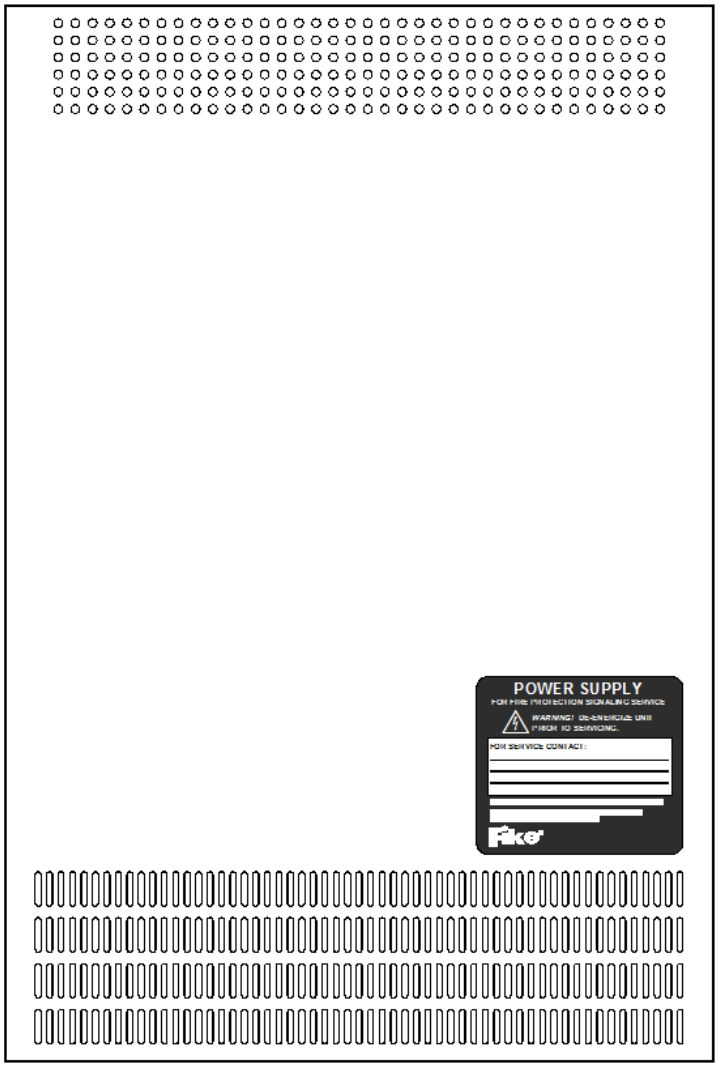
Product Manual

# Remote Power Supply
## (P/N 10-2829)




P/N 06-583, Rev. 3
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# TABLE OF CONTENTS

# LIST OF EXHIBITS

# DOCUMENT HISTORY

Document Title: Remote Power Supply, Product Manual

Document Reorder Number: 06-583

| Revision | Section | Date | Reason for Change |
|---|---|---|---|
| 0 | All Sections | 11/11 | Initial Release |
| 1 | Sections 1.1, 1.3, 1.4, 2.4.4, 5.0, 5.2 | 1/12 | MNS Approvals |
| 2 | Sections 2.4.7, 2.4.7.1, and Appendix B | 6/2012 | UL 2572 Updates |
| 3 | All Sections | 12/2012 | FCC Compliance Updates |

# ABOUT THIS MANUAL

This manual is intended to be a complete reference for the installation, operation, and service of Fike's remote power supply. The information contained in this manual shall be used by factory trained service technicians who are authorized to work on this product. This manual also serves as the Operations Manual for the component.

The first-time installer and/or user should thoroughly read and understand the instructions contained within this manual before using this device. These instructions must be followed to avoid damage to the equipment itself or adverse operating conditions caused by improper installation and programming.

# PRODUCT SUPPORT

If you have a question or encounter a problem not covered in this manual, you should first try to contact the distributor who installed the Fike system. Fike has a worldwide distribution network. Each distributor sells, installs, and services Fike equipment. Look on the back of the cabinet door, there should be a sticker with an indication of the distributor who installed the system. If you can not locate the distributor, please call Fike Customer Service for locating your nearest distributor, or go to our web-site at www.fike.com. If you are unable to contact your installing distributor or you simply do not know who installed the system, you can contact Fike Technical Support at (800) 979-FIKE (3453) for Commercial Products and (888) 628-FIKE (3453) for Fire Alarm Products, Monday through Friday, 8:00 am to 4:30 pm CST.

# SAFETY INFORMATION

Important safety admonishments are used throughout this manual to warn of possible hazards to persons or equipment.

**⚠Caution**

Cautions are used to indicate the presence of a hazard which will or may cause damage to the equipment if safety instructions are not followed or if the hazard is not avoided.

ⓘ**Note:** Provides information on installation, operation, maintenance, performance or general tips that are important but not hazardous to anything or anyone.

# TERMS USED IN THIS MANUAL

**Authority Having Jurisdiction** – The organization, office, or individual responsible for approving equipment, materials, and installation, or a procedure.

**Coded Signal** – A signal pulsed in a prescribed code for each round of transmission.

**Configure** – Panel set-up to properly recognize and supervise a device as the design requires.

**Fire Alarm Control Unit (Panel)** – A system component that receives inputs from automatic and manual fire alarm devices and might supply power to detection devices and to a transponder(s) or off-premises transmitter(s). The control unit might also operate releasing circuits or solenoids, provide transfer of power to the notification appliances, or transfer of condition to relays or devices connected to the control unit. The fire alarm control unit can be a local fire alarm control unit or a master control unit.

**Non-Power limited** – A fire alarm circuit powered by a power source with an output voltage no greater than 600 Volts, nominal.

**Power limited** – A fire alarm circuit in which the power is limited, the circuit supervised, and the circuit durably marked where plainly visible at terminations.

**Selective Silence** – A means of silencing the audible portion of a notification appliance while leaving the visual portion active.

**Synchronization** – A means of coordinating notification appliances so that they operate in unison.

# 1.0 PRODUCT OVERVIEW

The remote power supply (P/N 10-2829) is 10 amp power supply that can be used to extend the signaling capacity of Fike's fire alarm and suppression control systems. The remote power supply can be activated by a dedicated notification appliance circuit (NACs) or optional control modules, or used for standalone applications to supply power to auxiliary devices (i.e., door holders, duct detectors, panel peripheral bus devices, etc.). The remote power supply provides its own AC power connection, battery charging circuit, and battery connections in addition to the following features:

- *Form C Trouble Relay* - General trouble relay that will de-energize for any trouble condition.
- *Output Configurations* - Four power limited circuits that can be configured for notification appliance circuit (NAC) or auxiliary power supply operation. When used for NAC operation, each circuit can be configured as Class B or Class A and is rated for 3 amps maximum output, continuous duty. When used for auxiliary power output, a maximum 1A total can be drawn from all four NACs and the AUX output combined during normal standby and 10 amps @ 120/240 VAC or 8 amps @ 100 VAC during alarm.
- *Input Configurations* - Two electrically isolated control inputs that provide signal connection from the host control panel or control module. The inputs are triggered by the activation of a dedicated NAC (reverse polarity) or by a 12 or 24 VDC power source. When the control input circuit activates, the remote power supply will activate or deactivate its notification appliance circuits.
- *Auxiliary Output* - Dedicated, power limited, non-resettable (always on), auxiliary power output, rated for 1A maximum.
- *Ground Fault Detection* - Circuit board monitors for ground faults between the system power or system ground. If detected, the trouble relay de-energizes.
- *Synchronization* - Provides two configuration options that allow the remote power supply to be setup as a Generator or Follower for notification appliance synchronization. In the Generator mode, the remote power supply is capable of generating a sync pulse for System Sensor, Gentex, or Wheelock appliances, based on DIP-switch selection. In the follower mode, the remote power supply will follow the signal (continuous or modulated) provided by the host control panel or control module through the control inputs. Synchronization is isolated to the individual remote power supply.
- *Enclosure* - The remote power supply enclosure is made of 18 gauge steel and is available with a red finish. The enclosure is equipped with a hinged (left side only) outer door equipped with a key lock. The enclosure provides a mounting location for the circuit board, four addressable modules and up to two 12 AH batteries.

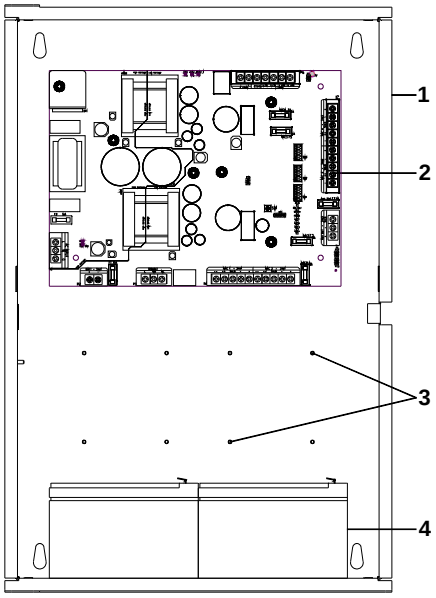
## 1.1 AGENCY STANDARDS AND COMPLIANCE

When installed in accordance with the following standards, the remote power supply can be connected to any of the notification appliances listed in Fike document 06-186, "Device Compatibility Document".

**NFPA 70** - NEC, Article 300 Wiring Methods
**NFPA 70** - NEC, Article 760 Fire Protective Signaling Systems
**NFPA 72** - National Fire Alarm Code
**UL 864** - Control Units and Accessories for Fire Alarm Systems
**UL 2572** - Mass Notification Systems
**FCC Compliance**- This equipment has been tested and found to comply with the limits for class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions contained in this manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case, the user will be required to correct the interference at his own expense.

## 1.2 REMOTE POWER SUPPLY COMPONENTS

Exhibit 1 illustrates the components that make up the remote power supply.




| Component | Description |
|---|---|
| 1* | Enclosure; Houses the remote power supply circuit board, two control modules, and two standby batteries (max. 12 AH). |
| 2* | Remote power supply circuit board; Provides connections for all circuits. See section 1.3 for details. |
| 3 | Mounting studs for up to four optional addressable modules:<br>• Monitor Module (P/N 55-041/55-046)<br>• Control Module (P/N 55-042/55-047)<br>• Relay Module (P/N 55-043/55-048) |
| 4* | Batteries (sold seperately); Enclosure is capable of holding up to two 12 AH batteries. Use external battery enclosure for larger batteries. |

*Indicates required component.

**Exhibit 1: Remote Power Supply Components**

### 1.2.1 PARTS LIST

The following components can be ordered separately for replacement purposes.

| Part Number | Description |
|---|---|
| 10-2767 | Remote Power Supply, circuit board |
| 02-13527 | Circuit board, mounting hardware |
| 10-2782 | Remote Power Supply enclosure |
| 02-13061 | 10 A Glass Tube Fuse, AC Input (F2)[1]<br>Mfg. P/N Littlefuse 0477010.MXP |
| 02-4174 | 15 A Fast Mini Auto Fuse, Battery Input (F1) |
| 02-13081 | 4 A Glass Tube Fuse, NAC Outputs (F3 – F6) |
| 02-13542 | 1 A Glass Tube Fuse, AUX Output (F7) |
| 02-12392 | Addressable Module, mounting hardware |
| 02-4622 | Battery, 12 AH (2 required) |
| 02-2820 | Battery, 18 AH (2 required)[2] |
| 02-3468 | Battery, 33 AH (2 required)[2] |
| 10-2154 | Battery Enclosure, 33 AH |
| 02-1973 | NAC Circuit EOL, 1K Ω |
| 02-13951 | Ferrite Bead |
| 02-13950 | AC Line Filter |

**Exhibit 2: Parts List**

[1] Must be ordered from Fike or replaced with mfg. part number called out above.
[2] Batteries larger than 12 AH must be housed in separate battery enclosure.

## 1.3 TERMINAL DESCRIPTIONS AND RATINGS

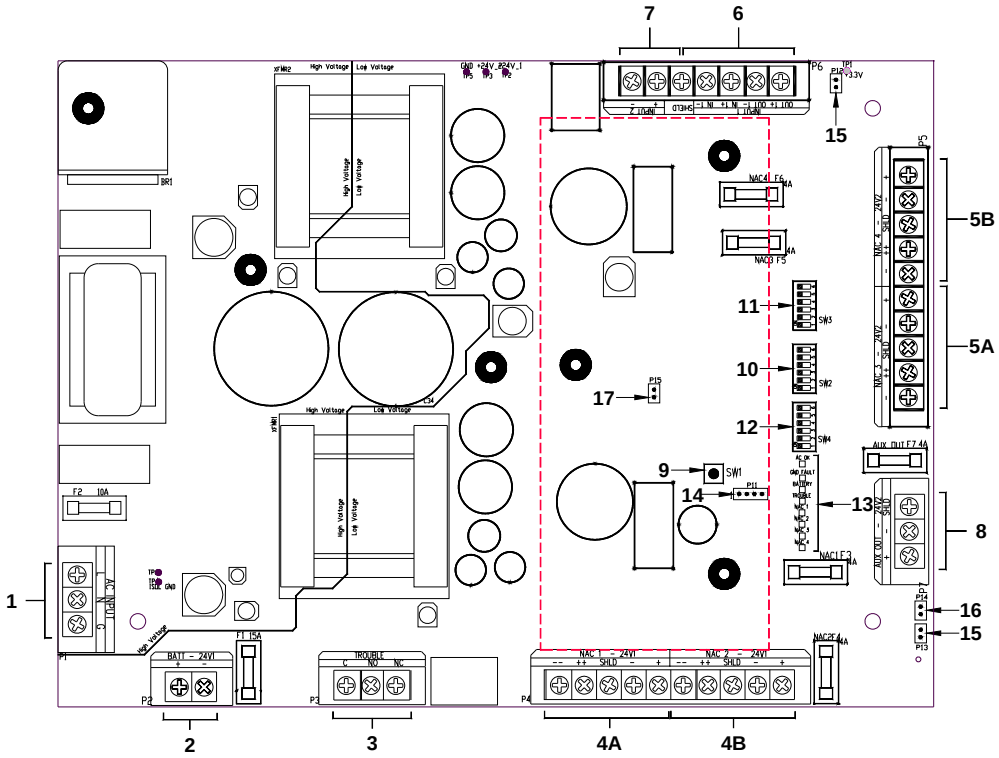



**Exhibit 3: Circuit Board Layout**

### 1. AC Input (P1)

- AC Line Voltage Input (Line/Neutral/Ground)
- AC input must originate from a dedicated circuit at the main building power distribution center. The circuit breaker shall be equipped with a lockout mechanism and be clearly labeled as a "Fire Protection Control Circuit".
- Variable Voltage Standby: 110 mA @ 100 VAC, 60 Hz, 8 A maximum output / 110 mA @ 120 VAC, 60 Hz, 10 A maximum output / 160 mA @ 240 VAC, 50 Hz, 10 A maximum output / 190 mA @ 240 VAC, 60 Hz, 10 A maximum output
- Variable Voltage Alarm: 4.7 A @ 100 VAC, 60 Hz, 8 A maximum output / 5 A @ 120 VAC, 60 Hz, 10 A maximum output / 2.65 A @ 240 VAC, 50/60 Hz, 10 A maximum output
- Fused by F2, 10 A replaceable (P/N 02-13061)
- Supervised and non-power limited circuit, requires AC filter per FCC requirement[4]

### 2. Battery Input (P2)

- Standby battery connection (+/-), sealed lead acid batteries only
- Charging capacity: 35 AH maximum
- Voltage: 24 VDC nominal
- Supervised and non-power limited circuit, requires ferrite bead per FCC requirement[4]
- Fused by F1, 15 A replaceable (P/N 02-4174)
- Maximum 12 AH housed in enclosure
- Circuit board current draw: 35 mA standby/141 mA alarm (used for battery calculations)
- Power supply will turn off if battery voltage falls < 18.4 V

### 3. Trouble Relay (P3)

- Style: Form C, SPDT, normally energized (C/NO/NC), contacts shown with power applied and no troubles
- Common system operation, configurable for AC trouble delay (2 hour) via dip-switch
- Contact rating (DC Operation): DC Operation: 2 A @ 30 VDC (pf=.35)
- Contact rating (AC Operation): AC Operation: 0.5 A @ 120 VAC (pf=.35)
- Non-supervised circuit, requires ferrite bead per FCC requirement[4]
- May be connected to power limited or non-power limited sources, not both.

