NOTIFIER®
by Honeywell

Field Charger/Power Supply
FCPS-24S6 & FCPS-24S8
FCPS-24S6E & FCPS-24S8E
FCPS-24S6C & FCPS-24S8C
Installation Manual

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Fire Alarm & Emergency Communication System Limitations

While a life safety system may lower insurance rates, it is not a substitute for life and property insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel (FACP) with remote notification capability—can provide early warning of a developing fire. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire.

An emergency communication system—typically made up of an automatic fire alarm system (as described above) and a life safety communication system that may include an autonomous control unit (ACU), local operating console (LOC), voice communication, and other various interoperable communication methods—can broadcast a mass notification message. Such a system, however, does not assure protection against property damage or loss of life resulting from a fire or life safety event.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premises following the recommendations of the current edition of the National Fire Protection Association Standard 72 (NFPA 72), manufacturer's recommendations, State and local codes, and the recommendations contained in the Guide for Proper Use of System Smoke Detectors, which is made available at no charge to all installing dealers. This document can be found at http://www.systemsensor.com/appguides/. A study by the Federal Emergency Management Agency (an agency of the United States government) indicated that smoke detectors may not go off in as many as 35% of all fires. While fire alarm systems are designed to provide early warning against fire, they do not guarantee warning or protection against fire. A fire alarm system may not provide timely or adequate warning, or simply may not function, for a variety of reasons:

Smoke detectors may not sense fire where smoke cannot reach the detectors such as in chimneys, in or behind walls, on roofs, or on the other side of closed doors. Smoke detectors also may not sense a fire on another level or floor of a building. A second-floor detector, for example, may not sense a first-floor or basement fire.

Particles of combustion or "smoke" from a developing fire may not reach the sensing chambers of smoke detectors because:

- Barriers such as closed or partially closed doors, walls, chimneys, even wet or humid areas may inhibit particle or smoke flow.
- Smoke particles may become "cold," stratify, and not reach the ceiling or upper walls where detectors are located.
- Smoke particles may be blown away from detectors by air outlets, such as air conditioning vents.
- Smoke particles may be drawn into air returns before reaching the detector.

The amount of "smoke" present may be insufficient to alarm smoke detectors. Smoke detectors are designed to alarm at various levels of smoke density. If such density levels are not created by a developing fire at the location of detectors, the detectors will not go into alarm.

Smoke detectors, even when working properly, have sensing limitations. Detectors that have photoelectronic sensing chambers tend to detect smoldering fires better than flaming fires, which have little visible smoke. Detectors that have ionizing-type sensing chambers tend to detect fast-flaming fires better than smoldering fires. Because fires develop in different ways and are often unpredictable in their growth, neither type of detector is necessarily best and a given type of detector may not provide adequate warning of a fire.

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions (caused by escaping gas, improper storage of flammable materials, etc.).

Heat detectors do not sense particles of combustion and alarm only when heat on their sensors increases at a predetermined rate or reaches a predetermined level. Rate-of-rise heat detectors may be subject to reduced sensitivity over time. For this reason, the rate-of-rise feature of each detector should be tested at least once per year by a qualified fire protection specialist. Heat detectors are designed to protect property, not life.

IMPORTANT! Smoke detectors must be installed in the same room as the control panel and in rooms used by the system for the connection of alarm transmission wiring, communications, signaling, and/or power. If detectors are not so located, a developing fire may damage the alarm system, compromising its ability to report a fire.

Audible warning devices such as bells, horns, strobes, speakers and displays may not alert people if these devices are located on the other side of closed or partly open doors or are located on another floor of a building. Any warning device may fail to alert people with a disability or those who have recently consumed drugs, alcohol, or medication. Please note that:

- An emergency communication system may take priority over a fire alarm system in the event of a life safety emergency.
- Voice messaging systems must be designed to meet intelligibility requirements as defined by NFPA, local codes, and Authorities Having Jurisdiction (AHJ).
- Language and instructional requirements must be clearly disseminated on any local displays.
- Strobes can, under certain circumstances, cause seizures in people with conditions such as epilepsy.
- Studies have shown that certain people, even when they hear a fire alarm signal, do not respond to or comprehend the meaning of the signal. Audible devices, such as horns and bells, can have different tonal patterns and frequencies. It is the property owner's responsibility to conduct fire drills and other training exercises to make people aware of fire alarm signals and instruct them on the proper reaction to alarm signals.
- In rare instances, the sounding of a warning device can cause temporary or permanent hearing loss.

A life safety system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time and only if the batteries have been properly maintained and replaced regularly.

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

Telephone lines needed to transmit alarm signals from a premises to a central monitoring station may be out of service or temporarily disabled. For added protection against telephone line failure, backup radio transmission systems are recommended.

The most common cause of life safety system malfunction is inadequate maintenance. To keep the entire life safety system in excellent working order, ongoing maintenance is required per the manufacturer's recommendations, and UL and NFPA standards. At a minimum, the requirements of NFPA 72 shall be followed. Environments with large amounts of dust, dirt, or high air velocity require more frequent maintenance. A maintenance agreement should be arranged through the local manufacturer's representative. Maintenance should be scheduled monthly or as required by National and/or local fire codes and should be performed by authorized professional life safety system installers only. Adequate written records of all inspections should be kept.

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Installation Precautions

Adherence to the following will aid in problem-free installation with long-term reliability:

WARNING - Several different sources of power can be connected to the fire alarm control panel. Disconnect all sources of power before servicing. Control unit and associated equipment may be damaged by removing and/or inserting cards, modules, or interconnecting cables while the unit is energized. Do not attempt to install, service, or operate this unit until manuals are read and understood.

CAUTION - System Re-acceptance Test after Software Changes: To ensure proper system operation, this product must be tested in accordance with NFPA 72 after any programming operation or change in site-specific software. Re-acceptance testing is required after any change, addition or deletion of system components, or after any modification, repair or adjustment to system hardware or wiring. All components, circuits, system operations, or software functions known to be affected by a change must be 100% tested. In addition, to ensure that other operations are not inadvertently affected, at least 10% of initiating devices that are not directly affected by the change, up to a maximum of 50 devices, must also be tested and proper system operation verified.

This system meets NFPA requirements for operation at 0-49º C/32-120º F and at a relative humidity 93% ± 2% RH (non-condensing) at 32°C ± 2°C (90°F ± 3°F). However, the useful life of the system's standby batteries and the electronic components may be adversely affected by extreme temperature ranges and humidity. Therefore, it is recommended that this system and its peripherals be installed in an environment with a normal room temperature of 15-27º C/60-80º F.

Verify that wire sizes are adequate for all initiating and indicating device loops. Most devices cannot tolerate more than a 10% I.R. drop from the specified device voltage.

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

Disconnect AC power and batteries prior to removing or inserting circuit boards. Failure to do so can damage circuits.

Remove all electronic assemblies prior to any drilling, filing, reaming, or punching of the enclosure. When possible, make all cable entries from the sides or rear. Before making modifications, verify that they will not interfere with battery, transformer, or printed circuit board location.

Do not tighten screw terminals more than 9 in-lbs. Overtightening may damage threads, resulting in reduced terminal contact pressure and difficulty with screw terminal removal.

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

Follow the instructions in the installation, operating, and programming manuals. These instructions must be followed to avoid damage to the control panel and associated equipment. FACP operation and reliability depend upon proper installation.

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FCC Warning

WARNING: This equipment generates, uses, and can radiate radio frequency energy and if not installed and used in accordance with the instruction manual may cause interference to radio communications. It has been tested and found to comply with the limits for class A computing devices pursuant to Subpart B of Part 15 of FCC Rules, which is designed to provide reasonable protection against such interference when devices are operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user will be required to correct the interference at his or her own expense.

Canadian Requirements

This digital apparatus does not exceed the Class A limits for radiation noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le present appareil numerique n'emet pas de bruits radioelectriques depassant les limites applicables aux appareils numeriques de la classe A prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

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In order to supply the latest features and functionality in fire alarm and life safety technology to our customers, we make frequent upgrades to the embedded software in our products. To ensure that you are installing and programming the latest features, we strongly recommend that you download the most current version of software for each product prior to commissioning any system. Contact Technical Support with any questions about software and the appropriate version for a specific application.

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It is imperative that the installer understand the requirements of the Authority Having Jurisdiction (AHJ) and be familiar with the standards set forth by the following regulatory agencies:

- Underwriters Laboratories Standards
- NFPA 72 National Fire Alarm Code

Before proceeding, the installer should be familiar with the following documents.

NFPA Standards

NFPA 72 National Fire Alarm Code
NFPA 70 National Electrical Code

Underwriters Laboratories Documents:

UL 464 Audible Signaling Appliances
UL 864 Standard for Control Units for Fire Protective Signaling Systems
UL 1638 Visual Signaling Appliances
UL 1971 Signaling Devices for Hearing Impaired
UL 2572 Standard for Mass Notification Systems

CAN/ULC - S524-01 Standard for Installation of Fire Alarm Systems
CAN/ULC-S527-99 Standard for Control Units for Fire Alarm Systems

Other:

NEC Article 250 Grounding
NEC Article 300 Wiring Methods
NEC Article 760 Fire Protective Signaling Systems
Applicable Local and State Building Codes
Requirements of the Local Authority Having Jurisdiction (LAHJ)
Canadian Electrical Code, Part 1

Other Notifier Documents:

Device Compatibility Document Document #15378

This product has been certified to comply with the requirements in the Standard for Control Units and Accessories for Fire Alarm Systems, UL 864, 9th Edition. Operation of this product with products not tested for UL 864, 9th Edition has not been evaluated. Such operation requires the approval of the local Authority Having Jurisdiction (AHJ).

Section 1: System Overview

The FCPS-24S6 is a 6 amp power supply and the FCPS-24S8 is an 8 amp power supply. Each FCPS-24S power supply is a compact, cost-effective, remote power supply and battery charger which provides ADA compatible strobe synchronization. Each remote power supply consists of a filtered 24 VDC output that can be configured to drive four Style Y (Class B) NACs (Notification Appliance Circuits). The four circuits can be configured for Style Z (Class A) with the optional ZNAC-4 Class A converter module. Alternatively, the four output circuits may be configured as 24 VDC resettable or nonresettable power outputs. The input circuits, which control the power supply operation, are triggered by the reverse polarity of an NAC or by a 12 VDC or 24 VDC power source. The power supplies are compatible with 12 VDC and 24 VDC control panels.

The FCPS-24S6E and FCPS-24S8E offer the same features as the FCPS-24S6 and FCPS-24S8 respectively but allow connection to 220/240 VAC. Unless otherwise specified, the information in this manual applies to both the 110/120 VAC versions and the 220/240 VAC versions of the power supplies.

The FCPS-24S6C and FCPS-24S8C are the Canadian versions which offer the same features as the FCPS-24S6 and FCPS-24S8 respectively. Unless otherwise specified, the information in this manual also applies to the Canadian versions of the power supplies.

1.1 General

The FCPS-24S power supplies can be used as remotely mounted power supplies and battery chargers to power four noncoded or coded NACs. The Main FACP (Fire Alarm Control Panel) NAC(s) is connected to the remote power supply input circuit(s). When the control input circuit activates due to reverse polarity of the NAC from the FACP, the power supply will activate its Notification Appliance Circuits.

During the inactive or nonalarm state, the power supply supervises its NAC field wiring for short and open conditions. AC fail, battery, charger and ground fault troubles will also be monitored by the power supply. If an NAC or power supply fault is detected, the power supply Normally-Closed Trouble contact will open.

If an alarm condition occurs and the NAC is activated, the supervision is disabled and the Notification Appliance Circuit is no longer supervised (except for shorts). Supervision of other power supply faults such as low battery, AC loss, ground fault and battery charger trouble will continue and may be monitored via the Trouble relay contacts.

1.2 Features

- Self-contained in a lockable cabinet
- 24 VDC remote power supply
- Outputs are completely power-limited (Class 2)
- Two optically-isolated input/control circuits, compatible with 12 VDC and 24 VDC control panel NACs
- Four output circuits:
  - Fully filtered power
  - Four 24 VDC Style Y (Class B) NACs
  - Optional ZNAC-4 Class A converter module for conversion to Style Z (Class A) NACs
  - Alternatively, all four circuits may be configured as 24 VDC special application power outputs
  - Output circuits may be configured as resettable or nonresettable
- NAC Trouble LED - blinks to indicate the number of the circuit in trouble

- Maximum current available for any one output circuit: 3.0 amps special application, 300mA regulated
- Maximum total continuous current available:
  - 4.0 amps for FCPS-24S6
  - 6.0 amps for FCPS-24S8
- Maximum total short term current (one hour maximum):
  - 6.0 amps for FCPS-24S6
  - 8.0 amps for FCPS-24S8
- Integral supervised battery charger for lead acid batteries only
- Capable of charging 7.0 AH to 18.0 AH (Amp Hour) batteries
- Fully supervised power supply, battery and NACs
- Selectable Strobe Synchronization for NACs (System Sensor, Gentex and Wheelock)
- Coded signal synchronization
- Fixed terminal blocks for field wiring capable of accepting 12 - 22 AWG wire
- Selectable Ground Fault detection by jumper JP1
- Power supply trouble Form-C relay contacts (fail-safe)
- Optional delay of AC loss reporting for 2 hours
- Auxiliary Special Application Power Output for SLC modules (500 mA maximum) with optional reset for 4-wire smoke detectors
- Mounting location for optional addressable control module

1.3 Start-up Procedure

1. Configure the power supply jumpers as described in “Jumpers” on page 10.
2. Install the power supply as described in“Installation” on page 14.
3. Program the power supply as described in “Programming Options” on page 20.
4. Wire the power supply circuits, referring to the options described in“Trouble Supervision” on page 26 and the application examples in“Applications” on page 28.
5. Connect primary power source wiring while observing the following:
   - Make certain that the AC mains circuit breaker is **off** before making any wiring connections between the mains and the power supply.
   - Make certain primary power source is 120 VAC, 60 Hz, 3.2 amps.
   - Run a pair of wires (with ground conductor) from the protected premises main breaker box to TB1 of the power supply main circuit board.
   - Use 14 AWG (1.6 mm O.D.) or heavier gauge wire with 600V insulation.
6. Apply power to the power supply using the following procedure:
   - Apply AC power by turning on the AC mains circuit breaker connected to the power supply.
   - Connect a properly charged battery to connector JP4 on the power supply main circuit board.

