NOTIFIER®
by Honeywell

Intelligent Power Supply
AMPS-24/E
Manual

Document 51907 Rev: J4
03/14/2019 ECN: 18-0305

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 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. Over-tightening 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.

Units with a touchscreen display should be cleaned with a dry, clean, lint free/microfiber cloth. If additional cleaning is required, apply a small amount of Isopropyl alcohol to the cloth and wipe clean. Do not use detergents, solvents, or water for cleaning. Do not spray liquid directly onto the display.

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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Software Downloads

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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Send email messages to:

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Section 1: Introduction

The AMPS-24/E is an intelligent power supply and battery charger with one 5VDC and three 24 VDC outputs. It can connect directly to a CPU2-3030*, NCA-2 or DS-DB via a harness cable with EIA-485 connections. For other systems it can operate in FlashScan or CLIP (Classic Loop Interface Protocol) mode and reside on the SLC. The AMPS-24 includes a battery charger capable of charging up to 200 AH batteries.

*Note that the CPU2-3030 must connect to the SLC as well to get correct trouble status reporting. Refer to “SLC Addressing” on page 27.

The AMPS-24/E may be installed remotely from an ONYX Series panel, connected as an SLC device in either FlashScan or CLIP mode to provide system supervision. In this configuration, it can simultaneously charge batteries and power remote devices. (See block diagram Figure 2.12 on page 21.)

1.1 Features

- SLC Addressable by any CLIP or FlashScan Fire Alarm Control Panel (FACP)
- Remote charger/general purpose power supply
- Charges 7 to 200 AH batteries
- Isolated Signaling Line Circuit (SLC) interface
- Brownout detection
- Battery/battery charger supervision
- Disconnect of deeply-discharged battery (low battery disconnect)
- Selectable charger current
- AC loss detection and AC loss delay reporting
- Five-point trouble reporting
- Two models available: AMPS-24 (120 VAC, 50/60 Hz) or AMPS-24E (220-240 VAC, 50/60 Hz)

1.2 Specifications

The AMPS-24 is comprised of two boards; the CPS-24 board (the smaller front board), and the AMPS-K2 (the larger rear board). See Figure 1.1.

1.2.1 CPS-24 Board

AC Power - TB1

120 VAC 50/60 Hz input, 5.0 A maximum

220 - 240 VAC 50/60 Hz input, 2.5 A maximum

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

Fuse: 8 amps, 250V, 5 x 20 mm, Fast-Acting, ceramic. Notifier P/N 12117

Secondary Power 5V and 24V AUX outputs - TB2

Power-limited (Class 2): 24V @ 0.5A, 5V @ 0.15A

Utilizes wire sizes 12-18 AWG (3.31 mm^2 - 0.821 mm^2)

Secondary Power (Battery) Charging Circuit - TB3

Sealed lead-acid battery charger which wll charge 7 - 200 AH batteries

Utilizes wire sizes 10-14 AWG (5.26 mm^2 - 2.08mm^2)

Charging current: 1.0A, 2.0A, 5.0A, or OFF (Software selectable)
Based on battery size programming (See “Outputs Current Settings” on page 31)

Charging voltage: 27.6 VDC (nominal)
To calculate expected standby operating times, see Section 4 on page 35.

When AC power is lost, the deeply-discharged battery cutoff protection will be invoked at 17 volts. The power supply will be disconnected from the batteries. The power supply’s normal operation will be restored when AC power returns.

1.2.2 AMPS-K2 Board

Main 24V Output Circuit - TB1

Main 24V output provides filtered power-limited (Class 2) power when set for 3A. Otherwise it provides filtered, non-power limited power. Refer to Table 1.1 below for maximum current settings for the various configurations.

Aux 24V Output Circuit - TB3

Auxiliary 24V output provides filtered power-limited (Class 2) power when set for less than 5A.Otherwise, it provides filtered, non-power limited power. Refer to Table 1.1 below for maximum current settings for the various configurations.

Charger Setting/Battery Size	Main 24V (TB1 on AMPS-K2 board) Maximum Current	Total AUX 24V (TB3 on AMPS-K2 board plus TB2 on CPS-24) Maximum Current
1A / 7 - 26AH Batteries	5A	3A
2A / 12 - 60AH Batteries	5A	3A
5A / 55 - 200 AH		
Configuration 1	5A	OFF
Configuration 2	3 A	1 A
Disabled	5A	5A

Table 1.1 Output Current for Each Configuration

NOTE: The AMPS-24 can provide up to 3A for releasing applications, limited by the FCM-1-REL.

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).

Trouble Bus - TB4

Trouble bus input is designed to receive trouble signals from any normally-open dry contacts or open-collector circuit.
Utilizes twisted-pair wire sizes 12-22 AWG (3.31 mm^2 - 0.326 mm^2).

Full Speed USB 2.0 - J3

USB Type B connector for programming installation parameters.

1.3 Installation Standards and Codes

The AMPS-24/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
- UL 2572 Standard for Mass Notification Systems

Underwriters Laboratories of Canada (ULC):

- ULC-S527-99: 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 864 9th and 10th Edition

- Per the UL Continuing Certification Program, UL 864 9th edition fire alarm control equipment will retain certification after the rollout of UL 10th edition (12/2/2018).
- Installations of UL 864 10th Edition certified equipment are permitted to use UL864 9th Edition certified equipment when approved by the local Authority Having Jurisdiction (AHJ).

For product compliance, refer to the UL/ULC listing cards located on the UL online certification directory.
http://iq.ulprospector.com

The following products have not received UL 864 9th or 10th Edition certification and may only be used in retrofit applications. Operation of the AMPS-24/E with products not tested for UL 864 10th 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).

- NFS-3030 Fire Alarm Control Panel
- AMG-1 Audio Message Generator
- NCA
- ICM-4/E

1.4 Related Documentation

To obtain a complete understanding of specific features of the AMPS-24, or to become familiar with functions in general, make use of the documentation listed in Table 1.2.

Title	Document Number
NFS2-3030 Installation, Operation, and Programming Manuals	52544, 52546, 52545
NFS-3030 Installation, Operation and Programming Manuals	51330,51344, 51345
NCA-2 Network Control Annunciator Manual	52482
NCA Network Control Annunciator Manual	51482
DS-DB Manual	53622
DVC/DAA Manual Manual	52411
ACM Series Annunciators Manual Manual	15842
LDM Series Lamp Driver Modules Manual	15885
SCS Series Smoke Control Annunciators Manual	15712
UDACT Manual	50050
UZC Universal Zone Coding Installation & Programming Manuals	15216, 15976
BB-100/200 Cabinet Installation Instructions	51981
CAB-3/CAB-4 Series Installation Instructions	15330
EQ Cabinet Series Installation Instructions	53412
Heat Dissipation Calculation Document for Cabinets with Digital Audio Products	53645
BB-25 Cabinet Installation Instructions	50898
NFS-LBB Cabinet Installation Instructions	50295
PK-PPS Power Supply Programming Utility Installation CD	PK-PPS Power Supply Programming Utility CD
VeriFire™ Tools Online Help	VeriFire-TCD
SLC Wiring Instruction Manual	51253
Device Compatibility Document	15378

Table 1.2 Related Documentation

NOTE: Unless otherwise indicated, when used in this manual, NFS2-3030 refers to both the NFS-3030 and NFS2-3030E and AMPS-24 refers to both the AMPS-24 and AMPS-24E.

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 AMPS-24 is comprised of two boards; the AMPS-K2 (the larger rear board), and the CPS-24 (the smaller front board). Figure 1.1 below illustrates the layouts for these boards. Figure 1.2 illustrates the positions of the LEDs.

