P/N 06-237058-001
April 2017

ARIES NET*Link*™
Intelligent Fire Alarm-Suppression Control Unit

Installation, Operation, and Maintenance Manual

UL Listing File

California Office of
State Fire Marshal
Certificate of Approval
No. 7165-1076:0195

New York City Fire Department
Certificate of Approval
No. 6092

***EXPORT INFORMATION (USA)*:**
Jurisdiction: EAR
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FOREWORD

Note: This Manual, P/N 06-237058-001, is to be used by qualified and factory-trained personnel, knowledgeable of NFPA standards and any other applicable standards in effect.

This Manual is intended to provide guidance to qualified technical professionals for the installation, operation and maintenance of the ARIES NET*Link*™ Intelligent Fire Alarm-Suppression Control Unit.

Only qualified persons experienced and trained in the installation of this type of equipment should install and configure the ARIES NET*Link*. They must be familiar and experienced with the wiring diagrams and components, electrical installation, and familiar not only with NEC, relevant NFPA and local codes but also trained and qualified by Kidde-Fenwal, Inc. Kidde-Fenwal, Inc. is a manufacturer of the components that make up the ARIES NET*Link* system, and may not have the opportunity to visit the sites where the product is installed or intended to be installed. It is the responsibility of the professional installer (described above) to properly install and configure the systems. Under no circumstances will Kidde-Fenwal, Inc. be liable for improper installation or configuration of the systems.

The technical data contained herein is provided for informational purposes only, and should not be used as a substitute for professional judgment. Although, Kidde-Fenwal, Inc. believes this information to be true and correct, it is published and presented without any guarantee or warranty whatsoever. Kidde-Fenwal, Inc. disclaims any liability for any use of the data other than as set out in this manual, foreword included.

Note: In some cases, certain modules or applications may not be listed by certain approval agencies or the listing may be in process. Always consult factory for latest listing information.

Any questions concerning the information presented in this manual should be addressed to:

Kidde-Fenwal, Inc.
400 Main Street
Ashland, MA 01721, USA
Phone: (508) 881-2000
Toll Free: (800) 872-6527
Technical Support: (866) 287-2531
Fax: (508) 881-8920

www.kiddefiresystems.com

TERMS AND ABBREVIATIONS

°C	°Centigrade
°F	°Farenheit
A:	Ampere
AC:	Alternating Current
ADA:	Americans with Disabilities Act
AH:	Ampere Hour
AHJ:	Authority Having Jurisdiction
AI:	Addressable Contact Input Device
AO:	Addressable Relay Output Device
ARC:	Automatic Release Circuit
AWG:	American Wire Gauge
CSFM:	California State Fire Marshal
DC:	Direct Current
DET:	Detector
EOC:	Event Output Control
EOLD:	End of Line Device
EOLR:	End of Line Resistor
FM:	Factory Mutual
ft.:	Feet
HSD:	High Sensitivity Smoke Detector
HSSD:	High Sensitivity Smoke Detector
Hz:	Hertz (Frequency)
in.:	Inch
I/O	Input/Output
IRI:	Industrial Risk Insurers
LCD:	Liquid Crystal Display
LED:	Light Emitting Diode
MCB	Main Controller Board
NAC:	Notification Appliance Circuit
N.C.:	Normally Closed
NEC:	National Electrical Code
NFPA:	National Fire Protection Association
N.O.:	Normally Open
NR:	Not registered
NYC:	New York City
PAS:	Positive Alarm Sequence
PC:	Personal Computer
PCB:	Printed Circuit Board
pF:	Pico-farads
P/N:	Part Number
PSU:	Power Supply Unit
RAM:	Random Access Memory
RDCM:	Remote Display Control Module
R-NAC:	Release-Notification Appliance Circuit
RTC:	Real Time Clock
SLC:	Signaling Line Circuit
TB:	Terminal Block
UL/ULI:	Underwriter Laboratories, Inc.
V:	Volts
Vac:	Volts AC
Vdc:	Volts DC
VRMS:	Volts Root Mean Square

SAFETY SUMMARY

WARNING AND CAUTION DEFINITIONS

This section defines the safety conventions used throughout this manual (“WARNING” and “CAUTION”). Review the definitions below to familiarize yourself with what these conventions mean and why and when they are used.

WARNING **Indicates an imminently hazardous situation which, if not avoided, could result in death, serious bodily injury and/or property damage.**

CAUTION **Indicates a potentially hazardous situation which, if not avoided, could result in property or equipment damage.**

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 unit.

Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by servicing while the unit is energized. Do not attempt to install, service, or operate this Control unit until this manual is read and understood.

CAUTION

System Re-acceptance Test after Re-Programming:

To ensure proper system operation, this system must be retested in accordance with NFPA 72 after any programming change. Re-acceptance testing is also required after any addition or deletion of system components, and after any modification, repair or adjustment to system hardware or wiring.

All components, circuits and system operations 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.

Note: This entire manual must be read and understood before installation.

This system meets FM and ANSI/UL 864 requirements for operation at 32° to 120°F (0 to 49°C) and at a relative humidity of 93% (non-condensing) @ 90°F (32.2°C). However, the useful life of the system’s standby batteries and the electronic components may be adversely effected by continuous operation at these environmental limits. Therefore, it is recommended that this system and its peripherals be installed in an environment with a nominal room temperature of 60-80°F.

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

Do not install electronic assemblies prior to mounting and attaching conduit for field wiring to the enclosure. Before making modifications, verify that they will not interfere with battery and printed circuit board locations. Do not overtighten screw terminals. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

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

Any communication wiring which exits the building or facility should not be routed to or located inside the same conduit as the AC power.

Follow the instructions in this manual. These instructions must be followed to avoid damage to the control unit and associated equipment. System 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, notification appliances, and a fire alarm control unit 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 not respond to a fire event if configured incorrectly:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in walls, on roofs, or on the other side of closed doors. Smoke detectors on one level 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 such as smoking in bed, violent explosions, escaping gas, improper storage of flammable materials, overloaded electrical circuits, children playing with matches, or arson.

Notification appliances, such as bells, may not alert people if these appliances 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 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 by a qualified fire protection specialist as recommended in NFPA 72.

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

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.

GENERAL SAFETY NOTICES

The following must be observed to maintain personnel safety.

The following general safety notices supplement specific warnings and cautions appearing in the manual. The safety precautions in this section must be understood and applied during operation and maintenance. This manual is to be used by trained distributors/technicians. The entire manual should be read and fully understood prior to installation.

FIRST AID

Any injury, no matter how slight, should never go unattended. Always obtain first aid or medical attention immediately.

GENERAL PRECAUTIONS

The following general safety precautions are to be observed at all times:

1. All electrical components associated with equipment shall be installed and grounded in accordance with NEC and local regulatory requirements.
2. Special precautionary measures are essential to prevent applying power to equipment at any time maintenance work is in progress.
3. Before working on electrical equipment, use a voltmeter to ensure that system is not energized.
4. When working near electricity, do not use metal rulers, flashlights, metallic pencils, or any other objects having exposed conductive material.
5. When connecting a meter to terminals for measurement, use a voltage range higher than expected voltage to be measured.

NOTICE TO USERS, INSTALLERS, AUTHORITIES HAVING JURISDICTION AND ALL OTHER INVOLVED PARTIES

This product incorporates field-programmable software. In order for this product to comply with the requirements in the Standard Control Units and Accessories for Fire Alarm Systems, ANSI/UL 864, certain programming features or options must be limited to specific values or not used at all as indicated below.

1.) Abort switches may be set up to operate in any of the following ways:

Abort Mode 1* (UL) - Count down to 10 seconds and hold. Resume countdown at 10 seconds.

Abort Mode 2 (Reset) - Reset to initial delay setting. Resume countdown for entire delay period.

Abort Mode 3 (IRI) - Same as Mode 1, except disable abort function if countdown timer has started.

Abort Mode 4 (NYC) - Resets to 120 seconds.

Abort Mode 5 - Disables the abort.

***NOTE**: Only Abort Mode 1 is ANSI/UL 864/ULC S527-11(3rd edition) compliant.

2.) Event Acknowledgement:

***NOTE**: Global Acknowledge is not ANSI/UL 864/ULC S527-11 (3rd edition) compliant.

3.) Programmable Alarm Verification:

Programmable Alarm Verification period cannot exceed 60 seconds to meet ANSI/UL 864/ULC S527-11 (3rd edition) requirements.

Note: The following notice applies to the following ARIES NET*Link* optional equipment:

- The Intelligent Interface Module (IIM) with modem (P/N 89-300014-001)
- The Digital Alarm Communicator Transmitter (DACT) card (P/N 76-800015-001).

NOTICE

FCC Part 68 Information - Applies to IIM and DACT Options

1. This equipment complies with Part 68 of the Federal Communication Commission (FCC) rules. This unit bears a label which contains, among other information, the FCC registration number and ringer equivalence number (REN) for this equipment. If requested, this information must be provided to the telephone company.
2. This equipment contains an FCC compliant modular jack. It is designed to be connected to the telephone network or premises wiring using compatible modular plugs and cabling which comply with the requirements of FCC Part 68 rules.
3. This equipment is alarm dialing equipment (equipment code “AL”) which must be able to seize the telephone line and place a call in an emergency situation. It must be able to do this even if other equipment (telephone, answering system, computer modem, etc.) already has the telephone line in use. To do so, alarm dialing equipment must be connected to a properly installed RJ45X jack that is electrically in series with and ahead of all other equipment attached to the same telephone line.
4. The Ringer Equivalence Number, or REN, is used to determine the number of devices which may be connected to the telephone line. Excessive RENs on a telephone line may cause the equipment to not ring in response to an incoming call. In most but not all areas, the sum of the RENs of all equipment on a line should not exceed five (5.0). To be certain of the number of devices that may be connected to a line, as determined by the total RENs, contact the local telephone company. The REN for this product is part of the product identifier that has the format “US:AAAEQ##TXXXX”. The digits represented by “##” are the REN without a decimal point (for example,“03” is a REN of “0.3”).
5. In the unlikely event that this equipment causes harm to the telephone network, the telephone company will notify you in advance that temporary discontinuance of service may be required. But if advance notice is not practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.
6. From time to time, the telephone company may make changes in its facilities, equipment, operations or procedures which could affect the operation of this equipment. If this occurs, the telephone company will provide advance notice in order for you to make the modifications necessary to maintain uninterrupted service.
7. If trouble is experienced with this equipment, repair and warranty information can be obtained in the U.S. from Kidde-Fenwal, Inc. at: +1 (508) 881-2000. If the equipment is causing harm to the telephone network, the telephone company may request that you disconnect the equipment until the problem is resolved.
8. This equipment must not be used on party lines.

NOTICE

Industry Canada Information - Applies to IIM Option

Note: The following notice applies to the Intelligent Interface Module (IIM) with modem (P/N 89-300014-001) only.

1. The Industry Canada label identifies certified equipment. This certification means that the equipment meets telecommunications network protective, operational and safety requirements as prescribed in the appropriate Terminal Equipment Technical Requirements document(s). The department does not guarantee the equipment will operate to the user's satisfaction.
2. Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company.
3. The equipment must also be installed using an acceptable method of connection.
4. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.
5. Repairs to certified equipment should be coordinated by a representative designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.
6. Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

   Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

7. The Ringer Equivalence Number (REN) assigned to each terminal device provides an indication of the maximum number of terminals allowed to be connected to a telephone interface. The termination on an interface may consist of any combination of devices subject only to the requirement that the sum of the Ringer Equivalence Numbers of all the devices does not exceed 5.

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CHAPTER 1
GENERAL INFORMATION

1-1 INTRODUCTION

This manual contains the operation, installation, maintenance, troubleshooting, and parts list information necessary to support the ARIES NET*Link*™ Intelligent Fire Alarm-Suppression Control Unit (hereinafter referred to as the "ARIES NET*Link*").

1-2 LISTINGS AND APPROVALS

The ARIES NET*Link* control unit, including the components and parts listed in Appendix C "List of Agency Listed Compatible Devices," is designed to meet the requirements of the agencies shown in Table 1-1 for the referenced system classifications, provided the system is installed as described in this manual.

The system classifications referenced in Table 1-1 are described in:

- NFPA 72 Standard "National Fire Alarm and Signaling Code"
- ANSI/UL 864 (9th edition) "Control Units for Fire Protective Signaling Systems"
- CAN/ULC - S527-11 (3rd edition)

Table 1-1. Agency Listing/Approval by System Classification

Agency	System Classification	Type	
		Service	**Signaling**
FM[1]	Automatic Releases for External Systems Local Protective Signaling	Automatic Manual Waterflow Sprinkler Supervisory	Non-Coded
UL[3]	Protected Premises Fire Alarm Systems - Protected Premises (Local) Unit - Releasing Device Control Unit	Automatic Manual Waterflow Sprinkler Supervisory	Non-Coded
cUL[2,3]	Protected Premises Fire Alarm Systems - Protected Premises (Local) Unit - Releasing Device Control Unit	Automatic Manual Waterflow Sprinkler Supervisory	Non-Coded
CSFM	Fire Alarm Control Unit (Non-High Rise) - Local - Releasing Device Service	Automatic Manual Waterflow Sprinkler Supervisory	Non-Coded

[1] FM approved to FM requirements, ANSI/UL 864 9th edition.
[2] Per Canadian Building Code.
[3] For UL and cUL installation, must not exceed 24 hours standby and 5 minutes of alarm.

1-3 CODES AND STANDARDS

The ARIES NET*Link* shall be installed, commissioned and maintained according to the most recent editions of the following:

- NFPA Standard 70, "National Electric Code®"
- NFPA Standard 72, "National Fire Alarm and Signaling Code®"
- This Installation, Operation, and Maintenance Manual (IOM)
- Any other standards enforced by a local Authority Having Jurisdiction (AHJ)

1-3.1 Suppression System Standards

The ARIES NET*Link* control unit is designed for the control and activation of suppression systems listed in Table 1-2 , which the designer/installer should be familiar with.

Table 1-2. Listed/Approved Suppression Systems

Application	Applicable NFPA Standard
HALON-1301 Fire Extinguishing Systems	NFPA 12A
Installation of Sprinkler Systems	NFPA 13
Water Spray Fixed Systems for Fire Protection	NFPA 15
Foam-Water Sprinkler and Foam-Water Spray Systems	NFPA 16
Water Mist Fire Protection Systems	NFPA 750
Clean Agent Fire Extinguishing Systems	NFPA 2001

1-3.2 Other Standards

The designer/installer should also be familiar with the most recent editions of the following (as applicable):

- NFPA Standard 75, “Standard for the Protection of Electronic Computer/Data Processing Equipment”
- NFPA Standard 76, “Fire Protection of Telecommunications Facilities”
- NFPA Standard 101, “Life Safety Code®”
- NFPA Standard 110, “Standard for Emergency and Standby Power Systems”
- UL Standard 38, “Manual Signaling Boxes for Fire Alarm Systems”
- UL Standard 268, “Smoke Detectors for Fire Protective Signaling Systems”
- UL Standard 268A, “Smoke Detectors for Duct Application”
- UL Standard 1481, “Power Supplies for Fire Protection Signaling Systems”
- Underwriter Laboratories of Canada (cUL) ULC - S527-11 (3rd edition), “Standard of Control Units for Fire Alarm Systems”
- Underwriter Laboratories of Canada (cUL) ULC-S529-09, “Smoke Detectors for Fire Alarm Systems”
- FM Standards 1011 and 1012, “Approval Standard for Deluge Systems and Preaction Systems”
- Local building codes
- Insurance requirements
- Any other standards mandated by the building owner and/or the local Authority Having Jurisdiction (AHJ)

1-4 SYSTEM DESCRIPTION

The ARIES NET*Link* system is an intelligent control panel which coordinates and monitors the varied components of a protected-premises fire suppression system and/or fire alarm system. For each protected zone, the ARIES NET*Link* system can provide:

- alarm initiation
- occupant notification
- event annunciation
- support-systems activation/de-activation
- extinguishing-system release
- fire department summons

Figure 1-1 illustrates a full fire suppression system application controlled by the ARIES NET*Link* control unit.

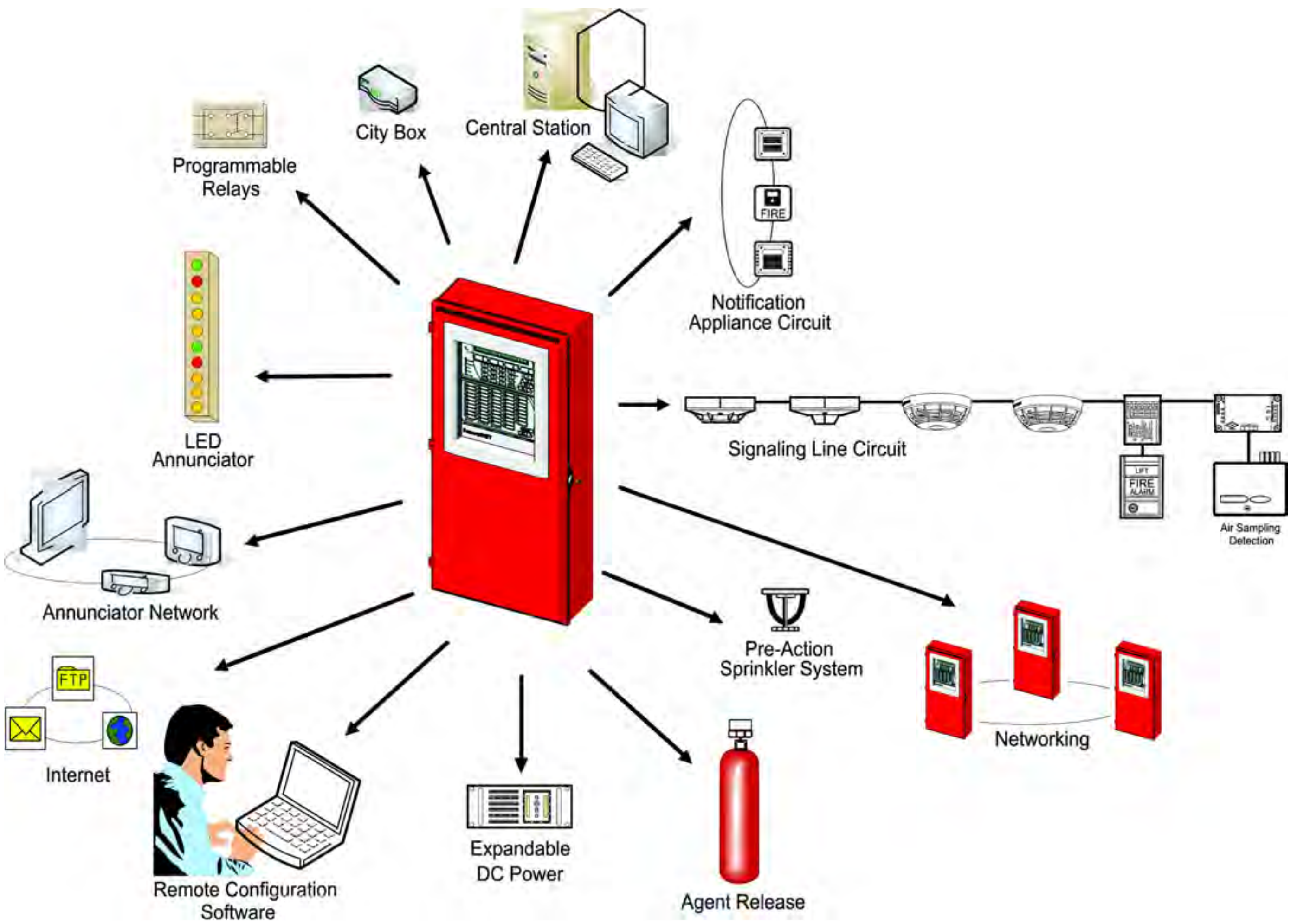


Figure 1-1. Full ARIES NET*Link* Fire Suppression System Applications

1-5 SYSTEM COMPONENTS

The main components of the basic ARIES NET*Link* control unit are:

- System Enclosure
- Main Controller Board with keypad and display
- Power Supply Unit/Power Management Assembly
- Standby Batteries, 12 Vdc (two required for 24 Vdc - each sold separately)

1-6 OPTIONAL COMPONENTS

- Expansion Card Cage and backplane to house optional Expansion Cards:
  - Signal Line Circuit (SLC) Card
  - Release/Notification Appliance Circuit (R-NAC) Card
  - Relay Card
  - City Tie Card
  - Network Interface Card (NIC)
  - Digital Alarm Communicator Transmitter (DACT) Card
  - Internet Communications Module (ICM) Card
- Trim Ring for flush-mounted enclosures
- Additional Expansion Enclosures
- Additional Power Supply Units/PMU Boards
- Battery Tray for bottom tier
- Large Capacity Battery Cabinet
- Remote Display Control Module (RDCM) with enclosure
- Remote LED Annunciator Module (R-LAM) with enclosure
- Integrated Front Panel LED Annunciator
- ATM-L LED Driver Module
- ATM-R Relay Driver Module
- Fiber Optic Converter Module in enclosure
- Remote Configuration Software (for control unit access/configuration from user-supplied PC)

1-7 SYSTEM ENCLOSURE TYPES

The ARIES NET*Link* control unit enclosure is designed to house all of the standard features of the control unit; expanded systems may require additional enclosures.

Two different sizes of the enclosure are available (specified at time of order):

- 3-Tiered Main or Expansion Enclosure: 31.50 in. (H) x 14.375 in. (W) x 5.375 in. (D)
- 2-Tiered Main or Expansion Enclosure: 22.50 in. (H) x 14.375 in. (W) x 5.375 in. (D)

Additional cabinets are available for remote use/LED Annunciation and larger capacity batteries:

- RDCM/LED Annunciator Remote Enclosure: 7.50 in. (H) x 12.75 in. (W) x 2.75 in. (D)
- Large Capacity Battery Cabinet: 12 in. (H) x 20in. (W) x 8.25 in. (D)

1-7.1 Enclosure Features

- Surface Mountable or Semi-Flush Mountable: The enclosure may be easily wall mounted with provided hardware. Refer to Chapter 2, Section 2-4.1 for complete instructions on wall mounting. The enclosure may optionally be semi-flush mounted between standard 16-in. spaced wall studs with provided hardware. A trim ring may be installed on semi-flush mounted enclosures.
- Battery Lip: A vertical lip at the bottom of the enclosure is provided for battery retention.
- Battery Tray: A Battery Tray is provided to slide out batteries for easy access for field wiring when batteries are installed.
- Hinged door with Keyed Lock: The enclosure door is hinged on the left and provides 180 degrees of swing. The door is easily removable and features a lock and key. A transparent Lexan window shows the display but prevents contact with the keypad.
- Wiring Space: The enclosure allows a minimum of 2 in. (50 mm) of wiring space between the wall and any wiring terminal.
- Wiring Knockouts: Conduit knockouts are provided at the top, bottom and sides of the enclosure to accommodate either 0.5 in. or 0.75 in. standard electrical conduit fittings. Four knockouts are provided at the top of the enclosure. Three knockouts are provided at the bottom of the enclosure. Either three or four knockouts are provided on the sides, depending on enclosure height, with one knockout located at the center of each side.

1-7.1.1 3-TIERED MAIN ENCLOSURE

Guidelines for internal configuration of the 3-Tiered Main Enclosure are listed below:

- **Top Tier**: Always reserved for the Power Supply Unit/Power Management (PMU) Board and Main Controller Board (MCB) with keypad/display. The System Enclosure door is designed for the LCD Display to show through the window at this location. The MCB with keypad/display is designed to fit over the assembly in a hinged arrangement in the Top Tier.
- **Middle Tier**: Typically reserved for Expansion Card Cage. A Power Supply/PMU Assembly may optionally be located here instead.
- **Bottom Tier**: Typically reserved for two standby batteries (12-AH pair or 17-AH pair) on a tray. Use of larger capacity battery pairs (greater than 17-AH) requires purchasing the separate Large Battery Enclosure. An Expansion Card Cage or Power Supply/PMU Assembly may optionally be located here instead.

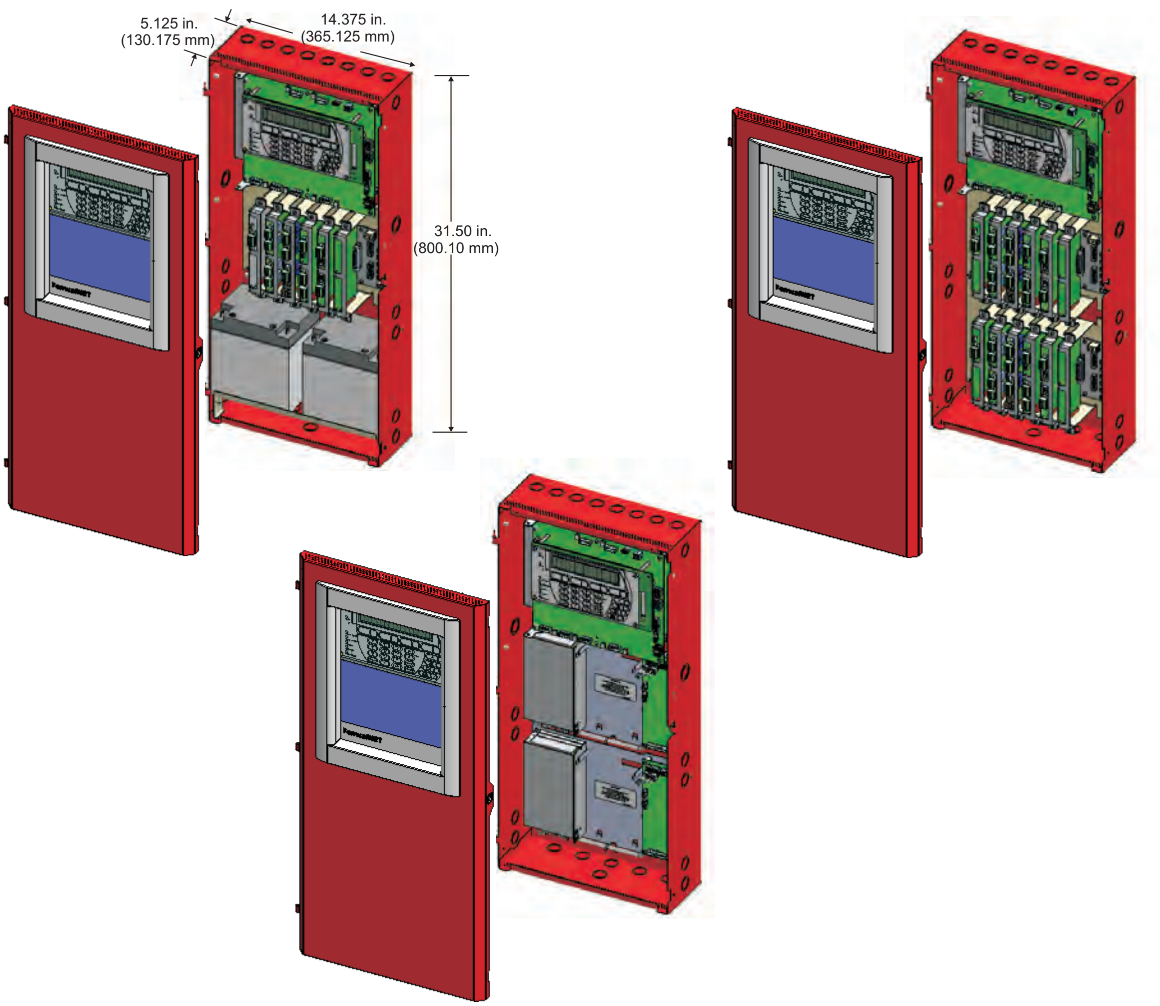


Figure 1-2. Illustration of Typical 3-Tiered Main Enclosure Configurations

1-7.1.2 2-TIERED MAIN ENCLOSURE

Guidelines for internal configuration of the 2-Tiered Main Enclosure are listed below:

- **Top Tier**: Always reserved for the Power Supply/PMU Assembly and Main Controller Board with keypad/display. The System Enclosure door is designed for the LCD Display to show through the window at this location. The MCB with keypad/display is designed to fit over the assembly in a hinged arrangement in the Top Tier.
- **Bottom Tier**: Typically reserved for two standby batteries (12-AH pair or 17-AH pair) on a tray. Use of larger capacity battery pairs (greater than 17-AH) requires purchasing the separate Large Battery Enclosure. An Expansion Card Cage or Power Supply/PMU Assembly may optionally be located here instead.

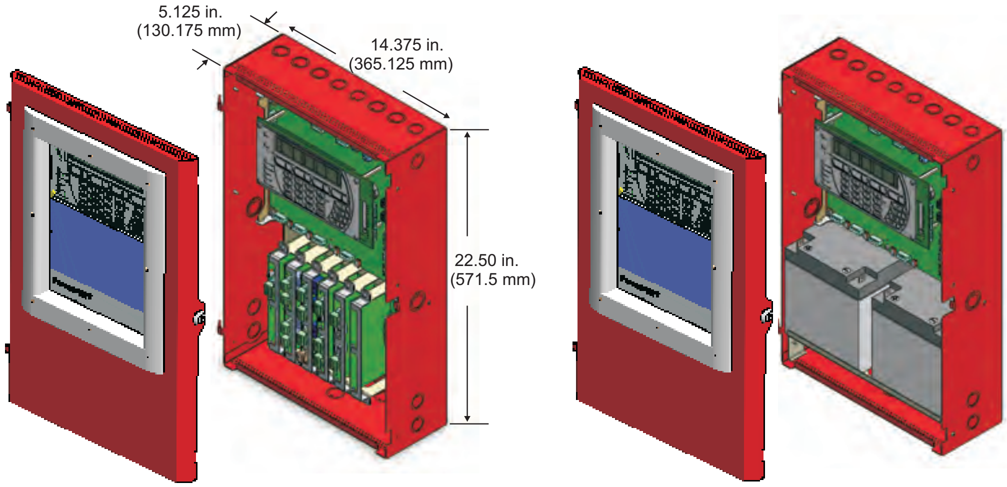


Figure 1-3. Illustration of Typical 2-Tiered Main Enclosure Configurations

1-7.1.3 EXPANSION ENCLOSURES

The ARIES NET*Link* system is capable of substantial expansion in its total number of add-on cards, Power Supply/PMU Assemblies and batteries. The illustrations below demonstrate available ways of expanding the system. Figure 1-4a shows the large Expansion Enclosure with a power supply/PMU Assembly and two expansion card cages. Figure 1-4b shows the small Expansion Enclosure with a Power Supply/PMU Assembly and standby batteries installed. The dimensions of the small and large expansion enclosures are exactly the same as the dimensions of the 2-tiered and 3-tiered Main Enclosures. The only difference between the Main and Expansion Enclosures is that the Expansion Enclosure does not include a window in the door.

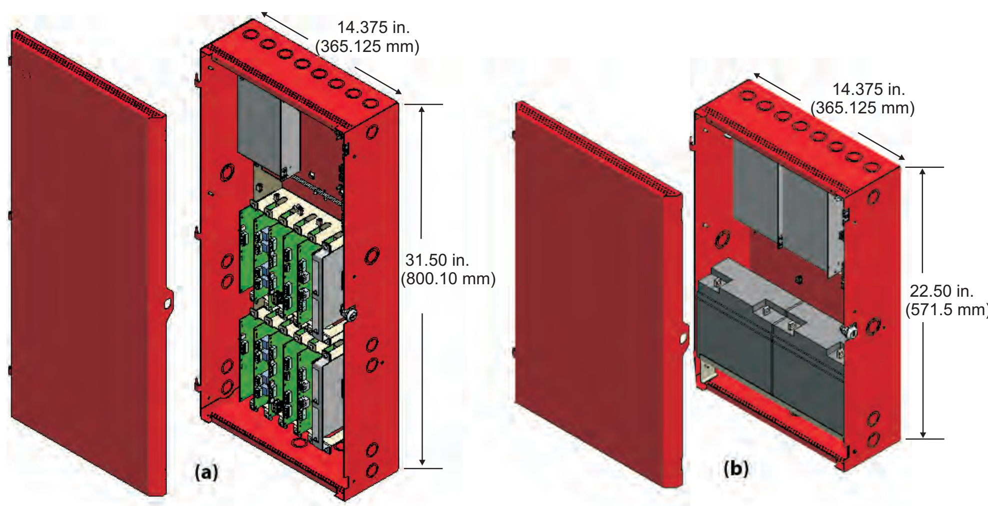


Figure 1-4. Large Expansion Enclosure (a) and Small Expansion Enclosure (b)

1-7.1.4 REMOTE ENCLOSURE

A smaller enclosure has been designed with common mounting features to house either the Remote Display Control Module (RDCM) or LED Annunciator Module optional devices (Figure 1-5). A Lexan window aligns with the display, LEDs, alphanumeric keypad and switches such that these features can be viewed but not touched with the door in the closed position. The key-locked door hinges on the left and opens to a full range of 180 degrees.

The Remote Enclosure allows a minimum of 2 in. (50 mm) of wiring space between the wall and wiring terminals. Two conduit knockouts are provided at the top of the enclosure to accommodate either 0.5 in. or 0.75 in. standard electrical conduit fittings. An additional conduit knockout of the same size is provided in the center of each side.

The Remote Enclosure, as with all ARIES NET*Link* enclosures, can be surface or semi-flush mounted. A trim ring for the Remote Enclosure (P/N 76-800300-004) fits over the enclosure.

Refer to Section 2-12.1, *Installing the Remote Enclosure* (in Chapter 2) for mounting instructions.

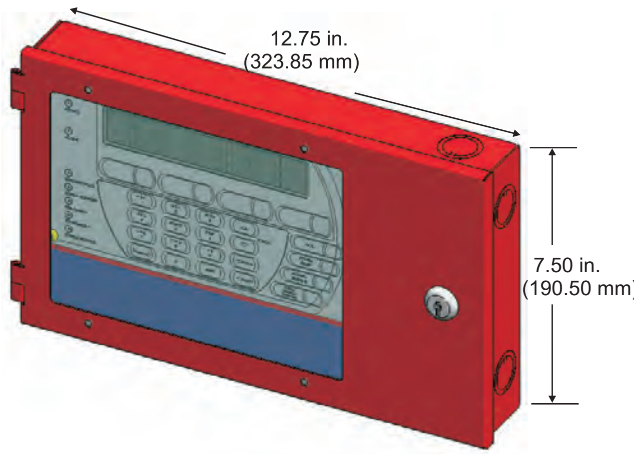


Figure 1-5. Illustration of Remote Enclosure (shown with Remote Display Control Module)

1-7.1.5 LARGE CAPACITY BATTERY CABINET

A stand-alone Large Capacity Battery Cabinet (P/N 76-100010-001) is available if required battery capacity is greater than can fit into the Main or Expansion Enclosure(s). The NEMA-1 Large Capacity Battery Cabinet is constructed of the same cold-rolled steel as the other available ARIES NET*Link* enclosures and is painted red. The Large Capacity Battery Cabinet door is hinged on the left and includes the same lock and key used with the ARIES NET*Link* enclosures. Three conduit knockouts are provided at the top to accommodate either 0.5 in. or 0.75 in. standard electrical conduit fittings.

1-8 KEYPAD AND DISPLAY

The built-in keypad and display is the physical means by which an operator and/or installer performs system functions, enters the security password, navigates the system menus, configures and tests the entire ARIES NET*Link* system. Refer to Chapters 3 and 4 for complete instructions on how to operate the system using the keypad/display.

Menus are available in one of four languages: English, French, Spanish and Portuguese.

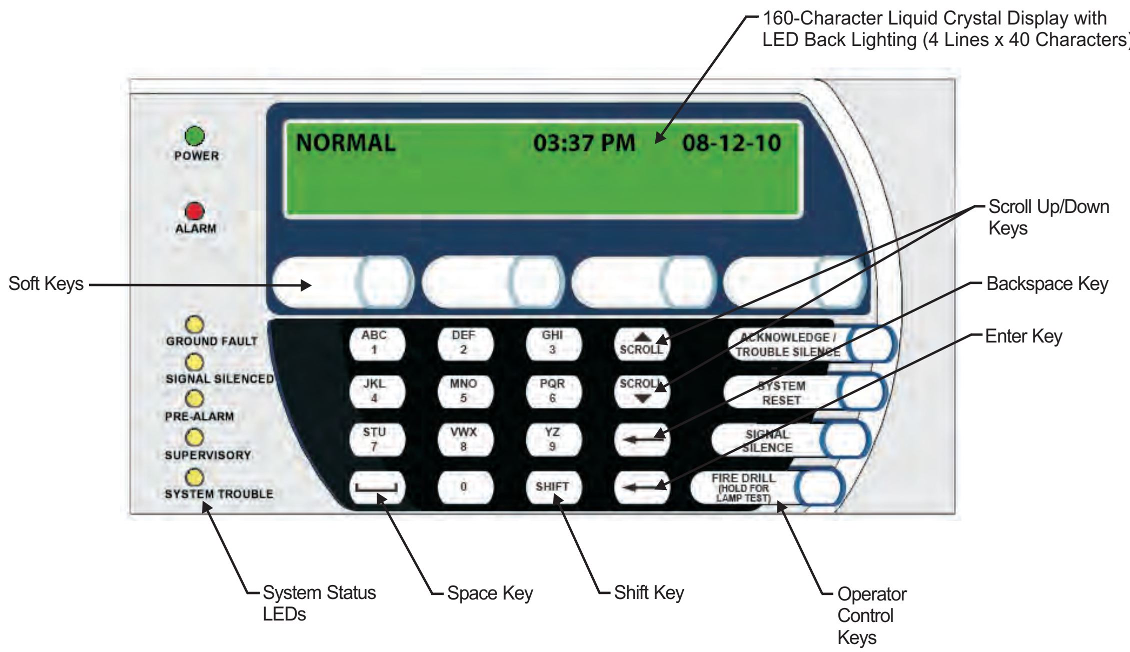


Figure 1-6. Keypad/Display

1-8.1 Keypad/Display Features

- A scrolling 160-character Liquid Crystal Display (LCD) window (four lines by 40 characters each).
- Seven (7) System-Status LEDs: Power On (green), Alarm (red), Pre-Alarm (yellow), Supervisory (yellow), System Trouble (yellow), Signal Silenced (yellow), Ground Fault (yellow)
- Four (4) built-in Operator Control Keys: System Acknowledge, System Reset, Signal Silence, Drill/Hold for Lamp Test
- Alphanumeric keypad with Up/Down Scroll Keys, Space Key, Backspace Key, Enter Key and Shift Key
- Four (4) Soft Keys which provide single pushbutton access to pre-programmed menu commands. When a Soft Key is pressed, the display immediately requests a password (not required for the "Call for Service" command). After successful password entry and verification, the command will execute.

  Note: A blank label area is provided next to each Soft Key for customized labeling. The label area has been designed to accommodate an Avery multi-use label, part number 5418. A template for printing the 5418 label is available on the Avery website (*www.avery.com*). Optionally, a label printer with a 0.5-in. width tape can be used. Affix the appropriate label directly on the surface of the overlay, to the left of the Soft Key button.

- Audible buzzer providing annunciation of system status at a sound level of at least 70 dBA at a distance of 3 ft. from the front of the panel, with the System Enclosure door closed. The buzzer can be configured to generate different patterns of sound for different events (such as Alarm, Pre-Alarm, Supervisory, Trouble and Abort) and will sound continuously for Main Controller Board failure.

1-9 MAIN CONTROLLER BOARD (MCB)

The ARIES NET*Link*'s main printed circuit board, P/N 76-800020-001, contains the system's central processing unit (CPU) and all of the primary circuits. The MCB is the heart of the system, controlling the operation and supervision of all the system modules and software within the ARIES NET*Link* system. It receives loop device data, processes the data based on pre-programmed instructions and transmits output commands to the output modules, field devices and display(s).

The MCB is packaged separately inside the ARIES NET*Link* shipping carton. Refer to Chapter 2, Section 2-4.7, for instructions on how to install the Main Controller Board.

Figure 1-7 shows the layout of the MCB, including terminals for external components, the operator interface, and connectors.

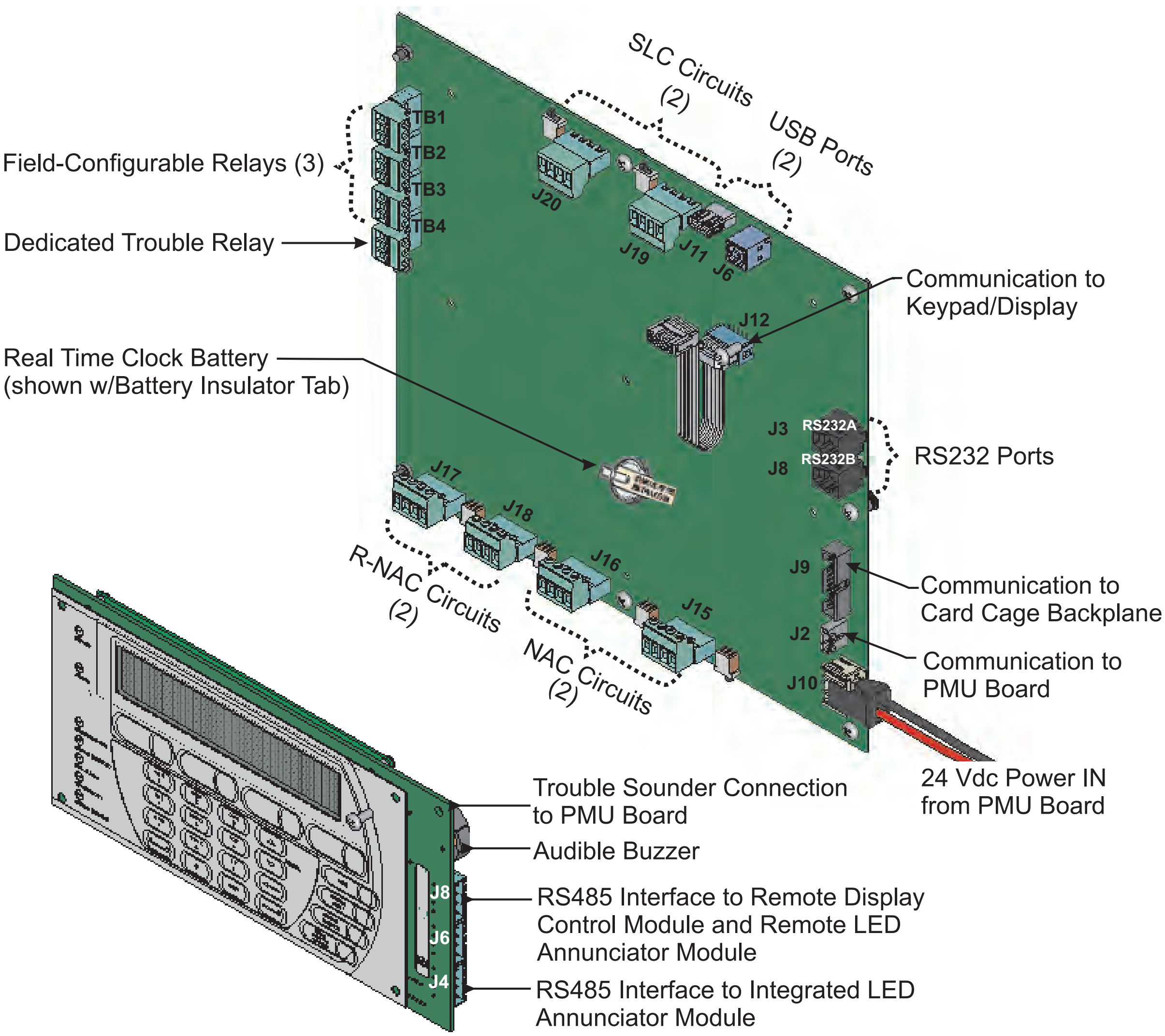


Figure 1-7. ARIES NET*Link* Main Controller Board Layout

1-9.1 Main Controller Board Features

The Main Controller Board, the main processing element of the ARIES NET*Link* system, incorporates these features into its PCB design:

- **SLC circuits**: Two onboard signaling-line circuits (SLC) for CLASS-A, CLASS-B or CLASS-A, Style 7 operation with a 255 intelligent-device capacity per SLC circuit.
- **NAC circuits:** Two onboard notification-appliance circuits (NACs) for CLASS-A or CLASS-B operation of audible or visual notification appliances such as horns, bells, strobes, etc.
- **R-NAC circuits**: Two onboard field-configurable outputs for notification appliances (NACs) or releasing solenoid-operated control heads and valves.
- **Trouble Relay**: One dedicated (non-programmable) Form-C relay for trouble conditions, including failure of the Main Controller Board. This relay is normally energized.
- **Field-Configurable Relays**: Three independently-driven, programmable Form-C type relays which can change states for alarm, trouble and supervisory conditions. These relays are normally de-energized and will not change state if all power is lost and for certain MCB failures.
- **USB Ports**: Two USB-style communications ports for connection to a PC (device port) and printer (host port).
- **RS232 Ports**: Two RS232 ports for interfacing to a PC (for remote configuration) or an RS232 printer, an ICM Card or modbus clients.
- **RS485 Remote Control/LED Annunciator interface**: A dedicated interface for communication and control of the Remote Display Control Module and LED Annunciator Module.
- **RS485 Expansion Card I/O interface**: A dedicated interface for communication and control of installed expansion cards, Power Management Unit (PMU) Board and peripherals.
- **Nonvolatile memory**: Onboard nonvolatile memory can store an Event Log of up to 10,000 events with ability to view and erase (password-protected) and can store system configuration.
- **Real-Time clock with Battery Backup**: A Real Time clock for time/date synchronization and display.
- **Degrade Mode operation**: A user-selectable option whereby, in the event that the Main Controller Board's microprocessor fails, loop devices can activate one or both NAC circuits on the MCB (in continuous mode) if they go into Alarm.
- **Ground Fault indication**: A Ground Fault can be identified to a single circuit (LED indicator lights on the front display).

Refer to Section 1-13 for information on expanding the functionality of the ARIES NET*Link* system with add-on cards.

1-10 POWER SUPPLY/PMU ASSEMBLY

The Power Supply/PMU Assembly, shown below in Figure 1-8, is comprised of:

1. one (1) or two (2) Power Supply Units
2. one (1) Power Management Unit (PMU) Board

Note: The Power Supply/PMU Assembly can be located in any tier, as desired. When the Power Supply/PMU Assembly is located in the Top Tier, the Main Controller Board with keypad/display fits over it in a hinged arrangement.

The PMU and Power Supply Unit(s) are packaged separately inside the ARIES NET*Link* shipping carton. Refer to Chapter 2, Section 2-4.3 and Section 2-4.4, for instructions on how to install the Power Supply/PMU Assembly.

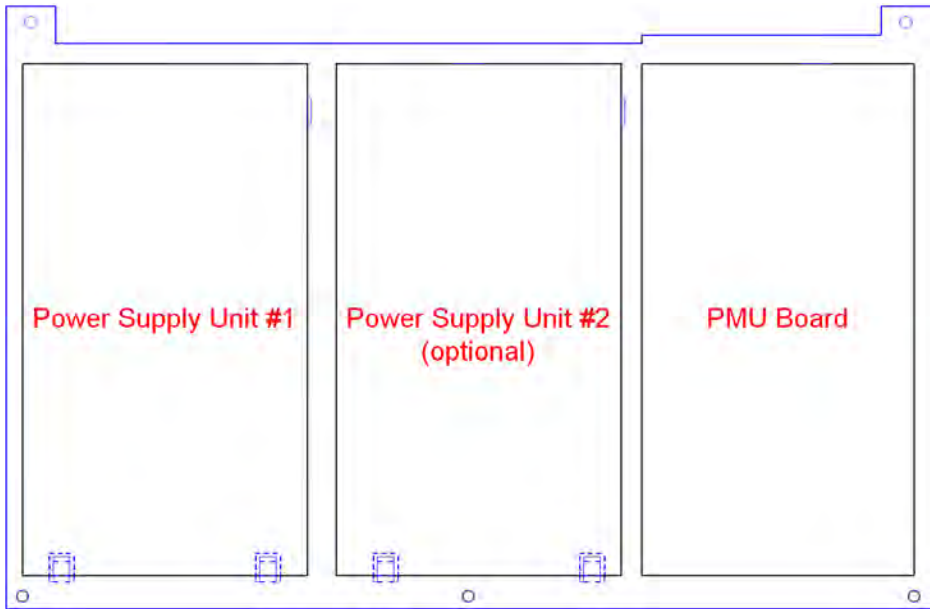


Figure 1-8. Power Supply/PMU Assembly Layout (shown without wiring harnesses)

1-10.1 Power Supply Units

An AC-to-DC switching power supply unit provides a total filtered output of 5.4 A @ 27 Vdc to support the basic ARIES NET*Link* system and its associated devices and to charge standby batteries. The power supply unit is user-configurable for either 120 Vac or 220/ 240 Vac, 50/60 Hz line voltage (switch located on side of power supply). A second power supply unit can be added to the Power Supply Assembly to provide a total output capacity of 10.8 A @ 27 Vdc. Refer to Appendix A, *Battery and Power Supply Calculations*, to determine battery and power supply needs.

Note: A fully expanded ARIES NET*Link* system can accommodate a maximum of eight power supply units (with each pair controlled by a PMU Board).

1-10.2 Power Management Unit (PMU) Board

The PMU Board, shown in Figure 1-9, is an electronic assembly that provides:

- **Battery charging and supervision**: The PMU Board can charge standby batteries of up to 165-AH capacity. The board can supply charging voltage of 27.0 Vdc (nominal) with a 4.0 Amp charging circuit current (using a single power supply) or 8.9 Amp current (using dual power supplies) respectively. The battery bank is constantly supervised for correct voltage and polarity. If there is more than one PMU board in a system, only one PMU Board will be responsible for charging, but all will supervise. Charging current is turned on if the battery charge current falls below maximum acceptable amplitude and is turned off if the battery charge current exceeds this limit.
- **AC power supervision**: AC primary power is constantly supervised and its condition reported to the Main Controller Board. In the event of a loss or reduction of AC power, the PMU Board automatically switches to standby batteries.
- **24 Vdc supervision**: The PMU Board regulates all internal DC power required for the system electronics from the 27.4 Vdc power and reports back to the Main Controller Board.
- **24 Vdc ground fault detection**: The PMU Board can detect if any system ground referenced external wiring is shorted to building Earth Ground. The amplitude of the ground fault offset is measured and reported to the Main Controller Board.
- **Auxiliary 24 Vdc outputs:** Two auxiliary output connectors, rated for 2 A @ 24 Vdc, are provided.

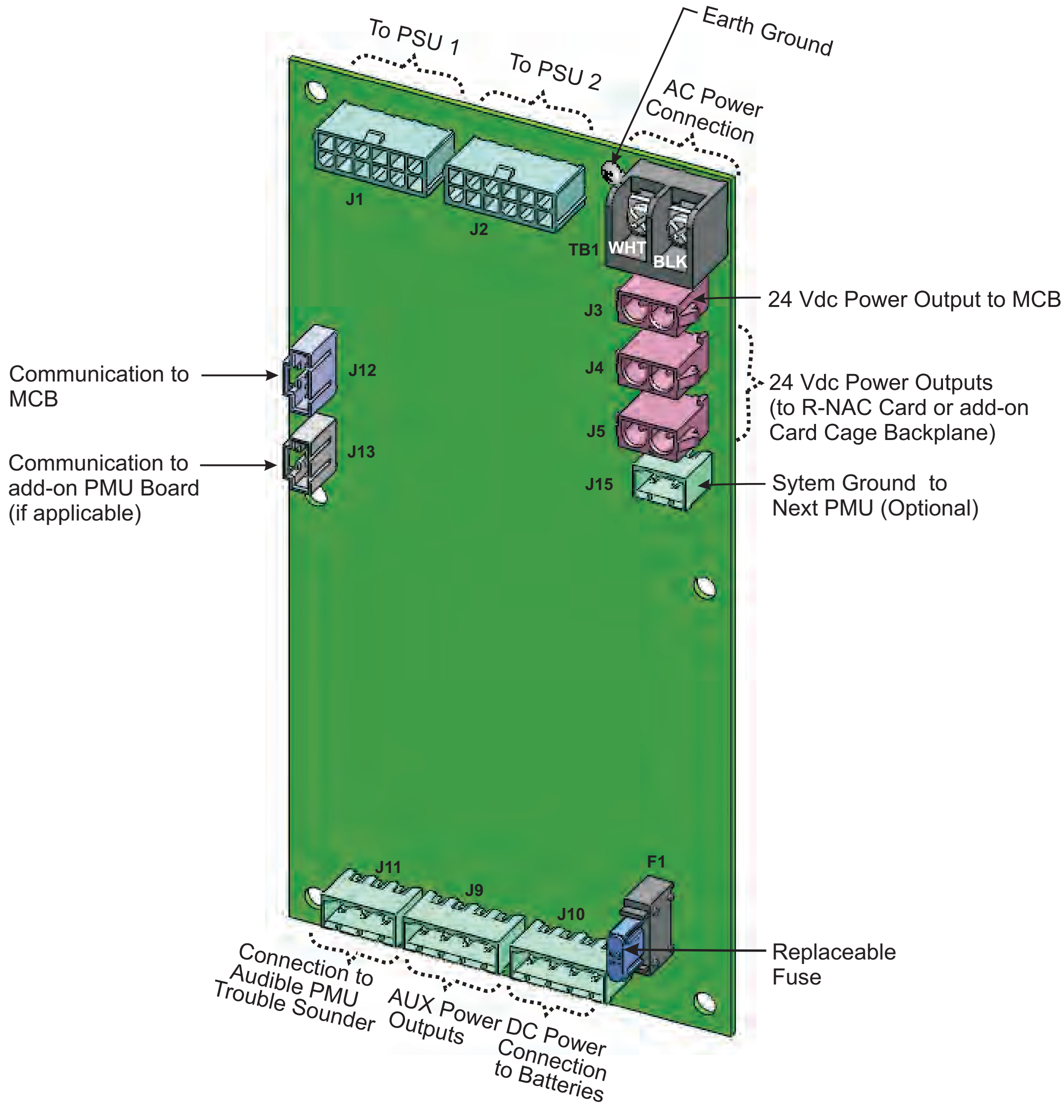


Figure 1-9. Power Management Unit (PMU) Board

1-11 BATTERIES

The 3-Tiered and 2-Tiered Main and Expansion Enclosure cabinets provide space for two (2) 12 Vdc 12-AH or 17-AH batteries. Only use sealed, lead-acid batteries. Batteries must be ordered separately. Batteries of various capacities are available. Use the Large Capacity Battery Cabinet, P/N 76-100010-001, for batteries larger than 17-AH.

Battery capacity should be calculated based on the application and the local Authority Having Jurisdiction (AHJ) for a 24-hour standby followed by a 10-min. alarm period or for a 90-hour standby followed by a 10-minute alarm period. Refer to Appendix A, *Battery and Power Supply Calculations* to calculate required battery capacity and standby times.

The ARIES NET*Link* software includes an optional Battery Monitoring Mode which can track battery lifetime from the original install date and sound an audible signal on the replacement due date.

1-12 EXPANSION CARD CAGE

The expandable and flexible nature of the ARIES NET*Link* system is facilitated by the Expansion Card Cage, where an Expansion Card can be easily plugged into a backplane connector.

The Expansion Card Cage is a metal frame which supports and secures a maximum of six Expansion Cards. The frame is fixed to the Expansion Backplane and mounts securely to the enclosure (in the second- or third-tier positions).

In a 3-Tiered System Enclosure, the second tier is typically reserved for the Expansion Card Cage. A fully-expanded ARIES NET*Link* system can accommodate a maximum number of four Expansion Card Cages (24 slots in total).

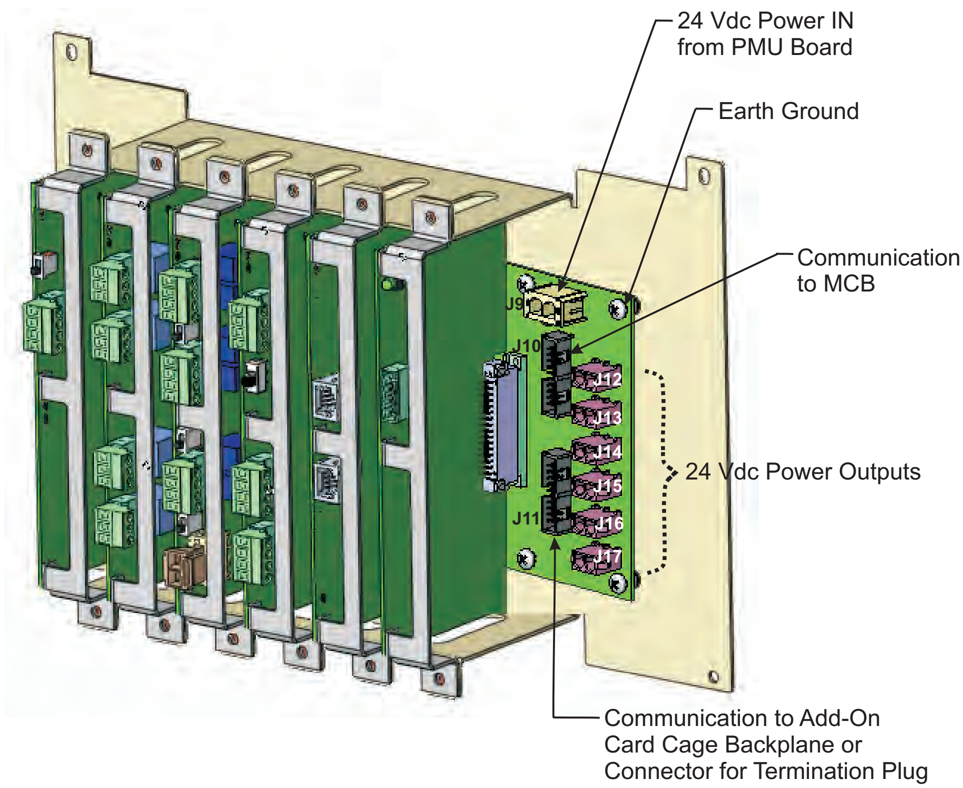


Figure 1-10. Expansion Card Cage (shown with cards inserted)

1-12.1 Expansion Backplane

The Expansion Backplane is a printed circuit board which is located underneath the Expansion Card Cage. The backplane provides six card connector positions. A convenient feature of the backplane is that any card can be inserted into any slot/backplane connector; there are no designated slots assigned to a particular card type.

An illustration of the Expansion Backplane is shown in Figure 1-11.

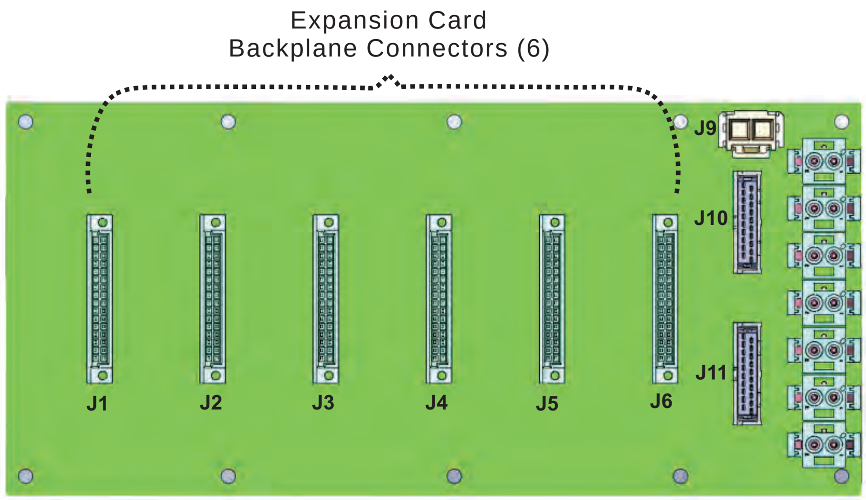


Figure 1-11. ARIES NET*Link* Expansion Backplane

The Expansion Backplane interfaces to the Main Controller Board and Power Supply Assembly via two dedicated connectors: System Power IN (J9) and Communications IN (J10).

- The System Power IN connects +24 Vdc power to all six Expansion Card connectors on the backplane.
- The Communications IN (J10) provides for the following two sets of RS485 communications signal (originating from the Main Controller Board Communications OUT connector):
    1. SLC Card
    2. I/O Expansion Bus

Communications IN (J10) transfers signals to all six Expansion Card Connectors (J1-J6) on the backplane, using a consistent set of pins/signals.

Communications OUT (J11) interfaces with the next Expansion Backplane (if applicable) to tie them together. The Communications OUT connector uses the same set of pins/signal lines for each backplane. These pins/signal lines also align with the Communications IN and Communications OUT connectors on the Main Controller Board.

A backplane address, configured by position, is transferred to all six Expansion Card connectors (J1-J6, Pins A,B,C,D), using the same set of pins/signal lines for each backplane. Each card that is inserted into a backplane connector reads the voltage at Pins A,B,C,D and assigns an Address value. Refer to Chapter 3 for further information on configuring addresses.

1-13 OPTIONAL EXPANSION CARDS

The following cards (each described in further detail in Table 1-3) may be included in the ARIES NET*Link* system:

- Signal Line Circuit (SLC) Card
- Release/Notification Appliance Circuit (R-NAC) Card
- Relay Card
- City Tie Card
- Digital Alarm Communicator Transmitter (DACT) Card
- Network Interface (NIC) Card
- Internet Communications Module (ICM) Card

1-13.1 General Guidelines for the Use of Expansion Cards

There are some general guidelines to be aware of when incorporating Expansion Cards into the ARIES NET*Link* system:

1. Cards can be plugged into any slot in the Expansion Card Cage. There are no reserved slots.
2. Removal of any card does not require removal of any other card or its wiring.

Note: Power should be off when removing or connecting PCBs and cabling.

3. Each Expansion Card is assigned a unique address.
4. An Expansion Card Cage contains a total of six Expansion Card slots.
5. A fully expanded ARIES NET*Link* system can include a total of four Expansion Card Cages.
6. A fully expanded ARIES NET*Link* system (24 available slots) can include the total number of Expansion Cards listed below:
    - 1 City Tie Card
    - 1 DACT Card
    - 6 SLC Cards (limited by number of unused slots)
    - 1 Network Interface Card (per node)
    - 1 Internet Communications Module Card
    - 24 R-NAC Cards (limited by number of unused slots)
    - 24 Relay Cards (limited by number of unused slots)
7. All cards are supplied with +24 Vdc power from the backplane, with the following exception:
    - R-NAC Card (only the output circuits on the R-NAC require external power)

1-13.2 Expansion Card Addresses

Physical Address: Identifies the physical slot number where the expansion card is installed in the card cage. Numbering begins at the first slot from the left of the first card cage (number "1") and is incremented from LEFT to RIGHT, up to 24 possible slots.

Logical Address: Used in the Event Output Control as a numerical identifier of the expansion card (for example, "SG1", "RY2"). The logical address does not need to change if an expansion card is moved to a different physical address.

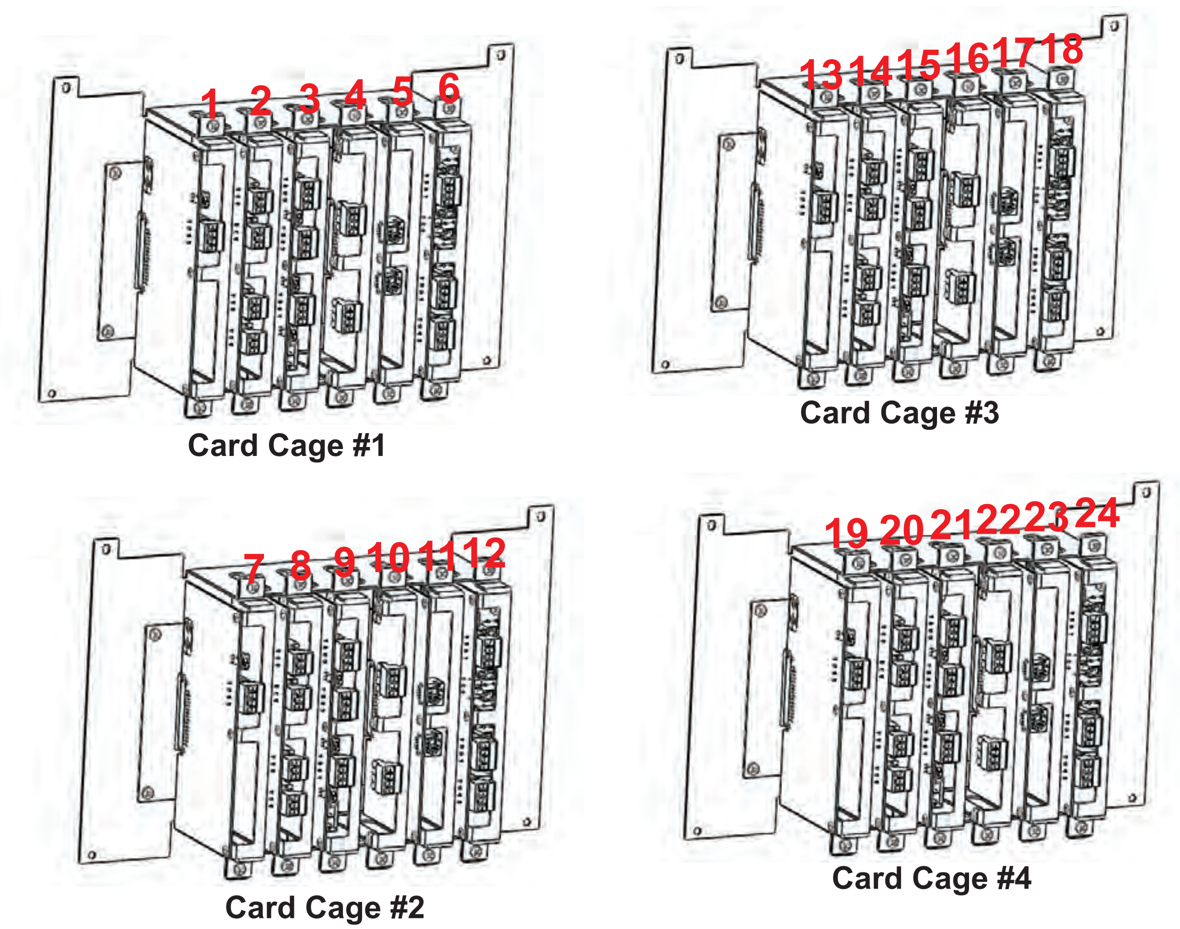


Figure 1-12. Physical Addresses of Expansion Cards

Table 1-3. Available Expansion Cards

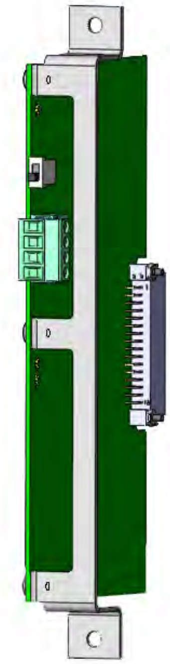
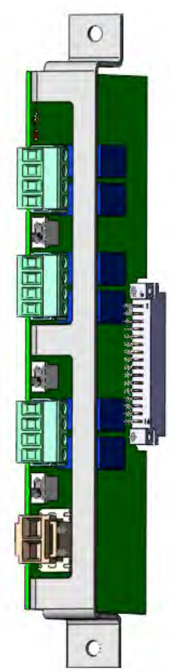
Expansion Card	Description	Illustration
Signal Line Circuit (SLC) Card **P/N 76-800011-001** *Refer to Figure 2-23 and Figure in Chapter 2, "Installation" for wiring diagrams for SLC circuits.*	A Signal Line Circuit (SLC) is a communications circuit where each addressable device continuously transmits its current status and responds to polling by the Main Controller Board. The SLC receives control requests from the Main Controller Board and establishes communications with the field devices. Status changes from the field devices are reported back to the Main Controller Board. Each control unit can support up to a total of eight SLC loops (two located on the MCB and six individual SLC Expansion Cards). Green/yellow communications LEDs (for the backplane and SLC separately) are visible from the outside edge of the module, where green indicates data transmission and yellow indicates data reception. A green/yellow status LED is also visible, with green indicating that the module is in an energized/enabled state and yellow indicating a de-energized/disabled state.	
Release/Notification Appliance (R-NAC) Circuit Card **P/N 76-800013-001** *Refer to Figure 2-28 and Figure 2-30 in Chapter 2, "Installation" for wiring diagrams for NAC and releasing circuits.*	Adding a Release/Notification Appliance Circuit (R-NAC) Expansion Card increases the functional capacity of the ARIES NET*Link* system by expanding the number of available signal/releasing circuits to control fire suppression or notification devices. These combination Release/Notification Appliance Circuits can be configured by the user (through the system menu or remote configuration software) to act independently as either solenoids/actuators or NACs. When the circuit is configured as an ARC, the maximum number of devices/loops supported per circuit is one solenoid and up to 12 actuators. When the circuit is configured as a NAC, either synchronized or non-synchronized strobes can be supported. The R-NAC Card occupies a single slot in the Card Cage and plugs directly into the backplane. +24 Vdc power is externally provided through a connector located on the field wiring card edge, not from the backplane connector. There is no limit on the number of R-NAC Cards which may be included in a fully expanded ARIES NET*Link* system (dependent only on how many slots are available).	

Table 1-3. Available Expansion Cards

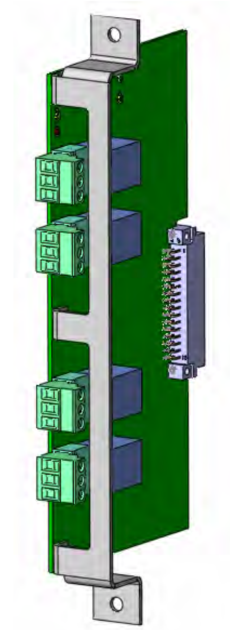
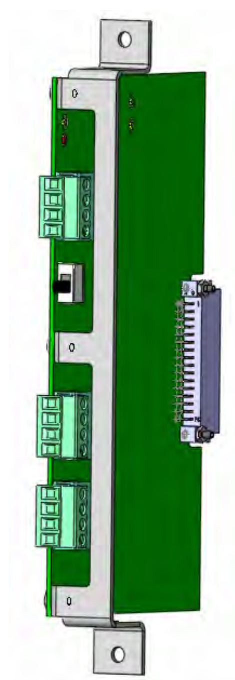
Expansion Card	Description	Illustration
Relay Card **P/N 76-800012-001** *Refer to Figure 2-32 in Chapter 2, "Installation" for a wiring diagram for Relay outputs.*	Adding a Relay Expansion Card expands the number of available programmable relays. The Relay Card is equipped with four Form C floating relay contacts. Each relay is independently-driven and can be pre-programmed to change state for all states of Alarm, Trouble and Supervisory conditions. Red and green/ yellow status LEDs are visible from the outside edge of the module. The ability to isolate an individual relay output is provided through the system menu. The relays on this card are normally de-energized and will not change state when total power is lost and for certain MCB and communication failures. Refer to Figure 2-32 in Chapter 2. Ratings are as follows: • 3 A at 30 Vdc • 3 A at 120 Vac The Relay Card occupies a single slot in the Card Cage and plugs directly into the backplane. +24 Vdc power is supplied via the backplane connector. There is no limit on the number of Relay Cards which may be included in an ARIES NET*Link* system (dependent only on how many slots are available in the Expansion Card Cage(s)).	
City Tie Card **P/N 76-800016-001** *Refer to Figure 2-33 in Chapter 2, "Installation" for a wiring diagram for the City Tie Card.*	The City Tie Expansion Card provides connection and operation for three independently-operated signaling circuits used to connect to Municipal Tie inputs: • Local Energy output • Shunt-Type Master Box output • Reverse Polarity output The City Tie Expansion Card occupies a single slot in the Card Cage and plugs directly into the backplane. +24 Vdc power is supplied via the backplane connector. An ARIES NET*Link* system can include only **one** City Tie Card.	

Table 1-3. Available Expansion Cards

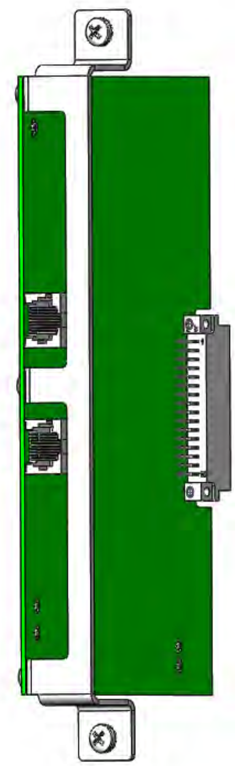
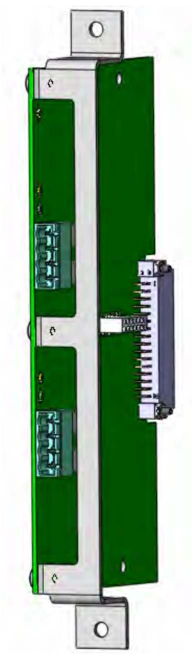
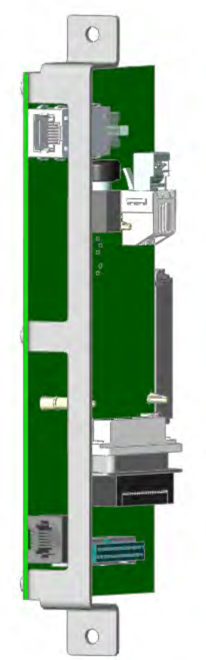
Expansion Card	Description	Illustration
Digital Alarm Communicator Transmitter (DACT) Card **P/N 76-800015-001** *Refer to Figure 2-34 in Chapter 2, "Installation" for a wiring diagram for the DACT Card.*	The Digital Alarm Communicator Transmitter (DACT) Expansion Card is an optional system component which transmits system status over phone lines to a Central Station. The DACT Card includes a built-in modem and two Loop Start Public Switched Telephone Network (PSTN) connections for use with RJ45X phone jacks. Green/yellow status LEDs are visible from the outside edge of the module, where green indicates data transmission and yellow indicates data reception. The DACT Card is supervised and controlled by the Main Controller Board using a half-duplex master-slave polling protocol. The DACT card receives system status updates, which are stored in memory. When one or more statuses change, the DACT initiates a transmission to the Central Station (over one or both phone lines). Main Controller Board status changes include: • System Status Normal • AC Failure • Low Battery Voltage • Alarm Per Point (Per SLC Address) • Supervisory Per Point (Per SLC Address) • System Supervisory • System Trouble • Ground Fault • Notification Appliance Circuits (NAC) Trouble • Degraded operation due to microprocessor failure Additional internal DACT events (not originating from the Main Controller Board) are also transmitted to the Central Station. These include: • RAM Fault • NOVRAM/Config Fault • Phone line #1 Trouble detected • Phone line #2 Trouble detected • Communication Trouble with MCB The DACT Card occupies a single slot in the Card Cage and plugs directly into the backplane. + 24 Vdc power is supplied via the backplane connector. An ARIES NET*Link* system can include only **one** DACT Card.	

Table 1-3. Available Expansion Cards

Expansion Card	Description	Illustration
Network Interface Card (NIC) **P/N 76-800014-001** *Refer to Figure 2-43 in Chapter 2, "Installation" for a wiring diagram for the Network Interface Card.*	The Network Interface Card is necessary to combine up to 64 ARIES NET*Link* control units into an integrated, peer-to-peer network for annunciation, event output control, and operator intervention. The NIC regenerates and boosts network communications between ARIES NET*Link* units and electrically isolates the networked control units from each other. An optional Fiber Optic Converter Module (which mounts externally from the control unit) is also available to allow connectivity via a fiber-optic medium. An ARIES NET*Link* system can include only **one** Network Interface Card in the Card Cage. Note that <u>each</u> ARIES NET*Link* control unit must contain one NIC in order to be included as a node on the network.	
Internet Communications Module (ICM) Card **P/N 76-800017-001** *Refer to Figure 2-35 in Chapter 2, "Installation" for a wiring diagram for the Internet Communications Module Card.*	The Internet Communications Module is an optional supplemental card which allows Internet connectivity to the Main Controller Board via an RS232 port. An RJ45 connector is provided on the card for Ethernet connection to the Internet. Physical connection to the Internet must be provided by the user, furnished by a commercially-available Internet provider. The Intelligent Communications Module (ICM) can be used to access the ARIES NET*Link* system via the Internet to view system status and current events and to download the history log. The ICM can be programmed to transmit up to five e-mails upon the occurrence of any unsolicited event in the system. The e-mail message embeds a link with the IP address of the control unit that sent the message for instant access to the remote system. The ICM can be accessed using any standard Web browsing program and requires no special proprietary software. The ICM Card occupies a single slot in the Card Cage and plugs directly into the backplane. + 24 Vdc power is supplied via the backplane connector. An ARIES NET*Link* system can include only **one** ICM Card in the Card Cage.	

1-14 OPTIONAL REMOTE DEVICES

In addition to expansion cards, optional remote devices can be used to expand the functionality of the ARIES NET*Link* system. These devices connect to the ARIES NET*Link* but reside outside the main enclosure.

1-14.1 Remote Devices Using RS232 or USB Ports

RS232 and USB ports located on the Main Controller Board provide a means to interface to a PC, printer, an ICM Card or modbus clients. Refer to Section 2-11.3 in Chapter 2, *Installation*, for a list of recommended printer models.

1-14.1.1 OPTIONAL CONFIGURATION VIA REMOTE COMPUTER

The ARIES NET*Link* control unit may be configured remotely from a PC connected to one of the MCB RS232 ports, if desired.

1-14.1.2 OPTIONAL MONITORING VIA INTERNET

The ARIES NET*Link* system may be remotely monitored by means of the Internet, if desired, by using an Internet Communication Module connected to one of the MCB RS232 ports. Refer to the *Internet Communications Module User's Guide* (P/N 06-236542-003) for a complete description of the ARIES NET*Link* Internet user interface.

Note: The Internet Communications Module (ICM) Card must be installed for this option.

1-14.2 Remote Devices Using RS485 Bus to MCB

The ARIES NET*Link* system's Main Controller Board includes an RS485 bus which can communicate with the following remote devices:

- Remote LED Annunciator Module (R-LAM)
- Remote Display Control Module (RDCM)
- Model ATM-L Annunciator Driver Module
- Model ATM-R Relay Driver Module
- Fiber Optic Converter Module

The ARIES NET*Link* control unit supports the use of:

- up to 16 LED Annunciator Modules
- up to 15 Remote Display Control Modules
- up to 16 ATM-L or ATM-R Driver Modules (or any combination of these modules)

Note: The total number of remote devices cannot exceed 31 addresses. If an integrated LED Annunciator is included in the ARIES NET*Link* front panel, the total number of remote devices cannot exceed 30 addresses.

1-14.2.1 REMOTE LED ANNUNCIATOR MODULE

The Remote LED Annunciator Module (R-LAM) is an optional module which drives the display of zone information and fits into the Remote Enclosure. The R-LAM provides 48 independently-programmable microcontroller-controlled LEDs (red/yellow) with space available to place a label to identify the event being annunciated. In addition, three system-level LED outputs are provided for the following general conditions: Module Power, Trouble and Signal Silenced. Two system-level input circuits for functional switches are reserved for Signal Silence and System Acknowledge/Self-Test commands.

Note: The file *LAM label template.doc* is provided on the ARIES NET*Link* User Disk, P/N 06-220289-002, to assist with customized labeling. Text for the labels can be entered into preset form fields (up to two lines of text per window). Cut the strips with a scissors and slide them into the LAM from the top, retaining the top tab for easy removal.

Refer to Figure 1-13 for an illustration of the Remote LED Annunciator Module. Refer to Appendix E for an illustration of the integrated LED Annunciator used in Canadian Applications.

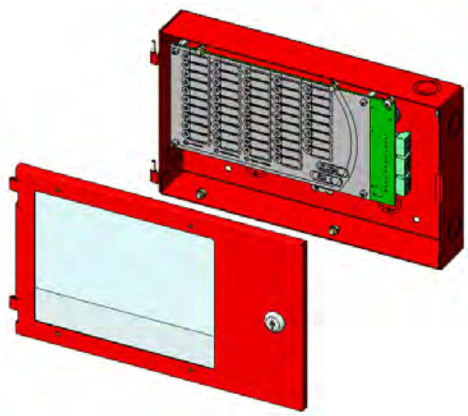


Figure 1-13. Remote LED Annunciator Module

1-14.2.2 REMOTE DISPLAY CONTROL MODULE (RDCM)

The Remote Display Control Module (RDCM) is a separate unit which is housed in the Remote Enclosure. The RDCM permits system events to be displayed, and operator intervention to be accomplished, from more than one location in a facility. The RDCM is a duplicate of the ARIES NET*Link*'s keypad/display and allows full operator intervention and system control. The RDCM includes a protected LCD display, keypad, buzzer, five system status LEDs and four user-programmable “soft” keys (used to invoke preprogrammed system operations). The unit interfaces with the Main Controller Board via an RS485 communications bus. A synchronization signal output allows expansion of up to 15 RDCM units.

Refer to Section 1-8 for detailed information on the features of the keypad/display.

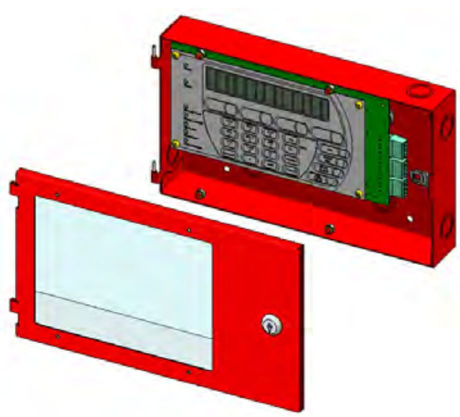


Figure 1-14. Remote Display Control Module (RDCM)

1-14.2.3 ATM SERIES DRIVER MODULES

The ATM Series Driver Modules support the use of third-party graphical annunciators and large numbers of auxiliary relays with the ARIES NET*Link*. Refer to Figure 1-15 below for an outline of the ATM Series Driver Module.

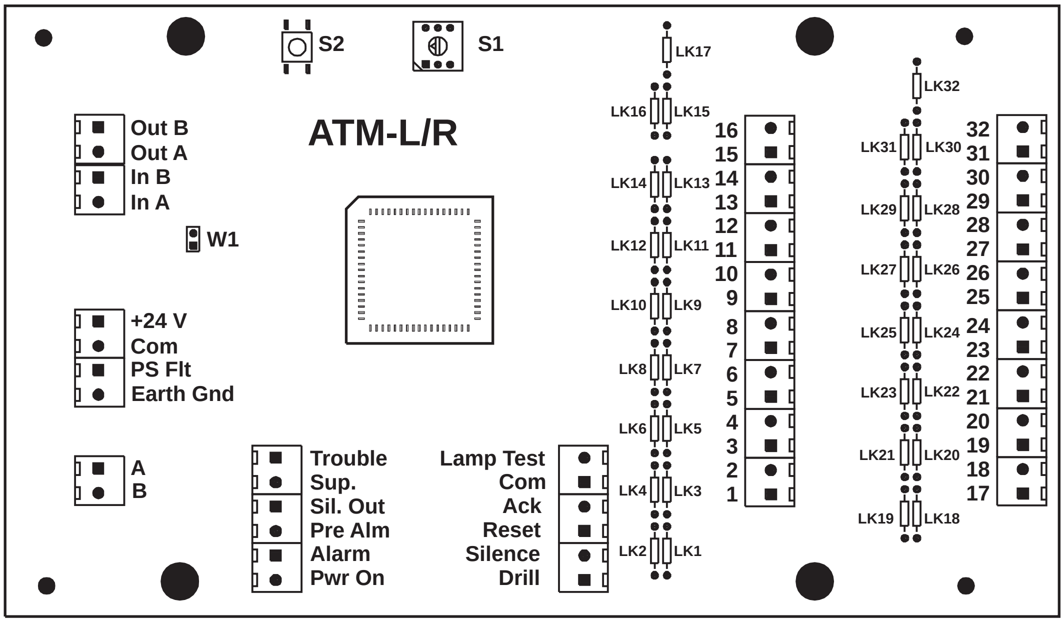


Figure 1-15. ATM Series Driver Module

1. **Model ATM-L Annunciator Driver Module**: The Model ATM-L Annunciator Driver Module provides the ARIES NET*Link* with up to 32 programmable, supervised LED outputs for graphical or tabular annunciators, along with six system-level LED outputs and five system-level input circuits for functional switches. The system-level LEDs correspond to the following general conditions: Module Power, Pre-Alarm, Alarm, Alarm Silence, Supervisory, and Trouble. The input circuits for functional switches provide for the following operator intervention: System Reset, Event Acknowledgement, Alarm Silence, Fire Drill, and Lamp Test.

2. **Model ATM-R Relay Driver Module**: The Model ATM-R Relay Driver Module can activate up to 32 programmable, supervised relays.

1-14.2.4 FIBER OPTIC CONVERTER MODULE (FOCM)

For network applications with communication paths between nodes greater than 4000 ft., or where these paths have excessive electrical noise, a fiber-optic option is available for use. The Fiber Optic Converter Module (FOCM) consists of a bi-directional, externally-powered unit mounted inside a 13 x 7-1/2 x 2 in. enclosure. One FOCM is required at both interconnected ARIES NET*Link* control units for a single communication channel.

The FOCM is shipped standard with one converter channel. For greater communication security and redundancy, a second optional Add-On channel can be installed in the same enclosure. This is most effective if the second channel is installed in a different pathway from the first.

For short transmission distances (under 1 mile), such as within a building or on a campus, mulit-mode optical fiber (MM fiber) can be used (62.5 μm core size/125 μm cladding diameter). For longer transmission distances (up to 12 miles), single-mode (SM fiber) can be used (8.3 μm core size/125 μm). Either type of fiber may be used and both connect to the ARIES NET*Link* power and RS485 data lines in the same fashion. The cable connections for both types of fiber are type 'ST'.

Each FOCM enclosure is equipped with electrical conduit knock-outs for both the fiber-optic cable and wire connections from the control unit for both 24 Vdc power and RS485 data lines. 24 Vdc power can be provided from the PMU Board J9 AUX 1 or AUX 2 terminal block outputs. These wires are then connected to the FOCM power input terminal block mounted inside its enclosure. The RS485 data link connection is provided at the ARIES NET*Link* Network Interface Card (NIC) which is inserted in the Card Cage. Wire connections are made at NIC terminal block J12 (Channel 1) or J13 (Channel 2). (See Section 2-13.1.)

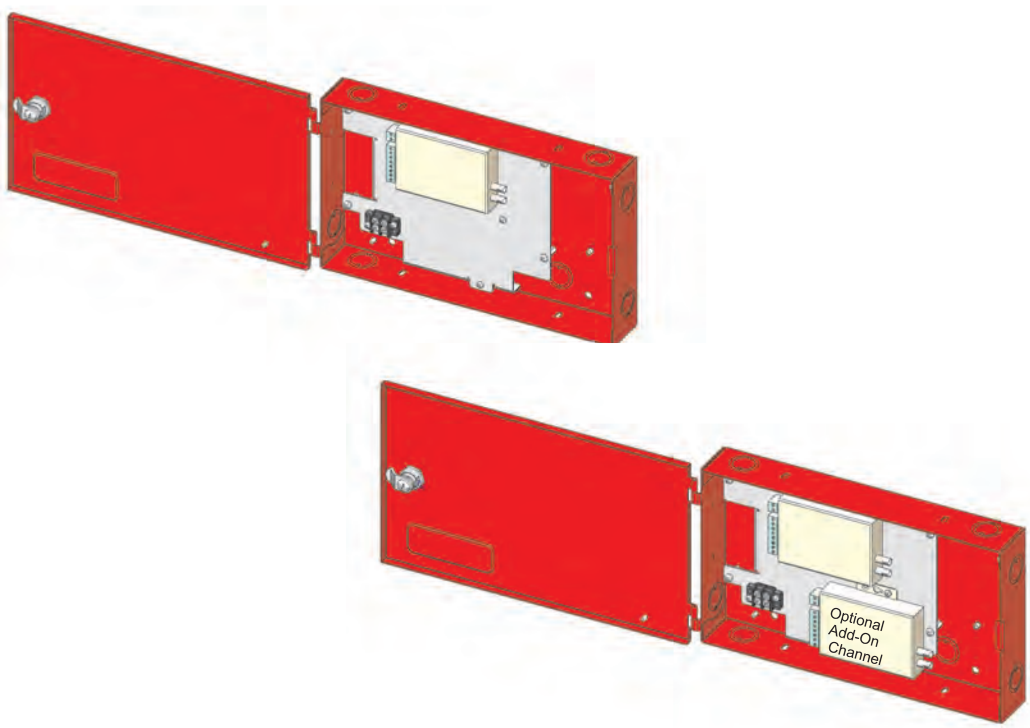


Figure 1-16. Fiber Optic Converter Modules

1-15 SIGNALING LINE CIRCUIT (SLC) DEVICES AND MODULES

1-15.1 SmartOne Devices

The ARIES NET*Link* supports the SmartOne® Series of intelligent smoke and heat detectors. These detectors have their own data transceivers, micro-controllers, micro-controller memory, and algorithms that allow the detectors to determine whether a normal, pre-alarm, alarm, or trouble condition exists at their monitoring locations.

Table 1-4. Supported SmartOne Intelligent Devices

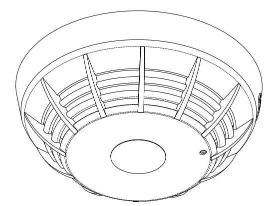
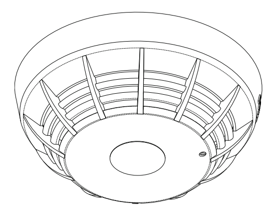
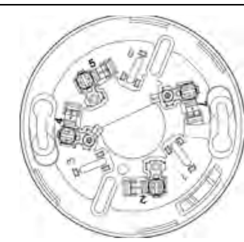
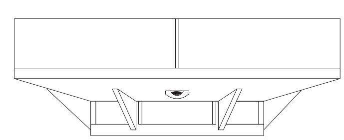
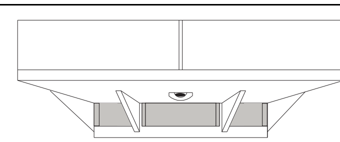
Device	Description	Illustration
SmartOne Protocol Photoelectric Smoke Detector **P/N DS-PS**	The Model DS-PS Photoelectric Smoke Detector is an addressable photoelectric detector featuring a bi-color LED with adjustable sensitivity settings from 0.9 to 3.5 % obscuration/ft. A field-replaceable optical sensing chamber detects smoke and the detector analyzes the sensor data to determine whether to initiate an alarm.	
SmartOne Protocol Thermal Detector **P/N DS-HFS**	The Model DS-HFS is an addressable thermal detector featuring fixed temperature heat detection. The heat sensor monitors the temperature of the air in its surroundings and the detector analyzes the data to determine whether to initiate an alarm.	
DS Series Standard Base **P/N DS-SB**	The Model DS-SB is the standard base for DS Series detectors. It connects a DS Series detector to a Smart-One-compatible Signaling Line Circuit (SLC).	
DS Series Relay Base **P/N DS-RB**	The Model DS-RB is another base available for DS Series detectors. It connects a DS Series detector to a SmartOne-compatible Signaling Line Circuit (SLC) and adds Relay functionality.	
SmartOne Ionization Smoke Detector **P/N 70-402001-100**	The Model CPD-7052 is a low-profile, intelligent smoke detector that uses an ionization sensing chamber. This detector can be utilized for open-area coverage or can be mounted in a duct with air velocities up to 2,000 feet per minute.	
SmartOne Photoelectric Smoke Detector **P/N 71-402001-100**	The Model PSD-7152 is a low-profile, intelligent smoke detector that uses a light-scattering sensing chamber. This detector can be utilized for open-area coverage or can be mounted in a duct with air velocities up to 4,000 feet per minute.	

Table 1-4. Supported SmartOne Intelligent Devices

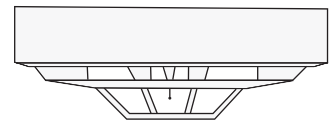
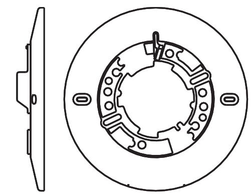
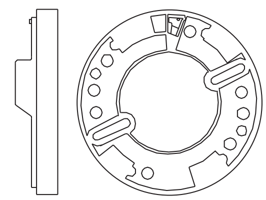
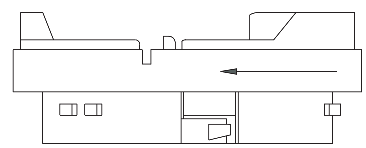
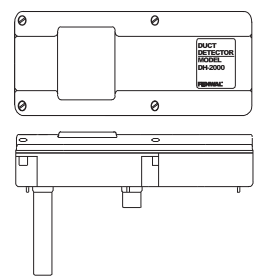
SmartOne Thermal Detector **P/N 70-404001-100**	The Model THD-7252 Thermal Detector is a low-profile, intelligent heat detector that uses a thermistor sensing chamber for fast response. This detector can be used for open-area coverage on low (< 10 ft.), flat ceilings with a spacing up to 70 ft.	
Flanged Detector Base, Model 6SB **P/N 70-400001-100**	The Model 6SB Detector Base is used in applications where the detector's installed appearance is a primary consideration. This base mounts to standard 3-, 3½-, and 4-inch electrical boxes. Operates with CPD-7052, PSD-7152, and THD-7152 detectors.	
Flangeless Detector Base **P/N 70-400001-101**	The Model 4SB Detector Base is used in underfloor applications, or in applications where mounting space is limited. This base mounts to standard 3- or 3½-inch electrical boxes. Operates with CPD-7052, PSD-7152, and THD-7152 detectors.	
Detector Base Adapter **P/N 70-400001-200**	The Model MA-002 Detector Base Adapter allows the low-profile SmartOne detectors to be retrofitted into the older-style SmartOne detector base, P/N 70-400000-001.	
Duct Housing **P/N 70-403001-100 (without detector)** **P/N 70-403001-152 (with PSD-7152 detector)** **P/N 70-403001-052 (with CPD-7052 detector)**	The Model DH-2000 Duct Housing is used to enclose an intelligent smoke detector that is monitoring for smoke in an air duct but located outside of the duct. The duct housing is used with inlet and outlet tubes that allow the air in the duct to be sampled uniformly and transported to the enclosed smoke detector for obscuration-level measurement.	

Table 1-5. Supported High Sensitivity Smoke Detectors

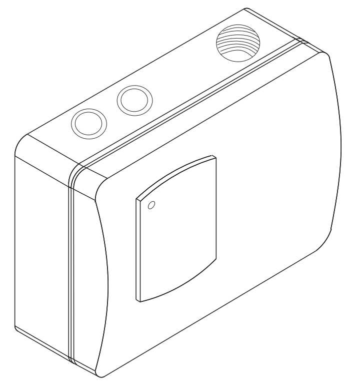
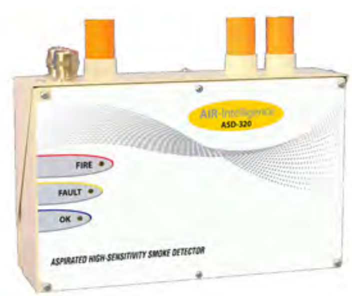
ORION XT **P/N 77-297101-000**	The ORION XT® High Sensitivity Smoke Detector is designed for early warning smoke detection applications such as telecommunications facilities, data processing rooms, museum, warehouses and cleanrooms. The ORION XT consists of a laser particle counter detector head, a high efficiency fan module and a termination board. When connected to an air sampling pipe network, the detector provides coverage for an area up to 20,000 square feet. An ORION XT can be connected to the Signaling Line Circuit using a PEGAsys™ Addressable Loop Module (PALM), P/N 77-297103-000, which mounts inside the detector housing. (Refer to Section 1-17, *SmartOne Addressable Modules*.)	
AIR-Intelligence ASD-160H **P/N 33-30671A**	The AIR-Intelligence™ ASD-160H is a highly sophisticated "next generation" detector that provides high sensitivity smoke detection with very early warning. The ASD-160H incorporates a patented "artificial intelligence" known as ClassiFire®, which allows the detector to configure itself to optimum sensitivity, alarm thresholds, and minimum nuisance alarms for various environments. The ASD-160H offers protection for an air sampling pipe network up to 164 feet (50 meters) total. An ASD-160H can be connected to the Signaling Line Circuit using an Addressable Protocol Interface Card (APIC), P/N 76-333002-001, which mounts inside the detector housing. Up to 127 AIR-Intelligence detectors can be networked together using an AIR-Intelligence Command Module.	
AIR-Intelligence ASD-320 **P/N 33-30672A**	The AIR-Intelligence ASD-320 is identical to the ASD-160H detector but offers protection for a larger air sampling pipe network up to 328 feet (100 meters) total. An ASD-320 can be connected to the Signaling Line Circuit using an Addressable Programmable Interface Card (APIC), P/N 76-333002-001, which mounts inside the detector housing. Up to 127 AIR-Intelligence detectors can be networked together using an AIR-Intelligence Command Module.	

Table 1-5. Supported High Sensitivity Smoke Detectors

AIR-Intelligence ASD-640 in plastic case **P/N 33-30621A** **AIR-Intelligence ASD-640 w/ Command Module in plastic case** **P/N 33-30620A**	The AIR-Intelligence ASD-640 is identical to the ASD-160H detector but offers protection for an even larger air sampling pipe network up to 656 feet (200 meters) total. An ASD-640 can be connected to the Signaling Line Circuit using an Addressable Protocol Interface Card (APIC), P/N 76-333002-001, which mounts inside the detector housing. Up to 127 AIR-Intelligence detectors can be networked together using an AIR-Intelligence Command Module.	

1-17 SMARTONE ADDRESSABLE MODULES

SmartOne addressable modules are of four general types:

- Monitor Modules: These modules provide a uniquely-identifiable interface between the ARIES NET*Link* and an initiating device.
- Relay Module: This module supplies an unpowered, Form-C contact at a point-specific address.
- Control Modules: These modules provide a uniquely-identifiable interface between the ARIES NET*Link* and conventional notification appliances such as horns and strobes.
- Remote Releasing Modules: These modules provide the ability to remotely activate extinguishing-system control devices (i.e. actuators and solenoid valves).

Table 1-6. Supported SmartOne Addressable Modules

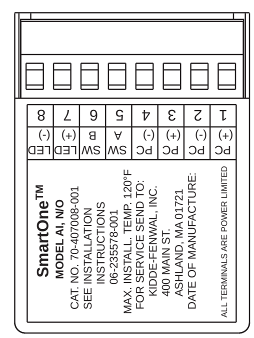
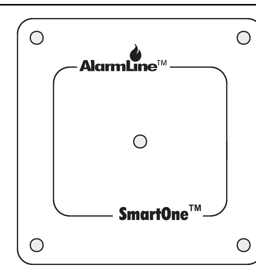
Device	Description	Illustration
SmartOne Addressable Monitor Module, Model AI **P/N 70-407008-001 (N.O)** **P/N 70-407018-001 (N.O./ non-silicone)** **P/N 70-407008-002 (N.C.)**	The Model AI Addressable Monitor Module is used to monitor conventional, unpowered, contact-type initiating devices through a **CLASS-B, Style-A** initiating device circuit. Two styles of AIs are available: P/N 70-4070X8-001 (Normally Open) for interfacing to normally-open, contact devices such as, abort stations, manual stations, waterflow switches, and supervisory switches and P/N 70-407008-002 (Normally Closed) for use within control equipment providing the normally closed trouble contact, such as older-style supervisory switches. The Normally Closed AI Module, P/N 70-407008-002, is not considered to be an initiating device circuit. The AI Module is designed to be mounted in the electrical box of the device being monitored.	
SmartOne Addressable AlarmLine Module, Model AAM **P/N 73-100001-003**	The Model AAM Addressable AlarmLine Module is a monitor module that enables an AlarmLine sensor cable to report pre-alarm and alarm or overheat events, and trouble signals to the ARIES NET*Link* through the signaling line circuit. The AAM, P/N 73-100001-003, is equipped with a metal cover plate for mounting to a 4" square electrical box. P/N 73-100003-001, is a surface-mount, NEMA-4 enclosure for the AAM.	

