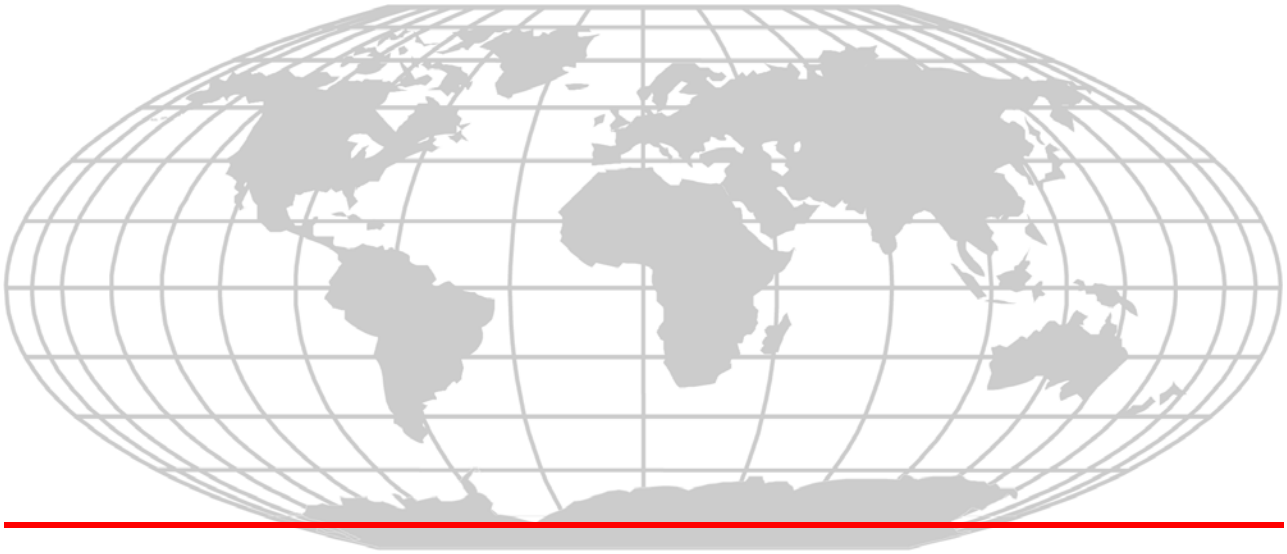
NOTIFIER®
by Honeywell



Addressable Charger/ Power Supply
ACPS-610/E
Manual

Document 53018
07/31/2007 Rev: A1
P/N 53018:A1 ECN 07-166

Fire Alarm System Limitations

While a fire alarm system may lower insurance rates, it is not a substitute for fire insurance!

An automatic fire alarm system—typically made up of smoke detectors, heat detectors, manual pull stations, audible warning devices, and a fire alarm control panel 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.

The Manufacturer recommends that smoke and/or heat detectors be located throughout a protected premise 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 Guides for Proper Use of System Smoke Detectors, which are made available at no charge to all installing dealers. These documents can be found at http://www.systemsensor.com/html/applicat.html. 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, or chimneys 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.
- 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, crippling its ability to report a fire.

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

- 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 or comprehend the meaning of the signal. It is the property owner's responsibility to conduct fire drills and other training exercise 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 fire alarm system will not operate without any electrical power. If AC power fails, the system will operate from standby batteries only for a specified time 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 premise 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 fire alarm malfunction is inadequate maintenance. To keep the entire fire alarm 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 fire alarm 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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Your feedback helps us keep our documentation up-to-date and accurate. If you have any comments or suggestions about our online Help or printed manuals, you can email us.

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- Your suggestion for how to correct/improve documentation

Send email messages to:

FireSystems.TechPubs@honeywell.com

Please note this email address is for documentation feedback only. If you have any technical issues, please contact Technical Services.

Table of Contents

Section 1: Introduction

The ACPS-610/E is an addressable power supply and battery charger with 24 VDC outputs. It operates in FlashScan® or CLIP (Classic Interface Protocol) mode, and has built-in strobe synchronization. Its four outputs may be independently configured to drive Notification Appliance Circuits (NACs--constant, coded, or synchronized) or to provide auxiliary power (resettable, door holder, or general purpose).

1.1 Features

- Addressable by any CLIP or FlashScan Fire Alarm Control Panel (FACP)
- Strobe/NAC Synchronization with System Sensor SpectrAlert® or SpectrAlert® Advance™ Series horns and strobes, or Gentex or Wheelock horns and strobes. (Use only devices from the same manufacturer in each system).
- NAC synchronization with UZC-256 (Universal Zone Coder)
- Combined output provides up to 6.0 A total (or up to 10.0 A total when charger is disabled).
  - Each output, configured as a NAC, provides 1.5 Amps
  - Each output, configured as Power, provides 1.5 Amps with charger enabled and 2.5 Amps with charger disabled.
- Power-limited outputs
- Charges 12 to 200 AH batteries
- Isolated Signaling Line Circuit (SLC) interface
- Brownout detection
- Battery charger supervision
- Battery voltage supervision
- Selectable charger current
- AC loss detection and AC loss delay reporting
- Switch-selectable Ground Fault Detection
  Zero (0) Ω from any output to Earth will cause Ground Fault Detection.
- Occupies between 5 and 14 addresses on an SLC, depending on configuration
- Selectable Canadian Two-stage option/Canadian Trouble reporting
- UL 864 9th edition compliant
- Configure databases, upgrade firmware, and upload/download to the power supply via USB port – **J3**.
  Requires PC or laptop with USB port and PK-PPS programming application.

1.2 Specifications

The ACPS-610 is comprised of two boards; the main control unit (the larger rear board), and the KAPS-24/E power supply (the smaller front board). See Figure 1.1.

1.2.1 KAPS-24/E Power Supply Board

■ AC Power - TB1

ACPS-610 – 120 VAC 50/60 Hz input, 5.0 A max.

ACPS-610E – 220 - 240 VAC 50/60 Hz input, 2.5 A max.

Maximum 12 AWG (3.31 mm^2) with 600 VAC insulation.

■ Secondary Power (Battery) Charging Circuit - TB3

Current-limited, sealed lead-acid battery charger which will charge 12 to 200 AH batteries.

Utilizes wire sizes 10-14 AWG. (5.26 mm.^{2} – 2.08 mm.^{2})

Charging current: 2.0 A, 5.0 A, or OFF (Software selectable)
Based on battery size programming.

Charging voltage: 27.6 VDC (nominal)

To calculate expected standby operating times, see Section 5.2 on page 49.

■ **Battery Fuse - (F2)**

15A, Slo-Blow Fuse P/N 12057

1.2.2 Main Control Unit

■ **Output Circuits - TB3, TB4, TB5, TB6**

– NAC Output

•Nominal voltage: 24 VDC, regulated

•1.5 A maximum for any output circuit configured as a NAC.

•At alarm current level with 12-18 AWG, no more than a 1.2 V drop at the end of the circuit, or sized to provide the minimum rated operation voltage of the appliances used.

– Output Power Circuit, resettable, door holder, and general power.

•Nominal voltage: 24 VDC, special applications.

•1.5 A max. with charger enabled.

•2.5 A max with charger disabled.

•Maximum ripple voltage: 200 mV p-p.

•12-18 AWG, no more than a 1.2 V drop at the end of the circuit, or sized to provide the minimum rated operation voltage of the appliances used.

Zero (0) ohms from any output to earth ground will cause ground fault detection.

Refer to the Device Compatibility Document for compatible devices, 24 VDC detectors, and notification appliances.

■ **SLC Circuit - TB2**

Average SLC current is 1.0 mA. The maximum resistance of the SLC wiring from any device to the FACP should not exceed 50 ohms.

Utilizes wire sizes 12-18 AWG (3.31 mm.^{2} – 0.821 mm.^{2})

■ **UZC - TB1**

24 VDC coded input (UZC or Sync Signal)

Utilizes wire sizes 12 – 22 AWG (3.31 mm.2 – 0.326 mm.^{2}) twisted pair wire

■ **Full Speed USB 2.0 - J3**

USB Type B connector

1.3 Installation Standards and Codes

The ACPS-610/E complies with the following standards:

NFPA 72 National Fire Alarm Code

Underwriters Laboratories:

- UL 864 Standard for Control Units and Accessories for Fire Alarm Systems

Underwriters Laboratories of Canada (ULC):

- ULC-S527-M99: Standard of Control Units for Fire Alarm Systems
- ULC-S524: Standard for the Installation of Fire Alarm Systems

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

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

1.3.1 UL 9th Edition Compliance

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.

The following products have not received UL 864 9th Edition certification and may only be used in retrofit applications. Operation of the ACPS-610/E with products not tested for UL 864 9th Edition has not been evaluated and may not comply with NFPA 72 and/or the latest edition of UL 864. These applications will require the approval of the local Authority Having Jurisdiction (AHJ).

- AFP-100
- AFP-200
- AFP-300/400
- AFC-600
- AM2020/AFP-1010
- NFS-640
- NFS-3030
- ICM-4/E

1.4 Related Documentation

To obtain a complete understanding of specific features of the ACPS-610, or to become familiar with functions in general, make use of the documentation listed in Table 1.1.

Title	Document Number
AFP-100 Instruction Manual	51010
AFP-200 Instruction Manual	15511
AFP-300/AFP-400 Installation, Operations, and Programming Manuals	50253, 50259, 50260
AM2020/AFP1010 FACP	15088
NFS-320 Installation, Operations, and Programming Manuals	52745, 52747, 52746
NFS-640 Installation, Operations, and Programming Manuals	51332, 51334, 51333
NFS2-640 Installation, Operations, and Programming Manuals	52741, 52743, 52742
NFS-3030 FACP Installation, Operations, and Programming Manuals	51330, 51345, 51344
NFS2-3030 FACP Installation, Operations, and Programming Manuals	52544, 52546, 52545
NCA Network Control Annunciator	51482
NCA-2 Network Control Annunciator	52482
UZC Universal Zone Coder Installation, Programming Manuals	15216, 15976
BB-100/200 Cabinet Installation Instructions	51981
CAB-3/CAB-4 Series Installation Instructions	15330
BB-25 Cabinet Installation Instructions	50898
BB-55 Cabinet Installation Instructions	50295
SLC Wiring Instruction Manual	51253
Device Compatibility Document	15378

Table 1.1 Related Documentation

NOTE: Unless otherwise indicated, when used in this manual, ACPS-610 refers to both the ACPS-610 and ACPS-610E.

1.5 Notes, Cautions, and Warnings

This manual contains notes, cautions, and warnings to alert the reader as follows:

NOTE: Supplemental information for a topic, such as tips and references.

CAUTION: A brief identifier stating the nature of the hazard.
Information about procedures that could cause programming errors, runtime errors, or equipment damage.

WARNING: A brief identifier stating the nature of the hazard.
Indicates information about procedures that could cause irreversible equipment damage, irreversible loss of programming data or personal injury.

1.6 Board Layout

The ACPS-610 is comprised of two boards; the main control unit (the larger rear board), and the KAPS-24/E power supply (the smaller front board). Figure 1.1 below illustrates the layouts for these boards. Figure 1.2 illustrates the positions of the LEDs.

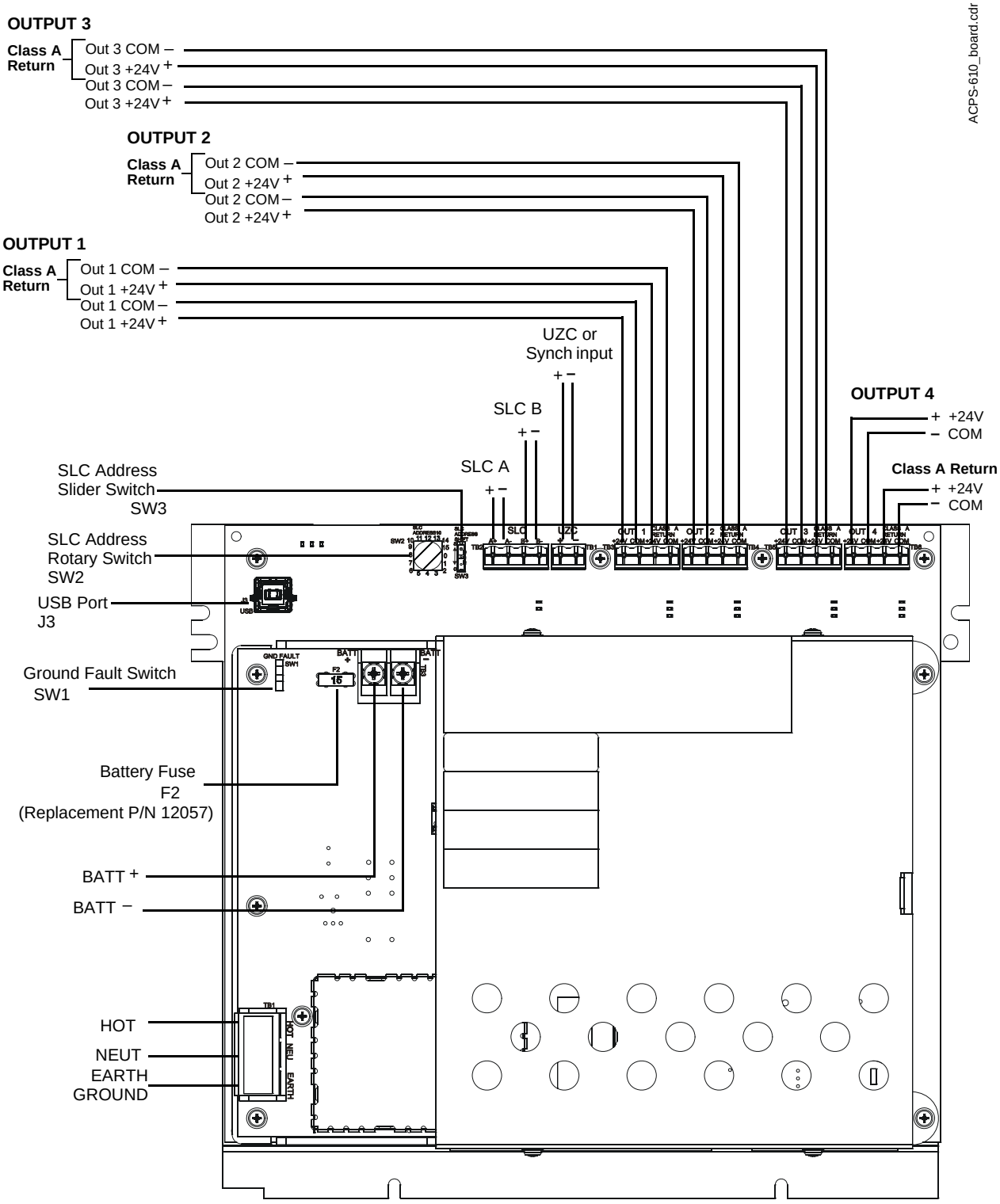


Figure 1.1 The ACPS-610 Board Layout

1.7 LED Indicators

There are 21 LEDs that indicate various conditions and troubles. The following table lists and describes each. Figure 1.2 on page 13 shows the location of the LEDs on the PC boards.