1.4 Jumpers

CAUTION: DISCONNECT POWER
REMOVE ALL POWER (AC & DC) BEFORE CUTTING OR MOVING ANY JUMPERS.

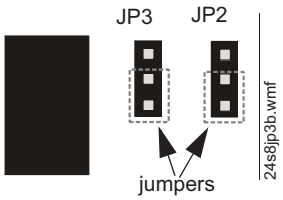
1.4.1 Jumper JP1 - Ground Fault Detection

The Ground Detection circuit monitors for zero impedance between the power supply and ground. Jumper JP1 is located in the top right section of the power supply circuit board. Cutting JP1 will disable ground fault detection by the power supply. This should only be done if ground faults are being monitored by a panel connected to the FCPS power supply.

1.4.2 Jumpers JP2 and JP3: Coded/Noncoded Input Selection

Jumpers JP2 and JP3 are located in the top right section of the power supply circuit board. JP2 is used for Control Input Circuit #1 and JP3 is used for Control Input Circuit #2. The position of these jumpers will depend on the type of signal being fed to the input circuits:

- If the source voltage to the input circuit is a noncoded (steady voltage) input signal, the jumper for the corresponding input circuit should be in the default position which jumpers the bottom two pins (as illustrated in drawing at left).
- If the source voltage to the input circuit is coded (variable voltage), the jumper for the corresponding input circuit should be moved to jumper the top two pins.



Jumper positions shown for noncoded (steady) source voltage

1.5 LED Indicators

- AC Power on (green) LED - indicates AC power is present
- Ground Fault (yellow) LED - indicates a ground fault condition (zero impedance to ground)
- Battery Trouble (yellow) LED - indicates low or no battery
- NAC Trouble (yellow) LED - indicates a Notification Appliance Circuit trouble (blinks once for Circuit 1 trouble, twice for Circuit 2 trouble, three times for Circuit 3 trouble and four times for Circuit 4 trouble. Note that multiple circuits in trouble will cause the LED to blink the number of the circuit with the highest number)
- Charger Trouble/AC Loss (yellow) LED - indicates a charger fault or loss of AC power:
  - If AC is applied to the power supply without a battery connected, both the Charger Trouble/AC Loss LED and Battery Trouble LED will turn on simultaneously, indicating that a battery is not connected.
  - When a battery is connected and the power supply is in Normal Mode, if the battery voltage drops too low or the battery is disconnected, only the Battery Trouble LED will turn on.
  - When a battery is connected and the charger develops a problem, only the Charger Trouble/AC Loss LED will turn on.

1.6 Specifications

Refer to Figure 1.1 on page 12 for terminal locations.

Primary AC Power - TB1

- FCPS-24S6(C) & FCPS-24S8(C): 120 VAC, 60 Hz, 3.2 amps maximum
- FCPS-24S6E & FCPS-24S8E: 240 VAC, 50 Hz, 1.6 amps maximum
- Wire size: minimum #14 AWG with 600V insulation

Control Input Circuits - TB4, Terminals 3 (+) & 4 (-) and 7 (+) & 8 (-)

- Trigger Input Voltage: 9 to 32 VDC
- Input Current Draw in Alarm Polarity:
  - 16 to 32 volts, 16.0 mA maximum per input
  - 9 to 16 volts, 6.0 mA maximum per input

NAC/Output Circuits - TB2, Terminals 1 (+) & 2 (-), 3 (+) & 4 (-), 5 (+) & 6 (-) and 7 (+) & 8 (-) alarm polarity

- Supervised and power-limited (Class 2)
- Voltage Rating: 24 VDC filtered
- Current:
  - Maximum for any one circuit - 3.0 amps special application, 300mA regulated
  - Maximum total continuous current for all output:
    FCPS-24S6 - 4.0 amps
    FCPS-24S8 - 6.0 amps
  - Maximum total short term current (one hour maximum) for all outputs:
    FCPS-24S6 - 6.0 amps
    FCPS-24S8 - 8.0 amps
- Output Circuit Types:
  - Four Style Y NACs (require 4.7 KΩ End-of-Line Resistors) or
    Style Z NACs using the optional ZNAC-4 Class A converter module
    OR
  - Four resettable or nonresettable 24 VDC power outputs
- Refer to the *Notifier Device Compatibility Document #15378* for listed compatible devices.
- For wiring requirements, refer to “Wire Requirements” on page 43.

Trouble Relay Contact Rating - TB5

- Fail-safe Form-C relay (normally energized, transfers with loss of power)
- 5.0 amps @ 24 VDC or 5.0 amps @ 30 VAC

Secondary Power (battery) Charging Circuit - JP4

- Supervised, nonpower-limited
- Supports lead acid type batteries only
- Float Charge Voltage: 27.6 VDC
- Maximum Charge Current: 1.5 A
- Battery fuse (F1) 15A, 32V (Canadian version is **nonreplaceable** 12A, 32V)
- Maximum Battery Capacity: 18.0 AH
- Minimum Battery Capacity: 7.0 AH
- Power supply draws maximum standby current of 65 mA from batteries

Auxiliary Special Application Power Output - TB4 Terminals 9 (+) & 10 (-)

- Special application power
- Power-limited (Class 2), nonsupervised
- Voltage Rating: 24 VDC
- Current:
  - 170 mA maximum with internal 7.0 Amp Hour batteries
  - 500 mA maximum with external 18.0 Amp Hour batteries

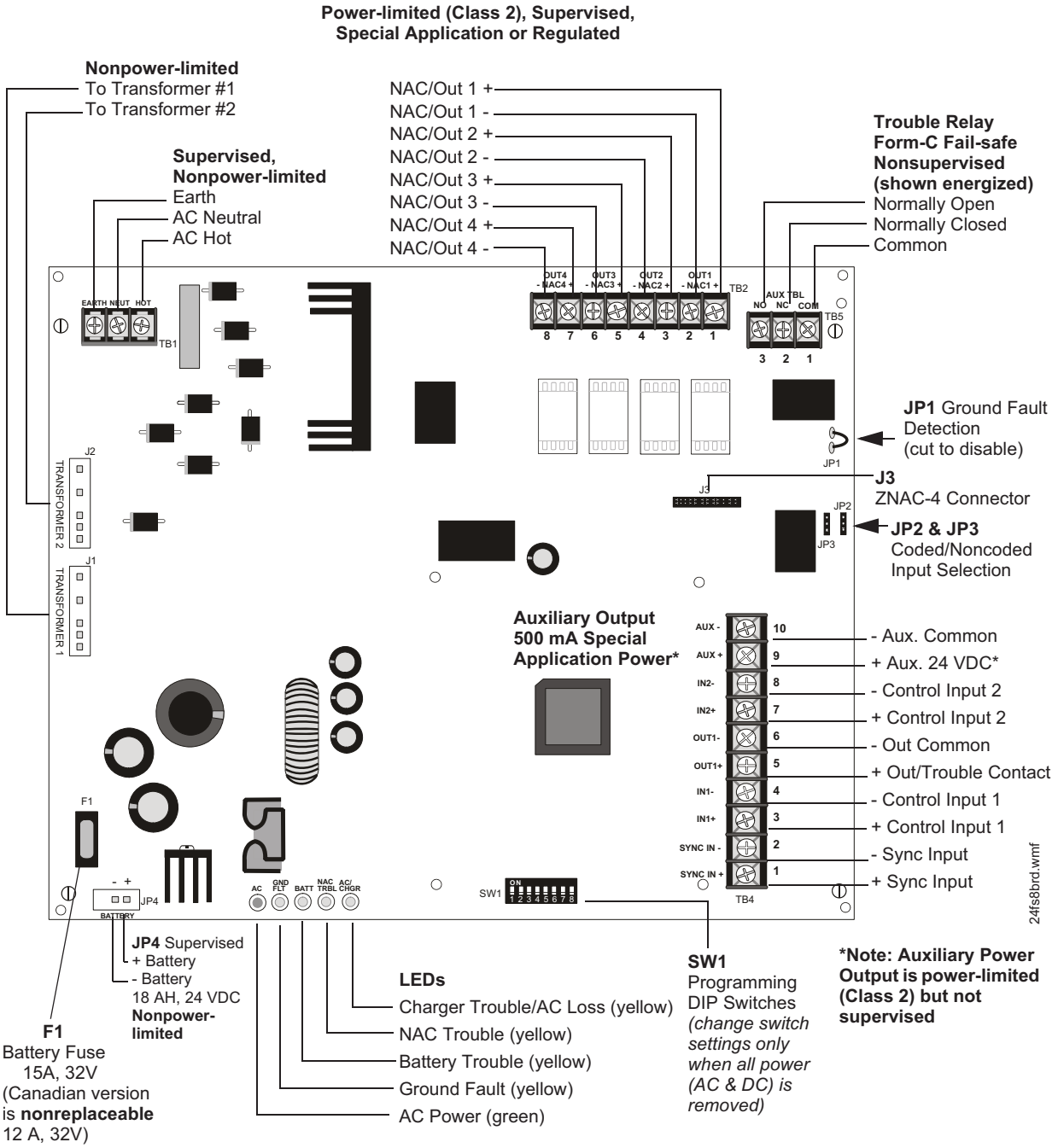


Figure 1.1 FCPS-24S Board Layout

1.7 General

The FCPS may be used in a number of different applications. It may be used as a remotely-mounted power supply and battery charger where it can provide up to four coded or noncoded, synchronized or nonsynchronized NACs (Notification Appliance Circuits). Alternatively, output #4 can be used as a door holder circuit which will provide a steady 24 VDC output until an alarm condition or AC fail condition causes it to drop to 0 VDC following a 10 second delay. All four outputs can also provide power.

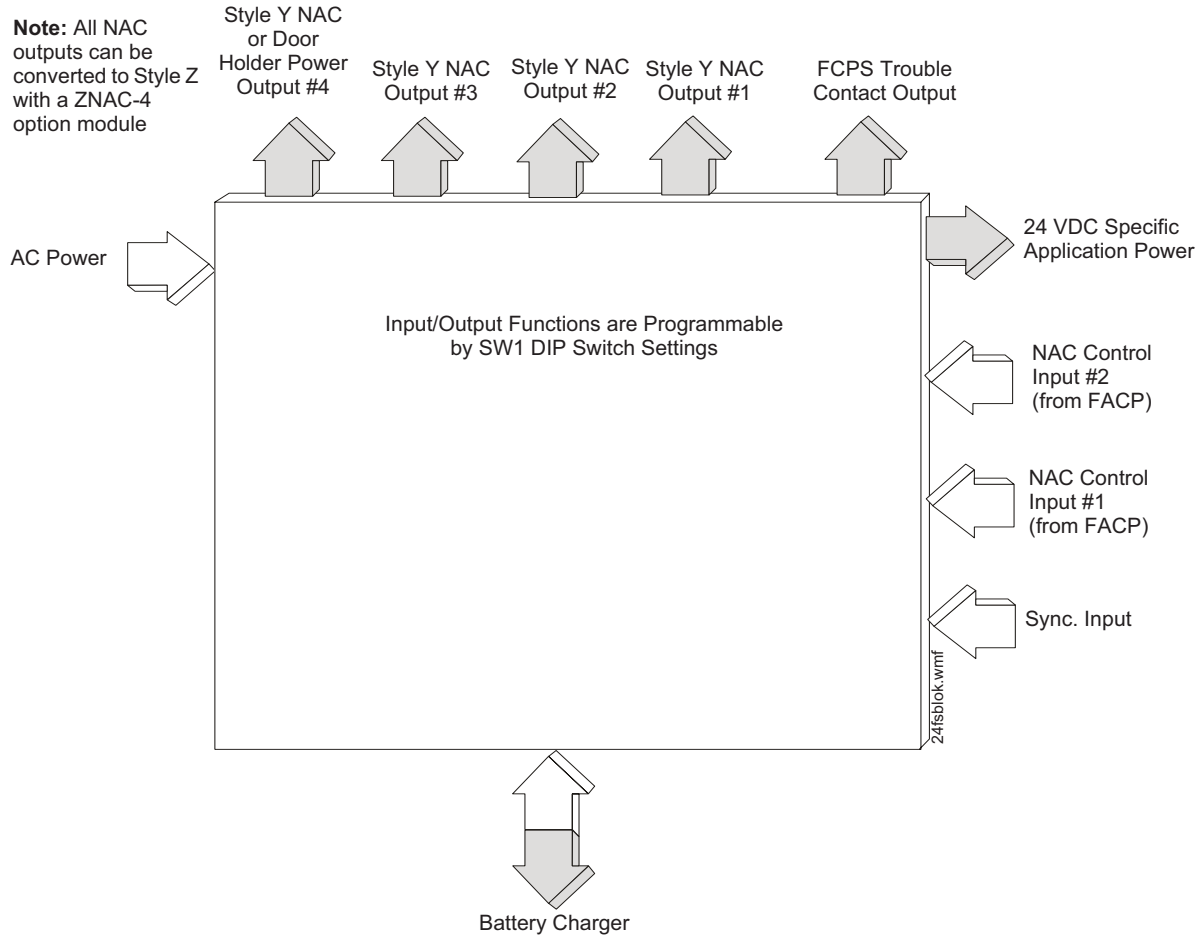


Figure 1.2 Simplified FCPS Block Diagram

One possible application for the FCPS remote power supply utilizes the NAC repeater feature. In this application, one or two NACs are connected from the main FACP to the remote power supply control input circuits. When the control input circuits are activated by the reverse polarity of the NACs, the power supply will activate its corresponding output circuits as programmed by SW1 DIP switch configuration (refer to Table 3.1 on page 21).

During the inactive state, the remote power supply supervises its NAC field wiring for short and open conditions. If a fault is detected, the power supply will enter a trouble condition and illuminate the NAC Trouble LED. When the NACs are activated, the supervision is disabled and the circuits are no longer supervised (except for short circuit conditions). Supervision of other power supply faults such as low battery, battery charger trouble, ground fault and AC loss will continue and may be monitored via the power supply trouble relay.

