s require connection of operating power.
- Maximum distance between the control panel and the first or last LCD-80 and between each LCD-80: 6000 feet (@16 AWG).
- If powering LCD-80s by a separate, listed power supply, you can connect up to 32 devices.
- 6000 feet maximum distance (@16 AWG) between the control panel and the first or last LCD-80 and between each LCD-80.
- Use twisted pair cable with a characteristic impedance of approximately 120 ohms.
- The EIA-485 circuit is rated 5.5 VDC max., 60 mA max.
- Refer to the LCD-80 Manual for additional information.

Connecting LCD-80s in ACS Mode

1) Set SW2 on the control panel to the "ACS" position.
2) Connect 24V power to the CPU-400 terminals TB4-1 (+) and TB4-2 (–). Power connections are supervised and power limited.
3) Set the LCD-80 start address to address "01."
4) Set SW2 to "1"; set SW3-1 and SW3-2 to OFF.
5) Set the LCD-80 to a size of 128 points.
6) Set the character display: To use a 40 character display, set SW5 OFF and SW6 ON; to use a 20 character display, set SW5 ON and SW6 OFF.
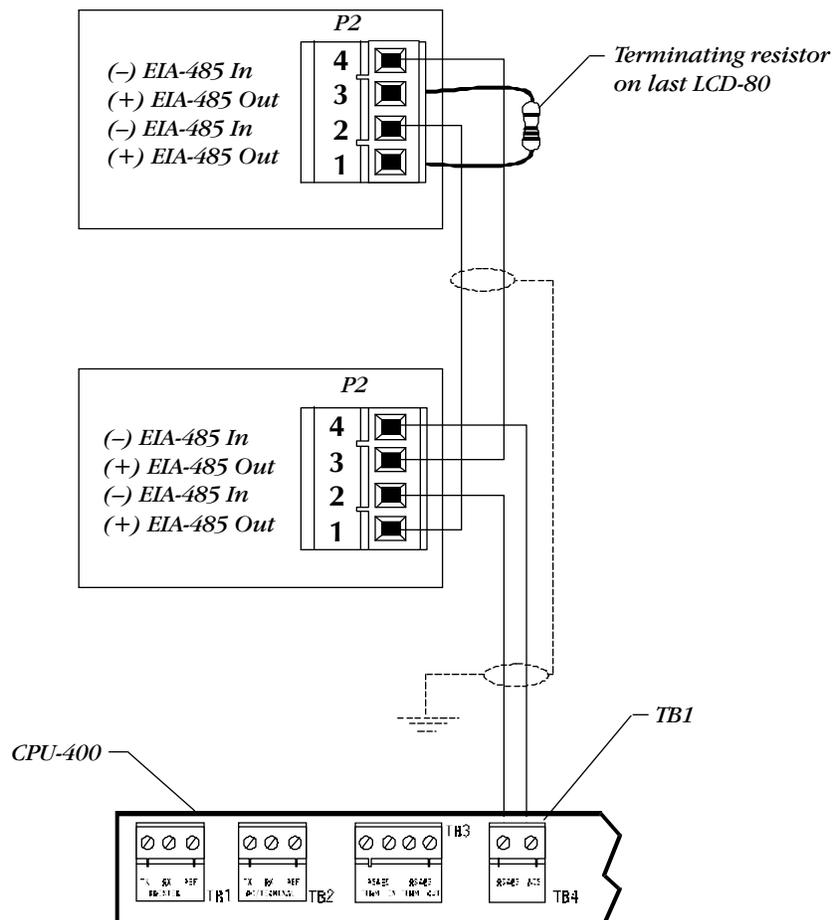7) Install a 120-ohm terminating resistor on the last LCD-80.

Figure A-2 LCD-80 ACS Mode EIA-485 Connection

Providing Power to ACS- and LDM-type Annunciators

Power Connections for LCD- and ACS-Type Annunciators

- Circuits are power limited.
- The power run to the LCD-80 or ACS Annunciator does not require a Power Supervision Relay. Loss of power is inherently supervised through a "Communication Loss."
- Maximum LCD-80 current draw from power supply is 500 mA.

Terminals 6 and 7 do not exist on the ACM-8R

7) N.C. Trouble
6) Inputs
5) Common in (–)
4) Common out (–)
3) Power In (+24VDC)
2) Power Out (+24VDC)
1) Earth Ground

MPS-400
TB2-1 (+)
TB2-2 (–)
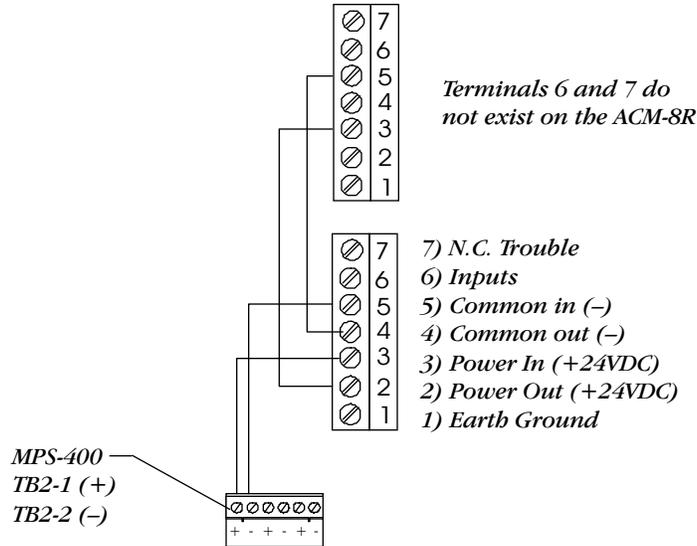
Figure A-3 Power Connections for LCD, ACS Type Annunciators

Providing Power to the LCD-80

- Circuits are power limited.
- The power run to the LCD-80 or ACS Annunciator does not require a Power Supervision Relay. Loss of power is inherently supervised through a "Communication Loss."
- Maximum LCD-80 current draw from power supply is 500 mA.