	Reference	LED Name	Color	Description
Main Control Unit	2	STATUS*	Green	Slow blink (1x/sec.) during normal operation.
	3	RESET	Yellow	Illuminates during on Power Up and ACPS-610 CPU reset. Blinking reset indicates trouble, call technical service.
	4	GEN TBL*	Yellow	Steady glow indicates trouble, except as noted below: • Slow blink (1x/sec.).....SLC Address Out of Range • Fast blink (5x/sec.) ..... Program Mode • 1 blink, pause and repeat ..... KAPS-24 Communication Failure • 2 blinks, pause and repeat ..... UZC Sync Signal Loss
	5	SLCRX	Green	Blinks when data is received from the SLC.
	6	SLCTX	Green	Blinks when data is transmitted to the SLC.
	7	OUT1 TBL*	Yellow	• Steady.....In Current Limit • Steady (with fast blinking GEN TBL) .....RAM Test Failure – Call Technical Service. • Fast blink (5x/sec.) .....Hardware Failure† • 1 blink, pause and repeat ..... Open • 2 blinks, pause and repeat .....Short
	8,9	OUT1 Active	Green/Red	Glows green when output is active +24V power. Glows red when output is active NAC.
	10	OUT2 TBL*	Yellow	• Steady.....In Current Limit • Steady (with fast blinking GEN TBL) ..... Revision ID Mismatch – Download compatible firmware (see page 30). • Fast blink (5x/sec.) .....Hardware Failure† • 1 blink, pause and repeat ..... Open • 2 blinks, pause and repeat .....Short
	11, 12	OUT2 Active	Green/Red	Glows green when output is +24V power. Glows red when output is active NAC.
	13	OUT3 TBL*	Yellow	• Steady.....In Current Limit. • Steady (with fast blinking GEN TBL) .....Corrupt Application – Download application (see page 30). • Fast blink (5x/sec.) .....Hardware Failure† • 1 blink, pause and repeat ..... Open • 2 blinks, pause and repeat .....Short
	14, 15	OUT3 Active	Green/Red	Glows green when output is active +24V power. Glows red when output is active NAC.
	16	OUT4 TBL*	Yellow	• Steady.....In Current Limit • Steady (with fast blinking GEN TBL) .....Corrupt Database – Download database (see page 30). • Fast blink (5x/sec.) .....Hardware Failure† • 1 blink, pause and repeat ..... Open • 2 blinks, pause and repeat .....Short
	17, 18	OUT4 Active	Green/Red	Glows green when output is active +24V power. Glows red when output is active NAC.
KAPS-24	1	Logic Power	Green	Illuminates when logic power is active (Normal condition).
	2	TRBL	Yellow	Blinks, pauses and repeats; as specified below, when the following troubles occur: – AC Failure.....1 blink – High Battery.....2 blinks – Low Battery.....3 blinks – Charger Failure.....4 blinks
	3	EARTH FAULT	Yellow	Illuminates when a ground fault is detected.
	4	AC	Green	Illuminates when there is AC power.

Table 1.2 LED Indicators

* STATUS, GENERAL and OUTPUT TROUBLE LEDS steady when database/firmware download is in process. Do not disconnect power or the USB cable during this time!

† Disconnect the output and wait for 10 seconds. Then, reset the Power Supply by disconnecting the battery and AC power. If the problem persists, replace the ACPS-610.

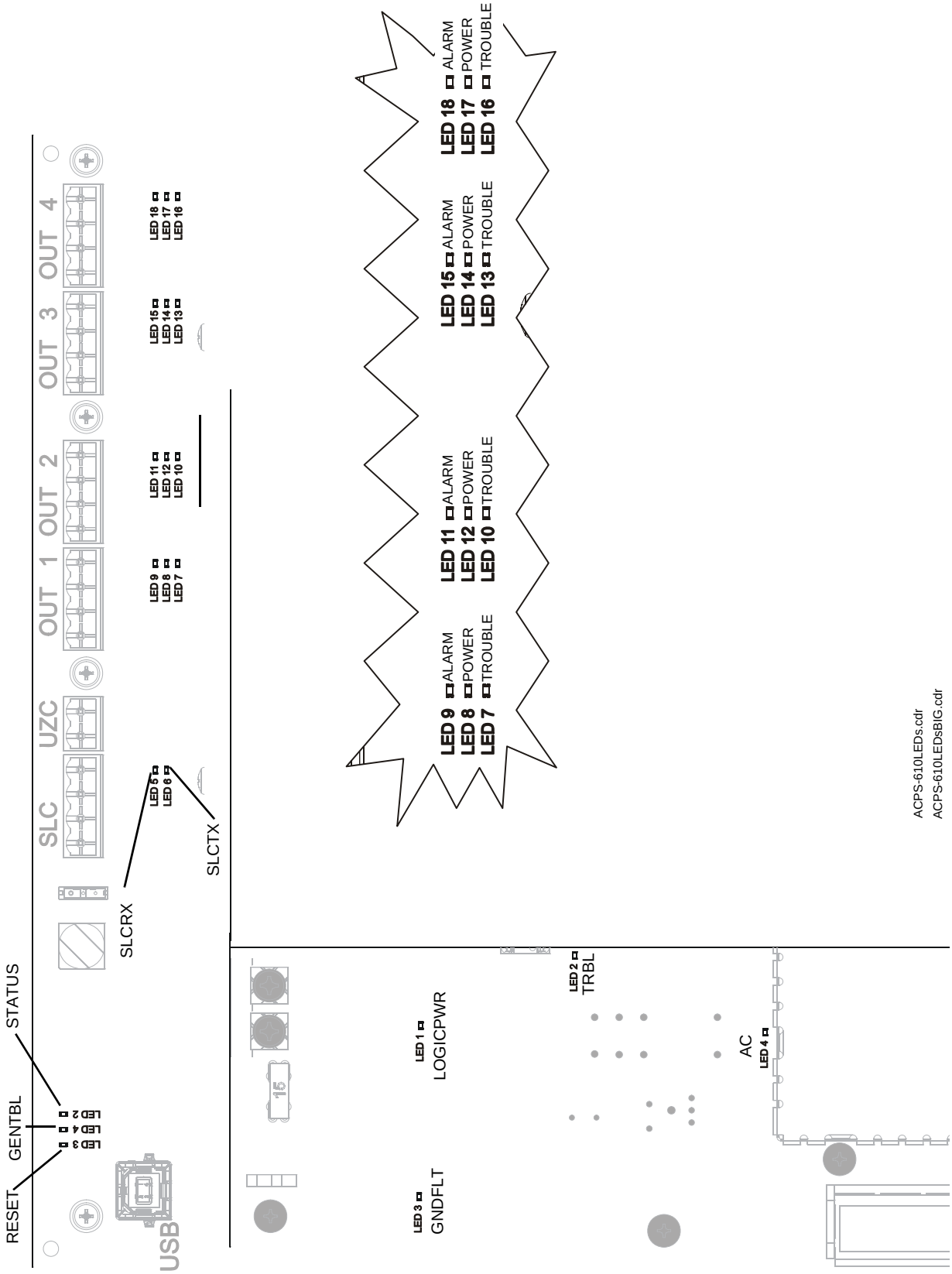


Figure 1.2 Locations of LED Indicators

Section 2: Installation

WARNING: High Voltages Present!
Use extreme caution when working with the ACPS-610. High voltage and AC line-connected circuits are present in this power supply. Turn off and remove all power sources. To reduce the risk of electric shock, make sure to properly ground the ACPS-610.
Install the snap-on cover for TB1 after wiring.

2.1 Mounting Options

2.1.1 In a CAB-PS1 Cabinet

The ACPS-610 mounts in a CAB-PS1 cabinet. Two 12 amp-hour batteries fit into the bottom of this cabinet along with the ACPS-610. The chassis is fastened to the two top right studs with two keps nuts, included, (P/N 36045).

When replacing an ACPS-2406 with an ACPS-610 in an existing CAB-PS1, a replacement door (P/N DR-PS1) must be used. The current door will not close and could cause damage to the equipment if attempted.

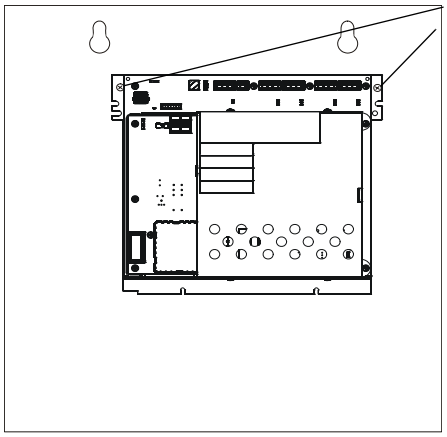


Figure 2.1 CAB-PS1 Mounting

2.1.2 In a CAB-4 Series Backbox

The ACPS-610 mounts in the lower left or lower right of a CAB-4 Series enclosure. The ACPS-610 should be mounted on the left of the enclosure when it will be connected to 26AH batteries that are located in the same cabinet. If another power supply occupies the left side of the enclosure mount the ACPS-610 on the right side and connect it to batteries that are located in a separate enclosure. This battery connection must be in conduit and less than 20 feet (6.096 meters) from the power supply.

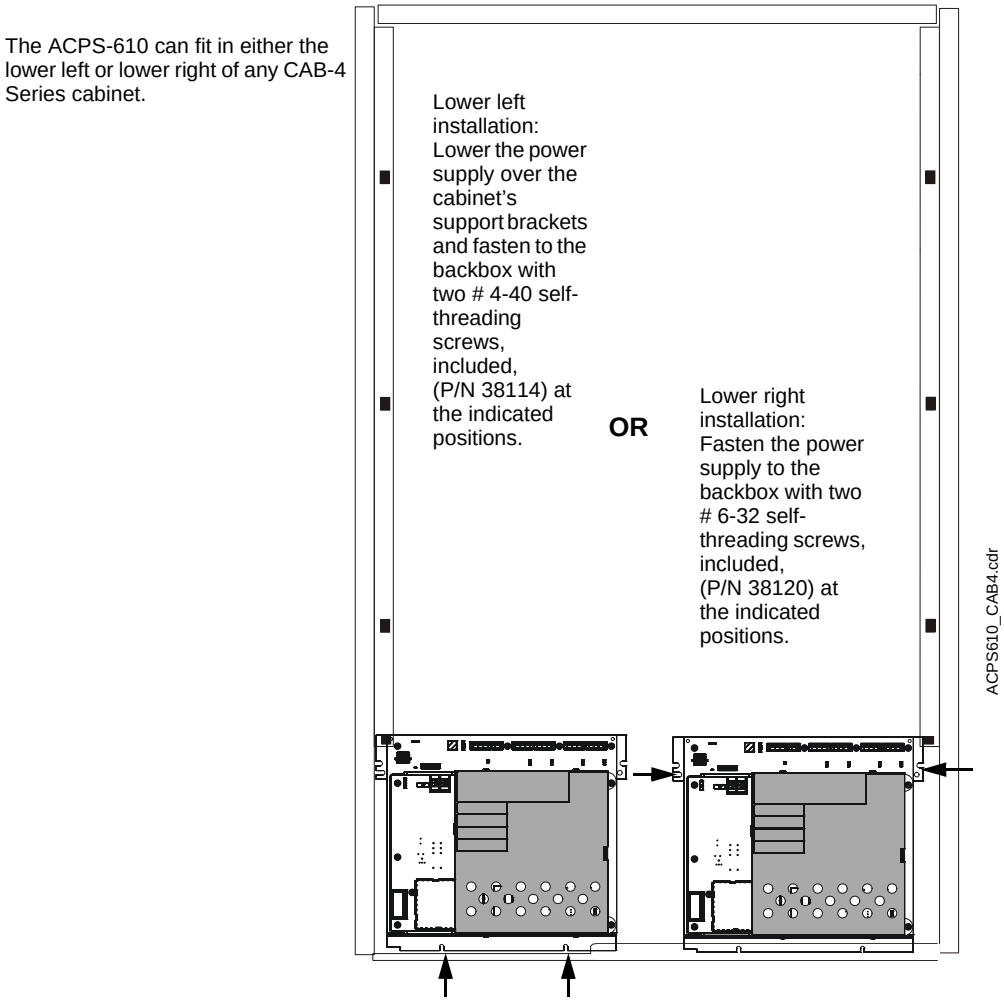


Figure 2.2 CAB-4 Series Backbox

CHS-6 Chassis

When the power supply cannot be mounted in the CAB-4's lowest row, use the CHS-6 chassis. The ACPS-610 will require the left two of the three chassis spaces.

The CHS-6 Chassis will fit in any row of the CAB-4 Series except for the bottom row. The bottom is designed to hold batteries and does not have the studs for mounting.

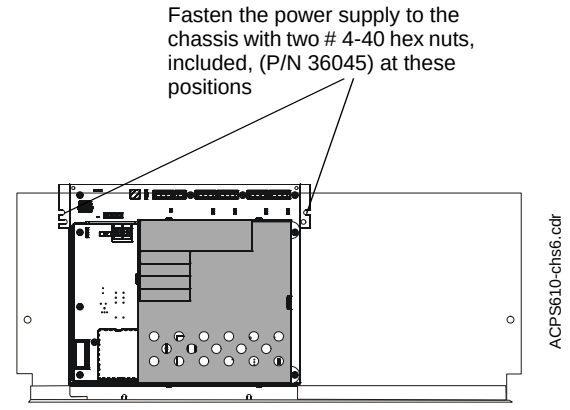


Figure 2.3 Mounted in a CHS-6 chassis.

2.1.3 In a BB-25 Cabinet

The ACPS-610 mounts in the left side of a BB-25 cabinet. Two 26 amp-hour batteries fit into the right side of the cabinet. A BB-100 or BB-200 cabinet is required for batteries larger than 26 amp-hour.

Fasten the power supply to the backbox with two # 8-32 self-threading screws, included, (P/N 38132) at the indicated positions.

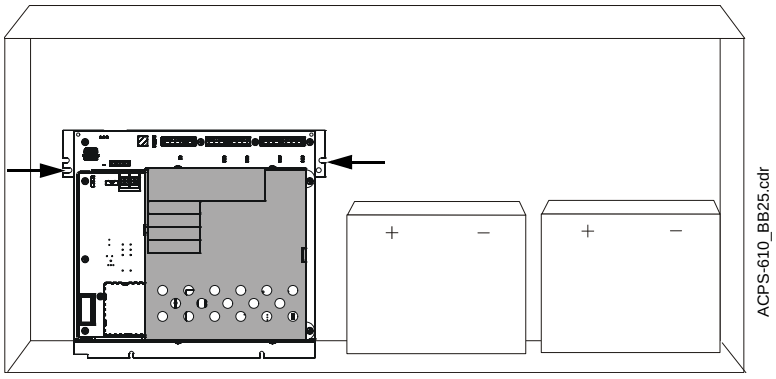


Figure 2.4 BB-25 Cabinet Mounting

2.1.4 In a BB-100 Cabinet

The ACPS-610 mounts in a BB-100 cabinet. Two 55 or 100 amp-hour batteries fit into the bottom of this cabinet under the ACPS-610. The power supply is fastened directly to the unpainted section of the backbox using the two provided keps nuts.

Fasten the ACPS-610 chassis to the backbox using the two # 4-40 keps nuts, included, (P/N 36045) at these positions.

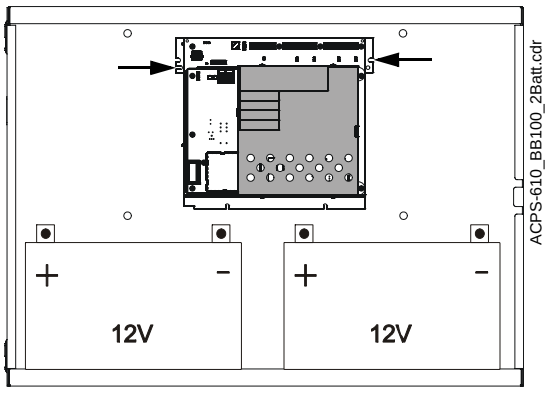


Figure 2.5 BB-100 Mounting

WARNING: Heavy Load!
The total weight of a fully loaded BB-100 will exceed 175 pounds. Additional support may be required when mounting this cabinet to a wall.
See BB-100/200 Cabinet Installation Instructions for more information.