Table 1-6. Supported SmartOne Addressable Modules

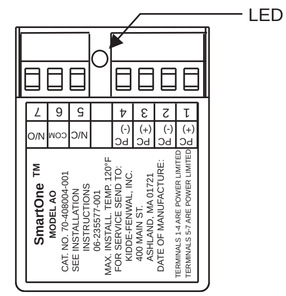
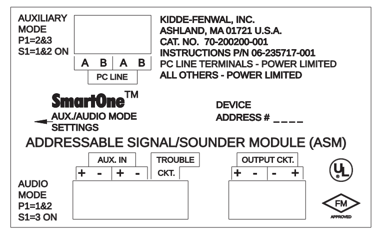
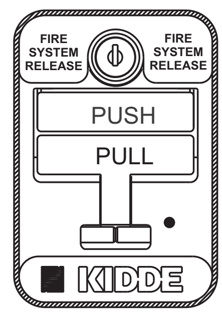
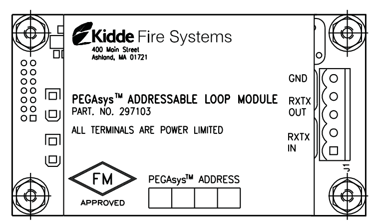
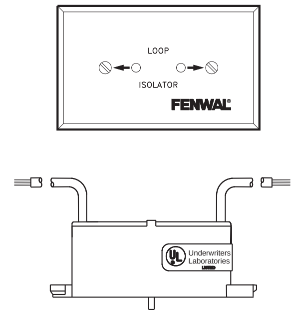
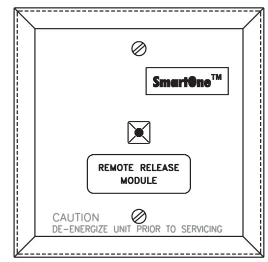
SmartOne Addressable Relay Module, Model AO **P/N 70-408004-001** **P/N 70-408014-001 (non-silicone)**	The Model AO Addressable Relay Module provides an unpowered, Form-C contact for remote control applications. The AO Module is designed to be mounted in the electrical box of the device being controlled.	
SmartOne Addressable Signal Module, Model ASM **P/N 70-200200-003**	The Addressable Signal Module permits notification appliances to be controlled by commands issued via the ARIES NET*Link*'s SLC. The ASM is supplied with a thermoplastic mounting cover and is designed to mount in a standard 4-11/16" electrical box or a 4" square, extra-deep electrical box. **Note:** The ASM cannot be programmed to synchronize with ARIES NET*Link* NAC and R-NAC outputs and does not support 60 or 120 BPM operation or Temporal Code 3.	
Addressable Manual Pull Station, Series 3300 **P/N 84-330002-001**	The Addressable Manual Pull Station is an intelligent initiating device that contains its own SmartOne Addressable Input (AI) module and interfaces directly to any SmartOne-compatible control unit. The initiating device circuit is wired as NFPA Class B. The Manual Pull Station is constructed of heavy die-cast aluminum for long life and uses an internal toggle switch for reliable operation.	
PEGAsys Addressable Loop Module (PALM) **P/N 77-297103-000**	The PEGAsys™ Addressable Loop Module (PALM), is a monitor module that enables the ORION XT High Sensitivity Smoke Detector (HSSD) to report Pre-alarm, Alarm, and Trouble signals to the ARIES NET*Link* control unit via its signaling line (SLC) circuit. The PALM mounts inside the ORION XT detector housing. **Note:** The PALM address cannot be set via the Handheld Programmer. Use either the ORION Configuration Software or the ARIES NET*Link*'s keypad/display to set the PALM's address.	
AIR-Intelligence SmartOne Addressable Protocol Interface Card (APIC) **P/N 76-333002-001**	The AIR-Intelligence SmartOne APIC is an interface module which integrates AIR-Intelligence High Sensitivity Smoke Detectors with the ARIES NET*Link* control unit via its signaling line (SLC) circuit. The APIC mounts inside the AIR-Intelligence detector housing. **Note:** Device addresses cannot be set via the Handheld Programmer; addresses must be set by moving switches on either the APIC or Command Module.	

Table 1-6. Supported SmartOne Addressable Modules

Isolator Modules **P/N 74-200012-002** **P/N 74-200012-004 (mounts in 6SB detector base)**	Isolator modules are automatic switches that open a segment of the signaling line circuit when a short-circuit fault is detected in that segment. The remainder of the signaling line circuit continues to function normally and is unaffected by the short-circuit fault. The isolator modules will close and resume normal operation when the short-circuit fault is removed.	
SmartOne Remote Releasing Module **P/N 70-600000-001 (std. mounting bracket)** **P/N 70-600000-002 (cabinet mounting bracket)**	The Remote Releasing Module (RRM) provides the ability to remotely activate extinguishing-system control devices (for example, actuators and solenoid valves). Connection is via the control unit's Signaling Line Circuit (SLC). The module is field-programmable using the control unit keypad or Hand-Held Programmer.	

The following power supplies are compatible with the Remote Releasing Module:

Table 1-7. Compatible RRM Power Supplies

Description	Manufacturer	Part Number
Multi-Zone Power Supply Assembly	Kidde	89-300020-001
24 VDC, 2A Auxiliary Power Outputs located on the ARIES NET*Link* PMU Board	Kidde	-
24 Vdc, 3A Power Supply, red enclosure	Altronix	AL400ULXR
24 Vdc, 3A Power Supply, grey enclosure	Altronix	AL400ULX
24 Vdc, 6A Power Supply, red enclosure	Altronix	AL600ULXR
24 Vdc, 6A Power Supply, grey enclosure	Altronix	AL600ULX
24 Vdc, 8A Power Supply, red enclosure	Altronix	AL1024ULXR
24 Vdc, 8A Power Supply, grey enclosure	Altronix	AL1024ULX
24 Vdc, 8A POWERPATH Power Supply	Eaton Wheelock	PS-8-LP

Note: Altronix power supplies may be ordered through an authorized Altronix dealer. For a list of dealers, visit www.altronix.com or call (888)-258-7669.

1-18 OPTIONAL SOFTWARE

An optional means of accessing the ARIES NET*Link* control unit is available which requires the use of a personal computer with specific software pre-installed.

1-18.1 Remote Configuration Software

Complete programming and configuration of the ARIES NET*Link* system can be accomplished with a user-provided personal computer running the ARIES NET*Link* Configuration Tool (ACT8000). Licensed distributors may download this software from the secure “Distributor Extranet” link on *www.kiddefiresystems.com*.

Note: The computer must be connected to the Main Controller Board by either an RS232 or USB connection.

The ARIES NET*Link* Configuration Tool is capable of performing the following tasks:

- configuration file upload to the ARIES NET*Link* panel
- configuration file download from the ARIES NET*Link* panel
- editing of configuration files
- storage of configuration files
- printing of configuration files
- comparison of two configuration files, with printout of differences
- verification and syntax-checking of configuration files
- download and storage of Event Logs
- purging of the Event Log
- complete User Interface menu access
- configuration of all SLC devices
- configuration of Soft Keys
- configuration of all panel parameters including NAC configurations, release circuit configurations, output control, etc.
- Event-Output-Control (EOC) programming
- configuration of control unit networking
- configuration of Isolation Macros

Installation, setup and operation of the ARIES NET*Link* Configuration Tool is explained fully in the *ARIES NETLink Configuration Tool User's Guide* (P/N 06-237059-001).

1-19 SYSTEM SPECIFICATIONS

Item	Description
OPERATING ENVIRONMENT	
Temperature:	32°F to 120°F (0°C to 49°C)
Relative Humidity:	93% RH @ 90°F

MAIN & EXPANSION ENCLOSURES	
Material of Construction:	16 Gauge (0.059 inches or 1.49 mm) rolled steel
Color:	Red
3-Tiered Main and Expansion Enclosures:	31-1/2 in. (800.1 mm) Height x 14-3/8 in. (365.1 mm) Width x 5-3/8 in. (136.5 mm) Depth
2-Tiered Main and Expansion Enclosures:	22-1/2 in. (571.5 mm) Height x 14-3/8 in. (365.1 mm) Width x 5-3/8 in. (136.5 mm) Depth

AUXILIARY ENCLOSURES	
Material of Construction:	16 Gauge (0.059 inches or 1.49 mm) rolled steel
Color:	Red
Remote Enclosure:	7-1/2 in. (190.5 mm) Height x 12-3/4 in. (323.9 mm) Width x 2-3/4 in.(69.8 mm) Depth
Large Capacity Battery Cabinet:	12 in. (304.8 mm) Height x 20 in. (508.0 mm) Width x 8-1/4 in. (209.5) Depth

EXPANSION CARDS	
Card Dimensions:	3.5 in. (88.9 mm) Height x 7.0 in. (177.8 mm) Width
SIGNALING LINE CIRCUIT CARD	Includes one (1) SLC Circuit; Maximum of 6 cards in fully expanded system
Connections between the control unit, the signaling line circuit, and the associated SLC devices are supervised and power-limited.	
Wiring Types:	– CLASS-B – CLASS-A – CLASS-A, Style 7 (Note: Requires Isolator Modules.)
Operating Voltage:	Nominal 24 Vdc
Maximum Line Resistance:	40 Ohms per loop
Maximum Conductor-to-Conductor Capacitance:	0.5 µF
Maximum SLC Loop Capacitance to Earth Ground:	0.5 µF (including devices)
Maximum SLC Loop Current:	350 mA (short circuit)
Max. Number of Devices:	255 per SLC circuit (limitations apply) Refer to Appendix B “Wiring and Configuration Requirements for Signaling Line Circuits” for more information.

Item	Description
RELAY CARD	Includes four (4) Form C Programmable Relays; no limit on number of Relay cards in fully expanded system (if slots available)
Contact Rating:	3.0 A @ 30 Vdc (resistive) 3.0 A @ 120 Vac (resistive)
CITY TIE CARD	Includes three (3) output circuits to connect to Municipal Tie inputs; Maximum of 1 card in fully expanded system
Local Energy Type:	24 Vdc nominal @ 550 mA maximum Supervised for opens and ground faults
Shunt-Type Master Box:	24 Vdc nominal @ 5 A maximum
Reverse Polarity Type:	24 Vdc nominal @ 100 mA maximum
DIGITAL ALARM COMMUNICATOR TRANSMITTER (DACT) CARD	
Operating Voltage/Current:	Nominal 24 Vdc @ 37 mA
Electrical Interface	PSTN line using a RJ45X phone jack
Protocols	SIA DC-05-1999.09 Ademco Contact ID SIA DC-03-1990.01 (R2003.10)
Digital Alarm Communicator Receivers (DACRs):	Compatible with Sur-Gard System I, Sur-Gard System III and Osborne Hoffman Model 2000E
NETWORK INTERFACE CARD (NIC)	Allows up to 64 control units to be networked; Maximum of 1 card per node.
Operating Voltage/Current:	Nominal 24 Vdc @ 63 mA
Interconnecting Wiring Type	AWG 18, twisted, shielded pair CLASS-B, Style 4 or CLASS-A, Style 7
Maximum Recommended Length	4,000 ft. (1.219 m)
Data Ports	EIA/TIA-485
Baud Rate	38,400 baud
INTERNET COMMUNICATIONS MODULE (ICM) CARD	Maximum of 1 card in fully expanded system
Operating Voltage/Current:	Nominal 24 Vdc @ 42 mA
Connector:	RJ45 (Ethernet)

Item	Description	
RELEASE-NOTIFICATION APPLIANCE CIRCUIT (R-NAC) CARD	Includes three (3) R-NAC Circuits; no limit on number of R-NAC cards in fully expanded system (if slots available)	
End-of-Line Resistor:	10 K, 5%, 1/2 W	
Total Voltage Drop at End-of-Line:	2 V	
Max. Supervisory Current:	5mA	
Release Output Specifications:		
Solenoid-Based Devices:	When solenoid-based releasing devices are used, the output can be wired as CLASS-A or CLASS-B. When wired as CLASS-A, the circuit is supervised for opens and short circuits and is power-limited. For CLASS-B wiring, if an In-Line Releasing Device is included, the circuit is supervised for opens and short circuits and is power-limited. For CLASS-B wiring, if an In-Line Releasing Device is NOT included, the circuit is supervised for opens only and is non-power-limited. Circuits are always supervised for ground faults.	
Actuator-Based Devices:	When actuator-based releasing devices are used, only CLASS-B wiring is allowed. The circuit is supervised for opens and short circuits and is power-limited when the In-line Releasing Device is used. Circuits are always supervised for ground faults.	
Maximum Devices per Circuit:	**Solenoid-Based Devices:** 1	**Actuator-Based Devices:** Refer to Table C-3 in Appendix C.
Maximum Output Circuit Terminal Voltage:	28 Vdc	28 Vdc
Minmum Output Circuit Terminal Voltage:	20 Vdc	20 Vdc
In-Line Releasing Device	P/N 76-800000-004 (for CLASS-A Power-Limited Wiring) P/N 06-220023-001 (for CLASS-B Power-Limited Wiring)	
NAC Output Specifications:		
Wiring Types / Electrical Supervision:	– 24 Vdc regulated – When NAC devices are used, the output can be wired as CLASS-A or CLASS-B. – When configured as a NAC, circuit is supervised and power-limited. – When configured as a NAC, either synchronized or non-synchronized strobes are supported.	
Maximum Output Current:	**Non-Synchronized:** 2.0 A	**Synchronized:** 1.5 A
Maximum Output Circuit	28 Vdc	28 Vdc
Minmum Output Circuit Terminal Voltage:	20 Vdc	20 Vdc
POWER MANAGEMENT UNIT (PMU) BOARD	Each Power Management Unit can interface with two AC-to-DC switching power supplies for a total of 10.8 A @ 27.6 Vdc. Maximum of 4 PMU's in fully expanded system.	
AC-to-DC Power Conversion:	1 or 2 switching power supplies per PMU	
Primary AC Power Input: **NOTE**: Primary power is selected by setting the slide switch on the side of the power supply.	**1 Power Supply Unit:** 120 Vac, 50/60 Hz, 3.2 A 240 Vac, 50/60 Hz, 1.6 A	**2 Power Supply Units:** 120 Vac, 50/60 Hz, 6.4 A 240 Vac, 50/60 Hz, 3.2 A
DC Power Output:	5.4A @ 27.6 Vdc	10.8A @ 27.6 Vdc

Item	Description
POWER MANAGEMENT UNIT (PMU) BOARD	(continued from previous page)
Trouble Relay Output:	1.0 A @ 30 Vdc (resistive)
Auxiliary Outputs:	2 per PMU, power-limited, special application
Aux. Output Operating Voltage Range:	19.2 - 27.6 Vdc , power-limited
Aux. Output Max. Current:	2 A @ 470 µF max. per output, power-limited
Battery Charging Circuit Voltage:	27.0 Vdc (nominal)
Maximum Battery Charging Circuit Current:	4.0 A (one Power Supply Unit); 8.9 A (two power supply units)
Maximum Battery Charging Capacity:	165 AH

MAIN CONTROLLER BOARD (MCB)	
DC Power Input to MCB:	27.6 Vdc @ 10.8 A maximum
KEYPAD/DISPLAY	MCB includes one (1) Keypad/Display (mounted to board).
RS485 Output:	EIA/TIA-485, AWG 18, twisted **shielded** pair 4,000 ft. (1,219 m) maximum wire length Use low capacitance cable – maximum 15pF per ft.
Baud Rate:	38,400 baud
Synch In/Out:	3.3 Vdc Logic - for local connections to RDCM and R-LAM Modules only
ON-BOARD RELAYS	MCB includes three (3) Form-C Voltage Free, Programmable Relays (normally de-energized) and one (1) dedicated Form-C Trouble Relay (normally energized)
Relay Contact Rating:	3.0 A @ 30 Vdc (resistive) 3.0 A @ 120 Vac (resistive)
ON-BOARD RELEASE-NOTIFICATION APPLIANCE CIRCUITS (R-NACs)	MCB includes two (2) R-NAC Circuits.
	Refer to Specifications for R-NAC Expansion Card
End-of-Line Resistor:	10 K, 5%, 1/2 W
Total Voltage Drop at End-of-Line:	2 V
Max. Supervisory Current:	5mA
ON-BOARD NOTIFICATION APPLIANCE CIRCUITS (NACs)	MCB includes two (2) NAC Circuits.
Wiring Types/Electrical Supervision:	– 24 Vdc regulated – CLASS-A or CLASS-B, supervised and power-limited – Either synchronized or non-synchronized strobes are supported.
End-of-Line Resistor:	10 K, 5%, 1/2 W
Total Voltage Drop at End-of-Line:	2 V

Item	Description	
MCB ON-BOARD NACs	(continued from previous page)	
Max. Supervisory Current:	5mA	
Maximum Output Current:	**Non-Synchronized:** 2.0 A	**Synchronized:** 1.5 A
Maximum Output Circuit Terminal Voltage:	28 Vdc	28 Vdc
Minimum Output Circuit Terminal Voltage:	20 Vdc	20 Vdc
ON-BOARD SIGNALING LINE CIRCUITS (SLCs)	MCB includes two (2) SLC Circuits.	
	Refer to Specifications for SLC Expansion Card	

REMOTE DISPLAY CONTROL MODULE (RDCM)	Maximum of 15 Remote Display Control Modules supported. The total number of remote devices cannot exceed more than 31 total addresses (30 if integrated LAM is included in system).
DC Power Input:	24.0 Vdc @ 150 mA maximum
Input Capacitance:	100 µF max.
PMU Trouble Relay Input:	short = normal; open = fault
Synch In/Out:	3.3 Vdc Logic - for local connections to RDCM and LAM Modules only
RS485 Input/Output:	EIA/TIA-485, AWG 18, twisted **shielded** pair 4,000 ft. (1,219 m) maximum wire length Use low capacitance cable – maximum 15pF per ft.

REMOTE LED ANNUNCIATOR MODULE (R-LAM)	Maximum of 16 Remote LED Annunciator Modules supported. The total number of remote devices cannot exceed more than 31 total addresses (30 if integrated LAM is included in system).
DC Power Input:	24.0 Vdc @ 150 mA maximum
Input Capacitance:	100 µF max.
PMU Trouble Relay Input:	short = normal; open = fault
Synch In/Out:	3.3 Vdc Logic - for local connections to RDCM and LAM Modules only
RS485 Input/Output:	EIA/TIA-485, AWG 18, twisted **shielded** pair 4,000 ft. (1,219 m) maximum wire length Use low capacitance cable – maximum 15pF per ft.
FIBER OPTIC CONVERTER MODULE	Allows up to 64 control units to be networked; mounted externally from control unit
Multi-mode cable type	62.5/125 μm duplex fiber-optic
Single-mode cable type	8.3/125 μm duplex fiber-optic
Max. Recommended Length	multi-mode: 1 mile (with no more than 6.4 dB/mile cable attenuation) single-mode: 12 miles (with no more than 1.66 dB/mile cable attenuation)
Enclosure Dimensions	13 x 7-1/2 x 2 in.
Fiber Optic Connections	Type “ST”
Electrical Connections	UL-recognized Terminal Blocks for wire size 12 - 30 AWG
Data Ports	EIA/TIA-485

Item	Description
FIBER OPTIC CONVERTER MODULE	(continued from previous page)
Baud Rate	38.4K Baud
Operating Voltage/Current	24 Vdc nominal @ 38 mA maximum (Single Mode) 24 Vdc nominal @ 36.9 mA maximum (Multi Mode)
Temperature Range	0 - 50 degrees C
Humidity Range	0 - 93% RH, non-condensing
Enclosure Color	Red
Weight	5 lbs.

CHAPTER 2
INSTALLATION

2-1 INTRODUCTION

This chapter is intended for system installers. It provides information necessary to successfully prepare for and install the ARIES NET*Link*™ control unit. Refer also to the Installer's Wiring Diagram, P/N 06-237046-001, that is packaged with the ARIES NET*Link* system.

2-2 PREPARING FOR INSTALLATION

Before beginning installation of the ARIES NET*Link* system, do the following:

1. Unpack the shipping carton.

Note: The use of two people to lift the control unit out of its carton is recommended.

2. Gather all necessary materials and tools.
3. Determine a wall location for the control unit and peripherals.

2-2.1 Unpacking the System

Check the contents of the ARIES NET*Link* shipping carton(s) to ensure that you have received the components listed below. (Refer to the Parts List in Chapter 8 for part numbers of some items.)

1. Remove the keys from the envelope taped to the top of the enclosure.
2. Disconnect the ground wire that connects the enclosure door to the enclosure.
3. Remove the control unit door first by unlocking it and then lifting the door up to allow the door's hinges to clear the mating-hinge pins on the enclosure.
4. Remove the separately packaged power supply unit, Power Management Unit Board, Main Controller Board with attached Keypad/Display and installation hardware and documentation from inside the enclosure. Set these parts and the door aside in a safe location to prevent damage.
5. Locate all optional system components ordered and set them aside in a safe location.

Note: Optional components such as the Expansion Card Cage, Expansion Cards, additional Power Supply Units, etc. will be packaged separately (not contained in the ARIES NET*Link* Enclosure).

2-2.1.1 STANDARD SYSTEM CONTENTS

- Enclosure w/Door
- Power Supply Unit, P/N 76-800030-002, with harness and hardware - quantity of one (1); additional units may be ordered separately.
- Power Management Unit (PMU) Board, P/N 76-800030-004, with harness and hardware - quantity of one (1); additional units may be ordered separately.
- Main Controller Board (MCB) with Keypad/Display, P/N 76-800020-001, with harnesses and hardware - quantity of one (1); additional units may be ordered separately.
- Operating Instructions, P/N 06-237049-001

- Installation/Configuration Kit, P/N 76-800000-008, containing:
  - User Disk
  - Installer’s Wiring Diagram

  The User CD includes the launcher which provides the ACT8000 Configuration Tool and the following user documentation: Installation, Operation and Maintenance Manual, ACT8000 User's Manual, Wiring Diagram, Operator Instructions and USB Driver Installation Instructions. These documents are also available on the distributor extranet on www.kiddefiresystems.com.

2-2.1.2 ADDITIONAL ITEMS

The additional items below are available separately from the standard control unit:

- Battery Tray, P/N 76-800030-006
- Large Capacity Battery Cabinet , P/N 76-100010-001
- Expansion Card Cage Assembly, P/N 76-800010-001
- Expansion Cards
- Standby Batteries
- Add-On Power Supply/PMU Assembly, P/N 76-800030-003
- Expansion Enclosures
- Remote Enclosure
- Dead Front Cover

2-2.2 Materials/Tools Required

The materials listed below are NOT supplied with the system, but may be needed for installation.

- 1/4” mounting bolts to mount the control unit cabinet (recommended)
- Electrical conduit for AC input power and field circuits
- Electrical junction boxes (as required)
- Wire-nuts and crimp-on terminals (as required)
- Basic electrician hand tools
- Wrist ground strap

2-2.3 Determining Wall Location

The control unit can be surface or semi-flush mounted. For either mounting configuration, locate the top of the cabinet approximately 66 in. above the floor so that the control unit’s display is positioned at a convenient height for viewing system events and for entering operator commands (or in accordance with field wiring).

Choose a location in an area that allows easy access for operation and maintenance of the system. If a location has been designated by an architect and/or fire-prevention authority, plan your installation according to that location. It is important that the location of the system be clean, dry, vibration-free, and maintained within the environmental limits.

2-2.4 Removing Knockouts From Enclosure

Remove knockouts as required for conduit connections. Consult approved electrical installation drawings for connection information.

2-2.5 Installing Conduit

Route properly-sized conduit from the control unit to locations designated on the approved layout drawings for peripheral devices. Refer to the locations of the automatic and manual initiating devices, notification appliances, Remote Display Control Modules, LED Annunciator Modules, control heads for the extinguishing system, and addressable relay modules on the system drawings.

2-2.6 Installing Electrical Boxes

Install an electrical box at each designated location for peripheral devices such as automatic and manual initiating devices, notification appliances, control heads for the extinguishing system, and addressable relay modules. Refer to the installation instructions included with the peripheral devices for the proper types of electrical boxes.

2-3 OVERVIEW OF INSTALLATION STEPS

The following paragraphs provide an overview of installation steps once the system is unpacked and site preparation is completed. Detailed instructions on how to complete each step are provided in the pages which follow.

2-3.1 Step One: Shut Off AC Power

Ensure that dedicated AC circuit is shut off before beginning installation.

CAUTION **Power should be off when removing or connecting PCBs and cabling.**

2-3.2 Step Two: Prepare the Enclosure and Electrical Wiring

Conduit knockouts must be removed from the enclosure and the installation site must be prepared with appropriate electrical wiring before system installation can begin.

2-3.3 Step Three: Mount the Enclosure

The control unit can be either surface or semi-flush mounted. For full mounting and installation procedures, refer to Section 2-4.1 (surface mounting) or Section 2-4.2 (semi-flush mounting).

2-3.4 Step Four: Install the Top Tier Power Supply/PMU Assembly and MCB

- Install one or more power supplies and the Power Management Unit(PMU) Board into the top tier.
- Install the hinged Main Controller Board with Keypad/Display over power suppl(ies) and PMU Board.
- Dress and connect field wiring to the PMU and Main Controller Boards as shown on the approved system drawings and as illustrated in this manual.
- Make AC power connections.
- Make internal DC power and COM connections.
- Remove the Battery Insulator Tab on the Main Controller Board Real Time Clock.

2-3.5 Step Five: Install Expansion Card Cage and Included Cards (if applicable)

- Install the Expansion Card Cage and Expansion Cards. If an Expansion Enclosure is required for either additional PMU-linked Power supply Units or Expansion Card Cages, Inter-Cabinet Harness Kit (P/N 76-800000-006) should also be installed.
- Dress and connect field wiring to applicable cards as shown on the approved system drawings and as illustrated in this manual.
- Make internal DC power and COM connections.

2-3.6 Step Six: Install Batteries

- Install standby batteries into bottom tier or Large Capacity Battery Cabinet.

2-3.7 Step Seven: Install Expansion Enclosures and/or Remote Modules (if applicable)

- Install add-on cabinets and equipment: Expansion Enclosure(s), Remote Display Control Modules, LED Annunciator Modules, additional Power Supply/PMU Assembl(ies), additional Card Cages.
- Dress and connect field wiring to applicable modules as shown on the approved system drawings and as illustrated in this manual.
- Make internal DC power and COM connections.

2-3.8 Step Eight: Auto-configuring the System

Auto-configure the system as directed in Section 3-1.1. Print out the list of SLC-based initiating devices and addressable control and/or relay modules detected by these procedures and compare this list to the approved set of SLC devices. Correct any inconsistencies and/or trouble messages.

2-3.9 Step Nine: Uploading the Configuration File and Performing the Pre-Test

Upload the site-specific configuration file. After uploading the configuration file, the control unit will restart in order to begin using the new settings. Note that the USB or RS232 cable should be disconnected at this time.

Pre-test the system in accordance with the approved sequence of operation. Be sure that extinguishing-system actuation devices are not connected to the extinguishing system during pre-testing.

Note: The serial number of the control unit, which is requested during initial startup, can be obtained from a label located on the inside of the control unit door.

2-3.10 Step Ten: Performing Final System Test and Commissioning the System

Final test and commission the system in the presence of the owner and the authority having jurisdiction. Be sure that extinguishing-system actuation devices are not connected to the extinguishing system during final testing.

2-3.11 Step Eleven: Installing the Actuation Devices and Extinguishing System

Connect the actuation devices to the extinguishing system per the procedures in the applicable suppression system installation manual.

2-3.12 Step Twelve: Performing Final Installation Procedures

Install the front door when testing is completed, all appropriate occupancy certificates have been secured, the end user has been thoroughly trained in the system operation, and the system is armed and ready for service. Lock the front door and give the key to the end user's designated personnel.

2-4 STANDARD SYSTEM INSTALLATION PROCEDURE

The instructions which follow pertain to installation of a standard ARIES NET*Link* control unit, which includes one Power Supply Unit, one Power Management Unit (PMU) Board and Main Controller Board (MCB) with Keypad/Display. Installation for additional equipment follows this section. Refer to Section 2-7.

2-4.1 Surface Mounting of Main or Expansion Enclosures

To surface mount either the 3-Tiered Enclosure or 2-Tiered Enclosure (see Figure 2-1), do the following;

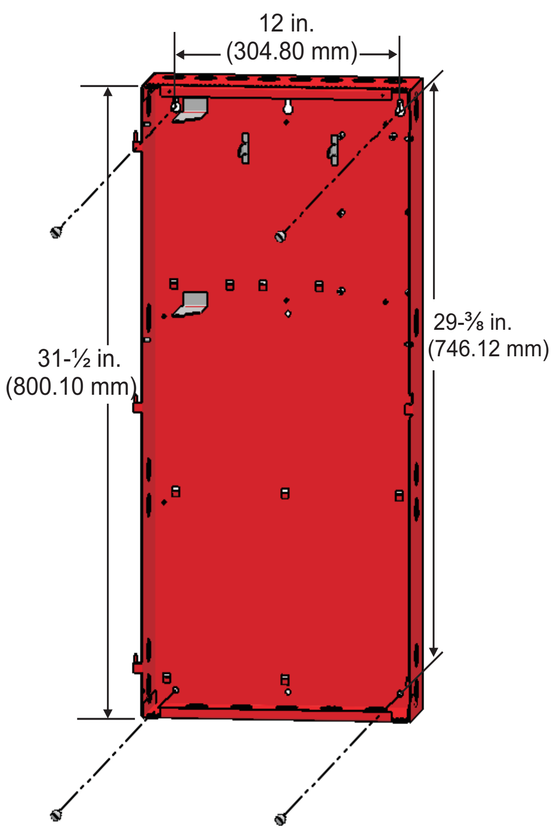
1. Mark and pre-drill holes for mounting bolts using the dimensions shown. Three keyhole slots (at the top) and three holes (at the bottom) are located in the enclosure's rear panel that serve as a template for surface mounting.

Note: The installer must supply the mounting bolts (up to size 1/4-20).

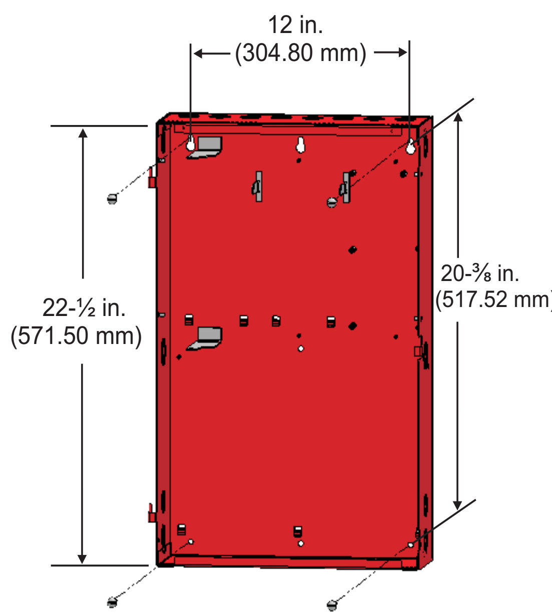
2. Insert the upper three fasteners in the wall. Leave approximately 1/4" of the screws protruding.
3. Slip upper keyholes of the enclosure over the protruding screws. Tighten the screws.
4. Insert and tighten the three lower screws.

Note: It is recommended that one of the rows of mounting holes be aligned with the wall stud, preferably the middle row of mounting holes.

5. Attach wiring conduit to the enclosure via the enclosure knockouts and pull the required number of wires through the conduit to the enclosure. Leave approximately 2 to 3 feet of wire length in the enclosure for field wiring connections.



(a)



(b)

Figure 2-1. Mounting Dimensions for 3-Tiered (a) and 2-Tiered (b) Main and Expansion Enclosures

2-4.2 Semi-Flush Mounting of Main or Expansion Enclosures

To semi-flush mount the control unit:

1. Cut and plumb an opening in the wall on which the control unit will be mounted:
   - approximately 15 in. wide by 32 in. high (see Figure 2-2 (a) for 3-Tiered Enclosure)
   - approximately 15 in. wide by 23 in. high (see Figure 2-2 (b) for 2-Tiered Enclosure)
2. Position and plumb the enclosure in the opening made in Step 1. Ensure that the front edge of the enclosure is at least 3/4 inches from the surface of the wall. Center the enclosure within the opening as closely as possible.
3. Secure the enclosure to the wall with appropriate mounting bolts (up to size 1/4-20). The enclosure may optionally be mounted to adjacent wall studs. Holes for stud mounting must be drilled as required into the side of the enclosure.
4. Attach wiring conduit to the enclosure through the knockouts, and pull the required number of wires through the conduit to the enclosure. Leave approximately 2 to 3 feet of wire length in the enclosure for field wiring connections.
5. Slide trim ring over the enclosure and fasten to wall using the included double-sided tape. Refer to Figure 2-3.

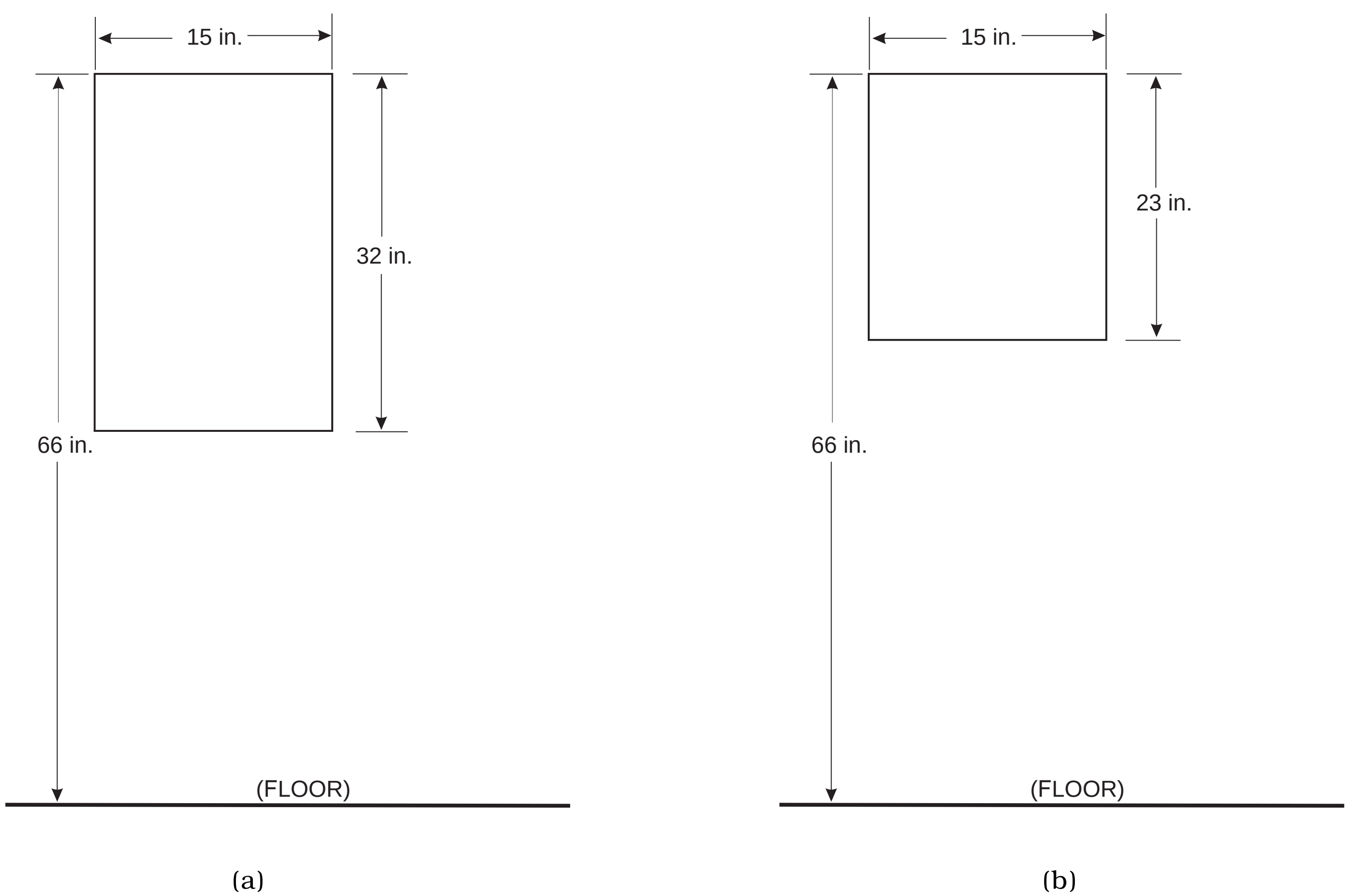


Figure 2-2. Rough Openings for 3-Tiered (a) and 2-Tiered (b) Main and Expansion Enclosures

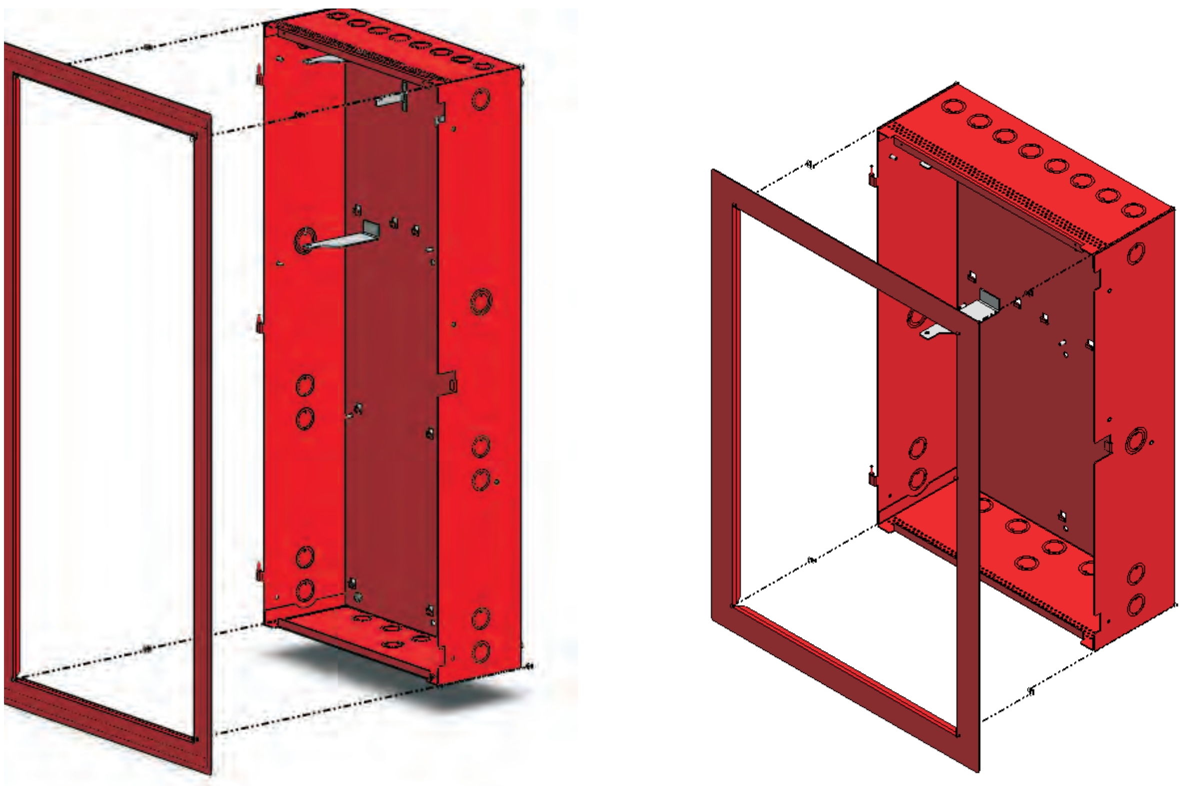


Figure 2-3. Semi-Flush Mounting of 3-Tiered and 2-Tiered Main & Expansion Enclosures

2-4.3 Installing A Power Supply Unit into The Enclosure Top Tier

CAUTION **Use a ground strap to prevent static discharge that could damage the power supply.**

Note: The top tier of the enclosure has been designed to accommodate two power supply units and a Power Management Unit (PMU) Board. Power supply units and PMU Board must be installed first, followed by the Main Controller Board and Keypad/Display which fits over these components.

To install a power supply unit into the top tier of an enclosure:

1. Make sure the control unit location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the power supply.
2. Remove the power supply unit from its packaging.
3. Orient the power supply unit such that its wire harness is located at the bottom.
4. Ensure that the power supply unit AC-input-voltage selector switch is set to the proper position for either 115 Vac or 230 Vac. See Figure 2-4 below.

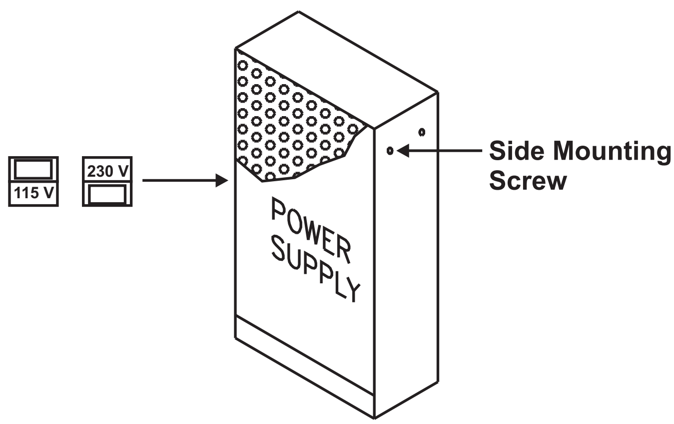


Figure 2-4. Power Supply Unit

5. Locate the side mounting screw which is in place on the side of the power supply unit. Refer to Figure 2-4 above for location of hole. Back out the screw by approximately 1/8-inch.
6. Locate the two power supply unit retention tabs in the cabinet and side fastening tab in the enclosure's back panel.
7. With the wire harness down, slide the power supply unit onto the two retention tabs, aligning the side mounting screw with the fastening tab at the same time.

Note: It is recommended that the leftmost Power Supply Unit slot be occupied first in order to access to the side fastening tab.

8. Slide the side mounting screw into the slot of the fastening tab.
9. Tighten the side mounting screw onto the fastening tab to secure the power supply unit in place.

Note: If an additional power supply unit has been purchased, repeat this procedure to install that power supply next to the one just installed.

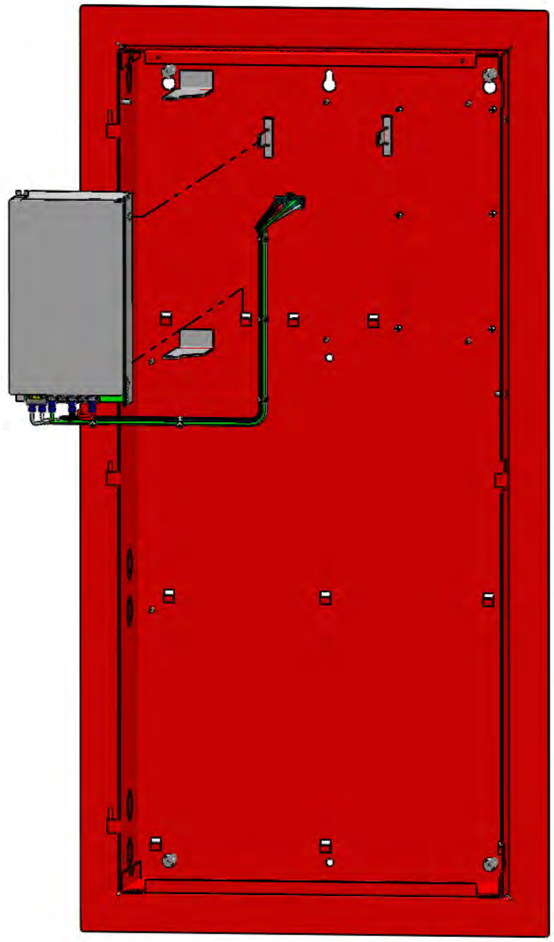


Figure 2-5. Installing A Power Supply Unit into the Enclosure Top Tier (Leftmost Slot)

2-4.4 Installing the Power Management Unit (PMU) Board into Enclosure Top Tier

Note: The top tier of the enclosure has been designed to accommodate two power supply units and a Power Management Unit (PMU) Board. Power supply units and PMU Board must be installed first, followed by the Main Controller Board and Keypad/Display which fits over these components.

Note: If AC power is lost on any PMU Board of a ARIES NET*Link* system containing multiple PSU/ PMU Board assemblies, the system will immediately stop charging standby batteries and the batteries will supply the load of all PMU Boards that are in the Trouble state. The system should be serviced immediately to restore AC power. Refer to Chapter 7, *Troubleshooting*, for more information on probable causes of AC power loss and recommended corrective actions.

If additional power supply units and PMU Boards are installed on a ARIES NET*Link* system, the PMU Board located at the top tier should always be the board physically connected to the Main Controller Board (both power cable and COM harness). This is to ensure that the MCB will remain powered on in the case where the control unit is operating on battery power and the battery voltage drops too low. The PMU Board powering the MCB is always the last one to be shut down on low battery voltage.

CAUTION **Use a ground strap to prevent static discharge that could damage the PCB.**

WARNING **Ensure that the dedicated AC circuit is shut off at its source before beginning this procedure.**

To install the PMU Board into the top tier of an enclosure:

1. Make sure the control unit location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the PMU Board.
2. Remove the PMU Board from its packaging.
3. Orient the board such that its black AC power input connectors (TB1) are positioned at the top right corner.
4. Locate the rightmost Power Supply Unit fastening tab in the enclosure's back panel. Position the PMU board such that the left side of the board aligns with this tab and the six mounting screw holes (as shown in Figure 2-6).
5. Locate the six #8 Phillips-head mounting screws, 5/8-in. standoff and ground wire assembly found in the hardware kit.
6. Insert and hand-tighten two of the three mounting screws on the left side of the board to hold it in place and align screw holes.
7. Position the 5-in. ground wire assembly over the right topmost screw hole (located beside the AC power input connector). Refer to Figure 2-11 for location of screw hole. Insert the 5/8-in. standoff and mounting screw; hand-tighten.
8. Put all remaining mounting screws in place and tighten securely.
9. With the PMU board mounted, connect the wire harnesses from the power supply unit(s) to the white connectors (J1 and J2) at the top of the board (as shown in Figure).
10. Proceed to Section 2-4.5, *Connecting the Audible PMU Trouble Sounder Harness*.

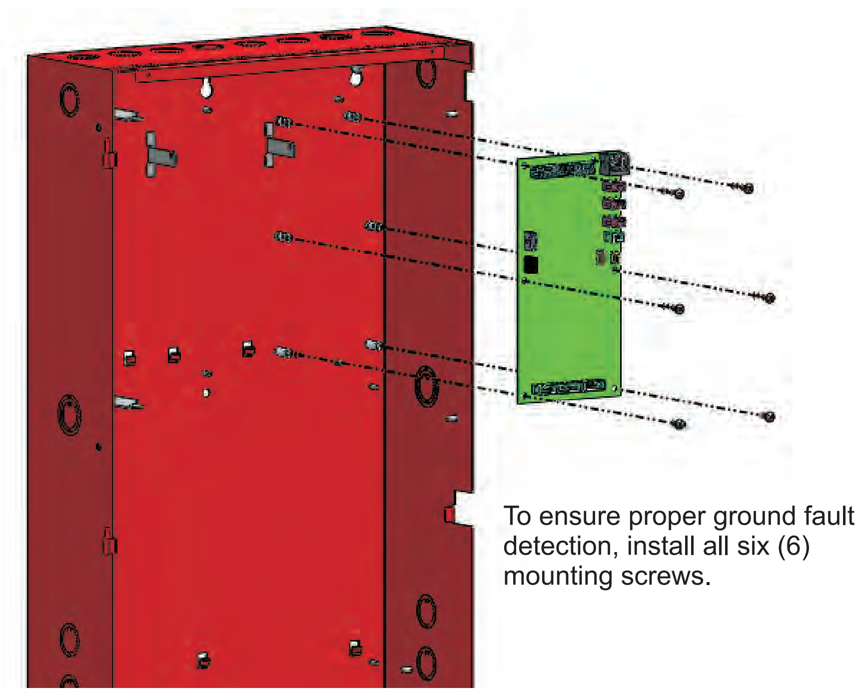


Figure 2-6. Installing A PMU Board into the Enclosure Top Tier

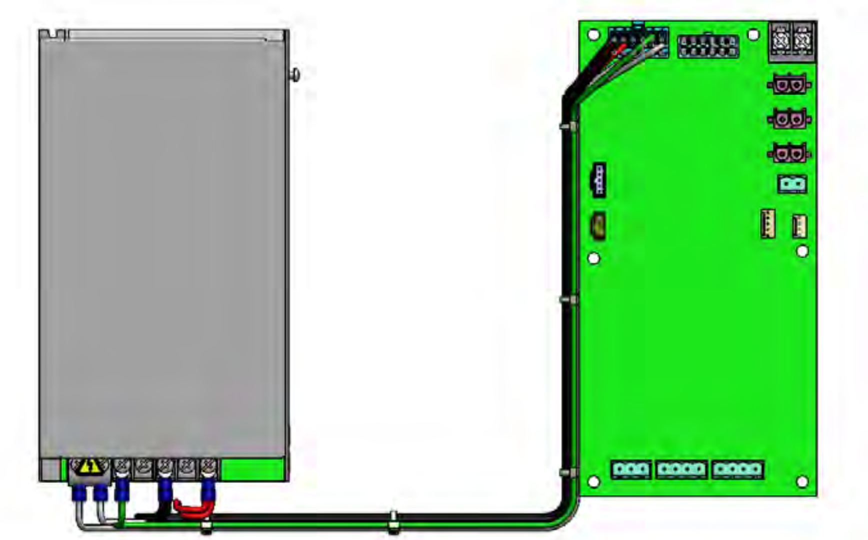
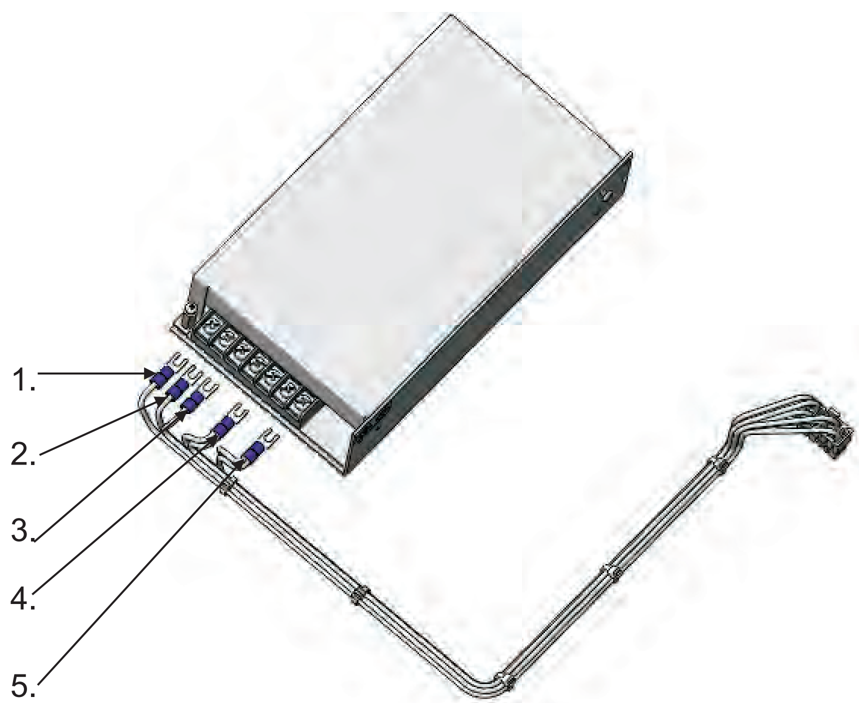


Figure 2-7. Connecting Power Supply Wiring Harness to PMU Board



Colored Harness Wire to Attach	Terminal on Power Supply (from Left to Right)
1. White and Black wire	1 (Line)
2. All-White wire	2 (Neutral)
3. Green wire	3 (Ground)
No connection	4
4. Double-Black wire	5 (24 Vdc Negative Return)
No connection	6
5. Double-Red wire	7 (24 Vdc Positive Return)

Figure 2-8. Power Supply Wiring Harness Connections

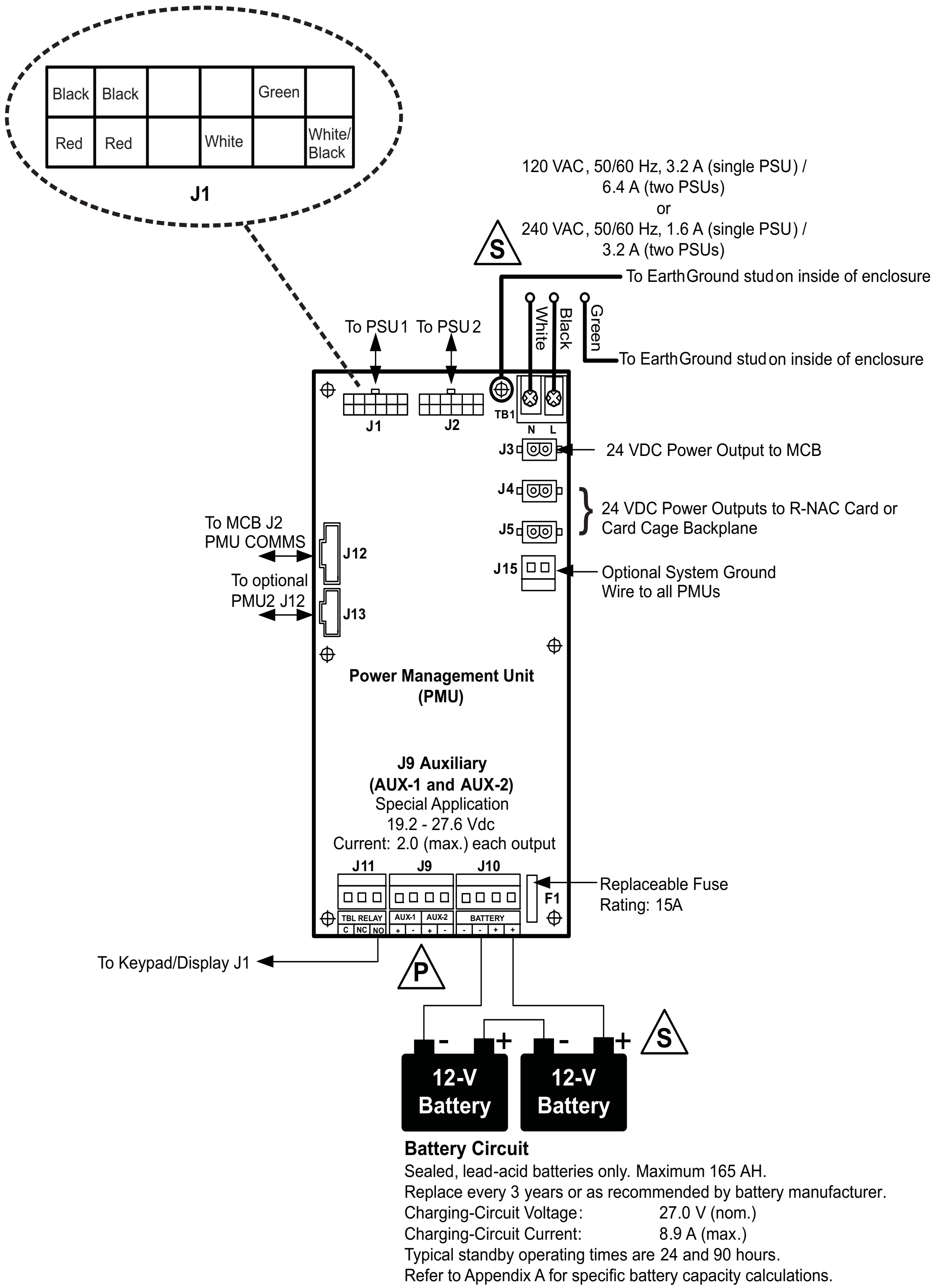


Figure 2-9. Wiring Diagram for Power Management Unit (PMU) Board

2-4.5 Connecting the Audible PMU Trouble Sounder Harness

The system's audible buzzer is activated by the Trouble Relay on the PMU board and sounds upon PMU microprocessor failure and loss of AC power. The Audible PMU Trouble Sounder harness, P/N 06-220341-002, is supplied in the PMU Board hardware kit.

To install the Audible PMU Trouble Sounder harness:

- Insert the correct end of the harness into Trouble Relay J11 on the PMU Board. Leave the other end dangling until the Main Controller Board is installed.
- Proceed to Section 2-4.6, *Making AC Power Source and Earth Ground Connections*

2-4.6 Making AC Power Source and Earth Ground Connections

The ARIES NET*Link* control unit uses commercially- or end-user-provided AC power as the primary power source, together with 24 Vdc standby batteries (when required by local codes and/or Authority Having Jurisdiction [AHJ] requirements). The primary AC power for the ARIES NET*Link* control unit is shown in Table 2-1.

Table 2-1. Primary AC Power Input

1 Power Supply Unit:	2 Power Supply Units:
120 Vac, 50/60 Hz, 3.2 A	120 Vac, 50/60 Hz, 6.4 A
240 Vac, 50/60 Hz, 1.6 A	240 Vac, 50/60 Hz, 3.2 A

Note: The default power configuration is 120 Vac and will require resetting for 220/240 Vac operation. Configuration of primary AC power requires that the AC power-selection switch on the side of the power supply unit be set correctly before it is installed in the enclosure. Refer to Figure 2-4 for switch location.

The ARIES NET*Link* system requires a separate, dedicated connection to an AC branch circuit that must be labeled "Fire Alarm." This branch circuit must connect to the line side of the main power connection for the premises. No other equipment can be powered from the fire-alarm branch circuit.

The branch-circuit wire must run continuously, without any disconnection devices from the source of AC power to the ARIES NET*Link* control unit. Over-current protection for this branch circuit must be limited to 15 Amp maximum and comply with Article 760 of the National Electric Code, in addition to any other local electrical codes. Use a minimum wire size of #14 AWG with 600-volt insulation for this branch circuit. Use a grounded power cord of #14 AWG or larger wire with 600 Vac rating to make the AC power connection to the control unit.

WARNING

Ensure that the dedicated AC circuit is shut off at its source before beginning this procedure.

Follow the procedure below to make PMU Board AC Power and Earth Ground connections:

1. Run AC-input wiring to the right side of the enclosure and bring it through one of the top knockouts on the right. Refer to Figure 2-11 for AC power connection locations.
2. Connect the other end of the PMU ground wire assembly (installed previously onto the PMU Board with a standoff) to the Earth Ground stud located at the right side of the enclosure.
3. Connect the Earth Ground (green) wire to the Earth Ground stud located at the right side of the enclosure.
4. Connect the hot (black) wire to the PMU Board Terminal Block TB1 labeled ‘L’ (Line).
5. Connect the neutral (white) wire to the PMU Board Terminal Block TB1 labeled ‘N’ (Neutral).
6. A Snap-On Suppression Filter, P/N 06-115904-087, has been provided to ensure the strictest compliance with FCC Part 15. The filter can be found in the NIC Card hardware kit. For networked control units, open the cylindrical ferrite core filter and place it around both the hot (black) and neutral (white) AC wires. Snap the filter tightly closed to secure in place around the wires. Refer to Figure 2-10 below.
7. Locate the AC Voltage Protection Cover found in the hardware kit. Install the cover over the AC power input terminals and fasten to the 5/8-in. standoff with the provided 8/32” Phillips mounting screw. Note that the standoff needs to be installed prior to this step.
8. Locate the 5-in. MCB ground wire assembly from the hardware kit.
9. Connect one end of the MCB ground wire assembly to the Earth Ground stud located at the right side of the enclosure. Leave the other end dangling.

CAUTION **For proper ground fault detection, all mounting screws should be installed.**

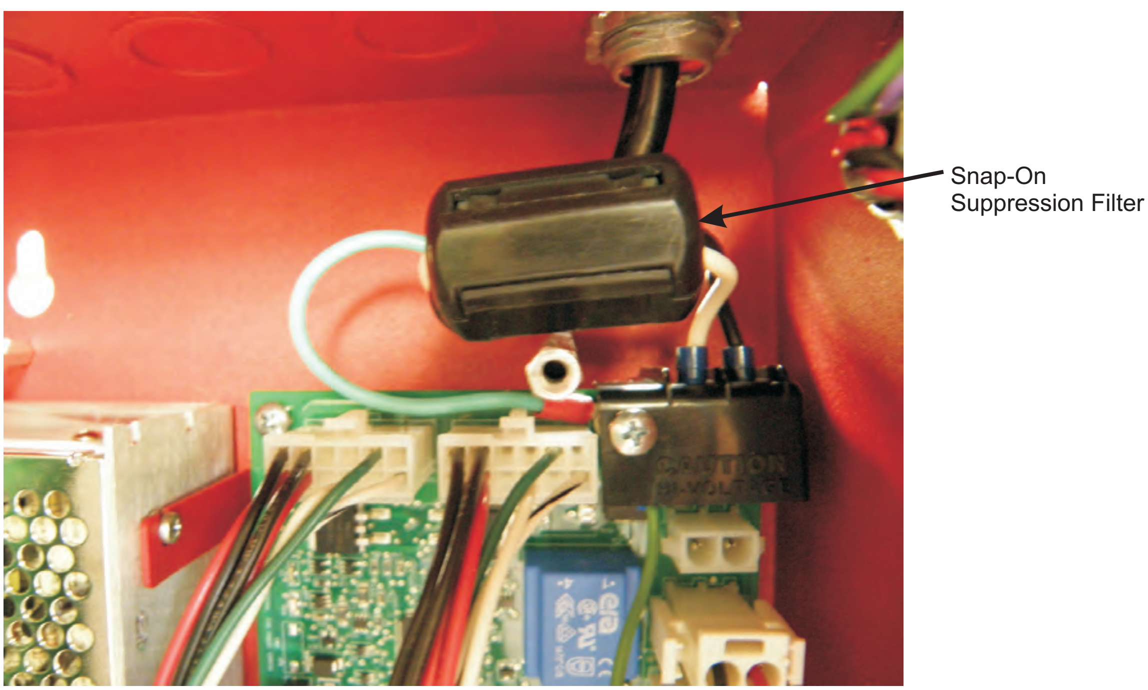


Figure 2-10. Snap-On Suppression Filter Shown Installed Around Black and White AC Power Wires

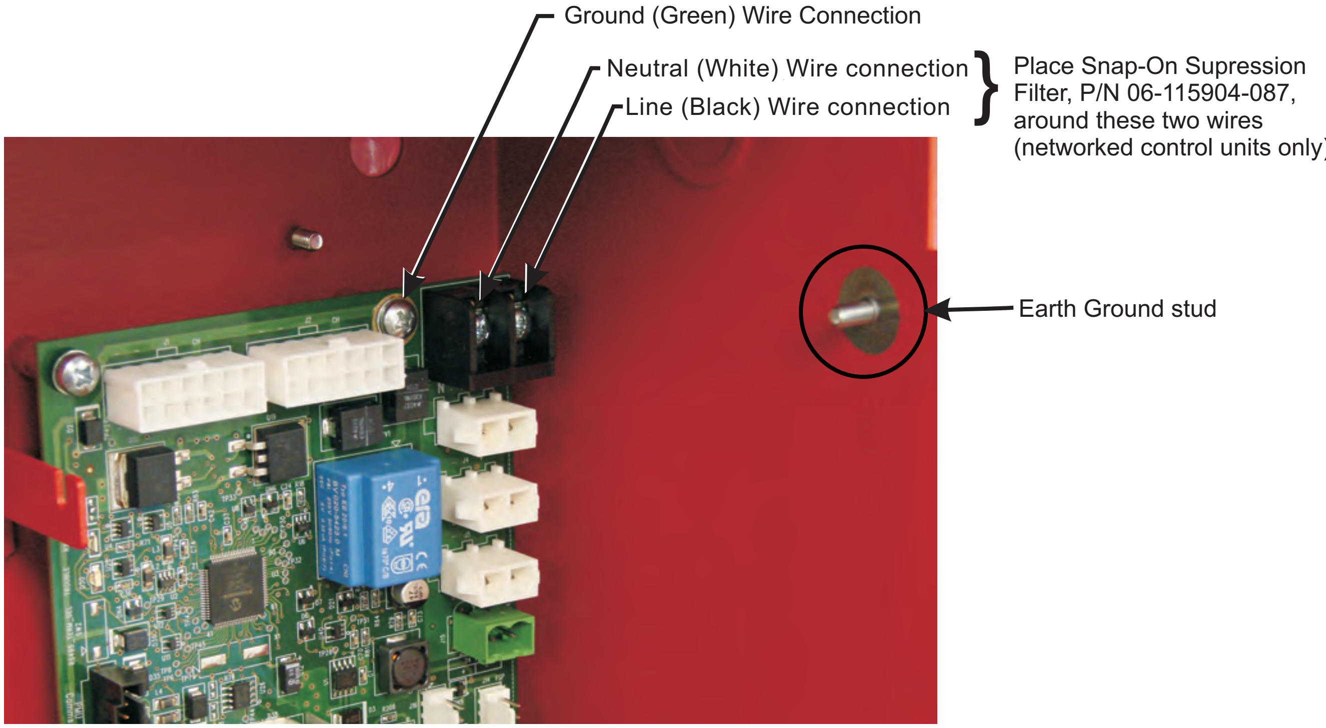


Figure 2-11. AC Connections to PMU Board
(shown without AC Voltage Protection Cover, Standoff, Snap-On Suppression Filter and PMU Ground Wire Assembly)

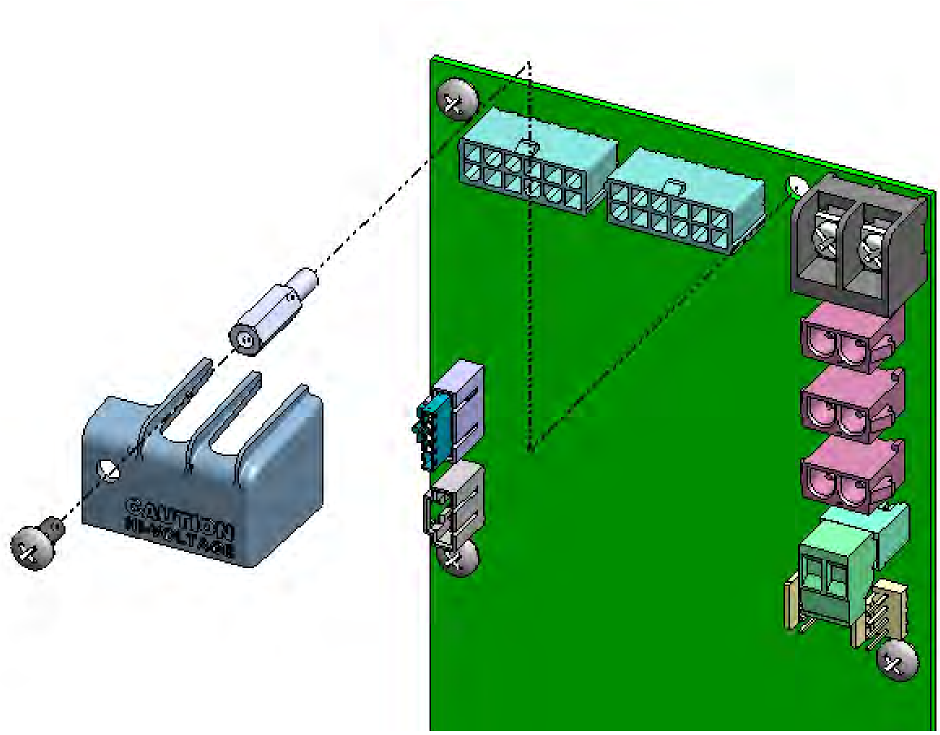


Figure 2-12. AC Voltage Protection Cover (prohibits access to AC Power input terminals)

2-4.7 Installing the Main Controller Board into Enclosure Top Tier

CAUTION **Use a ground strap to prevent static discharge that could damage sensitive components on the main PCB.**

Note: The top tier of the enclosure has been designed to accommodate two power supply units and a Power Management Unit (PMU) Board. Power supply units and PMU Board must be installed first, followed by the Main Controller Board with Keypad/Display which fits over these components.

To install the Main Controller Board (MCB) with Keypad/Display into the top tier of an enclosure:

1. Make sure the control unit location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the MCB.
2. Slip on a wrist ground strap and clip the ground strap to the Earth Ground in the enclosure. Do not remove the MCB from its shipping carton unless you have established a common earth-ground potential among yourself, the enclosure, and the MCB's shipping carton.
3. Remove the MCB from its packaging.
4. Locate the four 2-1/4 in. aluminum standoffs in the hardware kit and, using a nut driver, screw one securely into each of the four threaded studs in the back surface of the enclosure. Refer to Figure 2-13.
5. Orient the MCB such that its raised metal edge is on the left side.
6. Grasp the board at a 45-degree angle (to clear the upper bracket) and lift upwards to insert the board's topmost metal tab into the top hinge. Next, insert the board's bottom metal tab into the bottom hinge.

Note: Before securing the MCB, for ease of access, it is recommended to fully open the MCB and connect internal power and communication connections. Refer to Figure 2-15 and Figure 2-16 for an overview of power and communication connections.

7. Insert COM harness (supplied in MCB hardware kit) from connector J2 on the MCB to connector J12 on the PMU Board.
8. Insert a 24Vdc power cable (supplied in MCB hardware kit) from connector J10 on the MCB to connector J3 on the PMU Board.
9. If applicable, insert a terminal block onto the AUX power output (J9) on the PMU Board and install auxiliary power and standby battery wiring.
10. Connect the dangling end of the Audible PMU Trouble Sounder harness from the PMU Board to connector J1 on the back of the Keypad/Display PCB (small black connector above buzzer).
11. With connections made, gently push the MCB in place so that it pivots on its hinge and lays flat on top of the four aluminum standoffs.
12. Locate the four #8 Phillips mounting screws in the hardware kit.
13. Insert the three remaining mounting screws into the standoffs; tighten securely.
14. Connect the other end of the MCB ground wire harness (dangling from the Earth Ground stud on enclosure) to the top right standoff in the corner of the MCB with a #8 mounting screw.
15. Complete connection of power and COM harnesses from PMU to MCB.
16. Remove wrist ground strap.

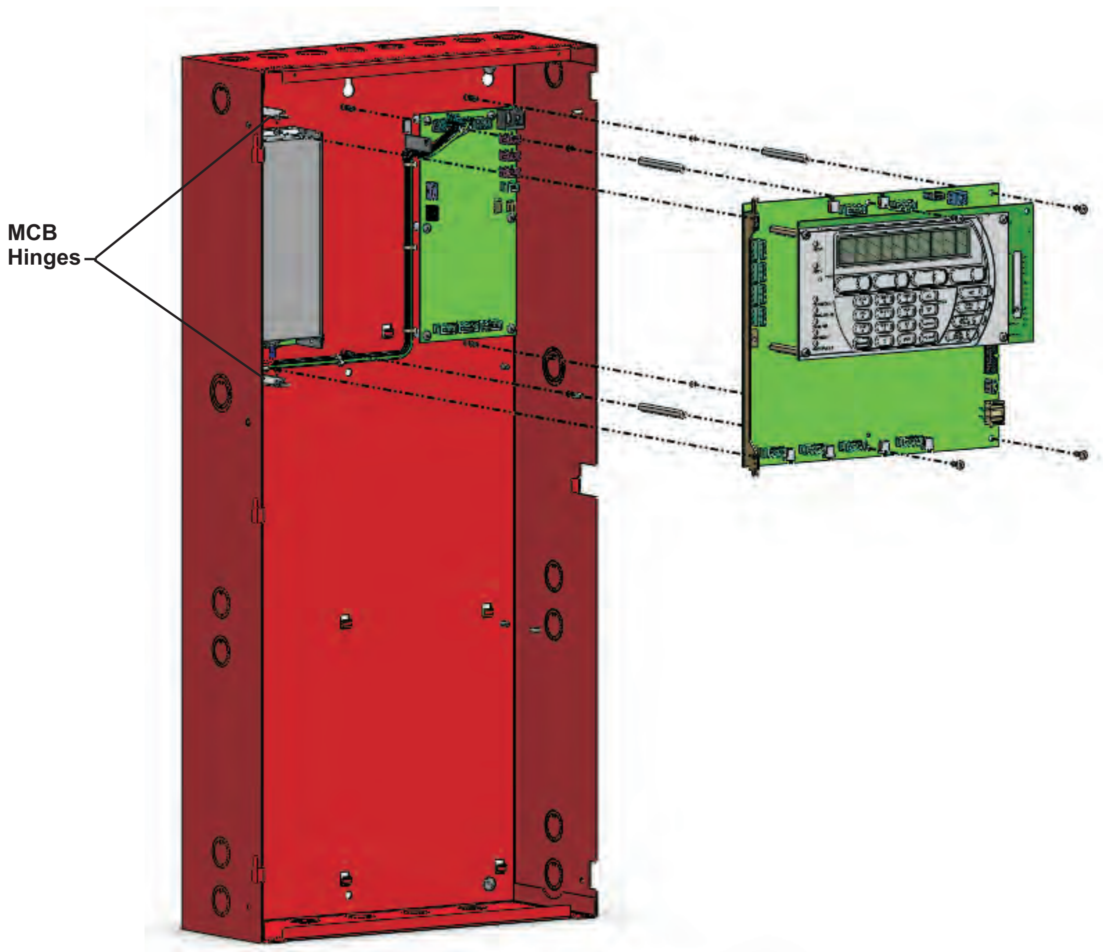


Figure 2-13. Installing A Main Controller Board with Keypad/Display into the Enclosure Top Tier

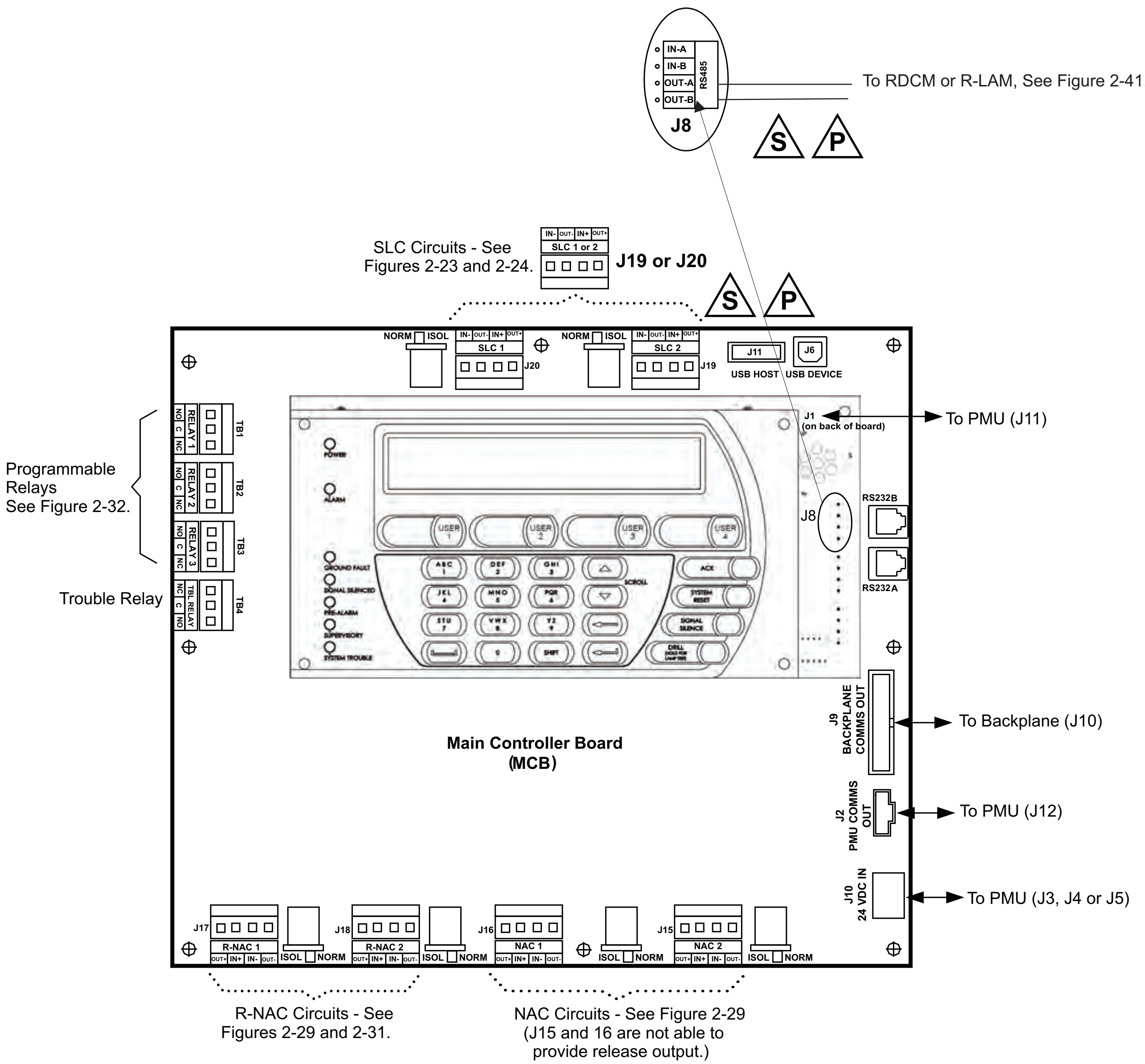


Figure 2-14. Wiring Diagram for Main Controller Board

2-4.8 Replacing Enclosure Door

When access to the internal components of the ARIES NET*Link* control unit is no longer required:

1. Re-attach the enclosure door by lifting it onto its built-in hinges.
2. Attach the ground wire assembly from the Earth Ground stud located on the door to the Earth Ground stud located on the left inside of the enclosure.
3. Close the door and lock with the provided key.

2-5 MAKING INTERNAL 24VDC POWER CONNECTIONS

Figure 2-15 provides an overview of internal 24Vdc power supply connections for the ARIES NET*Link* system.

Note: Output connectors are white; input connectors are black. All connectors are keyed for correct orientation when inserted.

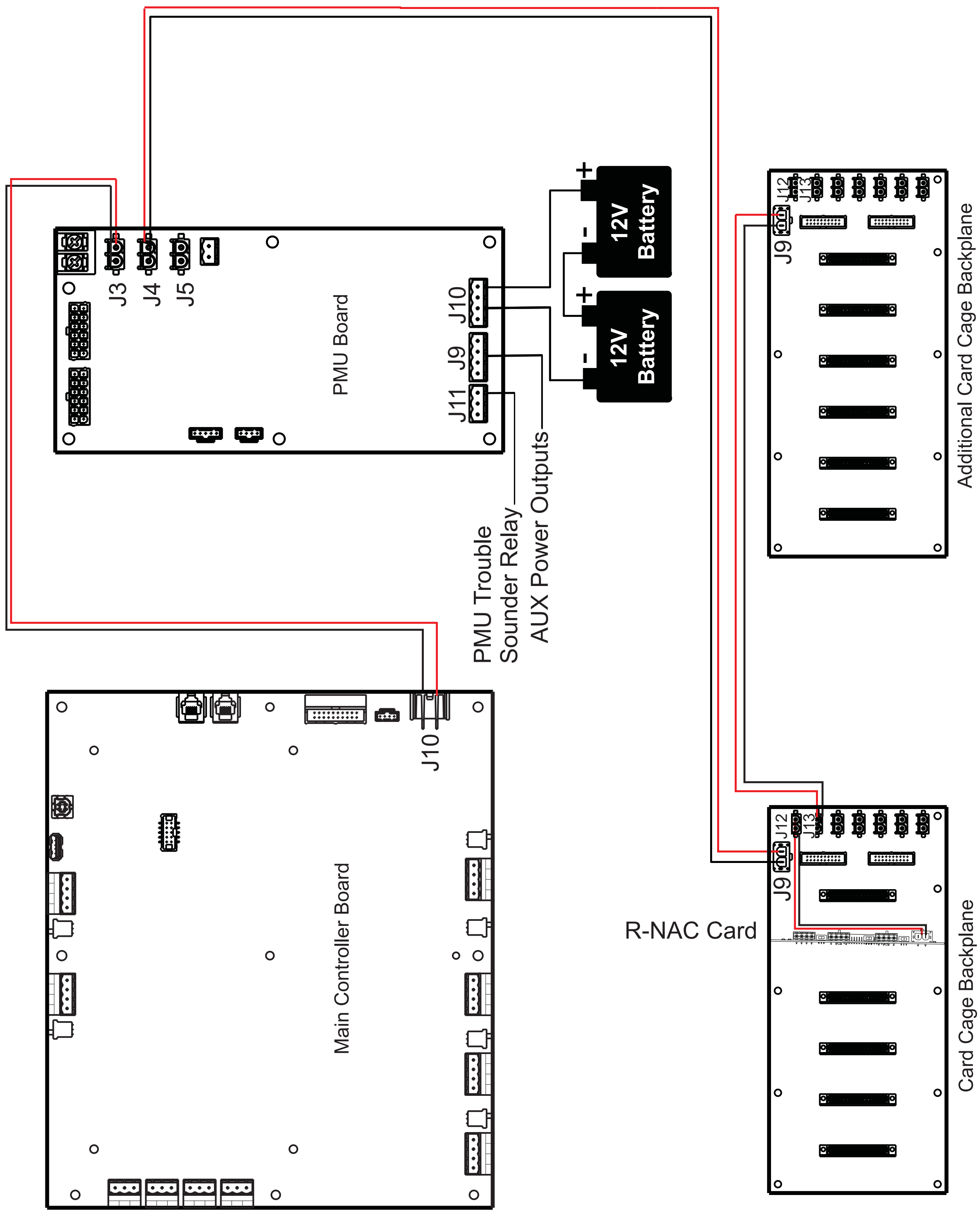


Figure 2-15. Internal 24 Vdc Power Connections

2-6 MAKING INTERNAL COMMUNICATION CONNECTIONS

Figure 2-16 provides an overview of internal communication connections for the ARIES NET*Link* system.

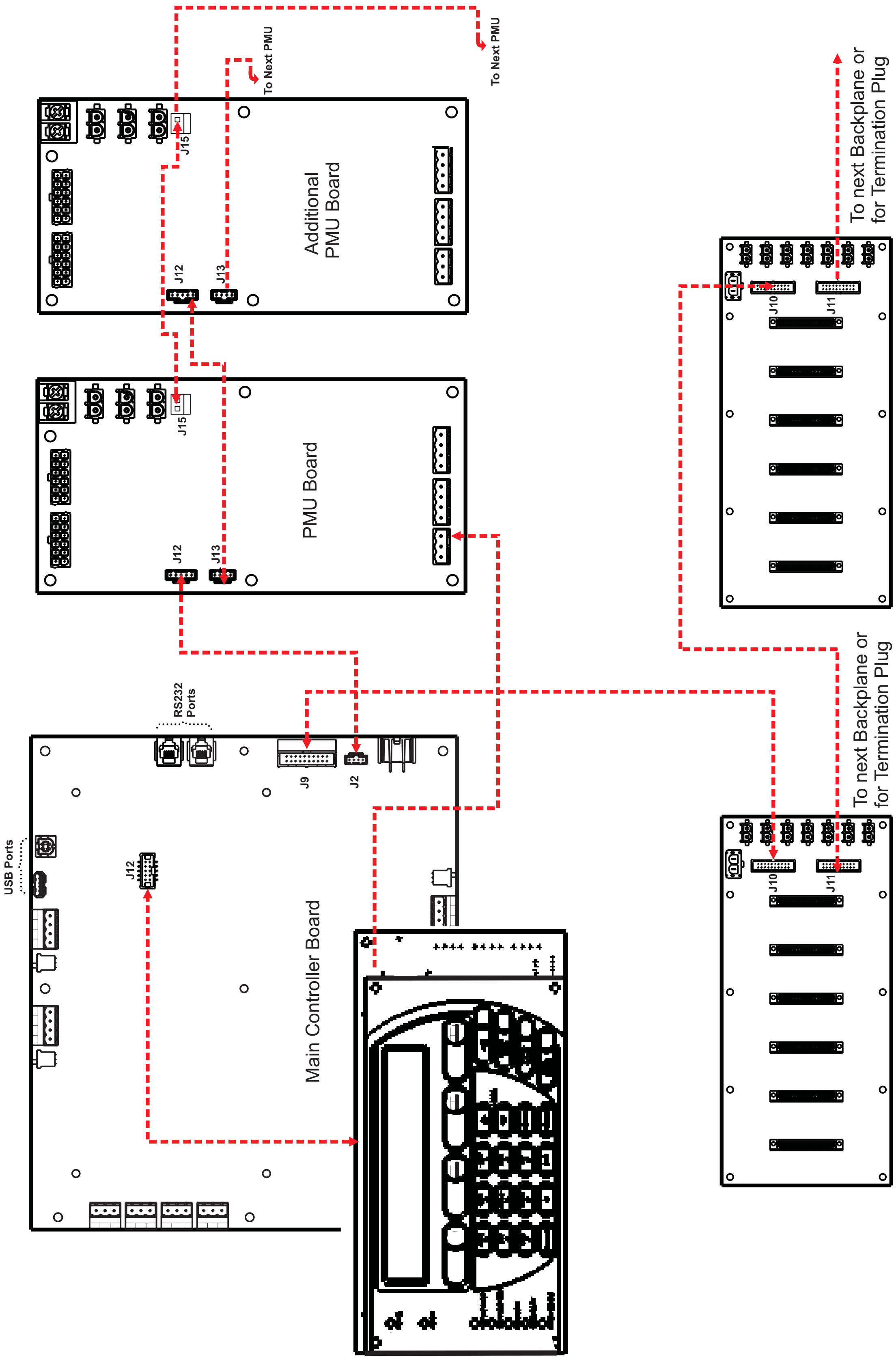


Figure 2-16. Internal Communication Connections

2-7 OPTIONAL EQUIPMENT INSTALLATION PROCEDURE

The instructions which follow pertain to installation of additional ARIES NET*Link* equipment, not included in the standard system shipping carton.

2-7.1 Installing the Expansion Card Cage

CAUTION **Use a ground strap to prevent static discharge that could damage sensitive components on the PCBs.**

To install the Expansion Card Cage:

1. Make sure the control unit location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the Card Cage assembly.
2. Verify that all power sources intended to provide power to the control unit are removed.
3. Slip on a wrist ground strap and clip the ground strap to the Earth Ground in the enclosure. Do not remove the Card Cage from its shipping carton unless you have established a common earth-ground potential among yourself, the enclosure, and the Card Cage's shipping carton.
4. Remove the Card Cage Assembly from its packaging.
5. Locate the two 8/32" nuts provided in the hardware kit.

Note: To get access to the PMU board power connectors, it is recommended that the MCB be opened. This requires disconnecting power and COM harnesses from the MCB and field wiring plugs as required, then removing the four mounting screws and opening the (hinged) MCB.

6. Locate the three retention tabs in the enclosure's back panel (found at the bottom).
7. Orient the Card Cage as shown in Figure 2-17 below.
8. Grasping the Card Cage with both hands, align the top slots with the studs in the enclosure and insert the bottom into the two outermost retention clips.
9. Gently hold the Card Cage in place and insert the two nuts with a nut driver.
10. Connect the 5-in. ground wire harness (attached to the backplane) to the Earth Ground stud located at the right of the enclosure.
11. Connect the DC power harness from connector J9 on the backplane to either J4 or J5 connectors on the PMU Board.
12. Connect the COM harness from connector J10 on the backplane to connector J9 on the MCB.

Note: If this is the only Card Cage in the entire ARIES NET*Link* system, insert an End-of-Line Terminator into connector J11 on the backplane.

13. Remove wrist ground strap.
14. Lastly, if the MCB was opened to gain access to PMU power connectors, close the MCB and replace all connections/field wiring previously disconnected. Replace screws to secure board.

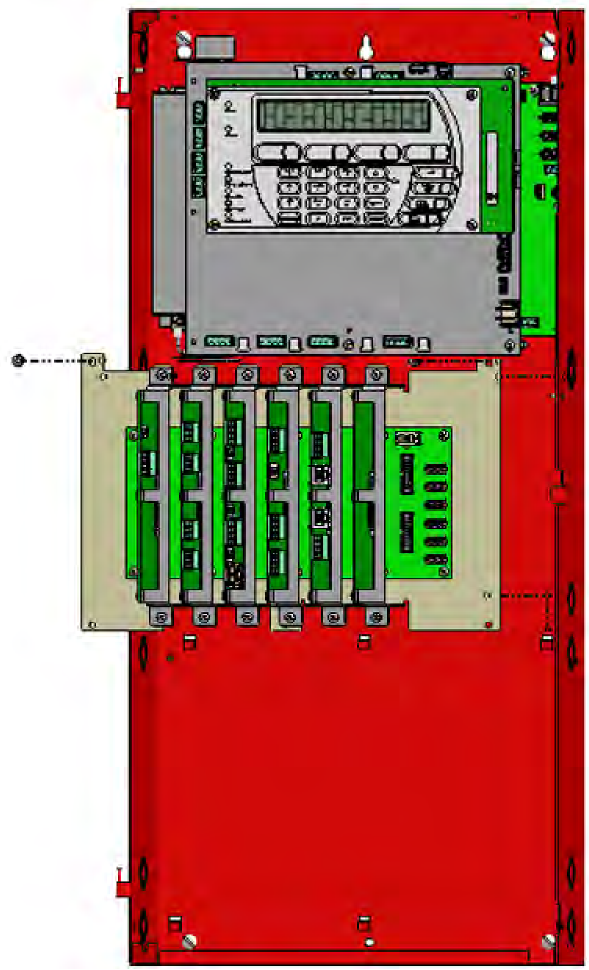


Figure 2-17. Installing the Expansion Card Cage

2-7.2 Inserting and Securing an Expansion Card

CAUTION **Use a ground strap to prevent static discharge that could damage sensitive components on the PCBs.**

To install a card into a Card Cage slot:

1. Make sure the enclosure location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the card.
2. Slip on a wrist ground strap and clip the ground strap to the Earth Ground in the enclosure. Do not remove any card from its shipping carton unless you have established a common earth-ground potential among yourself, the enclosure, and the shipping carton.
3. Remove the card to be inserted from its packaging.
4. Insert the card into the desired slot and push gently to ensure a good connection with the backplane connector.

Note: Cards can be plugged into any slot in the Expansion Card Cage. There are no reserved slots. Refer to Section 1-13.1, *General Guidelines for the Use of Expansion Cards* for more information on the use of expansion cards.

5. Locate two #8 mounting screws in the hardware kit.
6. Orient the card as shown in the Table 1-3 illustration column (in Chapter 1).
7. Insert the two mounting screws into the top and bottom mounting holes and tighten securely.
8. Remove wrist ground strap from enclosure.

Note: If installing an R-NAC card, connect the DC power harness from connector J8 on the R-NAC card to any available connector (J12 through J18) on the backplane.

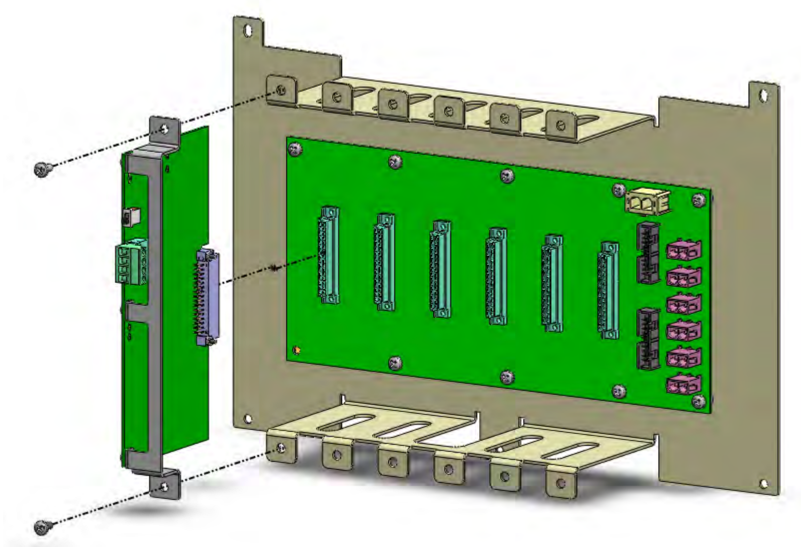


Figure 2-18. Inserting an Expansion Card into Card Cage Slot

2-7.3 Installing Add-On Power Supply/PMU Assembly With Bracket

CAUTION

Use a ground strap to prevent static discharge that could damage sensitive components on the PCB.

To install an Add-On Power Supply/PMU Assembly into any tier of an enclosure:

1. Make sure the control unit location is dry and that the enclosure is free of construction dust and metal shavings prior to installing the power supply.
2. Remove the Power Supply/PMU Assembly from its packaging.
3. Locate two #8 Phillips-head mounting screws in the hardware kit.
4. Ensure that the AC-input-voltage selector switch on the power supply unit(s) is set to the proper position for either 115 Vac or 230 Vac. Refer to Figure 2-4 in Section 2-4.3 for location of the selector switch.
5. Orient the Power Supply/PMU Assembly with the power supply unit(s) to the left, as shown below in Figure 2-19.
6. Locate the retention tabs in the enclosure's back panel.
7. Grasping the assembly with both hands, slide the assembly onto the two outermost retention tabs.
8. Gently hold the assembly in place and insert one of the top mounting screws; hand-tighten.
9. Repeat for the remaining screw and tighten both screws securely.
10. On the PMU Board, locate the right topmost screw (beside the AC power input connector). Remove the screw, attach the 5-in. ground wire assembly and tighten. Connect the other end of the ground wire assembly to the Earth Ground stud located at the right of the enclosure.
11. Connect the COM harness from connector J13 of the first PMU Board to J12 on the Add-On PMU Board. Refer to Figure 2-16.
12. Connect a GND wire (customer-supplied, minimum 14 AWG) between J15 on first PMU board to J15 on the Add-On PMU board. Either terminal may be used.
13. All Add-On PMUs (PMUs 2 through 4) must use the supplied nylon standoff on the left middle mounting hole. Refer to Figure 2-20.

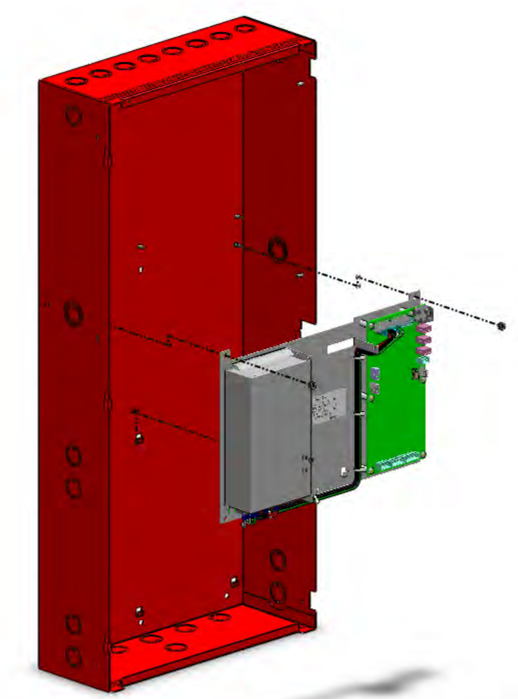
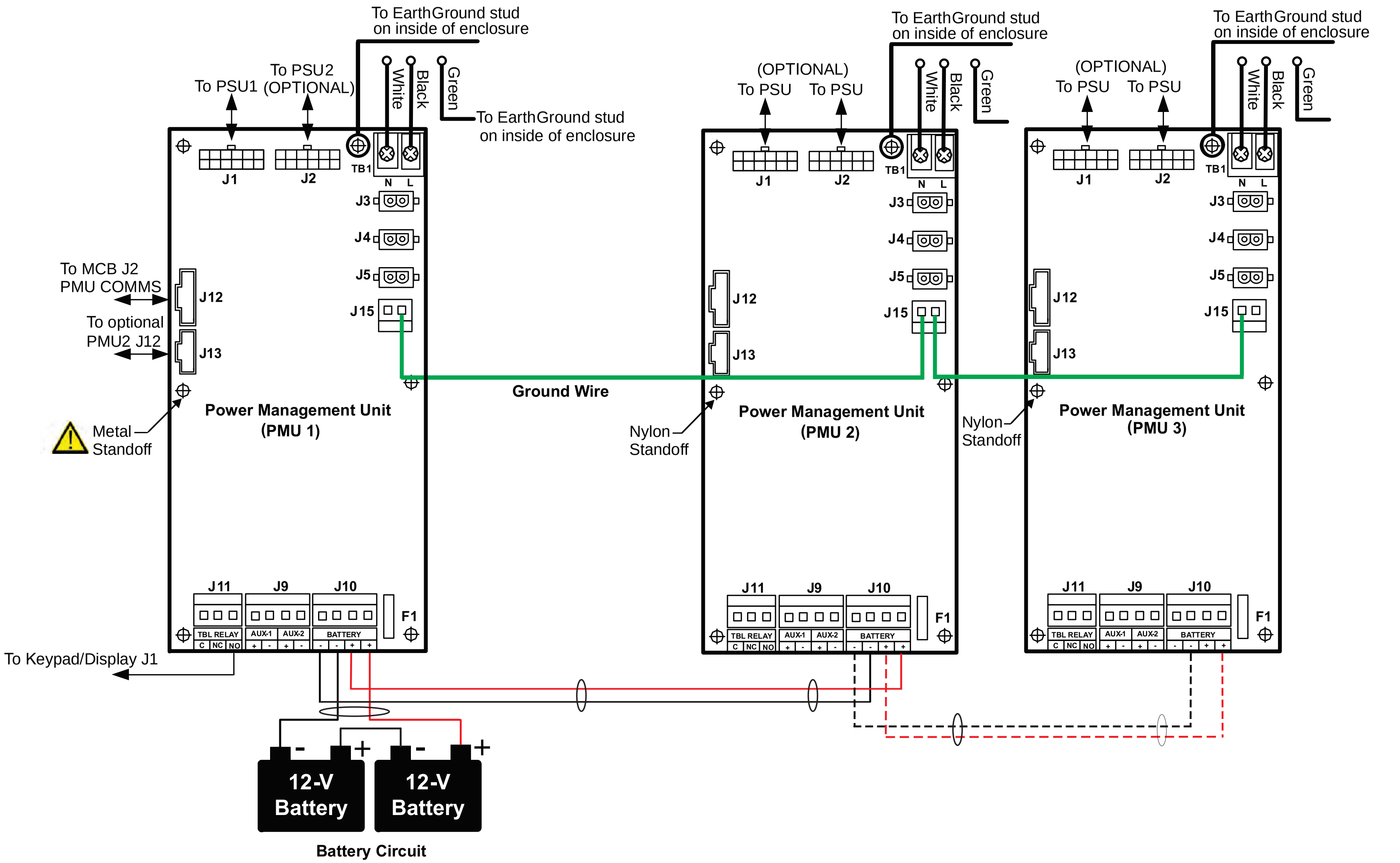


Figure 2-19. Installing the Add-On Power Supply/PMU Assembly with Bracket



NOTES:

1. The negative side of each PMU 24 VDC output must be tied together so that there is a common system negative (or common ground) for the system power. To create the common system negative, connect a wire (minimum 14 gauge) from J15 on the first PMU to J15 on the Add-On PMUs as shown in illustration.
2. An Earth Ground wire must be connected from TB1 on each PMU to a ground stud on the enclosure.
3. The middle left mounting position on the first PMU (PMU 1) uses a metal standoff. All other PMUs (PMU's 2 through 4) require a nylon standoff for the middle left mounting position.
4.Only one PMU can be configured to charge the batteries.
5. All PMUs must be configured to supervise the batteries.
6. Batteries must be directly connected to PMU 1 (where Main Controller Board is located) as shown in illustration.
7. In the event of an AC power loss, all PMUs must be able to draw power from the batteries. Connect the batteries as shown with suitable gauge wire to sustain a full system alarm current.

Figure 2-20. Multiple PMU Wiring Connections

2-7.4 Installing the Battery Tray

The battery tray (P/N 76-800030-006) fits securely into the bottom tier of a Main or Expansion Enclosure and serves to support the batteries while providing easy access to wiring at the bottom of the enclosure.

Note: Insertion of the battery tray is not necessary if knockouts at bottom of enclosure will not be used.

To install the battery tray, do the following:

1. Remove the battery tray from its packaging.
2. In the bottom tier of the enclosure, locate the three retention tabs in the enclosure's back panel.
3. Orient the tray such that its vertical lip is facing the front of the enclosure, as shown in Figure 2-21.
4. Grasp the tray with both hands and insert the back of the tray into the retention clips.
5. Push down firmly to ensure that the tray is securely seated.

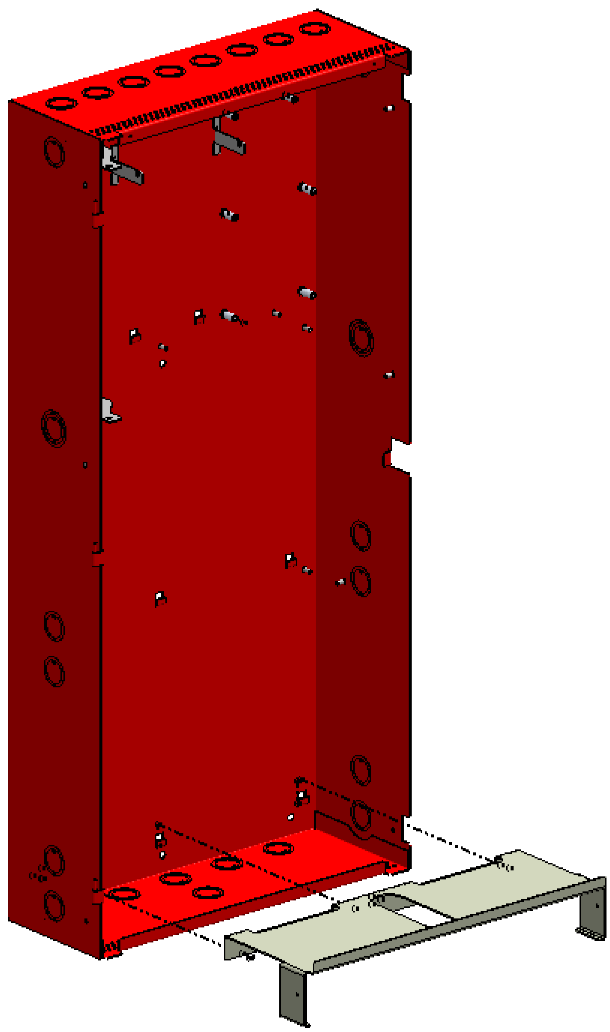


Figure 2-21. Installing the Battery Tray into Bottom Tier

2-7.5 Connecting Standby Batteries To PMU Board

WARNING

Batteries contain sulfuric acid that can cause severe burns to the skin and eyes and can damage clothing. Immediately flush areas of the skin or eyes that have been contacted with sulfuric acid for 15 minutes with water and seek medical attention promptly.

Note: Observe polarity when connecting batteries to the control unit.

To connect the standby batter(ies) to the control unit:

1. Calculate the size of the battery required for the application. Refer to Appendix A for the proper procedure.
2. Connect two or more 12-volt, series-wired batteries of the required ampere-hour (AH) capacity to Terminal J10 on the PMU Board using battery cables found in the PMU Board hardware kit. See Figure 2-22 below.