P1

EIA-232 Transmit — 7
EIA-232 Reference — 6
- System Common OUT — 5
- System Common IN — 4
+24 VDC OUT — 3
+24 VDC IN — 2
EIA-232 Receive — 1

P1

EIA-232 Transmit — 7
EIA-232 Reference — 6
- System Common OUT — 5
- System Common IN — 4
+24 VDC OUT — 3
+24 VDC IN — 2
EIA-232 Receive — 1

MPS-400:
TB2-1 (+)
TB2-2 (–)

Figure A-4 Power Connections for LCD-80s

ACS and LDM Series EIA-485 Connection

Connection Guidelines

- The circuit is power limited and supervised.
- You can connect up to 10 devices to this circuit (such as ACMs, LDMs, and AFMs).
- Maximum distance between the control panel and the furthest annunciator: 6000 feet (@16 AWG).
- Use twisted pair cable with a characteristic impedance of approximately 120 ohms.
- An EIA-485 circuit is rated 5.5 VDC max., 60 mA max.
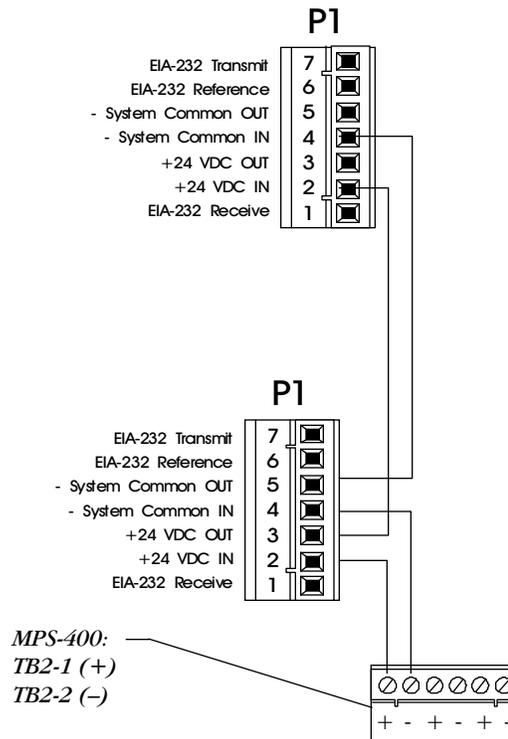- Refer to the ACS Manual and the LDM Manual for additional information.

ACS and LDM Series EIA-485 Connections

Connect ACS and LDM series devices to the CPU-400 as follows:

1) Set SW2 on the control panel to the "ACS" position.
2) Install a 120-ohm terminating resistor on the last annunciator in the series of connections.

TB2

120-ohm terminating resistor

4	*(–) EIA-485 In*
3	*(+) EIA-485 Out*
2	*(–) EIA-485 In*
1	*(+) EIA-485 Out*

TB2

4	*(–) EIA-485 In*
3	*(+) EIA-485 Out*
2	*(–) EIA-485 In*
1	*(+) EIA-485 Out*

CPU-400

RS485   ACS

TB4
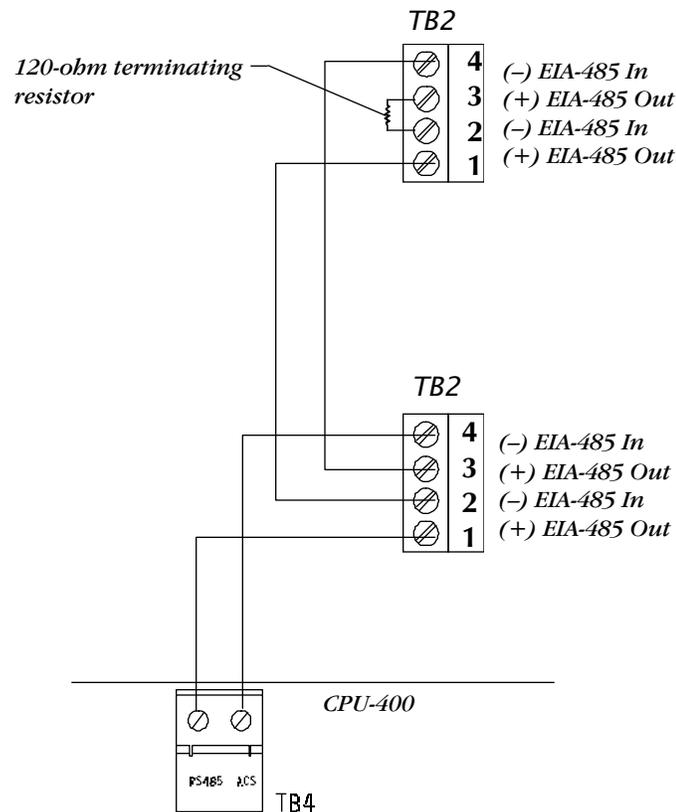
Figure A-5 ACS and LDM Series EIA-485 Connection

Protected Premises Wiring

Overview

The wiring diagram shows an AFP-400 set up for Protected Premises Wiring in Central Station and Proprietary Burglar Alarm Applications. In the wiring diagram, note the following:

- The MMX-1s are programmed with software type "BURGLAR ALA."

