EST3
Installation Sheets

P/N 3100051 • Rev 1.0 • 27APR00

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DEVELOPED BY	Edwards Systems Technology 6411 Parkland Drive Sarasota, FL 34243 (941) 739-4300
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CREDITS	This manual was designed and written by the EST Technical Services - Documentation Department, Sarasota.

DOCUMENT HISTORY

Date	Revision	Reason for change
27APR00	1.0	Initial release

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Content

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Introduction

About this manual

This manual contains copies of the EST3 installation sheets. The sheets are arranged in alphabetical order by title. The part number listed in *Content* is the installation sheet part number.

The EST3 library

A library of documents and multi-media presentations supports the EST3 life safety system. A brief description of each is provided below.

EST3 Installation and Service Manual (P/N 270380): Provides complete information on how to install and service the EST3 hardware. The manual also includes installation information on selected Signature Series components.

EST3 Programming Manual (P/N 270381): Provides quick reference information for defining and labeling individual system components using the Systems Definition Utility (SDU), and for writing rules to govern system operation.

EST3 System Operation Manual (P/N 270382): Provides detailed information on how to operate the system and system components.

EST3 International Installation Supplement Manual (P/N 270925): Provides information specific to systems installed outside the United States and Canada.

EST3 Smoke Management Application Manual (P/N 270913): Provides information for designing, programming, and testing an EST3 smoke control system.

EST3 Users Self-Study Course (P/N 270684): Contains a self-paced manual and accompanying video. The course is designed for building personal, security guards, firefighters, and other individuals that may be required to operate the system.

Related documents

In addition to documents in the EST3 library, you may find the following documents useful.

Signature Series Intelligent Smoke and Heat Detectors Applications Bulletin (P/N 270145): This manual provides additional applications information on the Signature series smoke and heat detector applications.

Signature Series Component Installation Manual (P/N 270497): This manual provides detailed mounting and wiring information for all Signature series devices.

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Speaker Application Guide (P/N 85000-0033): This manual provides information on the placement and layout of speakers for fire alarm signaling and emergency voice communications.

Strobe Applications Guide (P/N 85000-0049): This manual provides information on the placement and layout of strobes for fire alarm signaling.

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PRODUCT INFORMATION

The 3-AADC Addressable Analog Driver Controller module provides one Class A or Class B loop. The loop may contain up to 99 addressable analog sensors and 99 addressable analog modules.

The 3-AADC requires one connection on the rail chassis and is secured to the rail assembly using snap rivet fasteners. The module features a hinged front panel for mounting displays or a blank protective faceplate.

All field wiring connections to the 3-AADC are made via plug-in connectors that permit termination of field wiring without the module installed in the enclosure. The plug-in connectors and snap rivet mounting also facilitate rapid troubleshooting without the use of tools.

SPECIFICATIONS

Installation:	1 LRM space on rail chassis
Module Configuration:	1 addressable analog circuit
Wire Size:	12 AWG (1.5 mm^2) maximum 18 AWG (0.75 mm^2) minimum
Termination:	Removable plug-in terminal strips on module
Operating Environment	
Temperature:	32 - 120 °F (0 - 49 °C)
Humidity:	93% RH, non-condensing
Circuit Configuration:	Class B (Style 4) Class A (Style 6)
Circuit Capacity:	99 addressable analog sensors and 99 addressable analog modules
Circuit Resistance:	50 Ω, max.
Circuit Capacitance:	0.5 μF, max.
Current Requirements	
Standby:	175 mA
Alarm:	205 mA
Isolators:	6, max. 25 devices between isolators, max.

WARNINGS

This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures may result in equipment damage.

Rail modules may not be plugged into the rail chassis assembly while voltages are present on the rail. Failure to de-energize the panel before plugging in the rail module may result in equipment damage.

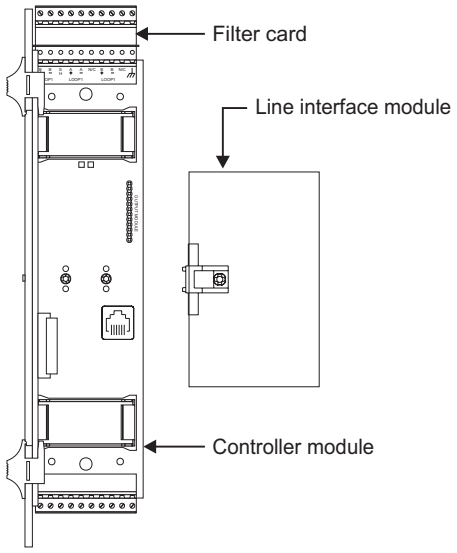
Do not flex the filter card or exert excessive pressure on the field wiring connectors when installing the filter card.

Do not connect field wiring or connect/disconnect the terminal block without supporting the back edge of the filter card to avoid flexing the filter card.

INSTALLATION INSTRUCTIONS

1. Connect the LIM card to CIRCUIT 1 on the back side of the rail module assembly. See Figure-1 on reverse side.
2. If a control/display module is required install it at this time. Refer to the instructions provided with the control/display module.
3. Carefully plug in the filter board into the connector on the rail module and install the module on the rail.
4. Before connecting the field wiring, test the field wiring for opens or shorts. When a circuit checks out properly, connect it to the appropriate terminals as shown in the diagram on the next page.

PRODUCT DIAGRAM



INSTALLATION SHEET

3-AADC Addressable Analog Driver Controller

INSTALLATION SHEET P/N: 387332	FILE NAME: 387332.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 08DEC99	CREATED BY: G. Sutton

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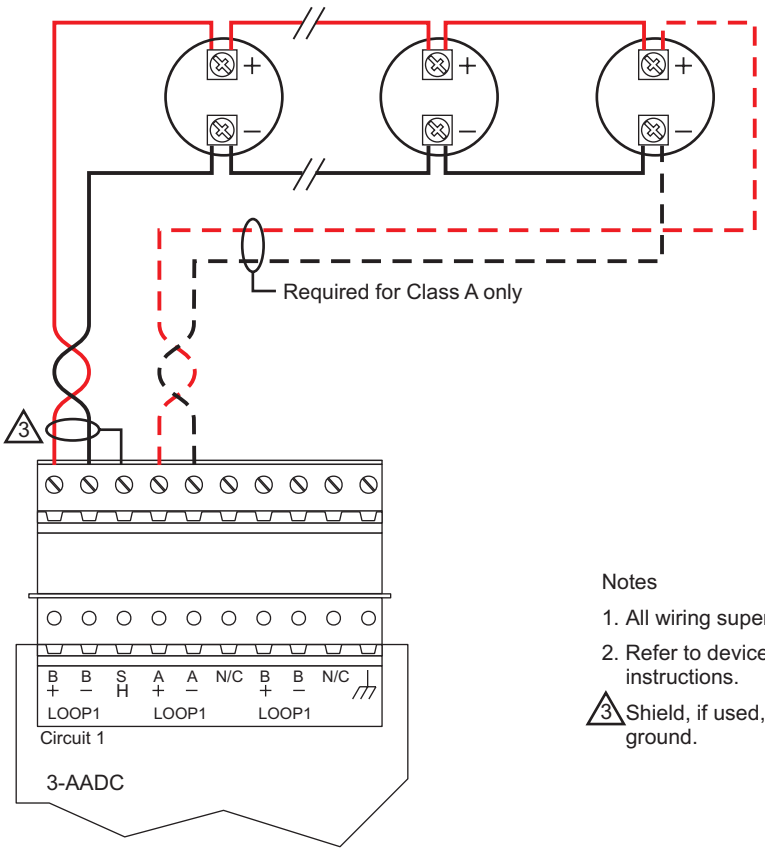
WIRING DIAGRAM



Notes

1. All wiring supervised and power-limited.
2. Refer to device installation sheets for specific wiring instructions.
3. Shield, if used, must be continuous and free from earth ground.

INSTALLATION INSTRUCTIONS (CONT.)

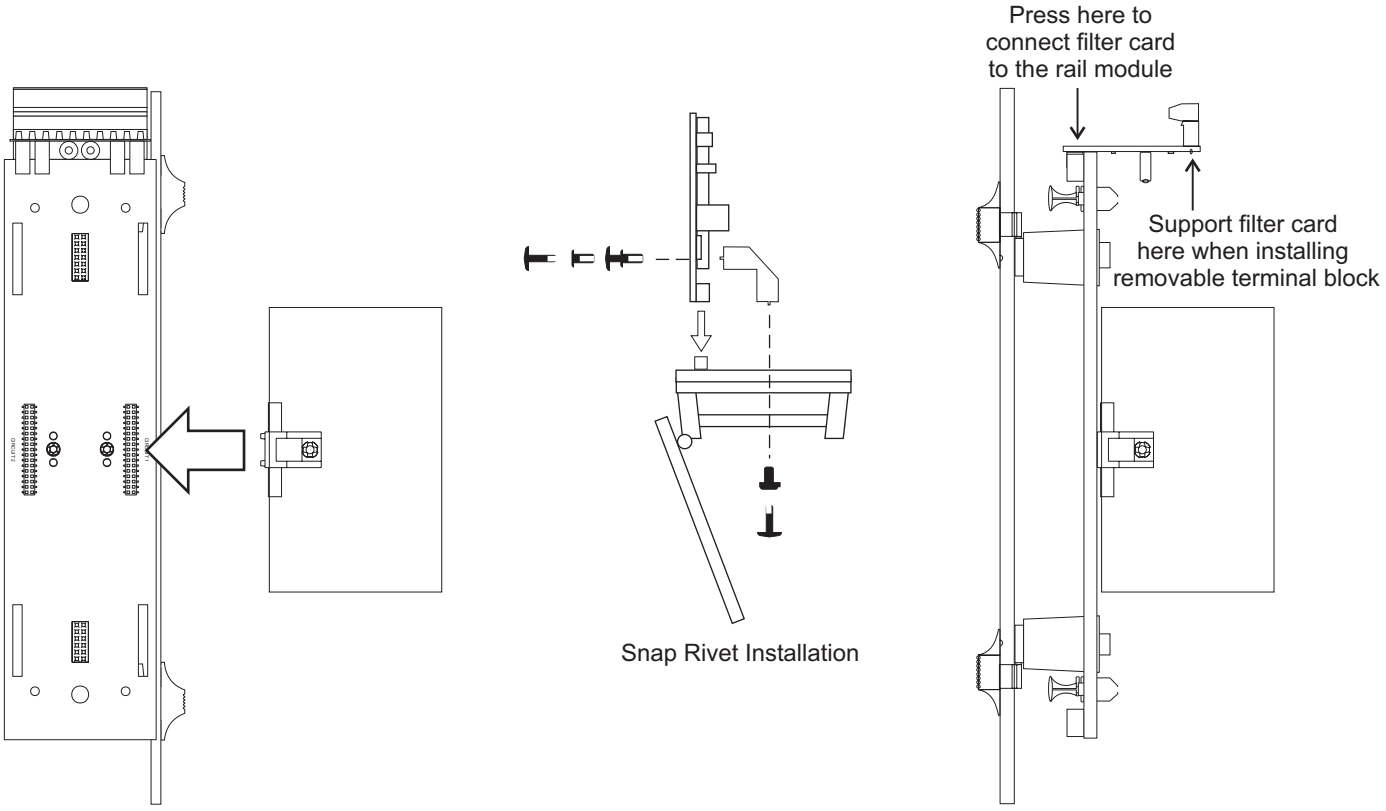


Figure-1: Filter card and LIM card installation

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PRODUCT INFORMATION

The 3-ANNCPU1 Annunciator Controller module is the control element for all the LCD and LED/Switch displays in an enclosure. The 3-ANNCPU1 processes all control information from switches on the displays installed within the cabinet as well as processing the data received from the network for display. The 3-ANNCPU1 contains 1MB of RAM.

An internal calendar and clock with leap year function provides date/time event stamping and initiates timed events. The controller automatically identifies and supervises all modules installed in the annunciator, and has an integral watchdog to identify both hardware and software faults.

The 3-ANNCPU1 communicates with other 3-ANNCPU1s and 3-CPU1 Central Processors on the network over a Class A or B RS-485 network data circuit. The controller functions as the local bus master and supervises all bus traffic between modules in the cabinet.

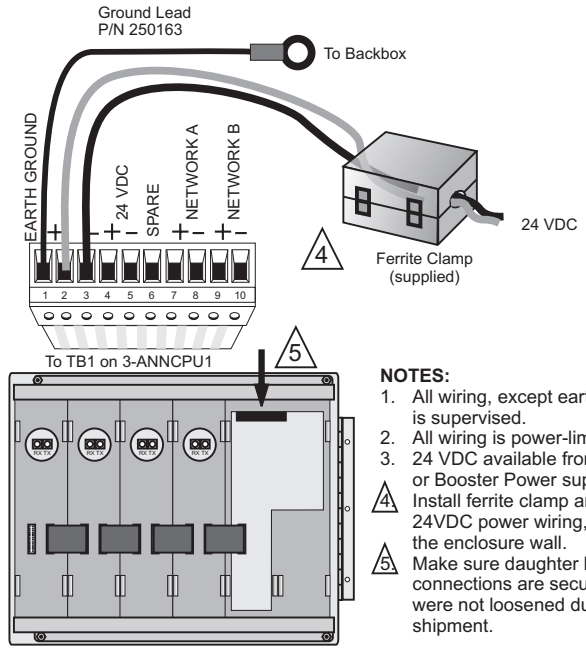
The 3-ANNCPU1 module requires two spaces at the left-most position of the enclosure. The controller is secured to the inner door by two retainer brackets. All field wiring connections to the 3-ANNCPU1 module are made via a plug-in connector, permitting termination of field wiring without the equipment installed in the enclosure. All external connections are power- limited and transient protected. The plug-in connector facilitates rapid remove and replace troubleshooting without the use of tools.

Note: 3-CPU Boot and Application Code must be version 1.33 or greater.

SPECIFICATIONS

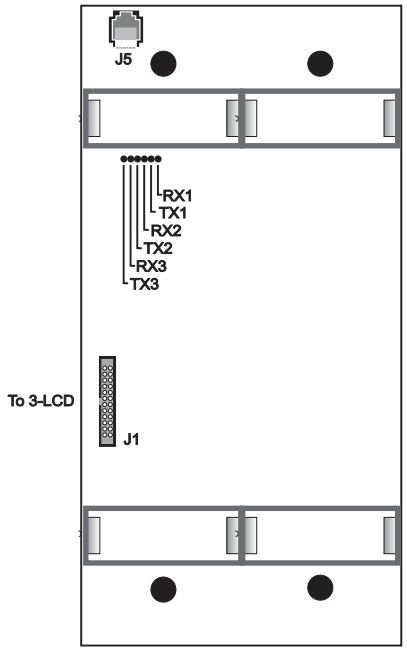
Space Required	2 spaces in enclosure
Display (optional)	3-LCD Display mounts on front
Message Capacity	
Message Queue	500 Events per queue
Event History Log	1,000 to 1,700 Events, depending on event type
Network Com Port	
RS-485	Isolated, Class B or Class A Max. length 5,000 ft (1,524 m) between any three panels
Max.Resistance	90 Ω
Max.Capacitance	0.3 μF
Wiring type	1 twisted pair, 18 AWG (0.75 mm^2) min. 12 AWG (2.5 mm^2) max.
Power Requirements	
Voltage	24 Vdc
Standby Current	171 mA @ 24 Vdc
Alarm Current	195 mA @ 24 Vdc
Termination	Plug-in terminal strip
Operating Environment	
Temperature	32 °F to 120 °F (0 °C to 49°C)
Humidity	93% RH, non-condensing

CENTRAL PROCESSOR WIRING



NOTES:
1. All wiring, except earth ground, is supervised.
2. All wiring is power-limited.
3. 24 VDC available from Primary or Booster Power supply.
4. Install ferrite clamp around 24VDC power wiring, close to the enclosure wall.
5. Make sure daughter board connections are secure and were not loosened during shipment.