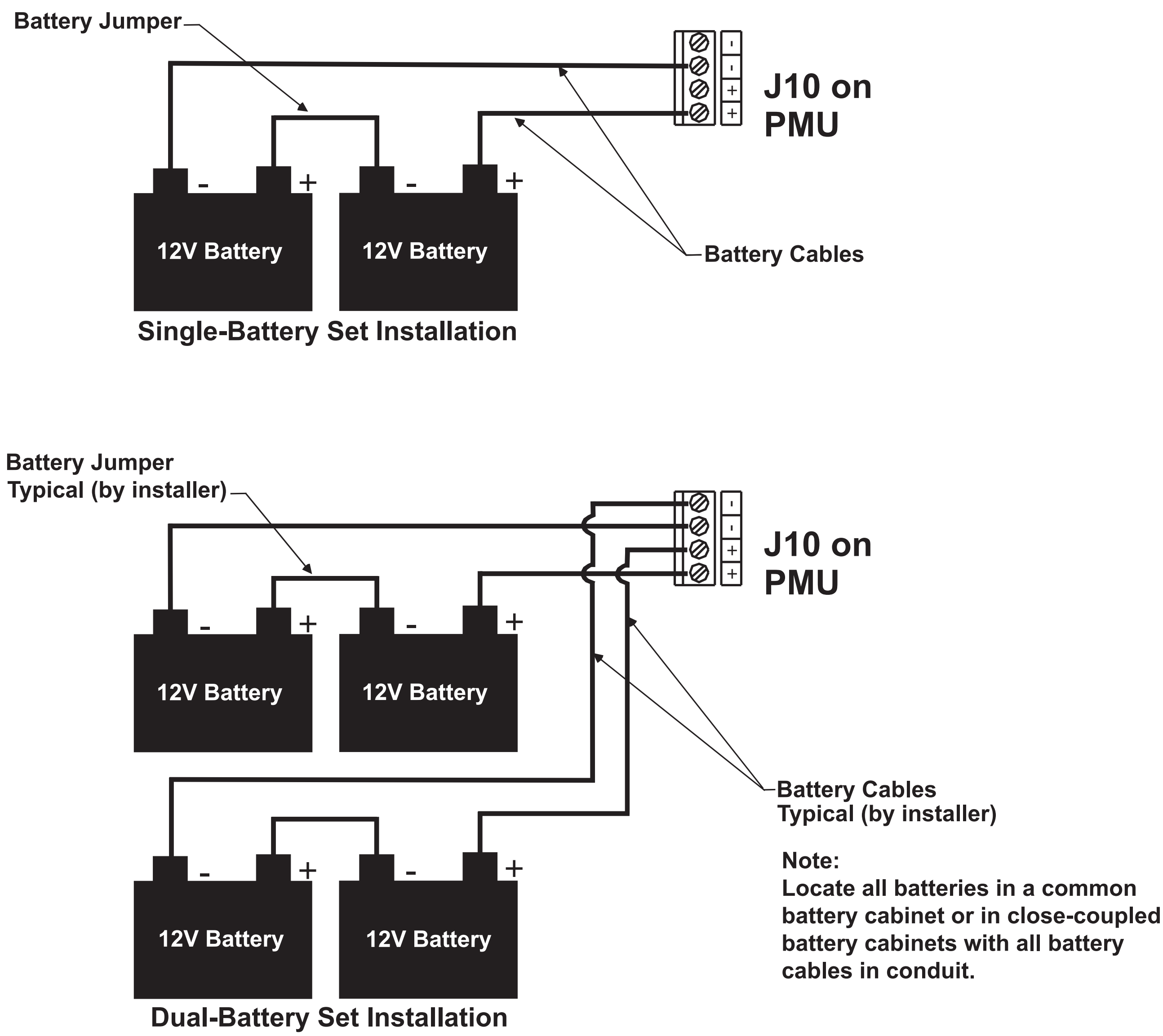


Figure 2-22. Standby Battery Connections

2-8 SETTING UP WIRING TO FIELD DEVICES

Requirements for field wiring connections to the control unit are determined by national and local codes. Refer to NFPA 72, “National Fire Alarm and Signaling Code” for more detailed information.

2-8.1 Installing Electrical Wiring and Making Connections

Route the properly-sized and required wiring through conduit from the control unit to the field devices. Observe the wiring manufacturer’s recommended minimum bending radii for all internal-control-unit and external wiring. Use appropriate equipment to check and record the wiring for insulation resistance to Earth Ground. Measure and record the wiring resistance for all external circuits. Also measure and the record the SLC wiring capacitance. Refer to the approved electrical installation drawings and to the recommendations in this manual.

Mount and make wiring connections to the peripheral devices as shown in their installation instructions. Be sure that all SLC-based devices have been electronically addressed prior to installation.

2-8.2 Overview of SLC Wiring Styles

The basic difference between wiring styles is the ability of the circuit to continue operating under conditions that compromise the integrity of the circuit itself.

- CLASS-A is a 4-wire circuit where two wires of the circuit leave the control panel, make connection with the field devices, and then return to the same control panel. In this type of installation, if one wire were to break or become loose, a Trouble signal would occur; however, all devices on that circuit would continue to function. CLASS-A circuits will be able to transmit a signal even with a single open fault or a single ground fault on the circuit.
- CLASS-B is a 2-wire circuit where two wires leave the control panel, make connection to the field devices and then connect to an "End-of-Line" device. If a wire were to break or become loose, a Trouble signal would occur but, unlike CLASS-A wiring, all devices downstream of the break point would not function. CLASS-B circuits will not be able to transmit a signal beyond a single open fault..
- CLASS-A, Style 7 is a 4-wire circuit which is operational past a single open fault, ground fault or short circuit and requires the use of loop isolators.

2-8.3 Electrical Supervision

- A short circuit from any field-wiring terminal (except AC-Power-Input Terminals and Form-C Relay Terminals) to Earth Ground will create a “Ground-Fault” trouble condition.
- An open circuit in the wiring for the SLC circuits, the outputs (NACs and R-NAC circuits), the RS-485 communications circuit, and the battery-charging circuit will create an “Open” trouble condition.
- A short circuit between conductors in the wiring for the SLC, the outputs (NACs and R-NAC circuits), the RS-485 communications circuit, and the battery-charging circuit will create a “Short” trouble condition.

  Exception: R-NAC circuits wired as non-power-limited.

- Impedance values for open-circuit and short-circuit conditions are:
  - open circuit: infinite ohms
  - short circuit: zero (0) ohms

2-8.4 Wiring Signaling Line Circuits

The Signaling Line Circuit (SLC) is the communications path between the ARIES NET*Link* control unit and the SmartOne and associated field devices. The SLC can accommodate combinations of up to 255 addressable devices, which include SmartOne automatic initiating devices, monitor modules, relay modules, and control modules.

The SLC can be wired to meet the following NFPA 72 wiring requirements:

- CLASS-A (Loop Isolators optional)
- CLASS-A, Style 7 (Loop Isolators required)
- CLASS-B

Note: All SLC wiring must be twisted, unshielded, low-capacitance, fire-alarm wire. For best results, use wiring with a nominal conductor-to-conductor capacitance of approximately 20 picofarads (or 20 x 10^{-12} farads) per foot. Refer to Appendix B, *Wiring and Configuration Requirements for Signaling Line Circuits* which provides recommended wire types and guidance on SLC resistance and capacitance limitations.

The use of shielded wire is not allowed except for very short runs or splices in total not exceeding 200 feet on any SLC loop. This length excludes any shielded wire that may have been used for the IDC, NAC, 24 VDC power circuits, release, trouble input circuits field wiring of AIs, ASMs and RRMs.

If using shielded wire on the AI, ASM and RRM external circuits including the IDC, NAC, 24 VDC Power circuits, release or trouble input circuits, this field wiring shall be limited to 50 feet per SLC module such as Addressable Input Module, Remote Release Module and Addressable Signal Module. When multiple modules on the same SLC loop are using shielded field wire on circuits other than the SLC, the total combined shielded field wire on all modules must not exceed 200 feet.

2-8.4.1 CROSS ZONE INITIATING DEVICES

Applications which utilize two detectors to initiate the activation of a suppression system, known as cross or counting zone detection, must comply with the following:

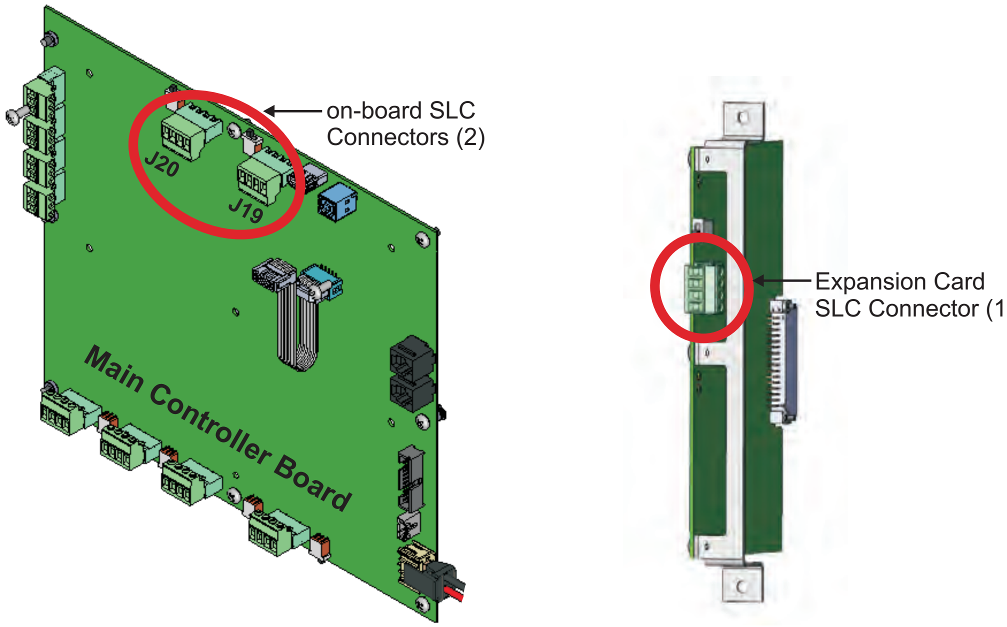
1. Must be acceptable by the local Authority Having Jurisdiction (AHJ).
2. A minimum of two (2) detectors must be used in each protected space.
3. The distance from one detector to another must be 0.7 times the standard linear spacing determined in accordance with NFPA 72.
4. The Alarm Verification feature cannot be used in cross zoned applications.

The two detector/cross or counting zone configuration is generally used for the actuation of suppression systems but can also be used as part of an alarm notification system.

2-8.4.2 USE OF OUTPUT MODULES

In order for AO, ASM and RRM Output Modules to activate within 10 seconds in response to an alarm or supervisory condition, to meet the requirement of UL 864 33.1.2.a, the SLC wiring and use of output modules shall be designed and installed in accordance with requirements in this chapter and Appendix B, *Wiring and Configuration Requirements for Signaling Line Circuits*.

2-8.4.3 SLC CONNECTIONS AND SPECIFICATIONS



Signaling Line Circuit Connectors
(located on MCB and SLC Expansion Card)

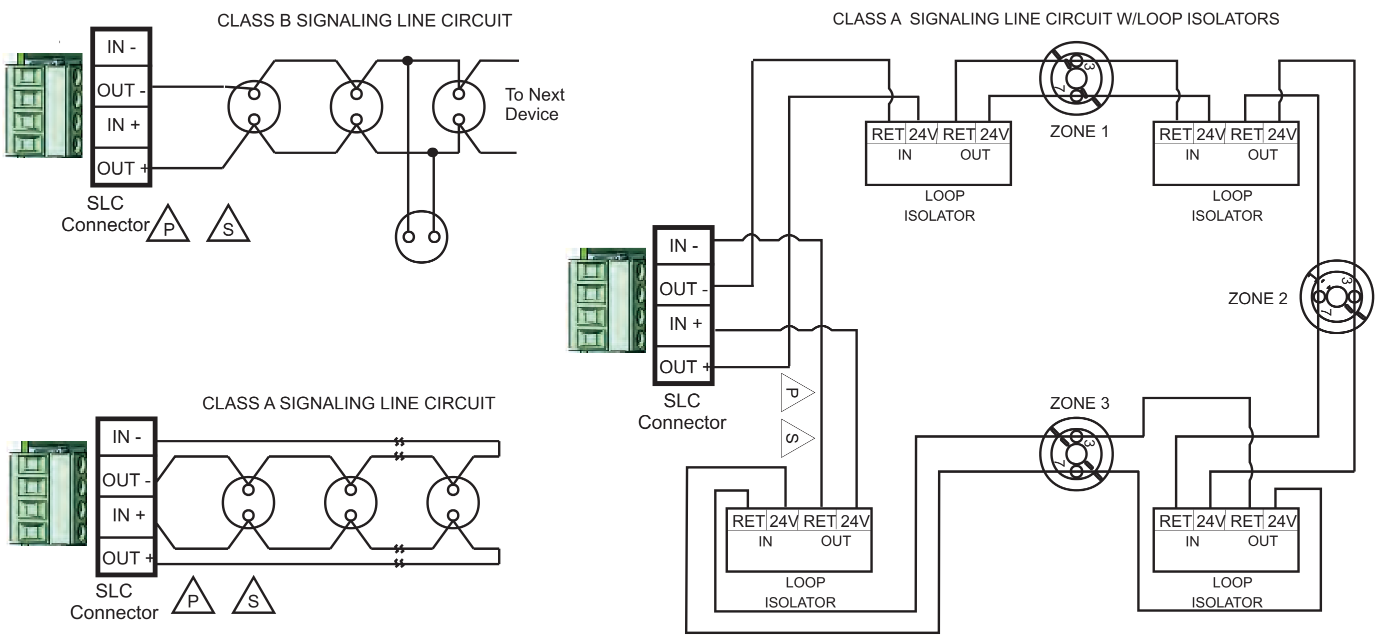


Figure 2-23. Wiring Diagram for CLASS-A and CLASS-B Signaling Line Circuits

CLASS A, STYLE 7 SIGNALING LINE CIRCUIT W/LOOP ISOLATORS

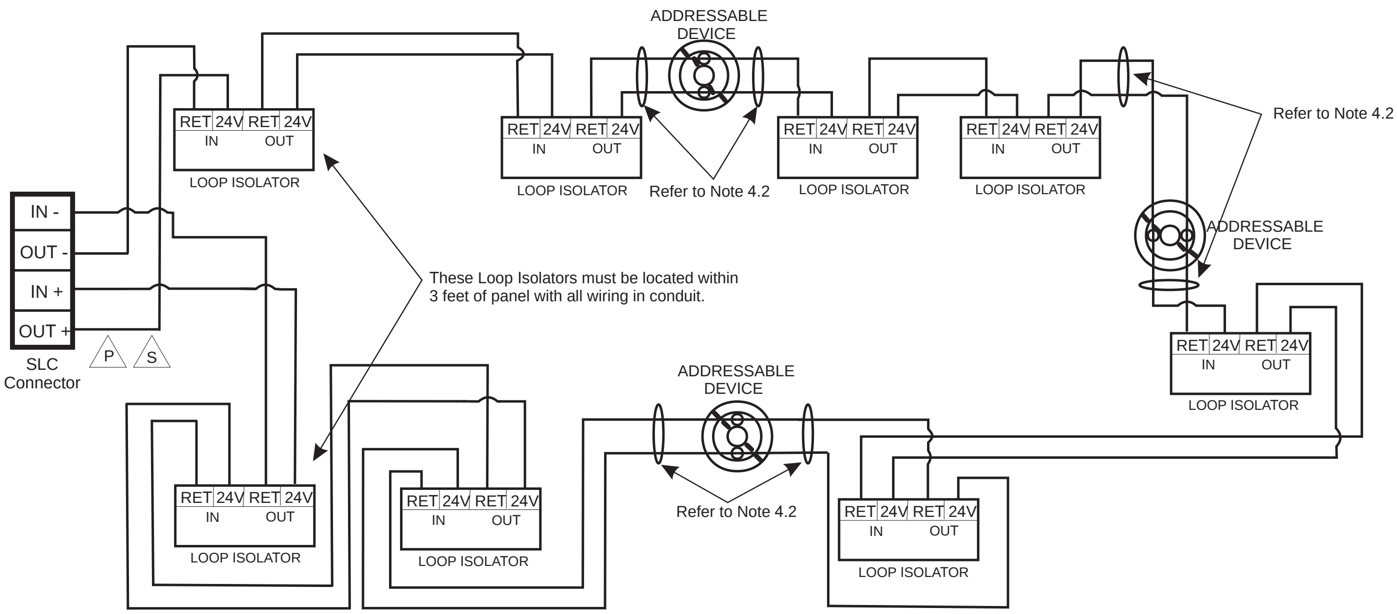


Figure 2-24. Wiring Diagram for CLASS-A, Style 7 Signaling Line Circuit

SLC WIRING NOTES:

1. SLC devices may utilize T-tap wiring method in CLASS B configuration only.
2. Maximum 20 loop isolators
3. No more than 30 SLC devices are allowed between two adjacent loop isolators.
4. Arrangements for SLC Circuit wiring:
   - 4.1 CLASS A, Style 7 requires the use of loop isolators as shown in the above illustration.
   - 4.2 For CLASS A, Style 7, the wiring between devices and each adjacent isolator must be in conduit and no further than 20 feet from loop device.
5. Maximum of one #12 AWG wire per terminal.
6. Loop Isolator Devices are polarized. Refer to wiring diagrams.
7. Denotes SmartOne or DS Series Device. These devices are not polarized.
8. For connections to SmartOne or DS Series devices, refer to the wiring diagrams for the particular device.
9. P - For power limited circuits.

   S - For supervised circuits.
10. Maximum of 255 devices per SLC loop (limitations apply). Refer to Appendix B, Wiring and Configuration Requirements for Signaling Line Circuits.
11. All SLC wiring must be twisted, unshielded, low-capacitance, fire-alarm wire. For best results use wiring with a nominal conductor-to-conductor capacitance of approximately 20 picofarads (or 20 x 10^{-12} farads) per foot. Typical wire types that meet these criteria are indicated in Appendix B, Wiring and Configuration Requirements for Signaling Line Circuits.
12. The use of shielded wire is not allowed except for very short runs or splices in total not exceeding 200 feet on any SLC loop. This length excludes any shielded wire that may have been used for IDC, NAC, 24 VDC power circuits, Release, Trouble input circuits and field wiring on AIs, ASMs and RRMs respectively.

    If using shielded wire on the AI, ASM and RRM external circuits including the IDC, NAC, 24 VDC Power circuits, release or trouble input circuits, this field wiring shall be limited to 50 feet per SLC module such as Addressable Input Module, Remote Release Module and Addressable Signal Module. When multiple modules on the same SLC loop are using shielded field wire on circuits other than the SLC, the total combined shielded field wire on all modules must not exceed 200 feet.

SIGNALING LINE CIRCUIT (SLC) Specification

Maximum Voltage:	28.0 VDC
Minimum Voltage:	19.0 VDC
Maximum Conductor-to-Conductor Capacitance:	0.5 µF
Maximum Capacitance to Earth Ground:	0.5 µF
Maximum Line Resistance:	40.0 Ohms/Loop
Maximum Number of Devices:	255 (Limitations apply)
Maximum Ripple Voltage:	100 mV RMS

SLC TX LED - Green LED indicates normal operation of SLC transmitter when blinking.
SLC RX LED - Yellow LED indicates normal operation of SLC receiver when blinking.
SW1 Circuit Isolation - Isolates SLC circuit from the SLC card containing the switch.

SMARTONE PROTOCOL DETECTORS USED:

Part Numbers	DS-PS	DS-HFS
	70-401001-000	70-402001-100
	70-401004-000	71-402001-100
	71-401001-000	70-404001-100
	71-401004-000	70-403001-XXX

CONTACT INPUT DEVICES:

Part numbers	70-407002-00X	70-407008-001
	70-407003-001	70-407008-002
	70-407004-001	

RELAY OUTPUT DEVICES:

Part numbers	70-408002-000	70-408004-001
	70-408003-000	

LOOP ISOLATORS:
Part Numbers
ELECT. BOX MOUNT 74-200012-002
BASE MOUNT 74-200012-004

PALM MODULE (FOR ORION XT HSSD DETECTOR):
Part Number 77-297103-000

ADDRESSABLE PROTOCOL INTERFACE CARD (APIC) (FOR AIR-INTELLIGENCE HSSD DETECTORS):
Part Number 76-333002-001

2-8.4.4 MEASURING CLASS-B SLC WIRING RESISTANCE

Note 1: The following method for measuring SLC wiring resistance applies to SLC circuits located on the Main Controller Board and/or the SLC Expansion Card.

Note 2: This method can only be used on SLC loops that do NOT use Loop Isolators. For SLC loops that do use Loop Isolators, refer to the examples in Appendix B *Wiring and Configuration Requirements for Signaling Line Circuits* for calculating the SLC Loop resistance.

The total wiring resistance from the control unit to the end of each individual branch line cannot exceed 40 ohms. Use the following procedure to determine the wiring resistance.

1. Short the ends of each branch line one at a time. Measure the resistance from the terminating points at the control unit to the end of the branch line. Refer to Figure 2-25.
2. Remove the shorting jumper after each branch-line resistance measurement.

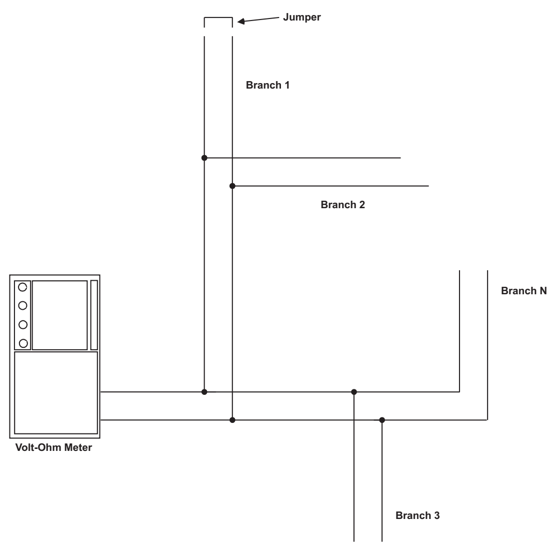


Figure 2-25. Measuring CLASS-B SLC Wiring Resistance

2-8.4.5 MEASURING CLASS-A SLC WIRING RESISTANCE

Note: This method can only be used on SLC loops that do NOT use Loop Isolators. For SLC loops that do use Loop Isolators, refer to the examples in Appendix B *Wiring and Configuration Requirements for Signaling Line Circuits* for calculating the SLC Loop resistance.

The total wiring resistance from the start of the “Out” leg to the end of the “Return” leg cannot exceed 40 ohms. Use the following procedure to determine the wiring resistance.

1. Short the “Out” and “Return” legs as shown in Figure 2-26. Measure the resistance using the other two terminating points at the control unit
2. Remove the shorting jumper after the resistance measurement.

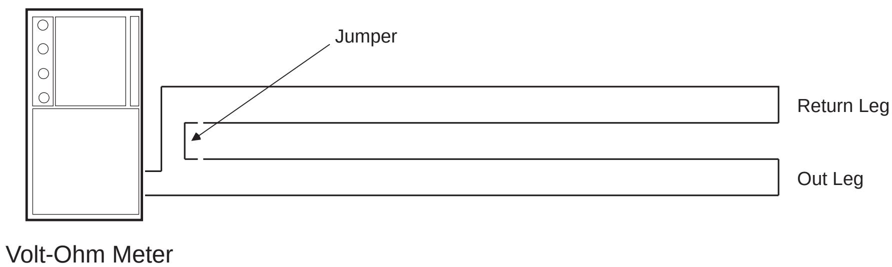


Figure 2-26. Measuring CLASS-A SLC Wiring Resistance

2-8.5 Wiring Auxiliary Power Outputs

Figure 2-27 shows the auxiliary power terminals on the PMU Board. Both outputs are configurable for either resettable or non-resettable operation. Both auxiliary power outputs are power-limited.

Each output is special application 19.2 - 27.6 Vdc current, 2.0A @ 470 μF (maximum).

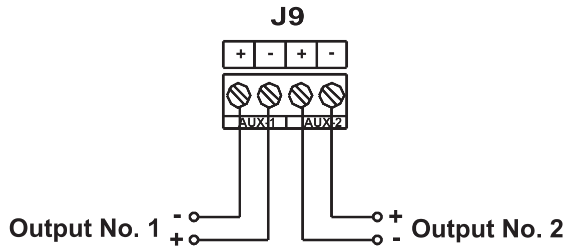


Figure 2-27. Auxiliary Power Output Terminals

Note: Table 2-2 lists the Kidde modules which can be powered by AUX power outputs. When using AUX outputs to drive output power to devices, the total input capacitance of all devices must be considered. Do not exceed the maximum input capacitances for the modules listed in Table 2-2:

Table 2-2. Auxiliary Power Maximum Input Capacitances

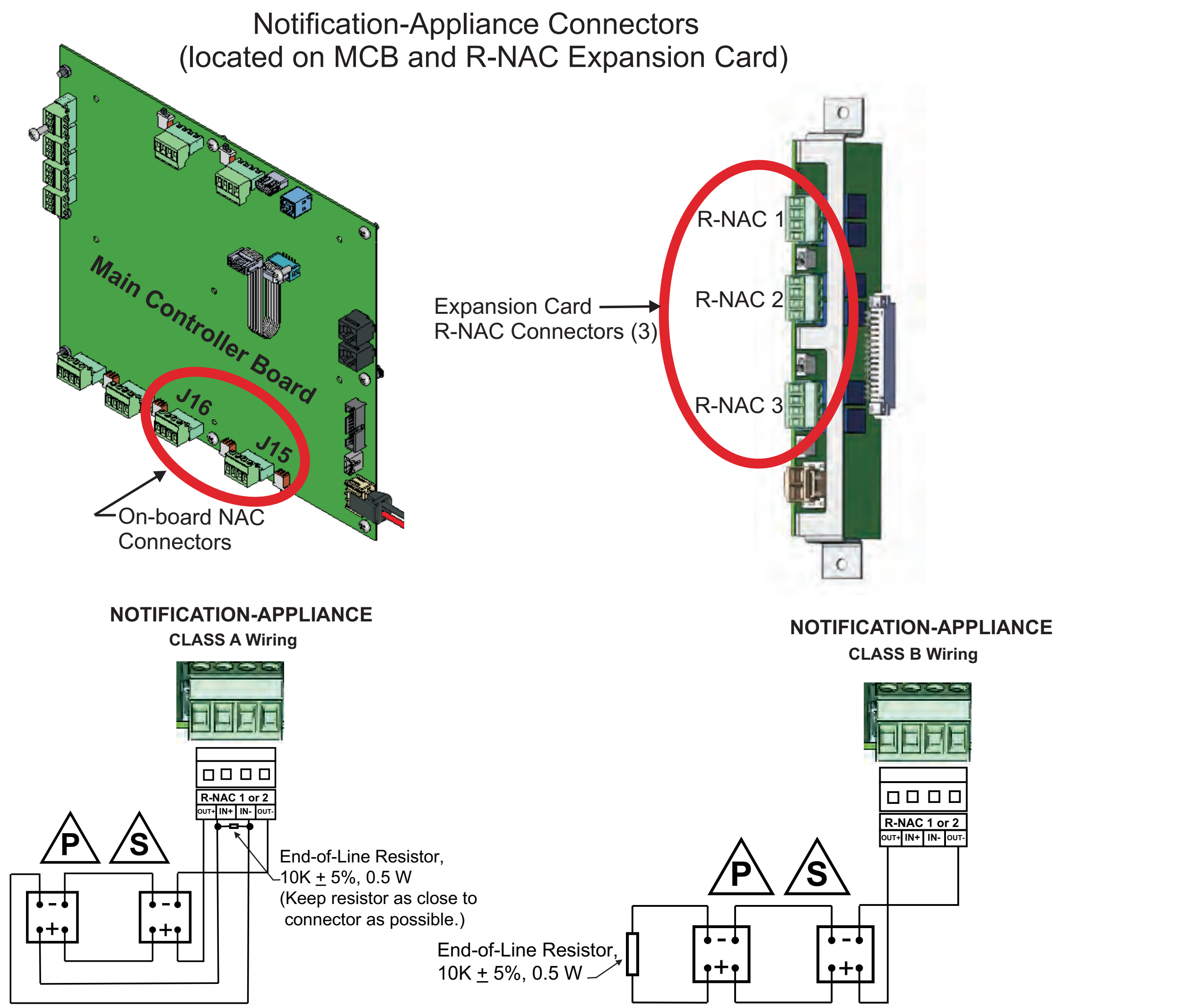
Module	Max. Input Capacitance (μF)
Addressable Signal/Sounder Module (ASM)	100
Remote Release Module (RRM)	220
Remote LED Annunciator Module (R-LAM)	100
Remote Display Control Module (RDCM)	100
Model ATM-L Annunciator Driver Module	100
Model ATM-R Relay Driver Module	100
Fiber Optic Converter Module (FOCM)	100

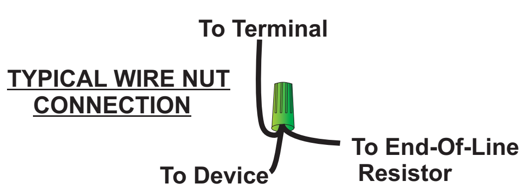
2-8.6 Wiring Notification Appliance Circuits

The ARIES NET*Link* control unit has two on-board notification-appliance circuits (NACs) that are labeled NAC1 and NAC2. These circuits have field-wiring connections that terminate at J16 and J15, respectively. If more circuits are desired, an R-NAC Expansion Card offers three additional R-NAC circuits (which can be used as NAC circuits). Each 24 Vdc regulated NAC circuit can supply up to 1.5 A of current (for synchronizable devices) or 2.0A (for non-synchronizable devices) at a nominal 24 Vdc for polarized notification appliances.

CLASS-A and CLASS-B wiring styles are shown below. When wiring for CLASS-A, resistors need to be connected to a separate conductor to avoid placing two conductors inside a connector terminal. A wire nut can be used to connect incoming field wiring to a resistor and connect lead wires to a connector (as shown in the illustration below).

Note: For enclosures which include one or two power supply units, total current output of the ARIES NET*Link* must not exceed 5.4 A per power supply unit. For enclosures which include three or more power supply units, total current output must not exceed the parameters listed in Appendix A, Section A-5, *Calculating Maximum Load For Multiple Power Supply Units In One Enclosure*.





Installation Notes:

1. Suitable for synchronized and non-synchronized notification appliances. Use polarized notification appliances only.
2. Maximum single notification-appliance current: 2.0 A for non-synchronized devices, 1.5 A for synchronized devices.
3. Multiple conductors cannot be used on the terminal blocks. Multiple conductors are to be connected as depicted at left.

Figure 2-28. Wiring Diagram for Notification-Appliance Circuits

Both NAC circuits are supervised, power limited, and are compatible with conventional, UL-Listed, 24-Vdc notification appliances such as:

- Wheelock® MT Series Multi-Tone Horns and Horn/Strobes
- Wheelock NS Series Horn/Strobes (see Note)
- Wheelock NH Series Horns (see Note)
- Wheelock RSS(P) Series Strobes
- Exceder Series Horns, Strobes, and Horn/Strobes (Xenon flashtube models only)

NOTE: Wheelock NS Series Horn/Strobes and Wheelock NH Series Horns cannot be programmed for synchronization.

Horn/strobe combination devices utilizing the appropriate synch protocol have the option to use silenceable horns and non-silenceable strobes. Refer to the horn/strobe manufacturer's installation sheet for details.

WARNING

All strobes are designed to flash with continuous applied voltage. Strobe notification appliances cannot be used on pulsing signaling (NAC or R-NAC) circuits. You must use a separate notification circuit if the application requires a pulsing signaling circuit for horns. Failure to adhere to this warning may cause system malfunction.

Use Figure 2-29 to estimate the maximum length of wire as a function of notification-appliance current for NACs.

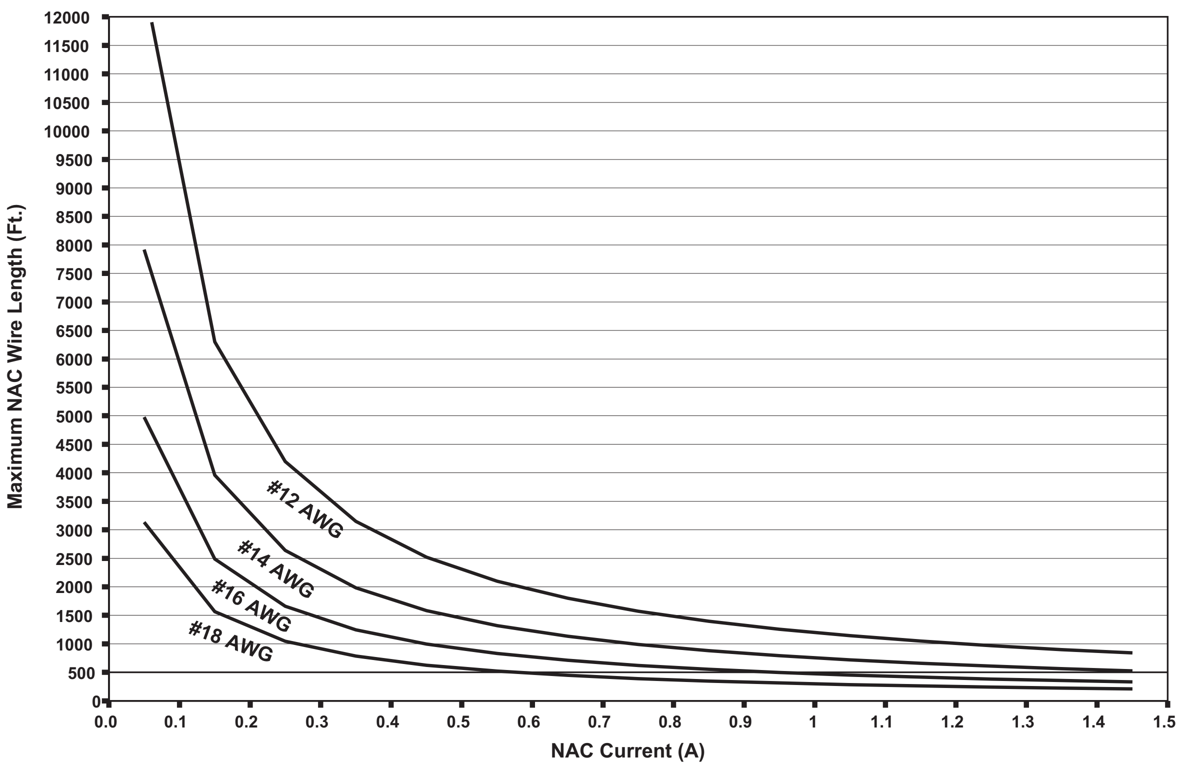


Figure 2-29. Wiring Length vs. Notification-Appliance Current

2-8.7 Wiring R-NAC (Combination) Circuits

The ARIES NET*Link* control unit has two on-board R-NAC circuits that can be used either as notification-appliance circuits (NACs) or as releasing circuits. The R-NAC circuits are labeled RNAC1 and RNAC2. These circuits have field-wiring connections that terminate at J17 and J18, respectively. If desired, an R-NAC Expansion Card offers three additional R-NAC circuits.

R-NAC circuits can be wired as:

- CLASS-A (4 wire) Power Limited
- CLASS-B (2 wire) Power Limited
- CLASS-B (2 wire) Non-Power-Limited

When wiring for CLASS-A, resistors need to be connected to a separate conductor to avoid placing two conductors inside a connector terminal. A wire nut can be used to connect incoming field wiring to a resistor and connect lead wires to a connector.

2-8.7.1 R-NAC CIRCUITS USED AS NACS

Each 24 Vdc regulated R-NAC circuit can supply up to 1.5 A of current (for synchronizable devices) or 2.0A (for non-synchronizable devices) at a nominal 24 Vdc for polarized notification appliances.

Note: For enclosures which include one or two power supply units, total current output of the ARIES NET*Link* must not exceed 5.4 A per power supply unit. For enclosures which include three or more power supply units, total current output must not exceed the parameters listed in Appendix A, Section A-5, *Calculating Maximum Load For Multiple Power Supply Units In One Enclosure*.

Both NAC circuits are supervised, power limited, and are compatible with conventional, UL-Listed, 24-Vdc notification appliances such as:

- Wheelock MT Series Multi-Tone Horns and Horn/Strobes
- Wheelock NS Series Horn/Strobes (see Note)
- Wheelock NH Series Horns (see Note)
- Wheelock RSS(P) Series Strobes
- Exceder Series Horns, Strobes, and Horn/Strobes (Xenon flashtube models only)

NOTE: Wheelock NS Series Horn/Strobes and Wheelock NH Series Horns cannot be programmed for synchronization.

Horn/strobe combination devices utilizing the appropriate synch protocol have the option to use silenceable horns and non-silenceable strobes. Refer to the horn/strobe manufacturer's installation sheet for details.

WARNING

All strobes are designed to flash with continuous applied voltage. Strobe notification appliances cannot be used on pulsing signaling (NAC or R-NAC) circuits. You must use a separate notification circuit if the application requires a pulsing signaling circuit for horns. Failure to adhere to this warning may cause system malfunction.

Use Figure 2-29 to estimate the maximum length of wire as a function of notification-appliance current for an R-NAC circuit used as a NAC.

2-8.7.2 R-NAC CIRCUITS USED AS RELEASING CIRCUITS

Each R-NAC circuit can be configured as a releasing circuit to activate either one control head or one pre-action-sprinkler or deluge-sprinkler valve.

Note: For enclosures which include one or two power supply units, total current output of the ARIES NET*Link* must not exceed 5.4 A per power supply unit. For enclosures which include three or more power supply units, total current output must not exceed the parameters listed in Appendix A, *Battery and Power Supply Calculations*.

WARNING

Ensure that all releasing devices are physically disconnected from the releasing circuits before performing any system testing or maintenance.

2-8.7.2.1 R-NAC Circuits for Single Control Head or Solenoid Valve

Figure 2-30 shows a releasing circuit wired for single-control-head or single-solenoid-valve actuation.

Both R-NAC circuits are supervised and power limited when configured as releasing circuits and when an in-line releasing device (P/N 06-220023-001 or P/N 76-800000-004) is wired in series with the solenoid valve. The compatible control heads and solenoid valves are listed in Appendix C, *List of Agency Listed Compatible Devices*.

Note: Route non-power-limited wiring at least 1/4 inch away from all power-limited wiring. Place non-power-limited wiring inside a conduit.

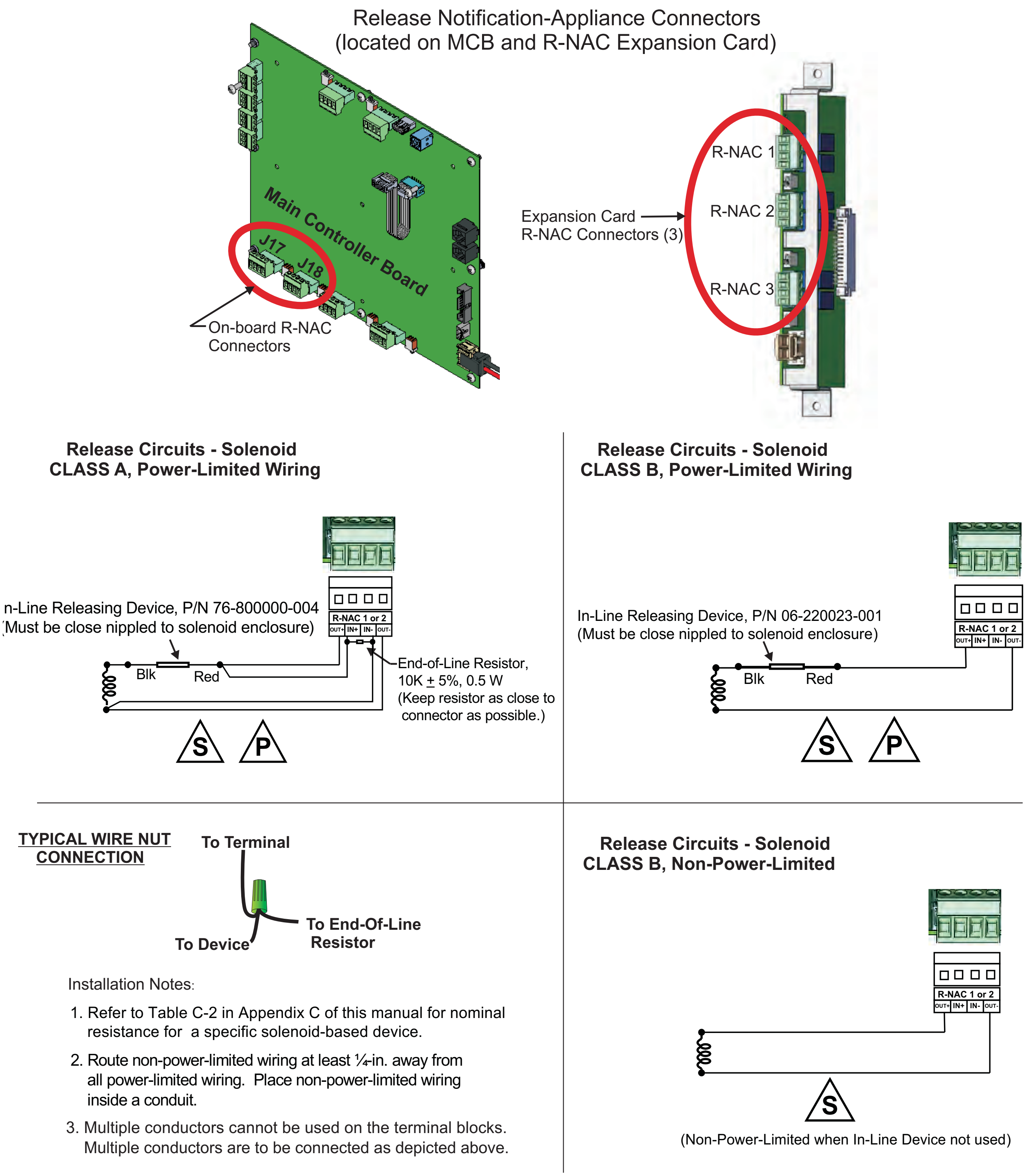
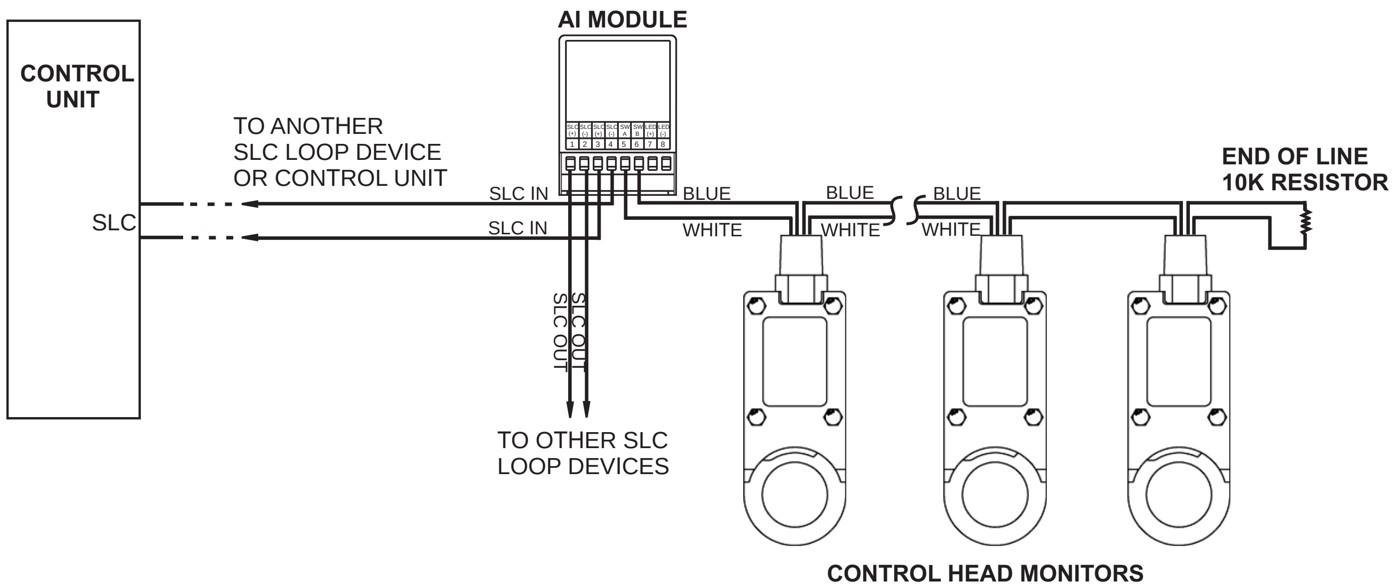


Figure 2-30. Wiring Diagrams for Solenoid-Based Releasing Devices

2-8.7.3 SUPERVISION OF CONTROL HEAD MONITORS ON CYLINDERS

Kidde offers a Control Head Monitor (CHM) for monitoring of control head placement, P/N 85-100000-100. The CHM is placed between the discharge valve and an electric or electric/cable operated cylinder control head. The CHM is wired into an AI module which is configured as Supervisory. Refer to the illustration below.



NOTES:

1. MULTIPLE CONTROL HEAD MONITORS CAN BE INSTALLED ON A SINGLE AI MODULE IDC (PINS 5 AND 6).
2. THE WIRE RESISTANCE OUT AND BACK TO THE 10K EOL RESISTOR MUST NOT EXCEED 50 OHMS.
3. AI MODULE WILL BE CONFIGURED AS SUPERVISORY.
4. THE CONTROL UNIT CANNOT IDENTIFY WHICH MONITOR IS THE SOURCE OF THE SUPERVISORY.
5. TO CONFIGURE THE CONTROL HEAD MONITOR TO A UNIQUE ADDRESS, USE ONE AI MODULE WITH EACH CONTROL HEAD MONITOR.
6. CONNECTIONS 1-6 ON THE AI MODULE ARE NOT POLARITY-SENSITIVE.

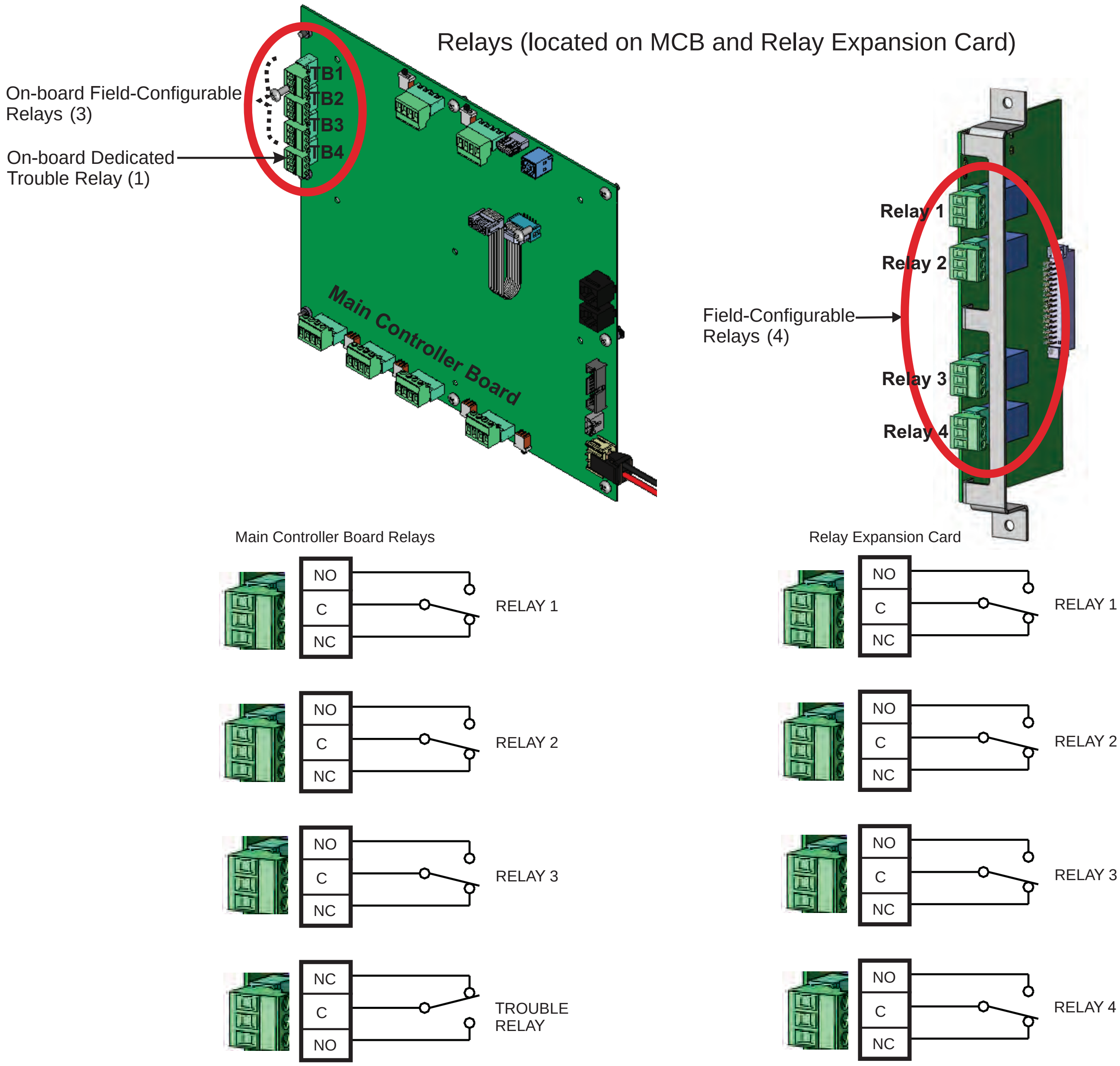
Figure 2-31. Connecting Control Head Monitors to an AI Module for Supervision from Control Unit

2-8.8 Relay Outputs

The Main Controller Board includes three Form-C, programmable relays and one Form-C, dedicated Trouble relay. All of these relays have the following contact ratings:

- 3.0 A @ 24 Vdc (resistive)
- 3.0 A @ 120 Vac (resistive)

The Relay Expansion Card includes four Form-C, programmable relays as shown in Figure 2-32. All of these relays have the same contact ratings listed above. Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the Relay Card.



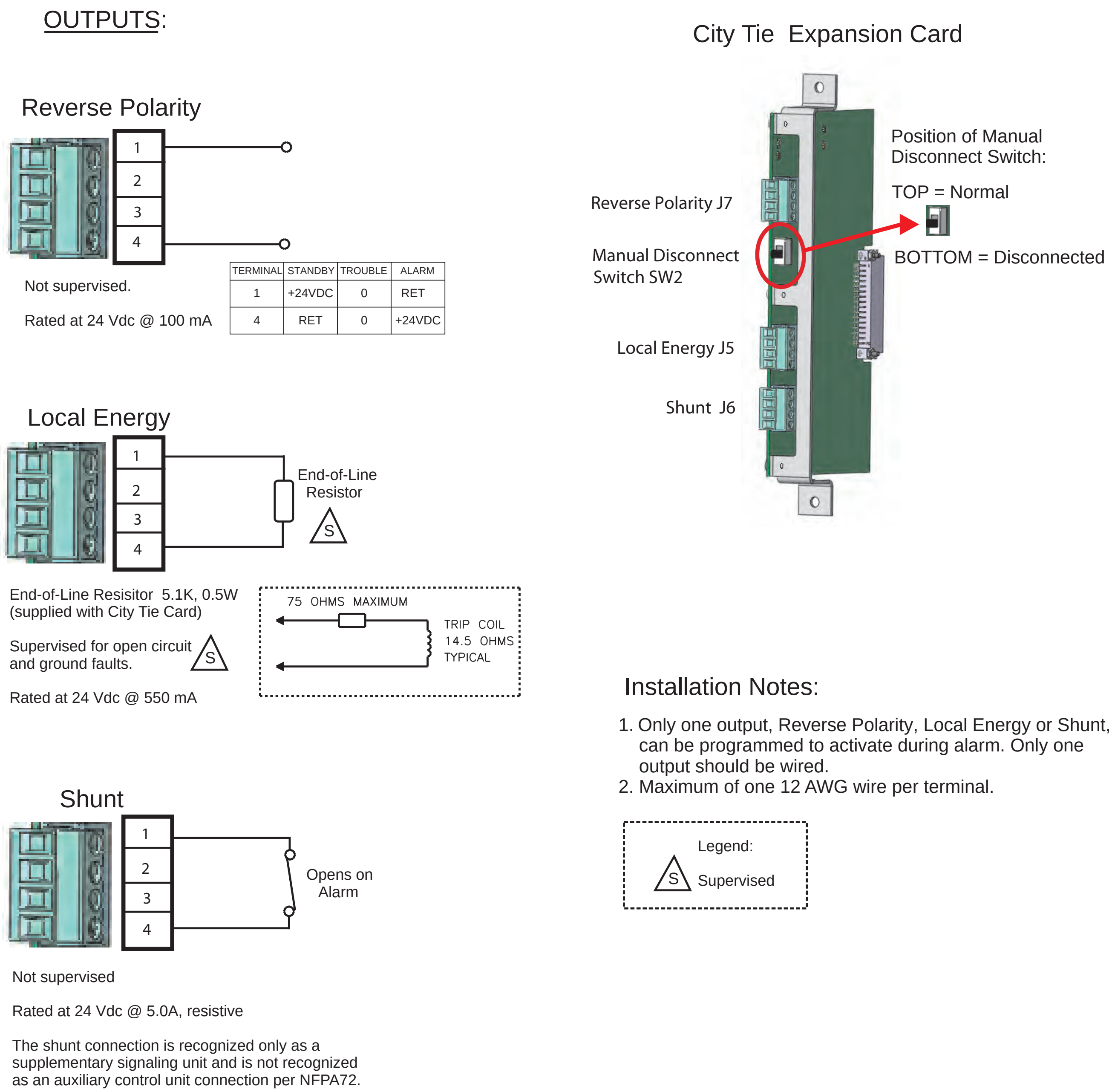
Installation Notes:

1. All relay outputs are shown with the panel powered in the normal standby condition.
2. The Trouble Relay is normally energized and the common "C" is connected to the normally closed "NC" when the panel is powered in the normal standby condition.
3. All contacts are dry contact type.
3. Outputs of all relays are not supervised.
4. Ratings - 3 Amps @ 30 VDC or 3 Amps @120 VAC.
5. Maximum of one 12 AWG wire per terminal.

Figure 2-32. Relay Outputs Diagram

2-8.9 City Tie Wiring

Refer to the wiring diagram shown below (Figure 2-33) for City Tie Card connections. Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the City Tie Card.



TERMINAL	STANDBY	TROUBLE	ALARM
1	+24VDC	0	RET
4	RET	0	+24VDC

Figure 2-33. City Tie Wiring Diagram

CAUTION

Any communications wiring which exits the building or facility should not be routed to or located inside the same conduit as the AC power.

2-9 DIGITAL ALARM COMMUNICATOR TRANSMITTER (DACT) WIRING

For communication to a central monitoring station, connect one or two phone lines to the phone jack connectors located on the DACT Card. The connections are Loop Start Public Switched Telephone Network connections which meet the specifications of UL864 and FCC Part 68. Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the DACT Card.

Refer to the wiring diagram shown below (Figure 2-34) for DACT Card connections.

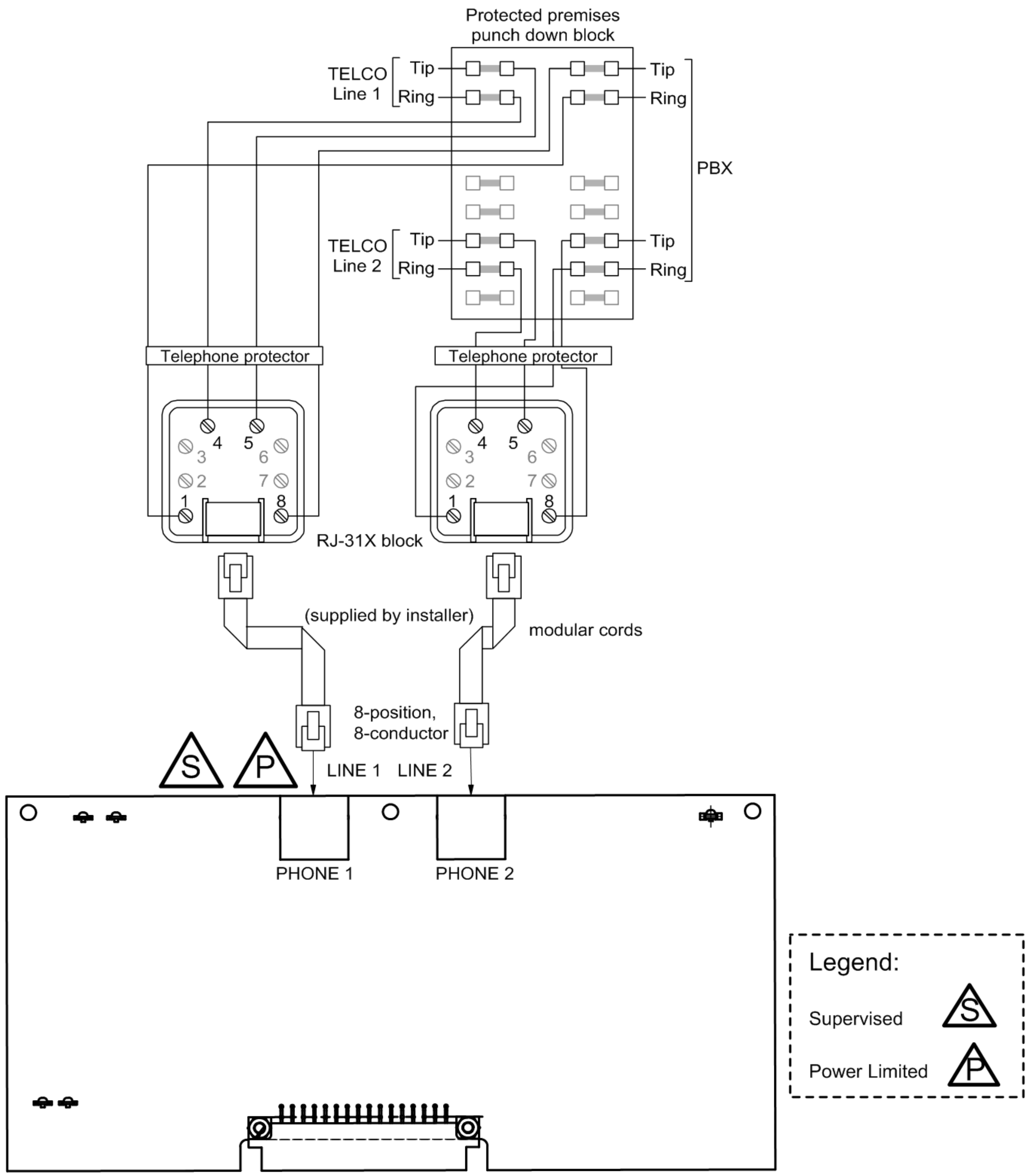


Figure 2-34. DACT Card Wiring Diagram

2-10 INTERNET COMMUNICATIONS MODULE (ICM) WIRING

Refer to the wiring diagram shown below (Figure 2-35) for ICM Card connections. Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the ICM Card.

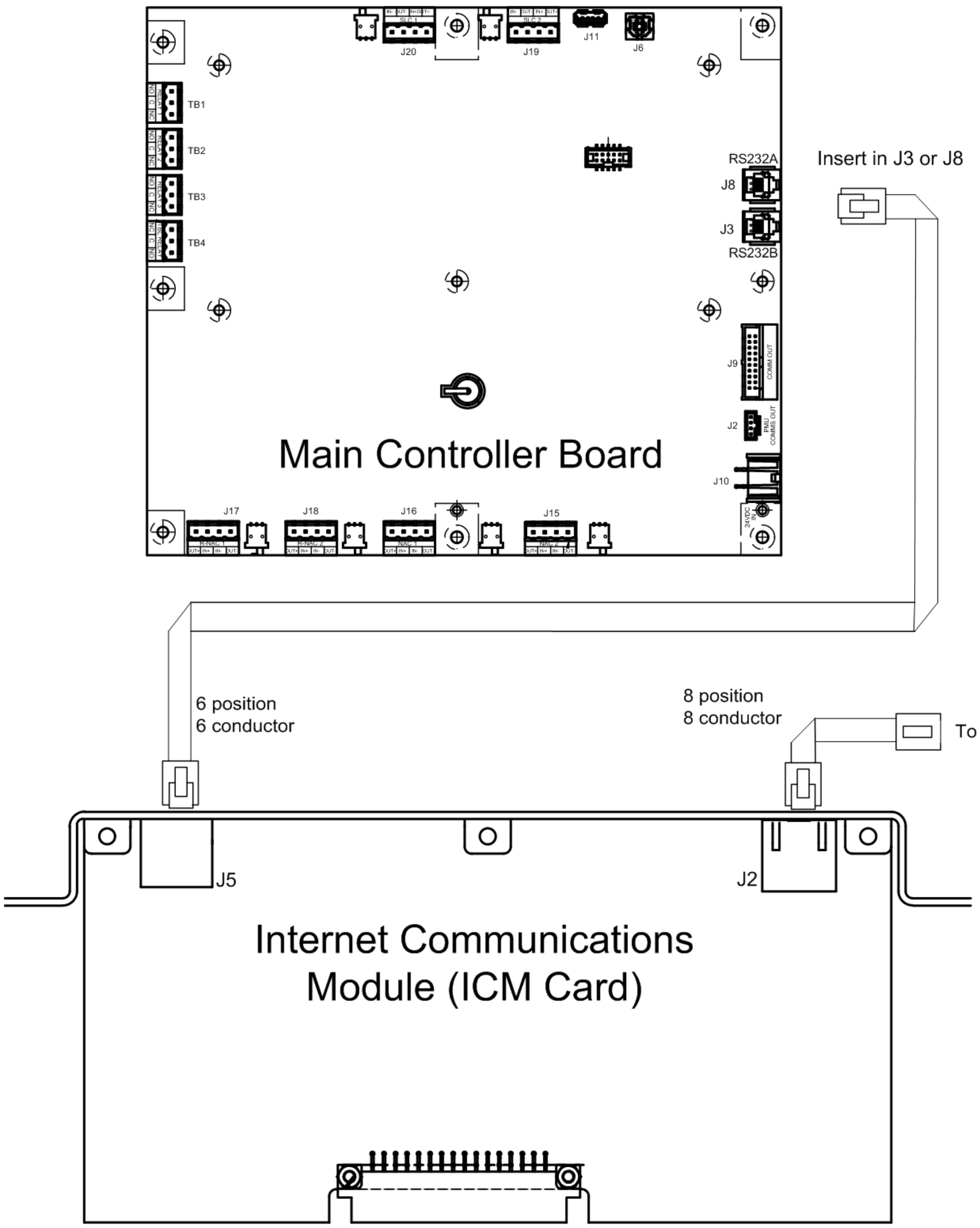


Figure 2-35. ICM Card Wiring Diagram

2-11 SETTING UP RS232 / USB COMMUNICATIONS

2-11.1 Setting up RS232 Communications Port

The Main Controller Board has two RS232 communications ports (RS232A and RS232B) to connect to various third-party supplementary devices such as serial printers and graphical monitoring systems.

The default parameters for these communications ports are:

- 38400 Baud Rate
- No Parity
- 8 Bit Word Length
- 1 Start Bit
- 1 Stop Bit

The RS232 connection to the MCB is via an RJ12 socket. The following signals are communicated via the RJ12 socket's pins:

Table 2-3. RJ12 Socket Pin Signals

Signal	Designation	Pin No.
Transmit Data	TX	1
Signal Ground	Gnd	5
Request to Send	RTS	3
Clear to Send	CTS	4
Receive Data	RX	6

Note: Pin No. 2 is not used.

The RS232 communications port can be connected to its associated supplementary device with a standard RS232 cable of up to 50 feet in length.

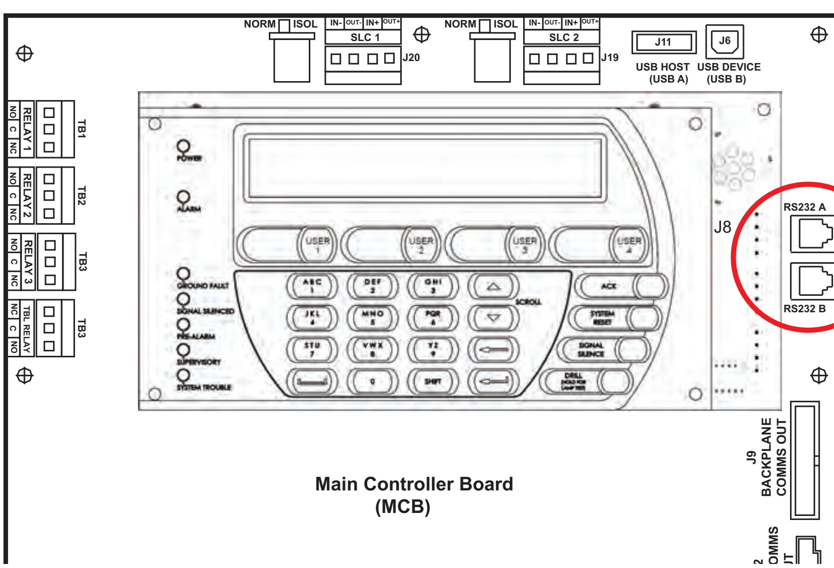


Figure 2-36. RS232 Communications Ports

2-11.2 Setting up USB Communications Ports

The Main Controller Board has two USB communications ports available for connection to a PC (device port J6) or printer (host port J11). A laptop or remote computer may be connected to device port J6 and used to upload/download a system configuration or to download event logs. A USB-driven printer may be connected to host port J11 for printing event logs, test results, etc.

Note: When using the USB port, the ground fault circuitry is not functional. This port is to be used to download configurations and operating system software only and is not intended to be used on a permanent basis. Do not connect or disconnect the USB cable while the control unit is powering up on system startup or initializing after a new configuration upload.

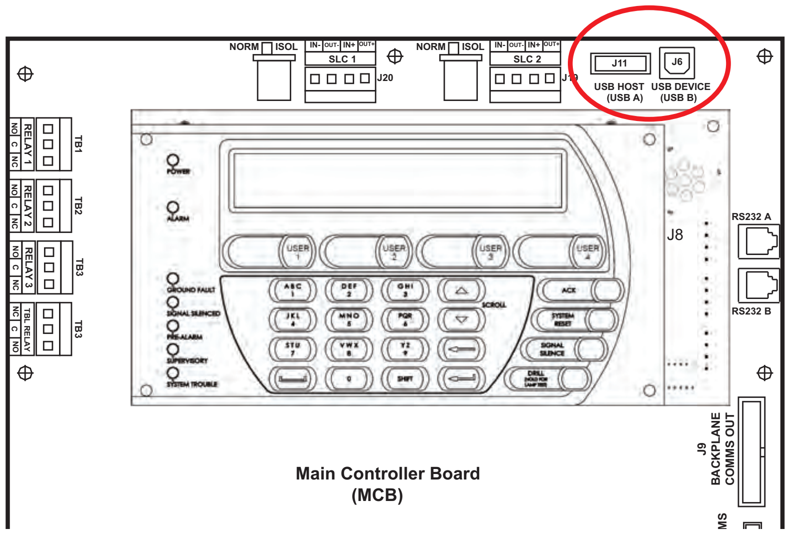


Figure 2-37. USB Communications Ports

2-11.3 Connecting a Laptop, Remote Computer or Printer

Figure 2-38 illustrates how to connect a laptop, remote computer and/or printer with either a USB or RS232 communications cable. Note that printers and computers must be located within 20 ft. of the control unit (in the same room). A tractor-feed printer is recommended for continuous printing of event logs.

Note: The printer models listed below are compatible with the ARIES NET*Link*:

1. Okidata Microline 186 (USB printer)
2. Okidata Microline 320 (Both USB and RS232 printers)
3. Epson FX-890 (USB printer)

If using a USB port:

- Connect the computer to device port J6 on the MCB
- Connect a USB-compatible printer to host port J11 on the MCB
- A USB Isolator must be used in series with the USB cable when connecting to port J6 as shown in Figure 2-38. This connection is typically used when sending or receiving information between the panel and a PC running the panel configuration software. Kidde Fire Systems has tested and recommends the USB Isolator P/N 10000071.

If using an RS232 port:

- Connect the computer to either RS232A or RS232B ports on the MCB
- Connect a serial printer to either RS232A or RS232B ports on the MCB
- The port will automatically be set to a baud rate of 9600 when configured for an RS232 printer.

Ports can be configured using either the ARIES NET*Link* remote configuration software or the Port Control command from the ARIES NET*Link* SET Menu (accessed from the Keypad/Display).

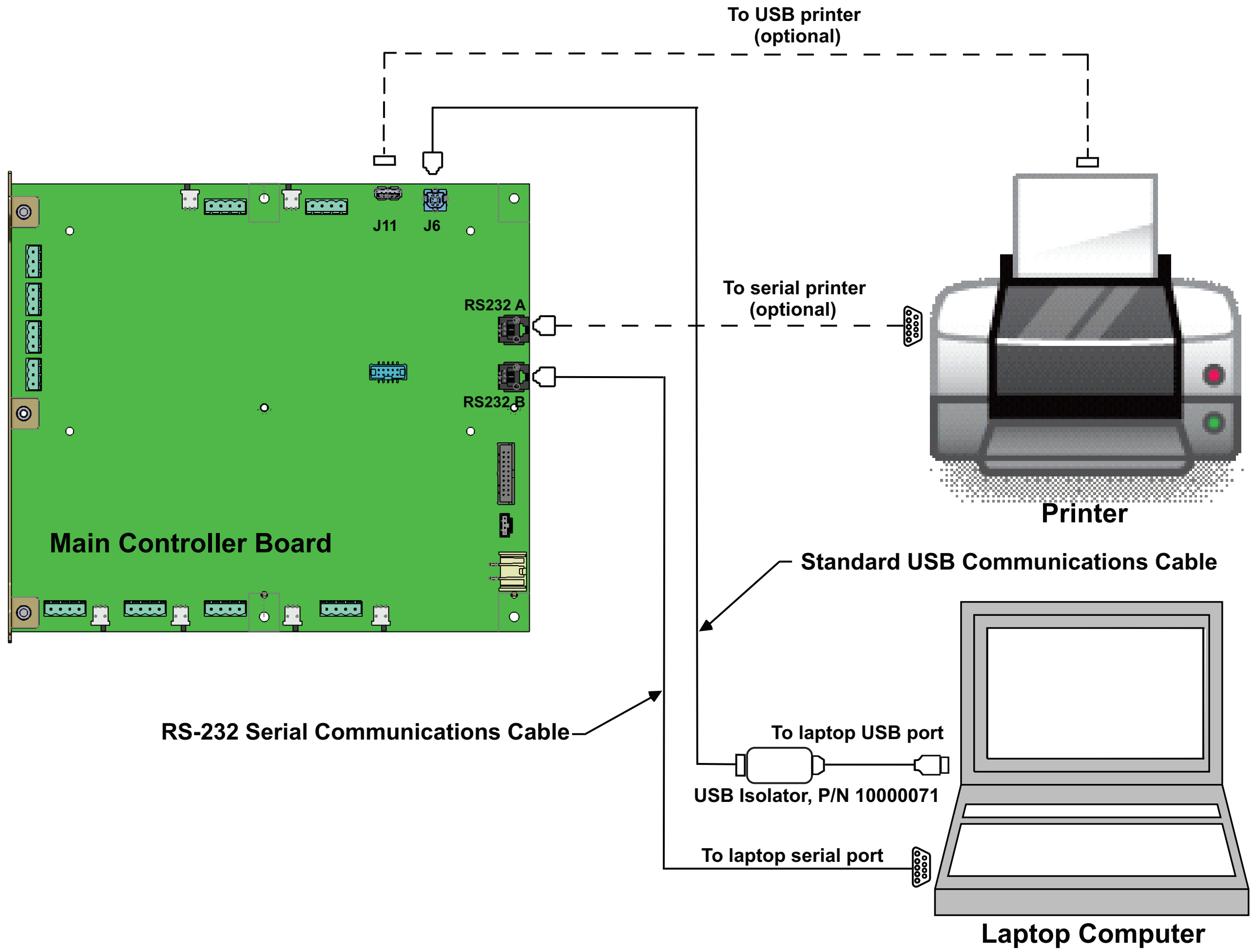


Figure 2-38. Laptop/Remote Computer and Optional Printer Connections to MCB

2-12 SETTING UP REMOTE RS485 PERIPHERAL DEVICES AND ENCLOSURES

The ARIES NET*Link* control unit can communicate with up to 31 peripheral (remote) devices via its RS485 communications circuit. The peripheral devices are listed below, along with the maximum numbers for each particular type of device. For instructions on how to set the address for an RDCM, refer to Section 2-12.3. For instructions on how to set the address for a LAM, refer to Section 2-12.2.

Note: If an integrated LED Annunciator is included in the ARIES NET*Link*, the total number of remote devices cannot exceed more than 30 addresses.

Table 2-4. ARIES NET*Link* System Maximum Peripheral Devices

Device	Maximum Number
Remote Display Control Module (RDCM)	15
Remote LED Annunciator Module (R-LAM)	16
Model ATM-L Annunciator Driver Module (ATM-L)	16
Model ATM-R Relay Driver Module (ATM-R)	16

2-12.1 Installing the Remote Enclosure

The Remote Enclosure houses either the Remote Display Control Module or the Remote LED Annunciator Module and mounts to the wall (surface or semi-flush mounting).

2-12.1.1 PREPARATION

Before you begin installation of the Remote Enclosure, prepare the enclosure by doing the following:

1. Remove knockouts from the enclosure to enable the connection between the conduit and the enclosure. Consult approved electrical installation drawings for connection information.
2. Route properly-sized conduit from the enclosure to locations designated on the approved layout drawings for peripheral devices.
3. Route the properly-sized and required wiring through conduit from the enclosure to the field devices. Observe the wiring manufacturer's recommended minimum bending radii for all internal-control-unit and external wiring. Use appropriate equipment to check and record the wiring for insulation resistance to Earth Ground. Measure and record the wiring resistance for all external circuits.
4. Remove the keys from the envelope taped to the top of the Remote Enclosure.
5. Remove the Remote Enclosure door first by unlocking it and then lifting the door up to allow the door's hinges to clear the mating-hinge pins on the enclosure.
6. Remove the separately packaged installation hardware and documentation from inside the enclosure. Set the door aside in a safe location to prevent damage.
7. Locate the top of the cabinet approximately 66 in. above the floor so that the display is positioned at a convenient height for viewing system events and for entering operator commands.

2-12.1.2 SURFACE MOUNTING ON WALL

To surface mount the Remote Enclosure, do the following;

1. Mark and pre-drill holes for four mounting bolts using the dimensions shown. Two keyhole slots (at the top) and two holes (at the bottom) are located in the enclosure's rear panel that serve as a template for surface mounting. (Refer to Figure 2-39.)

Note: The installer must supply the mounting bolts (up to size 1/4-20).

2. Insert the upper two fasteners in the wall. Leave approximately 1/4" of the screws protruding.
3. Slip upper keyholes of the enclosure over the protruding screws. Tighten the screws.
4. Insert and tighten the two lower screws.
5. Attach wiring conduit to the enclosure via the enclosure knockouts and pull the required number of wires through the conduit to the enclosure. Leave approximately 2 to 3 feet of wire length in the enclosure for field wiring connections.
6. With the enclosure secured to the wall, power and RS485 cables can be connected. Refer to the wiring diagram shown in Figure 2-41.

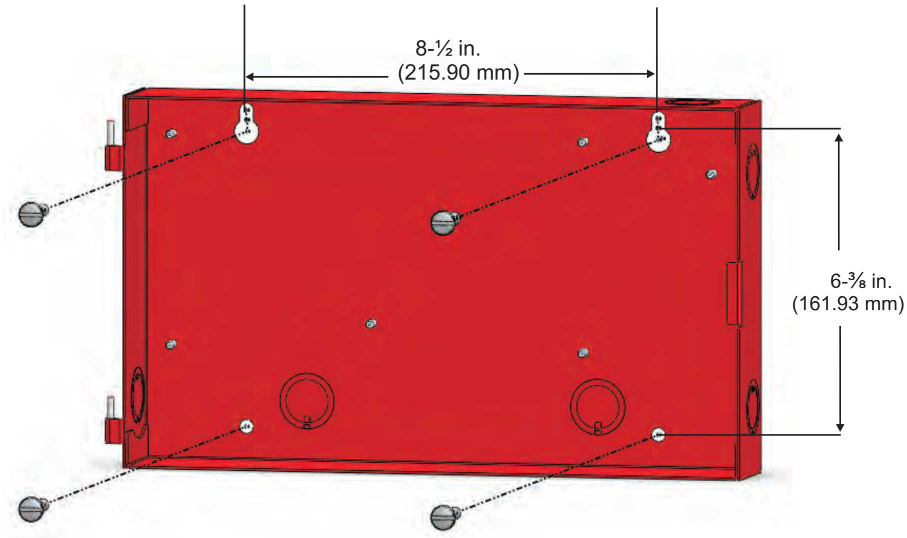


Figure 2-39. Surface Mounting of the Remote Enclosure (shown without RDCM or R-LAM modules)

2-12.1.3 SEMI-FLUSH MOUNTING ON WALL

To semi-flush mount the Remote Enclosure:

1. Remove the keys from the envelope taped to the top of the enclosure.
2. Remove the Remote Enclosure door first by unlocking it and then lifting the door up to allow the door's hinges to clear the mating-hinge pins on the enclosure.
3. Remove module PCB from inside enclosure by removing four screws holding it in place.
4. Cut and plumb an opening in the wall on which the Remote Enclosure will be mounted approximately 13 in. wide by 8 in. high (Refer to Figure 2-40.)
5. Position and plumb the enclosure in the opening made in Step 4. Ensure that the front edge of the enclosure is at least 3/4 inches from the surface of the wall. Center the enclosure within the opening as closely as possible.
6. Secure the enclosure to the wall with appropriate mounting bolts (up to size 1/4-20). The enclosure may optionally be mounted to adjacent wall studs. Holes for stud mounting must be drilled as required.
7. Slide the trim ring over the enclosure into opening, flush against wall.
8. Insert and hand-tighten four 8/32-in. screws (provided in hardware kit) through the slots in the enclosure into trim ring itself.
9. Adjust the position of the trim ring and tighten screws.
10. With the enclosure secured to the wall, replace module PCB removed earlier and secure screws.
11. Attach wiring conduit to the enclosure through the enclosure knockouts and pull the required number of wires through the conduit to the enclosure. Leave approximately 2 to 3 feet of wire length in the enclosure for field wiring connections.
12. Connect power and RS485 cables. Refer to the wiring diagram shown in Figure 2-41.
13. Replace the door when done.

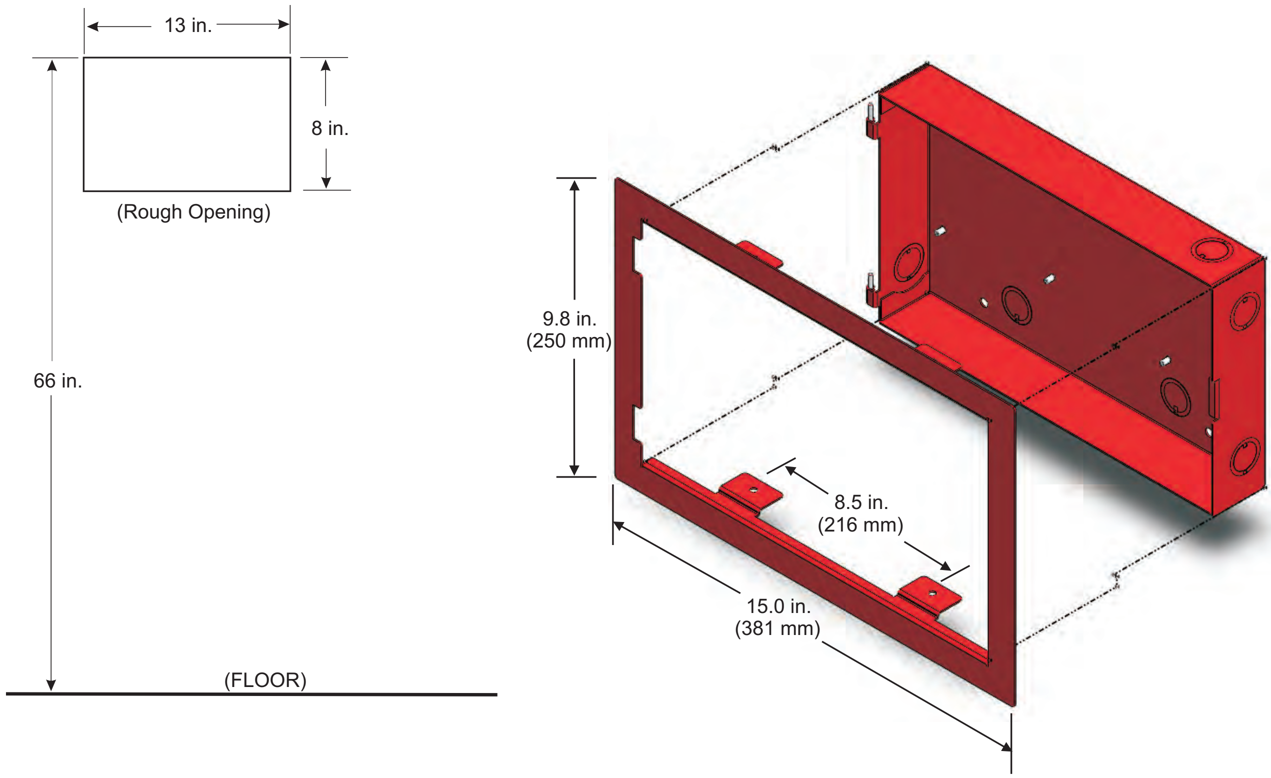


Figure 2-40. Semi-Flush Mounting of Remote Enclosure (shown without RDCM or R-LAM modules)

The RS485 communications circuit is power-limited. Figure 2-41 shows typical interconnections among the ARIES NET*Link* control unit and the peripheral devices using both a single and dual communications channel.

Installation Notes:

1. RS485 circuits must be terminated at the first and last device in the circuit. First device is the main Keypad/Display with termination resistor SW2 (located on the back side of the board) set to the ON (terminated) position. For Remote Keypad/Display and RDCM boards, set termination resistor SW2 to the OFF (open) position for intermediate assemblies by moving the small white switch lever. Leave in the ON position if assembly is the last device in the circuit. For ATM-L or ATM-R assembly termination settings, refer to the Model ATM-L/R Series Drivers Installation Manual, P/N 06-236179-002.

2. For remote synchronization between RDCMs, R-LAMs and the control unit (having power supply connections common to all), install wire from LED SYNCH OUT+ of the originating device to LED SYNCH OUT- of the first remote peripheral device. Continue for as many remote devices in the system. Note: An R-LAM cannot be an originating device.

Communications Circuit (J8)

Voltage:	24 VDC
Current:	Per RS485 Standard
Recommended Wire:	Twisted, shielded, low-capacitance, fire-alarm wire
Max. Wire Length:	4,000 Ft. per twisted pair

Use the following remote control modules only:

Module Type	**Model No.**
Display / Control	RDCM
Display	R-LAM

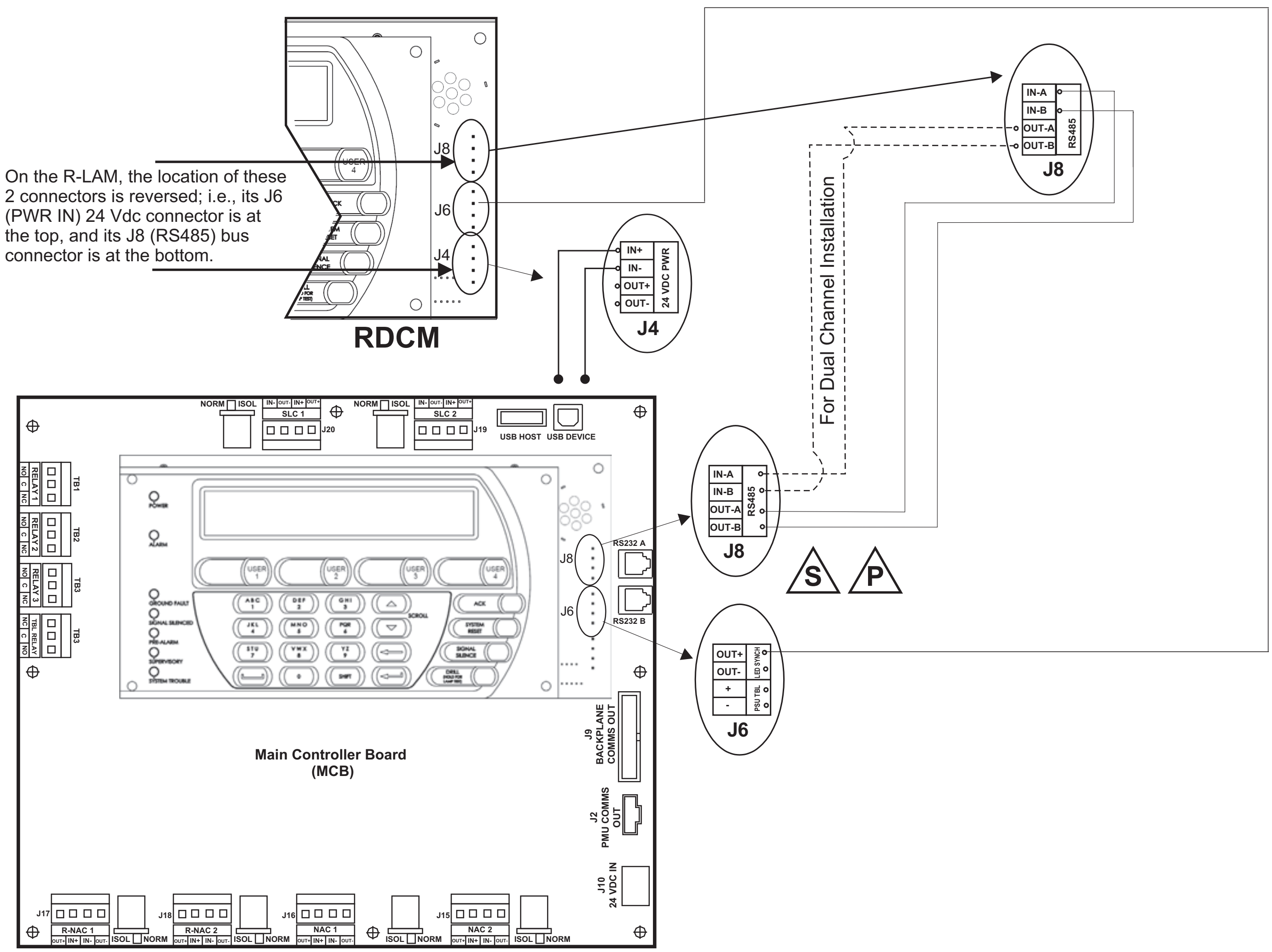


Figure 2-41. RS485 Wiring Diagram for Remote Devices to MCB

2-12.2 Setting Address for a Remote LAM or Integrated LAM

After an LED Annunciator Module (LAM) is installed and connected to the Main Controller Board or RS485 network, it requires addressing for detection by the ARIES NET*Link*. The address must be set locally on the module itself. Each LED corresponds to a numeric value, starting at “1” and incrementing to “16”.

Note: The LAM address may be a value between 1 and 16.

To address a brand new LED Annunciator Module:

1. Power on the module. The green Power LED will flash, indicating that the module is in “addressing mode.”
2. Press the <ACK> key on the module. A yellow LED will light at the first LED. This LED corresponds to the number “1”. If you wish the module address to be “1”, you are done.
3. To advance to the next LED (number “2”), press the <ACK> key again.
4. You may continue to advance to the next LED by pressing the <ACK> key repeatedly (incrementing the number each time) until you reach the 16th LED. Pressing the <ACK> key while on the 16th LED returns you to the first LED.
5. With the yellow LED lit at the LED having the desired value, press and hold the module’s <Signal Silence> button for 5 seconds to confirm your address selection.

To make changes afterwards:

1. On an installed and powered-up module, press and hold both the <ACK> and <Signal Silence> keys at the same time.
2. The green Power LED will flash, indicating that the module is in “addressing mode.”
3. Press the <ACK> key on the module. A yellow LED will light at the LED with the value of the LAM address currently in memory.
4. To change the value, press the <ACK> key repeatedly until you land on the LED with the desired new value (1 through 16).
5. Press and hold the module’s <Signal Silence> button for 5 seconds to confirm your new selection.

2-12.3 Setting Address for a Remote Display/Control Module (RDCM)

After a Remote Display/Control Module is installed and connected to the RS485 network, it requires addressing for detection by the ARIES NET*Link*. The address must be set locally on the module itself.

Note: The RDCM address may be a value between 1 and 15.

To address a brand new RDCM:

1. Power on the module. The green Power LED will light and the module will be in "addressing mode." The display will read: "Enter New Module Address (1-15):"
2. Using the RDCM keypad, type the desired address (1 - 15) and press the <Enter> key to store it.

Note: Addresses currently in use on the RS485 network will not be selectable.

To make changes afterwards:

1. On an installed and powered-up module, press the <1> key, followed by the <2> key, followed by the <3> key on the RDCM keypad. This provides access to the local menu of the RDCM.
2. The following options will be displayed:

   (1) MODULE ADDRESSING (displayed for RDCM only)
   (2) CONTRAST ADJUSTMENTS
   (3) BACKLIGHT SETTINGS
   (4) MANUFACTURER SERIAL NUMBER

3. Using the RDCM keypad, select "1" (for Module Addressing) and press <Enter>.
4. The display will read: "Enter New Module Address (1-15):"
5. Using the RDCM keypad, type the desired address (1 - 15) and press <Enter> to store it.

Note: Addresses currently in use on the RS485 network will not be selectable.

2-12.4 Adjusting Display Settings on RDCM or Control Unit Keypad/Display

On an installed and powered-up module, press the <1> key, followed by the <2> key, followed by the <3> key on the keypad. This provides access to the local menu of the RDCM or Control Unit Keypad/Display.

- To adjust the contrast of the display, select "2" on the keypad (for Contrast Adjustments) and press <Enter>. Use the UP/DOWN scroll keys to increase or decrease contrast until satisfied.
- To adjust the backlight of the display, select "3" on the keypad (for Backlight Settings) and press <Enter>. Press "1" on the keypad to turn OFF the backlight; press "2" on the keypad to enable the backlight in PowerSaver mode; press "3" on the keypad to enable the backlight continuously.

Use Figure 2-42 to estimate the maximum length of wire that can be connected to RS485 peripheral devices.

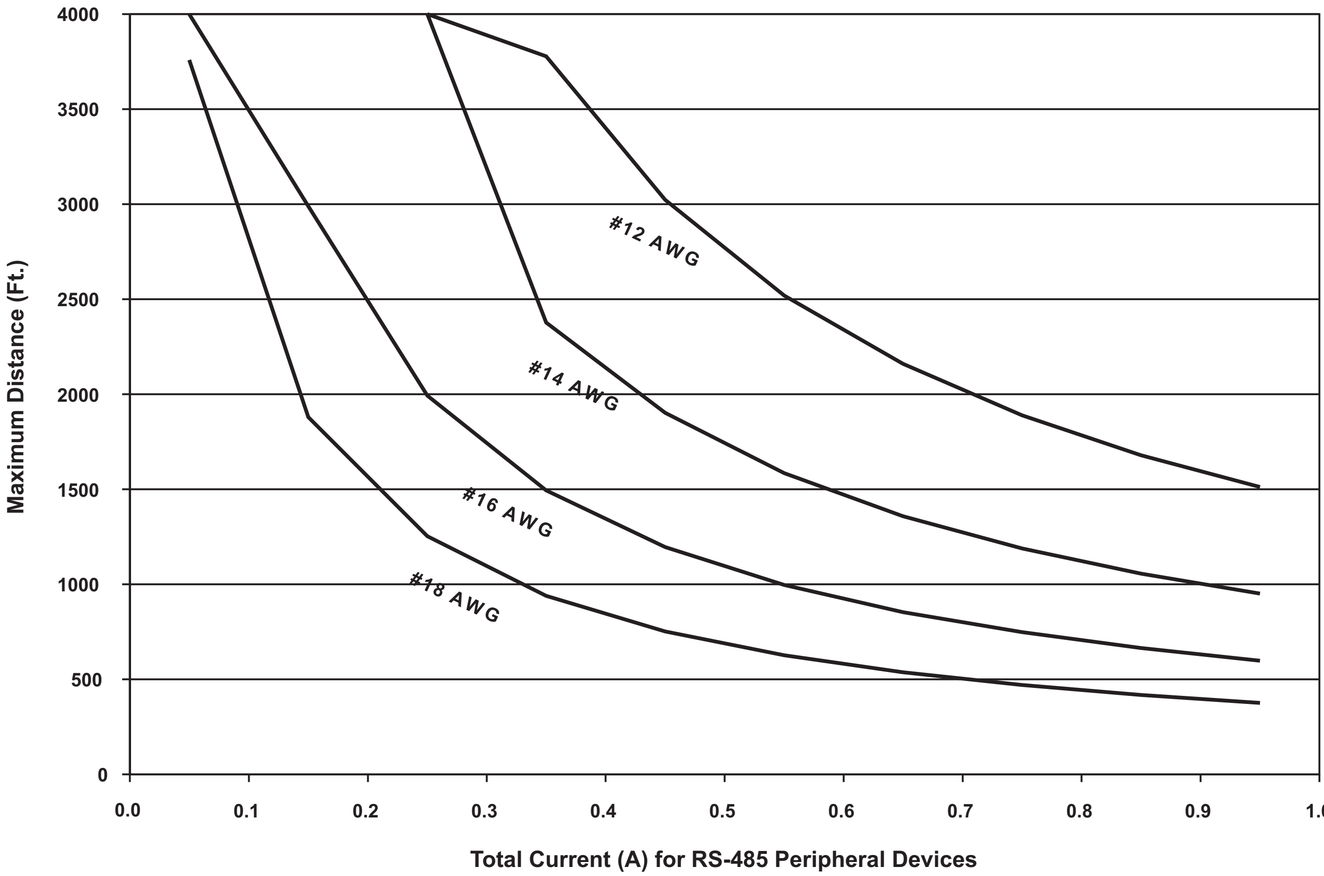


Figure 2-42. 24 Vdc-Power Wiring Length vs. Peripheral-Devices Current

2-12.5 Installing the ATM-L Annunciator Driver Module

Refer to the *ATM-L/R Series Drivers Installation Manual*, P/N 06-236179-002, for instructions on installing this driver module.

2-12.6 Installing the ATM-R Relay Driver Module

Refer to the *ATM-L/R Series Drivers Installation Manual*, P/N 06-236179-002, for instructions on installing this driver module.

2-13 SETTING UP NETWORK EQUIPMENT

2-13.1 Network Interface Card (NIC)

The Network Interface Card contains the circuitry for data communications between networked control units. One NIC must be installed in the Card Cage of each networked control unit (referred to as “nodes”). The nodes transmit and receive messages via RS485 communications. Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the NIC Card.

Note: At the originating NIC in the network, attach the Earth Ground wire behind the bottom NIC Card mounting screw. A ring terminal may be soldered or crimped to the end of the wire for easier attachment under screw.

Typical CLASS-B, Style 4 and CLASS-A, Style 7 wiring is shown below:

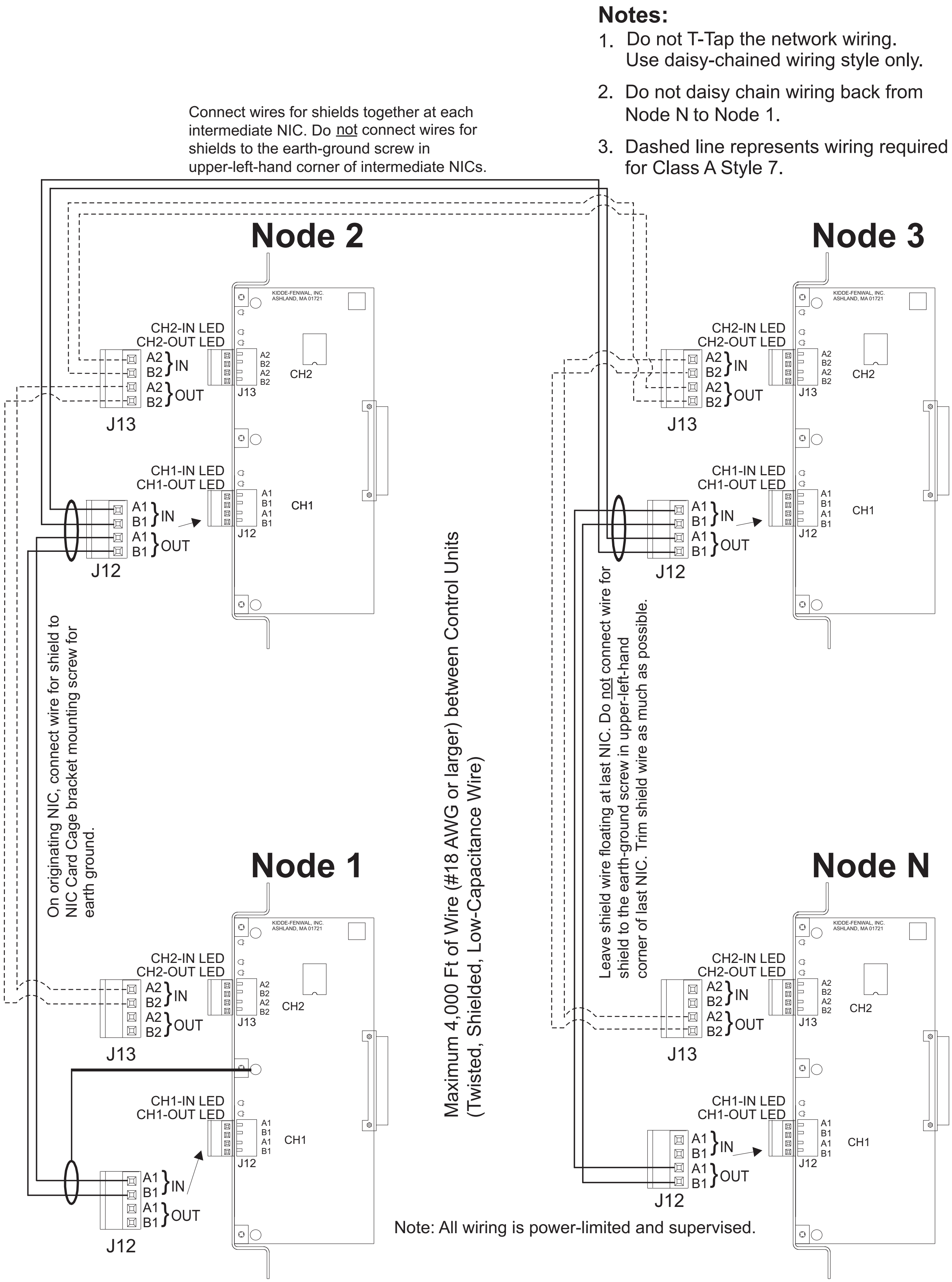


Figure 2-43. Network Interface Card Wiring

2-14 INSTALLING THE FIBER OPTIC CONVERTER MODULE (FOCM)

Each FOCM enclosure is equipped with electrical conduit knock-outs for both the fiber-optic cable and wire connections from the control unit for both 24 Vdc power and the RS485 data lines. 24 Vdc power can be provided from the PMU Board J9 AUX 1 or AUX 2 terminal block outputs. These wires are then connected to the FOCM power input terminal block mounted inside its enclosure. The RS-485 data link connection is provided at the ARIES NET*Link* Network Interface Card (NIC) which is inserted in the Card Cage. Wire connections are made at NIC terminal block J12 (Channel 1) or J13 (Channel 2).

Note: The FOCM enclosure can be located up to 4000 ft. from its parent Control Unit for convenient wiring connections. Use 18 AWG or larger twisted, shielded, low-capacitance wire for NIC-to-FOCM interconnections.

To install the Fiber Optic Converter Module:

1. Mark and pre-drill holes for four mounting bolts using the dimensions shown. Two keyhole slots (at the top) and two holes (at the bottom) serve as a template for surface mounting. Refer to Figure 2-44 below.

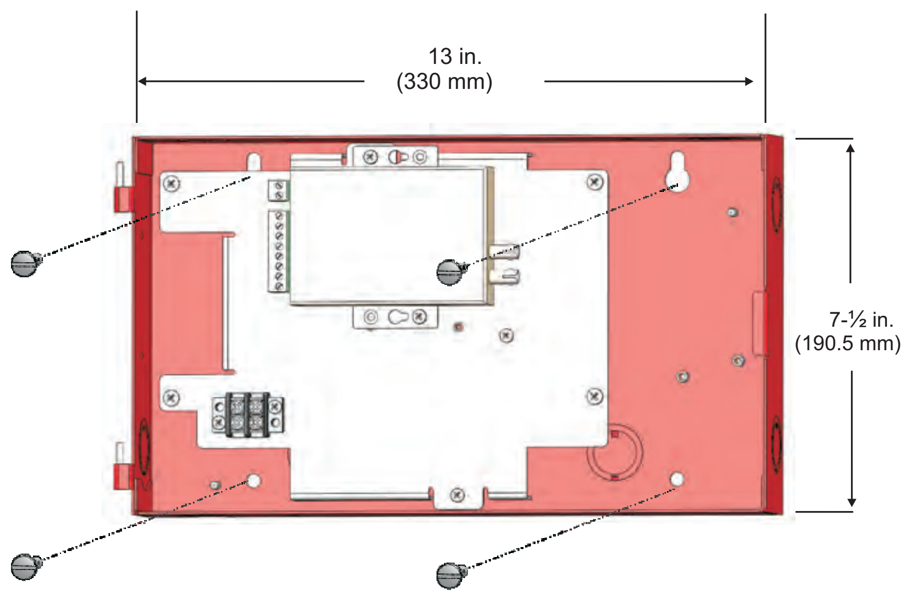


Figure 2-44. Mounting the FOCM Enclosure

2. Insert the upper two fasteners into the wall. Leave approximately 1/4-inch of the screws protruding.
3. Slip upper keyholes of the enclosure over the protruding screws. Tighten the screws.
4. Insert and tighten the two lower screws.
5. With the enclosure secured to the wall and power removed from the control unit, RS485, power and duplex fiber-optic cables can be connected through the conduit knock-outs. Refer to the wiring diagrams provided in Figure 2-45 (single channel) or Figure 2-46 (dual channel).
   - Connect an RS485 data cable from the Network Interface Card terminal block J12 (for Channel 1) or J13 (for Channel 2) to the RS485 input terminal block mounted inside the enclosure. Refer to provided wiring diagrams in Figure 2-45 or Figure 2-46.
   - Connect a 24 VDC power cable from the Power Management Unit (PMU) Board J9 AUX1 or AUX2 terminal block outputs to the FOCM power input terminal block mounted inside the enclosure.