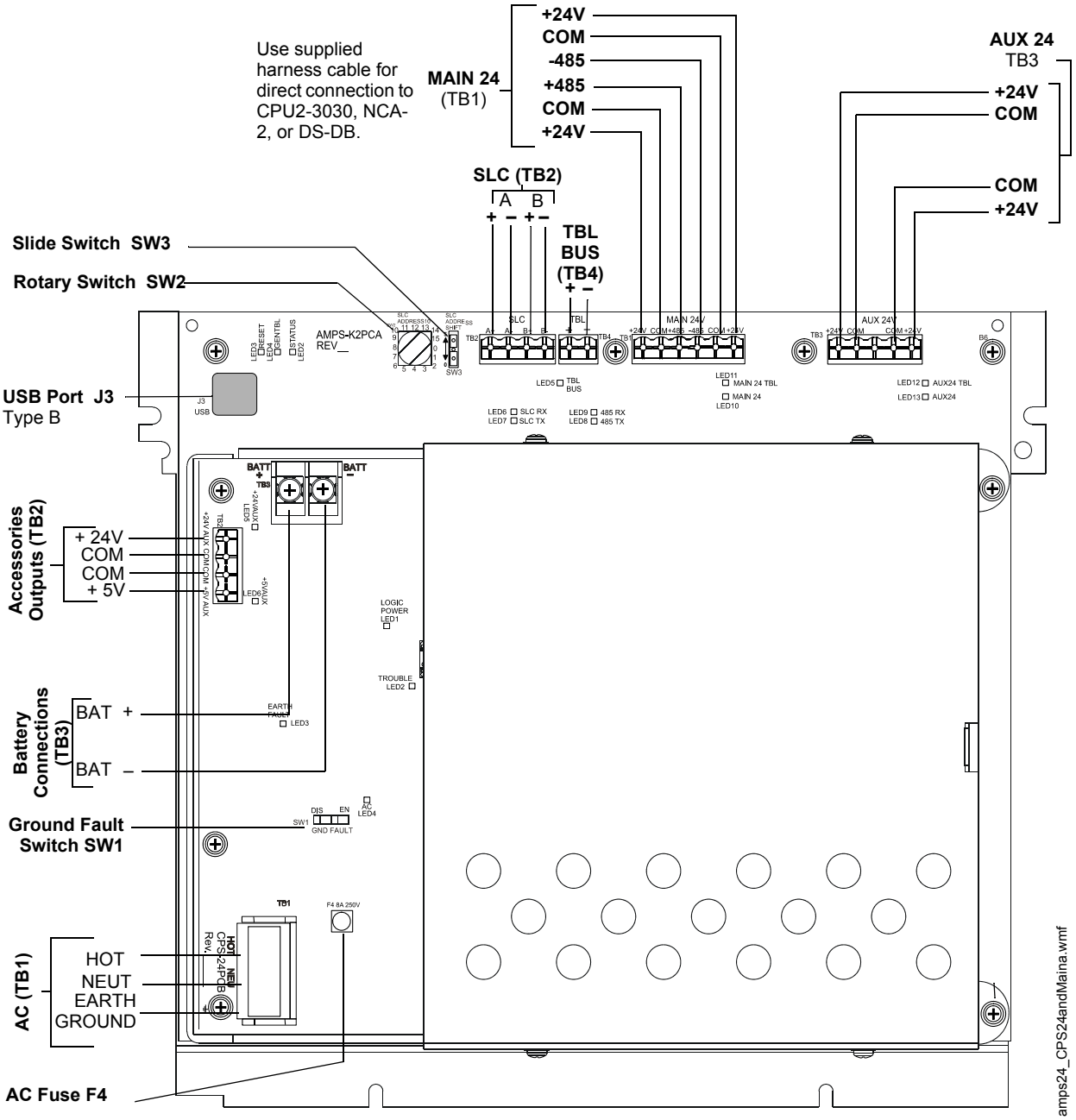


Figure 1.1 The AMPS-24 Board Layout

1.7 LED Indicators

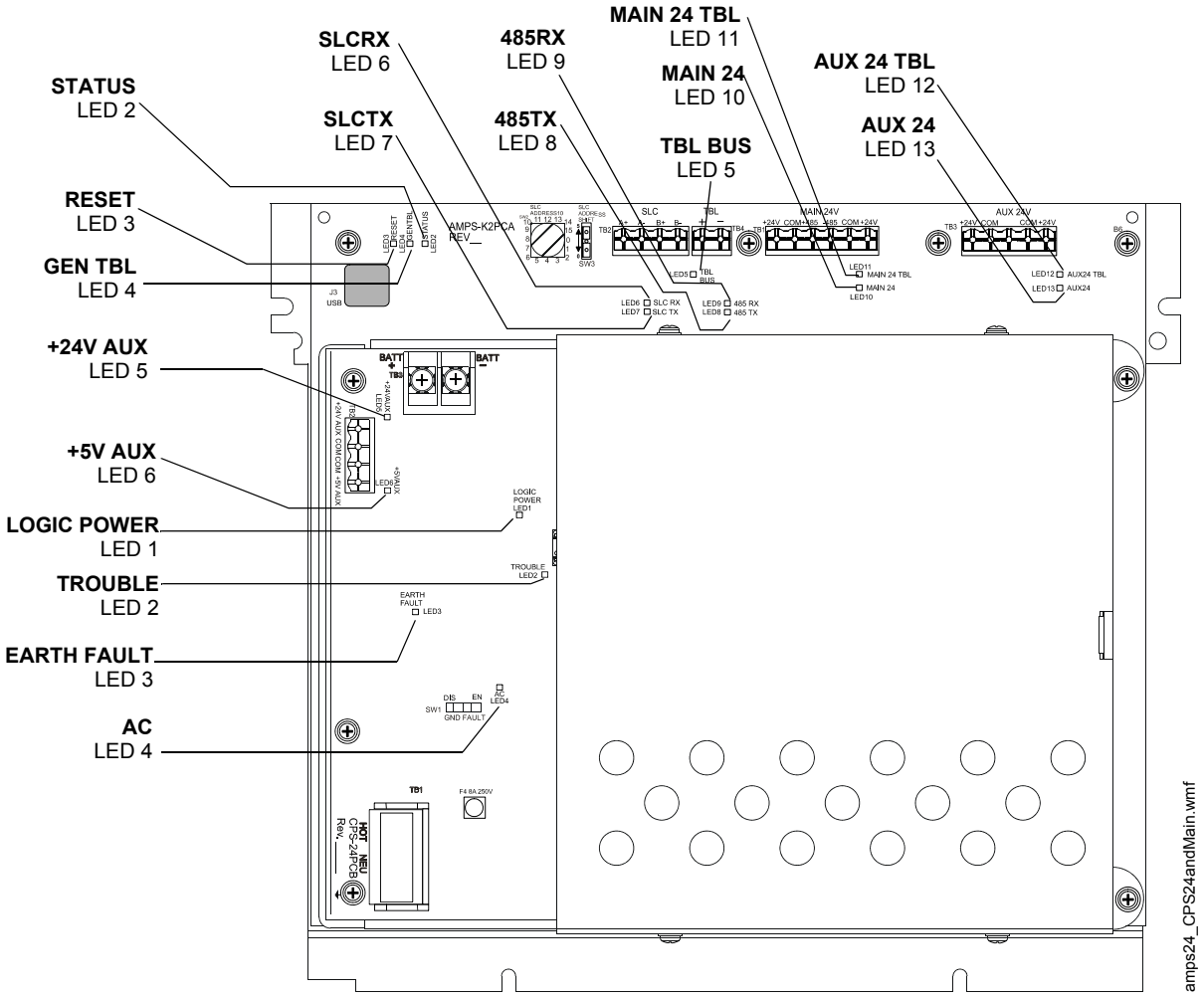


Figure 1.2 Locations of LED Indicators

There are eighteen LEDs that indicate various conditions and troubles. The following table lists and describes each.

	Reference	LED Name	Color	Description
AMPS-K2 Board	2	STATUS	Green	• +5V logic power and software indication • Normally slow blink (1 blink/sec) • Off in self-test failure or SLC address = 0 (bootloader) • Steady on memory Flashing and POR (+5V check)
	3	RESET	Yellow	RESET active.
	4	GEN TBL	Yellow	• Slow blink (1 blink/sec) if SLC address = 0 (bootloader) • Blinks once then pause in CPS communication failure • Fast blink (5 blinks/sec) in self-test failure or programming • Steady in any other trouble, POR and memory Flashing
	5	TBL BUS	Yellow	Steady when external trouble bus signal received (trouble bus shorted)
	6	SLCRX	Green	SLC incoming data
	7	SLCTX	Green	SLC outgoing data
	8	485TX	Green	485 outgoing data
	9	485RX	Green	485 incoming data
	10	MAIN 24V	Green	+24V at Main output
	11	MAIN 24V TBL	Yellow	• Steady if in current-limit • Fast blink (5 blinks/sec) in hardware failure • Steady on memory Flashing, or RAM self-test failure • Medium blink (3 blinks/sec) on application code CRC self-test failure
	12	AUX 24V TBL	Yellow	• Steady if in current-limit • Fast blink (5 blinks/sec) in hardware failure • Steady on memory Flashing, PCB rev test failed • Medium blink (3 blinks/sec) on application code CRC self-test failure
	13	AUX 24V	Green	+24V at AUX output
CPS-24 Board	1	LOGIC POWER	Green	+5V logic power
	2	TROUBLE	Yellow	Coded trouble indicator: 1 blink = AC failure; 2 blinks - high battery; 3 blinks = low battery; 4 blinks = charger failure
	3	EARTH FAULT	Yellow	Ground fault detected
	4	AC	Green	AC is on
	5	+24V AUX	Green	+24V Auxiliary power
	6	+5V AUX	Green	+5V Auxiliary power

Table 1.3 LED Indicators

Section 2: Installation

WARNING: HIGH VOLTAGES PRESENT!

USE EXTREME CAUTION WHEN WORKING WITH THE AMPS-24. 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 AMPS-24. INSTALL THE SNAP-ON COVER FOR TB1 AFTER WIRING.

NOTE: A surge suppressor, model EDCO HSP121BT-1RU (for 120VAC operations) is required when using the FCM-1-REL for releasing applications. The AMPS-24E power supply is not suitable for releasing applications.

NOTE: Test wire to wire faults with 0 ohm impedance.

2.1 In a CAB-4 Series Backbox

WARNING: RISK OF EQUIPMENT DAMAGE!

DUE TO HEAT DISSIPATION, TOTAL BATTERY CAPACITY MUST NOT EXCEED 26 AMP-HOURS WHEN THE AMPS-24 IS CHARGING IN A CAB-4 SERIES CABINET. REFER TO THE HEAT DISSIPATION PID TO DETERMINE THE ACCEPTABLE HEAT DISSIPATION IN THE CABINETS WHEN DIGITAL AUDIO PRODUCTS ARE PRESENT.

The AMPS-24 mounts in the lower left of a CAB-4 Series enclosure.

Install the AMPS-24 in the lower left of any CAB-4 Series cabinet.

Lower the power supply over the cabinet's support brackets and fasten to the backbox with two self-threading #6-32 screws, at the indicated positions.

The AMPS-24 may also be installed in a CHS-6 chassis in a CAB-4 Series cabinet. (Refer to Figure 2.2 on page 14.)

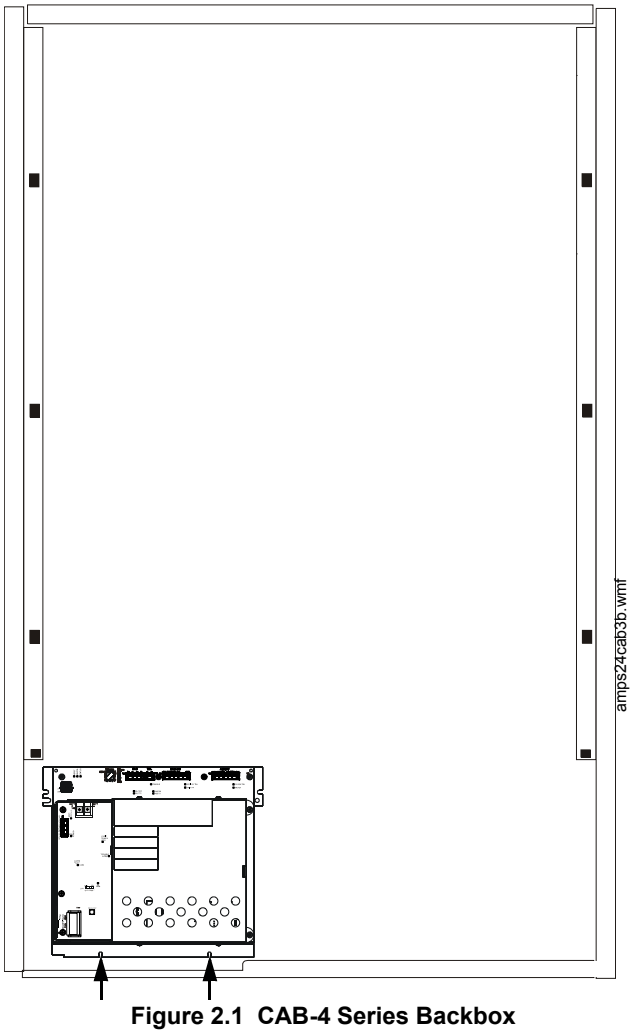


Figure 2.1 CAB-4 Series Backbox

2.2 In an EQ Series Backbox

WARNING: Risk of equipment damage!
Refer to the Heat Dissipation Calculation Document to determine the acceptable heat dissipation in the EQ Series cabinets when digital audio products are present.

The AMPS-24 mounts on a CHS-6 chassis into any EQ Series cabinet row. It will require the left two of the three chassis spaces.

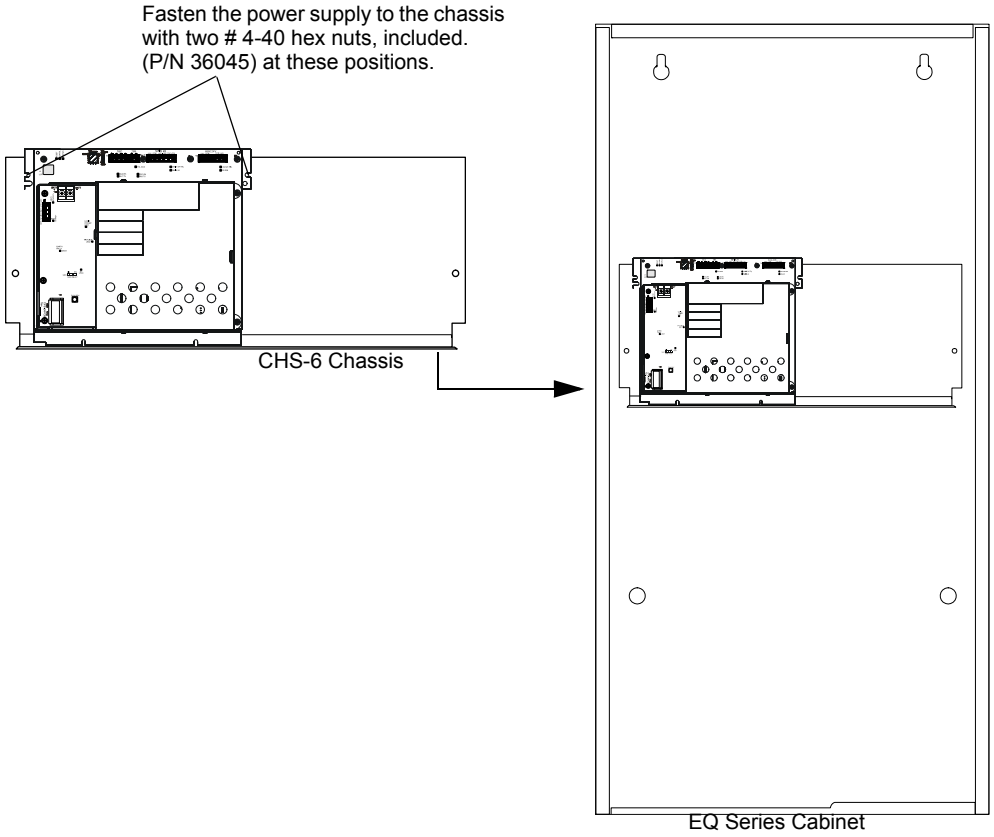


Figure 2.2 EQ Series Backbox

2.3 In a BB-25 Cabinet

The AMPS-24 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.

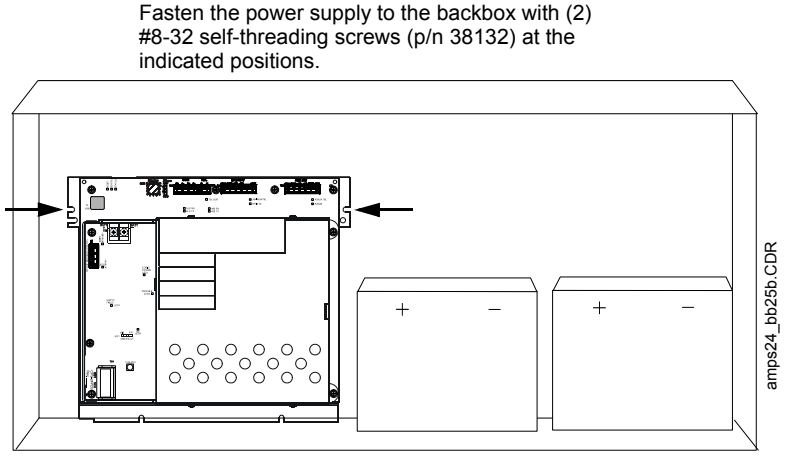


Figure 2.3 BB-25 Cabinet Mounting

2.4 In a BB-100 Cabinet

The AMPS-24 mounts in a BB-100 cabinet. Two 55 or 100 amp-hour batteries fit into the bottom of this cabinet under the AMPS-24. The power supply is fastened directly to the the backbox using the two provided keps nuts.

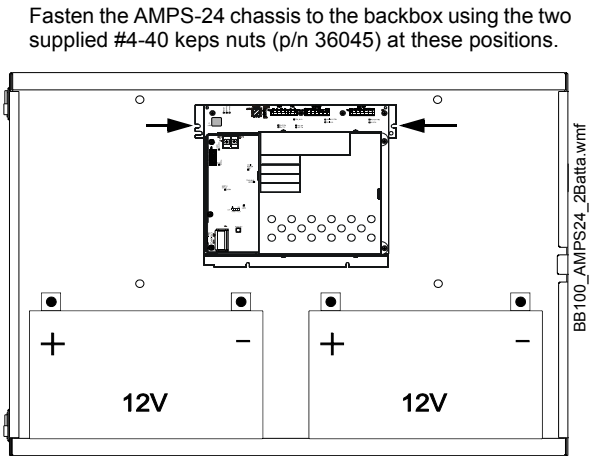


Figure 2.4 BB-100 Mounting

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.