3-ANNCPU1



INSTALLATION SHEET:

3-ANNCPU1
Annunciator Controller Module

INSTALLATION SHEET P/N: 387464	FILE NAME: 387464.CDR
REVISION LEVEL: 1.0	APPROVED BY: SM
DATE: 05/05/98	CREATED BY: GS

A UNIT OF GENERAL SIGNAL
GS BUILDING SYSTEMS CORPORATION
GS BUILDING SYSTEMS CORPORATION
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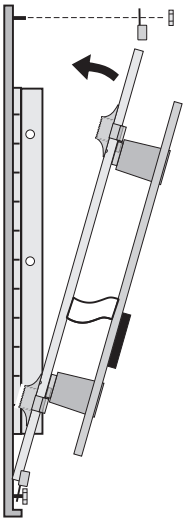
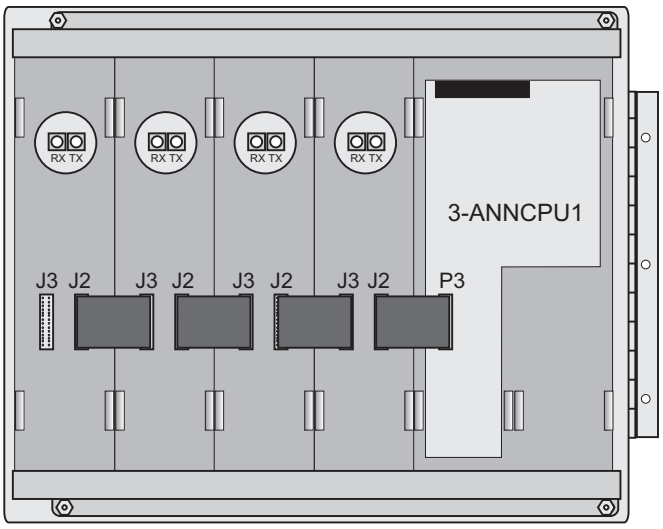
INSTALLATION

To install in remote annunciator cabinet enclosure:

Observe static sensitive material handling practices.

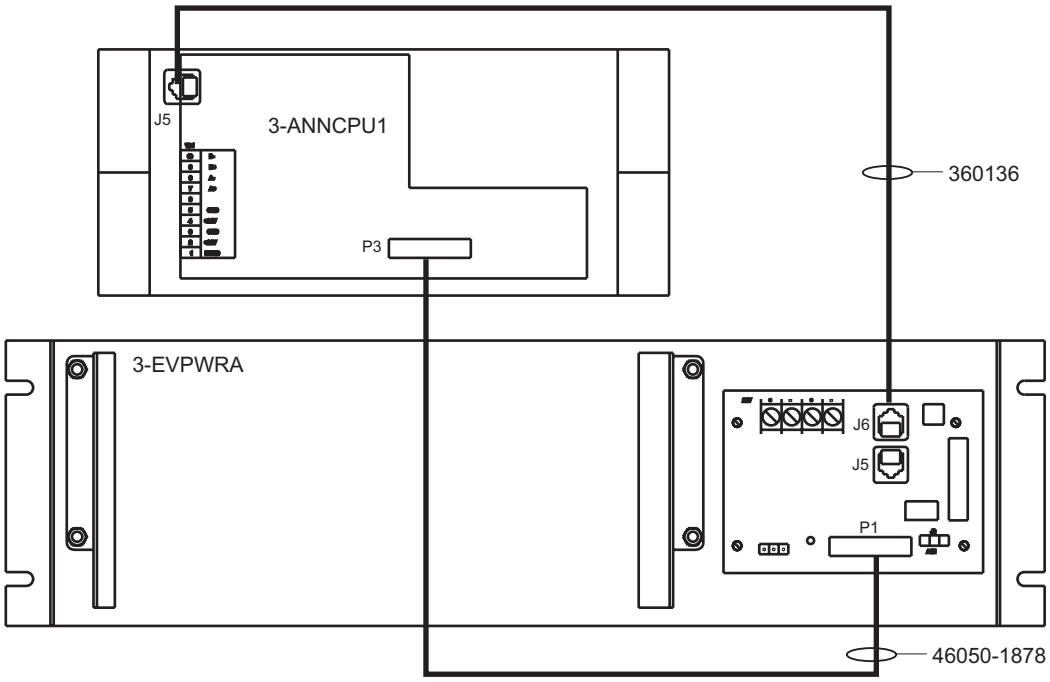
1. Remove the top module retainer bracket (see figure below).
2. Loosen the bottom module retainer bracket.
3. Insert the bottom of the 3-ANNCPU1 into the bottom module retainer bracket.
4. Tilt the 3-ANNCPU1 forward until the top touches the inner door.
5. Tighten the bottom module retainer bracket.
6. Secure the top module retainer bracket to the inner door.
7. Connect cable assembly from P3 on the 3-ANNCPU1 to J2 on the adjacent annunciator strip.





To install in 3-EVPWRA:

1. Remove one module retainer bracket and loosen the other (see figure below).
2. Connect cable assembly 360136 (supplied with 3-EVPWRA) to J5 on the 3-ANNCPU1.
3. Remove the 4 locking tabs on the 3-ANNCPU1.
4. Place the 3-ANNCPU1 between the module retainer brackets.
5. Tighten module retainer brackets on both ends.
6. Connect cable assembly 360136 to 3-EVPWR connector J6.
7. Connect cable assembly 46050-1878 (supplied with 3-EVPWRA) from P3 on the 3-ANNCPU1 to P1 on the 3-EVPWR.



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PRODUCT INFORMATION

The 3-ANNSM Annunciator Support Module provides the electronics required to operate the LED/Switch displays. The support modules are connected to the 3-ANNCPU by ribbon cables. The 3-ANNSM supports the following LED/Switch displays:

2-24R	3-24Y	3-24G
3-12SR	3-12SY	3-12SG
3-12/S1RY	3-12/S1GY	3-12/S2Y
3-6/3S1G2Y	3-6/3S1GYR	

SPECIFICATIONS

Installation	1 space
Current Requirements (does NOT include LED/Switch display)	
Standby	10 mA @ 24 VDC
Alarm	10 mA @ 24 VDC
Operating Environment	
Temperature	32°F (0°C) to 120°F (40°C)
Humidity	93%RH, non-condensing

INSTALLATION

1. Fill out and install a label in each LED/Switch display (step 1.)
2. Mount the display on the 3-ANNSM module (step 2.)
3. Connect the display ribbon cable (P/N 250186) from connector J1 on the display to connector J1 on the module (step 3.)
4. Install the module in the inner door of the enclosure (Figure 2.)

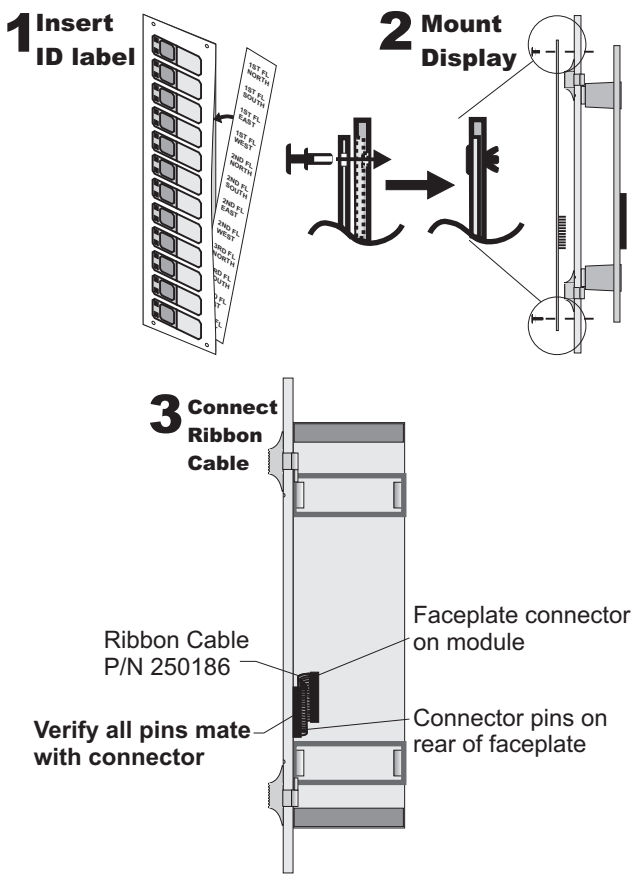

Figure 1
Mounting the LED/Switch Display

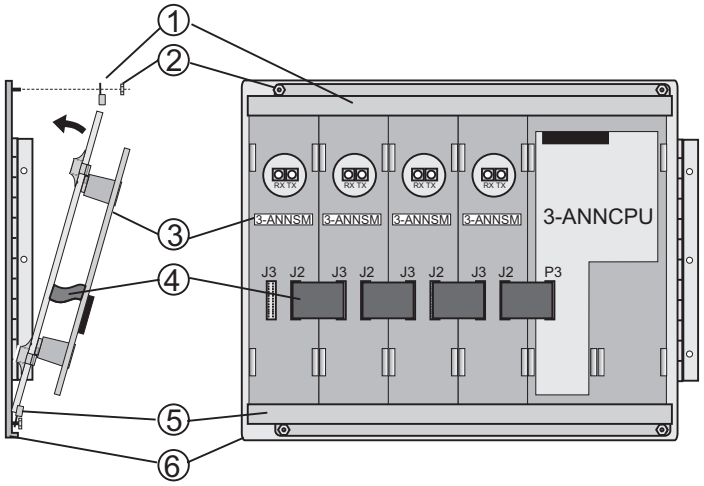

Figure 2
Installing the 3-ANNSM on the Inner Door

1. Install the lower module retainer bracket (5) on the inner door (6) using the nuts (2) provided. Do not tighten the nuts at this time.
2. Place the 3-ANNSM modules in the lower retainer bracket (5) next to the 3-ANNCPU. Install 3-ANNBF blank filler plates in any unused space.
3. Install the top module retainer bracket (1) on the top of the inner door with the nuts (2) provided. Tighten the nuts on both the top and bottom brackets.
4. Install the ribbon cables (4) between modules from P3 on the 3-ANNCPU to J2 on the first 3-ANNSM. Connect the ribbon cables from J3 of the first module to J2 of the next support module until all modules are connected by a ribbon cable.

Observe static sensitive material handling practices.

INSTALLATION SHEET:

3-ANNSM
Annunciator Support Module

INSTALLATION SHEET P/N: 387312	FILE NAME: 387312.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 04/06/99	CREATED BY: D. Miner

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PRODUCT INFORMATION

The 3-ASU Audio Source is the primary audio component of the fire command center. The 3-ASU provides the master paging microphone, audio signal database, and the digital message unit. The 3-ASU is the source of all audio signals distributed by the network. Audio sources include local and remote voice paging, firefighter's telephone paging, and an auxiliary audio input for non-emergency paging, etc. The 3-ASU features an integral digital voice message playback unit that can simultaneously provide up to 8 different audio signals. An integral audio signal database is provided for the evacuation, alert and other functions. Onboard memory is adequate for a total of 2 minutes of messages. With the optional memory installed, up to 32 minutes of messages can be stored. The audio source unit is comprised of the audio source electronics package mounted in a chassis assembly and a cover assembly. The 3-ASU has room to install an optional 4-space rail assembly, model 3-CHAS4 or 3-FTCU Firefighter's Telephone Control Unit.

The 3-ASU converts and compresses the real-time audio signals to a digital format. The eight digital signals are then combined together as a single digital multiplex signal and distributed throughout the network. An integral signal database may be configured with a wide selection of tones and messages: steady, 3-3-3, electronic bell, 120 beats-per-minute, and slow whoop. All tones are stored as digital signals within the 3-ASU. The internal digital message/signal unit can simultanously play back up to eight signals, as required by the system designer.

SPECIFICATIONS

Cabinet Installation
One chassis space
19" Rack Installation Dimensions
12.0" x 19.0" x 5.25" (30.48 cm x 48.26 cm x 13.34 cm)
Options
3-ASUMX Expansion Memory
3-FTCU Firefighter's Telephone Control Unit
3-CHAS4 Four LRM rail assembly
Audio Channels
8 simultaneous
Audio Inputs
Local microphone (isolated & supervised)
Remote microphone (isolated & supervised)
Firefighter's telephone (isolated & supervised)
4 aux. signal sources (isolated & supervised)
Prerecorded Message Storage
2 minutes standard, expandable to 32 minutes storage with 3-ASUMX/32 memory card
Auxiliary Input

Input Impedance	1KΩ
Input Level	0.1V_{RMS} to 1.0 V_{RMS}
Frequency Response	100Hz to 4KHz

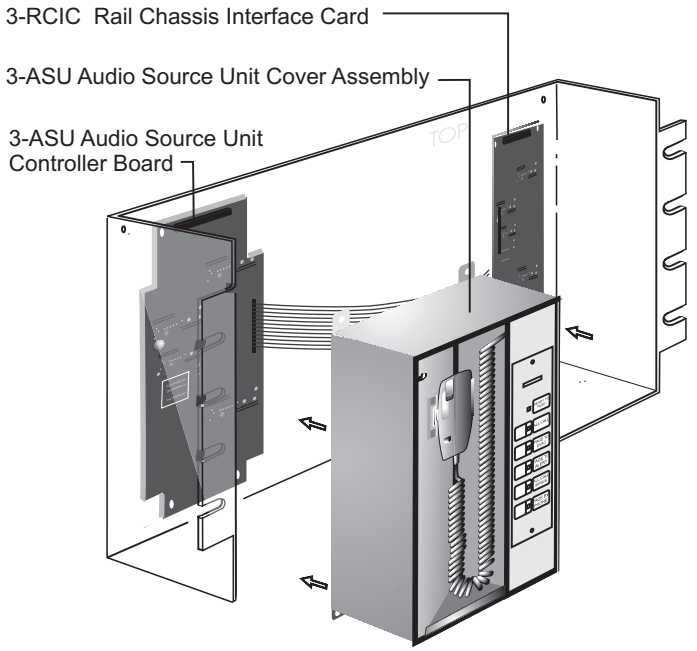
Network Audio Riser

Configuration	Class A/B
Format	RS-485
Circuit Length	5000Ft. (1524 M) max. between any 3 panels
Circuit Resistance	90Ω max.
Circuit Capacitance	.09μF. max.
Wire Type	1-2 pair twisted 18 AWG (0.75 mm^2) min.