If an application requires that all four outputs activate at the same time, only one NAC is required from the FACP. For this application, the NAC is connected to control input circuit #1 and SW1 DIP switch is set for this operation.

Section 2: Installation

Carefully unpack the system and check for shipping damage. Select a location for the cabinet that is in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the power supply. With the hinge mounting on the left, determine the number of conductors required for the devices to be installed and determine the appropriate knockouts. All wiring must be in accordance with the National and/or Local codes for fire alarm systems and power supplies.

2.1 Backbox Mounting

CAUTION: STATIC SENSITIVE COMPONENTS
THE CIRCUIT BOARD CONTAINS STATIC-SENSITIVE COMPONENTS. ALWAYS GROUND YOURSELF WITH A PROPER WRIST STRAP BEFORE HANDLING ANY BOARDS SO THAT STATIC CHARGES ARE REMOVED FROM THE BODY. USE STATIC SUPPRESSIVE PACKAGING TO PROTECT ELECTRONIC ASSEMBLIES.

1. Remove the PC board and transformers from the backbox before installing backbox. Set the board and transformers aside in a safe, clean place. *Avoid static discharge which may damage static sensitive components on the board.*
2. Mark and predrill holes for the top two keyhole mounting bolts.
3. Install two upper fasteners in the wall with the screw heads protruding approximately ¼".
4. Using the upper keyholes, mount the backbox over the two screws.
5. Mark the lower two holes, remove the backbox from the wall and drill the mounting holes.
6. Mount the backbox, install the remaining fasteners and tighten all screws.
7. When the location is dry and free of construction dust, reinstall the PC board and transformers and continue with the installation.
8. **IMPORTANT!** Make certain to connect the supplied *grounding strap* between the *Earth* terminal on TB1 (AC Terminal Block) of the main circuit board and the chassis *ground stud* as illustrated in Figure 2.1:

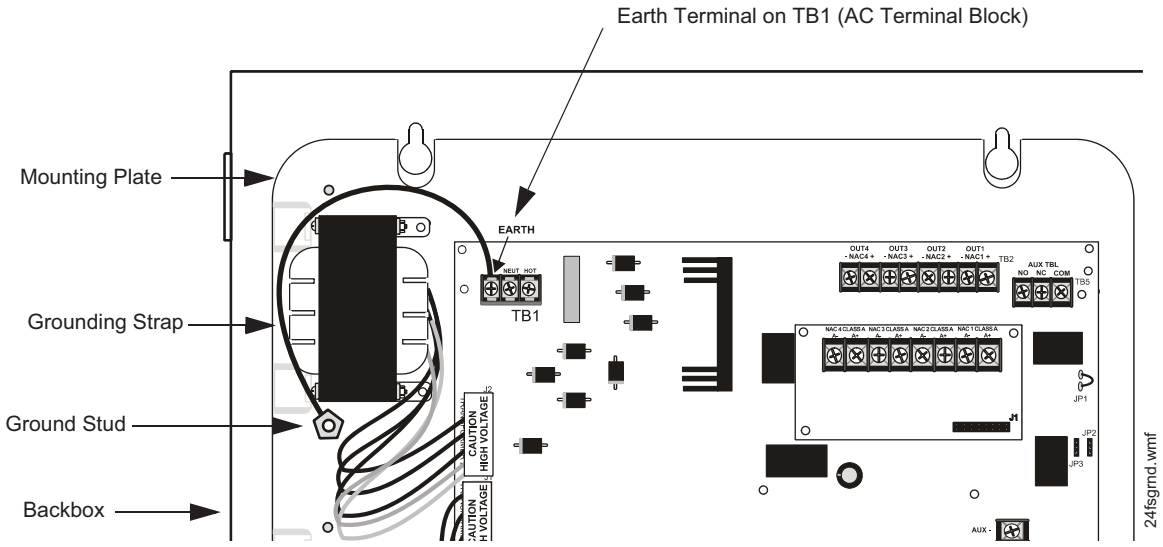


Figure 2.1 Grounding Strap

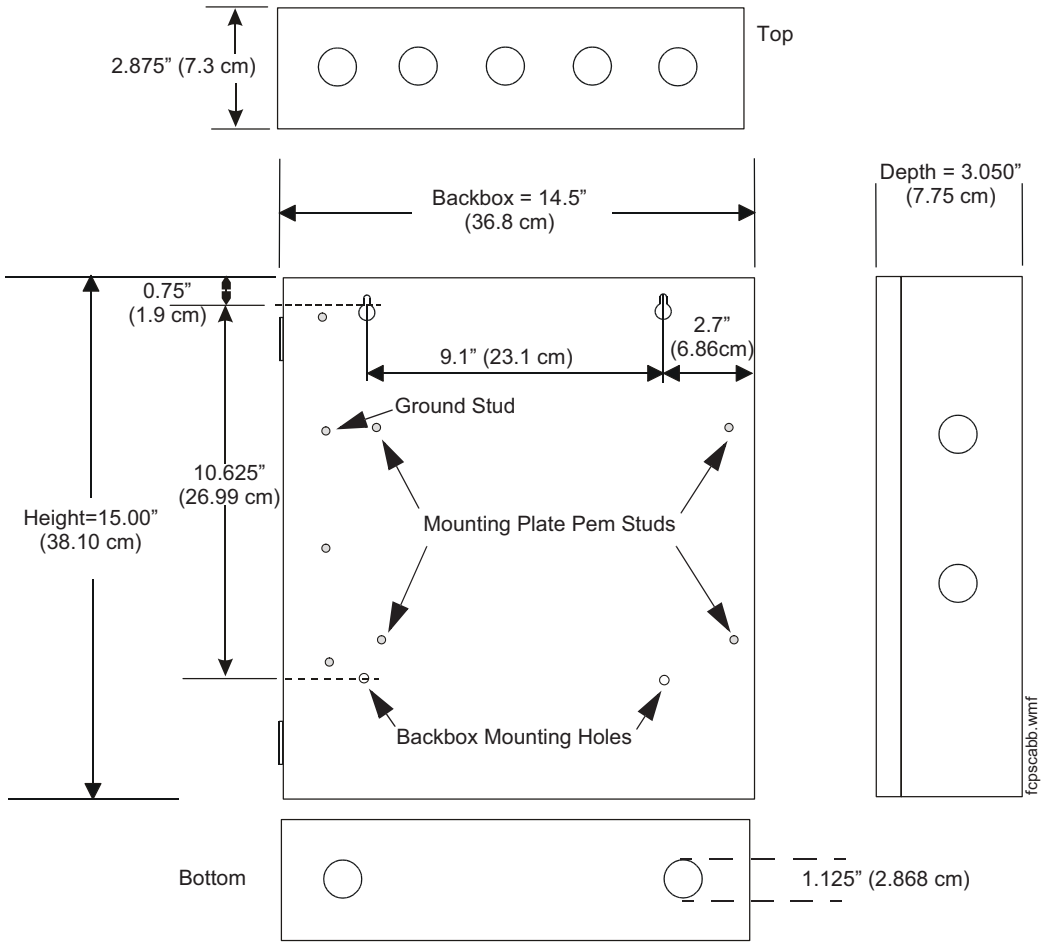


Figure 2.2 Backbox Mounting Dimensions

2.2 NAC Circuit Wiring

2.2.1 Style Y (Class B)

The standard configuration for NACs is Style Y (Class B) as shown in Figure 2.3.

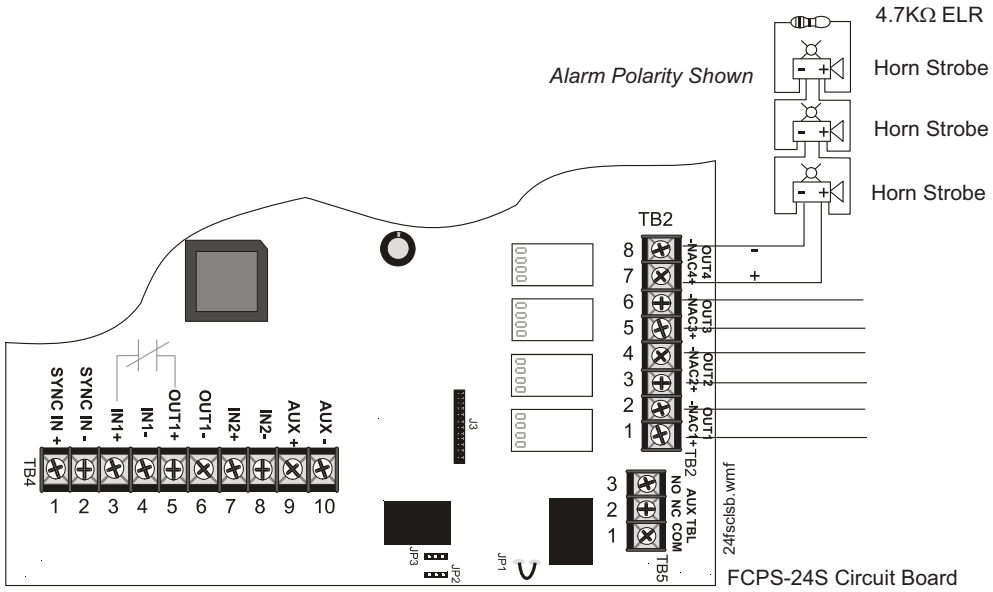


Figure 2.3 NAC Style Y (Class B)

2.2.2 ZNAC-4 Class A Option Module

The ZNAC-4 is an optional Class A conversion module which mounts to connector J3 on the upper right side of the FCPS-24S circuit board. This module allows the FCPS-24S6 or FCPS-24S8 to support Style Z (Class A) Notification Appliance Circuits.

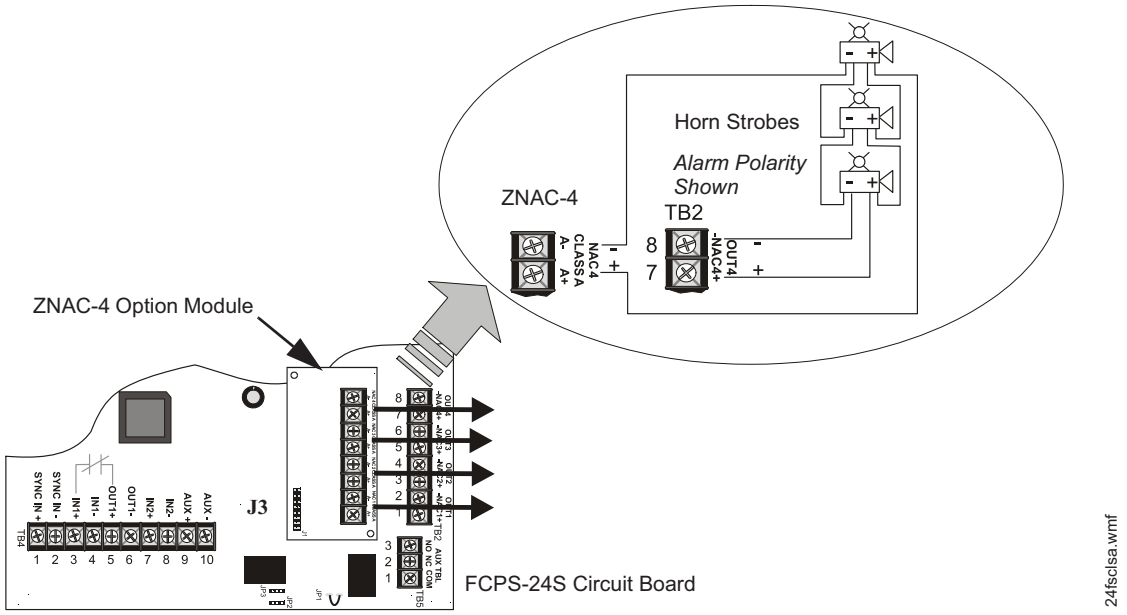
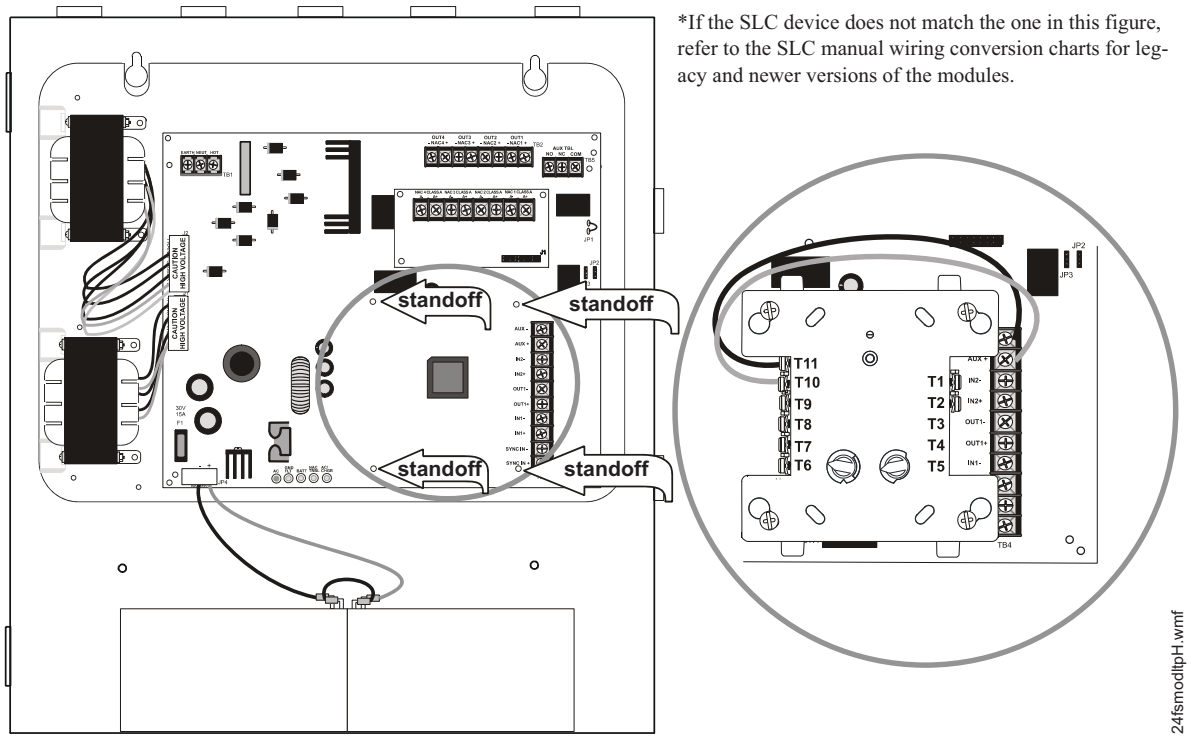


Figure 2.4 Style Z (Class A) NACs using ZNAC-4 Option Module

2.3 Addressable Module Mounting

The FCPS-24S has been designed to allow the mounting of an addressable control, relay or monitor module on the main circuit board inside the power supply cabinet with the module status LED visible through the closed door. This allows power to be fed from the FCPS-24S Auxiliary Power output directly to the module, if needed, without running the power wires outside the cabinet. As an example, Figure 2.5 illustrates wiring from the Auxiliary power output terminals to a FCM-1 control module's terminals 3 (-) and 4 (+).