2.5 In a BB-200 Cabinet

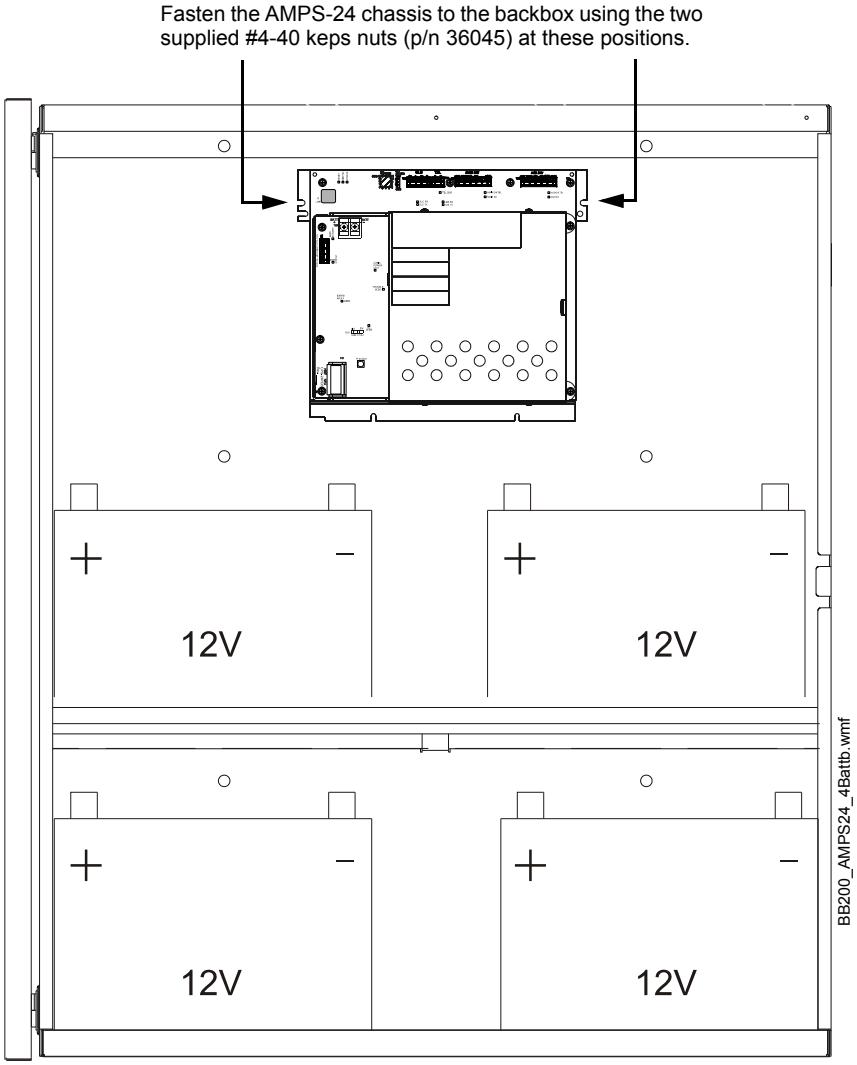


Figure 2.5 BB-200 Mounting

The AMPS-24 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.

2.6 Cabinet Wiring Examples

The terminal block and pin connections are illustrated in Figure 1.1. Power-limited (Class 2) wiring must remain separated from non-power-limited wiring by at least 0.25 in. (6.4 mm), and must enter an enclosure through different knockouts. TB1 (Main 24V) and TB3 (AUX 24) on the AMPS-K2 board are power-limited (Class 2) when set for 3A maximum current in the programmed database.

Install tie wraps and adhesive squares to secure the wiring. Figures 2.6 through 2.9 show samples of power-limited (Class 2) and non-power-limited wiring configurations in different cabinets.

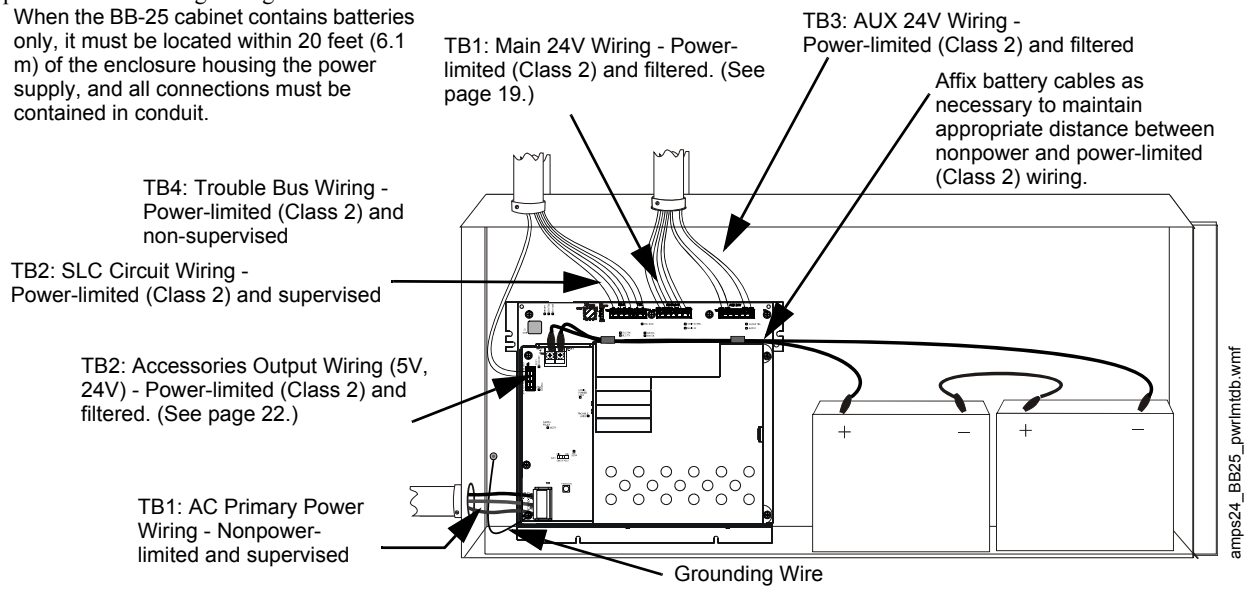


Figure 2.6 BB-25 Cabinet: Power-limited (Class 2) Wiring Example, with Two Battery Wiring

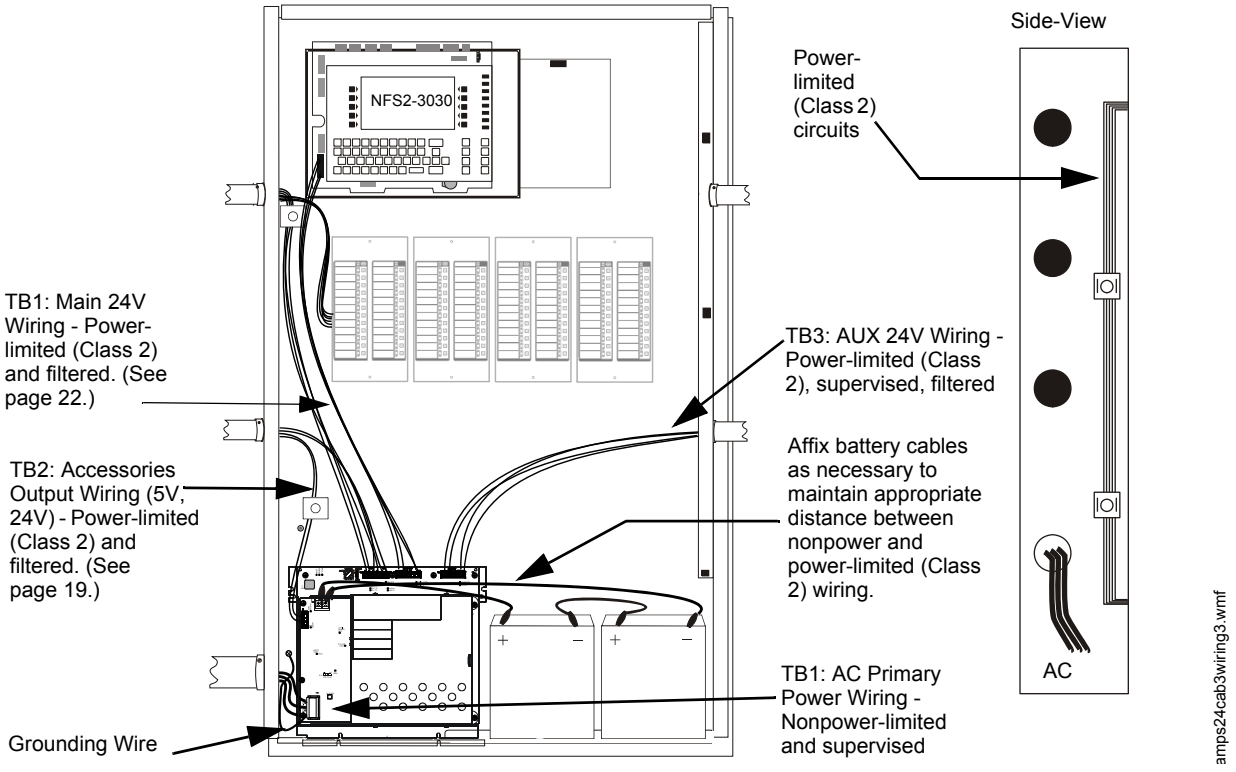


Figure 2.7 CAB-4 Series Cabinet: Power-limited (Class 2) Wiring Example

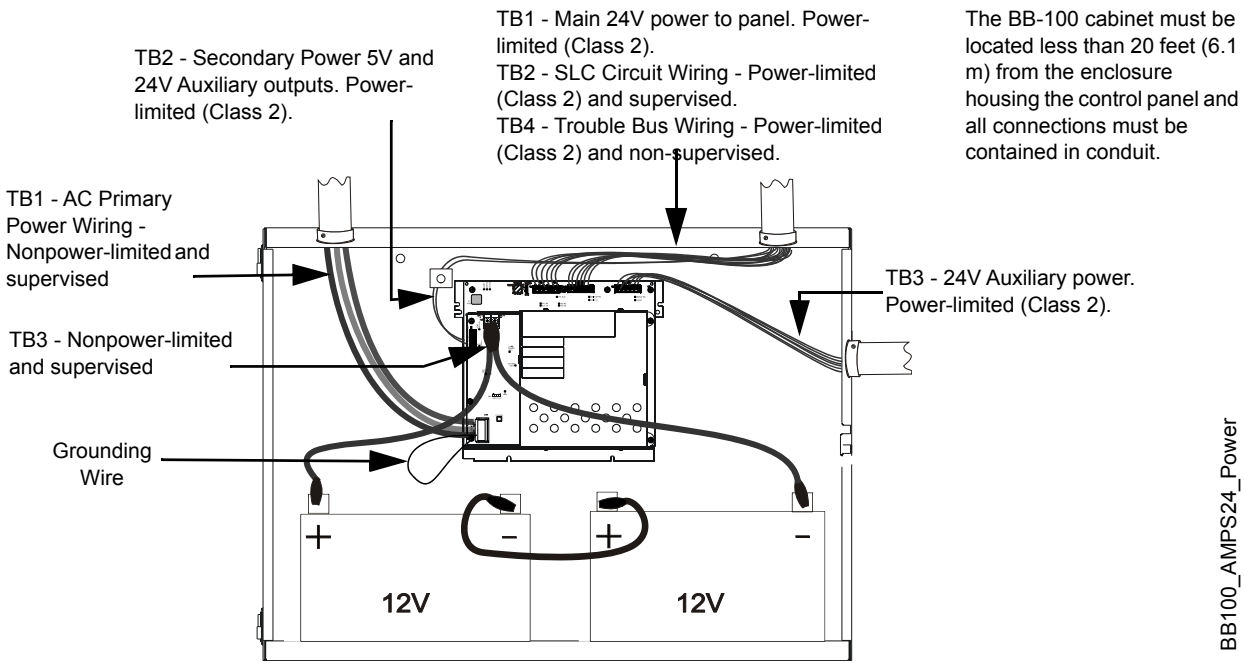


Figure 2.8 BB-100 Cabinet: Power-limited (Class 2) Wiring Example with Two Battery Wiring