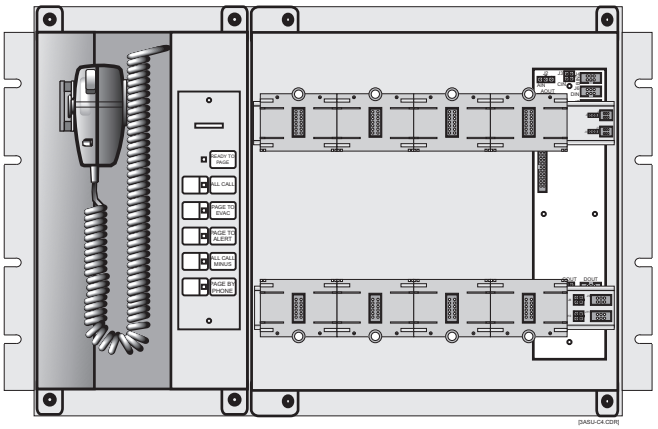
Panel Indicators
All call LED — Page EVAC LED
All call minus LED — Page alert LED
Page by phone LED
Operator Controls
Local microphone push-to-talk (PTT) switch
All call
All call minus
Page by phone
Page to alert
Page to EVAC
Communications Format
RS-485
Termination

Message Download	RJ45 jack
Remote Microphone	Plug-in terminal strip on 3-ASU
Auxiliary Inputs	Plug-in terminal strip on 3-ASU

COVER INSTALLATION



3-ASU



INSTALLATION SHEET

3-ASU
Audio Source Unit

INSTALLATION SHEET P/N: 270482	FILE NAME: 270482.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 6/14/99	CREATED BY: D. Miner

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INSTALLATION

1. To install the optional rail assembly, mount the left side bracket of the rail assembly on the #6-32 chassis studs indicated in the drawing. Secure the right ends of rails to the right side of the 3-ASU chassis assembly using the four self-tapping screws provided. Secure the right ends of the rails to the right side of the 3-ASU chassis assembly using the four self-tapping screws provided.

2. Mount the chassis assembly on the six #6-32 studs at rear of the cabinet. Secure the chassis to the cabinet with the washers and nuts provided.

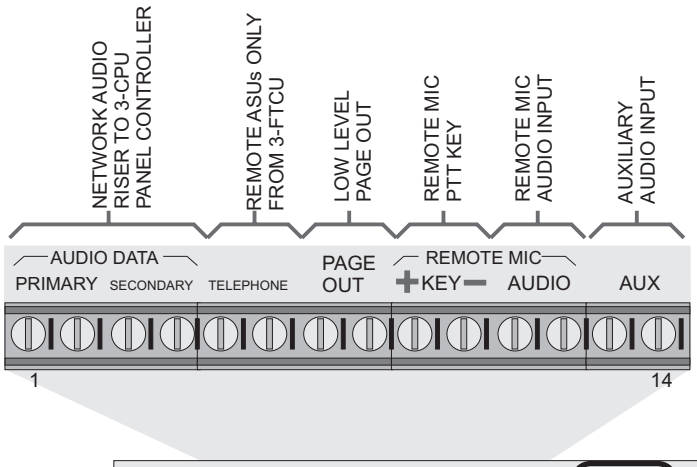
3. Mount the Rail Chassis Interface card on the studs at the right side of the chassis. Connect the power and data cables from the Rail Chassis Interface card to the previous and next chassis.

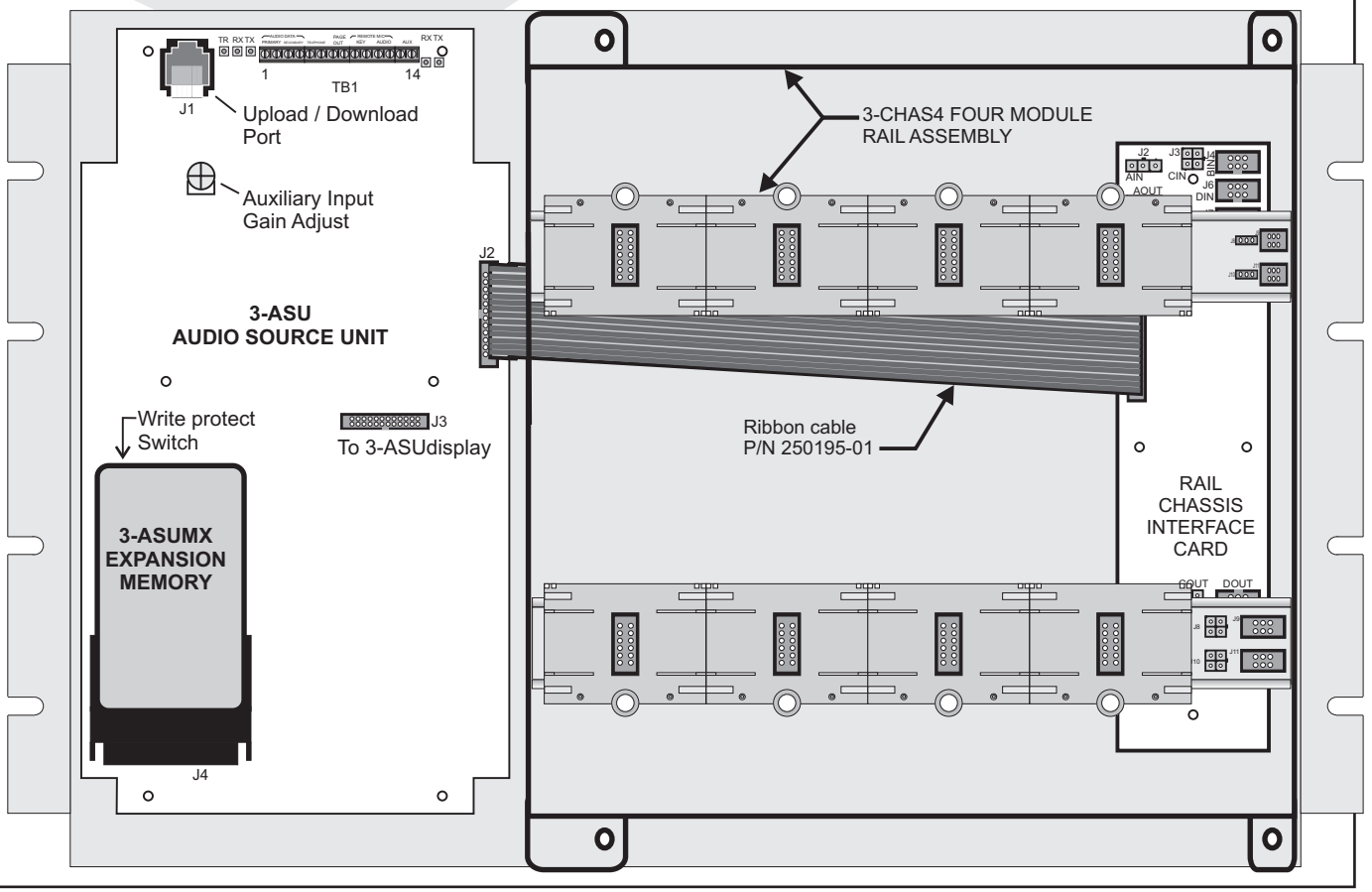
4. Mount the 3-ASU controller board on the six spacers on the left side of the chassis as shown on the figure below. Run ribbon cable (P/N 250195-01) from connector J2 on the 3-ASU controller board to connector J1 on the Rail Chassis Interface card.

5. Terminate the field wiring on TB1. Refer to the Wiring section on the next page.

6. Run ribbon cable (P/N 250194-00) from connector J3 on the 3-ASU controller board to connector J1 on the 3-ASU control board mounted in the Audio Source Unit cover assembly.

7. Install the 3-ASU cover assembly over the controller board and secure it with 4 nuts and washers.





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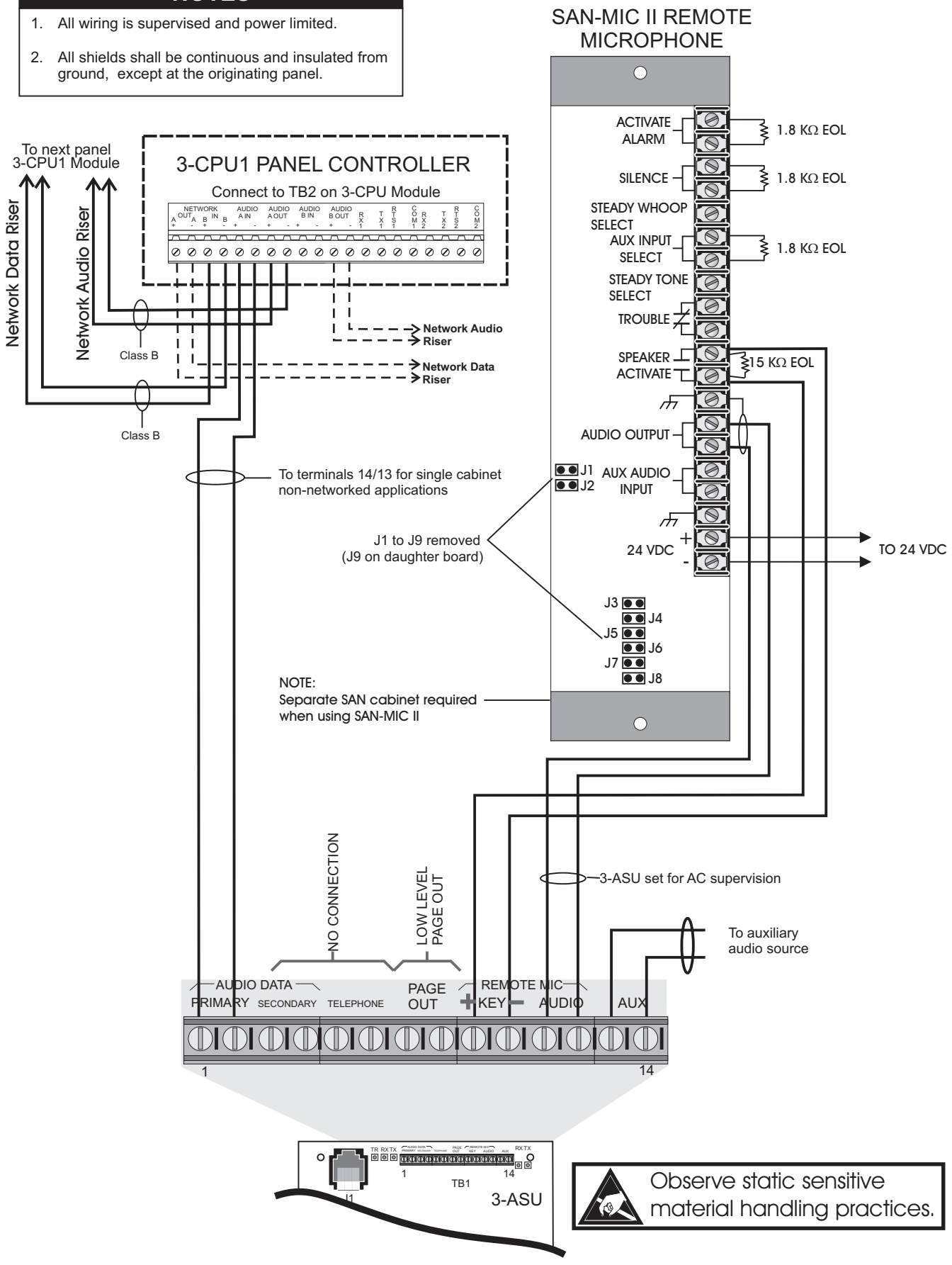
NOTES

1. All wiring is supervised and power limited.
2. All shields shall be continuous and insulated from ground, except at the originating panel.



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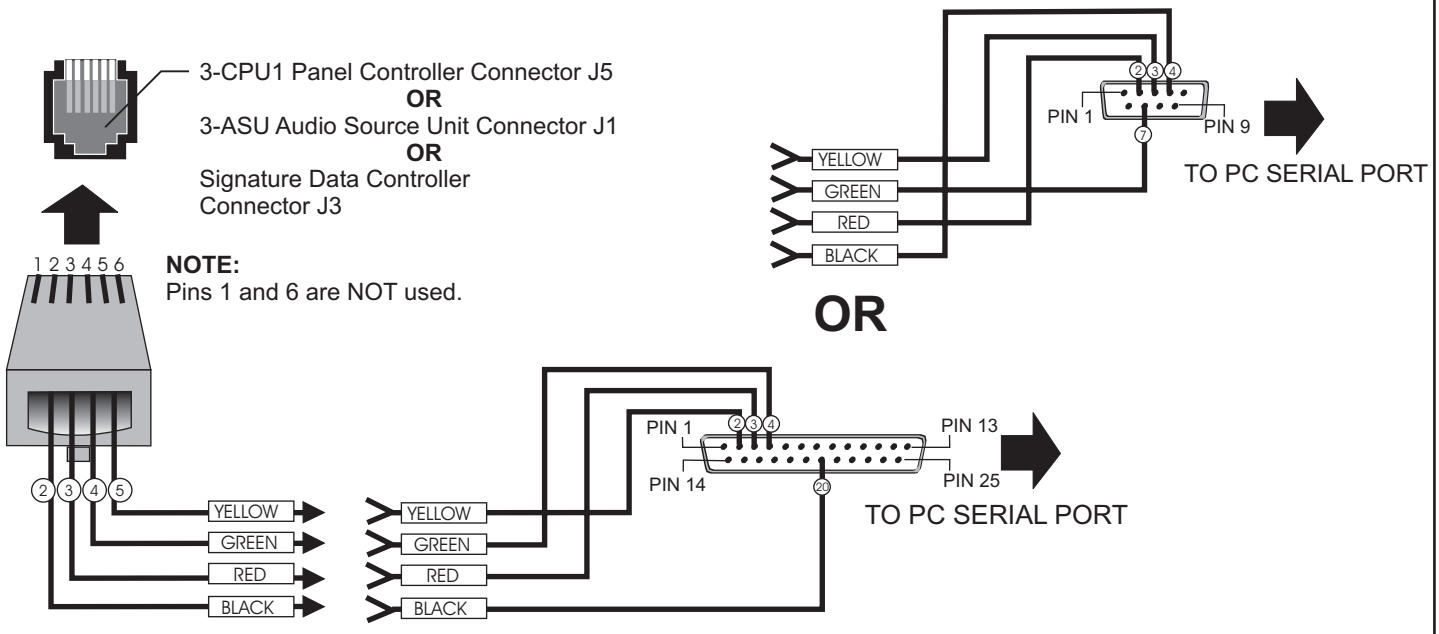
DOWNLOAD WIRING

The figure below indicates the wiring between the 3-ASU and the PC running the System Definition Utility program. This cable is used whenever downloading information into the 3-ASU. Refer to the Programming Manual for complete downloading information.



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SPECIFICATIONS

Cabinet Installation
One chassis space

19" Rack Installation Dimensions
12.0" x 19.0" x 5.25" (30.48 cm x 48.26 cm x 13.34 cm)

Options
3-ASUMX/32 Memory, 32 minutes of messages

Audio Channels
8 simultaneous

Audio Inputs
*Page - Local microphone (isolated & supervised)
*Page - Remote microphone (isolated & supervised)
*Page - Firefighter's telephone (isolated & supervised)
*Auxiliary (unsupervised)
* = Page and Auxiliary inputs are "live" signals.

Prerecorded Message Storage
2 minutes standard, expandable to 32 minutes

Auxiliary Input

Input Impedance	1 KΩ
Input Level	0.1 VRMS to 1.0 VRMS
Frequency Response	100 Hz to 4 KHz

Remote Microphone
3-REMICP or 3-REMICA

Network Audio Riser

Configuration	Class A/B
Format	RS-485
Circuit Length	5,000 Ft. (1524 M) max. between any 3 panels
Circuit Resistance	90 Ω, max.
Circuit Capacitance	.09 μF, max.
Wire Type	1-2 pair twisted 18 AWG (0.75 mm^2) min.

