PRO-2000 Series
Addressable Fire Detection and Control System
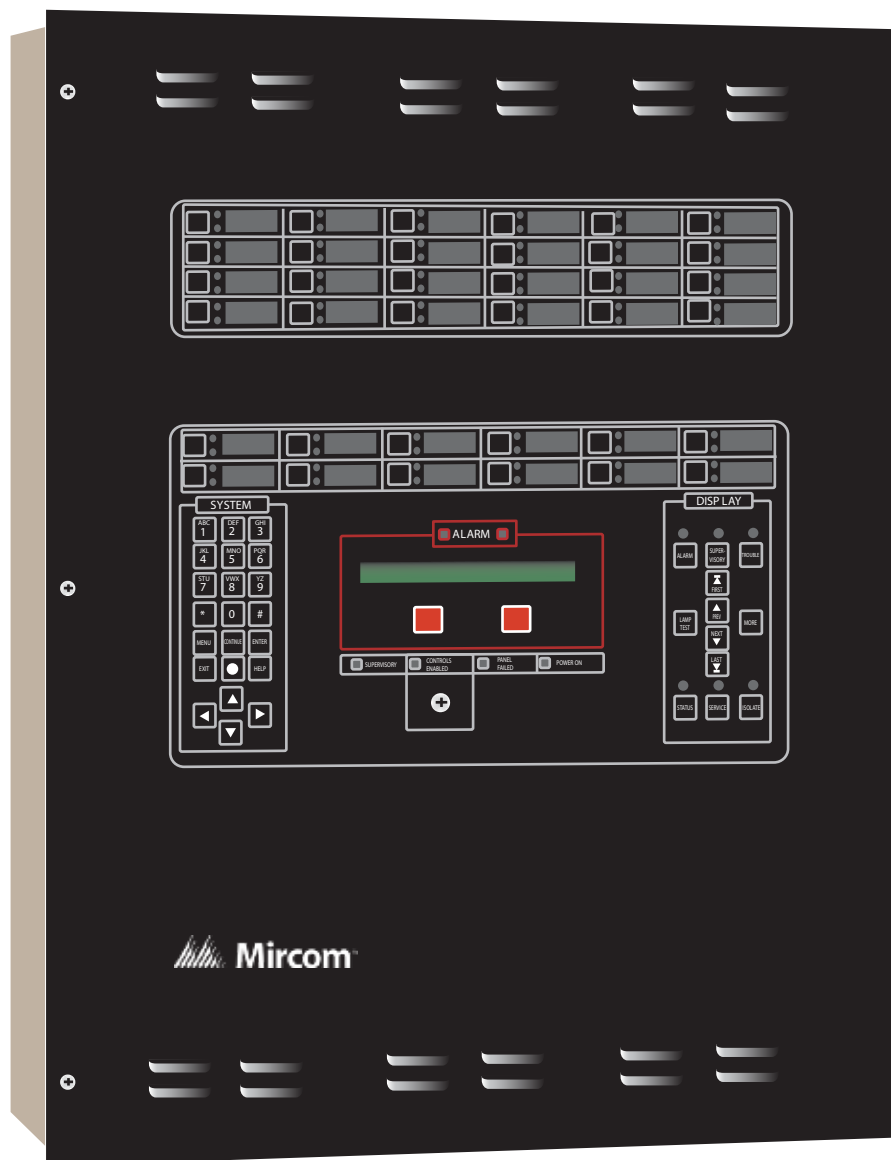

Installation and Operation Manual

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PRO-2000 Series

The PRO-2000 is a sophisticated micro-processor-based, fire detection, monitoring and control series of panels. The panels are fully on-site configurable.

The number and type of PRO-2000 panels depend on your application. They come in different versions-an X2, X6, and X0-allowing system scalability. The X2 and X6 versions are the main building blocks of the PRO-2000 series, with the X0 version acting as remote annunciators.

The connected detection, monitoring, and control devices can be configured in loop or stub configurations. The status of the devices can be displayed by a single panel or by multiple panels in a network. In a network configuration, one panel is programmed as a Master, with all other panels configured as Slaves-reporting alarms and device states to the Master panel.

The panels are designed to operate as a stand-alone fire detection and control panels, or as part of a network, comprising several PRO-2000 panels, with a total capacity of 10,000 I/O points. The PRO-2000 panel performs trend analyses of the measured values obtained from monitored sensors and adjusts individual alarm thresholds to compensate for detector contamination or slow-changing environmental influences. These analyses ensure reliable determination of the status (alarm, fault, or normal).

The basic configuration of a PRO-2000 panel comprises three main elements:

- An Enclosure containing the electronics necessary to run the system.
- A PRO-2000 panel may contain a combination of up to two expansion cards for the X2 series, and six expansion cards for the X6. For example, Addressable Devices Interface (ADI), Communication, Supervised Input, and Supervised OUTPUT cards. The enclosure size and contents depend on the configuration of your protected installation.
- A Power Supply connecting to an external power source as well as Battery charger/Battery backup capability.
- A user interface between the system and the operator equipped with LED indicators, push buttons, a Control Key Switch, and a Liquid Crystal Display (LCD).
- All PRO-2000 panels provide a 2 x 40 character, backlit, LCD display indicating the status (alarm, fault, or normal) of each of the devices. The Expanded versions, X6E, X2E, and X0E panels provide additional control and display capabilities with the addition of 24 push buttons and 48 LEDs.

The panels can act as releasing units for applications where different extinguishing agents are used. A typical releasing configuration comprises heat or smoke detectors, a pull station, an abort station, a set of extinguishant cylinders, and audible/visual signaling devices. The panel is factory programmed to meet the necessary requirements for each zone.

Applicable Standards: NFPA 11, 12, 12A, 12B, 13, 15, 16, 17, 17A, 70, 72, 750, 2001

UL 864 Rev. 9, ULC S524, ULC S527-99

The User Interface

Mounted on the enclosure door, the LCD Display provides the user interface for the PRO-2000. The LCD Display comprises an LCD card, a display/control escutcheon with configurable LEDs and push buttons, control key switch, and a buzzer.

The built-in buzzer draws attention to the panel on occurrence of any detected event. The buzzer sounds intermittently at two different rates: fast for alarms and slow for all other conditions.

The display/control escutcheon interfaces between the operator and the panel. There are 4 sections:

- The **Display** section provides selectable display lists of the events you want to access. By selecting a Mode, Alarm, Supervisory, Trouble, Status, Service or Isolate, the appropriate list appears in the LCD.
- The **System** section provides selections for system maintenance. For example, enable/disable printing, print the event log, place/remove devices into/from service or isolate mode.
- The **User Defined** section contains 12 configurable push buttons and 24 status LEDs-one red and one yellow for each push button.
- The **User Control** section displays events and provides acknowledge and reset features.

Membrane push button controls acknowledge and silence alarms, reset the detection circuits, and test the panel display. These controls also enable authorized service personnel to perform service functions. Using the System keypad, the operator can select different maintenance functions such as the event log, backlighting intensity, and other maintenance related features.

The LCD Display features a 2 line by 40 character Liquid Crystal Display (LCD) indicating the status of the panel and all connected input and OUTPUT devices. When an off-normal condition occurs, the first line displays event occurrence and time, the second line provides a plain language description of the off-normal condition. The text description for the zone or device is user-defined.
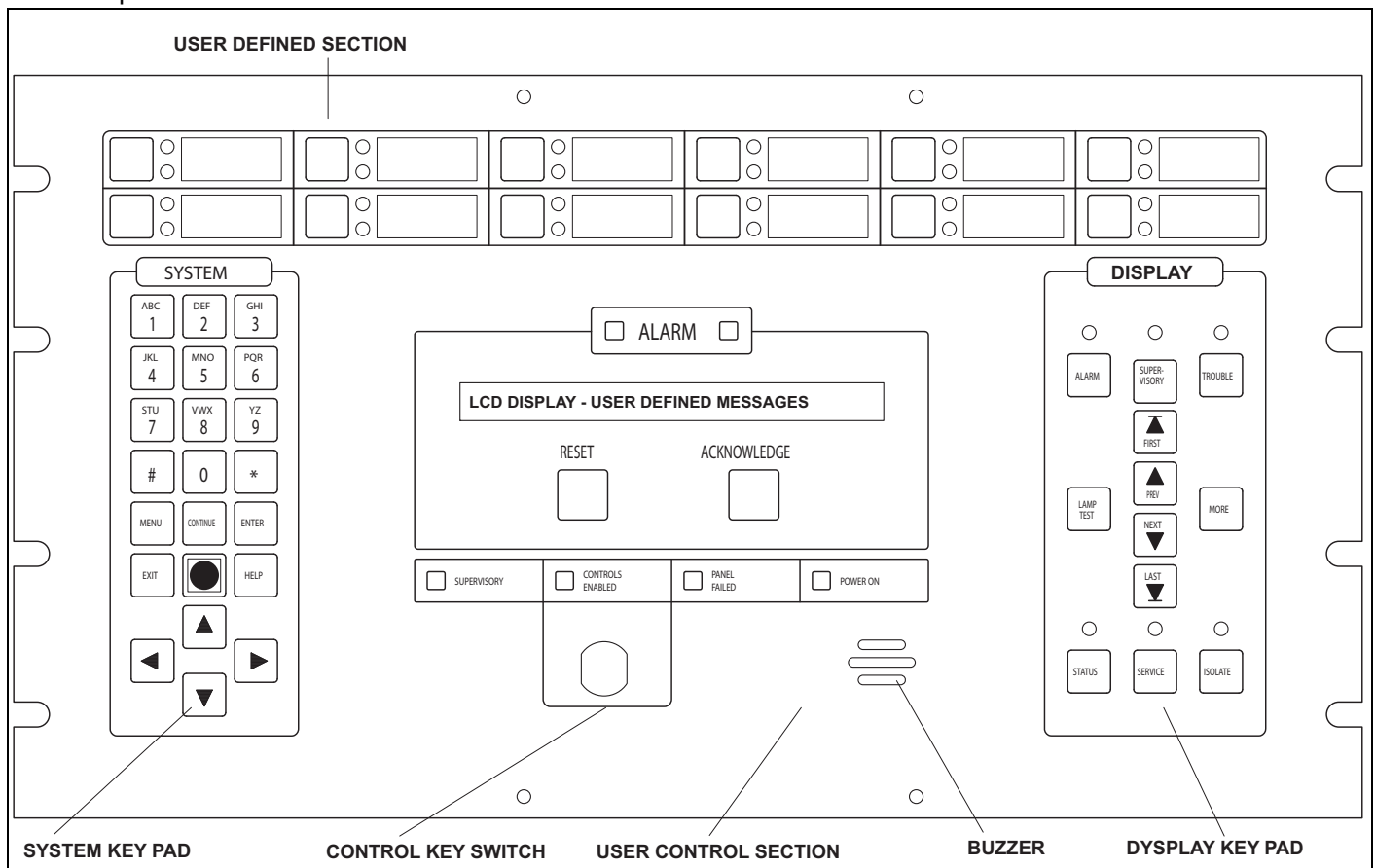
Figure 1: LCD Display

Features Table

USCG	UL/ULC	Feature	X2S	X2E	X2M	X6S	X6E	X6M	X6B	X0S	X0E	X0M
X	X	Listing	X	X	X	X	X	X	X	X	X	X
X	X	Up to 1200 local detection/control devices/zones per panel	X	X	X							
X	X	Up to 3600 local detection/control devices/zones per panel				X	X	X	X			
X	X	Up to 5000 networked detection/control zones per panel	X	X	X							
X	X	Up to 10000 networked detection/control zones per panel				X	X	X	X			
X	X	Support for addressable devices (detectors, monitor modules, control modules)	X	X	X	X	X	X	X			
X	X	Support for conventional 2-wire initiating devices (shouting and non-shorting devices)	X	X	X	X	X	X	X			
X	X	Support for notification circuits (dry contacts and supervised outputs)	X	X	X	X	X	X	X			
X	X	Support for panel networking RS-422 loop/stub	X	X	X	X	X	X	X	X	X	X
X	X	Support for Printer, MODBUS interface, diagnostic port RS-232 with or without handshake	X	X	X	X	X	X	X			
X	X	Support for repeater panels	X	X	X	X	X	X				
X	X	User interfaces: - 2 lines x 40 characters backlit LCD display, - 24 programmable local LED indicators, - 12 programmable local push buttons, - Easy one key access to display lists, Alarm, Supervisory, Trouble, Status, Service, Isolate	X	X	X	X	X	X		X	X	X
X	X	Adjustable panel brightness	X	X	X	X	X	X		X	X	X
X	X	One person walk test	X	X	X	X	X	X		X	X	X
X	X	Service and isolate modes	X	X	X	X	X	X		X	X	X
X	X	Battery back-up real time clock and event log	X	X	X	X	X	X		X	X	X
X	X	110 to 120VAC or 220 to 240VAC operation	X	X	X	X	X	X	X	X	X	X
X	X	Battery charger	X	X	X	X	X	X	X	X	X	X
X	X	Master Alarm and Trouble Relays	X	X	X	X	X	X	X			
X	X	All field wiring connected through removable connectors with screw terminators	X	X	X	X	X	X	X	X	X	X
X	X	Isolated power supplies on each interface card for exceptional noise immunity	X	X	X	X	X	X	X	X	X	X
X	X	Independent Ground fault detection circuits on each interface card for easy Ground fault tracking	X	X	X	X	X	X	X	X	X	X
X	X	Transient protection on all field connections and chassis	X	X	X	X	X	X	X	X	X	X
X	X	Wall mount enclosure	X	X	X	X	X	X	X	X	X	X
X	X	48 additional programmable local indicators		X			X				X	
X	X	24 additional programmable local push buttons		X			X				X	
X	X	Geographic mimic display containing up to 144 indicators (LED) and 72 push buttons			X			X				X

Table 1: Table of features

PRO-2000, X2 SERIES - S/E/M

The PRO-2000 X2 Series are fire alarm monitoring and control units suitable for small to medium applications. Large applications can be covered with networked panels.

The PRO-2000 X2 Series consists of three types of panels: the X2S, the X2E, and the X2M.

PRO-2000 X2S (Standard)

The X2S is the standard panel housed in a 23" x 24" (584 mm x 610 mm) enclosure. The X2S consists of a processing and display unit which processes all field data and displays all event. It has the standard 2 lines by 40 character display with the associated display list controls and indicators and the standard 24 configurable indicators (LEDs) and 12 configurable push buttons.

PRO-2000 X2E (Expanded)

The X2E is the expanded version housed in a 24" x 30" (610 mm x 762 mm) enclosure. It has the same features as the X2S plus an additional 48 configurable indicators (LEDs) and an additional 24 configurable push buttons.

PRO-2000 X2M (Mimic)

The X2M is the mimic version housed in a 24" x 41" (610 mm x 1041 mm) enclosure. It has the same features as the X2S plus a geographic mimic providing a graphical representation of the protected area. The mimic contains up to 144 indicators (LEDs) to provide visual feedback and 72 programmable push buttons.

PRO-2000 X2, Common Features

The X2 Series supports communication and networking functions. The X2 panels can operate as standalone panels or they can be networked in a master/slave configuration. The master can be programmed to monitor and control the slave panels as well as monitor its own devices.

By adding an RS-232 communication module to the LCD card, the X2 panels can communicate with external devices, such as printers or computers, via a standard modular phone jack. The RS-232 communication module supports one channel. By adding an RS-422 communication module, the X2 panels can be networked to other PRO-2000 panels. The RS-422 communication module supports 2 channels. The communication capabilities of the X2 Series can be further expanded by the addition of Communication cards.

The printer used must be UL ITE Listed. ITE stands for Information Technology Equipment as per UL requirement.

The X2 panels can be expanded using up to 2 of the following expansion cards:

- Addressable Detector Interface (ADI) card - smoke/heat detectors, monitor modules, control modules, and 4 on board supervised/unsupervised outputs
- 24/32 Zone Supervised Input (SI) card - conventional detectors, shorting and non-shorting devices
- 12 Zone Supervised OUTPUT (SO) card - supervised outputs and dry contacts
- Communication Card - networked configurations
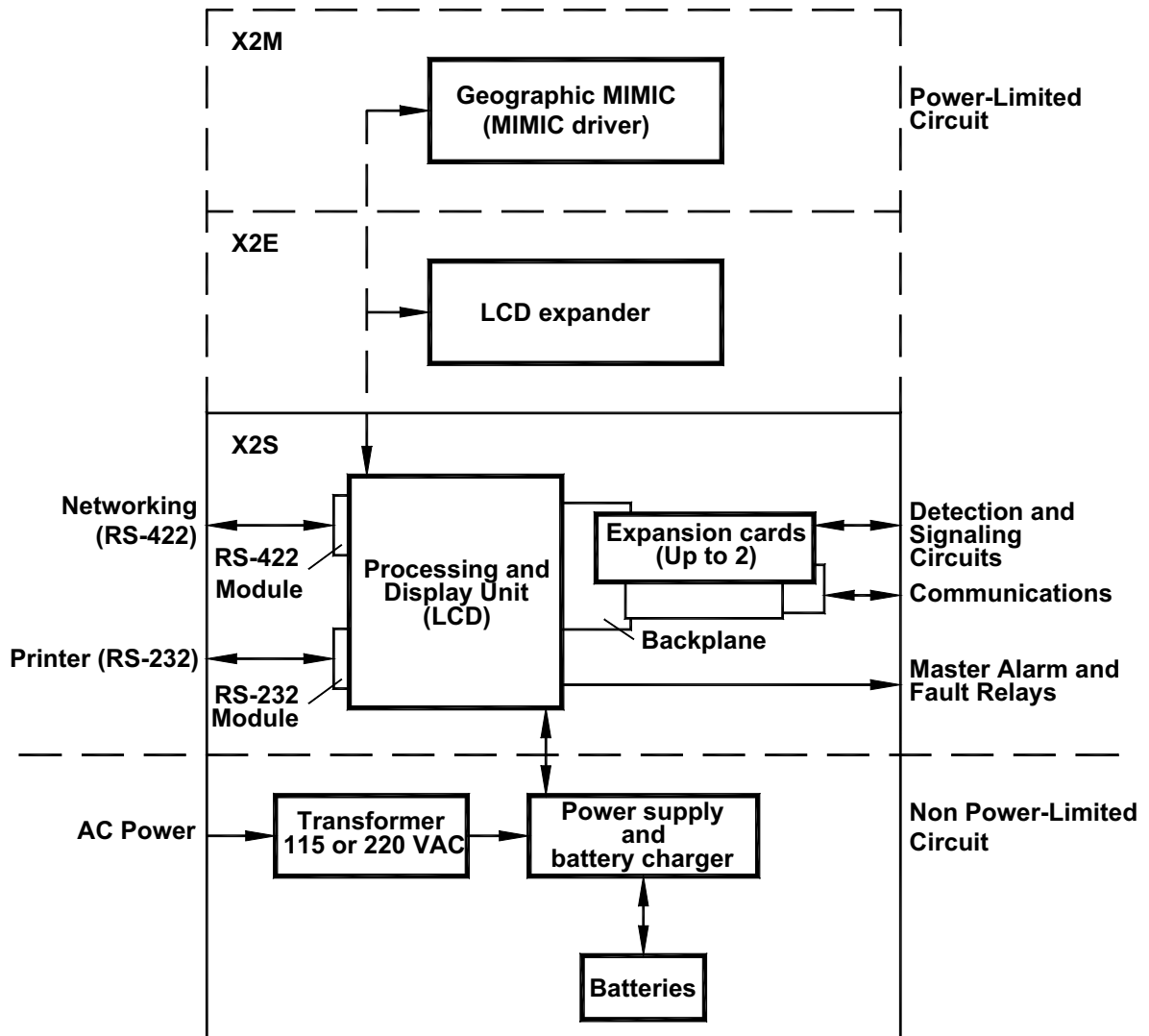
Figure 2: X2, Synoptic sketch of the PRO-2000, X2 series

General Installation Guidelines

X2 panels should be installed in a dry, clean, well lit secured area. No combustible or hazardous material should be stored in the vicinity of the installed unit. The installation must comply with all local and/or national regulations and codes of practice governing fire alarm system installation, electrical wiring, life safety, etc.

Special Handling

Circuit cards are to be stored in anti-static packaging and kept away from the sun and from direct sources of intense UV light. The circuit card may be subject to degradation due to electrostatic discharge; therefore grounding straps must be worn when handling the cards.

Enabling the Onboard Lithium Battery Backup

The X2 panels are shipped with the jumper for the lithium battery disconnected. You must insert the jumper to activate the battery backup for the real time clock and the RAM memory used for the event log. Jumper is located on the LCD (JP6).

LCD

LITHIUM BATTERY JUMPER
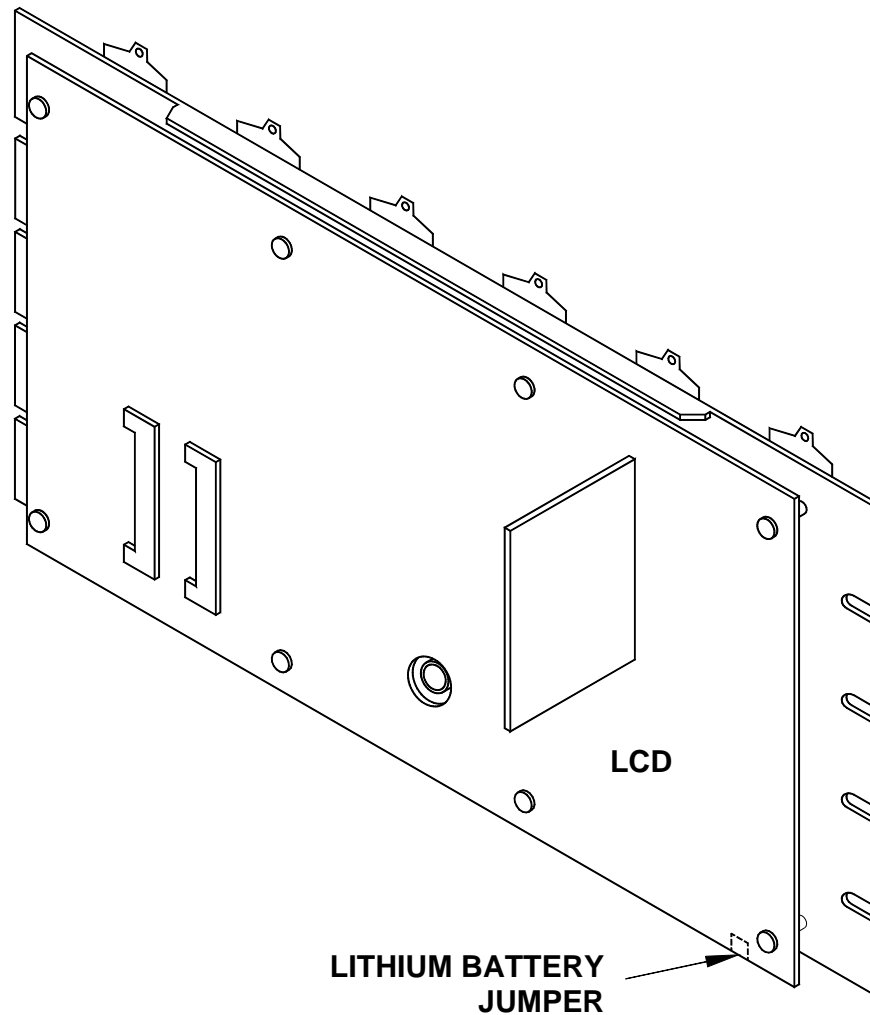
Figure 3: Lithium Battery Jumper

Cable Entry and Internal Routing

On the enclosure there are two removable cable entry plates. These plates are to be removed, punched and re-installed. If additional entry holes are required outside the cable entry plates, before punching cable entry holes:

1. Disconnect the wiring harness from the power supply to the LCD card.
2. Disconnect the door ground strap and remove the enclosure door with attached electronics.
3. Remove the mounting plate with attached power supply from the enclosure base.

Cable entry holes must be punched in accordance with the following criteria:

*   Separate holes are required for the entry of Power-Limited and Non-Power-Limited circuit cables.

- Centre-to-centre spacing between an entry hole for Power-Limited circuit cables and an entry hole for Non-Power-Limited circuit cables must not be less than two (2) times the diameter of the larger entry hole.

- Sufficient clearance must be provided around each hole to allow for any required conduit fittings, cable-clamps, lock nuts, washers or other hardware.

- Exclusive entry holes must be provided for the Primary AC Supply cable and for the External Standby Supply (battery backup) cable.

- At no point inside the enclosure must the spacing between power-limited and non-power-limited circuit conductors be less than 6.4mm (114 inch).

Wire length inside the enclosure should be kept to a minimum.
Cables must not interfere with, or touch any circuit card components other than the intended connector terminals.

Grounding and Bonding

All supply and device wiring must be grounded and bonded in accordance with applicable local regulations governing the wiring of Fire Alarm Systems.

Enclosure Installation

All cable entry holes should be punched out prior to installation of base.

Ensure wall or structure to which the enclosure base is being mounted is capable of supporting a fully loaded unit.

Sufficient clearance must be provided around the unit to allow the enclosure cover door to be fully opened (180°) without impediment. The enclosure box may be semi-flush mounted provided no less than 5 cm (2 inches) of the box frame protrudes from the wall surface.

The top of the enclosure should be no more than 2.0 meters (6.7 feet) above the finished floor.

Recommended mounting hardware: four 1/4" pan head screws (if bolts are used, four suitable flat washers are required).

1. Remove the ground strap (14 gauge, green) between the enclosure base and door by loosening and removing the ground stud nut and star washer.
2. Disconnect the power harness connectors at J5 and J7 on the LCD card.
3. Remove the enclosure door from the slip hinges.
4. Remove the mounting plate, with attached power supply, from the enclosure base.
5. Secure the enclosure to wall using the for ¼" panhead screws.
6. Align the mounting plate, with attached power supply, to the enclosure base threaded studs and secure with attaching nut and washer.
7. Re-install the door and ground strap between the door and the enclosure base.
8. Reconnect the power harness connectors at J5 and J7 on the LCD card.
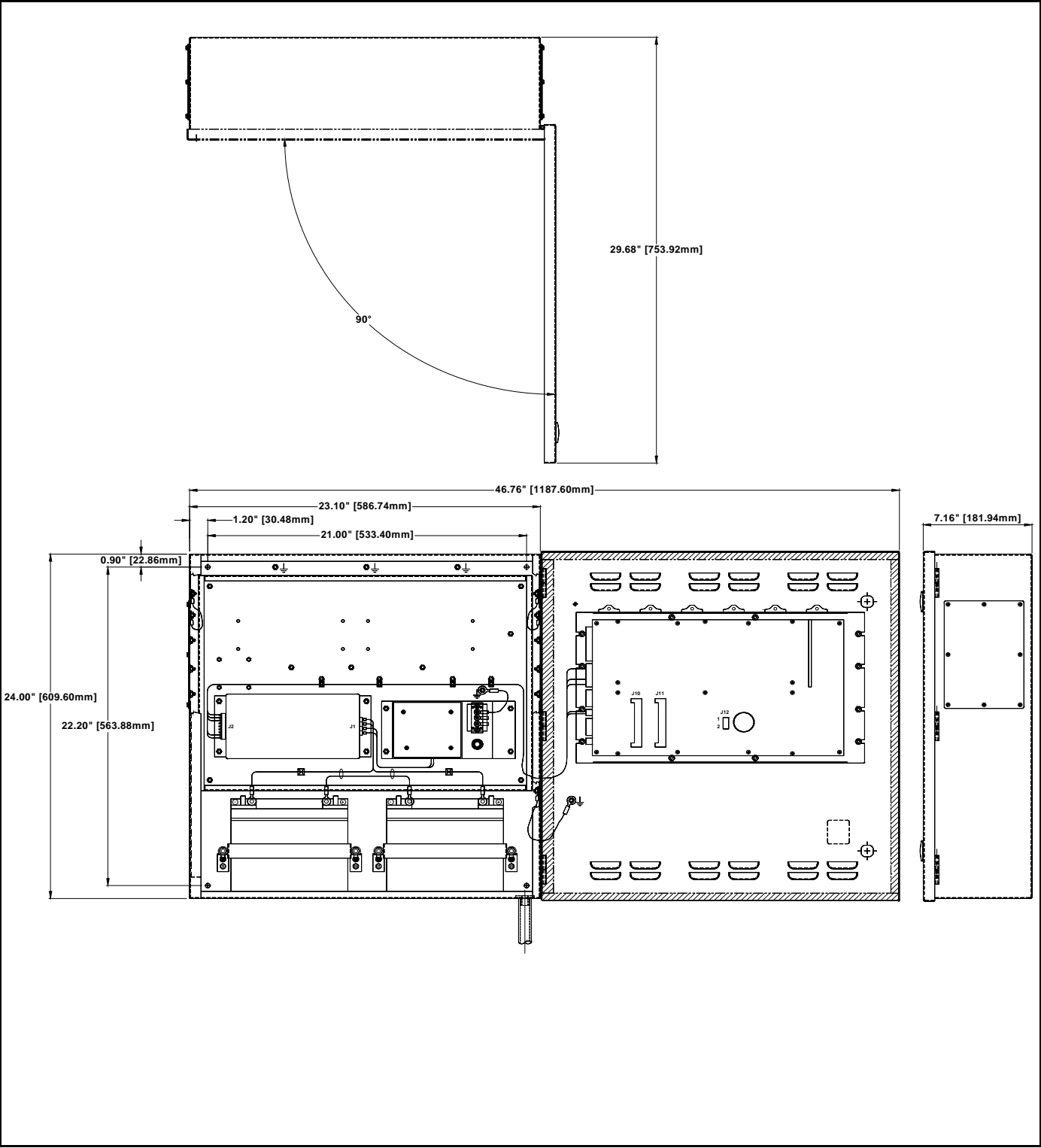
Figure 4: X2S, Installation Layout

Figure 5: X2E, Installation Layout
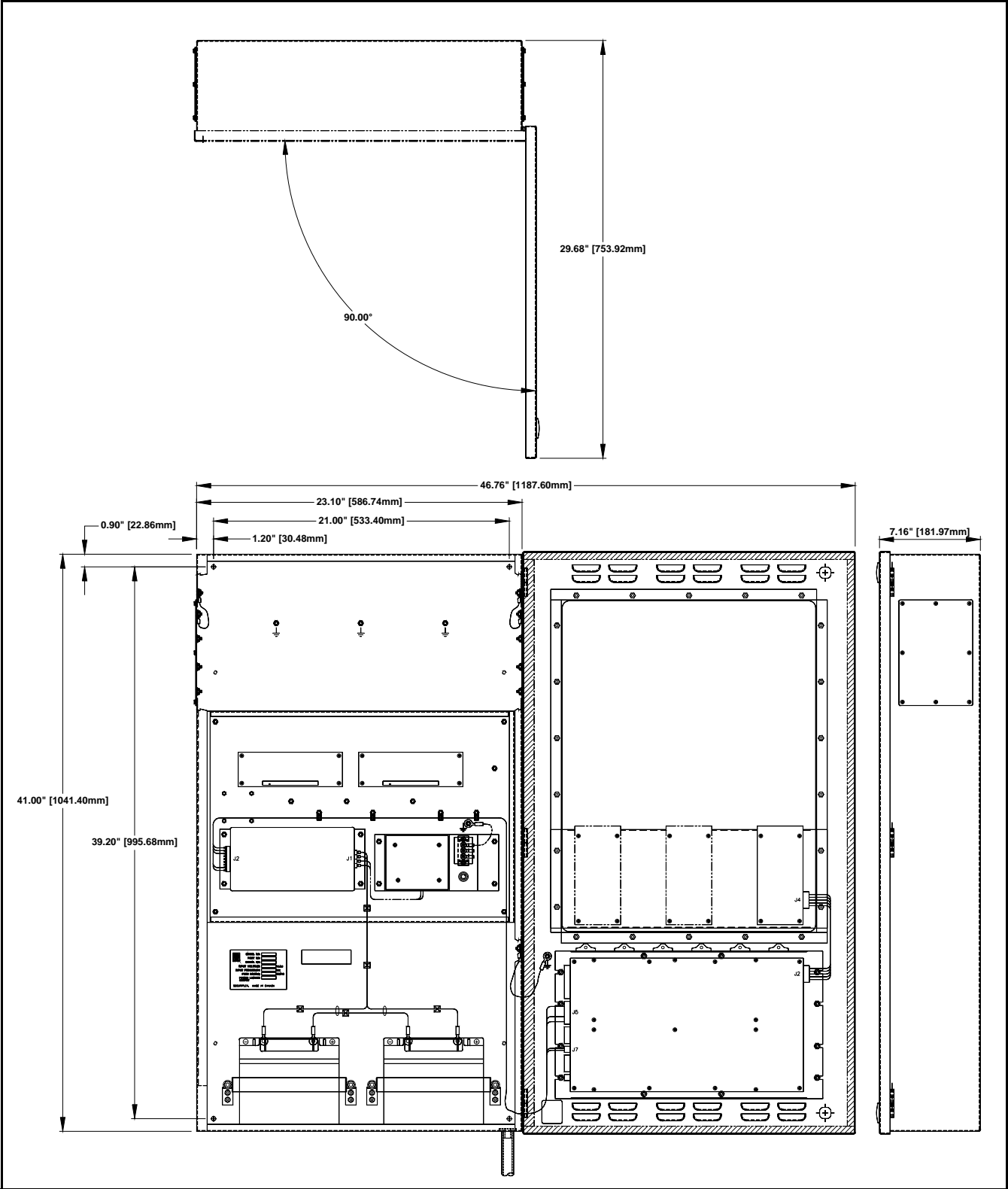
Figure 6: X2M, Installation Layout

Hookup of AC Power and Batteries

The Power Supply provides a regulated 28 VDC to the PRO-2000 series and provides charge current to the optional backup batteries. As the batteries are kept permanently charged, power is continuously provided (Uninterruptible Power Supply or UPS). The power supply AC ratings are as follows:

120 V version: V = 120 VAC nominal, I = 1.5 A, frequency 60 Hz

220 V version: V = 220 VAC nominal, I = 0.8 A, frequency 50 Hz

LEDs are visible on the Power Supply indicating the functional status of the unit. As the Power Supply is convection cooled, no fans or blowers are required. The transformer and power supply mount directly on the mounting plate.

A built-in battery charger maintains the batteries at full capacity. After extended power outages, the charger restores the batteries to full capacity. Short circuit, over-voltage, and brownout monitoring circuits protect all powered components by switching to the batteries whenever a trouble condition exists in the power supply.

Alarm Supply

Power to the alarm devices in a system must be supplied from a separate battery backed-up Power Supply which is "UL listed (ULC listed in Canada)" for fire protective signal system use.

AC Power Connection

CAUTION: Ensure all voltage sources are disconnected from the panels before installing or removing cards.

1. Remove terminal cover from terminal block, TB1, located on the transformer bracket.
2. Connect Primary supply Ground wire (green) to Ground stud.
3. Connect Primary supply Neutral wire (white) to TB1 NEUTRAL terminal.
4. Connect Primary supply Line wire (black) to TB1 LINE terminal.
5. Replace and secure terminal cover on TB1.
6. Maximum 150 VAC to Ground.

Figure 7: Terminal Connections

Installing Batteries in the Enclosure

The following instructions apply only to systems requiring 42 Amp-Hours or less of battery back-up capacity.

1. Remove battery retaining hardware.
2. Place two new fully charged 12V batteries on the bottom of the enclosure. Use 12V sealed lead-acid batteries.
3. Connect jumper between the batteries 'A' and 'B' poles (see Figure 8).
4. Connect black wire terminal to battery 'A'.
5. Connect red wire terminal to battery 'B' (+).
6. Replace battery and secure with retaining hardware.

For the Calculation of Battery Requirements, refer to Appendix A.
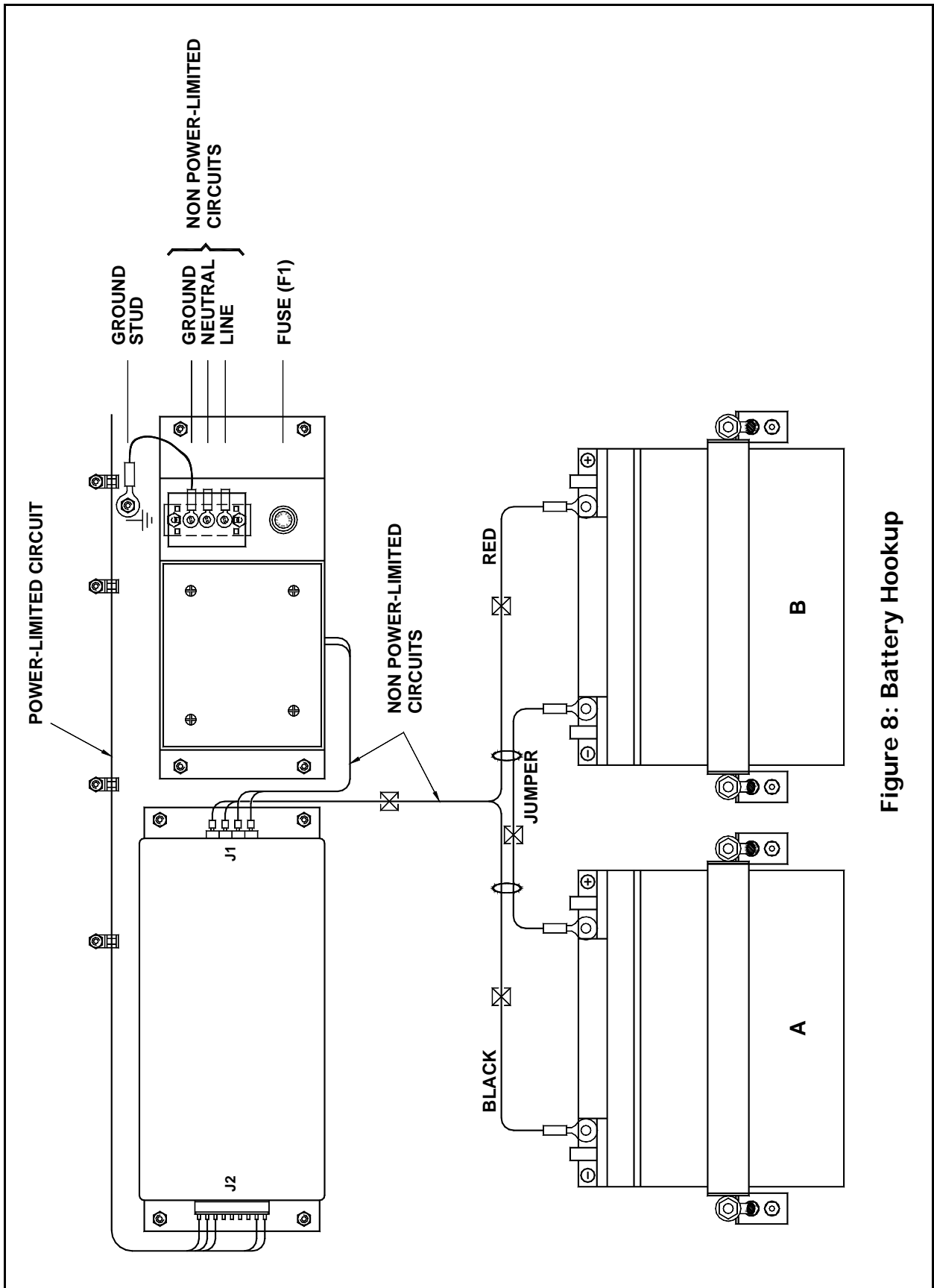
Figure 8: Battery Hookup

PRO-2000, X6 SERIES - S/B/E/M

The PRO-2000 X6 panels are fire alarm monitoring and control units suitable for medium to large applications. Very large applications can be covered with networked panels.