2.1.5 In a BB-200 Cabinet

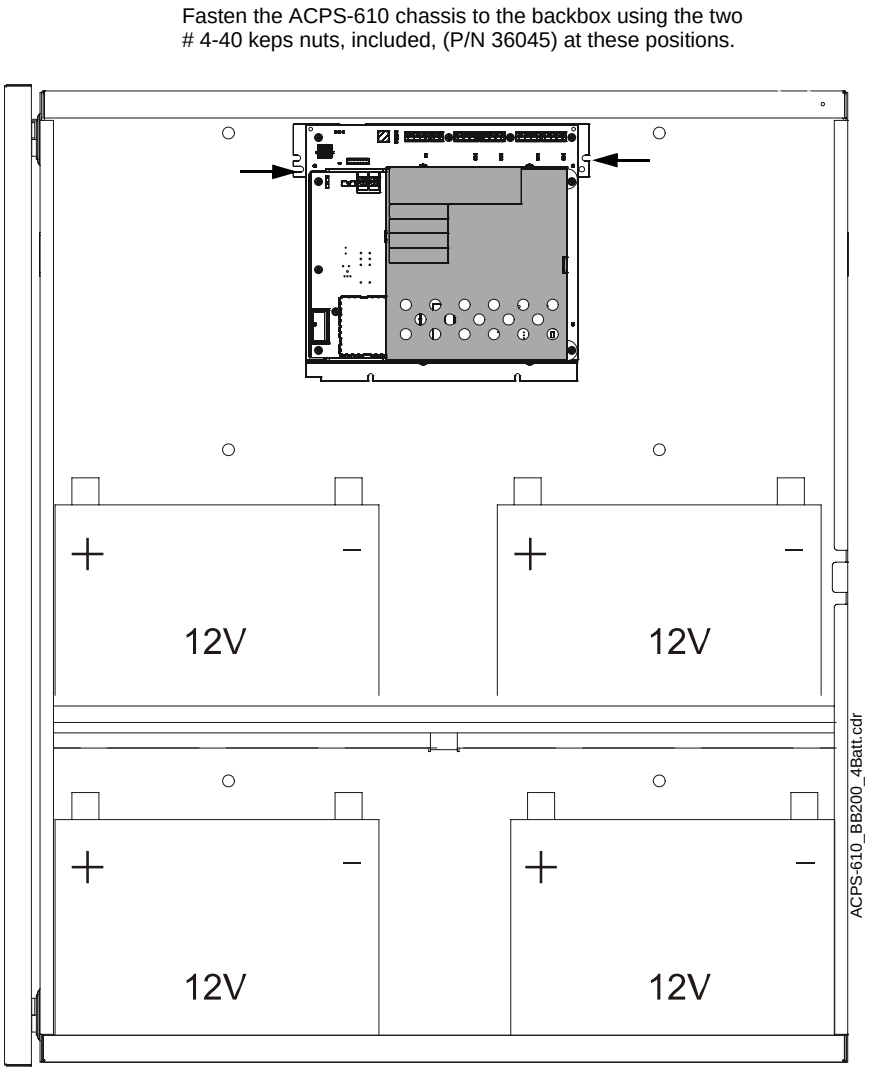


Figure 2.6 BB-200 Mounting

The ACPS-610 mounts in a BB-200 cabinet with four 100 amp-hour batteries (two on the top shelf and two on the bottom). The power supply is fastened directly to the unpainted section of the backbox with two keps nuts.

WARNING: Heavy Load!
The total weight of a fully loaded BB-200 will exceed 300 pounds. Additional support may be required when mounting this cabinet to a wall.
See BB-100/200 Cabinet Installation Instructions for more information.

2.2 UL Power-limited Wiring Requirements

Power-limited wiring must remain separated from nonpower-limited wiring by at least 0.25 in. (6.4 mm), and must enter the enclosure through different knockouts. Install tie wraps and adhesive squares to secure the wiring. Figures 2.7 and 2.8 show samples of power-limited and nonpower-limited wiring configurations in different cabinets.

Terminal block and pin connections are illustrated in Figure 1.1.

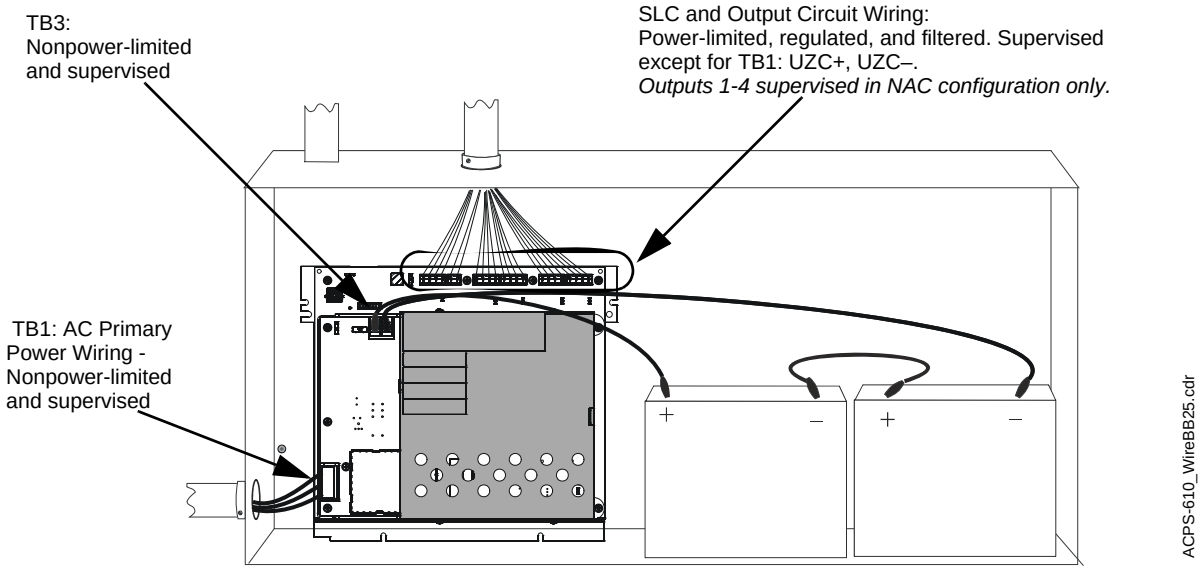


Figure 2.7 BB-25 Cabinet: Power-limited Wiring Example, with Two Battery Wiring

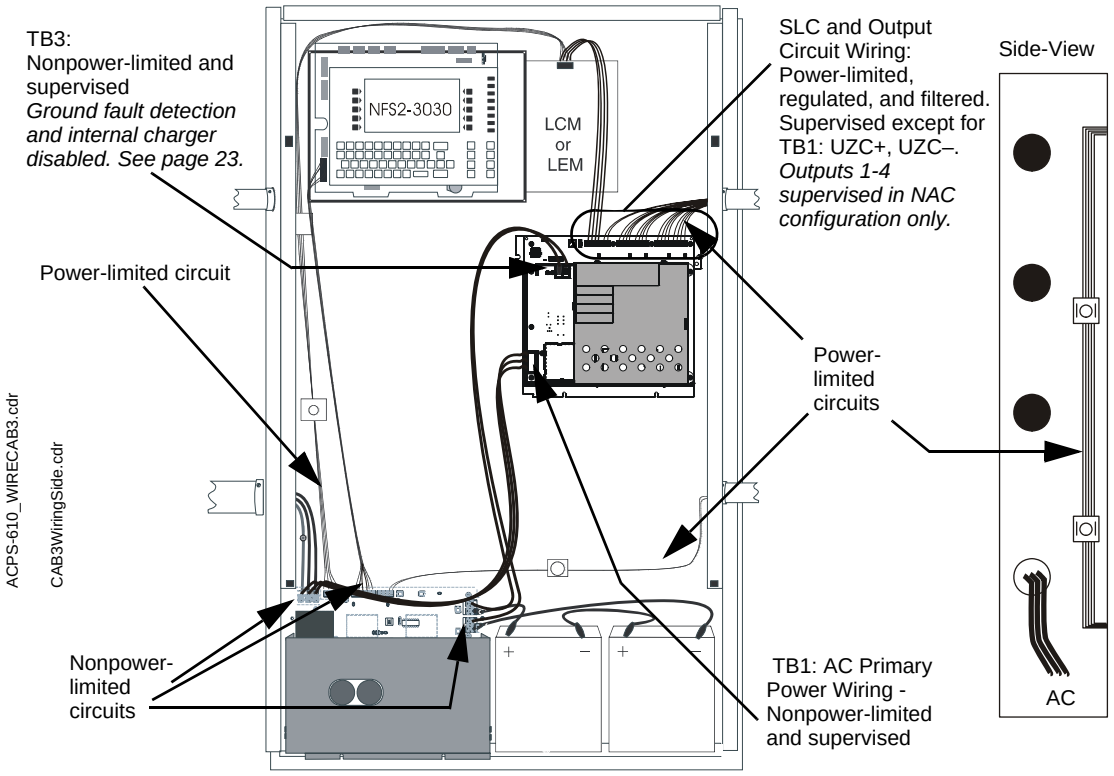


Figure 2.8 CAB-4 Series Cabinet: Power-limited Wiring Example

WARNING: Risk of electrical shock!
Remove all power sources to equipment while connecting electrical components. Leave the external, main power breaker OFF until installation of the entire system is complete.

WARNING: Risk of equipment damage!
Several sources of power can be connected to the control panel and/or power supply. Before servicing the control panel, disconnect all sources of input power *including the battery*. While energized, the control panel and associated equipment can be damaged by removing and/or inserting cards, modules, or interconnecting cables.

2.3 Connecting the Power Supply to AC Power

TB1 (KAPS-24) - Primary AC power source – 120 VAC, 50/60 Hz, 5.0 A (ACPS-610E uses 220-240 VAC, 50/60 Hz, 2.5 A) from line voltage source.

The ACPS-610 requires connection to a separate dedicated AC branch circuit. Follow these guidelines when connecting the AC branch circuit:

- Label the branch circuit “Fire Alarm”.
- Connect the branch circuit to the line side of the main power feed of the protected premises.
- Do not power other non fire alarm equipment from the fire alarm branch circuit.
- Run the AC branch circuit wire continuously, without any disconnect devices, from the power source to the power supply.
- Overcurrent protection for the AC branch circuit must comply with Article 760 of the National Electrical Codes, as well as local codes.
- Use 12–14 AWG (3.31 mm^2 – 2.08 mm^2) wire with 600 VAC insulation for the AC branch circuit.

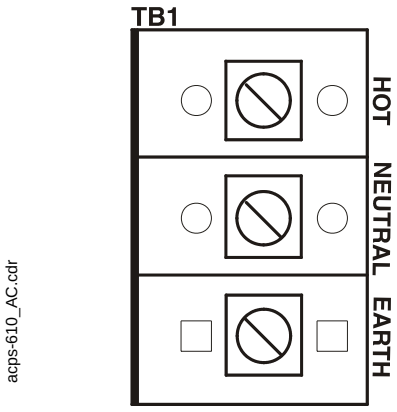


Figure 2.9 AC Power Connection

Connect primary power as follows:

1.Turn off the circuit breaker at the main power distribution panel.

2.Open the plastic insulating cover on TB1 on the KAPS-24 (see Figure 2.9).

3.Connect the earth ground terminal (TB1-EARTH) to a solid earth ground (a metallic, cold water pipe may be suitable in some installations). This connection is vital to maintaining the power supply's immunity to unwanted transients generated by lightning and electrostatic discharge.

4.Connect the primary power neutral line to terminal marked NEUTRAL and the primary power AC line to terminal marked HOT.

5.Close the plastic insulating cover over TB1.

WARNING: High Voltage!
Close cover for TB1 after wiring.

2.4 Installing and Connecting the Batteries

WARNING: Risk of severe burns!
Batteries contain sulfuric acid which can cause severe burns to the skin and eyes, and can destroy fabrics. If contact is made with sulfuric acid, immediately flush skin or eyes with water for 15 minutes and seek immediate medical attention.

WARNING: Risk of equipment damage!
Do not connect the battery interconnect cables, included, (P/N 75560, 75561, or 71070) at this time. Leave the battery interconnect cables disconnected until after initial system power-up.

WARNING: Risk of equipment damage!
To avoid contact with metal cabinet, always install terminal bolts towards the center of the battery. See Figure 2.10.

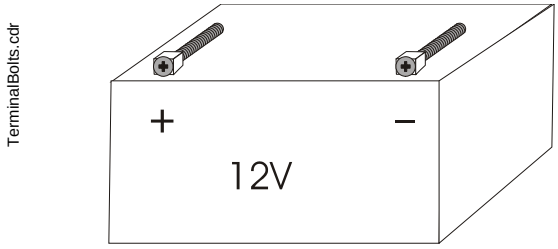


Figure 2.10 Terminal Bolt Installation

TB3 (KAPS-24) - Secondary power source – 24 VDC from batteries installed in the appropriate enclosure. Secondary (battery) power is required to support the system during loss of primary power.

Certain system designs may require connecting two or four batteries to the power supply, connecting multiple power supplies to each other, or connecting one set of batteries to multiple power supplies. Always use wire size 10-14 AWG. (5.26 $mm.^2$ – 2.08 $mm.^2$), and install the power supply and the batteries in the appropriate enclosures, as described in Section 2.1.

Use PK-PPS to select the appropriate battery charger current for the system's battery capacity. See page 31 and pages 49–50 for more information.

2.4.1 Setting the Charger

The ACPS-610 battery charger will charge 12 to 200 AH lead-acid batteries. Use PK-PPS to select the appropriate battery charger current for the system's battery capacity from three settings: **2 A**, **5 A**, or **DISABLE CHARGER**. Select **2 A** to charge 12 to 55 AH batteries. Set the charger to **5 A** when the power supply will be charging a system that requires 56 to 200 AH. Select **DISABLE CHARGER** when the power supply will be set for continuous output or when the batteries will be charged by an external charger (See page 23). See Section 3.2, "Programming the ACPS-610" for more information on programming via PK-PPS. Refer to Section 5.2, "Calculating the Battery Requirements", on page 49 for more information on determining your system's battery capacity.

2.4.2 Connecting the Power Supply to Two Batteries:

1. Use PK-PPS to set the charger to the appropriate current for the system's battery capacity.
2. Connect one cable from TB3 (BATT IN +) on the power supply to the positive (+) terminal of one battery.

3. Connect another cable from TB3 (BATT IN -) on the power supply to the negative (–) terminal of the other battery.
4. **Only after initial system power-up,** connect a battery interconnect cable between the negative (-) terminal on the first battery to the positive (+) terminal on the second battery.

To determine battery requirements, refer to Section 5.2 of this manual.

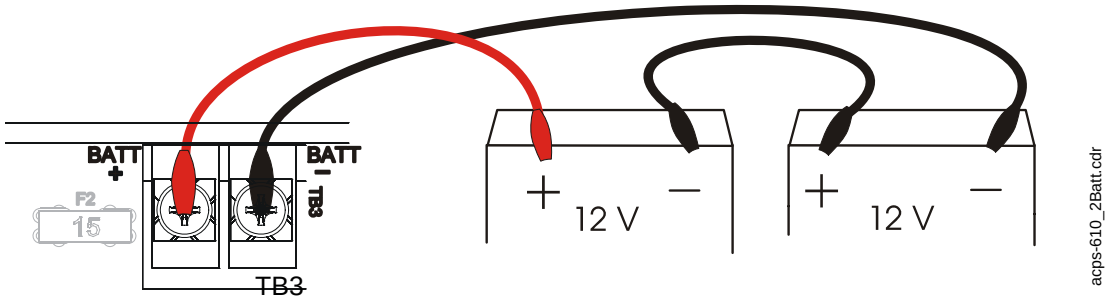


Figure 2.11 Connecting Two Batteries to the Power Supply

2.4.3 Connecting the Power Supply to Four Batteries:

1. Use PK-PPS to set the charger to the appropriate battery charger current for the system's battery capacity.
2. Continue the connection from the occupied positive (+) battery terminal to the positive (+) terminal of the next unconnected battery.
3. Continue the connection from the occupied negative (–) battery terminal to the negative (–) terminal of the remaining unconnected battery.
4. **Only after initial system power-up,** connect the two pairs of batteries. Use two battery interconnect cables to tie each unoccupied negative (–) terminal to an unoccupied positive (+) terminal, as shown in Figure 2.12.

To determine battery requirements, refer to Section 5 of this manual.