Telephone Riser

EOL Resistor	15 KΩ
Active Telephones	5 max.
Wire Type	1-2 pair twisted-shielded, 18 AWG (0.75 mm^2) min.
Configuration	Class A/B

Panel Indicators
All call LED
All call minus LED
Page by phone LED
Page to EVAC LED
Page to alert LED
Page volume level
8 line LCD display shows calls waiting/connected
Call-in buzzer

Operator Controls
Local microphone push-to-talk (PTT) switch
Master Telephone Handset (supervised)
All call
All call minus
Page by phone
Page to alert
Page to EVAC
Review Pending switch
Connect switch
Review Connected switch
Disconnect switch
Acknowledge (buzzer silence) switch

Termination

Message Download	RJ45 jack
Remote Microphone	Terminal strip on 3-ASU
Firefighter's Telephone	Terminal strip on 3-FTCU
Auxiliary Inputs	Terminal strip on 3-ASU

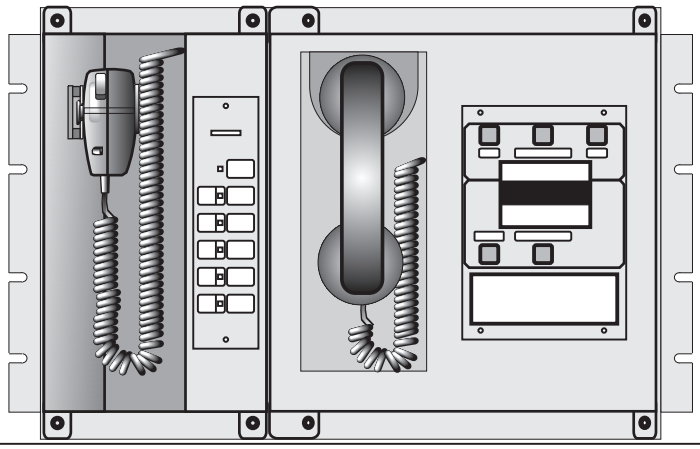
Operating temperature
32°F to 120°F (0°C to 49°C)
93% RH, non-condensing

PRODUCT INFORMATION

The Audio Source Unit with Firefighter's Telephone (3-ASU/FT) is comprised of the 3-ASU Audio Source Unit and the 3-FTCU Firefighter's Telephone Control Unit mounted on a common chassis. The Firefighter's Telephone option in conjunction with the audio source unit provides the main telephone riser. The 3-ASU/FT has provisions to use the telephone circuit as an audio source for paging purposes. The telephone circuit requires a separate hardwired riser and is not multiplexed over the network audio riser. The riser is supervised by the 3-ASU/FT. The 3-ASU/FT requires one chassis space within an enclosure.

The 3-ASU/FT features an 8-line LCD display to show the user the identity of up to 20 waiting calls and connected calls. To answer a call, the operator scrolls the display cursor over the waiting call's ID message and presses the connect switch. This connects the caller and automatically transfers the caller's ID message to the connected list. To end a call, the operator scrolls the display cursor over the connected caller's ID message and presses the disconnect switch. This disconnects the caller and automatically transfers the caller's ID message to the waiting call list, until the caller hangs up, when the ID message is removed.

3-ASU/FT



INSTALLATION SHEET:

3-ASU/FT
Audio Source Unit with
Firefighter's Telephone (3-FTCU)

INSTALLATION SHEET P/N: 270481	FILE NAME: 270481.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 01/10/00	REVISED BY: D. Miner

EDWARDS SYSTEMS TECHNOLOGY, INC.
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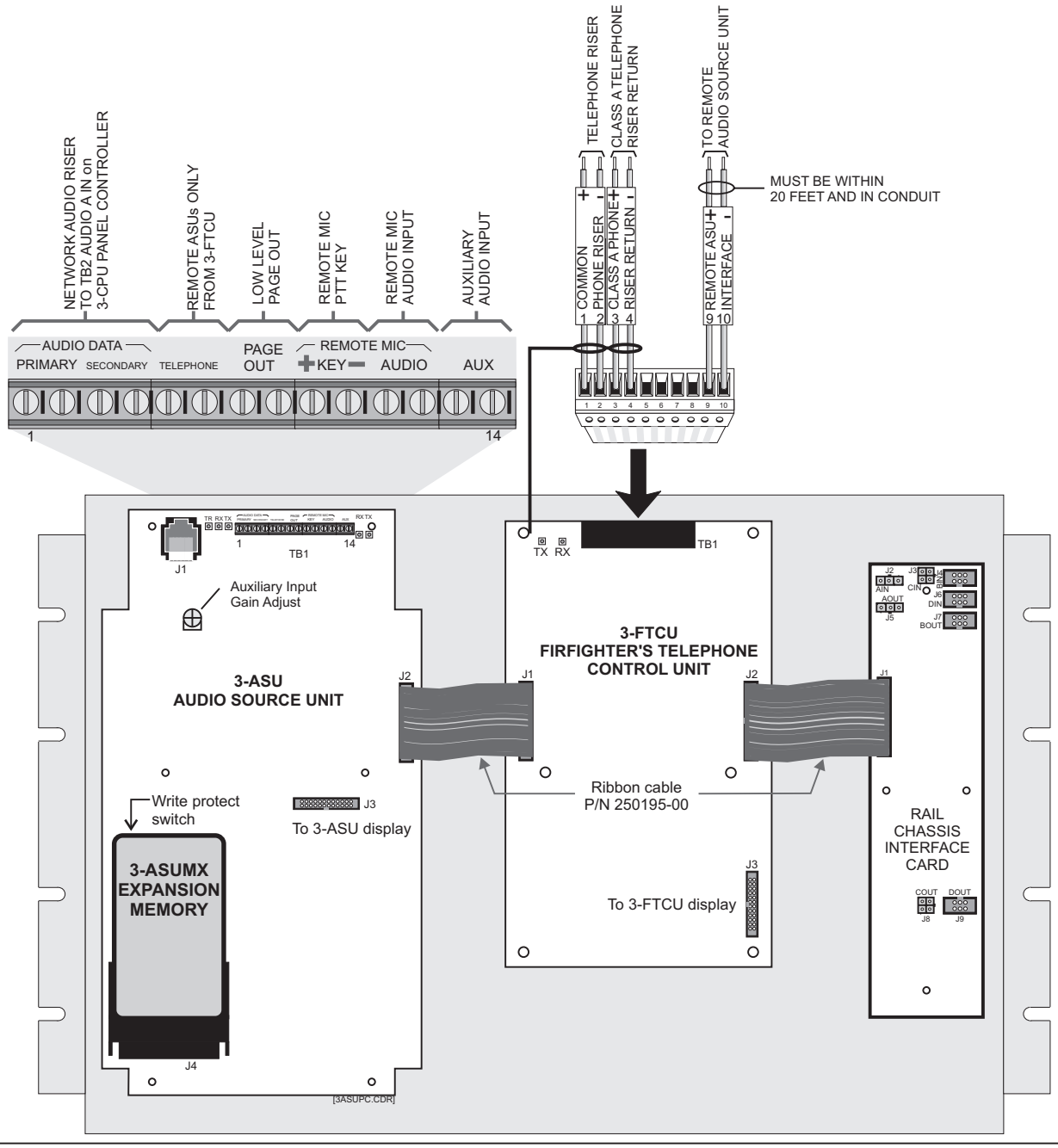
INSTALLATION

1. Mount the chassis assembly on the six #6-32 studs at rear of cabinet. Secure the chassis to cabinet with washers and nuts provided.
2. Mount the Rail Expansion card on the studs at the right side of the chassis. Connect the power and data cables from the Rail Expansion card to the previous and next chassis.
3. Mount the 3-FTCU telephone controller on the six spacers on the right side of the chassis as shown in the figure below. Run ribbon cable (P/N 250195-00) from connector J2 on the 3-FTCU controller board to connector J1 on the Rail Expansion card.
4. Mount the 3-ASU controller board on the six spacers on the left side of the chassis as shown below. Run ribbon cable (P/N 250195-00) from connector J2 on the 3-ASU controller board to connector J1 on the 3-FTCU telephone controller board.
5. Install the 3-ASUMX Expansion Memory board, if used, in connector J4 of the 3-ASU controller board.
6. Terminate the field wiring on TB1 of the 3-ASU and TB1 of the 3-FTCU. Refer to the Wiring section on the next page.
7. Run ribbon cable (P/N 250194-00) from connector J3 on the 3-FTCU controller board to connector J2 on the 3-FTCU display board mounted in the telephone control unit cover assembly.
8. Install the 3-FTCU cover assembly over the telephone controller board and secure it with 4 nuts and washers.
9. Run ribbon cable (P/N 250194-00) from connector J3 on the3-ASU controller board to connector J1 on the 3-ASU control board mounted in the Audio Source Unit cover assembly.
10. Install the 3-ASU cover assembly over the controller board and secure with 4 nuts and washers.



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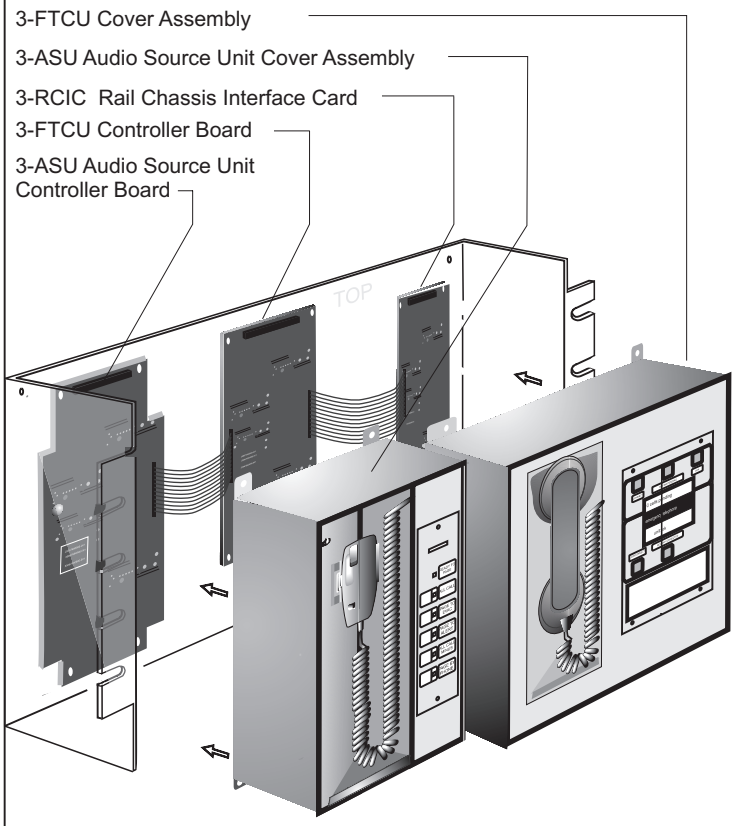
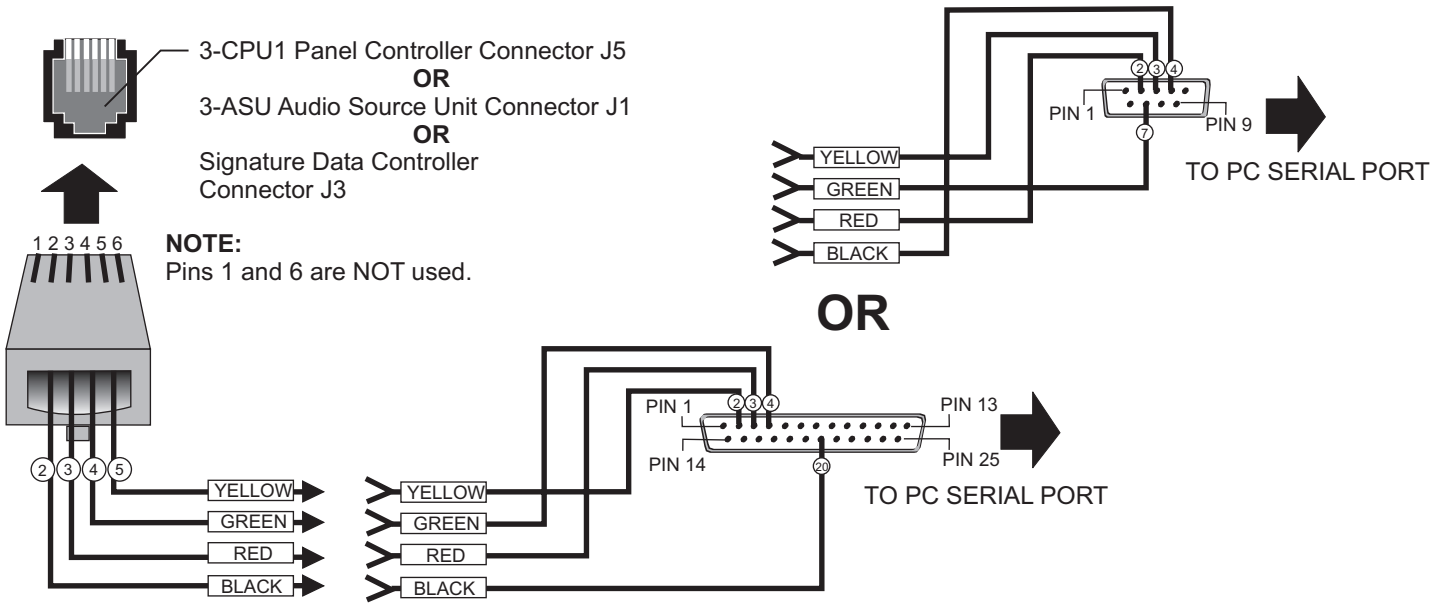
COVER INSTALLATION



DOWNLOAD WIRING

The figure below indicates the wiring between the 3-ASU and the PC running the System Definition Utility program. This cable is used whenever downloading information into the 3-ASU. Refer to the Programming Manual for complete downloading information.