The PRO-2000 X6 Series consist of four types of panels: the X6B, the X6E, the X6M and the X6S.

PRO-2000 X6S (standard)

The X6S is the standard panel housed in a 24" x 30" (610 mm x 762 mm) enclosure. The X6S consists of a processing unit (MPU to process all field data and a display unit (LCD) to display all events. The LCD has a standard 2 line x 40 character display with the associated display list controls and indicators and the standard 24 configurable indicators (LEDS) and 12 configurable push buttons.

PRO-2000 X6B (blank)

The X6B is the blank panel housed in a 24" x 30" (610 mm x 762 mm) enclosure. It has the same features as the X6S, but without a display unit (LCD).

PRO-2000 X6E (expanded)

The X6E is the expanded version housed in a 24" x 30" (610 mm x 762 mm) enclosure. It has the same features as the X6S plus an additional 48 configurable indicators (LEDs) and an additional 24 configurable push buttons.

PRO-2000 X6M (MIMIC)

The X6M is the mimic version housed in a 24" x 41" (610 mm x 1041 mm) enclosure. It has the same features as the X6S plus a geographic mimic providing a graphical representation of the protected area. The mimic contains up to 144 indicators (LEDs) to provide visual feedback and 72 programmable push buttons.

Figure 9: Synoptic Sketch of the PR0-2000, X6 Series

PRO-2000 X6 Common Features

The X6 Series supports communication and networking functions. The X6 can operate as a stand-alone panel or it can be networked in a master/slave configuration. The master can be configured to monitor and control the slave panels as well as monitor its own devices.

The X6 panels can support communication to one RS-232 and one repeater network using small communication modules. By adding an RS-232 communication module to the MPU card, the X6 panels can communicate with external devices, such as printers or computers, via a standard modular phone jack. The RS-232 communication module supports one channel. The built-in RS-422 communication module enables X6 panels to support a maximum of two Repeater networks. The RS-422 communication module supports 2 channels. For enhanced networking capabilities, Communication interface cards can be added to the panel.

The printer used must be UL Listed (ULC Listed in Canada).

The X6 panels can accept up to 6 of the following expansion cards:

- Addressable Detector Interface (ADI) card - smoke/heat detectors, monitor modules, control modules, and 4 onboard supervised/unsupervised outputs
- 24/32 Zone Supervised Input (S1) card - conventional detectors, shorting and non-shorting devices
- 12 Zone Supervised OUTPUT (SO) card - supervised outputs and dry contacts
- Communication Card - networked configurations

General Installation Guidelines

The panel should be installed in a dry, clean, well lit and secured area. No combustible or hazardous material should be stored in the vicinity of the installed unit. The installation must comply with all local and/or national regulations and codes of practice governing fire alarm system installation, electrical wiring, life safety, etc.

Special Handling

Circuit cards are to be stored in anti-static packaging and kept away from the sun and from direct sources of intense UV light. The circuit card may be subject to degradation due to electrostatic discharge; therefore grounding straps must be worn when handling the cards.

Enabling the Onboard Lithium Battery Backup

The X6 panels are shipped with the jumper for the lithium battery disconnected. You must insert the jumper to activate the battery backup for the real time clock and the RAM memory used for the event log. Jumper is located on the MPU (JP3).

Cable Entry and Internal Routing

On the enclosure there are two removable cable entry plates. These plates are to be removed, punched, and re-installed. For additional entry holes, outside the cable entry plates:

1. Disconnect the wiring harness from the MPU to the LCD card.
2. Disconnect the door ground strap and remove the enclosure door with attached electronics from the enclosure base.
3. Remove the mounting plate with the attached electronics from the enclosure base.

Figure 10: Micro-processor (MPU)

Cable entry holes must be punched in accordance with the following criteria:

- Separate holes are required for the entry of Power-Limited and Non-Power-Limited circuit cables.
- Centre-to-centre spacing between an entry hole for Power-Limited circuit cables and an entry hole for Non-Power-Limited circuit cables must not be less than two (2) times the diameter of the larger entry hole.
- Sufficient clearance must be provided around each hole to allow for any required conduit fittings, cable-clamps, lock nuts, washers or other hardware.
- Exclusive entry holes must be provided for the Primary AC Supply cable and for the External Standby Supply (battery backup) cable if required.
- At no point inside the enclosure must the spacing between power-limited and non-power-limited circuit conductors be less than 6.4mm (¼ inch).

Wire lengths inside the enclosure should be kept to a minimum.
Cables must not interfere with, or touch any circuit card components other than the intended connector terminals.

Grounding and Bonding

All supply and device wiring must be grounded and bonded in accordance with applicable local regulations governing the wiring of Fire Alarm Systems.

Enclosure Installation

All cable entry holes should be punched out prior to installation of enclosure base.

Ensure wall or structure to which the enclosure base is being mounted is capable of supporting a fully loaded unit.

Sufficient clearance must be provided around the unit to allow the enclosure door to be fully opened (180°) without impediment. The enclosure box may be semi-flush mounted provided no less than 5 cm (2 inches) of the box frame protrudes from the wall surface.

The top of the enclosure should be no more than 2.0 meters (6.7 feet) above the finished floor.

Recommended mounting hardware: four ¼" pan head screws (If bolts are used, four suitable flat washers are required).

1. Remove the ground strap (14 Gauge, green) between the enclosure base and door by loosening and removing the ground stud nut and star washer.
2. Remove the MPU-LCD harness connector from J6 on the LCD card.
3. Remove the enclosure door from the slip hinges.
4. Remove the mounting plate, with attached electronics and power supply, from the enclosure base.
5. Secure the enclosure base to the wall using the four ¼" panhead screws.
6. Align the mounting plate, with attached electronics and power supply, to the enclosure base threaded studs and secure with attaching nut and washer.
7. Re-install the door and ground strap between door and enclosure base.
8. Reconnect the MPU-LCD harness connector at J6 on the LCD card.

29.68" [753.92mm]

90°

46.76" [1187.60mm]

23.10" [586.74mm]

21.00" [533.40mm]

1.20" [30.48mm]

0.90" [22.86mm]

7.16" [181.97mm]

30.00" [762.00mm]

28.20" [716.28mm]

J2

J5

J8

J10

J2

J1

J6
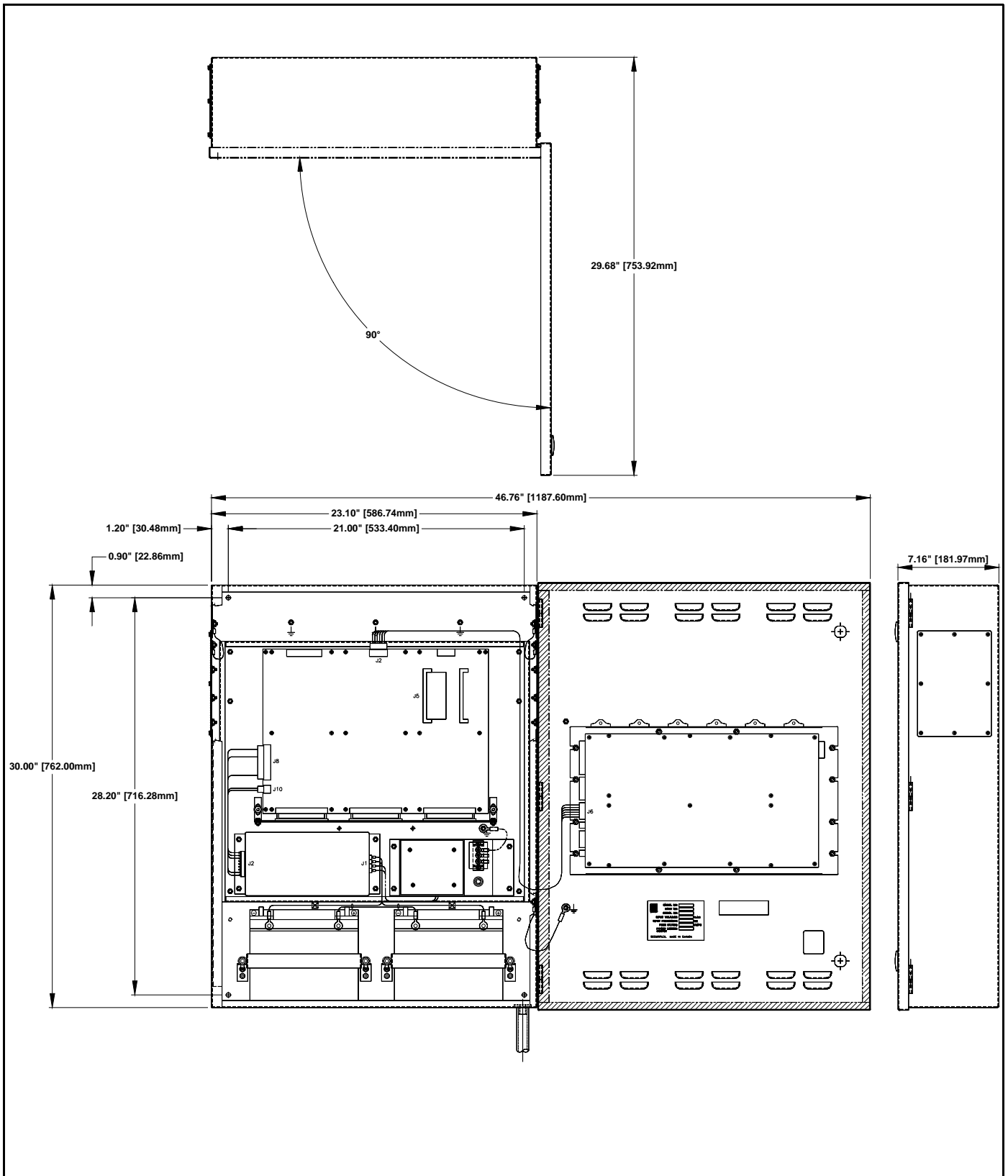
Figure 11: X6S, Installation Layout
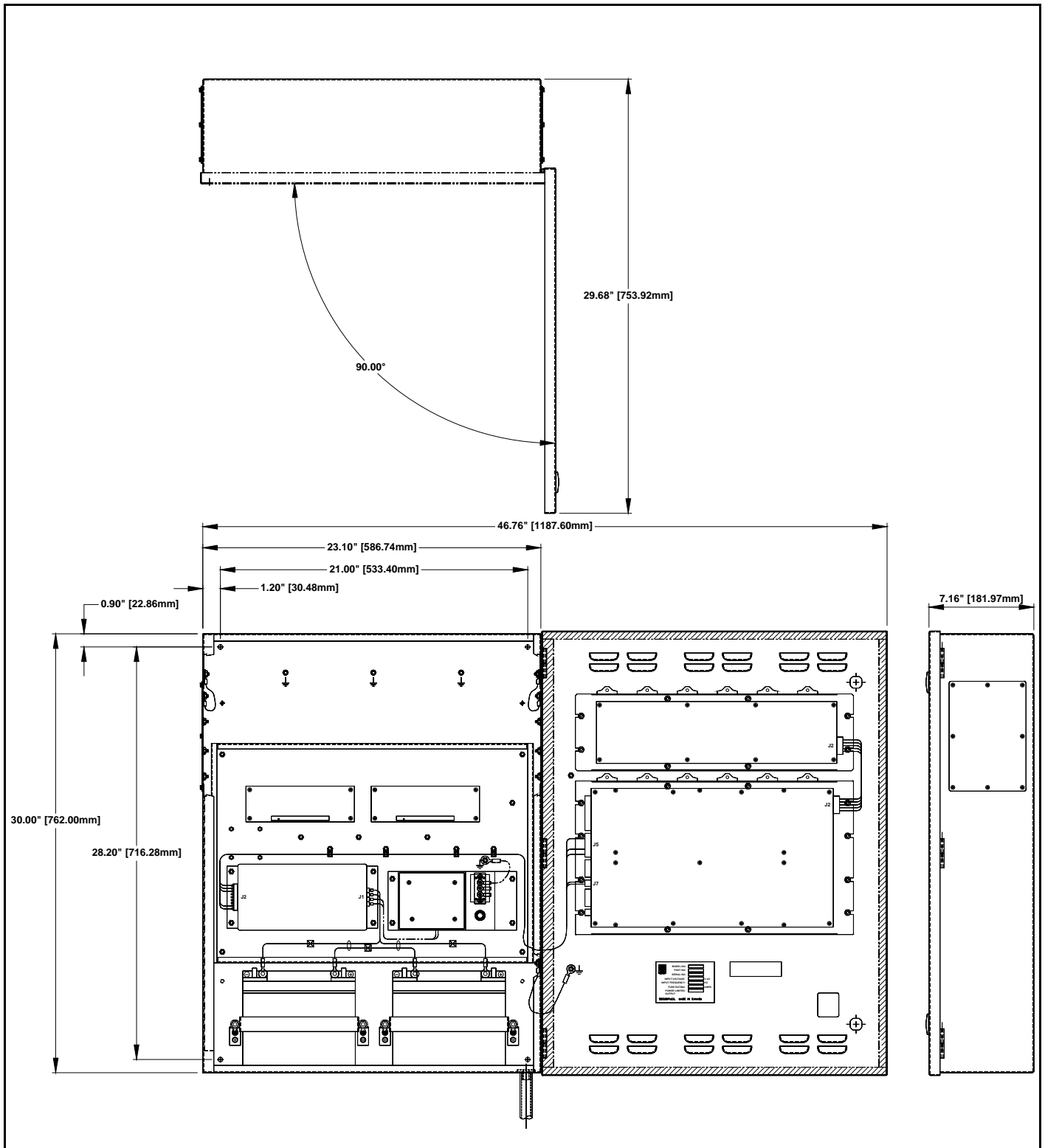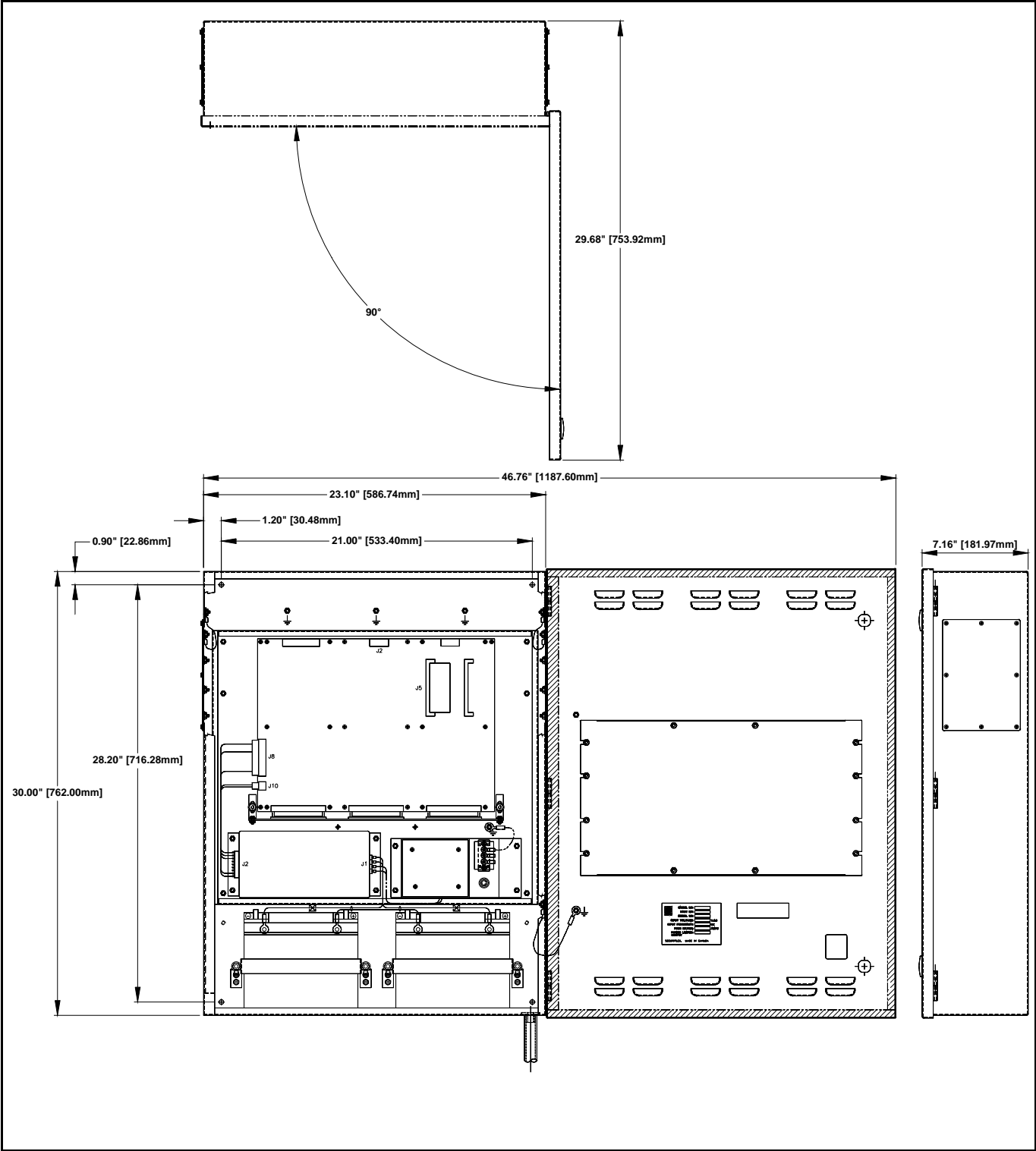
Figure 12: X6B, Installation Layout
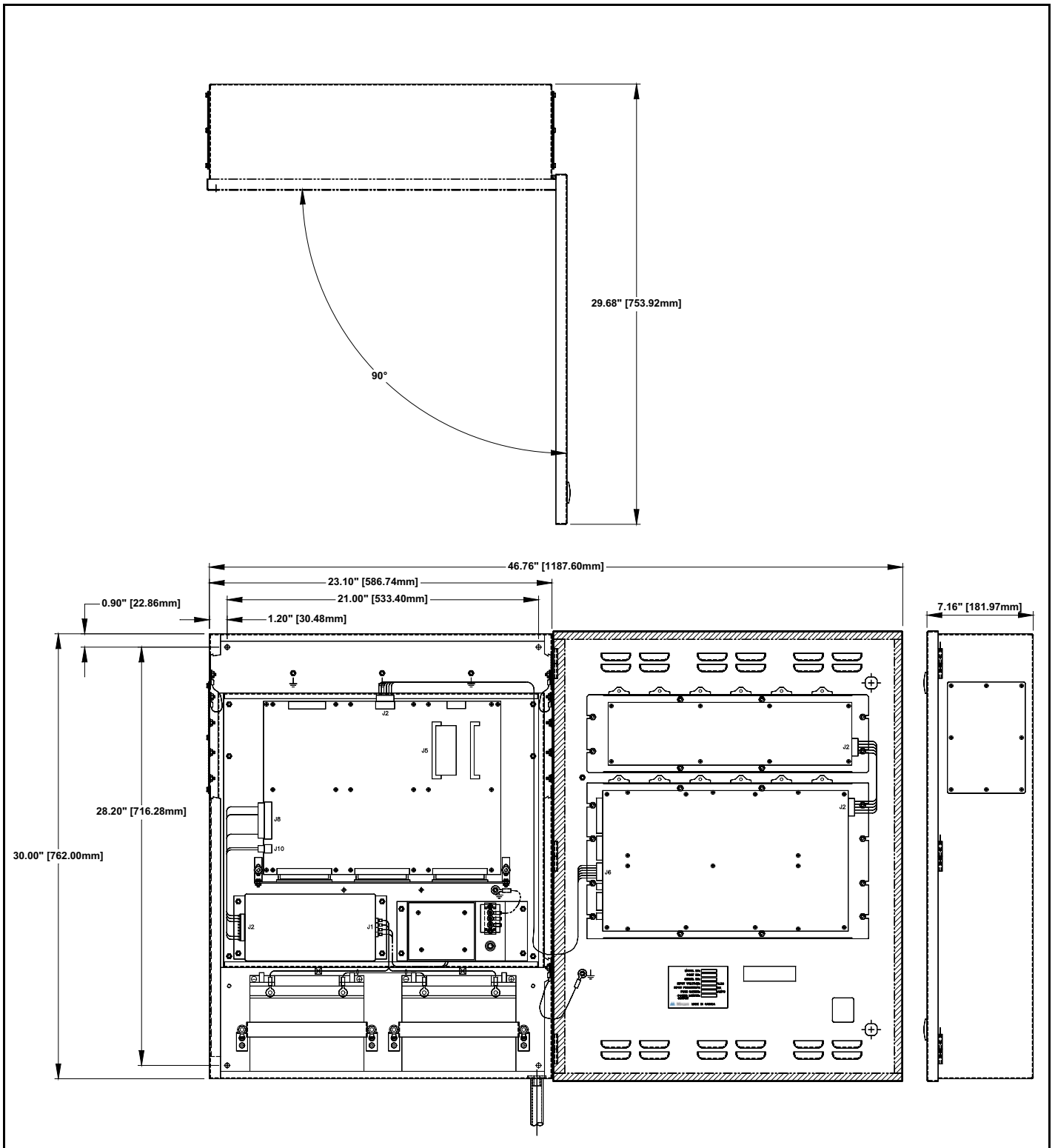
Figure 13: X6E, Installation Layout
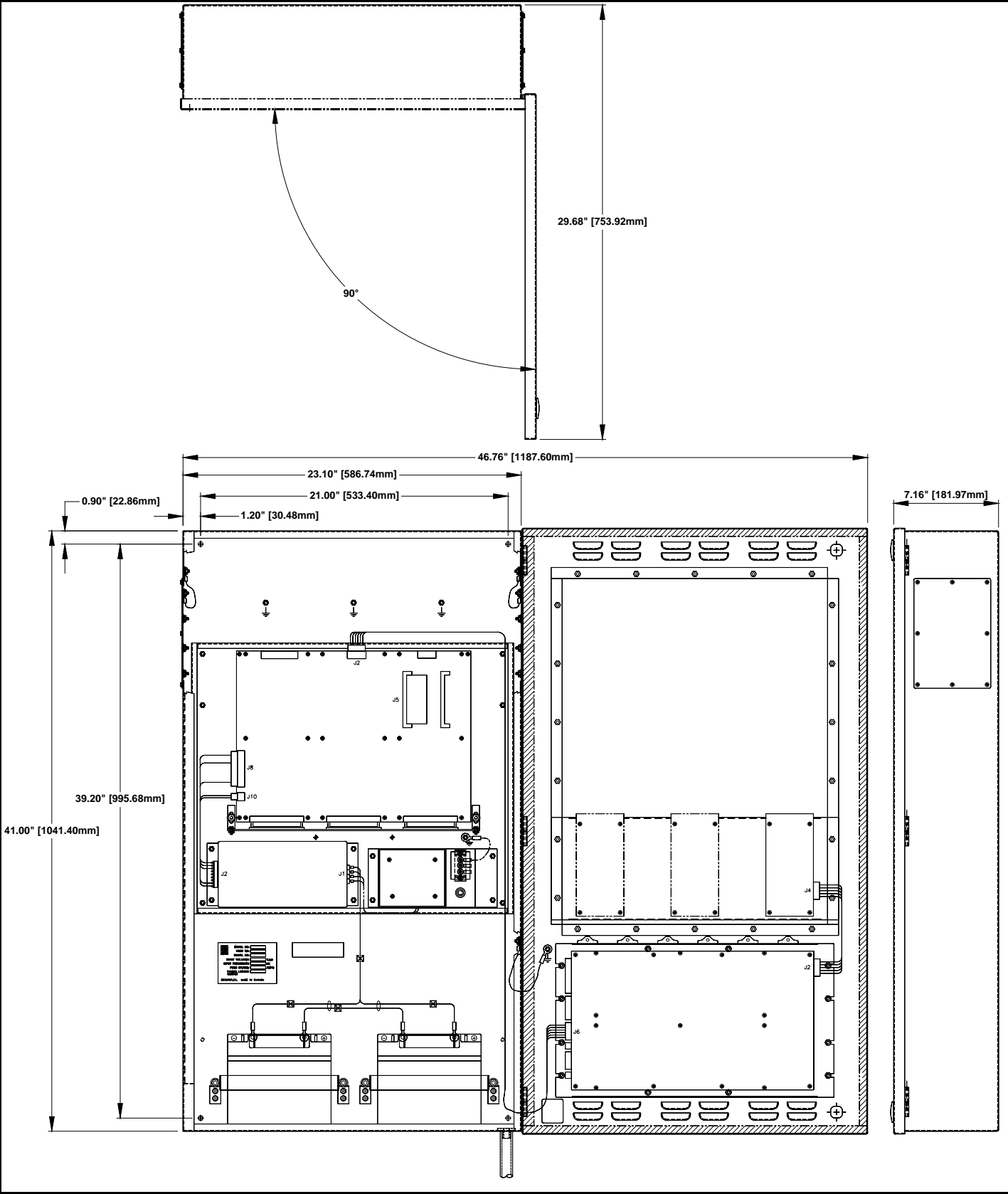
Figure 14: X6M, Installation Layout

Hookup of AC Power and Batteries

The Power Supply provides a regulated 28 VDC to the PRO-2000 series and provides charge current to the optional backup batteries. As the batteries are kept permanently charged, power is continuously provided (Uninterruptible Power Supply or UPS). The power supply AC ratings are as follows:

120 VAC Version: V = 120 VAC nominal, 1 =1.5 A, Frequency 60Hz

220 VAC Version: V = 220 VAC nominal, 1 =0.8 A, Frequency 50Hz

LEDs are visible on the Power Supply indicating the functional status of the unit. As the Power Supply is convection cooled, no fans or blowers are required. The transformer and power supply mount directly on the mounting plate.

A built-in battery charger maintains the batteries at full capacity. After extended power outages, the charger restores the batteries to full capacity. Short circuit, over-voltage and brownout monitoring circuits protect all powered components by switching to the batteries whenever a trouble condition exists in the power supply.

Alarm Supply

Power to the alarm devices in a system must be supplied from a separate battery backed-up Power Supply which is "UL listed (ULC listed in Canada)" for fire protective signal system use.

AC Power Connection
CAUTION: Ensure all voltage sources are disconnected from the panels before installing or removing cards.

1. Remove terminal cover from terminal block, TB1, located on the transformer bracket.
2. Connect Primary supply Ground wire (green) to Ground stud.
3. Connect Primary supply Neutral wire (white) to TB1 NEUTRAL terminal.
4. Connect Primary supply Line wire (black) to TB1 LINE terminal.
5. Replace and secure terminal cover on TB1.
6. Maximum 150 V AC to Ground.

Installing Batteries in the Enclosure

The following instructions apply to stems requiring 42 Amp-Hours or less of battery back-up capacity.

1. Remove battery retaining hardware.
2. Place two new fully charged 12V batteries on the bottom of the enclosure. Use 12V sealed lead-acid batteries.
3. Connect jumper between the batteries 'A' (+) and 'B' (-) poles (see Figure 15).
4. Connect black wire terminal to battery 'A'.
5. Connect red wire terminal to battery 'B' (+).
6. Replace battery and secure with retaining hardware.

*For Calculation of Battery Requirements refer to Appendix A.*
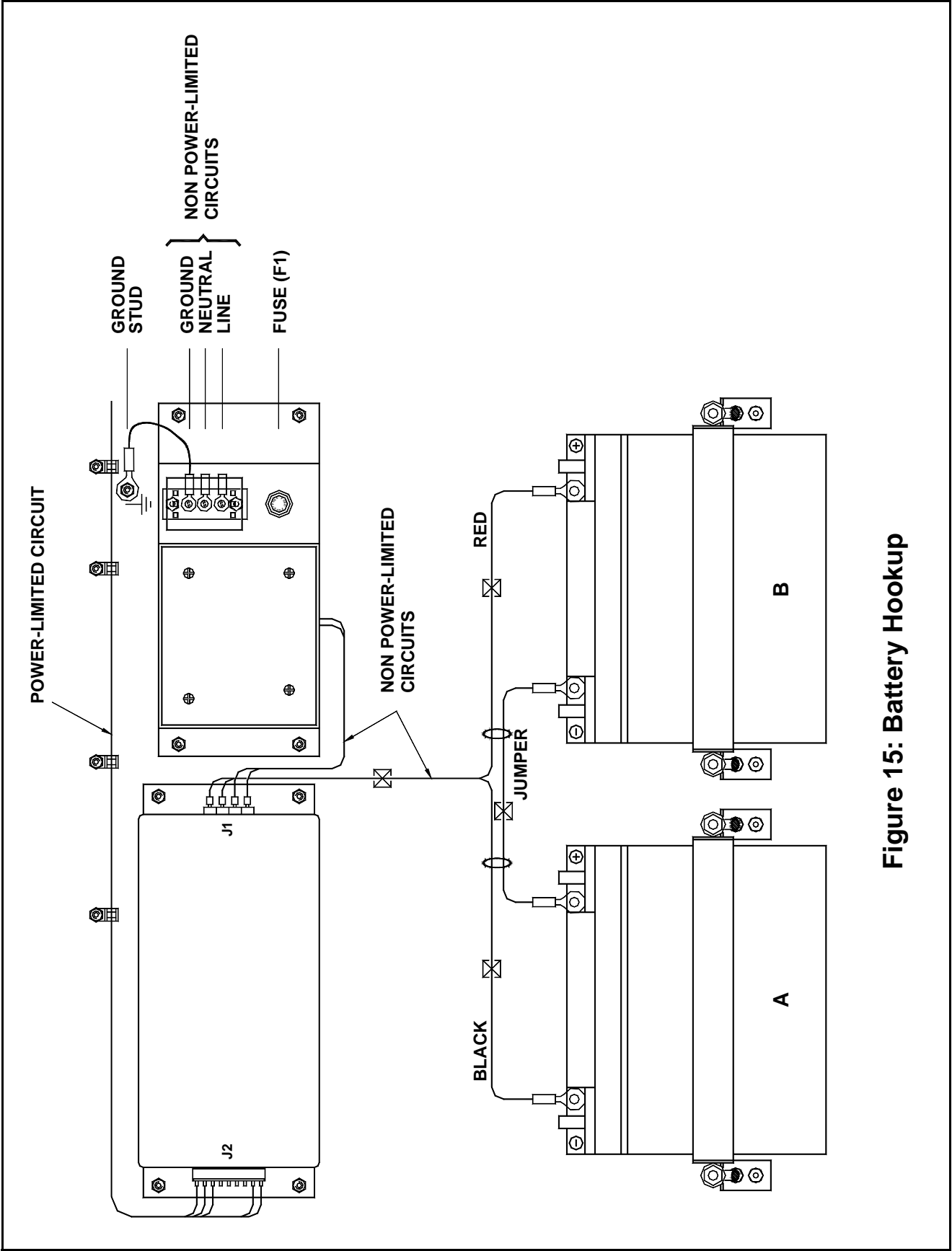
Figure 15: Battery Hookup

PRO-2000 X0 Series - S/E/M

The PRO-2000 X0 Series are remote annunciator panels for the X2 and X6 Series.

The PRO-2000 X0 Series consist of three types of panels: the X0S, the X0E, and the X0M.
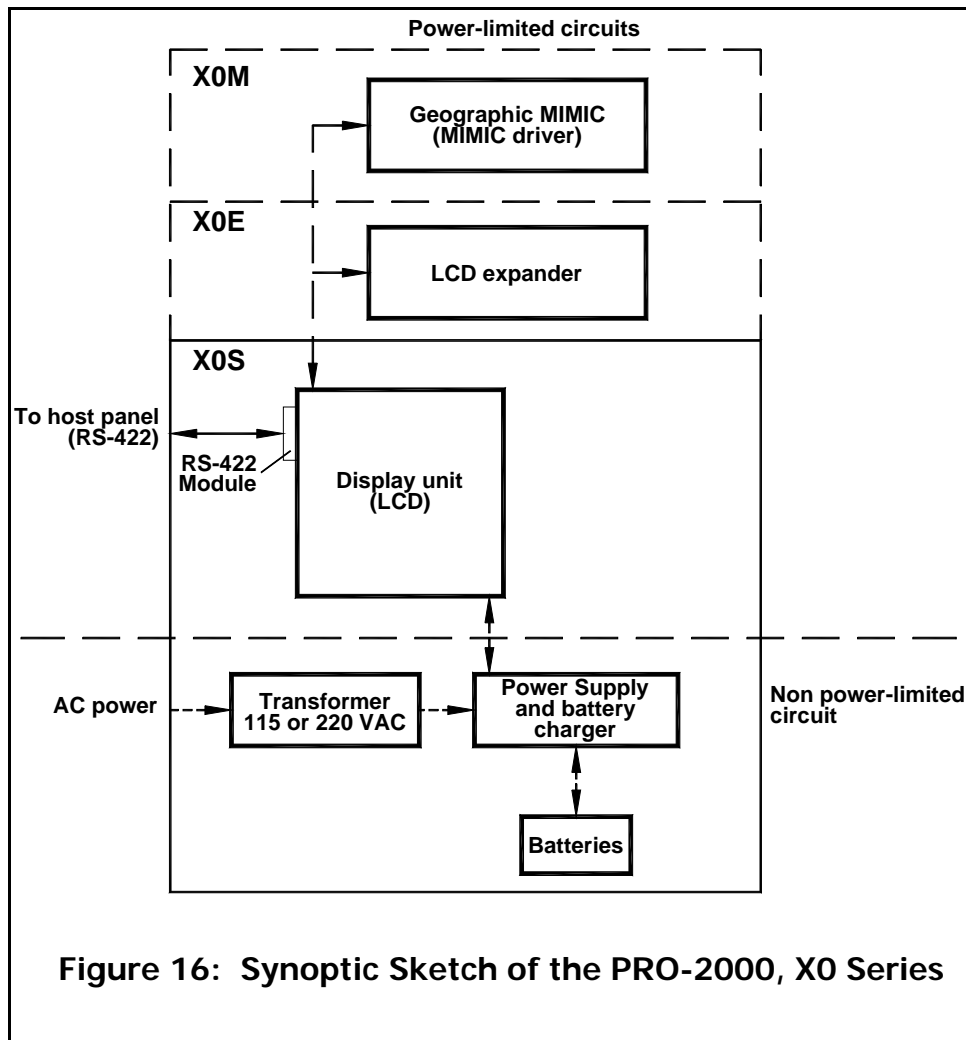
Figure 16: Synoptic Sketch of the PRO-2000, X0 Series

PRO-2000 X0S (Standard)

The X0S is the standard panel housed in a 23" x 24" (584 mm x 610 mm) enclosure. The X0S consists of a display unit which repeats all events report ed by the X2 or X6 host panel. It has the standard 2 lines x 40 character display with the associated display list controls and indicators and the standard 24 configurable indicators(LEDs) and 12 configurable push buttons.

PRO-2000 X0E (Expanded)

The X0E is the expanded version housed in a 24" x 30" (610 mm x 762 mm) enclosure. It has the same features as the X0S plus an additional 48 configurable indicators (LEDs) and an additional 24 configurable push buttons.

PRO-2000 X0M (Mimic)

The X0M is the mimic version housed in a 24" x 41" (610 mm x 1041 mm) enclosure. It has the same features as the X0S plus a geographic mimic providing a graphical representation of the protected area. The mimic contains up to 144 indicators (LEDs) to provide visual feedback and 72 programmable push buttons.

PRO-2000 X0, Common Features

The X0 panels operate as repeater panels. All the user interface functionality available on the host (X2 or X6) is also available on the repeater panel. This includes all display lists (alarm, supervisory, trouble, etc.), acknowledgement and reset functions, as well as System Maintenance accessibility.

The built-in RS-422 communication module allows the X0 Series to be connected to a host. Other than the RS-422 communication module, there are no expansion cards available with this unit.