### 4. NAC 1 and NAC 2 (P4)
- Configurable for NAC, Aux power or door holder circuit (--/++/shld/-/+)
- Wiring Configuration: Class B or Class A
- NAC Voltage: 24 VDC regulated
- AUX Output Voltage: 18.6 – 28.5 VDC
- Output Current: 3 amps maximum per circuit, continuous duty [1]
- End-of-line resistor: 1.0 kΩ NAC EOL (P/N 02-1973)
- Fused by F3 & F4, 4 A replaceable (P/N 02-13081)
- Supervised and power limited circuit, requires ferrite bead per FCC requirements[4]

### 5. NAC 3 and NAC 4 (P5)
- Configurable for NAC, Aux power or door holder circuit (--/++/shld/-/+)
- Wiring Configuration: Class B or Class A
- NAC Voltage: 24 VDC regulated
- AUX Output Voltage: 18.6 – 28.5 VDC
- Output Current: 3 amps maximum output, continuous duty [2]
- End-of-line resistor: 1.0 kΩ NAC EOL (P/N 02-1973)
- Fused by F5 & F6, 4 A replaceable (P/N 02-13081)
- Supervised and power limited circuit, requires ferrite bead per FCC requirements[4]

### 6. Input 1 (P6)
- Control Input (Out 1+/Out 1-/In 1+/In 1-)
- Electrically isolated circuit, requires ferrite bead per FCC requirements[4]
- Input Voltage: 12 - 30 VDC (FWR and unfiltered DC)
- Input Current: 2 mA
- Configurable for selective silence

### 7. Input 2 (P6)
- Control Input (+/-)
- Electrically isolated circuit, requires ferrite bead per FCC requirements[4]
- Input Voltage: 12 - 30 VDC (FWR and unfiltered DC)
- Input Current: 2 mA
- Configurable for selective silence

### 8. Aux Out (P7)
- Auxiliary Power Output (+/-/shld), dedicated and non-resettable
- Output Voltage: 18.6 – 28.5 VDC output voltage
- Output Current: 1 A maximum output, continuous duty [2]
- Fused by F7, 1 A replaceable (P/N 02-13542)
- Non-supervised and power limited circuit, requires ferrite bead per FCC requirements[4]
- No EOL required

### 9. SW1 – Reset Switch

### 10. SW2 – Configuration dip-switches (Output 1 and 2)
- See Section 3.0 for configuration Options.

### 11. SW3 – Configuration dip-switches (General Operation)
- See Section 3.0 for configuration Options.

### 12. SW4 – Configuration dip-switches (Output 3 and 4)
- See Section 3.0 for configuration Options.

### 13. Diagnostic LEDs
- See Section 1.4 for description of diagnostic LEDs.

### 14. Programming Header (factory use only)

### 15. Ground Fault Jumpers (P12 – P13)
- See Section 4.0 for description of ground fault operation.

### 16. Piezo Enable/Disable Jumper (P14)

### 17. AC Power Input Jumper (P15)
- See Section 4.3 for description of jumper operation.

[1] The total current that can be supplied by NAC 1 & 2 combined is limited by the AC voltage supplied to the power supply (terminal P1): 4 A maximum output @ 100 VAC or 5 A @ 120/240 VAC.
[2] The total current that can be supplied by NAC 3, 4 and AUX OUT combined is limited by the AC voltage supplied to the power supply (terminal P1): 4 A maximum output @ 100 VAC or 5 A @ 120/240 VAC.
[3] All terminal blocks accept 14 – 22 AWG (unless noted otherwise).
[4] Ferrite bead must be installed if circuit leaves the RPS enclosure.

## 1.4 LED INDICATORS

The remote power supply has eight (8) LED indicators that provide positive indication of the units operation.

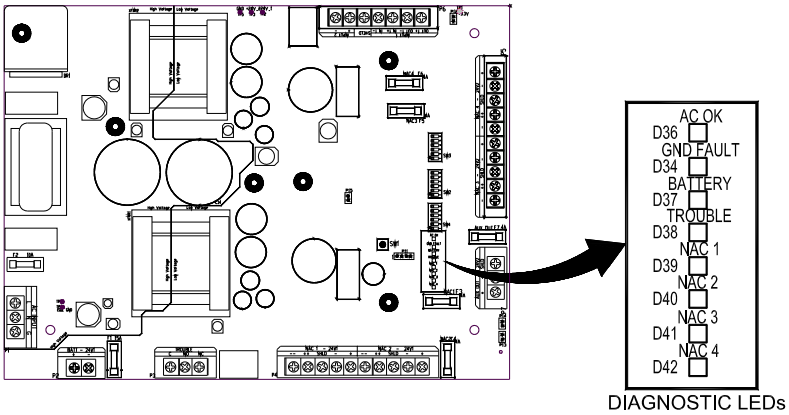



**Exhibit 4: Diagnostic LED Locations**

| LED | Label | Function | Color |
|---|---|---|---|
| D36 | AC OK | • On = AC power present<br>• Off = AC power loss<br>• Flash (fast) = Power section 24V1 failure, AC still present<br>• Flash (slow) = Power section 24V2 failure, AC still present | Green |
| D34 | GND FAULT | • On = Ground fault has been detected on the field wiring | Yellow |
| D37 | BATTERY | • On = Battery voltage between 18.4 and 19.4; clears at 22 volts<br>• Flash (fast) = Battery voltage below 18.4 V or missing<br>• Flash (slow) = Battery charger fault | Yellow |
| D38 | TROUBLE | • On = General trouble<br>• Flash (slow) = P7 aux power trouble | Yellow |
| D39 | NAC 1 | • On = Short circuit<br>• Flash (slow) = Circuit open<br>• Flash (fast) = Auxiliary fault or fuse missing | Yellow |
| D40 | NAC 2 | • On = Short circuit<br>• Flash (slow) = Circuit open<br>• Flash (fast) = Auxiliary fault or fuse missing | Yellow |
| D41 | NAC 3 | • On = Short circuit<br>• Flash (slow) = Circuit open<br>• Flash (fast) = Auxiliary fault or fuse missing | Yellow |
| D42 | NAC 4 | • On = Short circuit<br>• Flash (slow) = Circuit open<br>• Flash (fast) = Auxiliary fault or fuse missing | Yellow |

**Exhibit 5: Diagnostic LED Functions**

**CRITICAL NOTE:** All eight diagnostic LEDs will flash (very fast) if the remote power supply has been configured incorrectly. Check the DIP-switch settings for improper combinations.

The circuit board is equipped with an integral piezo (buzzer) that will activate upon any of the conditions listed above. The piezo can be silenced by correcting the condition causing the fault; then pressing the reset switch (SW1).

# 2.0 INSTALLATION

The following installation instructions are to be used by the field technician to install the remote power supply. The instructions must be strictly adhered to in order to prevent potential damage to the remote power supply and/or the associated control equipment. Refer to Fike document 06-604, "Remote Power Supply Enclosure Installation Instructions" for enclosure installation instructions.

**⚠Caution**

The remote power supply contains static sensitive components. Utilize proper anti-static safety procedures when handling electronic components. Use anti-static packaging to protect electronic assemblies removed from the unit.

**⚠Caution**

Never remove or install boards, internal cables or components with power (AC or DC) applied. Failure to follow the instructions provided in this section can result in irreparable damage to the system components. This damage may adversely affect the operation of the control unit but its effect may not be readily apparent.

## 2.1 INSTALL FIELD WIRING

Unless otherwise detailed in this manual or in other documents relating to this module, the designer, installation and service technician shall utilize published standards and references such as: NFPA 70 National Electrical Code; NFPA 72 National Fire Alarm Code; and other standards which may be relevant to the Local Authority Having Jurisdiction (AHJ) for field wiring installation requirements.

**Note:** Do NOT install the circuit board until after wire has been pulled into the enclosure to prevent potential damage to the circuit board.

### 2.1.1 FCC COMPLIANCE

A ferrite bead (P/N 02-13951) must be installed on all circuits (excluding AC power) that leave the remote power supply enclosure in order to comply with FCC requirements. The ferrite bead must be installed inside the RPS enclosure or externally mounted in junction box located within 8 inches (20.3 cm) of the RPS enclosure. Each wire must pass through the ferrite bead twice as illustrated below.

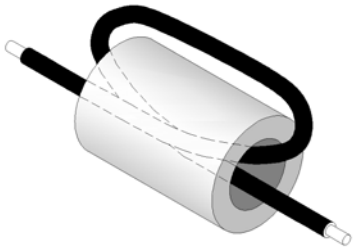


**Exhibit 6 Ferrite Bead Installation**

An AC line filter must be installed on the AC Power Input prior to connection to the RPS circuit board. Refer to Section 2.5 for wiring diagrams.

## 2.1.2 WIRE ROUTING

Pull field wiring into back-box leaving sufficient wire to make connections to the circuit board terminals without straining board components. Power limited and non-power limited wiring within the enclosure must be separated by a minimum of ¼" (6 mm) or type FPL, FPLR, or FPLP cable must be used per NEC. All power limited and non-power limited cable must enter the enclosure through different conduits. Non-power limited wiring must be enclosed in conduit. Wiring within the cabinet should be routed around the perimeter of the enclosure. Do NOT route wire across the printed circuit board.

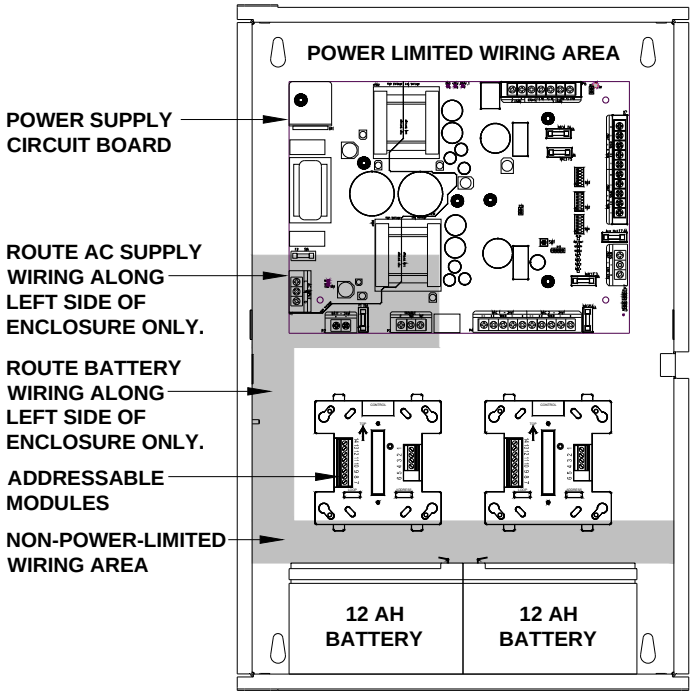



**Exhibit 7: Power limited versus Non-Power limited Wire Segregation**

Non-power limited wiring connections to the remote power supply circuit board include P1 AC power input and P2 Battery input. P3 trouble relay may be connected to power limited or non-power limited sources, not both. All other circuit board and module connections are power limited.

## 2.2 INSTALL CIRCUIT BOARD

The remote power supply circuit board is NOT installed in the enclosure prior to shipment and must be field installed. Utilize proper anti-static procedures when handling electronic components.

To install the circuit board:

1. Thoroughly clean the enclosure removing all debris and dust prior to installing the circuit board.
2. Remove the hardware kit (P/N 02-13527) supplied with the remote power supply and install the five (5) standoffs onto the threaded press studs supplied in the enclosure back-box. Install the single Nylon standoff on the upper left press stud.
3. Remove the circuit board from its anti-static packaging and check for signs of shipping damage.
4. Install the circuit board onto the standoffs and secure in place with the five hex-nuts supplied. Do not over-tighten hex-nuts or damage to the circuit board could occur.

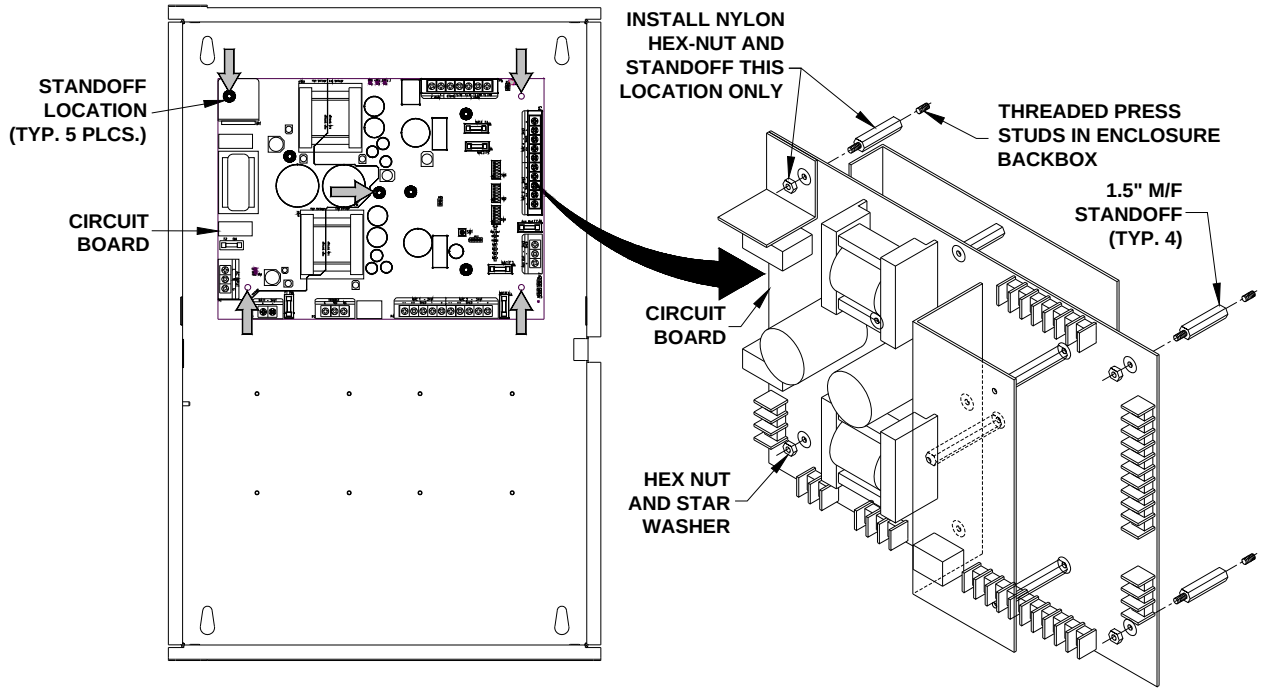



**Exhibit 8: Circuit Board Mounting**

## 2.3 INSTALL OPTIONAL ADDRESSABLE MODULE(S)

The remote power supply enclosure allows mounting of up to four (4) optional addressable modules (i.e., control, relay or monitor) within the enclosure.