- The CMX is set up as a Notification Appliance Circuit (do not break tabs) and programmed in the Protected Premises Unit. (For supplementary use only in UL Listed systems.)

Wiring Diagram

Figure A-6 Typical Protected Premises Wiring for Central Station and Proprietary Burglar Alarm Applications

Appendix B: Wire Requirements

Each type of circuit within the Fire Alarm Control System requires use of a specific wire type to ensure proper circuit operation. The wire gauge of a particular circuit depends on the length of that circuit. Use the table below to determine the specific wiring requirements for each circuit.
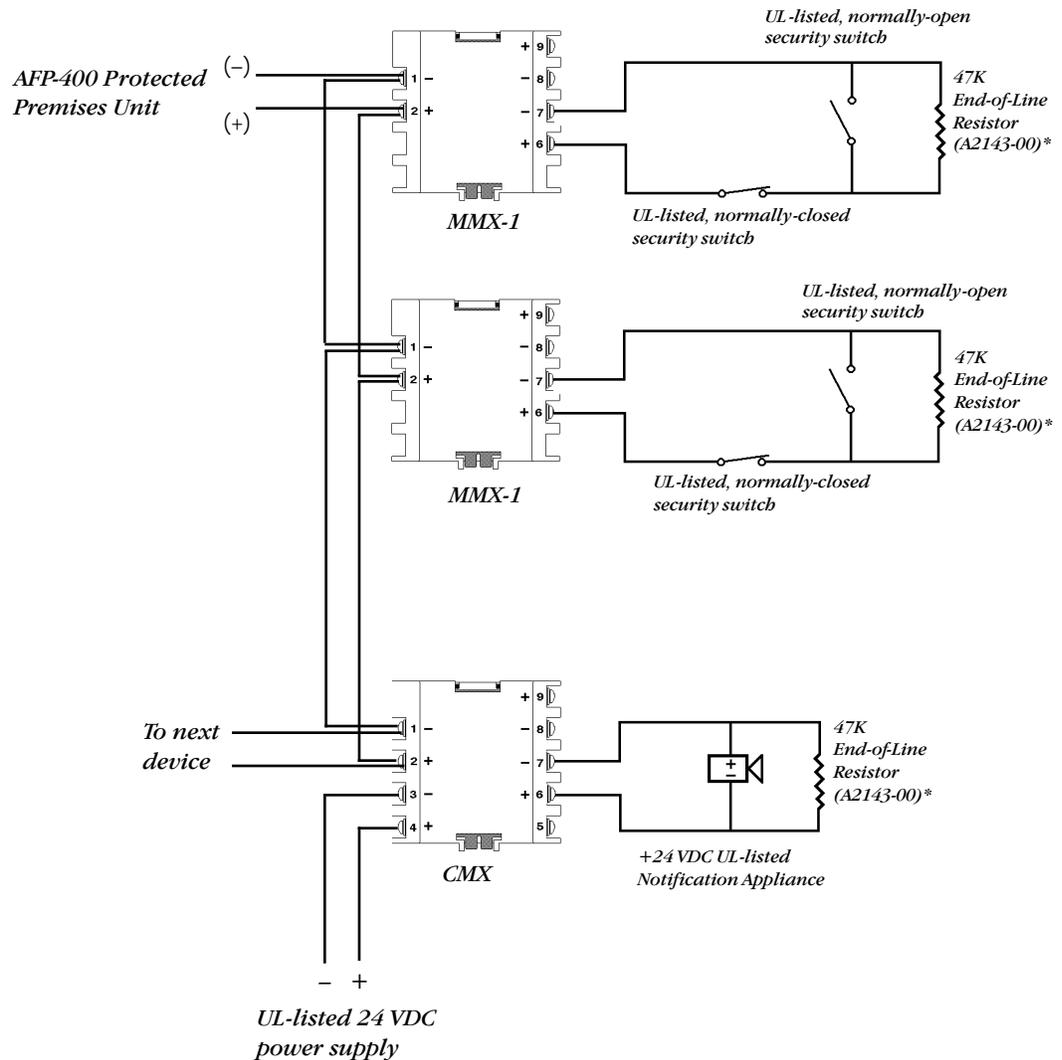
Compliance with the Federal Communications Commission (FCC) and Canadian Department of Communication regulations on electrical energy radiation requires the following: *Use twisted pair shielded wire for any wiring entering or exiting the AFP-400 cabinet that is not enclosed in conduit*.

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

Circuit Type	Circuit Function	Wire Requirements	Distance (feet)	Typical Wire Type
SLC Loop (power limited)	Connects to Intelligent and Addressable Modules.	Twisted-shielded pair, 12 to 18 AWG. 40 ohms maximum per length of Style 6 and 7 loops. 40 ohms per branch maximum for Style 4 loops.	10,000 8,000 4,875 3,225	12 AWG Belden 9583 WPW 999 14 AWG Belden 9581 WPW 995 16 AWG Belden 9575 WPW 991 18 AWG Belden 9574 WPW 975
		Untwisted, unshielded wire, in conduit or outside of conduit.	1,000	18-12 AWG
EIA-485 (power limited)	Connects to LCD-80 or to Annunciator Control System Modules	Twisted-shielded pair with a Characteristic Impedance of 120 ohms. 18 AWG minimum.	6,000 (max)	Belden 9860 (16 AWG)
EIA-232 (power limited)	Connects to PRN or P40 Remote Printers and to PC Computer	Twisted-shielded pair. 18 AWG minimum.	50 (without modem)	Belden 9860 (16 AWG)
MMX-1, MMX-101 (power limited)	Initiating Device Circuit	12-18 AWG. Maximum loop wire resistance is 20 ohms	To meet 20 ohms	12-18AWG
CMX (power limited)	Notification Appliance Circuit	12-18 AWG. MPS-24A: At alarm current level, no more than a 1.2 volts drop at the end of the circuit.	To meet 1.2V drop	12-18 AWG
24 VDC Power Runs (power limited)	To Annunciators and CMX	12-18 AWG. Size wire so that no more than 1.2 volts drop across wire run from supply source to end of any branch.	To meet 1.2 volt drop	12-18 AWG
NR45-24	Remote Secondary Power Source	12 AWG in conduit.	20 (max)	12 AWG