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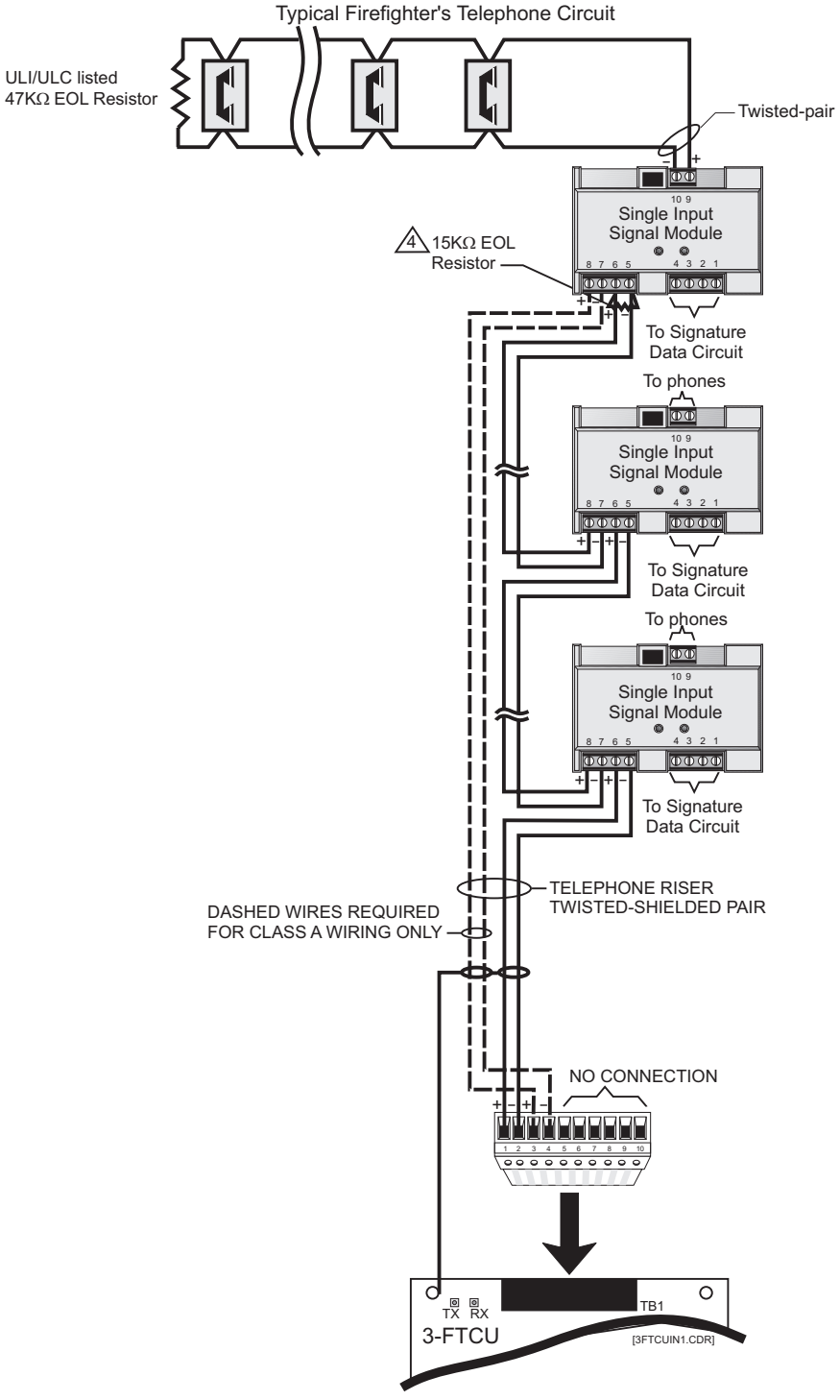
NOTES

1. Single Input Signal Modules set to Personality Code 6.
2. All wiring is supervised and power limited.
3. All shields shall be continouus and insulated from ground, except at the originating panel.
4. 15KΩ EOL resistor for Class B risers only.

Observe static sensitive material handling practices.



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PRODUCT INFORMATION

The 3-ATPINT Interface card is a 25 V_{RMS} and 70 V_{RMS} adapter for the ATP Amplifier Terminal Panel. The 3-ATPINT is required when using a distributed (high voltage) output of an audio amplifier as the audio source for the ATP.

The 3-ATPINT is designed for use with audio source amplifiers which use 24 VDC output circuit supervision with EOL resistor. Multiple 3-ATPINT cards can be connected to a common source amplifier using Class B or Class A supervision, as provided by the sourcing amplifier.

JUMPER SETTINGS

Jumper	Position	Input Voltage
P1	1/2	Pre-Amp #1 Input 70 V_{RMS}
	2/3	Pre-Amp #1 Input 25 V_{RMS}
P2	1/2	Pre-Amp #2 Input 70 V_{RMS}
	2/3	Pre-Amp #2 Input 25 V_{RMS}

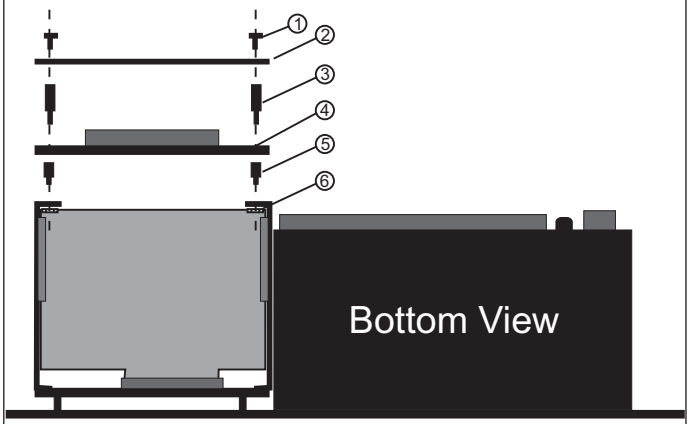
INSTALLATION INSTRUCTIONS

1 Remove the old cover plate and retaining clips on the left side of the ATP (4 screws).

2 Install four spacers (5) in the flanges of the card cage, and secure with nuts (6).

3 Mount the 3-ATPINT board (4) on the four short spacers (5) and secure with four long spacers (3).

4 Install the new cover plate (2) on the long spacers with screws and washers (1) provided.



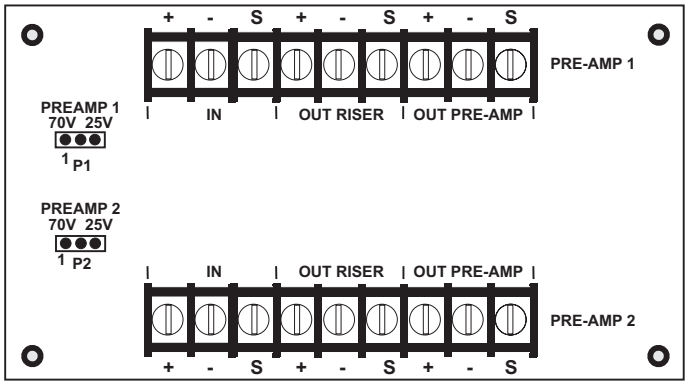
SPECIFICATIONS

Input Voltage	25 V_{RMS} or 70 V_{RMS}
Number of Circuits	2
Supervisory Isolation	DC Blocking Capacitor

NOTES

1. Use a SIGA-CT1 or SIGA-CT2 (P-code 3) to monitor the URSM at the end of the audio risers.
2. Use a SIGA-CT1 or SIGA-CT2 (P-code 3) to monitor ATP trouble contacts.
3. Use a SIGA-CC2 (P-code 7) to select audio from one of two audio riser circuits.
4. Use a SIGA-CC1 (P-code 5) to switch audio from a single audio riser to a branch circuit.
5. Use a SIGA-CR or SIGA-UM (P-code 8) to activate the ATP activity relay.
6. At startup, the 3-ZAxx amplifier must be turned on to the supervisory tone message recorded on the 3-ASU.

3-ATPINT



INSTALLATION SHEET:

3-ATPINT ATP Interface

INSTALLATION SHEET P/N: 387284	FILE NAME: 387284.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 04/06/99	CREATED BY: D. Miner

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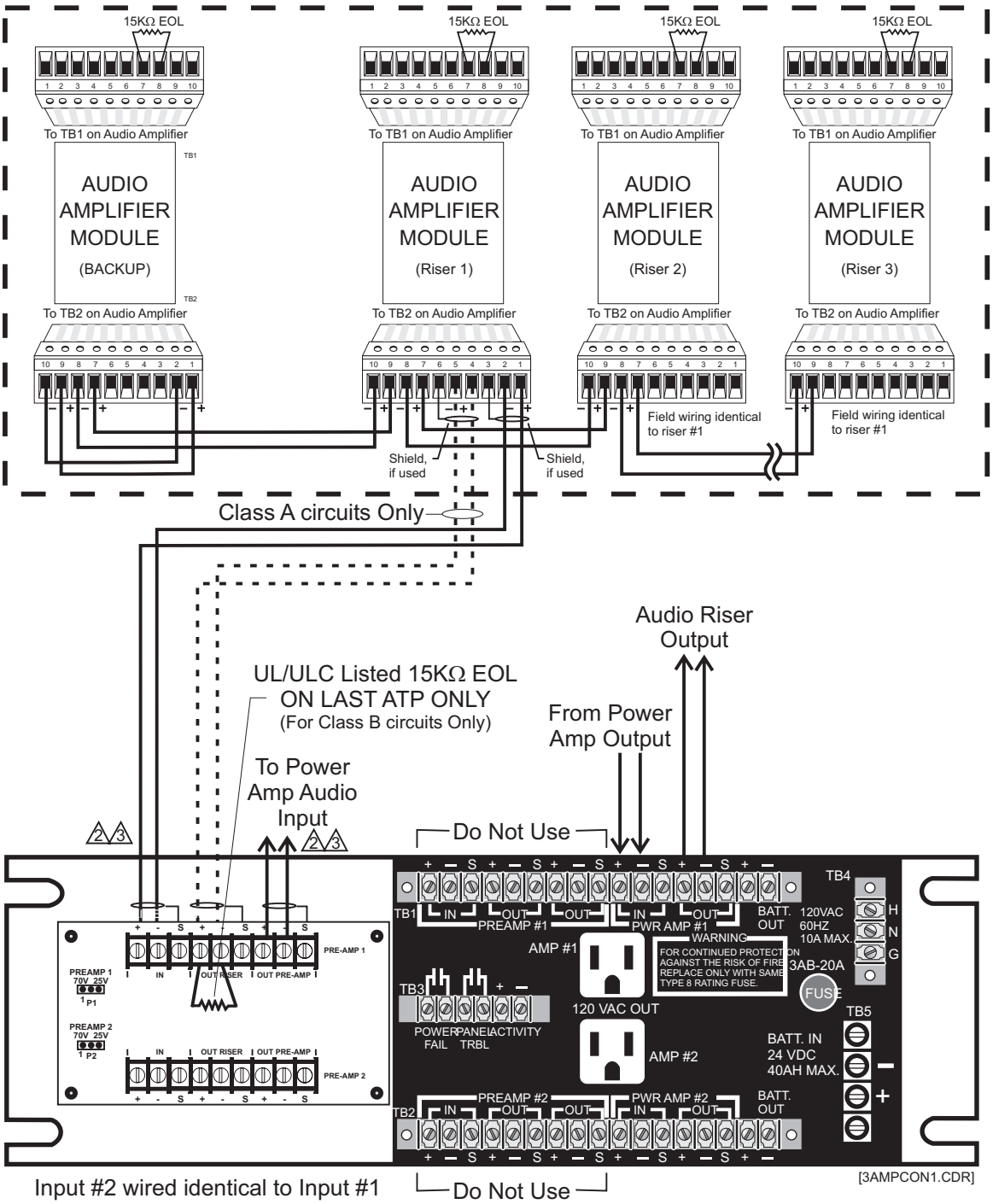
WIRING



Wiring Notes

1. Circuit polarity shown in supervisory condition.
2. Supervised circuit when URSM is used.
3. Power limited circuit.
4. Back up amplifier size must equal the wattage of the largest amplifier to be backed up.
5. Set J1 & J2 to match source amplifier output voltage.
6. Refer to Audio Manual, P/N 270219 for additional ATP and power amplifier installation information.
7. Additional ATPs may be connected to the same audio source by connecting the ATP pre-amp output to the pre-amp input of the next ATP.

JUMPER SETTINGS

P1 = 1/2, Pre-Amp #1 Input 70 V_{RMS}
P1 = 2/3, Pre-Amp #1 Input 25 V_{RMS}
P2 = 1/2, Pre-Amp #2 Input 70 V_{RMS}
P2 = 2/3, Pre-Amp #2 Input 25 V_{RMS}

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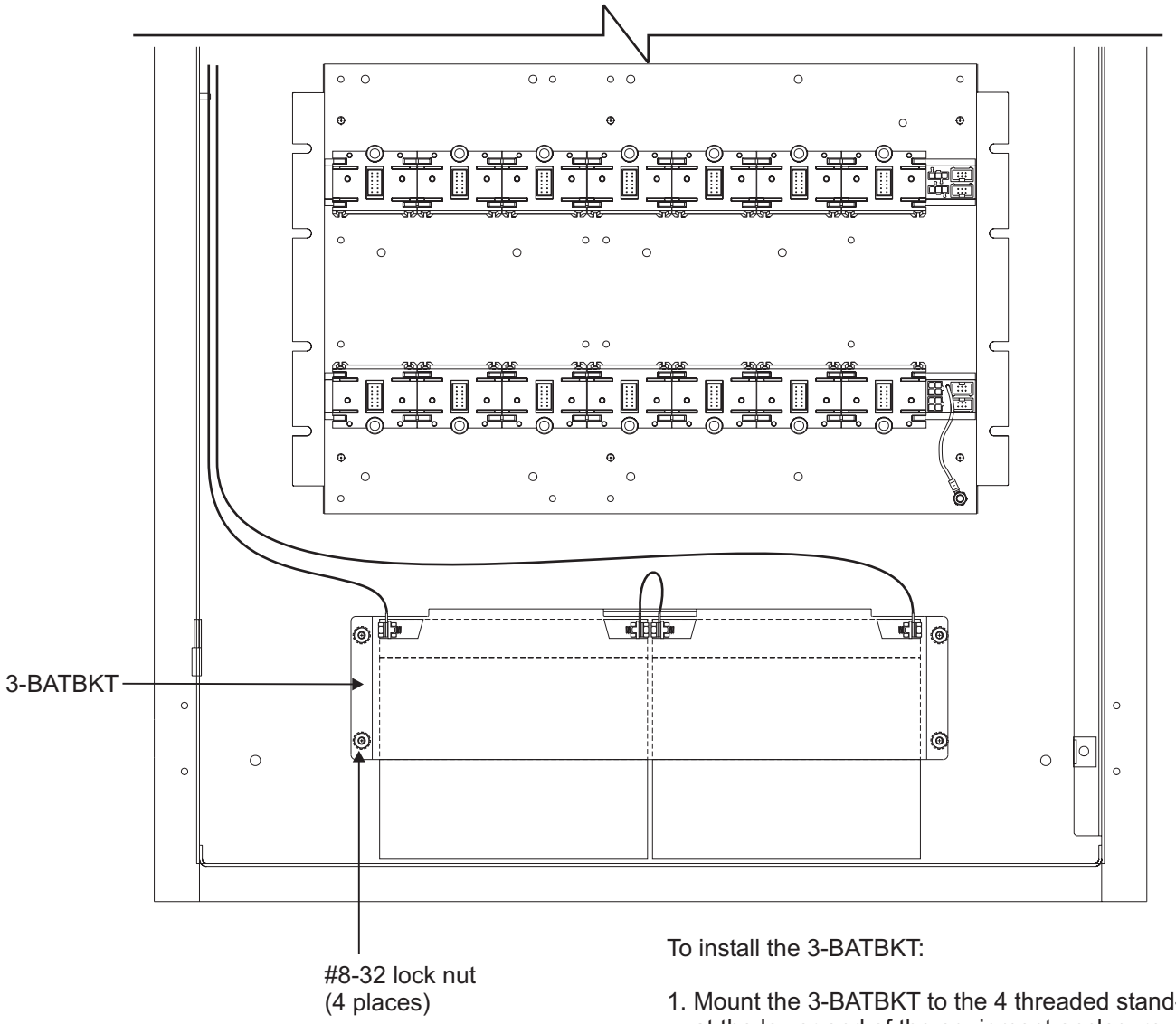
INSTALLATION



To install the 3-BATBKT:

1. Mount the 3-BATBKT to the 4 threaded stand-offs at the lower end of the equipment enclosure, over the standby batteries.
2. Secure the 3-BATBKT using the hardware provided.