To install the module(s):

1. Remove the mounting hardware supplied with the remote power supply and install the four (4) standoffs onto the threaded press studs supplied in the enclosure back-box.
2. Remove the module from its anti-static packaging and check for signs of shipping damage.
3. Install the module onto the standoffs and secure in place with the four hex-nuts supplied.

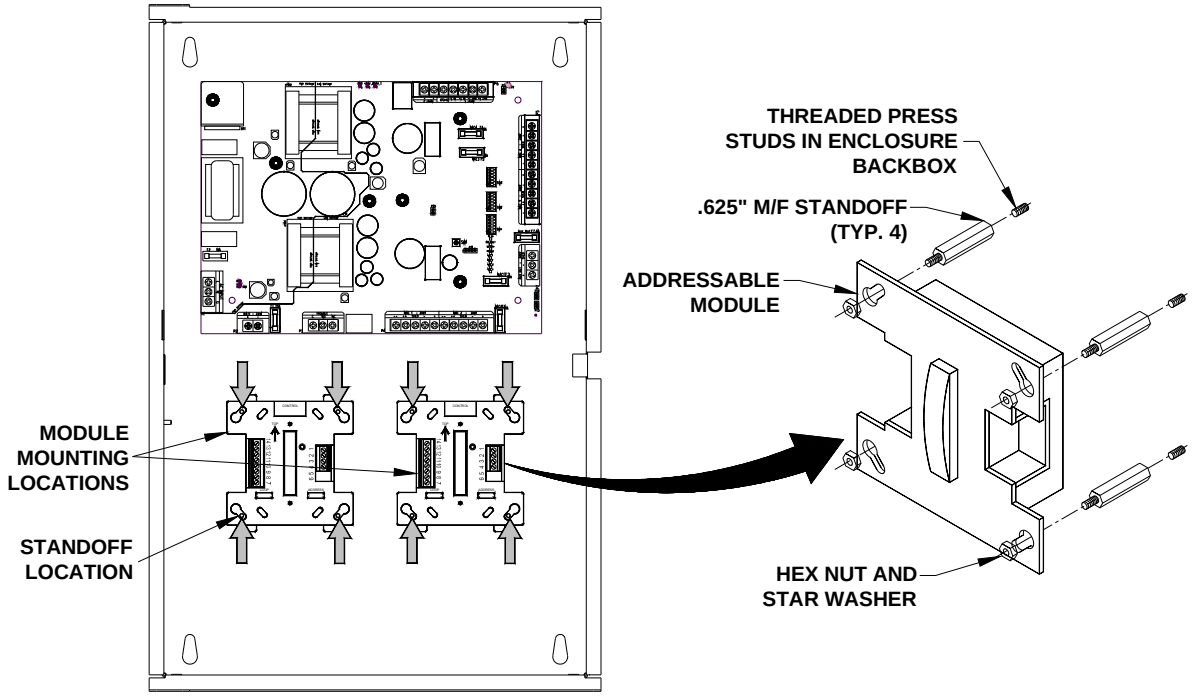



**Exhibit 9: Addressable Module Mounting**

If more than two (2) addressable modules need to be installed within the enclosure, replace the hex nut(s) used to secure the first two modules with another standoff. This allows an additional module to be stacked on top of the first. Secure top module in place with the hex-nuts.

**Note:** If stacking modules on top of another, you will need to address the devices prior to installing them into the enclosure.

## 2.4 INSTALL AC LINE FILTER

The AC line filter (P/N 02-13950) must be installed on all systems for FCC compliance. Threaded press studs are provided in the enclosure back-box for installation of the filter.

To install the filter:

1. Remove the AC filter from its packaging and install it on the mounting studs provided in the enclosure back-box as shown in Exhibit 10 below. Filter mounting orientation must match that shown in Exhibit 10 below.
2. Secure the filter in place with the two hex-nuts supplied.

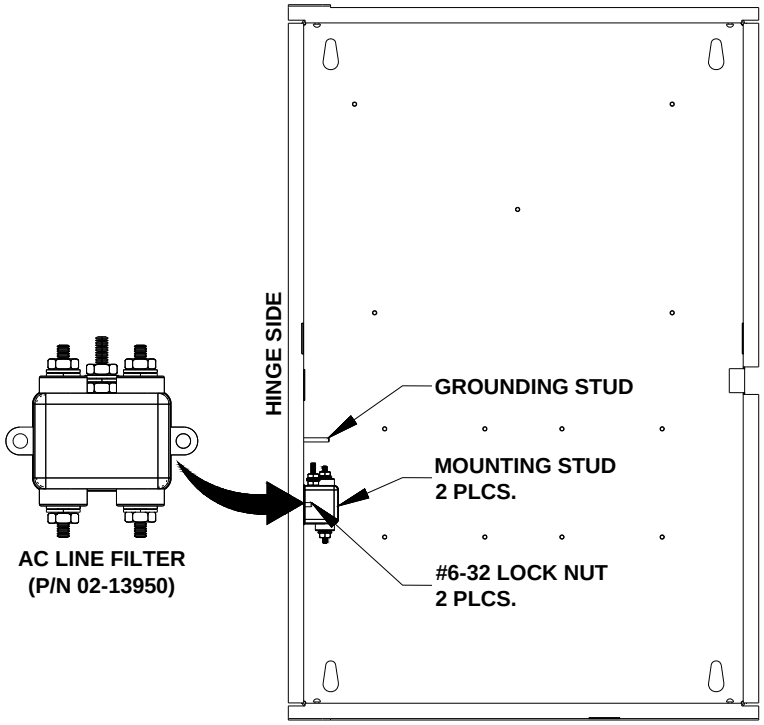



**Exhibit 10: AC Filter Mounting**

## 2.5 CONNECTING FIELD WIRING

The remote power supply is equipped with screw terminals that are capable of accepting 14 - 22 AWG wire. Break wire at each terminal connection to provide proper connection supervision. Do not loop wires under terminals. If using stranded wire, it is recommended that wire ends be tinned or spade connectors installed.

### 2.5.1 TEST FIELD WIRING

Utilize the following procedures to test all field wiring prior to connecting to remote power supply terminals.

- **Ground fault test:** Short one leg of the circuit to chassis ground. The ground fault LED on the remote power supply must light. If the ground fault detection on the remote power supply has been disabled, verify that the host control panel detects the ground fault condition.
- **NAC open circuit test:** Disconnect the EOL resistor from the last device on the circuit. The NAC trouble LED must light.
- **NAC short circuit test:** Place a short across each circuit. The individual NAC LED must light.

## 2.5.2 GROUND WIRING

The remote power supply enclosure is shipped with several prefabricated wire assemblies and necessary mounting hardware. Install the wires as shown in exhibit below making sure that AC Earth Ground is connected first to the back box grounding stud to ensure proper enclosure grounding.

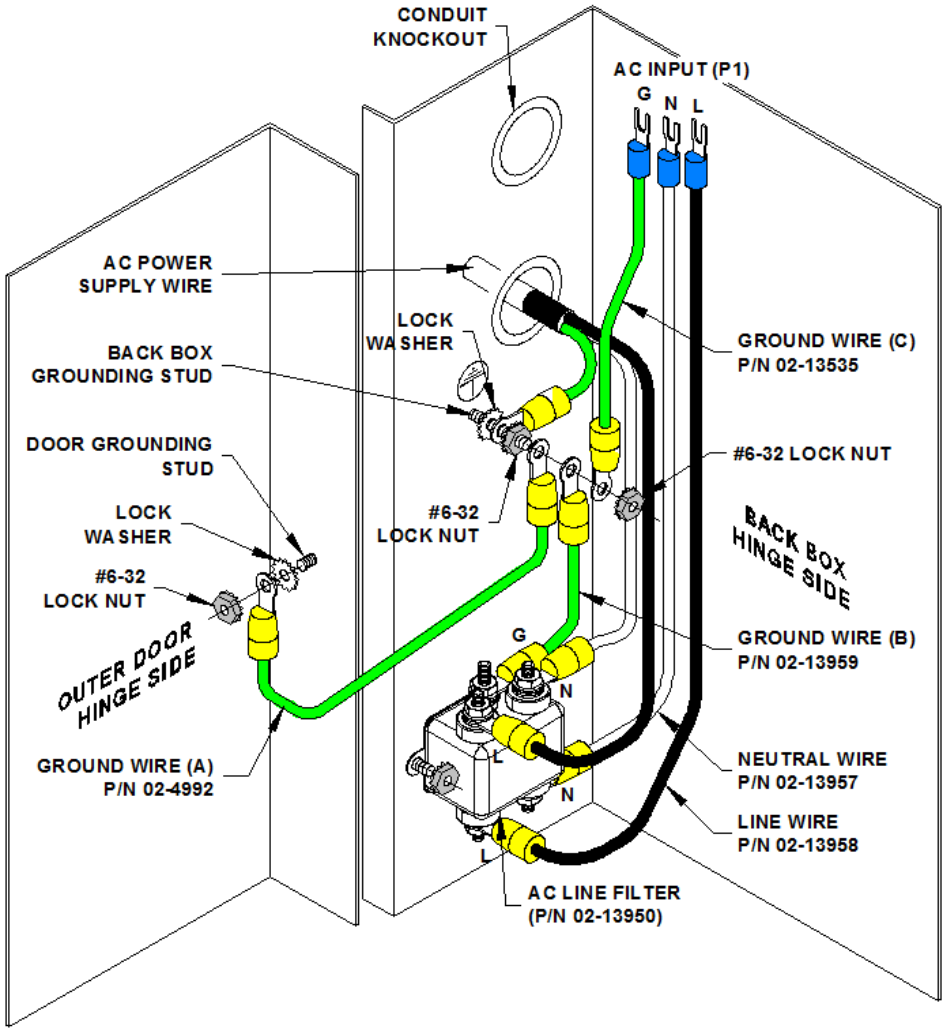



**Exhibit 11: Ground Wire Connection**

## 2.5.3 AC POWER WIRING (P1)

Terminal block P1 provides the connection point for the AC input to the remote power supply. AC power shall be supplied from a dedicated branch circuit from the buildings commercial light and power source. The circuit shall be equipped with a disconnecting means and shall be clearly identified with red marking as “FIRE ALARM CIRCUIT”. The disconnecting means shall be accessible to authorized personnel only and shall be protected against physical damage.

**⚠Caution**

Verify that AC power feed to the remote power supply is shut off before landing power wiring to the circuit board.

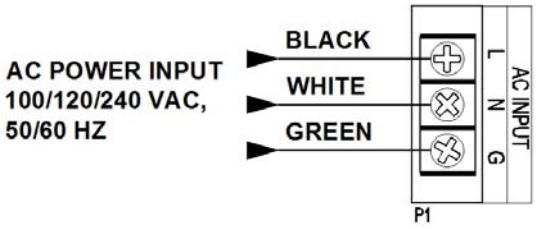



**Exhibit 12: AC Power Connection**

## 2.5.4 BATTERY WIRING (P2)

Terminal block P2 provides the connection point for two 12 VDC sealed lead acid backup batteries. The remote power supply is capable of charging up to two 35 AH batteries; however, batteries larger than 12 AH will not fit into the remote power supply enclosure and must be installed in a separate battery enclosure.

To connect the batteries:

1. Route battery wires through the ferrite bead. Refer to Section 2.1.1 for ferrite bead installation.
2. Connect the black wire to the negative (-) side of the first battery.
3. Connect the red wire to the positive (+) side of the second battery.
4. A jumper wire is provided to facilitate connection from the positive (+) side of the first battery to the negative (-) side of the second battery.

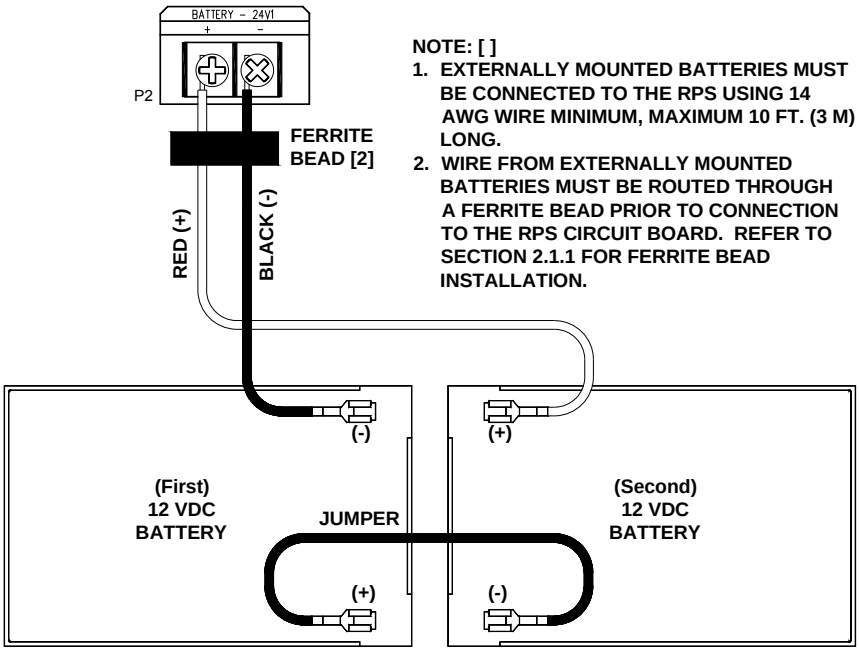



**Exhibit 13: Battery Connection**

ⓘ **Note:** Batteries should be replaced every three years. Refer to local and national codes for battery maintenance requirements. Power supply must be reset by pressing switch SW1 after changing batteries.