2-14.1 Fiber Optic Converter Module (FOCM) Wiring - Single Channel

A single channel system is shown below:

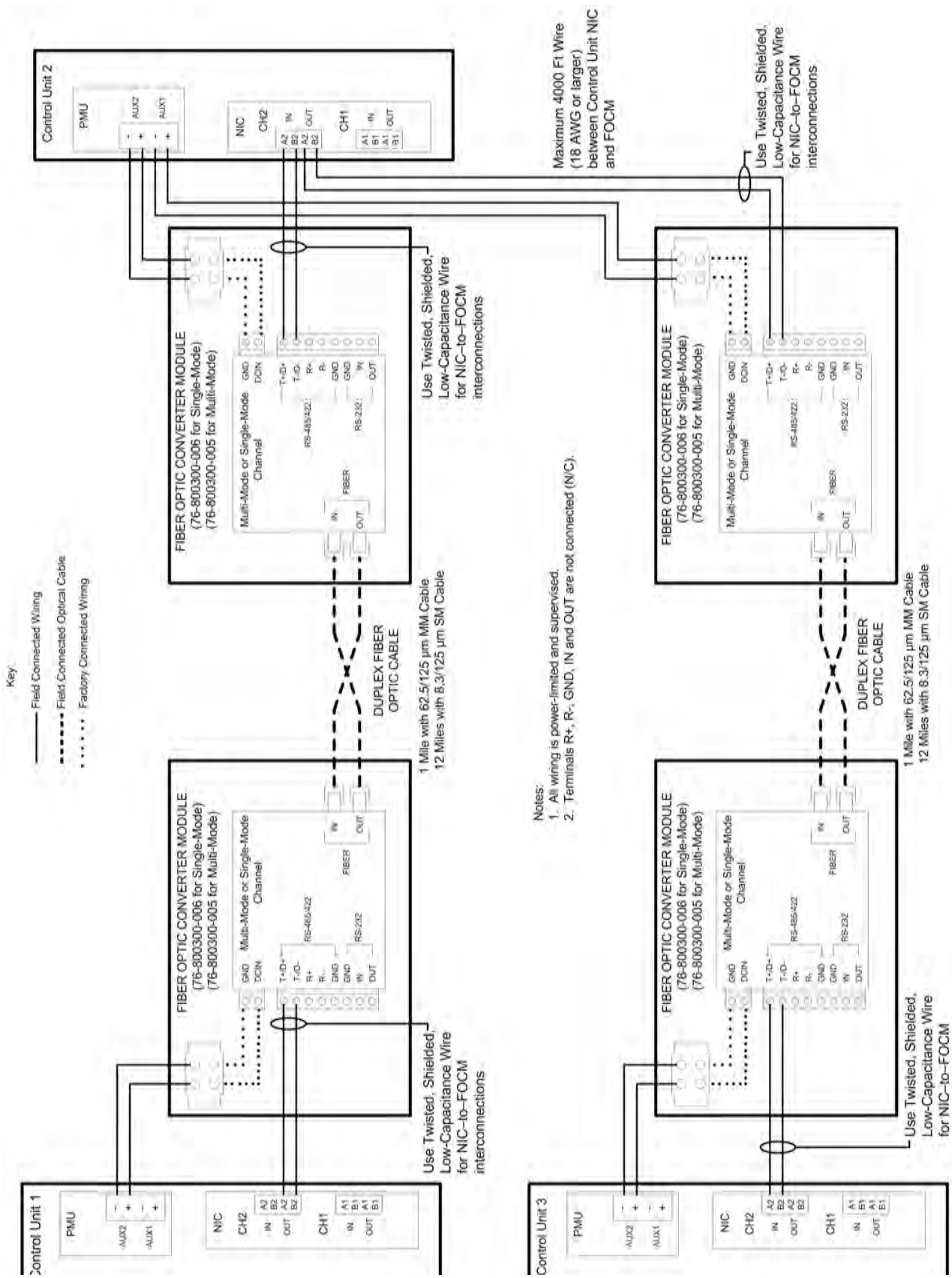


Figure 2-45. Wiring Diagram For Single Channel FOCM

2-14.2 Fiber Optic Converter Module (FOCM) Wiring - Dual Channel

For greater communication security and redundancy, an optional Add-On module can be installed in this enclosure to provide an additional channel. Note that this is most effective if the second channel is installed in a different pathway from the first. Refer to the wiring diagram below for a dual channel system.

<u>To mount the Add-On Channel</u>: Position the channel as shown in Figure 1-16 in Chapter 1, *General Information*. Attach to the plate by fastening the top and bottom mounting screws. Secure in place.

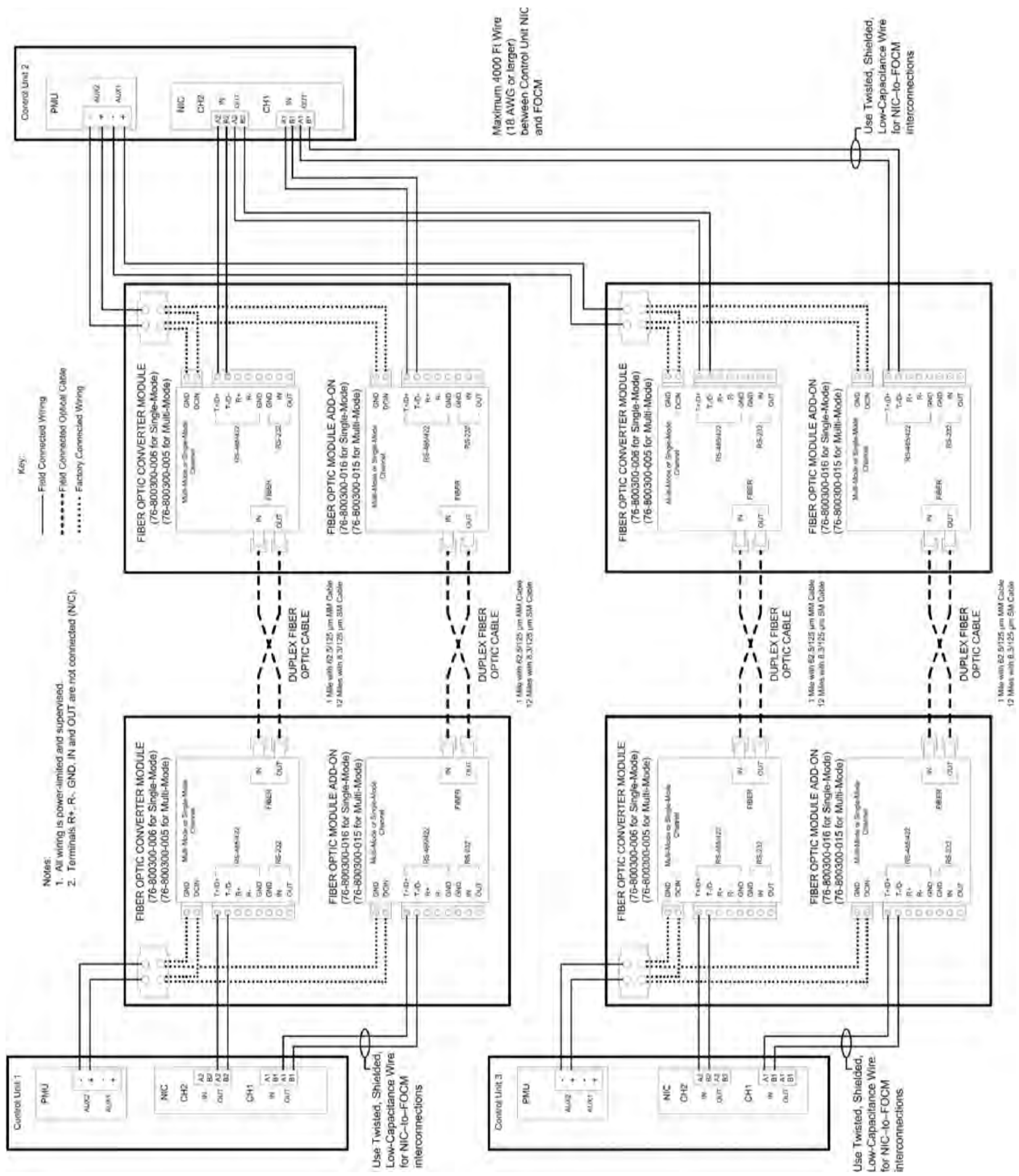


Figure 2-46. Wiring Diagram For Dual Channel FOCM

2-15 HSSD INTELLIGENT INTERFACE MODULE (IIM) WIRING

Refer to Section 2-7.2, *Inserting and Securing an Expansion Card* for instructions on how to install the IIM Card. Refer to the wiring diagram below (Figure 2-47) for IIM Card connections:

1. Connect the red and black power wires to the ARIES NET*Link* AUX-1 or AUX-2 power output terminals located on the PMU Board.
1. Install the RS232 cable from the socket labeled "CCM" on the IIM Card to the RS232A or RS232B socket on the ARIES NET*Link* MCB.
1. If desired, install an RS232 cable from the socket labeled "PC" on the IIM Card to a computer running SNIFF Version 3 software for configuration of the ORION-XT detector network.
1. Install RS485 field wiring to detectors. Refer to the ORION-XT *installation, Operation and Maintenance Manual*, P/N 06-236005-401, for complete instructions on how to set up and configure an ORION-XT network.

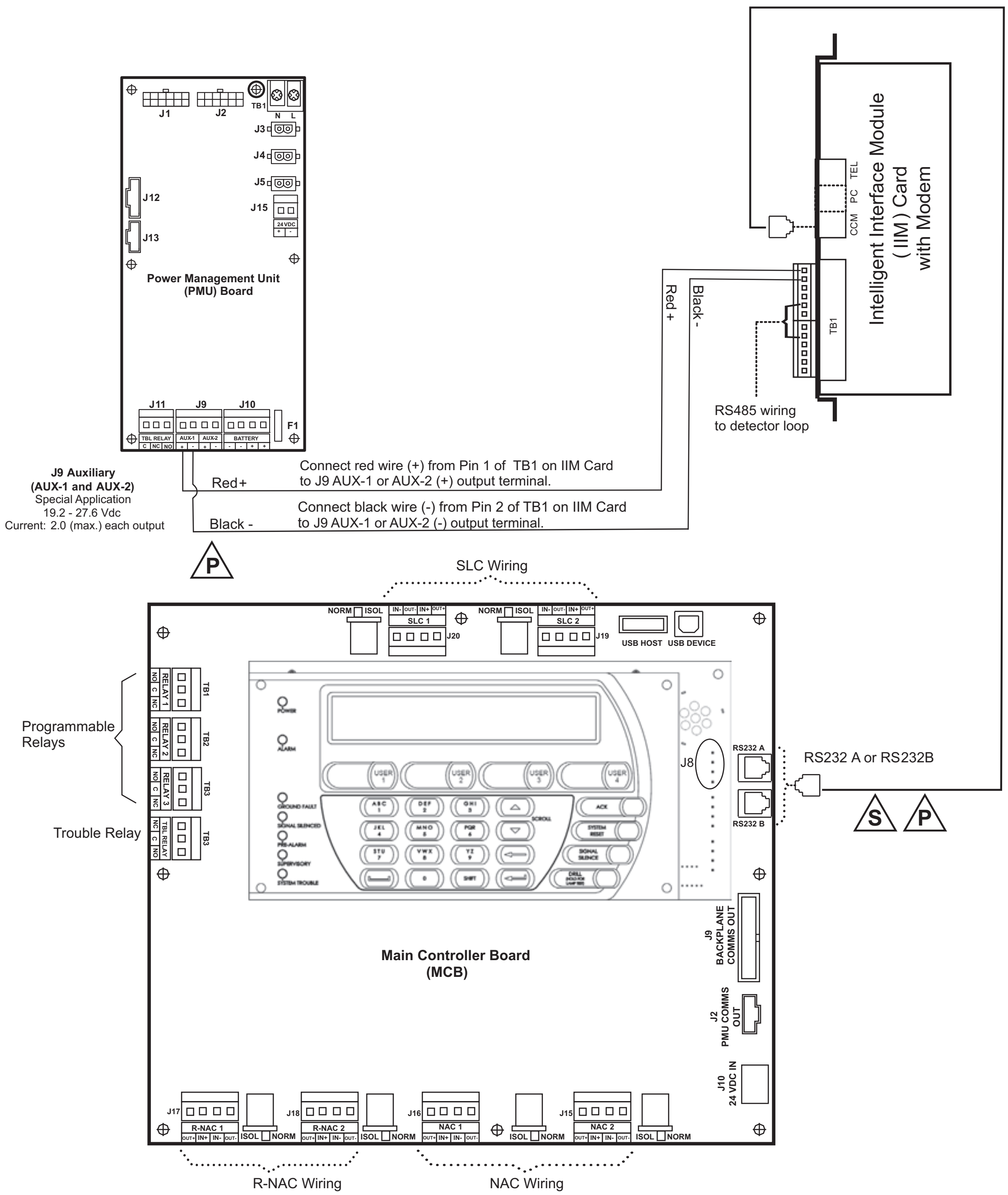


Figure 2-47. Wiring Diagram for Intelligent Interface Module (IIM) Card

2-16 INSTALLING THE LARGE CAPACITY BATTERY CABINET

A separate Large Capacity Battery Cabinet, P/N 76-100010-001, may be used to house up to two 12V, 40-AH sealed lead-acid batteries. The enclosure is designed to be surface-mounted using hardware similar to that used to mount the Main and Expansion Enclosures.

Note: Wiring for the batteries to the PMU Board must be sized accordingly to prevent unacceptable voltage drops.

The Large Capacity Battery Cabinet may be installed by performing these steps:

1. Prepare the battery cabinet by removing knockouts from the enclosure to enable the connection between the conduit and enclosure. Consult approved electrical installation drawings for connection information.
2. Remove the front door by first unlocking it and then rotating the door approximately 90 degrees from its closed position.
3. Lift up the door to allow the door's hinge pins to clear the mating-hinge sockets on the enclosure.
4. Determine the desired wall location for the battery cabinet.
5. Mark and pre-drill holes for four mounting bolts using the dimensions shown in Figure 2-48. Be certain to allow room for ventilation on both sides of the cabinet.

Note: The installer must supply the mounting bolts (up to size 1/4-20).

6. Insert the mounting screws into the top and bottom mounting holes and tighten securely.
7. Lastly, insert the batteries into the cabinet and replace the front door. Refer to Section 2-7.5, *Connecting Standby Batteries To PMU Board* to make DC power connections.

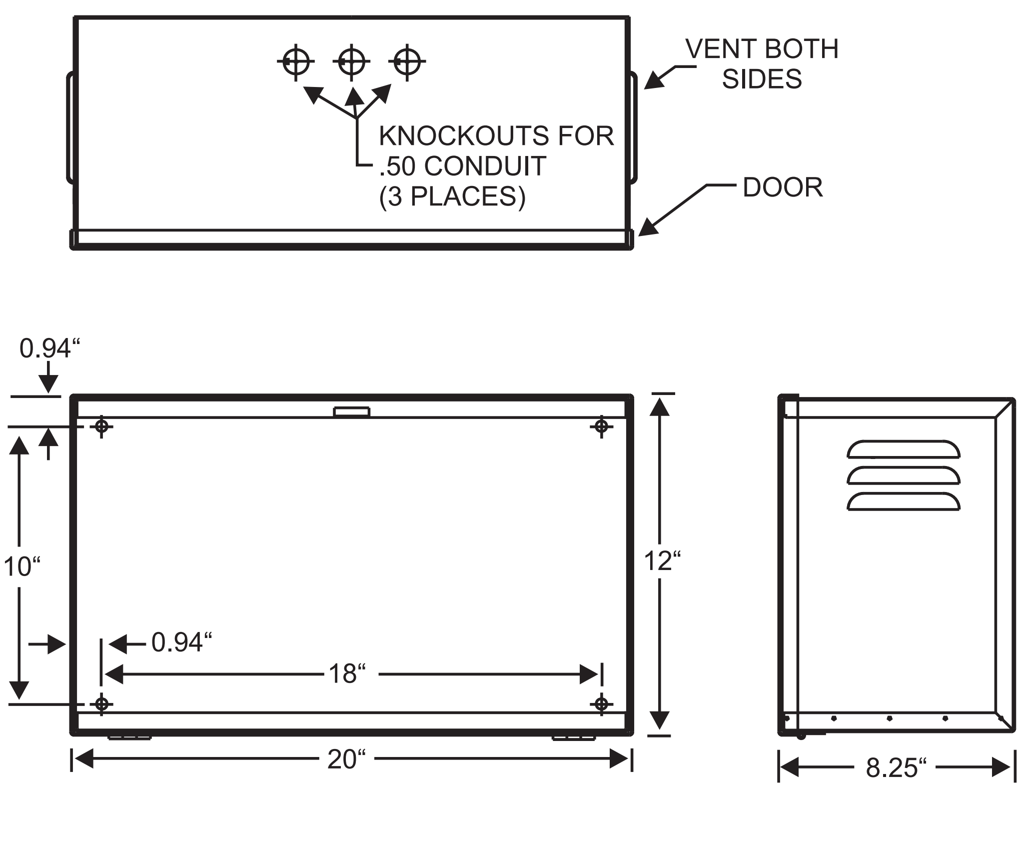


Figure 2-48. Mounting Dimensions for Large Capacity Battery Box

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CHAPTER 3
CONFIGURATION AND PROGRAMMING

3-1 INTRODUCTION

This chapter provides instructions on how to initialize an installed ARIES NET*Link*™ system, set up password protection and program all configurable options in the menu system to make the system ready for Normal Operation.

The ARIES NET*Link* system uses field-programmable software. An overview of the system menus (accessible from the Keypad/Display) and instructions on how to program the ARIES NET*Link* are provided in this chapter. Menus are available in four languages: English, French, Spanish and Portuguese.

Refer to the ARIES NET*Link* Configuration Tool User's Guide, P/N 06-237059-001, for instructions on how to program the ARIES NET*Link* system from a PC or laptop. Refer also to the Operating Instructions, P/N 06-237049-001, that are packaged with the ARIES NET*Link* system.

3-1.1 Initial Signaling-Line Circuit Configuration

Note: The following procedure assumes that all SmartOne devices have been addressed with the Handheld Programmer or via the ARIES NET*Link* keypad. Refer to the instructions provided with the Handheld Programmer to address SmartOne devices using this programmer.

Note: On the ARIES NET*Link* keypad, the BACKSPACE key (←) is located directly above the ENTER key (↵). In these instructions, the ENTER key is represented by its symbol: ↵

Use this procedure to initially configure and check the number of SmartOne devices connected to the SLC.

1. Connect the SLC wires to the applicable SLC Terminal Block. Refer to Figure 2-23 and Figure for typical SLC wiring.
2. Power the control unit, and set the time and date, by using the menu as depicted in this chapter.
3. All of the SmartOne devices connected to the SLC will report a not-registered trouble message similar to the message shown in Figure 3-1:

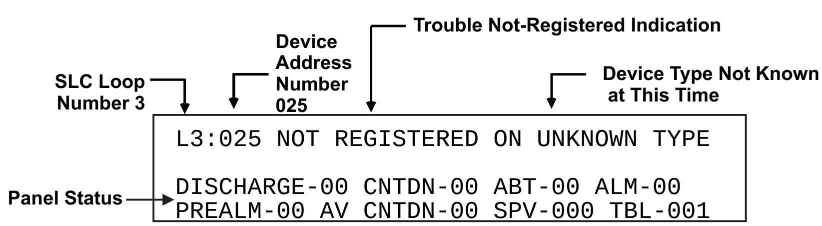


Figure 3-1. Typical Device Not Registered Message

4. Wait for all of the device-not-registered troubles to report. Press the <ACKNOWLEDGE> Key one or more times to silence the control unit buzzer.
5. Confirm that no more trouble messages have been reported.
6. Record the number of currently-active troubles. The number of troubles should be equal to the number of SmartOne devices connected to the SLC.
7. Run the AutoLearn Routine as follows:

a. Press the 0 Key. This display will show this message:

```
PLEASE ENTER PASSWORD
* * * * * *
```

Figure 3-2. Password Prompt

b. Enter the default Level-2 Password keys (186591) and then press ↵. The top-level menu selections will be displayed:

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 3-3. Top-Level Menu Selections

c. Press the 3 Key to select "SET"

```
1: TIME/DATE        2: PORT CONTROL
3: SLC DEVICES      4: PROGRAMMING
5: GLOBALS          6: OUTPUTS/BACKPLANE
7: CONTROL MODULES  8: NETWORK
```

Figure 3-4. Set Menu

d. Press the 4 Key to select "PROGRAMMING".

e. Press 3 to select “AUTOLEARN”

```
1: DAY/NIGHT         2: PASSWORDS
3: AUTOLEARN         4: AUTOSETUP
5: ALM VERIFICATION  6: POSITIVE ALM SEQ
7: CLEAR EVENTS       SCROLL for more
```

Figure 3-5. Programming Sub-Menu

Figure 3-6 shows a typical message that displays when the AutoLearn routine is running.

```
AUTO-LEARNING DEVICE ON SLC
AUTO-LEARNING DEVICE L1:025
```

Figure 3-6. Typical Auto-Learn In-Process Display

The AutoLearn Routine will register and assign a default operating configuration to each device on the SLC. Refer to Footnote #26 of Figure 3-26 for a detailed description of the AutoLearn Routine.

f. The control unit will display the following message when the AutoLearn Routine is finished.

```
AUTO-LEARNING DEVICES ON SLC
REGISTERED XXX DEVICES ON SLC
```

Figure 3-7. Typical Auto-Learn Complete Display

g. Press the <Backspace> Key as required to exit from the menu operating mode. The message “Initializing Configuration” will appear, followed by “System Must Restart”.

h. The control unit will restart in order to begin to use the new settings. Confirm that no new trouble messages have appeared on the display.

The ARIES NET*Link* control unit is now ready for site-specific programming.

3-1.2 Site-Specific Programming

Each ARIES NET*Link* system must be uniquely configured for the specific end-user application. System configuration involves assigning an address and operating characteristics to each SmartOne initiating or output device. It also involves defining what initiating events or combinations of initiating events will activate the various output circuits and devices. A site-specific application program can be created in the following three ways:

3-1.2.1 SYSTEM CONFIGURATION VIA THE AUTO-SETUP ROUTINE

The Auto-Setup Routine sets operating parameters for SLC-based devices by the combination of the device's type and address on the SLC. It assigns fixed activation sequences for each output circuit and output device by specific-initiating-device status and combinations-of-initiating-device status.

See Footnote #27 of Figure 3-26 for a complete discussion of system configuration through the Auto-Setup Routine.

3-1.2.2 CONFIGURING A SYSTEM USING THE REMOTE CONFIGURATION SOFTWARE

The ARIES NET*Link* system can also be configured via the ARIES NET*Link* remote configuration software for individual site-specific applications. This software allows you to set the operating parameters for the SmartOne initiating devices and to create activation sequences for each output circuit and each output device by specific-initiating-device status and combinations-of-initiating-device status.

Refer to the ARIES NET*Link* Configuration Tool User's Guide (P/N 06-237059-001) for an explanation of system configuration through the ARIES NET*Link* remote configuration Software.

Notes:

1. A PC (or laptop) must be connected to the RS232 or USB port of the Main Controller Board to be able to configure the ARIES NET*Link* system using the remote configuration software. Refer to Section 2-11.3, "*Connecting a Laptop, Remote Computer or Printer*", for instructions on how to connect a remote PC to the RS232 or USB port.
2. If any change is made to the control unit configuration, the control unit will automatically restart in order to begin using the new settings. Note that the USB or RS232 cable should be disconnected at this time.

3-1.2.3 CONFIGURING A SYSTEM FROM THE KEYPAD/DISPLAY

The SET Menu in the system menus (accessed from the Keypad/Display) is another method which can be used to configure the ARIES NET*Link*.

Note: If any change is made to the control unit configuration (using any of the three methods mentioned above), the control unit will automatically restart in order to begin using the new settings. Note that the USB or RS232 cable should be disconnected at this time.

3-2 MENU OPERATION

The ARIES NET*Link* has a built-in menu structure. This menu structure has been implemented to aid users with system operating functions.

An operator can use menu operation to:

- Isolate initiating devices and/or outputs
- List configuration settings and the application program
- Adjust configuration settings
- Initiate manual testing procedures

An operator cannot use menu operation if:

- He is attempting to access the main menu via an Remote Display Control Module while another operator already has access to the system. All other remote user interfaces will be locked out for 30 seconds. The yellow LED will blink when a device is in lock-out mode. The User Interface will always overrule the lock-out mode and take control, putting all other RDCMs and LAMs in lock-out.
- Another operator already has access to the system through the configuration software's terminal-emulation mode (Refer to the ARIES NET*Link* Configuration Tool User's Guide, P/N 06-237059-001, for information on terminal-emulation mode.)

Any of the following events cancel menu operation:

- An alarm signal
- An operator presses the <Backspace> Key at the main menu.
- A period of 60 seconds elapses from the last pressed key.

3-3 OVERVIEW OF MAIN MENU FUNCTIONS

The ARIES NET*Link* continuously monitors all initiating devices and outputs for any state change while in menu operation.

The Main Menu functions are shown in Figure 3-9. Most functions will require additional data to be entered to implement the function, such as a device address or desired alarm threshold.

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 3-8. Main Menu Functions

Table 3-1 provides a brief description of typical functions that can be performed using the ARIES NET*Link* system's menus. The following sections describe the menu structure, how to access the menu, menu functions, and how to exit the menu.

Table 3-1. Main Menu Functions and Descriptions

Menu	Function	Description
ISOLATE	Device and Circuit Isolation	The **ISOLATE** commands prevent the ARIES NET*Link* control unit from acting upon signals from initiating devices or from issuing activation commands to outputs. The initiating devices and outputs remain operational, but are disconnected from the control unit in the sense that events reported by isolated initiating devices are ignored by the control unit and commands to activate are ignored by isolated outputs and control modules.
LIST	Listing of Events and System Settings	The **LIST** commands are used to view the set of isolated initiating devices and control outputs. These commands are also used to display configuration settings for automatic initiating devices, to display the list of devices on the SLC and to view lower-level events that are not displayed due to the occurrence of higher-level events.
SET	Change Operating Parameters	The **SET** commands allow the installer to change the sensitivity settings for Smart-One automatic initiating devices, to address and register initiating and control devices, to activate a set of networked control units or to define global operating parameters such as Global Acknowledgement of trouble and supervisory events. These commands are also used to trigger automatic configuration routines such as AutoLearn and AutoSetup.
TEST	Confirming Proper Operation	The **TEST** commands enable service personnel to test the SmartOne initiating devices for the ability to transmit alarm signals. You can also perform alarm-simulation tests for the system's application program and can command on control modules connected to the SLC.
LANGUAGE	Specify Menu Language	The **LANGUAGE** command allows an installer to select the desired language for display of ARIES NET*Link* menus: English, French, Spanish or Portuguese.

Note: It is easier and faster to use the configuration software to configure the modules, than to use the Keypad/Display on the Control Unit. Refer to the *ARIES NETLink Configuration Tool (ACT8000) User's Guide*, (Chapters 2 and 3) P/N 06-237059-001, to configure the modules.

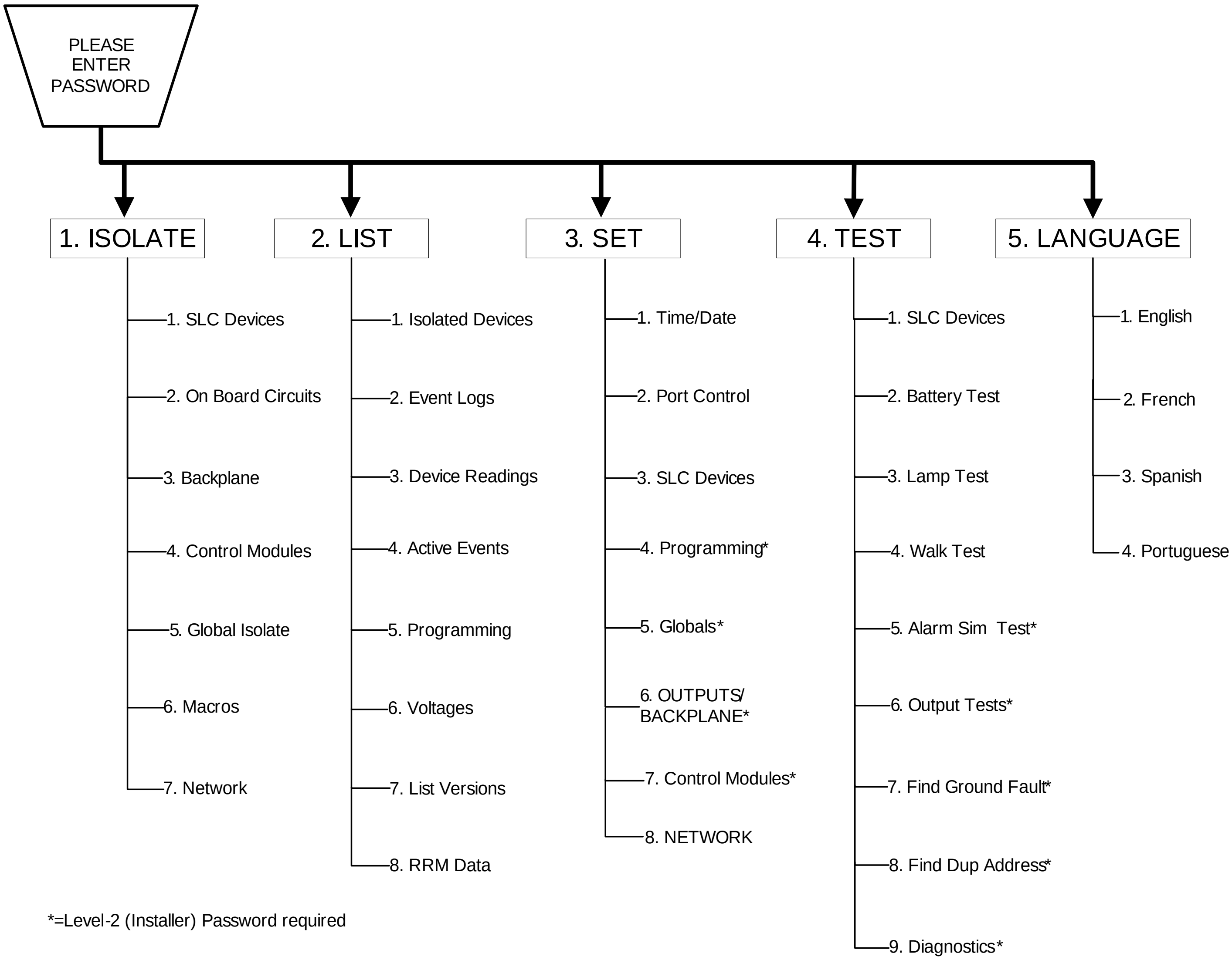


Figure 3-9. ARIES NET*Link* Main Menu Functions

3-3.1 ISOLATE MENU FUNCTIONS

The Isolate functions prevent the ARIES NET*Link* control unit from acting upon signals from initiating devices or from issuing activation commands to control unit-based and SLC-based outputs. The initiating devices and outputs remain operational, but are disconnected from the control unit in the sense that events reported by isolated initiating devices are ignored by the control unit and commands to activate are ignored by isolated outputs and control modules.

A Supervisory signal will occur after each Isolation command is executed, and will remain in effect until all Isolation commands are subsequently canceled by their corresponding De-Isolation commands.

Figure 3-10 through Figure 3-13 outline the Isolate menu functions. Each function is explained in detail in the remainder of Section 3-3.1.

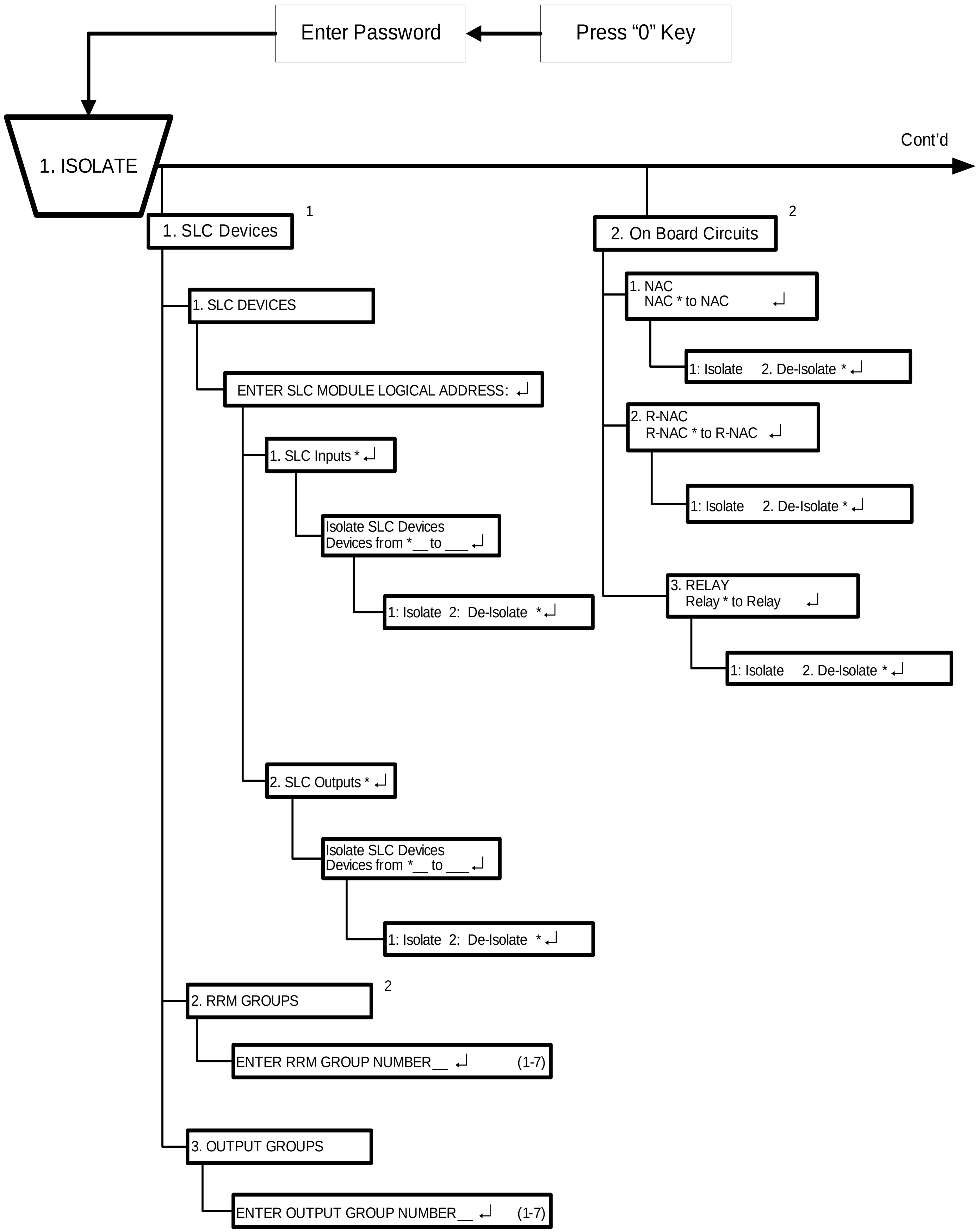


Figure 3-10. ARIES NET*Link* Isolate Menu Functions (Fig. 1 of 4)

FOOTNOTES (Figure 3-10):

1 **SLC Devices**. **Purpose**: To prevent initiating and trouble signals from selected SmartOne automatic detectors and monitor modules from being processed and acted upon by the ARIES NET*Link* control unit. Also to prevent selected SmartOne control and relay modules from carrying out activation instructions issued by the ARIES NET*Link* control unit. **Note**: An SLC device can only be isolated if it is not in either a trouble or alarm condition.

2 **RRM and Output Groups. Purpose**: To prevent selected RRM or Output (AO and ASM) group SLC based output devices from carrying out activation instructions issued by the ARIES NET*Link* control unit.

Note: The control unit always isolates all overlapped Release Groups. When an RRM belongs to multiple Release Groups and one of the group is isolated, other groups to which this RRM belongs to are also isolated. The same is also true for de-isolation.

The control unit always isolates all overlapped Output Groups. When an AO or ASM device belongs to multiple Output Groups and one of the group is isolated, other groups to which this AO or ASM belongs to are also isolated. The same is also true for de-isolation.

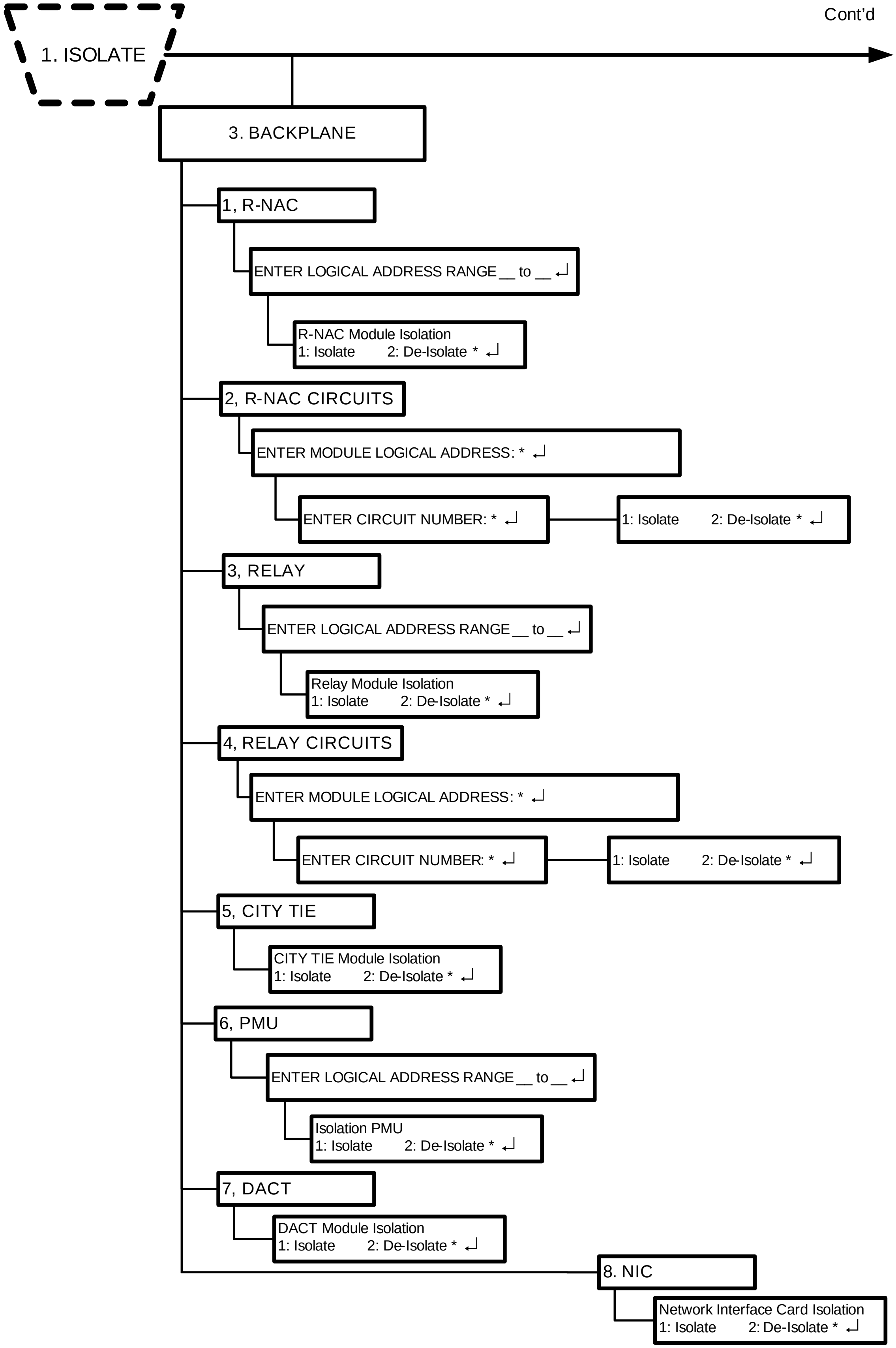


Figure 3-11. ARIES NET*Link* Isolate Menu Functions (Cont'd - Fig. 2 of 4)

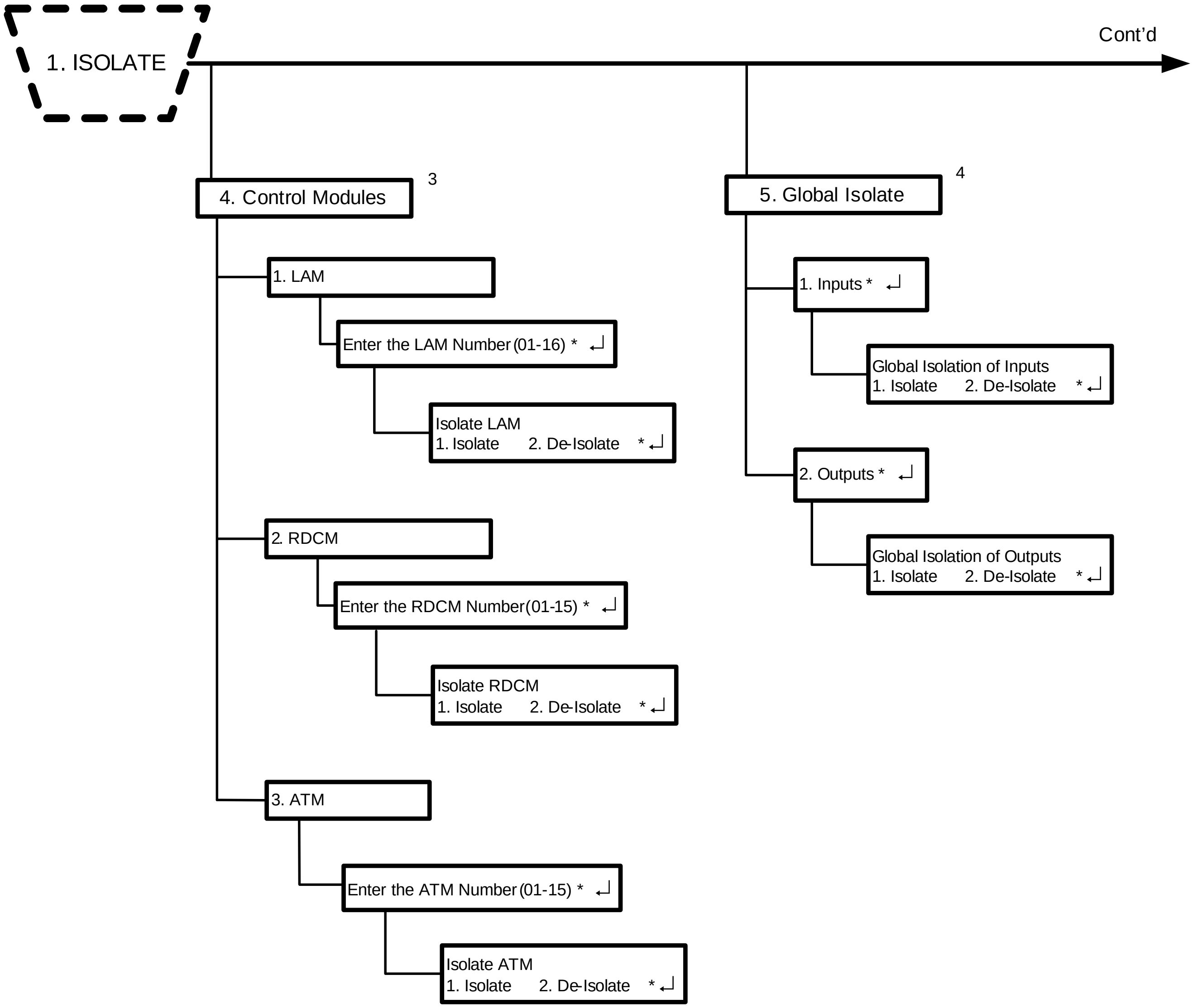


Figure 3-12. ARIES NET*Link* Isolate Menu Functions (Cont'd - Fig. 3 of 4)

FOOTNOTES (Figure 3-12):

3 **Control Modules. Purpose**: To prevent selected LAM, RDCM, and ATM modules from displaying messages, or from carrying out activation instructions issued by the ARIES NET*Link* control unit.

4 **Globally Isolate Initiating Devices. Purpose:** To isolate all inputs and/or all outputs with a single operation.

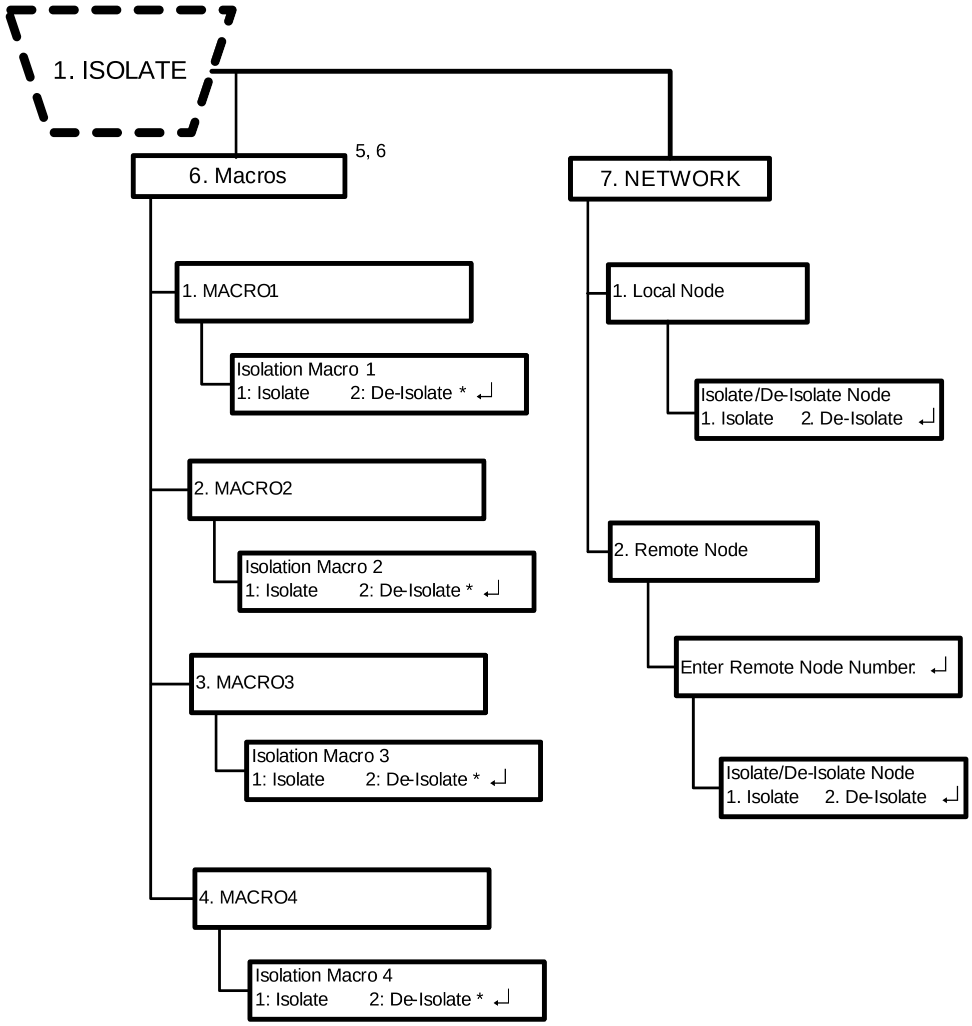


Figure 3-13. ARIES NET*Link* Isolate Menu Functions (Cont'd - Fig. 4 of 4)

FOOTNOTES (Figure 3-13):

5 **Execute a User-Defined Inputs/Outputs Isolation Routine**. **Purpose**: To perform multiple input and/or output isolations via a single menu selection. The inputs and/or outputs to be isolated are assigned to an "isolation macro" that is defined via the ARIES NET*Link* remote configuration software. The ARIES NET*Link* remote configuration software permits four "isolation macros" to be defined. Each macro can process up to ten separate isolation commands. The specific isolation commands are executed when an Isolation Macro option is selected. The isolation lists can include any of the following: initiating devices, control modules, or control-unit-based outputs individually or by address range. This includes automatic initiating devices, monitor modules, control modules, releasing circuits, notification-appliance circuits, combination notification-appliance/releasing circuits, and programmable relays. Refer to the ARIES NET*Link* Configuration Tool User's Guide, P/N 06-237059-001, for the procedure to assign initiating devices, control modules, or control-unit-based outputs to the isolation macros.

Note: Selecting the isolation-macro option for a second time will execute a de-isolation routine for all the devices and/or circuits that were isolated by the execution of the isolation macro. The isolation macros toggle the devices in the command lists between the isolated and non-isolated states.

6 **De-Isolate Isolation Macro**. **Purpose:** To de-isolate the multiple input and/or output isolations performed via an isolation macro.

3-3.1.1 ISOLATION MACROS FROM SOFT KEY AND ADDRESSABLE INPUT

The above steps performed from the menu to execute Isolation Macros can also be performed using a soft key or an SLC based Addressable Input device. The four (4) <SOFTKEYS> can be programmed using the ARIES NET*Link* menu system or the remote configuration software (ACT 8000) as Isolation Macros. The system will, when a soft key configured for Isolation Macro is pressed, prompt for the installer level password and execute the isolation process. A subsequent press of the soft key and password entry will execute the de-isolation process.

An SLC based AI device can be configured to activate an Isolation Macro. The AI should be in a locked enclosure and when activated would execute the Isolation Macro that it is configured for. Deactivation of the switch will execute the de-isolation process.

3-3.2 LIST MENU FUNCTIONS

The List functions are used to view the set of isolated initiating devices and control unit-based and SLC-based outputs. These functions are also used to display configuration settings for automatic initiating devices, to display the list of devices on the SLC, and to view lower-level events that are not displayed due to the occurrence of higher-level events.

Figure 3-14 through Figure 3-18 outline the List menu functions. Each function is explained in detail in the remainder of Section 3-3.2.

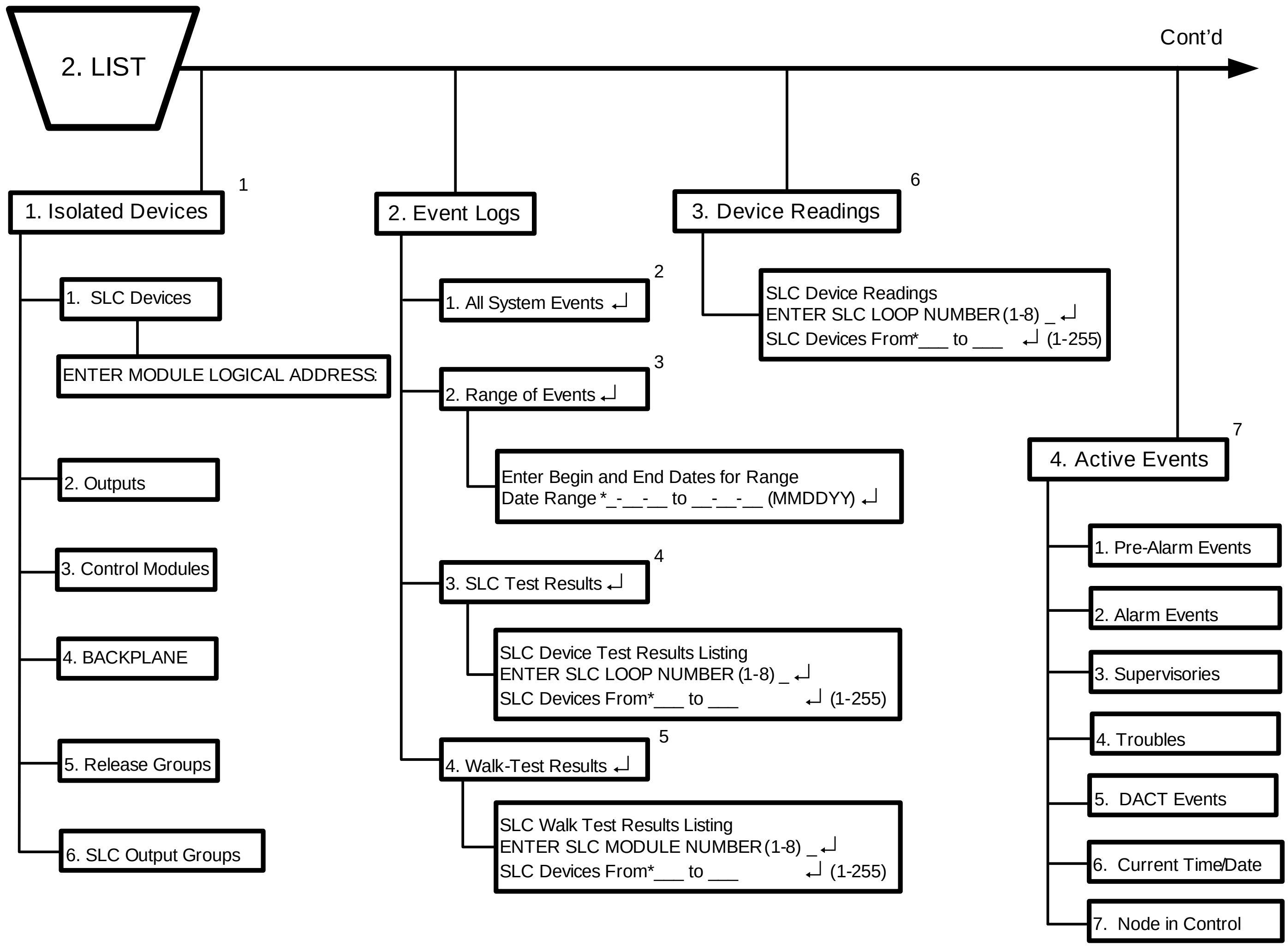


Figure 3-14. ARIES NET*Link* List Menu Functions (Fig. 1 of 5)

FOOTNOTES (Figure 3-14):

1 **Isolated Devices. Purpose:** To view the list of isolated devices and output circuits.

2 **All System Events**. **List the Entire Contents of the System Event Log**. **Purpose**: To view the history of system events.

3 **Range of Events. List the Contents of the System Event Log by Dates. Purpose**: To view the history of system events by selected dates.

4 **SLC Test Results. List the Most Recent Test Results for the Initiating Devices on the SLC**. **Purpose**: To view the most-recent test results for the initiating devices on the SLC. These tests confirm the abilities of the initiating devices to create and transmit alarm signals that can be properly interpreted and processed by the ARIES NET*Link* control unit.

5 **Walk Test Results. List Most Recent Walk Test Results for the Initiating Devices on the SLC**. **Purpose**: To view the most-recent walk-test results for the initiating devices on the SLC.

6 **Device Readings**. **List a Range of Automatic Detector Sensitivity Settings**. **Purpose**: To view the pre-alarm and alarm thresholds for a range of automatic detectors and to view the fire signatures being currently measured by the detectors. This procedure fulfills the intent of NFPA 72 as a test to ensure that each smoke detector is within its listed and marked sensitivity range.

7 **Active Events. Purpose**: To view the list of active events by event type. Use this option to view lower-level events such as trouble events whose display is suppressed by the concurrent occurrence of higher-level events.

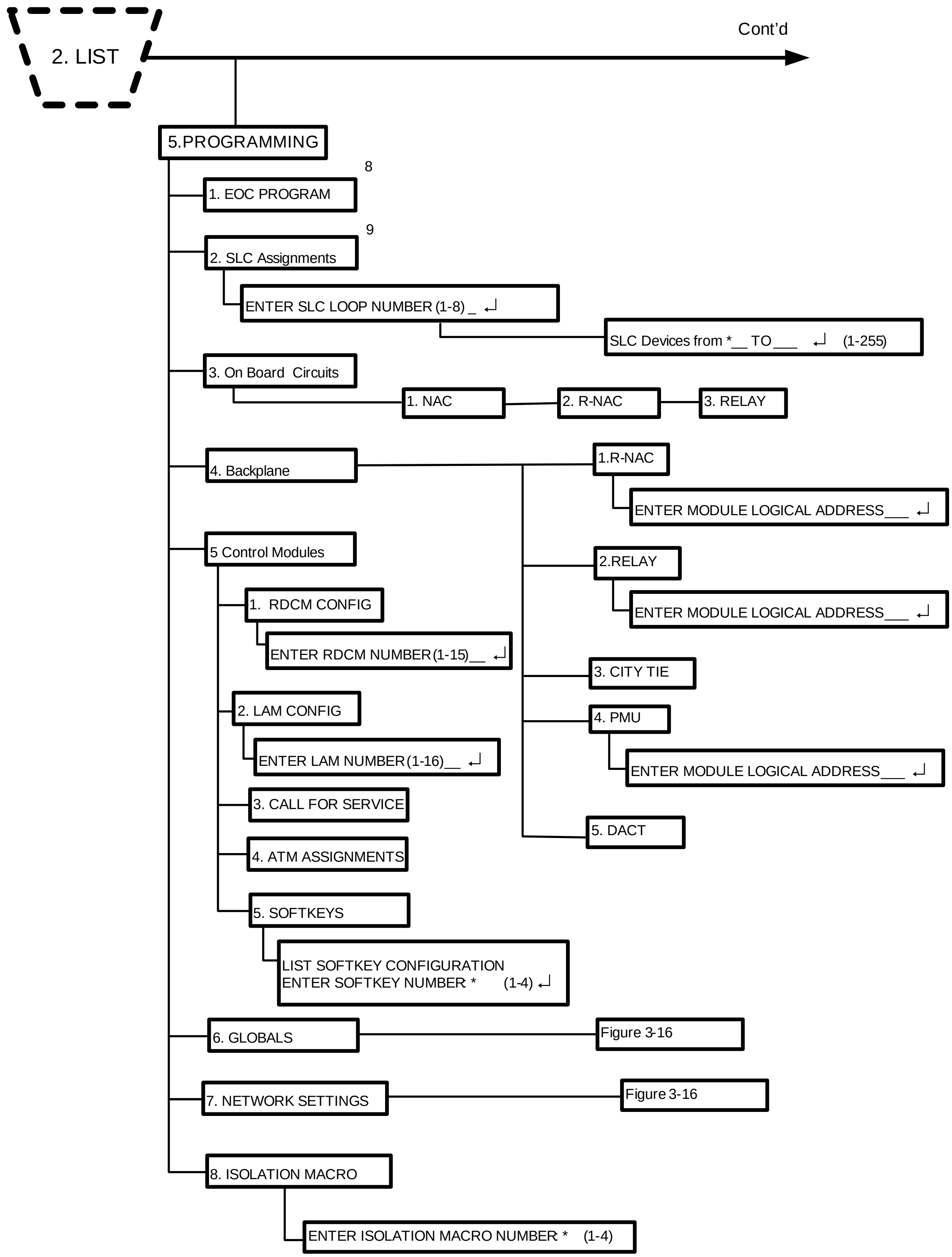


Figure 3-15. ARIES NET*Link* List Menu Functions (Cont'd - Fig. 2 of 5)

FOOTNOTES (Figure 3-15):

8 **EOC Program**. **Purpose**: To view the Event-Output-Control (EOC) part of the system configuration file.

9 **SLC Assignments**. **Purpose**: To view the registered devices on the SLC.

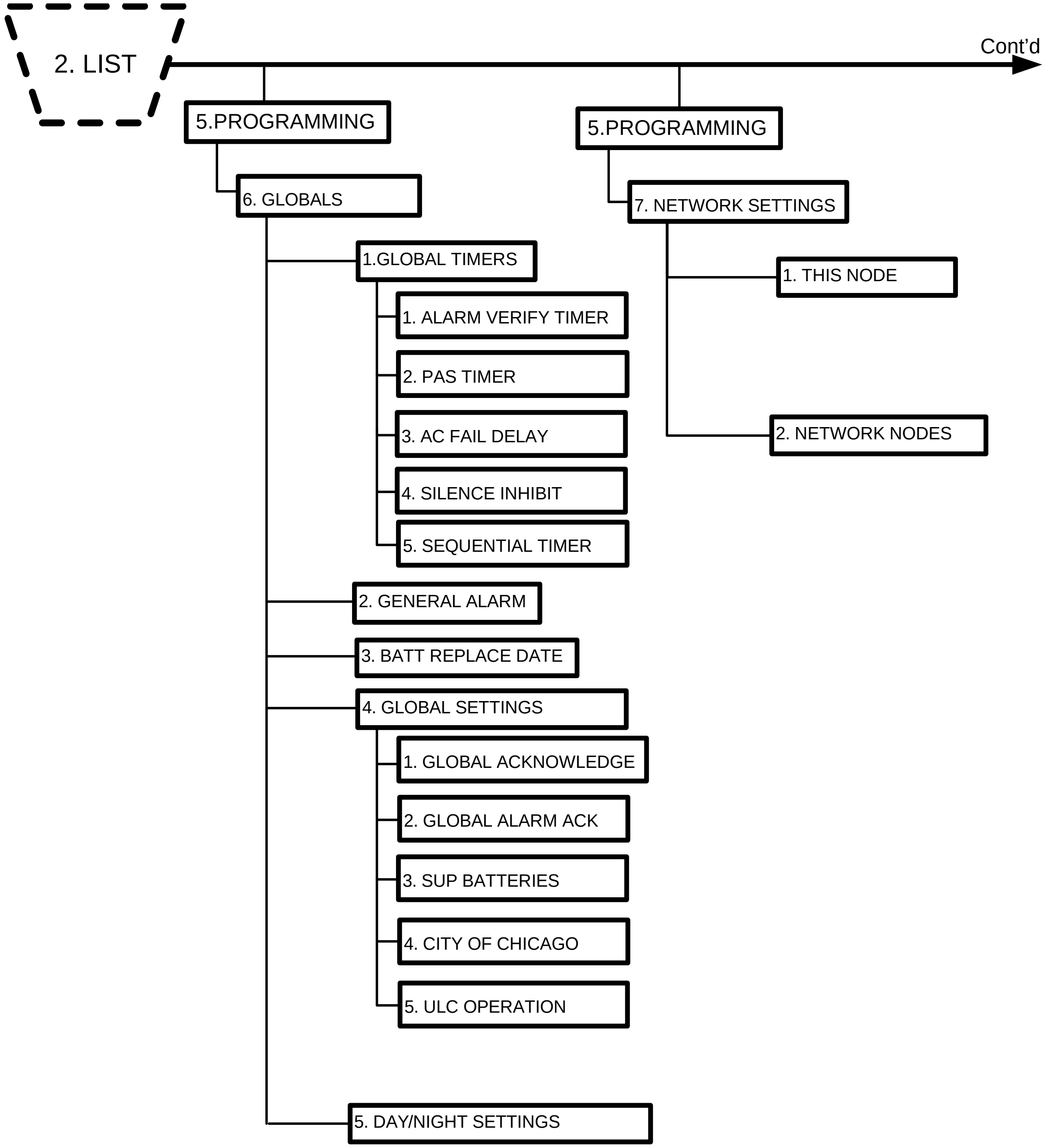


Figure 3-16. ARIES NET*Link* List Menu Functions (Cont'd - Fig. 3 of 5)

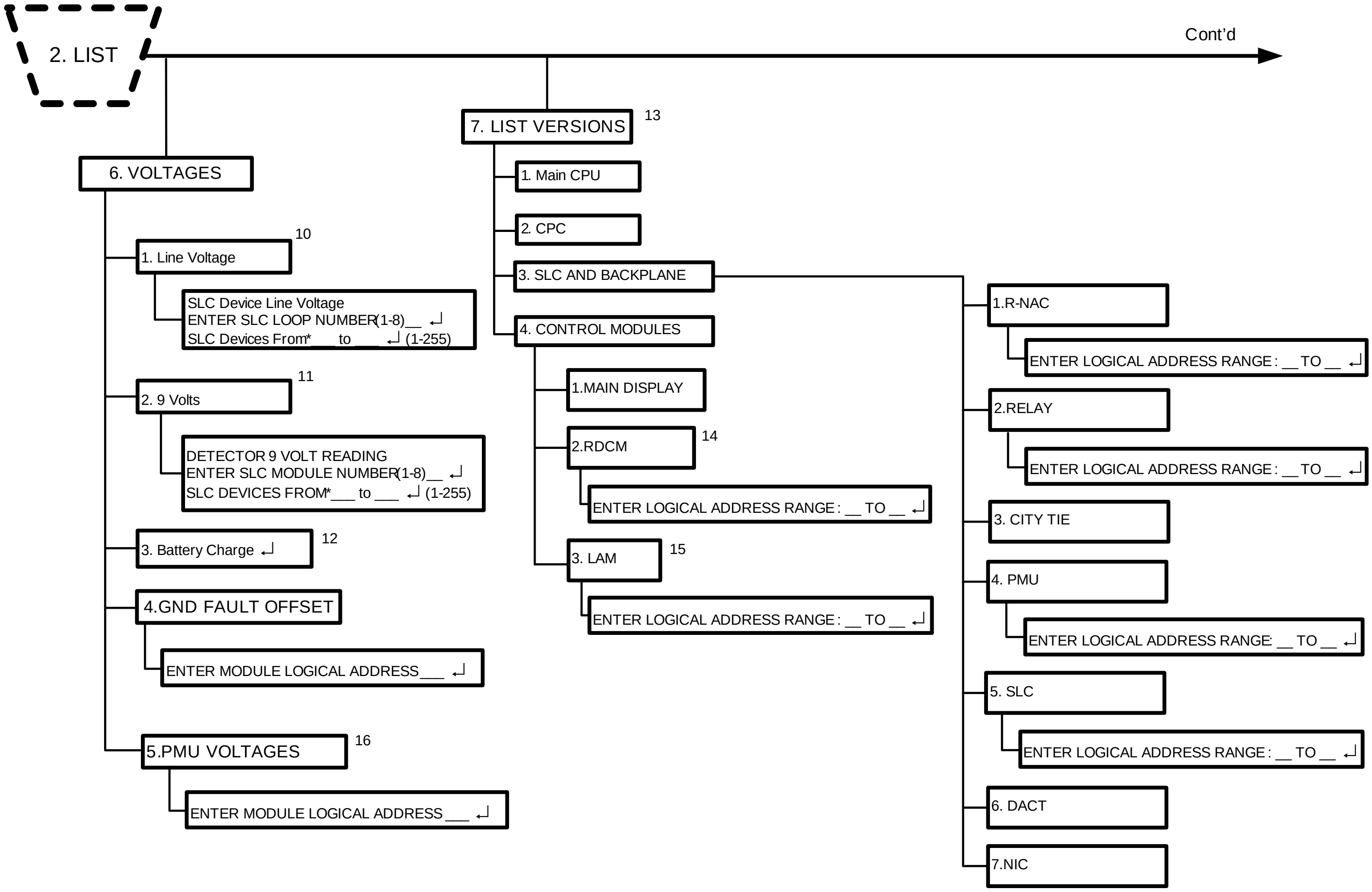


Figure 3-17. ARIES NET*Link* List Menu Functions (Cont'd - Fig. 4 of 5)

FOOTNOTES (Figure 3-17):

10 **Line Voltage**. **List a Range of SLC Device Voltages**. **Purpose**: To view the SLC line voltages for a range of initiating and/or control devices.

11 **9 Volts. List a Range of SLC Devices' 9-Volt Levels**. **Purpose**: To view the internal power-supply voltages for a range of SLC initiating and/or control devices.

12 **Battery Charge. View the Values of the Battery Voltage and Current**. **Purpose:** To view the latest current and voltage values of the battery. **Note**: This command can only be used if battery supervision is enabled.

13 **List Versions. View the Software Versions for the Control Units On-Board**. **Purpose**: To view the software versions currently installed.

14 **RDCM. List the Software Versions of the RDCMs Connected to the Control Unit**. **Purpose:** To view the software versions installed on the RDCMs connected to a ARIES NET*Link* control unit

15 **LAM. List the Software Versions of the LAMs Connected to the Control Unit**. **Purpose:** To view the software versions installed on the LAMs connected to a ARIES NET*Link* control unit

16 **PMU Voltages. List the Output Voltages of the PMUs Connected to the Control Unit**. **Purpose:** To Lists the output voltages of PMUs connected to the system.

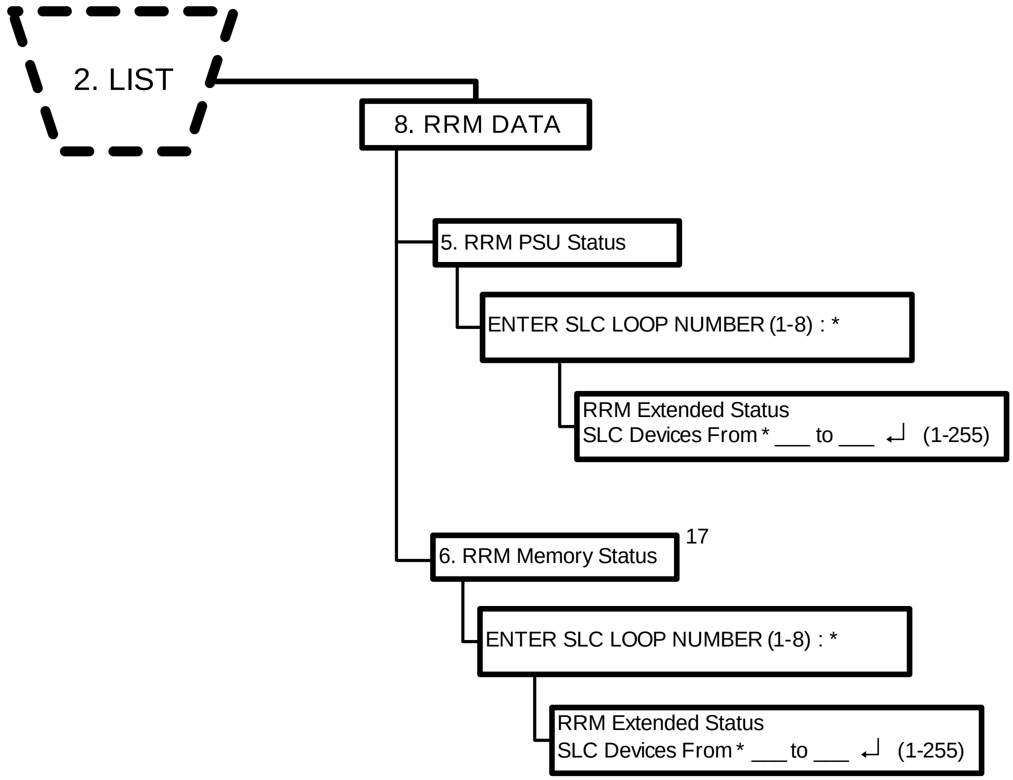


Figure 3-18. ARIES NET*Link* List Menu Functions (Fig. 5 of 5)

FOOTNOTES (Figure 3-18):

17 **RRM Memory Status**. **View the Memory Status of Remote Release Modules**. **Purpose**: To get diagnostic information concerning the memory status of RRM modules. Contact Kidde Technical Support if RRM units are not functioning properly.

3-3.3 SET MENU FUNCTIONS

The Set functions allow the installer to change the sensitivity settings for SmartOne automatic initiating devices, to address and register initiating and control devices, or to define global operating parameters such as Global Acknowledgment of trouble and supervisory events. These commands are also used to trigger automatic configuration routines such as AutoLearn and AutoSetup.

Figure 3-19 through Figure 3-32 outline the Set menu functions. Each function is explained in detail in the remainder of Section 3-3.3.

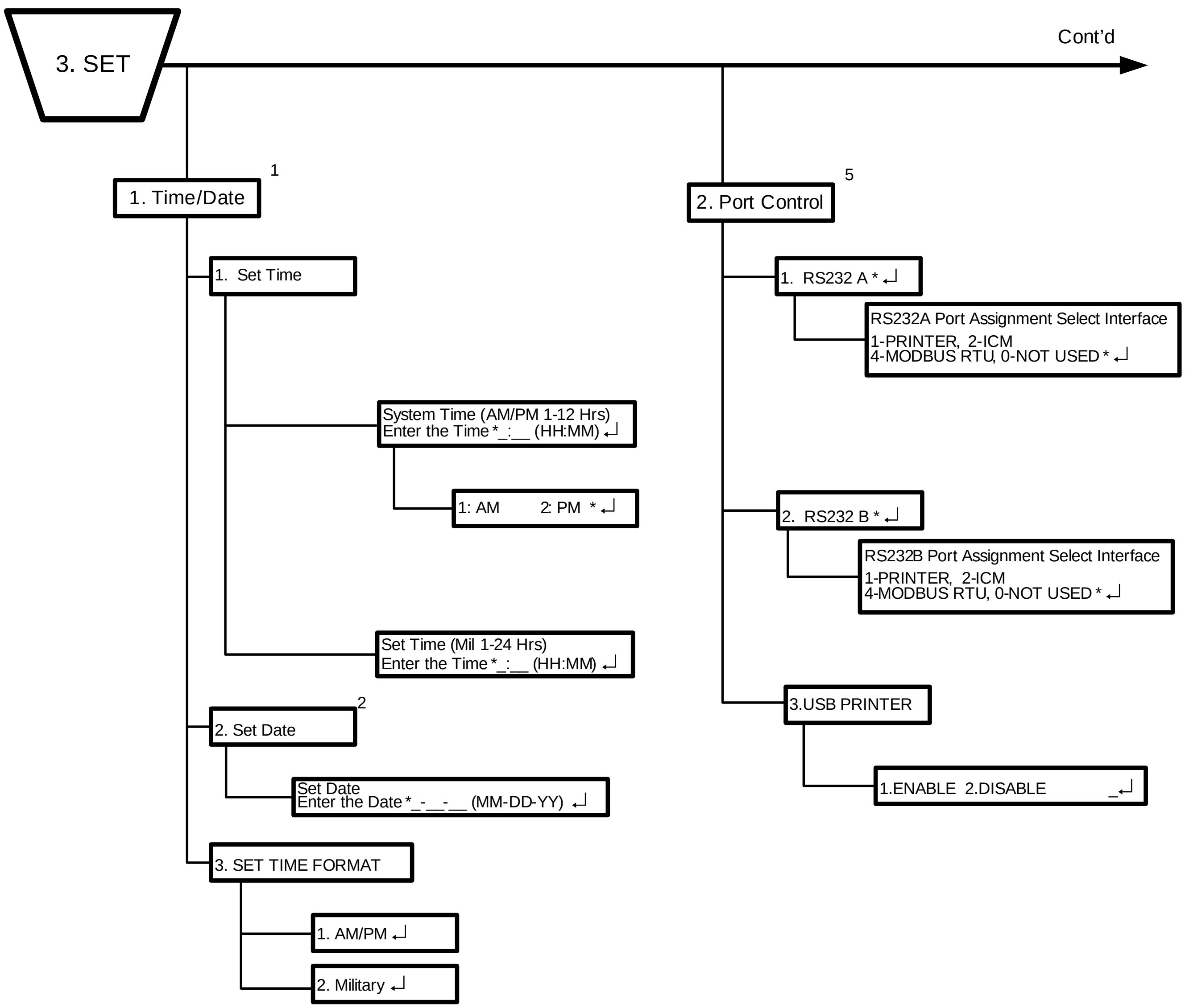


Figure 3-19. ARIES NET*Link* Set Menu Functions (Fig. 1 of 18)

FOOTNOTES (Figure 3-19):

1 **Time/Date. Set the Time**. **Purpose**: To set the correct time for a ARIES NET*Link* control unit. (Use either Steps 6a or 6b in table, depending on desired format).

2 **Set Date. Set the Date**. **Purpose**: To set the correct date for a ARIES NET*Link* control unit.

5 **Port Control. Configure the Communications Ports**. **Purpose**: To change the RS232 communications ports for use with a serial printer, laptop or desktop computer (PC), and/or terminal emulator.

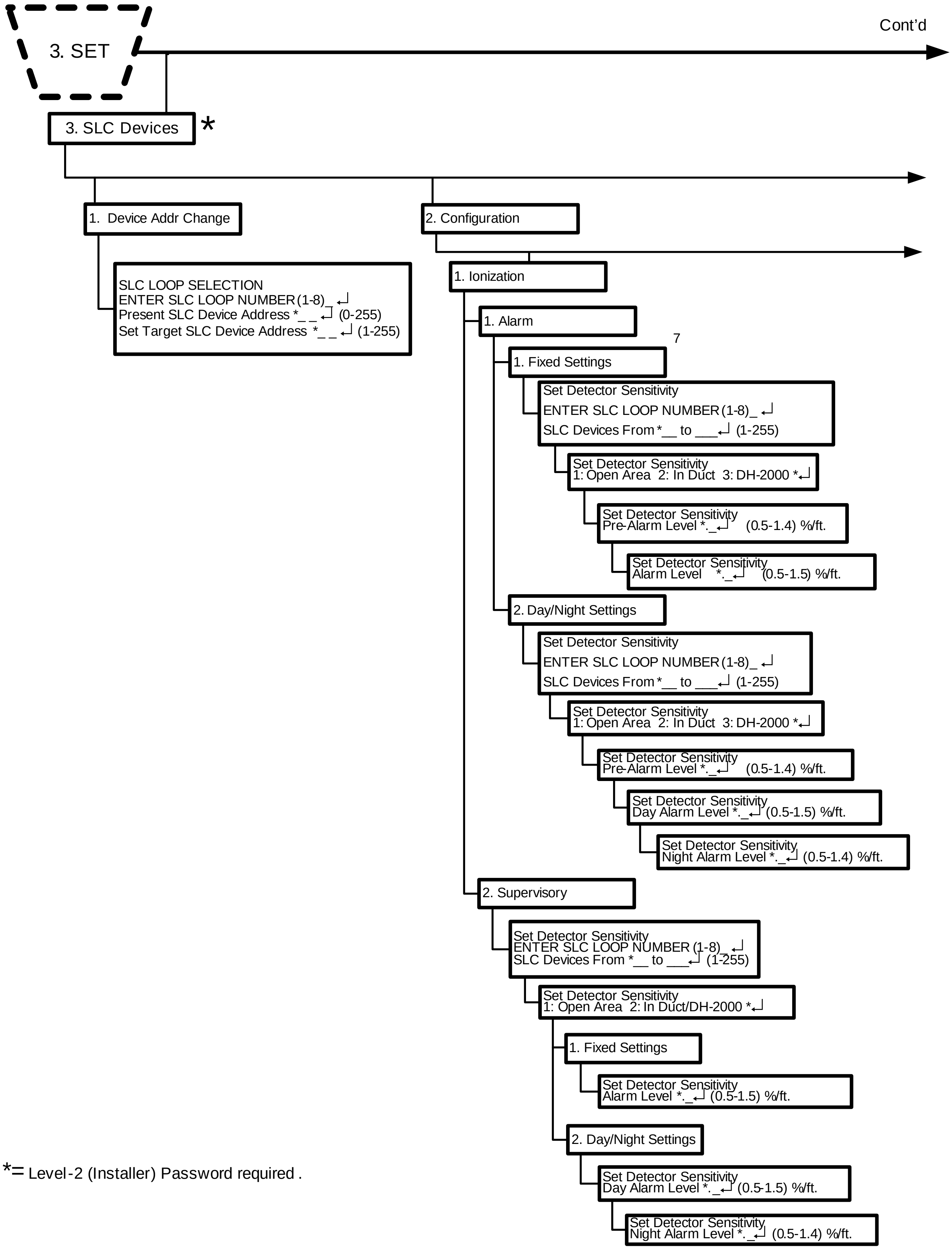


Figure 3-20. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 2 of 18)

FOOTNOTES (Figure 3-20:

7 **Fixed Settings. Change an Ionization Detector's Pre-Alarm and Alarm Thresholds**.

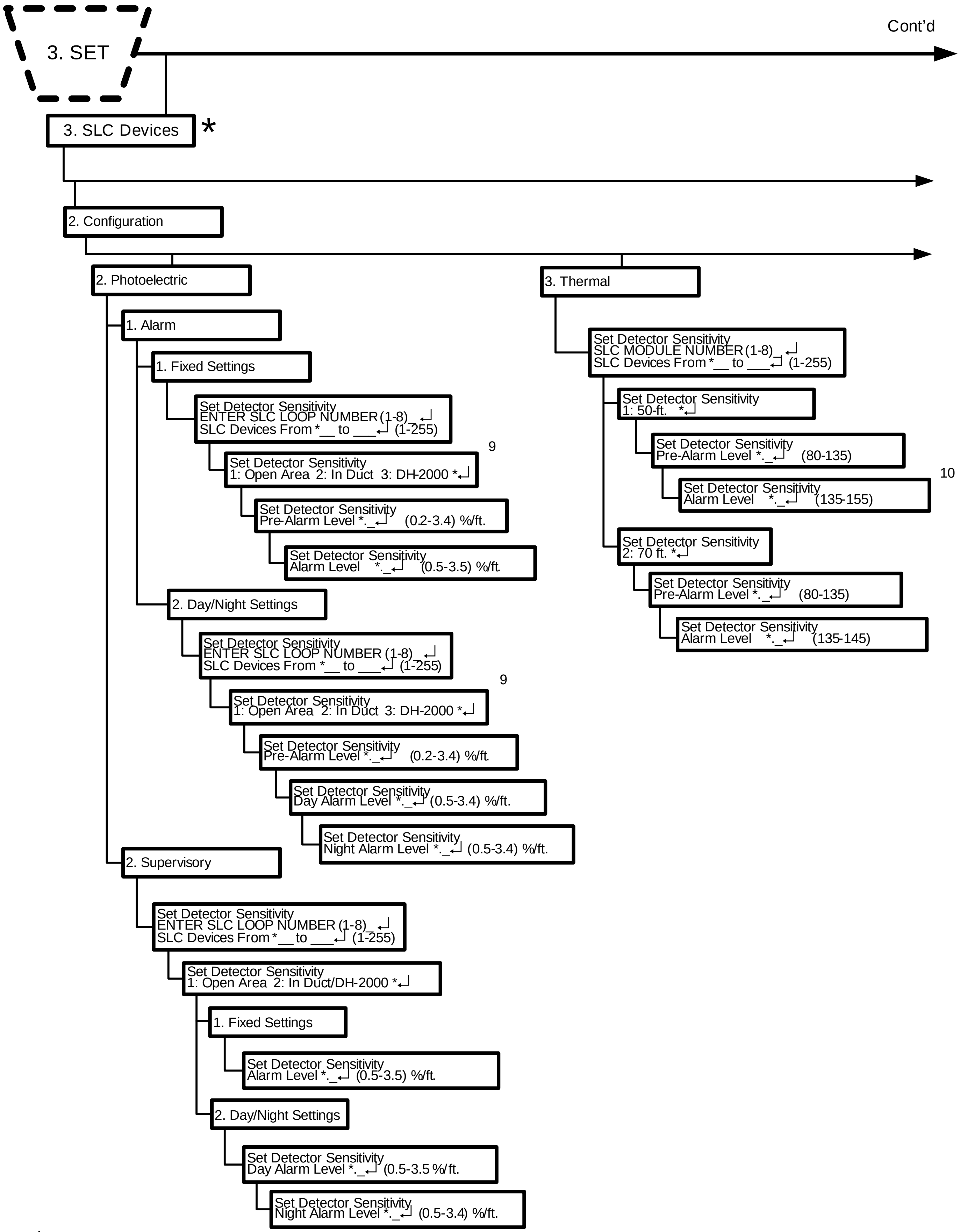
Purpose: To change the pre-alarm and alarm thresholds of one or more ionization detectors. Alarm thresholds can be set in 0.1 percent-per-foot increments. A pre-alarm threshold can also be set anywhere within the obscuration range of 0.5 to 1.4 percent per foot, but must be less than the detector's alarm threshold. Two additional alarm-reporting ranges are defined for special applications. The in-duct range refers to detector placement in an air duct. The DH-2000 range refers to detector placement in a DH-2000 Duct Housing with associated sampling tubes to monitor the air in either a supply- or return-air duct. The alarm ranges for these special applications are as follows:

Application	**Pre-Alarm/Alarm Range (%/foot)**
In-Duct	0.5 - 1.0
DH-2000	0.5 - 1.0

Ionization detectors can be automatically programmed to change alarm thresholds by time of day if they are configured for day/night operation. The night alarm thresholds must be less than the corresponding day thresholds.

Note: To install in Canada, and comply with ULC-S529-02 requirements:

1. The obscuration range of Smoke Detector Model CPD-7052 is 0.6% per foot or less.
2. The obscuration range of Smoke Detector Model PSD-7152 and Model DS-PS is 3.5% per foot or less.



*= Level-2 (Installer) Password required.

Figure 3-21. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 3 of 18)

FOOTNOTES (Figure 3-21):

9 **Set Detector Sensitivity. Change a Photoelectric Detector's Pre-Alarm and Alarm Thresholds.**

Purpose: To change the pre-alarm and alarm thresholds of one or more photoelectric detectors. Alarm thresholds can be set in 0.1 percent-per-foot increments. Default setting is 1.5%/ft for pre-alarm and 2.0%/ft for alarm.

PRE-ALARM SENSITIVITY:

For the PSD-7152 detector: A pre-alarm threshold can be set anywhere within the obscuration range of 0.2 to 3.4 percent per foot, but must be less than the detector's alarm threshold.

For the DS-PS detector: A pre-alarm threshold can be set anywhere within the obscuration range of 0.7 to 3.4 percent per foot, but must be less than the detector's alarm threshold.

Note: The DS-PS detector does NOT support configurable alarm settings below 0.9%/ft. If a DS-PS is configured with a threshold below 0.9%/ft. for Alarm or 0.7%/ft. for Pre-Alarm, the detector will operate at the lowest allowable setting.

Any time that the Pre-Alarm sensitivity is set below 0.7 % obscuration/ft, a message will automatically display which reads:

```
DS SERIES INVALID BELOW 0.7%/FT
1: CONTINUE, NOT DS SERIES    2: CANCEL
```

If the detector is a PSD-7152 detector, select 1 to continue use. If the detector is a DS-PS detector, select Cancel and re-enter a threshold above 0.7%/ft.

ALARM SENSITIVITY:

For the PSD-7152 detector: An Alarm threshold can be set anywhere within the obscuration range of 0.2 to 3.4 percent per foot.

For the DS-PS detector: An Alarm threshold can be set anywhere within the obscuration range of 0.9 to 3.4 percent per foot.

Any time that the Alarm sensitivity is set below 0.9 % obscuration/ft, a message will automatically display which reads:

```
DS SERIES INVALID BELOW 0.9%/FT
1: CONTINUE, NOT DS SERIES    2: CANCEL
```

If the detector is a PSD-7152 detector, select 1 to continue use. If the detector is a DS-PS detector, select Cancel and re-enter threshold above 0.9%/ft.

SPECIAL APPLICATIONS:

Two additional alarm-reporting ranges are defined for special applications. The in-duct range refers to detector placement in an air duct. The DH-2000 range refers to detector placement in a DH-2000 Duct Housing with associated sampling tubes to monitor the air in either a supply- or return-air duct. The alarm ranges for these special applications are as follows:

Application	Pre-Alm Range (%/ft.)	Alm Range (%/ft.)
In-duct (DS-PS detector)	0.7 - 1.9	0.9 - 2.0
In-duct (PSD-7152 detector)	0.2 - 1.9	0.5 - 2.0
DH-2000	0.2 - 1.9	0.5 - 2.0

Photoelectric detectors can be automatically programmed to change alarm thresholds by time of day if they are configured for day/night operation. The night alarm thresholds must be less than the corresponding day thresholds.

10 **Set Detector Sensitivity. Change a Thermal Detector's Pre-Alarm and Alarm Thresholds**.

Purpose: To change the pre-alarm and alarm thresholds of one or more thermal detectors. Alarm thresholds can be set in 1F° increments.

PRE-ALARM SENSITIVITY:

For the THD-7252 detector: A pre-alarm threshold can be set anywhere within the temperature range of 80°F to 135°F, but must be less than the thermal detector's alarm threshold.

For the DS-HFS detector: A pre-alarm threshold can be set only to 110°F. To disable Pre-Alarm reporting, set the pre-alarm threshold to 134°F.

ALARM SENSITIVITY:

For the THD-7252 detector: An alarm threshold can be set anywhere within the temperature range of 135°F to 155°F (at 50 ft. spacing) or 135°F to 145°F (at 70 ft. spacing).

For the DS-HFS detector: The DS-HFS detector does NOT have a configurable Alarm threshold and is always set to 135°F.

Note: When replacing a THD-7252 detector with the DS-HFS, ensure that the Alarm threshold and spacing are set to default settings, 135 degrees and 50 feet. If a DS-HFS detector is configured for any setting other than default, the detector will still operate at the 135 degree threshold. The DS-HFS is not agency approved for 70 ft. spacing, so any 70 ft. THD-7252 replacements will require repositioning of the detector.

The pre-alarm and alarm ranges for the thermal detectors are summarized below:

Table 3-2. Model THD-7252 Thermal Detector Ranges

Spacing (ft.)	Pre-Alarm Range (°F)	Alarm Range (°F)
50	80 - 135	135 - 155
70	80 - 135	135 - 145

Table 3-3. Model DS-HFS Thermal Detector Ranges

Spacing (ft.)	Pre-Alarm Range (°F)	Alarm Range (°F)
50	110	135

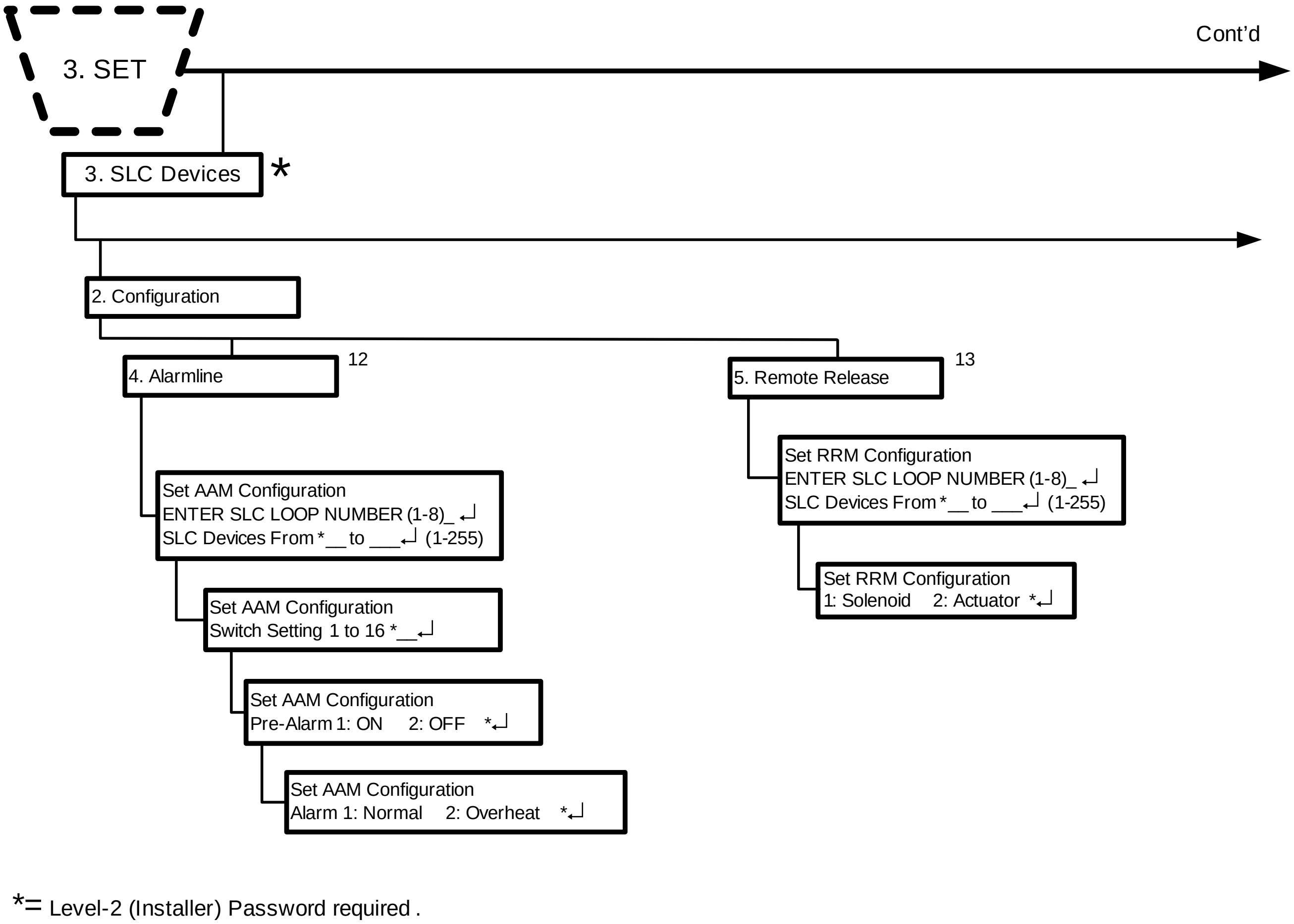


Figure 3-22. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 4 of 18)

FOOTNOTES (Figure 3-22):

12 **Alarmline. Change the Configuration of an Addressable AlarmLine Module**.

Purpose: To change one or more of the following Addressable AlarmLine Module (AAM) operating characteristics for a single module or range of modules: pre-alarm and alarm thresholds as defined by the module's variable-threshold-setting switch; pre-alarm reporting; alarm or overheat reporting

Note: The AAM will create an "Overheat" message on the display if its alarm threshold is exceeded and it is configured for overheat reporting. The control unit buzzer will also activate.

13 **Remote Release. Configure a Remote Release**.

Purpose: To change one or more of the following Remote Release Module (RRM) operating characteristics for a single or range of modules: solenoid and actuator.

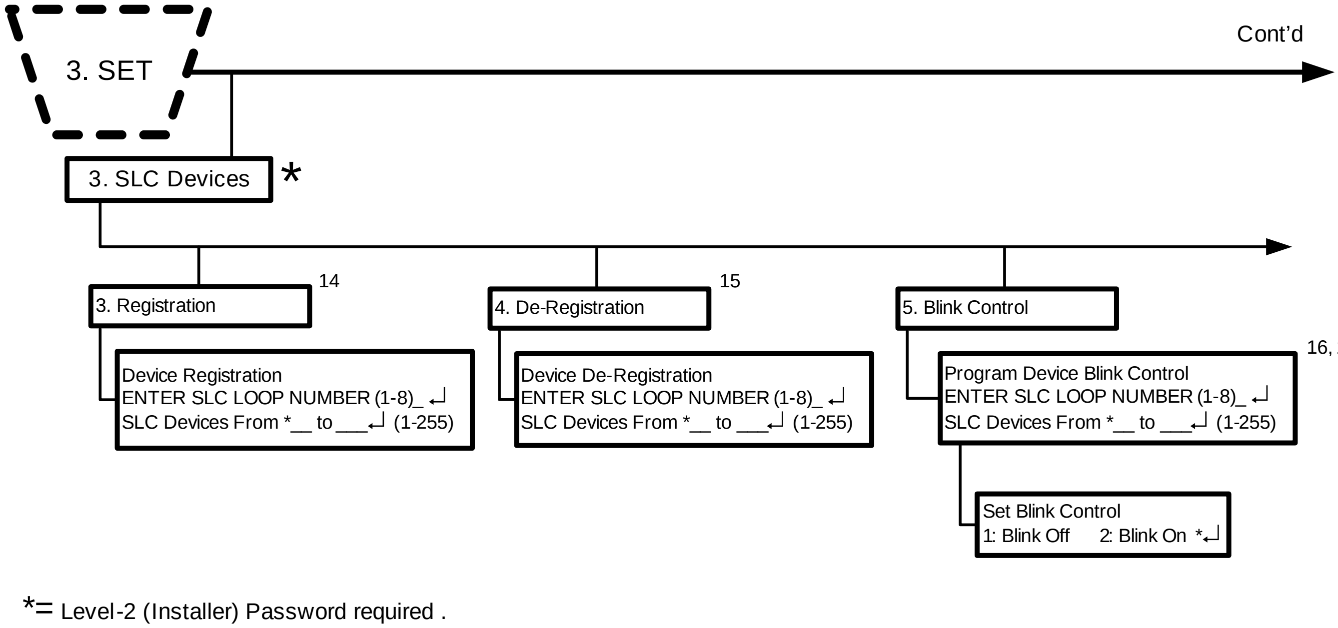


Figure 3-23. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 5 of 18)

FOOTNOTES (Figure 3-23):

14 **Registration. Manually Register SLC Devices**.

Purpose: The ARIES NET*Link* control unit needs to know which SLC addresses (of the 255 possible addresses) will be occupied by a SmartOne detector, monitor module, relay module or control module. The Registration Procedure enters an occupied address into the control-unit's configuration memory for each SLC device that it encounters during execution. The SLC devices must be uniquely addressed prior to execution of the Registration Procedure.

The Main Controller Board (MCB) recognizes the following default-operating parameters for these SLC devices:

SLC Device	Default Operating Parameters
Ionization Detectors	0.8% per foot Pre-alarm Threshold 1.0% per foot Alarm Threshold Latching Operation Activates General-Alarm List
Photoelectric Detectors	1.5% per foot Pre-alarm Threshold 2.0% per foot Alarm Threshold Latching Operation Activates General-Alarm List
Heat Detectors	120°F Pre-Alarm Threshold 135°F Alarm Threshold Latching Operation Activates General-Alarm List ITLCO/CTLCO Off
Monitor Modules (AIs)	Alarm-Initiating Device Latching Operation Activates General-Alarm List
Monitor Modules (PALMs)	Alarm-Initiating Device Latching Operation Activates General-Alarm List
Monitor Modules (AAMs)	Alarm-Initiating Device Latching Operation Activates General-Alarm List
Relay Modules (AOs)	Non-Silenceable Operation In General-Alarm List
Control Modules (ASMs)	Non-Silenceable Operation Enabled for Drill Activation Activates in Walk Test
Remote Release Modules (RRMs)	Solenoid, On Until Reset

The activation of any initiating device will activate the outputs in the general-alarm list.

Note: SLC devices are also automatically registered and configured for operation by the AutoLearn or AutoSetup Routines, or by a configuration upload via the ARIES NET*Link* remote configuration software.

Exception: PALMs require additional configuration via the ORION™ configuration software, APICs require additional configuration via the AIR-Intelligence™ Remote Configuration Software and AAMs require additional configuration via the SET Menu or the ARIES NET*Link* remote configuration software after an AutoLearn Procedure. Refer to Figure 3-22 to configure AAMs via the SET Menu.

CAUTION

The Registration Procedure shall not be used to configure a system. It is primarily a procedure to create a database of SLC devices. Owner locations are not assigned during the Registration Procedure.

Wait for each SLC device to report a "Not-Registered" trouble message and ensure that all these trouble messages have been acknowledged before proceeding with the Registration Procedure.

Execute the De-Registration prior to re-registering any previously-registered addresses.

15 **De-Registration. Manually De-Register SLC Devices.**

Purpose: To remove one or more SLC devices from the ARIES NET*Link* control unit's configuration memory. The de-registered device(s) must be physically removed from the SLC prior to or following the execution of the De-Registration Procedure.

CAUTION **Remove all references to the de-registered devices from the system's EOC program.**

16 **Program Device Blink Control. Disable the Flashing LEDs on SmartOne Detectors**.

Purpose: To prevent one or more SmartOne detector LEDs from flashing in standby operation. LEDs will only illuminate in alarm condition. The detectors' default-LED operation is flashing.

17 **Program Device Blink Control. Enable the Flashing LEDs on SmartOne Detectors**.

Purpose: To enable one or more SmartOne detector LEDs to resume flashing in standby operation. The flashing LEDs were disabled in a prior blink-control operation.