General Installation Guidelines

X0 panels should be installed in a dry, clean, well lit and secured area. No combustible or hazardous material should be stored in the vicinity of the installed unit. The installation must comply with all local and/or national regulations and codes of practice governing fire alarm system installation, electrical wiring, life safety, etc.

Special Handling

Circuit cards are to be stored in anti-static packaging and kept away from the sun and from direct sources of intense UV light. The circuit card may be subject to degradation due to electrostatic discharge; therefore grounding straps must be worn when handling the cards.

Cable Entry and Internal Routing

On the enclosure there are two removable cable entry plates. These plates are to be removed, punched, and re-installed. If additional entry holes are required outside the cable entry plates, before punching cable entry holes, disconnect the door ground strap and remove the enclosure door with attached electronics.
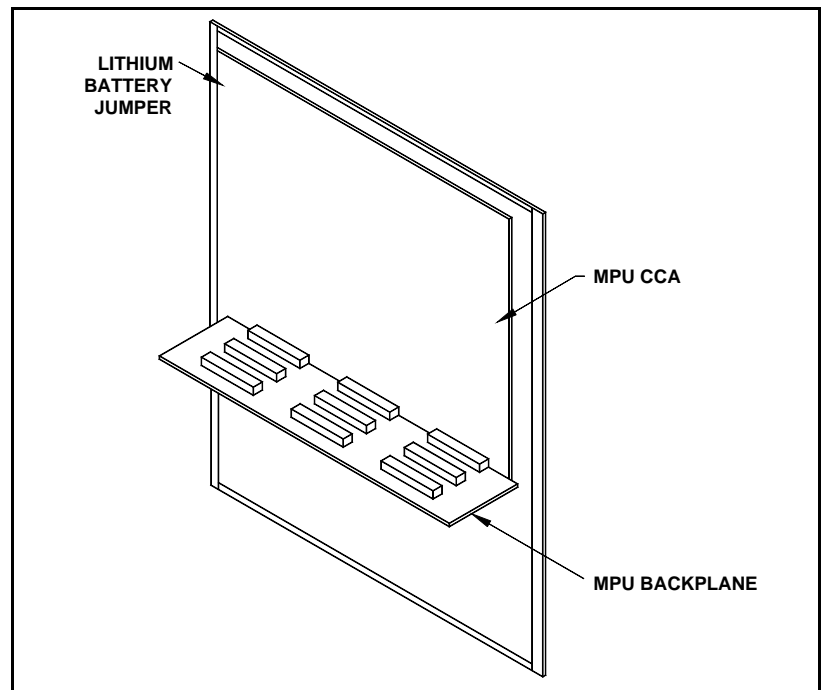
Cable entry holes must be punched in accordance with the following criteria:

- Separate holes are required for the entry of Power-Limited and Non-Power-Limited circuit cables.
- Centre-to-centre spacing between an entry hole for Power-Limited circuit cables and an entry hole for Non-Power-Limited circuit cables must not be less than two (2) times the diameter of the larger entry hole.
- Sufficient clearance must be provided around each hole to allow for any required conduit fittings, cable-clamps, lock nuts, washers or other hardware.
- At no point inside the enclosure must the spacing between power-limited and non-power-limited circuit conductors be less than 6,4mm (¼ po).

Wire lengths inside the enclosure should be kept to a minimum.
Cables must not interfere with, or touch any circuit card components other than the intended connector terminals.

Grounding and Bonding

All supply and device wiring must be grounded and bonded in accordance with applicable local regulations governing the wiring of Fire Alarm Systems. The enclosure must be connected to earth Ground.

Enclosure Installation

All cable entry holes should be punched out prior to installation of base.

Ensure wall or structure to which the enclosure base is being mounted is capable of supporting a fully loaded unit.

Sufficient clearance must be provided around the unit to allow the enclosure cover door to be fully opened (180°) without impediment. The enclosure box may be semi-flush mounted provided no less than 5 cm (2 inches) of the box frame protrudes from the wall surface.

The top of the enclosure should be no more than 2 meters (6.7 feet) above the finished floor.

Recommended mounting hardware: four ¼ " pan head screws (if bolts are used, four suitable flat washers are required).

1. Remove the ground strap (14 Gauge, green) between the enclosure base and door by loosening and removing the ground stud nut and star washer.
2. Remove the enclosure door from the slip hinges.
3. Secure the enclosure to wall using the four ¼" pan head screws.
4. Reinstall the door and ground strap between the door and the enclosure base.
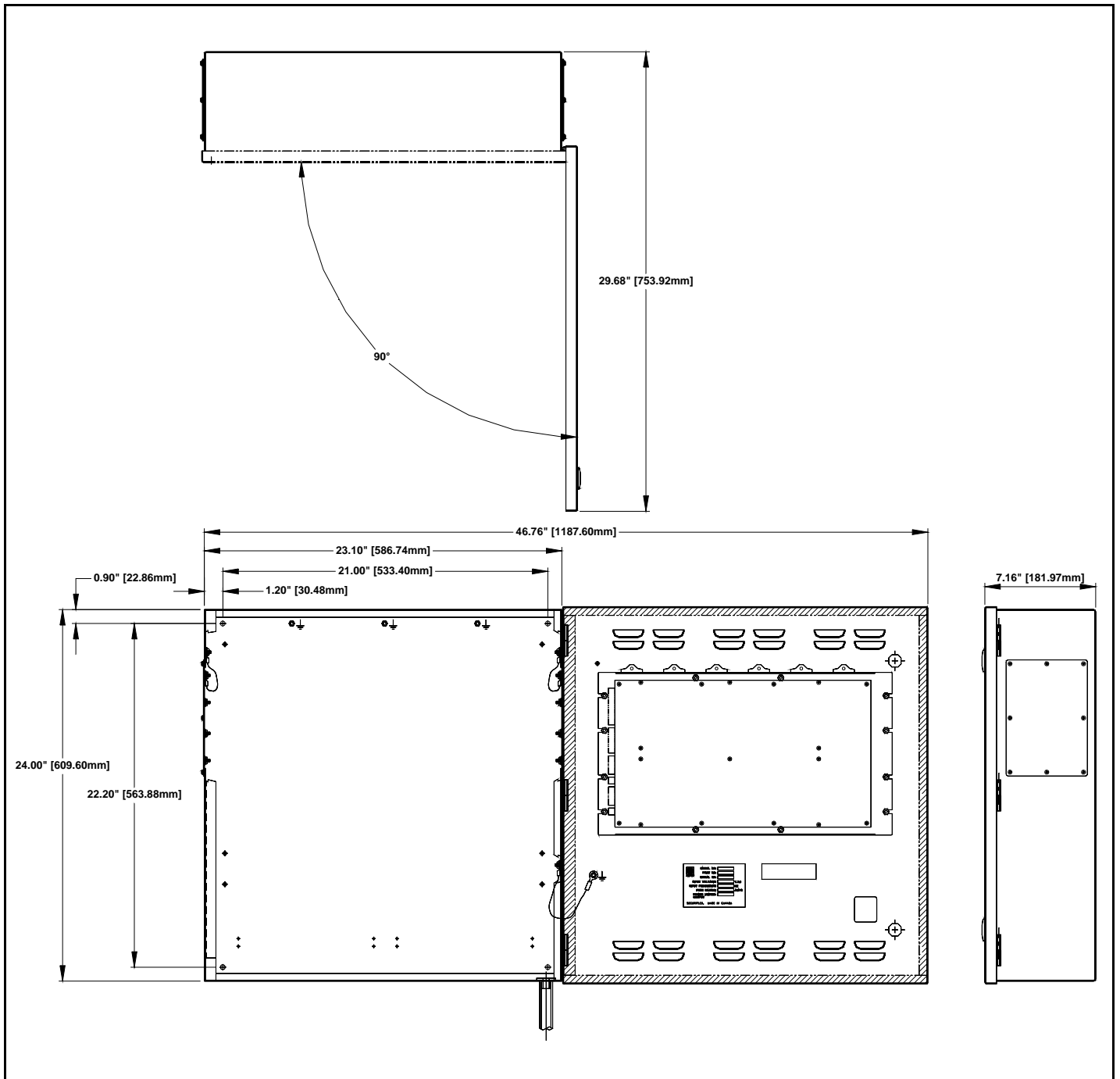
Figure 17: X0S, Installation Layout
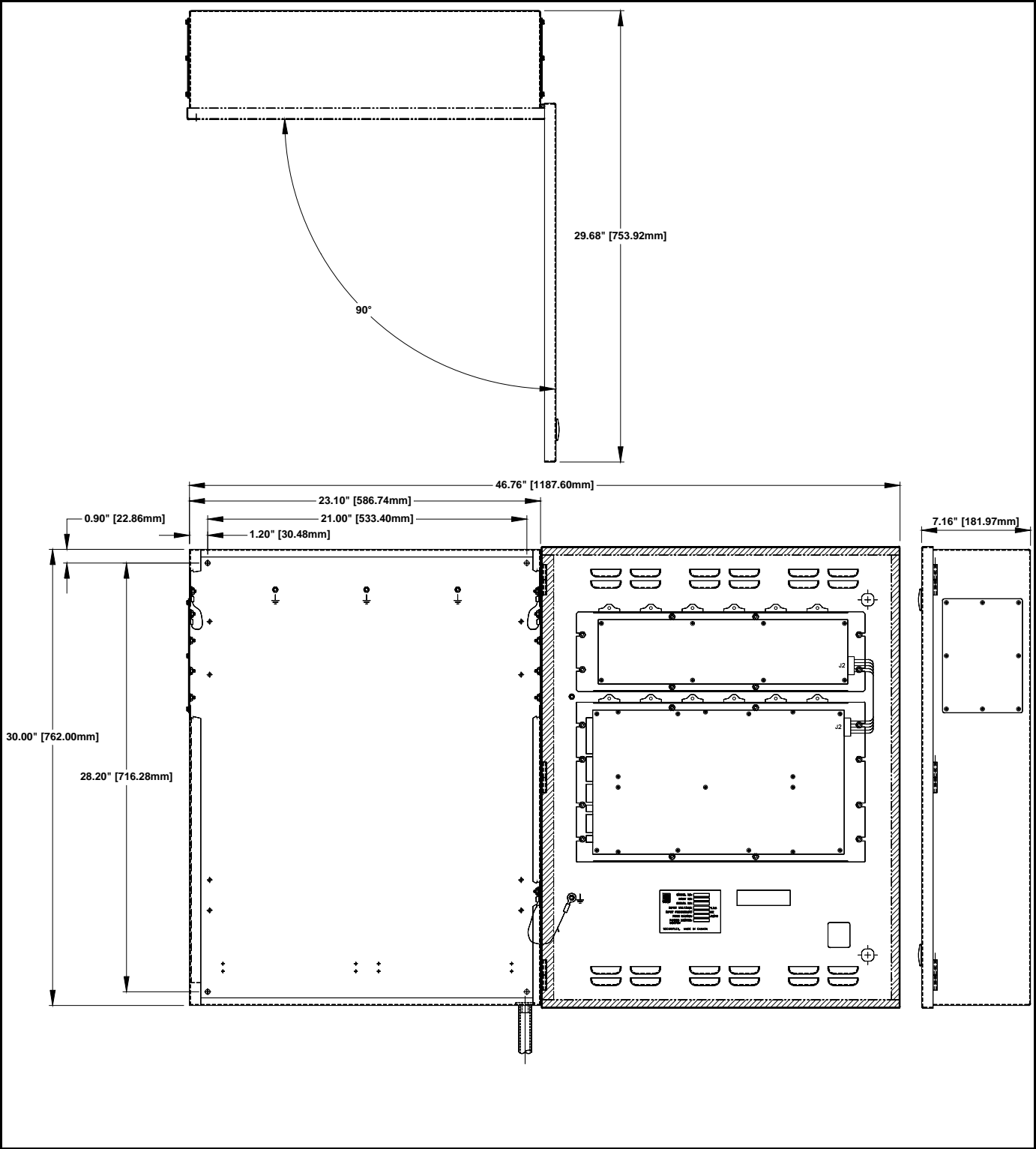
Figure 18: X0E, Installation layout
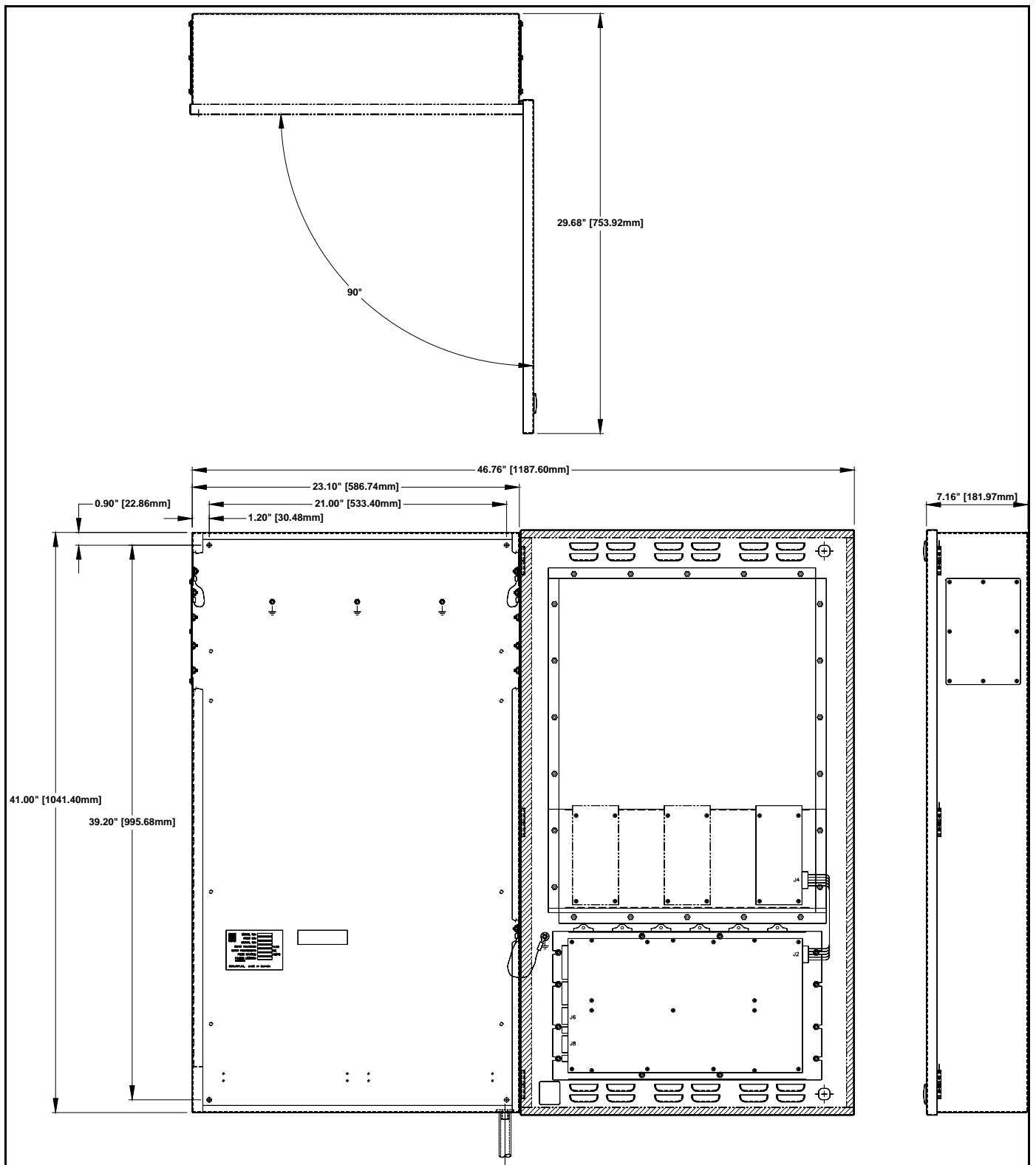
Figure 19: X0M, Installation Layout
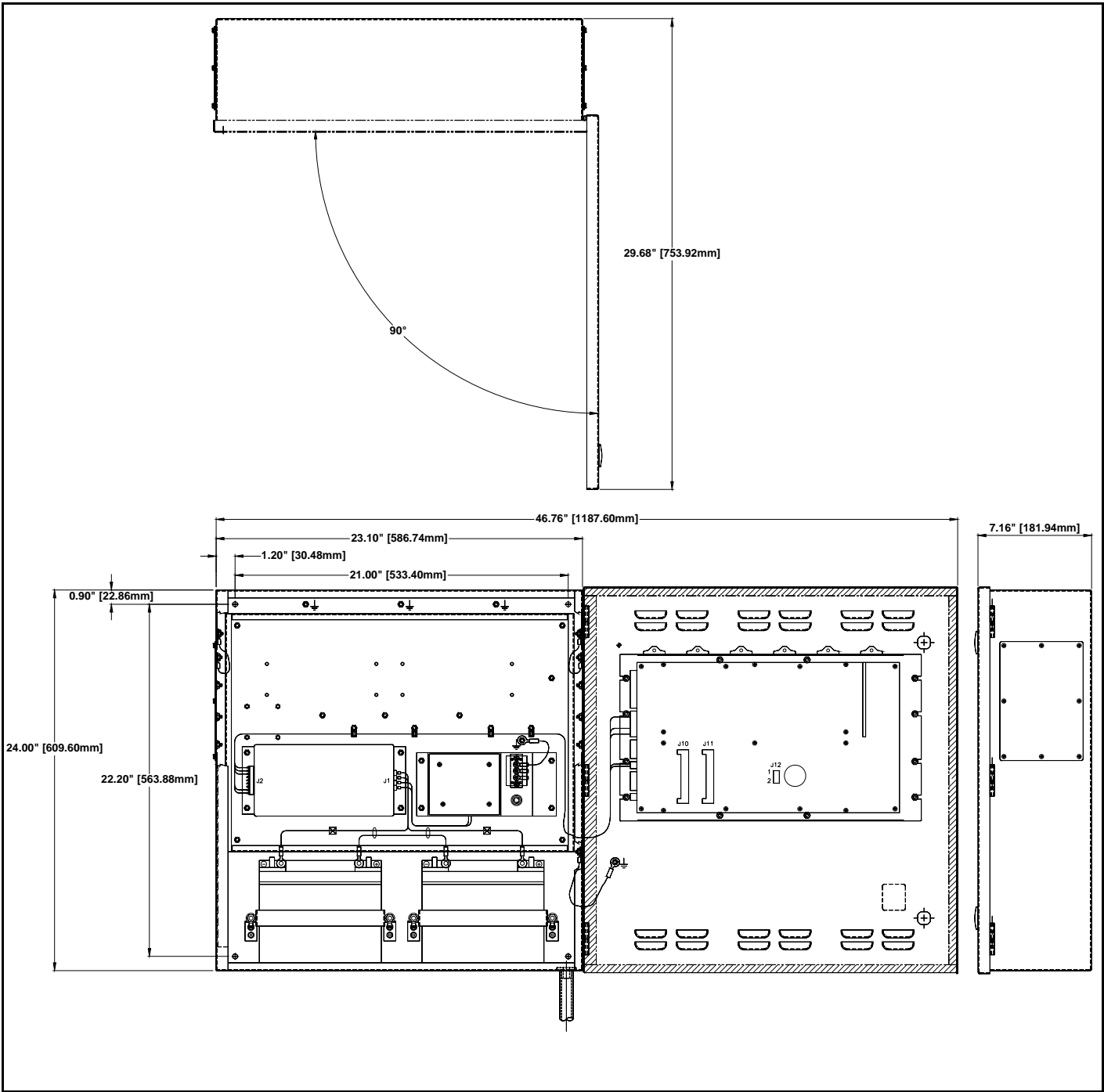
Figure 20: X0S, Installation Layout with Power Supply and Batteries
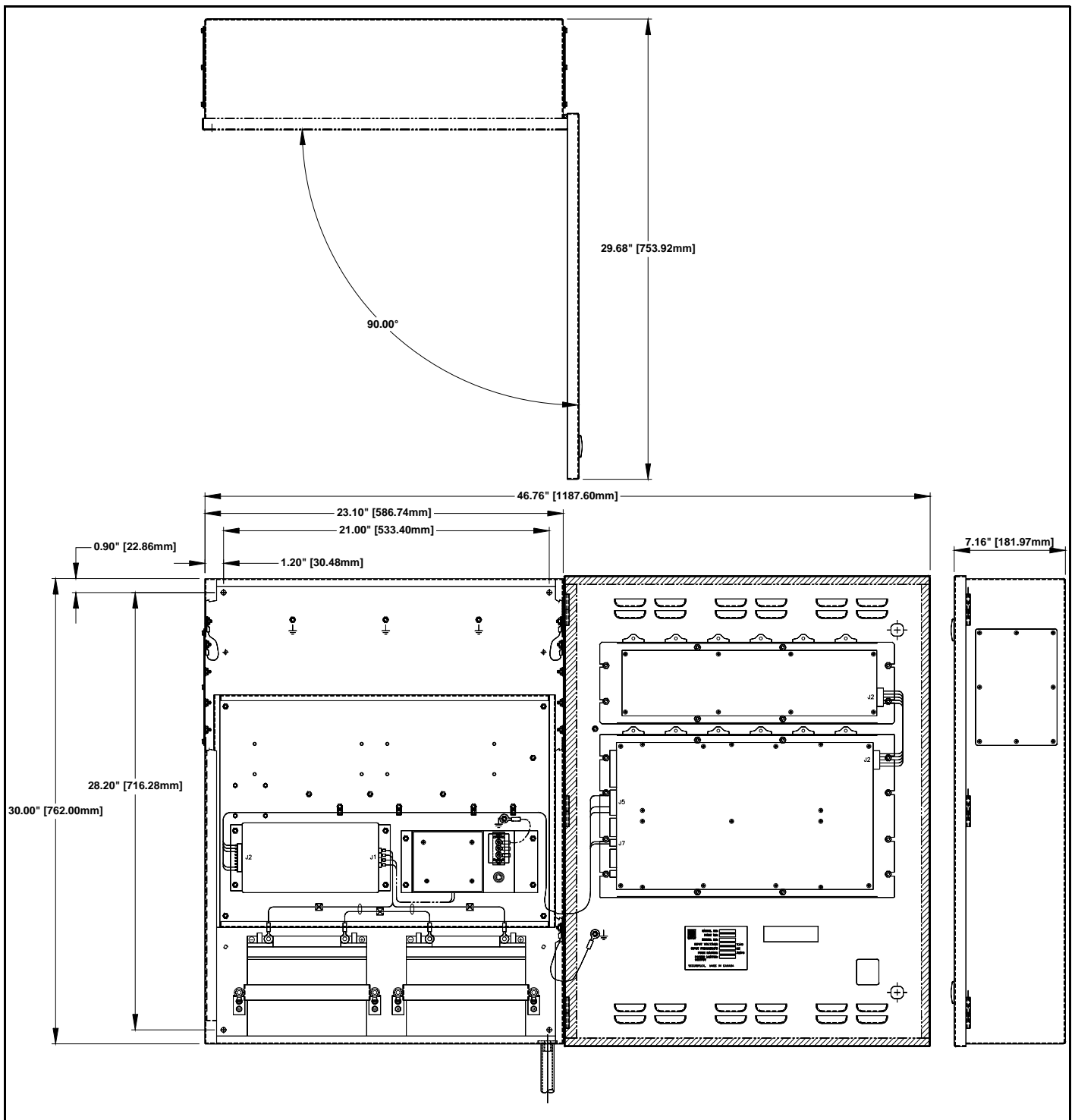
Figure 21: X0E, Installation Layout with Power Supply and Batteries

29.68" [753.92mm]

90.00°

46.76" [1187.60mm]

23.10" [586.74mm]

21.00" [533.40mm]

7.16" [181.97mm]

0.90" [22.86mm]

1.20" [30.48mm]

39.20" [995.68mm]

41.00" [1041.40mm]

J2

J1

J4

J2

J5

J7
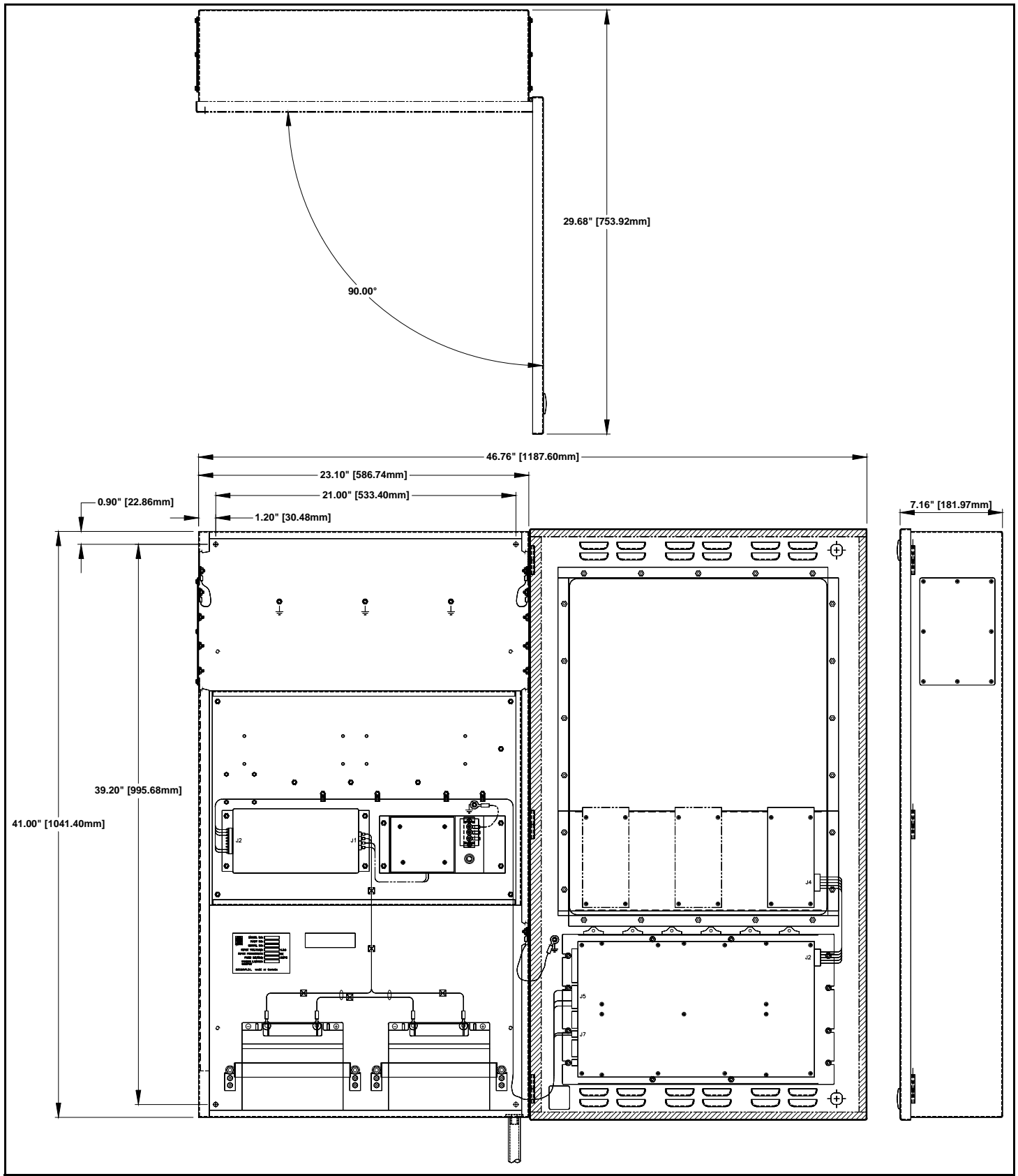
Figure 22: X0M Installation Layout with Power Supply and Batteries

PRO-2000 Multi-Panel Systems

PRO-2000 panels can be programmed to act as Master or Slave panels. A Master panel monitors and controls a system comprising several Slave panels.

Up to 32 PRO-2000 Slave panels can be connected, in an open or closed loop configuration, to the master panel by means of a 4-conductor, full duplex, serial communication data link.

Should a communication fault occur, isolating one or more Slave panels from the Master panel, the isolated panels revert to the stand-alone mode. In this mode, fire alarms are annunciated locally.

One or all of the networked panels can have a push button as a General Alarm. The General Alarm functionality is configurable. Activating a General Alarm, either through devices or through the GA ON/OFF push button, broadcasts the alarm to all the panels. Silencing the General Alarm at any panel silences all the 'General Alarm' devices. Any new alarm, anywhere in the system, reactivates all the 'General Alarm' devices.

Figure 23: PRO-2000 Networked Panels

ALL CIRCUITS ARE POWER-LIMITED AND SUPERVISED

NOTES

1. X2 SERIES Max. 28 V supply cable length depends on configuration.
   Must run in conduit separate from Tx and Rx cables.
   Maximum current (short circuit: 4.5 Amp).

   X6 SERIES Max. 28 V supply cable length depends on configuration.
   Must run in conduit separate from Tx and Rx cables.
   Maximum current (short circuit: 1 Amp).

2. Use shielded, twisted pair cables, one pair for Tx lines, one pair for Rx lines.
   No branches or T-Taps allowed. Shields to be connected according to specific system Wiring Diagrams.
   Maximum cable length for communication: 1 Km between panels.
   Maximum cable resistance (per pair): 40 Ohms.
   Maximum loop current (short circuit): 150 mA.

3. Number of Repeaters limited by the configuration of the Host panel.
   An external power supply can be used to extend the number of Repeaters.
   Use only UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited).

Minimum detected ground fault impedance is 10K ohms.

Figure 24: X2 and X6 Network Wiring to a Repeater, X0

ALL CIRCUITS ARE POWER-LIMITED AND SUPERVISED

X2 PANEL

LCD   J6

TX1+	⊘ 1
TX1-	⊘ 2
28V	⊘ 3
GND	⊘ 4
RX1+	⊘ 5
RX1-	⊘ 6

J8

TX2+	⊘ 1
TX2-	⊘ 2
28V	⊘ 3
GND	⊘ 4
RX2+	⊘ 5
RX2-	⊘ 6

MASTER PANEL

X6/X2 PANEL

COMM CARD

J1

⊘ 8	RX1-
⊘ 7	RX1+
⊘ 6	TX1-
⊘ 5	TX1+
⊘ 4	RX2-
⊘ 3	RX2+
⊘ 2	TX2-
⊘ 1	TX2+

SLAVE PANEL #1

X2 PANEL

LCD

J6

⊘ 1	TX1+
⊘ 2	TX1-
⊘ 3	28V
⊘ 4	GND
⊘ 5	RX1+
⊘ 6	RX1-

J8

⊘ 1	TX2+
⊘ 2	TX2-
⊘ 3	28V
⊘ 4	GND
⊘ 5	RX2+
⊘ 6	RX2-

SLAVE PANEL #2

Omit these wires
for stub operation

NOTES:

1. USE SHIELDED TWISTED PAIR CABLE.

2. NO BRANCHES OR T-TAPS ALLOWED.

3. MAXIMUM DISTANCE BETWEEN CONTROL UNITS: 1 Km.

4. MAXIMUM CABLE RESISTANCE BETWEEN CONTROL UNITS: 40 Ohms.

5. MAXIMUM LOOP CURRENT (SHORT CIRCUIT): 150 mA.
    MAXIMUM VOLTAGE: 7.0 VDC.

6. SHIELDS TO BE CONNECTED ACCORDING TO SPECIFIC SYSTEM
    WIRING DIAGRAMS.

7. MINIMUM DETECTED GROUND FAULT IMPEDANCE IS 10K OHMS.

Figure 25: Networking The X2 and X6 Using The Communication Card

MAIN PROCESSING CARDS

There are two main processing cards, the MPU and the LCD. These cards form the basis for the PRO-2000 Panels' electronics.

In the X6 panels, the MPU card with the MPU Backplane, expansion cards (optional), Power Supply and Transformer are mounted to a removable mounting plate in the enclosure base. The LCD card is mounted directly on the enclosure door.

In the X2 Series the power supply and transformer are mounted to a removable mounting plate in the enclosure base. The LCD with the LCD Backplane and optional expansion cards are mounted on the enclosure door.

MPU - Main Processing Unit card

The Main Processing Unit (MPU) provides processing and communication circuitry for the X6 series panels. It provides two RS-422 full-duplex, 4-conductor serial links used for communications with the local LCD panel.

The MPU is shipped pre-installed on the enclosure backplate with an MPU Backplane attached and an, RS-422 communication module installed. The MPU Backplane enables the MPU to have up to 6 expansion cards installed, for example, the ADI, Supervised output, or Supervised Input cards. The MPU Backplane has a side connector to plug into the MPU expansion slot providing connectivity between the MPU and the expansion cards.

The MPU provides monitoring of the power supply for AC/DC fault detection. The card provides the following visual indicators and controls:

Figure 26: MPU (Main Processing Unit) Card

- Various status LEDs provide a visual indication of the card's health. There are Red LEDs for error codes, blinking LEDs (Running) indicating the board is working; Green Power LEDs, and Communication LEDs.
- Reset push button to hard reset the MPU card.
- DIP switch providing software options. Factory set only.
- Rotary switch allowing the selection of different configuration modes. Factory set only.
- Three jumpers, two for the watchdog and one for battery. These jumpers must be connected at all times. A watchdog circuit, monitoring microprocessor, halts system operation if a hardware or software failure occurs. The lithium battery provides the backup for the real-time clock and the RAM memory used for event logging. The real-time clock provides time and date for event recording.

Figure 27: MPU Backplane Connectors

When a system is first delivered the MPU card has its internal battery jumper, JP3, disabled. Prior to installation, move the jumper shunt (located above the board mounted battery) into position over both pins. If the jumper is missing, the panel will annunciate a "Clock Battery Fault " at power up. If the jumper is in, you can remove power and the event log and the clock remain powered.

The MPU has two sockets for adding communication modules. Depending on your configuration, these could be either the RS-232 or RS-422 communication modules. Installing an RS-232 module activates the phone jack allowing MPU software configuration through an external PC or communication with a printer (depending on position of SW1, see Table 4 below).

Installing an RS-422 module activates the two connectors to the LCD. The two connectors provide power to the LCD. This available power is current limited to 1 amp. Note-the MPU ships with a pre-installed RS-422 module.

The MPU has built-in Common Alarm and Fault Relay-2 Form-C contacts for each relay. The Common Alarm Relay activates whenever an alarm is present on the system. The Common Fault Relay activates whenever a fault is present on the system. The rating for Common Alarm and Fault Relay is 2A at 30VDC.

COMM Loop (S1 (J2) X)		COMM Loop (S2 (J3) Y)		RS-232 Modular Phone Jack (J4)	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
TX1+ (out)	1	TX2+ (out)	1	TX (out)	5
TX1- (out)	2	TX2- (out)	2	RX (in)	2
24V	3	24V	3	RTS* (out)	3
GND	4	GND	4	CTS* (out)	6
RX1+ (in)	5	RX2+ (in)	5	CD* (in)	1
RX1- (in)	6	RX2- (in)	6	GND	4

Table 2: MPU Pinouts

Common Alarm and Trouble Relays (J1) 2A max @ 30V DC Resistive		Pin
Trouble	C1	1
	NC1	2
	NO1	3
	C2	4
	NC2	5
	NO2	6
Alarm	C1	7
	NC1	8
	NO1	9
	C2	10
	NC2	11
	NO2	12

Table 3: MPU Relays

SW1	0: Printer, 1: Configuration, 2: Normal/Diagnose; 3: ModBus, 4: LCD, 5: Network, 6: Redundant, E: Firmware upgrade, F: Default configuration
SW2	Normal position: All OFF
SW3	Used to reset the MPU card

Table 4: MPU Switches

Jumper	Function	Position
JP2	Watchdog Enable	Installed
JP1	Watchdog one-shot mode	Installed
JP3	Lithium Battery Enable	Installed on site
JP4	RAM Size Selection	Non installed when 128K x 8 RAM chips are used. Installed when 512K X 8 RAM chips are used.