AFP-400 Wiring Requirements

Appendix C: Compatible Equipment

This document lists equipment compatible with the AFP-400:

Notifier Compatible Equipment

Refer to the Device Compatibility Document, 15378 for compatible equipment.

4XTM Transmitter Module
AA-30 30-Watt Audio Amplifier
AA-100 100-Watt Audio Amplifier
AA-120 120-Watt Audio Amplifier
ABF-1 Annunciator Flush Box
ABF-1D Annunciator Flush Box with Door
ABF-2 Annunciator Flush Box
ABF-2D Annunciator Flush Box with Door
ABF-4 Annunciator Flush Box
ABF-4D Annunciator Flush Box with Door
ABM-16AT Annunciator Blank Module
ABM-32A Annunciator Module Blank
ABS-1T Annunciator Surface Box
ABS-2 Annunciator Surface Box
ABS-8R Annunciator Backbox for ACM-8R
ACM-16AT Annunciator Control Module
ACM-32A Annunciator Control Module
ACM-8R Annunciator Control Module
ACT-1 Audio Coupling Transformer
ADP-4 Annunciator Dress Panel
AEM-16AT Annunciator Expander Module
AEM-32A Annunciator Expander Module
AFM-16A Annunciator Fixed Module
AFM-16AT Annunciator Fixed Module
AFM-32A Annunciator Fixed Module
AKS-1 Annunciator Key Switch
AM2020/AFP1010 Fire Alarm Control Panel
AMG-1 Audio Message Generator
AMG-E Audio Message Generator
ARM-4 Auxilliary Relay Module
ATG-2 Audio Tone Generator
AVPS-24 Audio/Visual Power Supply
BB-55 Battery Box
BGX-101L Addressable Manual Pull Station
BM-1 Blank Module
BP-3 Battery Dress Panel
BX-501 Base for all Intelligent Detectors/Sensors
CAB-400AA AA-size cabinet
CCM-1 Communication Converter Module
CHS-4L Chassis
CHS-4M Chassis
CMX-1 Addressable Control Module
CMX-2 Addressable Control Module
CPU-400 CPU for AFP-400
CPX-551 Intelligent Ionization Smoke Detector
CPX-751 Intelligent Ionization Smoke Detector
CRE-4 Control Relay Expander
CRM-4 Control Relay Module
CRT-2 Video Display Monitor with Keyboard
DCM-4 Dual Channel Module
DHX501/DHX502 Duct Detector
DP-400AA Dress Panel for CAB-AA
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
FCPS-24 Field Charger Power Supply

Notifier Compatible Equipment, continued

Refer to the Device Compatibility Document, 15378 for compatible equipment.

FDX-551 Intelligent Thermal Sensor
FFT-7 Fire Fighters Telephone
FFT-7S Fire Fighters Telephone
FHS Fireman's Handset
FPJ Fireman's Phone Jack
FSK-2400 Modem
ICE-4 Indicating Control Expander
ICM-4 Indicating Control Module
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 Terminal Module LCD Annunciator
LDM-32 Lamp Driver Module
LDM-E32 Lamp Driver Module
LDM-R32 Lamp Driver Module
MMX-1 Addressable Monitor Module
MMX-2 Addressable Monitor Module
MMX-101 Addressable Mini Monitor Module
N-ARA-10 Agent Release Pull Station
N-ELR Assortment ELR Pack with Mounting Plate
NIB-96 Network Interface Board
NR45-24 Notifier Remote Battery Charger
P-40 Keltron Printer
PRN-4 80-Column Printer
PS-12120 Battery 12-volt, 12 amp-hour
PS-12170 Battery 12-volt, 17 amp-hour
PS-12250 Battery 12-volt, 25 amp-hour
PS-12550 Battery 12-volt, 55 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-470 470 End-of-Line Resistor
R-47K 47K End-of-Line Resistor
RA400 Remote Annunciator
RA400Z Remote Annunciator with diode
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
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
SDX-751 Intelligent Photoelectric Detector
STS-1 Security Tamper Switch for CAB-3 Series
STS-200 Security Tamper Switch for CAB-400AA
TR-500 Trim Ring for CAB-400AA
UDACT Universal Digital Alarm Communicator Transmitter
UZC-256 Universal Zone Coder
VERIFIRE-400 Programming Kit
VCE-4 Voice Control Expander
VCM-4 Voice Control 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

System Sensor Compatible Equipment

A2143-00 End of Line Resistor Assembly

Appendix D: CRT-2 Configuration

Overview

The CRT-2 communicates with the AFP-400 through a protocol defined by thirteen groups of parameters. To access a parameter group, press the corresponding function key (F1-F13). You can then program parameters in each group.