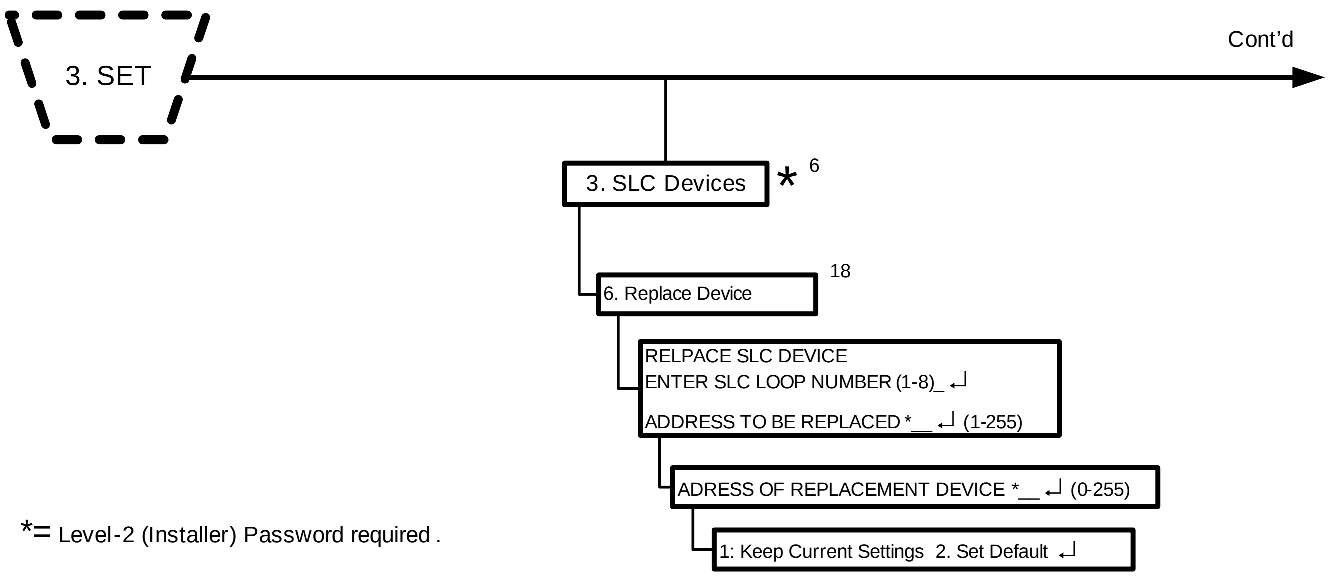


Figure 3-24. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 6 of 18)

FOOTNOTES (Figure 3-24):

6 **SLC Devices. Change an SLC Device Address**.

Purpose: To create or change an SLC device address using the ARIES NET*Link* keypad. All SLC devices are shipped with the default address of 000. This address must be changed to a valid address in the range 1 to 255 before the device can be used on the SLC. Only one device with address 000 can be connected to the SLC when using this procedure to initially address a new device. This procedure can also be used to re-address a previously addressed device. Be sure to de-register the previous address after the device is re-addressed.

Note: An SLC device can only have its address changed if it is not in either a trouble or alarm condition.

18 **Replace Drive. Replace an SLC Device**.

Purpose: To replace an existing device on an SLC with a new device.

Note: Before selecting to “Replace Device”, remove the “old” device and connect the “new” device to the SLC. The “old” device must report as “trouble open” and the “new” device must report as “unregistered” to ensure that the devices have different addresses.

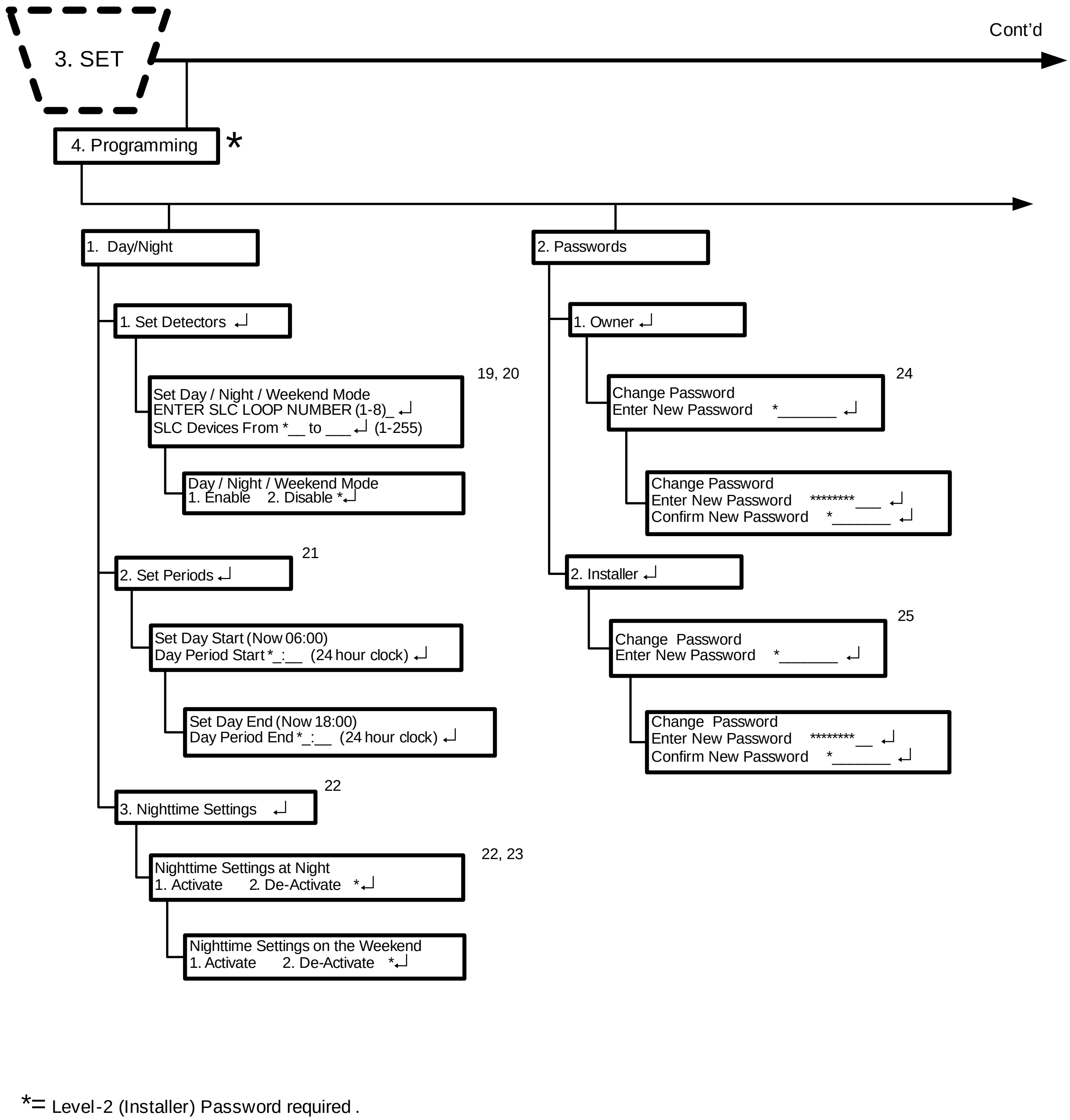


Figure 3-25. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 7 of 18)

FOOTNOTES (Figure 3-25):

19 **Set Day/Night/Weekend Mode. Activate Day/Night Operation for SmartOne Smoke Detectors**.

Purpose: To enable one or more SmartOne smoke detectors to automatically adjust alarm thresholds by time of day.

20 **Set Day/Night/Weekend Mode. De-Activate Day/Night Operation for SmartOne Smoke Detectors**.

Purpose: To disable one or more SmartOne smoke detectors from automatically adjusting alarm thresholds by time of day.

21 **Set Periods. Change the Day/Night Periods for Smoke Detectors**.

Purpose: To change daytime and nighttime periods for smoke detectors.

22 **Activate. Activate Day/Night Alarm Thresholds for Smoke Detectors**.

Purpose: To activate daytime and nighttime alarm thresholds for smoke detectors.

23 **Nighttime Settings at Night. De-Activate Day/Night Alarm Thresholds for Smoke Detectors**

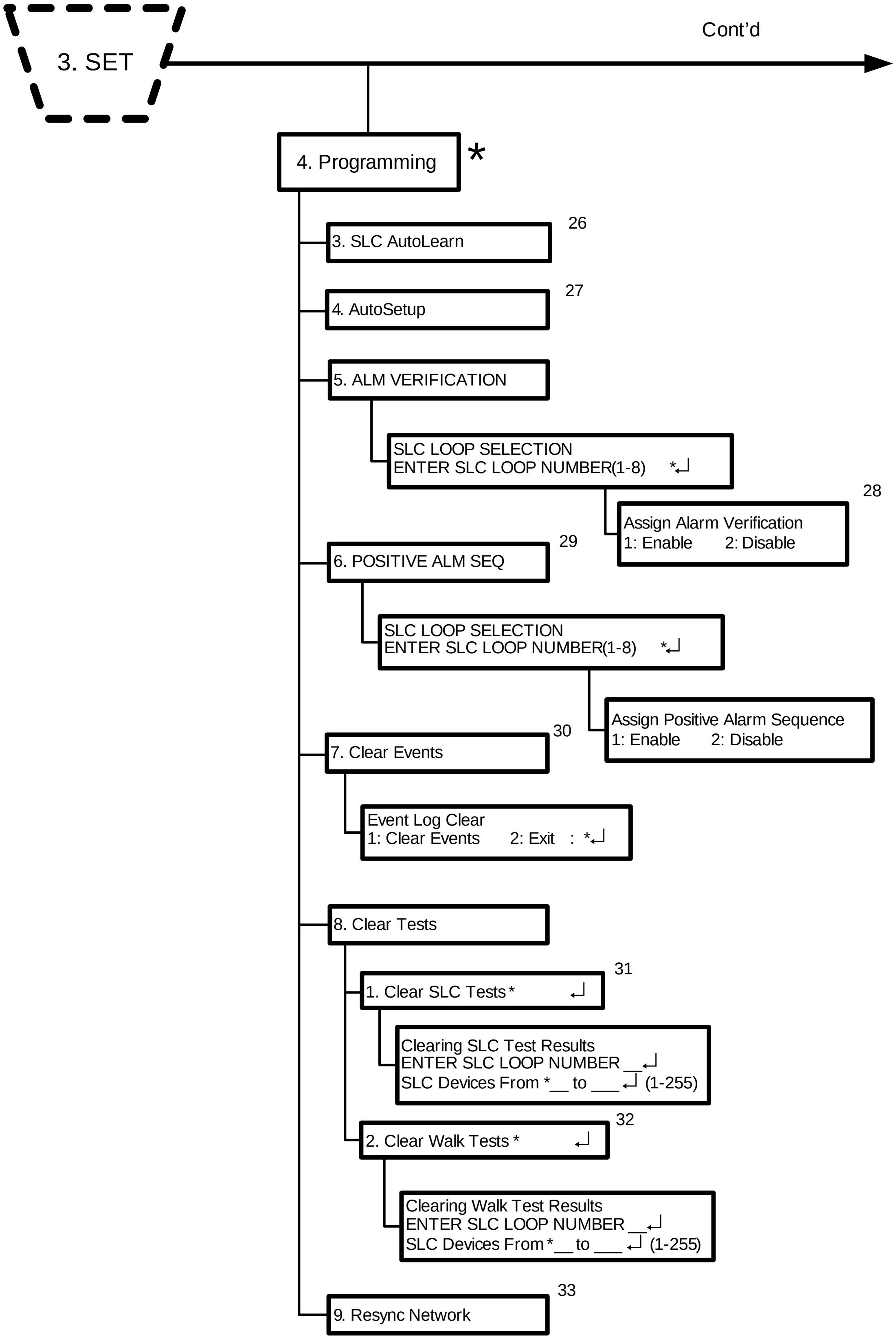
Purpose: To de-activate daytime and nighttime alarm thresholds for smoke detectors.

24 **Change Owner Password.**

Purpose: To change the owner's password from its current setting. The factory-default setting is 973480.

25 **Change Installer Password.**

Purpose: To change the installer’s password from its current setting. The factory-default setting is 186591.



*= Level-2 (Installer) Password required .

Figure 3-26. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 8 of 18)

FOOTNOTES (Figure 3-26):

26 **AutoLearn. Run the AutoLearn Procedure**.

Purpose: The primary purpose of the AutoLearn Procedure is to execute a Registration Procedure for all currently unregistered SLC devices.

This option registers any currently unregistered SLC devices, and if no Event-Output-Control programming exists in the control unit's memory, will update the general-alarm list by adding all on-board NACs and R-NAC circuits (if configured as NACs) and all SLC-based AOs and ASMs. All general-alarm outputs are configured for silenceable operation.

CAUTION

The AutoLearn Procedure shall not be used to configure a system. It is primarily a procedure to create a database of SLC devices and to build a general-alarm list of outputs. Owner locations are not assigned during the AutoLearn Procedure.

Note: The dedicated releasing circuits and combination circuits, when programmed as releasing circuits, are never included in the general-alarm list.

Note: Wait for each SLC device to report a "Not-Registered" trouble message and ensure that all these trouble messages have been acknowledged before activating "AutoLearn" .

27 **AutoSetup. Run the AutoSetup Procedure.**

Purpose: The AutoSetup Procedure executes a Registration Procedure for all unregistered SLC devices and, in addition, configures the system for operation as a waterless fire-suppression system. The following operating characteristics are assigned to the ARIES NET*Link* control unit and its associated SLC devices.

SLC Device Assignments

Automatic activation of the extinguishing system will be via crossed-zoned alarm-initiating signals generated by combinations of automatic initiating devices assigned to any of the first 100 addresses on the SLC. One half of the crossed-zoned alarm-initiating system will consist of any automatic initiating device addressed within the range of 001 through 050. The other half of the crossed-zoned automatic-initiating system will consist of any automatic initiating device addressed within the range of 051 through 100.

Spot-type detectors from each half of the crossed-zoned detection system must be alternated throughout the protected area.

The extinguishing system will be manually activated by monitor modules (i.e., AIs) configured as manual-release stations. Operation of a manual-release station will cause all alarm and shutdown devices to operate as if the system had operated automatically and will cause an immediate activation of the fire-extinguishing system. Operation of a manual-release station will override the operation of all abort switches. Each monitor module with address within the range of 101 through 105 will be assigned as a manual-release station.

Abort switches will, when operated, interrupt the countdown delay for the activation of the extinguishing system and prevent the operation of any alarms and control functions associated with the discharge of the extinguishing agent.

Note: Cumulative time delays, resulting from the operation of two or more abort switches connected into the same releasing device zone, shall not exceed 60 seconds.

The abort switches must be momentary, dead-man-type devices that require a constant force to remain engaged and active. Abort switches will be configured to reset the countdown timer to the full delay period. Each monitor module with address within the range of 106 through 110 will be assigned as an abort station.

- Each AO output module with address within the range of 111 to 115 will be assigned as a pre-alarm output point.
- Each AO output module with address within the range of 116 to 120 will be assigned as a pre-release output point.
- Each AO output module with address within the range of 121 to 125 will be assigned as a release output point.

Sequence of Operation

The ARIES NET*Link* will progress through the pre-alarm, pre-release, and release states as defined in Table 4-5. The time delay between the pre-release and the release states will be 30 seconds.

Control-Unit-Based Outputs Assignments

Control-unit-based outputs will be assigned to the pre-alarm, pre-release, and release states as follows:

Pre-Alarm State

NAC No. 1 (steady activation)

Programmable Relay No. 1

The owner-location field on the LCD will display the word "Pre-Alarm"

Pre-Release State

NAC No. 2 (steady activation)

Programmable Relay No. 2

The owner-location field on the LCD will display the word "Pre-Release" concurrently with the continuously-decremented countdown timer

Deactivate NAC No. 1

Release State

Release Circuit No. 1

Release Circuit No. 2

Combination NAC/Releasing Output No. 1 as a NAC (steady activation)

Combination NAC/Releasing Output No. 2 as a release circuit

Programmable Relay No. 3

The owner-location field on the LCD will display the word "Agent Release"

CAUTION

Owner locations are not assigned during the AutoSetup Procedure. The Abort operation in this setup is not UL Listed.

Note: Wait for each SLC device to report a "Not-Registered" trouble message and ensure that all these trouble messages have been acknowledged before selecting “AutoSetup”.

28 **Assign Alarm Verification. Activate Alarm Verification for Smoke Detectors**.

Purpose: To activate and de-activate alarm-verification for one or more smoke detectors. Refer to Section 4-11.3.6.

29 **Positive ALM SEQ. Activate Positive-Alarm Sequence for Smoke Detectors**.

Purpose: To activate and de-activate positive-alarm sequence for one or more smoke detectors. See Section 4-11.3.5.1 for the description of positive-alarm sequence.

30 **Clear Events. Clear the System Event Log**.

Purpose: To remove all previously recorded system events from the ARIES NET*Link* event log.

31 **Clear SLC Tests. Clear the Contents of the SLC-Initiating Devices Test Log**.

Purpose: To remove the most-recently recorded results of initiating devices tests from the SLC Test Log. All initiating devices are tested once per day to confirm that they can transmit an acceptable event-detection signal. The results of the most-recently-transmitted event signal are recorded in the SLC Test Log.

32 **Clear Walk Tests. Clear the Contents of the Walk-Test Log**.

Purpose: To remove the most-recently recorded results of initiating-devices walk tests from the Walk-Test Log. The results of the most-recently-conducted walk tests are recorded in the Walk-Test Log.

33 **Resynch. Network.**

Purpose: To restore uniformity of event display among the members of a networked ARIES NET*Link* system.

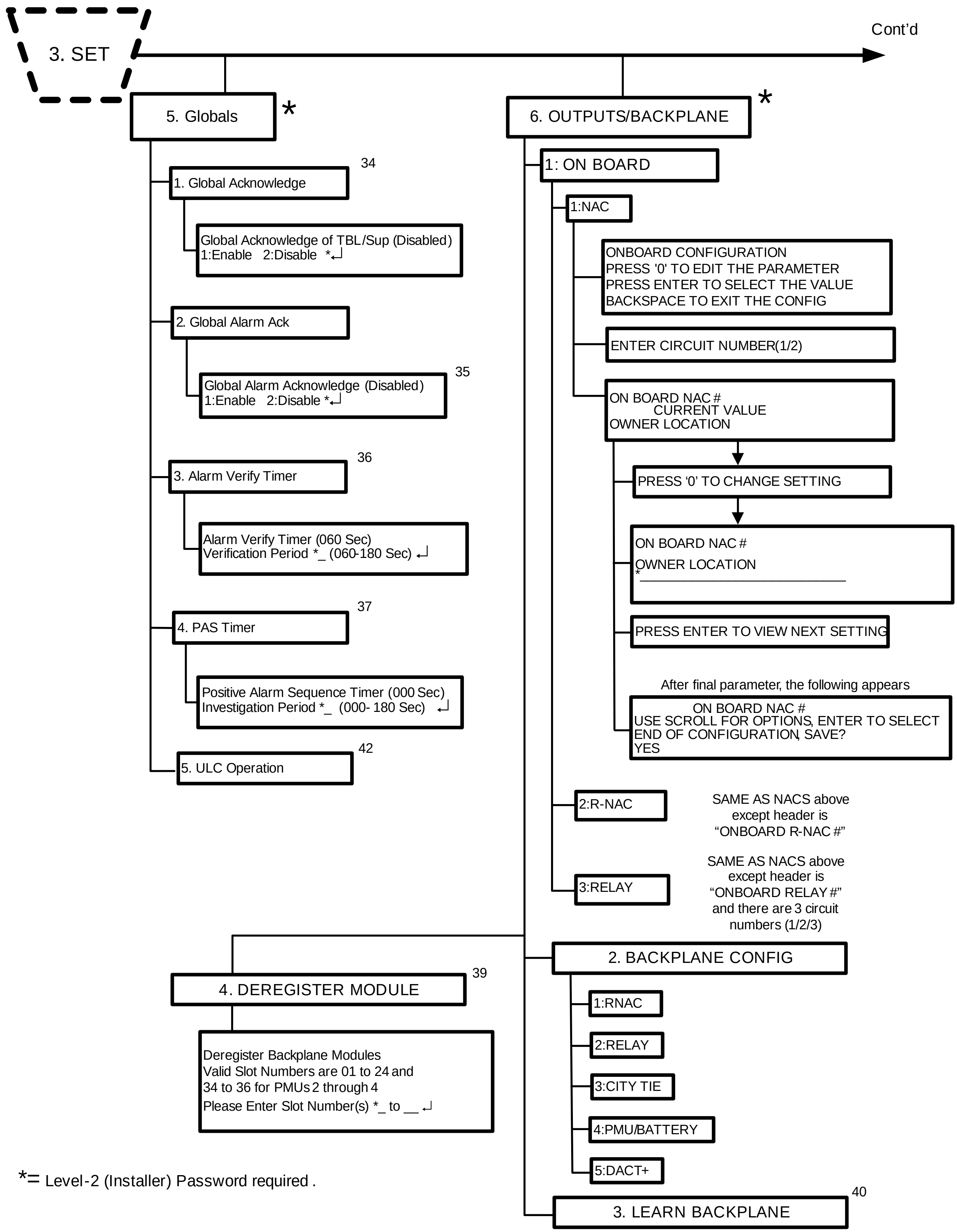


Figure 3-27. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 9 of 18)

FOOTNOTES (Figure 3-27):

34 **Global Acknowledge. Activate Global Acknowledge. Purpose:** To enable the "Acknowledge" Switch to process any combination of up to 30 unacknowledged supervisory or trouble events.

35 **Global Acknowledge of Alarms. Configure the Global Alarm Acknowledge. Purpose**: When this feature is enabled, when the operator presses the “Acknowledge” key, all current alarms are acknowledged. If this feature is disabled, the operator must acknowledge each alarm individually.

36 **Alarm Verify. Change the Smoke-Detectors’ Alarm-Verification-Delay Period. Purpose**: To change the period of time that the ARIES NET*Link* control unit will wait for a second, confirming signal from a smoke detector (or any other alarm-initiating device) that an alarm condition is valid and actually exists. The alarm verification period is programmable from 30 to 180 seconds in one-second increments, or 0 (zero).

37 **PAS. Change the Smoke-Detectors’ Positive-Alarm Sequence Investigation Period. Purpose**: To change the period of time that the ARIES NET*Link* control unit will wait for the occupants to investigate a smoke-detector’s positive-alarm-sequence report before it executes the smoke-detector's programmed alarm actions. The operator must reset the control unit before this time period expires or the programmed alarm actions will occur.

39 **Deregister Module. Purpose:** To remove a module from the backplane configuration.

40 **Learn Backplane. Purpose:** To add any modules not yet in the configuration but installed in the backplane to the configuration, with default settings.

42) **ULC Operation**. **Purpose:** Enabling this parameter changes certain panel operation to meet ULC requirements for networking.

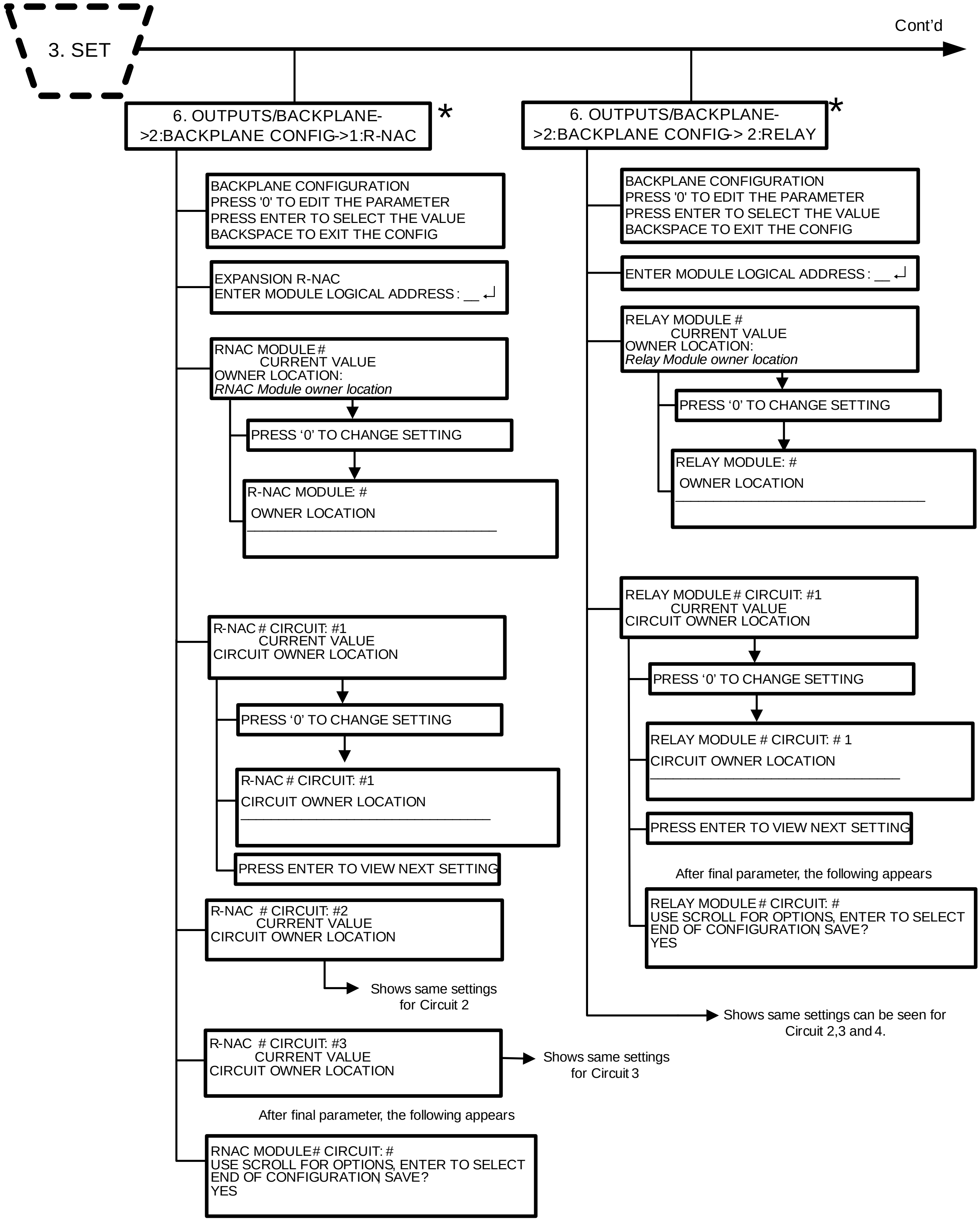


Figure 3-28. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 10 of 18)

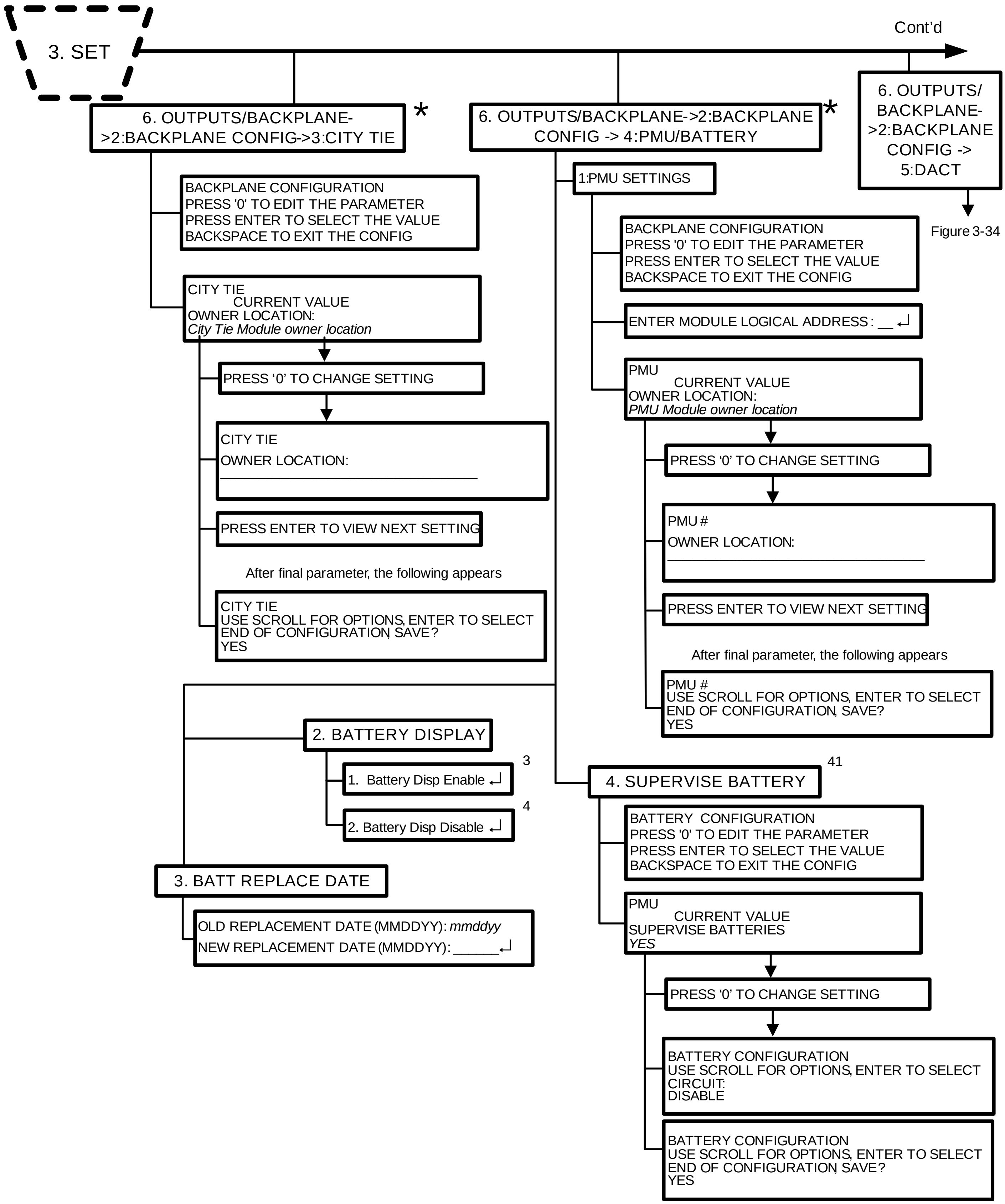


Figure 3-29. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 11 of 18)

FOOTNOTES (Figure 3-29):

3 **Battery Disp Enable. Set the Display to Show the Standby-Battery Condition. Purpose**: To replace the "Normal" message on the display with the standby-battery charging voltage and current. Battery Voltage 25.5V. Battery Current 0.50 A. If the control unit is restarted due to a configuration change or power cycle, this option must be re-enabled. The display will have the following typical appearance:

PS: 25.5 V 1 mA 02:15 PM 07/02/04 **North Communications Center**

4 **Battery Disp. Disable Set the Display to Not Show the Standby-Battery Condition. Purpose**: To replace the standby-battery charging voltage and current with the "Normal" message on the display.

41 **Supervise Battery. Enable Battery Supervision. Purpose**: To disable and restore battery supervision that was disabled using the “Battery Configuration” menu function.

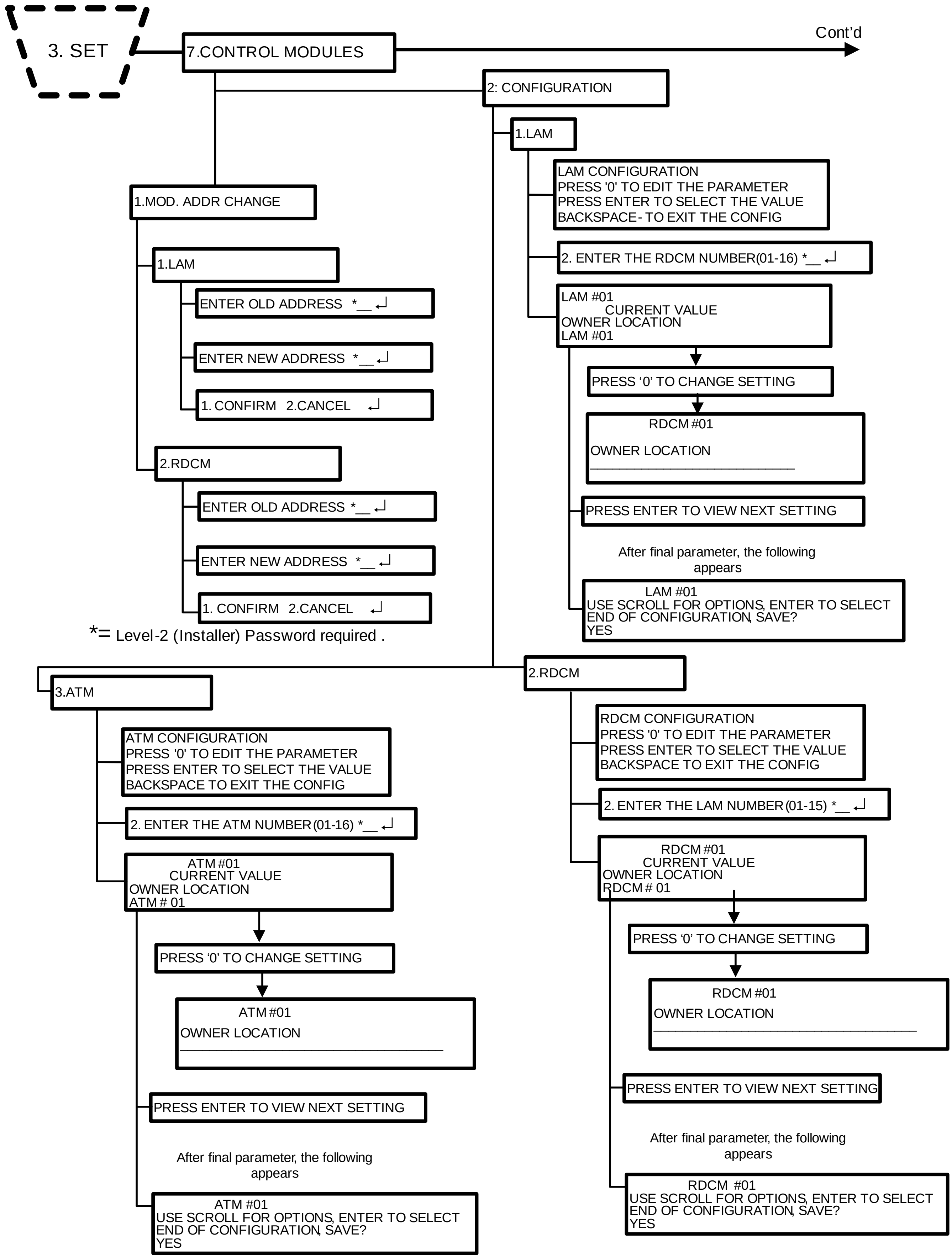


Figure 3-30. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 12 of 18)

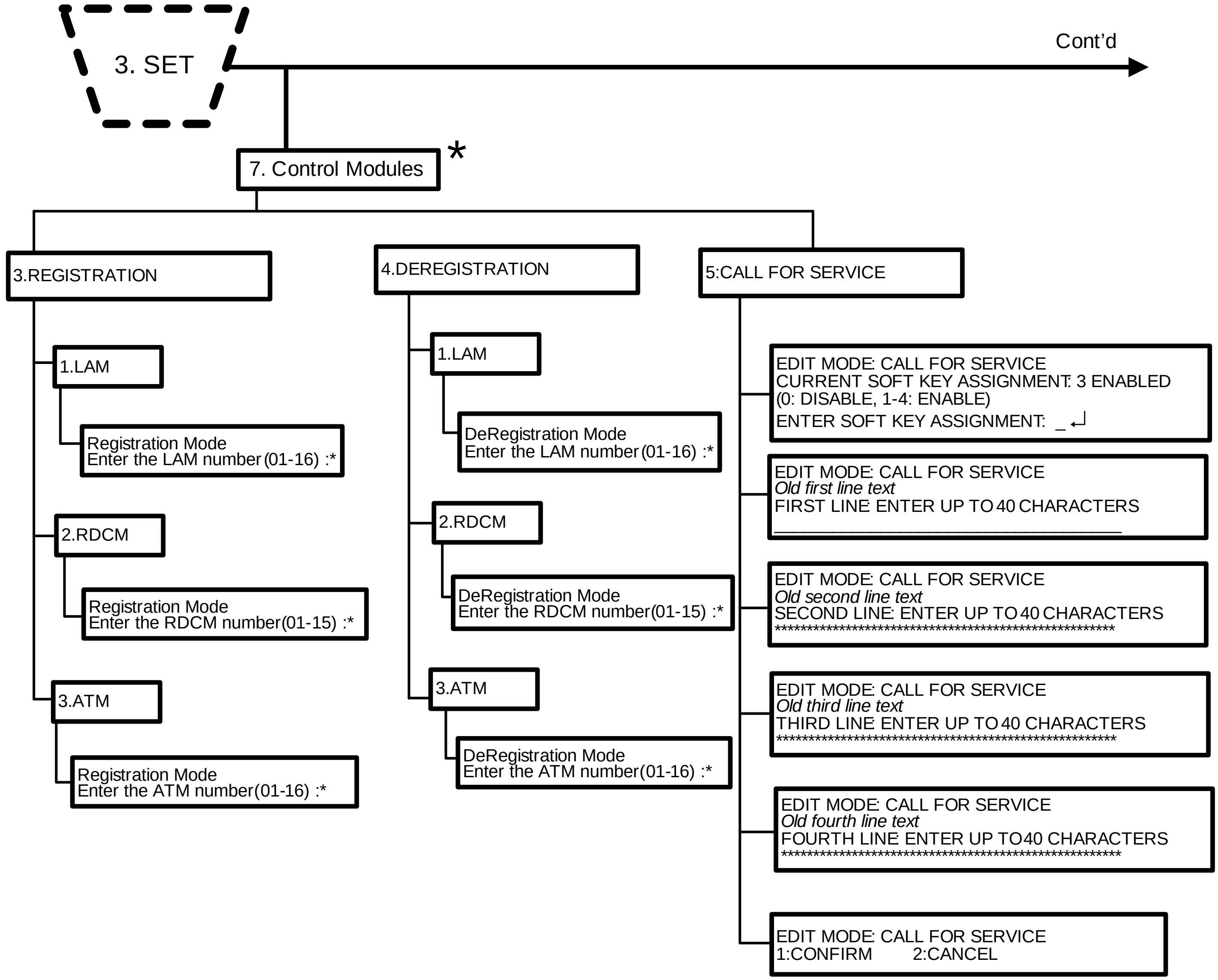
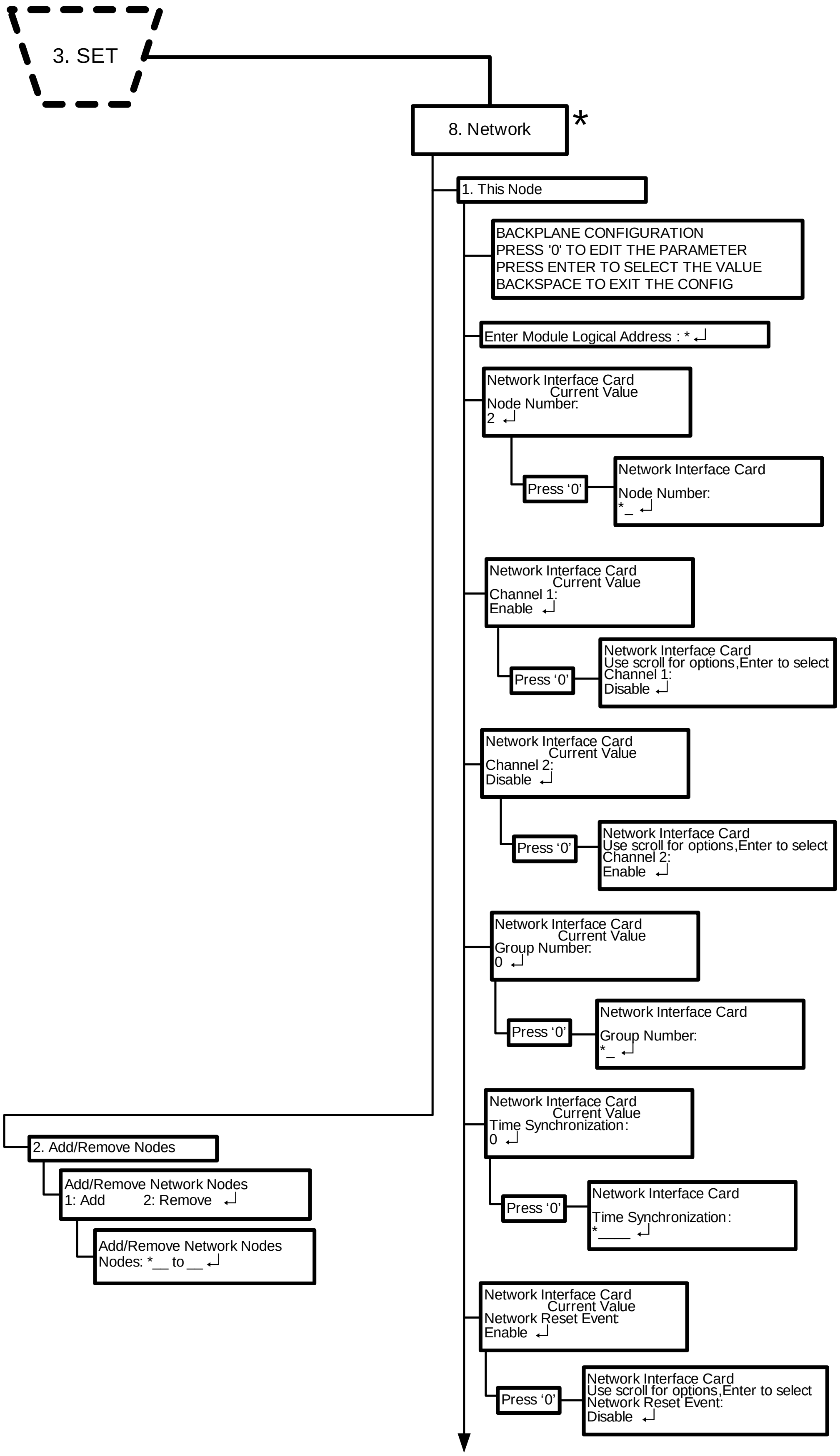


Figure 3-31. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 13 of 18)



Continued in Figure 3-33

Figure 3-32. ARIES NET*Link* Set Menu Functions (Cont'd - Fig. 14 of 18)

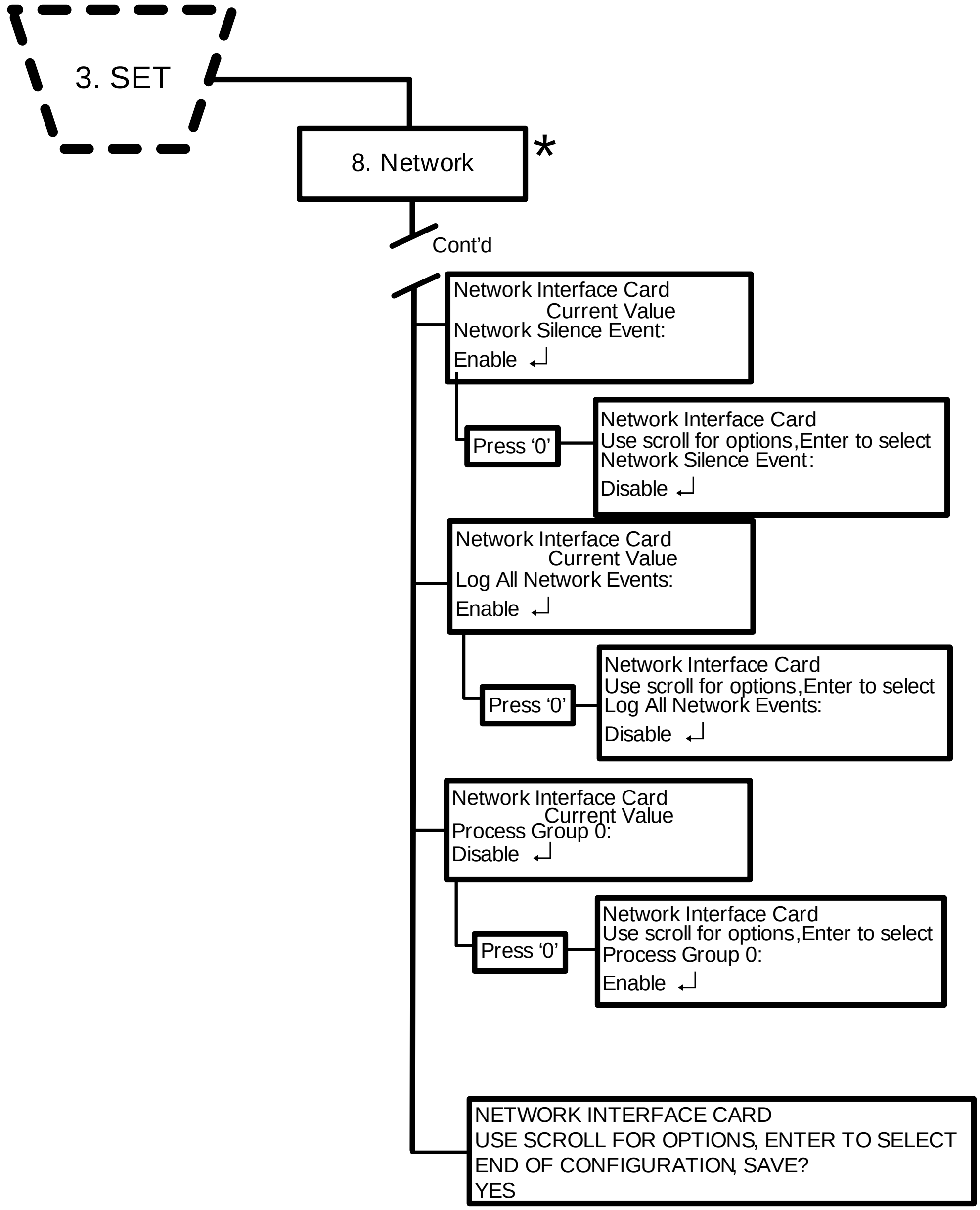


Figure 3-33. ARIES NET*Link* Set Menu Functions (Fig. 15 of 18)

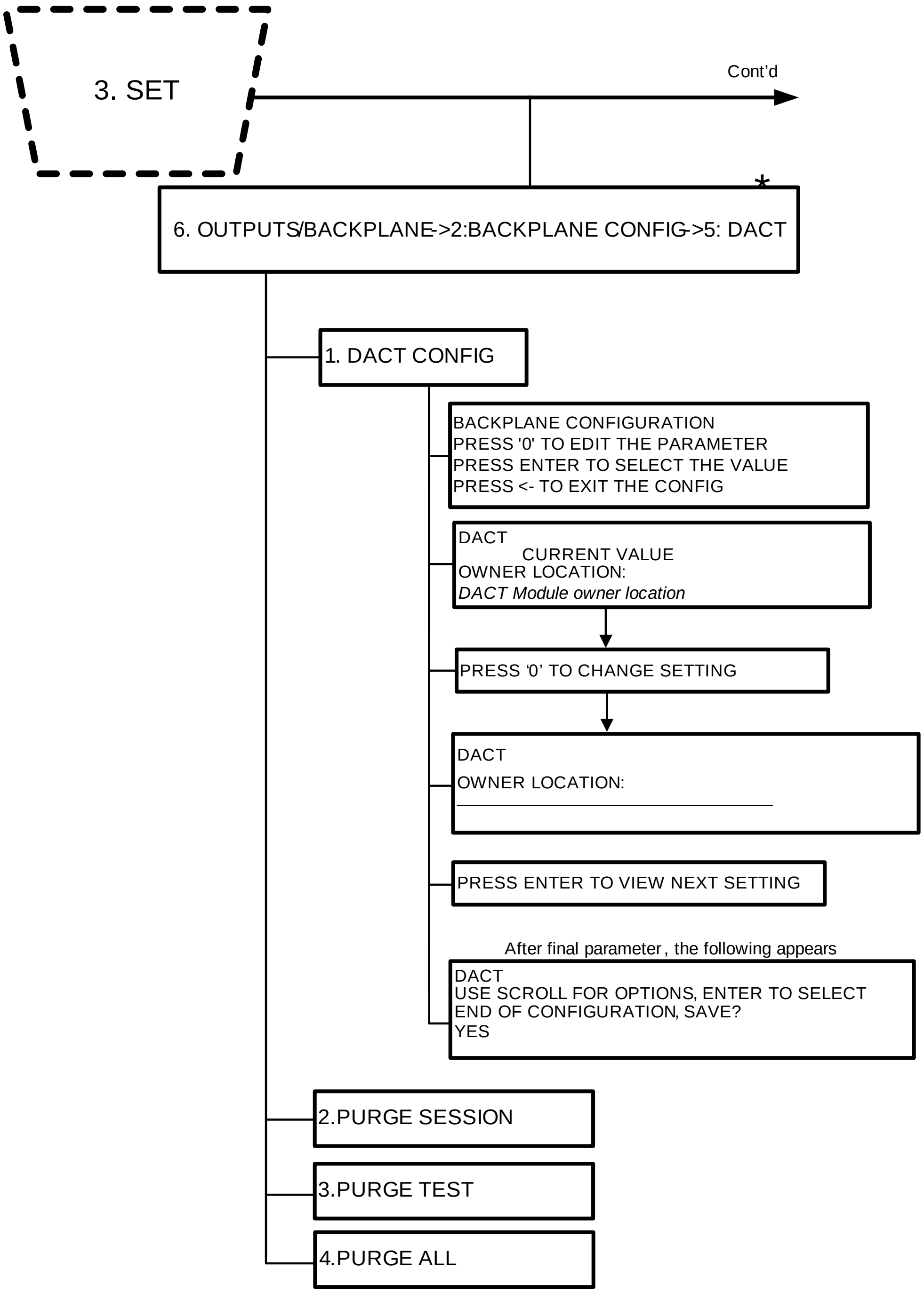


Figure 3-34. ARIES NET*Link* Set Menu Functions (Fig. 16 of 18)

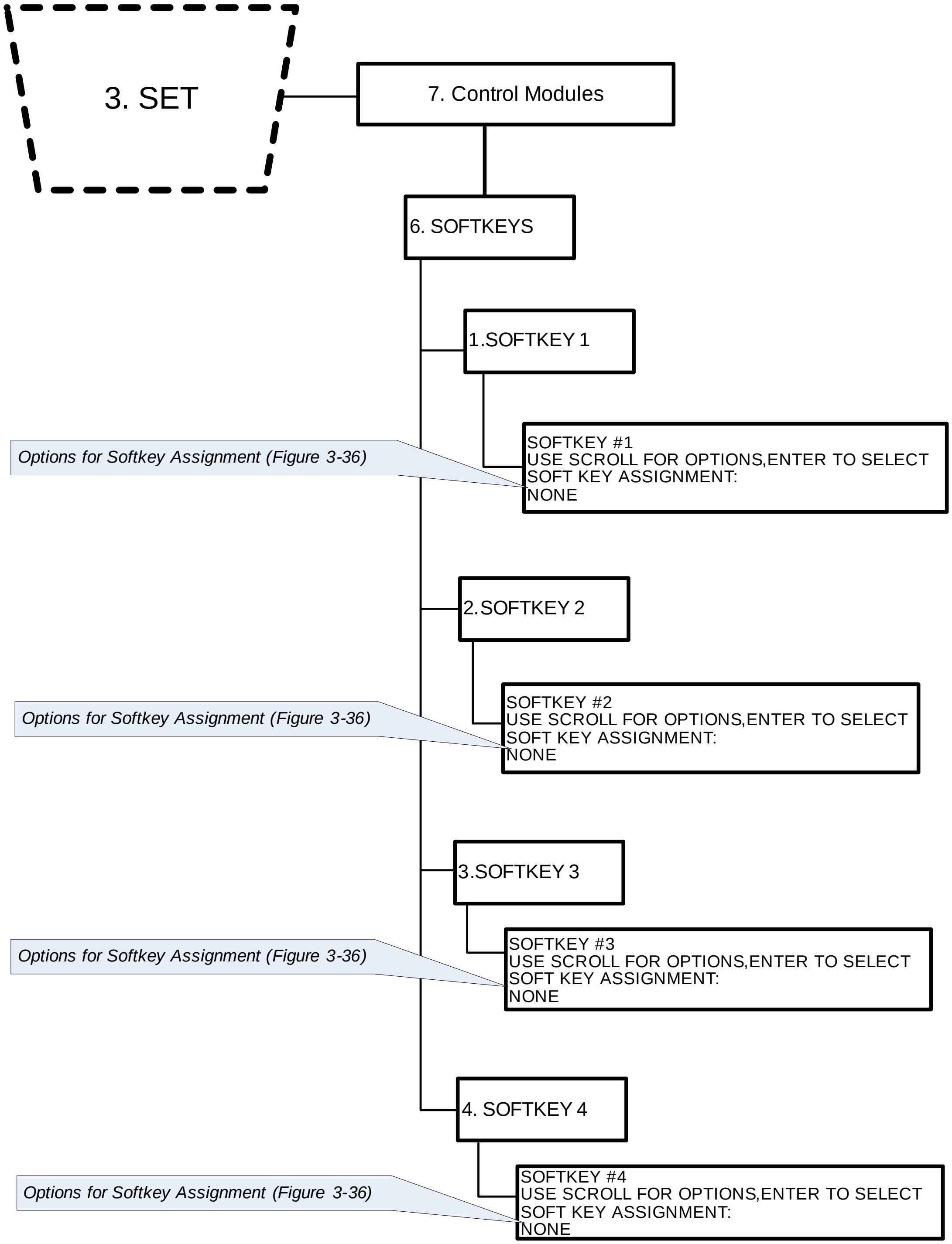


Figure 3-35. ARIES NET*Link* Set Menu Functions (Fig. 17 of 18)

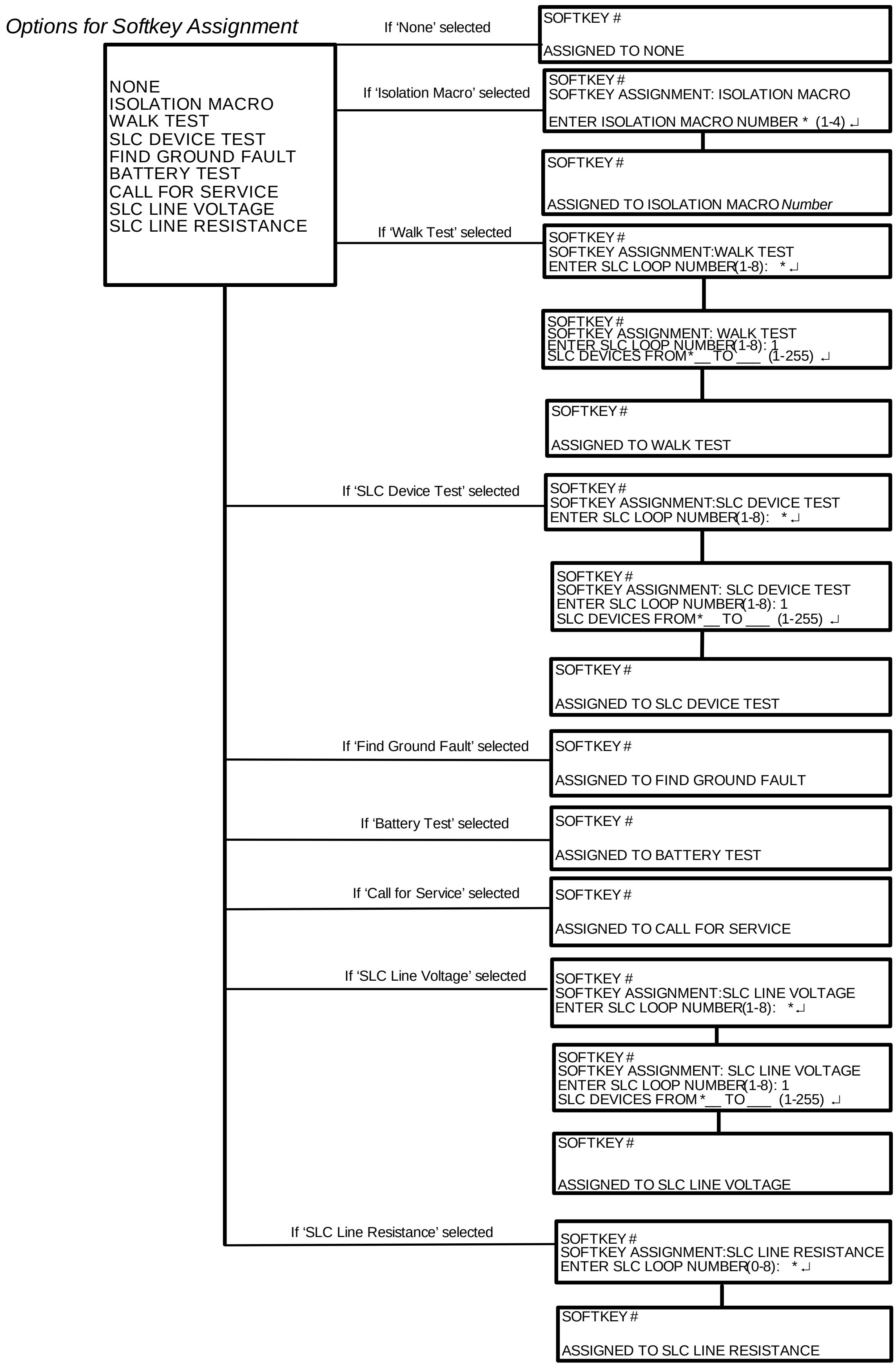


Figure 3-36. ARIES NET*Link* Set Menu Functions (Fig. 18 of 18)

3-3.4 TEST MENU FUNCTIONS

Test Menu functions enable service personnel to test the SmartOne initiating devices for the ability to transmit alarm signals. You can also perform alarm-simulation tests for the system's application program and can command on control modules connected to the SLC. In addition, **Test Menu** commands are used to initiate a walk test.

Figure 3-37 through Figure 3-41 outline the **Test Menu** functions. Each function is explained in detail in the remainder of Section 3-3.4.

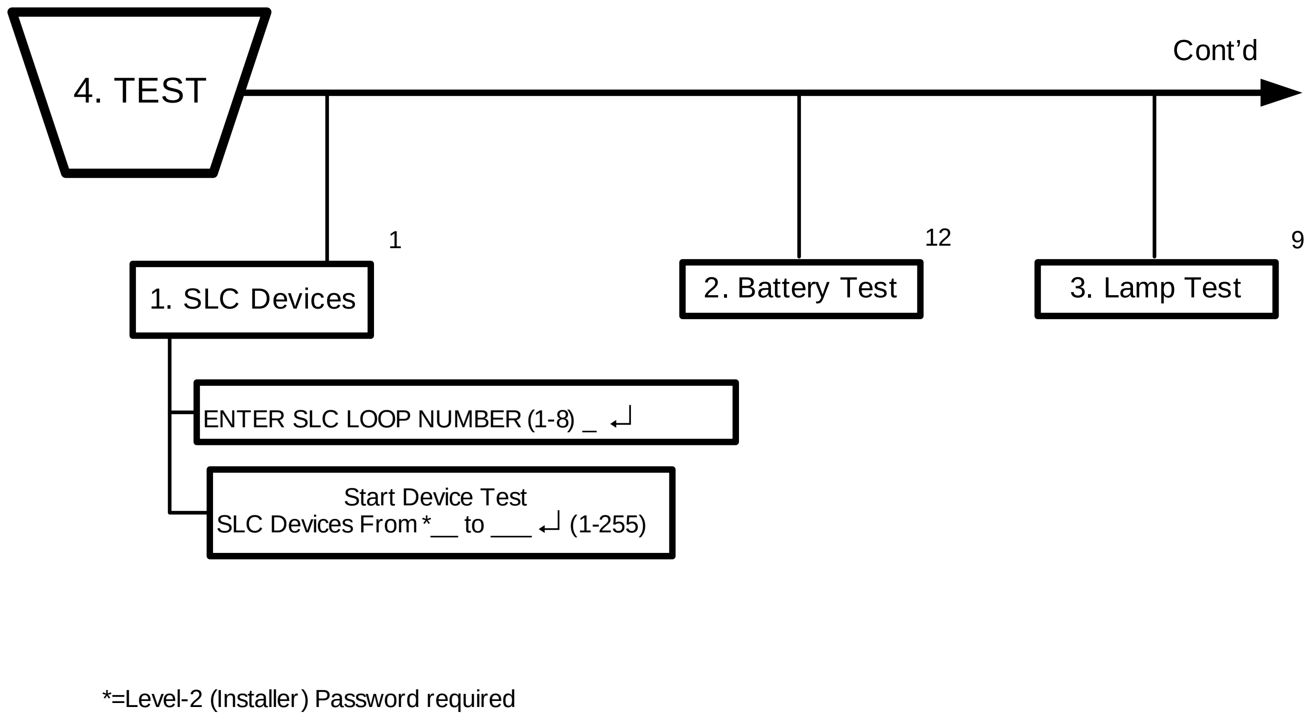


Figure 3-37. ARIES NET*Link* Test Menu Functions (Fig. 1 of 5)

FOOTNOTES (Figure 3-37):

1 **SLC Devices. Test SLC Initiating Devices. Purpose**: To manually test the capability of one or more SmartOne initiating devices (i.e., detectors and monitor modules) to generate and transmit alarm signals that can be properly interpreted and processed by the ARIES NET*Link* control unit. The most current test results for all initiating devices are stored in the SLC Test Results log.

CAUTION

Physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits and activate the global-isolate-outputs routine before testing any SLC initiating devices. Restore the system to normal operating condition at the conclusion of these tests and any other functional tests that were performed.

9 **Lamp Test. Run a Lamp Test. Purpose:** To test the LEDs on the keypad/display.

12 **Battery Test. Run a Battery Test. Purpose**: To measure the standby battery's open-circuit voltage and the power-supply unit's output voltage.

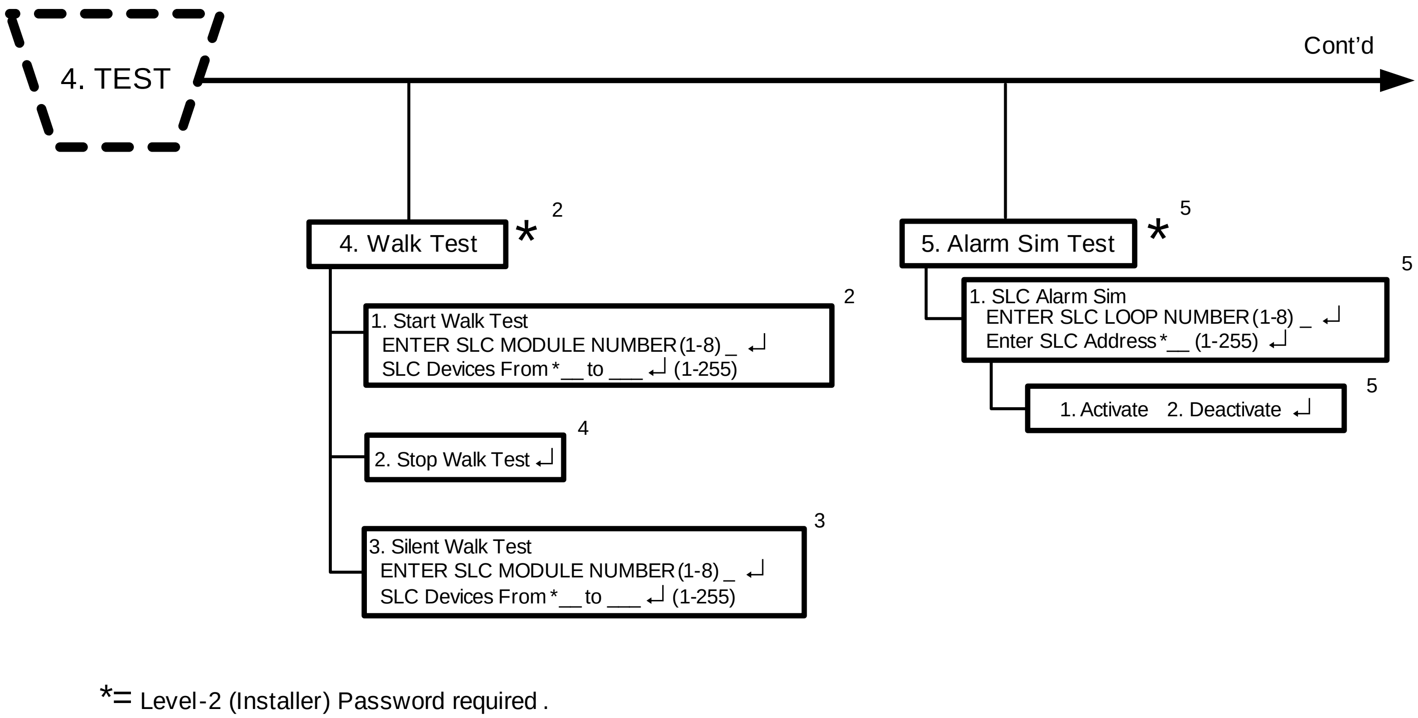


Figure 3-38. ARIES NET*Link* Test Menu Functions (Cont'd - Fig. 2 of 5)

FOOTNOTES (Figure 3-38):

Note: The Walk Test can only be executed on a single loop system.

2 **Walk Test. Start Walk Test. Run an Audible Walk Test. Purpose**: To suspend normal system operation for functional testing of one or more SmartOne initiating devices.

The ARIES NET*Link* control unit will not display and act upon alarm reports from initiating devices selected for walk testing. There is no need for the operator to acknowledge, silence, or reset an event initiated during a walk test. The control unit will only energize outputs programmed for walk-test activation for a period of one second following the receipt of an alarm signal from any of the devices selected for walk testing.

Outputs programmable for walk testing include control unit-based NACs and combination circuits configured as NACs and SLC-based output modules (such as ASMs and AOs).

The most-current walk-test results for all initiating devices are stored in the walk-test log. The walk-test mode will automatically end after 30 minutes of inactivity. It can also be ended by a system reset or by using the "Stop Walk Test" menu function.

Any initiating devices not selected for walk testing will report events as normal. Any alarm reported during a walk test will end the walk-test mode and cause the alarm report to be processed..

CAUTION

Physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits before walk testing any SLC initiating devices. Restore the system to normal operating condition at the conclusion of these tests and any other functional tests that were performed.

3 **Silent Walk Test. Run a Silent Walk Test.**

Purpose: To suspend normal system operation for functional testing of one or more SmartOne initiating devices.

The ARIES NET*Link* control unit will operate identically as in standard Walk Test mode when in a silent Walk Test mode, except that it will not energize the outputs programmed for walk-test activation.

CAUTION

Physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits before walk testing any SLC initiating devices. Restore the system to normal operating condition at the conclusion of these tests and any other functional tests that were performed.

4 **Stop Walk Test. End Walk Test. Purpose:** To terminate a walk test.

Note: The walk-test mode will automatically end after 30 minutes of inactivity. It can also be stopped by a system reset.

5 **Alarm Sim Test. Run an Alarm-Simulation Test. Purpose**:

Purpose: To activate system outputs by simulating an initiating-device event during system testing. The initiating device is not activated. The ARIES NET*Link* system outputs are activated as if the simulated initiating device had actually reported an alarm condition.

The simulated alarm report causes execution of the control unit's application program and activates any outputs in the general-alarm list. Event acknowledgment, alarms silencing, and a system reset are required to return the system to normal operating condition.

Note: The simulated alarm report must be manually de-activated via a menu operation before the system can be reset and returned to normal operating condition.

The alarm-simulation test can be run concurrently for multiple devices to test counting and crossed-zoned applications. Subsequent alarm acknowledgment and silencing are required. Each simulated initiating device must be manually de-activated via the menu before the control unit can be reset.

CAUTION

Isolate all releasing outputs using the Isolate function and physically disconnect the wiring to all agent-release, pre-action-sprinkler and auxiliary control circuits before running any alarm-simulation test(s). Restore the system to normal operating condition at the conclusion of these tests and any other functional tests that were performed.

5 **Alarm Sim Test. De-Activate an Alarm-Simulation Test.**

Purpose: To report an "alarm-off" message from an initiating device whose activation was simulated.

Note: Each simulated alarm report must be manually de-activated via this menu operation before the system can be returned to normal operating condition.

CAUTION

Isolate all releasing outputs using the Isolate function and physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits and auxiliary control circuits before running any alarm-simulation test(s). Restore the system to normal operating condition at the conclusion of all simulated alarm tests and any other functional tests that were performed.

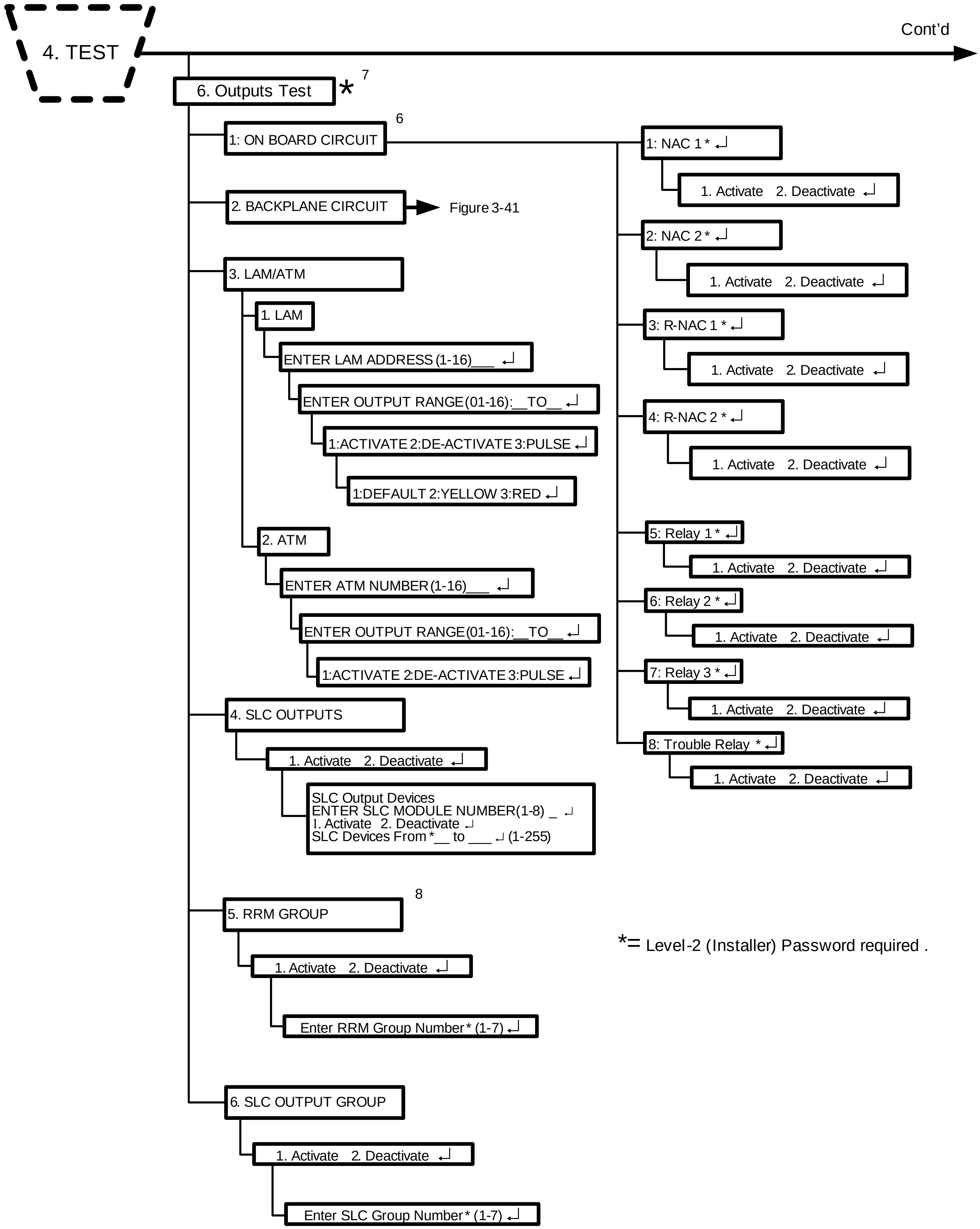


Figure 3-39. ARIES NET*Link* Test Menu Functions (Cont'd - Fig. 3 of 5)

FOOTNOTES (Figure 3-39):

6 **On Board Circuit. Activate Control-Unit-Based Outputs.**

Purpose: To manually activate control-unit outputs during system testing to confirm proper operation.

CAUTION

There is no indication at the control unit that an output is activated. Be sure to de-activate the output after proper operation has been confirmed.

Ensure that the outputs will not activate suppression systems or critical facility operations such as computer power. Physically disconnect all agent-release and pre-action-sprinkler circuits and bypass all affected power-off circuits before activating any outputs if the outputs are activating suppression systems or are shutting off power. Restore the system to normal operating condition at the conclusion of all output activation and any other functional tests.

6 **On Board Circuit. De-Activate Control-Unit-Based Outputs.**

Purpose: To manually de-activate control-unit outputs that were activated during system testing.

CAUTION

There is no indication at the control unit that an output is activated. Be sure to de-activate the output after proper operation has been confirmed.

Ensure that the outputs will not activate suppression systems or critical facility operations such as computer power. Physically disconnect all agent-release and pre-action-sprinkler circuits and bypass all affected power-off circuits before activating any outputs if the outputs are activating suppression systems or are shutting off power. Restore the system to normal operating condition at the conclusion of all output activation and any other functional tests.

7 **On Board Circuit. Activate or De-Activate Control Modules (i.e., as AO, ASM or RRM).**

Purpose: To manually activate or de-activate one or more control modules during system testing to confirm the proper operation of control functions via AOs, NAC operation via ASMs or RRMs.

Note: All control modules must be manually de-activated via a menu operation or a system reset before the system can be returned to normal operating condition.

CAUTION

There is no indication at the control unit that an output is activated. Be sure to de-activate the output after proper operation has been confirmed.

Ensure that the control modules are not activating suppression systems or controlling critical facility operations such as computer power. Physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits and bypass all affected power-off circuits before activating any control modules if the control modules are activating suppression systems or are shutting off power. Restore the system to normal operating condition at the conclusion of all control-module activations and any other functional tests.

8 **RRM Group. Activate or De-Activate Remote Release Modules.**

Purpose: To manually activate or de-activate one or more remote release modules during system testing to confirm the proper operation.

Note: All remote release modules must be manually de-activated via a menu operation or a system reset before the system can be returned to normal operating condition.

CAUTION

There is no indication at the control unit that an output is activated. Be sure to de-activate the output after proper operation has been confirmed.

Ensure that the remote release modules are not activating suppression systems. Physically disconnect the wiring to all agent-release and pre-action-sprinkler circuits if the control modules are activating suppression systems. Restore the system to normal operating condition at the conclusion of all RRM activations and any other functional tests.

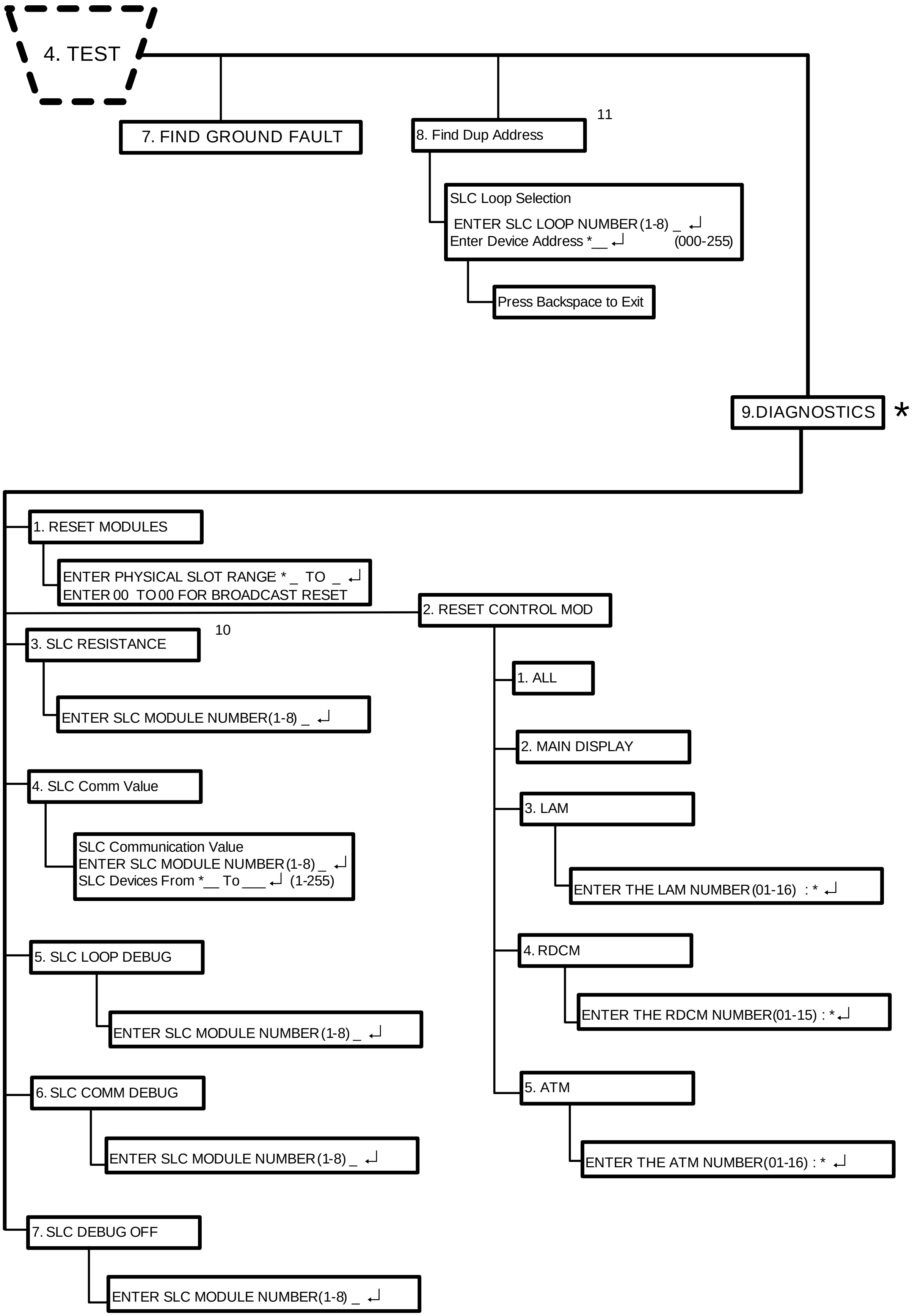


Figure 3-40. ARIES NET*Link* Test Menu Functions (Cont'd - Fig. 4 of 5)

FOOTNOTES (Figure 3-40):

10 **SLC Resistance. Measure SLC Resistance. Purpose**: To measure the SLC line resistance.

Note: The SLC line resistance cannot be measured for CLASS-B SLCs with T-Tapping.

11 **Find Dup Address. How to Find a Duplicate Address.**

Purpose: To clear the trouble message that appears when two SLC devices have been accidentally assigned the same address. The location of the affected SLC devices can be found by instructing the control unit to modify the doubly addressed devices LED pulse pattern.

Note: Only one address can be selected at a time if more than one double-address trouble exists.

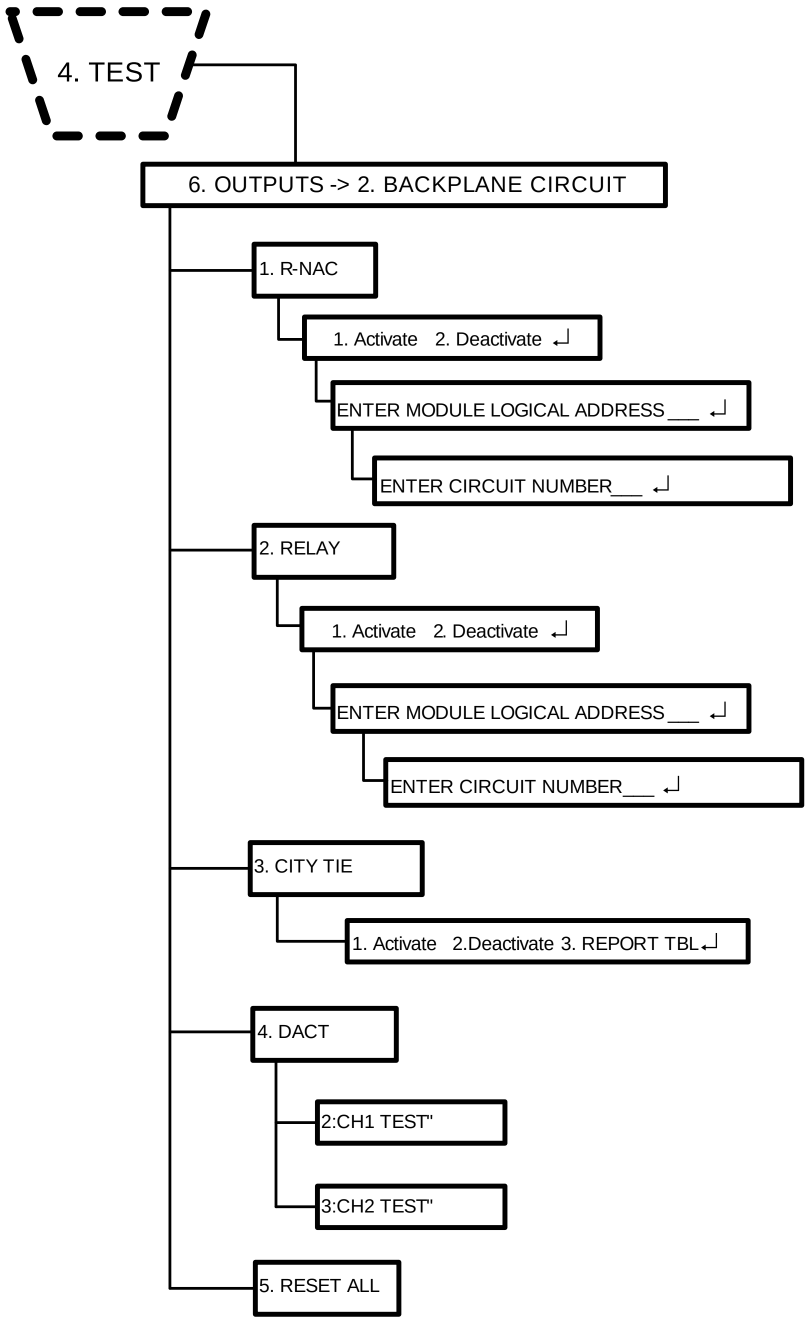


Figure 3-41. ARIES NET*Link* Test Menu Functions (Cont'd - Fig. 5 of 5)

CHAPTER 4
OPERATION

4-1 INTRODUCTION

This chapter addresses operation of individual ARIES NET*Link*™ systems. Instructions on how to start up and operate a configured ARIES NET*Link* System, including how to distinguish the different operating states, how to use the operator keys, entering passwords to access the system menus, and what the Status Indicating LEDs mean are presented in this chapter.

4-2 OPERATING STATES

The ARIES NET*Link* system has two operating modes:

- Normal Mode
- Off-Normal Mode

Normal Mode is characterized by the absence of any initiating signals from either automatic detectors or monitor modules, and by the absence of trouble conditions. The LCD Display will display the message “Normal” (with time and date).

Off-Normal Mode is triggered by system events or operator interrogation via the keypad. Off-Normal Mode operating states are listed in Table 4-1 below.

4-3 OFF-NORMAL TROUBLE CONDITIONS

4-3.1 Panel Trouble Conditions

A System Trouble LED indicator on the Keypad/Display and the panel trouble relay will activate whenever a system trouble is present indicating that there are one or more trouble conditions on the system.

WARNING **A system trouble is an indication that some or all of the fire panel functions may be in an inoperable state and must be addressed with urgency.**

4-3.2 Ground Fault Trouble Conditions

A Ground Fault LED indicator on the Keypad/Display and the panel trouble relay will activate indicating that there are one or more ground faults present in the system.

WARNING **A system ground fault trouble is an indication that action is required to ensure that the panel is not currently in an inoperable state or does not enter an inoperable state. Ground fault troubles must be resolved with the same urgency as a general panel trouble.**

WARNING **Critical fire safety functions including fire detection, fire notification and fire suppression functions may be inoperable during a panel trouble condition resulting in equipment loss, injury and possible loss of life in the event of a fire.**

Table 4-1. Off-Normal Mode Operating States

Operating State	Triggering Event(s)
Access-Via-Menu	A operator uses the keypad to isolate initiating devices and/or outputs, list configuration settings and the application program, adjust configuration settings, or manually initiate testing procedures.
Trouble	A report of a problem that could prevent the ARIES NET*Link* System from proper operation. Typical trouble signals include: Lack of response from a configured device on the signaling line circuit; Internal fault reported by a SmartOne® detector; Loss of monitoring integrity of the installation conductors; Power-supply fault; and/or Loss of primary AC power.
Alarm	An automatic spot-type smoke or heat detector or a high-sensitivity smoke detector senses a fire signature that is greater than the detector's programmable alarm threshold, or when a monitor module programmed as a manual-alarm, manual-release, waterflow or general-alarm point activates.
Pre-Alarm	An automatic spot-type smoke, heat detector or a high-sensitivity smoke detector senses a fire signature that is greater than a programmable, lower-level warning threshold but less than the detector's programmable alarm threshold.
Supervisory	A monitor module detects a condition such as gate-valve closure, low air pressure or water level, or pump failure that could impair the operation of a building's fire suppression system. It also enters this state when an operator isolates any initiating or control devices or control-unit-based output circuits. This mode is primarily event-driven.

4-3.3 The Event Output Control (EOC) Program

Operation of the ARIES NET*Link* System may be characterized as control by events. Outputs are activated by user-specified operating instructions contained in the system's Event Output Control (EOC) program. The EOC program is triggered by any event that transitions the system from the Normal Mode to an event-driven, Off-Normal operating state.

Note: All alarm events must be annunciated by public-mode notification.

Outputs should be dedicated to a single notification or function type and should, therefore, not be shared by alarm and non-alarm notifications.

4-4 USER INTERFACE KEYS AND FUNCTIONS

Operator keys for the ARIES NET*Link* System are located on the Keypad/Display. Figure 4-1 shows the location of the operator keys and System Status LEDs on the display. Table 4-2 lists the names and functions of the operator keys.

Note: The Enclosure door must be open to access the keys.

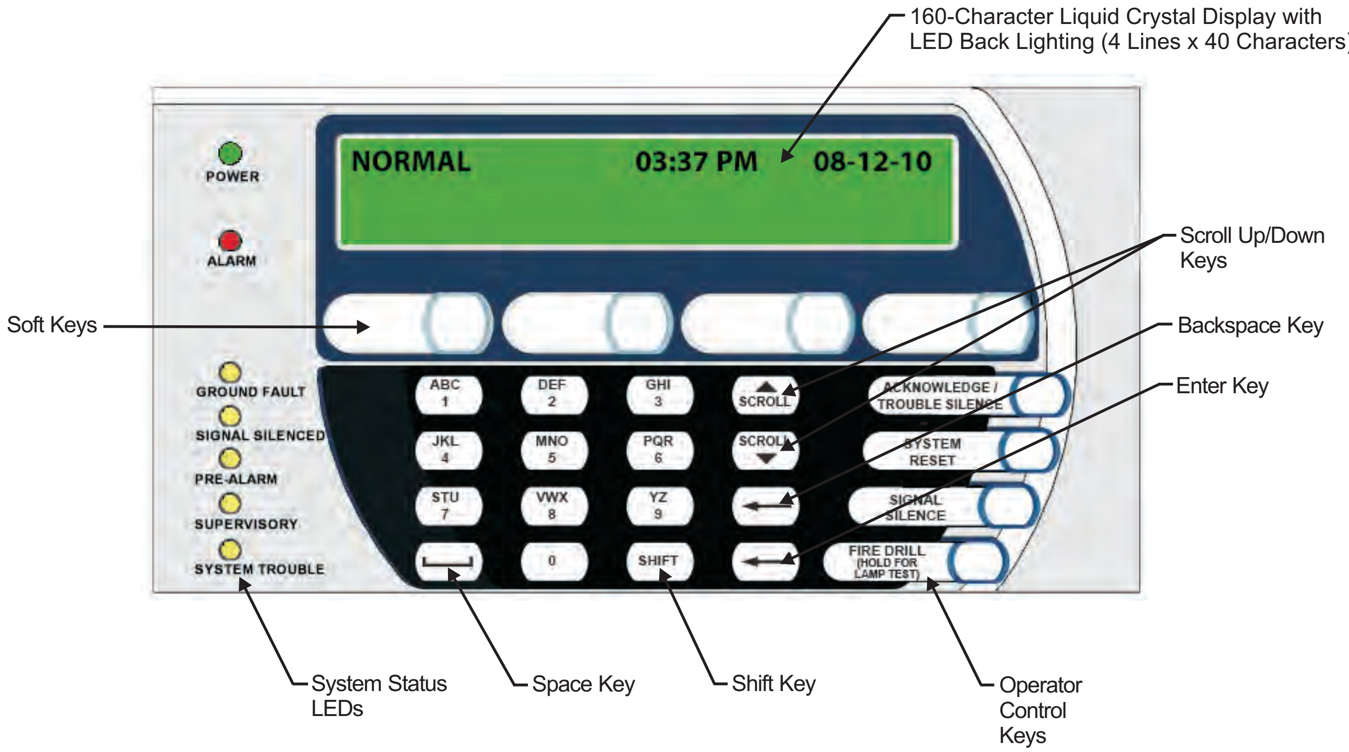


Figure 4-1. ARIES NET*Link* Keypad/Display

4-5 OPERATOR CONTROL KEYS

Operator Control Keys are provided to allow the operator to perform critical functions with the touch of one button. Table 4-2 lists the Operator Control Keys and their built-in functions.

Table 4-2. Operator Control Keys and Their Functions

BUTTON	**FUNCTION**
<PROGRAMMABLE SOFT KEYS>	The four (4) <SOFTKEYS> can be programmed using the ARIES NET*Link* menu system or the remote configuration software (ACT 8000). Each of these 4 keys can be used to program any of the following functions: 1) Isolation Macros; 2) Ground Fault Maintenance Mode; 3) Battery Tests; 4) Call for Service; 5) SLC Device Test; 6) Walk Test; 7) SLC Device voltage readings; or 8) SLC Line resistance readings
<ACKNOWLEDGE/TROUBLE SILENCE>	The <ACKNOWLEDGE/TROUBLE SILENCE> Key allows the operator to signal the ARIES NET*Link* system that a new event currently being displayed is understood. The control unit's audible notification appliance will silence and all flashing Pre-Alarm, Alarm, Supervisory, or Trouble LEDs will light steadily when all active events have been acknowledged.
<SYSTEM RESET>	The <SYSTEM RESET> Key restores the ARIES NET*Link* system to Normal Operation after all alarm system events have been acknowledged and have ceased reporting alarm conditions. For control units configured for ULC operation, the Silence Inhibit timer, if configured, will prevent reset until the expiration of that timer.

Table 4-2. Operator Control Keys and Their Functions

BUTTON	**FUNCTION**
<SIGNAL SILENCE>	Pressing the <SIGNAL SILENCE> Key after all current alarm events have been acknowledged shuts off any active, silenceable outputs, such as notification-appliance circuits or control modules. There is a 10-second buffer period during which subsequent presses of the <SIGNAL SILENCE> Key are intentionally ignored. A subsequent key press will only be acted upon after at least 10 seconds have elapsed since the previous key press. **Note:** The <SIGNAL SILENCE> Inhibit feature, which disables use of the <SIGNAL SILENCE> Key, can be programmed for 1, 3 and 5 minutes.
<FIRE DRILL/HOLD FOR LAMP TEST>	Pressing the <FIRE DRILL/HOLD FOR LAMP TEST> Key one time activates a Fire Drill. Each NAC and/or control module which has been configured for drill operation will be activated. Pressing the <SYSTEM RESET> Key will end the Fire Drill and return the system to Normal Operation. Pressing and holding the <FIRE DRILL/HOLD FOR LAMP TEST> Key tests the LEDs on the User Interface. All of the LEDs should illuminate while the key is depressed. Releasing the key will extinguish the LEDs.
<SCROLL UP/SCROLL DOWN>	The <SCROLL> Keys allow the operator to view all currently-active events by time of occurrence. Also used to navigate through the menu options.

4-5.1 User Interface Button Operations

Some of the above operations can also be performed for the LAM, ATM, and SLC based Addressable Input devices.

The LAM can perfom the following operations:

BUTTON	FUNCTION
<ACKNOWLEDGE/TROUBLE SILENCE>	The <ACKNOWLEDGE/TROUBLE SILENCE> Key allows the operator to signal the ARIES NET*Link* system that a new event currently being displayed is understood. The control unit's audible notification appliance will silence and all flashing Pre-Alarm, Alarm, Supervisory, or Trouble LEDs will light steadily when all active events have been acknowledged.
<SIGNAL SILENCE>	Pressing the <SIGNAL SILENCE> Key after all current alarm events have been acknowledged shuts off any active, silenceable control-unit-based or signaling-linecircuit-based outputs, such as notification-appliance circuits or control modules. There is a 10-second buffer period during which subsequent presses of the <SIGNAL SILENCE> Key are intentionally ignored. A subsequent key press will only be acted upon after at least 10 seconds have elapsed since the previous key press. Note: The <SIGNAL SILENCE> Inhibit feature, which disables use of the <SIGNAL SILENCE> Key, can be programmed for 1, 3 and 5 minutes.

The ATM can perform the following operations:

BUTTON (User-Provided)	FUNCTION
<ACKNOWLEDGE/TROUBLE SILENCE>	The <ACKNOWLEDGE/TROUBLE SILENCE> Key allows the operator to signal the ARIES NET*Link* system that a new event currently being displayed is understood. The control unit's audible notification appliance will silence and all flashing Pre-Alarm, Alarm, Supervisory, or Trouble LEDs will light steadily when all active events have been acknowledged.
<SYSTEM RESET>	The <SYSTEM RESET> Key restores the ARIES NET*Link* system to Normal Operation after all alarm system events have been acknowledged and have ceased reporting alarm conditions. For control units configured for ULC operation, the Silence Inhibit timer, if configured, will prevent reset until the expiration of that timer.
<SIGNAL SILENCE>	Pressing the <SIGNAL SILENCE> Key after all current alarm events have been acknowledged shuts off any active, silenceable control-unit-based or signaling-linecircuit-based outputs, such as notification-appliance circuits or control modules. There is a 10-second buffer period during which subsequent presses of the <SIGNAL SILENCE> Key are intentionally ignored. A subsequent key press will only be acted upon after at least 10 seconds have elapsed since the previous key press. Note: The <SIGNAL SILENCE> Inhibit feature, which disables use of the <SIGNAL SILENCE> Key, can be programmed for 1, 3 and 5 minutes.
<FIRE DRILL>	Pressing the <FIRE DRILL> switch input one time activates a Fire Drill. Each NAC and/or control module which has been configured for drill operation will be activated. Pressing the <SYSTEM RESET> or <SIGNAL SILENCE>Key will end the Fire Drill and return the system to Normal Operation.

The AI can be configured for and perform the following operations:

BUTTON CONFIGURED AI	FUNCTION
<ACKNOWLEDGE/TROUBLE SILENCE>	Activating the <ACKNOWLEDGE/TROUBLE SILENCE> AI switch allows the operator to signal the ARIES NET*Link* system that a new event currently being displayed is understood. The control unit's audible notification appliance will silence and all flashing Pre-Alarm, Alarm, Supervisory, or Trouble LEDs will light steadily when all active events have been acknowledged. The AI should be wired for a momentary switch.
<SYSTEM RESET>	Activating the <SYSTEM RESET> AI switch restores the ARIES NET*Link* system to Normal Operation after all alarm system events have been acknowledged and have ceased reporting alarm conditions. The AI should be wired for a momentary switch.
<SIGNAL SILENCE>	Activating the <SIGNAL SILENCE> AI switch after all current alarm events have been acknowledged shuts off any active, silenceable control-unit-based or signaling-linecircuit-based outputs, such as notification-appliance circuits or control modules. There is a 10-second buffer period during which subsequent presses of the <SIGNAL SILENCE> Key are intentionally ignored. A subsequent key press will only be acted upon after at least 10 seconds have elapsed since the previous key press. Note: The <SIGNAL SILENCE> Inhibit feature, which disables use of the <SIGNAL SILENCE> Key, can be programmed for 1, 3 and 5 minutes. The AI should be wired for a momentary switch.
<FIRE DRILL>	Activating the <FIRE DRILL> AI input activates a Fire Drill. Each NAC and/or control module which has been configured for drill operation will be activated. Deactivating the switch will end the Fire Drill operation.

4-6 ALPHANUMERIC KEYPAD

The 14-position keypad includes the following alphanumeric and functionality keys:

ALPHANUMERIC KEYPAD	The keypad includes all of the alphabetic characters plus 0-9 digits. Used to enter passwords, navigate through the menu options, and specify numeric operating data. Note that the ZERO (0) digit key initiates menu access.
<BACKSPACE>	Used to exit the menu system and to delete incorrect entries.
<ENTER>	Used as the <ENTER> Key for the menu system.
<SPACE>	Used as a delimiter between words and data when making entries.
<SHIFT>	Used to toggle between alphabetic characters (always capitals) and numeric characters when making entries.

4-7 STATUS-INDICATING LEDS

Table 4-3 lists the names and functions of the System Status LEDs on the display.

Table 4-3. System Status LEDs and Functions

LED	COLOR	FUNCTION
Power On	Green	A steady LED indicates primary AC power is on at acceptable levels. An unlit LED indicates unacceptable AC power levels or AC power is disconnected.
Alarm	Red	A flashing LED indicates one or more unacknowledged alarm events. A steady LED indicates all alarm events. The LED turns off when the control unit is reset if all current alarm event messages have been acknowledged and none of the alarm-initiating devices are reporting alarms.
Pre-Alarm	Yellow	A flashing LED indicates unacknowledged pre-alarm events. A steady LED indicates all current pre-alarm events have been acknowledged. The LED turns off when the control unit receives pre-alarm-off messages from all alarm-initiating devices that had reported a pre-alarm.
Supervisory	Yellow	A flashing LED indicates one or more unacknowledged supervisory events. A steady LED indicates all supervisory events have been acknowledged. The LED turns off when the control unit receives supervisory-off messages from all initiating devices that had reported supervisory conditions.
System Trouble	Yellow	A flashing LED indicates unacknowledged trouble events. A steady LED indicates all trouble events have been acknowledged. The LED turns off when the control unit receives trouble-off messages from all SLC or control-unit monitoring circuitry that had reported trouble conditions.
Signal Silenced	Yellow	A steady LED indicates the <SIGNAL SILENCE> Key has been pressed after all current alarm events have been acknowledged. The LED turns off when 1) the control unit is reset, or 2) the <SIGNAL SILENCE> key is pressed to toggle on any previously-silenced NACs and SLC-based modules. The <SIGNAL SILENCE> key will repeatedly toggle the NACs and SLC-based modules off and on and the Signal Silenced LED will track the activation state of the NACs and modules until the control unit is reset.
Ground Fault	Yellow	A steady LED indicates a Ground Fault has occurred in some circuit on the ARIES NET*Link* system. A Ground Fault condition will automatically cause the System Trouble LED to light and flash. The circuit with the wiring problem can be identified through the system menus. When the condition is resolved, either on its own or by installer intervention, the Ground Fault LED will extinguish. The control unit can then be reset to return to Normal operation.

4-8 LCD PANEL SYSTEM STATUS MESSAGES

The highlighted area of Figure 4-2 shows the LCD panel system status messages.

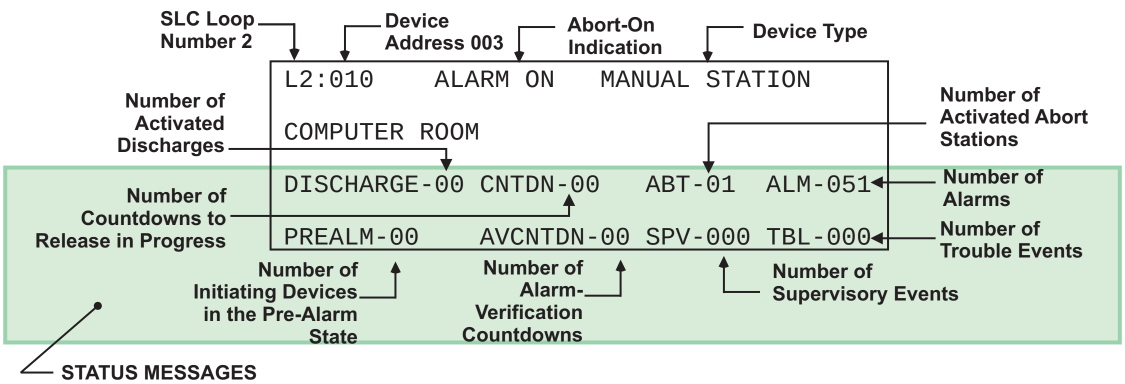


Figure 4-2. Typical Multiple Level-2 Event-Type Display

Table 4-4 lists the names and indications of the System Status Messages on the display (may be shown in English, French, Spanish or Portuguese as desired).

Table 4-4. LCD Panel System Status Messages

LCD SYSTEM STATUS MESSAGE	INDICATION
DISCHARGE-00	Number of activated discharges
CNTDN-00	Number of countdowns to release in progress
ABT-01	Number of activated abort stations
ALM-051	Number of alarms
PREALM-00	Number of initiating devices in the pre-alarm state
AVCNTDN-00	Number of alarm-verification countdowns
SPV-000	Number of supervisory events
TBL-000	Number of trouble events

4-9 USING PASSWORDS FOR SYSTEM SECURITY

Before beginning the system startup procedure, the user should become familiar with the use of password protection. The ARIES NET*Link* provides three distinct levels of program protection, as required by UL Standard 864. The user can only access the system by entering a valid password. Typical valid passwords consist of three or four characters, but may be up to eight characters in length.

4-9.1 Levels of Security

The three security levels are Owner's, Installer's, and System Manufacturer. The highest security level is reserved for the system manufacturer. System owner is level one; system installer is level two. Passwords consist of up to eight alphanumeric characters which allows access from the alphanumeric keypad.

4-9.2 Default Passwords

The ARIES NET*Link* provides protection from unauthorized entry to the system menus by utilizing two levels of default passwords–level one and level two. This feature provides two separate passwords which increases the security of the system. Default passwords are set when the system is shipped from Kidde. These default passwords are:

- Owner's = 973480
- Installer's = 186591

Note: These default passwords are valid until other passwords are programmed into the system.