## 2.5.5 FAIL-SAFE TROUBLE RELAY (P3)

Terminal block P3 provides a fail-safe, Form C, common trouble relay. Operation of the relay contacts is dependent upon the setting of DIP-switch SW3-2. See Section 3.3 for DIP-switch settings. The relay contacts can be monitored directly by the host control panel or by an addressable monitor module connected to the control panels signaling line circuit.

The trouble relay is normally energized and will deactivate under any of the following trouble conditions causing a trouble condition on the fire alarm control panel:

- AC power failure
- Battery failure
- Battery charger failure
- 24 V power trouble
- Auxiliary power failure
- Field wiring fault (open or short) on the NAC output(s)
- Ground fault detected on the remote power supply or field wiring

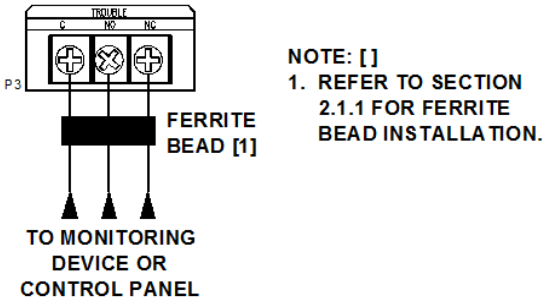



**Exhibit 14: Fail-Safe Trouble Relay Connection**

ⓘ **Note:** Relay contacts are shown in the normally energized state.

## 2.5.6 NAC OUTPUT WIRING (P4 AND P5)

Terminal blocks P4 and P5 provide four NAC outputs that can be configured as notification appliance or auxiliary power supply circuits. The operation of these circuits is controlled by the setting of DIP-switches SW2 and SW4. See Section 3.1 for DIP-switch settings.

### 2.5.6.1 NAC OPERATION

When configured for NAC operation, each output circuit can be assigned to operate independently upon activation of either Input 1 or 2. Each circuit is capable of supplying 24 VDC to its output terminals (+ / -). See Section 1.3 for circuit specifications.

Exhibit 15 shows the circuit wired as a Class B NAC with the EOL installed at the last device.

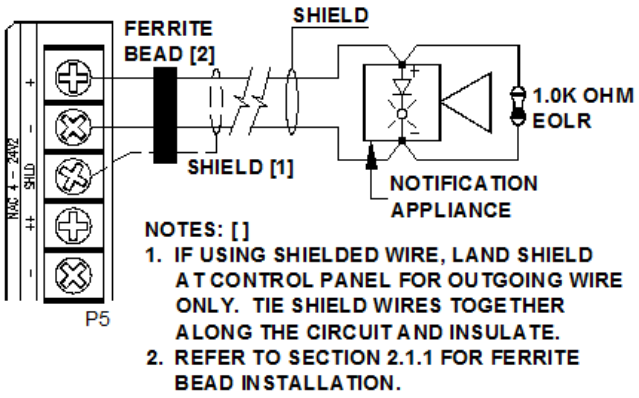



**Exhibit 15: Typical Class B NAC Connection**

Exhibit 16 shows the circuit wired as a Class A NAC with the EOL is installed at the corresponding Class A wiring terminals (--/++) on the remote power supply.

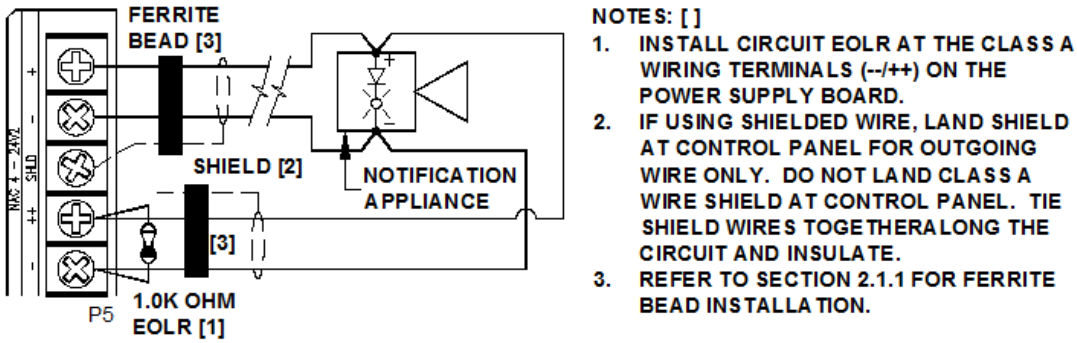



**Exhibit 16: Typical Class A NAC Connection**

### 2.5.6.2 AUXILIARY POWER

Each of the four NAC circuits can be configured as an auxiliary power circuit capable of supplying continuous, non-resettable, 24 VDC power to its output terminals (+ / -) upon power up. See Section 1.3 for circuit specifications.

ⓘ **Note:** When the NAC circuits are configured as AUX circuits, a UL listed EOL relay (P/N 02-4981) must be installed for supervision of the circuit.

## 2.5.7 CONTROL INPUT WIRING (P6)

Terminal P6 provides two input circuits that are used to control the operation of the remote power supply's four output circuits. The inputs circuits must be connected to a ***dedicated*** 12 or 24 VDC control input. If using a notification appliance circuit (NAC) to activate the power supply, no NAC devices may be connected to the circuit upstream or downstream of the power supply (dedicated control circuit). If using a single input circuit to control the power supply, it must be connected to Input 1.

Each of the four available output circuits can be assigned to operate independently upon activation of either Input 1 or 2. The functionality of the inputs is controlled by the power supplies DIP-switch settings. See Section 3.0 for DIP-switch setting details.

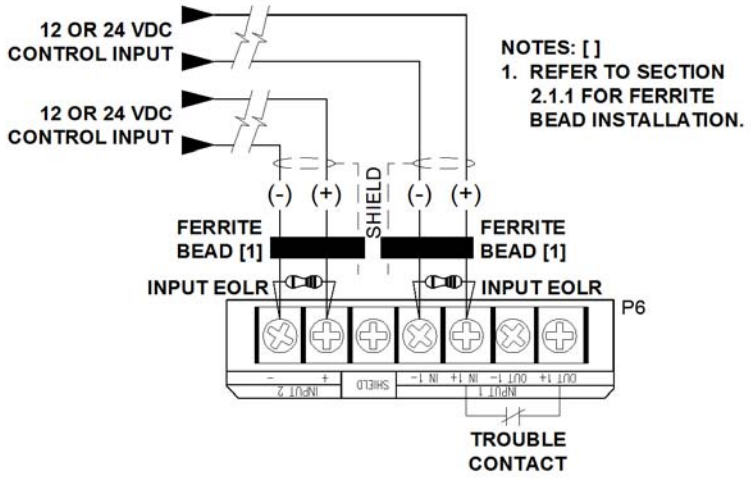



**Exhibit 17: Control Inputs Connected to a Single Power Supply**

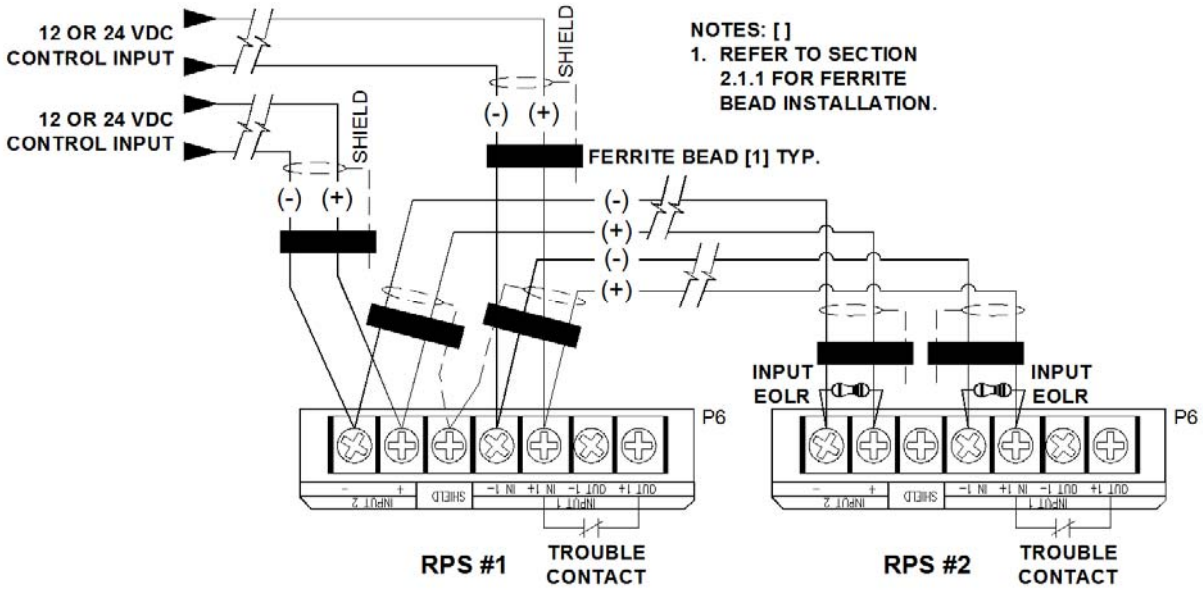



**Exhibit 18: Control Inputs Connected to Multiple Power Supplies**

ⓘ **Note:** Loss of the input signal will cause the remote power supplies four NAC circuits to turn off.

ⓘ **Note:** Voltage drop calculations must be performed on the control input circuit to verify that the voltage supplied at the input terminals on the last RPS does not drop below its minimum operating voltage.

### 2.5.7.1 INTERNAL TROUBLE CONTACT

Terminal block P6 provides an internal trouble contact between IN 1+ and OUT 1+ that can be used by the connected FACP or control module to supervise the power supply for internal troubles. This connection is meant to be used when there is not a means to monitor the power supply's dedicated P3 trouble relay. By installing the circuit's end-of-line resistor (EOLR) across the OUT terminals of Input 1, a trouble condition will be indicated on the circuit once the power supply's trouble contact opens and disconnects the EOLR from the circuit.

Any of the following conditions will cause the trouble contact to open, provided the input circuit is not active. If trouble monitoring is required when the power supply is in Alarm, the P3 trouble relay must be used:

- AC Trouble (AC loss, 24 V1, 24 V2)
- Auxiliary output Trouble
- Ground fault condition on the remote power supply
- Battery Trouble
- Battery charger Trouble
- A field wiring fault (open or short) on the NAC outputs of the remote power supply

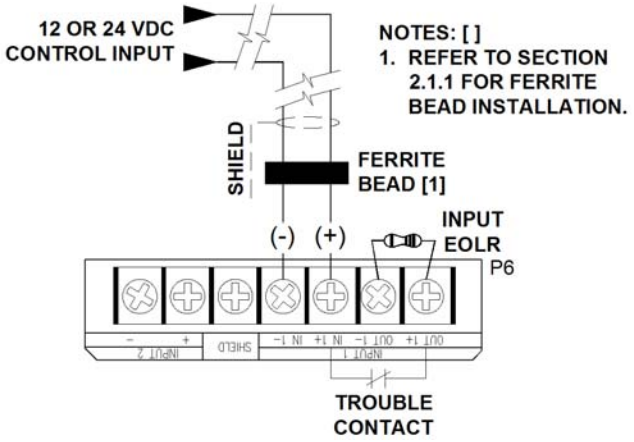



**Exhibit 19: Internal Trouble Contact Wiring**

ⓘ **Note:** Input 2 cannot be used to supervise the remote power supply for internal troubles, but an EOL resistor from the host control panel or control module is still required for wiring supervision.

### 2.5.8 DEDICATED AUXILIARY POWER (P7)

The remote power supply provides a single, dedicated auxiliary power circuit capable of providing continuous, non-resettable power (24 VDC at 1A) to field devices. A common application for this circuit would be to supply operating power to the optional addressable modules installed within the remote power supply enclosure.

ⓘ **Note:** If the device being powered is not capable of monitoring the power connection, a UL listed EOL relay (P/N 02-4981) must be installed for supervision of the circuit.

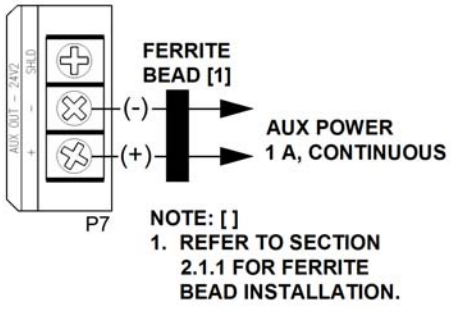



**Exhibit 20: AUX Power Connection**

# 3.0 DIP-SWITCH SETTINGS

Three (3), six-position DIP-switches are used to configure the remote power supply. See Exhibit 3 for location of DIP-switches. The information provided in this section shows the DIP-switch settings for the various input and output configurations. *Factory default setting for each DIP-switch is shown in bold.*

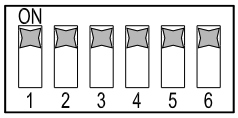



**Exhibit 21: Typical DIP-Switch (SW2, SW3 & SW4)**

**⚠CAUTION**

After any changes to the DIP-switch configuration, switch SW1 must be pressed to reset the power supply and accept DIP-switch configuration changes.

## 3.1 NAC CIRCUIT OPERATION (SW2 AND SW4)

DIP-switches SW2 and SW4 controls the functionality of the power supplies four NAC circuits. All DIP-switches are set to ON by default, which turns all outputs circuits off. The power supplies diagnostic LEDs will all flash (very fast) upon initial power up to indicate this condition.