NOTE: The module mounting kit (P/N 90286) is pre-installed on the power supply main circuit board.



Module Installation

1. Place addressable module over (4) standoffs and secure with (4) supplied screws.
2. Wire module as shown in illustration above.

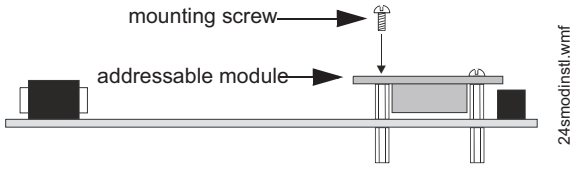


Figure 2.5 Mounting Module In FCPS-24S Cabinet

2.4 NEC Power-limited (Class 2) Wiring Requirements

Power-limited (Class 2) and nonpower-limited circuit wiring must remain separated in the cabinet. All power-limited (Class 2) circuit wiring must remain at least 0.25" away from any nonpower-limited circuit wiring. Furthermore, all power-limited (Class 2) circuit wiring and nonpower-limited circuit wiring must enter and exit the cabinet through different conduits. One such example of this is shown below. Your specific application may require different conduit knockouts to be used. Any conduit knockouts may be used. For power-limited (Class 2) applications, use of conduit is optional.

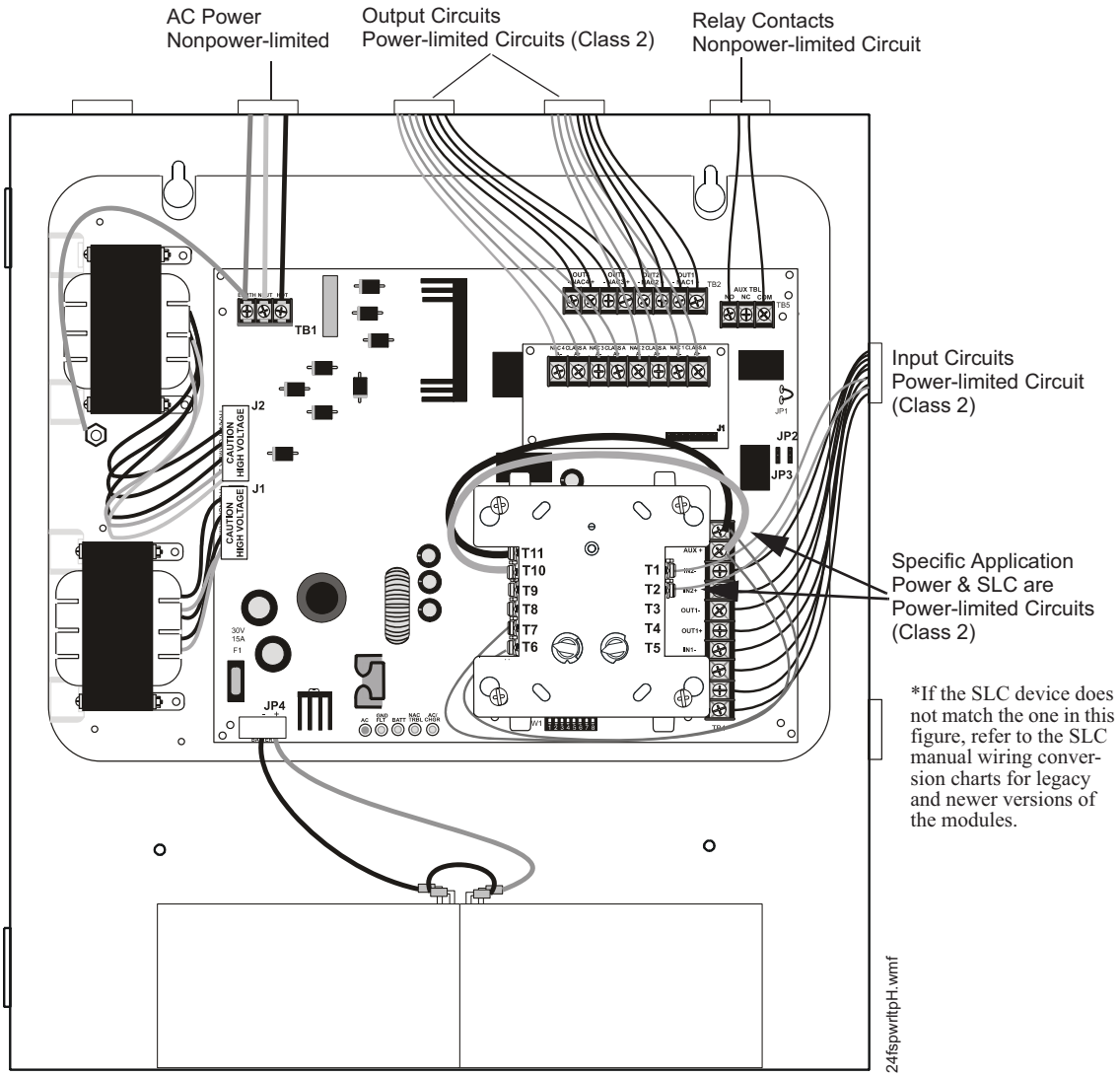


Figure 2.5 Power-limited (Class 2) Wiring Example

Notes

Section 3: Programming Options

This section describes the programming options available via DIP switch settings. The FCPS can be field programmed using option DIP switch SW1 which is located in the lower center of the circuit board. Refer to the following illustration for switch location and DIP switch placement in the ON and OFF positions.

Important: *Change DIP switch settings only when all power (AC & DC) is removed.*

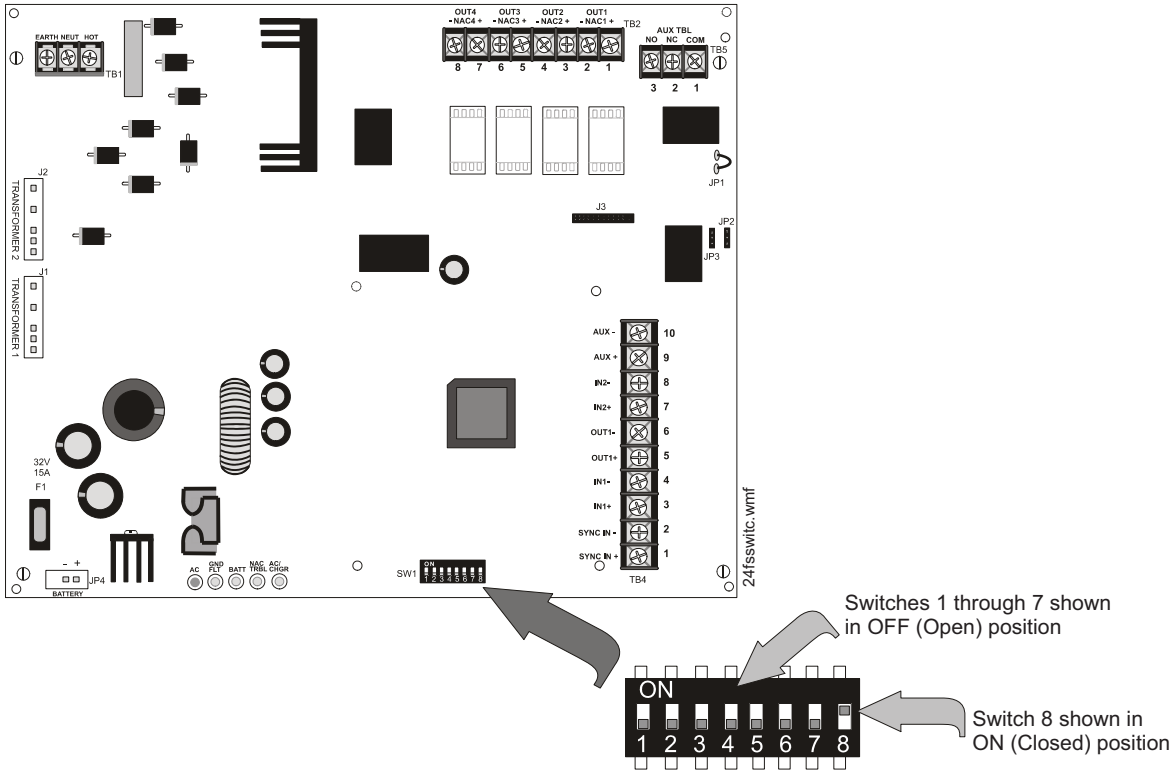


Figure 3.1 Field Programming DIP Switches

3.1 DIP Switch Settings

The following table lists the FCPS programmable features and the switch settings required to select a particular feature. A detailed description of each feature is presented in the following pages.

SW1 DIP Switch	ON	OFF
1	This switch works in conjunction with switch 2 to determine the Strobe Synchronization Type[1].	
2	**1 OFF, 2 OFF** = no sync (steady +24V) - **default** **1 OFF, 2 ON** = System Sensor **1 ON, 2 OFF** = Gentex **1 ON, 2 ON** = Wheelock	
3	FCPS configured for Slave Synchronization	FCPS configured for Master Synchronization - **default**
4	Delay AC Fail Reporting for 2 Hours - **default** Aux. Trouble Relay responds to all troubles Internal Trouble contact responds to AC loss	No Delay in AC Fail Reporting Aux. Trouble Relay responds **only** to AC Fail/Brownout Internal Trouble contact does not respond to AC loss
5	This switch works in conjunction with switch 6 to determine Input to Output functions	
6	**5 OFF, 6 OFF = General Alarm - default** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 through 4[2] are controlled by Control Input #1; Sync Input is ignored. • FCPS configured as Slave (switch 3 ON), NAC Outputs 1 through 4[2] are controlled by Control Input #1; Sync Input is monitored[3]. • Resettable or nonresettable Auxiliary Power Output is available from TB4 Terminals 9 & 10. Control Input #2 determines if reset will occur (must go from On to Off for a minimum 6 second reset to occur). • Output #4 function follows DIP switch 8 setting. **5 OFF, 6 ON = Split Alarm** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 & 2 are controlled by Control Input #1 and Outputs 3 & 4[2] are controlled by Control Input #2; Sync Input is ignored. • FCPS configured as Slave[4] (switch 3 ON), NAC Outputs 1 & 2 are controlled by Control Input #1 and Outputs 3 & 4[2] are controlled by Control Input #2; Sync Input is monitored[3]. • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10. • Output #4 function follows DIP switch 8 setting. **5 ON, 6 OFF = Split Temporal** • FCPS configured as Master (switch 3 OFF), Control Input #1 controls NAC Outputs 1 & 2 and Control Input #2 controls Outputs 3 & 4[2] which will generate a Temporal code signal without sync; Sync Input is ignored. • FCPS configured as Slave (switch 3 ON), Control Input #1 controls NAC Outputs 1 & 2 and Control Input #2 controls Outputs 3 & 4[2] which will generate a Temporal code signal without sync; Sync Input is monitored for Outputs 1 & 2[3]. • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10. • Output #4 function follows DIP switch 8 setting. **5 ON, 6 ON = Selective Silence** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 through 4[2] are controlled by Control Input #1; Sync Input is ignored. • Control Input #2 determines when Selective Silence for all outputs will occur[5] • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10. • Output #4 function follows DIP switch 8 setting.	
7	Disable Charger	Enable Charger - **default**
8	Output Circuit #4 = Door Holder	Output Circuit #4 = NAC - **default**

Table 3.1 DIP Switch Settings

1 Strobe Synchronization only works with non-coded NACs.
2 If Door Closer function is selected (switch 8 ON), Output 4 does not function as an NAC, therefore sync input is ignored for it.
3 If *no synchronization* is selected by switches 1 & 2, the Sync Input is ignored.
4 When using Split Alarm with power supply configured for Slave Mode, System Sensor cannot be used (use System Sensor with Master Mode only).
5 Selective Silence allows the silencing of the sounder portion of a horn/strobe combination device without turning off the strobe.

3.2 Programmable Features Description

3.2.1 Synchronization Type Selection

Synchronization is a feature that controls the activation of notification appliances in such a way that all devices will turn on and off at exactly the same time. This is particularly critical when activating strobes which must be synchronized to avoid random activation and a potential hazard or confusion. The FCPS can be programmed to operate with a variety of manufacturer's devices. Note that strobe synchronization works only with non-coded NACs.

DIP switches 1 and 2 are used to select the type of synchronization as listed below:

DIP Switch 1	DIP Switch 2	Synchronization Type
OFF	OFF	no synchronization (steady 24V)
OFF	ON	System Sensor
ON	OFF	Gentex
ON	ON	Wheelock

Table 3.2 Sync Type Settings

Maximum Number of Strobes for Synchronization

The total current draw for each Notification Appliance Circuit cannot exceed 3.0 amps special application, 300mA regulated. Refer to the manufacturer's documentation supplied with the strobes to determine the maximum current draw for each strobe and ensure that the circuit maximum is not exceeded.