INSTALLATION SHEET:

3-BATBKT Battery Bracket

INSTALLATION SHEET P/N: 387556	FILE NAME: 387556.CDR
REVISION LEVEL: 1.0	APPROVED BY: D. Munn
DATE: 23APR99	CREATED BY: G. Sutton

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PRODUCT INFORMATION

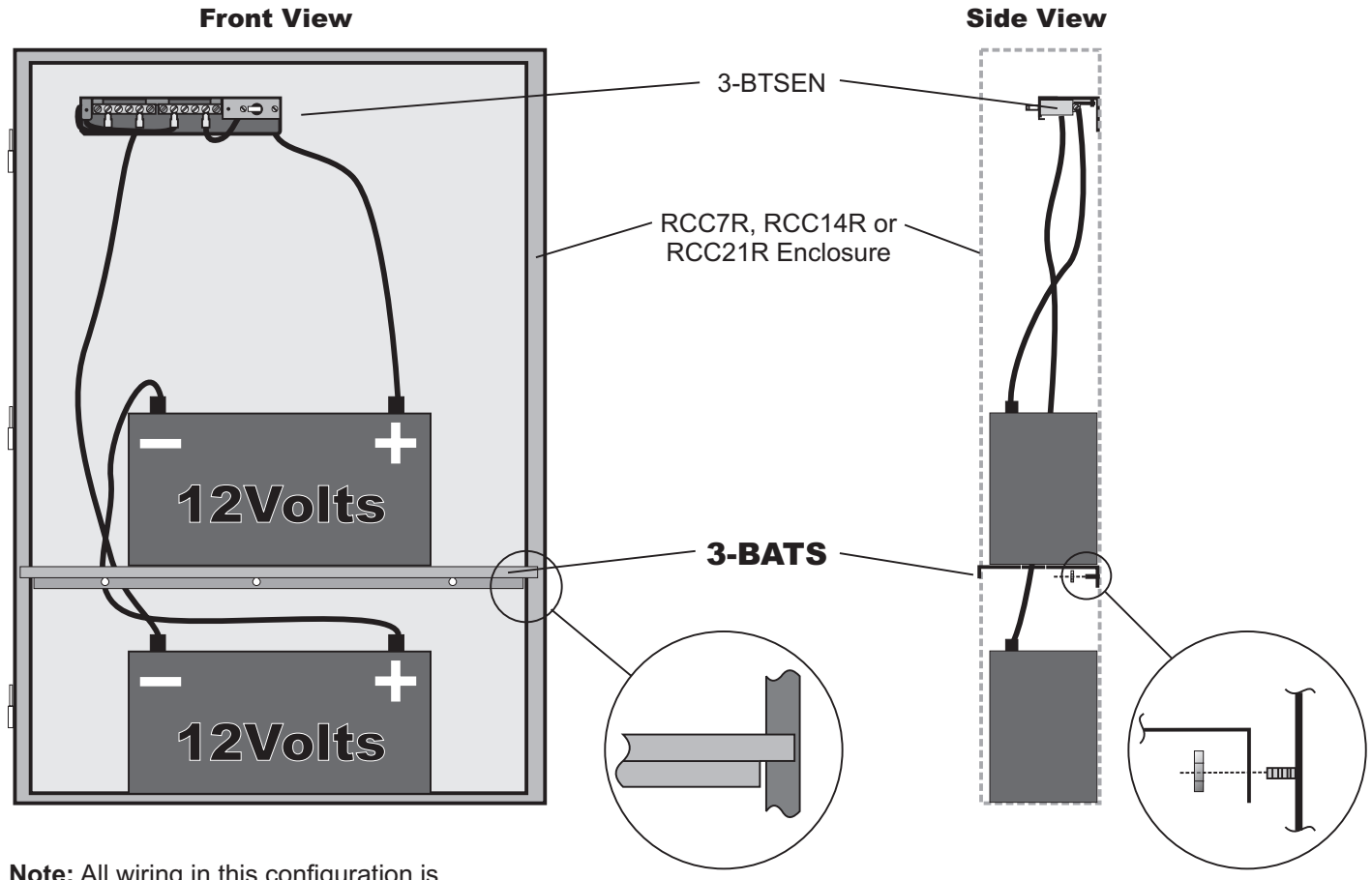
3-BATS Battery Shelf
The 3-BATS is used to convert the RCC7R, RCC14R, and RCC21R Enclosures, to accommodate up to two 65 AH batteries. The 3-BATS has four grommet holes to permit wiring to pass through the shelf.

SPECIFICATIONS

3-BATS

Mounting	RCC7R, RCC14R, or RCC21R Enclosures
Construction	16 Gauge Cold Rolled Steel

INSTALLATION



Note: All wiring in this configuration is non-power limited.

3-BATS

INSTALLATION SHEET:

3-BATS
Battery Shelf

INSTALLATION SHEET P/N: 387338	FILE NAME: 387338.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Munn
DATE: 04/14/99	CREATED BY: D. Miner

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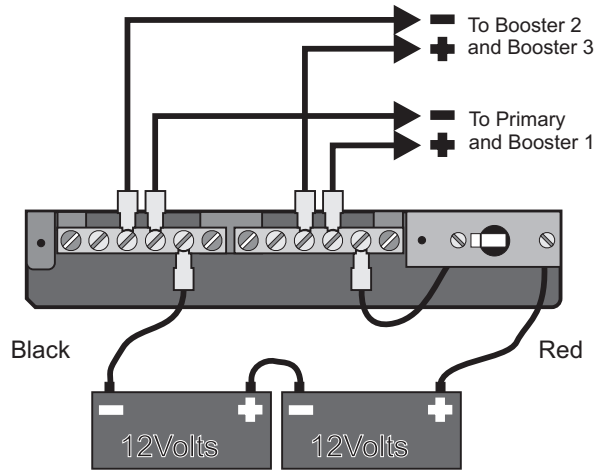
PRODUCT INFORMATION

The 3-BTSEN Battery Distribution Bus provides a backup battery bus for supplying backup power to multiple power supplies fed by a common battery. The 3-BTSEN features a 50 amp circuit breaker to protect the backup battery power bus.

The 3-BTSEN mounts in the BC-1 Battery Cabinet or any "RCC Series" enclosure.

WIRING



Notes:

1. Supervised, not power limited.
2. The diagram shows two pairs of wires going to four power supplies. To get twice the distance between the panel and the 3-BTSEN, use one pair of wires for each power supply in the panel. Refer to the following table for wire distances.

Allowable Wire Distance Per Pair of Wires Between Remote Battery Cabinet and Power Supply				
# of supplies fed by one pair of wires	Wire Size			
	#18 AWG (0.75 mm^2)	#16 AWG (1.0 mm^2)	#14 AWG (1.5 mm^2)	#12 AWG (2.5 mm^2)
1	8.84 ft. (2.7 M)	14 ft. (4.27 M)	22.4 ft. (6.83 M)	35.4 ft. (10.79 M)
2	4.42 ft. (1.35 M)	7 ft. (2.13 M)	11.2 ft. (3.41 M)	17.7 ft. (5.4 M)

SPECIFICATIONS

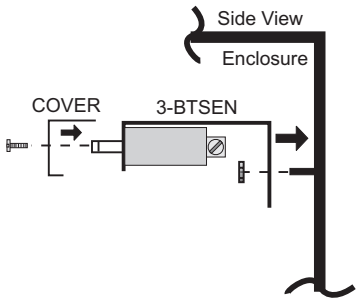
Mounting: BC-1 or RCC Series enclosures
Power Rating: 30 Amps @ 24 VDC
Circuit Breaker: 50 amps
Power Bus: 4 #10-32 machine screws
Operating Temperature Range: 32 to 120° F (0 to 49° C)
Operating Humidity Range: 93% RH non-condensing

WARNINGS

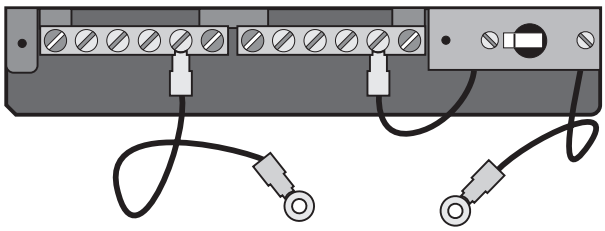
Batteries can deliver high currents. Remove all jewelry before working on these circuits.

INSTALLATION INSTRUCTIONS

The battery cabinet must be installed in the same room as the fire alarm panel and wiring run in conduit.



PRODUCT DIAGRAM



INSTALLATION SHEET

3-BTSEN
Battery Distribution Bus

INSTALLATION SHEET P/N: 387337	FILE NAME: 387337.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Munn
DATE: 10/06/99	CREATED BY: D. Miner

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PRODUCT DESCRIPTION

The 3-CAB series of equipment enclosure backboxes are made of 14-gauge steel and finished with a textured baked grey enamel. The backboxes are designed for semi-flush or surface mounting. Conduit and nail knockouts, keyhole style mounting holes, and wide wiring troughs facilitate quick installation.

Chassis assembly design facilitates separation of power-limited and nonpower-limited circuits inside the backbox by locating power-limited wiring towards the front of the cabinet and nonpower-limited wiring towards the rear.

SPECIFICATIONS

3-CAB7B Dimensions (H x W x D)

Rough-In (See note 1)	23.2 in x 24.0 in x 3.86 in (58.98 cm x 60.9 cm x 9.8 cm)
Finished	
Surface Mounted	25.5 in x 27.34 in x 5.5 in (64.77 cm x 69.4 cm x 14.0 cm)
Semi-Flush Mounted	25.5 in x 27.34 in x1.65 in (64.77 cm x 69.4 cm x 4.19 cm)

3-CAB14B Dimensions (H x W x D)

Rough-In (See note 1)	35.5 in x 24.0 in x 3.86 in (90.17 cm x 60.9 cm x 9.8 cm)
Finished	
Surface Mounted	37.75 in x 27.34 in x 5.5 in (95.89 cm x 69.4 cm x 14.0 cm)
Semi-Flush Mounted	37.75 in x 27.34 in x 1.65 in (95.89 cm x 69.4 cm x 4.19 cm)

3-CAB21B Dimensions (H x W x D)

Rough-In (See note 1)	47.75 in x 24.0 in x 3.86 in (121.29 cm x 60.9 cm x 9.80 cm)
Finished	
Surface Mounted	50.0 in x 27.34 in x 5.5 in (127.0 cm x 69.4 cm x 14.0 cm)
Semi-Flush Mounted	50.0 in x 27.34 in x 1.65 in (127.0 cm x 69.4 cm x 4.19 cm)

Note:

1) Add 1/4" to height and width to allow for knockouts when framing in backbox for semi-flush mounting.

Equipment Capacity

3-CAB7B

Chassis	1 chassis assembly
Batteries	
Model 6V8A	4 max.
Model 12V10A	2 max.
Model 12V17A	2 max.

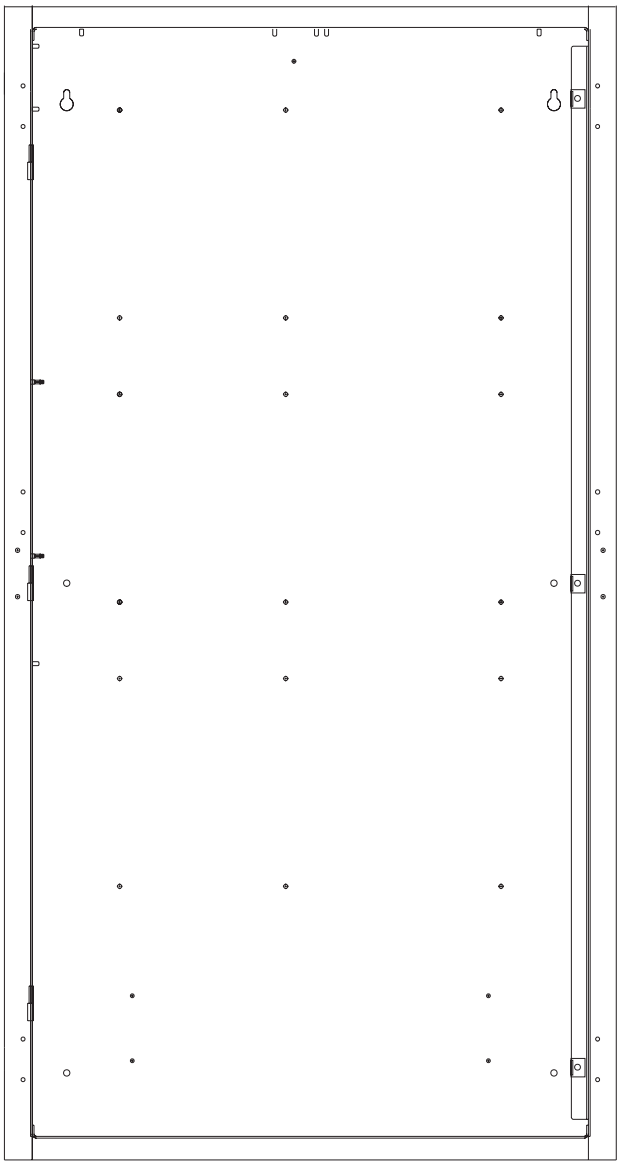
3-CAB14B

Chassis	2 chassis assemblies
Batteries	
Model 6V8A	4 max.
Model 12V10A	2 max.
Model 12V17A	2 max.

3-CAB21B

Chassis	3 chassis assemblies
Batteries	
Model 6V8A	4 max.
Model 12V10A	2 max.
Model 12V17A	2 max.

PRODUCT DIAGRAM



3-CAB21B shown

INSTALLATION SHEET:

3-CAB Series Equipment Enclosure Backboxes

INSTALLATION SHEET P/N: 387557	FILE NAME: 387557.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 24MAY99	CREATED BY: G. Sutton

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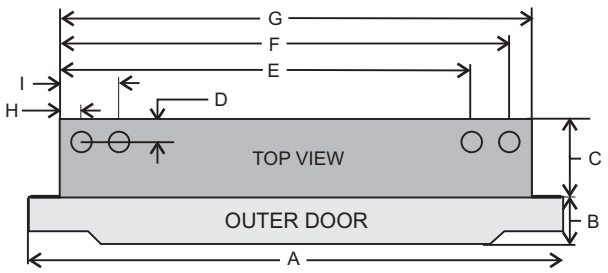
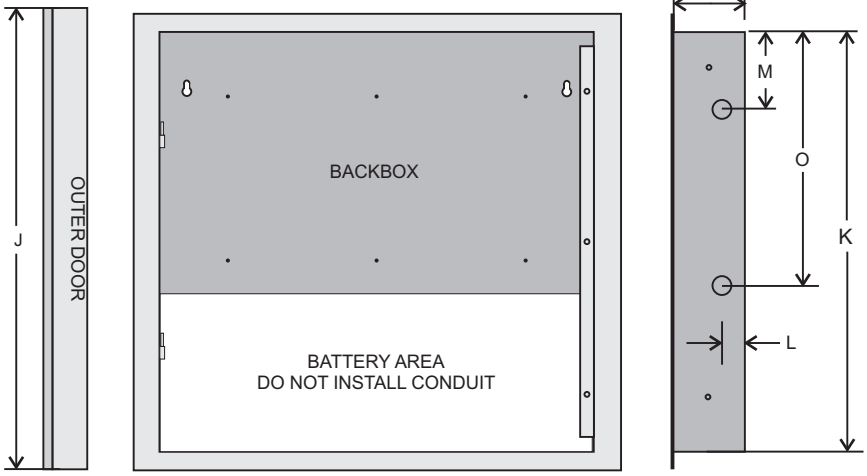
CABINET INSTALLATION DIMENSIONS



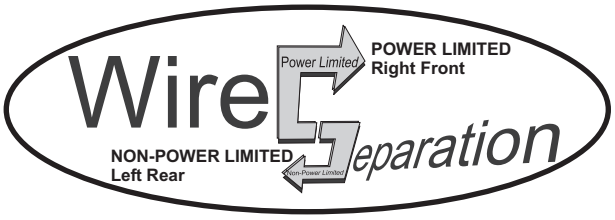
ALL KNOCKOUTS
FOR 3/4-INCH CONDUIT
(1.9 cm)