Setting CRT-2 Parameters

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

F1: Quick	Emulation=CRT-2 Comm Mode=Full Duplex Enhanced=On	EIA Baud Rate=2400 Aux Baud Rate=2400 Language=U.S.	EIA Data Format=8/1/N Aux Data Format=7/1/E Host/Printer=EIA/Aux
F2: Genrl	Emulation=CRT-2 Auto Font Load=On Monitor Mode=Off Host/Printer=EIA/Aux	Enhanced=On Auto Page=Off Bell Volume=09	Auto Wrap=Off Auto Scroll=On Warning Bell=On
F3: Displ	Page Length=24 Display Cursor=On Columns=80 Scroll=Jump	Screen Length=26 Lines Cursor=Blink Line Width Change Clear=Off Refresh Rate=60 Hz	Screen Video=Normal Auto Adjust Cursor=On Speed=Normal Overscan Borders=Off
F4: Kybd	Language=U.S. Keyclick=Off Key Lock=Caps	Char Set Mode=ASCII Key Repeat=Off Keyboard Present=Yes	Key Mode=ASCII Margin Bell=Off
F5: Keys	Enter Key=<CR> Alt Key=Meta Pound Key=U.S.	Return Key=<CR> Disconnect=Pause	Backspace=<BS>/<DEL> Desk Acc=Disabled
F6: Ports	EIA Baud Rate=2400 Aux Baud Rate=2400 EIA Xmt=Xon-Xoff Aux Xmt=Xon-Xoff EIA Break=Off Aux Break=Off	EIA Data Format=8/1/N Aux Data Format=7/1/E EIA Recv=Xon-Xoff(XPC) Aux Recv=Xon-Xoff(XPC) EIA Modem Control=Off Aux Modem Control=Off	EIA Parity Check=On Aux Parity Check=On EIA Xmt Pace=Baud Aux Xmt Pace=Baud EIA Disconnect=2 sec Aux Disconnect=2 sec
F7: Host	Comm Mode=Full Duplex Recv <DEL>=Ignore Send Block Term=<CR>	Local=Off Send ACK=On Null Suppress=On	Recv <CR>=<CR> Send Line Term=<CR><LF>
F8: Print	Prnt Line Term=<CR><LF>	Prnt Block Term=<CR>	Secondary Recv=Off
F9: Emul	Attribute=Page WPRT Intensity=Dim WPRT Blink=Off Status Line=Off	Bright Video=Off WPRT Reverse=Off Display NV Labels=Off Fkey Speed=Normal	Page Edit=Off WPRT Underline=Off Save Labels=On
F10	Setup Group F10 does not affect communications with the AFP-400.		
F11	Setup Group F11 does not affect communications with the AFP-400.		
F12: Prog	Program the function keys as follows: F1 ~A F2 ~B F3 ~C F4 ~D F5 ~E F6 ~F F7 ~G F8 ~H F9 ~I F10 ~J F11 ~K F12 ~L F13 ~M F14 ~N F15 ~O F16 ~P Shift F13 ~Q		

CRT-2 Configuration

Uploading or Downloading the Operating Program

For instructions on using Veri•Fire™ Upload/Download software, refer to the "Veri•Fire Programming Utility manual."

You can also use the AFP-400 EIA-232 port to upload and download the operating program of the control panel, using Veri•Fire™ Upload/Download software. Download operations that change the basic program of the control panel must be performed by responsible service personnel in attendance at the control panel. After downloading a program, test the control panel in accordance with NFPA 72-1993.

Appendix E: Terminal Interface Protocol

General Description

The control panel can communicate with a remote terminal or computer connected to the CPU-400 EIA-232 port. (Refer to Section 2, "Installation," for installation information.) Set up the EIA-232 port for interactive operation or for monitoring only. Interactive operation requires that all equipment be UL listed under UL Standard for Safety UL864 and be installed and set up as directed under "Local Terminal Mode (LocT)" or "Local Monitor Mode (LocM)." EDP listed equipment is allowed for ancillary system monitoring when the system is installed and set up as directed under "Remote Monitor Mode (RemM)." You can also use EDP-listed equipment for system servicing or programming.

The EIA-232 ports on some terminals/computers, including the CRT, are not isolated from earth ground. These devices should be connected to the panel through isolation modems, because direct connection can cause a ground fault.

Operating Modes

The AFP-400 provides three operating modes for the EIA-232 port, *Local Terminal*, *Local Monitor*, and *Remote Monitor*. You select the operating mode during control panel programming (system parameters). For more information, refer to the "AFP-400 Programming Manual."
The following subsections outline the functions, password requirements, and additional information for each operating mode.

Local Terminal Mode (LocT)

Functions: Read Status, Alter Status, and Control Functions
See Table E-1, "LocT Functions."

Passwords: User-defined password for Alter Status.

Features: The Terminal must be mounted in a UL-864 listed enclosure, a Notifier Rack-51, Rack-67, or arranged to provide equivalent protection against unauthorized use.

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

Table E-1 LocT Functions

Local Monitor Mode
(LocM)

Functions: Read Status, Alter Status, and Control Functions
                 See Table E-2, "LocM Functions."

Passwords: User-defined password for Alter Status and Control
                 Functions

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

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

Table E-2 LocM Functions

Remote Monitor Mode
(RemM)

Functions: Read Status only. See Table E-3, "RemM Functions."

Passwords: None

Features: Use with UL EDP-listed terminals, including personal
                 computers with Notifier Verifier software or terminal emula-
                 tion software. Intended for terminals connected through
                 modems, including FSK modems connected through a
                 public switched telephone network.

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

Table E-3 RemM Functions

Using the CRT-2 for Read Status

Overview

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

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

Table E-4 Read Status Functions

Accessing Read Status Options

Access the Read Status function from the CRT-2 by following these steps.
1) Turn on the CRT-2, which is connected to the control panel.
2) Press the Read Status function key – F1. The control panel displays the Read Status menu options:

F1

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

From the Read Status menu, you can select options 1-5.