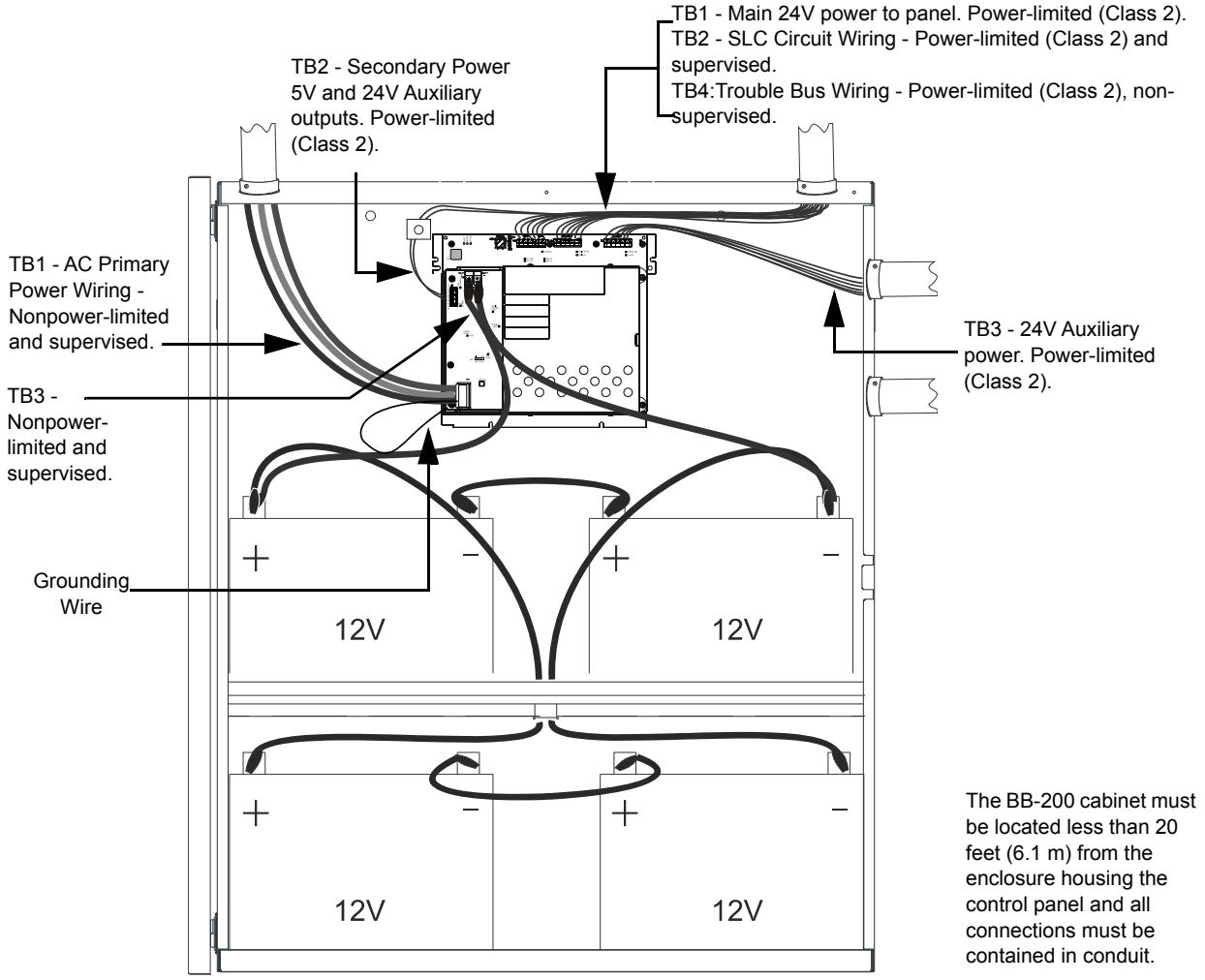


Figure 2.9 BB-200 Cabinet: Power-limited (Class 2) Wiring Example with Four Battery Wiring

2.7 Wiring the AMPS-24/E

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.

2.7.1 Overview

Complete all mounting procedures and check all wiring before applying power. Electrical connections are listed below and are detailed in the following paragraphs:

AMPS-K2 (rear board)

TB1 - MAIN 24V

Main output, 5 A, 24VDC (nominal), output.

- 5A
  1) with 5A charger and AUX 24V output disabled, or
  2) with 1A charger and 3A AUX 24V, or
  3) with 2A charger and 3A AUX 24V,

OR

- 3A (with 5A charger and 1A AUX 24V)

These values are described in table format in Table 1.1 on page 8.

TB3 - AUX 24V

Auxiliary 24V output provides filtered power-limited (Class 2) power for additional components.

- 5A (charger disabled)
- 3A (1A/2A charger)
- 1A (5A charger and 3A Main 24V output)

These values are described in table format in Table 1.1 on page 8.

TB2 - SLC Wiring

Connect to panel Signaling Line Circuit. This terminal is not used when the AMPS-24 is connected to a panel or DS-DB via the EIA-485 connection.

TB4 - TBL BUS

Trouble bus input is designed to receive trouble signals from any normally open dry contacts or open collector circuit.

J3 - USB

USB Type B connector for Power Supply configuration using a PC.

CPS-24 (front board)

TB1 - AC

Primary AC Power Source - 120 VAC, 50/60 Hz, 5A (AMPS-24E uses 220-240 VAC, 50/60 Hz, 2.5 A) from line voltage source.

TB2 - Accessories Output

Power-limited (Class 2); 24V @ 0.5A, 5V @ 0.15A.

TB3 - Secondary Output Source (Batteries)

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

2.7.2 Connecting TB1 MAIN 24V

To a Control Panel, Network Annunciator, or DS-DB

This output provides filtered, power-limited (Class 2)(when set for less than 5A) 24VDC power to a control panel, network annunciator, or DS-DB. Use a four-wire harness (P/N 75591) when connecting the power supply to a CPU-3030. Use a six-wire harness (P/N 75637 — supplied panel, network annunciator, and DS-DB) when connecting the power supply to a CPU2-3030, NCA-2, or DS-DB. (All six wires must be connected, even if SLC trouble reporting is selected in programming.) If not installed in the same enclosure as the control panel; the power supply must be located in the same room, total wire length must be less than 20 feet (6.1 meters), and all external connections must be in conduit. Do not splice or otherwise extend P/N 75591 or P/N 75637. Connect wiring with all power sources off.

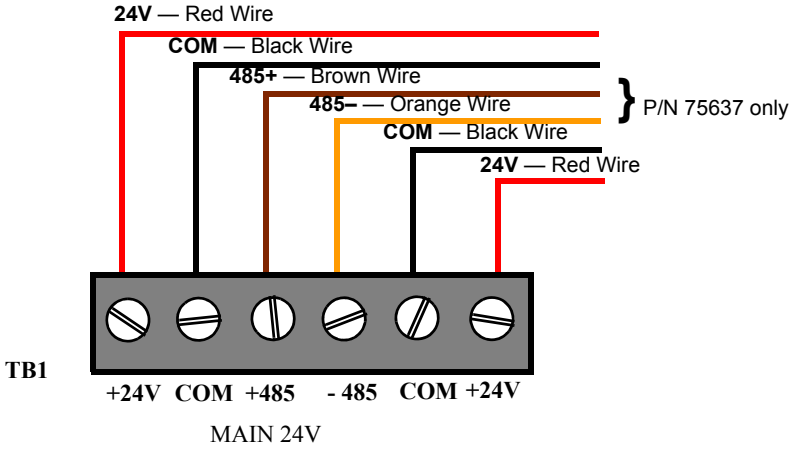


Figure 2.10 Connecting to the Main 24 Output TB1, Example 1

As General Purpose Power

When used as general purpose power, this output provides filtered, power-limited (Class 2) (when set for less than 5A) 24VDC general purpose (non-NAC) power. If not installed in the same enclosure as the devices it powers; the power supply must be located in the same room, total wire length must be less than 20 feet (6.1 meters), and all external connections must be in conduit. Examples of devices that may utilize this power provided by an AMPS-24 mounted remotely from the fire alarm control panel include:

- All current Notifier annunciators including
  - ACM Series annunciators
  - LDM Series lamp driver modules
  - SCS Series annunciators
  - UDACT
- Remote LEDs or incandescent lights supported by an LDM series annunciator
- 4-wire smoke detector (requires external reset control relay)
- 2-wire smoke detectors connected to FZM-1 module
- Solenoids (refer to the Device Compatibility Document for acceptable models)
- DVC Series
- NCM-W/F
- DS-DB Digital Series board (+/- 485 terminals must be connected).

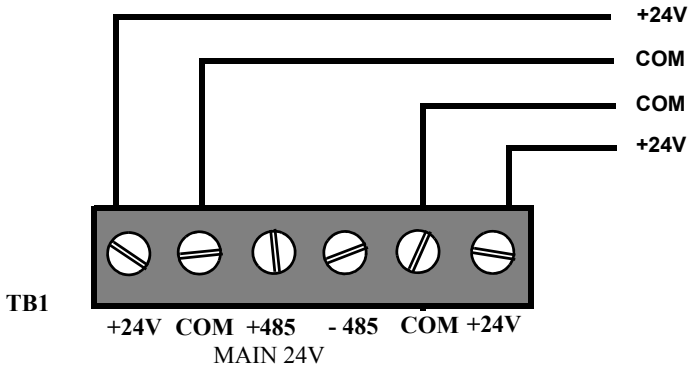


Figure 2.11 Connecting to the Main 24 Output TB1, Example 2

Figure 2.12 is a block diagram representing an application where an AMPS-24 is used as a general purpose remote power supply and battery charger.

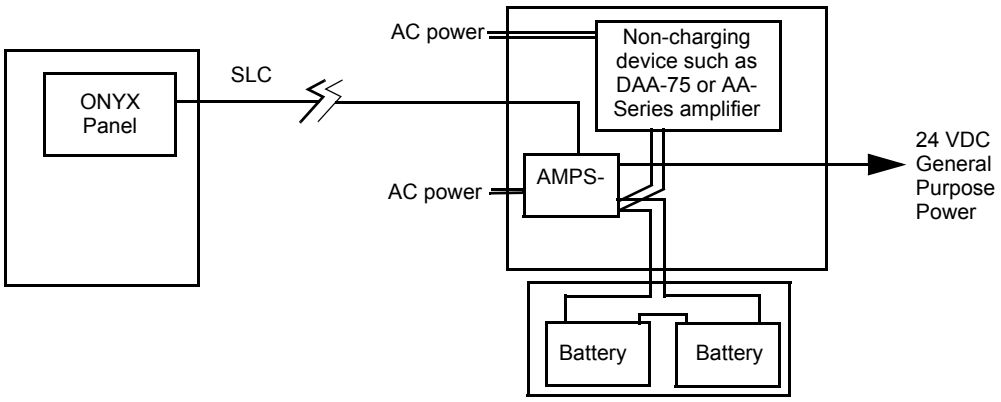


Figure 2.12 AMPS-24 as Battery Charger/General Purpose Remote Power Supply

2.7.3 Connecting to the AUX 24 Output

TB3 - This output supplies one non-resettable, power-limited (Class 2) (when set for less than 5A), filtered 24VDC circuit available to power external devices. It may be used to power the DS-DB when connected to TB24 on the DS-DB. This application requires that the AMPS-24 be monitored by an FACP.

The output can be configured to provide 3A or 5A maximum current, or it can be disabled. Refer to Section 3.2.6 on page 30.

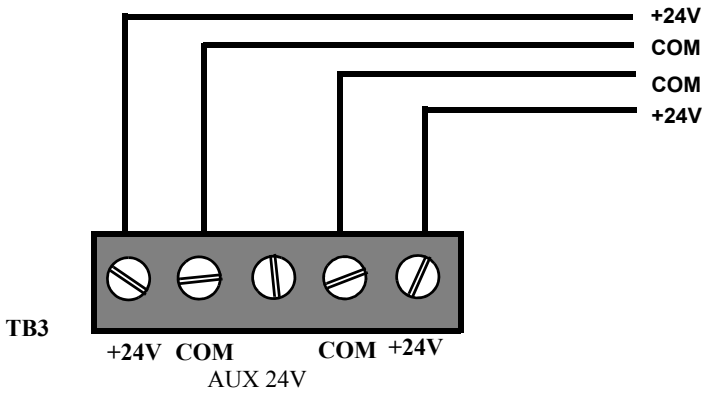


Figure 2.13 Connecting to the AUX 24V Output TB3

2.7.4 Connecting to the SLC

TB2 - Supervised and power-limited (Class 2). With all power sources off, connect the power supply from **TB2** to the SLC interface.

NOTE: Do not connect the AMPS-24 to the SLC if the AMPS-24 is communicating via 485 trouble reporting. (Refer to "Trouble Reporting" on page 32.)

See "SLC Addressing" on page 27.

Refer to the SLC Wiring Manual for more information.

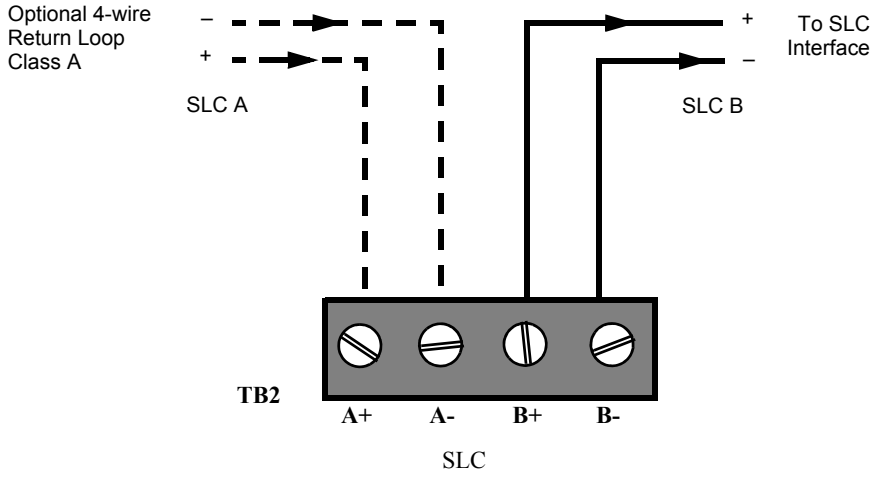


Figure 2.14 Connecting to the SLC Interface TB2

2.7.5 Connecting the Trouble Bus

Trouble bus input is designed to receive trouble signals from any normally-open dry contacts or open-collector circuit.