The four circuits can be configured for 24V power supply, NAC or door holder operation by setting the DIP-switches as shown in the following tables. In all operating modes, the power supply will turn off if the battery supply voltage drops below 18.4 volts.

| SW2-4 | SW2-5 | SW2-6 | Operating Mode |
|---|---|---|---|
| **ON** | **ON** | **ON** | Circuit Off (Not Used) |
| OFF | OFF | OFF | 24 V Power Supply |
| ON | OFF | OFF | 24 V NAC, IN 1, continuous |
| OFF | ON | OFF | 24 V NAC, IN 1, protocol |
| ON | ON | OFF | 24 V NAC, IN 2, continuous |
| OFF | OFF | ON | 24 V NAC, IN 2, protocol |
| ON | OFF | ON | 24 V Door Holder, 30s shutdown |
| OFF | ON | ON | 24 V Door Holder |

**Exhibit 22: DIP-switch SW2, NAC Circuit 1 Operation**

| SW2-1 | SW2-2 | SW2-3 | Operating Mode |
|---|---|---|---|
| **ON** | **ON** | **ON** | Circuit Off (Not Used) |
| OFF | OFF | OFF | 24 V Power Supply |
| ON | OFF | OFF | 24 V NAC, IN 1, continuous |
| OFF | ON | OFF | 24 V NAC, IN 1, protocol |
| ON | ON | OFF | 24 V NAC, IN 2, continuous |
| OFF | OFF | ON | 24 V NAC, IN 2, protocol |
| ON | OFF | ON | 24 V Door Holder, 30s shutdown |
| OFF | ON | ON | 24 V Door Holder |

**Exhibit 23: DIP-switch SW2, NAC Circuit 2 Operation**

| SW4-4 | SW4-5 | SW4-6 | Operating Mode |
|---|---|---|---|
| **ON** | **ON** | **ON** | Circuit Off (Not Used) |
| OFF | OFF | OFF | 24 V Power Supply |
| ON | OFF | OFF | 24 V NAC, IN 1, continuous |
| OFF | ON | OFF | 24 V NAC, IN 1, protocol |
| ON | ON | OFF | 24 V NAC, IN 2, continuous |
| OFF | OFF | ON | 24 V NAC, IN 2, protocol |
| ON | OFF | ON | 24 V Door Holder, 30s shutdown |
| OFF | ON | ON | 24 V Door Holder |

**Exhibit 24: DIP-switch SW4, NAC Circuit 3 Operation**

| SW4-1 | SW4-2 | SW4-3 | Operating Mode |
|---|---|---|---|
| **ON** | **ON** | **ON** | Circuit Off (Not Used) |
| OFF | OFF | OFF | 24 V Power Supply |
| ON | OFF | OFF | 24 V NAC, IN 1, continuous |
| OFF | ON | OFF | 24 V NAC, IN 1, protocol |
| ON | ON | OFF | 24 V NAC, IN 2, continuous |
| OFF | OFF | ON | 24 V NAC, IN 2, protocol |
| ON | OFF | ON | 24 V Door Holder, 30s shutdown |
| OFF | ON | ON | 24 V Door Holder |

**Exhibit 25: DIP-switch SW4, NAC Circuit 4 Operation**

ⓘ **CRITICAL NOTE:** If using the same input circuit to activate both door holders and notification appliances, the power supply must be configured for generator mode and the NAC circuits must be configured for protocol operation. If follower mode is selected, all diagnostic LEDs will flash (very fast) to indicate improper configuration.

### 3.1.1 NAC OPERATING MODE DESCRIPTIONS

- **Circuit Off** - In this mode, the circuit is off and will not activate under any condition.
- **24 V Power Supply** - In this mode, the circuit turns on during power up supplying continuous 24 VDC output to connected devices. Maximum 1A current draw for all five outputs (NACs and AUX) during normal standby and 10 amps @ 120/240 VAC or 8 amps @ 100 VAC during alarm.
- **24 V NAC, Continuous**
  - Generator mode - the NACs turn on upon activation of the selected input circuit (IN 1 or 2). The circuit will provide a continuous 24 VDC output to connected devices. No Sync or selective silence functions available.
  - Follower mode - the NACs turn on upon activation of the selected input circuit (IN 1 or 2). The circuit will provide a continuous 24 VDC output to connected devices. The circuit will follow the operation of the controlling input circuit (IN 1 or 2).
- **24 V NAC, Protocol**
  - Generator mode - the NACs turn on upon activation of the selected input circuit (IN 1 or 2). The circuit will utilize the sync pulse generated by the remote power supply. See Section 3.5.
  - Follower mode - the NACs turn on upon activation of the selected input circuit (IN 1 or 2). The circuit will utilize the sync pulse provided into the corresponding input circuit (IN 1 or 2).
- **24 V Door Holder, 30 Second Shutdown** - In this mode, the circuit turns on during power up supplying continuous 24 VDC output to connected devices. The circuit will turn off immediately upon activation of Input 1. Upon loss of AC power, the circuit will turn off automatically after 30 seconds. Maximum 1A current draw for all five outputs (NACs and AUX) during normal standby.
- **24 V Door Holder** - In this mode, the circuit turns on during power up supplying continuous 24 VDC output to connected devices. The circuit will turn off immediately upon activation of Input 1. Maximum 1A current draw for all five outputs (NACs and AUX) during normal standby.

### 3.1.2 ALLOWABLE CIRCUIT OPERATION COMBINATIONS

For proper operation and supervision, NAC circuits 1 and 2 must have compatible functions. Similarly, NAC circuits 3 and 4 must have compatible functions. The power supplies diagnostic LEDs will all flash (very fast) to indicate the selection of two incompatible operating modes.

The following tables indicate allowable circuit operation combinations.

| Output #1 | Output #2 |
|---|---|
| 24V Power Supply | 24V Power Supply |
| 24V Power Supply | Door Holder (Any Mode) |
| NAC (Any Mode) | NAC (Same Protocol) |
| Door Holder (Any Mode) | 24V Power Supply |
| Door Holder (Any Mode) | Door Holder (Any Mode) |

**Exhibit 26: NAC 1 & 2 Compatible Output Combinations**

| Output #3 | Output #4 |
|---|---|
| 24V Power Supply | 24V Power Supply |
| 24V Power Supply | Door Holder (Any Mode) |
| NAC (Any Mode) | NAC (Same Protocol) |
| Door Holder (Any Mode) | 24V Power Supply |
| Door Holder (Any Mode) | Door Holder (Any Mode) |

**Exhibit 27: NAC 3 & 4 Compatible Output Combinations**

## 3.2 SELECTIVE SILENCE MODE (SW3-1)

Selective silence is a feature used on NAC devices where a single 2-wire circuit controls both the audible and visual functions of the device; yet allows manual silencing of the audible function while allowing the visual function to continue operating.

DIP-switch SW3-1 controls whether remote power supply will generate the selective silence pulse that will be used by its four outputs. If set to ON, both Inputs 1 and 2 will be dedicated to selective silence operation.

| SW3-1 | Description |
|---|---|
| **OFF** | Selective silence by the remote power supply disabled. |
| ON | The remote power supply will generate the selective silence pulse and Inputs 1 & 2 will function as follows:<br>– Upon activation of Input 1 and 2 (constant on), all NACs will turn on.<br>– Upon deactivation of Input 2, the remote power supply will generate the selective silence pulse. The control circuit connected to Input 2 must be programmed as a silenceable point. |

**Exhibit 28: DIP-switch SW3-1, Selective Silence Mode**

ⓘ **CRITICAL NOTE:** Selective silence operation only applies when the remote power supply is configured by DIP-switch SW3-3 for generator mode.

## 3.3 AC POWER LOSS REPORTING (SW3-2)

The AC Power Loss delay feature provides and option to delay generation of a trouble signal to the host control panel via the P3 trouble relay for two hours, upon the loss of AC Power. This feature is used to prevent the transmission of multiple AC loss and restoral signals to the host control panel, allowing AC power to stabilize. The P6 internal trouble relay will transfer without delay upon AC Power Loss, unless Input 1 is active.

DIP-switch SW3-2 controls the AC power loss operation.

| SW3-2 | Operating Mode | Description |
|---|---|---|
| **OFF** | No Delay | The trouble relay contacts transfer instantly for any trouble on the remote power supply, including AC power fail. |
| ON | 2 Hour Delay | The trouble relay contacts transfer after 2 hours when AC power fails. The trouble relay contacts transfer immediately for all other events. This feature is used to prevent the monitoring control panel from receiving multiple events should a problem with the AC power occur. |

**Exhibit 29: DIP-switch SW3-2, AC Power Loss Reporting**

Regardless of the switch setting, the remote power supply will immediately indicate AC power loss by turning off the green “AC OK” LED and turning on the yellow “GENERAL TROUBLE” LED.

ⓘ **Note:** If the host control panel is programmed to delay AC power loss reporting, the remote power supply MUST be configured to delay the reporting of AC power loss.

## 3.4 NAC SYNCHRONIZATION MODE (SW3-3)

Synchronization is a function that controls the activation of the notification appliance so that all devices will turn on and off at exactly the same time. This feature also provides the ability to silence the audible portion of the appliance while allowing the visual portion to continue to operate on the same two-wire NAC (Selective Silence).

DIP-switch SW3-3 controls whether the remote power supply outputs will follow the Sync pulse generated by the control circuit connected to Input 1 and/or 2 (Follower) or will generate the Sync pulse that will be used by its four outputs (Generator). If Sync operation is not required, DIP-switch SW3-3 should be set to the OFF position.

| SW3-3 | Operating Mode | Description |
|---|---|---|
| **OFF** | Follower | NAC synchronization by the remote power supply disabled. The power supply’s NAC outputs will follow the input signal supplied by the control circuit connected to Input terminals 1 or 2. DIP-switches SW3-4 to 6 must be set to no sync. See Section 3.5. |
| ON | Generator | The remote power supply will generate its own Sync pulse for NAC operation. Signals provided at Inputs 1 & 2 for power supply activation must be non-coded (constant ON). Sync protocol can be configured for System Sensor, Gentex or Wheelock appliances using DIP-switches SW3-4 to 6. See Section 3.5. |

**Exhibit 30: DIP-switch SW3-3, NAC Synchronization**

ⓘ **Note**: Synchronization is isolated to the local remote power supply.

## 3.5 SYNC PROTOCOL AND GROUND FAULT DETECTION MODE (SW3-4 TO 6)

DIP-switches SW3-4 to 6 controls how the remote power supply will handle synchronization and ground fault detection for its four NAC circuits. The first function is to set the synchronization mode that will be used by the remote power supply. When DIP-switch SW3-3 is set to ON for NAC synchronization, these switches must be set so that the remote power supply will generate the compatible sync pulse for the selected manufacturer's NAC devices.

ⓘ **Note**: Synchronization works only with non-coded (continuous operation) NACs.

The second function is to set whether the remote power supply will do ground fault supervision for its output circuits or whether ground fault detection will be performed by the host control panel via the power supplies two Input circuits. When the DIP-switches are set for off board ground fault detection, the host control panel must be capable of performing ground fault detection for the remote power supply. When the DIP-switches are set for on board ground fault detection, the remote power supply will perform ground fault detection for its four NAC circuits. Jumpers P12 and P13 must be installed or removed in conjunction with these DIP-switch settings to enable or disable the power supplies ground fault detection. Refer to Section 4.0 for details.

| SW3-4 | SW3-5 | SW3-6 | Operating Mode |
|---|---|---|---|
| **OFF** | **OFF** | **OFF** | Off Board GF Detection / No sync |
| ON | OFF | OFF | Off Board GF Detection / System Sensor Sync |
| OFF | ON | OFF | Off Board GF Detection / Gentex Sync |
| ON | ON | OFF | Off Board GF Detection / Wheelock Sync |
| OFF | OFF | ON | On Board GF Detection / No Sync |
| ON | OFF | ON | On Board GF Detection / System Sensor Sync |
| OFF | ON | ON | On Board GF Detection / Gentex Sync |
| ON | ON | ON | On Board GF Detection / Wheelock Sync |

**Exhibit 31: DIP-switch SW3-4 to 6 Ground Fault and SYNC Protocol**

ⓘ **Critical Note**: Set DIP-switches (SW3 4-6) to no sync if the remote power supply is configured as a follower (SW3-3 off).

# 4.0 OPERATIONAL JUMPERS

The remote power supply board is equipped with three jumpers (P12 through P14) that when installed or removed affects the operation of the remote power supply. These jumpers are preinstalled prior to shipment from the factory and must be removed to achieve the required operation as detailed in this section.

## 4.1 GROUND FAULT DETECTION JUMPERS (P12 AND P13)

The remote power supply is equipped with two jumpers P12 and P13 that allow you to enable or disable the power supplies on board ground fault detection circuitry as shown in the Exhibit below. When a ground fault is detected, the remote power supply can signal the host control panel either through the P3 Trouble relay and/or through the P6 Inputs 1 or 2. If using the P6 Input circuits for ground fault transmission, the connected circuits must be capable of detecting ground fault conditions.

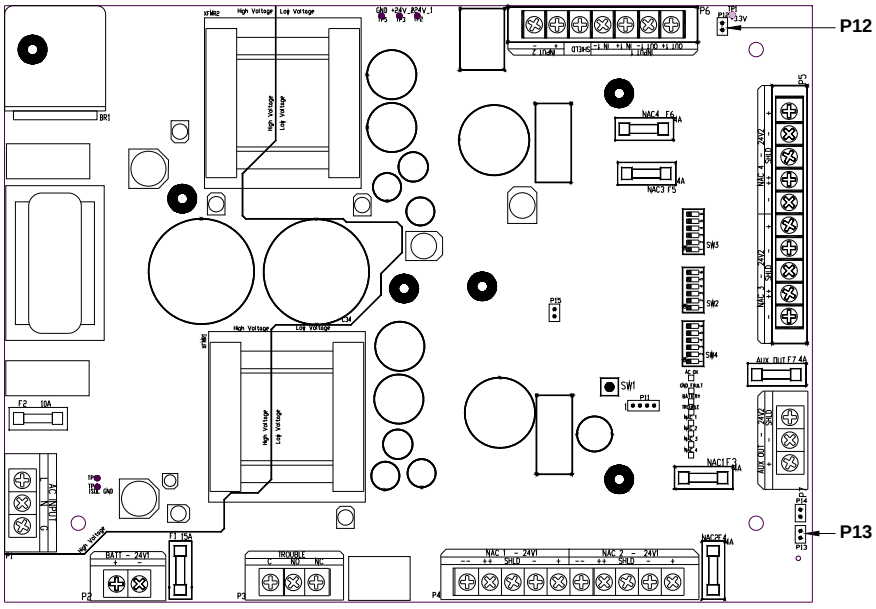



**Exhibit 32: Ground Fault Jumper Locations**

| P12 | P13 | Operating Mode |
|---|---|---|
| Installed | Removed | Off Board |
| Removed | Installed | On Board |

**Exhibit 33: Ground Fault Supervision Jumpers**

**Off Board** – In this mode, the power supplies input circuits are tied to its ground fault detection circuitry. This allows the host control panel to detect ground faults on the remote power supply via its control input circuits.

**On Board** – In this mode, the power supplies P6 input circuits are isolated from its ground fault detection circuitry. This option is typically used when a single control input circuit is being used to activate multiple power supplies as illustrated in Exhibit 34. If you do not disable ground fault detection when connecting multiple power supplies to the same control circuit, you may get excessive ground faults on your system or ground faults may fail to be reported. In this case, the remote power supply's P3 trouble relay must be monitored by the host control panel for indication of a ground fault condition on the connected power supplies.