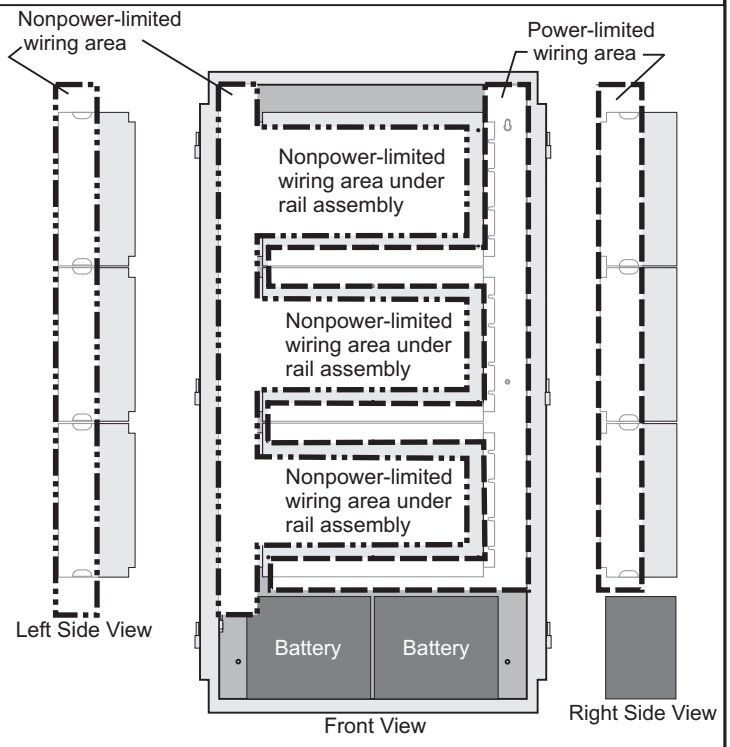


	3-CAB7B	3-CAB14B	3-CAB21B
A	27.34 in (69.40 cm)	27.34 in (69.40 cm)	27.34 in (69.40 cm)
B	1.65 in (4.19 cm)	1.65 in (4.19 cm)	1.65 in (4.19 cm)
C	3.86 in (9.80 cm)	3.86 in (9.80 cm)	3.86 in (9.80 cm)
D	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
E	21.0 in (53.34 cm)	21.0 in (53.34 cm)	21.0 in (53.34 cm)
F	22.75 in (57.8 cm)	22.75 in (57.8 cm)	22.75 in (57.8 cm)
G	24.0 in (60.9 cm)	24.0 in (60.9 cm)	24.0 in (60.9 cm)
H	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
I	3.0 in (7.7 cm)	3.0 in (7.7 cm)	3.0 in (7.7 cm)
J	25.5 in (64.77 cm)	37.75 in (95.89 cm)	50.0 in (127.0 cm)
K	23.2 in (58.98 cm)	35.5 in (90.17 cm)	47.75 in (121.3 cm)
L	1.25 in (3.16 cm)	1.25 in (3.16 cm)	1.25 in (3.16 cm)
M	4.37 in (11.1 cm)	4.37 in (11.1 cm)	4.37 in (11.1 cm)
N	3.86 in (9.80 cm)	3.86 in (9.80 cm)	3.86 in (9.80 cm)
O	14.1 in (35.8 cm)	14.1 in (35.8 cm)	14.1 in (35.8 cm)

POWER-LIMITED AND NONPOWER-LIMITED WIRING REQUIREMENTS

Fire Alarm System wiring is classified as either power-limited or nonpower-limited per NEC Article 760. All power-limited wiring must be separated from all nonpower-limited wiring by a minimum distance of 1/4 in (6 mm). The system enclosures and chassis assemblies are designed such that nonpower-limited wiring is at the left rear of the cabinet and the power-limited wiring is at the front of the cabinet. When installing nonpower-limited wiring, use the feed through notches at the left rear of the chassis. When installing power-limited wiring, use the feed through notches at the right front of the chassis.





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INSTALLATION INSTRUCTIONS

These instructions are for right-hand swing open operation of the outer door. For left-hand swing open operation, attach the enclosure hardware to the opposite side.

STEP1: Installing the enclosure hardware

1. With the back box securely mounted, attach the outer door hinge pins to the mounting studs on the back box left flange.
2. Attach the door stops to the top and bottom mounting studs on the back box right flange.
3. Attach the lock striker plate to the middle mounting studs on the back box right flange.

STEP 2: Assembling the outer door

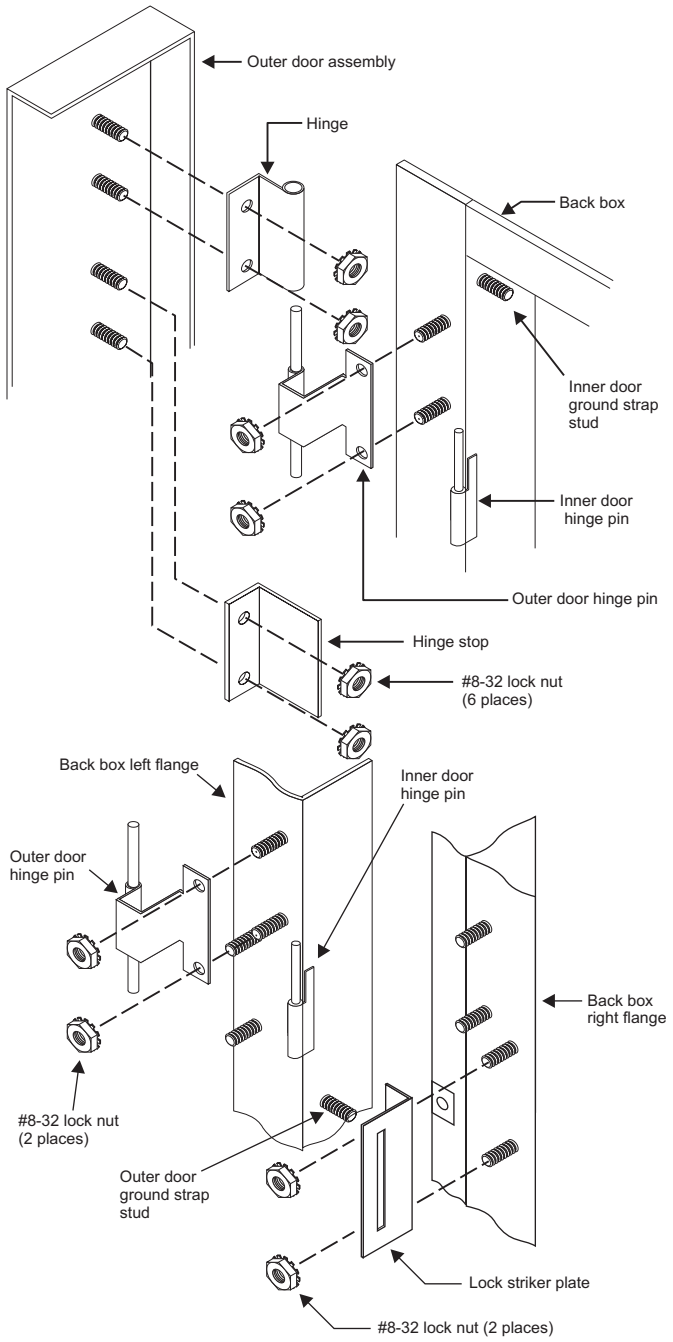
1. Place the outer door on a flat surface with the inside facing up.
2. Attach hinges to right mounting studs.
3. Insert the door lock through the opening opposite the hinges and with the latch pointing towards top of the door. See figure on other side.
4. Secure lock with the retaining clip.
5. Insert the plastic hole plug in the door opening closest to the hinges.

STEP 3: Mounting the outer door assembly

1. Set the outer door assembly onto the outer door hinge pins.
2. Attach the hinge stop to the outer door assembly.
3. Attach a grounding strap from the outer door ground strap stud on the back box to the outer door.

STEP 4: Mounting the inner door

1. Set the inner door onto the inner door hinge pins.
2. Attach a grounding strap from the inner door ground strap stud on the back box to the inner door.



PRODUCT DESCRIPTION

The 3-CAB series of equipment enclosure doors consists of an inner and outer door. The outer door may be mounted to either side of the back box for left-open or right-open operation, has a viewing window, and is secured with a key lock. A hinged interior door panel isolates the operator from the panel electronics and wiring, yet easily opens for maintenance.

The 3-CAB series of equipment enclosure doors include:

3-CAB7D	Grey door w/window for CAB7B back boxes
3-CAB7DR	Red door w/window for CAB7B back boxes
3-CAB14D	Grey door w/window for CAB14B back boxes
3-CAB14DR	Red door w/window for CAB14B back boxes
3-CAB14D	Grey door w/window for CAB21B back boxes
3-CAB14DR	Red door w/window for CAB21B back boxes

INSTALLATION SHEET:

3-CAB Series Equipment Enclosure Doors

INSTALLATION SHEET P/N: 270488	FILE NAME: 270488.CDR
REVISION LEVEL: 2.0	APPROVED BY: K. Patterson
DATE: 29MAR99	CREATED BY: G. Sutton

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Sarasota, FL 34243
USA

625 6th Street East
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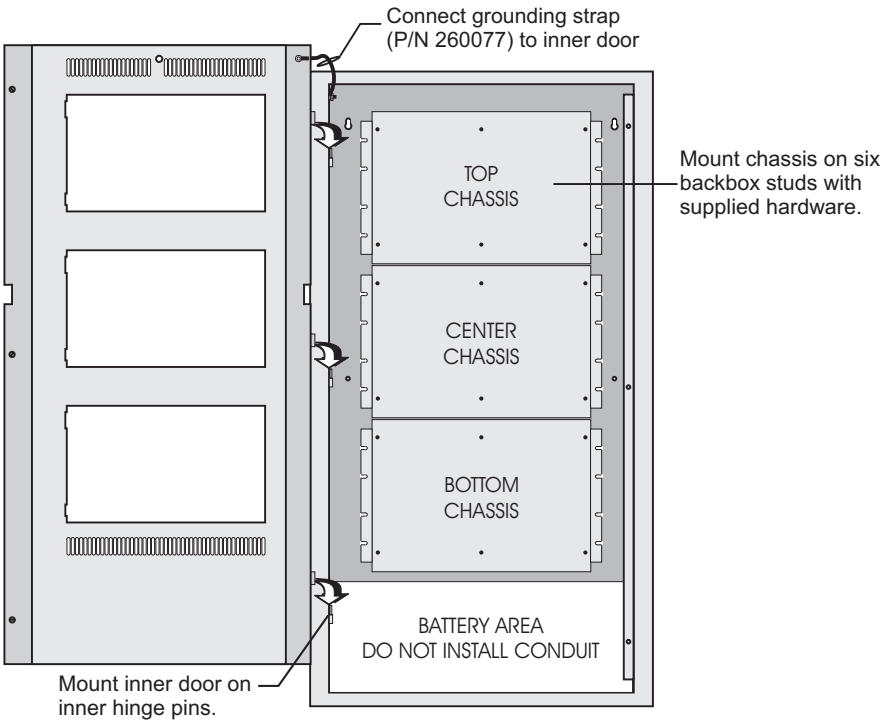
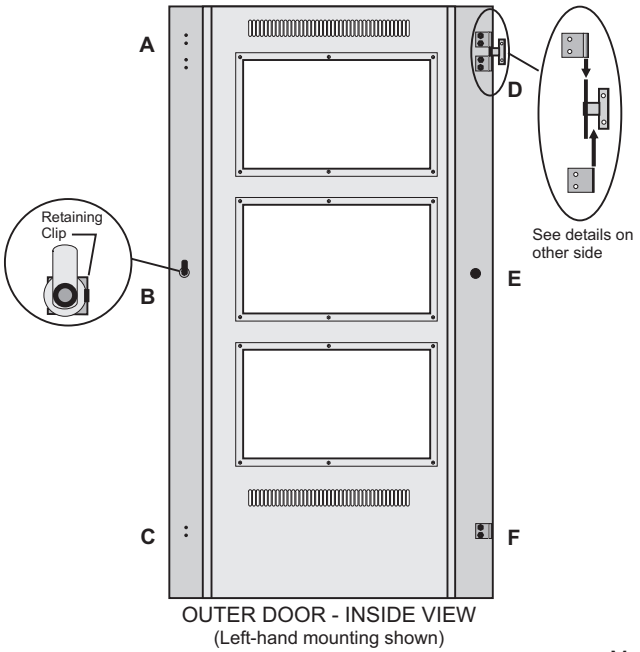
Inner Door Assembly

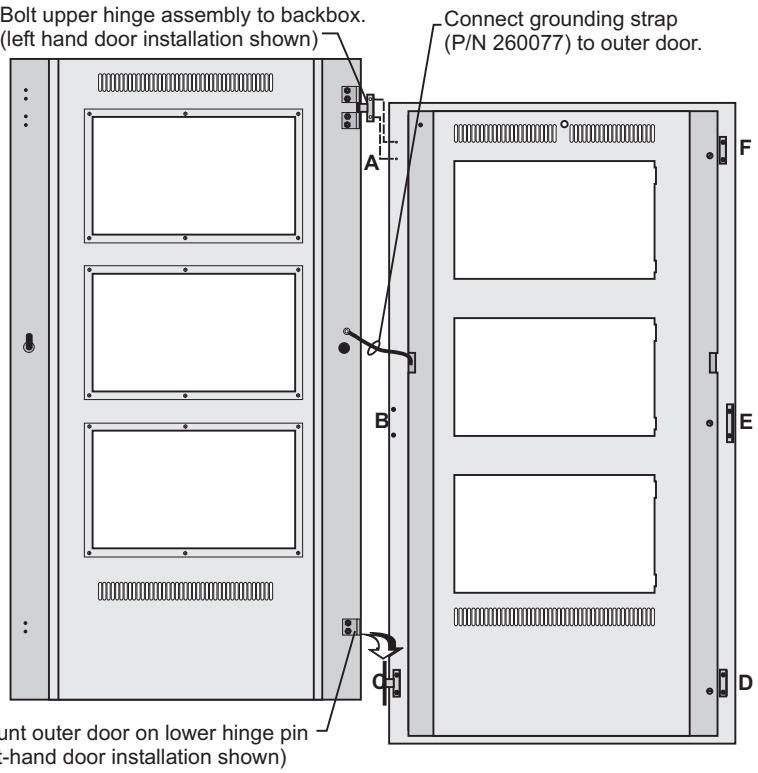


Outer Door Assembly



OUTER DOOR - INSIDE VIEW
(Left-hand mounting shown)

Outer Door Installation



	Female Hinges	Double Male Hinge	Lock	Plug
Left-hand Mounting	D & F	D	B Latch Up	E
Right-hand Mounting	A & C	A	E Latch Down	B

	Bumpers Plates	Lock Strike	Double Male Hinge Pin
Left-hand Mounting	D & F	E	C
Right-hand Mounting	A & C	B	F

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INSTALLATION INSTRUCTIONS

These instructions are for right-hand swing open operation of the outer door. For left-hand swing open operation, attach the enclosure hardware to the opposite side.

STEP1: Installing the enclosure hardware

1. With the back box securely mounted, attach the outer door hinge pins to the mounting studs on the back box left flange.
2. Attach the door stops to the top and bottom mounting studs on the back box right flange.
3. Attach the lock striker plate to the middle mounting studs on the back box right flange.