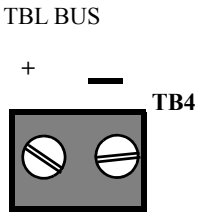


Figure 2.15 Trouble Bus Connection

2.7.6 Connecting the Accessories Output on the CPS-24

TB2 - Supplies one (1) non-resettable, power-limited (Class 2) 24 VDC circuit and one non-resettable power-limited (Class 2) 5 VDC circuit available to power external devices. UZC applications on the 5V connection to the Accessories Output must be within 10 feet (3.658 meters) of the power supply and should use the supplied cable, P/N 75595. Do not splice or otherwise extend P/N 75595. Refer to the "Wire Requirements" section of the panel installation manual for all applications requiring a 24V connection. The wiring must remain within the same enclosure, or it must be in conduit. Connect wiring with all power sources off.

- 24 VDC (nominal) @ 0.5 A max.
- 5 VDC (nominal) @ 0.15 A max.

Refer to the *Device Compatibility Document* for compatible devices and notification appliances.

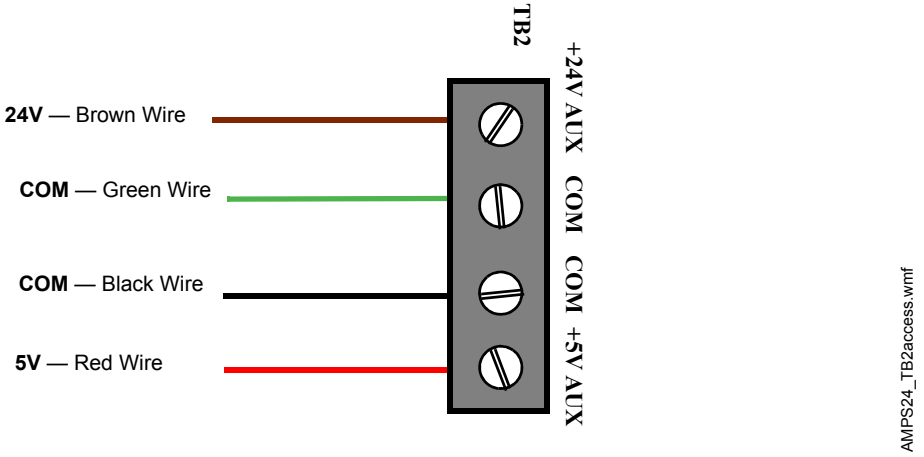


Figure 2.16 Connecting to the Accessories Output TB2 on CPS-24

2.7.7 Connecting the Power Supply to AC Power

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

The AMPS-24 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 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) or larger wire with 600 VAC insulation for the AC branch circuit.

Connect primary power as follows:

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

2.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 in reducing the panel's susceptibility to transients generated by lightning and electrostatic discharge.

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

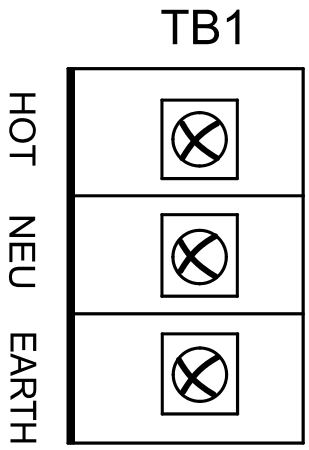


Figure 2.17 AC Power Connection

2.8 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 (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 2.18

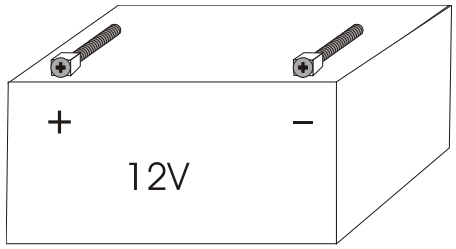


Figure 2.18 Terminal Bolt Installation

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 12-18 AWG (3.25 mm^2– 0.75 mm^2), and install the power supply and the batteries in the appropriate enclosures, as described in Sections 2.4 and 2.5.

2.8.1 Setting the Charger

The AMPS-24 battery charger will charge 7 to 200 AH lead-acid batteries. Use PK-PPS to select the appropriate battery charger current for the system's battery capacity from these settings: **1A**, **2A**, **5A**, or **DISABLE CHARGER**. Select **1A** to charge 7 to 26 AH batteries. Select **2A** to charge 12 to 60 AH batteries. Set the charger to **5 A** when the power supply will be charging a system that requires 55 to 200 AH. Select **DISABLE CHARGER** when the batteries will be charged by an external charger. See Section 3.2, "Programming the AMPS-24", on page 28 for more information on programming via PK-PPS. Refer to Section 4.2, "Calculating the Battery Requirements", on page 37 for more information on determining your system's battery capacity.

2.8.2 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 4 of this manual.

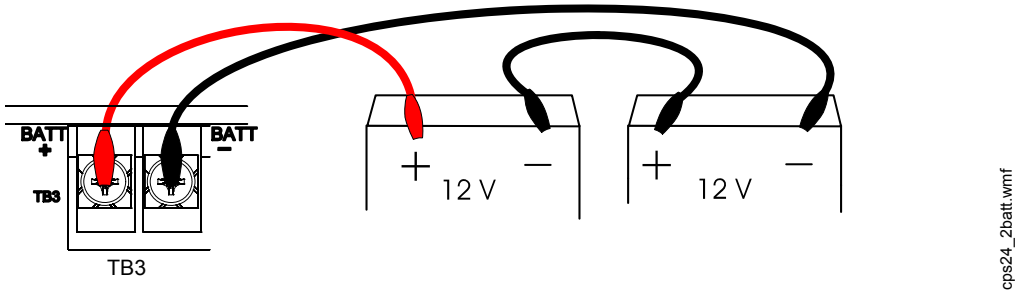


Figure 2.19 Connecting Two Batteries to the Power Supply

2.8.3 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 2.20.

To determine battery requirements, refer to Section 4 of this manual.

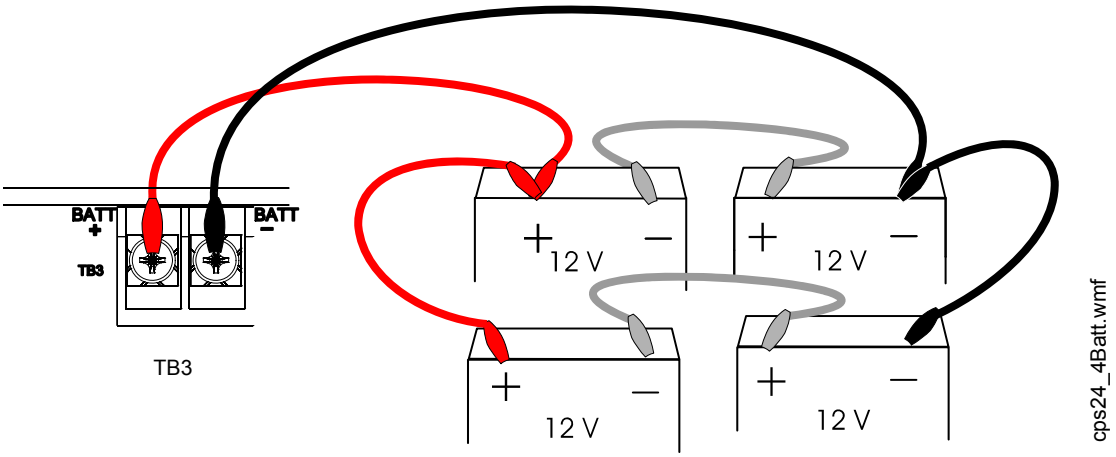


Figure 2.20 Connecting Four Batteries to the Power Supply

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

2.8.4 Connecting Multiple Power Supplies/Products (Separate Batteries)

Follow these guidelines when connecting multiple power supplies and products that use batteries (such as the DS-AMP and DAX):

- Disable Ground Fault detection on all products except one power supply. See Figure 1.1 on page 10.
  For proper supervision the power supply with the enabled ground fault detection must be connected to the SLC or to the EIA-485.
- Connect common bond wire between these products.
- All connections must be in conduit and the total battery connection must be less than 20 feet (6.1 meters) from the enabled power supply.
- Confirm that enabled chargers have the capacity to charge the total load of the selected battery configuration.
- Connect battery interconnect cables **only after initial system power-up**. Refer to "Installing and Connecting the Batteries" on page 23.

To determine AMPS-24 battery requirements, refer to Section 4.2 on page 37 in this manual.

Refer to the specific product 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.

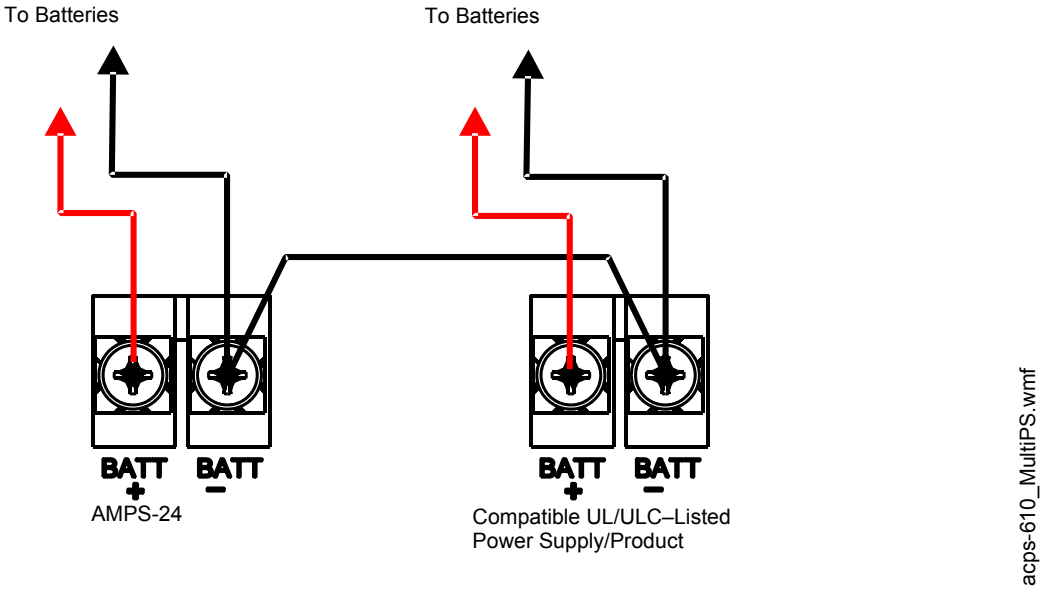


Figure 2.21 Connecting Multiple Power Supplies/Products with Common Bond Wire

2.8.5 Connecting Multiple Power Supplies/Products (One Set of Batteries)

Certain system designs may require connecting multiple power supplies and products that use batteries (such as the DS-AMP and DAX) to one set of batteries. Follow these connection guidelines:

- 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 on all power supplies/products except the one that is charging the batteries. See Figure 1.1 on page 10.
  For proper supervision the power supply with the enabled ground fault detection must be connected to the SLC, or to the EIA-485 to the CPU2-3030, NCA-2 or DS-DB.
- All power supply to power supply connections must be in conduit and the total battery connection must be less than 20 feet (6.1 meters).
- Connect battery interconnect cables **only after initial system power-up**. Refer to "Installing and Connecting the Batteries" on page 23.

To determine battery requirements, refer to Section 4.2, "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.

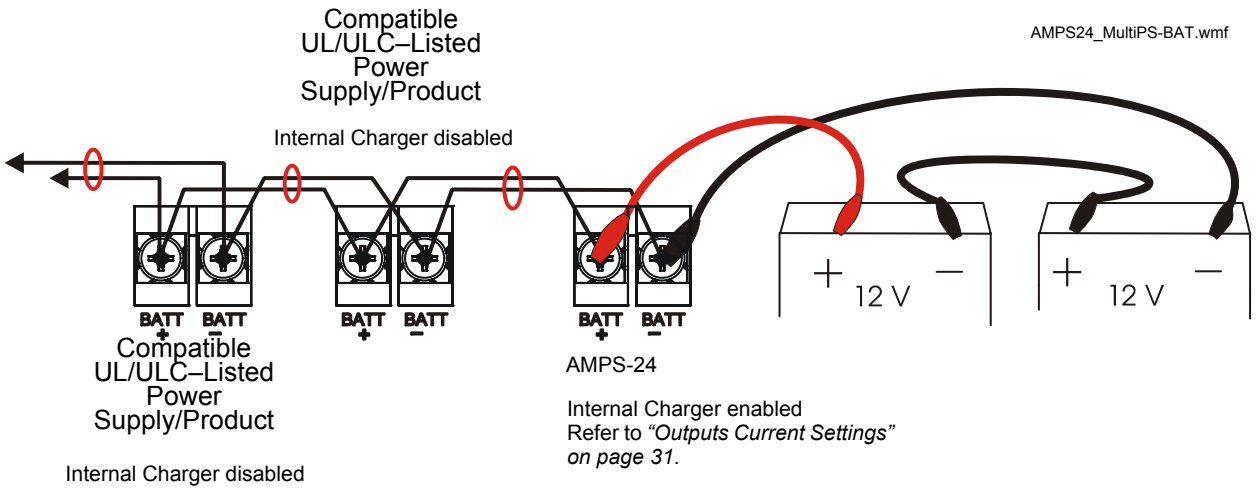


Figure 2.22 Connecting Multiple Power Supplies/Products (One Set of Batteries)

Section 3: Configuring the AMPS-24

3.1 SLC Addressing

NOTE: An AMPS-24 communicating over the EIA-485 protocol will not require an SLC address block. See Section 3.3, "Configuring the Network Annunciator" for more information.