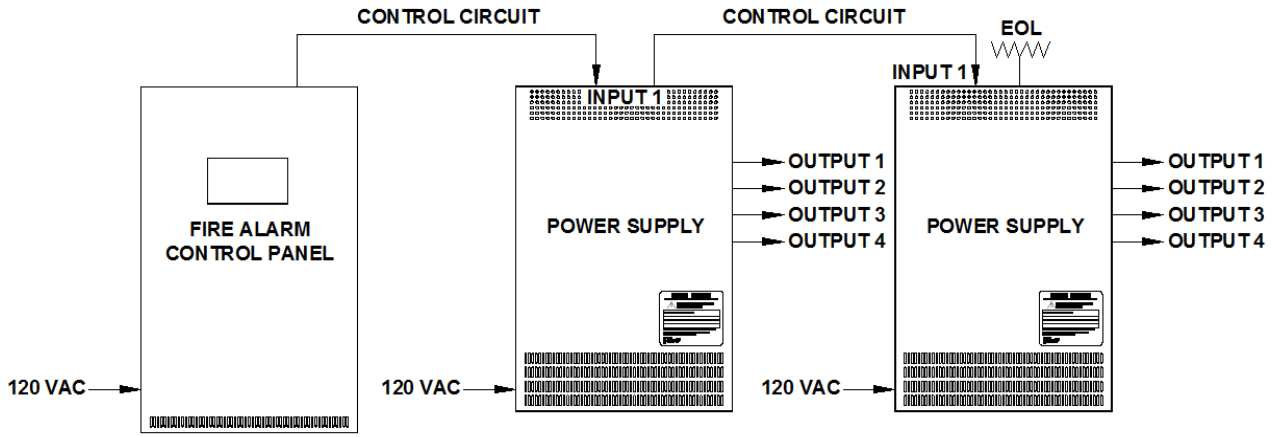



**Exhibit 34: Ground Fault Detection with Multiple Power Supplies**

## 4.2 PIEZO JUMPER (P14)

The remote power supply is equipped an integral piezo (audible) that will sound upon activation of the remote power supply or development of a trouble condition. With the P14 jumper installed (factory default) the piezo is active. Removing the jumper will disable the piezo operation.

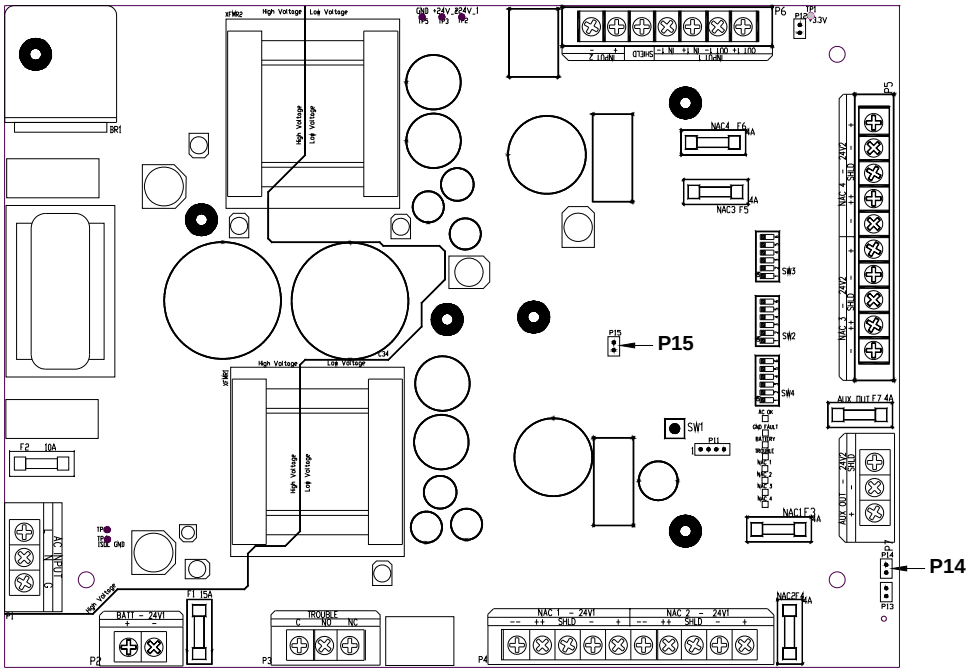



**Exhibit 35: Integral Piezo Enable/Disable and AC Power Input Jumpers**

## 4.3 AC POWER INPUT JUMPER (P15)

The AC power input jumper must be installed when the remote power supply is operating at 120/240 VAC and removed when operating at 100 VAC. The jumper sets the AC trouble threshold that is used by the power supply to monitor the AC power input. See Exhibit 35 for jumper location.

# 5.0 SERVICE

The remote power supply shall be tested by a factory trained technician in accordance with the requirements outlined in NFPA 72, National Fire Alarm and Signaling Code and the codes and standards adopted by the local authority having jurisdiction (AHJ).

***WARNING! Remove AC power prior to servicing the remote power supply.*** Use a voltmeter to check for presence of power before servicing.

## 5.1 FUSE REPLACEMENT

The remote power supply is equipped with several replaceable fuses. Replace if necessary using only fuses of equivalent type and rating with the exception of fuse F2. Refer to Section 1.2.1 for replacement parts.

***WARNING! Remove AC power prior to replacing any fuse.*** Use an AC voltmeter to check for AC presence before servicing.

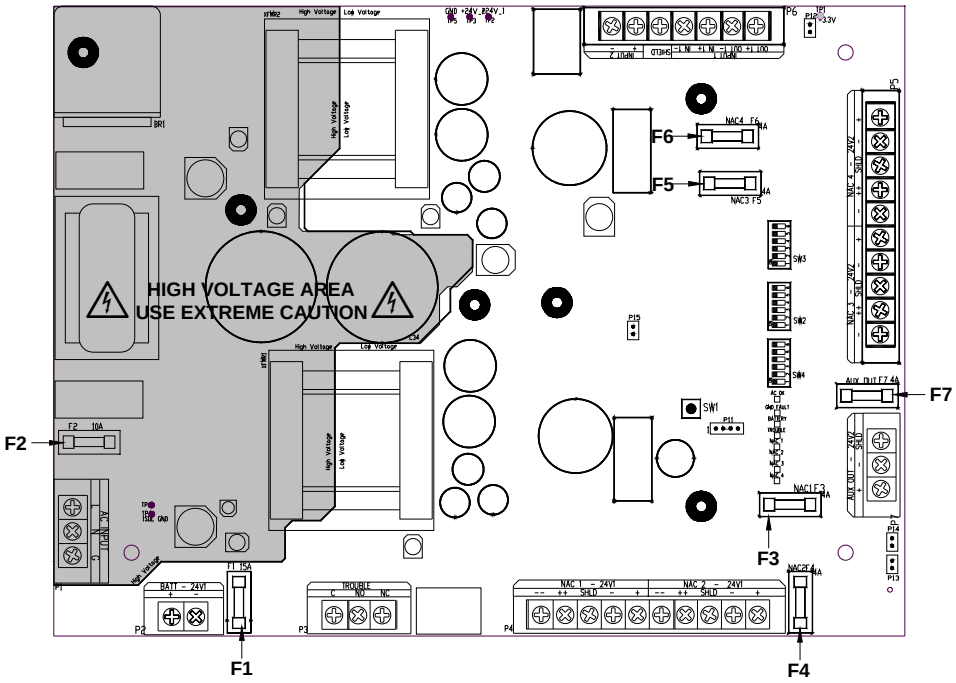



**Exhibit 36: Replaceable Fuse Locations**

F1 (battery input) = Mini auto fuse, 15A
F2 (AC input) = Glass tube fuse, 10A
F3 (NAC 1 output) = Glass tube fuse, 4A
F4 (NAC 2 output) = Glass tube fuse, 4A
F5 (NAC 3 output) = Glass tube fuse, 4A
F6 (NAC 4 output) = Glass tube fuse, 4A
F7 (AUX output) = Glass tube fuse, 1A

## 5.2 TEST POINTS

The remote power supply board is equipped with several test points for troubleshooting purposes. These test points should only be used under the explicit direction of Fike's Product Support department. This is due to the fact that certain portions of the remote power supply board are capable of producing high AC voltages and should be avoided to prevent electrical shock.

## 5.3 TROUBLE CONDITIONS

The trouble conditions listed in the table below will be reported through Input 1 (P6) integral Trouble relay and through the common Trouble relay (P3), based on DIP-switch settings.

| Condition | Description | Possible Resolutions |
|---|---|---|
| AC Trouble | AC input voltage is low or off.<br>1. The green "AC OK" LED turns off.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens.<br>5. Standby batteries engaged.<br>6. NACs and AUX circuit will remain active unless battery voltage drops below 18.4 VDC or 30 second time delay expires (applicable to door holder mode only). | 1. Check AC circuit breaker.<br>2. Check field wiring.<br>3. Check AC power fuse F2. |
| Battery Trouble | Indicates that the battery voltage level has fallen below acceptable levels.<br>1. The yellow "BATTERY" LED lights.<br>a. 18.4 – 19.4 = ON<br>b. <18.4 = flash fast<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens.<br>Note: Batteries are NOT supervised during an Alarm condition. | 1. Meter the battery terminals for 27.6 VDC.<br>2. Remove the jumper between the batteries and measure the voltage of each battery (12 VDC). Replace batteries if low.<br>3. Check the status of battery fuse F2.<br>4. Load test the batteries.<br>Note: RPS must be reset using switch SW1 after battery replacement. |
| Battery charger Trouble | Indicates that the battery charging level has fallen below acceptable levels.<br>1. The yellow "BATTERY" LED flashes slow.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens.<br>Note: Batteries are NOT supervised during an Alarm condition. | 1. Remove leads from battery terminals and temporarily install a 1.2K ohm, ¼ watt resistor (P/N 02-11457) and a 3300 µF, 50 V capacitor (P/N 02-3736).<br>2. Verify charging voltage is a minimum of 27 VDC. |
| Panel 24V Power Trouble (24V1 or 24V2) | Indicates that a problem has developed with the boards 24 VDC internal power sections.<br>1. The green "AC OK" LED flashes<br>a. 24V1 fault = fast<br>b. 24V2 fault = slow<br>2. The yellow "TROUBLE" LED lights.<br>3. The board piezo sounds.<br>4. The P3 trouble relay is de-energized.<br>5. The INPUT 1 trouble relay opens.<br>6. NAC circuits shut down. | 1. Use a meter to verify the presence of 24 VDC between TP5 and TP2 for 24V1.<br>2. Use a meter to verify the presence of 24VDC between TP5 and TP3 for 24V2. |
| General Trouble | Indicates that the power supply has detected a general trouble (i.e. board level, field wiring, etc.).<br>1. The yellow "TROUBLE" LED lights.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens. | 1. See other conditions for possible resolutions. |

**Exhibit 37: Trouble Conditions**

| Condition | Description | Possible Resolutions |
|---|---|---|
| AUX Trouble | Indicates that the power supply has detected a general trouble (i.e. board level, field wiring, etc.).<br>1. The yellow "TROUBLE" LED flashes slow.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens. | 1. Measure the output voltage at P7.<br>2. Check the status of fuse F7.<br>3. Determine wiring fault. |
| NAC Open Trouble | An open circuit condition has been detected.<br>1. The corresponding yellow "NAC #" LED will flash slow.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens. | 1. Remove field wiring and place circuit EOL across + and -. Verify that fault clears.<br>2. Remove field wiring and measure wire impedance. Verify that maximum allowable values have not been exceeded.<br>3. Ensure circuit EOL is placed correctly at last device. If Class A, verify that return wiring is landed to remote power supply's ++ and – terminals and that EOL is secured to same terminals. |
| NAC Short Trouble [1] | A short circuit condition has been detected.<br>1. The corresponding yellow "NAC #" LED will light steady.<br>2. The board piezo sounds.<br>3. The NAC will not activate until the short circuit condition is removed.<br>4. For overload conditions, the active NAC will shut down. | 1. Remove field wiring and place circuit EOL across + and -. Verify that fault clears.<br>2. Remove field wiring and measure wire impedance. Verify that maximum allowable values have not been exceeded.<br>3. Ensure circuit EOL is placed correctly at last device. If Class A, verify that return wiring is landed to remote power supply's ++ and – terminals and that EOL is secured to same terminals. |
| Ground Fault | A ground fault condition has been detected.<br>1. The yellow "GND FAULT" LED lights.<br>2. The board piezo sounds.<br>3. The yellow "TROUBLE" LED lights.<br>4. The P3 trouble relay is de-energized.<br>5. The INPUT 1 trouble relay opens. | 1. Remove circuit terminal blocks one at a time to isolate the ground fault. Wait 2 minutes for ground fault to clear. Once you have determined which circuit has the ground fault, progressively break the circuit in half to determine which section of the field wiring has the ground fault. |
| Fuse Missing or Blown | The relay contact (NC) on Input 1 has opened.<br>1. The yellow "TROUBLE" LED flashes fast.<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens. | 1. Measure the output voltage at affected output.<br>2. Check the status of fuse of the affected output.<br>3. Determine wiring fault. |
| Configuration Trouble | A configuration fault has been detected.<br>1. All diagnostic LEDs will flash (very fast).<br>2. The board piezo sounds.<br>3. The P3 trouble relay is de-energized.<br>4. The INPUT 1 trouble relay opens. | 1. Check the DIP-switch settings for improper combinations. |

[1] For AUX circuits, the trouble indicates an overload condition. The AUX circuit will shut down and then is reactivated once the overload condition is removed.

**Exhibit 38: Trouble Conditions - Continued**

# APPENDIX A - SAMPLE APPLICATIONS

This section provides several application examples that show how to properly utilize the remote power supply.

## A.1 SINGLE CONTROL MODULE ACTIVATING ALL FOUR OUTPUTS

In this application, the remote power supply has been set as a generator with off board ground fault detection and Sync generation capabilities. Two wire notification appliances are connected to output circuits 1 and 2, while output circuits 3 and 4 serve door holders. All four output circuits are controlled from one input circuit. An addressable control module is shown to illustrate how a remotely located power supply can be activated by an addressable fire alarm control panel. The addressable module can be replaced with any circuit capable of providing a polarity reversal input, such as an FACP notification appliance circuit (NAC).