To ensure proper strobe and circuit operation, there is also a limit to the number of strobes that can be attached to each circuit. Following is a table of the strobes that have been tested with the power supply and the maximum number that can be connected to each NAC when using the lowest candela settings. *Make sure that the NAC maximum current is not exceeded:*

Strobe Manufacturer	FCPS-24S6 (max. strobes)	FCPS-24S8 (max. strobes)
System Sensor	51	51
Wheelock	30	40
Gentex	39	39

3.2.2 Synchronization Mode - Master/Slave

The FCPS power supply can be configured for Master or Slave Synchronization by setting DIP switch 3 ON for Slave or OFF for Master mode.

In some installations, it is necessary to synchronize the flash timing of all strobes in the system for ADA compliance. Strobes accomplish this by monitoring very short timing pulses on the NAC power which are created by an FACP with synchronization capability. When installed at the end of a NAC wire run, this power supply can track (that is follow) the strobe synchronization timing pulses on the existing NAC wire run. This maintains the overall system flash timing of the additional strobes attached to this power supply.

When this power supply is configured as a *sync generator* (Master Synchronization mode), the Sync Input terminals are not used. The power supply is the originator of the strobe synchronization pulses on its NAC outputs. In *sync generator* mode, the sync type (System Sensor, Wheelock, or Gentex) is selectable via DIP switches 1 and 2.

When this power supply is configured as a *sync follower* (Slave Synchronization mode), the power supply's NAC outputs track the strobe synchronization pulses present at the supply's Sync Input terminals. The pulses originate from an upstream FACP or other power supply. Some FACPs pro-

vide synchronization timing pulses from a dedicated sync output connector. Connect the FCPS sync input terminals to the FACP sync output connector instead of the FACP NAC.
Note that the Synchronization Type configured by DIP switches 1 and 2 must be set to the same type as the signal being fed to the Sync Input circuit in the event that Selective Silence is employed.

Important! In Slave Mode, if the Input is active, but no signal is present on the Sync Input circuit, the power supply will turn the NACs on steady until a sync signal appears. The NACs will turn off when the Input becomes inactive.

Also in Slave Mode, if the Input is active and the Sync Input is suddenly lost (FCPS or wiring failure), there will be a three second period when NAC outputs are indeterminate. After this three second period, the power supply will turn the NACs on steady until the Input becomes inactive.

3.2.3 AC Fail Delay/Aux. Trouble Relay Function

The AC Fail Delay feature provides the option to delay generation of a trouble signal upon the loss of AC power. In addition, the operation of the Aux. Trouble Relay is altered.

- DIP switch 4 set to the ON position will delay the generation of an AC Loss/brownout trouble signal for 2 hours. In addition, the Aux. Trouble Relay will immediately respond to all trouble conditions on the power supply.
- DIP switch 4 set to the OFF position will allow the FCPS to generate a trouble signal immediately on the loss of AC power. In addition, the Aux. Trouble Relay will respond **only** to AC power fail/brownout conditions.

Refer to "Supervision of FCPS-24S Faults" on page 26, for operation of internal NAC trouble relay in response to AC loss.

3.2.4 Input/Output Function

DIP switches 5 and 6 are used to determine the Input Control circuits that will activate the four output circuits and the function of the output circuits. For example, to configure a **General Alarm** operation in which Input Control Circuit #1 activates all four output NACs, DIP switches 5 and 6 are both set to the OFF position. In this configuration, the Sync Input circuit is ignored if the power supply is set as a Master but will be monitored if the supply is set as a Slave. In addition, if the Auxiliary Power output is set as a resettable output, the circuit connected to Control Input Circuit #2 will control the auxiliary power reset function.

The following table details the four possible input/output configurations:

DIP Switch 5	DIP Switch 6	Input/Output Function
OFF	OFF	**General Alarm** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 through 4[1] are controlled by Control Input #1; Sync Input is ignored. • FCPS configured as Slave (switch 3 ON), NAC Outputs 1 through 4[2] are controlled by Control Input #1; Sync Input is monitored[2]. • Resettable or nonresettable Auxiliary Power Output is available from TB4 Terminals 9 & 10. Control Input #2 determines if reset will occur (must go from On to Off for a minimum 6 second reset to occur).
OFF	ON	**Split Alarm** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 & 2 are controlled by Control Input #1 and Outputs 3 & 4[1] are controlled by Control Input #2; Sync Input is ignored. • FCPS configured as Slave[3] (switch 3 ON), NAC Outputs 1 & 2 are controlled by Control Input #1 and Outputs 3 & 4[1] are controlled by Control Input #2; Sync Input is monitored[2]. • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10.

Table 3.3 Input/Output Configurations

ON	OFF	**Split Temporal** • FCPS configured as Master (switch 3 OFF), Control Input #1 controls NAC Outputs 1 & 2 and Control Input #2 controls Outputs 3 & 4[1] which will generate a Temporal code signal without sync; Sync Input is ignored. • FCPS configured as Slave (switch 3 ON), Control Input #1 controls NAC Outputs 1 & 2 and Control Input #2 controls Outputs 3 & 4[1] which will generate a Temporal code signal without sync; Sync Input is monitored for Outputs 1 & 2[2]. • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10.
ON	ON	**Selective Silence[4]** • FCPS configured as Master (switch 3 OFF), NAC Outputs 1 through 4[1] are controlled by Control Input #1; Sync Input is ignored. • Control Input #2 determines when Selective Silence for all outputs will occur. • Only nonresettable Auxiliary Power is available from TB4 Terminals 9 & 10

Table 3.3 Input/Output Configurations

1 If Door Closer function is selected (switch 8 ON), Output 4 does not function as an NAC, therefore sync input is ignored for Output 4.
2 If *no synchronization* is selected by switches 1 & 2, the Sync Input is ignored.
3 When using Split Alarm with power supply configured for Slave Mode, System Sensor cannot be used (use System Sensor with Master Mode only).
4 Selective Silence allows the silencing of the sounder portion of a horn/strobe combination device without turning off the strobe.

Auxiliary Power Control

The 24 VDC Auxiliary power from TB4 Terminals 9(+) & 10(-) can be resettable or nonresettable power only when the power supply is configured for General Alarm operation. For all other configurations, the auxiliary power output is only nonresettable.

In the General Alarm configuration, the Auxiliary power output can be made resettable by applying a steady signal to Control Input 2 (positive 12 to 24 VDC on TB4 Terminal 7 and common on Terminal 8). Temporarily removing the voltage or reversing the polarity will cause the Auxiliary power output to reset for 6 seconds.

3.2.5 Charger Enable/Disable

The FCPS-24S battery charger can be disabled to accommodate an external battery charger. Setting DIP switch 7 to the default setting of OFF will enable the battery charger. Setting DIP switch 7 to the ON position will disable the charger. It should only be disabled if an external battery charger is being used for the FCPS-24S.

3.2.6 Door Closers

Output Circuit #4 can be configured as an NAC or door closer circuit. Setting DIP switch 8 to the OFF position will configure Output Circuit #4 as an NAC. Setting DIP switch 8 to the ON position will configure *only* Output Circuit #4 as a door closer circuit which will provide a steady 24 VDC to door holders until an alarm or AC fail condition removes the power following a 10 second delay.

Notes

Section 4: Trouble Supervision

4.1 Supervision via FACP Notification Appliance Circuit

4.1.1 Supervision of FACP to FCPS wiring

The FACP (Fire Alarm Control Panel) supervises the connection between itself and the FCPS-24S via the control panels NAC End-of-Line Resistor (ELR). The ELR must be installed at the FCPS end of the circuit, after the last notification appliance on the circuit. If no additional devices are connected from the FCPS Control Input terminals, the ELR must be connected across terminals 5 & 6 for Control Input Circuit #1 and across terminals 7 & 8 for Control Input Circuit #2. An open or short anywhere on the control panel's NAC or power supply NAC will be detected at the FACP as a NAC trouble.

IMPORTANT: *If additional notification appliances are connected to the Out terminals 5 & 6 of Control Input Circuit #1 or extended from Control Input Circuit #2 Terminals 7 & 8, the ELR must be installed after the last device on the circuit.*

4.1.2 Supervision of FCPS-24S Faults

The FACP will detect FCPS power supply faults as an open circuit condition on its NAC. An internal trouble contact is located between TB4 Terminal 3 (In+) and TB4 Terminal 5 (Out+). Any of the following conditions will cause the trouble contact to open, provided the FACP Notification Appliance Circuit is *not* in alarm. The following trouble conditions will cause a general NAC trouble:

- A field wiring fault on the NAC output of the power supply
- An AC fail condition at the power supply (**only** if SW1 switch 4 is ON and a 2 hour delay has expired. If SW1 switch 4 is OFF, the Internal Trouble contact will not respond to an AC fail condition)
- A battery fail condition at the power supply
- A battery charger fail on the power supply
- A ground fault condition on the power supply (zero impedance between power supply and ground)

Any power supply trouble will break the connection between the FACP and the ELR connected to Control Input #1 provided the FACP's NAC is *not* in alarm. The FACP's ELR must be placed after the last notification appliance connected to FCPS terminals 5 & 6 on TB4 or, if no devices are connected to these terminals, the ELR must be connected directly across terminals 5 & 6.

If trouble monitoring is required when the power supply is in alarm, the Trouble Relay at TB5 can be used for this purpose. An addressable monitor module may be used to monitor these contacts. Refer to "Aux. Trouble Relay/AC Fail Relay" on page 26 in the following section.



NOTE: Control Input #2 (terminals 7 & 8) cannot be used to supervise the power supply for internal troubles, but an ELR is still required for FACP wiring supervision.

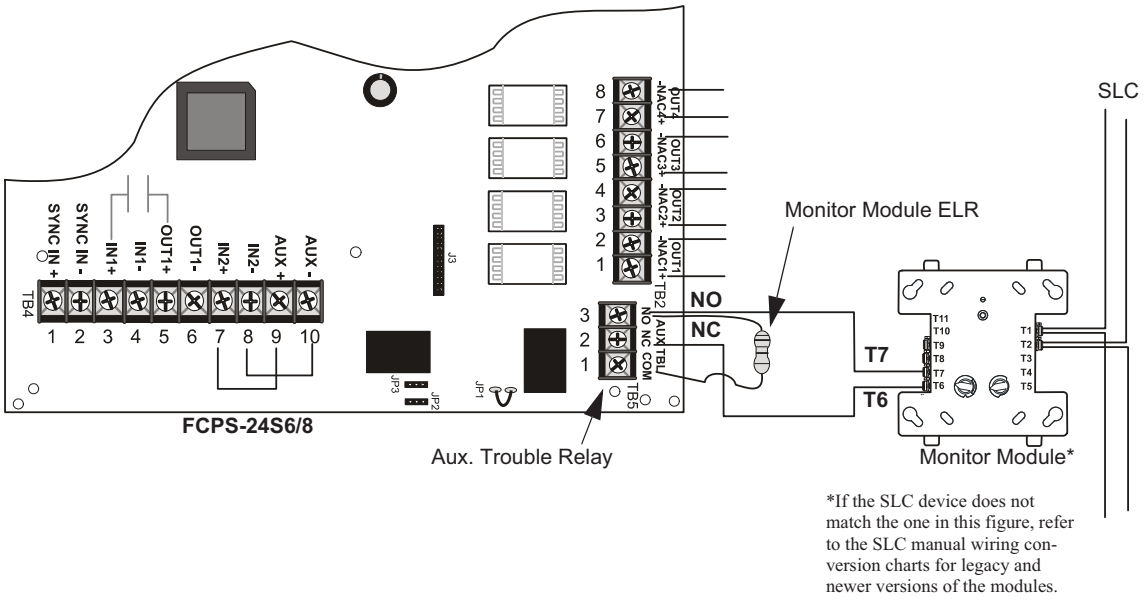
4.1.3 Aux. Trouble Relay/AC Fail Relay

The FCPS-24S power supply has one fail-safe Form-C aux. trouble relay located at TB5. The contacts can be monitored by an FACP input circuit or an addressable monitor module as illustrated below. The Aux. Trouble Relay responds to FCPS-24S power supply troubles depending on the setting of SW1 switch 4.

- With SW1 switch 4 set to the ON position, AC Fail/brownout reporting will be delayed 2 hours and the following trouble conditions will cause the normally energized Aux. Trouble Relay to change states regardless of whether the panel is in alarm or standby:
  - An AC fail condition at the power supply
  - A battery fail condition at the power supply
  - A battery charger fail on the power supply
  - A ground fault condition on the power supply (zero impedance between the power supply and ground
  - A field wiring fault on the NAC output of the power supply. (If the panel is in alarm, only a short circuit on the NAC will be detected as a trouble)

NOTE: The NAC Trouble LED will indicate which NAC circuit is in trouble by blinking once for Circuit 1, twice for Circuit 2, three times for Circuit 3 and four times for Circuit 4. If more than one circuit is in trouble, the LED will blink the highest circuit number in trouble.

- With SW1 switch 4 set to the OFF position, AC Fail/brownout reporting will occur immediately and the Aux. Trouble Relay will change state **only** for AC Fail/brownout conditions. A monitor module can be used to monitor the relay for AC fail.



4.2 AC Loss Reporting Delay

The reporting of AC loss to a central station is usually delayed in order to prevent multiple transmissions of AC loss and restoral, thus allowing AC power to stabilize. When a host FACP is programmed to delay AC loss reporting, the FCPS-24S must be configured to delay the reporting of AC fail. This is accomplished by setting SW1 DIP switch 4 to the ON position. This will prevent AC loss from being reported as a trouble condition for two hours.

Changing the AC Loss Reporting setting will also affect the functioning of the Trouble Relay. Refer to “Aux. Trouble Relay/AC Fail Relay” on page 26.

Note that the FCPS-24S power supply will immediately indicate loss of AC power by turning off the AC Power LED and turning on the Charger Trouble/AC Loss LED, regardless of the setting of SW1 DIP switch 4.

Section 5: Applications

5.1 Controlling Four NACs With One Input and Selective Silence

NOTE: The Relay Module is required only for this application with the power supply set as Master. If the power supply is set as Slave, the Relay Module is not required. In Slave mode, selective silence (horn mute) is provided by the FACP through the sync input.