When the AMPS-24 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 AMPS-24. Determining the size of the address block and setting the SLC base address is described in this section.

3.1.1 Determining Address Consumption

CAUTION: AMPS-24 TROUBLE REPORTING

Always select "SLC Trouble Reporting" when connecting the AMPS-24 to an NFS2-3030.

Software determines the AMPS-24 address consumption. An AMPS-24 can occupy either one or five addresses on an SLC. The AMPS-24 will consume five addresses on the SLC if configured for five-point trouble reporting. If trouble reporting is not selected, the AMPS-24 will only consume one address. Table 3.1 details address consumption.

AMPS-24 Addresses	EIA-485 or SLC Five Point Trouble Reporting NOT SELECTED	EIA-485 Trouble Reporting SELECTED*	SLC Trouble Reporting SELECTED†	SLC Address
PK-PPS Setting	**"SLC" Interface Type**	**"EIA-485" Interface Type**	• **"SLC" Interface Type** • **"Five-Point Monitoring" Trouble Reporting**	
Monitor General	✔		✔	B‡
Monitor AC Fail			✔	B + 1
Monitor Battery			✔	B + 2
Monitor Earth Fault			✔	B + 3
Monitor Charger Fault			✔	B + 4
	Total: 1 Address	No address when SLC is disabled.	Total: 5 Addresses Assign 5 sequential SLC addresses for this configuration.	

Table 3.1 SLC Address Consumption

* Required for use with NCA-2
† Required for use with NFS2-3030 and when used as a remote power supply.
‡ B = SLC Base Address

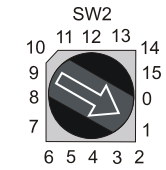
3.1.2 Setting the Base Address (SLC Enabled)

The base address is the first address used in an SLC address block. Combine rotary switch (SW2) and address 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 AMPS-24 is 05. Do not use FACP addresses 00 through 04 for the AMPS-24.

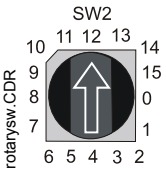
The Rotary Switch

The 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:

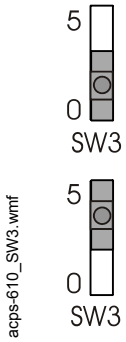
Pointing the arrow at the 1 selects the “one” address decade, beginning at 10.



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

The SLC Address Slider Switch (SW3)

Use the slider switch, SW3, to further define the SLC base address. While an address’ decade is defined by the rotary switch, the 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.

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.

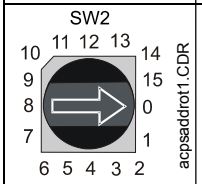
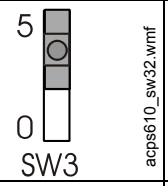
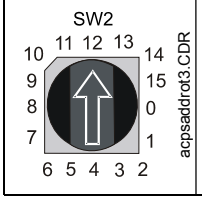
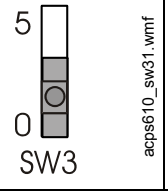
ROTARY SWITCH SETTING	SW3 SLIDER SWITCH POSITION	SLC BASE ADDRESS	SLC ADDRESSES SELECTED with five AMPS-24 Addresses
		5	5-9
		120	120-124

Figure 3.1 SLC Address Selection

3.2 Programming the AMPS-24

Use PK-PPS to program the charger current and trouble reporting. With PK-PPS, the AMPS-24 database can be configured and downloaded, and firmware updated. The power supply’s configuration can be modified online, while the PC is connected to the power supply; or offline, on a database that can be downloaded at a later date.

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 privileges.
2. Exit out of the NFN Gateway if it is running in the system tray.
3. Insert the CD into the PC's CD drive.
4. Double click on the file PPS.exe on the CD.
5. Follow the instructions of the PPS installation wizard to completion.
6. Connect the AMPS-24 to the PC via the USB cable. (*See Section 3.2.2*.) Wait for the operating system to detect the new hardware.
7. 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.	1. On the Found New Hardware Wizard window, click Next.
2. Select "Install from a list or specific location". Click Next.	2. Select "Search for a suitable driver for my device". 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.	3. Under optional search locations, select "Specify a location". Clear all other check boxes. Click Next.
4. On the Browse For Folder pop-up window, select the folder C:\ProgrammingKit\PowerSupply\USB Drivers. Click OK.	4. On the window that pops up, click the Browse button and select the file C:\ProgrammingKit\PowerSupply\USB Drivers\HfsUsb.inf. Click Open.
5. Click Next.	5. Click OK on the pop-up window.
6. On the Hardware Installation window that warns "The software has not passed Windows Logo testing...", click Continue Anyway.	6. Click Next. This will install the driver.
7. Click Finish.	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! DISCONNECT USB CABLE *ONLY* AFTER PROGRAMMING IS COMPLETE.

3.2.2 Establishing the Hardware Connection

NOTE: Before connecting PK-PPS to the power supply, exit out of the NFN Gateway if it is running in the system tray.

Connect a standard USB cable from the PC's USB port to the AMPS-24's USB interface (J3). When the download is complete, the unit automatically reboots and returns to normal operation.

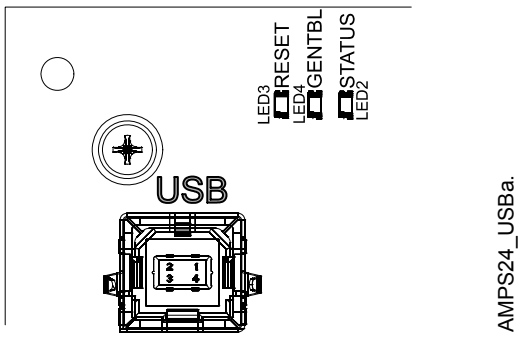


Figure 3.2 The AMPS-24 USB Interface (J3)

3.2.3 Working Offline

If the PC is not connected to a power supply, it can be used to create or edit AMPS-24 databases. These databases can be saved and downloaded at a later date.

To create a new database, select **NEW** from the **FILE** menu, then select AMPS-24.

To edit an existing database, select **OPEN** from the **FILE** menu, then select AMPS-24.

Refer to Figure 3.3 below.

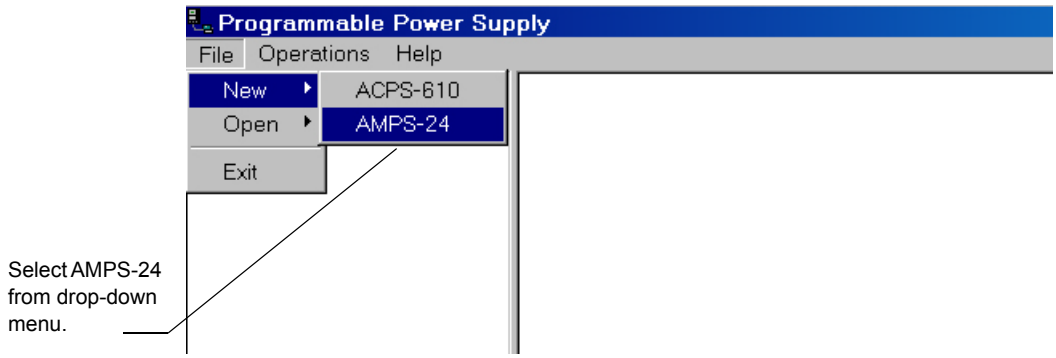


Figure 3.3 Power Supply Selection

3.2.4 Working Online

NOTE: Before connecting PK-PPS to the power supply, exit out of the NFN Gateway if it is running in the system tray.

In addition to creating and opening databases on the PC's local drive, modifications may be made to any AMPS-24 that is directly connected to the PC with the PK-PPS programming utility. When PK-PPS is open and the PC is 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.

Right-clicking on the AMPS-24 icon provides three work options:

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

MODIFY Select this option to edit the power supply's current configuration. When all changes are made, the new database will overwrite the one in the AMPS-24. The new database can also be saved to the local drive.

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

3.2.5 Downloading to the AMPS-24

1. Check to make sure that the PC is connected to the AMPS-24 (Section 3.2.2).
2. Right click on the AMPS-24 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 AMPS-24.
5. Disconnect USB cable *AFTER* programming is complete.

3.2.6 AMPS-24 Configuration

PK-PPS sets parameters for the AMPS-24, outputs/charger current and trouble reporting type. 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 the result of your selections.

PKPPS Label.bmp

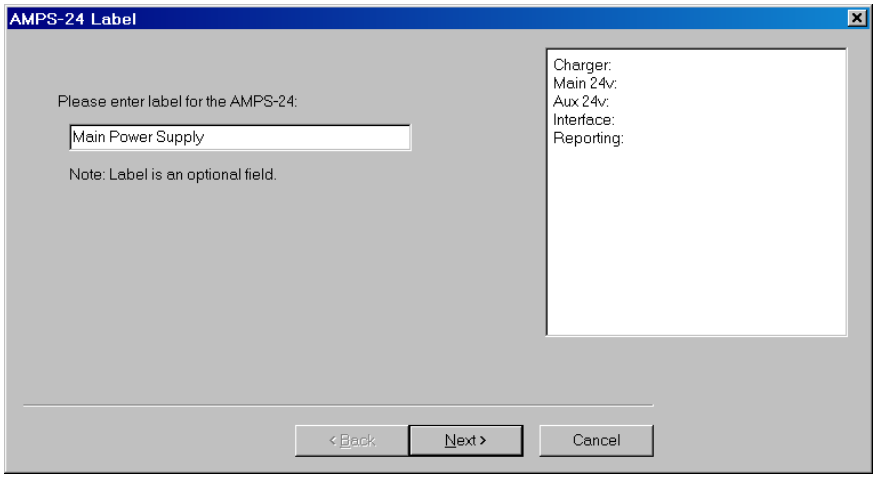


Figure 3.4 PK-PPS: Label

Label

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

PKPPS Charger.bmp

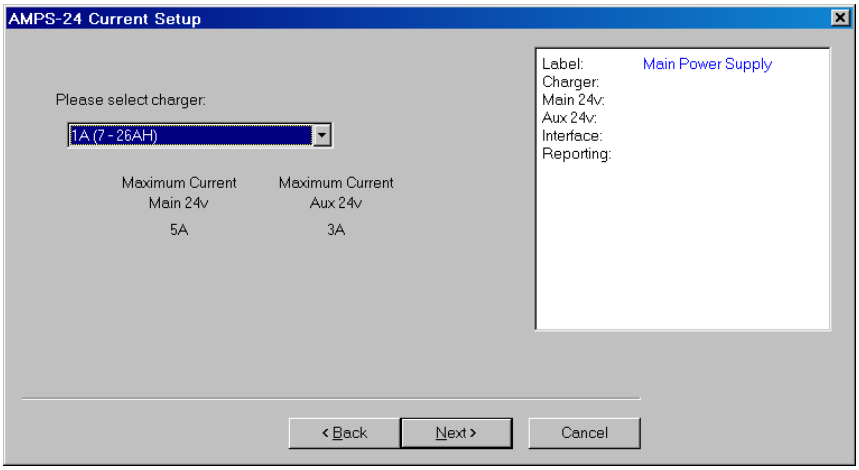


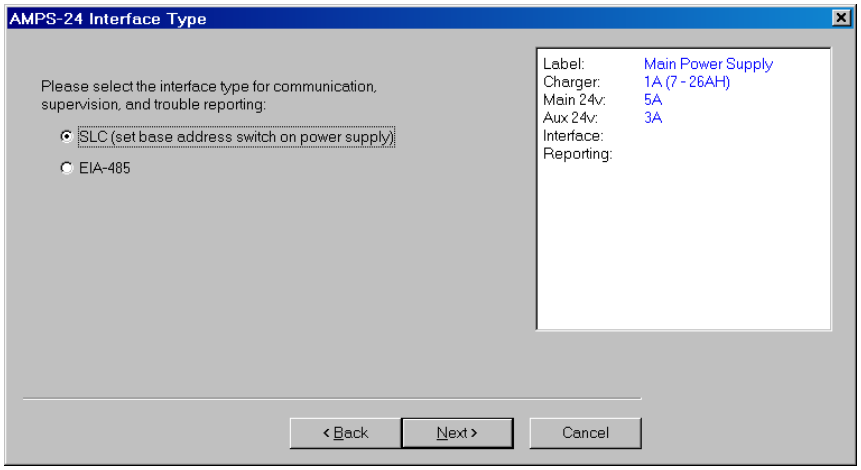
Figure 3.5 PK-PPS: Battery Charger/Outputs Current Setup

Outputs Current Settings

Choose the appropriate battery charger current for the system's battery capacity. Refer to Section 4.2, "Calculating the Battery Requirements", on page 37 for more information on determining your system's battery capacity.

There are three charger current options. Select **1A CHARGE** for 7 to 26AH, **2A CHARGE** to charge 12 to 26 AH batteries. Select **5A CHARGE** to charge 55 to 200 AH batteries. Select **DISABLE CHARGER** when the batteries will be charged by an external charger (See "Setting the Charger" on page 24.).

NOTE: The charger current option "**1A CHARGE**" is not approved for ULC applications.