Table 5: MPU Jumpers

LED	Function	Definition
LD1 (red)	Reset indicator	ON when the MPU is in a hardware reset state - At power up, or - On a fatal hardware or software failure
LD2 (green)	Status indicator	Not used (reserved)
LD3 (green)	Running indicator	Blinks when the MPU is executing its normal program
LD4-LD11 (red)	Error code indicators	Used to report internal error conditions
LD12-LD19	Communication indicators for the on board data links	These indicators will blink when data is received or transmitted on one of the data links. LD12 (RX1) and LD13 (TX1) for RS-422, X side (local LCD) LD14 (RX2) and LD15 (TX2) for RS-422, Y side LD16 (RX3) and LD17 (TX3) for RS-232 LD18 (RX4) and LD19 (TX4): are reserved
LD20 (green)	24 V input indicator	ON when the 24V input connector J10 is powered.
LD21 green)	VCC indicator	ON when the local VCC (5V) regulator is functional
LD22 green)	VISO1 indicator	ON when the local isolated power supply #1 is functional (RS-422 power supply)
LD23 (green)	VISO2 indicator	ON when the local isolated power supply #2 is functional (RS-232 power supply)
LD24 (green)	LCD loop power, X side	ON when power is available on the LCD connector, X side, J2
LD25 (green)	LCD loop power, Y side	ON when power is available on the LCD connector, Y side, J3

Table 6: MPU LEDs

LCD - Liquid Crystal Display card

The LCD implements the user interface to the PRO-2000 panels using LEDs and a 2-line x 40-character LCD unit.
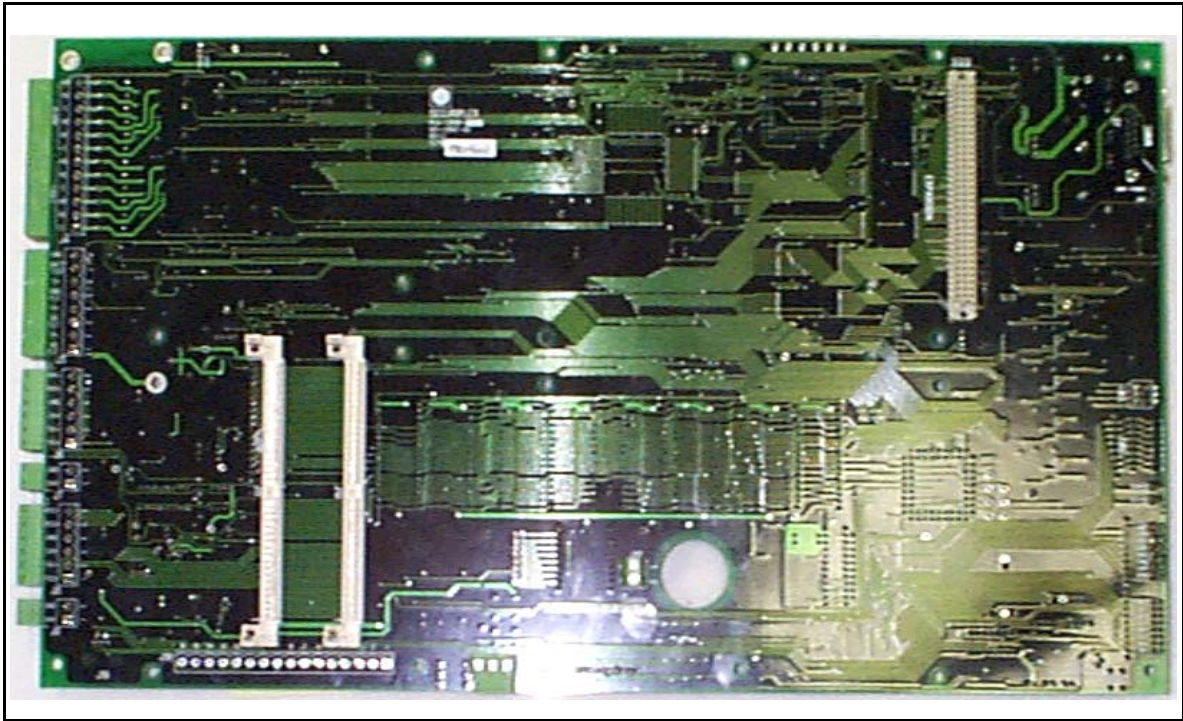
Figure 28: LCD Card
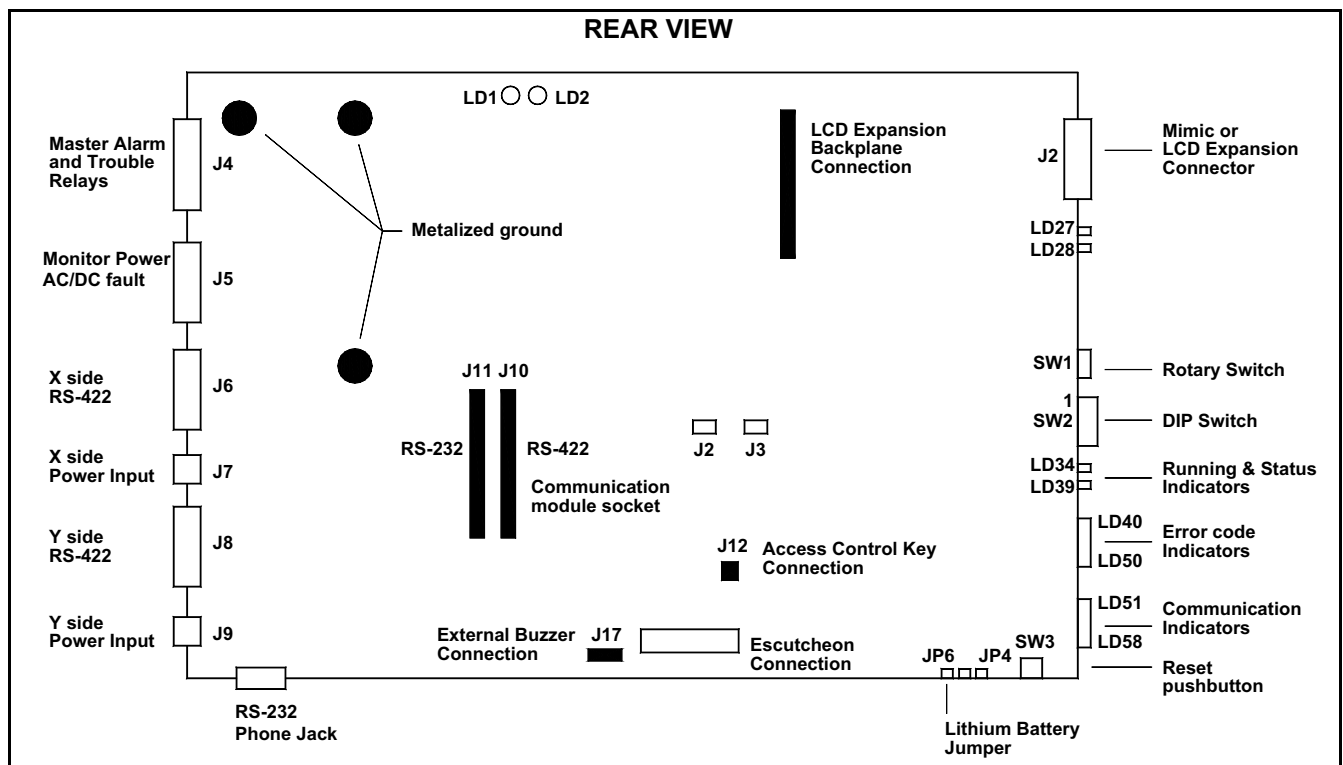
Figure 29: LCD Backplane Connectors

X6 and X0 series

The LCD performs only display functions.

X2 Series

- The LCD performs processing and display functions.
- The LCD Backplane is used to provide connectivity between the LCD and the interface cards. Up to 2 expansion cards can be connected to the LCD Backplane.
- The LCD has built-in Master Alarm and Fault Relay-2 Form-C contacts for each relay. The Master Alarm Relay is activated whenever an alarm is present on the system. The Master Fault Relay activates whenever a fault is present on the system.
- The LCD monitors the power supply for AC/DC fault detection.
- Various status LEDs provide a visual indication of the card's health. There are Red LEDs for error codes, blinking LEDs (Running) indicating the board is working, Green Power LEDs, and Communication LEDs.
- Reset push button to hard reset the LCD card.
- Dipswitch providing software options. Factory set only.
- Rotary switch allowing the selection of different configuration modes. Factory set only.
- Three jumpers, two for the watchdog and one for lithium battery. These jumpers must be connected at all times. A watchdog circuit, monitoring the microprocessor, halts system operation if a hardware or software failure occurs. The lithium battery provides the backup for the real-time clock and the RAM memory used for event logging. The real-time clock provides time and date for event recording.

When a system is first delivered the LCD card has its internal battery jumper, JP6, disabled. Prior to installation move the jumper shunt into position over both pins. If the jumper is missing the panel will annunciate a "Clock Battery Fault" at power up. If the jumper is in, you can remove power and the event log and the clock remain powered.

Up to two (2) expansion cards can be added via the LCD backplane. For panel models X0E, X0M, X2E, X2M, X6E, and X6M, the LCD Connector J2 connects the LCD to the MIMIC Driver card or the LCD Expander card for additional display/control capabilities.

The LCD has two sockets for adding communication modules. Depending on your configuration, these could be either RS-232 or RS-422 communication modules.

For LCDs used as processing and display units, installing an RS-232 module activates the phone jack allowing LCD software configuration through an external PC, or interfacing to a Printer (depending on position of SW1, see Table 9). Installing an RS-422 module activates data links to other panels.

The RS-232 module is not used when LCDs are display units. Installing an RS-422 module activates data links to the MPU or to a Repeater network.
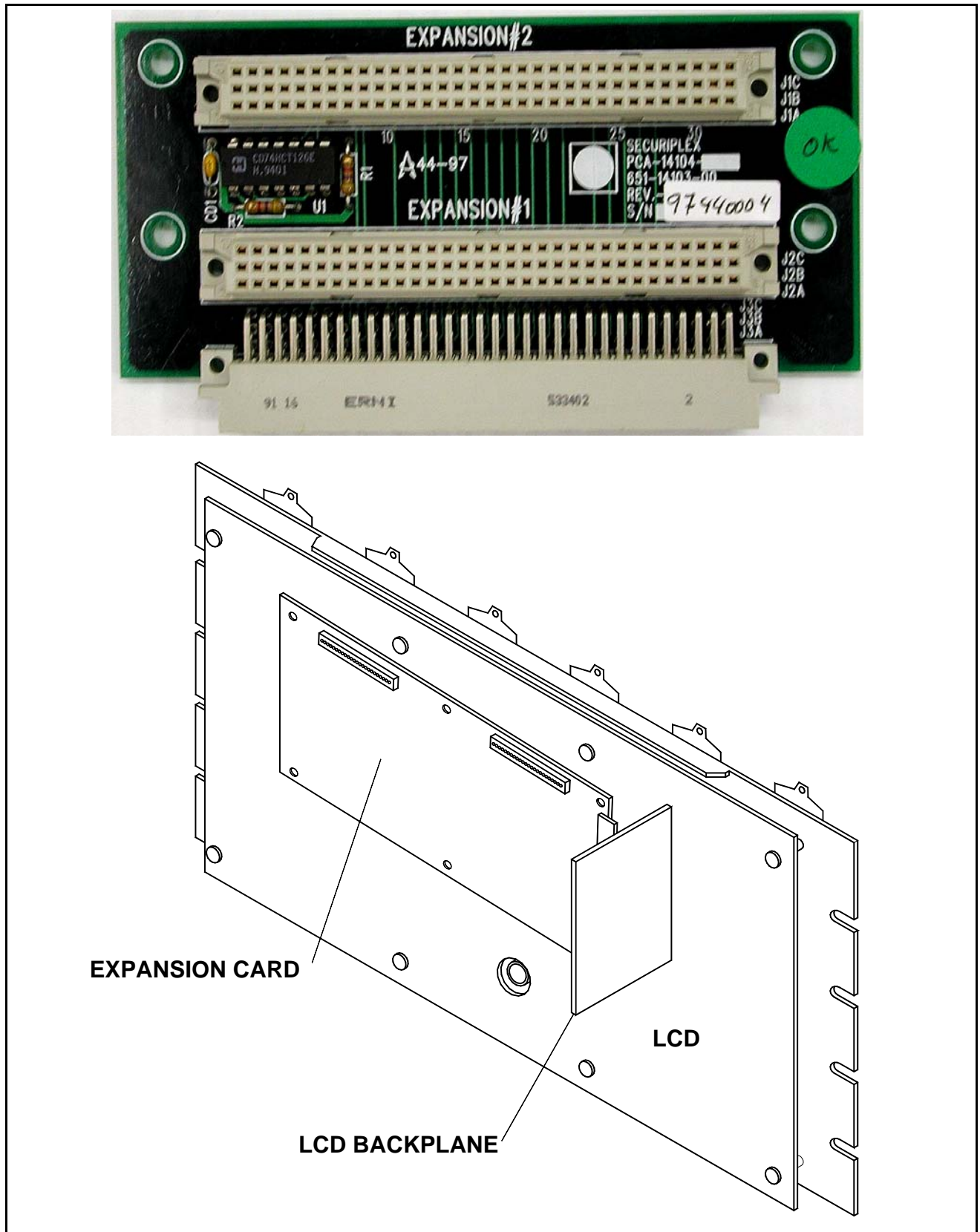
Figure 30: Expansion Card and LCD Backplane

COMM Loop (S1 (J6) X)		COMM Loop (S2 (J8) Y)		RS-232 Modular Phone Jack (J19)	
Signal	**Pin**	**Signal**	**Pin**	**Signal**	**Pin**
TX1+ (out)	1	TX2+ (out)	1	TX (out)	5
TX1- (out)	2	TX2- (out)	2	RX (in)	2
24V	3	24V	3	RTS* (out)	3
GND	4	GND	4	CTS* (in)	6
RX1+ (in)	5	RX2+ (in)	5	CD* (in)	1
RX1- (in)	6	RX2- (in)	6	GND	4

Table 7: LCD Pinouts

Common Alarm and Trouble Relays (J4) 2A max@30V DC Resistive		**Pin**
Trouble	C1	1
	NC1	2
	NO1	3
	C2	4
	NC2	5
	NO2	6
Alarm	C1	7
	NC1	8
	NO1	9
	C2	10
	NC2	11
	NO2	12

Table 8: LCD Relays

Switch	Position and description	
SW1	**For X2-** 0: Printer, 1: configuration, 2: Normal/Diagnose; 3: ModBus, 4: LCD, 5: Network, 6: Redundant, E: Firmware, F: Default Config **For X0**-: with SW2 bit 6 ON, **RS422 Baudrate selection:** 4: 2400, 5: 4800, 6: 9600, 7: 19200, 9: 64000.	
SW3	Used to reset LCD card	
SW2	4 (MSB), 3, 2, 1 (LSB)	Address ID of the LCD. When OFF (Address ID = 0), X2 mode is selected. Otherwise (Address ID 1-15), X0 mode is selected.
SW2	5	X0, with power supply. ON returns hardware trouble to master.
SW2	6	RS-422 Baud Rate - ON= see SW1, OFF = 19200.
SW2	7 (MSB) and 8 (LSB)	Indicates the number of LCD Expander or Mimic Driver module connected to the LCD.

Table 9: LCD Switches

Jumper	Function	Position
JP5	Watchdog enable	Installed
JP4	Watchdog one-shot mode	Installed
JP6	Lithium Battery enable	Installed on site
JP2, JP3	RAM size function	- Non installed when 128 K x 8 RAM chips are used. - Installed when 512 K x 8 RAM chips are used.

Table 10: LCD Jumpers

LED	Function	Definition
LD39 (green)	Status indicator	Reserved
LD34 (green)	Running indicator	Blinks when the LCD is executing its normal program
LD40 - LD42 LD46 - LD50 (red)	Error code indicators	Used to report internal error conditions
LD51 - LD58 (green)	Communication indicators for the on-board data links	These indicator will blink when data is received or transmitted on one of the data links. LD51 (RX1) and LD52 (TX1) for RS-422, S1 (X) side LD53 (RX2) and LD54 (TX2) for RS-422, S2 (Y) side LD55 (RX3) and LD56 (TX3) for RS-232 LD57 (RX4) and LD58 (TX4) Reserved
LD28 (green)	24V input indicator	ON when the 24V input connectors J6, J7, J8, or J9 are powered
LD1 (green)	VISO1 indicator	ON when the local isolated power supply #1 is functional (RS-422)
LD2 (green)	VISO2 indicator	ON when the local isolated power supply #2 is functional (RS-232)
LD27 (green)	Mimic Power indicator	ON when power is available on the mimic connector, J2

Table 11: LCD LEDs

EXPANSION CARDS

All expansion cards installed in the PRO-2000 Series panels are equipped with status indicators (LEDs) mounted on the card to indicate each card's operating state. Only a skilled technician should proceed with card replacement.

Expansion Card Installation

CAUTION: Ensure all voltage sources are disconnected from the Control Unit before installing or removing cards. Wear grounding strap when handling or working with cards.

There are several types of expansion cards that can be added to the PRO-2000 Series panels. These are:

- Addressable Detector Interface (ADI) card - smoke/heat detectors, monitor modules, control modules, and 4 onboard supervised/unsupervised outputs
- 24/32 Zone Supervised Input (S1) card - conventional detectors, shorting and non-shorting devices
- 12 Zone Supervised OUTPUT (SO) card - supervised outputs and dry contacts
- Communication Card - networked configurations

When ordering expansion cards they come with an installation kit. Each kit has five plastic standoffs and one metal standoff. The following steps can be used for the installation of any of the expansion cards.

1. Before placing the Expansion card onto the backplanes, attach all spacers to the Expansion card.

Each expansion card has a metal ring in the top right-hand side used for Ground fault monitoring and transient protection. This is the place for the metal standoff.

2. Supporting the backplane with your hand, press the Expansion card on the appropriate expansion slot.
3. Secure the Expansion card to the MPU/LCD using the screws that come with the installation kit.

Refer to System Configuration Expansion card slot positions.

Communication Card
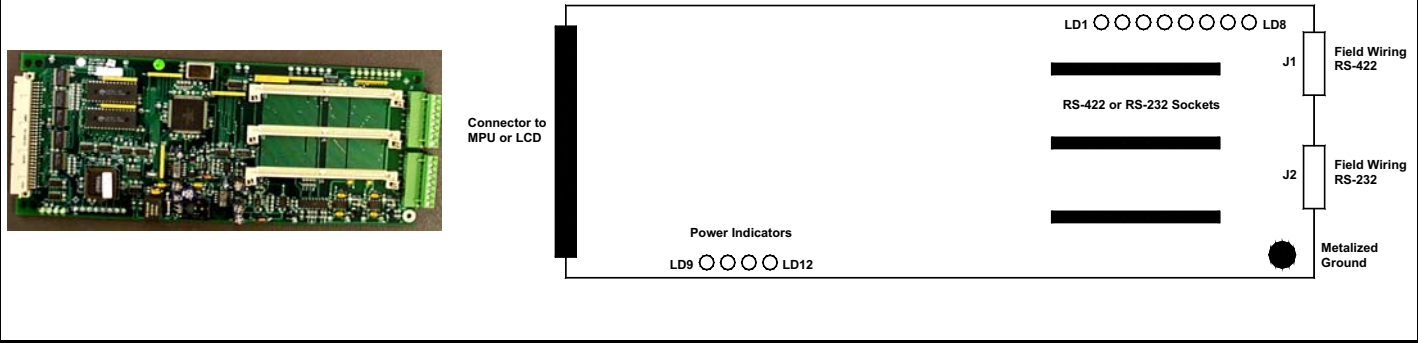
Figure 31: Communication Card Connections

The Communication card enables the PRO-2000 panels to be connected to various communication interfaces such as RS-232, and RS-422. You must install an RS-232 or RS-422 communication module (or both) into the interface sockets of the Communication card. It is the installation of the communication modules that defines if the card is RS-422 and/or RS-232. Field wiring connections on the Communication card are dependent on the installed module. The RS-422 communication module activates two serial data links on J1. The RS-232 communication module activates one serial data link on J2.

The communication modules can be inserted in any socket, however, there cannot be two of the same communication module on each Communication card.

The communication modules are powered through the Communication card. Each communication module uses an isolated power supply and are fully isolated from the main system and from themselves. There is transient protection provided on each module and Ground fault detection is separate for each communication module.

RS-422	Signal Name	RS-232	Signal Name
J1-1	TX2+ (out)	J2-1	TX (out)
J1-2	TX2- (out)	J2-2	RX (in)
J1-3	RX2+ (in)	J2-3	RTS* (out)
J1-4	RX2- (in)	J2-4	CTS* (in)
J1-5	TX1+ (out)	J2-5	BRG_out (out)
J1-6	TX1- (out)	J2-6	CD* (in)
J1-7	RX1+ (in)	J2-7	Not used
J1-8	RX1- (in)	J2-8	GND

Table 12: Communication card Pin outs

LED	Function	Definition
LD1-LD8 (green)	Communication indicators for the on-board data links	These indicators will blink when data is received or transmitted on one of the data links. LD1 (RX1) and LD2 (TX1) for RS-422, S1 (X) side LD3 (RX2) and LD4 (TX2) for RS-422, S2 (Y) side LD5 (RX3) and LD6 (TX3) for RS-232 LD7 (RX4) and LD8 (TX4) reserved
LD9 (green)	24V input indicator	ON when the 24V power from the Host system is present
LD10 (green)	VCC Indicator	ON when the local VCC (5 V) regulator is functional
LD11 (green)	VISO1 Indicator	ON when the local isolated power supply #1 is functional (RS-422, S1)
LD12 (green)	VISO2 Indicator	ON when the local isolated power supply #2 is functional (RS-232, S3)

Table 13: Communication Card LEDs
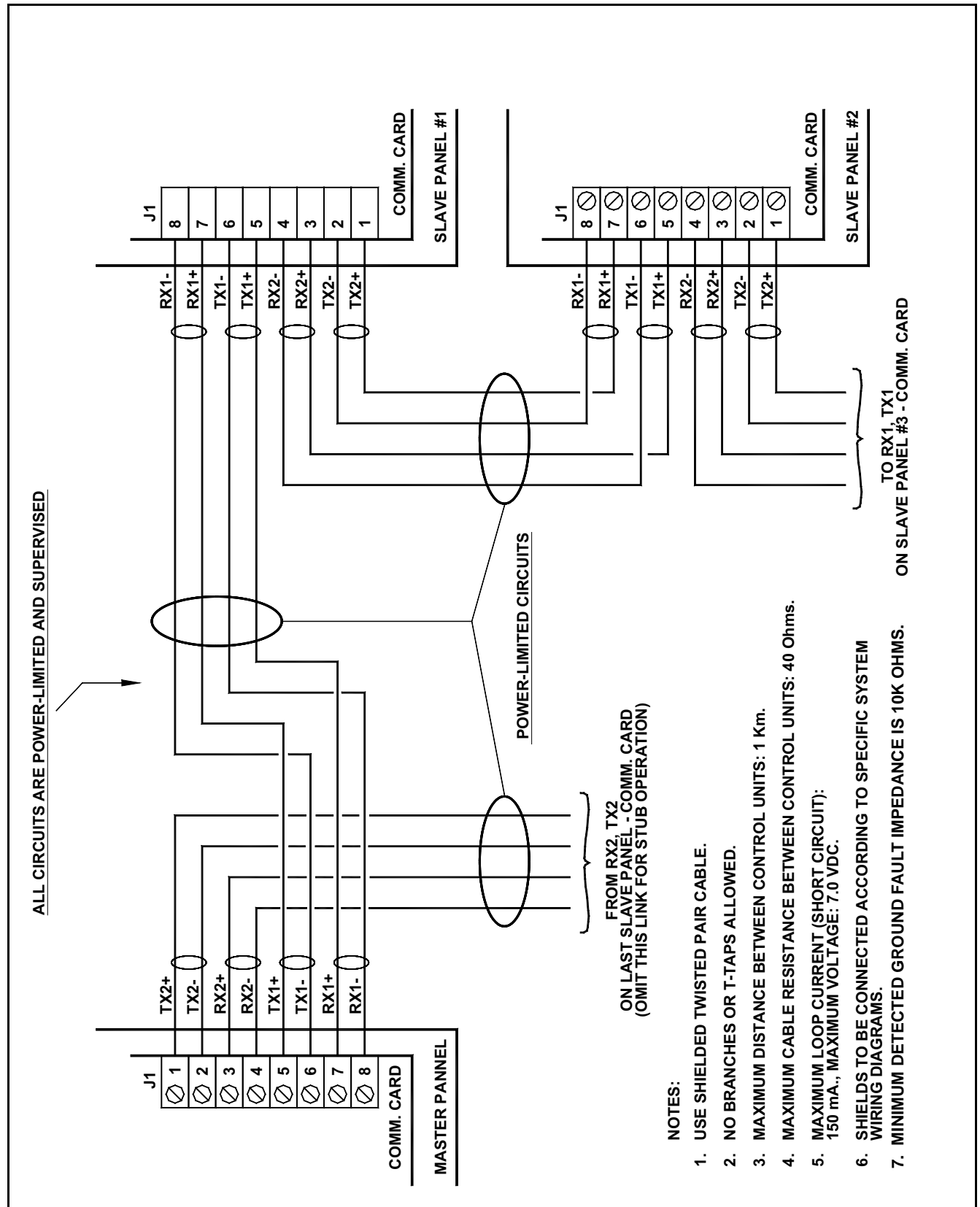
Figure 32: Communication Card Wiring - Loop/Stub Mode

NOTES:

1. USE SHIELDED TWISTED PAIR CABLE.

2. NO BRANCHES OR T-TAPS ALLOWED.

3. MAXIMUM DISTANCE BETWEEN CONTROL UNITS: 1 Km.

4. MAXIMUM CABLE RESISTANCE BETWEEN CONTROL UNITS: 40 Ohms.

5. MAXIMUM LOOP CURRENT (SHORT CIRCUIT):
150 mA., MAXIMUM VOLTAGE: 7.0 VDC.

6. SHIELDS TO BE CONNECTED ACCORDING TO SPECIFIC SYSTEM
WIRING DIAGRAMS.

7. MINIMUM DETECTED GROUND FAULT IMPEDANCE IS 10K OHMS.

APS-14127-00 Auxiliary Power Supply

The APS-14127-00 auxiliary power supply provides two power limited outputs, each rated at 28VDC and 2A. Both outputs can be used simultaneously and the total current available from the power supply is 2.5A in standby condition and 4A in alarm. In the event the main AC fails, the auxiliary supply battery will be connected without delay on the output ensuring an uninterrupted supply to external circuitry. Output voltage is regulated at 28VDC during AC power condition and will follow battery voltage (27 to 20VDC) during battery back-up periods. The battery will be disconnected at a voltage of 19.5V or less in order to prevent battery damage due to over-discharging.

The power supply has provision to charge batteries with 10 to 42 AH capacities. Normally open dry contact outputs are provided to signal AC fail, DC fail or ground faults condition.

The two power-limited outputs are not supervised at the auxiliary power supply: The applications shown elsewhere in this document will provide supply line supervision when wired as recommended.

Four holes in backbox for mounting.
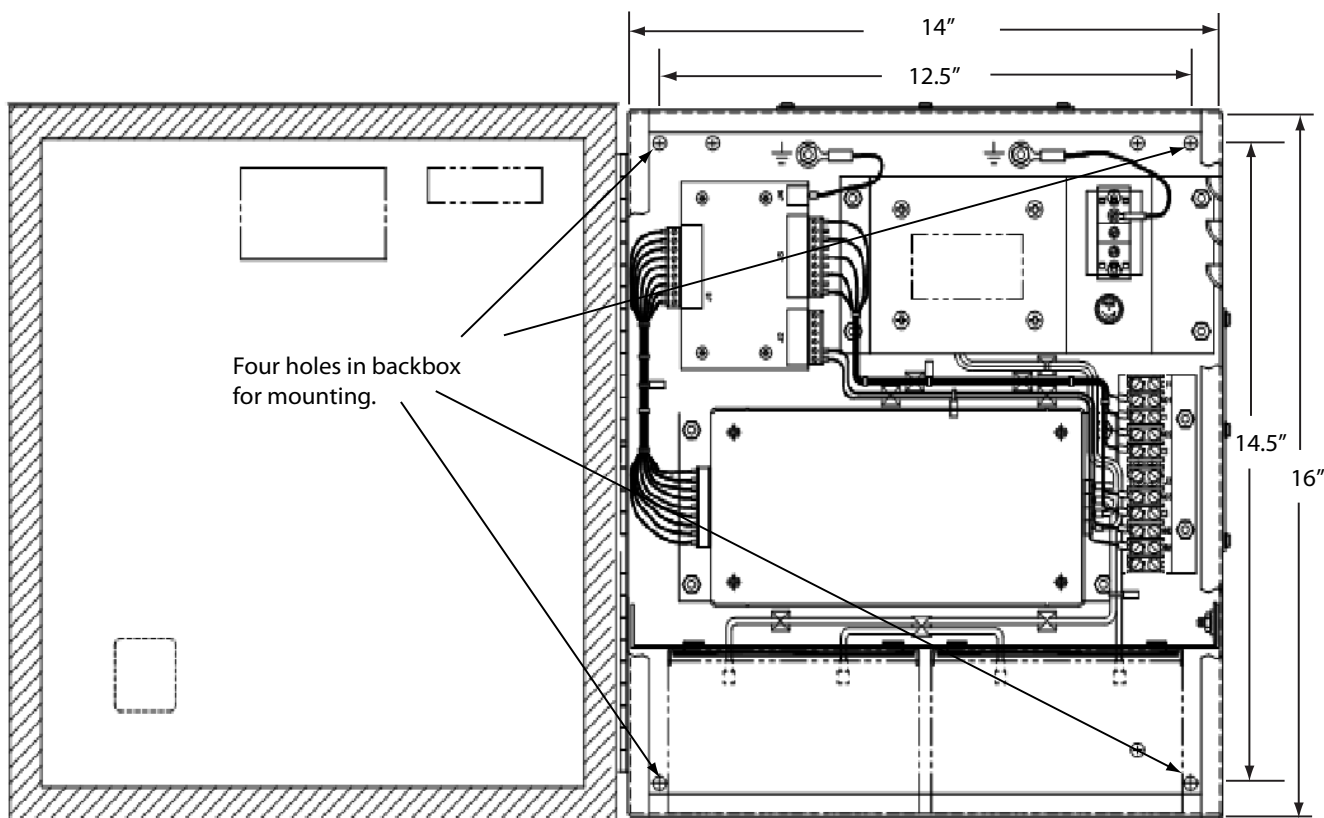
Figure 33: APS-14127-00 Auxiliary Power Supply

APS-14127-00 Auxiliary Power Supply Enclosure Installation

Sufficient clearance must be provided around the unit to allow the enclosure door to be fully opened (180°) without impediment. The enclosure box may be semi-flush mounted provided no less than 5 cm (2 inches) of the box frame protrudes from the wall surface.

The top of the enclosure should be no more than 2.0 meters (6.7 feet) above the finished floor. Recommended mounting hardware: four ¼" pan head screws (If bolts are used, four suitable flat washers are required).

1. Remove the enclosure door from the slip hinges.
2. Secure the enclosure to wall using the four ¼" pan head screws.
3. Reinstall the door and the enclosure base.
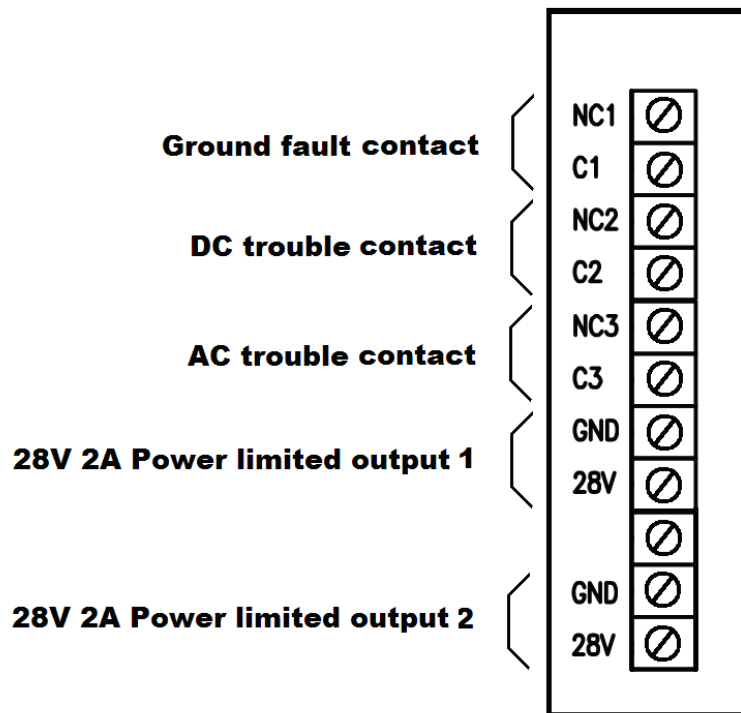
Figure 34: APS-14127-00 Auxiliary Power Supply Connector

Typical connection for APS-14127-00 auxiliary power supply is shown in next figure. In this scheme, s single monitor module is used for picking up trouble information from the auxiliary supply. If individual trouble reporting is required, use a single monitor module per trouble contact.

See sections on ADI and SO cards for further details for power connections.
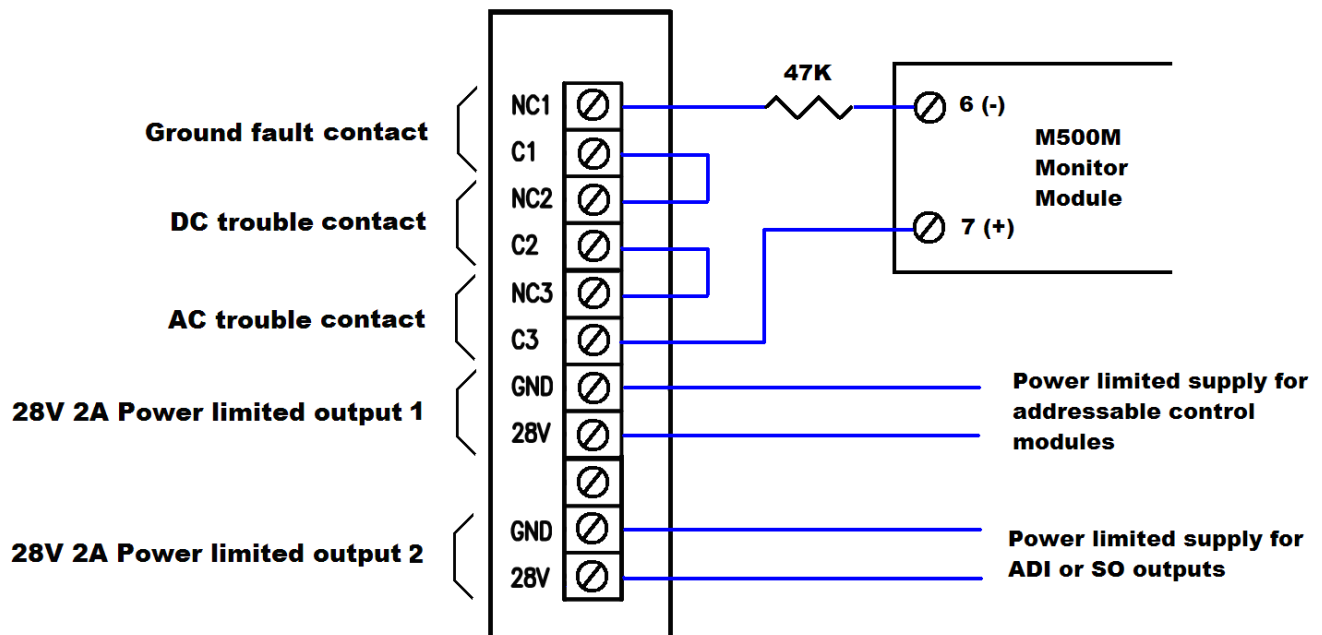
Figure 35: APS-14127-00 Auxiliary Power Supply Typical

Trouble tracing information is provided by the 14043 control interface situated in upper left corner of the APS-14127-00 auxiliary power supply enclosure.
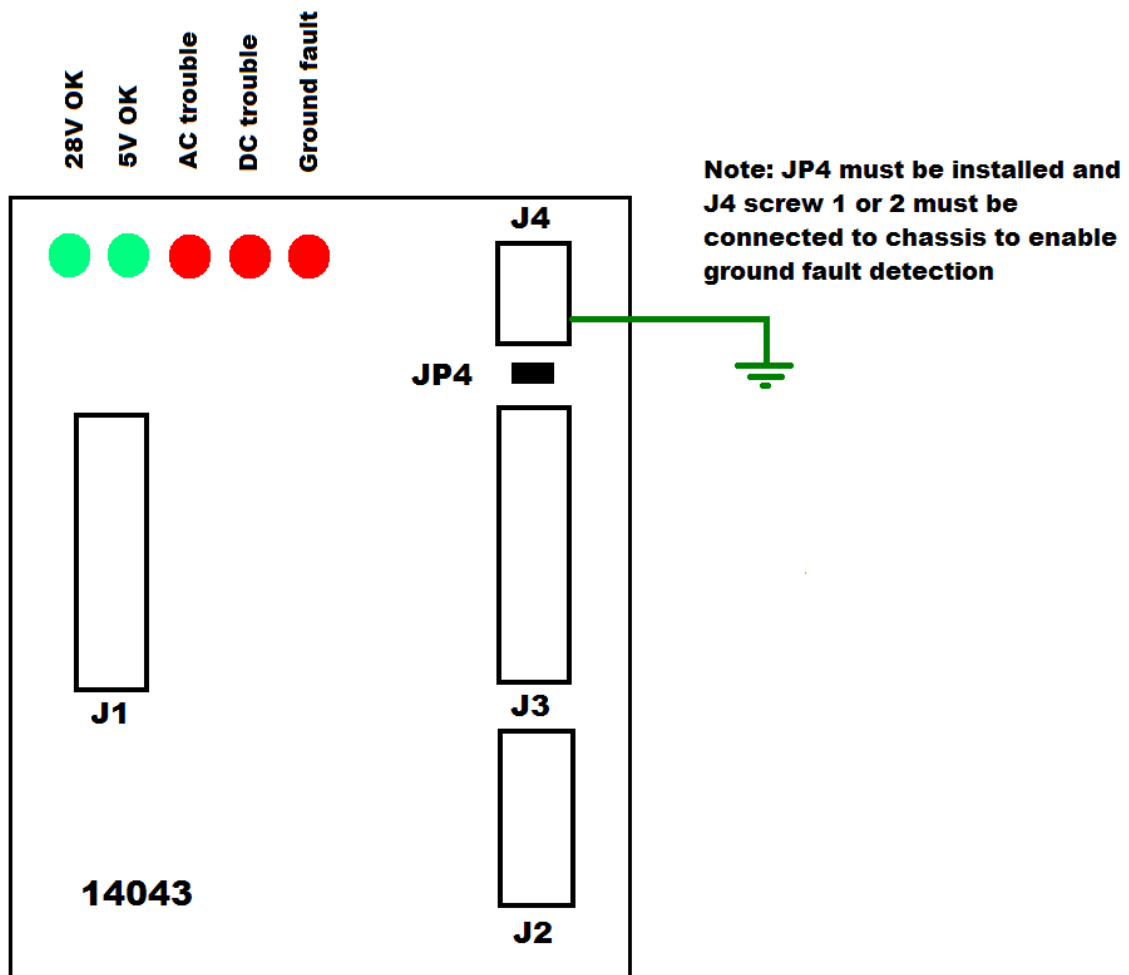
Figure 36: APS-14127-00 Auxiliary Power Supply LED Indicators

12 Zone Supervised OUTPUT Card
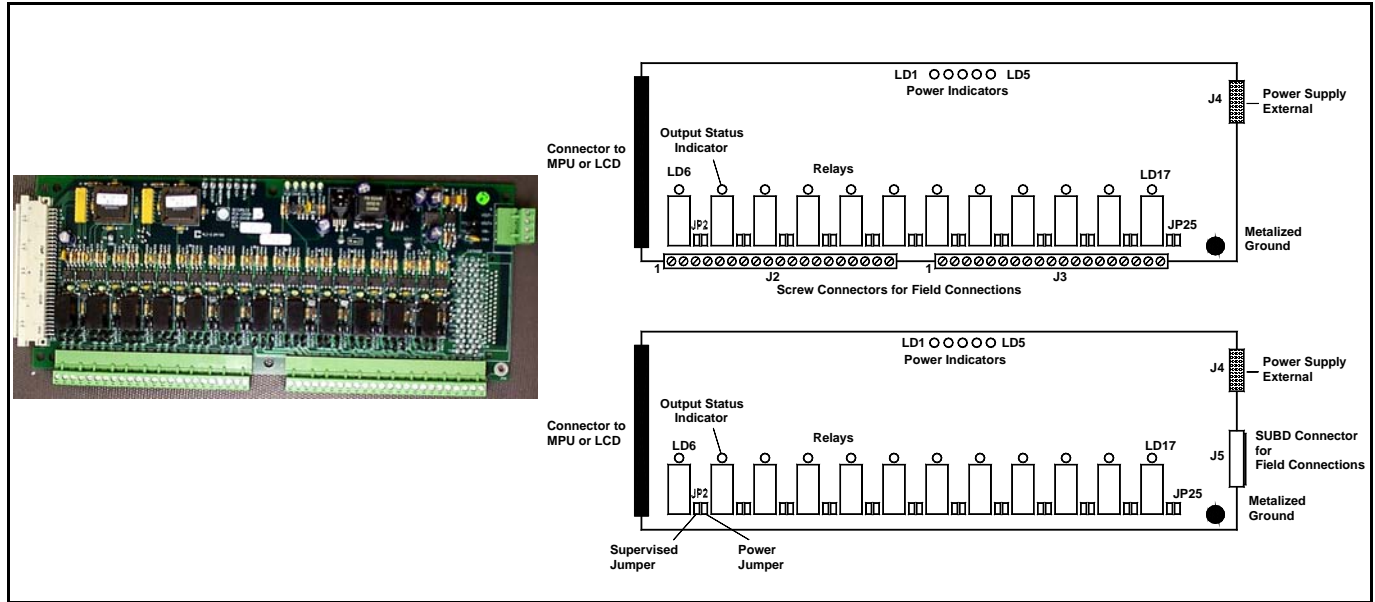
Figure 37: 12 Zone Supervised Output Card

The SO card supports 12 supervised outputs or 12 dry contacts (Form C). The card's 12 relays have jumpers to determine if the outputs are supervised or not.