In this application, the power supply has been set as a master with synchronized outputs and selective silence (see SW1 switch settings in following illustration). All four FCPS-24S output circuits, which are shown as NACs (Notification Appliance Circuits), can be controlled from one input such as an addressable control module as illustrated in Figure 5.1. *Only Mass Notification, Fire, or combo Mass Notification/Fire NACs are allowed in this configuration*. The control module can be powered from the FCPS-24S auxiliary 24 VDC power output (TB4, Terminals 9 & 10) and supervised by an EOL relay. An addressable relay module, *programmed as an alarm output and a silenceable point,* can be used as a selective silence input.

The control module is shown to demonstrate the use of a remotely mounted device associated with an addressable fire alarm control panel. The module could be replaced with any circuit capable of polarity reversal, such as an FACP NAC.

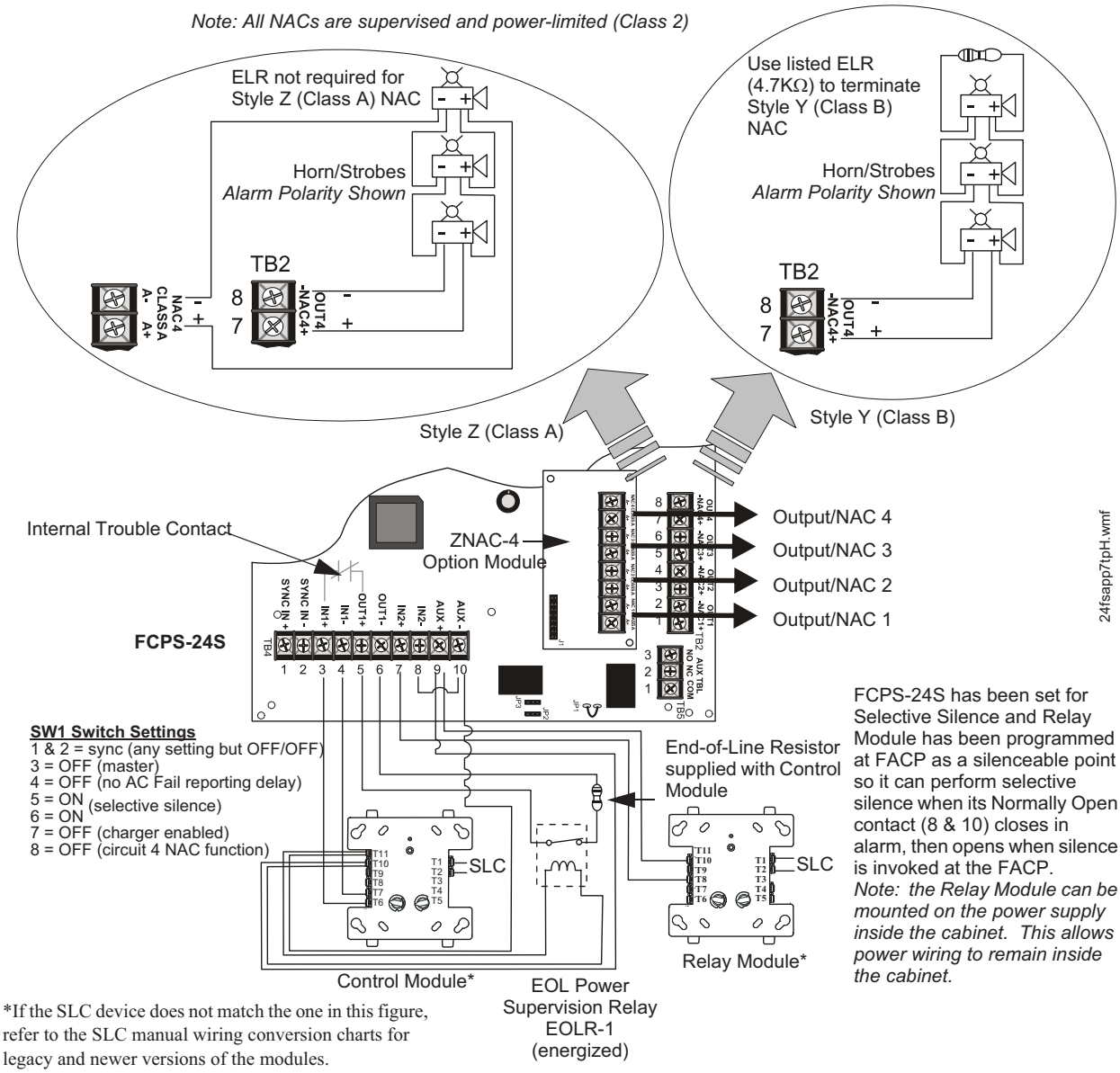
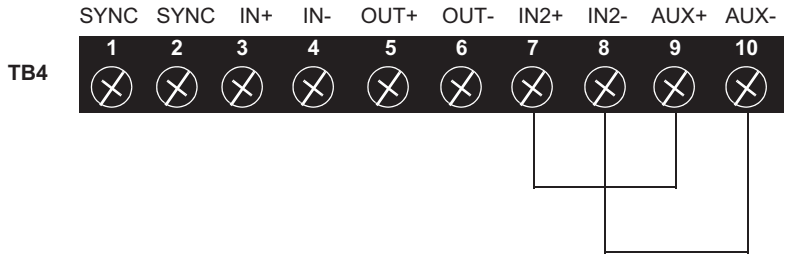


Figure 5.1 Controlling Four Outputs With One Input

The following notes apply to Figure 5.1 on page 29.

1. When the FCPS-24S power supply is in an inactive state (control module not active), a trouble on the power supply will result in an open circuit condition on the control module output circuit (monitored by End-of-Line Resistor across TB4, Terminals 5 & 6). As an alternative, the trouble contacts at TB5 of the power supply can also be used for independent trouble monitoring.
2. The addressable relay module must be programmed as a silenceable point at the FACP to allow selective silence of horn/strobe devices. The Normally Open contact of the relay module is connected between TB4 Terminal 7 (IN2 +) and Terminal 9 (Aux. Power +).
3. Do not loop wires under screw terminals. Break wires to maintain proper supervision.
4. An End-of-Line Resistor must be installed between TB4, Terminals 5 & 6 for control module wiring supervision (the ELR value is dependent on the module employed).

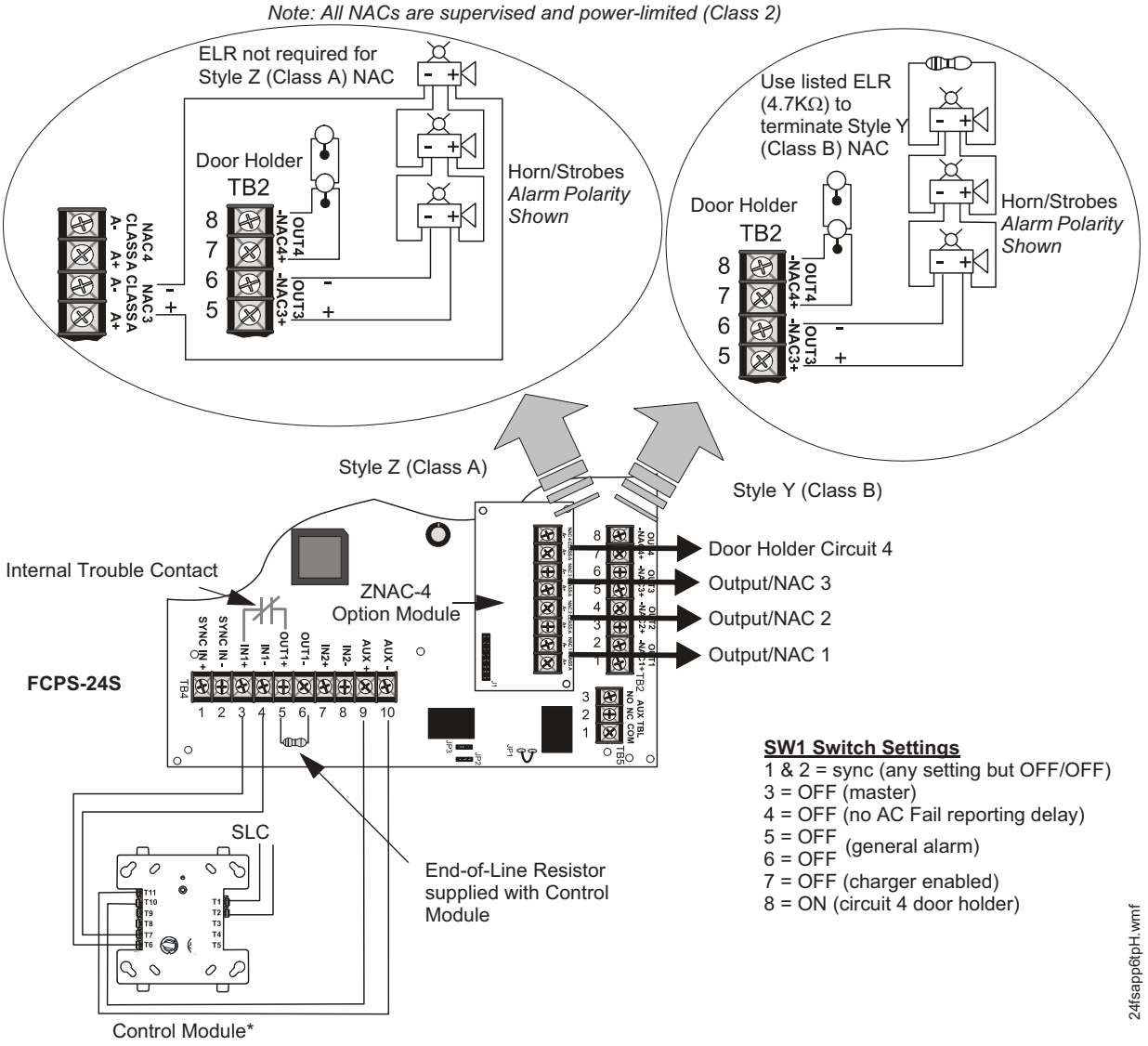
5. Supervise the power wiring between the FCPS-24S auxiliary 24 VDC output on TB4, Terminals 9 & 10 with an EOL relay (P/N: EOLR-1).
6. For a list of compatible devices, refer to the *Notifier Device Compatibility Document #15378*.
7. **IMPORTANT!** When the power supply is programmed for both *Selective Silence* and *Slave Mode*, TB4 Terminal 7 (IN+) must be jumpered to Terminal 9 (AUX+) and Terminal 8 (IN-) must be jumpered to Terminal 10 (AUX-). The FACP will control the Selective Silence feature with this configuration.
   If the terminals are not jumpered as indicated, the horn portion of the horn/strobes will be silenced at all times.



5.2 Controlling Three NACs and One Door Holder With One Input

In this application, the power supply has been set as a master with synchronized outputs. All four FCPS-24S output circuits, three NACs and one door holder, can be controlled from one input such as an addressable control module as illustrated in Figure 5.2. The control module can be powered from the FCPS-24S auxiliary 24 VDC power output (TB4, Terminals 9 & 10).

The control module is shown to demonstrate the use of a remotely mounted device associated with an addressable fire alarm control panel. The module could be replaced with any circuit capable of polarity reversal, such as an FACP Notification Appliance Circuit.



*If the SLC device does not match the one in this figure, refer to the SLC manual wiring conversion charts for legacy and newer versions of the modules.

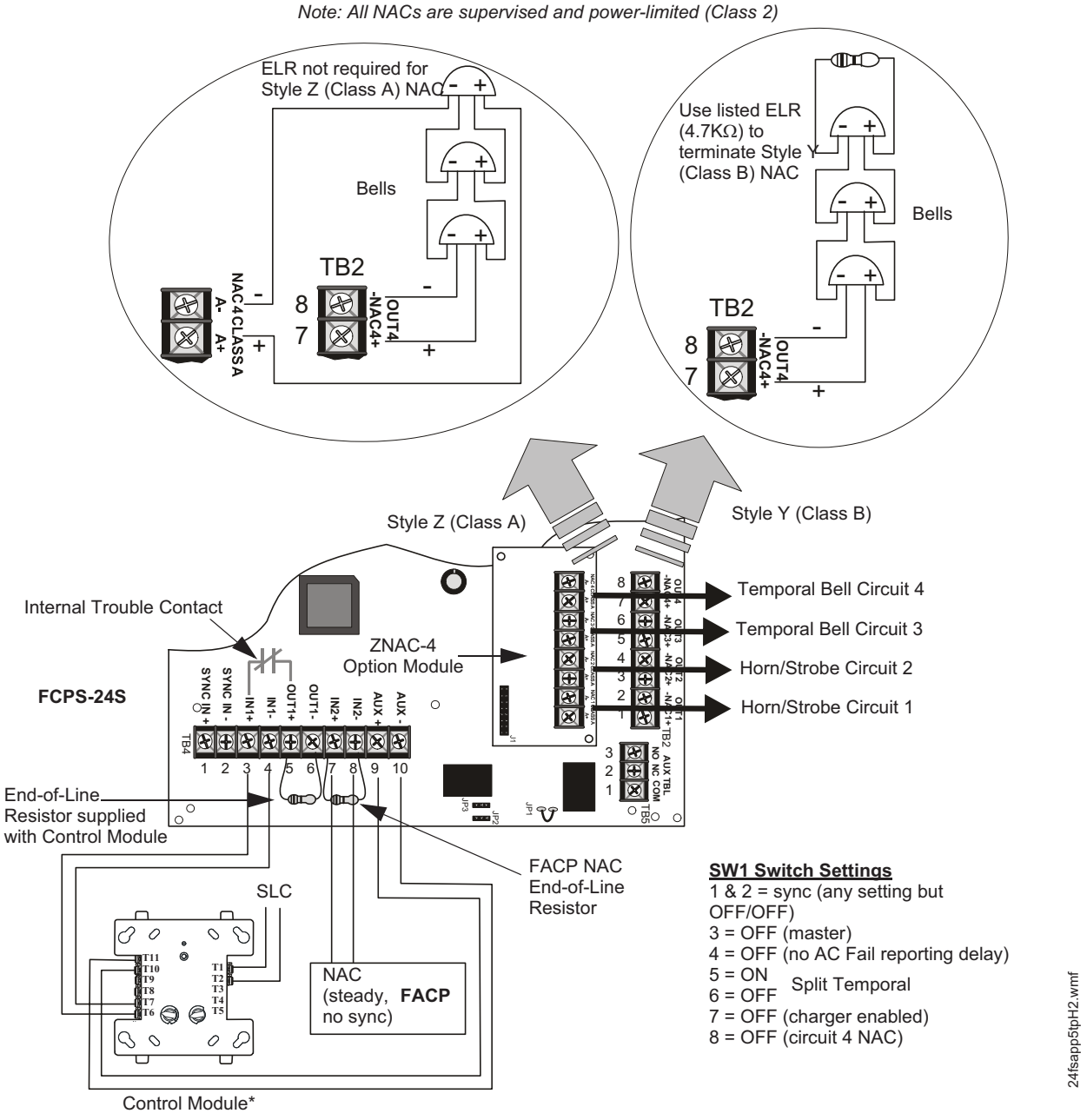
Figure 5.2 Controlling Three NACs and One Door Holder With One Input

The following notes apply to Figure 5.2 on page 31.