PKPPS Interface.bmp

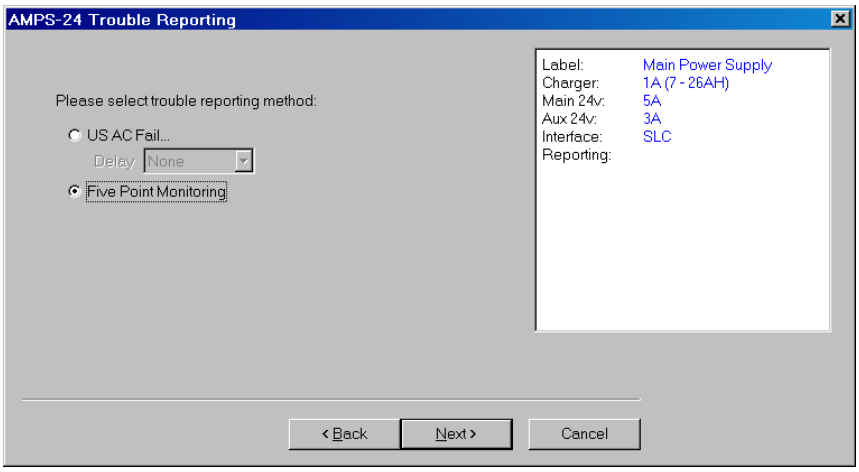
Figure 3.6 PK-PPS: Interface Type

Interface Type

Select the interface type.

SLC: This must be selected when the AMPS-24 is used as the power supply for a CPU2-3030 or as a remote power supply.

EIA-485: This must be selected when the AMPS-24 is used with an NCA-2.



PKPPS Trouble.bmp

Figure 3.7 PK-PPS: Trouble Reporting

Trouble Reporting

Select the trouble reporting option.

Five Point Monitoring: When the power supply is configured for Five Point Monitoring (trouble reporting over the SLC), the panel will report a trouble message beginning at the base SLC address. This selection must be made if the power supply is being used to power a CPU2-3030 or as a remote power supply. Reporting at the base address ("Monitor General") includes current limit, hardware failure, trouble bus active, and CPS communication trouble. Refer to "SLC Addressing" on page 27.

When the power supply is configured for Five Point Monitoring, the panel displays a specific trouble message for AC Fail, Battery, Earth Fault, and Charger Fail addresses (See Table 3.1).

In CLIP mode, the labels for the "Base + x" addresses must be entered manually. In FlashScan mode, device labeling is automatic.

US AC Fail Delay time: Make a selection (**0**, **2 HOURS**, **8 HOURS**, or **16 HOURS**) from the drop-down menu.

PK-PPS Summary.jpg

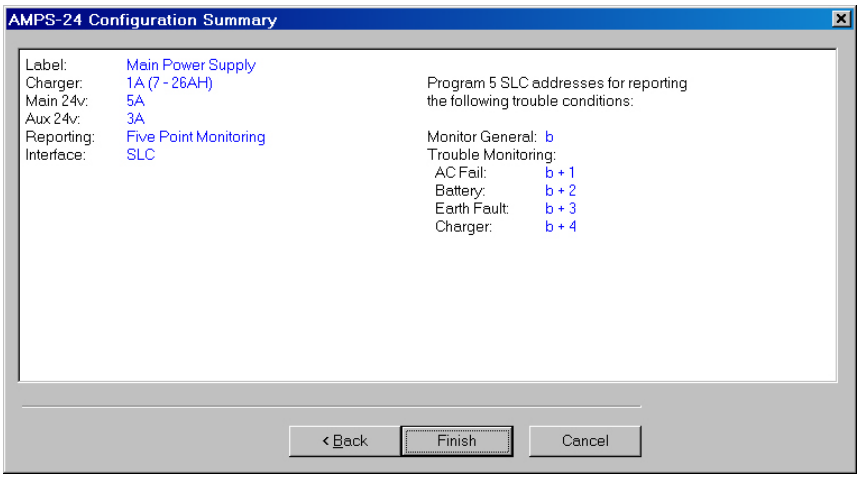


Figure 3.8 PK-PPS: Summary

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 Network Annunciator

3.3.1 Programming

Because the AMPS-24 communicates with an NCA-2 through the use of 485 trouble reporting, it does not require an SLC address block. Supervision and addressing for the AMPS-24 is assigned at the network annunciator. Note that the AMPS-24 can connect to the NCA-2 via TB1 (dedicated connection) or TB3 (remote connection) on the AMPS-K2 board.

See the NCA-2 manual for more information.

3.3.2 Display

When the power supply is configured for 485 Trouble Reporting, the NCA-2 displays a system trouble for each specific trouble message for each AMPS-24.

CAUTION: 485 TROUBLE REPORTING

485 Trouble Reporting must be selected when an AMPS-24 is connected to an NCA-2.

3.4 Configuring the FACP

3.4.1 Programming

Assign the main power supply's AC Fail address at the Panel Program submenu, Supervision; or at the VeriFire Tools System Programming worksheet, General II. The Autoprogram command will show the assignments of the four remaining AMPS-24 addresses according to the rotary and slider switch selection and in the order given in Table 3.3. Each SLC address may also be programmed manually at the panel or through the VeriFire Tools utility. Note that either one or five addresses can be associated with the power supply depending on the configuration.

3.4.2 Software Type ID Codes

When manually programming AMPS-24, each address point on the AMPS-24 should carry the module type, "MONITOR"; the Type Code Label, "POWER MONITR"; and the FlashScan Code Label "PS MON." Refer to the panel programming manual or VeriFire Tools Online Help for further instructions.

Order of AMPS-24 Address Assignment	AMPS-24 Addresses	Type ID	FlashScan Code Label
B*	Monitor General	POWER MONITR	PS MON
B+1	Monitor AC Fail	POWER MONITR	PS MON
B+2	Monitor Battery	POWER MONITR	PS MON

Table 3.3 Addressing

B+3	Monitor Earth Fault	POWER MONITR	PS MON
B + 4	Monitor Charger Fault	POWER MONITR	PS MON

Table 3.3 Addressing

* B = Base Address

NOTE: AMPS-24/E revisions previous to the AMPS-K2 revision do not have the extra monitor point for Charger Fault. When replacing a previous revision AMPS-24 with an AMPS-K2 version, remember to program the monitor point.

3.4.3 Panel Display

When the power supply is configured for Five Point Monitoring, a specific trouble message for each AMPS-24 address will display. Five Point Monitoring must be selected for proper AC Fail reporting. See Section 3.1 for further information.

CAUTION: SLC TROUBLE REPORTING

SLC Trouble Reporting *must* be selected when an AMPS-24 is connected to an NFS2-3030.

Section 4: 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.

The AMPS-24 provides filtered 24VDC (nominal) power that may be used for operating external devices. The power for operating external devices is limited. Use Table 4.1 to determine if external loading is within the capabilities of the power supply.

4.1 Calculating the System Current Draws

When used as the main power supply, the AMPS-24 must be able to power all internal system devices (and several types of external devices) continuously during non-fire alarm conditions. Use column 1 in Table 4.1 to calculate the Non-Fire Alarm Load on the power supply when applying primary power. The main power supply must also provide a finite amount of additional current during a fire alarm condition. Use column 2 in Table 4.1 to calculate the additional current needed during fire alarms. The requirements for non-fire alarm and fire alarm current loads cannot exceed the capabilities of the power supply as listed below.

4.1.1 How to Use the Calculating Tables

In the following section, the term “secondary” refers to the AMPS-24’s backup batteries: the term “primary” is reserved for the AMPS-24’s primary source of power, 120 VAC 50/60 Hz power (240 VAC 50/60 Hz for the AMPS-24E). 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.

The Primary Non-Fire Alarm Current and Fire Alarm Current columns are DC current calculations. Use these calculations to confirm that the AMPS-24 can provide enough current to support the system during Primary Non-Fire Alarm and Fire Alarm conditions.

Quantities List the number of devices powered by the MAIN 24V Main Output (TB1), AUX 24 Output (TB3), and the AUX 24V Accessories Output (TB2 on the CPS-24). Devices powered by the Accessories Outputs draw current directly from the AMPS-24. Devices powered by the Main Output draw current through the fire panel’s connection to the power supply. Use these quantities to calculate total current draw of each set of devices in calculation columns 1, 2, and 3.

Calculation Column 1 (Primary, Non-Fire Alarm Current in amps) Add the contents of Column 1 to get the current drawn from the AMPS-24 during a non-fire alarm condition, with AC power applied. See Section 2.7.1.

Calculation Column 2 (Primary, Fire Alarm Current in amps) Column 2 lets the system designer determine the current load that the AMPS-24 must support during a fire alarm. See Section 2.7.1.

Typically, a system should contain capacity to activate all output circuits and relays, and support fire alarms on no less than 10% of Initiating Device Circuits, subject to the requirements of the Authority Having Jurisdiction (AHJ).

If the system provides power for Notification Appliance Circuits, refer to the Device Compatibility Document for 24 VDC notification appliances that are UL/ULC-listed for fire alarm systems.

Calculation Column 3 [Secondary (Battery) Non-Fire Alarm Current] Column 3 lets the system designer calculate the non-fire alarm current drawn from the secondary source in a non-fire alarm condition during AC power loss. The non-fire alarm current is required to complete the standby battery calculations. After summing all current draws, insert the total in Table 4.2.

4.1.2 Calculation for Main Supply Current

AMPS-24 *Terminal Blocks:*	Quantities TB1 (MAIN 24)*	Quantities TB3 (AUX 24)	Calculation Column 1 Primary, Non-Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)	Calculation Column 2 Primary, Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)	Calculation Column 3 Secondary, Non-Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)
CPU-3030, CPU2-3030	1	N/A	x [0.120]=	0.12	0	x [0.120]=	0.12	0	x [0.120]=	0.12	0
Keyboard/Display Option	1	N/A	x [0.220]=	0.22	0	x [0.220]=	0.22	0	x [0.220]=	0	0
LCM-320 (refer to Doc. 51330,52544)	[ ]	N/A	x [0.130]=		0	x [0.130]=		0	x [0.130]=		0
LEM-320 (refer to Doc. 51330,52544)	[ ]	N/A	x [0.100]=		0	x [0.100]=		0	x [0.100]=		0
SLC Loop†	[ ]	N/A	x [0.200]=		0	x [0.200]=		0	x [0.200]=		0
NCA, NCA-2 (Backlight ON)	[ ]	[ ]	x [0.400]=			x [0.400]=			x [0.400]=		
NCA, NCA-2 (Backlight OFF)	[ ]	[ ]	x [0.200]=			x [0.200]=			x [0.200]=		
NCM-W, NCM-F	[ ]	[ ]	x [0.110]=			x [0.110]=			x [0.110]=		
HS-NCM-W/MF/SF/MFSF/WMF/WSF	[ ]	[ ]	x [0.400]=			x [0.400]=			x [0.400]=		
DPI-232‡	[ ]	[ ]	x [ ]			x [ ]=			x [ ]=		
DVC components (Refer to DVC manual)	[ ] [ ]	[ ] [ ]	x [ ]= x [ ]=			x [ ]= x [ ]=			x [ ]= x [ ]=		
DVC-RPU components (Refer to DVC-RPU manual)	[ ]	[ ]	x[ ]=			x[ ]=			x[ ]=		
DS-DB (Refer to the DS-DB manual)	[ ]	[ ]	x [ ]=			x [ ]			x [ ]=		
ICM-4RK, CRM-4RK	[ ]	N/A	x [0.007]=		0	x [0.072]=		0	x [0.007]=		0
ICE-4	[ ]	N/A	x [0.001]=		0	x [0.065]=		0	x [0.001]=		0
CRE-4	[ ]	N/A	N/A		0	x [0.065]=		0	N/A		0
DCM-4RK	[ ]	N/A	x [0.008]=		0	x [0.080]=		0	x [0.008]=		0
VCE-4	[ ]	N/A	x [0.001]=		0	x [0.040]=		0	x [0.001]=		0
VCM-4RK	[ ]	N/A	x [0.007]=		0	x [0.040]=		0	x [0.007]=		0
IZM-8RK	[ ]	N/A	x [0.047]=		0	x [0.047]=		0	x [0.047]=		0
IZE-A	[ ]	N/A	x [0.004]=		0	x [0.003]=		0	x [0.004]=		0
ARM-4 Auxiliary Relay	[ ]	[ ]				x [0.146]=					
FSD-751RPL (Duct Detector)	[ ]	[ ]	x [0.025]=			x [0.087]=			x [0.025]=		
FSA-8000/FSA-20000 (FAAST Detector)	[ ]	[ ]	x [0.465]=			x [0.493]=			x [0.465]=		
ACM-24AT	[ ]	[ ]	x [0.016]=			x [0.070]=			x [0.016]=		
ACM-48A	[ ]	[ ]	x [0.016]=			x [0.070]=			x [0.016]=		
AEM-24AT	[ ]	[ ]	x [0.002]=			x [0.056]=			x [0.002]=		
AEM-48A	[ ]	[ ]	x [0.002]=			x [0.056]=			x [0.002]=		
Maximum number of LEDs illuminated on these annunciators during non-fire conditions:	[ ]	[ ]	x [0.0054]=						x [0.0054]=		
AFM-16AT, AFM-32A	[ ]	[ ]	x [0.040]=			x [0.056]=			x [0.040]=		
ACM-16AT, ACM-32A	[ ]	[ ]	x [0.040]=			x [0.056]=			x [0.040]=		
AEM-16AT, AEM-32A	[ ]	[ ]	x [0.002]=			x [0.018]=			x [0.002]=		
TM-4	[ ]	[ ]	x [0.110]=			x [0.175]=			x [0.110]=		
SCS-8 (refer to Doc. 15712)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
AFM-16A	[ ]	[ ]	x [0.025]=			x [0.065]=			x [0.025]=		
LCD-80	[ ]	[ ]	x [0.100]=			x [0.100]=			x [0.050]=		
ACM-8R (refer to Doc. 15342)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
LDM (refer to Doc. 15885)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
UZC-256	[ ]	[ ]	x [0.035]=			x [0.085]=			x [0.035]=		
AMG-1, AMG-E, ATG-2	[ ]	[ ]	x [0.060]=			x [0.060]=			x [0.060]=		
FFT-7, FFT-7S	[ ]	[ ]	x [0.060]=			x [0.120]=			x [0.060]=		
RM-1	[ ]	[ ]	x [0.020]=			x [0.020]=			x [0.020]=		
FZM-1, MMX-2	[ ]	[ ]	x [0.0094]=			x [0.090]=			x [0.0094]=		
XPIQ (Refer to Doc. 51013)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
RPT-W, RPT-WF, RPT-F	[ ]	[ ]	x [0.017]=			x [0.017]=			x [0.017]=		
RPT-485W, RPT-485WF	[ ]	[ ]	x [0.049]=			x [0.049]=			x [0.049]=		
RFX	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
UDACT Communicator	[ ]	[ ]	x [0.040]=			x [0.100]=			x [0.040]=		
UDACT-2 Communicator	[ ]	[ ]	x [0.052]=			x [0.087]=			x [0.052]=		
VEC-25/50	[ ]	N/A	x [0.215]=			x [1.215]=			x [0.215]=		
with optional FC-AAM25	[ ]	N/A	x [0.245]=			x [2.215]=			x [0.245]=		
Four-Wire Smoke Detectors	[ ] [ ]	[ ] [ ]	x [ ]= x [ ]=			x [ ]= x [ ]=			x [ ]= x [ ]=		
Power Supervision Relay (EOLR-1)	[ ]	[ ]	x [0.020]=			x [0.020]=			x [0.020]=		
FWSG (only if powered by the FWSG 24V connections TB:A2 and TB:A3)	[ ]	[ ]	x [0.040]			x [0.040]			x [0.040]		
Compatible Devices not listed above**	[ ] [ ]	[ ] [ ]	x [ ]= x [ ]=			x [ ]= x [ ]=			x [ ]= x [ ]=		
Main Output (MAIN 24, TB1) Sub-totals ††			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		
AUX Output (AUX 24, TB3) Sub-totals ††			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		
AMPS-24									[ ] x [0.13]=		
Accessories Output (TB2 on CPS-24). Enter 0.5 A in all white boxes if TB2 is in use. Leave blank if not in use.											
Local Energy Municipal Box						[ ]x [ ]=					
Sum each column for totals			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		