Read Point

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

Press...

Address ——┐   ┌— *Number*

| 1 | | ENTER |

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

Enter the following:

1) Enter the first letter of the device.

  • **D**etector
  • **M**odule   (nnn)
  • **P**anel circuit
  • **Z**one   └— *Address*
  • Special **F**unction   └— *Loop number*
  • **R**eleasing Zone; or
  • **S**ystem Parameter.

2) Enter the address or number of the device.

3) Press <Enter>.

| F5 | To scroll forward through a list of devices.

| F6 | To scroll back through a list of devices.

Example: Read the point for detector 101.

Press...   **and the CRT-2 Displays...**

| D | | 1 | | 0 | | 1 |

NORMAL SMOKE(PHOTO) DETECTOR ADDR 101 Z03 Z Z Z Z 000%A5 PA:3 ** D101

| ENTER |

| NEXT |

NORMAL SMOKE(ION) DETECTOR ADDR 102 Z02 Z Z Z Z 000%A5 PA:0 ** D102

Display devices in Alarm or Trouble

From the Read Status menu, select *Alm/Tbl Status*, option 2.

| Press... | and the CRT-2 displays... |

2   ENTER

```
TROUBL SMOKE(PHOTO)    DETECTOR ADDR 101 Z03 INVALID REPLY  01;09P 08/01/95 D101
TROUBL SMOKE(ION)      DETECTOR ADDR 102 Z02 INVALID REPLY  01;09P 08/01/95 D102
TROUBL SMOKE  MONITOR  MODULE ADDR 101   Z04 INVALID REPLY  01;09P 08/01/95 M101
```

Display the status of all programmed points

From the Read Status menu, select *Read All Points*, option 3. The CRT-2 displays a list of the status of all addressable detectors, modules, panel circuits, system parameters and software zones.

| Press... | and the CRT-2 displays... |

3   ENTER

```
NORMAL SMOKE(PHOTO)   DETECTOR ADDR  101  Z03  Z  Z  Z  Z 000%A5 PA:0 ** D101
NORMAL SMOKE(ION)     DETECTOR ADDR  102  Z02  Z  Z  Z  Z 00%A5  PA:0 ** D102
NORMAL HEAT(ANALOG)   DETECTOR ADDR  103  Z01  Z  Z  Z  Z 000%A5 PA:0 *  D103
OFF    CONTROL        MODULE ADDRESS 149  Z00  Z  Z  Z  Z 052%       IS* M149
NORMAL MONITOR        MODULE ADDRESS 150  Z06  Z  Z  Z  Z              M150
```

View the history buffer

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

The first line that appears displays the number of events in the history buffer.

Press...

4   ENTER

```
EVENT History Start                              Events in HIST:005
```

Number of Events in the History Buffer

Step through the history buffer one event at a time by pressing the Next (F5) or Prior (F6) function keys.

F5   To scroll forward through the history buffer.

F6   To scroll back through the history buffer.

Using the CRT-2 for Read Status, continued

Send the history buffer to the CRT

From the Read Status menu, select *History-All*, option 5. This option sends the entire history buffer to the CRT, from most recent event to oldest event.

Press...

$\boxed{5}$ $\boxed{\text{ENTER}}$

Most recent event ⌐   ⌐ *Semicolon*

```
*******************    EVENT  HISTORY**********************************
                                ALL SYSTEMS NORMAL 04;15P Tue 08/01/95
   SYSTEM RESET                                    04;15P Tue 08/01/95
 ALARM SILENCED                                    04;15P Tue 08/01/95
 ACKNOWLEDGE                                       04;14P Tue 08/01/95
 ALARM: PULL STATION MODULE ADDRESS 151   Zone 06  04;14P 08/01/95 M151
 *******************       PRINT END       *********************************
```

All Events in the History Buffer

The semicolon, a control character in networking applications, separates the hour and minute of events displayed from history. If events display as they occur, a colon separates the hour and minute.
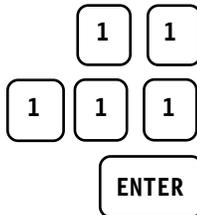
Using the CRT-2 for Alter Status

Overview

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

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

Table E-5 Alter Status Functions

Accessing Alter Status Options

Access the Alter Status function from the CRT-2 by following these steps.
1) Turn on the CRT-2 connected to the control panel.
2) Press the Alter Status function key. The control panel displays the Alter Status menu options:

Press...

ALTER
STATUS

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

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

1   1

1   1   1

ENTER

```
*****
```

The Alter Status Options menu appears.

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

Alter Status Options

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

Enable or disable detectors, modules, or panel circuits

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

Press...

Address ⎤   ⎡ *Number*

| 1 | | ENTER |

```
Disable/Enable. Type D(nnn) / M(nnn) / P(nn) / Z(nn) then Enter
    STATUS CHANGE       Dis/Ena point                      08:29A Wed 08/
02/95
```

Enter the following:

1) Enter the first letter to read one of the following:

(nnn)

- **D**etector
- **M**odule
- **P**anel Circuit
- **Z**one

⎣ *Address*
⎣ *Loop number*

2) Enter the address or number of the device.

3) Press <Enter> and a display similar to the following will appear.