1. The Output 4 door holder circuit will deactivate 10 seconds after Control Input #1 is activated or AC power is lost.
2. When the FCPS-24S power supply is in an inactive state (control module not active), a trouble on the power supply will result in an open circuit condition on the control module output circuit (monitored by an End-of-Line Resistor across Terminals 5 & 6). As an alternative, the trouble contacts at TB5 of the power supply can also be used for independent trouble monitoring.
3. Do not loop wires under screw terminals. Break wires to maintain proper supervision.
4. An End-of-Line Resistor must be installed between terminals 5 & 6 for control module wiring supervision (the ELR value is dependent on the module employed).
5. For a list of compatible devices, refer to the *Notifier Device Compatibility Document #15378*.

5.3 Split Temporal Mode of Operation

In this application, the power supply has been set as a master with two synchronized and two non-synchronized outputs as determined by the Split Temporal mode feature. Control Input #1 (TB4, Terminals 3 & 4) is connected to an addressable control module which will cause the synchronized power supply output circuits 1 & 2 to turn on. Control Input #2 (TB4, Terminals 7 & 8) is connected to an FACP Notification Appliance Circuit which is used to activate the power supply's temporal output circuits 3 & 4.



*If the SLC device does not match the one in this figure, refer to the SLC manual wiring conversion charts for legacy and newer versions of the modules.

Figure 5.3 Split Temporal Mode Application

The following notes apply to Figure 5.3 on page 32.

1. When the FCPS-24S power supply is in an inactive state (control module not active), a trouble on the power supply will result in an open circuit condition on the control module output circuit (monitored by an End-of-Line Resistor across Terminals 5 & 6). As an alternative, the trouble contacts at TB5 of the power supply can also be used for independent trouble monitoring.
2. Do not loop wires under screw terminals. Break wires to maintain proper supervision.
3. An End-of-Line Resistor must be installed between terminals 5 & 6 for control module wiring supervision (the ELR value is dependent on the module employed) and across terminals 7 & 8 for FACP NAC wiring supervision (the ELR value is dependent on the NAC).
4. For a list of compatible devices, refer to the *Device Compatibility Document*.

5.4 Remote Supply With Resettable and Nonresettable Power

The FCPS-24S can be used as a remote stand-alone power supply to provide power to any devices that require filtered, resettable or nonresettable power. The FCPS-24S6 can provide up to 4 amps of continuous current and the FCPS-24S8 can provide up to 6 amps of continuous current. The power supply must be set for Split Alarm mode. Output circuits 1 & 2 are configured as resettable power outputs by connecting the resettable power from an FACP to Control Input 1 Terminals 3(+) & 4(-) on TB4 of the FCPS-24S. Output circuits 3 & 4 are configured as nonresettable power outputs by connecting jumpers between the auxiliary 24 VDC output on TB4 to the Control Input 2 terminals on TB4 [Terminals 9(+) to 7(+) and 10(-) to 8(-)].



NOTE: All four outputs can be configured as resettable or all four can be configured as nonresettable by setting the power supply for General Alarm and then connecting a resettable power source to Control Input 1 or a nonresettable power source, such as the Aux. Power output of the FCPS-24S, to Control Input 1.

For addressable panel applications, an addressable monitor module can be used to monitor the trouble contact of the FCPS-24S and the resettable power connection from the FACP using an End-of-Line power supervision relay. If the FCPS-24S enters a trouble condition, the Normally Closed trouble contact will open and if the resettable power from the FACP is lost, the Normally Closed power supervision relay contact will open.

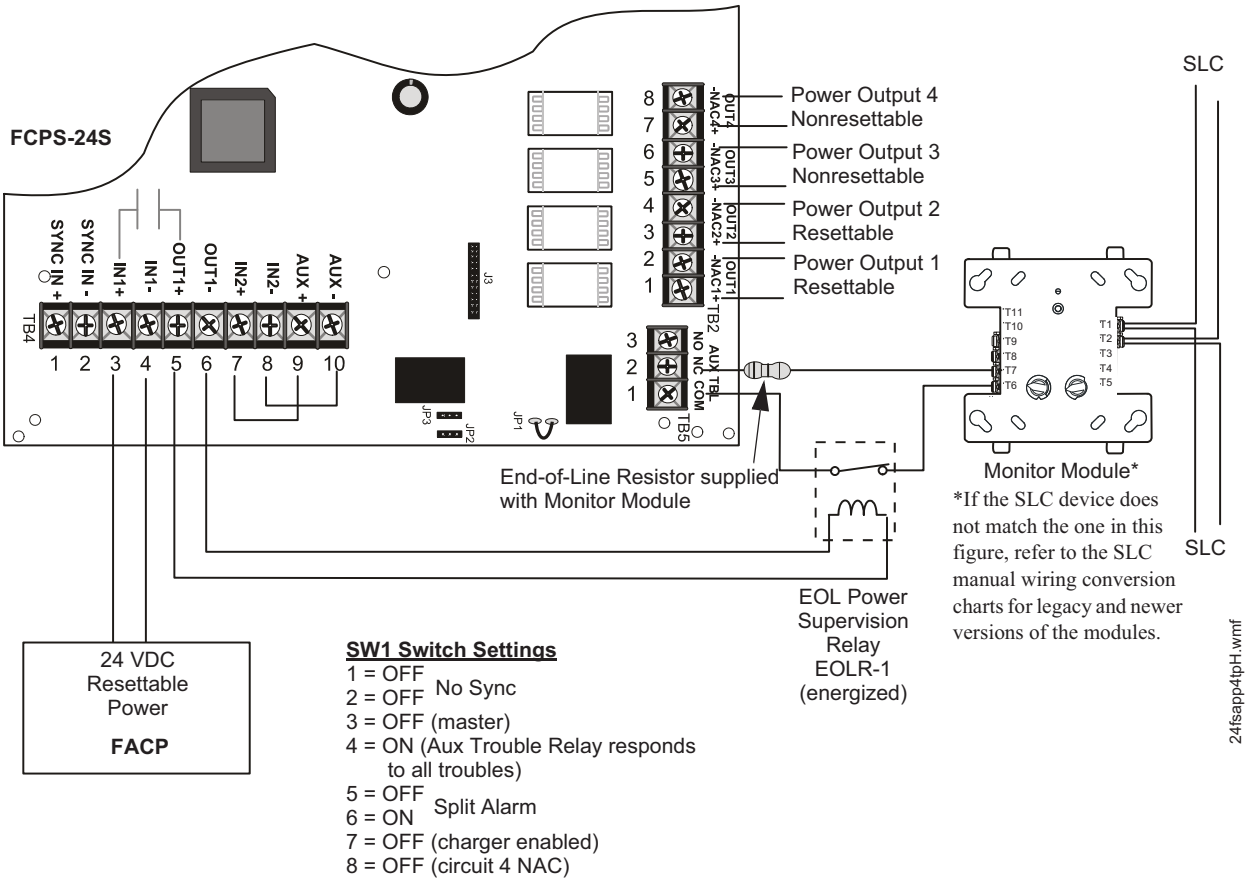


Figure 5.4 Remote Power Supply Application

The following notes apply to Figure 5.4 on page 34.

1. An End-of-Line Resistor must be installed between TB5, Terminal 1 (trouble relay common) and the monitor module input circuit for module wiring supervision (the ELR value is dependent on the module employed).
2. An End-of-Line power supervision relay must be connected between TB4, Terminals 5 & 6. The Normally Closed (when energized) power supervision relay contact must be in series with the End-of-Line Resistor referred to in note 1.
3. Do not loop wires under screw terminals. Break wires to maintain proper supervision.
4. For a list of compatible devices, refer to the *Notifier Device Compatibility Document #15378*.

5.5 Master FACP with Slave FCPS-24S Power Supply

In this application, an FCPS-24S power supply, configured as a Slave unit, is connected to a master FACP programmed for synchronized output. The power supply should be set for synchronization which matches the FACP programming.

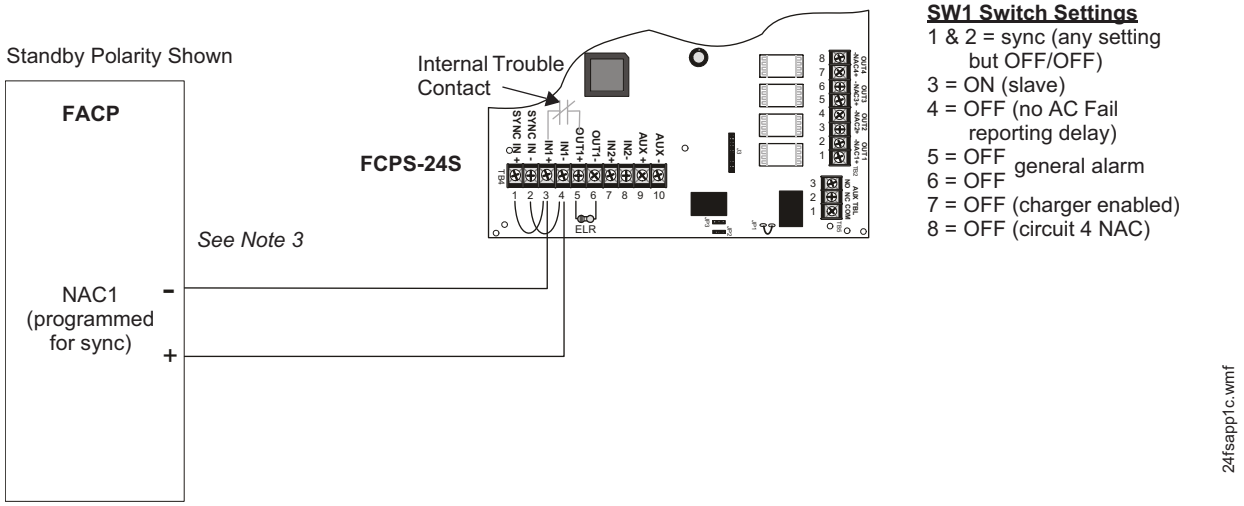


Figure 5.5a: Supervised Master/Slave Connections (Filtered, Synchronized NAC Source)

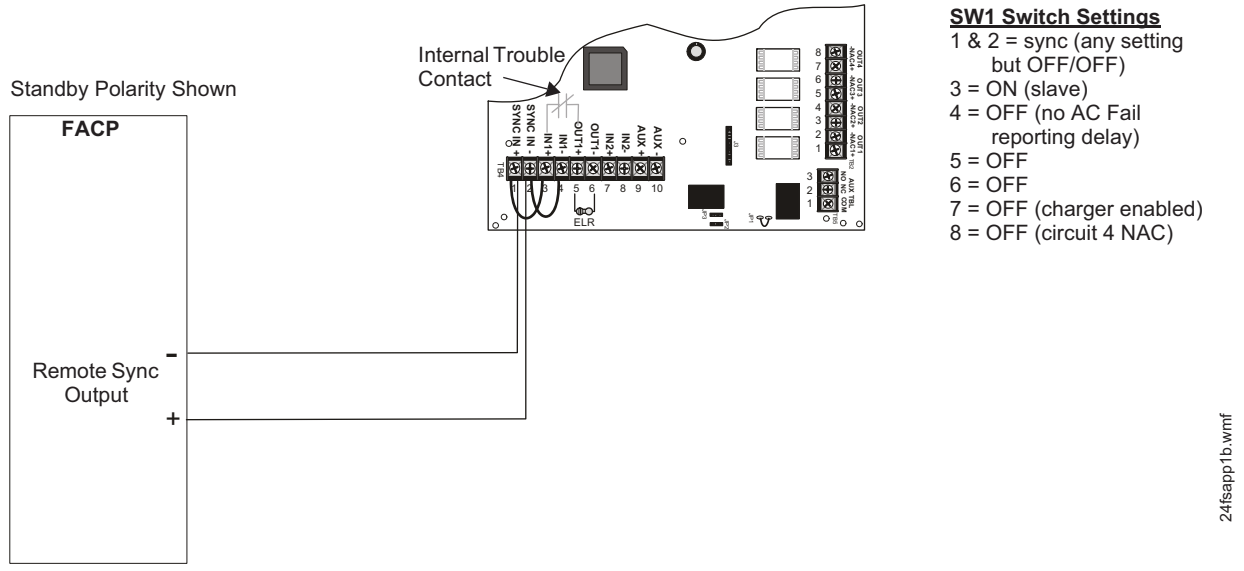


Figure 5.5b: Supervised Master/Slave Connections (Remote Sync Source)

Figure 5.5 Supervised Master/Slave Connections

The following notes apply to both illustrations in Figure 5.5 on page 35

1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Use only devices from the same manufacturer in each system.
3. If the FACP has a dedicated sync output connector, wire the remote sync output connector to the FCPS Sync In terminals TB4 terminals 1 & 2. Refer to the Supervised Master/Slave Connections (Remote Sync Source) in Figure 5.5b.

5.6 Master FCPS-24S Power Supply Connected to FACP

In this application, a master FCPS-24S power supply, set for synchronization, is connected to an FACP with nonsynchronized output.