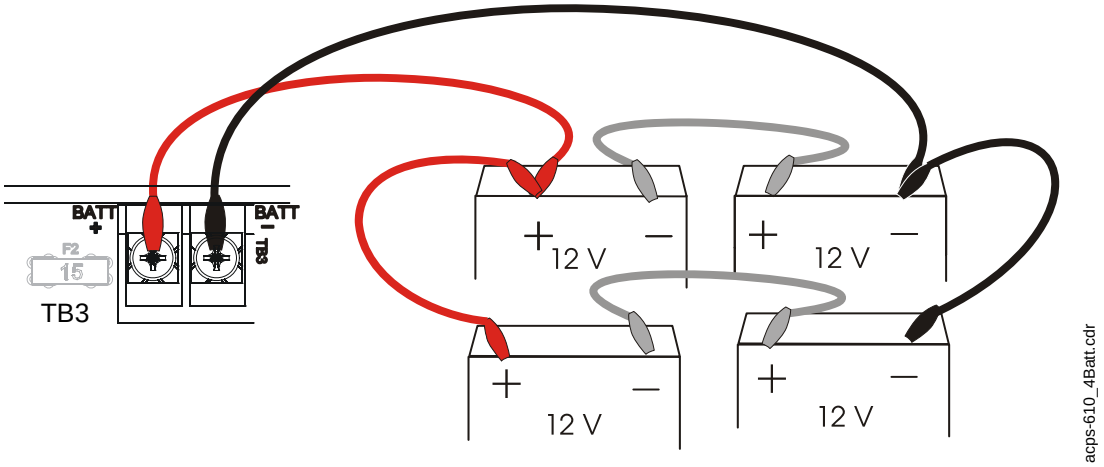


Figure 2.12 Connecting Four Batteries to the Power Supply

NOTE: Use a ring terminal to attach two cables to one battery terminal.

2.4.4 Connecting Multiple Power Supplies (Separate Batteries)

This application may be used when you want a single power supply to monitor for ground fault for multiple power supplies. Follow these guidelines when connecting multiple power supplies:

- Disable Ground Fault detection at all power supplies except one. See Figure 1.1 on page 11. *For proper supervision the power supply with the enabled ground fault detection must be connected to the SLC.*

NOTE: For best results, enable ground fault detection on the power supply connected to the battery with the largest capacity.

- Connect common bond wire between the main power supply and power supplies with disabled ground fault detection.
- Connect battery interconnect cables **only after initial system power-up**. Refer to "Installing and Connecting the Batteries" on page 20.

To determine ACPS-610 battery requirements, refer to Section 5.2 on page 49 in this manual.

Refer to the specific power supply manual(s) and/or Device Compatibility Document for further information and instructions.

CAUTION: Risk of possible equipment damage.
To maintain proper supervision, auxiliary supplies used to power Panel Circuits, such as the ICM-4/E, must be connected to the same batteries as the main power supply. Failure to do so may result in equipment damage.

acps-610_MultiPS.cdr

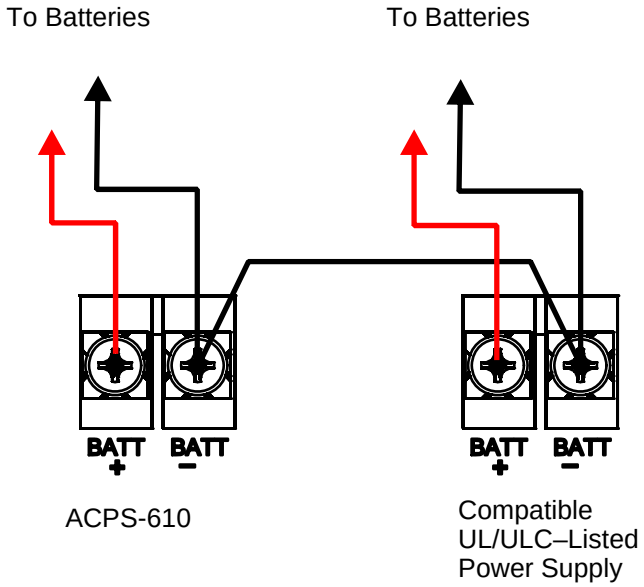


Figure 2.13 Connecting Multiple Power Supplies with Common Bond Wire

2.4.5 Connecting Multiple Power Supplies (One Set of Batteries)

Certain system designs may require connecting multiple power supplies to one set of batteries. Follow these guidelines when connecting multiple power supplies:

- For proper supervision, enable only the charger directly connected to the batteries. Disable all other chargers.
- Confirm that the enabled charger has the capacity to charge the total load of the selected battery configuration.
- Use PK-PPS to set the charger to the appropriate battery charger current for the system's battery capacity.
- Disable Ground Fault detection at all power supplies except one. See Figure 1.1 on page 11. *For proper supervision the power supply with the enabled ground fault detection must be connected to the SLC.*
- All power supply to power supply connections must be in conduit and the total battery connection must be less than 20 feet (6.09 meters) from the enabled power supply.
- Connect battery interconnect cables **only after initial system power-up**. Refer to "Installing and Connecting the Batteries" on page 20.

To determine battery requirements, refer to Section 5.2, "Calculating the Battery Requirements" in this manual.

Refer to the specific power supply manual(s) and/or Device Compatibility Document for further information and instructions.

CAUTION: Risk of possible equipment damage.
To maintain proper supervision, auxiliary supplies used to power Panel Circuits, such as the ICM-4/E, must be connected to the same batteries as the main power supply. Failure to do so may result in equipment damage.

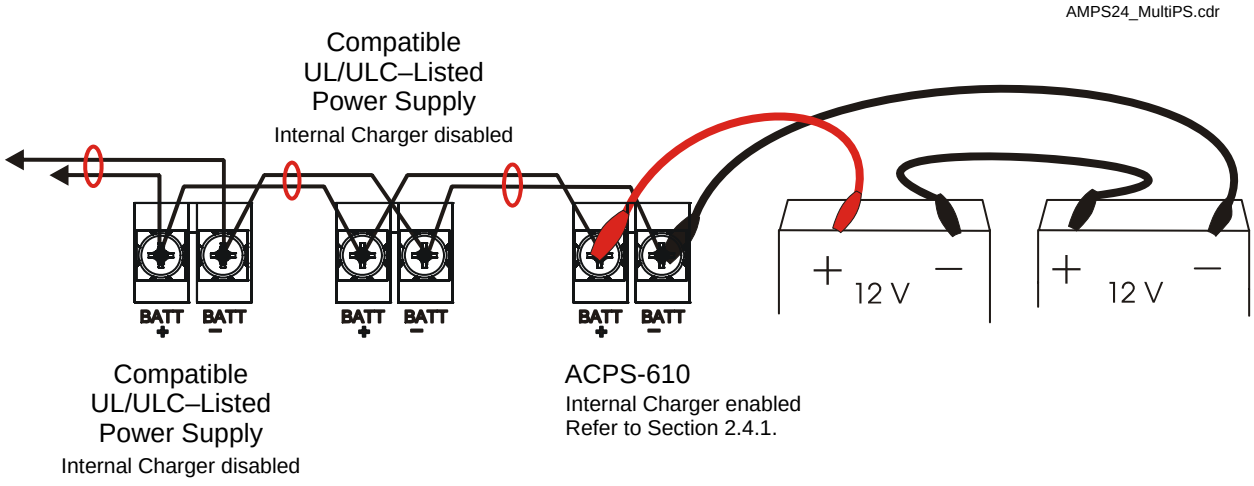


Figure 2.14 Connecting Multiple Power Supplies (One Set of Batteries)

2.5 UPS Trouble Connections

When a UPS is required, use a monitor module with a trouble Type ID to convey a trouble signal to the FACP.

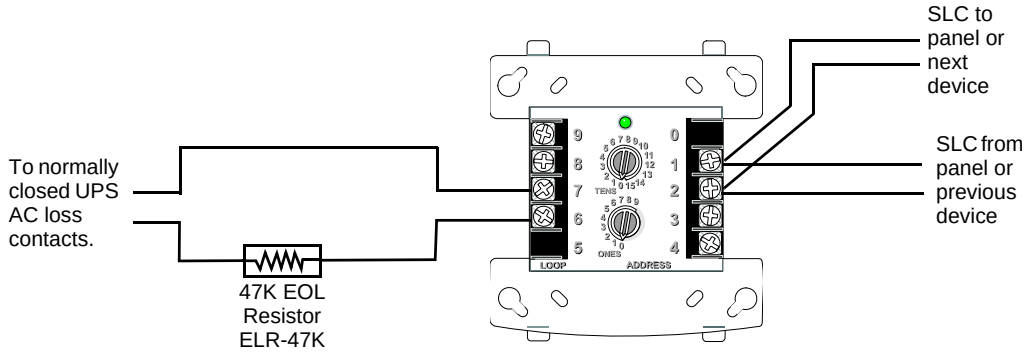


Figure 2.15 UPS Trouble Connections

2.6 Connecting NAC and Power Outputs

TB3, TB4, TB5, TB6 - Outputs 1 through 4. Power-limited. Supervised when in NAC configuration. Combined output provides up to 6.0 A total (or up to 10.0 A total with charger disabled). All the outputs are independently configurable as NAC (constant, coded, or syncronized) or Power (resettable, door holder, or general purpose). Each output provides 1.5 A maximum current when configured as a NAC, 1.5 A maximum current when configured as Power with the charger enabled, and 2.5 A maximum current when configured as Power with the charger disabled. With all power sources off, connect wiring. Refer to Section 4 of this manual for applications suggestions.

2.7 Connecting to the SLC

TB2 - Supervised and power-limited. With all power sources off, connect the power supply from TB2 to the SLC interface.

Refer to the SLC Wiring Manual for more information.

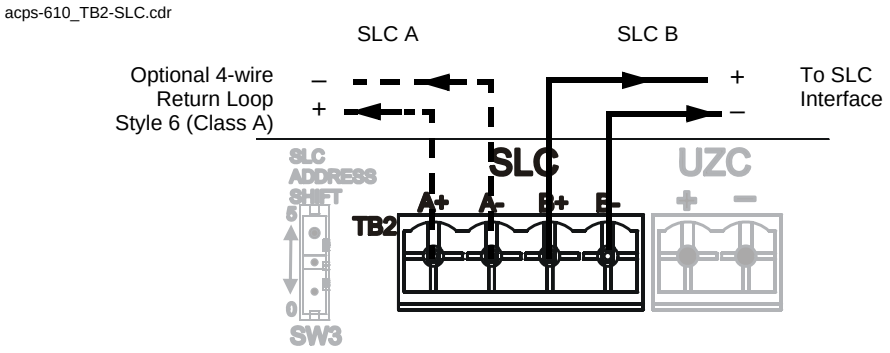


Figure 2.16 Connecting to the SLC Interface TB2

2.8 External Coding and Synchronization

Power-limited and non-supervised. UZC input is used to sync or code outputs from an external source. TB1 provides support for external coding sources such as UZC-256 (pulsed 24V) or coded NAC output, or it can be an external sync input for strobe circuits. With all power sources off, connect wiring. Refer to Section 4 of this manual for applications suggestions.

Notes

Section 3: Configuration and Programming

3.1 SLC Addressing

When the ACPS-610 communicates via the SLC, the installer must reserve sequential SLC addresses (an address block) equal to the number of addresses that will be consumed by the ACPS-610. Determining the size of the address block and setting the SLC base address is described in this section.

3.1.1 Determining SLC Address Consumption

Depending on how it is configured, an ACPS-610 can occupy a minimum of 5 and a maximum of 14 addresses on an SLC. When programming is complete, the ACPS-610's programming application, PK-PPS, displays the resulting SLC address consumption in its summary section. See Section 3.2, "Programming the ACPS-610" for more information.

Description	SLC Address*
Monitor General	B†
ACPS-610 Output #1	B + 1
ACPS-610 Output #2	B + 2
ACPS-610 Output #3	B + 3
ACPS-610 Output #4	B + 4
Signal Silence	NEXT‡
Monitor AC Fail (Canada only)	NEXT
Monitor Battery (Canada only)	NEXT
Monitor Earth Fault (Canada only)	NEXT
Monitor Charger (Canada only)	NEXT
Two Stage Output #1	NEXT
Two Stage Output #2	NEXT
Two Stage Output #3	NEXT
Two Stage Output #4	NEXT

Table 3.1 ACPS-610 SLC Addresses

* Addresses within shaded areas are assigned in blocks and cannot be assigned independently.
† B = SLC Base Address.
‡ SLC addresses depend upon configuration. NEXT = last address in power supply sequence +1.

NOTE: Addresses included in the address block must be programmed points in the FACP whether or not the output points are actually used. Even though some of the 14 possible ACPS-610 addresses may be skipped, none of the addresses in the FACP address block may be skipped.

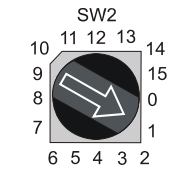
3.1.2 Setting the Base Address

The base address is the first address used in an SLC address block. Combine the SLC Address rotary switch (SW2) and slider switch (SW3) settings to determine the base address (B). The base address will be a number that ends in zero or five and the rest of the address block will progress sequentially from that number until all the addresses in the block are consumed.

NOTE: The lowest base address for the ACPS-610 is 05. Do not use FACP addresses 00 through 04 for the ACPS-610.

The SLC Address Rotary Switch (SW2)

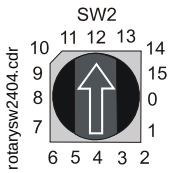
The SLC address rotary switch (SW2) determines the address decade. Each number on the dial represents the ten addresses of a decade. Turning the arrow until it points at a number selects that number's decade.



For example:

Pointing the arrow at the 1 selects the "one" address decade, beginning at 10.

or



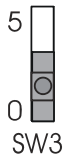
rotarysw2404.cdr

Pointing the arrow at the 12 selects the "twelve" address decade, beginning at 120.

The SLC Address Slider Switch (SW3)

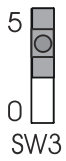
Use the SLC address slider switch (SW3) to further define the SLC base address. While an address' decade is defined by the rotary switch, this slider determines whether the base address (B) will end in a zero or a five. Sliding the switch towards the 0 selects a base address that ends with a zero. Sliding the switch towards the 5 selects a base address that ends with a five.

For example:



Slide the switch towards the 0, as shown in the illustration to the left, to select an initial address that ends in zero. Since the rotary switch defines the decade, if the rotary switch were to point at 8, the base address in this address block would be 80.

or



acps-610_SW3.cdr

Slide the switch towards the 5, as shown in the illustration to the left, to select an initial address that ends in five. Since the rotary switch defines the decade, if the rotary switch were to point at 8, the base address in this address block would be 85.

Figure 3.1 below gives two examples of setting the base address with both rotary and slider switch settings.

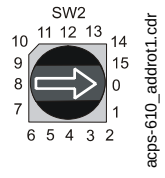
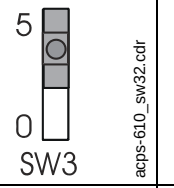
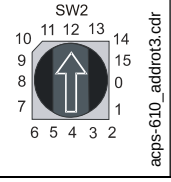
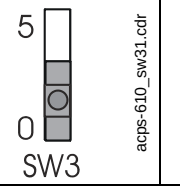
SW2 ROTARY SWITCH SETTING	SW3 SLIDER SWITCH POSITION	SLC BASE ADDRESS	SLC ADDRESSES SELECTED with maximum fourteen ACPS-610
		005	005-018
		120	120-133

Figure 3.1 SLC Address Selection

3.2 Programming the ACPS-610

Use PK-PPS to program the ACPS-610's global functions and individual outputs. With PK-PPS, you can configure and download the ACPS-610 database and update firmware. You can modify a power supply's configuration online, or offline, on a database that can be download at a later date.

PK-PPS is bundled as a separate program on the VeriFire Tools installation CD (P/N VERIFIRE-TCD). Updates are available for download from www.magni-fire.com.

3.2.1 Installing the Configuration Software

Minimum Requirements

- Windows XP Professional with SP2, or Windows 2000 with SP4.
- PC or Laptop with USB 2.0 port.

Installation

1. Log in. The user must have Administrative priveleges.
2. Insert the CD into the PC's CD drive.
3. Double click on the file PPS.exe on the CD.
4. Follow the instructions of the PPS installation wizard to completion.
5. Connect the ACPS-610 to the PC via the USB cable. (*See Section 3.2.2.*) Wait for the operating system to detect the new hardware.
6. Follow the set of steps in Table 3.2 below that are specific to your operating system.