4-9.3 Entering Passwords

The password entry procedure is listed below:

1. Verify that the system status is displayed.
2. Press the 0 (zero) key to access the menu system. Verify that the display reads: **PLEASE ENTER PASSWORD**
3. Type in the Owner's or Installer's default passwords from the keypad. Ensure that an asterisk (*) appears on the display for each key pressed.

Note: Use the default password only if a new password has not been set already.

4. Press the <RETURN> key. Verify that the top-level menu displays:

1: ISOLATE 2: LIST
3: SET 4: TEST
5: LANGUAGE

4-10 SYSTEM STARTUP PROCEDURE

CAUTION

Do not connect or disconnect the USB cable while the control unit is powering up on system startup or is initializing after a new configuration upload.

The following paragraphs describe system start-up procedures following a successful installation.

4-10.1 Preliminary Procedures

Ensure that the following tasks were successfully completed:

- The ARIES NET*Link* control unit is securely mounted in a clean and dry area that has a normal range of environmental temperatures.
- The power supply unit has been configured correctly for the AC supply voltage.
- The Battery Insulator Tab on the Main Controller Board Real Time Clock has been removed.
- All field wiring has been checked for continuity, Earth Grounds, and short circuits. Wiring resistance and capacitance values have been measured and recorded, where appropriate.
- All SLC-based initiating devices and relay/control modules are electronically addressed, or will be addressed shortly after the control unit is powered up.

  Note: SLC wiring is not connected to the control unit at this point in the procedure.
- The initiating circuits for all AI Monitor Modules are terminated with 10 kOhm end-of-line resistors.
- Peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules) have their address switches correctly set.
- Field wiring for all control unit-based NACs is terminated with 10 kOhm end-of-line resistors.
- All control heads for special-extinguishing systems, if used, are removed from the agent storage containers.

- All actuator circuits have been replaced by simulated loads and are not connected to the fire suppression system.
- Pre-Action/deluge solenoids are removed from the valves that control the distribution of water to the sprinkler heads.

4-10.2 Initial Power-Up

The ARIES NET*Link* power-up procedure is as follows:

1. Close the circuit breaker to apply AC power to the control unit. Verify that the green "Power On" LED illuminates. Immediately, the buzzer will sound and the yellow Trouble LED will light.
2. The following message will appear, requesting the control unit Serial Number. The format for the serial number is “AAAXXXXXXXXXXXX”, where “A” is an alphabetic character and “X” is a numeric digit.

Note: The serial number can be obtained from a label located on the inside of the control unit door.

```
ENTER SERIAL NUM FROM LABEL
*--------------- (Use Shift for Letters)
MAIN vx.x.x/UIvx.x.x
SLC1Vx.x.x/SLC2vx.x.x/CPCvx.x.x
```

Figure 4-3. Serial Number Request Message

Note: To access alphabetic characters on the keypad, press the <SHIFT> Key once and look for the “carrot” symbol (^) to appear in the upper right corner of the display. To return to numeric characters, press the <SHIFT> Key again, which will remove the “carrot” symbol. Note that all system alphabetic characters are always uppercase when entered from the keypad. Use the <Backspace> Key to correct entry errors.

3. Upon successful entry of the serial number, the display shows this message for approximately 5 seconds, at which time the user can remove the tab marked “Clock Battery”:

```
PLEASE REMOVE CLOCK BATTERY TAB
```

Figure 4-4. Remove Clock Battery Tab Message

4. The display next shows the following message for approximately 15 seconds

```
SYSTEM BOOT ver x.x.x
```

```
SYSTEM INITIALIZING
```

Figure 4-5. Initial Power-Up Message

5. The following message appears for 10 to 20 seconds and the Trouble LED extinguishes.

```
SYSTEM INITIALIZING
ARIES NETLINK X.X.X/UI VX.X.X
SLC1Vx.x.x/SLC2vx.x.x/CPCvx.x.x
```

Figure 4-6. Initialization Message

6. Connect the standby batteries as shown in Figure 2-22. The Trouble LED will again light and the buzzer will sound. The display will indicate the following messages:

```
PASSWORD NOT SET ON
```

```
SLC X NOT MONITORING ON
```

```
003 ACTIVE TROUBLES REMAIN
PRESS SCROLL TO VIEW
```

Figure 4-7. Boot-Up Message

7. Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to silence the buzzer and change the Trouble LED from flashing to steady illumination.
8. Proceed to Step 9 after the “SLC Not Monitoring On” messages disappear and the number of active troubles changes from 002 to 001.
9. Set the desired menu language, time and date as follows:
   a. Press the 0 Key. This display will show this message:

```
PLEASE ENTER PASSWORD
* * * * * *
```

Figure 4-8. Password Prompt

   b. Press the default Level-1 (Owner) Password (973480) keys and press the <ENTER> Key. The top-level menu will appear:

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 4-9. Top-Level Menu Selections

   c. If a language other than English is desired, press the 5 Key. The control unit is factory-set to English. If English is the desired language, skip to Step 9f.
   d. Press the appropriate key for French, Spanish or Portuguese menus.

```
1: ENGLISH          2: FRENCH
3: SPANISH          4: PORTUGUESE
```

Figure 4-10. Language Selection Menu

   e. Immediately after confirmation, the control unit will reset and the “System Initializing” message will appear in the selected language. Menus will always display in the selected language (until a different language is chosen).

```
          ARE YOU SURE?
     1. CONTINUE    2. CANCEL
```

Figure 4-11. Language Confirmation Prompt

f. Press the 3 Key to select "SET" from the top-level menu. The items shown below will appear:

```
1: TIME/DATE        2: PORT CONTROL
3: SLC DEVICES      4: PROGRAMMING
5: GLOBALS          6: OUTPUTS/BACKPLANE
7: CONTROL MODULES  8: NETWORK
```

Figure 4-12. Set Menu

g. Press the 1 Key to select "TIME/DATE"

```
1: SET TIME    2: SET DATE
3: SET TIME FORMAT
```

Figure 4-13. Time/Date Sub-Menu

h. Press the 3 Key to select “SET TIME FORMAT”

```
1: AM/PM             2: MILITARY
```

Figure 4-14. Sub-Menu for Time-Display Format

i. Press the <BACKSPACE> key.

j. Press the 1 Key again to select "AM/PM" format

```
SET TIME (AM/PM 1-12 HOURS)
ENTER THE TIME  *_:_ _ (HH:MM)
```

Figure 4-15. Sub-Menu to Enter Current Time

k. Enter the time (HH = hours, 0-12; MM = minutes, 0-59) using the digits keys. Press the <ENTER> Key to finish your entry.

l. Press the 1 Key for AM or the 2 Key for PM as indicated below, and then press the <ENTER> Key to enter your selection:

```
SET TIME (AM/PM)
1: AM             2: PM  *
```

Figure 4-16. Sub-Menu to Complete Current-Time Entry

m. The display will indicate the following message:

```
       SYSTEM TIME (AM/PM)
      TIME HAS BEEN UPDATED
```

Figure 4-17. Time Updated

The display will return to the sub-menu below when you press the <BACKSPACE> Key:

```
1: SET TIME       2: SET DATE
3: SET TIME FORMAT
```

Figure 4-18. Time/Date Sub-Menu

n. Press the 2 Key to select "SET DATE"

```
SYSTEM DATE
ENTER THE DATE  *_-_ _-_ _ (MM-DD-YY)
```

Figure 4-19. Sub-Menu to Enter Current Date

o. Enter the date (MM = month, 0-12; DD = day, 0-31, YY = year, 00-99) using the digits keys.

p. Press the <ENTER> Key to finish your entry. The following display will indicate the following message:

```
          SYSTEM DATE
     DATE HAS BEEN UPDATED
```

Figure 4-20. Date Updated

Note: If the Time Format is changed, the control unit will reset upon exiting the menu so that configuration memory can be updated.

10. Press the <BACKSPACE> Key three times to exit from the menu operating state. Confirm that no new trouble messages have appeared on the display.
11. Remove all power from the control unit by disconnecting the standby battery first and then disconnecting the AC power in anticipation of initially configuring the signaling line circuit.

Note: Because the MCB includes a Real-Time Clock battery, it will not be necessary to re-enter the date and time each time that the ARIES NET*Link* System is powered down.

4-11 ARIES NET*LINK* SYSTEM OPERATION OVERVIEW

The following paragraphs give general operating instructions for a stand-alone system.

4-11.1 Normal Operation

There are no active events such as alarms or troubles during Normal Mode operation. The control unit continuously monitors all initiating devices and supervised circuits for any changes of state. The LCD display shows the “Normal” message, the time and date, and an optional user-defined custom message as shown in Figure 4-21.

```
NORMAL           (TIME)  (DATE)
       STANDBY MESSAGE
```

Figure 4-21. Normal Operation Display

4-11.2 Trouble State

The ARIES NET*Link* enters the Trouble State when an event occurs such as an open in a supervised installation conductor.

The upper line of the LCD display shows the trouble event by the device or circuit address, the type of trouble event and its state change, and the device or circuit type. The lower line indicates the up-to-40-character message assigned to the device or circuit using the ARIES NET*Link* remote configuration software.

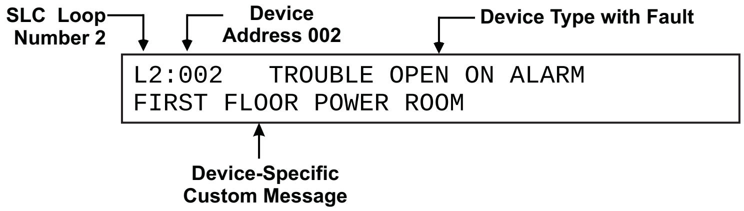


Figure 4-22. Typical Trouble Message Display

The following actions also occur when any trouble condition is reported:

- The Trouble LED on the display flashes
- The internal buzzer pulses
- The Trouble Relay de-energizes to transfer the Trouble contacts
- The trouble event is stored in the event log
- The trouble message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The trouble message is communicated via the RS232 ports.
- Point- or group-specific and general trouble outputs activate, including previously silenced outputs.

4-11.2.1 WHAT TO DO WHEN A TROUBLE OCCURS

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to change the Trouble LED from flashing to steady and to silence the internal buzzer.

It will be necessary to press the <ACKNOWLEDGE/TROUBLE SILENCE> Key once for each trouble report if multiple unacknowledged trouble events are present and the global acknowledgment option has not been selected.

Note: Global Acknowledge for acknowledgment of multiple events is not ANSI/UL 864 compliant.

Each acknowledged trouble event (or block of events when the global acknowledgment option is used) will disappear from the display. The display changes to indicate the next unacknowledged trouble event in the case of multiple trouble events. The active troubles can be manually displayed in order of occurrence using the <SCROLL> Key at this time, after all trouble events have been acknowledged. A summary of the number of active trouble events will be displayed as shown in Figure 4-23 at the conclusion of each manual scroll cycle.

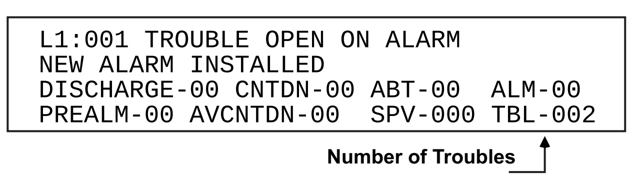


Figure 4-23. Typical Message After Manual Trouble Scroll Cycle

A trouble event that occurs after all previous trouble events are acknowledged will re-initialize the Trouble State as defined in Section 4-11.2.

4-11.2.2 TROUBLE RESOUND

The internal buzzer will resound if one or more acknowledged trouble conditions are still active 24 hours after they were acknowledged. The display will show the following message:

```
     24-HOUR TROUBLE REMINDER
PRESS ACKNOWLEDGE TO SILENCE BUZZER
```

Figure 4-24. 24-Hour Trouble Reminder Message

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to silence the buzzer. The resound trouble signal will also be automatically retransmitted to the supervising station. Retransmission is accomplished by energizing the trouble relay for one minute and then de-energizing it.

4-11.2.3 HOW TO RESET THE CONTROL UNIT AFTER A TROUBLE CONDITION

Trouble conditions are non-latching, except for an open circuit in an SLC configured for CLASS-A operation. There is no indication that a trouble event has cleared when multiple, acknowledged troubles are present. The only indication will be that the trouble event as depicted in Figure 4-23 has disappeared from the set of manually scrolled events and that the total number of troubles displayed has decreased.

The system will automatically return to normal operations when all of the trouble events have cleared if events were non-latching troubles.

Press the <SYSTEM RESET> pushbutton to return to normal operations after an open circuit in an SLC configured for CLASS-A wiring has been repaired.

4-11.3 Alarm State

The Alarm State occurs when the ARIES NET*Link* receives an emergency signal from an alarm-initiating device such as a smoke detector, a manual release station, or a waterflow switch.

The upper line of the LCD display shows the event by the device address, the change of state, and the device type. The lower line indicates the up-to-40-character message assigned to the initiating device using the ARIES NET*Link* remote configuration software.

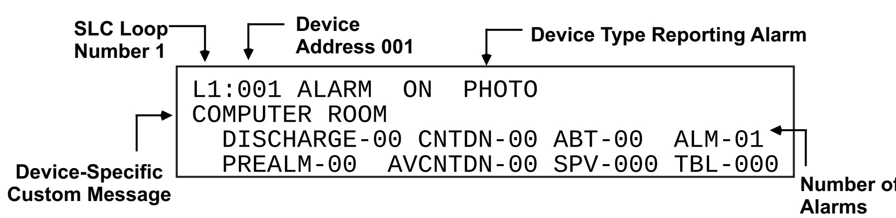


Figure 4-25. Typical Alarm Message Display

The following actions also occur when any alarm condition is reported:

- The Alarm LED on the display flashes
- The internal buzzer sounds continuously
- The alarm event is stored in the event log
- The alarm message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The alarm message is communicated via the RS232 port, as applicable.
- Point- or group-specific and general-alarm outputs will activate, including previously-silenced outputs.

4-11.3.1 WHAT TO DO WHEN AN ALARM OCCURS

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to change the Alarm LED from flashing to steady illumination and to silence the internal buzzer.

It will be necessary to press the <ACKNOWLEDGE/TROUBLE SILENCE> Key once for each device in alarm if multiple unacknowledged alarm events are present. All alarm acknowledgments are logged.

The LDC displays the acknowledged event for 10 seconds, and then returns to displaying the first alarm.

The active alarms and acknowledged alarm-initiating devices can then be manually displayed, in the format of Figure 4-25, in order of occurrence using the <SCROLL> Keys. A summary of the number of active alarm events will be displayed at the conclusion of each manual scroll cycle.

4-11.3.2 ALARM SILENCING

Press the <SIGNAL SILENCE> Key to de-activate any silenceable outputs such as NACs and SLC-based signal or relay modules after all alarms have been acknowledged. Outputs are configured as silenceable through the ARIES NET*Link* remote configuration software. The control unit will display the following message for 5 to 10 seconds.

```
OUTPUTS SILENCED
```

Figure 4-26. Outputs Silenced Message

You may then manually scroll through the list of active and acknowledged alarm-initiating devices by using the <SCROLL> Keys after the message in Figure 4-25 is displayed. A summary of the number of active alarm events will be displayed at the conclusion of each manual scroll cycle.

The Signal Silenced LED will illuminate when the <SIGNAL SILENCE> Key is pressed after all alarms have been acknowledged. A subsequent press of the <SIGNAL SILENCE> Key will re-activate any outputs that were silenced if no new alarm events have been reported since the outputs were silenced. The Signal Silenced LED will also go out. This toggling capability will remain in effect until the control unit is reset.

A silence command that caused all silenceable outputs to de-activate will be overridden by a subsequent alarm report. All silenced outputs associated with the subsequent alarm-initiating device will reactivate, and the Signal Silenced LED will go out. You will need to press the <SIGNAL SILENCE> Key again to de-activate any active, silenceable outputs.

Note: There is a 10-second buffer period during which subsequent presses of the <SIGNAL SILENCE> Key are intentionally ignored. A subsequent key press will only be acted upon after at least 10 seconds have elapsed since the previous key press.

Note: A control unit which is set up for “ULC Operation” does not permit releasing service signal outputs to be silenceable.

4-11.3.3 ALARM DISPLAY LIMITATION

The ARIES NET*Link* control unit can display a maximum of 512 active alarm messages by manually scrolling through them. All alarms in excess of 512 will be processed by the control unit even though they are not displayed, and all outputs will be activated as programmed in the control unit's application program.

The LCD will temporarily display the following message when a manual scroll operation goes beyond the 512th alarm message and then will return to the first alarm message (as shown in Figure 4-25):

```
MORE THAN 512 ALARMS
PRESS SCROLL TO VIEW
```

Figure 4-27. Alarm Events Buffer Full Message

The normal control unit actions will also occur when any non-displayed alarm condition is reported. These actions include:

- Logging of the alarm event
- Activation of point- or group-specific and general-alarm outputs, including previously-silenced outputs.

4-11.3.4 HOW TO RESET THE CONTROL UNIT AFTER AN ALARM CONDITION

The ARIES NET*Link* control unit will not reset and resume normal operations unless it has received Alarm Off messages from all previously alarmed initiating devices. This means, for example, that:

- All automatic initiating devices such as smoke detectors are measuring obscuration levels below their programmed alarm thresholds and have been reset
- All manual stations have been reset and are in non-activated positions
- Sprinkler system water has been shut off and all waterflow switches have stopped reporting discharge conditions

Press the <SYSTEM RESET> Key to resume normal operations after all alarm-initiating devices have transmitted Alarm Off messages.

Note: It is possible that one or more trouble and/or supervisory messages will be reported after the system-reset operation is performed. For example, a special extinguishing system may need to be recharged or a sprinkler gate valve may be in an off-normal position. Servicing personnel must take prompt action to restore the system to normal operating conditions.

4-11.3.5 SPECIAL ALARM CONDITIONS

WARNING **Do not use the following special smoke-detector configurations for releasing applications.**

Two special alarm states are positive alarm sequence and alarm verification.

4-11.3.5.1 Positive Alarm Sequence

The Positive Alarm Sequence (PAS) is designed to give on-site personnel time to investigate a fire-alarm report from a smoke detector and to prevent an evacuation signal from being generated in the event of a spurious fire-signature detection or an inconsequential fire-alarm report. Refer to NFPA 72, National Fire Alarm Code (latest edition) for further details. Refer to the *ARIES NETLink Configuration Tool User's Guide*, P/N 06-237059-001, to configure a smoke detector for PAS operation.

The PAS State occurs when the ARIES NET*Link* control unit receives an emergency signal from a smoke detector configured for PAS. The upper line of the LCD display shows the event by the device address, the change of state, and the device type. The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* remote configuration software.

Note: For systems configured with Positive Alarm Sequencing, a manual override must also be employed (by having a manual pull station located near the ARIES NET*Link* panel).

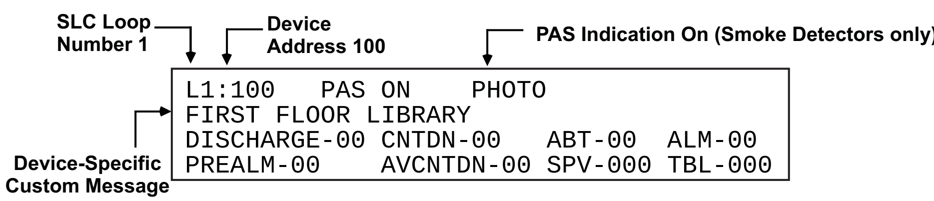


Figure 4-28. Typical PAS Message Display

The following actions also occur when any PAS event is reported:

- The internal buzzer pulses
- The PAS event is stored in the event log
- The PAS message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The PAS message is communicated via the RS232 ports

4-11.3.5.2 What to Do When PAS Occurs

You must press the <ACKNOWLEDGE/TROUBLE SILENCE> Key within 15 seconds of receipt of the PAS report to prevent a PAS condition from changing to an alarm condition as described in the opening section of this chapter. The internal buzzer will silence and the display will change to the appearance in Figure 4-29 if the <ACKNOWLEDGE/TROUBLE SILENCE> Key is pressed within 15 seconds of receipt of the PAS report. PAS acknowledgments are logged.

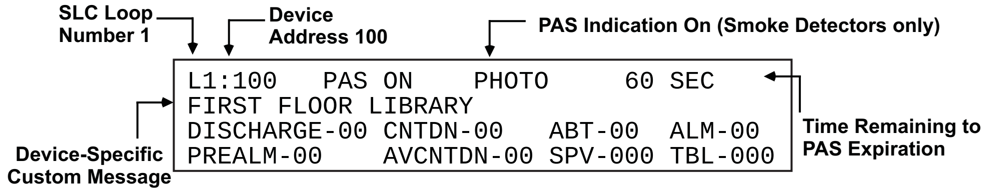


Figure 4-29. PAS Acknowledgment Message

The upper line of the LCD display shows the time remaining to investigate the PAS report before the PAS event transitions to an alarm condition. The investigation time will continually decrease in one-second intervals. The PAS status and display will be cleared if the smoke detector has reported an Alarm clear and you press <SYSTEM RESET> or the PAS timer expires. A PAS de-activation event is stored in the event log if an Alarm Off message is reported.

4-11.3.6 ALARM VERIFICATION

Alarm verification allows a fire-alarm system to delay generating an evacuation signal when an alarm report is received from a smoke detector. The fire-alarm system will wait for a second alarm report from the smoke detector that issued the initial alarm report or another alarm signal from any other alarm-initiating device before it generates the evacuation signal. The fire-alarm system will resume normal operations if it does not receive a second alarm report from the smoke detector or another alarm signal within the user-defined alarm-verification period. Refer to NFPA 72, National Fire Alarm Code (latest edition) for details.

The Alarm Verification State occurs when the ARIES NET*Link* control unit receives an emergency signal from a smoke detector configured for alarm verification.

The upper line of the LCD display shows the event by the device address, the change of state, and the device type. The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* remote configuration software.

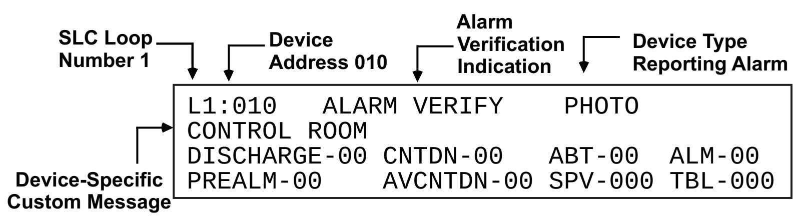


Figure 4-30. Typical Alarm Verification Message Display

The following actions also occur when an alarm verification is reported:

- The internal buzzer pulses
- The alarm verification event is stored in the event log
- The alarm verification message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The alarm verification message is communicated via the RS232 and USB ports

Note: For systems configured with Alarm Verification, the alarm-verification period cannot exceed **60 seconds** for a UL/ULC-listed installation.

4-11.3.6.1 What to Do When Alarm Verification Occurs

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to silence the internal buzzer. The display will change appearance. Acknowledgments of alarm verifications are logged.

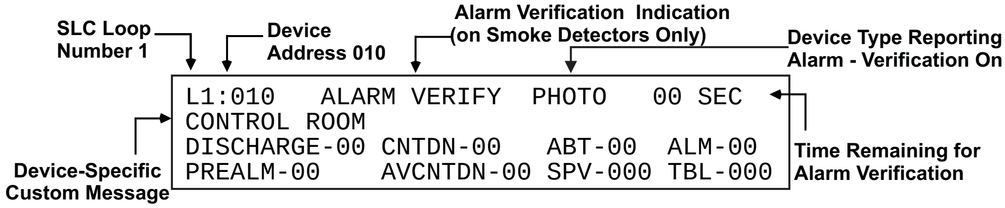


Figure 4-31. Alarm Verification Acknowledgment Message

The upper line of the LCD display shows the verification time remaining to receive an alarm confirmation signal from the smoke detector. The verification time will continually decrease in one-second intervals. The control unit will return to Normal Mode if the smoke detector does not reconfirm the alarm condition or if no other alarm-initiating device reports at any time prior to the expiration of the verification period. A verification off event is stored in the event log if neither an alarm reconfirmation nor a secondary-alarm message is reported.

4-11.4 Supervisory State

The ARIES NET*Link* control unit enters the Supervisory State when an initiating event occurs such as a monitor module report of a low-air-pressure condition in a pre-action-sprinkler system. It also occurs when any SLC-based initiating or control device, or any control unit based output circuit, is isolated.

The upper line of the LCD display shows the supervisory event by the device address, the state change, and the device type. The lower line indicates the up-to-40-character message assigned to the supervisory device using the ARIES NET*Link* remote configuration software.

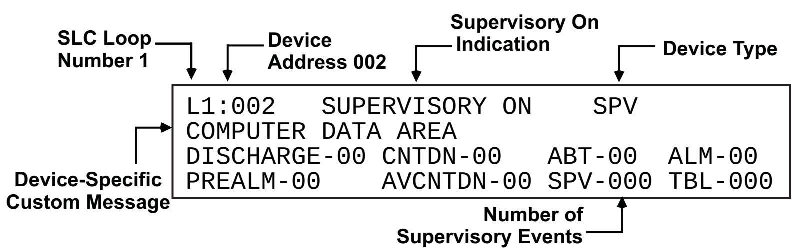


Figure 4-32. Typical Supervisory Message Display

The following actions also occur when any supervisory condition is reported:

- The Supervisory LED flashes
- The internal buzzer pulses
- The supervisory event is stored in the event log
- The supervisory message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The supervisory message is communicated via the RS232 ports
- Point- or group-specific and general supervisory outputs will activate, including previously-silenced outputs.

4-11.4.1 WHAT TO DO WHEN A SUPERVISORY EVENT OCCURS

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to change the Supervisory LED from flashing to steady and to silence the internal buzzer.

It will be necessary to press the <ACKNOWLEDGE/TROUBLE SILENCE> Key once for each supervisory event if multiple unacknowledged supervisory events are present and the global acknowledgment option has not been selected.

Note: Global Acknowledge for acknowledgement of multiple events is not ANSI/UL 864 compliant.

Each acknowledged supervisory event (or block of supervisory events when global acknowledgment is used) will disappear from the display after acknowledgment. The display changes to indicate the next unacknowledged supervisory event in the case of multiple supervisory events. The active supervisory events can be manually displayed in order of occurrence using the <SCROLL> Keys at this time after all supervisory events have been acknowledged. A summary of the number of active supervisory events will be displayed at the conclusion of each manual scroll cycle.

A supervisory event that occurs after all previous supervisory events have been acknowledged will re-initialize the Supervisory State as defined in Section 4-11.4.

4-11.4.2 HOW TO RESET THE CONTROL UNIT AFTER A SUPERVISORY CONDITION

Supervisory conditions are user configurable to be non-latching or latching. There is no indication that a supervisory event has cleared when multiple, acknowledged supervisory events are present regardless of whether the supervisory event is configured for latching or non-latching operation. The only indication will be that the supervisory event has disappeared from the set of manually scrolled events and that the total number of supervisory events displayed has decreased.

The system will automatically return to the Normal Mode when all of the supervisory events have cleared if the monitor modules that reported the events were configured to be non-latching, or if all isolated SLC devices and control-unit-based circuits are restored to normal-operating condition.

Press the <SYSTEM RESET> switch to resume normal operations after a latching supervisory event has cleared.

4-11.5 Pre-Alarm State

The Pre-Alarm State occurs when a SmartOne automatic initiating device (such as a smoke detector) senses a fire signature that is below its configured alarm-threshold value but above a lower-threshold value called the “pre-alarm” threshold.

The upper line of the LCD display shows the pre-alarm event by the device address, the change of state, and the device type. The lower line indicates the up-to-40-character message assigned to the alarm device using the ARIES NET*Link* Configuration Tool.

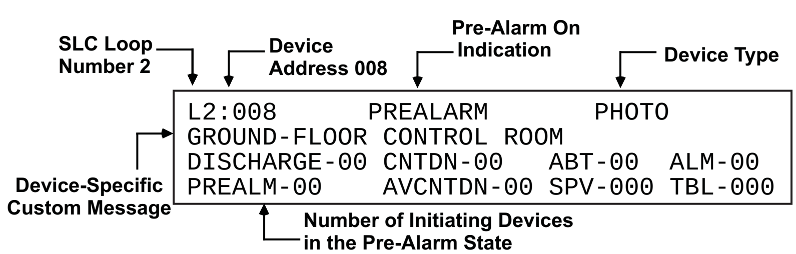


Figure 4-33. Typical Pre-Alarm-Message Display

The following actions also occur when any pre-alarm condition is reported:

- The Pre-Alarm LED flashes
- The internal buzzer pulses
- The pre-alarm event is stored in the event log
- The pre-alarm message is transmitted to peripheral devices (such as Remote Display Control Modules and Remote LED Annunciator Modules), if applicable
- The pre-alarm message is communicated via the RS232 ports
- Point- or group-specific and general pre-alarm outputs will activate, including previously-silenced outputs.

4-11.5.1 WHAT TO DO WHEN A PRE-ALARM OCCURS

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key to change the Pre-Alarm LED from flashing to steady illumination and to silence the internal buzzer. It will be necessary to press the <ACKNOWLEDGE/TROUBLE SILENCE> Key more than once to change the Pre-Alarm LED from flashing to steady illumination and to silence the internal buzzer if multiple unacknowledged pre-alarm events are present. All pre-alarm acknowledgments are logged.

The display changes to indicate the next unacknowledged pre-alarm event in the case of multiple pre-alarm events, or the first occurring pre-alarm event, if all pre-alarms have been acknowledged.

You may manually scroll through the list of active and acknowledged pre-alarm-initiating devices in order of occurrence by using the <SCROLL> Key. They will be displayed using the format of Figure 4-33. The first line of the display will read: “PREALARM”.

4-11.5.2 PRE-ALARM SILENCING

Press the <SIGNAL SILENCE> Key to de-activate any silenceable outputs such as control unit-based notification-appliance circuits and SLC-based signal or relay modules after all pre-alarms have been acknowledged. Outputs are configured as silenceable through the ARIES NET*Link* remote configuration software.

The control unit will display the following message for 5 to 10 seconds:

```
OUTPUTS SILENCED
```

Figure 4-34. Outputs-Silenced Message

You may then manually scroll through the list of active and acknowledged pre-alarm-initiating devices after the outputs silenced message in Figure 4-34 is displayed.

The Signal Silenced LED will illuminate when the <SIGNAL SILENCE> Key is pressed after all pre-alarm events have been acknowledged. A subsequent press of the <SIGNAL SILENCE> Key will re-activate any outputs that were silenced if no new pre-alarm events were reported. The Signal Silenced LED will also go out. This toggling capability will remain in effect until the control unit is reset.

A silence command that caused all silenceable outputs to de-activate will be overridden by a subsequent pre-alarm report. All silenced outputs associated with the subsequent pre-alarm initiating device will reactivate, and the Signal Silenced LED will go out. The <SIGNAL SILENCE> Key must be pressed again to de-activate any active, silenceable outputs.

4-11.5.3 HOW TO RESET THE CONTROL UNIT AFTER A PRE-ALARM CONDITION

The ARIES NET*Link* control unit resumes normal operations when it receives "Pre-Alarm Off" messages from all previously-alarmed automatic initiating devices. This mode of operation ensues regardless of whether the automatic alarm-initiating devices are configured for latching or non-latching operation.

4-11.6 Concurrent States

It is possible for the ARIES NET*Link* system to be in more than one of the event-driven, Off-Normal Mode states concurrently. In general, any new event, regardless of its type, is prioritized for immediate display, and the control unit's application program runs to activate the outputs, if any, associated with the new event. The ARIES NET*Link*'s hierarchy for displaying events will determine whether the details associated with the new event will continue to be displayed after acknowledgment or whether its display will be suppressed due to the presence of other higher-priority events.

The general hierarchy for the display of events is as follows:

- Alarm
- Pre-Alarm
- Supervisory and Trouble

4-11.6.1 ALARM EVENTS

An alarm event is a signal indicating an emergency situation that requires an immediate response. However, there are varying degrees of alarm signals, depending on whether the system’s primary objective is property protection and mission continuity or whether it is occupant notification and building evacuation.

4-11.6.1.1 Property Protection/Mission Continuity Alarm Events

A property-protection/mission continuity system is usually installed to suppress a fire in the area that it is protecting. Waterless fire-suppression systems typically progress through multiple, sequential alarm states before the extinguishing system is discharged. The automatic detection system is either crossed-zoned or arranged in a counting zone to ensure that a flaming fire is present at the time of extinguishing-system discharge and for added reliability.

The typical alarm stages of a ARIES NET*Link* system designed for property protection/mission continuity are summarized in Table 4-5.

Note: There must be at least two detectors in the protected area when either crossed-zoned or counting-zone automatic detection is used.

Table 4-5. Progressive Alarm States of a ARIES NET*Link* System

State	When Occurs
Pre-Alarm State	The pre-alarm state occurs when any automatic detector that is a member of a crossed-zoned or counting-zone detection system issues an alarm report. The pre-alarm state for a property-protection/ mission-continuity system with waterless fire suppression typically refers to the receipt of an alarm signal from a spot-type smoke detector or an HSSD. The pre-alarm state described in Paragraph 4-11.5 dealt with essentially a warning signal from an automatic detector that the fire signature at a specific location had exceeded a user-configurable, low-level threshold value. That pre-alarm signal did not create an actual alarm. The pre-alarm state discussed here should not be confused with the pre-alarm state discussed in Paragraph 4-11.5. The pre-alarm state must be annunciated by distinctive public-mode notification.
Pre-Release State	The pre-release state occurs when two automatic detectors (one detector from each of the two crossed zones or any two detectors in a counting zone) issue an alarm report. The discharge criterion for the waterless fire-suppression system is attained when the pre-release state occurs. The pre-release state is also referred to as the countdown state because it typically triggers a time-delay period that precedes the discharge of the waterless fire-suppression system. The pre-release state must be annunciated by public-mode notification different from the pre-alarm state public notification mode.
Release State	The release state occurs when the waterless fire-suppression system discharges at the conclusion of the time-delay period. The release state can also be triggered without a time delay by a manual-release station. It is also common practice to trigger a pre-action-sprinkler system concurrently with the discharge of the waterless suppression system. The release state must be annunciated by public-mode notification different from both the pre-alarm-state and pre-release-state public notification modes.
Abort State	The abort state occurs when an abort switch is manually activated to interrupt or prevent the start of the countdown timer whose expiration will trigger the discharge of the waterless fire-suppression system.

4-11.6.1.2 Occupant Notification/Building-Evacuation Alarm Events

An occupant-notification/building-evacuation system is usually installed as required by fire codes to warn the occupants of a building to evacuate because of a fire. This system enters the alarm state when devices such as an automatic detector, a manual-alarm station, or a waterflow switch reports as an alarm event. The ARIES NET*Link* system uses temporal-coded horns and strobes (or other method of non-voice-messaging, public notification acceptable to the authority having jurisdiction) to notify the occupants to evacuate the building.

An occupant-notification/building-evacuation system has two sub-alarm states that are designed to delay the building-evacuation signals or to prevent a transient, non-fire signature from activating the building-evacuation signals. These two sub-alarm states are Positive-Alarm Sequence and Alarm Verification, described previously.

4-11.6.2 HIERARCHY FOR DISPLAY OF CONCURRENT EVENTS

The hierarchy for the display of concurrent events, from highest to lowest priority, is as follows:

Table 4-6. Priority Levels for Different Types of Concurrent Events

Priority Level	Types of Events
1	Countdown-to-Release Events
2	Release, Alarm, Abort, and PAS-Countdown Events
3	Pre-Alarm Events (per Paragraph 4-11.5)
4	Alarm-Verification-Countdown Events
5	Supervisory and Trouble Events

Lower-level events will not be automatically displayed if higher-level events are active.

4-11.6.3 HOW CONCURRENT EVENTS ARE DISPLAYED

The information shown on the ARIES NET*Link* display will change if the system is in more than one state concurrently.

4-11.6.4 LEVEL-1 AND LEVEL-2 EVENT DISPLAY

The upper line of the LCD display shows the time to release for the first suppression zone that has begun to count down after you acknowledge the alarm event (or events) that have triggered the countdown. The time to release will continually decrease in one-second intervals until the expiration of the time-delay period. The lower 2 lines indicate the numbers of concurrently-active events for the following Level-1 and Level-2 event types:

- Discharges
- Countdowns to Release
- Aborts
- Alarms
- PAS Countdowns in Progress

Level-3 and lower-level events will not appear on the display as long as any Level-1 or Level-2 event is active and is in process.

Figure 4-35 shows the appearance of the display when a suppression zone has begun to count down.

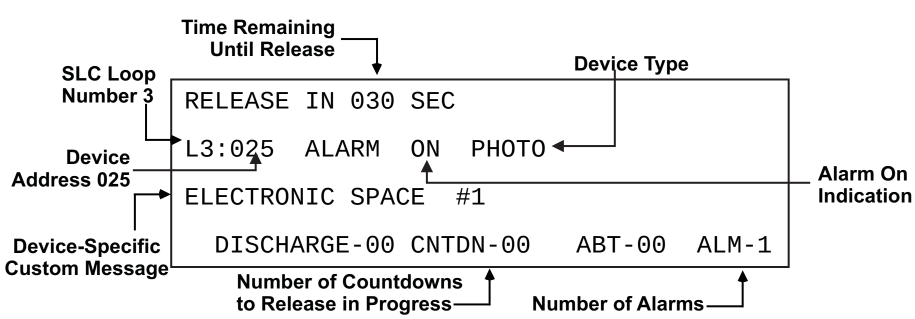


Figure 4-35. Typical Countdown-to-Release Display

The display will show the following message when an extinguishing system has been released:

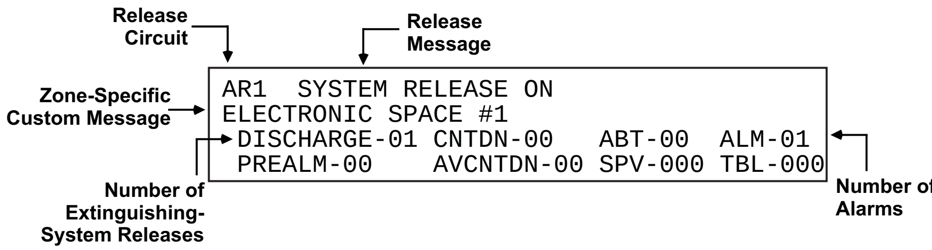


Figure 4-36. Typical Release Message

Press the <ACKNOWLEDGE/TROUBLE SILENCE> Key when the message in Figure 4-36 momentarily appears to silence the buzzer. The display will change as shown in Figure 4-37. You may then manually scroll the display using the <SCROLL> Key to show any other suppression zones (successively by order of occurrence, if applicable) that have begun to count down after the release in the first suppression zone. Otherwise, you may manually scroll the display to show the completed events which will appear in the bottom two lines of the display, as in Figure 4-39.

```
ACKNOWLEDGED
ARI SYSTEM RELEASE ACK ON
ELECTRONIC SPACE #1
DISCHARGE
```

Figure 4-37. Typical Display after Acknowledgment of Release Message

A new event will not automatically override the appearance of the display when a countdown to release is in progress. The appropriate LED on the display will flash and the buzzer will sound when any new system event is reported, and the new event will be logged. The new event will only be displayed when the <ACKNOWLEDGE/TROUBLE SILENCE> Key is pressed.

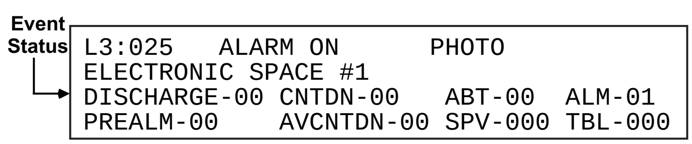


Figure 4-38. Typical Display with Event Status

4-11.6.5 WHAT TO DO WHEN A LEVEL-1 OR LEVEL-2 MESSAGE IS DISPLAYED

Press the <SCROLL> Keys to display the details about the impending special extinguishing system release. There is only the time remaining in the countdown to abort and halt the extinguishing-system release. A successful abort-switch activation will display the following message:

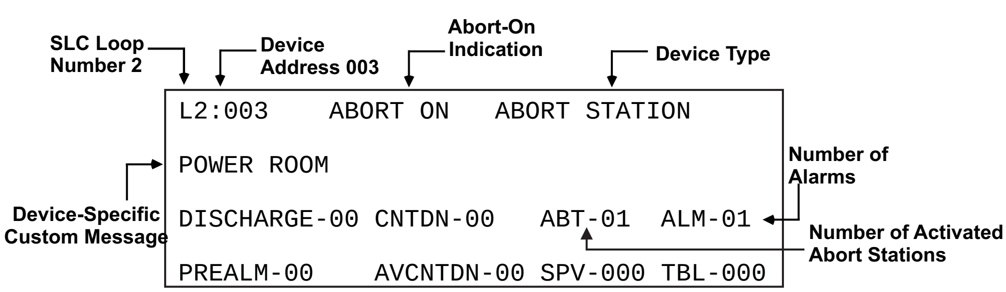


Figure 4-39. Typical Display After Abort-Switch Operation

Press the <ACKNOWLEDGE/TROUBLE SILENCE> key when the message in Figure 4-39 appears to silence the buzzer.

Press the <SCROLL> Keys to display the information for the next highest-priority and subsequent events. The display will show the 1st event, then each subsequent event as the <SCROLL> key is pressed. The upper line of the display will revert to showing the highest-priority event approximately 30 seconds after the last press of the <SCROLL> Key.

Scrolling will display each event type and owner location, if applicable. It is not possible to scroll through active countdowns.

4-11.6.6 LEVEL-3 THROUGH LEVEL-5 EVENT DISPLAY

The upper line of the LCD display shows the pertinent device or circuit address, the change of state, and the device type. The second line indicates the location of the pertinent device or circuit. The bottom line indicates the numbers of active Level-3, Level-4 and Level-5 events including:

- Pre-Alarms
- Active Verification Countdowns
- Supervisory Events
- Trouble Events

Level-3 events and lower-level events will not appear on the display as long as any Level-1 or Level-2 event is active. Figure 4-40 shows the appearance of the display when a Level-5 event is active.

```
L1:005  TROUBLE OPEN ON PHOTO
LOBBY
DISCHARGE-00 CNTDN-00 ABT-000 ALM-000
PREALM-000 AV CNTDN-00 SPV-000 TBL-001
```

Figure 4-40. Typical Multiple Level-5 Event-Type Display

You may manually scroll the display among the active Level-5 events by using the <SCROLL> Key.

4-11.6.7 WHAT TO DO WHEN LEVEL-3 THROUGH LEVEL-5 EVENTS ARE DISPLAYED

Press the <SCROLL> Keys to display the information for the highest-priority and subsequent events. The display will show the 1st event, then each subsequent Level-3 through Level-5 event as the <SCROLL> key is pressed. The upper line of the display will revert to showing the highest-priority event approximately 30 seconds after the last press of the <SCROLL> Keys.

The appearance of the display when manually scrolling through the active Level-3 through Level-5 events is shown in the two bottom lines of the display. (Refer to Figure 4-40.)

4-11.6.8 LEVEL-5 DISPLAY LIMITATIONS

The ARIES NET*Link* can display a maximum of 512 active trouble, supervisory, pre-alarm, and alarm-verification messages. However, new events in excess of the 512 active reports will be processed by the control unit, and all outputs associated with the 512th (or higher) event will be activated as programmed in the control unit's application program.

When manually scrolling, the control unit will temporarily display the following message after the 512th event is displayed and then will return to the first event message (as shown in Figure 4-41):

```
   512 PREALMS/AVCTNDNS/TBLS/SPVS
        PRESS SCROLL TO VIEW
DISCHARGE-00 CNTDN-00   ABT-00  ALM-20
PREALM-99    AVCNTDN-00 SPV-410 TBL-000
```

Figure 4-41. Lower-Level-Events-Buffer-Full Message

The normal control unit actions will occur when any non-displayed event is reported. These actions include:

- Logging of the event
- Activation of point- or group-specific and general state outputs, including previously-silenced outputs

CHAPTER 5
NETWORKING

5-1 NETWORK SYSTEM OPERATION

Multiple ARIES NET*Link* systems can be networked together to form a larger, integrated system for common event reporting, operator control, and outputs activation. A peer-to-peer network can be created for up to 64 ARIES NET*Link* control units. These units perform the following networked fire alarm and/or suppression system operations:

- Event reporting
- Protected premises local and/or remote event annunciation
- Occupant notification by audible and visible signaling appliances
- Process and equipment control to activate safety procedures
- Fire extinguishing system release
- Off-premises transmissions to a central station or a fire department

Each networked control unit supervises its own initiating devices and output circuits. It also manages the input point to output circuit operations specific to its local protected area(s). These operations occur with or without network inter-control unit communications, lack of network communications due to catastrophic fault, or irrespective of the condition of any other control unit in the network.

A typical networked ARIES NET*Link* system is shown in Figure 5-1.

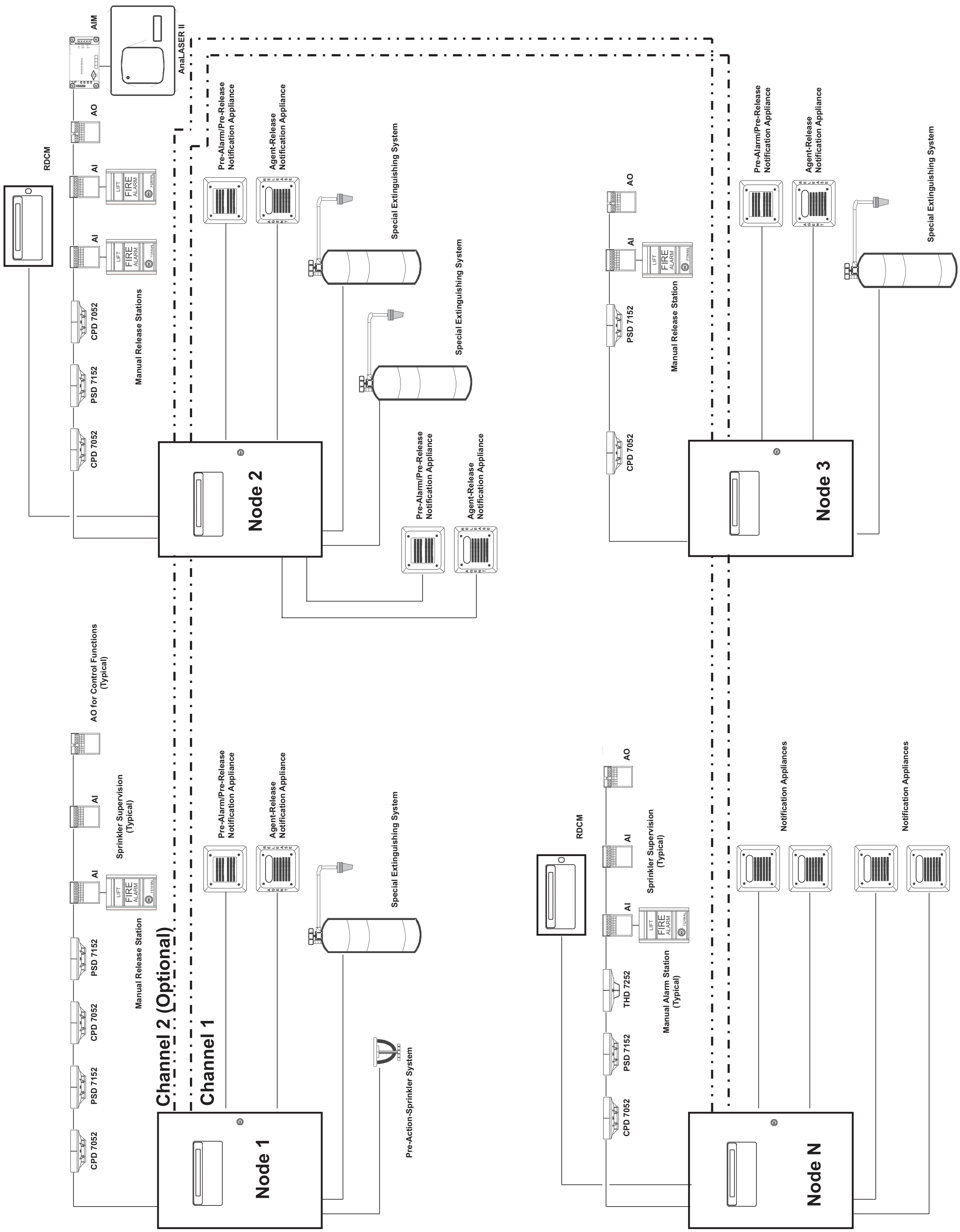


Figure 5-1. Typical Networked ARIES NET*Link* System

5-2 COMMUNICATIONS

Each networked control unit can communicate with every other control unit in the network. Control unit communication is peer-to-peer via a token-passing protocol. This method ensures that only one control unit is broadcasting at any one time. Network Interface Cards (NICs) integrate two or more control units in a networked configuration.

Networked control units are interconnected using shielded, twisted-wire pair, fiber-optic medium, or mixed transmission media (combination of fiber optic or twisted pair of wires). The network structure supports up to 4,000 feet distance between nodes when twisted pair wiring is used; up to 12 miles distance between nodes when single mode fiber-optic cables are used and up to 1 mile when multi-mode fiber-optic cables are used.

Network messages and broadcasts are transmitted over either single- or dual-channel communications connections. Dual-channel connections offer a redundant communications path that allows network broadcasting and inter-control-unit functionality with an open- or short-circuit fault or ground fault on one of the channels. Any fault in either a single- or dual-channel communications channel creates a network trouble condition.

5-3 NETWORK EVENT BROADCASTS

Each networked control unit can be configured to broadcast any event associated with its initiating devices or monitored output circuits:

- Locally to the control unit-of-origin only
- Selectively to a subset of networked control units
- Globally to every control unit within the network.

Network broadcasts extend to all ancillary equipment such as Remote Display Control Modules (RDCMs), LED Annunciator Modules (LAMs), and Annunciator Terminal Modules (ATMs) associated with a designated subset of control units when selective event broadcasting is chosen. Network broadcasts extend to all such equipment associated with every control unit when the network is configured for global-event broadcasting.

The default operation for event broadcast is globally to all control units in the network.

5-4 OPERATOR CONTROL

Operators can acknowledge events, silence notification appliances, and perform resets in three different configurations:

- Locally to the control unit-of-origin only
- Selectively to a subset of the networked control units
- Globally to all control units in the network.

Operator-intervention capability extends to all ancillary equipment such as Remote Display Control Modules (RDCMs), LED Annunciator Modules (LAMs), and Annunciator Terminal Modules (ATMs) associated with a designated subset of control units when selective operator control is used. It extends to all such equipment associated with every control unit when the network is configured for global operator control.

5-5 EVENT RECORDING

Each control unit is configurable to record and display events as follows:

- Locally from its directly-monitored peripheral devices and output circuits only
- Selectively from a subset of networked control units
- Globally from all control units in the network

The default operation for event recording and display is globally from all control units in the network.

5-6 EVENT OUTPUT CONTROL (EOC)

A confirmed event at any control unit can create output control, including extinguishing-system activation, in any of the following ways:

- Locally to its directly controlled peripheral devices and output circuits only
- Selectively to peripheral devices and output circuits controlled by a subset of networked control units

Note: This requires EOC code on the remote control units to activate their local outputs.

- Globally to peripheral devices and output circuits controlled by all control units in the network.

Note: This requires EOC code on the remote control units to activate their local outputs.

The default operation for event-output control is globally to all control units in the network.

Any control unit can create local output control, including extinguishing system activation, only to its directly controlled peripheral devices and output circuits. Refer to the *ARIES NETLink Configuration Tool User's Guide,* P/N 06-237059-001, for information on configuring the EOC for network events.

5-7 CONFIGURATION UPLOADS/DOWNLOADS

The ARIES NET*Link* control unit network structure permits uploading of configurations to a remote node and downloading of configurations from a remote node. Refer to the *ARIES NETLink Configuration Tool User's Guide*, P/N 06-237059-001, for information on configuring the different network settings.

5-8 DISPLAY AND CONTROL

Menu routines for a control unit can be activated:

- Directly from its keypad/display
- Selectively from a subset of the networked control units
- Globally from all control units in the network

5-8.1 Accessing Remote Nodes Via Keypad

When a password is entered on an active network system, the prompt shown in Figure 5-2 is displayed.

```
PRESS ENTER TO SELECT THE LOCAL NODE
OR ENTER NETWORK NODE NO. (1 - 64)
```

Figure 5-2. Network Node Prompt

Local Node Access - Press the <Enter> key to select the local node; the response shown in Figure 5-3 is displayed.

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 5-3. Top-level Menu Selections

Remote Node Access - Enter the node number then press the <Enter> key; in response, the password prompt for the remote node is displayed.

5-9 NETWORK GROUPS

Autonomous sub-networks or groups can be created within a network of ARIES NET*Link* control units. These groups can be programmed to selectively interact as separate entities for event reporting, event output control, acknowledgment of events, alarm silencing, and system resets. There are 65 possible groupings, numbered 0 to 64. By default, all control units in the network have no pre-assigned group number.

Note: A network is configured for global operations when no groups are defined.

5-9.0.1 CONTROL UNITS WITH A NON-ZERO GROUP NUMBER

A group of networked control units will operate as described below when they are assigned a non-zero group number. Each control unit in a group will be able to:

- Display and log all events that take place in any control unit in the group
- Issue an event-acknowledgment command to all control units in the group for any event that occurs in the group
- Send alarm-silence commands to all control units in the group to de-energize any silenceable outputs that have been activated within the group
- Send reset commands to all control units in the group once all activated initiating devices have transmitted an “alarm-off” message(s) to the affected control unit(s)
- Transmit output-activation commands to any or all other control units in the group for activation of remotely-controlled outputs

5-9.0.2 NETWORK GROUP 0

One control unit in the network can be assigned to Network Group 0. This control unit serves as the master control unit for the network, and is capable of the following interactions with all sub-groups in a selectively-signaling network:

- Displaying and logging all network events from all network groups
- Issuing acknowledge, silence, and reset commands to all control units in all network groups
- Activating its outputs upon any initiating event from all control units in all network groups

Figure 5-4 shows the possible interactions among the various members of a selectively-signaling networked system with groupings and with one control unit designated as the master control unit.

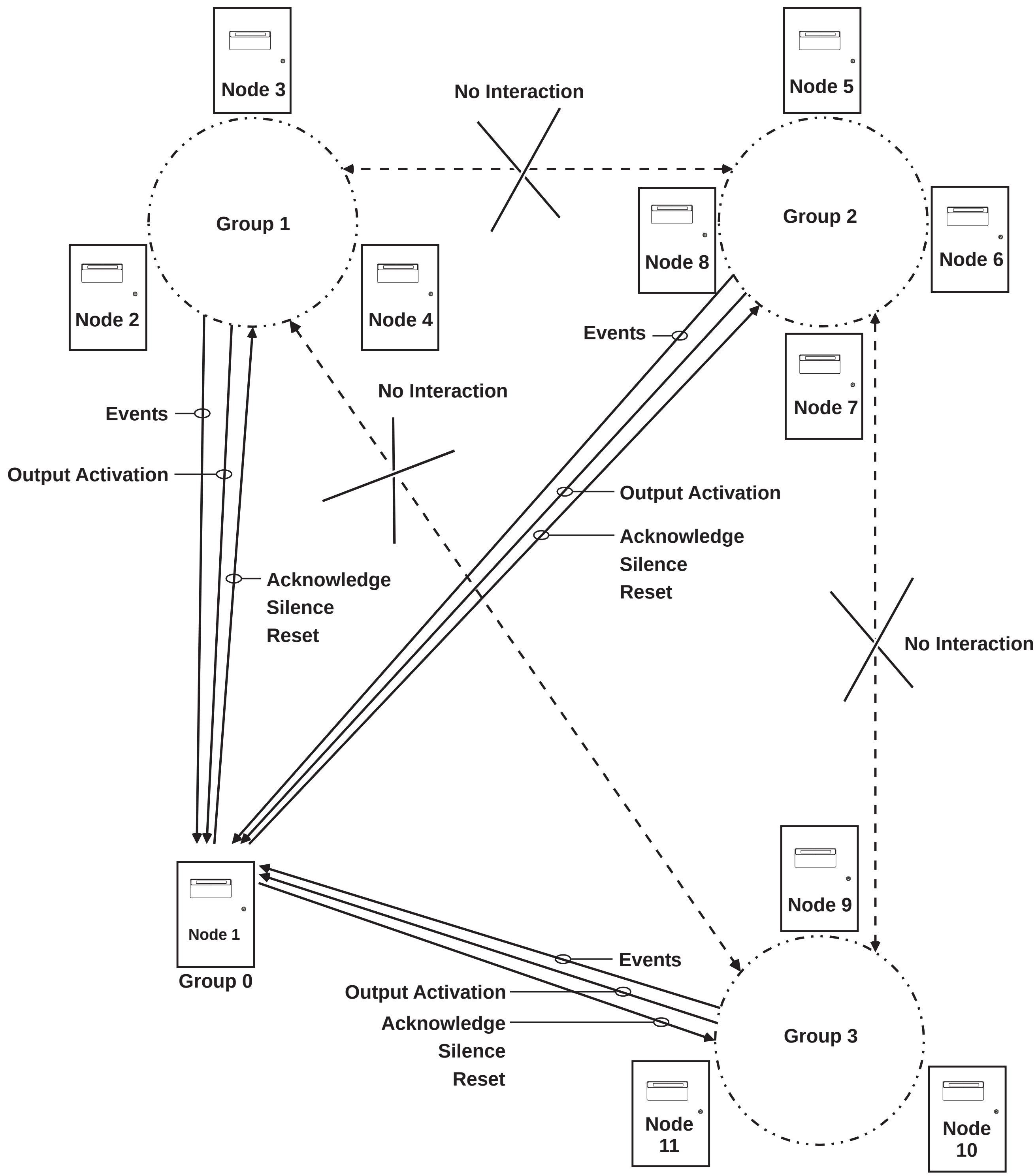


Figure 5-4. Group 0 Networked Control Unit Interactions

5-9.0.3 PROCESS GROUP 0 EVENTS

Each control unit can be configured to Process Group 0 Events. This means that a node will process events from a group 0 node in addition to commands. A node configured with a non-zero group number and to Process Group 0 Events would be capable of the following interactions:

- Displaying and logging all network events from nodes within its group or group 0
- Activating its outputs upon any initiating event from all control in its group or group 0
- Issuing acknowledge, silence, and reset commands to all control units in its group or group 0
- Processing acknowledge, silence, and reset commands from all control units in its group or group 0

Figure 5-5 shows the possible interactions among the various members of a selectively signaling networked system with groupings, with one control unit designated as the master control unit and with group nodes also configured to process group 0 events.

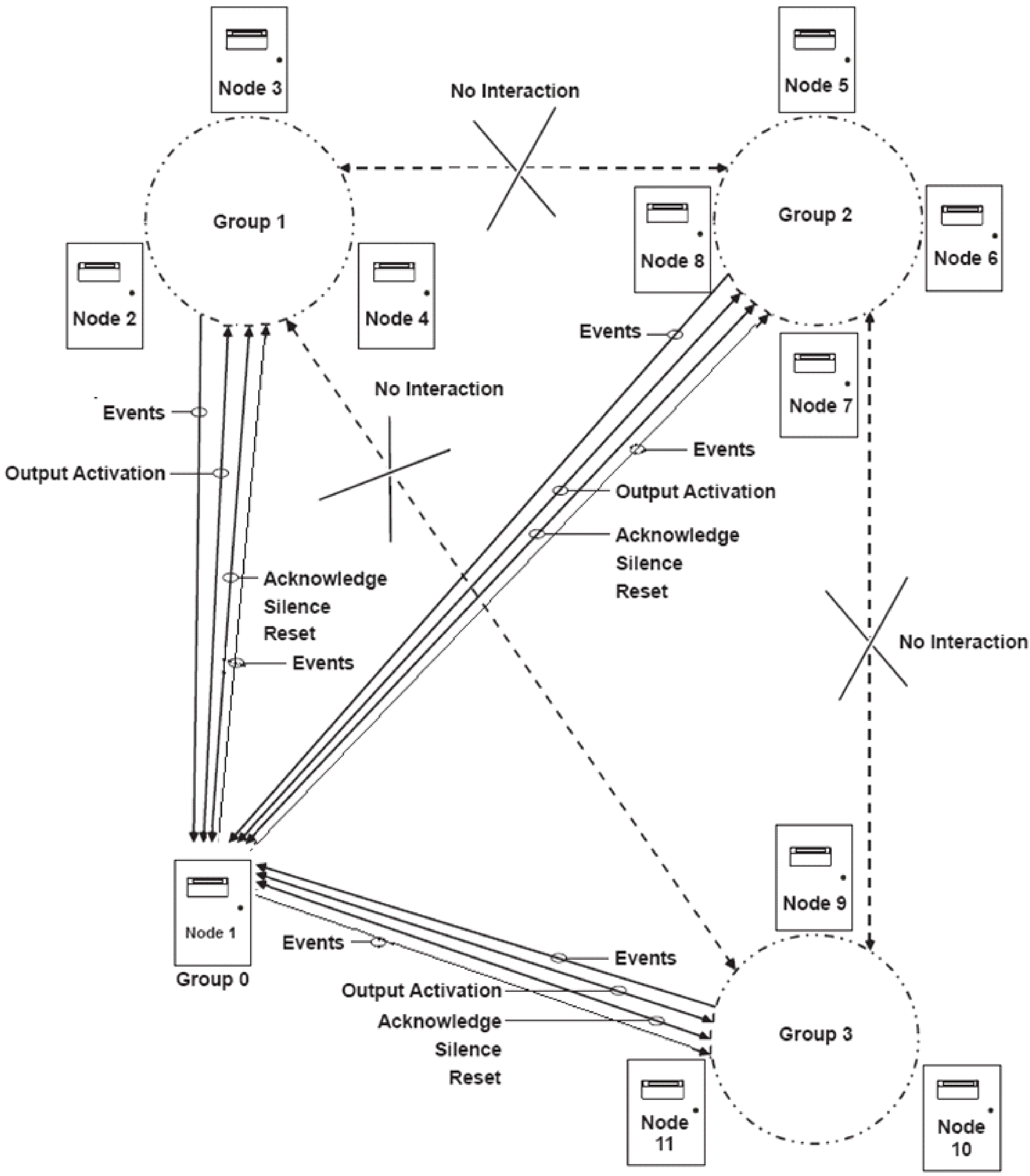


Figure 5-5. Processing Group 0 Networked Control Unit Interactions

5-9.1 Operating States

A network of ARIES NET*Link* Systems has the five distinct Off-Normal operating states discussed in Section 4-2. The normal network message display when there are no active system events is as follows:

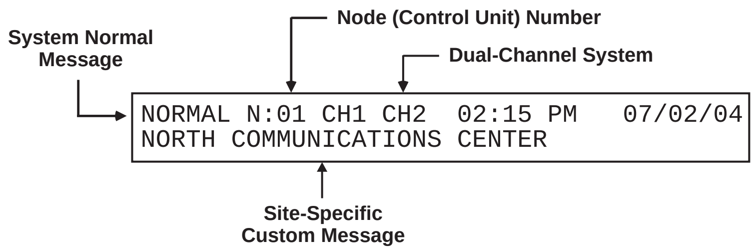


Figure 5-6. Network Normal Message Display

5-9.1.1 OPERATOR-DRIVEN MENU STATE

The system enters the Menu State when an operator presses the 0 Key and enters the appropriate password as described in Section 4-8. The operator will be prompted to enter a network node number. The requested menu will be accessible if the node number corresponds to:

- The control unit whose display is being utilized
- Another control unit in the same group as the control unit whose display is being utilized
- Any control unit in a network configured for global operation
- The control unit whose display is being utilized is defined as Group 0

5-9.1.2 EVENT-DRIVEN STATES

A networked control unit will enter one of the event-driven states (pre-alarm, alarm, supervisory, or trouble) when it is configured as Group 0 or when the event that occurs is:

- Resident in the control unit or its associated peripheral devices
- From another control unit in the same group as the control unit
- From any control unit in a network configured for global operation
- From a control unit in group 0 if Process Group 0 Events is configured

5-9.1.3 NETWORK OUTPUTS ACTIVATION

Control unit or SLC outputs can be activated via execution of operating instructions contained in each networked control unit's event output control (EOC) program. The EOC program for a particular control unit is triggered by any event that transitions it from the Normal Mode to any of the Off-Normal operating states discussed in Section 4-10. The control unit must be configured to selectively receive and respond to the event as described Section 5-9 or the network must be configured for global operation.

5-9.2 Operator Control Keys

The operator control keys are used to:

- Acknowledge receipt of initiating or monitoring-circuitry reports
- Silence alarm-notification appliances
- Transition one or more control units back to the Normal Mode.

These keys are functional if the control unit is configured as Group 0 or if the event and/or activated appliances are:

- Resident in the control unit or in its associated peripheral devices
- From or connected to another control unit in the same group as the control unit
- From or connected to a control unit in a network configured for global operation

5-9.3 Status-Indicating LEDs

The five status-indicating LEDs (alarm, pre-alarm, trouble, supervisory, and alarm silence) will light when the control unit is configured as Group 0 or when the event is:

- Resident in the control unit or its associated peripheral devices
- From another control unit in the same group as the control unit
- From any control unit in a network configured for global operation

5-9.4 Network Display Messages

Display messages will appear as described in Section 4-7 and Section 4-10, for the control unit in which the events occur. Remote control unit events will be displayed as described in the following paragraphs. Note that messages can be displayed in English, French, Spanish or Portuguese. The default language is English.

5-9.5 Remote Trouble Events

Remote trouble events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device or circuit address
- Type of trouble event and its state change
- Device or circuit type

The lower line indicates the up-to-40-character message assigned to the device or circuit using the ARIES NET*Link* configuration program.

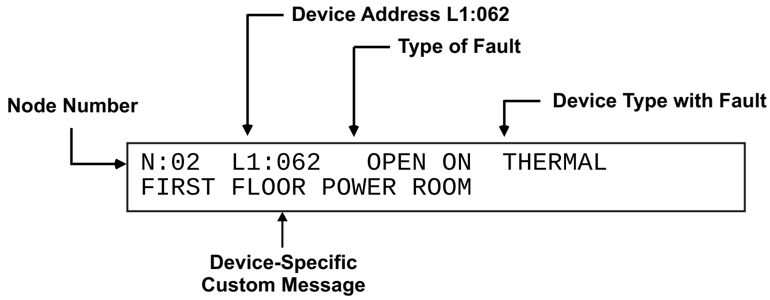


Figure 5-7. Typical Remote-Trouble-Message Display

The following actions also occur when the control unit is configured as Group 0 or when the trouble event is either from another control unit in the same group as the control unit or from any control unit in a network configured for global operation.

1. The Trouble LED on the display flashes
2. The internal buzzer pulses
3. The Trouble Relay de-energizes to transfer the Trouble contacts
4. The trouble event is stored in the event log
5. The trouble message is transmitted to peripheral devices such as RDCMs, LAMs, and ATM-Ls, if applicable
6. The trouble message is communicated via the NIC and RS232 ports, as applicable
7. Point- or group- specific and general trouble outputs activate, including previously silenced outputs.

Refer to Section 4-11.2.1 for what to do when a remote trouble message is received.

5-9.6 Remote Alarm Events

Remote alarm events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device address
- Change of state
- Device type

The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* configuration program.

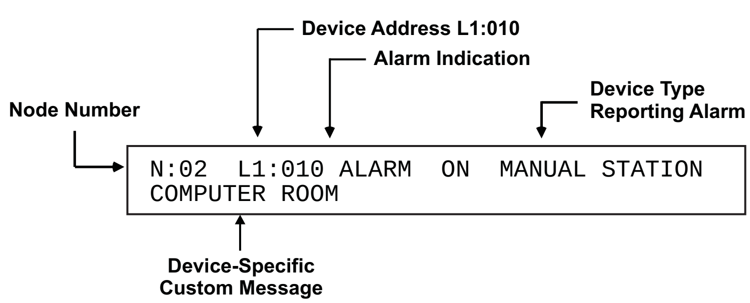


Figure 5-8. Typical Remote Alarm Message Display

The following actions also occur when the control unit is configured as Group 0 or when the alarm event is either from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation.

1. The Alarm LED on the display flashes
2. The internal buzzer sounds continuously
3. The alarm event is stored in the event log
4. The alarm message is transmitted to peripheral devices such as RDCMs, LAMs, and ATM-Ls, if applicable
5. The alarm message is communicated via the NIC and RS232 ports, as applicable
6. Point- or group-specific and general-alarm outputs activate, including previously-silenced outputs.

Refer to Section 4-11.3.1 for what to do when a remote alarm message is received.

5-9.7 Remote Positive-Alarm-Sequence (PAS) Events

Remote PAS events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device address
- Change of state
- Device type

The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* configuration program.

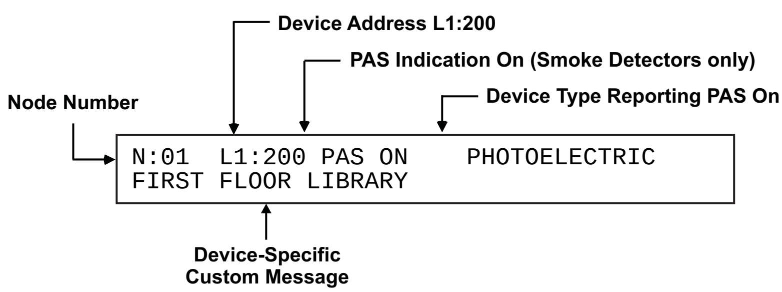


Figure 5-9. Typical Remote PAS Message Display

The following actions also occur when the control unit is configured as Group 0 or when the PAS event is either from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation.

1. The internal buzzer pulses
2. The PAS event is stored in the event log
3. The PAS message is transmitted to peripheral devices such as RDCMs, if applicable
4. The PAS message is communicated via the NIC and RS232 ports, as applicable

Refer to Section 4-11.3.5.2 for what to do when a Remote PAS Message is Received.

Note: The time remaining on the PAS countdown timer will only appear on the display of the control unit that received the PAS report from the smoke detector. Remote, networked control units will not display the PAS countdown timer.

5-9.8 Remote Alarm-Verification Events

Remote alarm-verification events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device address
- Change of state
- Device type

The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* configuration program.

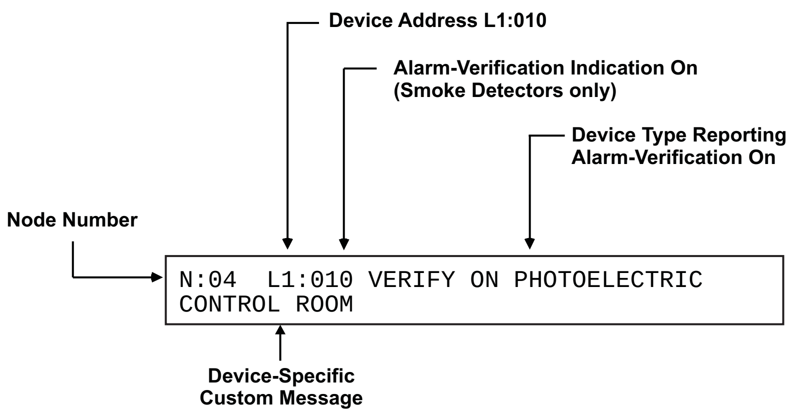


Figure 5-10. Typical Remote Alarm-Verification Message Display

The following actions also occur when a control unit is configured as Group 0 or when the alarm-verification event is either from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation.

1. The internal buzzer pulses
2. The alarm-verification event is stored in the event log
3. The alarm-verification message is transmitted to peripheral devices such as RDCMs, if applicable
4. The alarm-verification message is communicated via the NIC and RS232 ports, as applicable

Refer to Section 4-11.3.6.1 for what to do when a remote alarm-verification message is received.

Note: The time remaining on the alarm-verification timer will only appear on the display of the control unit that received the verification report from the smoke detector. Remote, networked control units will not display the alarm-verification timer.

5-9.9 Remote Supervisory Events

Remote supervisory events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device address
- State change
- Device type

The lower line indicates the up-to-40-character message assigned to the device using the ARIES NET*Link* configuration program.

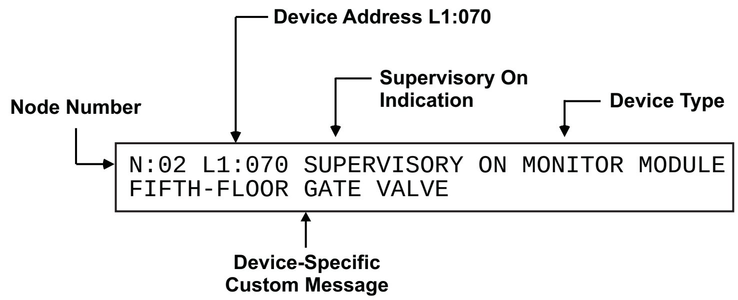


Figure 5-11. Typical Remote Supervisory Message Display

The following actions also occur when the control unit is configured as Group 0 or when the supervisory event is either from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation.

1. The Supervisory LED on the display flashes
2. The internal buzzer pulses
3. The supervisory event is stored in the event log
4. The supervisory message is transmitted to peripheral devices such as RDCMs, LAMs, and ATM-Ls, if applicable
5. The supervisory message is communicated via the NIC and RS232 ports, as applicable
6. Point- or group-specific and general-supervisory outputs activate, including previously-silenced outputs.

Refer to Section 4-11.4.1 for what to do when a remote supervisory message is received.

5-9.10 Remote Pre-Alarm Events

Remote pre-alarm events from a networked control unit are shown in the upper line of the LCD display by:

- Node-of-origin
- Device address
- Change of state
- Device type

The lower line indicates the up-to-40-character message assigned to the alarm-initiating device using the ARIES NET*Link* configuration program.

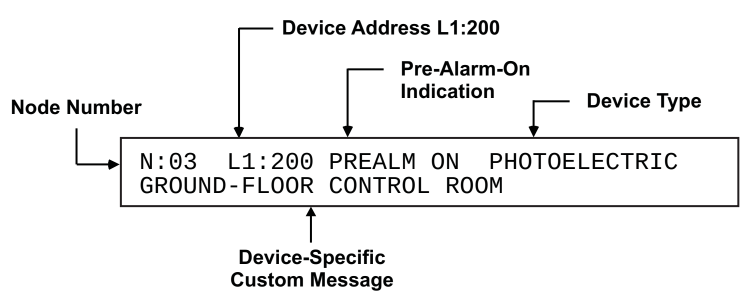


Figure 5-12. Typical Remote Pre-Alarm Message Display

The following actions also occur when the control unit is configured as Group 0 or when the pre-alarm event is either from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation.

1. The Pre-Alarm LED on the display flashes
2. The internal buzzer pulses
3. The pre-alarm event is stored in the event log
4. The pre-alarm message is transmitted to peripheral devices such as RDCMs, LAMs, and ATM-Ls, if applicable
5. The pre-alarm message is communicated via the NIC and RS232 ports, as applicable
6. Point- or group-specific and general pre-alarm outputs activate, including previously-silenced outputs.

Refer to Section 4-11.5.1 for what to do when a remote pre-alarm message is received.

5-9.11 How Concurrent Remote Events Will Be Displayed

The information shown on the ARIES NET*Link* display will change if the system is in more than one Off-Normal state concurrently. Remote events will be displayed when a control unit is configured as Group 0 or when the events that occur are from another control unit in the same group as the control unit or from any other control unit in a network configured for global operation

5-9.11.1 REMOTE LEVEL-1 EVENT DISPLAY

Remote countdowns to release from a networked control unit are not shown. Only countdowns active on the local control unit are displayed.

The lower line indicates the numbers of active or completed network events for the following event types:

- Discharges
- Countdowns to Release
- Aborts
- Alarms
- PAS countdowns in progress

Level-2 and lower-level events will not appear on the display as long as any Level-1 event is active.

Figure 5-13 shows a typical display when an extinguishing system has been released:

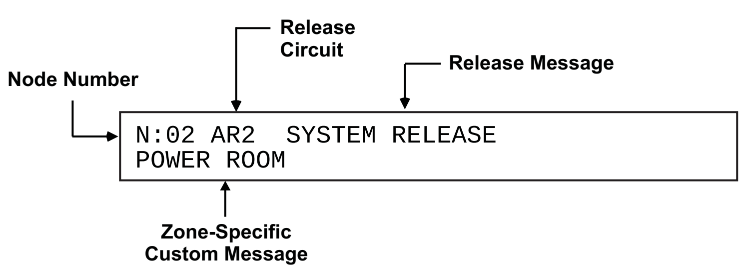


Figure 5-13. Typical Network Release Message

Press the <ACKNOWLEDGE/TROUBLE SILENCE> key when the message in Figure 5-13 appears to silence the buzzers on all control units that have displayed the above messages. The displays will now show any other suppression zones (successively by order of occurrence, if applicable) that have discharged after the release in the first suppression zone. Otherwise, its possible to resume scrolling among the completed Level-1 and active Level-2 event displays as shown in Figure 5-14.

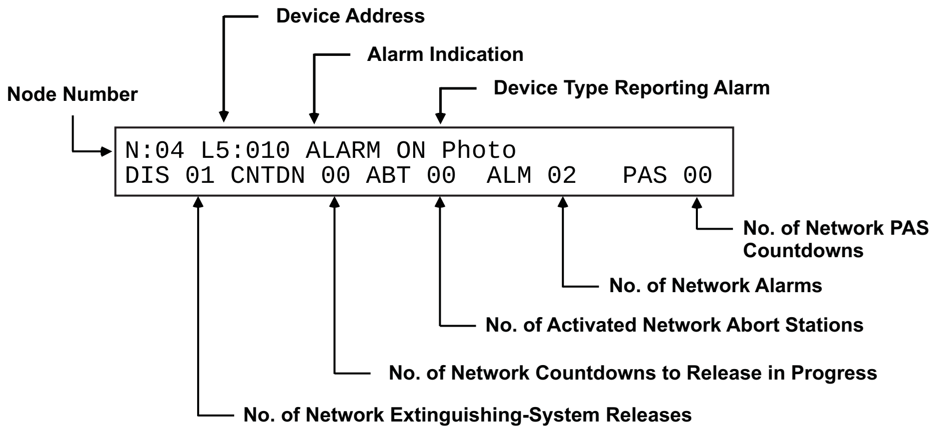


Figure 5-14. Typical Display After Acknowledgment of Remote-Release Message

A new event will not automatically override the appearance of the displays when a countdown to release is in progress. The appropriate LEDs on the display will flash and the buzzer will sound when any new system event is reported, and the new event will be logged. The new event will only be displayed when the <ACKNOWLEDGE/TROUBLE SILENCE> Key or <SCROLL> Key is pressed on one of the affected control units.

Refer to Section 4-11.6.5 for what to do when a remote Level-1 message is displayed.

5-9.11.2 REMOTE LEVEL-2 EVENT DISPLAY

Remove Level-2 events from a networked control unit are shown in the upper line of the LCD display by the node-of-event origin, the activated device or circuit address, the change of state, and the device type that reported the event or the release circuit that has activated.

The lower line indicates the numbers of active or completed events for the following Level-1 and Level-2 event types:

- Discharges
- Countdowns to Release
- Aborts
- Alarms
- PAS Countdowns

Level-3 and lower-level events will not appear on the display as long as any Level-2 event is active. Figure 5-15 shows the display when more than one type of Level-2 event is active.

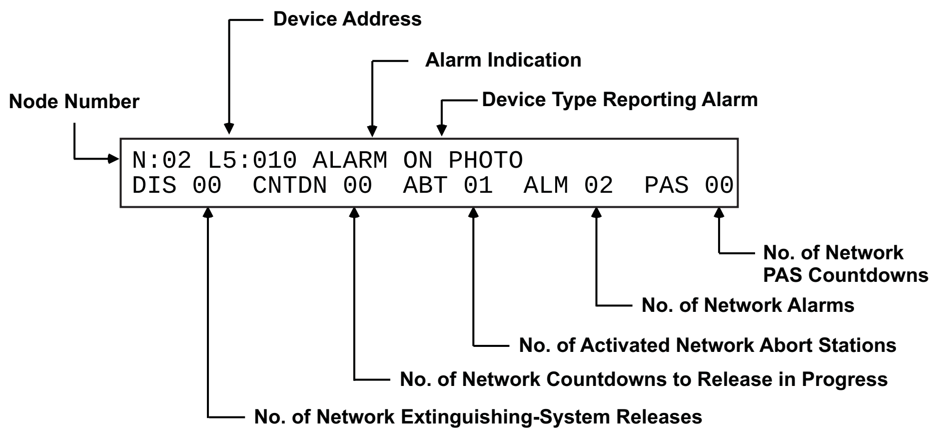


Figure 5-15. Typical Multiple Level-2 Event-Type Display

The upper line will display the active Level-2 events. The lower line will summarize the numbers of completed Level-1 and active Level-2 events.

Refer to Section 4-11.6.5 for what to do when Level-2 events are reported.

5-9.11.3 REMOTE LEVEL-3 AND LOWER-LEVEL EVENT DISPLAY

Remote Level-3 and lower-level events from a networked control unit are shown in the upper line of the LCD display by the node-of-event origin, the activated device or circuit address, the change of state, and the device or circuit type that reported the event. The lower line indicates the numbers of active events for the following Level-3 through Level-5 event types:

- Pre-Alarms
- Alarm-Verification Countdowns
- Supervisory Events
- Troubles

Figure 5-16 shows the appearance of the display when more than one type of Level-3 through Level-5 event is active.

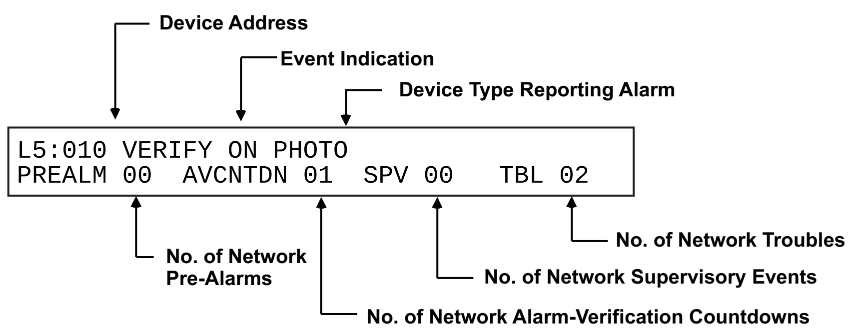


Figure 5-16. Typical Multiple Lower-Level Event Display

The upper line will display the active lower-level events according to the priority of events as described in Section 4-11.6.2

Only Level-3 events will scroll, if present. Level-4 events will scroll if there are no Level-3 events. Supervisory and trouble events will scroll if there are no active pre-alarms or alarm verifications. The lower line will summarize the numbers of active Levels-3 through Level-5 events as shown in Figure 5-15.

Refer to Section 4-11.6.7 for what to do when Level-3 and lower-level events are displayed.

5-10 NETWORK START-UP

It is important to proceed in a step-by-step manner when you start up, test, and commission a networked ARIES NET*Link* System. The objective is to have all the individual control units that comprise the network clear of all Off-Normal events, and fully tested as stand-alone control units, before any attempt is made to network them. Network operations, and testing to confirm proper EOC operations among the various network control units, should only begin when all the control units show the “System Status Normal” message.

Note: Refer to Section 4-10.2 for the recommended sequence of steps to properly start up the individual nodes of a networked ARIES NET*Link* System.

5-10.0.1 SPECIAL PROCEDURES FOR NETWORKED SYSTEMS

The following paragraphs describe how a networked ARIES NET*Link* system must be configured, initialized, tested, and commissioned.

5-10.0.1.1 Network-Interface-Card (NIC) Installation and Wiring

Follow the instructions in Section 2-13.1 of Chapter 2 of this manual to install each NIC and make the wiring interconnections among all the networked control units as shown in Figure 2-43.

5-10.0.1.2 Initial Configuration

Connect Node 1 to AC power source and turn on AC power. Set the time and date as directed in Section 4-10.2. Refer to the *ARIES NETLink Configuration Tool User’s Guide* and upload this Node’s configuration using your laptop computer and the ARIES NET*Link* Remote Configuration Tool. The configuration software can include lines of EOC for output control to/from other network nodes. The inter-node control statements can also be added at a later time.

Pay particular attention to the structure of the inter-node control statements as shown in the *ARIES NETLink Remote Configuration Tool User’s Guide*. There are significant differences in sentence structure between an EOC statement for a standalone control unit and an EOC statement that references initiating points on another network node. The configuration file must also include the node’s network settings, such as node number, group number, and wiring style.

Clear all trouble and supervisory conditions from Node 1, if present. Test Node 1 for proper operation in accordance with the job specifications and/or local fire codes. Verify proper operation for each initiating device and output circuit.

Repeat this procedure for each additional network control unit.

5-10.0.1.3 Activating the Network

Begin configuring the individual control units for networked operation. Start with the lowest group number if the network consists of specific sub-groups. Add and test one group at a time. If specific sub-groups are not used, configure Nodes 1 and 2 for networked communications and test these nodes for proper inter-node input/output operations. Use the following procedure to activate Nodes 1 and 2 for networked operations:

1. Press the 0 Key on Node 1. This display will show this message:

```
PLEASE ENTER PASSWORD
* * * *
```

Figure 5-17. Password Prompt

2. Enter the Level-2 Password and then press the <Enter> Key. The network-node prompt will appear as follows:

```
PRESS ENTER TO SELECT THE LOCAL NODE
OR ENTER NETWORK NODE NO. (1 - 64)*
```

Figure 5-18. Network Node Prompt

3. Select the local node by pressing the <Enter> Key. The top-level menu selections will be displayed.

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 5-19. Top-Level Menu Selections

4. Press the 3 Key to select the Set menu and the following options will appear:

```
1: TIME/DATE        2: PORT CONTROL
3: SLC DEVICES      4: PROGRAMMING
5: GLOBALS          6: OUTPUTS/BACKPLANE
7: CONTROL MODULES  8: NETWORK
```

Figure 5-20. Set Menu Options

5. Press the 8 Key to select NETWORK.
6. Press the <Scroll> Key and then the 2 Key to select ADD/REMOVE NODES

```
1: THIS NODE         2:ADD/REMOVE NODES
```

Figure 5-21. Add/Remove Nodes

7. The display will indicate the following;

```
ADD/REMOVE NETWORK NODES

1: ADD           2: REMOVE
```

Figure 5-22. Prompt to Add/Remove Network Nodes

8. Select ADD and enter the range of node numbers to add to the network. The node being used to ADD must be in the range or currently active on the network.

```
ADD/REMOVE NETWORK NODES

NODES FROM 01 TO __
```

Figure 5-23. Adding Network Nodes

9. After entering the range the following two messages will appear:

```
ADD/REMOVE NETWORK NODES

UPDATING NETWORK NODEMAP, PLEASE WAIT...
```

Figure 5-24. Adding Network Nodes, Wait Message

```
ADD/REMOVE NETWORK NODES

NUMBER OF NODES ADDED: 5
```

Figure 5-25. Adding Network Nodes, Success Message

10. Press the <Backspace> Key multiple times as required to exit the Menu mode of operation. Nodes 1 and 2 will now begin communications with each other.

Confirm EOC programming for Nodes 1 and 2. Add successive network nodes one at a time as outlined in the procedure above and continue to confirm proper networked operations. Use Node 1 as the point for adding more control units to the network. Repeat this procedure until all the nodes have been successfully added. Use a consecutive range of network node addresses to simplify the process of bringing the network on line. Be sure that each node being added shows “System Status Normal” before you add it to the network.

Test the entire network for proper operation in accordance with the job specifications and/or local fire codes. Verify proper operation for each initiating device and output circuit.

5-10.0.1.4 Network Maintenance

A control unit must be isolated from the network before any maintenance is performed. The other network control units will ignore all alarm, supervisory, and trouble reports from the isolated control unit, and they will report it as a network supervisory condition subject to the operating rules discussed in Section 3-3.1.

Any networked control unit can be isolated by a control unit designated as Group 0, or by

- Another control unit in the same group as the control unit to be isolated
- Any control unit in a network configured for global operation
- The control unit itself

Use the following procedure to isolate a networked control unit:

1. Press the 0 Key on the keypad of the control unit being used to do the isolation. The display will show this message:

```
PLEASE ENTER PASSWORD
* * * *
```

Figure 5-26. Password Prompt

2. Enter the Level-2 Password and then press the <Enter> Key. The network-node prompt will appear as follows:

```
PRESS ENTER TO SELECT THE LOCAL NODE
OR ENTER NETWORK NODE NO. (1 - 64)
```

Figure 5-27. Network Node Prompt

3. Select the local node by pressing the <Enter> Key, or enter a remote node number then press the <Enter> Key. The top-level menu selections will be displayed.

```
1: ISOLATE           2: LIST
3: SET               4: TEST
5: LANGUAGE          [<- to return]
```

Figure 5-28. Top-Level Menu Selections

4. Press the 1 Key to select the ISOLATE sub-menu

```
1: SLC DEVICES    2: ONBOARD CIRCUITS
3: BACKPLANE      4: CONTROL MODULES
5: GLOBAL ISOLATE 6: MACROS
7:NETWORK
```

Figure 5-29. Isolate Sub-Menu

5. Select NETWORK and press <Enter>

```
1: LOCAL NODE       2: REMOTE NODE
```

Figure 5-30. Additional Isolate Menu Options

6. Select 1 to Isolate the local node from the Network or 2 to Isolate a remote node on the Network. If REMOTE NODE is selected, a prompt for the node number is displayed:

```
ENTER REMOTE NODE NUMBER:
```

Figure 5-31. Isolate/De-Isolate Nodes

7. Press the 1 key to select the local node or enter the remote node number and press <Enter>. The following options appear:

```
ISOLATE/DE-ISOLATE NETWORK NODES
1: ISOLATE          2: DE-ISOLATE  *
```

Figure 5-32. Isolate Node Selection

8. Select 1 to Isolate the node and the following confirmation is displayed.

```
ISOLATE/DE-ISOLATE NODE

LOCAL NODE HAS BEEN ISOLATED
```

Figure 5-33. Prompt for Node to be Isolated

9. Press the <Backspace> Key multiple times as required to exit from the Menu operational mode. The selected node will now be isolated from the network.

5-10.0.1.5 Removing Power from a Control Unit

A networked control unit should not to be powered down if it is on line. Any changes that occurred among the other control units while it was powered down may not be transmitted to the control unit when it is powered up again. This will lead to reporting discrepancies on the displays of control units that are configured to log and display all network events. Use the procedure in Section 5-10.0.1.4 to isolate a control unit first if it is necessary to power it down. Do not isolate a control unit from the network if it is inadvertently powered down. Wait for control unit to restart and be recognized again by the network.

5-10.0.1.6 Resynchronizing the Network

Some networked control units may occasionally retain alarm, supervisory or trouble events from other control units in the network even if the events have cleared from the other control units. This can be corrected by the “Resynch Network” function that resynchronizes all messages across the network.

Network events can be resynchronized by using a control unit configured as Group 0, or by using

- Another control unit in the same group as the control unit retaining events
- Any control unit in a network configured for global operation
- The control unit itself

Use the following procedure to resynchronize the network:

1. Press the 0 Key on the keypad of the control unit being used to resynchronize the network. This display will show this message:

```
PLEASE ENTER PASSWORD
* * * *
```

Figure 5-34. Password Prompt

2. Enter the Level-2 Password and then press the <Enter> Key. The network-node prompt will appear as follows:

```
PRESS ENTER TO SELECT THE LOCAL NODE
OR ENTER NETWORK NODE NO. (1 - 64)
```

Figure 5-35. Network Node Prompt

3. Select the local node by pressing the <Enter> Key, or enter a remote node number then press the <Enter> Key. The top-level menu selections will be displayed.

```
1: ISOLATE          2: LIST
3: SET              4: TEST
5: LANGUAGE         [<- to return]
```

Figure 5-36. Top-Level Menu Selection

4. Press the 3 Key to select the Set sub-menu.

```
1: TIME/DATE        2: PORT CONTROL
3: SLC DEVICES      4: PROGRAMMING
5: GLOBALS          6: OUTPUTS/BACKPLANE
7: CONTROL MODULES  8: NETWORK
```

Figure 5-37. Set Sub Menu

5. Press the 4 Key to select PROGRAMMING

```
1: DAY/NIGHT        2: PASSWORDS
3: SLC AUTOLEARN    4: AUTOSETUP
5: ALM VERIFICATION 6: POSITIVE ALM SEQ
7: CLEAR EVENTS   SCROLL for more
```

Figure 5-38. Additional Set Menu Options

6. Press the <Scroll> Key once and then press the 9 Key to select RESYNCH NETWORK.

```
8: CLEAR TESTS    9: RESYNCH NETWORK  *
```

Figure 5-39. Resynch Network Option

7. The display will indicate the following; press backspace to exit from the menus.

```
NETWORK EVENT RESYNCHRONIZATION


MESSAGE SENT, PRESS BACKSPACE TO EXIT
```

Figure 5-40. Resynch Network Display

8. Press the <Backspace> Key multiple times as required to exit from the Menu State.

The events being displayed on the control unit will now be consistent with the events being displayed on all of the networked control units.

5-11 ULC 527 NETWORK DISPLAY AND CONTROL CENTRE OPERATION

The ARIES NET*Link* Intelligent Fire Alarm-Suppression Control Unit meets the Display and Control Centre requirements of ULC 527-11 by establishing a Display and Control Centre Node upon initial control unit button press activity. When configured for ULC Operation and networked with other control units, any control unit can become the Display and Control Centre Node. The first node to perform a control type operation - event acknowledge, system reset, system silence or fire drill - shall gain control of the network. When a node is in control, all other nodes will display an indication of the node in control, as shown below.

5-11.1 System Status Normal

When system status is Normal, the following shall be displayed on the bottom line of the LCD:

'NODE ## IN CONTROL'

(where ## is the node currently acting as the Display and Control Centre)

5-11.2 Off-Normal Status

When any Off-Normal status is active, the following shall be displayed on the third line of the LCD:

'DCHRG-00 CNTDN-00 ABT-000 ALM-000 IN-##'

(where 'IN' refers to 'In Control Node' and ## is the node number)

5-11.3 System Control From the Display and Control Centre Node

The Display and Control Centre Node shall maintain control as long as keypad operations continue to be performed. If no keypad operations are performed for approximately 60 seconds, control is relinquished and another node can take control by pressing an operational button - Acknowledge, Reset, Silence or Fire Drill. Prior to this inactivity period expiring, another node can request control by pressing an operational button and selecting "REQUEST CONTROL" as described in the section below.

5-11.4 System Control From a Node Other Than the Display and Control Centre Node

When an operator tries to operate the system through other control units, a message shall be displayed with information regarding a lockout, including which node is the Display and Control Centre node.

'NODE ## IS IN CONTROL'

InControl Node Location Name

When appropriate, a prompt shall also be displayed indicating if control will be requested.

'NODE ## IS IN CONTROL'

InControl Node Location Name

1. REQUEST CONTROL
2. CANCEL BUTTON

The operator at the non-Display and Control Centre node can press '1' on the keypad to request control. If the request is made, the current Display and Control Centre node will display a prompt as follows on its LCD, and the operator can grant or refuse the request.

'NODE ## REQUESTING CONTROL'

Requesting Node Location Name

1. ACCEPT AND GRANT CONTROL
2. REJECT AND MAINTAIN CONTROL

If the request is granted, the button press shall be processed and the requesting node shall become the new Display and Control Centre Node. If rejected, the button press shall be discarded. If the Display and Control Centre Node does not respond to the request within approximately 60 seconds, control will be granted to the requesting node and all nodes will be informed of the change.

5-11.5 Local Menu Access

Local operations on non-Display and Control Centre nodes that do not affect network operations or nodes, such as Scroll and local menu access, will always be available whether or not a Display and Control Centre Node is in control.

5-11.6 Network Communication Failures

Network communication failures (on all enabled network channels) with the Display and Control Centre Node will indicate a trouble on all nodes and will allow another node to take control and become the new Display and Control Centre Node.

5-11.7 ULC Operation System Status Messages

Figure 5-41 shows system status messages which may display on the LCD panel of a Display and Control Centre Node:

```
L2:010  ALARM ON MANUAL STATION

COMPUTER ROOM

DISCHARGE-00 CNTDN-00 ABT-00 ALM-001 IN-01

PREALM-00  AVCNTDN-00 SUP-000 TBL-001
```

In Control Node

Figure 5-41. Typical System Status Messages (Shown on Display and Control Centre Node)

The table below lists the names and indications of the system status messages on the display:

Table 5-1. System Status Messages for ULC Operation

LCD SYSTEM STATUS MESSAGE	INDICATION
DISCHARGE-00	Number of activated discharges
CNTDN-00	Number of countdowns to release in progress
ABT-01	Number of activated abort stations
ALM-051	Number of alarms
IN-01	In Control Node (Display and Control Centre node)
PREALM-00	Number of initiating devices in the pre-alarm state
AVCNTDN-00	Number of alarm-verification countdowns
SUP-000	Number of supervisory events
TBL-000	Number of trouble events

5-12 ENABLING ULC OPERATION

Enabling or disabling ULC Operation can be accomplished in the SET Menu by selecting:

3.SET>5.GLOBALS>5.ULC OPERATION

Enabling ULC Operation assigns *this* control unit as the highest priority node when obtaining network control and sets the Network Group number to 0.

Refer to Figure 3-27 in Chapter 3, *Configuration and Programming.*

5-12.1 Viewing ULC Operation Current Setting

The current setting of ULC Operation can be viewed from the LIST menu by selecting:

2.LIST>5.PROGRAMMING>6.GLOBALS>4.GLOBAL SETTINGS>5.ULC OPERATION

Refer to Figure 3-16 in Chapter 3, *Configuration and Programming.*

5-12.2 Configuring Network Interface Card (NIC) Settings

With ULC Operation enabled, the Network Interface Card settings can be changed to designate a control unit as a ULC Display and Control Centre node (DNCC Node). Network Interface Card settings can be changed by selecting:

3.SET>9.NETWORK>1.THIS NODE

THIS NODE Network Settings are as follows, in order:

- NODE NUMBER (0-64)
- CHANNEL 1 (Enable/Disable)
- CHANNEL 2 (Enable/Disable)
- DISPLAY AND CONTROL CENTRE NODE (Enable/Disable, only available if ULC Operation is enabled)
- GROUP NUMBER (0-64, set to 0 when DISPLAY AND CONTROL CENTRE NODE is enabled)
- TIME SYNCHRONIZATION (600 – 30000 seconds)

Note: The following settings are NOT available when ULC Operation is enabled.

- NETWORK RESET EVENT (Enable/Disable)
- NETWORK SILENCE EVENT (Enable/Disable)
- LOG ALL NETWORK EVENTS (Enable/Disable)
- PROCESS GROUP 0 (Enable/Disable)

Refer to Figure 3-33 in Chapter 3, *Configuration and Programming.*

5-12.3 Viewing Network Interface Card Current Settings

The current settings of Network Interface Card parameters can be viewed from the LIST menu by selecting:

2.LIST>5.PROGRAMMING>8.NETWORK SETTINGS>1.THIS NODE

Refer to Figure 3-16 in Chapter 3, *Configuration and Programming.*

5-12.4 Viewing Active Display and Control Centre Node(s)

Active Display and Control Centre Node(s) in the system can be viewed by selecting:

3.LIST>4.ACTIVE EVENTS>7.NODE IN CONTROL

Refer to Figure 3-14 in Chapter 3, *Configuration and Programming.*

CHAPTER 6
TESTING AND MAINTENANCE

6-1 INTRODUCTION

The ARIES NET*Link*™ System must be inspected, tested and maintained in accordance with the requirements of NFPA 72 (latest edition), or in accordance with the inspection, testing and maintenance schedule mandated by the Authority Having Jurisdiction (AHJ).

Follow the required inspection, testing, and maintenance procedures for the associated extinguishing system(s) as directed by the manufacturer and by the standards and codes that apply to those systems.

WARNING

Do not attempt any testing or maintenance of the ARIES NET*Link* System until you have:

- **Isolated all onboard releasing outputs and RRMs via the Isolate function.**
- **Physically disconnected the wiring to actuator assemblies (if used) from the release-circuit terminals, shorted the leads together, and wrapped the leads in insulating tape.**
- **Physically disconnected all control heads (if used) from their associated agent-storage-container discharge valves.**
- **Physically disconnected the wiring to solenoid valves (if used) for pre-action/deluge sprinkler systems.**
- **Ensured that emergency operations controlled by this system such as facility power shutoff are bypassed.**
- **Notified personnel in the facility and at off-premises monitoring locations that you are working on the system and that you will inform them when system servicing has ended.**

6-2 OFF-NORMAL TROUBLE MAINTENANCE

6-2.1 Panel Trouble Conditions

A System Trouble LED indicator on the Keypad/Display and the panel trouble relay will activate whenever a system trouble is present indicating that there are one or more trouble conditions on the system.

WARNING

A system trouble is an indication that some or all of the fire panel functions may be in an inoperable state and must be addressed with urgency.

6-2.2 Ground Fault Trouble Conditions

A Ground Fault LED indicator on the Keypad/Display and the panel trouble relay will activate indicating that there are one or more ground faults present in the system.

WARNING

A system ground fault trouble is an indication that action is required to ensure that the panel is not currently in an inoperable state or does not enter an inoperable state. Ground fault troubles must be resolved with the same urgency as a general panel trouble.

WARNING

Critical fire safety functions including fire detection, fire notification and fire suppression functions may be inoperable during a panel trouble condition resulting in equipment loss, injury and possible loss of life in the event of a fire.

6-3 SEMI-ANNUAL AND ANNUAL TESTING

Perform the following tests as part of each semi-annual or annual system inspection:

6-3.1 Lamp Test

Test the LEDs on the control unit's display by selecting “Lamp Test” from the system menu. Refer to Figure 3-37 for menu structure location. Replace the display's membrane if any LED fails to illuminate.