Example: Disable Detector address 01 on loop #1.

| D | | 1 | | 0 | | 1 |

| ENTER |

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

4) Press <E> to Enable or press <D> to Disable; then press <Enter>.

| E | or | D |

| ENTER |

```
Device now disabled
TROUBL SMOKE(PHOTO) DETECTOR ADDR 101   Z03 DEVICE DISABLED  08:29A Wed 08/02/95 D101
```

Change Alarm and Prealarm levels

This option lets you change the alarm and prealarm levels of any address-able detector in the system. To do so, follow these steps.

1) From the Alter Status menu, select option 2, *Alarm/Prealarm.*
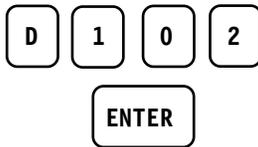
2 Enter the address of the detector you wish to change.

For example: Change alarm and prealarm levels for detector 102.

Press...   **and the CRT-2 displays...**

[2] [ENTER]

```
Det. Alarm/Prealarm level, type address D(nnn), then Enter
   STATUS CHANGE     Alarm/Prealarm level                   09:53A Wed 08/02/95
```

[D] [1] [0] [2]

[ENTER]

```
   STATUS CHANGE     Alarm/Prealarm level                   09:53A Wed 08/02/95
D102 sens. at level 5, Prealarm at level 3, Enter AxPx to change, Esc. to Abort
D102 now set at new Alarm level 5 and new Pre-alarm level 2
```

Clear the verification counter

Clear Verification lets you clear the verification counter for all the address-able detectors in the system.

Press...   **and the CRT-2 displays...**

[3] [ENTER]

```
   STATUS CHANGE     Clear verify count                      09:37A Wed 08/02/95
```

Clear the entire history buffer

Clear History lets you clear the entire history buffer. To do so, follow these steps.

Press...   **and the CRT-2 displays...**

[4] [ENTER]

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

Set the Prealarm for Alert or Action

Set Action/Alert lets you set the prealarm for Alert or Action. For example, Change Prealarm from "Alert" to "Action." To do so, follow these steps.

Press...   **and the CRT-2 displays...**

[5] [ENTER]

```
Set Pre-alarm Alert(T)/Action(N). Type T or N then Enter
   STATUS CHANGE     Change Alert/Action                     09:37A Wed 08/02/95
```

[N] [ENTER]

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

Appendix F: UL Power Limited Wiring Requirements

Overview

Power limited and nonpower limited circuit wiring must remain separated in the cabinet. All power limited circuit wiring must remain at least 0.25 inches from any nonpower limited circuit wiring. All power limited and nonpower limited circuit wiring must enter and exit the cabinet through different knockout and or conduits.

Power Limited Modules and Circuits

The following table lists all power limited modules and circuits compatible with the AFP-400.

| Power Limited Components	Include the following…		
Modules with power limited circuits	ACM-16A	AMG-2	LDM-32E
	AEM-16A	CPU-400	NIB-96
	ACM-32A	DCM-4	RPT-485
	ARM-32A	FFT-7	UDACT
	AFM-16A	FFT-7S	UZC-256
	AFM-16A	ICM-4	VCE-4
	AFM-32A	ICE-4	VCM-4
	ACT-1	LCD-80	
	AMG-1	LCD-80TM	
	AMG-E	LDM-32	
Modules with nonpower circuits	AA-30	AC and battery circuits are nonpower limited	
	AA-100		
	AA-120		
	AVPS-24		
	MPS-400		
	4XTM	Municipal Box circuit is nonpower limited	
Circuits (dry contacts) on theses modules when connected to power limited sources	ACM-8R		
	ARM-4		
	CRM-4		
	CRE-4		
	LDM-R32		

Power Limited Components

> 📄 All nonpower limited circuits connected to ACM-8R, ARM-4, CRM-4, CRE-4, and LDM-R32 modules must be identified in the space provided on the cabinet door label.