Windows XP Professional with SP2	Windows 2000 with SP4
1. On the Found New Hardware Wizard window, select “No, not this time”. Click Next. 2. Select “Install from a list or specific location”. Click Next. 3. Select “Search for the best driver in these locations”. Clear the check box next to “Search removable media” and set the check mark next to “Include this location in the search”. Click Browse. 4. On the Browse For Folder pop-up window, select the folder C:\Notifier\Power Supply\PPS\USB Drivers. Click OK. 5. Click Next. 6. On the Hardware Installation window that warns “The software has not passed Windows Logo testing...”, click Continue Anyway. 7. Click Finish.	1. On the Found New Hardware Wizard window, click Next. 2. Select “Search for a suitable driver for my device”. Click Next. 3. Under optional search locations, select “Specify a location”. Clear all other check boxes. Click Next. 4. On the window that pops up, click the Browse button and select the file C:\Notifier\Power Supply\PPS\USB Drivers\HfsUsb.inf. Click Open. 5. Click OK on the pop-up window. 6. Click Next. This will install the driver. 7. Click Finish.

Table 3.2 Operating System Instructions

WARNING: Power Supply Disabled!
The power supply is out of service during database/firmware upload and downloads.

WARNING: Risk of Irreversible Loss of Programming Data!
Steady STATUS, GENERAL and OUTPUT TROUBLE LEDS indicate that a database/firmware download is STILL in process. Do not disconnect power or the USB cable during this time! Disonnect USB cable *only* after programming is complete.

3.2.2 Establishing the Hardware Connection.

Connect a standard USB cable from the PC’s USB port to the ACPS-610’s USB interface (J3). When the download is complete, the unit automatically reboots and returns to normal operation.

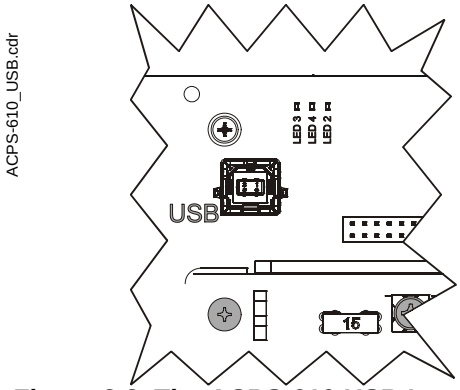


Figure 3.2 The ACPS-610 USB Interface (J3)

3.2.3 Working Offline

If your PC is not connected to a power supply, you may create or edit ACPS-610 databases. These databases can be saved and downloaded at a later date.

To create a new database, select **NEW** from the **FILE** menu.

To edit an existing database, select **OPEN** from the **FILE** menu.

3.2.4 Working Online

NOTE: Start the PK-PPS utility before connecting to the power supply.

In addition to creating and opening databases on your local drive, you may modify any ACPS-610 that is directly connected to your PC with the PK-PPS programming utility. When you are in the program and you are connected via the USB to a power supply, that power supply is represented by the icon in the left window. Click on this icon to see the power supply's current configuration and version information (Figure 3.3).

When you right-click on the ACPS-610 icon, you have three work options:

SAVE Select this option to save the power supply's current configuration as a database file (*.pdb) on your local drive.

MODIFY Select this option to edit the power supply's current configuration. After you make all of your changes, your new database will overwrite the one in the ACPS-610. You will also have the option to save this database to your local drive.

DOWNLOAD Select this option to download a database, application, or bootloader file to the power supply. See Section 3.2.5.

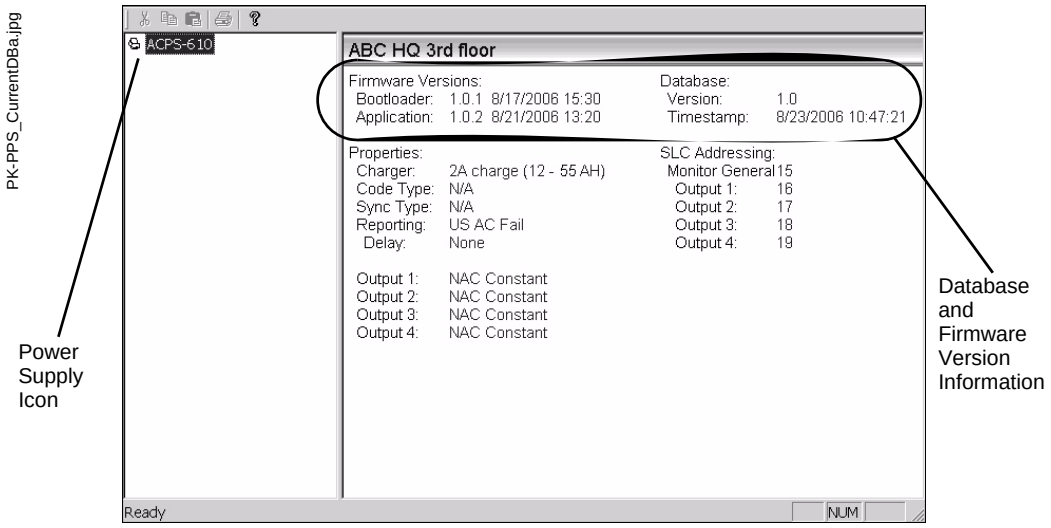


Figure 3.3 PK-PPS: Current Database

3.2.5 Downloading to the ACPS-610

1. Check to make sure that the PC is connected to the ACPS-610 (Section 3.2.2).
2. Right click on the ACPS-610 icon, select **DOWNLOAD** and choose the type of application you wish to download or select Download from the Operation menu.
   You may download a program database file (.pdb), an application file (*.hex), or a bootloader file (*.hex).*
3. Use the Browse button to navigate to the file you wish to download.
4. Open the file to download it to the ACPS-610.
5. Disconnect USB cable *AFTER* programming is complete.

3.2.6 ACPS-610 Configuration

PK-PPS sets parameters for the ACPS-610 and all of its outputs. Selections must be made in order shown below. Lower level options will not be available until upper level options have been selected.

The worksheet's summary section displays all selections. When programming is complete, PK-PPS displays the SLC address consumption that is result of your selections.

PK-PPS_Label.jpg

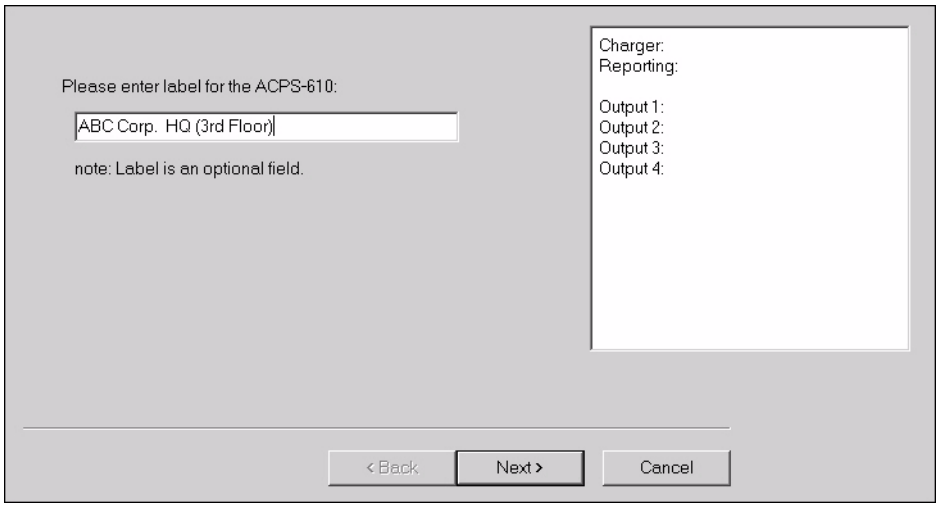


Figure 3.4 PK-PPS: Label

Label

For greater ease of identification, you may create a label for each power supply. Labels may have a maximum of 40 characters.

BatteryChargerUSa.jpg

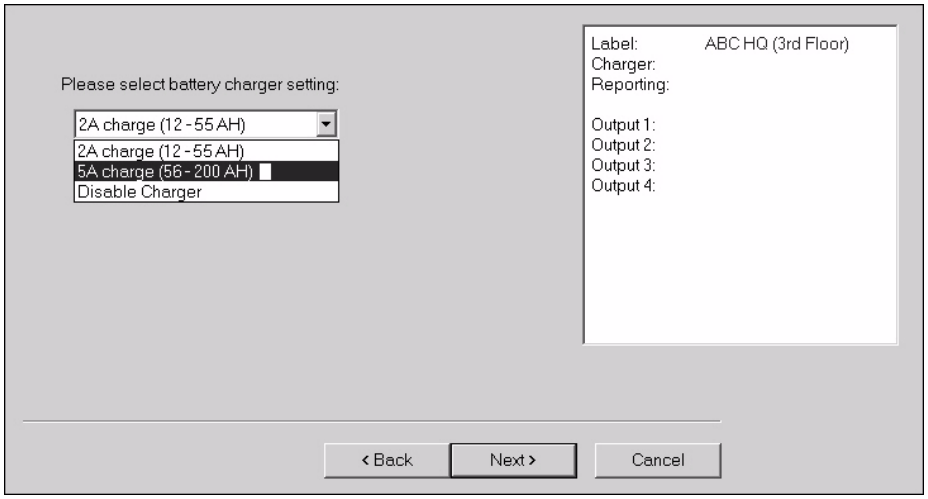


Figure 3.5 PK-PPS: Battery Charger

Battery Charger

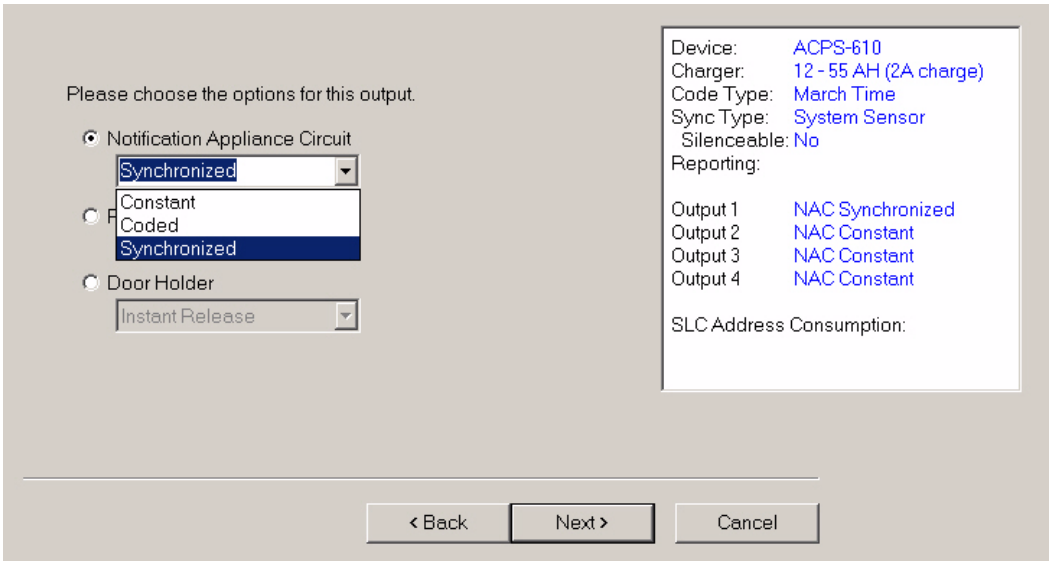
Choose the appropriate battery charger current for the system's battery capacity. Refer to Section 5.2, "Calculating the Battery Requirements", on page 49 for more information on determining your system's battery capacity.

There are three charger current options. Select **2A CHARGE** to charge 12 to 55 AH batteries. Select **5A CHARGE** to charge 56 to 200 AH batteries. Select **DISABLE CHARGER** when the power supply will not be connected to any batteries or when the batteries will be powered by an external charger (See page 23).

NOTE: When the battery charger is disabled, the power output continuous current is 2.5 Amps.

3.2.7 Output Configuration

Output circuits one through four can be programmed independently with these worksheets. Each output may be configured as either a NAC, a power circuit, or a door holder.



PK-PPS_NACOut.jpg

Figure 3.6 PK-PPS: Output Configuration

NAC

NOTE: Active NACs will disable the power supply's charger.

Choose the type of NAC output for each circuit.

CONSTANT The output goes active in Alarm and provides steady voltage with no code or sync.

CODED The output provides a coded signal. The code type can be determined internally or by an external source. See "Coding Type" on page 33.

SYNCHRONIZED The output provides a synchronized signal. Signal synchronization can be determined internally or by an external source. See "Synchronization" on page 34.

NOTE: Do not place strobes from any manufacturer onto a coded output. For example SpectrAlert or SpectrAlert Advance Series horns and strobes can not be synchronized with a UZC-256 or any coded output.

Power

Choose whether the output will supply non-resettable or resettable power.

Door Holder

Select delay time conditions from the drop down menu. Choose **INSTANT RELEASE** for a delay of zero seconds, **DELAY 30 SECONDS** for a thirty second delay before the doors are released, or **NEVER RELEASE** to keep all doors open.

WARNING: Risk of Bodily Injury!
All outputs that are configured as a releasing door holder ("Instant Release" or "Delay 30 Seconds") **MUST** be programmed at the FACP as a non-silenceable SLC point. *See the FACP manual for more information.*

3.2.8 Global Settings

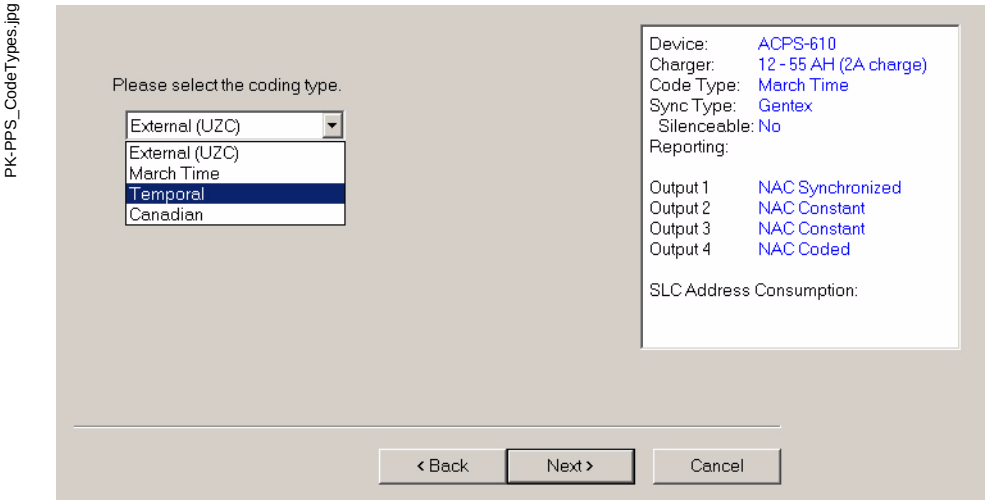


Figure 3.7 PK-PPS: Coding Type

Coding Type

Code type is a global setting that applies to all NAC outputs configured as **CODED**. (See Section 3.2.6 on page 30.) NAC codes can be generated internally or they can come from an external source via the power supply's UZC sync input (TB1).

Choose the internal or external coding for all coded NAC outputs.

EXTERNAL (UZC): The NAC sends a signal that is determined by an external source via the power supply's UZC sync input (TB1). Select this option when the power supply will be connected (via TB1) to an external coded signal. This option will not be available if the UZC is already configured to accept a synchronized signal.

MARCH TIME: The NAC sends a pulsed signal of 120 PPM (Pulses Per Minute).

TEMPORAL: The NAC sends a pulsed signal in a pattern of three cycles of 0.5s on/off followed by 1.5s off. Temporal is the standard NFPA 72 evacuation pattern.

CANADIAN:

TWO STAGE 1: The NAC sends a dual-stage signal of Alert tone followed by a temporal pattern.

TWO STAGE 2: The NAC sends a dual-stage signal of Alert tone followed by 120 PPM (March Time).