6-3.2 Battery Test

Test the standby batteries by selecting “Battery Test” from the system menu. Refer to Figure 3-37 for menu structure location. Replace all batteries if either the charging voltage or current do not fall within the specified ranges.

Replace batteries every three years, or more frequently as recommended by the battery manufacturer.

If a Battery Replacement Date was entered during the initial configuration process, the system software will emit an audible trouble signal and display a message indicating it is time to replace the batteries when that date occurs.

Kidde Fire Systems provides the following batteries:

Table 6-1. Available Standby Batteries

Part Number	Capacity (AH)
06-115915-013	7
06-115915-047	12
06-115915-046	17/18
89-100052-001	35

Note: Other capacity (AH) batteries can be used (obtained from third party suppliers).

6-3.3 Initiating-Devices Test

The ARIES NET*Link* control unit automatically verifies all of the initiating devices connected to the Signaling Line Circuit on a daily basis.

You may test the initiating devices by selecting “SLC” circuits from the system menu, from either on-board or installed SLC Expansion Card(s). Refer to Figure 3-37 for menu structure location. Investigate any "Device-Failed" messages and replace any defective initiating devices as appropriate.

6-3.4 Walk Test

Confirm acceptable fire-signature-entry characteristics for all automatic initiating devices by selecting “Walk Test” from the system menu. Refer to Figure 3-38 for menu structure location. Use these menu functions to confirm that all monitor modules are also working correctly.

6-4 MCB CLOCK BATTERY REPLACEMENT

The Main Controller Board includes an on-board Real-Time Clock with a lithium battery. Refer to Figure 1-7 for location of the MCB Real-Time Clock Battery. The following replacement batteries are recommended:

- Maxell CR1220
- Panasonic BR1220
- Renata CR1220 MFR

To replace the MCB clock battery:

1. Use a screwdriver or other small instrument to remove the old battery, pushing to the right side opening.
2. Remove the old battery and discard.
3. Gently slide the replacement battery into place from the right side opening and press to secure in the holder.

6-5 TESTING FREQUENCY

The testing frequency shall be per NFPA 72 (latest edition) or the following (whichever is more stringent).

Table 6-2. Testing Frequency

Battery status check	Annual
Battery test	Semi-annual
Lamp test	Semi-annual
System test	Semi-annual

6-6 FUSE REPLACEMENT

The PMU Board includes a 15A fuse (F1) which may need to be replaced periodically. A replacement fuse kit, P/N 76-800030-007, is available.

Note: If the ARIES NET*Link* displays a "Battery Disconnected Fault" when batteries are physically connected, the fuse on the PMU Board may need to be replaced. A bad fuse will report this trouble.

To replace the fuse:

1. Remove the fuse which is in place from the fuse holder and discard.
2. Insert the replacement fuse and gently push into place.

Refer to Figure 1-9 for location of the fuse.

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CHAPTER 7
TROUBLESHOOTING

7-1 INTRODUCTION

This chapter lists all the error messages, their probable causes, and suggested procedures to return the ARIES NET*Link*™ system to proper operating condition.

If desired, use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services for assistance. Refer to the configuration software user's guide.

WARNING

Do not attempt any of the corrective actions listed in this chapter until you have:

- **Physically disconnected the wiring to actuator assemblies (if used) from the release-circuit terminals, shorted the leads together, and wrapped the leads in insulating tape**
- **Physically disconnected all control heads (if used) from their associated agent storage container discharge valves**
- **Physically disconnected the wiring to solenoid valves (if used) for pre-action/deluge-sprinkler systems**
- **Ensured that emergency operations controlled by this system such as facility power shutoff are bypassed**
- **Notified personnel in the facility and at off-premises monitoring locations that you are working on the system and that you will inform them when system servicing has ended.**

Table 7-1. General System Events

General System Events		
Error Message	**Probable Cause**	**Corrective Action**
`AC INPUT FAULT ON`	Loss or degradation of primary power from commercial light and power company. Message will appear if AC supply voltage drops to 85% or less of the normal operating voltage. Accompanied by message "System Changed Over to Battery Power" if standby battery used.	**WARNING:** **If AC power is lost on any PMU Board of a ARIES NET*Link* system containing multiple PSU/PMU Board assemblies, the system will immediately stop charging standby batteries and the batteries will supply the load of all PMU Boards that are in the Trouble state. The system should be serviced immediately to restore AC power.** • Notify commercial light and power company of loss of service. • Check connections to Power Management Unit (PMU) Board TB1. Use voltmeter to check for nominal 120/240 Vac at TB1. • Remove secondary and primary power. Label and disconnect all field wiring. **CAUTION**: **Disconnect all electrical control heads and short together and tape wiring to actuators (if applicable)** • Ensure AC Selector Switch on power supply unit is correctly set for line voltage. Refer to Figure 2-4 • Re-install printed-circuit board, connect field wiring, and apply primary and secondary power if incorrect AC Selector-Switch setting. Perform functional tests as necessary
`BATTERY CHARGER FAULT ON`	Failure of the battery-charging circuitry	• Check battery connections to Power Management Unit (PMU) Board J10. Refer to Figure 2-9. • Disconnect battery leads from Power Management Unit (PMU) Board J10 and use digital volt-ohm meter to measure battery open-circuit voltage. Replace batteries if open-circuit voltage is less than 22 Vdc. • Replace the fuse on the PMU Board if blown. See Figure 1-10. • Replace the power supply unit. See Figure 1-8 • Replace Power Management Unit, PMU. See Section 2-4.4.

Table 7-1. General System Events (Continued)

General System Events		
Error Message	**Probable Cause**	**Corrective Action**
BATTERY DISCONNECTED FAULT ON	Faulty battery connection, no batteries connected or battery connection is reversed. **Note:** Battery disconnected-fault messages do not disappear immediately when corrected. The control unit only rechecks the battery connection once every 5 to 10 seconds.	• Check battery connections to Power Management Unit (PMU) Board J10. Refer to Figure 1-9. • Disconnect battery leads from Power Management Unit (PMU) Board J10 and use digital volt-ohm meter to measure battery open-circuit voltage. Replace batteries if open-circuit voltage is less than 22 Vdc. • Replace the fuse on the PMU Board if blown. See Figure 1-9
PMU# PSU1 NOT PRESENT ON	The PMU is not detecting a power supply unit on connection 1.	• Check the PSU connection • Measure PSU #1 output voltage at terminals 4 & 5 (refer to Figure 2-8). Voltage should measure 27.6 Vdc.
PMU# PSU2 NOT PRESENT ON	The PMU is not detecting a power supply unit on connection 1 or 2.	• If the second power supply unit is not used, change and upload the configuration using the PC configuration software or the control unit menu to disable the second PSU.
NOTE: The terms "-VDC" and "+VDC" in the Ground Fault error messages below refer to the measured ground fault voltage offset, not to the PMU Board terminal J9 itself. If the value of the voltage offset is too low (less than 6.6 VDC, measured between the Earth Ground stud and PMU J9 (-) terminal), the ground fault is considered a <u>negative</u> fault. If the value of the voltage offset is too high (greater than 6.6 VDC, measured between the Earth Ground stud and PMU J9 (-) terminal), the ground fault is considered a <u>positive</u> fault.		
PMU GROUND FAULT -VDC ON	Low impedance path between negative field conductor and Earth Ground. Normal earth-ground offset voltage is 6.6 Vdc (nom.) relative to system common (e.g.. PMU J9 (-) terminal, refer to Figure 2-9)	• Use the control unit menu to view the ground fault offset voltage. • Use the control unit menu to execute the Find Ground Fault option. • Continuously monitor DC voltage between earth-ground stud on left side of back box and PMU J9 (-) terminal. Voltage should be 6.6 (nom.) Vdc. Earth ground is positive relative to system common. • If the menu operation does not find the origin of the ground fault, remove field circuits one at a time until earth-ground offset voltage restores to 6.6 (nom.) Vdc. • Check for connections to Earth Ground on field circuit whose removal restored proper earth-ground offset voltage. • If applicable, disconnect USB port-to-PC connection and check for ground fault.

Table 7-1. General System Events (Continued)

General System Events		
Error Message	**Probable Cause**	**Corrective Action**
`PMU GROUND FAULT +VDC ON`	Low impedance path between positive field conductor and Earth Ground. Normal earth-ground offset voltage is 6.6 (nom.) Vdc relative to system common (e.g.. PMU J9 (-) terminal, refer to Figure 2-9)	• Use the control unit menu to view the ground fault offset voltage. • Use the control unit menu to execute the Find Ground Fault option. • Continuously monitor DC voltage between earth-ground stud on left side of back box and PMU J9 (-) terminal. Voltage should be 6.6 (nom.) Vdc. Earth ground is positive relative to system common. • If the menu operation does not find the origin of the ground fault, remove field circuits one at a time until earth-ground offset voltage restores to 6.6 (nom.) Vdc. • Check for connections to Earth Ground on field circuit whose removal restored proper earth-ground offset voltage.
`PMU# 24VDC OUTPUT HIGH ON` `PMU# 24VDC OUTPUT LOW ON`	The combined power-supply output to the control unit is too high or low.	• Measure the PSU output voltage at terminals 4 & 5 (refer to Figure 2-8). • Remove secondary and primary power. Label and disconnect all field wiring. **CAUTION: Disconnect all electrical control heads and short together and tape wiring to actuators (if applicable).** • Inspect connections of power-supply-connector flying leads to power supply unit. Tighten if necessary. • Ensure AC Selector Switch on power supply unit is correctly set for line voltage. Refer to Figure 2-4. • Re-install printed-circuit board, connect field wiring, and apply primary and secondary power if loose connection(s). Perform functional tests as necessary • Replace power supply unit if no loose connections or AC Selector-Switch problem.

`PMU# PSU1 24VDC OUTPUT HIGH ON`
`PMU# PSU1 24VDC OUTPUT LOW ON`
`PMU# PSU2 24VDC OUTPUT HIGH ON`
`PMU# PSU2 24VDC OUTPUT LOW ON`
	The PSU1 and/or PSU2 output to the system is too low or too high.	• Check connections from the PMU to the PSU(s).
		• Measure the PSU output voltages at terminals 4 & 5 of both power supplies (refer to Figure 2-8).

`PMU# PSU1 NOT CONFIGURED ON`	The PMU has detected a power supply unit, but the configuration settings do not include a PSU.	• Change and upload the configuration using the PC configuration software or the control unit menu to enable the PSU

Table 7-1. General System Events (Continued)

General System Events		
Error Message	**Probable Cause**	**Corrective Action**
PMU# LOW BATTERY FAULT ON	Discharged battery. Open-circuit voltage of two series-wired batteries must be greater than 22 Vdc. **Note**: Low-battery fault messages do not disappear immediately when corrected. The control unit only rechecks the battery voltage once every 5 to 10 seconds.	• Disconnect battery leads from Power Management Unit (PMU) Board J10 and use digital volt-ohm meter to measure battery open-circuit voltage. Replace batteries if open-circuit voltage is less than 22 Vdc. • Reconnect batteries to Power Management Unit (PMU) Board J10 if open-circuit voltage is greater than 22 Vdc. Let batteries re-charge for 48 hours. Re-place batteries if fault remains after 48 hours.
PMU# AUX1 SHORT CIRCUIT ON PMU# AUX2 SHORT CIRCUIT ON	A short circuit or over current condition has been detected on auxiliary output 1 and/or 2.	• Remove load and see if trouble clears from display. • Check load capacitance, measurement must be 470µF or less.
NO PMUS FOUND ON	The system requires at least one PMU. No PMUs were found to be communicating.	• Remove primary and secondary power sources. • Check all PMU connections, including connection from J12 on PMU to J2 on MCB • Connect a PMU to the Main Controller Board
SLC DEGRADE SIGNAL FAULT ON	A signal is detected from the SLC module(s) indicating a communication or circuit board problem.	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
PRINTER SUPERVISION FAULT ON	Communications problem between printer and the control unit or USB printer is giving an indication such as out of paper. offline, etc.	• Check RS-232/USB cable between Main Controller Board and printer • Make sure printer is powered and connected and ready to print • Verify that the RS-232 port assigned to the printer via the menu is correct. Refer to Section 2-11.1 • Disable printer port if no printer is used
INVALID USB DEVICE ATTACHED ON	A USB Device other than an approved printer has been connected to the USB Host port. Refer to Section 2-11.3 for a list of compatible printers.	• Remove the USB device. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources.
BACKPLANE ADDRESS FAULT ON	A signal indicating faulty expansion backplane addressing detected.	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system

Table 7-1. General System Events (Continued)

General System Events		
Error Message	**Probable Cause**	**Corrective Action**
CONFIGURATION MEMORY CHECKSUM FAILURE	Faulty upload of configuration or improper execution of a configuration change via the menu system.	• Re-upload applications program • Re-test the system for proper functionality
CONFIGURATION MEMORY WRITE FAILURE	Faulty upload of applications program or improper execution of a configuration change via the menu system	• Re-upload applications program if message occurs after configuration upload • Re-execute configuration change via menu operation if message appears after menu operation
PROGRAM MEMORY CORRUPT ON	Program memory self-test failure	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
MAIN BOARD RAM FAILURE ON	Main Controller Board memory self test has failed.	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
PASSWORD NOT SET ON	Main Controller Board self test of memory used for Password data has failed. The passwords will be set to default values. This message appears on a factory unit to remind installer to change password.	• Change the system passwords using the control unit menu. • Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources. • Functionally test the system
EVENT MEMORY WRITE FAILURE ON	Faulty storage	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
DATE/TIME MUST BE SET TROUBLE ON	Message appears if the Real Time Clock chip on the Main Controller Board has a problem.	• Set the date and time as instructed in Section 4-10.2. • Check the lithium cell battery on the Main Controller Board and replace if necessary.

Table 7-2. SLC Events

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr `SWITCH NOT SET ON` ***AlarmLine Module***	An incorrect configuration for the AAM at address *L#: Addr,* where *L#* is the SLC loop number and *Addr* is the device address.	• Check the configuration settings for the AAM. Re-configure and upload the correct configuration. • Refer to AlarmLine Installation, Operation, and Maintenance Manual, P/N 73.04
L#: Addr `24 VDC FAILURE ON` ***Signal/ Sounder***	Failure of the DC-to-DC converter in the ASM at address *L#: Addr*	• Refer to ASM Installation Instructions, P/N 06-235717-001. • Check 24 Vdc power connections to ASM. • Ensure that the ASM's Jumper P1 and Switch S1 are set for 24 Vdc operation • Replace the ASM if steps above are unsuccessful
L#: Addr `9V DC FAULT ON` ***Device Type***	A failure of the internally generated 9-Volt power supply for the SmartOne smoke or heat detector at address *L#: Addr.*	• Check SLC wiring. Refer to Figure 2-23 and Figure . Ensure that wiring resistance and capacitance limitations have not been exceeded. • Visually inspect the detector to ensure that its red LED is flashing. Use Handheld Programmer to test the device if the LED is not flashing. Replace the detector if it fails the Handheld-Programmer test. • List the automatic initiating device's 9-Volt level. Refer to the list menu in Figure 3-16. Replace the device if the 9-Volt level varies by + / - 1.0 (nom.) Vdc volts. • Conduct an initiating device test on the automatic detector. See Section 3-3.4 • Activate and confirm a proper alarm response from the detector. • Replace the device if any of the above tests are unsuccessful.
L#: Addr `ABORT TROUBLE ON` ***Monitor Module***	The abort switch being monitored by the AI at address *L#: Addr* is activated and the system is not in alarm	• Check abort switch for mechanical failure

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr ALARM TEST FAIL *Device Type*	An initiating device (i.e., automatic detector or monitor module) at address *L#: Addr* failed a device test. The initiating device was unable to send an acceptable alarm-test signal when requested by the control unit.	• Globally isolate all outputs. See the Global Isolate menu in Figure 3-12. • Disconnect device from SLC and visually inspect for damage. Clean if automatic detector. • Use Handheld Programmer to test the device. Reconnect device to SLC. • Conduct an initiating device test on the initiating device. Repeat this procedure at least 3 times. Refer to the Test SLC menu in Figure 3-37. Check SLC wiring if test results are inconsistent. Refer to Section 2-8.4. Ensure that wiring-resistance and -capacitance limitations have not been exceeded. • Activate and confirm a proper alarm response from the initiating device • Replace device if any of above tests is unsuccessful. • Globally de-isolate all outputs. See Figure 3-12.
L#: Addr DEVICE COMMUNICATION FAULT ON	A loss of communications between the SLC's driver circuit and the device at address *L#: Addr*.	• Check device connections to SLC wiring • Ensure that device has not been removed • Check SLC wiring for excessive capacitance and/or resistance if the device LED is blinking. Refer to Section 2-8.4. Rewire SLC using recommended wire in Appendix B. • Replace the device if above procedures are unsuccessful.

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
`L#: Addr DRIFT FAULT ON Device Type`	The inability of a SmartOne smoke detector to further compensate for reference signal variation	• Globally isolate all outputs. See the Global Isolate menu in Figure 3-12. • Disconnect smoke detector from SLC and visually inspect for damage. Clean the detector as recommended. • Use Handheld Programmer to test the device. Reconnect device to SLC. • Measure the detector sensitivity. Refer to the Device Reading menu in Figure 3-14. Replace the detector if the clean-air reference value is more than one half of the alarm-threshold value. • Conduct an initiating device test on the detector. Refer to the Test menu in Figure 3-37. • Activate and confirm a proper alarm response from the detector. • Replace device if any of above tests is unsuccessful. • Globally de-isolate all outputs. Refer to the Global Isolate menu in Figure 3-12.
`L#: Addr DUPLICATE ADDRESS FAULT ON`	There is more than one SLC device with address *L#: Addr*.	• Find duplicate address using the Find Dup Address menu, refer to Figure 3-40. • Find all SLC devices with rapidly-pulsing LEDs. Monitor modules require an external LED to be installed. • Check the approved layout drawing for the correct address corresponding to each device location • Remove the incorrectly-addressed device(s) and re-address with the Handheld Programmer. • Alternatively, remove the correctly-addressed device and all but one incorrectly-addressed device. Use the Device Addr Change in the menu structure, shown in Figure 3-20, to change the incorrect device address. • Add one more incorrectly-addressed device and re-address. Use the Device Addr Change in the menu structure, shown in Figure 3-20, to change the incorrect device address. Repeat as necessary until all incorrectly-addressed devices have been correctly addressed. • Reconnect the original correctly-addressed device

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr EEPROM FAULT ON	The device at address *L#: Addr* is reporting an internal software fault	• Replace the device
L#: Addr INPUT TROUBLE ON *Monitor Module*	An open circuit in a monitor module's initiating device circuit	• Refer to AI Installation Instructions, P/N 06-235578-001. • Look for discontinuity in initiating device circuit. • Check for missing 10k end-of-line resistor.
L#: Addr LINE VOLT FAULT ON *Device Type*	A failure of the DC-to-DC converter in the device type at address *L#: Addr*.	• Check SLC wiring. Refer to Section 2-8.4. Ensure that wiring resistance and capacitance limitations have not been exceeded. • Visually inspect the device to ensure that its red LED is flashing (if applicable). Use Handheld Programmer to test the device. Replace the device if it fails the Handheld-Programmer test. • List the device's line-voltage level. Refer to the Voltage menu shown in Figure 3-16. Line-voltage level must be a minimum 18 Vdc. Consider using larger wire gauge if line voltage is too low. • Conduct an initiating device test if the device is an initiating device. Refer to the Test menu shown in Figure 3-37. Be sure to observe the warnings called out in beginning of this chapter. • Conduct an output device test if the device is a control module. Refer to the Output Test menu shown in Figure 3-39. Be sure to observe the warnings called out in the Footnotes of this figure and the beginning of this chapter. • Activate and confirm a proper operation for the device. • Replace the device if any of the above tests are unsuccessful.
L#: Addr NOT REGISTERED ON *Device Type*	The control unit has not been set up to expect the device at address *L#: Addr*.	• Register the device if part of system configuration. Refer to the Registration menu shown in Figure 3-23. If this menu procedure is insufficient, try one of the following menu functions: • Run the AutoLearn Procedure. Refer to the AutoLearn menu shown in Figure 3-26. • Upload a new application program that includes the previously unregistered device.

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr OUTPUT RELAY FAULT *Addressable Relay*	The AO at address *L#: Addr* failed to activate upon receipt of an activation command	**CAUTION: Be sure to bypass the shutoff to equipment controlled by the AO before functionally testing this device.** • Check SLC wiring. Refer to Section 2-8.4. Ensure that wiring-resistance and capacitance limitations have not been exceeded. • Visually inspect the AO to ensure that its red LED is flashing. Use Handheld Programmer to test the device if the LED is not flashing. Replace the AO if it fails the Handheld-Programmer test. • Functionally test the existing or replaced AO. Replace the AO if it fails the functional test. • Functionally re-test the AO for all configured actuation scenarios.
L#: Addr ACTIVATION FAULT ON *ASM or RRM*	The ASM or RRM at address *L#: Addr* failed to activate upon receipt of an activation command	• Check SLC wiring. Refer to Section 2-8.4. Ensure that wiring-resistance and capacitance limitations have not been exceeded. • Visually inspect the ASM/RRM to ensure that its red LED is flashing. Use Handheld Programmer to test the device if the LED is not flashing. Replace the ASM/RRM if it fails the Handheld-Programmer test. • Functionally test the existing or replaced ASM/RRM. Replace the ASM/RRM if it fails the functional test. • Functionally re-test the ASM/RRM for all configured actuation scenarios.
L#: Addr OUTPUT TROUBLE ON *Signal/Sounder*	Open or short circuit in notification-appliance circuit for ASM at address *L#: Addr*.	• Refer to ASM Installation Instructions, P/N 06-235717-001. • Look for discontinuity in NAC wiring to find open circuit. • Check for missing end-of-line resistor. • Troubleshoot NAC wiring by breaking-up circuit to isolate short circuit to specific leg.
L#: Addr OVERHEAT ON *Alarmline Module*	An AlarmLine cable being monitored by an AAM and configured for overheat detection is reporting an overheat condition. This is not an error message. The control unit's buzzer will sound but no LED on the membrane will illuminate. Notification will only occur if programmed via an EOC statement.	• Check the monitored area for excessively-high temperature. • Start air-conditioning units to lower temperature in monitored area.

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
`L#: Addr PSU OPEN CIRCUIT ON Signal/Sounder`	Loss of 24 Vdc signal to power-input circuit of ASM at address *L#: Addr*.	• Refer to ASM Installation Instructions, P/N 06-235717-001. • Check 24 Vdc power connections to ASM. • Ensure that the ASM's Jumper P1 and Switch S1 are set for 24 Vdc operation • Check auxiliary power supply for faults.
`L#: Addr PSU SHORT CIRCUIT ON Signal/Sounder`	Appearance of 0 Vdc signal at power-input circuit of ASM at address "L#: Addr".	• Refer to ASM Installation Instructions, P/N 06-235717-001. • Check 24 Vdc power connections to ASM. • Ensure that the ASM's Jumper P1 and Switch S1 are set for 24 Vdc operation • Check auxiliary power supply for faults.
`L#: Addr RAM FAULT ON`	The device at address *L#: Addr* is reporting an internal software fault	• Replace the device
`L#: Addr SENSOR FAULT ON AlarmLine Module`	A problem in the AlarmLine cable being monitored by an AAM.	• Check the AlarmLine wiring connections to the AAM. • Refer to AlarmLine Installation, Operation, and Maintenance Manual, P/N 73.04
`L#: Addr TROUBLE OPEN ON Device Type`	Loss of communications to device at address *L#: Addr*	• Check device connections to SLC wiring • Ensure that device has not been removed • Check SLC wiring for excessive capacitance and/or resistance if the device LED is blinking. Refer to Section 2-8.4. Rewire SLC using recommended wire in Appendix B. • Use the De-Registration menu (shown in Figure 3-23) to de-register the address if no device should occupy that address.

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr TYPE ERROR ON *Device Type*	The device at address *L#: Addr* is reporting a device type that is different from the type of device that is configured for that address	• Ensure that the device installed at address *L#: Addr* matches the device type configured for that address. Install corrected device or correct configuration file and re-upload application. • Use Handheld Programmer to test the device if the device type matches the entry in the configuration file. Replace the device if it fails the test or if the error message returns when the device is re-installed. • Intermittent type errors could be a symptom of SLC wiring problems. Check SLC wiring if random errors are reported. Refer to Section 2-8.4. Ensure that wiring-resistance and -capacitance limitations have not been exceeded.
L#: Addr SWITCH FAULT ON	The contacts of AI device at address *L#: Addr* are still connected. This fault reports when AI is configured for switch type inputs – Drill, Silence, Acknowledge, etc. are left active.	• Disconnect the switch connected to the AI device • Check device to be sure the switch is properly wired
L#: Addr FAILED TO CARRY OUT COMMAND ON	An SLC output device at address *L#: Addr* failed to process the activation command.	• Check device connections to SLC wiring • Ensure that device has not been removed • Check SLC wiring for excessive capacitance and/or resistance if the device LED is blinking. Refer to Section 2-8.4. Rewire SLC using recommended wire in Appendix B. • Perform a test to activate the device. • Replace the device if above procedures are unsuccessful.
L#: Addr DETECTOR TBL ON *Orion XT Interface Module*	A problem in a high-sensitivity smoke detector (HSSD) being monitored by an PALM/APIC	• Check the PALM/APIC-to-HSSD connections • Use ORION Configuration Software or AIR-Intelligence Remote Configuration Software to troubleshoot the HSSD. • Refer to ORION XT Installation, Operation, and Maintenance Manual, P/N 06-236005-401 or appropriate AIR-Intelligence detector manual, P/N 33-308100-001/-002/-003.

Table 7-2. SLC Events (Continued)

SLC Events	For the following SLC-related events, *L#* is the SLC loop number and *Addr* is the device address.	
Error Message	**Probable Cause**	**Corrective Action**
L#: Addr HIGH AIRFLOW ON *ORION XT Interface Module*	A problem in a high-sensitivity smoke detector (HSSD) being monitored by a PALM/APIC. Excessively high air flow through the piping system	• Look for leaks in the HSSD's piping system • Use ORION Configuration Software or AIR-Intelligence Remote Configuration Software to troubleshoot the HSSD. The airflow may need to re- normalized. • Refer to ORION XT Installation, Operation, and Maintenance Manual, P/N 06-236005-401 or appropriate AIR-Intelligence detector manual, P/N 33-308100-001/-002/-003.
L#: Addr LOW AIRFLOW ON *ORION XT Interface Module*	A problem in a high-sensitivity smoke detector (HSSD) being monitored by a PALM/APIC. Low air flow through the piping system	• Look for blockages in the HSSD's piping system • Use ORION Configuration Software or AIR-Intelligence Remote Configuration Software to troubleshoot the HSSD. The airflow may need to re-normalized. • Refer to ORION XT Installation, Operation, and Maintenance Manual, P/N 06-236005-401 or appropriate AIR-Intelligence detector manual, P/N 33-308100-001/-002/-003.
L#: Addr OFFSET TROUBLE ON *ORION XT Interface Module*	The PALM/APIC at address *L#: Addr* is reporting an offset problem with the HSSD that it is monitoring. This is probably a problem with the background obscuration level in the area of the HSSD.	• Work with the end user to improve the air quality in the HSSD location. • Check the PALM/APIC-to-HSSD connections • Use ORION Configuration Software or AIR-Intelligence Remote Configuration Software to troubleshoot the HSSD. • Refer to ORION XT Installation, Operation, and Maintenance Manual, P/N 06-236005-401 or appropriate AIR-Intelligence detector manual, P/N 33-308100-001/-002/-003.

Table 7-3. R-NAC Card-Related Events

R-NAC Card-Related Output Events	For the following R-NAC-related events, # is the logical address of the R-NAC Expansion Card as defined in the configuration. The numbers “1”, “2” and “3” refer to the three (3) circuits available on each R-NAC Expansion Card.	
Error Message	**Probable Cause**	**Corrective Action**
AR#:1 OPEN CIRCUIT TROUBLE ON AR#:2 OPEN CIRCUIT TROUBLE ON AR#:3 OPEN CIRCUIT TROUBLE ON	Open circuit in field wiring connected to expansion R-NAC Circuit 1, 2 or 3 (configured as release circuit).	• Look for discontinuity in R-NAC circuit field wiring. Refer to Section 2-8.7.2 • Check for missing 10k end-of-line resistor.
AR#:1 SHORT CIRCUIT TROUBLE ON AR#:2 SHORT CIRCUIT TROUBLE ON AR#:3 SHORT CIRCUIT TROUBLE ON	Short circuit in field wiring connected to expansion RNAC Circuit 1, 2 or 3 (configured as release circuit).	• Troubleshoot R-NAC circuit wiring by breaking-up circuit to isolate short circuit to specific leg. • Look for discontinuity in R-NAC circuit field wiring. Refer to Section 2-8.7.2
AR#:1 ACTIVATION FAILURE ON AR#:2 ACTIVATION FAILURE ON AR#:3 ACTIVATION FAILURE ON	The activation of an R-NAC circuit (configured as release circuit) has failed due to overcurrent or other problem.	• Troubleshoot R-NAC circuit wiring by breaking-up circuit to isolate short circuit to specific leg. • Look for discontinuity in R-NAC circuit field wiring. Refer to Section 2-8.7.2
SG#:1 OPEN CIRCUIT TROUBLE ON SG#:2 OPEN CIRCUIT TROUBLE ON SG#:3 OPEN CIRCUIT TROUBLE ON	Open circuit in field wiring connected to expansion R-NAC Circuit 1, 2 or 3 (configured as NAC).	• Check for missing 10k end-of-line resistor. • Look for discontinuity in R-NAC circuit field wiring. Refer to Section 2-8.7.1.
SG#:1 SHORT CIRCUIT TROUBLE ON SG#:2 SHORT CIRCUIT TROUBLE ON SG#:3 SHORT CIRCUIT TROUBLE ON	Short circuit in field wiring connected to expansion R-NAC Circuit 1, 2 or 3 (configured as NAC).	• Troubleshoot R-NAC circuit wiring by breaking-up circuit to isolate short circuit to specific leg.
SG#:1 ACTIVATION FAILURE ON SG#:2 ACTIVATION FAILURE ON SG#:3 ACTIVATION FAILURE ON	The activation of an R-NAC circuit (configured as NAC) has failed due to overcurrent or other problem.	• Troubleshoot R-NAC circuit wiring by breaking-up circuit to isolate short circuit to specific leg.

Table 7-4. MCB-Related Output Events

MCB-Related Output Events		
Error Message	**Probable Cause**	**Corrective Action**
SLC1 COMMUNICATIONS FAULT ON SLC2 COMMUNICATIONS FAULT ON	This indicates that there has been a communication problem between the two processors on the control unit and the SLC is not being monitored.	• Use the PC configuration software to download the event log and forward an electronic copy to Kidde Technical Services. Refer to the configuration software user's guide. • Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system.
SLC1 OPEN CIRCUIT ON SLC2 OPEN CIRCUIT ON	Open circuit in the field wiring connected to Main Controller Board J20 or J19. Applies to CLASS-A wiring only	• Look for discontinuity in SLC wiring.
SLC1 SHORT CIRCUIT ON SLC2 SHORT CIRCUIT ON	Short circuit in the field wiring connected to Main Controller Board J20 or J19	• Troubleshoot SLC wiring by breaking-up circuit to isolate short circuit to specific branch or leg.
AR1 OPEN CIRCUIT TROUBLE ON AR2 OPEN CIRCUIT TROUBLE ON	Open circuit in field wiring connected to Main Controller Board J17 or J18 (when R-NAC1 or R-NAC2 configured as release circuits)	• Look for discontinuity in R-NAC1 or R-NAC2 field wiring. Refer to Section 2-8.7.
AR1 SHORT CIRCUIT TROUBLE ON AR2 SHORT CIRCUIT TROUBLE ON	Short circuit in field wiring connected to Main Controller Board J17 or J18 (when R-NAC1 or R-NAC2 configured as release circuits)	• Troubleshoot R-NAC1 or R-NAC2 wiring by breaking-up circuit to isolate short circuit to specific leg.
SG1 OPEN CIRCUIT TROUBLE ON SG2 OPEN CIRCUIT TROUBLE ON	Open circuit in field wiring connected to Main Controller Board J16 or J15	• Check for missing 10k end-of-line resistor. • Look for discontinuity in NAC1 or NAC2 field wiring. Refer to Section 2-8.6.
SG1 SHORT CIRCUIT TROUBLE ON SG2 SHORT CIRCUIT TROUBLE ON	Short circuit in field wiring connected to Main Controller Board J16 or J15	• Troubleshoot NAC1 or NAC2 wiring by breaking-up circuit to isolate short circuit to specific leg.
SG3 OPEN CIRCUIT TROUBLE ON SG4 OPEN CIRCUIT TROUBLE ON	Open circuit in field wiring connected to Main Controller Board J17 or J18 (when R-NAC1 or R-NAC2 configured as NACs)	• Check for missing 10k end-of-line resistor. • Look for discontinuity in R-NAC1 or R-NAC2 field wiring. Refer to Section 2-8.7.
SG3 SHORT CIRCUIT TROUBLE ON SG4 SHORT CIRCUIT TROUBLE ON	Short circuit in field wiring connected to Main Controller Board J17 or J18 (when R-NAC1 or R-NAC2 configured as NACs)	• Troubleshoot R-NAC1 or R-NAC2 wiring by breaking-up circuit to isolate short circuit to specific leg.

Table 7-5. Other Card-Related Events

Card-Related Events	For the following expansion card-related events, # is the logical address of the expansion card as defined in the configuration.	
Error Message	**Probable Cause**	**Corrective Action**
CITY TIE OPEN CIRCUIT ON	Open circuit in field wiring connected to City Tie Expansion Card	• Look for discontinuity in City Tie circuit field wiring. Refer to Section 2-8.9.
PMU# CONFIGURATION UPDATE FAULT ON RNAC# CONFIGURATION UPDATE FAULT ON RELAY# CONFIGURATION UPDATE FAULT ON CITY TIE CONFIGURATION UPDATE FAULT ON SLC# CONFIGURATION UPDATE FAULT ON DACT CONFIGURATION UPDATE FAULT ON NIC CONFIGURATION UPDATE FAULT ON	The expansion card has failed to properly receive and store its configuration from the Main Controller Board.	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the card using PC configuration software or the control unit menu • Functionally test the system.
SLOT# INCOMPATIBLE MODULE FAULT ON	An expansion card (module) was unable to accept and respond to a command from the Main Controller Board.	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the control unit using PC configuration software or the control unit menu • Functionally test the system
SLOT# MODULE MISMATCH ON	An expansion card (module) has been inserted in the wrong backplane slot.	• Power down the control unit. Verify all cards are inserted in backplane slots that match the configuration. • Re-apply primary and secondary power sources • Reconfigure the control unit using PC configuration software or the control unit menu • Functionally test the system
SLC# BACKPLANE 24VDC HIGH Fault ON SLC# BACKPLANE 24VDC LOW Fault ON RNAC# BACKPLANE 24VDC HIGH Fault ON RNAC# BACKPLANE 24VDC LOW Fault ON RELAY# BACKPLANE 24VDC HIGH Fault ON RELAY# BACKPLANE 24VDC LOW Fault ON CITY TIE BACKPLANE 24VDC HIGH Fault ON CITY TIE BACKPLANE 24VDC LOW Fault ON	The expansion backplane voltage (nominally 24VDC) is too low or too high	• Check 24Vdc from PMU • Check P/Ns on connector that plugs into backplane. Check P/Ns while reseating connectors. • Turn off power and reseat module into backplane. Power-up unit.

Table 7-5. Other Card-Related Events

RNAC# EXTERNAL PSU HIGH Fault ON RNAC# EXTERNAL PSU LOW Fault ON RNAC# PSU SUPERVISION Fault ON	The R-NAC expansion card has a problem with its external 24 VDC input.	• Check connection of EXT 24V power cable.
RNAC# RAM FAILURE ON RELAY# RAM FAILURE ON RNAC# RAM FAILURE ON		• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
PMU# CONFIGURATION FAULT ON RNAC# CONFIGURATION FAULT ON RELAY# CONFIGURATION FAULT ON CITY TIE CONFIGURATION FAULT ON SLC# CONFIGURATION FAULT ON DACT CONFIGURATION FAULT ON NIC CONFIGURATION FAULT ON	The expansion card has failed its check of configuration memory. The configuration settings are set to default values when this happens.	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the card using PC configuration software or the control unit menu • Functionally test the system.
SLOT# Not Registered ON *Module (Card) Type*	The control unit has not been set up to expect the card at the backplane slot #.	• Register the card if part of system configuration. • Remove primary and secondary power sources and then remove the module if not intended to be part of the configuration.
PMU# COMMUNICATION FAULT ON RNAC# COMMUNICATION FAULT ON RELAY# COMMUNICATION FAULT ON CITY TIE COMMUNICATION FAULT ON DACT COMMUNICATION FAULT ON NIC COMMUNICATION FAULT ON	The expansion card has failed to respond to commands from the Main Controller Board.	• Remove primary and secondary power sources • Review the configuration and verify cards are in the correct backplane slots. Make any necessary changes. • Re-apply primary and secondary power sources • Reconfigure the control unit using PC configuration software or the control unit menu • Functionally test the system.
DACT SESSION FAULT ON	A transmission of event status to the central station via the DACT has failed	• Enter the panel menu and review the DACT Events to determine if the line was busy, no answer, etc. • Address the reason for the failure listed in the menu. • Verify the phone line wiring is connected properly to a valid PSTN phone line. • Verify any in-line phones are properly wired and not in use. • Execute a DACT Test from the control unit menu • Functionally test the system
LINE FAULT CH1 LINE FAULT CH2	The DACT was unable to detect a valid phone line.	• Verify the phone line wiring is connected properly to a valid PSTN phone line. • Verify any in-line phones are properly wired and not in use. • Execute a DACT Test from the control unit menu • Functionally test the system

Table 7-5. Other Card-Related Events

MODEM INITIALIZATION FAULT	The DACT module could not initialize	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system • Replace the DACT if steps above are unsuccessful.
MODEM CONFIGURATION FAULT	The DACT module was unable to configure its modem chip	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system • Replace the DACT if steps above are unsuccessful.
CH1 COMMUNICATION FAULT : N# CH2 COMMUNICATION FAULT : N#	A networked control unit (N#) has failed to communicate on the specified channel 1 or 2	• Verify proper network wiring and connections between control units. • Ensure that network wiring is daisy-chained and not T-Tapped. • Check network wiring for excess resistance or capacitance. • Check node N# for any fault events associated with that node's NIC. • Confirm proper network settings on N# and the node reporting the fault • Correct parameters via the control-unit menu options or re-upload corrected configuration again
CH1 TOKEN NOT RECEIVED CH2 TOKEN NOT RECEIVED	The control unit is not receiving the network communication token, so it cannot transmit status events to other nodes.	• Verify proper network wiring and connections between control units. • Ensure that network wiring is daisy-chained and not T-Tapped. • Check network wiring for excess resistance or capacitance. • Check node N# for any fault events associated with that node's NIC • Check the configuration of other control units to be sure the node is in the node map • If the node is missing from the node map, use the panel menu option to add that node to the network. • If the node should not be in the node map, disconnect the wiring to/from the control unit and use the panel menu option to remove that node from the network.

Table 7-5. Other Card-Related Events

`CH1 UNMAPPED NODE FAULT : N#` `CH2 UNMAPPED NODE FAULT : N#`	A control unit with a node number that is not in the network node map (N#) is communicating.	• Check the configuration and the node map to be sure all connected nodes are included in the map as required by the installation. • If the unmapped node should be in the node map, use the panel menu option to add that node to the network. • If the node should not be in the node map, disconnect the wiring to/from the control unit and use the panel menu option to remove that node from the network.

Table 7-6. Remote-Display/Annunciator Events

Remote-Display/Annunciator Events		
Error Message	**Probable Cause**	**Corrective Action**
`RDCM`*`Addr`* `COMMUNICATION FAULT ON`	A communications fault between the Main Controller Board/User Interface and the RDCM at address *Addr*.	• Check the RS-485 wiring from Main Controller Board Terminal Block J8 to RDCM J8. Refer to Figure 2-41. • Check for a discontinuity in the RS-485 field wiring to RDCM (J8, IN-A, IN-B, OUT-A, and OUT-B. • Troubleshoot wiring to RDCM J8, Terminals IN-A, IN-B, OUT-A, and OUT-B, by breaking-up the circuits to isolate short circuit to specific leg or legs. • Check for 24 Vdc power at RDCM J4 (24 VDC PWR). • Check for duplicate addressed RDCMs. • Check for RS-485 termination resistor switch SW2 is activated.
`RDCM`*`Addr`* `NOT REGISTERED ON`	The control unit has not been set up to expect the RDCM at RDCM RS-485 circuit address *Addr*.	• Register the RDCM if part of system configuration. Refer to the Register Control/Display Module menu shown in Figure 3-31. • De-register the RDCM if not part of system configuration. Refer to the Register Control/Display Module menu shown in Figure 3-31. • Check the 24 Vdc power (J4, Terminals IN+ and IN-) and RS-485 communications wiring (J8, Terminals IN-A, IN-B, OUT-A, and OUT-B) from the control unit to the RDCM.

`RDCM`*`Addr`* `PSU HIGH VOLTAGE FAULT ON`
`RDCM`*`Addr`* `PSU LOW VOLTAGE FAULT ON`
`RDCM`*`Addr`* `PSU SUPERVISION FAULT ON`
	A loss of 24 Vdc power at J9, Terminals AUX-1 and AUX-2 or an open circuit in the RDCM's monitoring circuit from Aux. Power Output.	• Check for 24 Vdc power at RDCM, J8 Terminals IN-A and IN-B.
		• Check for trouble with third-party remote power supply

`RDCM`*`Addr`* `PSU DETECTED FAULT ON`	The module is configured to not supervise a Remote Power Supply but a short circuit is detected on the Remote PSU Supervision input terminals.	• Reconfigure the module to supervise a remote power supply –or- • Disconnect any input on the Remote Power Supply terminals of the RDCM
`RDCM`*`Addr`* `STUCK BUTTON FAULT ON`	Control unit has detected a double key press or a key is stuck in the “pressed” state.	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the module using PC configuration software or the control unit menu • Functionally test the system. • Replace the device if above procedures are unsuccessful.

Table 7-6. Remote-Display/Annunciator Events

Remote-Display/Annunciator Events		
Error Message	**Probable Cause**	**Corrective Action**
RDCM*Addr* CONFIGURATION FAULT ON	The RDCM has failed its check of configuration memory. The configuration settings are set to default values when this happens.	• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the module using PC configuration software or the control unit menu • Functionally test the system.
RDCM*Addr* PROGRAM MEMORY FAULT ON		• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system
LAM*Addr* COMMUNICATION FAULT ON	A communications fault between the Main Controller Board and the LAM at address *Addr*.	• Check the RS-485 wiring from Main Controller Board J8 to LAM Board J8. Refer to Figure 2-41. • Check for a discontinuity in the RS485 field wiring to LAM. • Troubleshoot wiring to LAM J8 by breaking-up the circuits to isolate short circuit to specific leg or legs. • Check for 24 Vdc power at LAM J6. • Ensure that the LAM's RS485 Termination Jumper W2 is set correctly. • Check for duplicate addressed LAMs.
LAM*Addr* NOT REGISTERED ON	The control unit has not been set up to expect the LAM at LAM RS485 circuit address *Addr*.	• Register the LAM if part of system configuration. • De-register the LAM if not part of system configuration. • Check the 24 Vdc power (J4) and RS485 communications (J8) wiring from the control unit to the LAM.
LAM*Addr* PSU HIGH VOLTAGE FAULT ON LAM*Addr* PSU LOW VOLTAGE FAULT ON LAM*Addr* PSU SUPERVISION FAULT ON	A problem with the 24 Vdc power at J6 or an open circuit in the LAM's monitoring circuit from J5 to the normally-closed trouble contacts of its associated remote power supply	• Check for 24 Vdc power at LAM Board J6. • Look for discontinuity in wiring from Terminals 3 and 4 to remote power supply trouble contacts. • Check for trouble with third-party remote power supply.
LAM*Addr* PSU DETECTED FAULT ON	The module is configured to not supervise a Remote Power Supply but a short circuit is detected on the PSU Supervision input terminals.	• Reconfigure the module to supervise a remote power supply –or- • Disconnect any input on the Remote Power Supply terminals of the LAM
LAM*Addr* RAM FAILURE ON		• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system

Table 7-6. Remote-Display/Annunciator Events

Remote-Display/Annunciator Events		
Error Message	**Probable Cause**	**Corrective Action**
`LAM`*`Addr`* `CONFIGURATION FAULT ON`		• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Reconfigure the module using PC configuration software or the control unit menu • Functionally test the system.
`LAM`*`Addr`* `PROGRAM MEMORY FAULT ON`		• Re-initialize the control unit by first removing, and then re-applying, primary and secondary power sources • Functionally test the system

Table 7-7. ATM Events

ATM Events		
Error Message	**Probable Cause**	**Corrective Action**
`ATMAddr Acknowledge Input Fault ON`	An open circuit in wiring from the ATML's	• "Acknowledge" input terminal to the associated annunciator's acknowledge switch. ATM-L address is Addr. • Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to acknowledge switch. • Check for missing 10k end-of-line resistor.
`ATMAddr Communication Fault ON`	A communications fault between the main printed circuit board and the ATM at address Addr.	• Check the RS-485 wiring from main printed circuit board Terminal Block TB15 to ATM Terminal Blocks TB1 and TB2. Refer to Figure 2-41. • Check for a discontinuity in the RS-485 field wiring (Terminal Blocks TB1 and TB2). • Troubleshoot wiring to ATM Terminal Blocks TB1 and TB2 by breaking-up the circuits to isolate short circuit to specific leg or legs. • Check for 24 Vdc power at ATM Terminal Block TB3. • Ensure that the ATM's RS-485 Termination Jumper W1 is set correctly • Ensure that the ATM Address Switch S1 is set correctly. • Refer to ATM Installation Manual, P/N 06-236179-002
`ATMAddr Drill Input Fault ON`	An open circuit in wiring from the ATML's "Drill" input terminal to the associated annunciator's drill switch. ATM-L address is Addr.	• Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to drill switch. • Check for missing 10k end-of-line resistor.
`ATMAddr Monitored Output Fault ON`	An open circuit in any connection from the ATM to the LEDs (ATM-L) or relays (ATM-R) being driven.	• Check for 24 Vdc power at LAM Board J6. • Look for discontinuity in wiring from Terminals 3 and 4 to remote power supply trouble contacts. • Check for trouble with third-party remote power supply.

Table 7-7. ATM Events

ATM Events		
Error Message	**Probable Cause**	**Corrective Action**
`ATMAddr Not Registered ON`	The control unit has not been set up to expect the ATM at ATM RS-485 circuit address Addr.	• Register the ATM if part of system configuration. See Paragraph . This procedure is insufficient. The following procedure must also be conducted. • Upload a new application program that includes the previously unregistered ATM. • De-register the ATM if not part of system configuration. See Section 3-2.5.2.4.55. • Check the 24 Vdc power (Terminal Block TB3)and RS-485 communications wiring (Terminal Blocks TB1 and TB2) from the control unit to the ATM • Ensure that the ATM Address Switch S1 is set correctly. • Refer to ATM Installation Manual, P/N 06-236179-002.
`ATMAddr PSU Fault ON`	A loss of 24 Vdc power at Terminal Block TB3 or an open circuit in the monitoring circuit from the ATM's "PS Flt" and "Com" terminals to the normally-closed trouble contacts of its associated remote power supply	• Refer to ATM Installation Manual, P/N 06-236179-002. • Check for 24 Vdc power at ATM Terminal Block TB3. • Look for discontinuity in wiring to remote-power-supply trouble contacts. Jumper these terminals if you are using the ARIES NET*Link* Control Unit to power the ATM. • Check for trouble with third-party remote power supply.
`ATMAddr Reset Input Fault ON`	An open circuit in wiring from the ATML's "Reset" input terminal to the associated annunciator's reset switch. ATM-L address is Addr.	• Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to reset switch • Check for missing 10k end-of-line resistor.
`ATMAddr Silence Input Fault ON`	An open circuit in wiring from the ATML's "Silence" input terminal to the associated annunciator's alarm-silence switch. ATM-L address is Addr.	• Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to alarm-silence switch • Check for missing 10k end-of-line resistor.
`ATMAddr Silenced Output Fault ON`	An open circuit in wiring from the ATML's "Silence" output terminal to the associated annunciator's alarm-silence LED. ATM-L address is Addr.	• Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to alarm-silence LED (if used) • Check for missing 20k supervising resistor if alarm-silence LED not used

Table 7-7. ATM Events

ATM Events		
Error Message	**Probable Cause**	**Corrective Action**
`ATMAddr Test Lamps Input Fault ON`	An open circuit in wiring from the ATML's Lamp Test" input terminal to the associated annunciator's lamp-test.	• Refer to ATM Installation Manual, P/N 06-236179-002. • Look for discontinuity in wiring to lamp-test switch • Check for missing 10k end-of-line resistor

CHAPTER 8
PARTS LIST

8-1 AVAILABLE PARTS

Refer to Table 8-1 below for descriptions and part numbers of available parts for the ARIES NET*Link*™ control unit. Note that all parts may not be available for purchase for the life of the product.

Systems and Options:

Category	Part Number	Part Name
ARIES NET*Link* Systems	76-800100-001	ARIES NET*Link* 3-Tiered Control Unit (includes Main Controller Board with Keypad/Display, 5.4A Power Supply and Power Management Unit Board)
	76-800200-001	ARIES NET*Link* 2-Tiered Control Unit (includes Main Controller Board with Keypad/Display, 5.4A Power Supply and Power Management Unit Board)
	76-800101-002	ARIES NET*Link* 3-Tiered Control Unit, Canadian Application (includes Main Controller Board with Keypad/Display, 5.4A Power Supply, Power Management Unit Board and Dead Front Cover -- with integrated LED Annunciator Module)
	76-800201-002	ARIES NET*Link* 2-Tiered Control Unit, Canadian Application (includes Main Controller Board with Keypad/Display, 5.4A Power Supply, Power Management Unit Board and Dead Front Cover -- with integrated LED Annunciator Module)
	76-800102-001	City of Chicago ARIES NET*Link* Kit (consists of ARIES NET*Link* 3-Tiered Control Unit, City of Chicago Dead Front Cover, City of Chicago Stand-Alone Control Box and mounting hardware)
	76-800202-001	City of Chicago ARIES NET*Link* Kit (consists of ARIES NET*Link* 2-Tiered Control Unit, City of Chicago Dead Front Cover, City of Chicago Stand-Alone Control Box and mounting hardware)
Expansion Enclosures	76-800100-003	3-Tiered Expansion Enclosure (without window)
	76-800200-003	2-Tiered Expansion Enclosure (without window)
Enclosure Trim Rings	76-800100-004	Trim Ring for 3-Tiered Main and Expansion Enclosures
	76-800200-004	Trim Ring for 2-Tiered Main and Expansion Enclosures
	76-800300-004	Trim Ring for Remote Enclosure (for RDCM or R-LAM)
Expansion Cards	76-800011-001	SLC Card (adds 1 SLC)
	76-800012-001	Relay Card
	76-800013-001	Release-Notification Appliance Circuit (R-NAC) Card
	76-800016-001	City Tie Card
	76-800015-001	Digital Alarm Communicator Transmitter (DACT) Card
	76-800017-001	Internet Communications Module (ICM) Card
	76-800014-001	Network Interface (NIC) Card
	89-300014-001	Intelligent Interface Module (IIM) Card, with modem
	89-300015-001	Intelligent Interface Module (IIM) Card, without modem

Spare Parts:

Category	Part Number	Part Name
Expansion Card Cage	76-800010-001	Expansion Card Cage Assembly (includes Backplane Board, Bracket and hardware kit with cables)
	76-800010-002	Expansion Backplane Board
Remote Annunciators / Modules	76-800300-001	Remote Display Control Module (RDCM), with enclosure
	76-800300-002	Remote LED Annunciator Module (R-LAM), with enclosure
	76-200004-032	Model ATM-L LED Driver Module
	76-200005-032	Model ATM-R Relay Driver Module
External Modules	76-800300-005	Fiber Optic Converter Module, Multi-mode, with enclosure (single channel)
	76-800300-006	Fiber Optic Converter Module, Single-mode, with enclosure (single channel)
	76-800300-015	Fiber Optic Converter Module Add-On Channel, Multi-mode
	76-800300-016	Fiber Optic Converter Module Add-On Channel, Single-mode
Replacement Enclosures and Covers	76-800100-101	ARIES NET*Link* 3-Tiered Spare Main Enclosure
	76-800200-101	ARIES NET*Link* 2-Tiered Spare Main Enclosure
	76-800101-101	ARIES NET*Link* 3-Tiered Spare Main Enclosure, Canadian Application -- with window for integrated LED Annunciator Module (Dead Front Cover may be ordered separately, if needed.)
	76-800201-101	ARIES NET*Link* 2-Tiered Spare Main Enclosure, Canadian Application -- with window for integrated LED Annunciator Module (Dead Front Cover may be ordered separately, if needed.)
	76-800101-005	Dead Front Cover for ARIES NET*Link* 3-Tiered Main Enclosure (for Canadian and City of Chicago Applications)
	76-800201-005	Dead Front Cover for ARIES NET*Link* 2-Tiered Main Enclosure (for Canadian and City of Chicago Applications)
	76-800300-101	Replacement Remote Enclosure (fits either Remote Display Control Module (RDCM) or Remote LED Annunciator Module (R-LAM)
MCB & Keypad / Display	76-800020-001	Main Controller Board Assembly w/ Keypad/Display and mounting hardware
	76-800020-002	Replacement Keypad/Display Assembly
	76-800020-003	Replacement LED Annunciator (LAM) PCB Assembly
	-	Maxell CR1220 3V Lithium Cell Battery * (for MCB Real Time Clock)
	-	Panasonic BR1220 3V Lithium Cell Battery * (for MCB Real Time Clock)
	-	Renata CR1220 MFR 3V Lithium Cell Battery * (for MCB Real Time Clock)

*** Note**: 3V Lithium cell batteries to be purchased from a retail store or supplier.

Spare Parts (continued):

Category	Part Number	Part Name
Power Supplies and Standby Batteries	76-800030-002	Expansion Power Supply, 5.4 A (with wiring harness to PMU Board)
	76-800030-001	Replacement Power Supply, 5.4 A (without wiring harness to PMU Board)
	76-800030-004	Power Management Unit (PMU) Board
	76-800030-005	Power Supply Assembly Mounting Bracket
	76-800030-003	Add-on Power Supply/PMU Assembly (includes 1 Power Supply, PMU Board, Bracket and mounting hardware -- for mounting in Tier #2 or Tier #3 of Main Enclosure or for mounting in any tier of Expansion Enclosure)
	76-800030-007	Replacement Fuse Kit for PMU Board
	PS-8-LP	Eaton Wheelock POWERPATH PS-8-LP NAC Power Supply
	PS-EXP	PS-EXP Expansion Module for PS-8-LP
	06-115915-013	Battery, 12 Vdc, 7-AH (order 2 for 24V)
	06-115915-047	Battery, 12 Vdc, 12-AH (order 2 for 24V)
	06-115915-046	Battery, 12 Vdc, 17/18-AH (order 2 for 24V)
	89-100052-001	Battery, 12 Vdc, 35-AH (order 2 for 24V - requires Large Capacity Battery Cabinet)
	76-100010-001	Large Capacity Battery Cabinet, Red
	76-800030-006	Battery Tray (fits on bottom tier of Main or Expansion Enclosures-provides access to bottom knockouts)
Misc.	76-800000-001	Installation Hardware, universal
	76-800000-006	Inter-Cabinet Harness Kit (for expansion enclosure)
	76-800000-005	Bezel for Enclosure Door (fits both Main Enclosures)
	76-800000-002	Plexiglass Window, standard
	76-800000-003	Plexiglass Window, for use with integrated LED Annunciator
	06-220314-001	Spare Lockset/Key for 3-Tiered and 2-Tiered Main and Expansion Enclosures
	06-220314-002	Spare Lockset/Key for Large Capacity Battery Cabinet
	06-129924-001	Spare Lockset/Key for Remote Enclosure
	76-800400-001	PEGAsys Control Unit Retrofit Kit (Includes ARIES NET*Link* MCB hardware mounting frame, bracket, compatible door and installation hardware)
	70-411001-005	EOL Resistor Kit, 10 K, 0.5 W, package of 10
	76-800000-004	In-Line Releasing Device (used for CLASS-A Power-Limited Solenoid-Based Releasing Devices)
	06-220023-001	In-Line Releasing Device (used for CLASS-B Power-Limited Actuator-Based and Solenoid-Based Releasing Devices)
	06-220297-001	EOL Module, RS485 Circuit (terminates up to four Expansion Card Cages)
	76-800500-001	City of Chicago Stand-Alone Control Box
	10000071	USB Isolator (For use with USB Upload/Download Cable, connects PC to panel USB J6 port)

Category	Part Number	Part Name
Misc. (continued)	84-878752-010	Suppression Abort Station (requires a Model AI Addressable Monitor Module)
	84-878752-110	Abort Station for applications that require compliance to ULC S527-11, 3rd edition requirements. Includes blue faceplate, raised white letters and yellow push button. Order back box (PN 06-236881-001) and N.O. Model AI (PN 70-407008-001) separately.
	76-800600-101	Canadian Releasing Service Signal Silence Station (includes Faceplate with Key Switch and Identification Label, Backbox, N.O. Model AI Addressable Monitor Module with bracket and installation hardware)
	SIGA-DMP	Duct Mounting Plate for DS-PS Photoelectric Smoke Detector
	2-SPRC1	Replacement Smoke Chamber for DS-PS Photoelectric Smoke Detector
	85-100000-100	Control Head Monitor for monitoring of control head placement (requires AI Module)
Handheld Programmer	70-600000-100	SmartOne Handheld Device Programmer, complete with accessories (includes DS Series Detector Programming Adapter, SLC Interface Adapter, AC Adapter (120 VAC), AI/AO Module Adapter, 4 NiMH AA Rechargeable Batteries and Storage Case)
	70-600000-101	SmartOne Handheld Device Programmer (includes SLC Interface Adapter and Quick Reference Guide only). Does not include DS Series Programming Adapter, Batteries or Storage Case
	70-600000-110	DS Series Programming Adapter
	06-220197-001	SmartOne Handheld Device Programmer Accessory Kit (includes SLC Interface Adapter, AC Adapter (120 VAC) and AI/AO Adapter)
	06-118577-001	SmartOne Handheld Device Programmer AC Adapter (240 VAC)

Devices:

Category	Part Number	Part Name
SLC Devices	DS-PS	Intelligent SmartOne Protocol Photoelectric Smoke Detector, head only
	DS-HFS	Intelligent SmartOne Protocol 135°F (57°C) Fixed- Temperature Heat Detector, head only
	DS-SB	Standard Base for DS Series Detectors
	DS-RB	Relay Base for DS Series Detectors
	70-402001-100	SmartOne Ionization Smoke Detector, Model CPD-7052
	71-402001-100	SmartOne Photoelectric Smoke Detector, Model PSD-7152
	70-404001-100	SmartOne Thermal Detector, Model THD-7252
	70-400001-100	SmartOne Flanged Universal Detector Base, Model 6SB (for CPD-7052, PSD-7152 and THD-7252)
	70-400001-101	SmartOne Flangeless Universal Detector Base, Model 4SB (for CPD-7052, PSD-7152 and THD-7252)
	70-400001-200	SmartOne Detector Base Adapter, Model MA-002
	70-403001-152	SmartOne Duct Housing w/Photo. Detector, Model DH-2000PSDI
	70-403001-052	SmartOne Duct Housing w/Ionization Detector, Model DH-2000CPDI
	70-403001-100	SmartOne Duct Housing Assembly, without Detector
	77-297101-000	ORION-XT High Sensitivity Smoke Detector
	33-30671A	ASD-160H Small-Area Air Sampling Detector w/Docking Station
	33-30760A	ASD-160H Small-Area Air Sampling Detector w/Docking Station and Input Relay Card
	33-30672A	ASD-320 Medium-Area Air Sampling Detector w/Docking Station
	33-30764A	ASD-320 Medium Area Air Sampling Detector w/Docking Station and Input Relay Card
	33-30621A	ASD-640 Large-Area Air Sampling Detector in molded plastic case
	33-30620A	ASD-640 Large-Area Air Sampling Detector with Command Module in molded plastic case
	33-30706A	ASD-640 Large-Area Air Sampling Detector in steel case
	33-30707A	ASD-640 Large-Area Air Sampling Detector with Command Module in steel case
	33-30710A	ASD-640 Large-Area Air Sampling Detector with Minimum Display in steel case
	33-30624A	Stand-Alone Command Module in molded plastic case
	33-30709A	Stand-Alone Command Module in steel case
	70-407008-001	SmartOne Addressable Monitor Module (for N/O initiating devices), Model AI
	70-407008-002	SmartOne Addressable Monitor Module (for N/C initiating devices) Model AI
	70-407018-001	SmartOne Addressable Monitor Module (for N/O initiating devices), Model AI, non-silicone
	73-100001-003	SmartOne AlarmLine Addressable Linear Heat Detector Module, Model AAM
	70-408004-001	SmartOne Addressable Relay/Control Module, Model AO
	70-408014-001	SmartOne Addressable Relay/Control Module, Model AO, non-silicone
	70-200200-003	SmartOne Addressable Signal Module, Model ASM

Category	Part Number	Part Name
SLC Devices (continued)	70-200200-004	SmartOne Addressable Signal Module, Model ASM-6SB
	70-600000-001	SmartOne Remote Releasing Module, w/standard mounting bracket
	70-600000-002	SmartOne Remote Releasing Module, w/cabinet mounting bracket
	84-330002-001	Kidde 3300 Addressable Dual Action Pull Station with integral SmartOne AI Module
	74-200012-002	Loop Isolator Module, standard
	74-200012-004	Loop Isolator Module (on 6SB detector base)
	77-297103-000	PEGAsys Addressable Loop Module (PALM) for ORION XT detector
	76-333002-001	SmartOne AIR-Intelligence Addressable Protocol Interface Card (APIC)
	84-878752-010	Suppression Abort Station (requires a Model AI Addressable Monitor Module)

APPENDIX A
BATTERY AND POWER SUPPLY CALCULATIONS

A-1 CALCULATING THE STANDBY BATTERIES

Enter the system operating current and alarm load using the worksheet provided below in Table A-1. These values will be used to calculate required standby battery capacity.

Table A-1. Current and Alarm Load Worksheet

Unit Description	Qty	Unit Standby Current (A)	Unit Alarm Current (A)	Total Standby Current	Total Alarm Current
ARIES NET*Link*™ Components:					
MCB (with Keypad/Display)		0.1583	0.300		
PMU Board		0.070	0.090		
Integrated LED Annunciator (Canadian)		0.032	0.0684		
RS485 External Modules:					
Remote Display Control Module		0.0895	0.0909		
Remote LED Annunciator Module		0.032	0.0684		
Model ATM-L Driver Module		0.0450	0.0450		
LEDs *		-	0.0120		
Model ATM-R Driver Module		0.0450	0.0450		
Relays *		-	0.0250		
Fiber-Optic Converter Module (Single Mode)		0.0380	0.0380		
Fiber-Optic Converter Module (Multi Mode)		0.0369	0.0369		
Expansion Cards:					
Signaling Line Circuit (SLC)		0.0459	0.0459		
R-NAC		0.0207	0.1325		
Relay		0.012	0.0796		
City Tie		0.0128	0.0306		
DACT		0.0240	0.0370		
ICM		0.0420	0.0420		
NIC		0.0630	0.0630		
SLC Devices:					
DS-PS		0.000150	0.000220		
DS-HFS		0.000150	0.000220		
PSD-7152		0.000405	0.000445		
CPD-7052		0.000400	0.000440		
THD-7252		0.000400	0.000440		
DH-2000 PSDI		0.000405	0.000445		
DH-2000 CPDI		0.000400	0.000440		
N/O AI		0.000580	0.000580		
N/C AI		0.000580	0.000580		
AAM		0.000450	0.000450		
AO		0.000500	0.000500		
ASM		0.000500	0.000500		
ASM-6SB		0.000500	0.000500		
Single-gang Isolator		-	0.007	-	
Det.-base Isolator		-	0.007	-	
RRM		0.000410	0.000410		
PALM		0.000450	0.000450		
APIC		0.000100	0.000100		

Table A-1. Current and Alarm Load Worksheet (Continued)

Unit Description	Qty	Unit Standby Current (A)	Unit Alarm Current (A)	Total Standby Current	Total Alarm Current
Solenoid-Based Devices:	**Note**: Must be used in conjunction with Microswitches 87-120039-001, 87-120039-501 or 87-120047-001 for momentary operation.				
890181 (WK-890181-000), Momentary “On”		-	-	-	-
895630 (81-895630-000), Momentary “On”		-	-	-	-
899175 (WK-899175-900), Momentary “On”		-	-	-	-
87-120099-001 (Momentary “On”)		-	-	-	-
87-120099-002 (Momentary “On”)		-	-	-	-
87-120099-600 (Momentary “On”)		-	-	-	-
87-120099-602 (Momentary “On”)		-	-	-	-
93-487100-001 (Momentary “On”)		-	-	-	-
486500-01 (82-486500-010)		-	0.240	-	-
06-118329-001		-	0.225	-	-
06-118384-001		-	0.520	-	-
38-509834-001		-	0.632	-	-
38-509837-001		-	0.400	-	-
81-100000-001		-	0.44	-	-
897494-000 (WK-897494-000)		-	1.500	-	-
897494-530 (WK-897494-530)		-	1.500	-	-
Marioff 3-101-46A/2 (D21070), Standard		-	0.920	-	-
FM Release Panel Group 3 Solenoid Valve, 22W		-	0.915	-	-
Actuator-Based Devices:*	**Note**: The firing current of “Momentary On” actuator devices will be 2.5 A.				
93-002009-004 (Momentary “On”)		-	-	-	-
31-199932-004 (Momentary “On”)		-	-	-	-
31-199932-012 (Momentary “On”)		-	-	-	-
93-191001-001 (Momentary “On”)		-	-	-	-
Notification Appliances: (enter below)					
PMU Auxiliary Out Use: (enter below)					
ENTER TOTAL STANDBY CURRENT (Sum of column):					
ENTER TOTAL ALARM CURRENT (Sum of column):					

* Typical currents only. Refer to specific product information sheets.

Table A-1. Current and Alarm Load Worksheet (Continued)

Calculations:

REFERRING TO TABLE A-2, ENTER **STANDBY TIME REQUIRED** (in hours): ______
REFERRING TO TABLE A-2, ENTER **ALARM TIME REQUIRED** (in minutes): ______
CONVERT **ALARM TIME REQUIRED** TO HOURS (using formula below): (minutes)/60 = ______hours
CALCULATE **TOTAL AMPERE HOURS** (using formula below): **((TOTAL STANDBY CURRENT) x (STANDBY TIME REQUIRED** in hours)) + **((TOTAL ALARM CURRENT x ALARM TIME REQUIRED** in hours)) = ______**TOTAL AMPERE HOURS**
CALCULATE **BATTERY CAPACITY** WITH A DE-RATING FACTOR OF 20% (using formula below): **1.2 x TOTAL AMPERE HOURS** = ______**BATTERY CAPACITY**
REFERRING TO TABLES A-3 AND A-4, DETERMINE **NUMBER OF POWER SUPPLIES NEEDED:** NOTE: If **TOTAL ALARM CURRENT** > 5.4 A, then 2 or more PSUs are required.

Table A-2. Duration Times for Standby and Alarm

Type of System	**Standby**	**Alarm**
Local Fire Alarm Systems per NFPA 72	24 hours	5 minutes
Clean Agent Suppression Systems per NFPA 12, 12A, 12B, and 2001	24 hours	5 minutes
Deluge or Pre-Action Water Spray Systems per Factory Mutual	90 hours	10 minutes

Note: ARIES NET*Link* systems must comply with Table A-2 in order to satisfy UL and FM requirements.

The maximum battery capacity that can be charged per UL 864, ULC S527-11 and FM requirements is 165-AH, which should be de-rated per applicable country, NFPA code and local requirements.

A-2 EXAMPLE

An example is shown below which uses the worksheet provided in Table A-1 (entries shown in red):

Unit Description	Qty	Unit Standby Current (A)	Unit Alarm Current (A)	Total Standby Current	Total Alarm Current
ARIES NET*Link* Components:					
MCB (with Keypad/Display)	**1**	0.158	0.300	**0.158**	**0.300**
PMU Board	**1**	0.070	0.090	**0.070**	**0.090**
Expansion Cards:					
R-NAC	**1**	0.021	0.1325	**0.021**	**0.1325**
Relay	**2**	0.012	0.0796	**0.024**	**0.160**
DACT	**1**	0.024	0.037	**0.024**	**0.037**
ICM	**1**	0.042	0.042	**0.042**	**0.042**
SLC Devices:					
PSD-7152	**12**	0.000405	0.000445	**0.005**	**0.005**
Solenoid-Based Devices:					
897494-000	**1**	-	1.500	-	**1.5**
897494-530	**2**	-	1.500	-	**3.0**
Notification Appliances:* (enter below)					
NS-24MC (w/110 cd)	**30**	-	**0.174**	-	**5.22**
ENTER TOTAL STANDBY CURRENT (Sum of column)=				**0.344**	
ENTER TOTAL ALARM CURRENT (Sum of column)=					**10.487**

Calculations:

REFERRING TO TABLE A-2, ENTER **STANDBY TIME REQUIRED** (in hours) = **24** hours
REFERRING TO TABLE A-2, ENTER **ALARM TIME REQUIRED** (in minutes) = **5** mins.
CONVERT **ALARM TIME REQUIRED** TO HOURS (using formula below): (minutes)/60 = **0.083** hours
CALCULATE **TOTAL AMPERE HOURS** (using formula below): **((TOTAL STANDBY CURRENT) x (STANDBY TIME REQUIRED** in hours)) + **((TOTAL ALARM CURRENT x ALARM TIME REQUIRED** in hours)) = _____**TOTAL AMPERE HOURS** **(0.344 x 24) + (10.487 x 0.083) =** **8.256 + 0.870 = 9.126** Ampere Hours
CALCULATE **BATTERY CAPACITY** WITH A DE-RATING FACTOR OF 20% (using formula below): **1.2 x 9.126 AH** = **10.951 AH BATTERY CAPACITY** = **12-AH** Batteries
REFERRING TO TABLES A-3 AND A-4, DETERMINE **NUMBER OF POWER SUPPLIES NEEDED:** NOTE: If **TOTAL ALARM CURRENT** > 5.4 A, then 2 or more PSUs are required. **10.487 A > 5.4 A = 2** PSUs required

A-3 CALCULATING POWER SUPPLY NEEDS

Use Tables A-3 through A-4 to determine power supply configuration needs.

Table A-3. Minimum Power Supply Requirements for 3-Tiered Enclosure

Number of Power Supply Units	Charging Current Available	Total Alarm Current
1	4 A	5.4 A
2	8.9 A	10.8 A
3	8.9 A	12 A
4	8.9 A	16 A
5	8.9 A	20 A (17 A)*
6	8.9 A	20 A (17 A)*

Note: Amount of current with dead front cover in place shown in parentheses.

Table A-4. Minimum Power Supply Requirements for 2-Tiered Enclosure

Number of Power Supply Units	Charging Current Available	Total Alarm Current
1	4 A	5.4 A
2	8.9 A	10.8 A
3	8.9 A	15 A (11 A)*
4	8.9 A	15 A (11 A)*

Note: Amount of current with dead front cover in place shown in parentheses.

A-4 FOR INSTALLATIONS IN CANADA

For panels installed in Canada, the charger must replace 80-percent of the used battery capacity within 24 hours per ULC S527-11.

Referring to our earlier example, since the total ampere hours of battery to be used is equal to 9.126, the system's PSUs must re-charge 9.126 x 0.80 AH (7.30 AH) back into the battery within 24 hours for compliance with ULC S527-11. In our example, which includes two power supply units, the available charging current is equal to 8A maximum. Therefore, the system can supply 8A for 24 hours or 192-AH and will exceed ULC requirements.

A-5 CALCULATING MAXIMUM LOAD FOR MULTIPLE POWER SUPPLY UNITS IN ONE ENCLOSURE

At a nominal operating temperature range of 32 to 120 °F (0 to 49 °C), the installer needs to be aware of power supply limitations which occur when **three or more** PSU's are present in a 3-Tiered or 2-Tiered Enclosure. After system installation, the maximum Alarm current load for the entire system should be tested to verify that the power supplies are de-rated according to Tables A-5 through A-8:

Table A-5. Power Supply Limitations for 3-Tiered Enclosure

Number of Power Supply Units Inside Enclosure	Maximum Alarm Current for Enclosure
1 to 2	5.4 Amps per PSU
3 to 4	4 Amps per PSU
5 to 6	Not to exceed 20 Amps for entire enclosure*

Table A-6. Power Supply Limitations for 3-Tiered Enclosure with Dead Front Cover

Number of Power Supply Units Inside Enclosure	Maximum Alarm Current for Enclosure
1 to 2	5.4 Amps per PSU
3 to 4	4 Amps per PSU
5 to 6	Not to exceed 17 Amps for entire enclosure*

Table A-7. Power Supply Limitations for 2-Tiered Enclosure

Number of Power Supply Units Inside Enclosure	Maximum Alarm Current for Enclosure
1 to 2	5.4 Amps per PSU
3 to 4	Not to exceed 15 Amps for entire enclosure*

Table A-8. Power Supply Limitations for 2-Tiered Enclosure with Dead Front Cover

Number of Power Supply Units Inside Enclosure	Maximum Alarm Current for Enclosure
1 to 2	5.4 Amps per PSU
3 to 4	Not to exceed 11 Amps for entire enclosure*

* NOTE: Maximum current load cannot exceed 4 Amps for an individual PSU.

APPENDIX B
WIRING AND CONFIGURATION REQUIREMENTS FOR SIGNALING LINE CIRCUITS

B-1 SLC WIRING AND CONFIGURATION SUMMARY

The SLC loop shall be designed, configured and installed per the requirements in this appendix. This appendix describes how to calculate required information, and provides guidance and examples of wiring recommendations.

The requirements for each loop are:

- Maximum Number of Output Modules To Be Activated Within 10 Secs, calculated as described in Section B-2
- Maximum SLC Loop Resistance: 40 Ohms
- Maximum SLC Conductor-to-Conductor Capacitance: 0.5 μf
- Maximum SLC Loop Capacitance to Earth Ground: 0.5 μf

B-2 USE OF OUTPUT MODULES ON SIGNALING LINE CIRCUIT

Please use the configurations and rules of this section to ensure compliance with UL 864 Clause 33.1.2, which requires that an alarm or supervisory event should cause all associated outputs and countdown functions to become active within 10 seconds of the event.

B-2.1 Calculating Output Activation Time

Table B-2 details the maximum number of devices that can be activated in ten seconds for a stand-alone panel.

Table B-3 provides similar information for networked panels. In networked applications, when a node has outputs on multiple SLC loops, the output activation formula shown below must be used to calculate the number of outputs that can activate within 10 seconds.

Output activation time = 2.26 + (0.54 x N) + (1.6 x G) + (0.1 x (L-1)) + ppA

Where:

N = the number of individual outputs <u>not assigned to a group</u> (ASMs, AOs, RRMs and detector bases containing relays)

G = the number of Output and Releasing Groups

L = the number of SLC loops on this node

ppA = a constant based on the number of nodes in the network (see Table B-1 below)

Note: When determining the number of outputs (N) and the number of groups (G), only consider those that are going to be programmed to activate on the initiating alarm or supervisory. Outputs that are not associated with the initiating alarm or supervisory do not need to be counted. However, the number of loops on a node and the number of nodes on a network always need to be counted.

Table B-1. ppA Factor per Number of Nodes

Number of nodes	ppA Factor
stand-alone	0
up to 4 nodes	0.321
5 to 8 nodes	0.495
9 to 12 nodes	0.687
13 to 16 nodes	0.895
17 to 20 nodes	1.120
21 to 24 nodes	1.361
25 to 28 nodes	1.619
29 to 32 nodes	1.894
33 to 36 nodes	2.186
37 to 40 nodes	2.494
41 to 44 nodes	2.819
45 to 48 nodes	3.160
49 to 52 nodes	3.518
53 to 56 nodes	3.893
57 to 60 nodes	4.284
61 to 64 nodes	4.693

B-3 USE OF GROUPING

- Grouping can be used to shorten output activation time.
- Devices are assigned to a group of up to twenty (20) devices that activate simultaneously.
- There are two types of groups:
  - Releasing Groups support only RRMs.
  - Output Groups support only AOs and ASMs.
- Seven (7) Releasing Groups and seven (7) Output Groups are supported per node.
- When spreading outputs across multiple SLC loops, the number of outputs activating within ten seconds can be increased. Design the system so that all outputs within a group reside on the same SLC loop. If it is not possible to keep all devices within a group on the same loop, include that group in the timing calculation for all SLC loops where devices within that group reside.

Table B-2. Configurations For Standard-Alone (Non-Networked) Panels

Panel/System Configuration	Devices Grouped	Maximum Number of Output Modules and Groups
Stand-Alone Panel with all Output Modules on a Single SLC	No	14 individual modules
Stand-Alone Panel with all Output Modules on a Single SLC	Yes	82 modules (using 4 groups plus 2 individual outputs)
Stand-Alone Panel with Output Modules on Multiple SLCs	No	# of individual output modules per SLC = (7.74 - (# of SLC loops -1) x 0.1) / 0.54 Example: For 8 loops, there are 13 modules per loop, 104 individual modules for 8 loops.
Stand-Alone Panel with Output Modules on Multiple SLCs	Yes	Time to activate N individual modules and G grouped modules on each SLC within a system with L SLC loops is = 2.26 +0.54xN +1.6xG + Lx0.1

For networked systems, the number of devices that can be activated within ten seconds of alarm initiation varies as shown in the table below:

Table B-3. Configuration for Networked Panels with Grouped Output Modules

Configuration of Outputs	Number of Nodes	Devices Grouped	Maximum Number of Output Modules and Groups
All Output Modules are on a Single SLC	2 to 8	No	13 individual modules
All Output Modules are on a Single SLC	2 to 8	Yes	81 modules (using 4 groups plus 1 individual output)
Output Modules are on Multiple SLCs	2 to 8	No	# of individual output modules per SLC = (7.74-(L-1)x0.1-ppA)/0.54 For 8 SLCs = 96 individual modules
All Output Modules are on a Single SLC	9 to 12	No	13 individual modules
All Output Modules are on a Single SLC	9 to 12	Yes	81 modules (using 4 groups plus 1 individual output)
Output Modules are on Multiple SLCs	9 to 12	No	# of individual output modules per SLC = (7.74-(L-1)x0.1-ppA)/0.54 For 8 SLCs = 88 individual modules
All Output Modules are on a Single SLC	13 to 16	No	12 individual modules
All Output Modules are on a Single SLC	13 to 16	Yes	80 modules (using 4 groups)
Output Modules are on Multiple SLCs	13 to 16	No	# of individual output modules per SLC = (7.74-(L-1)x0.1-ppA)/0.54 For 8 SLCs = 80 individual modules
…	…	…	…
Output Modules are on Multiple SLCs	Any #	No	# of individual output modules per SLC = (7.74-(L-1)x0.1-ppA)/0.54
Output Modules are on Multiple SLCs	Any #	Yes	Time to activate N individual modules and G grouped modules on each SLC within a system with L SLC cards = 2.26+0.54xN+1.6xG+(L-1)x0.1+ppA

B-4 RECOMMENDED WIRE TYPES

All SLC wiring must be twisted, unshielded, low-capacitance, fire-alarm wire. For best results, use wiring with a nominal conductor-to-conductor capacitance of approximately 20 picofarads (or 20 x 10^{-12} farads) per foot. Typical wire types that meet these criteria are indicated in Table B-4, Table B-5, Table B-6 and Table B-7.

The use of shielded wire is not allowed except for very short runs or splices in total not exceeding 200 feet on any SLC loop. This length excludes any shielded wire that may have been used for the IDC, NAC, 24 VDC power circuits, release, trouble input circuits field wiring of AIs, ASMs and RRMs.

If using shielded wire on the AI, ASM and RRM external circuits including the IDC, NAC, 24 VDC Power circuits, release or trouble input circuits, this field wiring shall be limited to 50 feet per AI, ASM and RRM module. When multiple modules on the same SLC loop are using shielded field wire on circuits other than the SLC, the total combined shielded field wire (non-SLC) on all modules must not exceed 200 feet.

Table B-4. Typical Wire Types - 18 AWG

Manufacturer	Part Number	Rating	Conductor-to-Conductor Capacitance (pf/ft.)
Atlas Wire and Cable Corp.	228-18-1-1TP	FPL	12.5
West Penn Wire	D980	FPL	16.0
West Penn Wire	60980B	FPLP	29.0
Coleman Cable	98181	FPL	19.0
Coleman Cable	98820	FPLR	26.0
Clifford of Vermont, Inc.	1P18 B1 FPL-M	FPL	15.0
Comtran Corporation	4184	FPLR	20.0
Belden Wire and Cable Co.	5320UJ	FPL	12.5
Belden Wire and Cable Co.	9571	FPLR	22.0
Belden Wire and Cable Co.	6320UJ	FPLP	25.0
BSCC	341802E	FPLP	25.0
Genesis Cable Systems	4050	FPL	15.0
Genesis Cable Systems	4431	FPLR	15.0
Genesis Cable Systems	4631	FPLP	16.0

Table B-5. Typical Wire Types - 16 AWG

Manufacturer	Part Number	Rating	Conductor-to-Conductor Capacitance (pf/ft.)
Atlas Wire and Cable Corp.	228-16-1-1TP	FPL	12.5
West Penn Wire	D990	FPL	18.0
Coleman Cable	98161	FPL	20.0
Coleman Cable	98620	FPLR	27.0
Clifford of Vermont, Inc.	1P16 B1 FPL-M	FPL	19.0
Comtran Corporation	4234	FPLR	20.0
Belden Wire and Cable Co.	5220UJ	FPL	13.5
Belden Wire and Cable Co.	9572	FPLR	29.0
Belden Wire and Cable Co.	6220UJ	FPLP	27.0
BSCC	341602E	FPLP	18.0
Genesis Cable Systems	4051	FPL	17.0
Genesis Cable Systems	4432	FPLR	17.0
Genesis Cable Systems	4632	FPLP	18.0

Table B-6. Typical Wire Types - 14 AWG

Manufacturer	Part Number	Rating	Conductor-to-Conductor Capacitance (pf/ft.)
Atlas Wire and Cable Corp.	228-14-1-1TP	FPL	14.5
Coleman Cable	98141	FPL	20.0
Coleman Cable	98420	FPLR	25.0
Comtran Corporation	4240	FPLR	21.0
Belden Wire and Cable Co.	9580	FPLR	27.0
Belden Wire and Cable Co.	6120UJ	FPLP	25.9
BSCC	341402E	FPLP	20.0
Genesis Cable Systems	4052	FPL	19.0
Genesis Cable Systems	4433	FPLR	19.0
Genesis Cable Systems	4633	FPLP	20.0

Table B-7. Typical Wire Types - 12 AWG

Manufacturer	Part Number	Rating	Conductor-to-Conductor Capacitance (pf/ft.)
Coleman Cable	98121	FPL	27.0
Coleman Cable	98200	FPLR	29.0
Genesis Cable Systems	4054	FPL	21.0
Genesis Cable Systems	4434	FPLR	22.0

B-5 ESTIMATING THE SLC LOOP CAPACITANCE TO EARTH GROUND

The maximum allowable capacitance to Earth Ground is 0.5 microfarads per SLC loop. In order to ensure that this capacitance limitation is not exceeded, the Capacitance Worksheets provided in this section MUST be completed for any SLC loop that meets the criteria in Table B-8 below.

Table B-8. Criteria for Capacitance to Earth Ground Calculation Required

1	Loop exceeds 7500 feet total in length (including all T-Tap lengths)
2	Loop has a combination of 5 or more PALMs and AAMs installed
3	Loop has a combination of 10 or more ASMs, RRMs, APICs, PALMs and AAMs installed
4	Loop has 140 or more Smoke or Heat Detectors installed
5	Loop has 35 or more AI modules installed

Note: If none of the criteria in Table B-8 exist, filling out the Capacitance Worksheets is not required.

Table B-9. Capacitance Worksheet - Part 1 (SLC Devices)

SLC Device Type	**Capacitance of Each Device (nF)**	**Quantity** *Enter number of each type of device in this column*	**Total Device Capacitance (nF)** *Multiply Qty by provided capacitance value for each type of device*
PALM Module	20		
AAM Module	20		
ASM Module	8		
ASM-6SB	8		
RRM Module	6		
APIC Card	7		
AI Module, Normally Open	2		
AI Module, Normally Closed	2		
AO Module	0.8		
DS-PS Photoelectric Detector	0.8		
DS-HFS Thermal Detector	0.8		
PSD-7152 Photoelectric Detector	0.8		
CPD-7052 Ionization Detector	0.8		
THD-7252 Thermal Detector	0.8		
DH-2000 Duct Detector	0.8		

Add up the entries in the Total Device Capacitance column and enter here →

Continue to Part 2 of Worksheet

Total SLC Device Capacitance To Ground (nF)

Table B-10. Capacitance Worksheet - Part 2 (SLC Wiring)

SLC Wire Type** (*see Note 2 for device field wiring*)	**Estimated Capacitance To Earth Ground (pF/ft)** *For unshielded wire, 9 pF is typical. For shielded wire, enter conductor capacitance to shield-See Note 1*	**Length of SLC Loop** *Enter Total Length of SLC Loop Wire in feet (include all T-Taps)*	**Total Wire Capacitance for One Conductor (pF)** *Multiply capacitance per foot by length of SLC Loop Wire*	**Total Wire Capacitance for Two Conductors (pF)** *Multiply entry at left by 2 to account for both SLC conductors*	**Total Wire Capacitance for Two Conductors (nF)** *Divide entry at left by 1000 to convert to Nanofarads*
Unshielded Wire	9				
Shielded Wire* (*see Note 1*)					

Add up the entries in the Total Wire Capacitance for Two Conductors column and enter here

Continue to Part 3 of Worksheet

Total SLC Wire Capacitance To Ground (nF)

Note 1:
The conductor to shield capacitance can be obtained from the wire manufacturer's technical data sheet and will be listed in Picofarads as "Capacitance from conductor to shield with other conductor(s) tied to shield."

Note 2:
This example assumes that the SLC device field wiring (non-SLC wiring) restrictions on the use of shielded wire have been adhered to. Refer to Note 12 on Figure 2-24 of Chapter 2.

Table B-11. Capacitance Worksheet - Part 3 (Summary)

Total SLC Device Capacitance To Ground (nF) from Part One	*enter here*	
Total SLC Wire Capacitance To Ground (nF) from Part Two	*enter here*	
Add together the entries for Total SLC Device Capacitance to Ground and Total SLC Wire Capacitance to Ground (nF)	*enter here*	
Divide the Nanofarad value by 1000 to convert to Microfarads This is an estimate of Total SLC Loop Capacitance to Earth Ground. **Maximum allowable is 0.5 microfarads.**	*enter here*	**Total SLC Device and Wire Capacitance To Ground (μF)**

B-6 EXAMPLE 1

The following example illustrates how to calculate parameters to ensure SLC requirements are met and has the following configuration:

- The SLC is on a networked panel and the network has 4 nodes.
- This SLC loop is one of 8 SLC loops on this panel.
- CLASS B, Style 4 Wiring Style
- Wire is 14 AWG, Coleman cable P/N 98141 (see Table B-6 above)
- SLC total loop length is 3750 feet, with no T-Taps, using unshielded wire
- 3 PALMs
- 5 ASMs
- 40 AIs
- 15 AOs
- 100 Smoke Detectors
- 10 RRMs
- The 5 ASMs and 10 AOs are in one Output Group
- The 10 RRMs are in one Releasing Group
- 5 of the AOs are not assigned to a group
- All Groups (Releasing and Output) and the 5 ungrouped AOs are on this SLC loop and are programmed to activate without a time delay from the same inputs.

B-6.1 Calculating SLC Loop Resistance

For Class B loops, the sum of the total wire resistance for the positive and negative SLC loop legs from the panel to the last device must not exceed 40 Ohms. If “T” taps are used, the total wire resistance from the panel to the end of each “T” tap must not exceed 40 Ohms.

For this example, the SLC loop is a Style 4 Class B loop with no “T” taps. The total length of the SLC loop is 3750 ft. The total wire length to the last device is the sum of wire (in feet) for the positive and negative SLC legs.

If #14 AWG wire is used in Example 1, the total wiring resistance is:

3750 feet x 2 = 7500 feet	#14 AWG wire is 2.525 Ohm/1000 ft (Reference American Wire Gauge Resistance Per 1000 Feet Table)

7500 feet x 2.525 Ohms/1000 ft = 18.9 Ohms

Conclusion: 18.9 Ohms is less than 40 Ohms, so #14 AWG wire is **acceptable** for resistance.

B-6.2 Calculating SLC Loop Conductor-to-Conductor Capacitance

If Coleman cable is selected (P/N 98141 from Table B-6), the total SLC conductor-to-conductor capacitance is:

Cable specification is 20 picofarads/ft

20 pf = 20 x 10^{-12} farads

3750 ft x 20 x 10^{-12} farads/ft = 0.075 x 10^{-6} farads (or 0.075 microfarads)

Conclusion: 0.075 microfarads is less than 0.5 microfarads, so #14 AWG Coleman cable (P/N 98141) is **acceptable** for conductor-to-conductor capacitance.

B-6.3 Calculating SLC Loop Capacitance To Earth Ground

Referring to Table B-8, Criteria for Capacitance to Earth Ground Calculation, the system meets Criteria 3 and Criteria 5.

1	Loop exceeds 7500 feet total in length (including all T-Tap lengths)	NO
2	Loop has a combination of 5 or more PALMs and AAMs installed	NO
3	Loop has a combination of 10 or more ASMs, RRMs, APICs, PALMs and AAMs installed	YES
4	Loop has 140 or more Smoke or Heat Detectors installed	NO
5	Loop has 35 or more AI modules installed	YES

Conclusion: Because any one of the criteria in Table B-8 are met, the Capacitance Worksheets must be filled in and the associated requirements met. See worksheets below.

SLC Device Type	**Capacitance of Each Device (nF)**	**Quantity** *Enter number of each type of device in this column*	**Total Device Capacitance (nF)** *Multiply Qty by provided capacitance value for each type of device*
PALM Module	20	3	60
ASM Module	8	5	40
AI Module, Normally Open	2	40	80
AO Module	0.8	15	12
Remote Releasing Module	6	10	60
PSD-7152 Detector	0.8	50	40
CPD-7052 Detector	0.8	50	40
			332

SLC Wire Type (*see Note 2 for device field wiring*)	**Estimated Capacitance To Earth Ground (pF/ft)** *For unshielded wire, 9 pF is typical. For shielded wire, enter conductor capacitance to shield-See Note 1*	**Length of SLC Loop** *Enter Total Length of SLC Loop Wire in feet (include all T-Taps)*	**Total Wire Capacitance for One Conductor (pF)** *Multiply capacitance per foot by length of SLC Loop Wire*	**Total Wire Capacitance for Two Conductors (pF)** *Multiply entry at left by 2 to account for both SLC conductors*	**Total Wire Capacitance for Two Conductors (nF)** *Divide entry at left by 1000 to convert to Nanofarads*
Unshielded Wire	9	3750	33750	67500	67.5
					67.5

Note 1:
The conductor to shield capacitance can be obtained from the wire manufacturer's technical data sheet and will be listed in Picofarads as "Capacitance from conductor to shield with other conductor(s) tied to shield."

Note 2:
This example assumes that the SLC device field wiring (non-SLC wiring) restrictions on the use of shielded wire have been adhered to. Refer to Note 12 on Figure 2-24 of Chapter 2.

Summary:

Total SLC Device Capacitance To Ground (nF) from Part One	332.0
Total SLC Wire Capacitance To Ground (nF) from Part Two	67.5
Add together the entries for Total SLC Device Capacitance to Ground and Total SLC Wire Capacitance to Ground (nF) Total in Nanofarads (nF)	399.5
Divide the Nanofarad value by 1000 to convert to Microfarads Estimated Total SLC Loop Capacitance to Earth Ground (microfarads)	**0.3995**

Conclusion: 0.3995 microfarads is less than 0.5 maximum allowable, so this combination of SLC devices and SLC wire length is **acceptable** for SLC Loop Capacitance to Earth Ground.

B-6.4 Output Modules Calculation

In this example, this SLC loop is on a node that has 8 SLC loops and is part of a 4-node network. There are two groups of outputs: one Releasing Group with 10 RRMs and one Output Group with 5 ASMs and 10 AOs. There are also 5 AOs on this loop that are not assigned to a group.

Output activation time = 2.26 + (0.54 x N) + (1.6 x G) + (0.1 x (L-1)) + ppA

Where:

N = the number of individual outputs not assigned to a group (ASMs, AOs, RRMs and detector bases containing relays) on this SLC loop
G = the number of groups on this SLC loop
L = the number of SLC loops on this node
ppA = a constant based on the number of nodes in the network (see Table B-1)

2.26+(0.54 x 5)+(1.6 x 2)+(0.1 x (8-1))+0.321 = 9.181

N = there are 5 non-grouped outputs on this SLC loop
G = there are 2 groups on this SLC loop (1 Releasing Group and 1 Output Group)
L = there are 8 SLC loops
ppA = since there are 4 nodes, the constant from Table B-1 is 0.321

Conclusion: 9.181 seconds is the output activation time for this SLC loop. 9.181 seconds is less than 10 seconds, so the output activation time meets the UL requirement of 10 seconds for this SLC loop and is **acceptable**. There are no other loops with output devices on this node so the output activation time meets the UL requirement of 10 seconds for this node.

B-7 EXAMPLE 2

The following example illustrates how to calculate parameters to ensure SLC requirements are met and has the following configuration:

- The SLC is on a networked panel and the network has 21 nodes.
- This SLC loop is one of 3 SLC loops on this panel.
- CLASS A, Style 6 Wiring Style
- SLC total loop length is 4500 feet using unshielded wire
- 2 PALMs
- 10 ASMs
- 20 AOs
- 50 AIs
- 160 Smoke Detectors
- 5 Duct Detectors
- 5 RRMs
- The 10 ASMs and 20 AOs are in 2 Output Groups
- All 5 RRMs are in 1 Releasing Group
- All Groups (Releasing and Output) are on this SLC loop and are programmed to activate without a time delay from the same inputs.

B-7.1 Calculating SLC Loop Resistance

The total wire length is the sum of wire (in feet) for the positive and negative SLC legs, so for Class A Style 6 loops, it is double the total loop length.

First try #18 AWG wire. The total SLC wiring resistance is:

4500 feet x 2 = 9000 feet #18 AWG wire is 6.385 Ohm/1000 ft (Reference American Wire Gauge Resistance Per 1000 Feet Table)

9000 feet x 6.385 Ohms/1000 ft = 57.5 Ohms

<u>Conclusion</u>: 57.5 Ohms is greater than 40 Ohms, so using #18 AWG wire exceeds the maximum allowed SLC wiring resistance and is **not acceptable**. Larger wire must be used.

Next try #16 AWG wire. The total SLC wiring resistance is:

4500 feet x 2 = 9000 feet #16 AWG wire is 4.016 Ohm/1000 ft (Reference American Wire Gauge Resistance Per 1000 Feet Table)

9000 feet x 4.016 Ohms/1000 ft = 36.14 Ohms

<u>Conclusion</u>: 36.14 Ohms is less than 40 Ohms, so using #16 AWG wire is **acceptable**.

B-7.2 Calculating SLC Loop Conductor-to-Conductor Capacitance

If Coleman cable is selected (P/N 98161 from Table B-5), the total SLC conductor-to-conductor capacitance is:

Cable specification is 20 picofarads/ft

20 pf = 20 x 10^{-12} farads

4500 ft x 20 x 10^{-12} farads/ft = 0.09 x 10^{-6} farads (or 0.09 microfarads)

Conclusion: 0.09 microfarads is less than 0.5 microfarads, so #16 AWG Coleman cable (P/N 98161) is **acceptable** for conductor-to-conductor capacitance.

B-7.3 Calculating SLC Loop Capacitance To Earth Ground

Referring to Table B-8, Criteria for Capacitance to Earth Ground Calculation, the system meets Criteria 3, Criteria 4 and Criteria 5.

1	Loop exceeds 7500 feet total in length (including all T-Tap lengths)	NO
2	Loop has a combination of 5 or more PALMs and AAMs installed	NO
3	Loop has a combination of 10 or more ASMs, RRMs, APICs, PALMs and AAMs installed	YES
4	Loop has 140 or more Smoke or Heat Detectors installed	YES
5	Loop has 35 or more AI modules installed	YES

Conclusion: Because any one of the criteria in Table B-8 are met, the Capacitance Worksheets must be filled in and the associated requirements met. See worksheets below.

SLC Device Type	**Capacitance of Each Device (nF)**	**Quantity** *Enter number of each type of device in this column*	**Total Device Capacitance (nF)** *Multiply Qty by provided capacitance value for each type of device*
PALM Module	20	2	40
ASM Module	8	10	80
AI Module, Normally Open	2	50	100
AO Module	0.8	20	16
Remote Releasing Module	6	5	30
PSD-7152 Detector	0.8	80	64
CPD-7052 Detector	0.8	80	64
DH-2000 Duct Detector	0.8	5	4
			398

SLC Wire Type (*see Note 2 for device field wiring*)	**Estimated Capacitance To Earth Ground (pF/ft)** *For unshielded wire, 9 pF is typical. For shielded wire, enter conductor capacitance to shield-See Note 1*	**Length of SLC Loop** *Enter Total Length of SLC Loop Wire in feet (include all T-Taps)*	**Total Wire Capacitance for One Conductor (pF)** *Multiply capacitance per foot by length of SLC Loop Wire*	**Total Wire Capacitance for Two Conductors (pF)** *Multiply entry at left by 2 to account for both SLC conductors*	**Total Wire Capacitance for Two Conductors (nF)** *Divide entry at left by 1000 to convert to Nanofarads*
Unshielded Wire	9	4500	40500	81000	81
					81

Note 1:
The conductor to shield capacitance can be obtained from the wire manufacturer's technical data sheet and will be listed in Picofarads as "Capacitance from conductor to shield with other conductor(s) tied to shield."

Note 2:
This example assumes that the SLC device field wiring (non-SLC wiring) restrictions on the use of shielded wire have been adhered to. Refer to Note 12 on Figure 2-24 of Chapter 2.

Summary:

Total SLC Device Capacitance To Ground (nF) from Part One	398
Total SLC Wire Capacitance To Ground (nF) from Part Two	81
Add together the entries for Total SLC Device Capacitance to Ground and Total SLC Wire Capacitance to Ground (nF) Total in Nanofarads (nF)	479
Divide the Nanofarad value by 1000 to convert to Microfarads Estimated Total SLC Loop Capacitance to Earth Ground (microfarads)	**0.479**

Conclusion: 0.479 microfarads is less than 0.5 maximum allowable, so this combination of SLC devices and SLC wire length is **acceptable** for SLC Loop Capacitance to Earth Ground.

B-7.4 Output Modules Calculation

In this example, this SLC loop is on a node that has 3 SLC loops and is part of a 21-node network. There are three groups of outputs: one Releasing Group with RRMs and two Output Groups with ASMs and AOs.

Output activation time = 2.26 + (0.54 x N) + (1.6 x G) + (0.1 x (L-1)) + ppA

Where:

N = the number of individual outputs not assigned to a group (ASMs, AOs, RRMs and detector bases containing relays) on this SLC loop

G = the number of groups on this SLC loop

L = the number of SLC loops on this node

ppA = a constant based on the number of nodes in the network (see Table B-1)

2.26+(0.54 x 0) + (1.6 x 3)+(0.1 x (3-1))+1.361 = 8.621

N = there are zero non-grouped outputs on this SLC loop

G = there are 3 groups on this SLC loop (1 Releasing Group and 2 Output Groups)

L = there are 3 SLC loops on this node

ppA = since there are 21 nodes, the constant from Table B-1 is 1.361

Conclusion: 8.621 seconds is the output activation time for this SLC loop. 8.621 seconds is less than 10 seconds, so the output activation time meets the UL requirement of 10 seconds for this SLC loop and is **acceptable**. There are no other loops with output devices on this node so the output activation time meets the UL requirement of 10 seconds for this node.