Table 4.1 System Draw Current Calculations

* Devices powered by the Main Output (MAIN 24, TB1) draw current through the fire panel's connection to the power supply.
† Value represents an SLC's maximum current draw. Refer to device datasheets for individual current draws. Total device current cannot exceed 200mA.
‡ Current consumption of the DPI-232 is dependent upon the baud rate selection (via slide switch on the DPI-232). See DPI-232 manual for details.
** Refer to manual and/or Device Compatibility Document.
†† Refer to Table 1.1, "Output Current for Each Configuration," on page 8 to determine the maximum current for your configuration.

4.1.3 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 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 4.4 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 AMPS-24 (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 4.1, col 3		=	
Additional Load	[ ] X	=	
Sum Column for Secondary Non-Fire Alarm Load		=	

Table 4.2 Maximum Secondary Power Non-Fire Alarm Current Draw

4.1.4 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 4.4 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 AMPS-24 (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 4.1, col 2		=	
Additional Load	[ ] X	=	
Sum Column for Secondary Fire Alarm Load		=	

Table 4.3 Maximum Secondary Power Fire Alarm Current Draw

4.2 Calculating the Battery Requirements

4.2.1 Calculating the Battery Capacity

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

Current (amps)	X	Time (hours)	=	_____AH
Secondary Non-Fire Alarm Current (from Table 4.2) _____	X	Required Secondary Non-Fire Alarm Standby Time (24 or 60 hours) _____	=	_____AH
Secondary Fire Alarm Load (from Table 4.2) _____	X	Required Fire Alarm Standby Time:* _____	=	_____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 4.4 Secondary Power Standby and Fire Alarm Load

The following notes apply to Table 4.4:

1. NFPA 72 Local, Proprietary, Central Station, Auxiliary and Remote systems requires 24 hours of standby power followed by 5 minutes in alarm.
2. Older NFPA standards and certain jurisdictions require 60 hours or standby power followed by 5 minutes in alarm. Verify this requirement with the AHJ.

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.
7. The following battery derating factors must be used for Canadian installations using an AMPS-24 charger:
   - For 7 AH capacity, use derating factor of 1.1
   - For 12 AH capacity, use derating factor of 1.2
   - For 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

4.2.2 Calculating the Battery Size

Use this table to choose the battery size, in amp-hours, needed to support the fire alarm system. The AMPS-24 can charge batteries from 7 to 200 AH. Select batteries that meet or exceed the Total Amp-Hours calculated in Table 4.4 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	Our Part Number*	Backbox† (Order Part Number)
7 AH	12 volts	two	BAT-1270	CABS-PS1, SBB-A4, SBB-B4, SBB-C4, SBB-D4, EQBB-B4, EQBB-C4, EQBB-D4, BB-25
12 AH	12 volts	two	BAT-12120	CABS-PS1, SBB-A4, SBB-B4, SBB-C4, SBB-D4, EQBB-B4, EQBB-C4, EQBB-D4, BB-25
26 AH	12 volts	two	BAT-12260	SBB-A4, SBB-B4, SBB-C4, SBB-D4, EQBB-B4, EQBB-C4, EQBB-D4, BB-25
55 AH	12 volts	two for 55 AH four for 110 AH	BAT-12550	BB-55, NFS-LBB BB-100
100 AH	12 volts	two for 100 AH four for 200 AH	BAT-121000	BB-100 BB-200

Table 4.5 Selecting the Battery Size

* Manufactured to our specifications by PoweSonic.
† Red version available for non-EQCAB models; add “R” to part number listed here.

NOTE: Battery size is limited to 7 AH minimum and 200 AH maximum using the internal AMPS-24 battery charger.

Appendix A: Compatibility with Other Systems

A.1 XLS3000

The AMPS-24 is UL/ULC-listed for use with the XLS3000.

Installation, programming, and operation of the AMPS-24 with the XLS3000 is as described in this manual.

Refer to the XLS3000 Installation manual (P/N 52509) for more information about connecting to this power supply.

A.1.1 Power Supply Calculations

Table A.1 on the following page provides Honeywell-specific current draw calculations for devices powered by the AMPS-24. This table replaces Table 4.1 on page 36 when AMPS-24 is used to power XLS3000 systems.

A.1.2 Calculation for Main Supply Current

AMPS-24 *Terminal Blocks:*	Quantities TB1 (MAIN 24)*	Quantities TB3 (AUX 24)	Calculation Column 1 Primary, Non-Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)	Calculation Column 2 Primary, Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)	Calculation Column 3 Secondary, Non-Fire Alarm Current (amps) X [current draw]=	Total on: TB1 (MAIN 24)	Total on: TB3 (AUX 24)
XLS3000-CPU,	1	N/A	x [0.120]=	0.12	0	x [0.120]=	0.12	0	x [0.120]=	0.12	0
Keyboard/Display Option	1	N/A	x [0.220]=	0.22	0	x [0.220]=	0.22	0	x [0.220]=	0	0
XLS-ELCM-320, LCM-320 (refer to Doc. 52509)	[ ]	N/A	x [0.130]=		0	x [0.130]=		0	x [0.130]=		0
XLS-ELEM-320, LEM-320 (refer to Doc. 52509)	[ ]	N/A	x [0.100]=		0	x [0.100]=		0	x [0.100]=		0
SLC Loop†	[ ]	N/A	x [0.200]=		0	x [0.200]=		0	x [0.200]=		0
XLS-NCA, XLS-NCA-2 (Backlight ON)	[ ]	[ ]	x [0.400]=			x [0.400]=			x [0.400]=		
XLS-NCA, XLS-NCA-2 (Backlight OFF)	[ ]	[ ]	x [0.200]=			x [0.200]=			x [0.200]=		
NCM-W, NCM-F	[ ]	[ ]	x [0.110]=			x [0.110]=			x [0.110]=		
HS-NCM-W/MF/SF/MFSF/WMF/WSF	[ ]	[ ]	x [0.400]=			x [0.400]=			x [0.400]=		
DPI-232‡	[ ]	[ ]	x [ ]			x [ ]=			x [ ]=		
XLS-DVC components (Refer to manual)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
DVC-RPU components (Refer to DVC-RPU manual)	[ ]	[ ]	x[ ]=			x[ ]=			x[ ]=		
DS-DB (Refer to the DS-DB manual)	[ ]	[ ]	x [ ]=			x [ ]			x [ ]=		
TC806D1059 (Duct Detector)	[ ]	[ ]	x [0.025]=			x [0.087]=			x [0.025]=		
TC846F1002/TC846F4046 (FAAST Detector)	[ ]	[ ]	x [0.465]=			x [0.493]=			x [0.465]=		
ACM-24AT	[ ]	[ ]	x [0.016]=			x [0.070]=			x [0.016]=		
ACM-48A	[ ]	[ ]	x [0.016]=			x [0.070]=			x [0.016]=		
AEM-24AT	[ ]	[ ]	x [0.002]=			x [0.056]=			x [0.002]=		
AEM-48A	[ ]	[ ]	x [0.002]=			x [0.056]=			x [0.002]=		
Maximum number of LEDs illuminated on these annunciators during non-fire conditions:	[ ]	[ ]	x [0.0054]=						x [0.0054]=		
TM-4	[ ]	[ ]	x [0.110]=			x [0.175]=			x [0.110]=		
SCS-8 (refer to Doc. 15712)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
AFM-16A	[ ]	[ ]	x [0.025]=			x [0.065]=			x [0.025]=		
LCD-80	[ ]	[ ]	x [0.100]=			x [0.100]=			x [0.050]=		
ACM-8R (refer to Doc. 15342)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
LDM (refer to Doc. 15885)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
UZC-256	[ ]	[ ]	x [0.035]=			x [0.085]=			x [0.035]=		
AMG-1, AMG-E, ATG-2	[ ]	[ ]	x [0.060]=			x [0.060]=			x [0.060]=		
FFT-7, FFT-7S	[ ]	[ ]	x [0.060]=			x [0.120]=			x [0.060]=		
RM-1	[ ]	[ ]	x [0.020]=			x [0.020]=			x [0.020]=		
TC841A1000, XLS-MM-Z	[ ]	[ ]	x [0.0094]=			x [0.090]=			x [0.0094]=		
XPIQ (Refer to Doc. 51013)	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
RPT-W, RPT-WF, RPT-F	[ ]	[ ]	x [0.017]=			x [0.017]=			x [0.017]=		
RPT-485W, RPT-485WF	[ ]	[ ]	x [0.049]=			x [0.049]=			x [0.049]=		
RFX	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
UDACT Communicator	[ ]	[ ]	x [0.040]=			x [0.100]=			x [0.040]=		
UDACT-2 Communicator	[ ]	[ ]	x [0.052]=			x [0.087]=			x [0.052]=		
VEC-25/50	[ ]	N/A	x [0.215]=			x [1.215]=			x [0.215]=		
with optional FC-AAM25	[ ]	N/A	x [0.245]=			x [2.215]=			x [0.245]=		
Four-Wire Smoke Detectors	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
Power Supervision Relay (A77-716B)	[ ]	[ ]	x [0.020]=			x [0.020]=			x [0.020]=		
FWSG (only if powered by the FWSG 24V connections TB:A2 and TB:A3)	[ ]	[ ]	x [0.040]			x [0.040]			x [0.040]		
Compatible Devices not listed above**	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
	[ ]	[ ]	x [ ]=			x [ ]=			x [ ]=		
Main Output (MAIN 24, TB1) Sub-totals ††			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		
AUX Output (AUX 24, TB3) Sub-totals ††			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		
AMPS-24									[ ] x [0.13]=		
Accessories Output (TB2 on CPS-24). Enter 0.5 A in all white boxes if TB2 is in use. Leave blank if not in use.											
Local Energy Municipal Box						[ ]x [ ]=					
Sum each column for totals			Primary, non-alarm:			Primary, alarm:			Secondary, non-alarm:		

Table A.1 System Draw Current Calculations

* Devices powered by the Main Output (MAIN 24, TB1) draw current through the fire panel's connection to the power supply.
† Value represents an SLC's maximum current draw. Refer to device datasheets for individual current draws. Total device current cannot exceed 200mA.
‡ Current consumption of the DPI-232 is dependent upon the baud rate selection (via slide switch on the DPI-232). See DPI-232 manual for details.
** Refer to manual and/or Device Compatibility Document.
†† Refer to Table 1.1, "Output Current for Each Configuration," on page 8 to determine the maximum current for your configuration.

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