TWO STAGE 3: The NAC sends a dual-stage signal of Alert tone followed by a continuous tone.

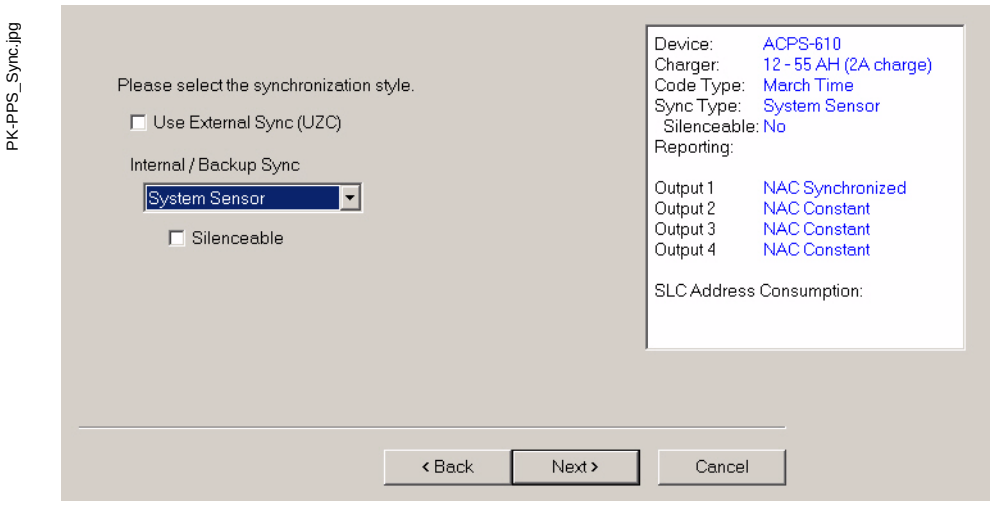


Figure 3.8 PK-PPS: Synchronization

Synchronization

Select the protocol for synchronized outputs. Select **USE EXTERNAL SYNC (UZC)**, when the power supply will be connected (via TB1) to an external sync source.The external sync source must be an FACP or power supply manufactured by the same manufacturer as the ACPS-610. This is a non-supervised connection. This option will not be available if the UZC is already configured to accept a coded signal (See “Coding Type” on page 33).

If no external sync is selected or there is a loss of signal, the ACPS-610 will generate an internal sync pattern based upon the selection from the **INTERNAL/BACKUP SYNC** dropdown menu.

■ Silenceable

Select this option to silence all synchronized NACs when signal silence is activated. Use this option with Gentex, System Sensor and Wheelock synchronized devices.

If any output address is configured as “non-silenceable” at the panel, the horns will mute, but the strobes will remain active when silenced. If any output address is configured as “silencable” at the panel, both horns and strobes will become inactive when silenced.

Making outputs silenceable adds an additional SLC address (see Section 3.1.1 on page 26). This extra address is specifically for Signal Silence only. The Signal Silence SLC address should be configured in the panel as a “silenceable output”, activated by CBE.

CAUTION: All Synchronized power supplies must have the same protocol!
FOR SYNCHRONIZED MASTER/SLAVE OPERATION: when a synchronized signal is supplied to the UZC connections of TB1, the same protocol must also be programmed at the slave ACPS-610 as programmed at the master ACPS-610. This will ensure operation of all synchronized outputs of the slave ACPS-610 should signal loss occur of the synchronization input (UZC connections) at TB1.

PK-PPS_TroubleReport.jpg

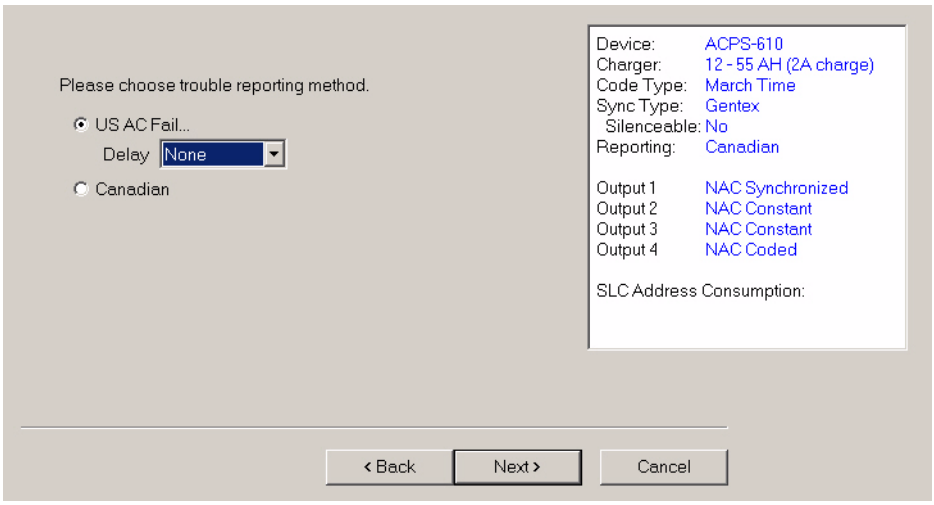


Figure 3.9 PK-PPS: Trouble Reporting

Trouble Reporting

Select the trouble reporting option. When the power supply is configured for US trouble reporting options, the panel will report a trouble message at the base address. Choose a US AC Fail Delay time (**0**, **2 HOURS**, **8 HOURS**, or **16 HOURS**) from the drop-down menu. In FlashScan systems, the panel will display the specific trouble type (AC Fail, Battery Low, Battery High, Earth Fault, or Charger Failure) at the power supply's base address. In CLIP systems, the panel will only display a general trouble at the power supply's base address.

When the power supply is configured for Canadian trouble reporting, the panel displays a specific trouble message for at the AC Fail, Battery, Earth Fault, and Charger Fail addresses (See Table 3.1). If a Canadian code type is selected, trouble reporting will be set automatically to Canadian.

PK-PPS_Summarya.jpg

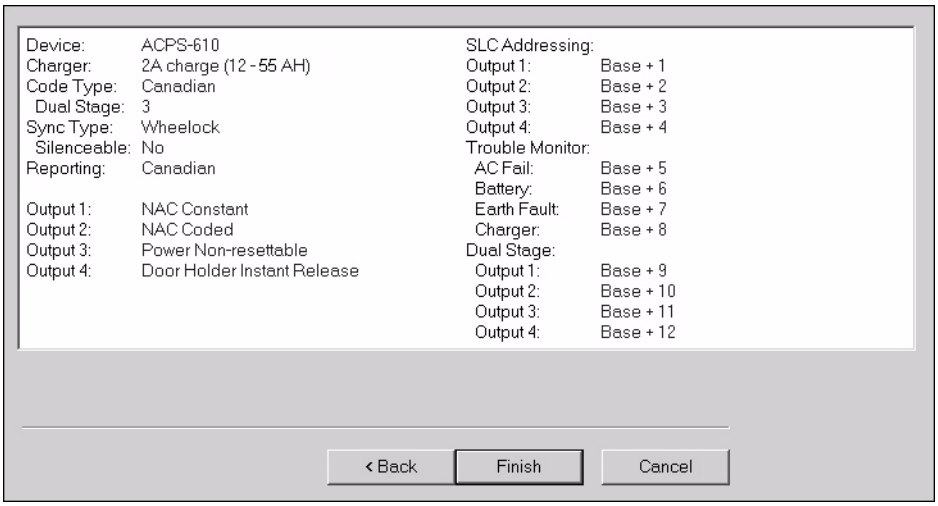


Figure 3.10 PK-PPS: Summary

Summary

The Summary screen displays all of your previous selections and the resulting SLC address consumption. Review this summary screen before downloading and ensure that the proper number of consecutive addresses are reserved. You may use the **BACK** button to edit any of your selections. Click the **FINISH** button to save your changes to the database.

3.3 Configuring the FACP

3.3.1 Software Type ID Codes

ACPS-610 points must be programmed at the FACP with Software Type ID codes. Refer to the panel programming manual for specific Software Type ID codes. Table 3.3 below gives general categories of codes that may be used for the AFP-100, AFP-200, AFP-300/400, AFC-600, AM2020/AFP-1010 FACPs. See FACP manual for more information.

Point Type	Allowable Software Type ID Codes
Trouble Points	Software Type ID Codes for trouble monitors
NAC Points	Software Type ID Codes for supervised NAC circuits
+24V Relay Points	Software Type ID Codes for relay circuits

Table 3.3 Software Type ID Codes, AFP-100, AFP-200, AFP-300/400, AFC-600, AM2020/AFP-1010

Table 3.4 below categorizes codes used with the NFS FACPs.

Point Type	Module Type	NFS-3030/NFS2-3030		NFS-640 NFS2-640 NFS-320	VeriFire Tools for NFS-3030/NFS2-3030, NFS-640/NFS2-640, and NFS-320	
		Type Code Label	FlashScan Type	Type Code Label	Type Code Label	FlashScan Type
Trouble Points	Monitor	Power Monitr	PS Mon	Power Monitr	Power Monitr	PS Monitor
NAC Points	Control	Control	PS NAC	Control	Control	PS Control
+24V Relay	Control	Relay	PS Relay	Relay	Relay	PS Relay

Table 3.4 NFS-3030/NFS2-3030, NFS-640/NFS2-640, NFS-320 Software Type Codes

NOTE: When a UPS is used, program the associated monitor module with a trouble point Type ID from Table 3.3.

3.4 Two Stage Alert/Evacuation (Canada Only)

3.4.1 Addressing in Two-Stage Mode

Two Stage Alert/Evacuation is a mode option for use in Canada only, with the NFS-3030/NFS2-3030, NFS-640/NFS2-640, NFS-320, or AM2020/AFP1010. In this mode each coded NAC output operates in one of two stages: alert or evacuation. The alert stage generates a pulsing output of 20 pulses per minute: the evacuation stage generates an output in the NFPA Temporal Pattern (Canadian 1), March Time--120 ppm--(Canadian 2), or a continuous tone (Canadian 3).

Select the Two Stage mode from the Coding Type worksheet (page 33). Any individual ACPS-610 output circuits must be set to the coded NAC option on the corresponding Output Configuration Worksheet in PK-PPS (page 32).

When the ACPS-610 is set to dual-stage, each output circuit uses two control addresses, even if the circuit is not configured for dual-stage (i.e. not a coded NAC). The installer should ascertain that an appropriate block of consecutive FACP addresses is available prior to addressing an ACPS-610 in Two Stage. Table 3.1 on page 26 shows Two Stage addressing and address consumption.

The first address for each output does one of three things:

1. If the output is a coded NAC, activating the first associated address activates Stage 1 (alert).

2. If the output is a synchronized NAC, activating the first associated address turns the output on.
3. If the output is a Door Holder, activating the first address turns the output off (instantly, in 30 seconds, or never – depending upon configuration. (See page 32).
4. If the output is a +24V power output, activating the first associated address has no effect, but the address must be in communication with the panel.

The second address for each output does the following:

1. If the output is a coded NAC, activating the second associated address activates stage 2 (evacuation). Note that the first address must also be activated.
2. If the output is a synchronized NAC, activating the second associated address has no effect but the address must be in communication with the panel.
3. If the output is a Door Holder, activating the second associated address has no effect, but the address must be in communication with the panel.
4. If the output is a +24V power output, activating the second associated address has no effect, but the address must be in communication with the panel.

3.4.2 Two Stage Panel Programming

All second stage timing is controlled by the FACP. All addresses must be programmed in the FACP. Null control-by-event (CBE) should be employed for unused second-stage points. Figure 3.11 illustrates the panel CBE programming.

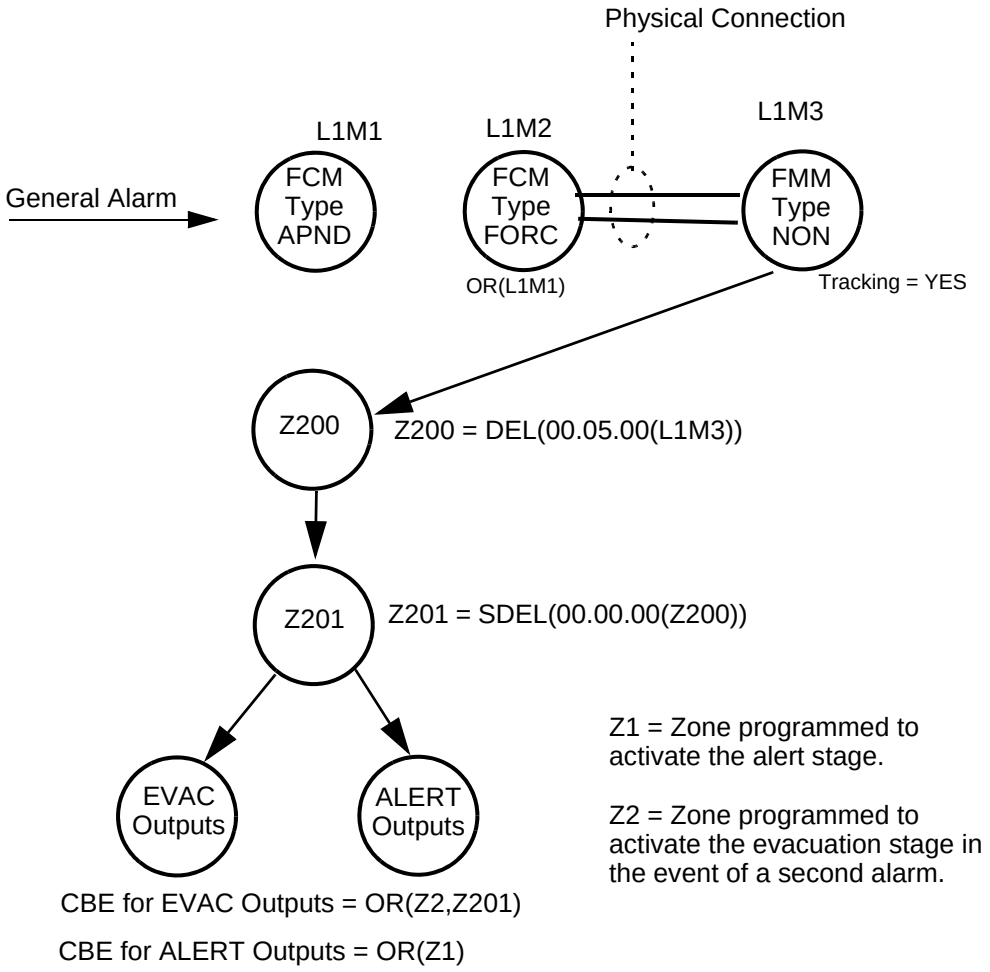


Figure 3.11 Canadian Two Stage for the NFS-3030/NFS2-3030

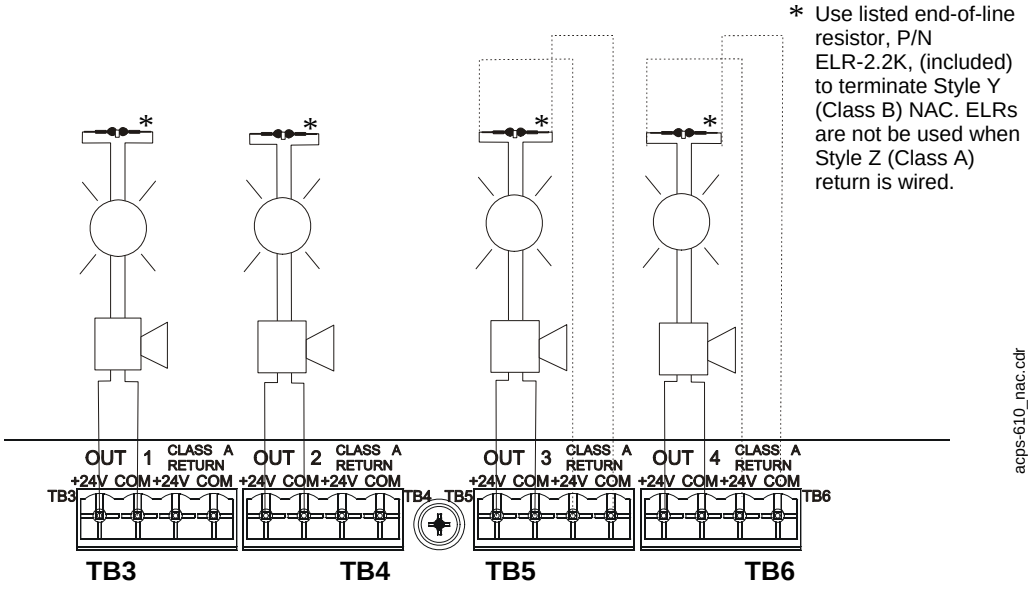
The sequence of operations is as follows.