There are two versions of this card. It can either come with screw terminal connections or a DSUB connector. The screw terminal connections allow more current load and should be used for high power outputs. The DSUB connector version is limited in current handling but is easier to use when wiring a large number of outputs. Supervision circuits use an external power supply (24V) isolated from the main power supply of the card. The power supply should be regulated and UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada), battery backed-up, and fully supervised. The metallized Ground on the card provides the path to chassis for transient protection.

To use dry contacts, no external power is required. The *supervised jumper* and *power jumper* should be removed. To activate supervision circuits of the Supervised OUTPUT card, an external power supply must be connected to the *External Power Connector*. To configure each individual OUTPUT as supervised, insert the *supervised jumper* and remove the *power jumper* for that output.

Signal	Connection	Signal	Connection	Signal	Connection	Signal	Connection
SO1-NO	J2-1	SO4-NO	J2-13	SO7-NO	J3-1	SO10-NO	J3-13
SO1-NC	J2-2	SO4-NC	J2-14	SO7-NC	J3-2	SO10-NC	J3-14
SO1-COM	J2-3	SO4-COM	J2-15	SO7-COM	J3-3	SO10-COM	J3-15
GND	J2-4	GND	J2-16	GND	J3-4	GND	J3-16
SO2-NO	J2-5	SO5-NO	J2-17	SO8-NO	J3-5	SO11-NO	J3-17
SO2-NC	J2-6	SO5-NC	J2-18	SO8-NC	J3-6	SO11-NC	J3-18
SO2-COM	J2-7	SO5-COM	J2-19	SO8-COM	J3-7	SO11-COM	J3-19
GND	J2-8	GND	J2-20	GND	J3-8	GND	J3-20
SO3-NO	J2-9	SO6-NO	J2-21	SO9-NO	J3-9	SO12-NO	J3-21
SO3-NC	J2-10	SO6-NC	J2-22	SO9-NC	J3-10	SO12-NC	J3-22
SO3-COM	J2-11	SO6-COM	J2-23	SO9-COM	J3-11	SO12-COM	J3-23
GND	J2-12	GND	J2-24	GND	J3-12	GND	J3-23

Table 14: 12 Zone Supervised OUTPUT Card Pin outs - Screw Termination

Signal	Connection	Signal	Connection	Signal	Connection	Signal	Connection
SO1-NO	J5-1	SO4-NO	J5-13	SO7-NO	J5-25	SO10-NO	J5-37
SO1-NC	J5-2	SO4-NC	J5-14	SO7-NC	J5-26	SO10-NC	J5-38
SO1-COM	J5-3	SO4-COM	J5-15	SO7-COM	J5-27	SO10-COM	J5-39
GND	J5-4	GND	J5-16	GND	J5-28	GND	J5-40
SO2-NO	J5-5	SO5-NO	J5-17	SO8-NO	J5-29	SO11-NO	J5-41
SO2-NC	J5-6	SO5-NC	J5-18	SO8-NC	J5-30	SO11-NC	J5-42
SO2-COM	J5-7	SO5-COM	J5-19	SO8-COM	J5-31	SO11-COM	J5-43
GND	J5-8	GND	J5-20	GND	J5-32	GND	J5-44
SO3-NO	J5-9	SO6-NO	J5-21	SO9-NO	J5-33	SO12-NO	J5-45
SO3-NC	J5-10	SO6-NC	J5-22	SO9-NC	J5-34	SO12-NC	J5-46
SO3-COM	J5-11	SO6-COM	J5-23	SO9-COM	J5-35	SO12-COM	J5-47
GND	J5-12	GND	J5-24	GND	J5-36	GND	J5-48

Table 15: 12 Zone Supervised OUTPUT Card Pin outs - DSUB Termination

Signal	Connection
VIN+	J4-1
VIN-	J4-2
Vout+	J4-3, J5-49, J5-50
Vout-	J4-4

Table 16: External Power Supply Connections

Jumper	Function	Position
JP2	Supervision mode for OUTPUT #1	Installed for la supervision (Use EOL jumper for UL release device. Refer to Release Service Devices section). Not installed for dry contact.
JP4, 6, 8, 12, 14, 16, 18, 20, 22, 24	Supervision mode for outputs 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12	
JP3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25	Reserved	Not installed

Table 17: 12 Zone Supervised OUTPUT Card Jumpers

LED	Function	Position
LD3 (green)	24V input indicator	ON when the 24V power from the Host system is present.
LD2 (green)	Fused 24V input indicator	ON when the fused 24V from the Host system is present.
LD1 (green)	VCC indicator	ON when the local VCC (5V) regulator is functional.
LD5 (green)	External power input indicator	ON when a 24V power supply is connected to the external power input (J4-1, J4-2)
LD4 (green)	External power OUTPUT indicator	ON when 24V power is available on the external power connector (J4-3, J4-4). Indicates that the power is available for the supervision circuits.
LD6-17 (green)	outputs #1 through #12 State	ON when corresponding OUTPUT is activated.

Table 18: 12 Zone Supervised OUTPUT Card LEDs

NOTE:

1.   MORE THAN ONE RELAY, VALVE OR SOLENOID PER OUTPUT IS NOT ALLOWED.

POWER LIMITED, SUPERVISED CIRCUITS

SO CARD J2

GND 4
C 3
NC 2
NO 1

(-)
Note 3
EOL Note 4
(+)

ALL CIRCUITS ARE POWER-LIMITED AND SUPERVISED

J4

VIN+ 1
VIN- 2

(+)   (-)
24VDC
POWER
SUPPLY
(NOTE 2)

NOTES:

1. Jumper to be installed as per supervision jumper Table 22.

2. Use only UL listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power-limited).

3. See Appendix B for compatible NAC or releasing devices.
    Max. allowable circuit voltage: 28 VDC
    Max. current load (per relay circuit): 2A

4. Use MP-300SP when NAC circuit EOL devices must be on a mounting plate. Use MP-320SP when solenoid circuit EOL devices must be on a mounting plate.

5. Minimum detected ground fault impedance is 10K ohms.

Figure 38: Supervised Output Wiring

24/32 Zone Supervised Input Card
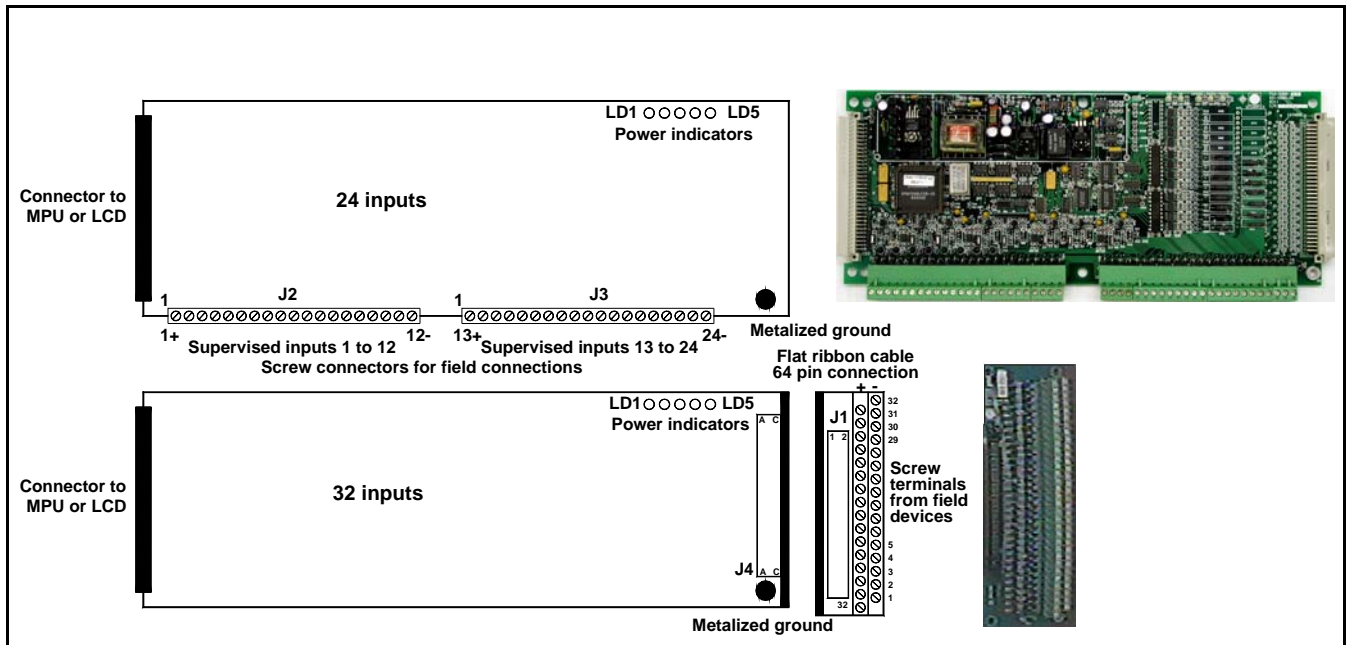
Figure 39: 24/32 Zone Supervised Input Card

The Supervised Input card supports up to 32 conventional detection zones. There are two versions of this card. One is with screw termination and supports 24 supervised inputs.The other is used with model PCA-14308-00 screw terminal adapter and gives access to 32 supervised inputs.

The supported field devices can be shorting or non-shorting devices. The Power indicators provide status of internal voltages on the card. The metallic-mounting hole provides transient protection and Ground fault detection.

See Appendix B for the List of Conventional Devices which are compatible with 24/32 Zone Supervised Input card.

Signal	Connection	Signal	Connection	Signal	Connection
SI1+	J2-1	SI9+	J2-17	SI17+	J3-9
SI1-	J2-2	SI9-	J2-18	SI17-	J3-10
SI2+	J2-3	SI10+	J2-19	SI18+	J3-11
SI2-	J2-4	SI10-	J2-20	SI18-	J3-12
SI3+	J2-5	SI11+	J2-21	SI19+	J3-13
SI3-	J2-6	SI11-	J2-22	SI19-	J3-14
SI4+	J2-7	SI12+	J2-23	SI20+	J3-15
SI4-	J2-8	SI12-	J2-24	SI20-	J3-16
SI5+	J2-9	SI13+	J3-1	SI21+	J3-17
SI5-	J2-10	SI13-	J3-2	SI21-	J3-18
SI6+	J2-11	SI14+	J3-3	SI22+	J3-19
SI6-	J2-12	SI14-	J3-4	SI22-	J3-20
SI7+	J2-13	SI15+	J3-5	SI23+	J3-21
SI7-	J2-14	SI15-	J3-6	SI23-	J3-22
SI8+	J2-15	SI16+	J3-7	SI24+	J3-23
SI8-	J2-16	SI16-	J3-8	SI24-	J3-24

Table 19: 24 Zone Supervised Input Card Pin outs

The adapter's supervised input # is indicated near the screw connections. The + and - signs on the adapter indicate the polarity of the connection.

Signal	Connection	Signal	Connection	Signal	Connection	Signal	Connection
SI1+	J4-A32	SI9+	J4-A24	SI17+	J4-A16	SI25+	J4-A8
SI1-	J4-C32	SI9-	J4-C24	SI17-	J4-C16	SI25-	J4-C8
SI2+	J4-A31	SI10+	J4-A23	SI18+	J4-A15	SI26+	J4-A7
SI2-	J4-C31	SI10-	J4-C23	SI18-	J4-C15	SI26-	J4-C7
SI3+	J4-A30	SI11+	J4-A22	SI19+	J4-A14	SI27+	J4-A6
SI3-	J4-C30	SI11-	J4-C22	SI19-	J4-C14	SI27-	J4-C6
SI4+	J4-A29	SI12+	J4-A21	SI20+	J4-A13	SI28+	J4-A5
SI4-	J4-C29	SI12-	J4-C21	SI20-	J4-C13	SI28-	J4-C5
SI5+	J4-A28	SI13+	J4-A20	SI21+	J4-A12	SI29+	J4-A4
SI5-	J4-C28	SI13-	J4-C20	SI21-	J4-C12	SI29-	J4-C4
SI6+	J4-A27	SI14+	J4-A19	SI22+	J4-A11	SI30+	J4-A3
SI6-	J4-C27	SI14-	J4-C19	SI22-	J4-C11	SI30-	J4-C3
SI7+	J4-A26	SI15+	J4-A18	SI23+	J4-A10	SI31+	J4-A2
SI7-	J4-C26	SI15-	J4-C18	SI23-	J4-C10	SI31-	J4-C2
SI8+	J4-A25	SI16+	J4-A17	SI24+	J4-A9	SI32+	J4-A1
SI8-	J4-C25	SI16-	J4-C17	SI24-	J4-C9	SI32-	J4-C1

Table 20: 32 Zone Supervised Input Card Pin outs

LED	Function	Position
LD1 (green)	24V input indicator	ON when the 24V power from the Host system is present.
LD2 (green)	VCC indicator	ON when the local VCC (5V) regulator is functional.
LD3 (green)	Isolated 24V power indicator	ON when the isolated 24V power supply is activated.
LD4 (green)	Isolated +5V power indicator	ON when the isolated +5 V power supply is activated.
LD5 (green)	Isolated -5V power indicator	ON when the isolated -5 V power supply is activated.

Table 21: Supervised Input Card LEDs

LEGEND: ◯ I **IONIZATION SMOKE DETECTOR**

⊗ **HEAT DETECTOR**

▣ **MANUAL FIRE ALARM BOX**

To SI Card
SI1+

SI1-

EOL 6.8K ohms
Note 3

TYPICAL ZONE WIRING

POWER LIMITED CIRCUIT

NOTES:

1. **Circuits are power limited and supervised**
-Maximum circuit current: 28 mA
-Voltage range: 19 - 25.5VDC
-Maximum cable resistance: 50 ohms

2. **See Appendix B for PRO-2000 compatible input devices. Wire devices as per manufacturers instructions.**

3. **Use MP-300SP when end of line mounting plate is required.**

4. **Minimum detected ground fault impedance is 10K ohms.**

Figure 40: Supervised Input Wiring

ADI - Addressable Device Interface card
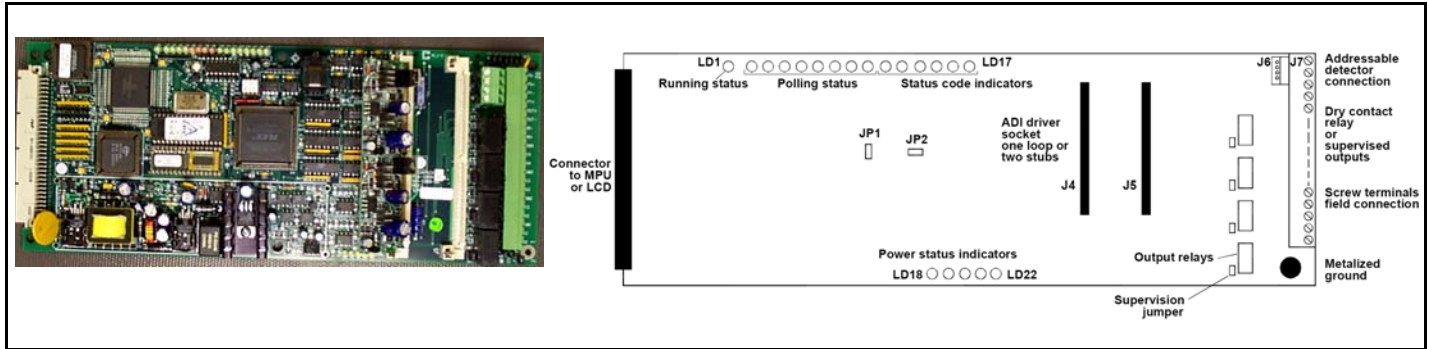
Figure 41: ADI - Addressable Device Interface Card and Connections

The ADI card supports up to two loops (complying with the operation and supervision requirements of NFPA Signalling Line Circuit Style 6) of detectors or up to four stubs (complying with NFPA SLC Style 4 requirements). You can have up to 99 detectors and 99 modules on each loop or stub for a total monitoring capacity of 600 devices - limited by memory. The ADI card interfaces with addressable sensors (photoelectric, ionization and thermal), addressable modules (monitor and control) and Conventional Detector Interface (CDI) modules.

The ADI's modular design provides two sockets (J4 and J5) for the ADI Drivers. Each ADI Driver can support one loop or two stubs (J4 for Loop 1 and J5 for Loop 2).

To install an ADI Driver on the ADI card, proceed as follows:

1. Press the ADI Driver module into the ADI card socket
2. Rotate it down until the side tabs click securing the ADI Driver in place.

   To remove an ADI Driver from the ADI card, proceed as follows:

1. Gently pull out two side tabs holding the card in place.
2. Pull the ADI Driver module out of the ADI card socket.
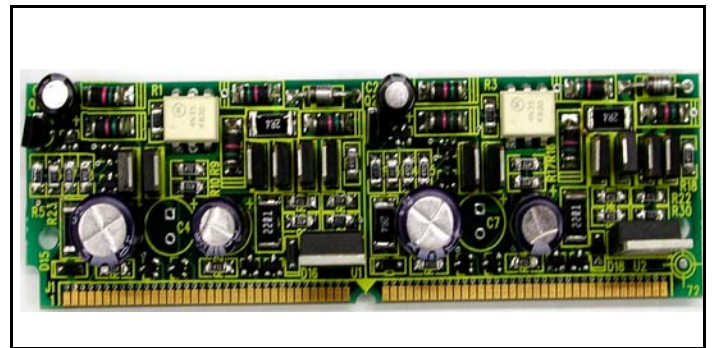
Figure 42: ADI Driver Module

The metallic-mounting hole on the ADI card is used for transient protection and for Ground fault detection making a connection between the card and the chassis.

In addition to the addressable detector interface, this card provides four relay outputs, which can be configured as supervised or unsupervised outputs.

To use dry contacts, no external power is required. The *supervision jumper* should be removed. To activate supervision circuits of the ADI card, an external power supply must be connected to the J7 Pin 13 (VIN +) and 14 (VIN -). To configure each individual OUTPUT as supervised, insert the *supervision jumper* for that output.

Signal	Connection	Signal	Connection	Signal	Connection
NO1	J7-1	NC4	J7-11	LPY+ (loop2) S4	J6-1
NC1	J7-2	COM4	J7-12	LPY- (loop2) S4	J6-2
COM1	J7-3	VIN+	J7-13	LPX+ (loop2) S3	J6-3
NO2	J7-4	VIN-	J7-14	LPX- (loop2) S3	J6-4
NC2	J7-5	Vout+	J7-15		
COM2	J7-6	Vout-	J7-16		
NO3	J7-7	LPY+ (loop1) S2	J7-17		
NC3	J7-8	LPY- (loop1) S2	J7-18		
COM3	J7-9	LPX+ (loop1) S1	J7-19		
NO4	J7-10	LPY- (loop1) S1	J7-20		

Table 22: ADI Card Pin outs

Jumper	Function	Position
JP1 and JP2	Reserved	Installed
JP3	Supervision mode for OUTPUT #1	Installed for la supervision
JP4, JP5, JP6	Supervision mode for outputs 2, 3, 4	Not installed for dry contacts

Table 23: ADI Card Jumpers

LED	Function	Position
LD1 (green)	Running indicator	Blinks when the ADI is executing its normal program
LD2 (green)	X1 Stub polling indicator	Will be ON when the ADI card is polling a device on Stub X1 (J7-19, J7-20) S1
LD3 (green)	Y1 Stub polling indicator	Will be ON when the ADI card is polling a device on Stub Y1 (J7-17, J7-18) S2
LD4 (green)	X2 Stub polling indicator	Will be ON when the ADI card is polling a device on Stub X2 (J6-3 J6-4) S3
LD5 (green)	Y2 Stub polling indicator	Will be ON when the ADI card is polling a device on Stub Y2 (J6-1, J6-2) S4
LD6 - LD9 (red)	Line break indicator	ON if a break on stub X1(LD6), Y2 (LD7), X2(LD8), Y2(LD9)
LD10 - LD17 (green)	Internal status codes	Used to report internal status
LD18 (green)	24V input indicator	ON when the 24V power from the Host system is present
LD19 (green)	Fused 24V input indicator	ON when the fused24V power from the Host system is present
LD21 (green)	VCC indicator	ON when the local VCC (5V) regulator is functional
LD20 (green)	Isolated 24V power indicator	ON when the isolated 24V power supply is activated
LD22 (green)	Isolated 5V power indicator	ON when the isolated 5V power supply is activated

Table 24: ADI Card LEDs

See Appendix B for the List of Addressable Devices which are compatible with Addressable Device Interface.

NOTE:

1.   MORE THAN ONE RELAY, VALVE OR SOLENOID PER OUTPUT IS NOT ALLOWED.

NOTES:

1. Devices wired in accordance with system wiring diagrams. Loop wiring supervised/power-limited.
   Max. voltage: 28VDC
   Max. current: 500 mA, 250mA per loop
   Max. wire resistance: 40 ohms
   Max. inductance: 1mH
   Max. Capacitance: 0.5uF
   Max. Length: 4000 Ft.
   Use shielded, twisted pair wires of appropriate gauge.

2. To be used to power ACDI modules only. Nominal voltage: 24 VDC. Maximum current drawn from this supply should not exceed 250mA. (Max. of 8 ACDI modules)

3. Relay outputs can be supervised or unsupervised. Non power-limited circuits must not be connected to these relays.

4. Use only UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited).

5. Two addressable device loops are available, the 1st located at J7 pin 17-20. The 2nd located at J6 pin 1-4

6. Omit link for stub operation.

Figure 43: ADI Card Wiring - Stub and Loop Mode

Minimum detected ground fault impedance is 1K ohms.

ADI CARD

J6

4	3	2	1
LPX1-	LPX1+	LPY1+	LPY1-

J7

20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
LPX1-	LPX1+	LPY1+	LPY1-	VOUT+	VOUT-	VIN-	VIN+	C4	NC4	NO4	C3	NC3	NO3	C2	NC2	NO2	C1	NC1	NO1

JP6
RELAY 1
JP5
RELAY 2
JP4
RELAY 3
JP3
RELAY 4

NOTES:

1. Jumper to be installed for each relay to be supervised.

2. Use only UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited).

3. Use only UL listed (ULC in Canada) signaling devices.
   Nominal voltage: 24 VDC
   Max. current load (per relay circuit): 2A

4. For NAC ciruits use MP-300SP end of line mounting plate where required.
   For selenoids ciruits use MP-320SP end of line mounting plate where required

Figure 44: ADI Card Wiring - Supervised Relay Outputs

24VDC POWER SUPPLY (NOTE 2) (+) (-)

SUPERVISED, POWER-LIMITED CIRCUIT

Minimum detected ground fault impedance is 1K ohms.

Note 3 (+) (-)

EOL Note 4

MIMIC Driver Module

The MIMIC Driver Module drives the LEDs on the MIMIC displays for the X0M, X2M, and X6M panels. The LCD card controls the MIMIC Driver module. Each MIMIC Driver module supports up to 48 LEDs and 24 push buttons via two connectors. Flat ribbon cables with crimping capabilities are used to attach LEDs on a MIMIC display. A total of 3 MIMIC Modules can be cascaded from a single LCD card.
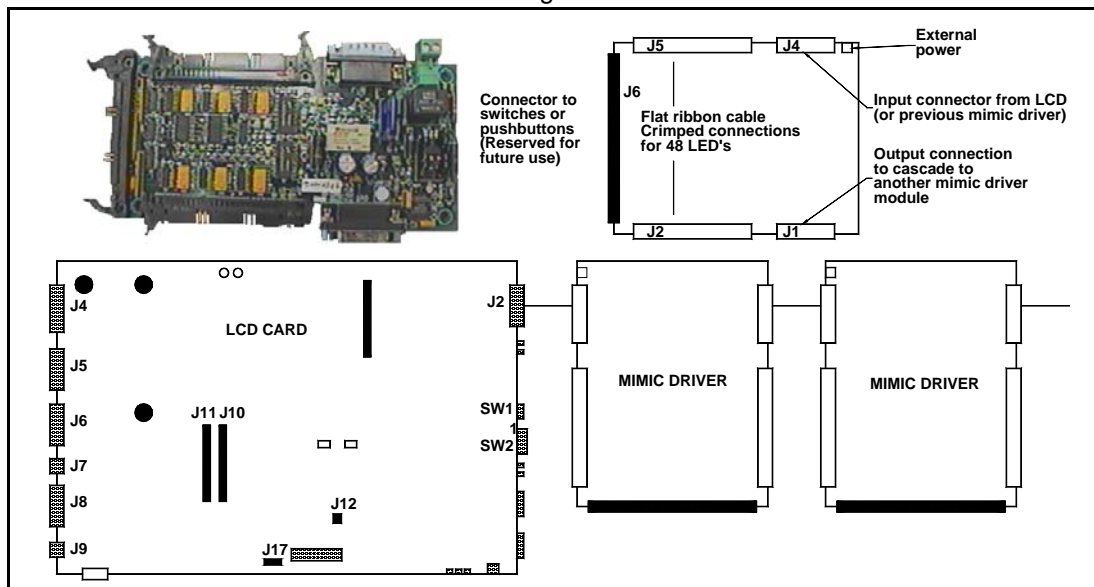
Figure 45: MIMIC Driver Module and Connections

LEDs 1-24	J5		LEDs 25-48	J2	
LED Number	Anode	Cathode	LED Number	Anode	Cathode
1	1	2	25	1	2
2	3	4	26	3	4
3	5	6	27	5	6
4	7	8	28	7	8
5	9	10	29	9	10
6	11	12	30	11	12
7	13	14	31	13	14
8	15	16	32	15	16
9	17	18	33	17	18
10	19	20	34	19	20
11	21	22	35	21	22
12	23	24	36	23	24
13	25	26	37	25	26
14	27	28	38	27	28
15	29	30	39	29	30
16	31	32	40	31	32
17	33	34	41	33	34
18	35	36	42	35	36
19	37	38	43	37	38
20	39	40	44	39	40
21	41	42	45	41	42
22	43	44	46	43	44
23	45	46	47	45	46
24	47	48	48	47	48

Table 25: MIMIC Driver Module LEDs

LED	Function	Definition
LD2 (green)	24V input indicator	ON when 24V power is present at J4
LD1 (green)	VCC indicator	ON when the VCC (5V) regulator is functional

Table 26: MIMIC Driver Module LEDs

LCD Expander Card
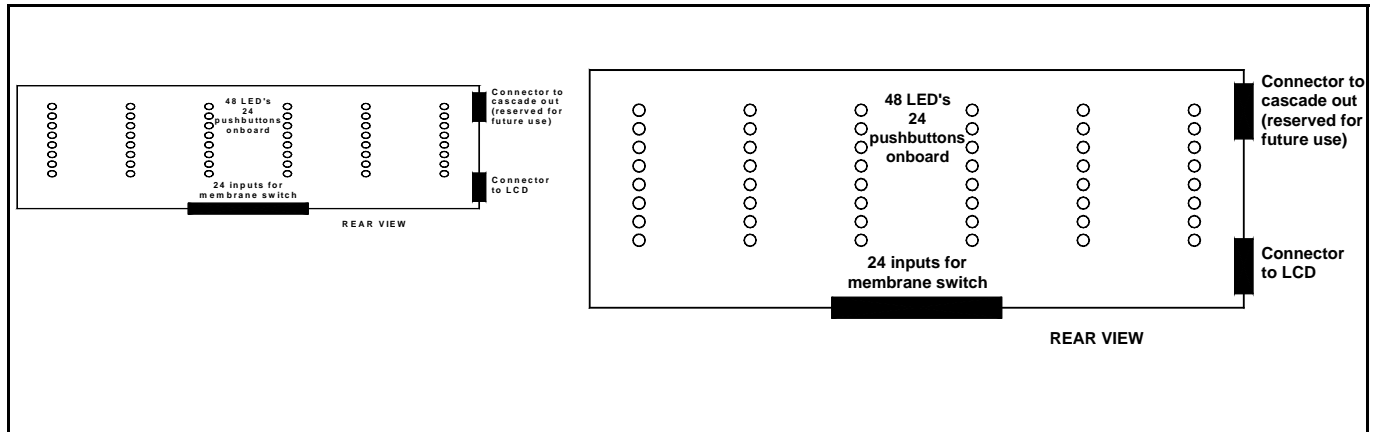
Figure 46: LCD Expander Card and Connections

The LCD Expander card is used in the X0E, X2E, and X6E panels. The Expander is controlled by the LCD card and supports 48 configurable LEDs and 24 configurable push buttons.

LED	Function	Definition
LD49 (green)	24V input indicator	ON when 24V power is present at J2
LD50 (green)	VCC indicator	ON when the VCC (5V) regulator is functional

Table 27: LCD Expander LEDs

External Devices

The information on connection and wiring of sensors and signaling devices to the modules is intended only as a guideline. For full wiring details for a specific system, refer to the system drawings and instructions and to the installation and wiring instructions provided with each device.

Monitor Module

The Monitor module interfaces standard contact type devices with the PRO-2000 panels via the ADI card. You can program the module's unique address using two rotary switches located on the front of the mounting bracket.

The module monitors the contact device with a supervised input circuit. For Class B supervised circuits, a 47K ohm End-Of-Line (EOL) resistor maintains a trickle current through the detector line. The status of the detector line (normal, open or short circuit) latches in the module until polled by the PRO-2000 panel. A LED indicator flashes each time PRO-2000 panel addresses the module. The module transmits, to the PRO-2000 panel, the status of the supervised input along with the actual analog value of the supervision.

Monitor modules provide a two-wire, Class B or fault-tolerant, Class A initiating circuit for normally open contact alarm and supervisory devices.

The module mounts into a 4" square junction box via a mounting bracket (included). Screw terminals with clamping plates are provided for ease of wiring.

The module monitors the contact device with a supervised input circuit. For Class B supervised circuits, a 47 KOhm End-Of-Line (EOL) resistor maintains a trickle current through the detector line. The status of the detector line (normal, open or short circuit) latches in the module until polled by a PRO-2000 panel.

You can program the module's unique address using two rotary switches located on the module.

The module transmits, to the PRO-2000 panel, the status of the supervised input along with the actual analog value of the supervision.

To ADI card addressable loop connections (loop mode)

LPY+
LPY-
LPX+
LPX-

SHIELDED, TWISTED PAIR

FROM LAST MODULE/DETECTOR

NOTES:

TERMINALS 6 & 7 ARE CURRENT LIMITED TO 230 MICRO AMPS MAX AND VOLTAGE LIMITED TO 12V MAX.