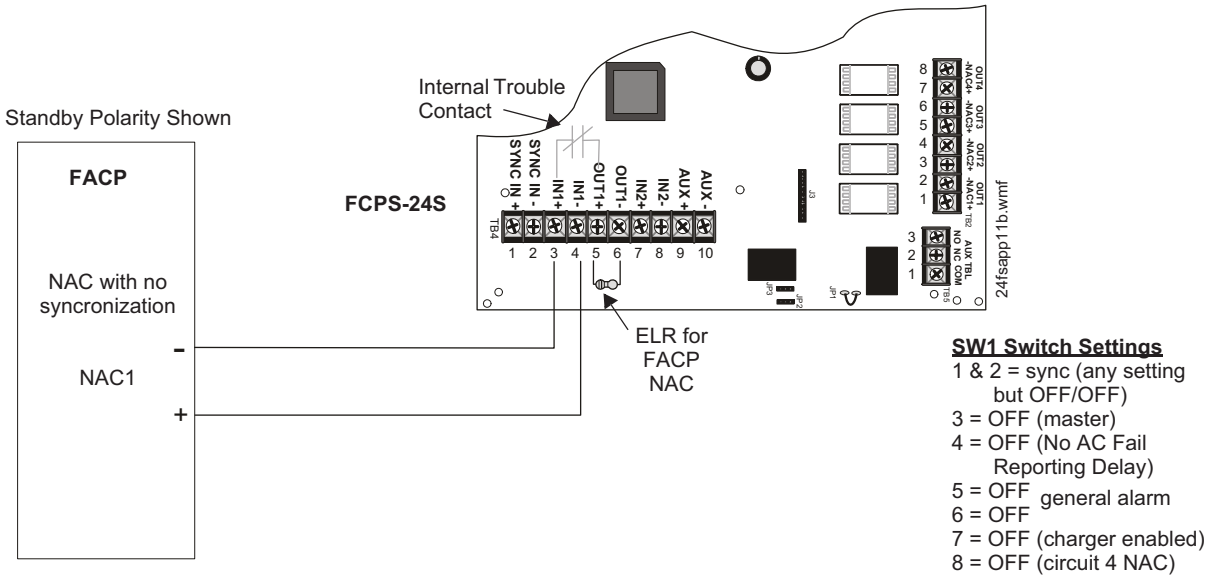


Figure 5.6 Supervised FACP to Master Connections (nonsynchronized source)

The following notes apply to this illustration

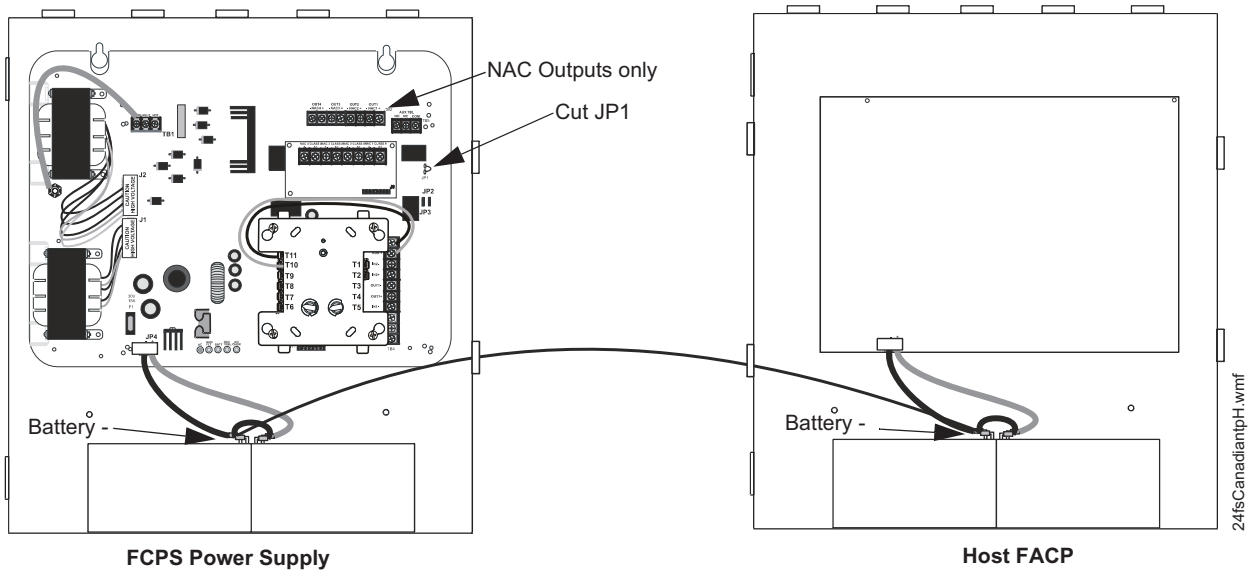
1. Refer to NFPA 72, Chapter 4-4, Visible Characteristics, Public Mode.
2. Use only devices from the same manufacturer in each system.

5.7 Canadian Applications

NOTE: Mass Notification is not for use in Canadian applications.

Canadian applications, per ULC, require the following:

- The FCPS-24S power supply must be used as a Notification Appliance Circuit extender only. The TB2 terminals cannot be configured as auxiliary power outputs.
- The host FACP must monitor for all ground fault conditions. The Ground Fault Detection circuit on the FCPS-24S power supply must be disabled by cutting jumper JP1.
- The negative (-) battery terminal of the FCPS-24S power supply must be connected to the negative (-) battery terminal of the host FACP.



*If the SLC device does not match the one in this figure, refer to the SLC manual wiring conversion charts for legacy and newer versions of the modules.

Section 6: Power Supply Requirements

6.1 Overview

This section contains instructions and tables for calculating power supply currents in alarm and standby conditions. This is a four-step process, consisting of the following:

1. Calculating the total amount of AC branch circuit current required to operate the system
2. Calculating the power supply load current for non-fire and fire alarm conditions and calculating the secondary (battery) load
3. Calculating the size of batteries required to support the system if an AC power loss occurs
4. Selecting the proper batteries for your system

6.2 Calculating the AC Branch Circuit

The power supply requires connection to a separate, dedicated AC branch circuit, which must be labeled **FIRE ALARM**. This branch circuit must connect to the line side of the main power feed of the protected premises. No other non-fire alarm equipment may be powered from the fire alarm branch circuit. The branch circuit wire must run continuously, without any disconnect devices, from the power source to the power supply. Overcurrent protection for this circuit must comply with Article 760 of the National Electrical Codes as well as local codes. Use 14 AWG (2.00 mm^2) wire with 600 volt insulation for this branch circuit.

Use Table 6.1 to determine the total amount of current, in AC amperes, that must be supplied to the system.

Device Type	Number of Devices		Current Draw (AC amps)		Total Current per Device
FCPS-24S6/8(C) or FCPS-24S6/8E	1	x	3.2 or 1.6	=	
[ ]	[ ]	x	[ ]	=	
[ ]	[ ]	x	[ ]	=	
	Sum Column for AC Branch Current Required			=	

Table 6.1 120/240 VAC Branch Circuit Requirements

6.3 Calculating the System Current Draw

6.3.1 Overview

The power supply must be able to power all internal and external devices continuously during the non-fire alarm condition. To calculate the non-fire alarm load on the power supply when primary power is applied, use Calculation Column 1 in Table 6.3 on page 40. The power supply must support a larger load current during a fire alarm condition. To calculate the fire alarm load on the power supply, use Calculation Column 2 in Table 6.3 on page 40. The secondary power source (batteries) must be able to power the system during a primary power loss. To calculate the non-fire alarm load on the secondary power source, use Calculation Column 3 in Table 6.3 on page 40.

When calculating current draw and the battery size, note the following:

- *Primary* refers to the main power source for the power supply.
- *Secondary* refers to the power supply's backup batteries.
- All currents are given in amperes (A). Table 6.2 shows how to convert milliamperes and microamperes to full amperes.

To convert...	Multiply	Example
Milliamperes (mA) to amperes (A)	mA x 0.001	3 mA x 0.001 = 0.003 A
Microamperes (μA) to amperes (A)	μA x 0.000001	300 μA x 0.000001 = 0.0003 A

Table 6.2 Converting to Full Amperes

6.3.2 How to Calculate System Current Draw

Use Table 6.3 on page 40 to calculate current draws as follows:

1. Enter the quantity of devices in all three columns.
2. Enter the current draw where required. Refer to the *Notifier Device Compatibility Document* for compatible devices and their current draws.
3. Calculate the current draws for each in all columns.
4. Sum the total current for each column.
5. Copy the totals from Column 2 and Column 3 to Table 6.3 on page 40.

Following are the types of current that can be entered into Table 6.3 on page 40.

- ✓ **Calculation Column 1** - The primary supply current load that the power supply must support during a non-fire alarm condition, with AC power applied
- ✓ **Calculation Column 2** - The primary supply current load the power supply must support during a fire alarm condition, with AC power applied
- ✓ **Calculation Column 3** - The standby current drawn from the batteries in a non-fire alarm condition during a loss of AC power

Table 6.3 contains three columns for calculating current draws. For each column, calculate the current and enter the total (in amperes) in the bottom row. When finished, copy the totals from Calculation Column 2 and Calculation Column 3 to Table 6.4 on page 41.

Device Type	Calculate Column 1 Primary, Non-Fire Alarm Current (amps)	Calculate Column 2 Primary, Fire Alarm Current (amps)	Calculation Column 3 Secondary, Non-Fire Alarm Current (amps)
	Qty X (current draw) = Total	**Qty X (current draw) = Total**	**Qty X (current draw) = Total**
Main Circuit Board	1 X [0.091] =	1 X [0.145] =	1 X [0.065] =
Power Supervision Relay	[ ] X [0.025] =	[ ] X [0.025] =	[ ] X [0.025] =
NAC/Output #1		[ ] X [ ] =	
NAC/Output #2		[ ] X [ ] =	
NAC/Output #3		[ ] X [ ] =	
NAC/Output #4		[ ] X [ ] =	
Current Draw from TB4 Terminals 9 & 10	[ ] =	[ ] =	[ ] =
Sum each column for totals	**Primary Non-Alarm =**	**Primary Alarm =**	**Secondary Alarm =**

Table 6.3 System Current Draw Calculations

6.4 Calculating the Battery Size

Use Table 6.4 to calculate the total Standby and Alarm load in ampere hours (AH). This total load determines the battery size (in AH) required to support the power supply under the loss of AC power. Complete Table 6.4 as follows:

1. Enter the totals from Table 6.3 on page 40, Calculation Columns 2 and 3 where shown.
2. Enter the NFPA Standby and Alarm times. Refer to Section 6.4.1, "NFPA Battery Requirements".
3. Calculate the ampere hours for Standby and Alarm, then sum the Standby and Alarm ampere hours.
4. Multiply the sum by the derating factor of 1.2 to calculate the proper battery size (in AH).
5. Write the ampere hour requirements on the Protected Premises label located inside the cabinet door.

Secondary Standby Load (total from Table 6.3 Calculation Column 3) [ ]	Required Standby Time (24 or 60 hours) X [ ]	= AH
Primary Alarm Load (total from Table 6.3 Calculation Column 2) [ ]	Required Alarm Time (for 5 min., enter 0.084, for 10 min., enter 0.168) X [	= AH
Sum of Standby and Alarm Ampere Hours		= AH
for **nonULC** applications, multiply by the Derating Factor[1] for **ULC** applications, multiply by the Derating Factor[1]		X 1.2 X 2.5
Battery Size, Total Ampere Hours Required		= AH

Table 6.4 Total Secondary Power Requirements at 24 VDC

1 Multiply by **only one** of the Derating Factors, depending on whether the power supply is being used for a ULC (Canadian) application or nonULC application.

6.4.1 NFPA Battery Requirements

NFPA 72 Local and Proprietary Fire Alarm Systems require 24 hours of standby power followed by 5 minutes in alarm.

6.4.2 Selecting and Locating Batteries

Select batteries that meet or exceed the total ampere hours calculated in Table 6.4. The power supply can charge batteries in the 7 AH to 18 AH range. The power supply cabinet is capable of housing batteries up to 7 AH. Batteries larger than 7 AH require the BB-17 or other UL listed external battery cabinet.

Notes

Appendix A: Wire Requirements

Connecting external system accessories to the main circuits must be carefully considered to ensure proper operation. It is important to use the correct type of wire, gauge and run length for each circuit. The following table lists NAC wiring requirements for the FCPS-24S6 and FCPS-24S8 Field Charger Power Supply.

NAC Load (Amps)	Max. allowable total loop resistance (ohms)	CLASS-B Max. allowable wire pair lenth (feet)				CLASS-A Max. allowable wire pair length (feet)			
		AWG 12 solid	AWG 14 solid	AWG 16 solid	AWG 18 solid	AWG 12 solid	AWG 14 solid	AWG 16 solid	AWG 18 solid
0.25	6.00	1554	977	613	386	777	489	307	193
0.5	3.00	777	489	307	193	389	244	153	97
0.75	2.00	518	326	204	129	259	163	102	64
1.0	1.50	389	244	153	97	194	122	77	48
1.25	1.20	311	195	123	77	155	98	61	39
1.5	1.00	259	163	102	64	130	81	51	32
1.75	0.86	222	140	88	55	111	70	44	28
2.0	0.75	194	122	77	48	97	61	38	24
2.25	0.67	173	109	68	43	86	54	34	21
2.5	0.60	155	98	61	39	78	49	31	19
2.75	0.55	141	89	56	35	71	44	28	18
3.0	0.50	130	81	51	32	65	41	26	16

Table A.1 NAC Wiring Requirements for Power Supply



NOTE: Calculations are based on Direct-Current Resistance data for uncoated copper wire, per National Electrical Code (2005 Edition) Table 8, Conductor Properties.



NOTE: These distances reflect the worst case scenario and are based on the correct draw of the highest candela strobes at the low end of the supported NAC voltage with the entire load at the end of the circuit. Further distances can be achieved by performing a point to point voltage calculation that more accurately reflects the specific devices used and how they are dispersed on the circuit.

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