UL Power Limited Wiring Requirements

A typical wiring diagram for the AFP-400 follows. The first two rows show rows of modules configured with at least a 0.25 inch separation between power limited and nonpower limited wiring.
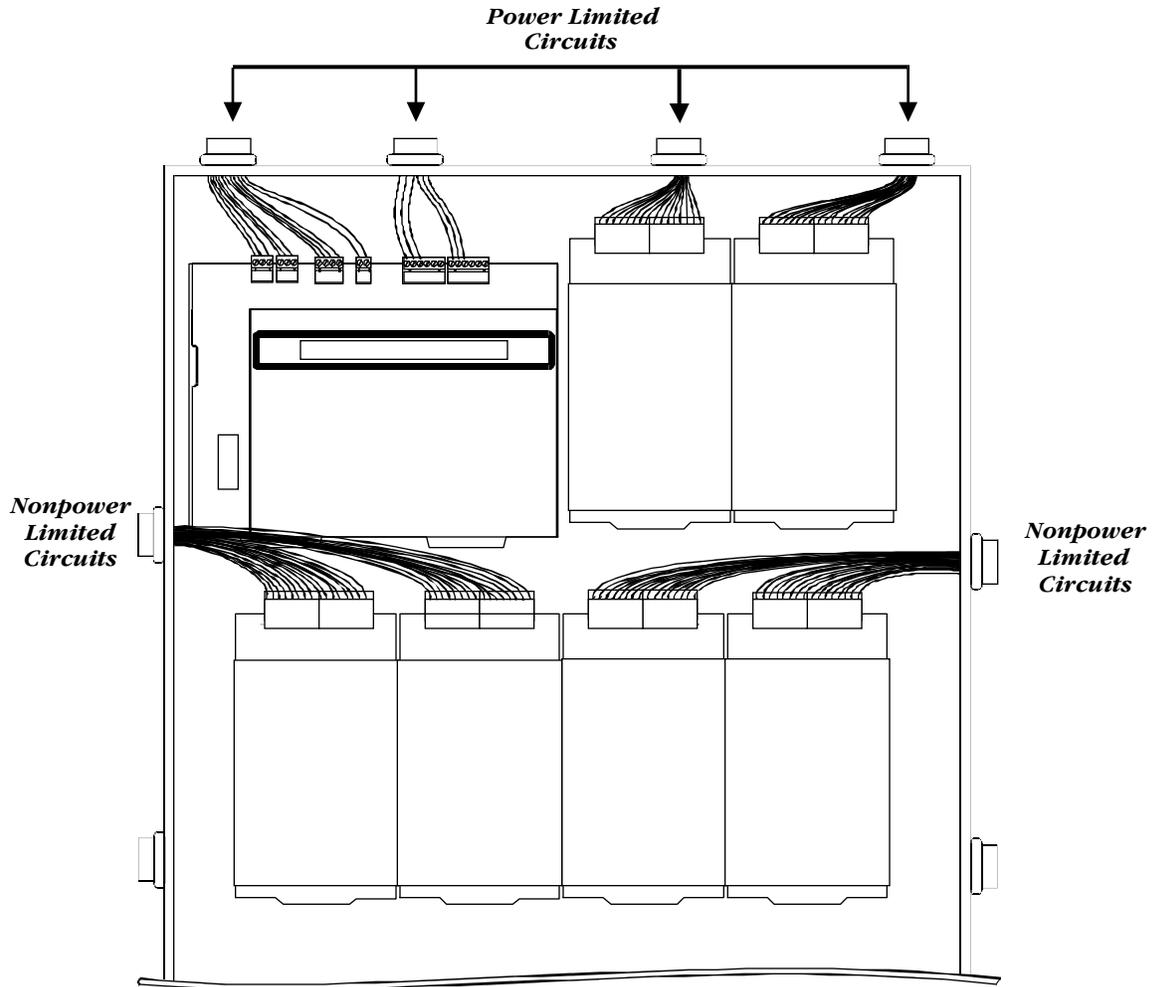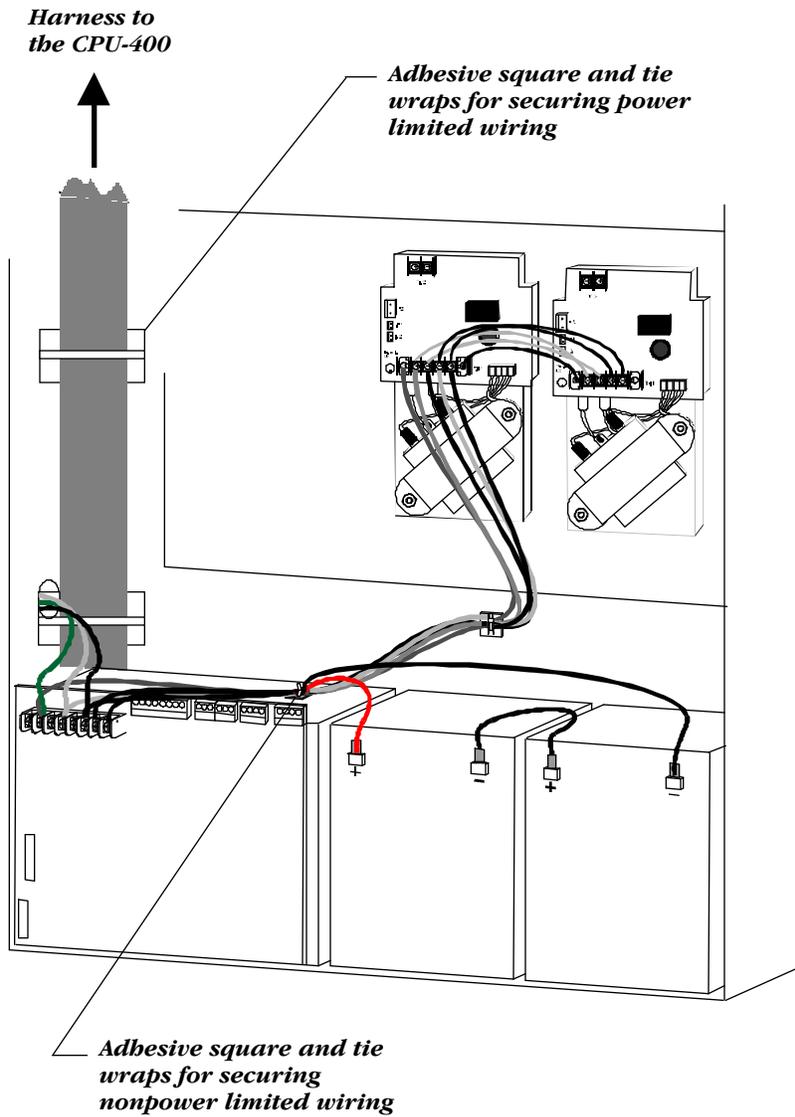

Typical Wiring for UL Power Limited Wiring Requirements

UL Power Limited Wiring Requirements

Power Supply Overview

AC and battery wiring are not power limited. Maintain at least 0.25 inches between power limited and nonpower limited circuit wiring. Install tie wraps and adhesive squares to secure the wiring. A typical wiring diagram for a power supply follows:

Power Supply Wiring Diagram

Harness to the CPU-400

Adhesive square and tie wraps for securing power limited wiring

Adhesive square and tie wraps for securing nonpower limited wiring

Typical Power and Nonpower Limited Wiring for Power Supplies

Limited Warranty

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