1 (-)
7 (+)

2 (+)
6 (-)

M500M MONITOR MODULE

POWER-LIMITED CIRCUITS

TO NEXT DEVICE

CIRCUIT SUPERVISED AND POWER-LIMITED

* **EOL Resistor is supplied with the Monitor Module**

*

47K EOLR
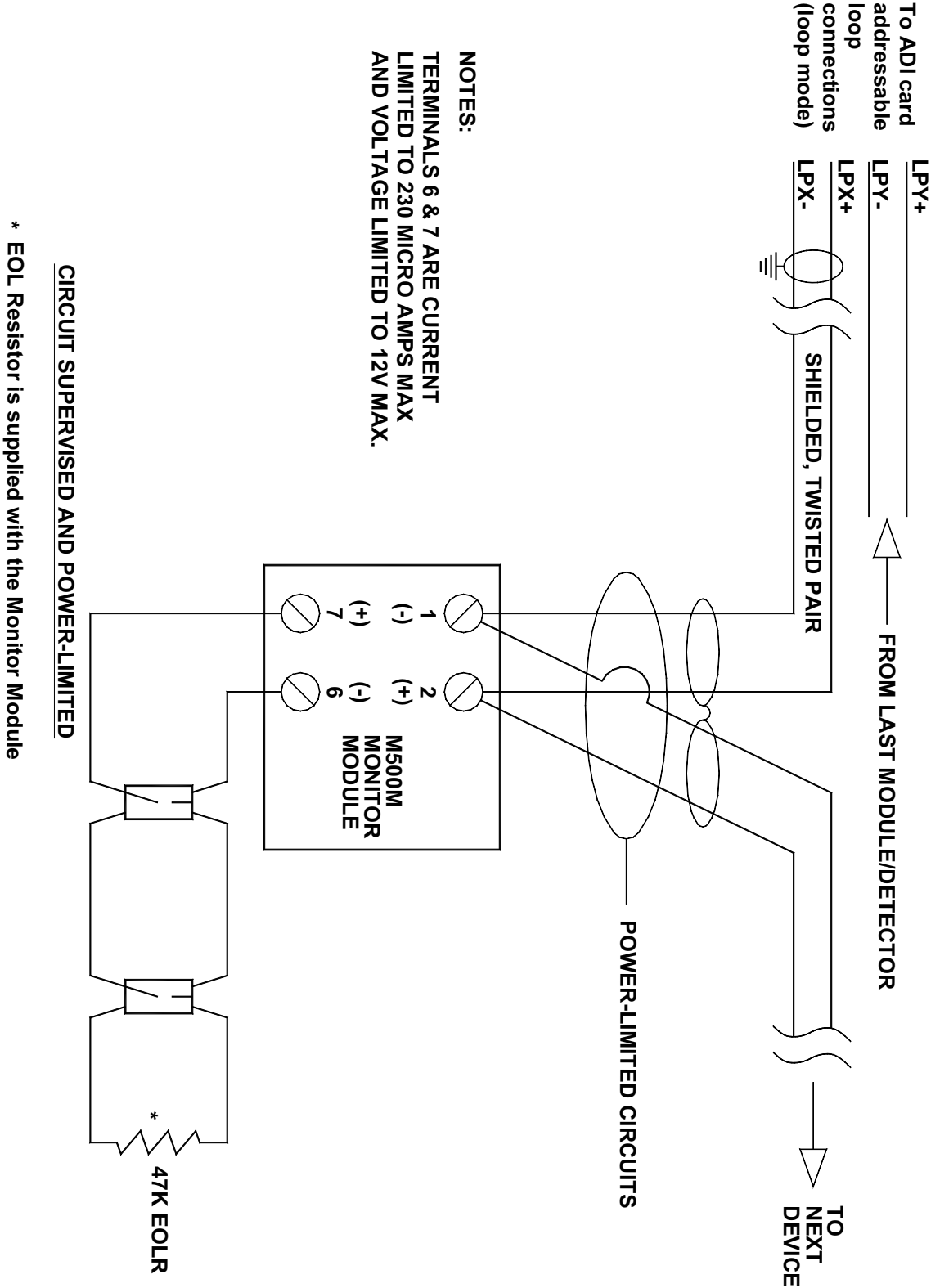
Figure 47: 2 Wire Class B Initiating Circuit Configuration of Monitor Module

To ADI card addressable loop connections (loop mode)

LPY+
LPY-
LPX+
LPX-

SHIELDED, TWISTED PAIR

FROM LAST MODULE/DETECTOR

TO NEXT DEVICE

POWER-LIMITED CIRCUITS

M500M MONITOR MODULE

2 (+)
1 (-)
(-) 6
(+) 7
(-) 8
(+) 9

CIRCUIT SUPERVISED AND POWER-LIMITED

NOTES:

TERMINALS 6 & 7 AND 8 & 9 ARE CURRENT LIMITED TO 230 MICRO AMPS MAX AND VOLTAGE LIMITED TO 12V MAX.
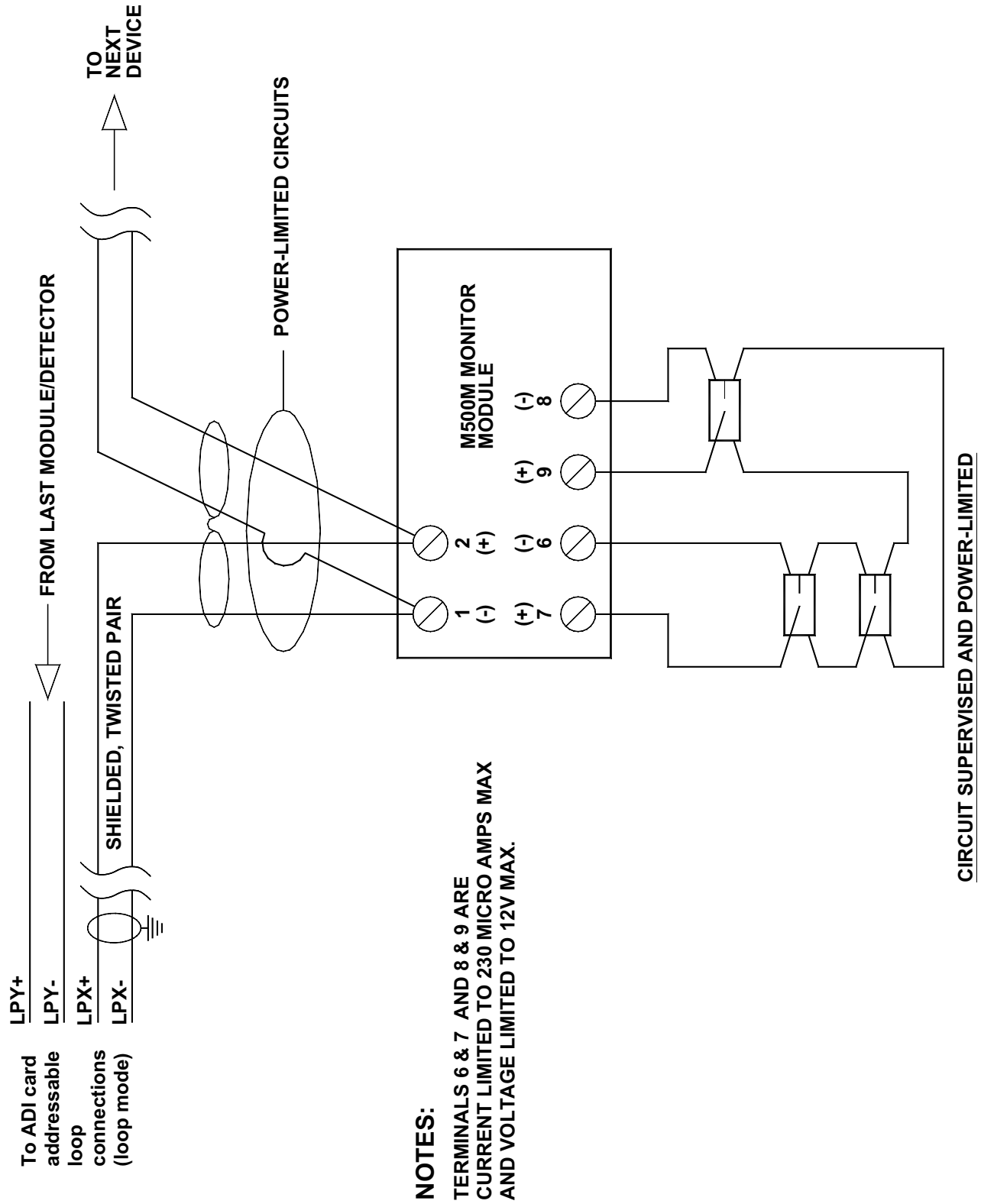
Figure 48: 2 Wire Class A Initiating Circuit Configuration of Monitor Module

Control Module

The Control module interfaces standard OUTPUT alarm devices with a PRO-2000 panel via the ADI card. You can program the module's unique address using two rotary switches located on the front of the mounting bracket. The module mounts into a 4" square junction box via a mounting bracket (included).

The module can either supervise alarm devices with a supervision circuit or provide a dry *Form-C* relay contact for signaling purposes. When used as a supervised output, a secondary voltage source must be provided. Power, from a UL listed for Fire Protective Signaling Systems (ULC listed in Canada) 24 VDC regulated power source, is used by the module to switch on the controlled devices. Relay control, with *Form-C* contacts (unsupervised), is obtained by breaking off tabs J1 and J2.

The unit can be connected in NFPA Class A or B circuits. The status of the OUTPUT line (normal, open or Short circuit) latches in the module until polled by the PRO-2000 panel.

A LED indicator flashes each time the module is addressed by a PRO-2000 panel. The module transmits, to the PRO-2000 panel, the status of the supervised OUTPUT along with the actual analog value of the supervision.

All circuits are power-limited and supervised

NOTES:

1. Use only "UL listed" (ULC listed in Canada) regulated, isolated 24VDC power supply with 24 hour battery back-up. Max. current: 2A

2. Do not use looped wire on terminals 3 and 4. Break wire run to provide supervision of connection.

3. Use UL listed (ULC Canada) indicating devices Max.Load: 1.5A, 24V DC

✱ EOL Resistor is supplied with the Control Module
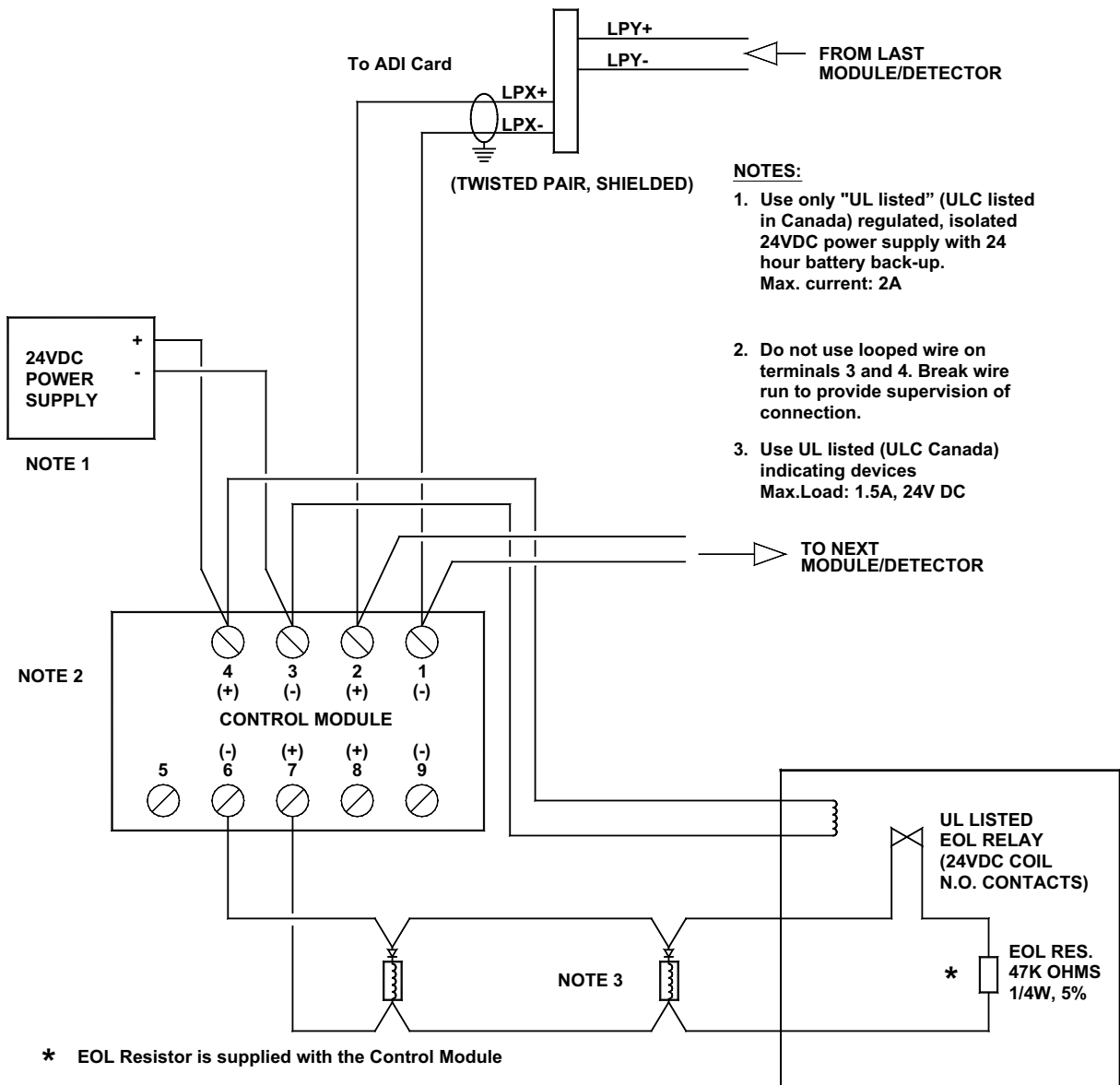
Figure 49: Class B Indicating Circuit Wiring of Control Module

Isolator Module

When the addressable detectors and modules are linked to the ADI Card through a communication loop, isolator modules can be used to divide this loop into several segments.

The Isolator module is an automatic switch that opens when the line voltage drops below 4 Volts. If a short circuit occurs between any two isolators, both isolators immediately switch to an open circuit state and isolate the Group of detectors/modules between them. The use of isolator modules enable part of the communication loop to continue operating should a short circuit occur.

An LED indicator flashes in the normal condition and illuminate steady ON during a short circuit condition. The Isolator module automatically restores the communication loop to the normal condition when the short circuit is removed.

The Isolator modules mount into a 4" square listed junction box with the included mounting bracket. Screw terminals with clamping plates are provided for ease of wiring. It is recommended that sufficient Isolator modules be installed to ensure that not more than 20 detectors/modules are isolated in the event of a single short circuit.
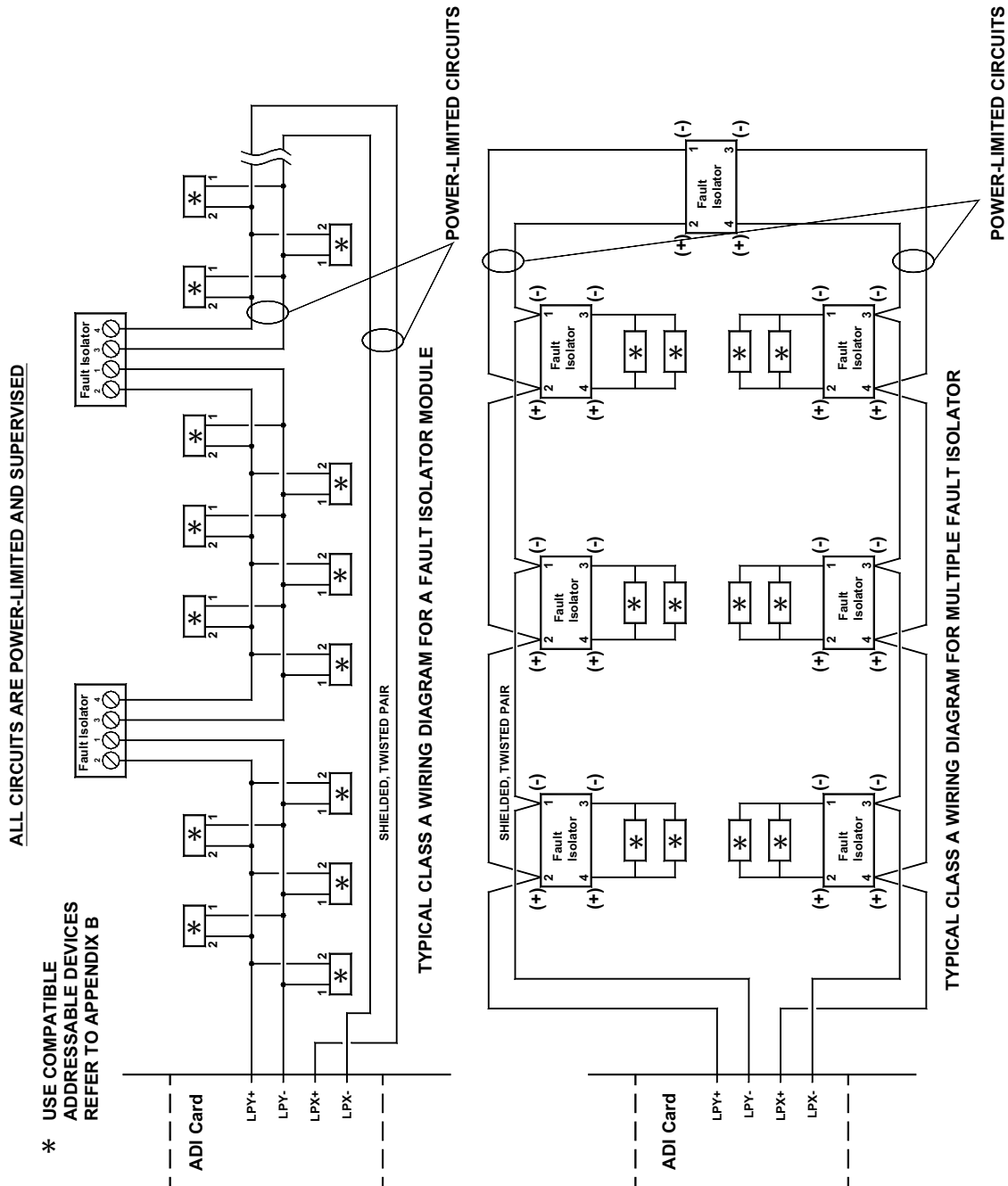
Figure 50: Typical Isolator Module Wiring – Using EOL Relay for Line Supervision

Releasing Device Service

The PRO-2000 Series panel can act as a releasing unit for zones where different extinguishing agents are used. A typical releasing set-up consists of heat or smoke detectors, a pull station, an Abort station, a set of extinguishant cylinders and audible/visual signaling devices. The panel will be programmed to meet the necessary requirements for each zone.

For Releasing Device Service, the ADI card (using the Monitor Modules/Control Modules or Supervised OUTPUT Relays), or SI Card (Supervised Input Card), SO Card (Supervised OUTPUT Card) may be used.

The PRO-2000 Series panel may use cross-zone initiating function. The panel must be factory configured to use the cross zoning. If it is the case, more that one dedicated initiating device must operate prior to initiate release sequence. The operation of a single initiating device will trigger all other intended alarm signals.

Release Sequence

The PRO-2000 Series initiates the release sequence when:

- The designated inputs 1 detectors are in alarm, or
- The designated manual release station is activated.

The following pre-programmed sequence occurs:

1. The pre-release audible/visual signal is continuously energized.
2. Start the 60 second* 'pre-release' delay.
3. Once the pre-release delay terminates and if the Abort push button is not pressed the release annunciators and release actuators are activated.
4. The release actuators may be deactivated after a per-programmed delay.

   * This is the maximum allowable delay time. Delays can be pre-programmed to this maximum.

"Abort" Push buttons

The Abort push button will be operational for releases initiated either from detectors or from manual release actuation. Therefore, **the manual release will not override the abort switch**. The Abort push button may be pressed to temporarily delay the release of the extinguishing agent. In order to delay the release, the Abort push button must be pressed and held. The release actuators will not be energized until the push button is released, even if the 'pre-release' delay expires.

If the Abort push button is pressed outside a release sequence, only a status change will be annunciated at the Control Unit.

Cross zoning is only applicable to the releasing function on the fire control unit. For local alarm notification, cross zoning in not used.

Figure 51: ADI CARD - Typical Wiring Diagram Number 1 for Control Module In
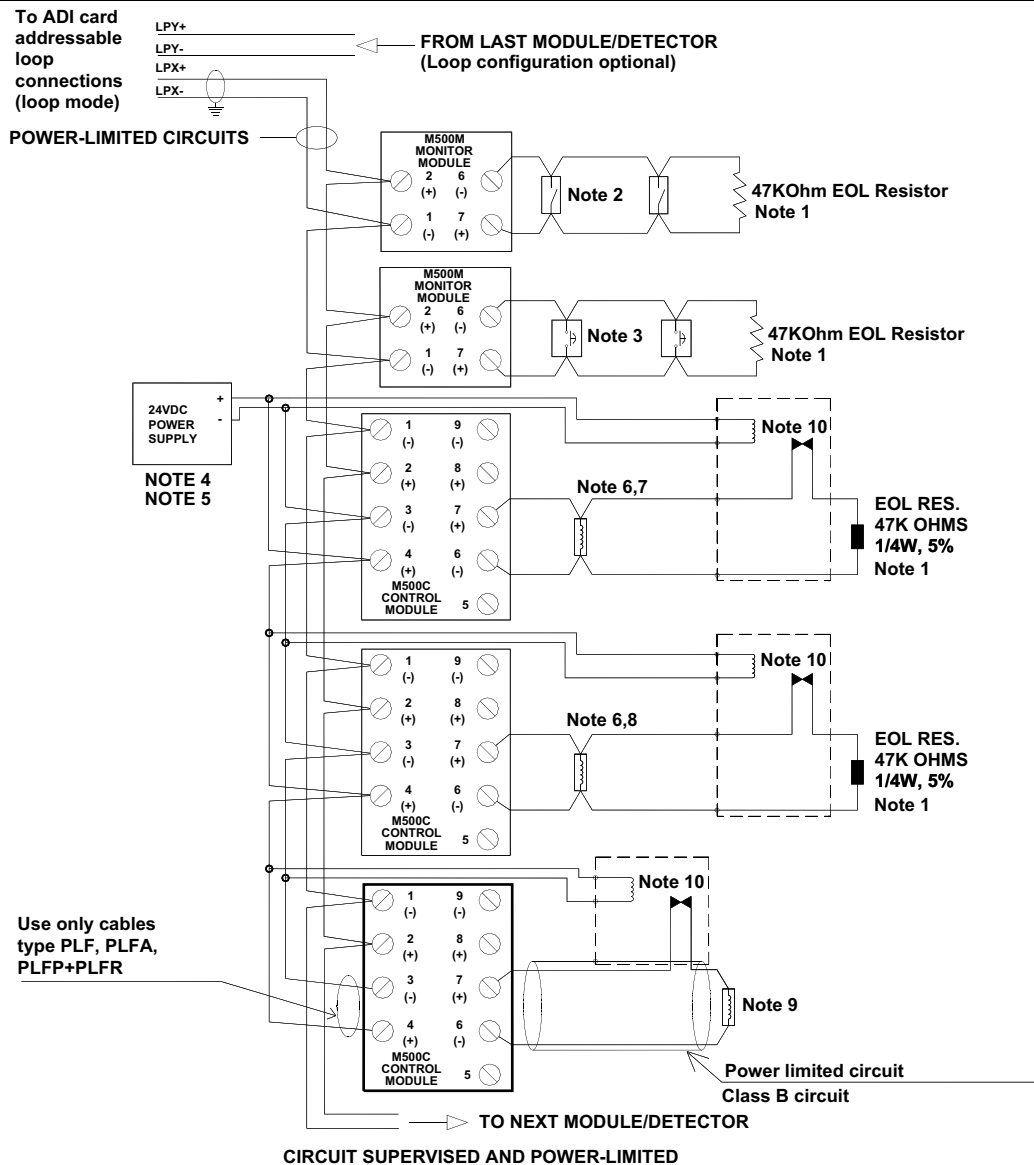
NOTES:

1. EOL Resistor is supplied with the Monitor Module.

2. Manual release switch (Mircom No. 210-13495-00) UL listed only. (ULC Canada)

3. Abort switch (self restoring switch) UL listed only. (ULC Canada)

4. For NAC circuits use only UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited). For Releasing circuits use Special Application Mircom APS-14127-00 Auxiliary Power Supply.

5. Do not use looped wire on terminals 3 and 4. Break wire run to provide supervision of connection.

6. Use UL listed (ULC Canada) NAC devices Max.Load: 1.5A, 24VDC.

7. General Alarm NAC devices Use UL listed (ULC Canada).

8. Release NAC devices Max.Load: 1.5A, 24VDC.

9. Release Device (Valve, Solenoid) Max.Load: 1.5A, 24VDC Min.Load: 0.005A, 24VDC Use UL listed (ULC Canada)

10. UL listed (ULC Canada) EOL relay N.O. contacts (24VDC COIL)

11. If multiple zones are configured in a system , each one should have its own power supply and style 7 wiring should be used for the SLC. Isolation should be provided between the zones as per Figure 50.

To ADI card addressable loop connections (loop mode)
LPY+
LPY-
LPX+
LPX-

FROM LAST MODULE/DETECTOR (Loop configuration optional)

POWER-LIMITED CIRCUITS

CIRCUIT SUPERVISED AND POWER-LIMITED

MONITOR MODULE
2 (+)   6 (-)
1 (-)   7 (+)

Note 2

47K EOLR
Note 1

MONITOR MODULE
2 (+)   6 (-)
1 (-)   7 (+)

Note 3

47K EOLR
Note 1

24VDC POWER SUPPLY
+
-
NOTE 4
NOTE 5

CONTROL MODULE
1 (-)   9 (-)
2 (+)   8 (+)
3 (-)   7 (+)
4 (+)   6 (-)
5

Note 6,7,11

EOLR
47K OHMS
1/4W, 5%
Note 1

CONTROL MODULE
1 (-)   9 (-)
2 (+)   8 (+)
3 (-)   7 (+)
4 (+)   6 (-)
5

Note 6,8

EOLR
47K OHMS
1/4W, 5%
Note 1

Use only cables type PLF, PLFA, PLFP+PLFR

CONTROL MODULE
1 (-)   9 (-)
2 (+)   8 (+)
3 (-)   7 (+)
4 (+)   6 (-)
5

Note 9

Non power-limited circuit
Classe B, style 1 (NFPA 72-35) circuit

Note 10

M500M MONITOR MODULE
2 (+)   6 (-)
1 (-)   7 (+)

47K EOLR
Note 1

TO NEXT MODULE/DETECTOR

NOTES:

1. EOL Resistor is supplied with the Monitor Module.

2. Manual release switch
   UL listed only (ULC Canada).

3. Abort switch (self restoring switch)
   UL listed only (ULC Canada).

4. For NAC circuits use UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited).

   For Releasing circuits use Special Application Mircom APS-14127-00 Auxiliary Power Supply.

5. Do not use looped wire on terminals 3 and 4. Break wire run to provide supervision of connection.

6. Use UL listed (ULC Canada) NAC devices
   Max.Load: 1.5A, 24VDC

7. General Alarm
   NAC devices
   Use UL listed (ULC Canada)

8. Release
   NAC devices
   Max.Load: 1.5A, 24VDC

9. Release Device (Valve, Solenoid)
   Max.Load: 1.5A, 24VDC
   Min.Load: 0.005A, 24VDC
   Use UL listed (ULC Canada)

10. UL listed (ULC Canada) EOL relay
    N.O. contacts (24VDC COIL)

11. If multiple zones are configured in a system, each one should have its own power supply and style 7 wiring should be used for the SLC. Isolation should be provided between the zones as per Figure 50.

Figure 52: ADI CARD - Typical Wiring Diagram Number 2 for Control Module In Release Configuration

LEGEND: ○ **IONIZATION SMOKE DETECTOR**

RELEASE MANUAL SWITCH

**ABORT SWITCH
(SELF RESTORING SWITCH)**

NOTES FOR SUPERVISED INPUT CARD:

1. -Maximum cable resistance: 40 ohms
   -Voltage range: 19-25 VDC.
   -Maximum circuit current: 28mA
   Circuits are power limited and supervised

2. See Appendix B for PRO-2000 compatible
   input devices. Wire detectors according
   to manufacturers instructions.

3. Use MP-300SP when EOL mounting plate is required.
   EOL resistor: 6.8K ohms

4. Use only cables type PLF, PLFA, PLFP+PLFR

Minimum detected ground fault impedance is 10K ohms.

Figure 53: SI Card Typical Wiring Diagram for Releasing System

POWER LIMITED, SUPERVISED CIRCUITS
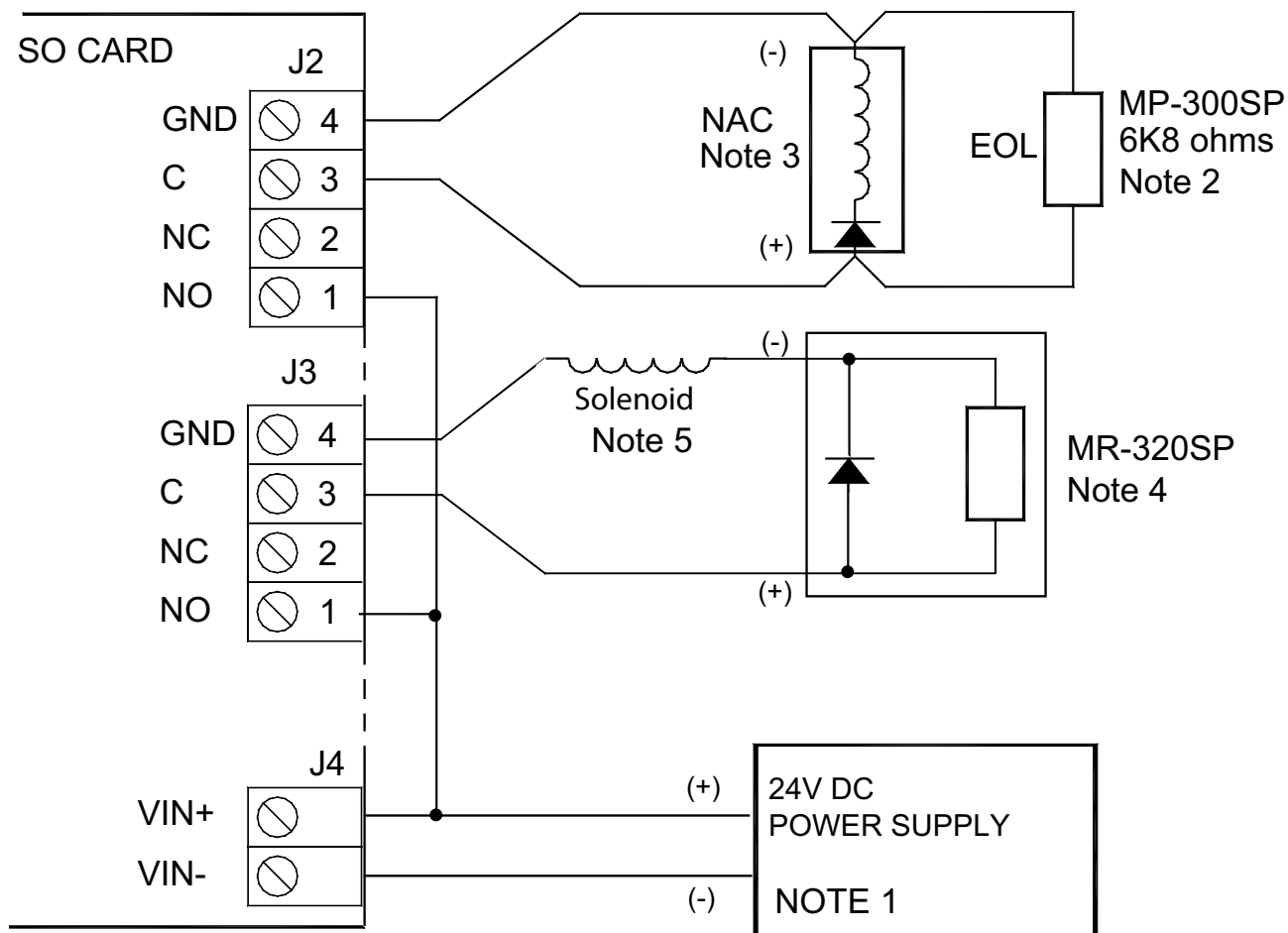
NOTES:

1. For NAC circuits use UL Listed for Fire Protective Signaling Systems (ULC Listed in Canada) regulated, isolated 24VDC power supply (supervised and power limited).

    For Releasing circuits use Special Application Mircom APS-14127-00 Auxiliary Power Supply.

2. For NAC circuits, us MP-300SP when EOL mounting plate is required.

3. See Appendix B for PRO-2000 compatible NAC devices.

4. Use MP-320SP when solenoid circuit EOL devices must be on a mounting plate.

5. See Appendix B for PRO-2000 compatible releasing devices.

Figure 54: SO Card Typical Wiring Diagram for Releasing System

OPERATING INSTRUCTIONS

The LCD Panel

The LCD Panel provides the main user interface for the PRO-2000 Series. The front panel divides into four functional areas:

SYSTEM STATUS　　　Alarm indicators (also called Dual Alarm indicators), the Liquid Crystal Display, the **Reset** and **Acknowledge** push buttons, the Supervisory, Controls Enabled, Panel Failed, Power indicators and the Control Key Switch.

DISPLAY　　　Provides visual indication of, and access to, the system status. The DISPLAY area contains the **Alarm**, **Supervisory**, **Trouble**, **Status**, **Service**, **Isolate**, and **Lamp Test** push buttons and associated indicators. There are also directorial buttons to scroll through Event Lists on the LCD. The **More** push button provides additional details on the currently displayed event condition in the LCD.

USER-DEFINED　　　Provides user control of Special Functions through configurable push buttons (12) and LEDs (24).

SYSTEM　　　Provides access to the system's Menu selection to control certain data and functions such as Event Log, Access Level, Set Clock, Panel Brightness, and Maintenance Mode settings. This area is security access protected.

Figure 55: LCD Panel

Buzzer	Draws attention that a change of state has occurred. A fast beep indicates an alarm condition, and slow beep indicates all other events.
Alarm indicators	The Red indicators illuminate/flash on detection of an alarm condition. Rapid flashing indicates new alarms, slow flashing indicates cleared alarms, and steady-on to indicate acknowledged alarms.

LCD	Displays event history and maintenance mode selection. The LCD is the most important part of the PRO-2000 User Interface. It can either display system information or guidance on how to interact with the system.
	For example, a typical message displayed during an alarm:
	`Alarm # 1 of 3 <NEW> HH:MM:SS`
	`Protected Area Name (user defined)`
	Where:
	`Alarm # 1 of 3` means that this is the first of three alarms detected by the system.
	`<NEW>` means that this alarm was detected but not acknowledged or cleared.
	`HH:MM:SS` is the time at which the alarm signal was picked up.
	`Protected Area Name` identifies the device/zone in alarm. This message is user defined.

Reset push button	Acknowledges the currently displayed alarm, supervisory, trouble, or status event. Security access level protected.
Acknowledge push button	Resets the currently displayed alarm, supervisory, trouble, and status event and silences the buzzer. Security access level protected.
Supervisory indicator	The Yellow indicator illuminates when a Supervisory condition has been detected. Flashing indicates a new event, steady-on indicates an acknowledged event.
Control Enabled indicator	The Yellow indicator illuminates steady-on when the current access level is set to 1. The indicator flashes when the current access level is set to 2.
Panel Failed indicator	The Yellow indicator illuminates when the Panel electronics have failed and cannot sustain normal operation. When illuminated, the buzzer turns ON and can be silenced using the **Acknowledge** button. All other keys are inactive.
Power On indicator	The Green indicator illuminates whenever the system is powered on.
Control Key	Sets the security level of the system to level 1 when ON, level 0 when OFF. Provides control over who can Acknowledge/Reset the system. Prevents tampering by unauthorized personnel.

Table 28: System Status

DISPLAY

The indicators on the display panel flash as each new event occurs and remain steady-on when acknowledged. Resetting or clearing an event state causes the corresponding LEDs to flash then extinguish.

Alarm indicator	The Red indicator illuminates/flashes on detection of an alarm condition. Rapid flashing indicates new alarms, slow flashing indicates cleared alarms, and steady-on to indicate acknowledged alarms.
Alarm push button	Pressing the push button displays the alarm list on the LCD.
Supervisory indicator	The Yellow indicator illuminates when a Supervisory condition has been detected. Flashing indicates a new event, steady-on indicates an acknowledged event.
Supervisory push button	Pressing the push button displays the supervisory list on the LCD.
Trouble indicator	The Yellow indicator illuminates when a Trouble condition has been detected. Flashing indicates a new event, steady-on indicates an acknowledged event.
Trouble push button	Pressing the push button displays the trouble list on the LCD.
Lamp Test push button	Tests all indicators on the panel. Press and hold to illuminate the indicators, display all the character dots on the LCD and activate the buzzer.
Next/Previous/First/Last push buttons	Allow scrolling through the selected event list. You can use the **Next/Previous/First/Last** arrows in the Display area to move up and down the event list in the LCD one entry at a time or to skip directory to the beginning or the end of the list.
More push button	Provides additional details on the currently displayed event condition in the LCD.
Status indicator	The Yellow indicator illuminates when a Status event occurs. Flashing indicates a new event, steady-on indicates an acknowledged event.
Status push button	Pressing the push button displays the status list on the LCD.
Service indicator	The Yellow indicator illuminates when a device is placed in service mode.
Service push button	Pressing the push button displays the service list on the LCD.
Isolate indicator	The Yellow indicator illuminates when a device is placed in isolate mode.
Isolate push button	Pressing the push button displays the isolate list on the LCD.

Table 29: Indicators and Push buttons from Display Panel

Operating Conditions

Five conditions may be identified by the PRO-2000. Four of those are considered Off-Normal.

- **Normal:** Everything is as it should be.
- **Alarm:** triggered when a fire detection or alarm initiating device (e.g. smoke or heat detector, fire alarm station etc.) goes into alarm.
- **Supervisory:** Triggered when a safety system component which IS NOT directly connected to the PRO-2000, but is connected to one of its modules is in an Off-Normal condition and used for the activation of a sprinkler flow switch. NOT to be confused with Trouble.
- **Trouble:** Triggered when an integral component of the PRO-2000 (e.g. electronic component, detector, monitor module, cable, etc.) is found to be defective or faulty. NOT to be confused with Supervisory.
- **Status:** Triggered when a status change is detected on a connected device or system. These devices or systems are not part of the PRO-2000, but are connected to it. For example, a monitoring input can be used to check the status of a door (open or closed).

Display Modes

The PRO-2000 processes and displays information on the LCD in one of three modes: Normal, Single event display, and Dual event display.

- **Normal** condition - All Systems Normal and the current time, `HH:MM:SS`, and date, `YYYY:MM:DD`, display.
  ```
  All systems normal
  HH:MM      YYYY:MM:DD
  ```

- **Single event** mode is the default display mode for new and cleared conditions. The LCD displays events one at a time using its two display lines. To view additional information regarding the displayed event press and hold the **More** push button.
  ```
  Alarm #1 of 1 <NEW> HH:MM:SS
  Protected Area Name (User defined)
  ```

- **Dual event** mode is the default display mode for acknowledged conditions. The LCD displays two events at one time: the oldest event of a certain type with the highest priority, for example Alarm, displays on the first LCD line and the newest event of that same type displays on the second LCD line. If only one event is resident in the system, that event repeats on both lines.
  ```
  Alarm #1, Protected Area Name (User defined), HH:MM:SS
  Alarm #3, Protected Area Name (User defined), HH:MM:SS
  ```

Off-Normal Sequence of Events

The following is a sequence of events after detecting an off-normal condition:

1. The LCD displays that condition in Single Event Mode. The `<NEW>` tag displays. The buzzer starts to sound and the corresponding LED starts to flash.

2. Read the LCD information and acknowledge the condition using the **Acknowledge**. Acknowledge push button (Note the correct access level is required for acknowledgement). If no other events occur, the LCD automatically switches to the dual event mode displaying the highest priority event in the list. If that is the only off-normal event in the system, both lines display the same message. Otherwise the last event in the list is displayed on the second line.

3. Investigate the situation. After the situation clears, select the condition by pressing the appropriate Display mode push button and navigating to the event to be cleared.

   The LCD switches back to Single Event Mode and displays the condition.

4. Press the **Reset** push button (Note the correct access level is required for the reset function).

   The `<CLR>` tag displays. The buzzer starts to sound and the corresponding LED starts to flash.

5.   Press the **Acknowledge** push button.

     The condition becomes non-resident and the LCD updates. If this is the last off-normal condition, the message, All Systems Normal displays. Otherwise, the system returns to the dual event modes.

When the system registers mixed events, the basic scenario remains the same with one major difference: the system prioritizes events according to specific rules. The first event in the list is always the event requiring immediate action.

Event Type Priority

Highest priority: New Alarm, Supervisory, Trouble, Status
                    Cleared Alarm, Supervisory, Trouble, Status
                    Acknowledged Alarm, Supervisory, Trouble

Lowest priority: Acknowledged Status

You can use the Display section push buttons to view a selected event list. The LCD remains in the selected event list for 5 minutes. If no push button is activated or new event occurs, the display defaults to displaying the event with the highest priority.

Non-Resident conditions

Clearing a condition removes it from the system (non-resident) but it still appears in the System Log. The System Log records this action as it occurs and the event remains until removed, cleared, or when the memory becomes full, the system erases the oldest events-first in-first out.