- A general alarm activates FCM L1M1 (Type code APND).
- L1M2, which has been programmed via CBE for OR(L1M1), activates (Type code FORC).
- L1M3 (Type code NONA) physically monitors L1M2 contacts. L1M3 activates.
- Software Zone Z200 (RZON) is programmed to activate after a 5 minute delay with the equation Z200 = DEL(00.05.00(L1M3)). Z200 will clear (or never activate) if L1M1 is acknowledged or if the system is reset before the 5 minute timer expires.
- Software Zone Z201 (RZON) is programmed to activate after a 0 delay when Z200 activates. Z201 will only clear from a system reset.
- Alert Software Zone Z1 will activate when the Z1 equation is satisfied. ALERT = OR(Z1). A CBE (Control-by-event) in this equation refers to any local CBE that is programmed into this point. It could be a CBE that programs four cross-zoned detectors, for example.
- EVAC Software Zone Z2 will activate when the Z2 equation is satisfied. EVAC = OR(Z2, Z201). The CBE in this equation refers to any local CBE that is programmed into this point. It could be a CBE that programs four or more cross-zoned detectors, for example.

Refer to the programming section of the FACP manual for more information on programming.

Section 4: Applications

4.1 NAC Outputs

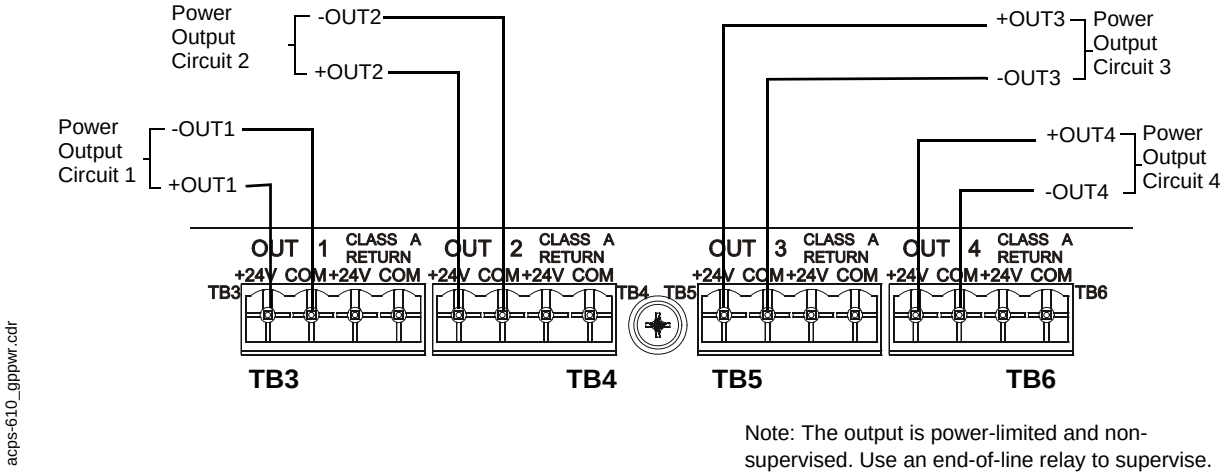


Note: The NAC outputs shown above are in a non-coded configuration.

Figure 4.1 Four NAC Outputs

NOTE: Active NACs will disable the power supply's charger.

4.2 Power Outputs



Note: The output is power-limited and non-supervised. Use an end-of-line relay to supervise.

Figure 4.2 General Purpose Power Output

CAUTION: Risk of equipment damage!
When the battery charger is disabled, the total power output continuous current is 2.5 Amps.

4.3 Style B (Class B) Initiating Device Circuit

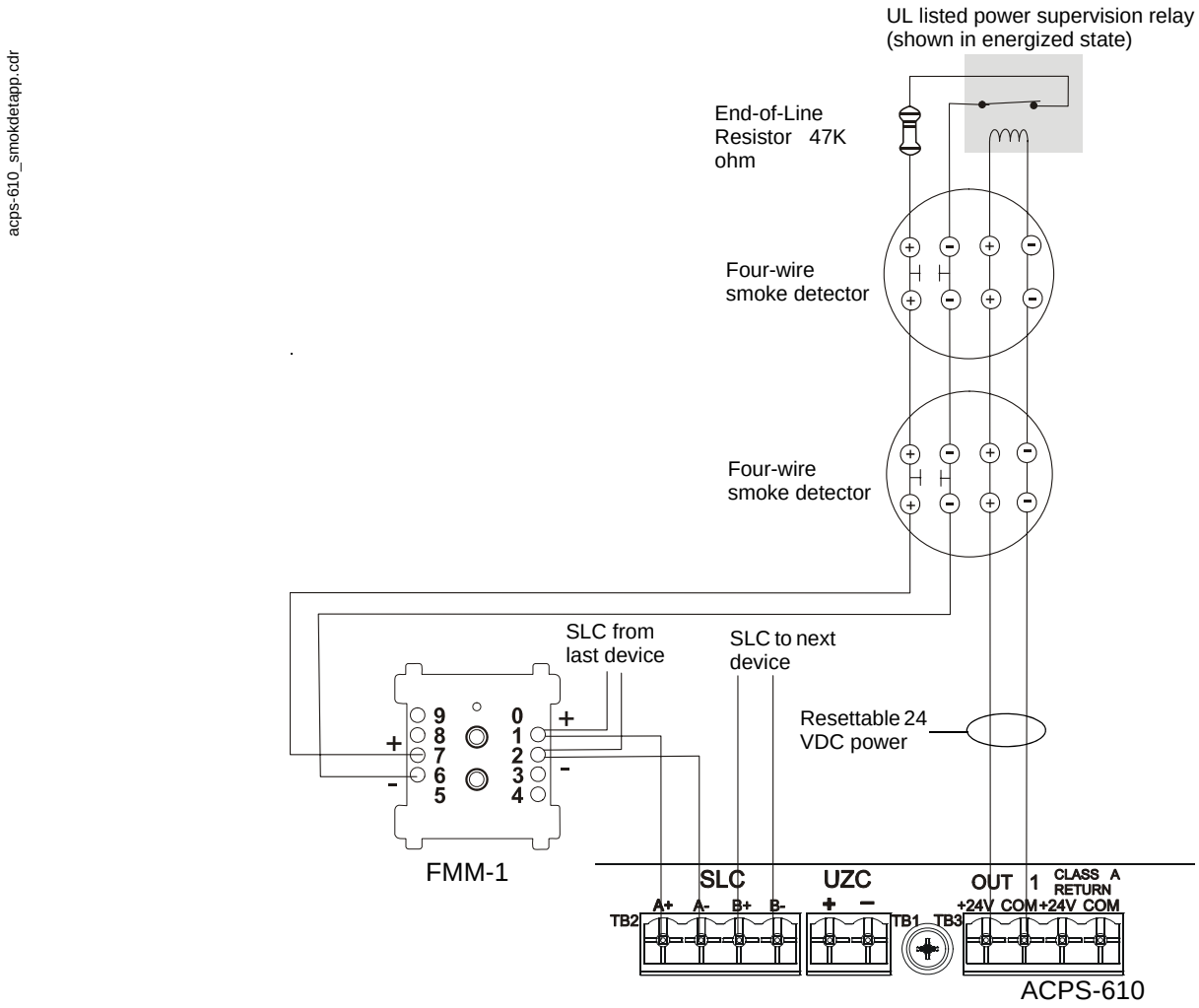


Figure 4.3 Style B (Class B) IDC

4.4 Synchronization

The ACPS-610 provides synchronization to Gentex, System Sensor SpectrAlert and SpectrAlert Advance Series, and Wheelock strobes and horns. When the ACPS-610 is set for synchronization, these NAC devices will flash and/or sound together.

The ACPS-610 can also provide synchronization for bells and horns when used with a UZC-256 Universal Zone Coder if the NAC output is configured for coded signals only.

NOTE: Do not place strobes from any manufacturer onto a coded output.
For example SpectrAlert and SpectrAlert Advance Series horns and strobes can not be synchronized with a UZC-256 or any coded output.

Refer to the following figures for application illustrations.

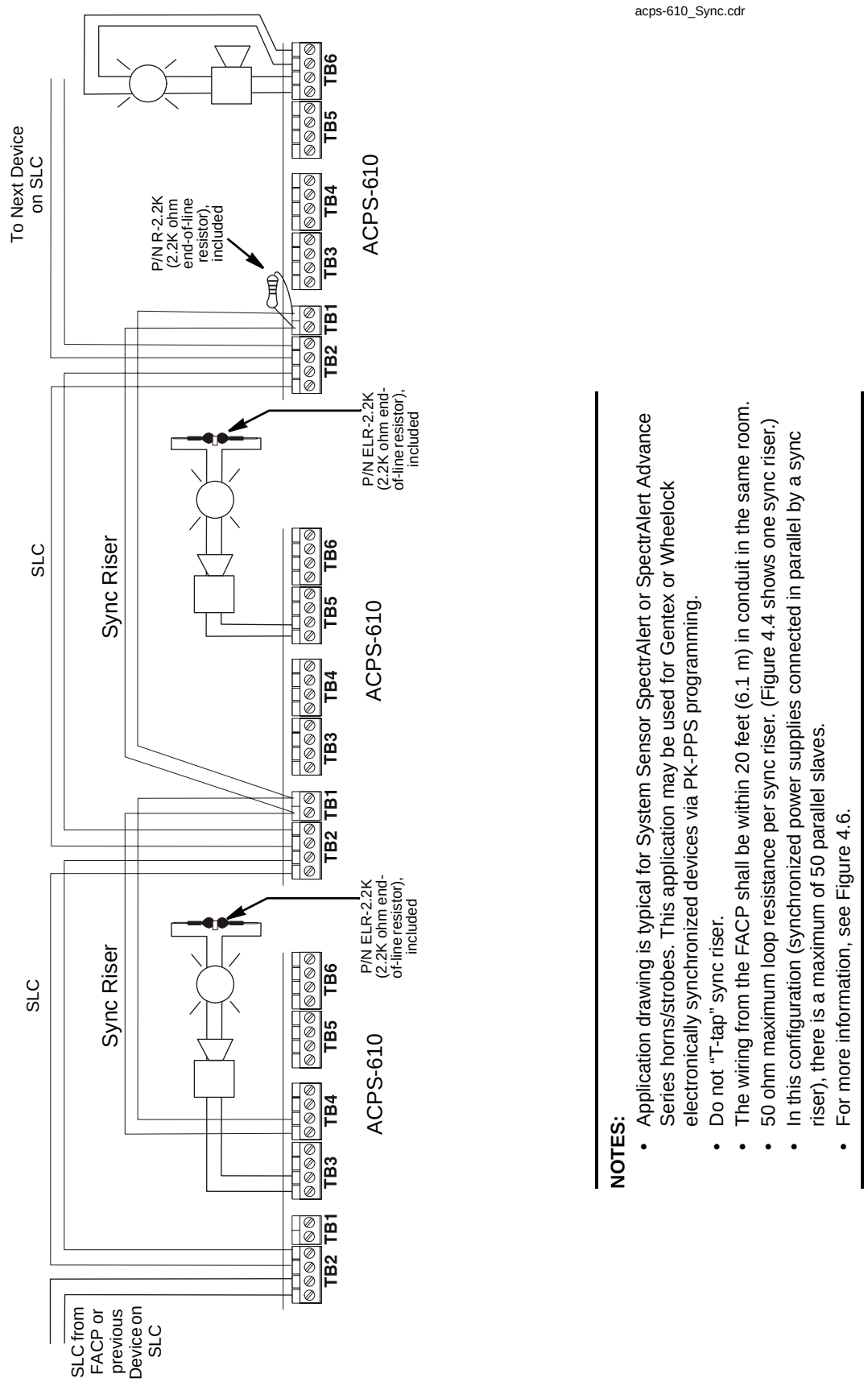
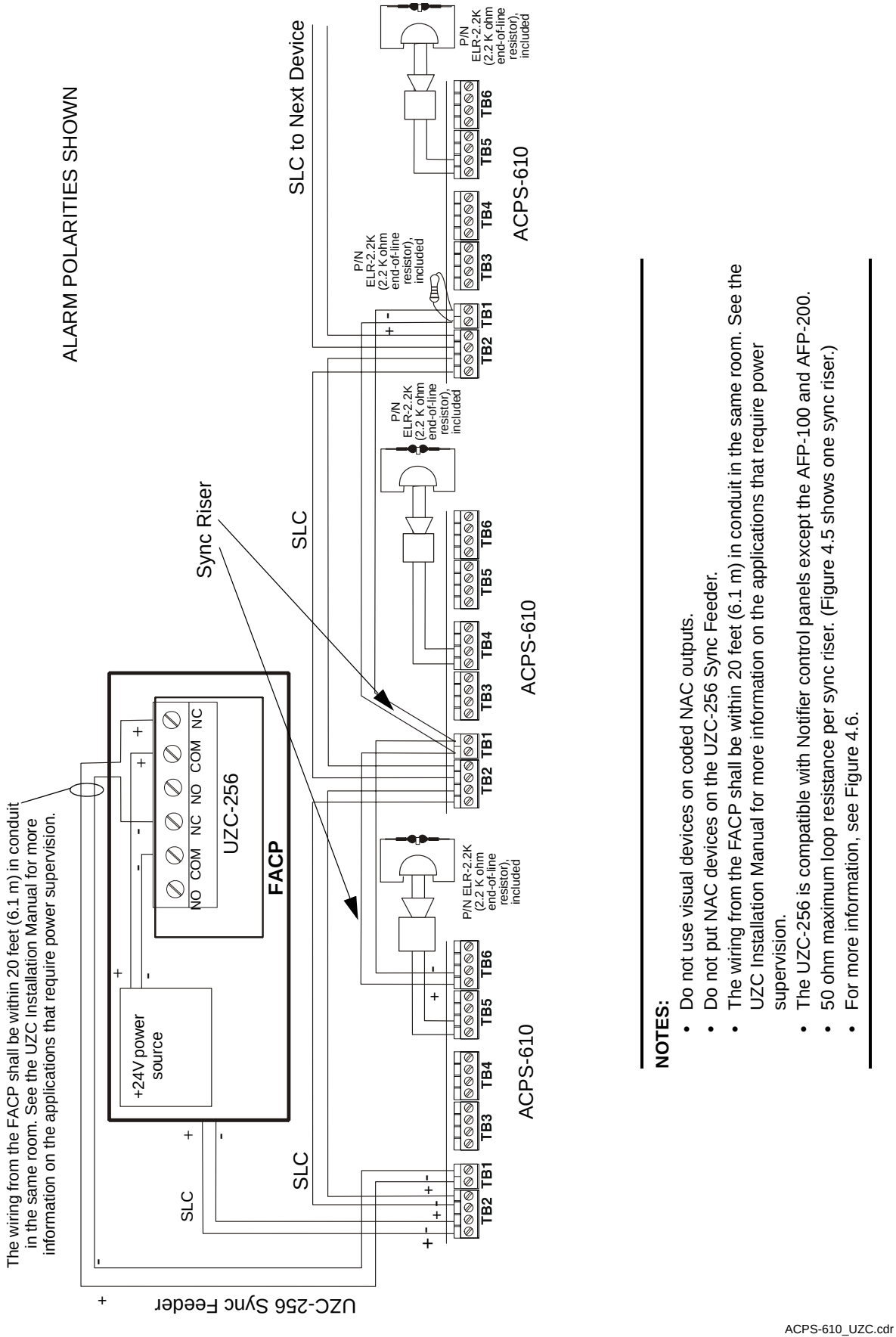