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APPENDIX C
LIST OF AGENCY LISTED COMPATIBLE DEVICES

Table C-1. SLC Initiating and Control Devices

Model No.	Part Number	Description
DS-PS	DS-PS	Photoelectric Detector
DS-HFS	DS-HFS	Fixed Temperature Thermal Detector
DS-SB	DS-SB	Standard Base for DS Series Detectors
DS-RB	DS-RB	Relay Base for DS Series Detectors
PSD-7152	71-402001-100	Photoelectric Detector
PSD-7140	71-401001-000	Photoelectric Detector (retrofit only)
PSD-7140	71-401004-000	Photoelectric Detector w/Relay (retrofit only)
CPD-7052	70-402001-100	Ionization Detector
CPD-7040	70-401001-000	Ionization Detector (retrofit only)
CPD-7040	70-401004-000	Ionization Detector w/ Relay (retrofit only)
THD-7252	70-404001-100	Heat Detector
6SB	70-400001-100	Flanged Detector Base
4SB	70-400001-101	Detector Base
MA-002	70-400001-200	Detector-Base Adapter
N/A	70-400001-000	Detector Base (retrofit only)
DH-2000 PSDI	70-403001-152	Duct Housing w/Photoelectric Detector
DH-2000CPDI	70-403001-052	Duct Housing w/Ionization Detector
DH-4000	70-403000-000	Duct Housing (retrofit only)
AI	70-407008-001	Monitor Module (N/O)
AI	70-407008-002	Monitor Module (N/C) (UL only)
AI	70-407018-001	Monitor Module (N/O) (non-silicone)
AI	70-407018-002	Monitor Module (N/C) (non-silicone; UL only)
AI	70-407004-001	Monitor Module (N/O) (retrofit only)
AO	70-408004-001	Control Module
AO	70-408014-001	Control Module (non-silicone)
AO	70-408001-000	Control Module w/o Mtg. Plate (retrofit only)
AO	70-408002-000	Control Module w/Mtg. Plate (retrofit only)
AO	70-408003-000	Control Module w/SS Mtg. Plate (retrofit only)
PALM	77-297103-000	PEGAsys Addr. Loop Module (Fits in ORION XT)
AAM	73-100003-001	Addr. Alarmline Mod.(in NEMA-4 enclosure)
ASM	70-200200-001	Addr. Signal Module
ASM	70-200200-003	Addr. Signal Module
ASM-6SB	70-200200-002	Addr. Signal Module (on 6SB Detector Base)
N/A	74-200012-002	Isolator Module (single-gang mount)

Model No.	Part Number	Description
N/A	74-200012-004	Isolator Module (detector-base mount)
RRM	70-600000-001	Remote Releasing Module (standard mount)
RRM	70-600000-002	Remote Releasing Module (in-cabinet mount)
APIC	76-333002-001	APIC for AIR-Intelligence HSSDs
--	84-802398-000	Main-to-Reserve Transfer switch
--	84-878752-010	Suppression Abort Station (requires AI module)

Table C-2. Releasing Devices - Solenoid-Based

				Wire Length (ft.) Note: Wire length is total wire[A]						
Device Model and Part Number	**I (Max.) Amps**	**Resistance (Min.) Ohms**	**"On" Time**	**12 AWG**	**14 AWG**	**16 AWG**	**18 AWG**	**Max. No. per R-NAC Circuit**	**Max. No. per RRM**	**Agency**
Kidde-Fenwal Sol. Model 890181 P/N WK-890181-000	2.40	10.0	Momentary	300	200	120	—	1	1 or 2	UL, FM
Kidde-Fenwal Sol. Model 895630 P/N 81-895630-000	2.00	12.0	Momentary	300	200	120	—	1	1 or 2	UL, FM
Kidde-Fenwal Sol. Model 899175 P/N WK-899175-900	2.20	10.8	Momentary	300	200	120	—	1	1 or 2	UL, ULC, FM
Kidde-Fenwal Model XV Control Unit P/N 87-120099-001[B] (using optional Solenoid P/N 83-100034-001)	2.00	12.0	Momentary	360	240	140	—	1	1 or 2	UL, FM, ULC
Kidde-Fenwal Model XV Control Unit P/N 87-120099-002[B] (using optional Solenoid P/N 83-100034-001)	2.00	12.0	Momentary	360	240	140	—	1	1 or 2	UL, FM, ULC
Control Unit P/N 87-120099-600[B] (using Kidde-Fenwal optional Solenoid P/N 83-100034-001)	2.00	12.0	Momentary	360	240	140	—	1	1 or 2	UL, ULC
Control Unit P/N 87-120099-602[B] (using Kidde-Fenwal optional Solenoid P/N 83-100034-001)	2.00	12.0	Momentary	360	240	140	—	1	1 or 2	UL, ULC

Table C-2. Releasing Devices - Solenoid-Based

Device Model and Part Number	I (Max.) Amps	Resistance (Min.) Ohms	"On" Time	Wire Length (ft.) Note: Wire length is total wire[A] 12 AWG	14 AWG	16 AWG	18 AWG	Max. No. per R-NAC Circuit	Max. No. per RRM	Agency
Kidde-Fenwal Model CXV Control Unit P/N 90-487100-001[B] (using optional Solenoid P/N 83-100034-001)	2.00	12.0	Momentary	360	240	140	—	1	1 or 2	UL, ULC, FM
Kidde-Fenwal Sol. Model 486500-01 P/N 82-486500-010	0.240	103.0	Steady	3000	2000	1200	800	1	1 or 2	UL, FM
Kidde-Fenwal Sol. P/N 06-118384-001	0.520	46.0	Steady	1440	760	480	340	1	1 or 2	UL
Kidde-Fenwal Sol. P/N 38-509834-001	0.632	38.0	Steady	1050	550	330	240	1	1 or 2	ULC, FM
Kidde-Fenwal Sol. P/N 38-509837-001	0.400	60.0	Steady	2300	1460	915	570	1	1 or 2	ULC, FM
Kidde-Fenwal Sol. P/N 81-100000-001	0.440	59.0	Steady	2300	1460	915	570	1	1 or 2	UL, FM
Kidde-Fenwal Electric Control Head Model 897494 P/Ns 897494-000 and WK-897494-000	1.50	15.9	Steady	380	240	140	—	1	1	UL, FM
Kidde-Fenwal Electric Control Head Model 897494 P/Ns 897494-530 and WK-897494-530	1.50	15.9	Steady	380	240	140	—	1	1	UL, FM

Table C-2. Releasing Devices - Solenoid-Based

				Wire Length (ft.) Note: Wire length is total wire[A]						
Device Model and Part Number	**I (Max.) Amps**	**Resistance (Min.) Ohms**	**"On" Time**	**12 AWG**	**14 AWG**	**16 AWG**	**18 AWG**	**Max. No. per R-NAC Circuit**	**Max. No. per RRM**	**Agency**
For FM Systems:										
Kidde-Fenwal Sol. P/N 06-118329-001	0.225	108.0	Steady	3000	2000	1200	800	1	1 or 2	FM
Marioff 3-101-46A/2 (D21070)	0.92	26.0	Steady	483	327	190	—	1	1	FM
FM Release Panel Group 3	Any FM Approved Solenoid Valve rated 22W and below Consult FM Approvals for solenoid valve power ratings.							1	1	FM

[A] To determine the total wire length, you must calculate both the to and from distance. For example, a 300 foot length of wire means a total length of 600 feet as travel down the wire and back must be taken into account.

[B] **Must** be used in conjunction with Microswitches P/N 87-120039-001, 87-120039-501 or 87-120047-001 for momentary operation.

Table C-3. Releasing Devices - Actuator-Based

Device	**I (Max.) Amps**	**Resistance (Min.) Ohms**	**"On" Time**	**Max. Number per R-NAC Circuit or RRM**	**Agency**
83-132500-500	*	0.9	Momentary	1	FM
83-131082-001	*	0.9	Momentary	1	FM

* The circuit resistance for this device must be 10 $\pm$ 1 ohms. The firing current will be 2.5 Amps.

APPENDIX D
FM RULES FOR PREACTION/DELUGE SYSTEMS

ARIES NET*Link* applications which require Factory Mutual (FM) approved Pre-Action and/or Deluge Systems must conform to the following guidelines:

- Detection Zone 1 (Det1), Detection Zone 2 (Det2) and Waterflow (W'Flow) Initiating Circuits must be configured for CLASS-A, Style D wiring.
- The Battery backup system must provide for 90 hours of Standby operation followed by 10 minutes of Alarm operation. Refer to Appendix A for calculations.
- The Agent Release Output must be configured for Deluge Solenoid activation. The Solenoid Activation Time must be set either for:
  - 10 minutes, or
  - 15 minutes, or
  - On-until-reset.

  The wiring connection of the control unit to the Deluge Solenoids must be as detailed in the Installation section of this manual.
- The DS-HFS Thermal Detector must be installed at 15 ft. spacings. The pre-alarm and alarm setpoint ranges are as follows:
  - Pre-Alarm: 110° F
  - Alarm: 135° F

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APPENDIX E
ROUTINGS FOR POWER-LIMITED AND NON-POWER-LIMITED WIRING

This appendix provides guidelines for power-limited and non-power-limited wiring requirements. The following wiring requirements shall be observed:

- Power-limited and non-power-limited wiring must be physically separated within the control unit enclosure.
- All power-limited wiring must be separated by at least 1/4-inch (6 mm) from any non-power-limited wiring.
- Non-power-limited wiring must be placed inside a conduit.
- Power-limited and non-power-limited wiring cannot enter and exit the control unit enclosure through the same knockout or conduit.
- Cables from switching power supply units must be kept a minimum of 1/4-inch (6 mm) away from field wiring coming into the Main Controller Board (MCB) and any installed Expansion Cards.
- Location of expansion cards in the Expansion Card Cage, combined with configuration of their output circuits (available optionally for either power-limited or non-power-limited applications), MUST take into consideration maintaining minimally 1/4-inch of separation between wiring to these circuits.

Figure E-1 and Figure E-2 show examples of typical wiring for power-limited and non-power-limited circuits in a 3-Tiered Enclosure and location of enclosure knockouts. Figure E-3 shows typical wiring for power-limited and non-power-limited circuits in a 2-Tiered Enclosure with location of knockouts also noted.

Figures E4 through E6 are photographs of an ARIES NET*Link* control unit where standard electrical tie wraps and clamps, in addition to the enclosure's standoffs, brackets and card cage frame, are used to properly dress power-limited and non-power-limited wiring with the required 1/4-in. minimum separation.

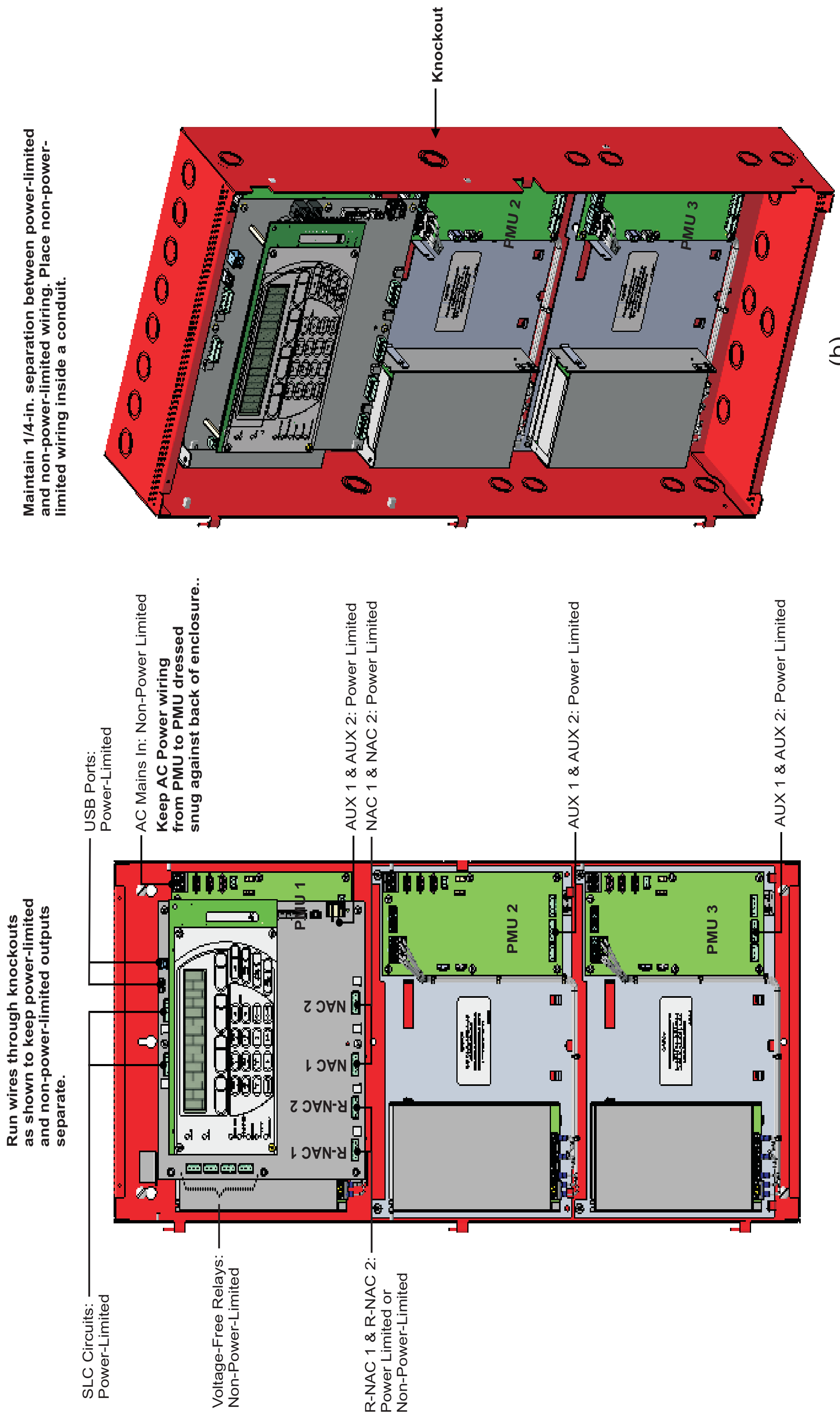

Figure E-1. Example Showing Wiring in 3-Tiered Enclosure with Additional PSU/PMU Assemblies(a); Location of knockouts (b)

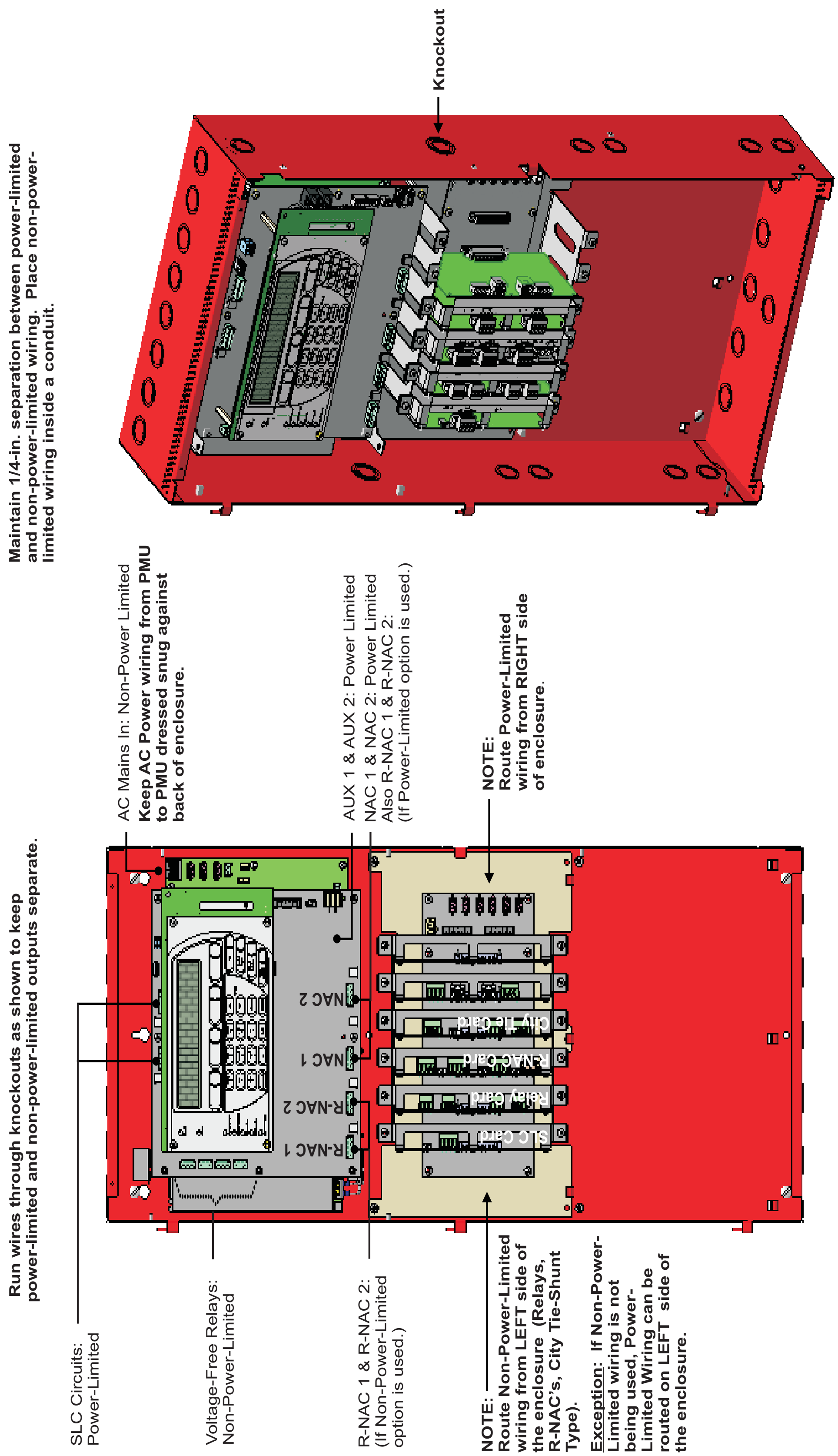

Figure E-2. Example Showing Wiring in 3-Tiered Enclosure with Card Cage Assembly (a); Location of knockouts (b)

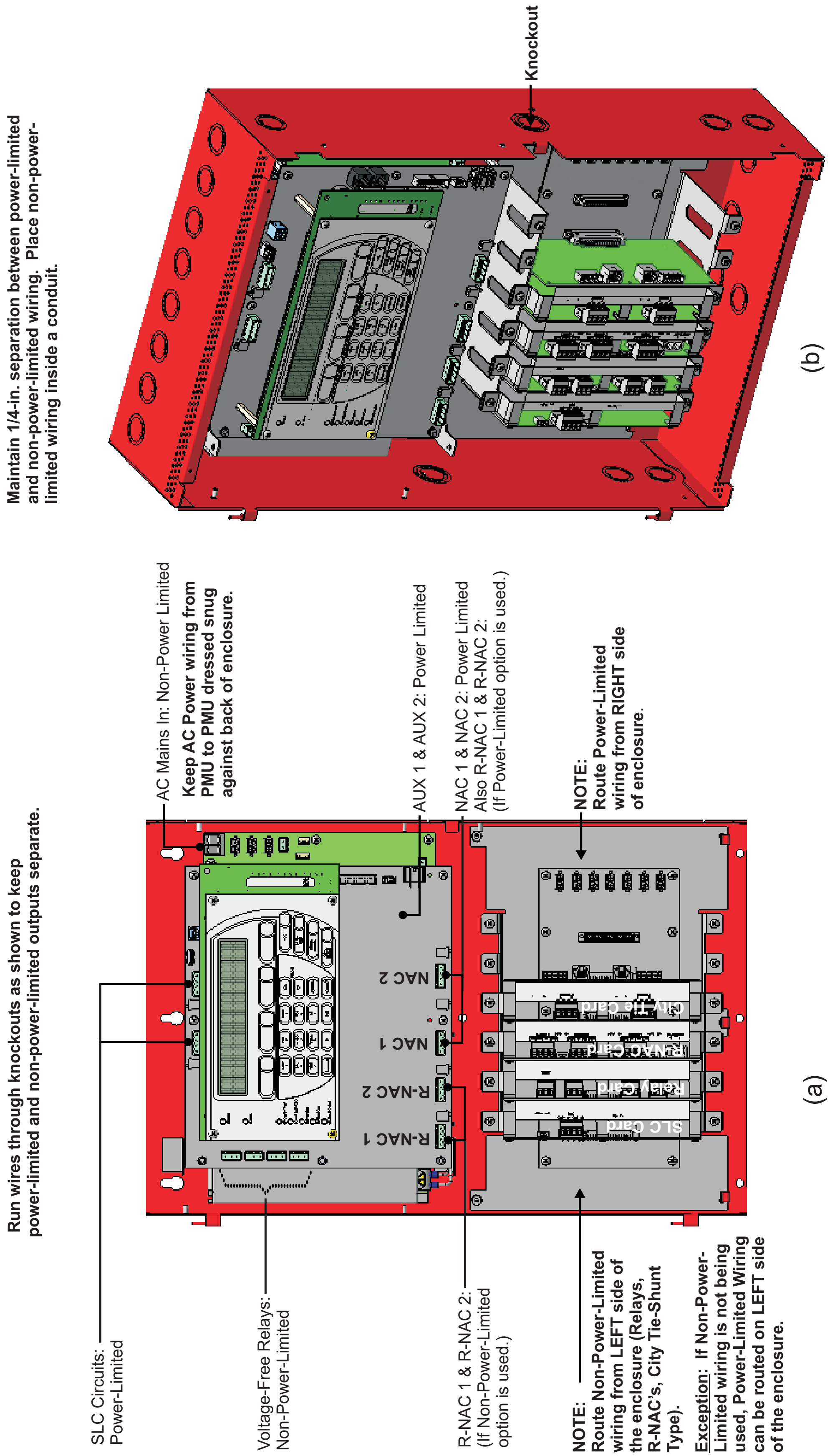

Figure E-3. Example Showing Wiring in 2-Tiered Enclosure with Card Cage Assembly (a); Location of knockouts (b)

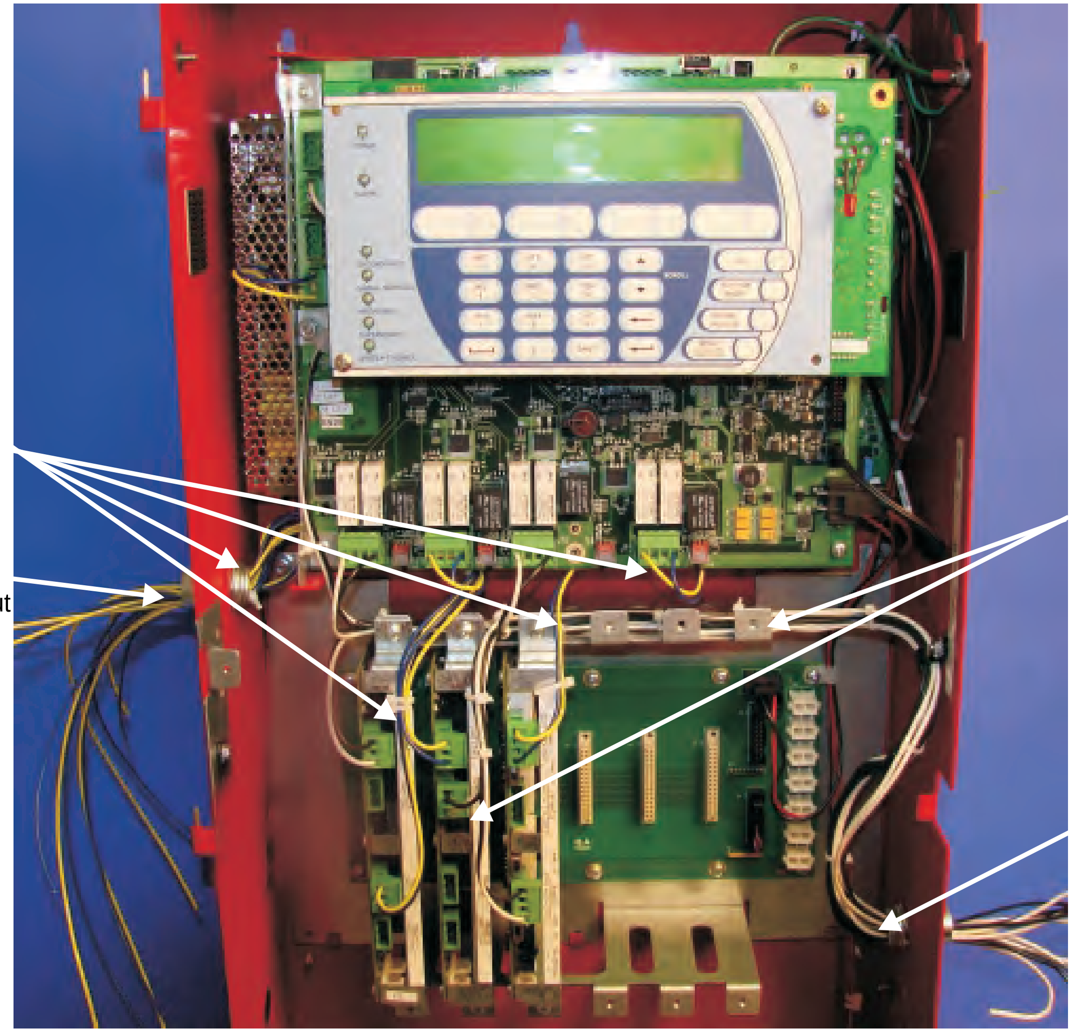

Figure E-4. An Example of a Typical ARIES NET*Link* Wiring Scenario

Note: Figure E-4 illustrates a typical wiring scenario where 3 expansion cards are included in the system with power-limited wiring (Black/White wires) and non-power-limited wiring (Blue/Yellow wires) properly spaced. Using standard wiring tools (such as P-clamps and tie-wraps), in conjunction with the enclosure standoffs, brackets and card cage frame, power-limited and non-power-limited types of circuits can easily be connected and harnessed to meet the 1/4-inch separation requirement.

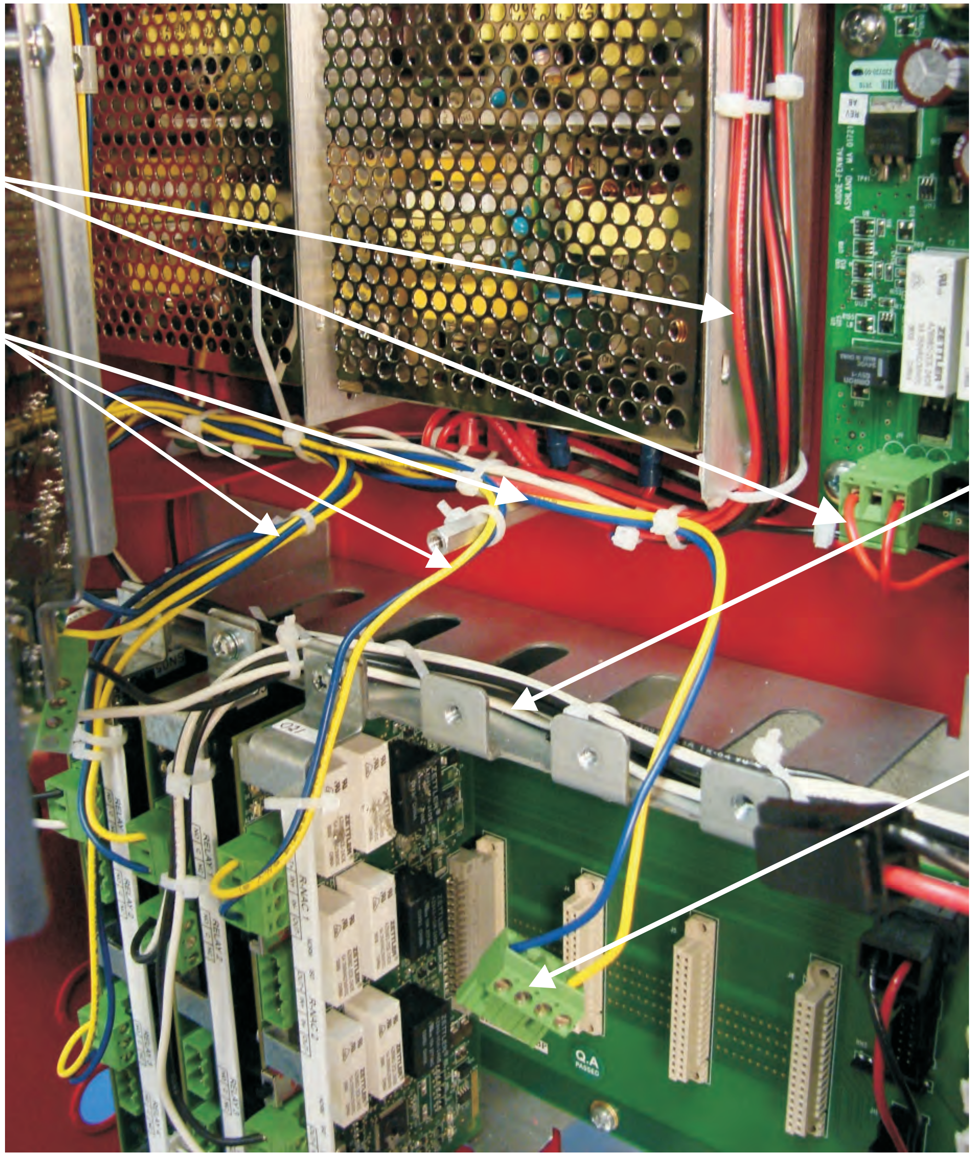

Figure E-5. An Example of a Typical ARIES NET*Link* Wiring Scenario - MCB Opened

Note: Figure E-5 illustrates a typical wiring scenario where 3 expansion cards are included in the system with power-limited wiring (Black/White wires) and non-power-limited wiring (Blue/Yellow wires) properly spaced. Using standard wiring tools (such as P-clamps and tie-wraps), in conjunction with the enclosure standoffs, brackets and card cage frame, power-limited and non-power-limited types of circuits can easily be connected and harnessed to meet the 1/4-inch separation requirement.

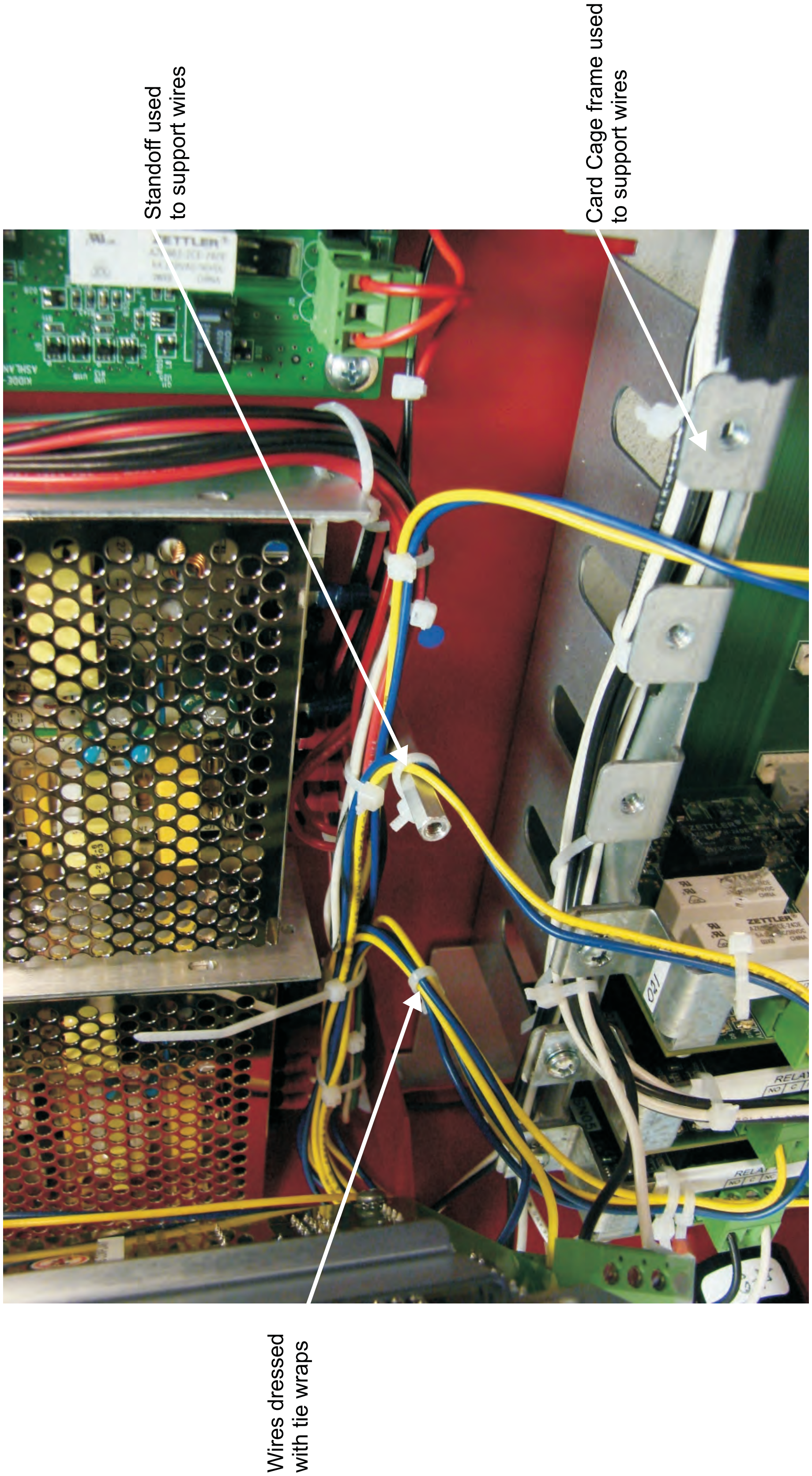

Figure E-6. An Illustration of Suggested Methods to Dress Wires

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APPENDIX F
ARIES NET*LINK* FOR CANADIAN APPLICATIONS

F-1 INTRODUCTION

Information pertaining to the operation of the ARIES NET*Link* in Canada are presented in this appendix, based on the requirements set forth in ULC 527-11.

F-2 CANADIAN APPLICATION-STYLE ENCLOSURES

The ARIES NET*Link*™ enclosure for Canadian Applications (Figure F-1 and Figure F-2) is divided into two or three tiers and provides room to house the Power Supply/PMU Assembly, Main Controller Board, Keypad/Display, integrated LED Annunciator, Expansion Card Cage and two batteries (up to 17-AH each). Either system can be expanded by adding one or more Expansion Enclosures. The ARIES NET*Link* for Canadian Applications is operated in the same manner as the standard ARIES NET*Link* (as described in this manual). Refer to the Parts List in Chapter 8 for ordering information.

The Canadian Application is similar to the standard Main Enclosure, with the following exceptions:

- A second (dead) front panel is included to prevent accidental operator exposure to AC voltages and access to internal electronics as required by ULC-S527. The dead front cover is constructed of the same steel and matching color as the ARIES NET*Link* and is installed between the front door and its internal components. With the dead front cover installed, an operator has access to the front Keypad/Display and LED Annunciator only.
- An integrated LED Annunciator is included on the front of the panel beneath the Keypad/Display.

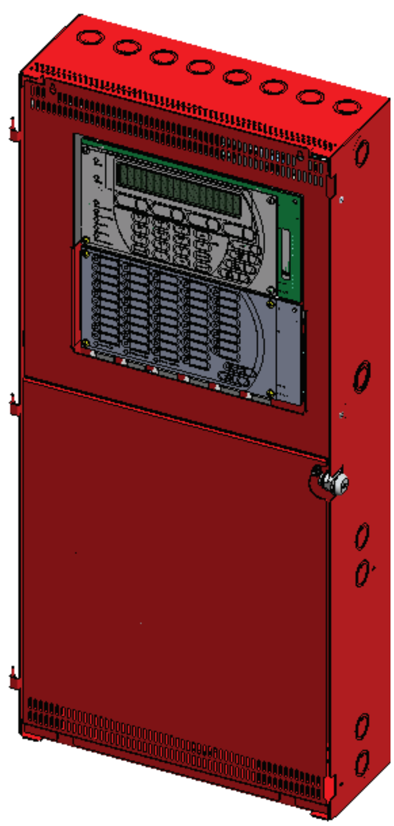

Figure F-1. 3-Tiered Canadian Application Enclosure (shown with Enclosure Door removed)

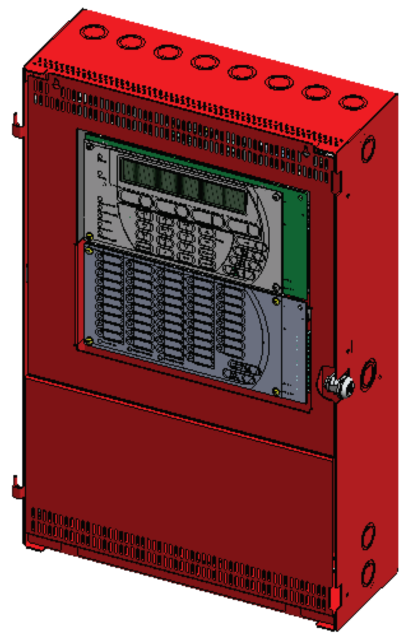

Figure F-2. 2-Tiered Canadian Application Enclosure (shown with Enclosure Door removed)

F-3 INSTALLATION

To install the Dead Front Cover and LED Annunciator Module (LAM):

1. Remove the control unit door by first unlocking it, disconnecting the door's Earth Ground assembly, and then lifting the door up to allow the hinges to clear the mating-hinge pins on the enclosure. Set the door aside in a safe location to prevent damage.
2. Remove the Dead Front Cover from its packaging.
3. Install the LED Annunciator Module (P/N 76-800020-003):
    a. Remove the four (4) Phillips screws from the blanking plate and lift off the plate. Set plate aside.
    b. Remove the LED Annunciator Module from its packaging and mount the module in place of the blanking plate, using the same screws.
    c. Plug supplied wiring harness from U1 on the LED Annunciator Module to the connector labeled "LAM" on the Operator Interface board.
4. Remove the 8/32" nuts from left and right studs located midway inside the enclosure.
5. Place the unthreaded side of one Dead Front "L" Bracket over the stud on one side and secure with nut. Repeat for remaining "L" Bracket on other side.
6. Grasping the Dead Front Cover, insert the bottom retention tabs into the bottom lip of the enclosure and lay flat over control unit.
7. Adjust and tighten the two (2) top Phillips mounting screws in their keyholes.
8. Secure the threaded hole of both "L" Brackets to the cover with a 6/32" screw.
9. Tighten the two (2) side Phillips mounting screws securely.
10. Locate the label provided with the Dead Front Cover written in English and French (P/N 06-231867-374). Affix label to front of Dead Front Cover in a prominent location where it can be easily viewed.
11. Replace the control unit door and reconnect the Earth Ground assembly.

F-4 MANUAL RELEASE STATIONS

For ULC installations, Manual Release Stations listed to CAN/ULC-528 must be used.

F-5 ABORT STATIONS

For ULC installations, an Abort Station which meets the requirements of CAN/ULC 527-11, 3rd edition, is available for purchase (P/N 84-878752-110).

F-6 ULC MAXIMUM AGENT RELEASE DELAY

ULC 527-11 requires that any automatic delay provided prior to release operation by a control unit shall be a maximum of 60 seconds, timed from a release initiation condition which uses any feature or combination of features as described in ULC 527-11 subsections 4.25.2.5, Cross-Zone Initiation Feature; 4.25.2.6, Single-Zone Multiple Device (Counting Zone) Initiation Feature; and 4.25.2.7, Combination Single-Zone Multiple-Device (Counting Zone) and Cross Zone Initiation Feature.

Any time programmed in the Event Output Control (EOC) delay D() statements shall not exceed 60 seconds. Refer to the *ARIES NETLink Configuration Tool (ACT8000) User's Guide* for instructions on how to configure the EOC.

F-7 RELEASING SERVICE SIGNAL SILENCE FOR CANADIAN APPLICATIONS

For ULC installations, the control unit shall not be configured to allow releasing service signal outputs to be silenceable using the Signal Silence button. The Signal Silence button (located on the keypad) shall only silence outputs that do not annunciate Releasing Service. In order to provide a Releasing Service Signal Silence control and meet the requirements of ULC 527-11 section 4.25.2.2.6, an SLC-based Addressable Input (Model AI) module can be used along with EOC programming.

The method for doing this is as follows:

1. Releasing service signal outputs must NOT be configured as silenceable.
2. Configure an Addressable Input (AI) device as a 'Release Silence' type input. This device, when active, will silence release service signal outputs. (When activated in a non-alarm state, this AI will cause a 'SWITCH FAULT' trouble to be annunciated.)
3. The AI shall be marked and secured as required by ULC 527-11 section 4.25.2.2.6(A) and 4.25.2.2.6(B) i or ii.

Note: A Releasing Service Signal Silence Station, P/N 76-800600-101, is available for purchase. This station includes a faceplate with key switch and identification label, backbox, Model AI Module (Normally Open) inside bracket with mounting hardware.

4. The Event Output Control (EOC) shall be configured to deactivate the releasing service output(s) when the AI is activated. This can be accomplished by using the 'N'ot operator. Refer to the EOC program example which follows.
5. The EOC shall be configured to activate a yellow LAM LED to indicate releasing service signal silence. This LED must be labeled per ULC527 section 4.12.3 B. (An ATM-L terminal with a properly labeled yellow LED can also be used to provide this indication.)
6. The Event Output Control (EOC) shall be configured to allow resound of releasing service or other output(s) when another alarm occurs. Refer to the EOC program example which follows.

F-7.1 EOC Example for Releasing Service Signal Silencing

An EOC example for silencing a releasing service signal output on a Canadian-application control unit is presented here.

Note: This EOC program is presented for instructional purposes only and will need to be customized for the control unit in use.

In this example, the following configuration applies:

- Release Silence AI on SLC 1 at address 20 to be used for silencing release service signal outputs.
- Alarm devices on SLC 1 at addresses 1 through 10 used to initiate a release.
- LAM with address 1 configured with LED 30 to be yellow in color.

```
L1:20=I2                        $ RELEASE SERVICE SIGNAL SILENCE SWITCH
I2*C2=LED1:30,NSG2              $ SILENCE SG2, THE RELEASE SIGNAL
$ FIRST ALARM
L1:1#10=I1                      $ FIRST ALARM
I1*NC2*NC3=SG1                  $ FIRST ALARM SIGNAL OUTPUT
$ SECOND ALARM, PRE-DISCHARGE
I1>1=SG2/60,NSG1,C2             $ SECOND ALARM, START COUNTDOWN
$ DISCHARGE COUNTDOWN
D(C2,30)=AR1,SG2/C,C3           $ DISCHARGE – AR1
$ RESOUNDING
I1*C2*NC3=SG2/60,NSG1,NLED1:30 $ PRERELEASE STATE, AFTER SILENCE
I1*C3=SG2/C,NLED1:30            $ DISCHARGE STATE, AFTER SILENCE
C2*NI2*NC3=SG2/60,NLED1:30      $ SILENCE OFF, TURN SG2 BACK ON
C3*NI2=SG2/C,NLED1:30           $ SILENCE OFF, TURN SG2 BACK ON
```

F-7.2 Signal Silencing Operation

When a signal activates, first acknowledge all alarms by pressing the <ACKNOWLEDGE/TROUBLE SILENCE> key on the keypad.

<u>To de-activate silenceable signals:</u>
Press the <SIGNAL SILENCE> key on the keypad.

<u>To de-activate Releasing Service signals</u>:
Insert the Releasing Service Signal Silence key into the lock on the front of the Releasing Service Signal Silence Station and turn to the right. Leave the key in this position. (Moving the key back to its original upright position will cause Releasing Service Signals to sound.) The designated yellow LED will glow steadily until the key is returned to its original position. Return key to original position after control unit is reset.

If a new alarm occurs, releasing service signals will re-sound with the key in its Silenceable position. To silence again, first press the <ACKNOWLEDGE/TROUBLE SILENCE> key to acknowledge the alarm(s). Move the key back to its original position and then turn key to its Silenceable position.

F-7.3 Releasing Service Signal Silencing Station Installation

The following are included with the Releasing Service Signal Silence Station, P/N 76-800600-101:

- faceplate with key lock, key and identification label
- backbox
- Model AI Addressable Monitor Module, N.O. and bracket
- four (4) #6-32 x 1/2-in. mounting screws
- 10K resistor

The following tools are required for this procedure:

- wrist ground strap
- slotted screwdriver

CAUTION

Use a ground strap to prevent static discharge that could damage sensitive components on the PCBs.

WARNING

Two different sources of power can be connected to the control unit. Disconnect both sources of power and critical components such as control heads for special extinguishing systems and addressable pilot relays controlling facility-power shutoff before beginning this procedure. The control unit and associated equipment may be damaged by connecting wiring while the control unit is energized.

To install the Releasing Service Signal Silence Station:

1. Determine a location to surface-mount the station which is **within 18 inches (46 cm) from the control unit**.
2. Make sure the wall location is dry and free of construction dust and metal shavings prior to installation.
3. The ARIES NET*Link* system must be powered down properly before installation.
4. Slip on a wrist ground strap and clip the ground strap to Earth Ground.
5. Mount the backbox to the wall. (Mounting hardware not provided.)
6. Seat the Model AI addressable monitor module inside its bracket.
7. Connect wiring as shown in the wiring diagram to both the control panel Signaling Line Circuit (SLC) and the key lock switch. Include a 10k resistor as shown.
8. Place the Model AI with bracket inside the backbox, aligning its mounting holes.
9. Cover with the faceplate and install four mounting screws (provided).
10. Remove wrist strap.
11. Provide Releasing Service Signal Station Key to authorized personnel.

Refer to the illustration and wiring diagram which follow.

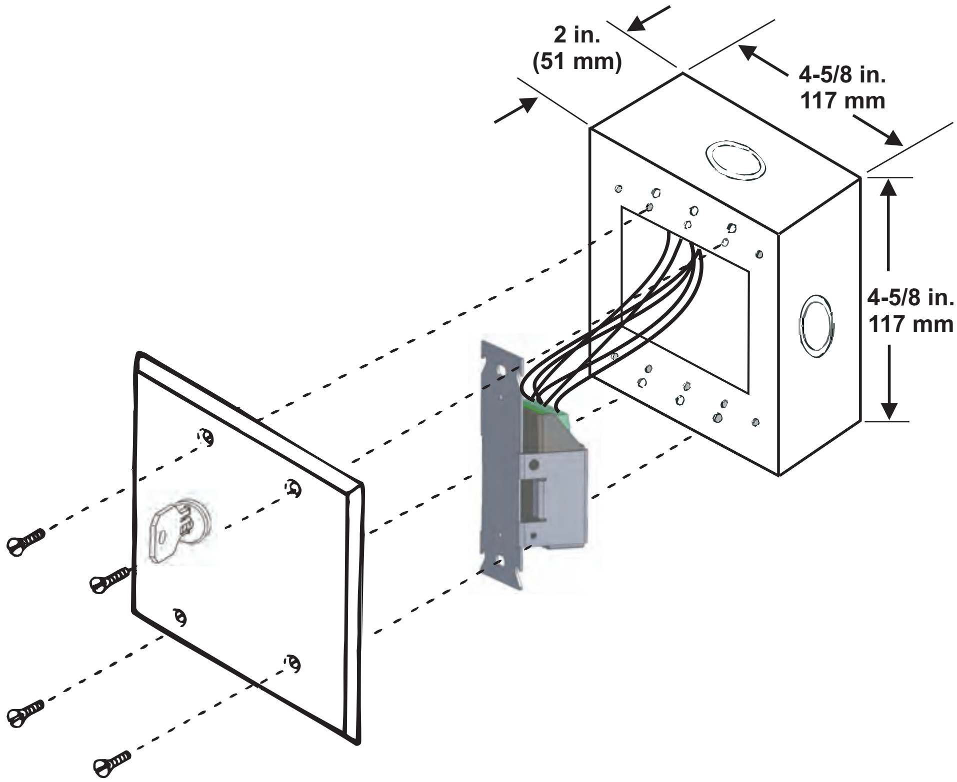

Figure F-3. Installation of Releasing Service Signal Silence Station

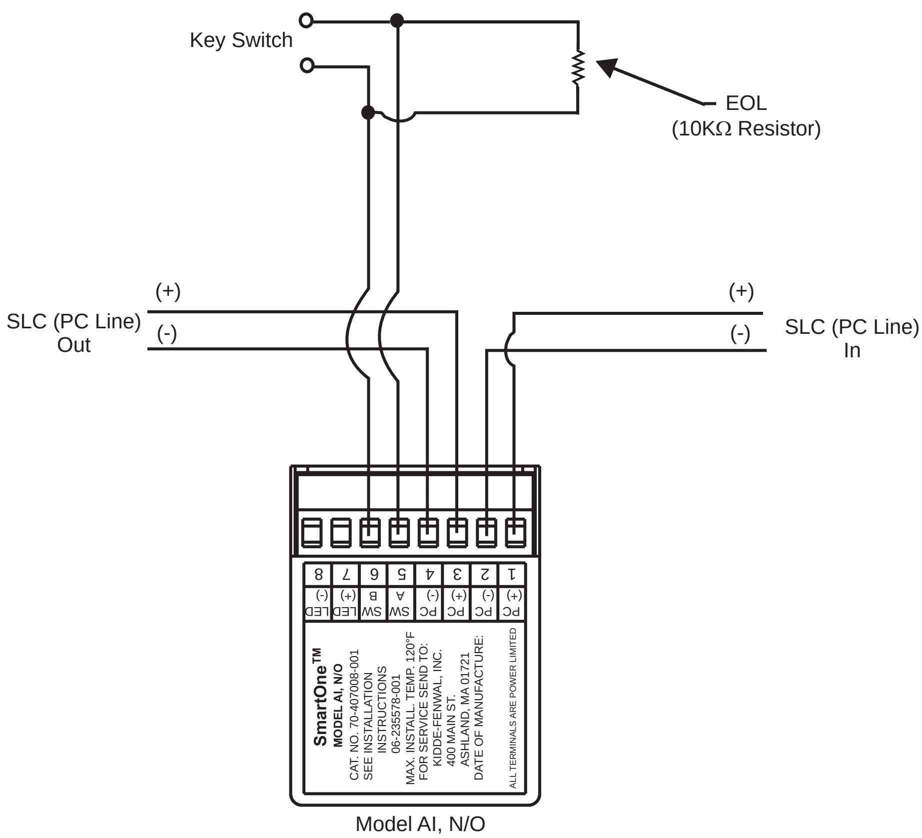

Figure F-4. Releasing Service Signal Silence Station Wiring Diagram

APPENDIX G
ARIES NET*LINK* FOR CITY OF CHICAGO APPLICATIONS

G-1 INTRODUCTION

This appendix provides instructions on how to set up and operate the City of Chicago Stand-alone Control Box, P/N 76-800500-001. This equipment is included as part of the City of Chicago Kit for the ARIES NET*Link*™.

The contents of the 3-tiered and 2-tiered City of Chicago Kits are shown below:

Part Number	Description
76-800500-001	City of Chicago Stand-Alone Control Box
76-800102-001	City of Chicago ARIES NET*Link* Kit (consists of ARIES NET*Link* 3-Tiered Control Unit, City of Chicago Dead Front Cover, City of Chicago Stand-Alone Control Box and mounting hardware)
76-800202-001	City of Chicago ARIES NET*Link* Kit (consists of ARIES NET*Link* 2-Tiered Control Unit, City of Chicago Dead Front Cover, City of Chicago Stand-Alone Control Box and mounting hardware)

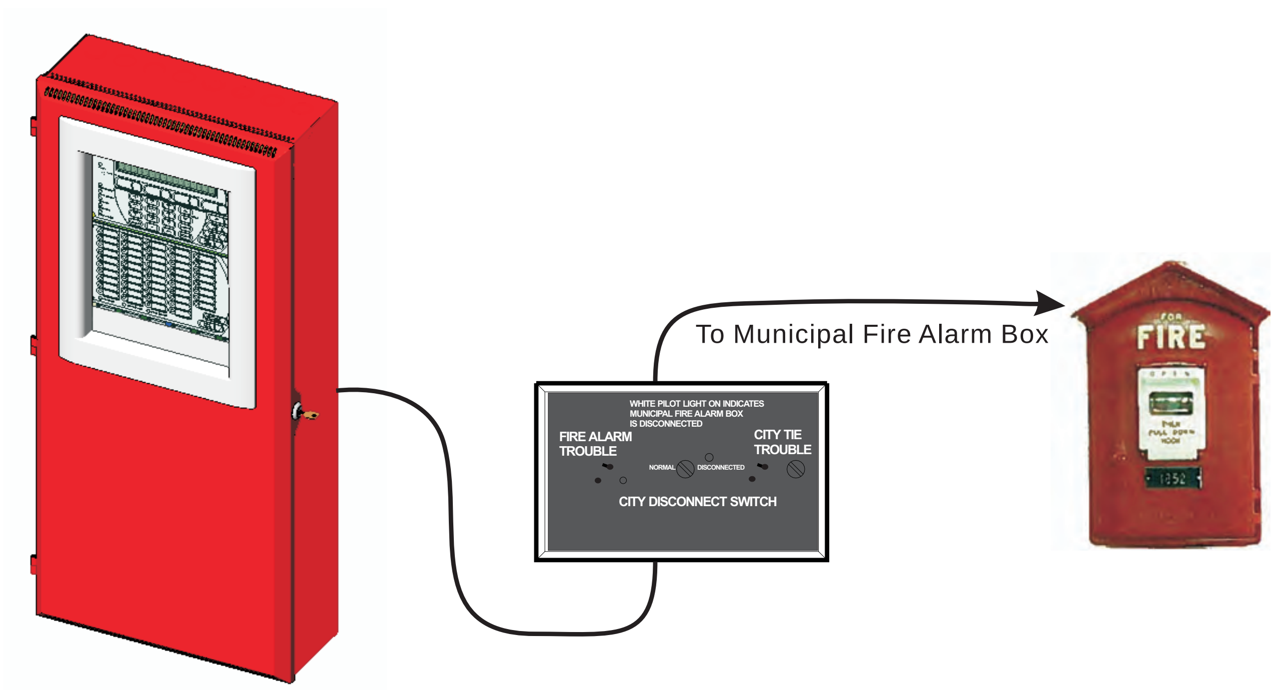

Figure G-1. Typical City of Chicago Application

G-2 OVERVIEW OF THE STAND-ALONE CONTROL BOX

The front panel of the control box is comprised of three main areas:

- Fire Alarm Trouble
- City Tie Trouble
- City Disconnect Switch

Refer to Figure G-2 for location of controls.

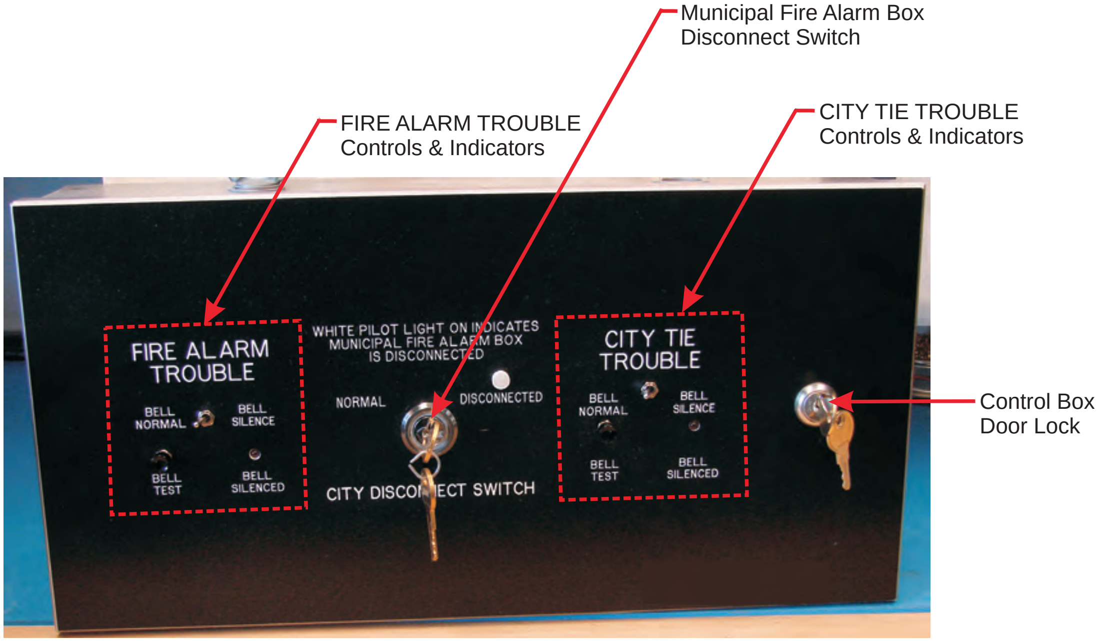

Figure G-2. Stand-Alone Control Box Front Panel

G-2.1 Fire Alarm Trouble

The ARIES NET*Link* supports an external FIRE ALARM TROUBLE indicator and controller for City of Chicago applications. The external indicator is a 24 Vdc bell. When the ARIES NET*Link* panel enters a Trouble state, the System Trouble LED on the ARIES NET*Link* front display begins to flash. Immediately, the Stand-Alone Control Box activates the separately-installed bell, annunciating a Trouble State. The bell may be silenced by moving the box's toggle switch to "Bell Silence". When the switch is in the "Bell Silence" position, the Bell Silenced indicator will light. When the System Trouble clears, if silenced, the bell will resound to warn the operator that the toggle switch is in the "Bell Silence" position. To return the Stand-Alone Control Box to its normal mode, move the toggle switch to "Bell Normal". A pushbutton switch is also located on the front of the box (labeled "Bell Test") to permit testing of the bell as desired.

G-2.2 City Tie Trouble

The ARIES NET*Link* supports an external CITY TIE TROUBLE indicator and controller for City of Chicago applications. The external indicator is a 24 Vdc bell. If the wire connection to the Master Box becomes disconnected (either by turning the City Disconnect Key Switch or by some other means), the Stand-Alone Control Box activates the separately-installed bell, annunciating a Trouble State. The bell may be silenced by moving the box's toggle switch to "Bell Silence". When the switch is in the "Bell Silence" position, the Bell Silenced indicator will light. When the City Tie Trouble clears, if silenced, the bell will resound to warn the operator that the toggle switch is in the "Bell Silence" position. To return the Stand-Alone Control Box to its normal mode, move the toggle switch to "Bell Normal". A pushbutton switch is also located on the front of the box (labeled "Bell Test") to permit testing of the bell as desired.

Note: If a hardware problem occurs with the City Tie Expansion Card, the ARIES NET*Link* panel will go into a Trouble state and the FIRE ALARM TROUBLE indicator will activate.

G-2.3 City Disconnect Switch

The ability to externally disconnect the City Tie circuit is provided through a door-mounted key switch. The key switch is located in the middle of the front panel and has two states: Normal and Disconnected. Turning the key switch to the "Disconnected" position causes the white pilot light to light. After the key is positioned as desired, it should be removed and stored with designated personnel.

G-3 INSTALLATION AND CONNECTIONS

G-3.1 Labeling

Inside the provided hardware kit are adhesive-backed labels which should be placed on the front of the ARIES NET*Link* control unit:

1. Install the "Fire Alarm System (Kidde)" label on the bottom left corner of the control unit door as shown in Figure G-3.
2. Install the "Chicago Approval No." label on the dead front cover as shown in Figure G-3.

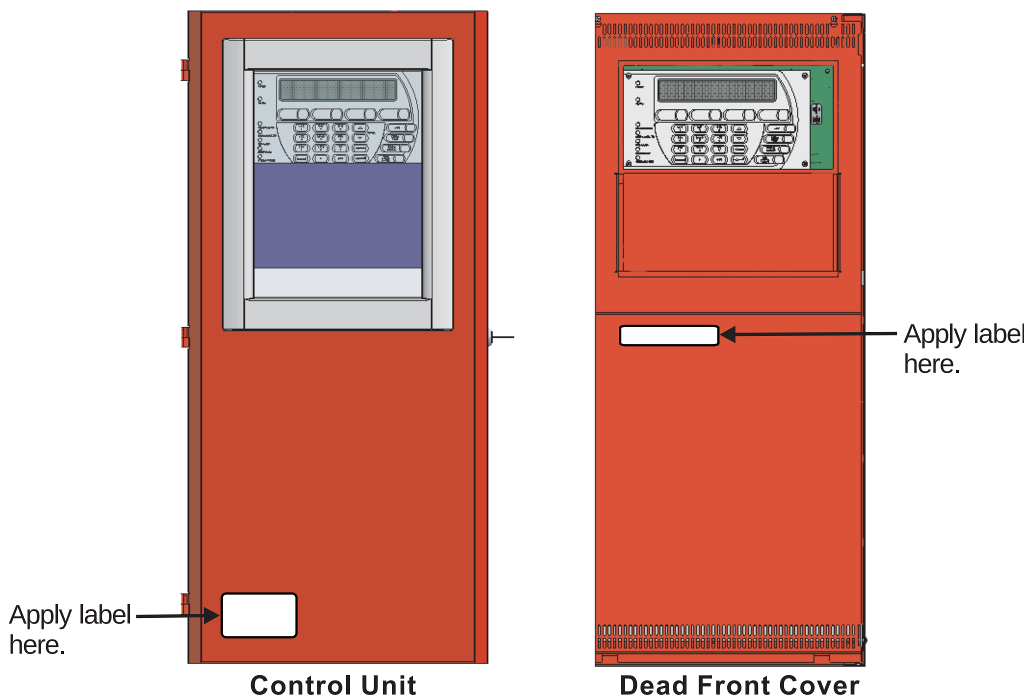

Figure G-3. Door and Dead Front Cover Label Placement

3. Apply three (3) blank labels over the control unit's indicator and keys listed below as shown in Figure G-4. These keys should not be used by the operator, in accordance with the AHJ:
   – FIRE DRILL (Hold for Lamp Test) Operator Control Key
   – SIGNAL SILENCE Operator Control Key
   – Signal Silenced LED

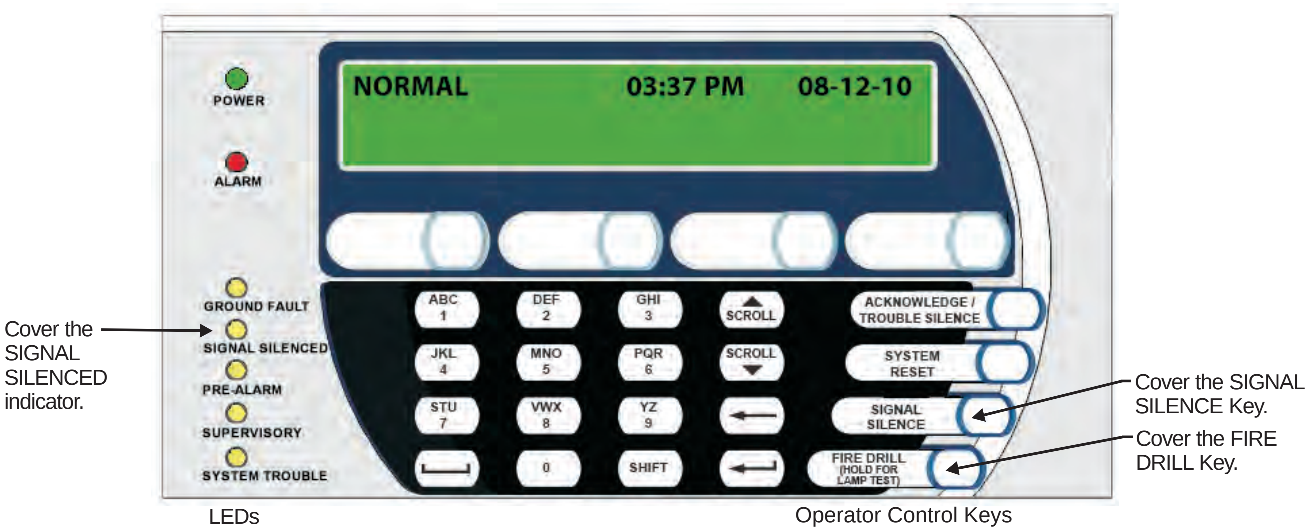

Figure G-4. Keypad/Display Label Placement

G-3.2 Field Wiring Connections

All field wiring connections are made via terminal blocks with screw-type terminations which can adequately hold #12 AWG solid conductors. Each terminal is clearly numbered for visible identification. A conduit knockout is provided at the top of the unit. Wire sizes of #12 AWG, #14 AWG, #16 AWG and #18 AWG are acceptable for use.

To access internal connections, turn the rightmost key switch and unlock/open the door.

Refer to Figure G-5 for a guide to connections.

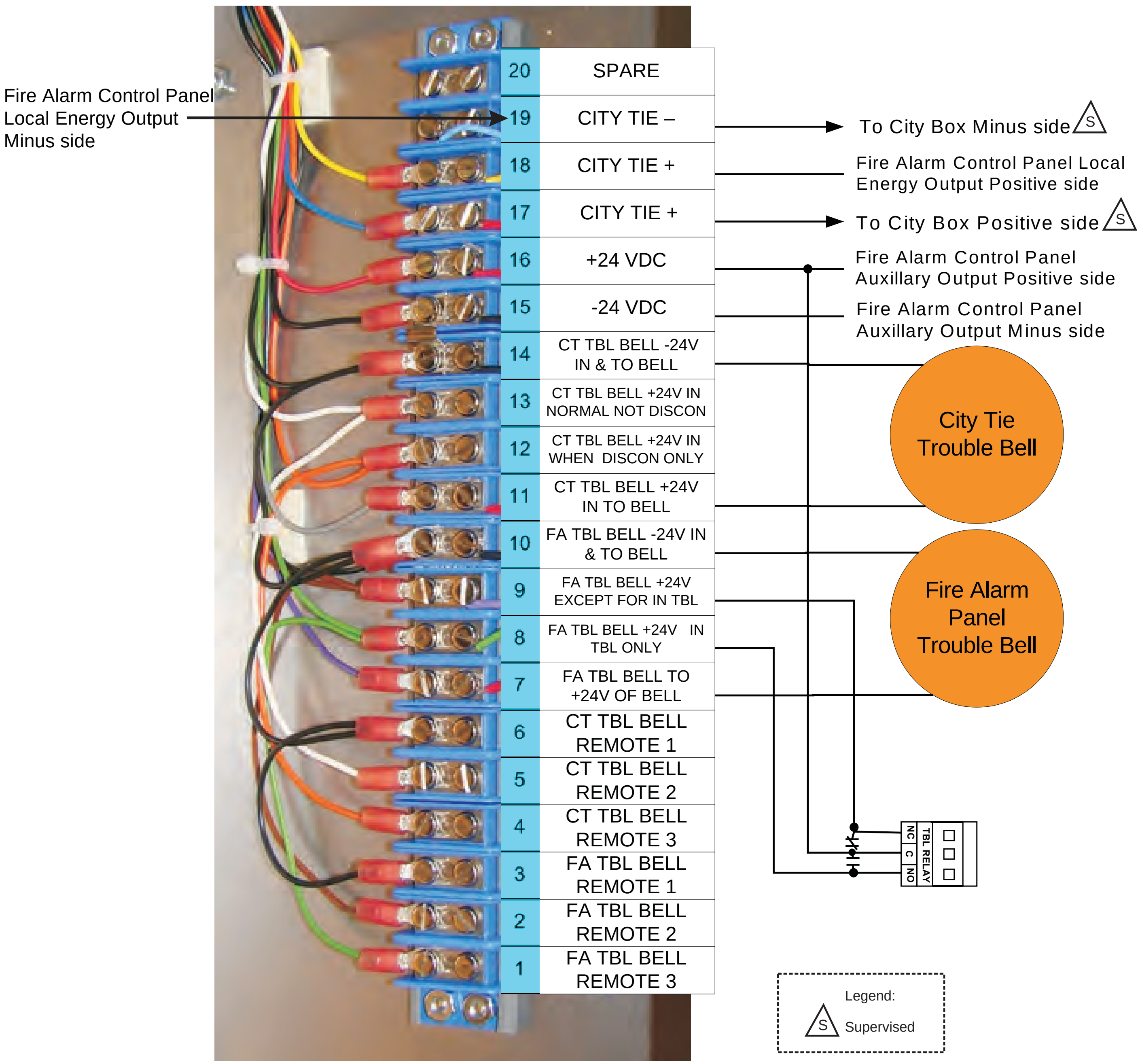

Figure G-5. Control Box Connections

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APPENDIX H
CONVERSION INSTRUCTIONS FOR PEGASYS

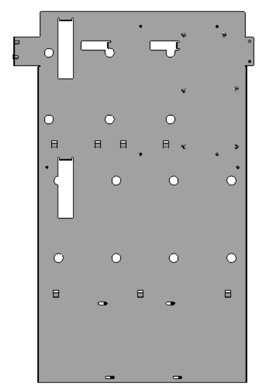
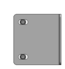
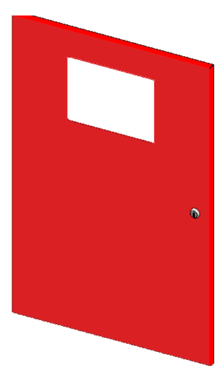
H-1 INTRODUCTION

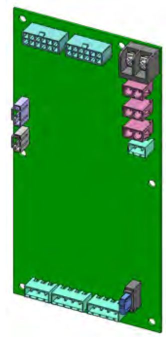
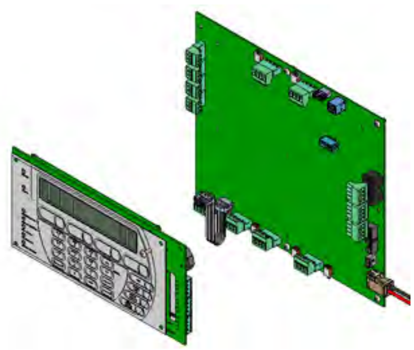
This appendix provides instructions on how to convert a PEGAsys™ control unit into a fully-functional 2-Tiered ARIES NET*Link*™ control unit, housed in the existing PEGAsys enclosure.

Note: This procedure is not applicable to the PEGAsys LV control unit.

H-2 CONTENTS OF PEGASYS CONTROL UNIT RETROFIT KIT

This procedure requires the purchase of one (1) Retrofit Kit (P/N 76-800400-001) for each PEGAsys control unit to be retrofitted. Note that if retrofitting a networked system, all panels will need to be upgraded at the same time. The following parts are included in the Retrofit Kit:

Part Name	Quantity Provided	Illustration
base plate	1	
base plate bracket	1	
replacement door	1	
retrofit installation hardware	1 package	• #6 nuts (4) • #8 nuts (2) • #10 nut (1) • self-threading screw (1) • #8 machine screw/nut (1)

Part Name	Quantity Provided	Illustration
Expansion Power Supply, 5.4A, with wiring harness to PMU Board (P/N 76-800030-002)	1	
Power Management (PMU) Board (P/N 76-800030-004)	1	
Main Controller Board with Keypad/Display and mounting hardware (P/N 76-800020-001)	1	
MCB Installation Hardware Kit (P/N 06-220294-001)	1 package	• cable assembly (1) • ground wire assembly (1) • aluminum standoffs (4) • 8/32" screws (4) • EOL 10K resistors (5)
PMU Installation Hardware Kit (P/N 06-220293-001)	1 package	• cable assemblies (3) • ground wire assembly (1) • battery harness kit (1) • 8/32" screws (6) • PMU term.block cover (1) • aluminum standoff (1) • 4-position plug (2) • 2-position plug (1)
Installation/Configuration Kit (P/N 76-800000-008)	1 package	• wiring diagram on paper (1) • User Disk (1)

H-3 OPTIONAL PARTS (NOT INCLUDED IN RETROFIT KIT)

H-3.1 Parts for the Control Unit Bottom Tier

One of the following optional equipment may be added to the bottom tier of the retrofitted control unit, if desired. (**Exception**: See Note below regarding batteries.)

1. Card Cage with backplane, bracket and hardware kit with cables, P/N 76-800010-001
2. Standby Batteries (select one pair from list below)

STANDBY BATTERIES (order 2 for 24V)	
06-115915-013	Battery, 12 Vdc, 7-AH
06-115915-047	Battery, 12 Vdc,12-AH
06-115915-046	Battery, 12 Vdc, 17/18-AH

3. Add-on Power Supply/PMU Assembly with bracket and hardware, P/N 76-800030-003

Note: If the Card Cage will be installed in the retrofitted control unit, it is possible to fit a 7-AH or 12-AH battery pair inside the enclosure. However, the 17/18-AH battery pair will NOT fit in a retrofitted control unit which includes a Card Cage.

Installation instructions for these parts are provided in this manual in Chapter 2, *Installation,* or refer to the individual instructions packaged with the equipment.

H-3.2 Additional ARIES NET*Link* Parts

In some cases, it may be necessary to order additional parts for complete ARIES NET*Link* functionality. For example, if the retrofitted control unit includes the Card Cage, ARIES NET*Link* expansion cards must be ordered and installed. Older PEGAsys expansion cards will not work in an ARIES NET*Link* system.

H-4 TOOLS REQUIRED

- Safety glasses (recommended)
- grinding tool with spare grinding wheels
- Screwdriver
- Vacuum, small
- Pencil

H-5 PREPARATION

WARNING **Safety goggles should be worn when performing this procedure.**

WARNING **Two different sources of power can be connected to the PEGAsys control unit. Disconnect both sources of power and critical components such as control heads for special extinguishing systems and addressable pilot relays controlling facility-power shutoff before beginning this procedure. The control unit and associated equipment may be damaged by connecting wiring while the control unit is energized.**

1. Ensure that you use PEGAsys Configuration Software to download all configuration, event log, and EOC data before powering down. Print the configuration settings for use when programming the ARIES NET*Link* control unit.
1. Lift the PEGAsys control unit door off its hinges and discard or store.
2. Mark and remove field wiring.
3. Remove all electronics from inside the PEGAsys control unit and discard or store, including the CCM Motherboard.
4. Tape wires to the side of the PEGAsys enclosure to remove them from the work area.

H-6 PROCEDURE

1. Remove the empty electronics brackets which are attached to the PEGAsys control unit enclosure. (An installer may chose his own method to remove the empty brackets, based on individual experience and available tools.)

Note: A suggested method, which is safe and easy to perform, is to use a grinding tool such as manufactured by Dremel (with a grinding wheel attached) to first grind off all pop rivets in the cabinet (except for the four at the bottom as shown in Figure H-1). With the pop rivets grinded off, carefully pry the empty brackets off the enclosure with a screwdriver and discard or store.

2. With the cabinet empty, remove the #10 nut from the Earth Ground lug located at the top left of the enclosure.
3. Insert the base plate as shown in Figure H-1.
4. Manually hold the small bracket to the base plate at the right (shown in Figure H-1). Mark the hole location in pencil.
5. After marking the hole location, remove dry-fitted parts and drill a 0.189 hole for #8 machine screw/nut (surface mounted enclosure) or a 0.136 hole for self-threading screw (recess mounted enclosure). Deburr the hole and clean all debris from the empty cabinet. Vacuum all metal filings.
6. Insert a #8 screw/nut or self-threading screw into the hole just drilled. Tighten to secure.
7. Replace the #10 nut on the Earth Ground lug at the top left of the enclosure.
8. Fasten four (4) #6 nuts over the screws at the bottom of the enclosure (shown in Figure H-1).

9. On the top tier, install the Power Supply and PMU Board according to the installation instructions provided in Chapter 2 of this manual (or packaged individually with the equipment).
10. Next, install the Main Controller Board and Keypad/Display on the top tier according to the installation instructions provided in Chapter 2 of this manual (or packaged individually with the equipment).
11. On the bottom tier, install any optional equipment according to the installation instructions provided in Chapter 2 of this manual (or packaged individually with the equipment).
12. After all electronics have been installed, remove tape from wires which were previously taped and place the replacement door on the enclosure hinges.
13. Follow the steps in Section 4-10 of Chapter 4, *Operation*, to start up the system.

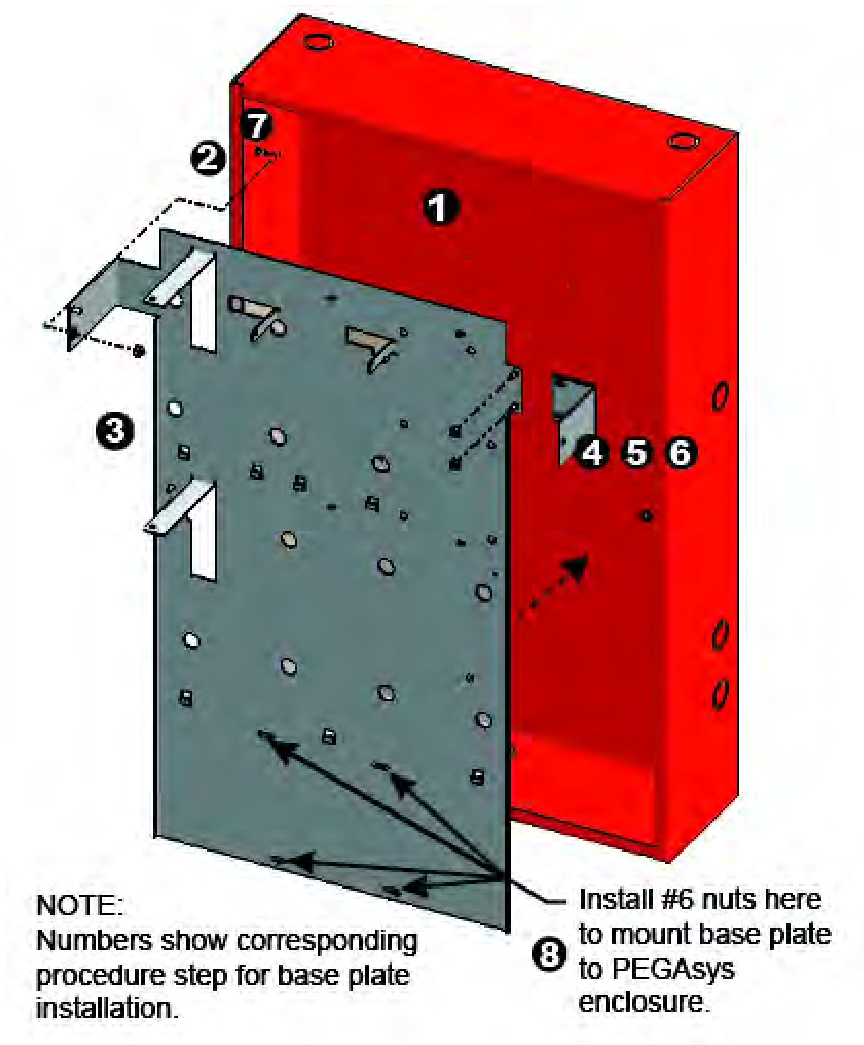


Figure H-1. Installing the Base Plate

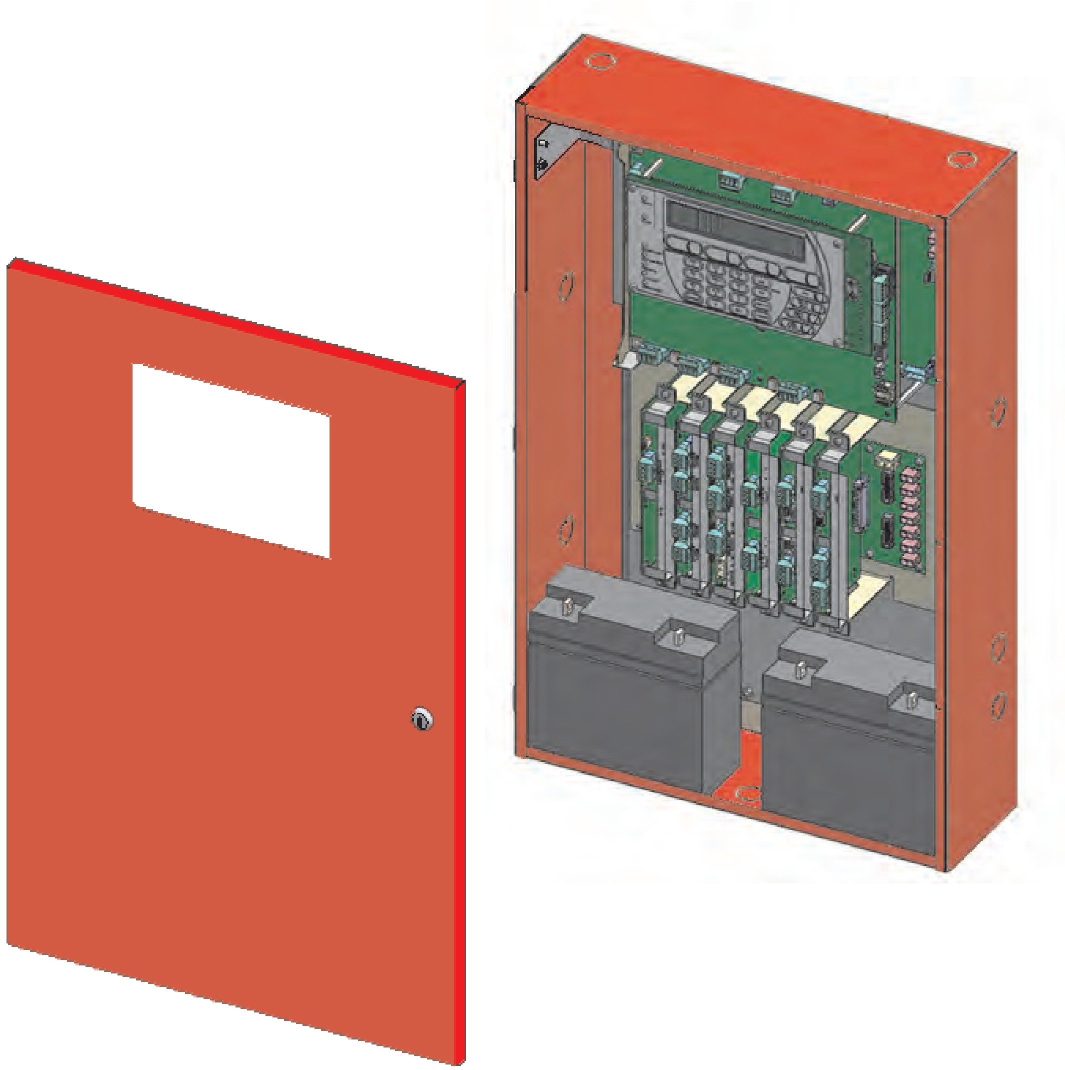


Figure H-2. The Retrofitted Enclosure with ARIES NET*Link* Electronics Installed

APPENDIX J
SEISMIC CONVERSION KIT INSTALLATION

J-1 INTRODUCTION

ARIES NET*Link* control units are approved for applications requiring Seismic Certification, if installed in keeping with the following instructions and using the additional hardware supplied in Seismic Conversion Hardware Kit for Enclosures (P/N 76-800000-009). Additional details, including control unit and device model numbers, can be found in: "SPECIAL SEISMIC CERTIFICATION OF EQUIPMENT AND COMPONENTS APPLICATION NO. OSP - 0286-10" available on the website:

http://www.oshpd.ca.gov/FDD/Pre-Approval/special_seismic_cert_pre-approval.html

In addition, the ARIES NET*Link* Large Capacity Battery Cabinet, P/N 76-100010-001, will satisfy the requirements for Seismic Certification, if installed in keeping with the following instructions and using the additional hardware supplied in Seismic Conversion Hardware Kit for the Large Capacity Battery Cabinet (P/N 76-800000-010).

Two conversion kits are available:

Part Number	Description
76-800000-009	Hardware Kit, Seismic Conversion for Enclosures, ARIES NET*Link*
76-800000-010	Hardware Kit, Seismic Conversion for Large Capacity Battery Cabinet, ARIES NET*Link*

Note: Seismic certification not tested by FM Global.

J-2 CONTROL UNIT CONVERSION PROCEDURES

J-2.1 Surface Mounting of Main or Expansion Enclosures (All)

1. Refer to Section 2-4.1 in Chapter 2, *Installation,* for general mounting steps.
2. Install seven (7) 1/4-20 Grade 2 bolts (not provided) at all hole locations indicated on Figure J-1. Apply washers (provided in the hardware kit, P/N 76-800000-009).
3. Make appropriate conduit connections for wiring.
4. Remove the Seismic Certification Label from its protective package in hardware kit, peel off backing, and apply label to the top inside of the enclosure door (above the view window) as shown in Figure J-2.

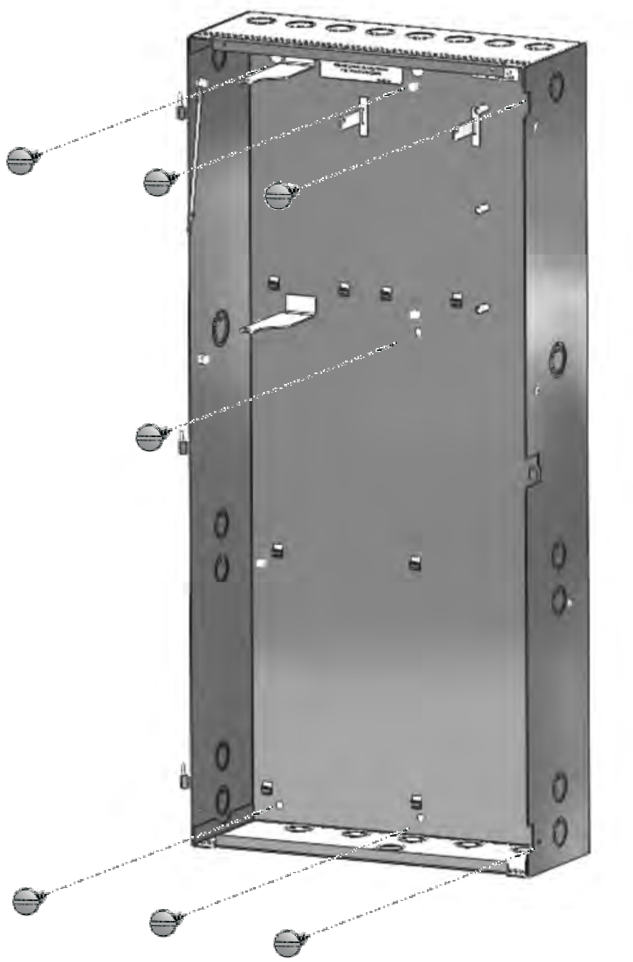


Figure J-1. Location of Enclosure Mounting Holes

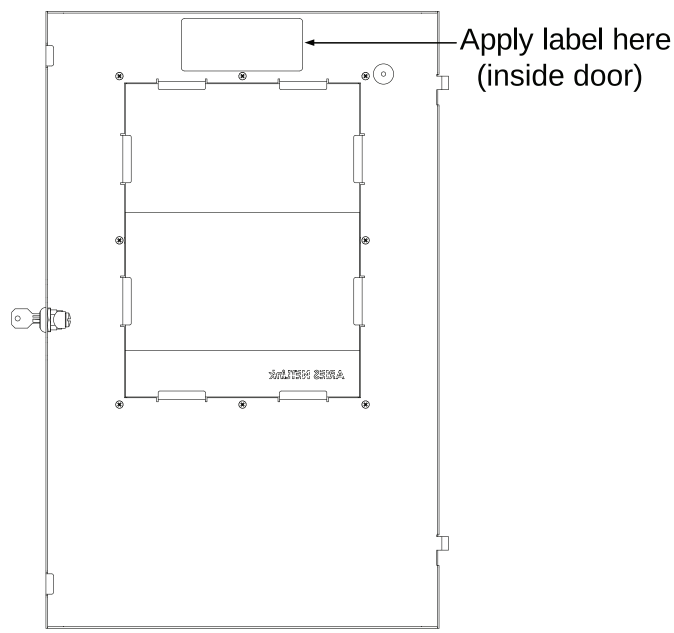


Figure J-2. Label Placement Inside Door

J-2.2 Installing a Power Supply Unit into Enclosure Top Tier

1. Refer to Section 2-4.3 in Chapter 2, *Installation*, for general power supply unit installation steps.
2. Install an additional M3 x 5 screw (supplied in the hardware kit, P/N 76-800000-009) as shown in Figure J-3 and Figure J-4.

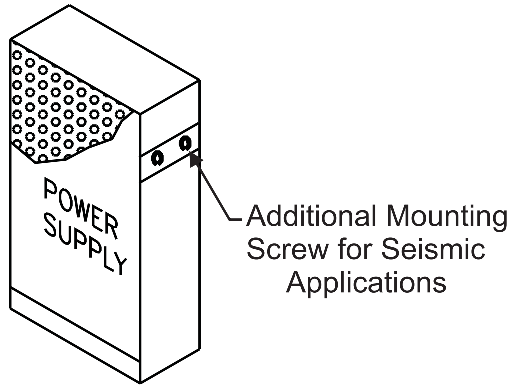


Figure J-3. Power Supply Unit Additional Screw Hole Location

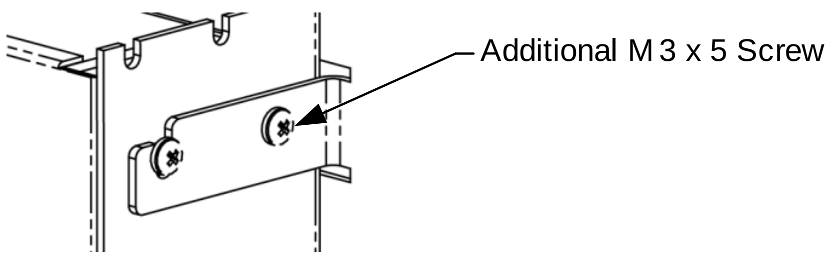


Figure J-4. Power Supply Unit Shown Inside Retention Bracket On Control Unit Enclosure

J-2.3 Installing An Add-On Power Supply/PMU Assembly with Bracket (P/N 76-800030-003) Into Enclosure

1. Refer to Section 2-7.3 in Chapter 2, *Installation,* for general installation steps.
2. Install an additional M3 x 5 screw (supplied in the hardware kit, P/N 76-800000-009) for each power supply, as shown in Figure J-3 and Figure J-4.

J-2.4 Installing the Enclosure Battery Tray and 17-AH Batteries

For seismic applications using 17-AH batteries (P/N 06-115915-046 - PowerSonic) in an ARIES NET*Link* enclosure, a Battery Tray (P/N 76-8000030-006) is required.

1. Refer to Section in Chapter 2, *Installation*, for general installation steps.
2. Slide a plastic edge protector (two supplied in the hardware kit, P/N 76-800000-009) over the front edge of each wire channel opening, as shown in Figure J-5.

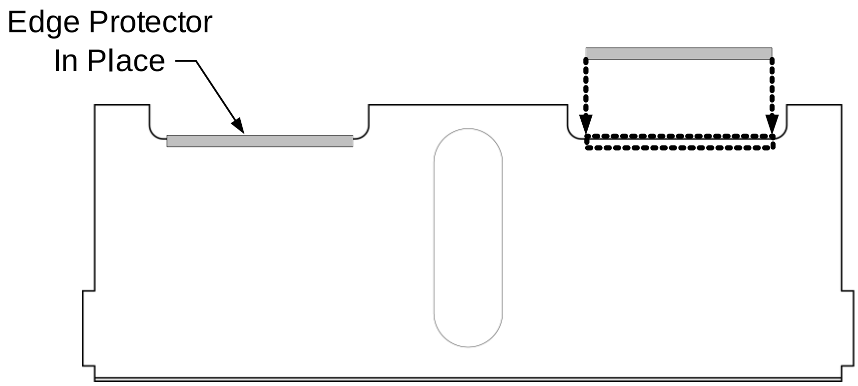


Figure J-5. Edge Protectors on Battery Tray

3. In the bottom tier of the enclosure, locate the three retention tabs in the enclosure's back panel.
4. Orient the tray such that its vertical lip is facing the front of the enclosure.
5. Grasp the tray with both hands and insert the back of the tray into the retention clips.
6. Push down firmly to ensure that the tray is securely seated.
7. Next, install two self-threading screws (supplied in the hardware kit, P/N 76-800000-009) from holes on each side of the enclosure into the matching holes of the battery tray.
8. Thread the clinching straps through the wiring channel.
9. Set the two batteries in place on the tray, then secure with clinching straps.

J-3 LARGE CAPACITY BATTERY CABINET CONVERSION PROCEDURE

The ARIES NET*Link* Large Capacity Battery Cabinet, P/N 76-100010-001, will also satisfy the requirements for Seismic Certification, if installed in keeping with the following instructions and using the additional hardware supplied in Seismic Conversion Hardware Kit for Battery Cabinet (P/N 76-800000-010).

CAUTION — **DO NOT CONNECT BATTERIES UNTIL ALL BATTERY INSTALLATION STEPS ARE COMPLETED.**

1. Refer to Section 2-16 in Chapter 2, *Installation,* for general mounting steps.
2. Install five (5) 3/8-16 Grade 2 bolts (not provided) at all hole locations indicated on Figure J-6. Apply washers (provided in the hardware kit, P/N 76-800000-010).

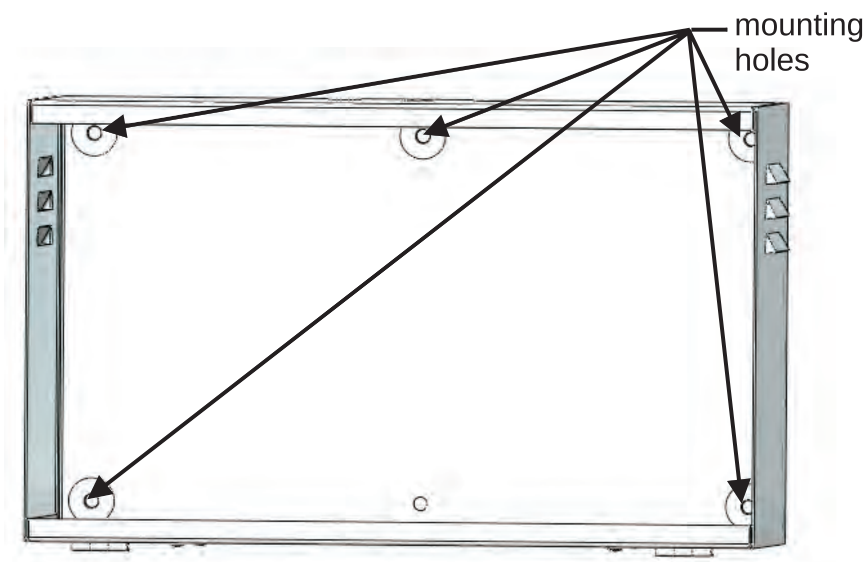


Figure J-6. Battery Cabinet Mounting Hole Locations

3. Mount the Large Capacity Battery Cabinet using 5 bolts (instead of the 4 outlined in the manual).
4. Make appropriate conduit connections for wiring.
5. Remove the Seismic Certification Label from its protective package in hardware kit, peel off backing, and apply label to the inside of the Cabinet door.
6. Locate one battery bracket from the hardware kit, either right or left, and set over the three matching slots in the cabinet bottom. Insert #8 screws and tighten.
7. Place both batteries side-by-side in the cabinet in the same orientation as shown in Figure J-9.
8. Set the remaining battery bracket in place and tighten with #8 screws.
9. (Optional) If the fit of the batteries inside the brackets is loose, remove one bracket and apply velcro spacers as required either between the two batteries and/or between batteries and the back of the cabinet (as shown in Figure J-7), then replace the bracket.
10. Locate two #10 stop nuts and one rod bracket from the hardware kit. Screw a stop nut all the way up on each threaded end of the rod bracket (also provided in kit).

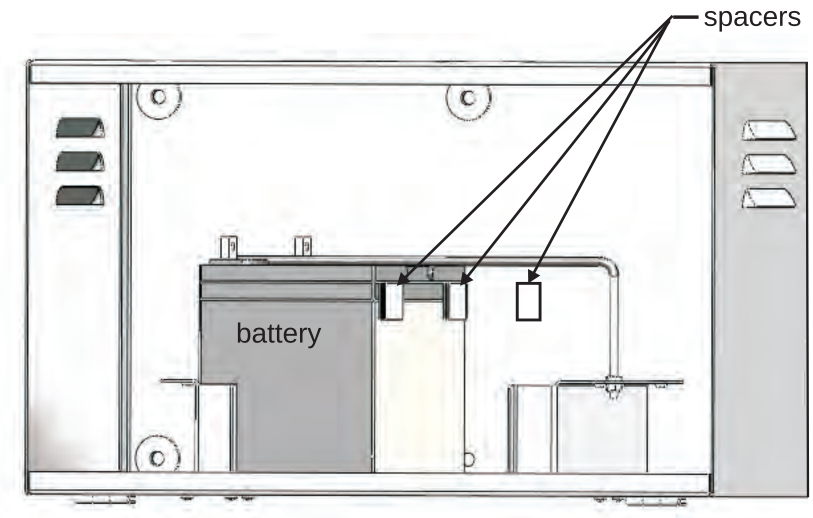


Figure J-7. Recommended Velcro Spacer Locations

11. Set the rod bracket over batteries and insert each threaded end into mating holes of brackets already mounted to the cabinet.
12. Adjust the two stop nuts downward until they just make contact with the brackets. Refer to Figure J-8.

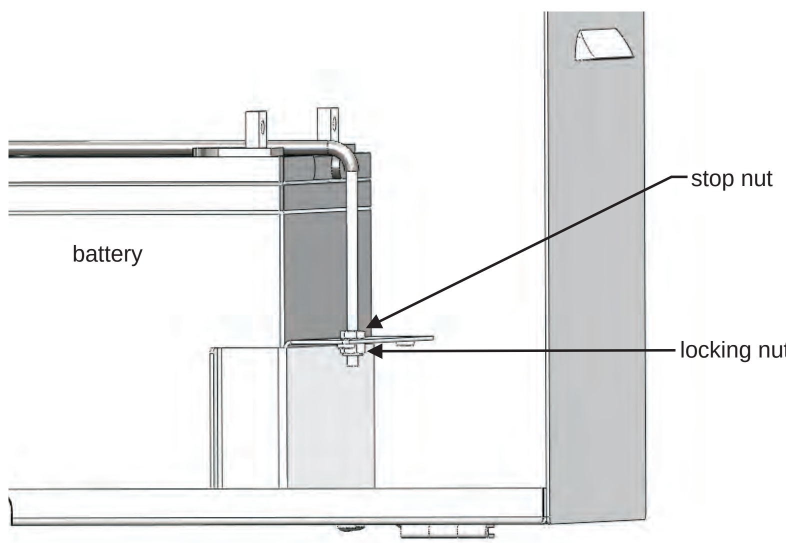


Figure J-8. Fastening Rod Brackets Over Batteries

13. Hold the rod bracket in place by screwing the two locking nuts from the hardware kit onto each end of the rod bracket and tightening.
14. Make all necessary battery connections.

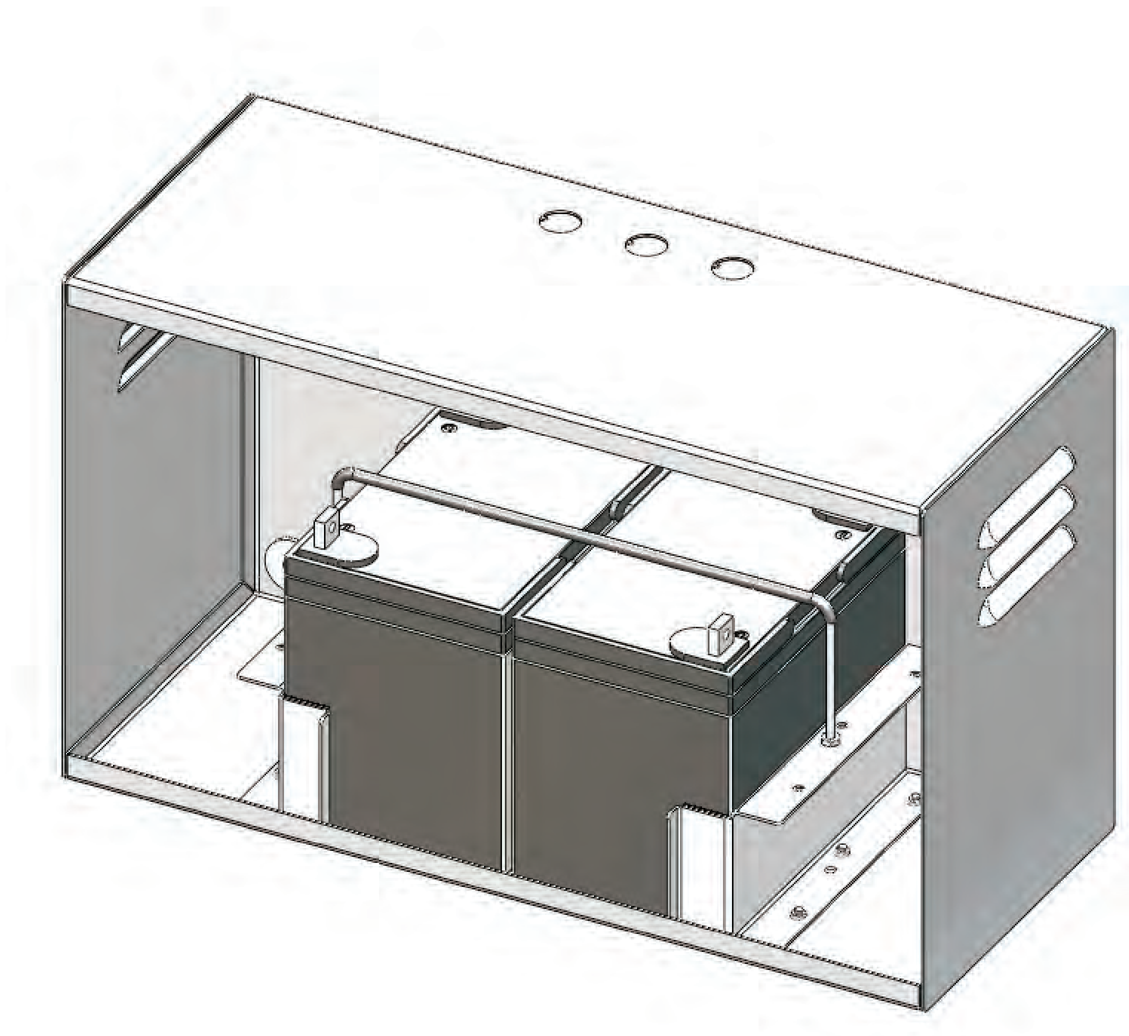


Figure J-9. Batteries inside Large Capacity Battery Cabinet with Seismic Hardware Installed

(shown without door)

Note: Orientation of batteries shown below is important to minimize the possibility of an accidental short circuit.

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Kidde
Fire Systems
400 Main Street
Ashland, MA 01721 USA
Ph: 508.881.2000
Fax: 508.881.8920
www.kiddefiresystems.com

These instructions do not purport to cover all the details or variations in the equipment described, nor do they provide for every possible contingency to be met in connection with installation, operation and maintenance. All specifications subject to change without notice. Should further information be desired or should particular questions arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to KIDDE-FENWAL INC., Ashland, Masssachusetts