Access Levels

The PRO-2000 recognizes three access levels. This prevents tampering by unauthorized personnel. When a Menu Option is selected or when a Function push button is depressed, the system begins by verifying the access level required for that action. The three access levels are as follows:

0   The lowest access level. At this level, only the **Lamp Test** and the Display push buttons function. The system defaults to level 0 at power up.

1   To access this level use the Control Key. After activating the Control Key switch the Controls Enabled indicator illuminates and access to the remaining controls and to some Menu functions is permitted. Note that the **Acknowledge** and **Reset** push buttons become functional at this level.

2   To access this level, activate the Control Key and enter a password. When this level is active, the Controls Enabled indicator flashes. At this level the complete panel functionality is available. This level is typically used for maintenance purposes.

If requesting a function while the system is not set at a sufficiently high access level the following message displays:

Permission denied, access level too low
Press Continue

Device ID Concepts

The Device ID is a special code used by the system to identify all the devices connected to the PRO-2000. In certain menus it is required to identify a certain device Group to the system. For example, when placing/removing a device/device Group in/from Service or Isolate modes. The following identifies the different fields of the Device ID:

AA-BBCD-EFFF.G

where:
- Field A is the Node number - A number identifying a specific panel. This number is a node address and is assigned when the system is configured.
- Field B is the Slot number - A number identifying the expansion card to which the device is connected. Slot 00 has a special meaning and refers to devices on the MPU for the X6 Series or on the Processing and Display Unit (LCD) for the X2 Series.
- Field C is the Line type - A letter identifying whether the device is connected to a Stub or a Loop.
- Field D is the Line Number - A number identifying the Stub/Loop.
- Field E is the Device type - A letter identifying the type of the Device, for example:

F:	Thermal detector	V:	Virtual device
N:	Ionization detector	H:	Hardware fault
S:	Photoelectric detector	K:	Cable break
M:	Monitor module	P:	Push button
C:	Control module	L:	LCD Panel LED
D:	ACDI module	R:	ADI Supervised output
#:	All devices	I:	Supervised Input device
B	Omni Detector	O:	Supervised OUTPUT device
E	Laser Detector	A:	Card fault

- Field F is the Device address - An identification of the device on the Stub or Loop.
- Field G is the Device point - A decimal point and number value identifying a specific device function. For example, for an addressable module connected to the ADI card, 0 represents a module (monitor, control, or ACDI), or 1 for a detector.

Slot	Line Type	Line #	Device Type	Device Address	Device Point
00	S	0 to 9	V = Virtual Device	0 to 99	0 to 9
00	S	1	P = Push buttons	1 to 84	1
00	S	1	L = LCD panel LEDs (red and yellow)	00 to 22	0 to 7
00 to 06/02	S	1	H = Hardware fault		
00 to 06/02			K = Cable break		
00 to 06/02			A = Card fault		
01 to 06/02	*	*	I = Supervised Input device	1 to 32	0
01 to 06/02	*	*	O = Supervised OUTPUT device	1 to 12	0
01 to 06/02	S/L	1 to 4	M = Monitor module	1 to 99	0
01 to 06/02	S/L	1 to 4	N = Ionization detector	1 to 99	1
01 to 06/02	S/L	1 to 4	S = Photoelectric detector	1 to 99	1
01 to 06/02	S/L	1 to 4	F = Thermal detector	1 to 99	1
01 to 06/02	S/L	1 to 4	C = Control Module	1 to 99	0
01 to 06/02	S/L	1 to 4	B = Omni detector	1 to 99	1
01 to 06/02	S/L	1 to 4	E = Laser Detector	1 to 99	1
01 to 06/02	S	5	R = ADI Supervised output	1 to 4	0

Table 30: PRO-2000 - Device ID

The 06/02 in the table refer to slots in the X6 and X2 Series panels.

Entering a Device ID Example

The first line of the LCD gives information on how to proceed while the second one is reserved for the Device ID.
```
USE: ←,→,↑,↓, to scroll, Enter to select
Device ID: NN-NNAN-ANNN.N  (Edit +S)
```

The plus sign and the letter S displayed next to <u>Edit</u> *refers to the action being taken. In this case, they indicate a device is to be placed in Service Mode. When removing the device from Service Mode a minus sign appears next to the letter S.*

```
Enter node number ## for all nodes
Device ID: NN-NNAN-ANNN.N (Edit, +S)
```

1. Enter the complete device ID.

    The Node Number automatically defaults to the Node Number of the connected panel.

    The cursor moves as each number is entered. Use the ARROW push buttons to move back and forth as required.

2. Move the cursor to the next field to choose the slot number. The following message displays:
    ```
    Enter slot number ## for all slots
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

3. Move the cursor to the next field to choose between Stub or Loop. The following message displays:
    ```
    ↑,↓ for the line type   (Stub)
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

4. Move the cursor to the next field to choose the desired line number. The following message displays:
    ```
    Enter line number # for all lines
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

5. Move the cursor to the next field to choose the device type. The following message displays:
    ```
    ↑,↓ for device type (Thermal detect)
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

6. Move the cursor to the next field to choose the number identifying the desired device on the selected Stub or Loop. The following message displays:
    ```
    Enter device address, ### for all
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

7. Move the cursor to the next field to choose a specific function of the selected device. The following message displays:
    ```
    Enter point number, # for all points
    Device ID: NN-NNAN-ANNN.N  (Edit, +S)
    ```

8. Press and release the **Enter** push button to confirm the selection. If the selected Device ID is not valid, the LCD displays the following:
    ```
    Incorrect Device Selection
    Please re-Enter, PRESS: Continue
    ```

9. Pressing **Continue** allows you to correct the Entered Device ID. Pressing **Exit** returns to the Service Menu.

10. If the ID is valid the LCD displays the following message:
    ```
    Selected device(s): 05-03S2-I001.1      →
    USE: Enter to confirm, Continue to retry
    ```

The arrow for more information is only active when no wildcards (#) are used.

Operating Procedures - Off-Normal conditions

The following procedures apply to the PRO-2000 default configuration. It is designed to offer maximum security. Your system may be configured differently.

General Alarm Condition

The General Alarm Sequence is applied to each control OUTPUT which has been configured as a General Alarm output. The General Alarm On and Off push buttons can be factory configured to use two of the user-defined buttons. The General Alarm sequence consists of the following stages:
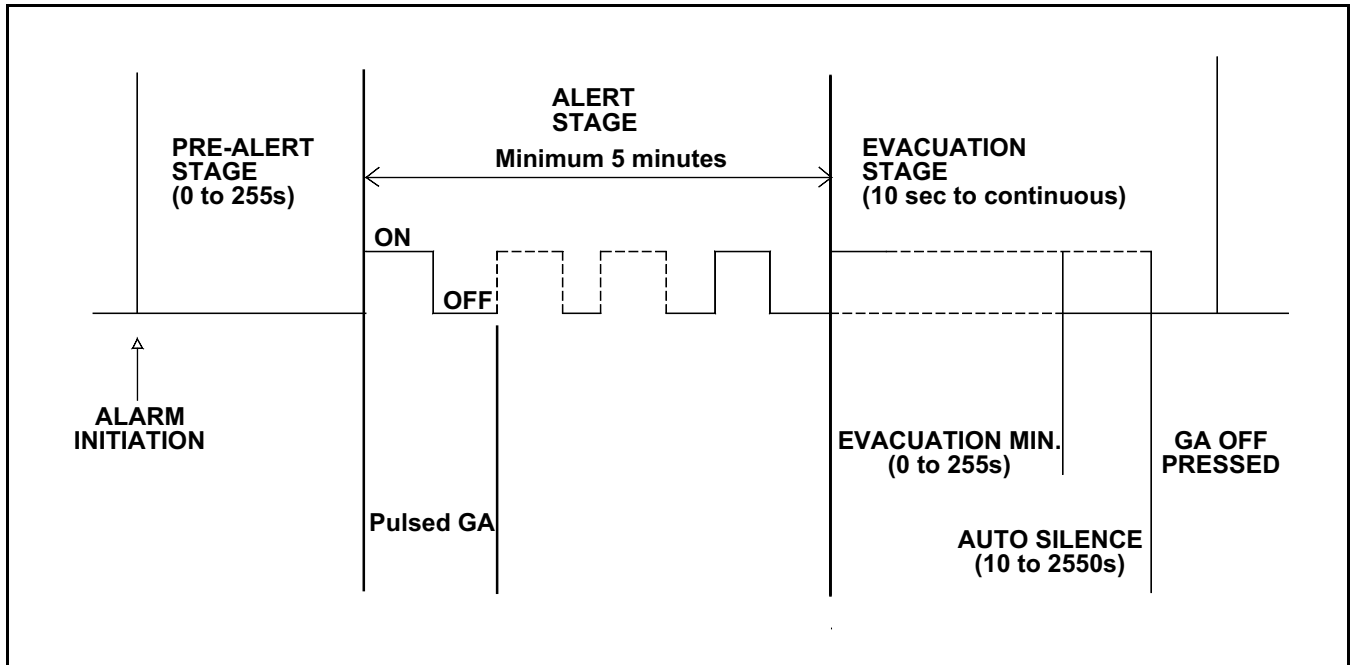
- When permitted (see NFPA 72 1-5.4.10)

> **Pre-Alert Stage** - initiated by an alarm condition. Alarm is annunicated locally but the GA OUTPUT is not energized during this time.

- When permitted (see NFPA 72 1-5.4.8)

> **Alert Stage** - General Alarm OUTPUT pulses, On/Off, during this time period. At this stage there is a possibility of fire. Depending on the GA configuration, the alarm may or may not be silenced at this time using the GA OFF push button at the panel.

> **Evacuation Stage** - The General Alarm OUTPUT activates and can only be stopped at the panel using GA OFF push button. However, it can be configured to automatically stop

.

Single New Off-Normal Condition

When all systems are normal and a single New Off-Normal alarm condition is detected (PRO-2000 receives a signal from only one of its monitoring devices), the following events occur:

- The Off-Normal Condition indicators start flashing (rapidly for alarms).
- If configured (and the condition is not a Trouble), a General Alarm activates as described in *General Alarm Condition*.
- The buzzer starts beeping rapidly if it is an Alarm and slowly for all other conditions.
- The LCD updates. For example, in the case of an alarm:
  ```
  Alarm #1 of 1 <NEW> HH:MM:SS
  Protected Area Name (User defined)
  ```

The time field reflects the time the off-normal was detected.

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To Acknowledge a Single New Off-Normal Condition
- Insert the key into the Control Key switch and turn to activate. The Controls Enabled indicator illuminates.
- Depress and release the **Acknowledge** push button. The following events occur:
  - The off-normal indicators stop flashing and remain on.
  - The buzzer stops beeping.
  - LCD updates. For example, in the case of an alarm:

        Alarm #1, Protected Area Name (user defined), HH:MM:SS
        Alarm #1, Protected Area Name (user defined), HH:MM:SS

To Reset a Single Acknowledged Off-Normal Condition
AFTER INVESTIGATING THE OFF-NORMAL CONDITION and no hazardous condition has been found:

Activate the Control Key switch, depress and release the **Reset** push button to verify if the off-normal condition has cleared. If the off-normal condition is still active, nothing happens. Otherwise, the following events occur:
- The Off-Normal indicators start flashing slowly.
- The buzzer starts beeping slowly.
- The LCD updates. For example, in the case of an alarm:

        Alarm <CLR>, HH:MM:SS
        Protected Area Name (user defined)

The time field reflects the time at which the off-normal was cleared.

To Acknowledge a Single Cleared Off-Normal Condition
Activate the Control Key switch, depress and release the Acknowledge push button. This causes the following events to occur:
- The Off-Normal indicators go off.
- The buzzer silences.
- The PRO-2000 resumes its normal operating mode and the LCD updates.

        All systems Normal
        HH:MM   AAAA:MM:DD
- Turn and remove the key from the Control Key switch.

Multiple Mixed conditions

The PRO-2000 responds according to a fixed system of priority when mixed conditions are resident in the system. When displaying a single acknowledged trouble on the LCD and a single new alarm occurs by the system, the following events occur:
1. Before the new alarm registers the acknowledged Trouble appears in the LCD:
   - The Trouble indicator is steady on.
   - The LCD displays the following:

        Trouble #1, Protected Area Name (user defined), HH:MM:SS
        Trouble #1, Protected Area Name (user defined), HH:MM:SS

The Dual Event Mode is the default mode.
When selecting an Event List the LCD switches to the Single Event Mode for a period of five minutes.

2. When the alarm signal comes in:
   - The Alarm indicators start flashing rapidly.
   - The buzzer starts beeping rapidly.
   - The LCD updates.

        Alarm #1 of 1 <NEW> HH:MM:SS
        Protected Area Name (user defined)

3. Acknowledge the new single alarm. Activate the Control Key switch, depress and release the **Acknowledge** push button. This causes the following events to occur:
   - The Alarm indicators steady.
   - The buzzer stops.
   - The LCD updates.

        Alarm <ACK> HH:MM:SS
        Protected Area Name (user defined)

4. Clear the acknowledged alarm. After the alarm condition has been investigated and no hazardous condition has been found, activate the Control Key switch. Depress the **Display Alarm** push button to access the Alarm Event List. If necessary, use the Navigation arrows to select the alarm to reset. Depress and release the **Reset** push button. If the alarm is still active nothing happens. If the alarm has cleared:

   • The Alarm indicators start flashing slowly.
   • Buzzer starts beeping slowly.
   • The LCD updates.

   ```
   Alarm <CLR> HH:MM:SS
   Protected Area Name (user defined)
   ```

5. Acknowledge the cleared single alarm. Activate the Control Key switch, depress and release the **Acknowledge** push button. This causes the following events to occur:

   • The Alarm indicators go off.
   • The buzzer stops.
   • The LCD updates to show the original trouble message.

   ```
   Trouble #1, Protected Area Name (user defined), HH:MM:SS
   Trouble #1, Protected Area Name (user defined), HH:MM:SS
   ```

LCD Panel Operations - Menu Mode

The buttons on the System Keypad are used mainly for maintenance functions at access level 1 and 2.

- The **numbers** are used to select menu options and used as a generic numeric keypad for operations such as setting the clock.

- **Enter** push button confirms the keyed information.

- **Exit** push button aborts the current command and returns to the previous menu. Depressing the **Exit** push button instead of the **Enter** push button causes the panel to leave the current function and disregard any previously entered values.

- **Continue** push button confirms selection. The system, in some instances, prompts to depress this push button before going to another step.

- **Menu** push button activates the main system menu selection list.

- **Help** push button displays context sensitive help.

- **Arrow** push buttons move the cursor across the text displays on the LCD, scroll through menus, and tab over selections.

When the Menu push button from the System keypad is pressed and he PRO-2000 is set at Access Level 1 or 2, the system goes into Menu Mode. This mode allows access to various menus to enter information in the system. The Main Menu offers eight options:

Event Log option	Displays, prints, and clears the Event Log.
Access Level option	Sets access protection level 2 (using a password).
Set Clock option	Sets the system date and time.
Panel Brightness Control option	Adjusts the intensity of the LCD and LEDs.
Maintenance option	Place part or all of the PRO-2000 in Service and Isolate Mode, to manually activate and deactivate outputs, to put a stub or loop back in service. Removing a zone from Isolate places the devices in Service mode for verification of the state of the devices.

The system automatically exits the Menu Mode if a new event occurs, for example, a new Alarm, Supervisory, or Status event, or if no push button is depressed for more than 5 minutes.

Main Menu

Use the Control Key switch to activate the panel for level 1 access. Press and release the **Menu** push button. The following message displays on the LCD, two lines at a time. Use the arrow push buttons to scroll through the Main Menu options.

```
MAIN MENU
1 Event Log
2 Access Level
3 Set Clock
4 Brightness
5 Maintenance
6 Error Log
EXIT QUIT
```

To choose an option, press and release the corresponding numeric push button or depress the **Exit** push button to exit the Main Menu.

Main Menu -> Event Log

The system maintains a chronological log of all detected events. This log contains each and every event affecting the system, from configuration procedures to the setting of the clock. The system first asks for a time interval. If none is entered, the system starts with the first event and finishes with the last. The system can either give out all of the events or it can filter through the information contained in the log and display only a certain type (alarm, trouble etc.).

When the memory becomes full, the oldest events in the list are overwritten. This ensures that the full capacity of the memory is used to store the most recent events.

Select **1** from the Main Menu. The following message appears on the LCD:

```
EVENT LOG MENU
1 Display Log
2 Print Log
3 Clear Log
EXIT Previous Menu
```

Main Menu -> Event Log -> Display Log

Select **1** from the Event Log Menu. The LCD displays:

```
DISPLAY LOG MENU
1 All Events
2 Alarms
3 Troubles
4 Supervisory
5 Status
6 Service
7 Isolate
8 Maintenance
9 outputs
EXIT - Previous Menu
```

To exit, depress and release **Exit** push button.

For example, selecting **8** displays the recorded information regarding:

- System configuration
- System clock setting operations
- Access level changes

Whichever option you select from the Display Log menu, the system asks for specification of the time interval. The LCD displays the following:

```
Display events logged in time interval:
YYYY:MM:DD HH:MM     to     YYYY:MM:DD HH:MM
```

The YYYY:MM:DD HH:MM references specify the time interval of the logged events to display. Default references correspond to the time of the oldest and of the newest event in the log.

To modify this time interval, use the numeric keypad digit and **arrow** push buttons

If you press the **Enter** push button without making any change, all events in the event log display. The first event displayed is the oldest.

To move through the log one entry at a time, use the **arrow** push buttons. To go to the start of the log, use the left **arrow** push button. To go to the end of the log, use the right **arrow** push button.

Should the Event Log be empty for the selected time interval, the following message displays:

```
No event logged in the specified time interval.
PRESS: EXIT to return
```

Main Menu -> Event Log -> Print Log
Select **2** from the Event Log Menu. The following displays:
```
PRINT EVENT LOG
1 - Print Log
2 - Print Continuously
3 - Cancel Printing
EXIT - Previous Menu
```

Select **1** from Print Event Log menu. The following message appears:

```
Print Event Log?
Press Enter to print. Exit to cancel
```

Pressing **Enter** starts the printing of the log. The following message displays:

```
Event Log print started
Press Exit to return to print menu
```

Main Menu -> Event Log -> Print Log -> Print Continuously
Continuous printing means that the events print as they occur. Select 2 from Print Event Log menu. The following message displays:

```
Print Continuously?
Press Enter to activate, Exit to cancel
```

Pressing **Enter** starts the printing of the log. The following message displays:

```
Continuous Print activated
Press Exit to return to print menu
```

Main Menu -> Event Log -> Print Log -> Cancel Printing
Select **3** from Print Event Log menu to cancel ALL printing. The following message displays:

```
Stop Printing?
Press Enter to stop, Exit to cancel
```

Pressing **Enter** stops ALL printing of the log. The following message appears:

```
Print canceled
Press Exit to return to print menu
```

Main Menu -> Event Log -> Clear Event Log
This option requires access level **2**.

If this option is selected while the system is not set at access level 2, the LCD displays the following message:

```
Permission denied, access level too low
PRESS Continue
```

To gain access to level 2, refer to the next section (going to access level 2).

Select **3** from the Event Log Menu. The following message displays:

```
Clear Event Log?
Press Enter to clear, Exit to cancel
```

Pressing **Enter** clears all the events stored in the Event Log. The following message displays:

```
Event Log cleared
Use Continue to return to event log menu
```

Main Menu -> Access Level

Access Level 2 is required to use the Service, Isolate, and the Clear Event Log options.

Select 2 from the Main Menu. The LCD displays:

```
Enter password: *******
EXIT - Return to Main Menu
```

Use the numeric keypad to enter the password. Asterisks (*) appear as you type in your password - seven characters long.

After entering all digits, the LCD displays the following message:

```
Access level will be set to 2
USE: Enter to confirm, Exit to cancel
```

Entering access level 2 causes the Controls Enabled LED to flash.

If, on the other hand, you have entered an incorrect password, the LCD displays the following message:

```
Password incorrect, Access level still 1
PRESS: Continue to retry, Exit to quit
```

1) *The Controls Enabled indicator always shows the current access level. LED off: Access Level 0. LED steady: Access Level 1. LED flashing: Access Level 2.*
2) *If no push button is depressed for a period of 5 minutes, the system automatically returns to Access Level 1.*

Main Menu -> Set Clock

Select **3** from the Main Menu. The LCD displays the following message:

```
Current Time: YYYY:MM:DD    HH:MM
PRESS: Continue to modify or Exit
```

Line 1 indicates the current date and time and line 2 shows the options.

Press and release the **Continue** push button. The LCD then displays:

```
Enter year of new date
AAAA:MM:DD HH:MM
```

The current time and date display. The cursor appears on the first digit of the Year field.

Press and release the **Exit** push button at any time to exit the Set Clock option. The time is not updated.

Enter the correct time and date using the numeric keypad. The cursor moves automatically as the information is entered. The cursor may be moved manually using the ARROW push buttons.

Press and release the **Enter** push button. The LCD displays the following message:

```
New time and date: YYYY:MM:DD    HH:MM:SS
USE: Enter to confirm, Exit to cancel
```

Press the **Enter** push button to confirm the entry. The system then defaults to the Main Menu. You may now select another option or depress and release the **Exit** push button to exit the Main Menu.

On entering an incorrect value the LCD displays the following message:

```
Error Invalid Time or Date
Press Continue
```

Pressing and releasing the **Continue** push button returns to the select Menu

Main Menu -> Brightness

Select 4 from the Main Menu to adjust the brightness of the panel lights. The LCD displays the following message:

```
USE: ←, → Enter to Save, Exit to Cancel
MIN □□□□□□□□□□ MAX
```

This function controls the brightness of the visual indicators (LEDs) and the LCD.

Use the ARROW push buttons to obtain the desired brightness. The number of squares indicates the level of brightness. If only one bar displays, the LCD and LEDs shine at minimum intensity; if all ten bars display, they shine at maximum intensity.

Press and release the **Enter** push button to prompt the system to accept the new brightness setting.

Press and release the **Exit** push button to return to the Main Menu.

Main Menu -> Maintenance

```
MAINTENANCE MENU
1 - Service Mode
2 - Isolate Mode
EXIT - QUIT
```

Service Mode	Allows verification of the operational state of the PRO-2000 initiating devices (for example, smoke detectors). The alarms are normally annunciated at the panel, but not associated outputs are triggered.
Isolate Mode	Isolates a device or an entire loop of devices. It causes the device to operate as if it had been disconnected from the system. Subsequent alarms or faults, for the particular device, are ignored by the system.

Table 31: Maintenance Menu - Description of each service

Maintenance Menu - > Service Mode

With this option (access Level 2) any part or even all of the PRO-2000 can be placed into or removed from Service Mode. This option allows system maintenance. In Service Mode, alarms are annunciated but the associated outputs are not triggered.

When at least one device has been placed in Service Mode, the Display Service mode indicator illuminates. Select **1** from the Maintenance Menu. The LCD displays the following:
```
SERVICE MENU
1 Place
2 Remove
3 Place in test
EXIT - Previous Menu
```

Maintenance Menu - > Service Mode - > Place
Select **1** from the Service Menu. The LCD displays the following instructions:
```
USE: ←, →, ↑, ↓, for loop & Type, 0 - 9 & Enter
PRESS: Continue
```

If Access Level 2 is not active the LCD displays:
```
Permission denied, access level too low
PRESS: Continue
```

To exit, depress and release the **Exit** push button.

Press and release the **Continue** push button and enter the node number. Enter ## to select all nodes.

The Service Mode option offers two ways to select the desired device or devices. The **Continue** push button toggles between the modes, <List +S> and <Edit +S>.

- In Edit Mode enter the Device ID using the numeric keypad. The ARROW push buttons change the display letters. The **#** push button is used as a wildcard and can be used to represent any possible value. The left and right arrow push buttons can be used to move the cursor left and right.
- In List Mode scroll through the list of devices already in service using the arrow keys.

After confirming the ID Number, the Display Service indicator illuminates. The system then asks you for another Device ID. If you do not have any other ID Number to enter, press the **Exit** push button to return to the Service Menu.

Maintenance Menu - > Service Mode -> Remove
Select **2** from the Service Menu. The information entered when placing a device in Service displays on the LCD with the exception of the plus sign which changes to a minus sign (-S, meaning remove from Service).

After entering the Device ID, confirm using the **Enter** push button, to remove the device from service. After removing the last device from Service, the Display Service indicator extinguishes.

A detector in Alarm cannot be removed from service until the Alarm condition has cleared.

Maintenance Menu - > Service Mode -> Place In Test
The Place In Test mode allows a maintenance operator to perform a one person walk test. All devices selected to operate in this mode must be manually activated. The devices generate silent alarms which are detected, automatically acknowledged, and reset by the panel. Placing devices in the *Place In Test* mode causes the Display Service indicator to illuminate. While in *Place In Test* mode, associated outputs are not triggered.

The LCD displays the Device ID with the letter T (for Test), the date and time the device was tested, and user defined text.
```
05 03S1 I001.1 (T)      YYYY:MM:DD HH:MM:SS
Protected Area Name (User Defined)
```

The panel responds by Alarm indicators steady-on and no buzzer. The signal is automatically acknowledged and is reset following a configurable delay. By setting an entire loop in Test, you could test all the devices in the loop at one time. The events are all recorded and can be printed at a later time.

All devices have four event lines (the T denotes Test):
```
Device ID <T> <NEW> HH:MM:SS
Device ID <T> Acknowledged -- time stamp should be identical the NEW
Device ID <T> <CLR> - configurable seconds after Acknowledged
Device ID <T> <NORMAL>
```

Maintenance Menu - > Service Mode -> List
The List Devices in Service screen displays the following information: Device ID, date and time the device was put in Service Mode and user defined text.
```
05 03S1 I001.1 (S)      AAAA:MM:JJ  HH:MM:SS
Protected Area Name (User Defined)
```

If no Devices are in service, the following message appears:
```
There are no devices in service mode.
PRESS EXIT to return to service menu
```

This list is identical to the list accessible through the Display Service push button.

Maintenance Menu - > Isolate Mode
All or part of the PRO-2000 can be placed/removed in/from Isolate mode with Access Level 2. In Isolate Mode, alarms are ignored by the system.

When any part of the PRO-2000 has been placed in Isolate Mode, the Isolate indicator illuminates. Removing a zone from Isolate places the devices in Service mode for verification of the state of the devices.

Select **2** from the Maintenance menu. The LCD displays the following menu:
```
ISOLATE MENU
1 Place
2 Remove
3 List
EXIT - Previous Menu
```

To place any part of the PRO-2000 in Isolate Mode or to remove it from that mode, follow the procedure outlined in the Service Mode section.

The LCD displays (+I) when placing in Isolate Mode and (-I) when removing from that mode.

Trouble List

When a trouble condition is first annunciated, the Display Trouble LED blinks, the panel buzzer starts to sound in a slow tempo and the LCD displays a message describing the Trouble.

- Read and acknowledge the trouble message or messages by pressing the **Acknowledge** push button once for each trouble message.
- To get more detailed information press and hold the **More** push button.
- Investigate the trouble and take the appropriate corrective action. Press **Reset** to clear the trouble.
- Press **Acknowledge** to remove the trouble from the system's event list.
-

This section contains a list of PRO-2000 Trouble messages.

Some trouble messages could mean that an entire area is no longer monitored by the system.

All Devices	
Controlling I/O Card Failed	An I/O Card fails or is missing. The system indicates a trouble for each device attached to that card. This is to remind users that there is no protection in the area monitored by that card.
MPU Device	
Hardware Trouble	General error message for all devices.
Communication fault	General communication trouble.
ADI Device	
Relay OFF	Device OUTPUT set to ON and the device return value indicates the OUTPUT is OFF. Verify this device, it is not changing state.
Relay ON	Device OUTPUT set to OFF and the device return value indicates the OUTPUT is ON. Verify this device, it is not changing state.
Wrong Device	Device present at the specified address (refer to device ID) is not consistent with the information.
Class A	Class A fault detected on a monitor module.
Compensation	Device is not able to compensate.
Not Reached	The device located at the specified address (refer to device ID) had not been configured due to an earlier error (short-circuit, cable break, wrong device on the line).
Setpoint Too Low	The normal value of the detector located at the specified address (refer to device ID) is too low.
Setpoint Too High	The normal value of the detector located at the specified address (refer to device ID) is too high. This either means that the detector is dirty and needs cleaning or that a fire has been detected while the system is being powered up.
Collision	More than one detector is responding to a single address. This condition usually indicates an address conflict.
Supervision	Device located at the specified address (refer to device ID) does not have an end-of-line (EOL) supervision resistor.
Short-Circuit	A short-circuit has been detected on a detector/module. To locate the faulty detector/module refer to device ID.
Line Break	A cable break has been detected on a detector/module. To locate the faulty detector/module refer to device ID.
Bad Device	Indicates that a communication fault was detected while communicating with an addressable device. This condition usually indicates a bad line.
SO Device	
Supervision	Device located at the specified address (refer to device ID) does not have an end-of-line (EOL) supervision resistor.
Internal Hardware	Device located at the specified address (refer to device ID) has an internal hardware problem. The relay is latched in an open position when requested to close.

Table 32a: Device Trouble

SI Device	
Bad A/D	Device located at the specified address (refer to device ID) report s a defective analog to digital convertor.
Open Circuit	An open circuit is detected at the specified address (refer to device ID).
Short-Circuit	A short-circuit is detected at the specified address (refer to device ID).
Bad Device	Indicates that the returned value is in an invalid range.
Internal Hardware	Indicates a problem with the card at the specified address (refer to device ID).
Current limit	A current limit is reached at the specified address (refer to device ID). Trouble is specific for devices 1 to 8.
Input 9-16 Current limit	A current limit is reached at the specified address (refer to device ID). Trouble is specific for devices 9 to 16.
Input 17-24 Current limit	A current limit is reached at the specified address (refer to device ID). Trouble is specific for devices 17 to 24.
Input 25-32 Current limit	A current limit is reached at the specified address (refer to device ID). Trouble is specific for devices 25 to 32.

Table 32b: Device Trouble (continuation)

Card Trouble

MPU Card	
AC Fault	No AC power.
Power Fault - Stub X or Y	On a X2 panel, a trouble (short-circuit, etc.) was detected on the power stub X or Y of the LCD card RS-422 channel.
Power Fault - Mimics	On a X2 panel, a trouble (short-circuit, etc.) was detected on the power to the Mimic Driver card.
Battery Fault - Short test	Back-up batteries have failed a test in which a load is put on them for a short period of time (60 ms). The batteries are probably not connected to the system.
Battery Fault - Long test	Back-up batteries have failed a test in which a load is put on them for a long period of time (10 s). Back-up batteries faulty, change the batteries.
MPU Ground Fault detected	Ground fault on system.
RS-422 Ground Fault detected on MPU	Ground fault on the RS-422 line.
RS-232 Ground Fault detected on MPU	Ground fault on the RS-232 line.
Printer not active	Verify printer status.
Lithium Battery on MPU Controller	The lithium battery on the main processing unit card has failed a functional test. The battery is either absent, improperly installed (film in place, jumper not in place) or defective.
Power - 422, Stub X	On a X6 panel, a trouble (short-circuit, etc.) was detected on the power stub X of the MPU card RS-422 channel.
Power - 422, Stub Y	On a X6 panel, a trouble (short-circuit, etc.) was detected on the power stub Y of the MPU card RS-422 channel.
Bad configuration ID	The system cannot find a proper configuration. Either X6 or X2 is faulty or it has not been configured. System defaults to default configuration.
Bad configuration checksum	The X6 or X2 panel configuration has lost its integrity. System defaults to default configuration.
Invalid configuration	System cannot run current configuration. System defaults to default configuration.
Bad configuration - Version old	Incompatible software.
Unsupported configuration	Incompatible software.
Bad configuration format	Incompatible software.
Wrong card type in slot #	The card present in the specified slot is not consistent with the current configuration.
Communication with panel ## failed	The master panel cannot communicate with the panel ##, verify panel ##.
Panel ## has failed	The slave panel ## failed, verify the panel ##.
Communication with LCD ## failed	The communication with the LCD ## failed, verify the LCD.
LCD display ## has failed	General failure, verify panel.
Line break port ## S REACHED X -mm Y - pp	A sychronous port line break between mm in X and pp in Y has been detected. Where mm and pp are panel numbers.
Line break port ## A REACHED X -mm Y - pp	A asychronous port line break between mm in X and pp in Y has been detected. Where mm and pp are panel numbers.
Printer not ready	Indicates that the printer is either not connected to the panel or that it was detected to be off-line, while attempting to perform a print operation.
LCD display #, AC fault	No AC power on LCD #
LCD display #, Battery Fault - Short test	On the LCD located at the specified address #, the back-up batteries have failed a test in which a load is put on them for a short period of time (60 ms). The batteries are probably not connected to the system.

Table 33a: Card Trouble

LCD display #, Battery Fault - Long test	On the LCD located at address #, the back-up batteries have failed a test in which a load is put on them for a long period of time (10 s). Back-up batteries faulty, change the batteries.
LCD display #, Ground Fault detected	Ground fault on LCD at address #.
LCD display #, RS-232 Ground Fault detected	Ground fault on the RS-232 line on LCD at address #.
ADI Card	
Ground fault on ADI card in slot ##	Ground fault on line connected to the specified ADI card.
ADI card in slot ## missing	An ADI card is missing in the specified slot.
ADI card in slot ## failed	The ADI card in the specified slot is not responding. This fault may be due to hardware or software (bad EPROM, RAM failure, etc.) or to the presence of a wrong card in the specified slot.
Cable break S##-L## REACHED ## on X	A cable break has been detected. S## indicates the slot of the card, L## indicates the line in the card, and ## indicates the number of devices reached from the X side. If the number is 0, no devices were reached from that particular side.
Cable break S##-L## REACHED ## on Y	A cable break has been detected. S## indicates the slot of the card, L## indicates the line in the card, and ## indicates the number of devices reached from the Y side. If the number is 0, no devices were reached from that particular side.
Shout Slot ##-L## on X	A short-circuit has been detected. Slot ## indicates the slot of the card, L## indicates the line in the card.
Shout Slot ##-L## on Y	A short-circuit has been detected. Slot ## indicates the slot of the card, L## indicates the line in the card.
COMM Card	
Comm card in slot ## missing	A COMM card is missing in the specified slot.
Comm card in slot ## failed	The COMM card in the specified slot is not responding. This fault may be due to hardware or software or to the presence of a wrong card in the specified slot.
ISO1/Ground fault on card in slot ##	Ground fault has been detected on the isolated line 1 connected to the COMM card inserted in the specified slot.
ISO2/Ground fault on card in slot ##	Ground fault has been detected on the isolated line 2 connected to the COMM card inserted in the specified slot.
Cable break S##-L## NOT REACHED##	A cable break has been detected. S## indicates the slot of the card, L## indicates the line in the card, and ## indicates the number of devices not reached.
Cable break S##-L## NOT REACHED## L2	A cable break has been detected. S## indicates the slot of the card, L## indicates the line in the card of the loop, L2 indicates from side 2 of the loop, and ## indicates the number of devices not reached.
SO Card	
SO card in slot ## missing	A SO card is missing in the specified slot.
SO card in slot ## failed	Specified SO card not responding. This fault may be due to hardware or to the presence of a wrong card in the specified slot.
SO card in slot ## missing ext. power	Specified SO card is missing external power for the supervision of the output.
SO card in slot ## config error	Bad configuration for specified SO card.

Table 33b: Card Trouble (continuation)

SI Card	
SI card in slot ## missing	A SI card is missing in the specified slot.
SI card in slot ## failed	Specified SI card not responding. This fault may be due to hardware or to the presence of a wrong card in the specified slot.
SI card in slot ## bad isolated power	Specified SI card isolated power supply is not functioning.
SI card in slot ## Ground fault	Ground fault detected on the specified SI card.
SI card in slot ## config error	Specified SI card has an invalid configuration.
SI card in slot ## A/d #1 failed test	The first analog to digital converter in the specified slot failed the initialization test. Channels 1 to 11 are not available.
SI card in slot ## A/d #2 failed test	The second analog to digital converter in the specified slot failed the initialization test. Channels 12 to 22 are not available.
SI card in slot ## A/d #3 failed test	The third analog to digital converter in the specified slot failed the initialization test. Channels 23 to 32 are not available.
SI card in slot ## SPI failed test	Specified SI card is faulty.
SI card slot ##-L## Isol. Power = ## Vcc	The isolated voltage is under 21 VDC

Table 33c: Card Trouble (continuation)

Appendix A - Battery Calculations

Nominal battery voltage should be 24 VDC.
Charging voltage is 2.3V per cell minimum.
Initial charging current is 2.14A total.

Battery capacity requirements calculations

This appendix contains tables used to adequately calculate the battery capacity needed for a specific PRO-2000 panel configuration.

Seven tables are available for current consumption calculations:

- Standby current consumption of PRO-2000 X2 panels, Main power supply
- Standby current consumption of PRO-2000 X2 panels, Battery Back-up
- Alarm current consumption of PRO-2000 X2 panels, Battery Back-up
- Standby current consumption of PRO-2000 X6 panels, Main power supply
- Standby current consumption of PRO-2000 X6 panels, Battery back-up
- Alarm current consumption of PRO-2000 X6 panels, Battery back-up
- Current consumption of PRO-2000 System components, External power supply

The first six tables are used to calculate the Standby and Alarm current for X2 and X6 panels. The current required by the X0 panels is included in the calculated current of its host X2 or X6 panel.

For 24 Hours of Supervisory plus 5 minutes of Alarm:
The calculated Standby current on the Main power supply for a panel must not exceed 1.5 Amps.
The calculated Alarm current on the Main power supply for a panel must not exceed 3 Amps.