Figure 4.4 Supervised Parallel Master/Slave Synchronization Connections

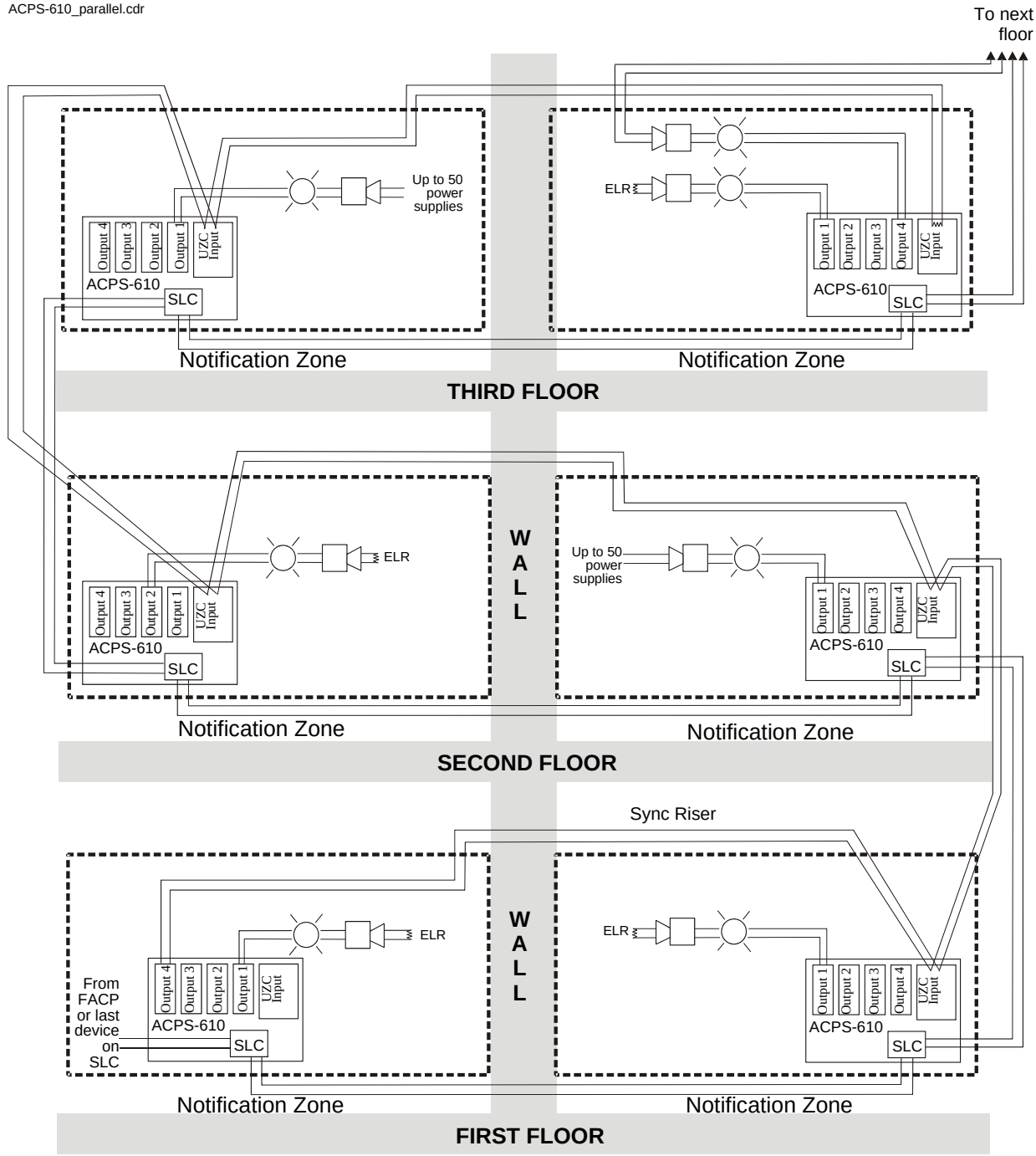


NOTES:

- Do not use visual devices on coded NAC outputs.
- Do not put NAC devices on the UZC-256 Sync Feeder.
- The wiring from the FACP shall be within 20 feet (6.1 m) in conduit in the same room. See the UZC Installation Manual for more information on the applications that require power supervision.
- The UZC-256 is compatible with Notifier control panels except the AFP-100 and AFP-200.
- 50 ohm maximum loop resistance per sync riser. (Figure 4.5 shows one sync riser.)
- For more information, see Figure 4.6.

ACPS-610_UZC.cdr

Figure 4.5 Supervised Synchronization Wiring Using UZC-256



NOTE:

1. The NAC output devices from one power supply must be partitioned with walls and/or floors from the next power supplies and their NAC output devices.
2. Use only devices from the same manufacturer in each system.
3. 50 ohm maximum loop resistance per sync riser. (Figure 4.6 shows one continuous sync riser.)

Figure 4.6 Supervised Parallel Connection (Typical)

Notes

Section 5: Power Supply Calculations

Calculations must be done to determine standby and alarm DC current loads. Ampere-hour requirements must be calculated as well to determine battery size.

In the following section, the term “secondary” refers to the ACPS-610’s backup batteries: the term “primary” is reserved for the ACPS-610’s primary source of power, 120 VAC 50/60 Hz power or 220-240 VAC 50/60 Hz power. The term “standby” refers to the output current required when no fire alarm is present. The term “alarm” refers to the output current required when a fire alarm is present.

5.1 DC Current Draw Calculations

The ACPS-610 provides filtered 24VDC power that may be used for operating Notification Appliance Circuits (4 x 1.5 A) or other external devices (4 x 1.5 A with charger enabled or 4 x 2.5 A with charger disabled). The power for operating external devices is limited. Use Tables 5.1 through 5.5 to determine if external loading is within the capabilities of the power supply.

1. Enter the current draw values for each output into Tables 5.1 through 5.4. Refer to the Device Compatibility document and the device manufacturer’s data sheets packaged with each device to find the standby and alarm current draws to use in these tables.
2. Enter the Standby Current Total and the Alarm Current Total from each of these four tables into Table 5.5, and add the figures in Column A and Column B to determine total DC current draw.

NOTE: Columns A and B of Tables 5.1 through 5.5 are not battery calculations. They are current calculations to confirm whether the ACPS-610 can output enough DC current to support its devices during standby and alarm conditions.

OUTPUT 1						
CATEGORY	**COLUMN A Standby Current (amps)**			**COLUMN B Alarm Current (amps)**		
	Qty	X current draw=	Total	Qty	X current draw=	Total
Power Supervision Relays (EOLR-1)		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
Annunciators		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Notification Appliances	Not Applicable				X =	A
Notification Appliances					X =	A
Notification Appliances					X =	A
Sum each column for totals		**Output 1 Standby Current Draw total:**	**A**		**Output 1 Alarm Current Draw total:**	**A**

Table 5.1 DC Current Draw Calculations, ACPS-610 Output 1

OUTPUT 2						
CATEGORY	**COLUMN A Standby Current (amps)**			**COLUMN B Alarm Current (amps)**		
	Qty	X current draw=	Total	Qty	X current draw=	Total
Power Supervision Relays (EOLR-1)		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
Annunciators		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Notification Appliances	Not Applicable				X =	A
Notification Appliances					X =	A
Notification Appliances					X =	A
Sum each column for totals		**Output 2 Standby Current Draw total:**	**A**		**Output 2 Alarm Current Draw total:**	**A**

Table 5.2 DC Current Draw Calculations, Output 2

OUTPUT 3						
CATEGORY	**COLUMN A Standby Current (amps)**			**COLUMN B Alarm Current (amps)**		
	Qty	X current draw=	Total	Qty	X current draw=	Total
Power Supervision Relays (EOLR-1)		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
Annunciators		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Notification Appliances	Not Applicable				X =	A
Notification Appliances					X =	A
Notification Appliances					X =	A
Sum each column for totals		**Output 3 Standby Current Draw total:**	**A**		**Output 3 Alarm Current Draw total:**	**A**

Table 5.3 DC Current Draw Calculations, Output 3

OUTPUT 4						
CATEGORY	**COLUMN A Standby Current (amps)**			**COLUMN B Alarm Current (amps)**		
	Qty	X current draw=	Total	Qty	X current draw=	Total
Power Supervision Relays (EOLR-1)		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
4-Wire Smoke Detectors		X =	A		X =	A
Annunciators		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Auxiliary Devices		X =	A		X =	A
Notification Appliances	Not Applicable				X =	A
Notification Appliances					X =	A
Notification Appliances					X =	A
Sum each column for totals		**Output 4 Standby Current Draw total:**	**A**		**Output 4 Alarm Current Draw total:**	**A**

Table 5.4 DC Current Draw Calculations, Output 4

		Column A Standby Current (amps)		Column B Alarm Current (amps)
ACPS-610 Power Supply		0.09 A		0.09 A
Output 1 (Enter Totals from Table 5.1)		**A**		**A**
Output 2 (Enter Totals from Table 5.2)		**A**		**A**
Output 3 (Enter Totals from Table 5.3)		**A**		**A**
Output 4 (Enter Totals from Table 5.4)		**A**		**A**
Sum each column for totals	**Standby Current Draw total:**	**A**	**Alarm Current Draw total:**	**A**
Note: STANDBY CURRENT TOTAL cannot exceed 6.0A/10.0A or 1.5 A/2.5 A. for any single output. ALARM CURRENT TOTAL cannot exceed 6.0 A or 1.5 A for any single output.				

Table 5.5 Total ACPS-610 DC Current Draw Calculations

5.1.1 Calculating the Maximum Secondary Power Non-Fire Alarm Current Draw

Use the table below to determine the maximum current requirements of the secondary power source during non-fire alarm, standby conditions. The result obtained is the amount of current that the batteries must be able to supply to the fire alarm system. Use the result in Table 5.8 to determine the size of the batteries needed for the fire alarm system.

Results taken from the table below assume that, while in a non-fire alarm condition, batteries must feed the ACPS-610 (and any additional supplies) with the maximum rated power each supply can provide.

Device	Quantity	Alarm Current (in amps)	Total Current/Type
Alarm Current, from Table 5.5, col A		=	
Additional Load	[ ] X	=	
Sum Column for Secondary Non-Fire Alarm Load		=	

Table 5.6 Maximum Secondary Power Non-Fire Alarm Current Draw

5.1.2 Calculating the Maximum Secondary Power Fire Alarm Current Draw

Use the table below to determine the maximum current requirements of the secondary power source during fire alarm conditions. The result obtained is the amount of current that the batteries must be able to supply to the fire alarm system. Use the result in Table 5.8 to determine the size of the batteries needed for the fire alarm system.

Results taken from the table below assume that, while in a fire alarm condition, batteries must feed the ACPS-610 (and any additional supplies) with the maximum rated power each supply can provide.

Device	Quantity	Alarm Current (in amps)	Total Current/Type
Alarm Current, from Table 5.5, col B		=	
Additional Load	[ ] X	=	
Sum Column for Secondary Fire Alarm Load		=	

Table 5.7 Maximum Secondary Power Fire Alarm Current Draw

5.2 Calculating the Battery Requirements

5.2.1 Calculating the Battery Capacity

Use this table to determine the battery capacity needed for the system:

Current (amps)	**X**	**Time (hours) Required**	**=**	**_____AH**
Secondary Non-Fire Alarm (Standby) Current (from Table 5.6)		Required Standby Time (hours)		
_____	X	_____	=	_____AH
Secondary Fire Alarm Load (from Table 5.7)		Required Fire Alarm Time (minutes):*		
_____	X	_____	=	_____AH
Sum Column for Total Secondary Amp Hours calculated			=	_____AH
Multiply by the derating factor x 1.2 (See Note 7)			=	_____AH
Battery Size – Total Secondary Amp Hours Required			=	_____AH

* Following are decimal conversions for standard numbers of minutes:

5 minutes	0.084
10 minutes	0.167
15 minutes	0.250
30 minutes	0.5
60 minutes	1.0
120 minutes	2.0

Table 5.8 Secondary Power Standby and Fire Alarm Load

The following notes apply to Table 5.8:

1. NFPA 72 Local, Proprietary, Central Station, and Remote Station systems require 24 hours of standby power followed by 5 minutes in alarm.
2. NFPA 72 Auxiliary systems require 60 hours or standby power followed by 5 minutes in alarm.
3. Batteries installed in a system powered by an automatic starting engine generator need to provide at least 4 hours of standby power.
4. Factory Mutual requires 90 hours of standby for deluge-preaction systems.
5. Emergency voice/alarm communications systems require 2 hours of operation in the alarm condition. Due to the sporadic nature of voice operation, however, NFPA 72 permits 15 minutes of operation at a maximum connected load to equal 2 hours of normal use.
6. If the total exceeds 200 AH, an Uninterruptable Power Supply with sufficient amp-hour capacity is needed. The Uninterruptable Power Supply must be UL-listed for Fire-Protective Signaling. (Refer to pages 24 and 36 for trouble connections and FACP programming.)
7. The following battery derating factors must be used for Canadian installations using an ACPS-610 charger. Derating factors are subject to local AHJ approval.
   - For 12 – 26 AH capacity, use derating factor of 1.2
   - For 55 AH capacity, use derating factor of 1.8
   - For 100 – 200 AH capacity, use derating factor of 2.5

5.2.2 Calculating the Battery Size

Use this table to choose the battery size, in amp-hours, needed to support the fire alarm system. The ACPS-610 can charge batteries from 12 to 200 AH. Select batteries that meet or exceed the Total Amp-Hours calculated in Table 5.8 and that are within the acceptable battery charger range. Write the amp-hours requirements on the Protected Premises label.

Battery Size	Voltage Rating	Number Required	Part Number*	Backbox† (Order Part Number)
12 AH	12 volts	two	BAT-12120	CAB-PS1, SBB-A4, SBB-B4, SBB-C4, SBB-D4, BB-25
26 AH	12 volts	two	BAT-12260	SBB-A4, SBB-B4, SBB-C4, SBB-D4, BB-25
55 AH	12 volts	two for 55 AH four for 110 AH	BAT-12550	NFS-LBB BB-100
100 AH	12 volts	two for 100 AH four for 200 AH	BAT-121000	BB-100 BB-200

Table 5.9 Selecting the Battery Size

* Manufactured to our specifications by WUHAN SOTA ENERTECH, INC.
† Red version available for some models. Check for availability.

NOTE: Battery size is limited to 12 AH minimum to 200 AH maximum using the internal ACPS-610 battery charger.

Notes

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Limited Warranty

Honeywell International Inc. warrants products manufactured by it to be free from defects in materials and workmanship for eighteen (18) months from the date of manufacture, under normal use and service. Products are date stamped at time of manufacture. The sole and exclusive obligation of **Honeywell International Inc.** is to repair or replace, at its option, free of charge for parts and labor, any part that is defective in materials or workmanship under normal use and service. All returns for credit are subject to inspection and testing at the factory before actual determination is made to allow credit. **Honeywell International Inc.** does not warrant products not manufactured by it, but assigns to the purchaser any warranty extended by the manufacturer of such products. This warranty is void if the product is altered or repaired by anyone other than **Honeywell International Inc.** or as expressly authorized by **Honeywell International Inc.** in writing, or is serviced by anyone other than **Honeywell International Inc.** or its authorized distributors. This warranty is also void if there is a failure to maintain the products and systems in which they operate in a proper and workable manner. In case of defect, secure a Return Material Authorization form from our Return Authorization Department.

This writing constitutes the only warranty made by **Honeywell International Inc.**, with respect to its products. **Honeywell International Inc.**, does not represent that its products will prevent any loss by fire or otherwise, or that its products will in all cases provide the protection for which they are installed or intended. Buyer acknowledges that **Honeywell International Inc.**, is not an insurer and assumes no risk for loss or damages or the cost of any inconvenience, transportation damage, misuse, abuse, accident or similar incident.

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This warranty replaces all previous warranties and is the only warranty made by **Honeywell International Inc**. No increase or alteration, written or verbal, of the obligation of this warranty is authorized.

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