**APPLICATION NOTES:**

1. During normal operation (Control Input 1 not active), a continuous 24 VDC is supplied to Outputs 3 and 4 for door holder operation. The door holder circuit will deactivate upon activation of the addressable control module connected to Input 1. The door holder circuit can be configured via dip switches to turn off 30 seconds after AC power fail or turn off automatically if the battery voltage drops below 18.4 VDC to prevent deep discharge of the batteries.
2. By connecting the control module's EOL to the power supply's P6 Output terminals (+/-), a trouble on the power supply will result in an open circuit condition on the control module's output circuit; thus providing a trouble indication back to the host control panel. The power supply's P3 trouble contacts can be monitored by an addressable monitor module as an alternative means of monitoring the power supply for troubles.
3. Upon activation of the addressable control module connected to Input 1, Outputs 1 and 2 will activate using the Sync protocol generated by the power supply. In this case Gentex. The control module must be configured for continuous operation for proper Sync operation.
4. Loss of signal at Input 1 will return the power supply to normal operation restoring power to door holder circuits (Outputs 3 & 4) and turning off notification appliance circuits (Outputs 1 & 2).
5. Jumper P12 must be installed to allow the Input circuit 1 to annunciate a ground fault condition.
6. The addressable control module can be powered from the power supply's auxiliary 24 VDC power output (terminal P7).
7. Output circuits shown with Class B wiring.
8. Output synchronization is isolated to this power supply.
9. If used for door holder operation,

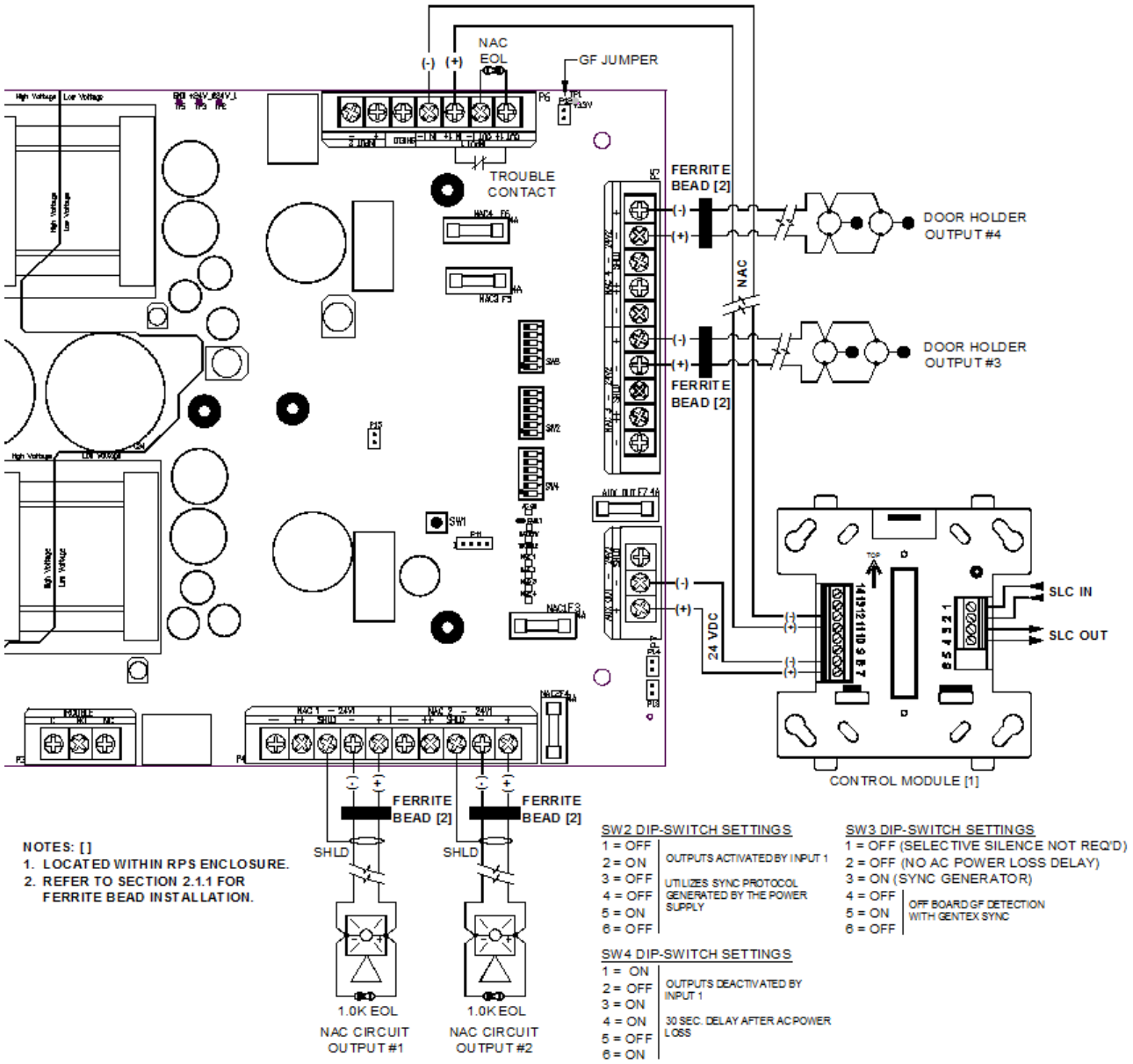



**Exhibit 39: Single Input activating all Four Outputs**

ⓘ **Note**: An addressable relay module programmed as an Alarm output and a silenceable point can also be used to trigger the activation of the power supply. 24 VDC power from the P7 AUX OUT terminals can be routed through the normally open contact of the relay module to the P6 Input 1 terminals. Upon Alarm operation, the relay contact will close providing 24 VDC to Input 1, thus triggering the operation of the power supply. The relay module MUST be located within remote power supply cabinet.

ⓘ **Note**: Ferrite beads must be installed on all circuits that leave the RPS enclosure, including AC power and battery wiring.

## A.2 SINGLE FACP NAC WITH SYNC AND SELECTIVE SILENCE ACTIVATING ALL FOUR OUTPUTS

In this application, the remote power supply has been set as a follower with off board ground fault detection and no Sync generation or selective silence capabilities. Two wire notification appliances are connected to all four output circuits. All four output circuits are activated by a polarity reversal input from a single FACP notification appliance circuit (NAC) capable of synchronization and selective silence operation.

**Note:** When configuring the remote power supply as a follower, devices connected to the remote power supply's outputs must be compatible with the Sync pulse generated by the input circuit.

**APPLICATION NOTES:**

1. By connecting the FACP notification appliance circuit EOL to the power supply's P6 Output terminals (+/-), a trouble on the power supply will result in an open circuit condition on the input circuit; thus providing a trouble indication at the host control panel. The power supply's P3 trouble contacts can be monitored by an addressable monitor module as an alternative means of monitoring the power supply for troubles.
2. Upon activation of the FACP NAC circuit connected to Input 1, all four outputs will activate using the Sync protocol generated by the FACP NAC circuit. In this case System Sensor. The NAC circuit must be configured for continuous operation for proper Sync operation.
3. All four output circuits will follow the selective silence operation of the control circuit connected to Input 1. This allows silencing of the audible portion of the notification appliances, while allowing the visual portion to remain active over the same two-wire circuit.
4. Loss of signal at Input 1 will turn off all four notification appliance circuits.
5. Jumper P12 must be installed to allow the Input circuit 1 to annunciate a ground fault condition.
6. Output circuits shown with Class B wiring.
7. Output synchronization is isolated to this power supply.

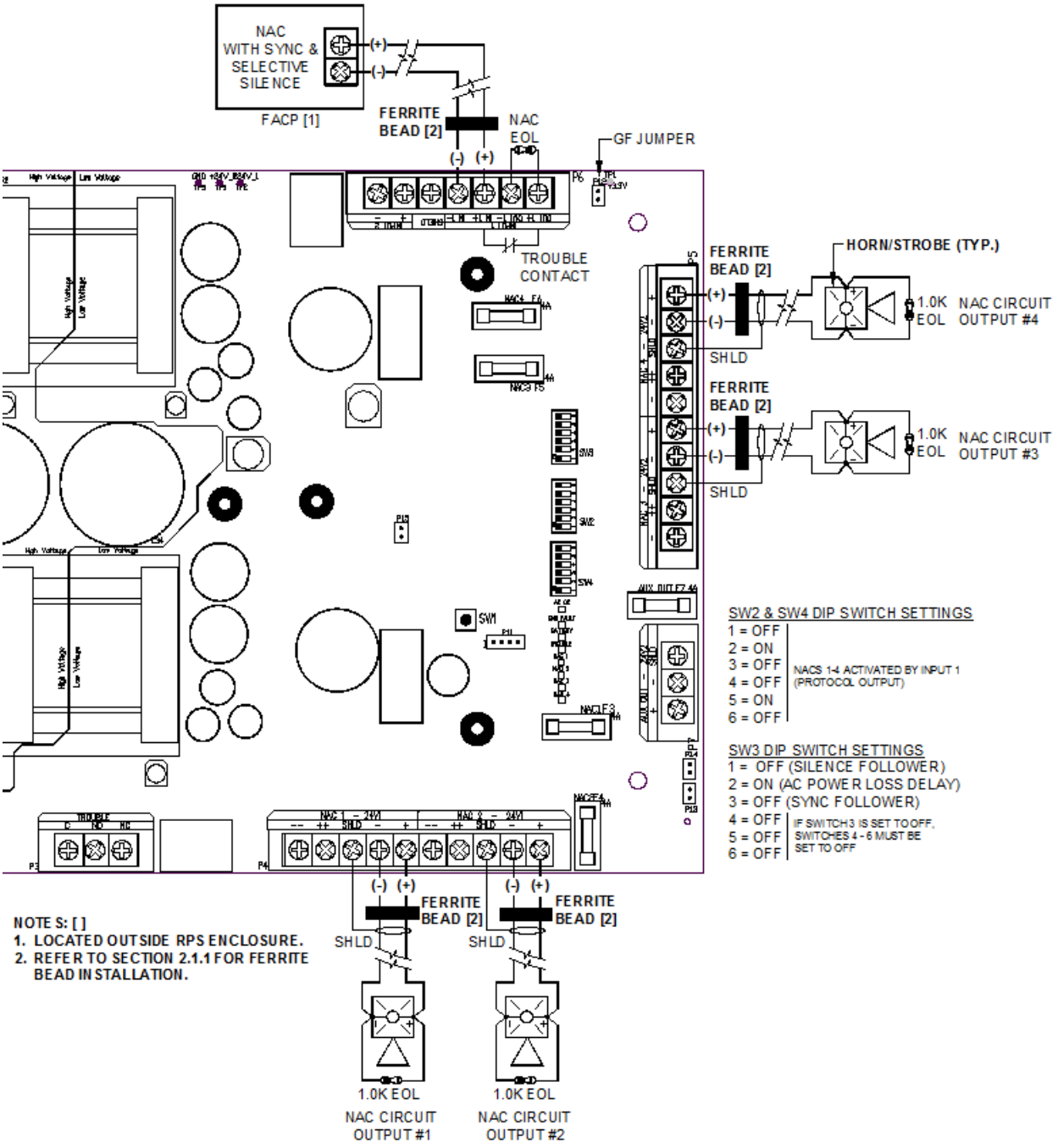



**Exhibit 40: Single FACP NAC with Sync activating all Four Outputs**

ⓘ **Note**: Ferrite beads must be installed on all circuits that leave the RPS enclosure, including AC power and battery wiring.

## A.3 INDEPENDENT HORN-STROBE OPERATION

In this application, the remote power supply has been set as a follower with off board ground fault detection, no Sync or selective silence capabilities. Four wire notification appliances are connected to the remote power supply's four output circuits with the horn and strobe functions wired separately. Output circuits 1 and 2 are activated by a polarity reversal input from an addressable control module connected to Input 1. Output circuits 3 and 4 are activated by a polarity reversal input from an FACP NAC connected to Input 2.

**APPLICATION NOTES:**

1. By connecting the FACP notification appliance circuit EOL to the power supply's P6 Output terminals (+/-), a trouble on the power supply will result in an open circuit condition on the input circuit; thus providing a trouble indication at the host control panel. The power supply's P3 trouble contacts can be monitored by an addressable monitor module as an alternative means of monitoring the power supply for troubles.
2. Upon activation of the addressable control module connected Input 1, output circuits 1 and 2 will activate. The horns will follow the modulated signal (i.e., slow, fast, continuous) provided by the module. This operation is commonly used for suppression system applications to signal the system's change of state from Alarm, to Pre-discharge, to Release.
3. Upon activation of the FACP NAC connected to Input 2, output circuits 3 and 4 will activate following the Sync pulse generated by the FACP NAC. In this case Gentex.
4. The addressable control module can be powered from the power supply's auxiliary 24 VDC power output (terminal P7).
5. Output circuits shown with Class B wiring.
6. Output synchronization is isolated to this power supply.

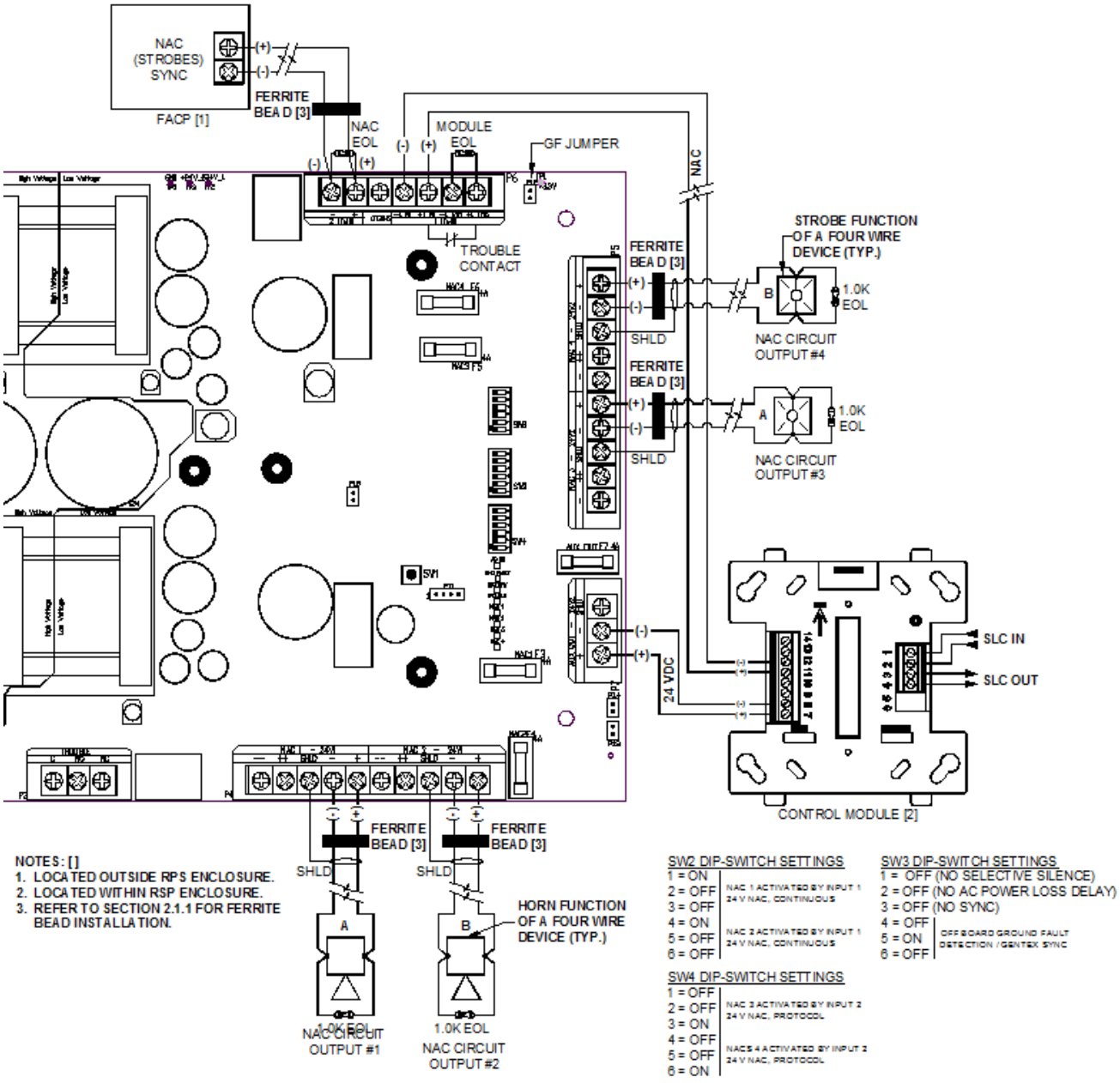



**Exhibit 41: Independent Horn-Strobe Operation**

ⓘ **Note**: Ferrite beads must be installed on all circuits that leave the RPS enclosure, including AC power and battery wiring.