The battery capacity required for a specific panel configuration can be calculated using the following table and the calculated Battery Back-up Standby and Alarm currents. The "Current" column is multiplied by the "Time required" column to generate the values of the "Battery capacity" column. The "Time required" column must be filled in accordance with the authority having jurisdiction (AHJ) requirements. The total battery capacity required for the panel configuration is the sum of the "Battery capacity" column to a maximum of 37.8 AH (42AH derated at 10 percent).

	Current (Amps)	Time required (Hours)	Battery capacity (A/H)
Calculated Battery back-up Standby current		X	=
Calculated Battery back-up Alarm current		X	=
		TOTAL BATTERY CAPACITY (Maximum value 37.8AH)	

Table 34: Battery Capacity - Panel Specific Configuration

Standby current consumption of PRO-2000, X2 panels Main power supply (28V nominal)

System Component	Standby Current (amps)	Qty	Total
LCD card (X0) (with RS-422)	0.278	X	=
LCD card (X2)	0.251	X 1	= 0.251
LCD on board RS-232 module	0.063	X	=
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.056	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.046	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.177	X	=
ADI driver module	0.054	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.204	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.036	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.095	X	=
Comm. Card on board RS-232 module	0.063	X	=
Total Standby current (add this total to Table 34) **The total standby current must not exceed 1.5 Amperes** **Main power supply (28V nominal)**			

Table 35: X2 Panel Standby Current Consumption - Main Power Supply

Standby current consumption of PRO-2000, X2 panels Battery back-up (24V nominal)

System Component	Standby Current (amps)	Qty	Total
LCD card (X0) (with RS-422)	0.301	X	=
LCD card (X2)	0.274	X 1	= 0.274
LCD on board RS-232 module	0.073	X	=
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.057	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.047	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.201	X	=
ADI driver module	0.063	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.232	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.040	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.113	X	=
Comm. Card on board RS-232 module	0.073	X	=
Total Standby current (add this total to Table 34) **The total standby current must not exceed 1.5 Amperes** **Battery back-up (24V nominal)**			

Table 36: X2 Panel Standby Current Consumption - Battery back-up

Alarm current consumption of PRO-2000,
X2 panels Battery back-up (24V nominal)

System Component	Alarm Current (amps)	Qty	Total
LCD card (X0) (with RS-422)	0.301	X	=
LCD card (X2)	0.313	X 1	= 0.313
LCD on board RS-232 module	0.073	X	=
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.057	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.047	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.201	X	=
ADI driver module	0.063	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.232	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.040	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.113	X	=
Comm. Card on board RS-232 module	0.073	X	=
Total Alarm current (add this total to Table 34) **The total alarm current must not exceed 3 Amperes** **Battery back-up (24V nominal)**			

Table 37: X2 Panel Alarm Current Consumption - Battery back-up

Standby current consumption of PRO-2000, X6 panels Main power supply (28V nominal)

System Component	Standby Current (amps)	Qty	Total
MPU card (with RS-422)	0.246	X 1	= 0.246
MPU on board RS-232 module	0.063	X	=
LCD card (local or X0) (with RS-422)	0.278	X 1	= 0.278
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.056	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.046	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.177	X	=
ADI driver module	0.054	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.204	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.036	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.095	X	=
Comm. Card on board RS-232 module	0.063	X	=
Total Standby current (add this total to Table 34) **The total standby current must not exceed 1.5 Amperes** **Main power supply (28V nominal)**			

Table 38: X6 Panel Standby Current Consumption - Main Power Supply

Standby current consumption of PRO-2000, X6 panels Battery back-up (24V nominal)

System Component	Standby Current (amps)	Qty	Total
MPU card (with RS-422)	0.273	X 1	= 0.273
MPU on board RS-232 module	0.073	X	=
LCD card (local or X0) (with RS-422)	0.301	X 1	= 0.301
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.057	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.047	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.201	X	=
ADI driver module	0.063	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.232	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.040	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.113	X	=
Comm. Card on board RS-232 module	0.073	X	=
Total Standby current (add this total to Table 34) **The total standby current must not exceed 1.5 Amperes** **Battery back-up (24V nominal)**			

Table 39: X6 Panel Standby Current Consumption - Battery back-up

Alarm current consumption of PRO-2000, X6 panels Battery back-up (24V nominal)

System Component	Alarm Current (amps)	Qty	Total
MPU card (with RS-422)	0.294	X 1	= 0.294
MPU on board RS-232 module	0.073	X	=
LCD card (local or X0) (with RS-422)	0.301	X 1	= 0.301
LCD card user defined LED (local or X0)	0.0022	X	=
LCD expander card (Local or X0)	0.057	X	=
LCD expander card (local or X0) LED	0.0022	X	=
Mimic driver module (local or X0)	0.047	X	=
Mimic driver module (local or X0) LED	0.0022	X	=
ADI card	0.201	X	=
ADI driver module	0.063	X	=
Addressable devices (excluding ACDI)	0.00022	X	=
Addressable sensors in alarm	0.010	X	=
Isolator modules	0.00042	X	=
ADI card OUTPUT supervision current	-	X	=
ADI card OUTPUT activated output	0.0113	X	=
SI card	0.232	X	=
SI card input supervision current	0.0035	X	=
SI card input short circuit current	0.0225	X	=
SO card	0.040	X	=
SO card OUTPUT supervision current	-	X	=
SO card activated OUTPUT	0.0175	X	=
Communication card	0.113	X	=
Comm. Card on board RS-232 module	0.073	X	=
Total Alarm current (add this total to Table 34), The total alarm current must not exceed 3 Amperes) Battery back-up (24V nominal)			

Table 40: X6 Panel Alarm Current Consumption - Battery back-up

Current consumption of PRO-2000 system components, External power supply

System Device	Current from External power supply (Amps)
MPU card (with RS-422)	-
LCD card (X0/X6) (with RS-422)	-
LCD card (X2)	-
LCD card user defined LEDs (current for one LED)	-
LCD expander card	-
LCD expander card LEDs	-
Mimic driver module	-
Mimic driver module LEDs	-
ADI card	-
ADI driver module	-
Addressable devices (excluding ACDI)	-
Addressable sensors in alarm	-
Isolator modules	-
ADI card OUTPUT supervision current	0.0065
ADI card OUTPUT activated output	0.005
SI card	-
Supervision current per input	-
Short circuit current per input	-
SO card	0.055
Supervision current per output	0.0065
Current per activated OUTPUT	0.005
Communication card	-
RS-232 module	-
RS-422 module	-

Table 41: System Components Current Consumption - External Power Supply

Appendix B - Compatible Devices

Pro-2000 Series UL Listed Compatible Addressable Loop Modules

Manufacturer & Model	Description
Mircom	
MIX-1251	Low-Profile Analog Ionization Smoke Sensor
MIX-2251RAP (CLIP Mode)	Advanced Protocol Photoelectronic Smoke Sensor
MIX-2251/B/BT	Low-Profile Analog Photoelectronic Smoke Sensor/plus Thermal
MIX-2251BR	Low-Profile Analog Photoelectronic Smoke Sensor with Sensitivity Test
MIX-2251TM	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor
MIX-7251	Pinnacle™ Intelligent Laser Smoke Sensor
MIX-5251P/RP	Low-Profile Analog Thermal Sensor/Rate of Rise
MIX-M500MB	Monitor Module (Universal)
MIX-M500CH	Addressable Control Module
MIX-M501M	Addressable Mini-Monitor Module
MIX-M502M	Universal Monitor Module
MIX-M500R	Addressable Relay Output Module
MIX-M500S	Addressable Supervised Output Module
MIX-M500DMAP(CLIP Mode)	Advanced Protocol Dual Input Monitor Module
MIX-M500DM	Addressable Dual Input Monitor Module
MIX-DH200PL	Intelligent Smoke Detector
MIX-DH200RPL	Intelligent Smoke Detector (with relay)
MIX-210LP	200 Series Low Profile Intelligent Base
MIX-B501BH	200 Series Low Profile Intelligent Base with Horn
MIX-B501BHT	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
MS-401APU (CLIP Mode)	Advanced Protocol Addressable Single Stage Single Action Station
MS-402APU (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MS-702APU (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MS-710APU (CLIP Mode)	Advanced Protocol Addressable Single Stage Dual Action Manual Station
MS-401ADU	Addressable Single Stage Single Action Station
MS-402ADU	Addressable Two Stage Single Action Manual Station
MS-702ADU	Addressable Two Stage Single Action Manual Station
MS-710ADU	Addressable Single Stage Dual Action Manual Station

Manufacturer & Model	Description
Secutron	
MRI-1251	Low-Profile Analog Ionization Smoke Sensor
MRI-2251/B/T	Low-Profile Analog Photoelectronic Smoke Sensor/plus Thermal
MRI-2251RAP (CLIP Mode)	Advanced Protocol Photoelectronic Smoke Sensor
MRI-2251TM	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor
MRI-7251	Pinnacle™ Intelligent Laser Smoke Sensor
MRI-5251P/RP	Low-Profile Analog Thermal Sensor/Rate of Rise
MRI-M500MB	Monitor Module (Universal)
MRI-M500CH	Addressable Control Module
MRI-M501M	Addressable Mini-Monitor Module
MRI-M502M	Universal Monitor Module
MRI-M500R	Addressable Relay Output Module
MRI-M500S	Addressable Supervised Output Module
MRI-M500DMAP(CLIP Mode)	Advanced Protocol Dual Input Monitor Module
MRI-M500DM	Addressable Dual Input Monitor Module
MRI-DH200PL	Intelligent Smoke Detector
MRI-DH200RPL	Intelligent Smoke Detector (with relay)
MRI-210LP	200 Series Low Profile Intelligent Base
MRI-B501BH	200 Series Low Profile Intelligent Base with Horn
MRI-B501BHT	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
MRM-401APU (CLIP Mode)	Advanced Protocol Addressable Single Stage Single Action Station
MRM-402APU (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MRM-702APU (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MRM-710APU (CLIP Mode)	Advanced Protocol Addressable Single Stage Dual Action Manual Station
MRM-401ADU	Addressable Single Stage Single Action Station
MRM-402ADU	Addressable Two Stage Single Action Manual Station
MRM-702ADU	Addressable Two Stage Single Action Manual Station
MRM-710ADU	Addressable Single Stage Dual Action Manual Station
System Sensor	
FTX-P1	Filtrex™ Intelligent Photoelectric Smoke Sensor
ISO-6	Advanced Protocol Six Isolator Module
M500X	Fault Isolator Module

Manufacturer & Model	Description
System Sensor continued	
M500DMR1	Multiple Module with 2 Monitor Inputs and 2 Relay Outputs
APIM-10 (CLIP Mode)	Advanced Protocol Ten Input Monitor Module
IM-10	Ten Input Monitor Addressable Module
APCR-6 (CLIP Mode)	Advanced Protocol Six Relay Control Module
CR-6	Six Relay Control Module
SC-6	Six Supervised Control Module
B254BI	Analog Base with Isolator
B501B	Analog Base
B200SR	Intelligent Sounder Base
B200SR-LF	Low Frequency Intelligent Sounder Base
B210LP	200 Series Low Profile Intelligent Base
B501B-FTX	Filtrex Base
B501BH	200 Series Low Profile Intelligent Base with Horn
B501BHT	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
CZ-6	Six Addressable Universal Zone Module
BEAM200	Intelligent Addressable Beam Detector
BEAM200S	Intelligent Addressable Beam Detector (with Sens Test)
DNR	Innovair Flex Duct Detector Housing for MIX-2251B and MIX-2251BR Heads
DNRW	Watertight Innovair Flex Duct Detector Housing for MIX-2251B and MIX-2251BR Heads

Pro-2000 Series UL Listed Compatible Two-Wire Smoke Detectors

ℹ️ **Notes:**
1. Whether mixing different models of compatible smoke detectors or using the same model on the same circuit, total standby current of all detectors must not exceed 3 mA.
2. The below listed smoke detectors are compatible with initiating circuits having Compatibility Identifier "A".

Smoke Detector Manufacturer Model / Base	Compatibility Identifier Head / Base	Rated Standby Current	Maximum # of devices per circuit
Mircom			
MIR-525U	FDT-1	0.10 mA	30
MIR-525TU	FDT-1	0.10 mA	30
Apollo			
55000-225 / 45681-251, -255, -256, -258	225 / 251, 255, 256, 258	0.045 mA	30
55000-325 / 45681-251, -255, -256, -258	325 / 251, 255, 256, 258	0.045 mA	30
Detection Systems Inc.			
DS250	B - N/A	0.10 mA	30
DS250TH	B - N/A	0.10 mA	30
DS282	B - N/A	0.10 mA	30
DS282TH	B - N/A	0.10 mA	30
Hochiki			
DCD-135/NS6-220	HD-3/HB-72	0.035mA	30
DCD-135/NS4-220	HD-3/HB-3	0.035mA	30
DCD-135/HSC-220R	HD-3/HB-3	0.035mA	30
DCD-190/NS6-220	HD-3/HB-3	0.035mA	30
DCD-190/NS4-220	HD-3/HB-3	0.035mA	30
DCD-190/HSC-220R	HD-3/HB-3	0.035mA	30
SIJ-24/NS6-220	HD-3/HB-72	0.040mA	30
SIJ-24/NS4-220	HD-3/HB-3	0.040mA	30
SIJ-24/HSC-220R	HD-3/HB-3	0.040mA	30
SLR-24/NS6-220	HD-3/HB-72	0.045mA	30
SLR-24/NS4-220	HD-3/HB-3	0.045mA	30
SLR-24/HSC-220R	HD-3/HB-3	0.045mA	30
SLR-24H/NS6-220	HD-3/HB-3	0.045mA	30
SLR-24H/NS4-220	HD-3/HB-3	0.045mA	30

Smoke Detector Manufacturer Model / Base	Compatibility Identifier Head / Base	Rated Standby Current	Maximum # of devices per circuit
Hochiki continued			
SLR-24H/HSC-220R	HD-3/HB-72	0.045mA	30
SLR-835/NS6-220	HD-3/HB-3	0.045mA	30
SLR-835/NS4-220	HD-3/HB-3	0.045mA	30
SLR-835/HSC-220R	HD-3/HB-72	0.045mA	30
SLR-835B-2	HD-6	55µa @ 24VDC	30
NAPCO			
FW-2	HD-6	55µA @ 24VDC	30
Sentrol - ESL			
429C	S10A - N/A	0.10 mA	30
429CT	S10A - N/A	0.10 mA	30
429CST	S11A - N/A	0.10 mA	30
429CRT	S11A - N/A	0.10 mA	30
711U/701E, 701U, 702E, 702U	S10A - S00	0.10 mA	30
712U / 701E, 701U, 702E, 702U	S10A - S00	0.10 mA	30
713-5U / 701E, 701U, 702E, 702U	S10A - S00	0.10 mA	30
721U / 702E, 702U	S10A - S00	0.10 mA	30
732U / 702E, 702U, 702RE, 702RU	S11A - S00	0.10 mA	30
721UT / 702E, 702U	S10A - S00	0.10 mA	30
722U / 702E, 702U	S10A - S00	0.10 mA	30
731U / 702E, 702U, 702RE, 702RU	S11A - S00	0.10 mA	30
721UT / 702E, 702U	S10A - S00	0.10 mA	30
721UT / 702E, 702U	S10A - S00	0.10 mA	30
System Sensor			
4451HT / B401	A - A	0.12 mA	25
5451 / B401B	A - A	0.12 mA	25
5451 / B401	A - A	0.12 mA	25
2451 / B401B	A - A	0.12 mA	25
2451 / B406B	A - A	0.12 mA	25
2451 / DH400	A - N/A	0.12 mA	25
2451TH / B406B	A - A	0.12 mA	25

Smoke Detector Manufacturer Model / Base	Compatibility Identifier Head / Base	Rated Standby Current	Maximum # of devices per circuit
System Sensor continued			
2451 / B401	A - A	0.12 mA	25
2451TH / B401	A - A	0.12 mA	25
4451HT / B401B	A - A	0.12 mA	25
4451HT / B406B	A - A	0.12 mA	25
1100	A - N/A	0.12 mA	25
1151/ B110LP	A - A	0.12 mA	25
1151/ B116LP	A - A	0.12 mA	25
1400	A - N/A	0.10 mA	25
1451/B401	A - A	0.12 mA	25
1451/ B401B	A - A	0.12 mA	25
1451/ B406B	A - A	0.12 mA	25
1451DH/ DH400	A - A	0.12 mA	25
2100	A - N/A	0.12 mA	25
2100T	A - N/A	0.12 mA	25
2151/ B110LP	A - A	0.12 mA	25
5451 / B406B	A - A	0.12 mA	25
2151/ B116LP	A - A	0.12 mA	25
2400	A - N/A	0.12 mA	25
2400TH	A - N/A	0.12 mA	25
2WTA-B	A - N/A	0.1 mA	1
2WTR-B	A - N/A	0.1 mA	1
2W-B, 2WT-B	A - N/A	0.1 mA	30

Pro-2000 Series UL Listed Compatible Four-Wire Smoke Detectors

Manufacturer & Model/Circuit	Maximum # of Devices
Mircom	
MIR-545U	30
MIR-545TU	30
Sentrol-ESL	
541C	N/A
541CXT	N/A
709-MV-21	N/A
709-24V-21	N/A
741U WITH 702U or 702E Base	N/A
449AT, 449C, 449CT, 449CRT, 449CST, 449CSTE, 449CSRT, 449CSRH, 449CSST, 449CSSTE, 449CTE, 449CSLT	N/A
System Sensor	
1424	25
6424	30
6424A	30
A77-716B	
DH400ACDCI	8
DH400ACDCP	8
DH400ACDCIHT	8

Pro-2000 Series UL Listed Compatible Signalling Devices

System Sensor - SpectrAlert	Wheelock continued	Wheelock continued
P2415	AS-2475C-FW	AMT-12/24-R-ULC
P2415W	AS-24100C-FW	AMT-24-LS-VFR-ULC
P241575	AH-24-R	MB-G6-24-R
P241575W	AH-24-WP-R	MB-G10-24-R
P2475	NS-2415W-FR	SM-12/24-R
P2475W	NS-241575W-FR	DSM-12/24-R
P24110	NS-2430W-FR	
P24110W	NS-2475W-FR	
S2415	NS-24110W-FR	
S2415W	NS4-2415W-FR	
S241575	NS4-241575W-FR	
S241575W	NS4-2430W-FR	
S2475	NS4-2475W-FR	
S2475W	NS4-24110W-FR	
S24110	RS-2415W-FR	
S24110W	RSS-241575W-FR	
H12/24	RSS-2415W-FR	
H12/24W	RSS-241575W-FR	
MDL	RSS-2430W-FR	
MDLW	RSS-2475W-FR	
Wheelock	RSS-24110W-FR	
AS-2415W-24-FR	RSS-2415C-FW	
AS-241575W-FR	RSS-2430C-FW	
AS-2430W-FR	RSS-2475C-FW	
AS-2475W-FR	RSS-24100C-FW	
AS-24110W-FR	MT-12/24-ULC	
AS-2415C-FW	MT-24-LS-VFR-ULC	
AS-2430C-FW	MT-24-WS-VFR-ULC	

Pro-2000 Series ULC Listed Compatible Devices

Pro-2000 Series ULC Listed Compatible Addressable Loop Modules

Manufacturer & Model	Description
Mircom	
MIX-1551A	Analog Ionization Smoke Sensor
MIX-1251A	Low-Profile Analog Ionization Smoke Sensor
MIX-2251/BA	Analog Photoelectronic Smoke Sensor
MIX-2251BRA	Low-Profile Analog Photoelectronic Smoke Sensor with Sensitivity Test
MIX-2251A/2251TA	Low-Profile Analog Photoelectronic Smoke Sensor / Plus Thermal
MIX-2251TMA	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor
MIX-2251RAPA (CLIP Mode)	Advanced Protocol Photoelectronic Smoke Sensor
MIX-7251A	Pinnacle™ Intelligent Laser Smoke Sensor
MIX-M500MA	Monitor Module (Universal)
MIX-M500CHA	Addressable Control Module
MIX-M500DMAPA (CLIP Mode)	Advanced Protocol Dual Input Monitor Module
MIX-M501MA	Addressable Mini-Monitor Module
MIX-DH200PLA	Intelligent Smoke Detector
MIX-DH200RPLA	Intelligent Smoke Detector (with relay)
MIX-210LPA	200 Series Low Profile Intelligent Base
MIX-B501BHA	200 Series Low Profile Intelligent Base with Horn
MIX-B501BHTA	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
MS-401AP (CLIP Mode)	Advanced Protocol Addressable Single Stage Single Action Manual Station
MS-402AP (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MS-401AD/-402AD/-407AD	Addressable Manual Stations
MS-702AP (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MS-701AD/MS-702AD	Addressable Manual Stations
MS-710AP (CLIP Mode)	Advanced Protocol Addressable Single Stage Dual Action Manual Station
MS-710AD	Addressable Dual Action Manual Station
Secutron	
MRI-1551A	Analog Ionization Smoke Sensor
MRI-1251A	Low-Profile Analog Ionization Smoke Sensor
MRI-2551/BA	Analog Photoelectronic Smoke Sensor
MRI-2251A/2551TA	Low-Profile Analog Photoelectronic Smoke Sensor / Plus Thermal

Manufacturer & Model	Description
Secutron continued	
MRI-2251TMA	Low-Profile Acclimate™ Intelligent Photoelectric Thermal Sensor
MRI-7251A	Pinnacle™ Intelligent Laser Smoke Sensor
MRI-M500MA	Monitor Module (Universal)
MRI-M500CHA	Addressable Control Module
MRI-M500DMAPA (CLIP Mode)	Advanced Protocol Dual Input Monitor Module
MRI-M501MA	Addressable Mini-Monitor Module
MRI-DH200PLA	Intelligent Smoke Detector
MRI-DH200RPLA	Intelligent Smoke Detector (with relay)
MRI-210LPA	200 Series Low Profile Intelligent Base
MRI-B501BHA	200 Series Low Profile Intelligent Base with Horn
MRI-B501BHTA	200 Series Low Profile Intelligent Base with Horn (Temporal Code)
MRM-401AP (CLIP Mode)	Advanced Protocol Addressable Single Stage Single Action Manual Station
MRM-402AP (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MRM-401AD/-402AD/-407AD	Addressable Manual Stations
MRM-702AP (CLIP Mode)	Advanced Protocol Addressable Two Stage Single Action Manual Station
MRM-701AD/MRM-702AD	Addressable Manual Stations
MRM-710AP (CLIP Mode)	Advanced Protocol Addressable Single Stage Dual Action Manual Station
MRM-710AD	Addressable Dual Action Manual Station
System Sensor	
5551A	Analog Thermal Sensor
5551RA	Analog Rate of Rise Thermal Sensor
5251PA	Low-Profile Analog Thermal Sensor
5251RPA	Low-Profile Analog Rate of Rise Thermal Sensor
FTX-P1A	Filtrex™ Intelligent Photoelectric Smoke Sensor
ISO-6A	Advanced Protocol Six Isolator Module
M500X	Fault Isolator Module
M500DMR1A	Multiple Monitor with 2 Monitor Inputs and 2 Relay Outputs
B254BIA	Analog Base with Isolator
B501B	Analog Base
B200SRA	Analog Base with Sounder
APIM-10A (CLIP Mode)	Advanced Protocol Ten Input Monitor Module
IM-10A	Ten Input Monitor Addressable Module

Manufacturer & Model	Description
System Sensor continued	
APCR-6A (CLIP Mode)	Advanced Protocol Six Relay Control Module
CR-6A	Six Relay Control Module
SC-6A	Six Supervised Control Module
BEAM200A	Intelligent Addressable Beam Detector
BEAM200SA	Intelligent Addressable Beam Detector (with Sens Test)
DNRA	Innovair Flex Duct Detector Housing for MIX-2251BA and MIX-2251BRA Heads
DNRWA	Watertight Innovair Flex Duct Detector Housing for MIX-2251BA and MIX-2251BRA Heads

Pro-2000 Series ULC Listed Compatible Hardwire Smoke Detectors

Notes: Whether mixing different models of compatible smoke detectors or using the same model on the same circuit, total standby current of all detectors must not exceed 3 mA.

Manufacturer & Model	Maximum # of Devices/ Circuit	Manufacturer & Model	Maximum # of Devices/ Circuit
Mircom		**Fenwal continued**	
MIR-525	30	PSD-7130/70-201000-003	base
MIR-525T	30	PSD-7130/70-201000-005	base
MIR-1400A	30	PSD-7128/70-201000-001	base
MIR-2400A	25	PSD-7126/70-201000-002	base
Apollo		PSD-7126/70-201000-003	base
55000-325	30	PSD-7126/70-201000-005	base
55000-325 / 45681-251, -255, -256, -258	30	PSD-7129/70-201000-000	base
Cerberus Pyrotronics		PSD-7125/70-201000-001	base
D1-2	base	PSD-7126/70-201000-002	base
D1-3/DB-3S	30	PSD-7125/70-201000-003	base
Edwards		PSD-7125/70-201000-005	base
6249C	base	CPD-7021/70-201000-001	base
6250C	base	CPD-7021/70-201000-002	base
6264C	base	CPD-7021/70-201000-003	base
6266C	base	CPD-7021/70-201000-005	base
6269C	base	**Hochiki**	
6270C	base	DCD-135/NS6-220	30
6269C-003	base	DCD-135/NS4-220	30
6270C-003	base	DCD-135/HSC-220R	30
Fenwal		DCD-190/NS6-220	30
PSD-7131/70-201000-001	base	DCD-190/NS4-220	30
PSD-7131/70-201000-002	base	DCD-190/HSC-220R	30
PSD-7131/70-201000-003	base	SIJ-24/NS6-220	30
PSD-7131/70-201000-005	base	SIJ-24/NS4-220	30
PSD-7130/70-201000-001	base	SIJ-24/HSC-220R	30
PSD-7130/70-201000-002	base	SLR-24/NS6-220	30

Manufacturer & Model	Maximum # of Devices/ Circuit	Manufacturer & Model	Maximum # of Devices/ Circuit
Hochiki continued		**System Sensor continued**	
SLR-24/NS4-220	30	1451DH/DH400A	30
SLR-24/HSC-220R	30	2451-A/DH400A	25
SLR-24H/NS6-220	30	1151A	30
SLR-24H/NS4-220	30	2151A	30
SLR-24H/HSC-220R	30	C2W-BA/C2WT-BA	30
SLR-835/NS6-220	30	C2WTR-B	1
SLR-835/NS4-220	30	C2WTA-BA	1
SLR-835/HSC-220R	30	**NAPCO**	
SLR-835B-2	30	FW-2	30
Mirtone			
73471	base		
73494	base		
73575	base		
73495/73486	base		
73495/73487	base		
73595/73486	base		
73595/73497	base		
73594/73400	base		
73405/73400	base		
73594/73401	base		
73405/73401	base		
Simplex			
2098-9110	base		
System Sensor			
1400-A	30		
2400-A	25		
1451-A/B401B	25		
1451-A/B406B	25		
2451-A/B401B	25		
2451-A/B406B	25		

Pro-2000 Series Compatible Synchronized Modules and Strobes

> **Notes:**
> 1. * Strobes and horns must be connected to separate circuits since the horn is a non-synchronized audible appliance.
> 2. Do not mix and match sync module with strobes from different manufacturers because each manufacturer uses different synchronization protocols.

Manufacturer	Brand	Sync. Module	Strobe Model	Max. Strobe / NAC
Amseco / Potter	Mircom	SDM 240	FHS-240-110	15
Gentex Corp.	Secutron	AVS44 R	MRA-HS3-24ww	20
SpectrAlert	System Sensor	MDL	P1224 MC	25
Wheelock	Wheelock	DSM 12/24	NS-24 MCW -FW	25
Faraday	Faraday	5406	6234B-14-24	26*

Pro-2000 Series Compatible Solenoids

Manufacturer	Description
ASCO 8210 series	
T8210A107 24VDC	
R8210A107 24VDC	
8210A107 24VDC	
AMEREX	
17014	Actuator
BSCO	
510006	Actuator
Kidde Fenwal Protection Systems	
486500-01	Actuator
Parker	
73212	Valve Solenoid
Parker Skinner Valve Division Cardox 7-061-0006	
V5L 72750	Valve Solenoid
SIEMENS	
CPYEC-24	
TSP	
17842	Actuator

Pro-2000 Fire Panel Maximum Number of Horn/Strobes

Manufacturer	Maximum # of Horn/Strobes
Wheelock	
NS-24MCW-FW	13
Gentex	
MRA-HS3-24	8
System Sensor	
P1224 MC	12
Mircom	
FHS-240-110	9
Faraday	
6234 Series	9

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Warranty & Warning Information

Warning Please Read Carefully

Note to End Users: This equipment is subject to terms and conditions of sale as follows:

Note to Installers

This warning contains vital information. As the only individual in contact with system users, it is your responsibility to bring each item in this warning to the attention of the users of this system. Failure to properly inform system end-users of the circumstances in which the system might fail may result in over-reliance upon the system. As a result, it is imperative that you properly inform each customer for whom you install the system of the possible forms of failure.

System Failures

This system has been carefully designed to be as effective as possible. There are circumstances, such as fire or other types of emergencies where it may not provide protection. Alarm systems of any type may be compromised deliberately or may fail to operate as expected for a variety of reasons. Some reasons for system failure include:

•*Inadequate Installation*

A Fire Alarm system must be installed in accordance with all the applicable codes and standards in order to provide adequate protection. An inspection and approval of the initial installation, or, after any changes to the system, must be conducted by the Local Authority Having Jurisdiction. Such inspections ensure installation has been carried out properly.

•*Power Failure*

Control units, smoke detectors and many other connected devices require an adequate power supply for proper operation. If the system or any device connected to the system operates from batteries, it is possible for the batteries to fail. Even if the batteries have not failed, they must be fully charged, in good condition and installed correctly. If a device operates only by AC power, any interruption, however brief, will render that device inoperative while it does not have power. Power interruptions of any length are often accompanied by voltage fluctuations which may damage electronic equipment such as a fire alarm system. After a power interruption has occurred, immediately conduct a complete system test to ensure that the system operates as intended.

•*Failure of Replaceable Batteries*

Systems with wireless transmitters have been designed to provide several years of battery life under normal conditions. The expected battery life is a function of the device environment, usage and type. Ambient conditions such as high humidity, high or low temperatures, or large temperature fluctuations may reduce the expected battery life. While each transmitting device has a low battery monitor which identifies when the batteries need to be replaced, this monitor may fail to operate as expected. Regular testing and maintenance will keep the system in good operating condition.

•*Compromise of Radio Frequency (Wireless) Devices*

Signals may not reach the receiver under all circumstances which could include metal objects placed on or near the radio path or deliberate jamming or other inadvertent radio signal interference.

•*System Users*

A user may not be able to operate a panic or emergency switch possibly due to permanent or temporary physical disability, inability to reach the device in time, or unfamiliarity with the correct operation. It is important that all system users be trained in the correct operation of the alarm system and that they know how to respond when the system indicates an alarm.

•*Automatic Alarm Initiating Devices*

Smoke detectors, heat detectors and other alarm initiating devices that are a part of this system may not properly detect a fire condition or signal the control panel to alert occupants of a fire condition for a number of reasons, such as: the smoke detectors or heat detector may have been improperly installed or positioned; smoke or heat may not be able to reach the alarm initiating device, such as when the fire is in a chimney, walls or roofs, or on the other side

of closed doors; and, smoke and heat detectors may not detect smoke or heat from fires on another level of the residence or building.

•*Software*

Most Mircom products contain software. With respect to those products, Mircom does not warranty that the operation of the software will be uninterrupted or error-free or that the software will meet any other standard of performance, or that the functions or performance of the software will meet the user's requirements. Mircom shall not be liable for any delays, breakdowns, interruptions, loss, destruction, alteration or other problems in the use of a product arising our of, or caused by, the software.

Every fire is different in the amount and rate at which smoke and heat are generated. Smoke detectors cannot sense all types of fires equally well. Smoke detectors may not provide timely warning of fires caused by carelessness or 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.

Even if the smoke detector or heat detector operates as intended, there may be circumstances when there is insufficient warning to allow all occupants to escape in time to avoid injury or death.

•*Alarm Notification Appliances*

Alarm Notification Appliances such as sirens, bells, horns, or strobes may not warn people or waken someone sleeping if there is an intervening wall or door. If notification appliances are located on a different level of the residence or premise, then it is less likely that the occupants will be alerted or awakened. Audible notification appliances may be interfered with by other noise sources such as stereos, radios, televisions, air conditioners or other appliances, or passing traffic. Audible notification appliances, however loud, may not be heard by a hearing-impaired person.

•*Telephone Lines*

If telephone lines are used to transmit alarms, they may be out of service or busy for certain periods of time. Also the telephone lines may be compromised by such things as criminal tampering, local construction, storms or earthquakes.

•*Insufficient Time*

There may be circumstances when the system will operate as intended, yet the occupants will not be protected from the emergency due to their inability to respond to the warnings in a timely manner. If the system is monitored, the response may not occur in time enough to protect the occupants or their belongings.

•*Component Failure*

Although every effort has been made to make this system as reliable as possible, the system may fail to function as intended due to the failure of a component.

•*Inadequate Testing*

Most problems that would prevent an alarm system from operating as intended can be discovered by regular testing and maintenance. The complete system should be tested as required by national standards and the Local Authority Having Jurisdiction and immediately after a fire, storm, earthquake, accident, or any kind of construction activity inside or outside the premises. The testing should include all sensing devices, keypads, consoles, alarm indicating devices and any other operational devices that are part of the system.

•*Security and Insurance*

Regardless of its capabilities, an alarm system is not a substitute for property or life insurance. An alarm system also is not a substitute for property owners, renters, or other occupants to act prudently to prevent or minimize the harmful effects of an emergency situation.

IMPORTANT NOTE: End-users of the system must take care to ensure that the system, batteries, telephone lines, etc. are tested and examined on a regular basis to ensure the minimization of system failure.

Limited Warranty

Mircom Technologies Ltd. together with its subsidiaries and affiliates (collectively, the "Mircom Group of Companies") warrants the original purchaser that for a period of one year from the date of manufacture, the product shall be free of defects in materials and workmanship under normal use. During the warranty period, Mircom shall, at its option, repair or replace any defective product upon return of the product to its factory, at no charge for labor and materials. Any replacement and/or repaired parts are warranted for the remainder of the original warranty or ninety (90) days, whichever is longer. The original owner must promptly notify Mircom in writing that there is defect in material or workmanship, such written notice to be received in all events prior to expiration of the warranty period.

International Warranty

The warranty for international customers is the same as for any customer within Canada and the United States, with the exception that Mircom shall not be responsible for any customs fees, taxes, or VAT that may be due.

Conditions to Void Warranty

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover:

•damage incurred in shipping or handling;

•damage caused by disaster such as fire, flood, wind, earthquake or lightning;

•damage due to causes beyond the control of Mircom such as excessive voltage, mechanical shock or

•water damage;

•damage caused by unauthorized attachment, alterations, modifications or foreign objects;

•damage caused by peripherals (unless such peripherals were supplied by Mircom);

•defects caused by failure to provide a suitable installation environment for the products;

•damage caused by use of the products for purposes other than those for which it was designed;

•damage from improper maintenance;

•damage arising out of any other abuse, mishandling or improper application of the products.

Warranty Procedure

To obtain service under this warranty, please return the item(s) in question to the point of purchase. All authorized distributors and dealers have a warranty program. Anyone returning goods to Mircom must first obtain an authorization number. Mircom will not accept any shipment whatsoever for which prior authorization has not been obtained. NOTE: Unless specific pre-authorization in writing is obtained from Mircom management, no credits will be issued for custom fabricated products or parts or for complete fire alarm system. Mircom will at its sole option, repair or replace parts under warranty. Advance replacements for such items must be purchased.

Note: Mircom's liability for failure to repair the product under this warranty after a reasonable number of attempts will be limited to a replacement of the product, as the exclusive remedy for breach of warranty.

Disclaimer of Warranties

This warranty contains the entire warranty and shall be in lieu of any and all other warranties, whether expressed or implied (including all implied warranties of merchantability or fitness for a particular purpose) And of all other obligations or liabilities on the part of Mircom neither assumes nor authorizes any other person purporting to act on its behalf to modify or to change this warranty, nor to assume for it any other warranty or liability concerning this product.

This disclaimer of warranties and limited warranty are governed by the laws of the province of Ontario, Canada.

Out of Warranty Repairs

Mircom will at its option repair or replace out-of-warranty products which are returned to its factory according to the following conditions. Anyone returning goods to Mircom must first obtain an authorization number. Mircom will not accept any shipment whatsoever for which prior authorization has not been obtained.

Products which Mircom determines to be repairable will be repaired and returned. A set fee which Mircom has predetermined and which may be revised from time to time, will be charged for each unit repaired.

Products which Mircom determines not to be repairable will be replaced by the nearest equivalent product available at that time. The current market price of the replacement product will be charged for each replacement unit.

The foregoing information is accurate as of the date of publishing and is subject to change or revision without prior notice at the sole discretion of the Company

WARNING: Mircom recommends that the entire system be completely tested on a regular basis. However, despite frequent testing, and due to, but not limited to, criminal tampering or electrical disruption, it is possible for this product to fail to perform as expected.

NOTE: Under no circumstances shall Mircom be liable for any special, incidental, or consequential damages based upon breach of warranty, breach of contract, negligence, strict liability, or any other legal theory. Such damages include, but are not limited to, loss of profits, loss of the product or any associated equipment, cost of capital, cost of substitute or replacement equipment, facilities or services, down time, purchaser's time, the claims of third parties, including customers, and injury to property.

MIRCOM MAKES NO WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO ITS GOODS DELIVERED, NOR IS THERE ANY OTHER WARRANTY, EXPRESSED OR IMPLIED, EXCEPT FOR THE WARRANTY CONTAINED HEREIN.