# A.4 ADDRESSABLE CONTROL MODULE ACTIVATING ALL FOUR OUTPUTS WITH SELECTIVE SILENCE INPUT

In this application, the remote power supply has been set as a generator with on board ground fault detection, Sync generation and selective silence capabilities. Two wire notification appliances are connected to all four output circuits. All four output circuits are activated by an addressable control module. An addressable relay module is used to provide the selective silence input.

**APPLICATION NOTES:**

1. By connecting the control module's EOL to the power supply's P6 Output terminals (+/-), a trouble on the power supply will result in an open circuit condition on the input circuit. The power supply's P3 trouble contacts can be monitored by an addressable monitor module as an alternative means of monitoring the power supply for troubles.
2. Upon activation of the addressable control module connected to Input 1, all four outputs will activate using the Sync protocol generated by the power supply. In this case Wheelock. The addressable control module must be configured for continuous operation for proper Sync operation.
3. Upon activation of the control module connected to Input 1, the addressable relay module (programmed as silenceable) will activate causing its normally open (NO) contact to close allowing 24 VDC power to be supplied to Input 2. Upon silencing of the FACP, the relay module will deactivate, removing 24 VDC power from Input 2; thus triggering the selective silence operation of the power supply. This allows silencing of the audible portion of the notification appliances, while allowing the visual portion to remain active over the same two-wire circuit.
4. Loss of signal at Input 1 will turn off all four notification appliance circuits.
5. Jumper P13 must be installed to allow the Input circuit 1 to annunciate a ground fault condition.
6. The addressable modules can be powered from the power supply's auxiliary 24 VDC power output (terminal P7).
7. Output circuits shown with Class B wiring.
8. Output synchronization is isolated to this power supply.
9. The exhibit shows the power supply's P3 trouble relay connected to a monitor input on an addressable relay module. If the module being utilized does not have this feature, an addressable monitor module must be added.

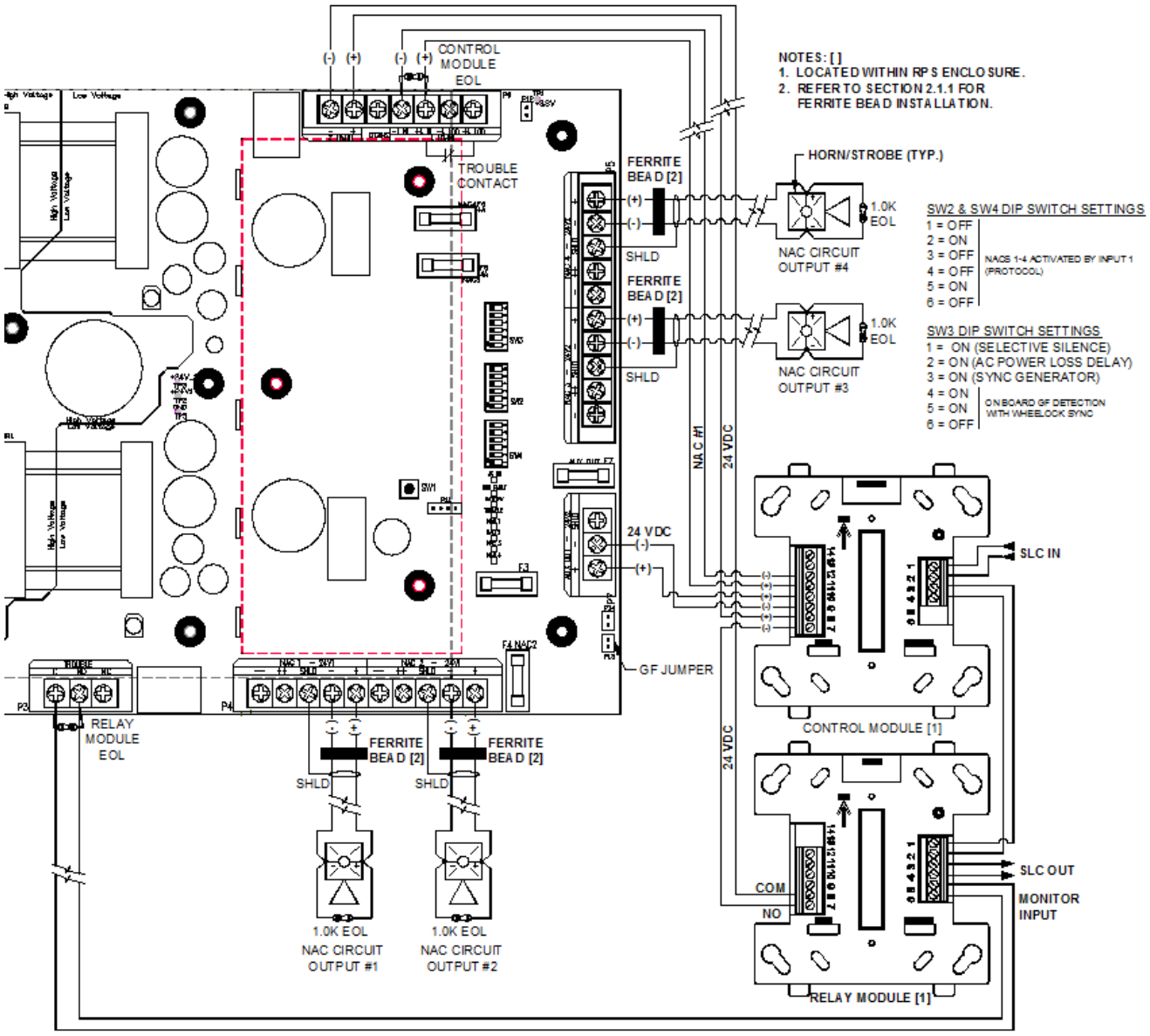



**Exhibit 42: Addressable Control Module activating all Four Outputs with Selective Silence Input**

ⓘ **Note**: Ferrite beads must be installed on all circuits that leave the RPS enclosure, including AC power and battery wiring.

# A.5 REMOTE POWER SUPPLY

In this application, the power supplies four output circuits are being utilized to supply continuous, non-resettable, 24 VDC power to field devices upon power up. Each NAC circuit is rated for 3 amps, although you can only draw a total of 1 amp total from the power supplies five (5) outputs during normal standby. In alarm, the power output varies depending upon the AC voltage supplied: 10 amps @ 120/240 VAC or 8 amps @ 100 VAC.

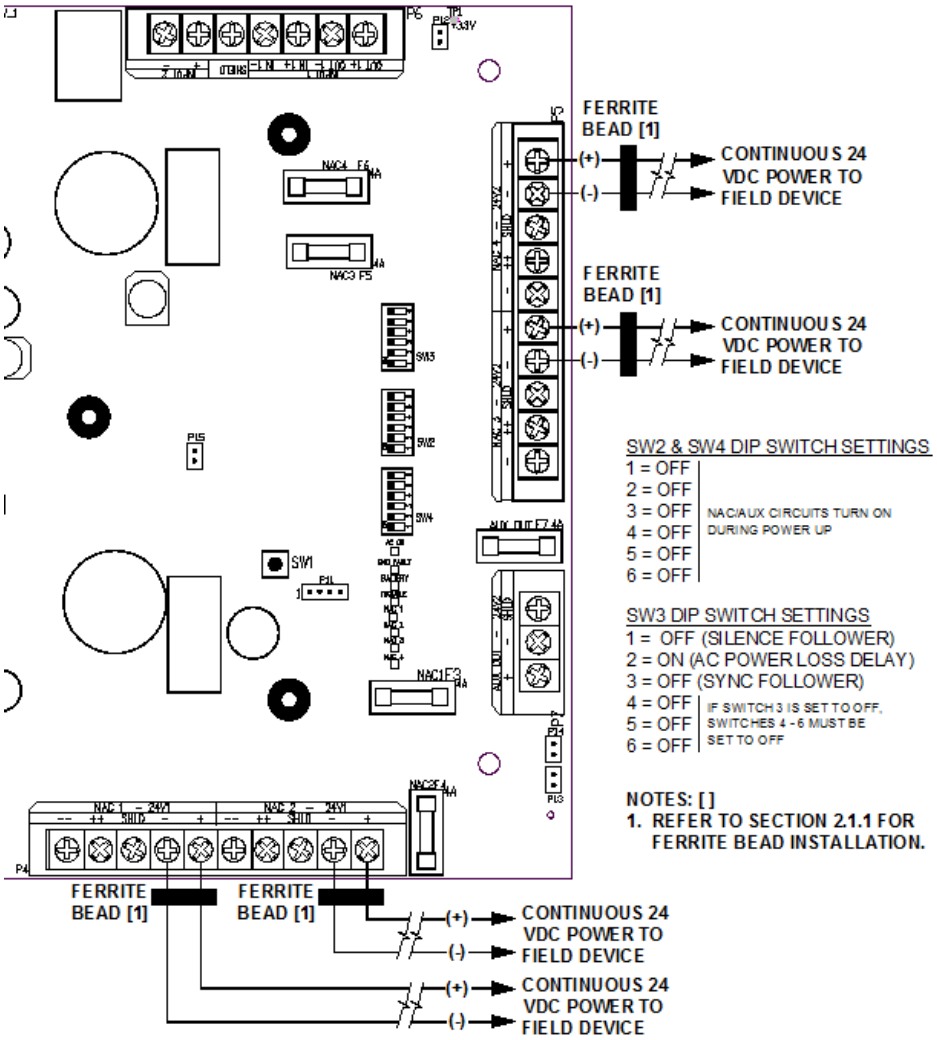



**Exhibit 43: Remote power supply Operation**

ⓘ **Note**: Ferrite beads must be installed on all circuits that leave the RPS enclosure, including AC power and battery wiring.

# APPENDIX B - POWER CALCULATIONS

Calculations must be done to determine Standby and Alarm current loads for the system to assure that the remote power supply is capable of providing the required quantity of power during normal system operation and fire alarm conditions. The power requirements cannot exceed the capabilities of the remote power supply. Amp-hour requirements must be calculated as well to determine proper back-up battery size selection.

To calculate the required standby and alarm power, as well as required back-up battery size for the remote power supply, simply list the number of each type of device that will be connected to the remote power supply in the quantity column(s) and perform the required calculations.

**Exhibit 44: Battery Calculation Form**

## BATTERY CALCULATION FORM

**Section 1 - System Requirements**

| Item | Description | Standby Current per Unit (Amps) | | Qty | | Total Standby Current per item (Amps) | Alarm Current per Unit (Amps) | | Qty | | Total Alarm Current per item (Amps) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 10-2767 Board | 0.035 | x | 1 | = | 0.035 | 0.141 | x | 1 | = | 0.141 |
| 2 | NAC 1 (Notes 2,3) | | x | NA | = | | | x | 1 | = | |
| 3 | NAC 2 (Notes 2,3) | | x | NA | = | | | x | 1 | = | |
| 4 | NAC 3 (Notes 2,3) | | x | NA | = | | | x | 1 | = | |
| 5 | NAC 4 (Notes 2,3) | | x | NA | = | | | x | 1 | = | |
| 6 | P7 AUX OUT (Note 1) | | x | 1 | = | | | x | 1 | = | |

| Total System Standby Current (Amps): | | Total System Alarm Current (Amps): | |
|---|---|---|---|

Note 4

***Max. Quiescent Load (Standby):*** _____ hr (Note 5) ***Total Alarm Load:*** _____ min. x 1/60 = _____ hr (Note 6)

| Required Standby Time (hr) | | Total System Standby Current (Amps) | | Required Standby Capacity (Amp-hr) | Required Alarm Time (hr) | | Total System Alarm Current (Amps) | | Required Alarm Capacity (Amp-hr) |
|---|---|---|---|---|---|---|---|---|---|
| | x | | = | | | x | | = | |

| Required Standby Capacity (Amp-hr) | | Required Alarm Capacity (Amp-hr) | | Total Required Capacity (Amp-hr) | | Optional Factor of Safety | | Adjusted Battery Capacity (Amp-hr) |
|---|---|---|---|---|---|---|---|---|
| | + | | = | | x | | = | |
| | | | | | | Note 7 | | Note 8 |

**NOTES:**

1. Maximum output capacity of the circuit is 1 A standby and alarm.
2. Maximum output capacity of each NAC circuit is 3 amps, not to exceed 5 amps @ 120/240 VAC or 4 amps @ 100 VAC for NAC 1 & 2 combined or NAC 3, 4 & AUX OUT combined.
3. Insert current draw totals from Section 2.
4. Maximum output capacity of the remote power supply is 10 amps.
5. NFPA 72 requires that the secondary power supply have sufficient capacity to operate the remote power supply under non-alarm condition for a minimum of 24 hours. Alternate standby times may be required by the local authority or approval agency.
6. NFPA 72 requires that at the end of the 24 hour standby period, the secondary power supply shall have sufficient capacity to operate all alarm notification appliances used for evacuation or to direct aid to the location of an emergency for 5 minutes (0.083 hrs) standard, 15 minutes (0.25 hrs) for emergency voice/alarm communication service or UL 2572 mass notification service.
7. 1.2 represents a battery derating factor of 20 percent.
8. The remote power supply can support charging up to 35 AH standby batteries.

## Exhibit 45: NAC Circuit Current Draw Calculations

### Section 2 – NAC Devices

| Item | Device Description / Circuit 1-4 | Alarm Current per Unit (mA) | | Qty | | Total Alarm Current per item (mA) |
|---|---|---|---|---|---|---|
| 1 | | | x | | = | |
| 2 | | | x | | = | |
| 3 | | | x | | = | |
| 4 | | | x | | = | |
| 5 | | | x | | = | |
| 6 | | | x | | = | |
| 7 | | | x | | = | |
| 8 | | | x | | = | |
| 9 | | | x | | = | |
| 10 | | | x | | = | |
| 11 | | | x | | = | |
| 12 | | | x | | = | |
| 13 | | | x | | = | |
| 14 | | | x | | = | |
| 15 | | | x | | = | |
| 16 | | | x | | = | |
| 17 | | | x | | = | |
| 18 | | | x | | = | |
| 19 | | | x | | = | |
| 20 | | | x | | = | |
| 21 | | | x | | = | |
| 22 | | | x | | = | |
| 23 | | | x | | = | |
| 25 | | | x | | = | |
| 25 | | | x | | = | |
| | | Total NAC Power Standby Current (Amps): | | | | |

Total NAC Alarm (mA): _____ /1000 = _____ A
Total

**Insert totals in Section 1 – Line Items 2 through 5.**

**NOTE:**
1. Complete separate calculations for each NAC circuit (1 – 4).

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