STEP 2: Assembling the outer door

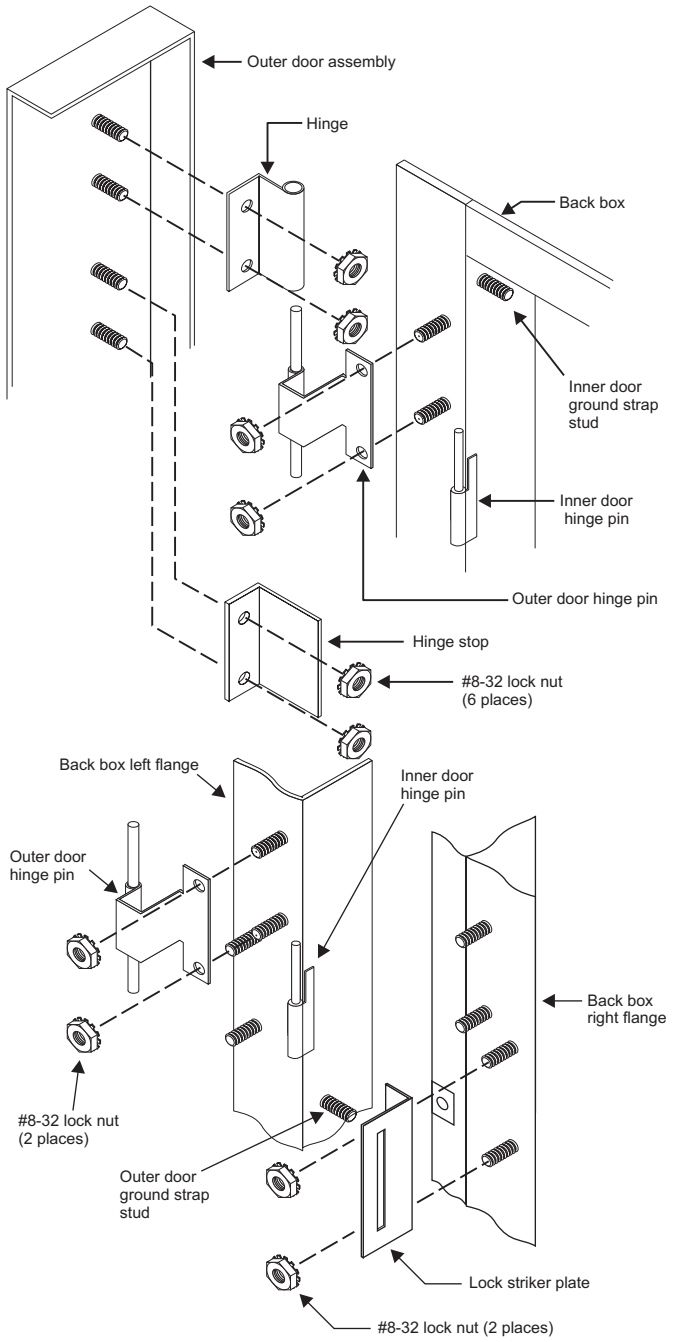
1. Place the outer door on a flat surface with the inside facing up.
2. Attach hinges to right mounting studs.
3. Insert the door lock through the opening opposite the hinges and with the latch pointing towards top of the door. See figure on other side.
4. Secure lock with the retaining clip.
5. Insert the plastic hole plug in the door opening closest to the hinges.

STEP 3: Mounting the outer door assembly

1. Set the outer door assembly onto the outer door hinge pins.
2. Attach the hinge stop to the outer door assembly.
3. Attach a grounding strap from the outer door ground strap stud on the back box to the outer door.

STEP 4: Mounting the inner door

1. Set the inner door onto the inner door hinge pins.
2. Attach a grounding strap from the inner door ground strap stud on the back box to the inner door.



PRODUCT DESCRIPTION

The 3-CAB-E series of equipment enclosure doors consists of an inner and outer door. The outer door may be mounted to either side of the back box for left-open or right-open operation, has a viewing window, and is secured with a key lock. A hinged interior door panel isolates the operator from the panel electronics and wiring, yet easily opens for maintenance.

The 3-CAB-E series of equipment enclosure doors include:

3-CAB7D-E	Grey door w/window for CAB7B back boxes
3-CAB7DR-E	Red door w/window for CAB7B back boxes
3-CAB14D-E	Grey door w/window for CAB14B back boxes
3-CAB14DR-E	Red door w/window for CAB14B back boxes
3-CAB21D-E	Grey door w/window for CAB21B back boxes
3-CAB21DR-E	Red door w/window for CAB21B back boxes

INSTALLATION SHEET:

3-CAB-E Series Equipment Enclosure Doors

INSTALLATION SHEET P/N: 387549	FILE NAME: 387549.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 23APR99	CREATED BY: G. Sutton

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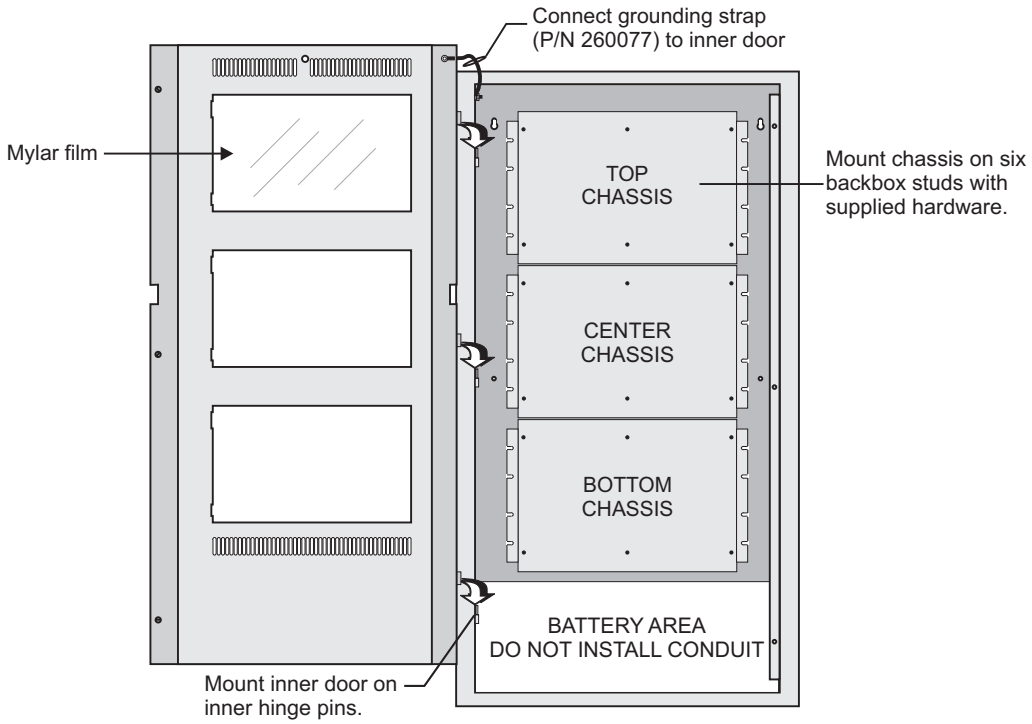
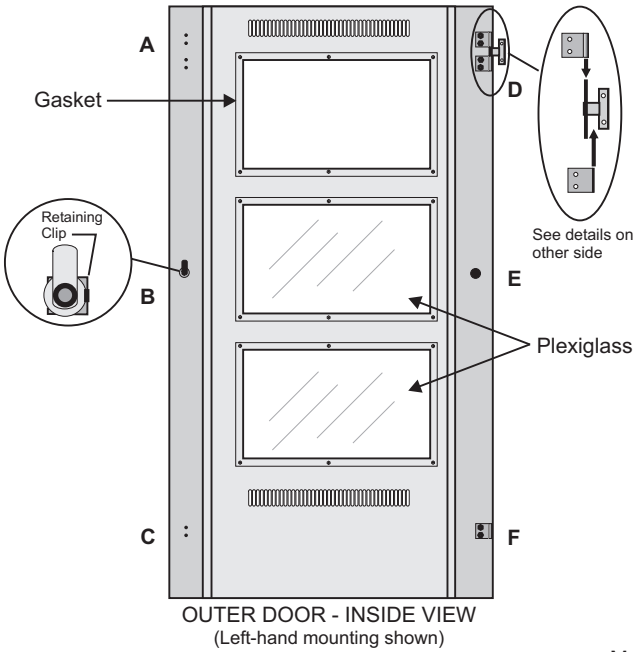
Inner Door Assembly

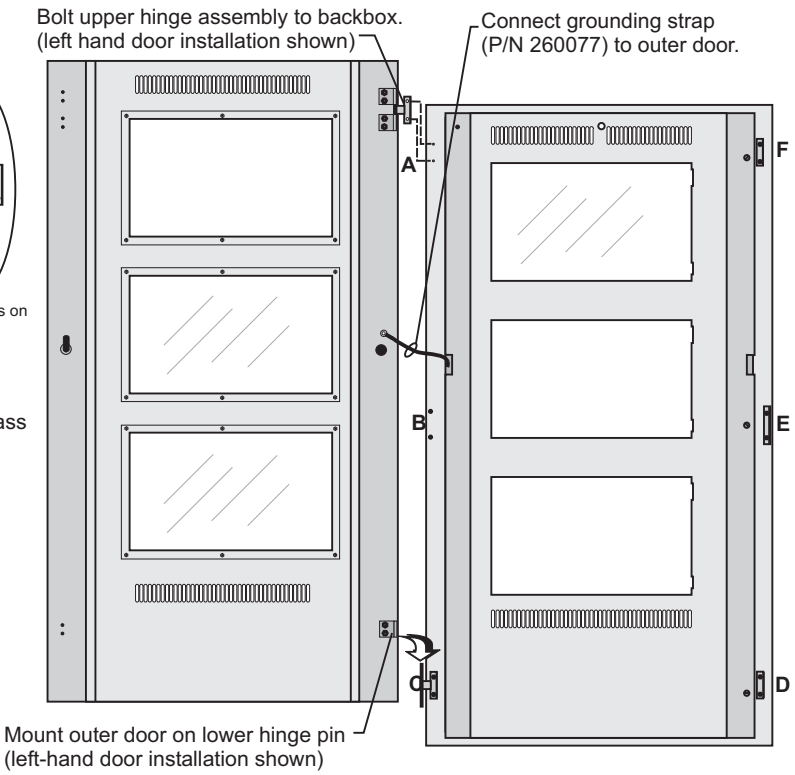


Outer Door Assembly



OUTER DOOR - INSIDE VIEW
(Left-hand mounting shown)

Outer Door Installation



	Female Hinges	Double Male Hinge	Lock	Plug
Left-hand Mounting	D & F	D	B Latch Up	E
Right-hand Mounting	A & C	A	E Latch Down	B

	Bumpers Plates	Lock Strike	Double Male Hinge Pin
Left-hand Mounting	D & F	E	C
Right-hand Mounting	A & C	B	F

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PRODUCT INFORMATION

The 3-CAB5(R) cabinet provides 5 local rail module (LRM) spaces and up to 10 amp-hour standby batteries. The 3-CAB5(R) cabinet is made of 14 gauge steel and finished with a textured baked enamel. The enclosure is suitable for semi-flush or surface mounting. Conduit and nail knockout keyhole style mounting holes and wide wiring troughs facilitate quick installation. Cabinet design facilitates separation of power limited and non-power limited circuits by locating power limited circuitry toward the front of the cabinet and non-power limited wiring at the rear of the cabinet. The removable exterior door mounts on the left side of the cabinet, has a Lexan™ viewing window, and is secured with a key lock. A hinged interior door panel isolates the operator from the internal electronics and wiring, yet easily opens to reveal the system components for maintenance.

SPECIFICATIONS

Dimensions (HWD)

3-CAB5B Back Box

Rough-In	22.37 in x 14.0 in x 3.86 in (56.82 cm x 35.56 cm x 9.80 cm) NOTE: Add 1/4" to height and width to allow for knockouts when framing in backbox for semi-flush mounting.
Finished	
Surface Mounted	24.25 in x 16.4 in x 5.5 in (61.60 cm x 16.4 cm x 14.0 cm)
Semi-Flush Mounted	24.25 in x 16.4 in x 1.65 in (61.60 cm x 16.4 cm x 4.19 cm)

Capacity

Modules	Five module spaces
Battery	Two 10 AH @ 12 VDC

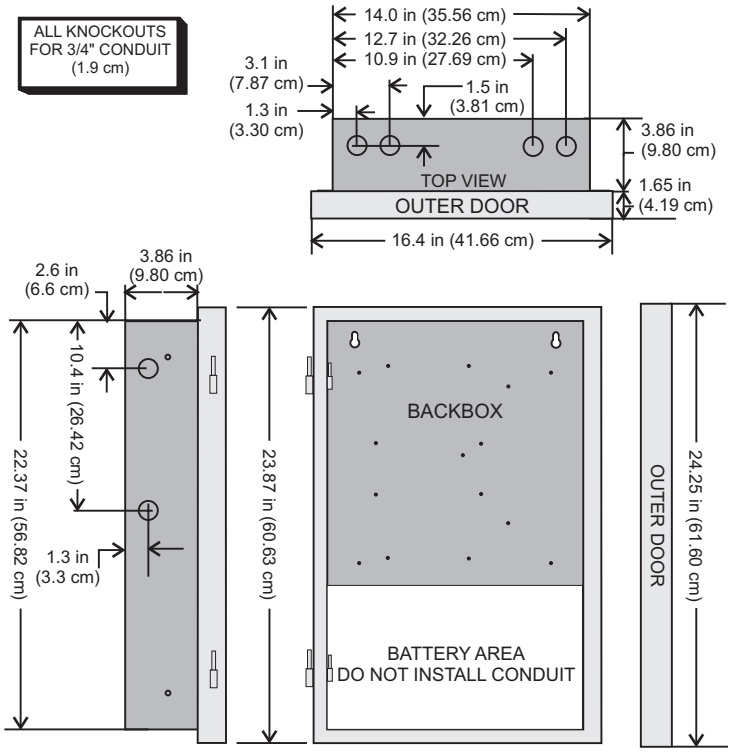
Finish

3-CAB5	Gray textured enamel
3-CAB5R	Red textured enamel

CABINET INSTALLATION

1. Mount the backbox at the required location. A dedicated 120 VAC (for systems using model 3-PPS/M power supplies), or 230 VAC (for systems using model 3-PPS/M-230 power supplies) 50/60 Hz circuit is required for each cabinet. Install all conduit and pull all wiring into the backbox before proceeding to the next step.
2. Install the outer door at this time.
3. Install the 3-TAMP5 Tamper Switch, if used.
4. Install the equipment chassis. After all chassis assemblies have been installed, mount the inner door on the inside hinge pins.
5. Connect the ground strap between the stud on the inner door and the backbox, using the hardware provided.
6. Install the ground strap between the stud on the exterior door and the stud on the backbox.

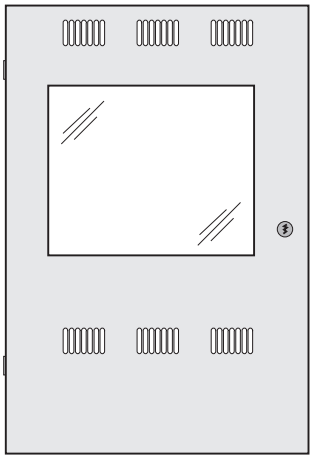
CABINET INSTALLATION DIMENSIONS



MODEL DEFINITIONS

3-CAB5	Cabinet with Door, Gray
3-CAB5R	Cabinet with Door, Red

3-CAB5 / 3-CAB5-R



INSTALLATION SHEET:

3-CAB5
3-CAB5R

INSTALLATION SHEET P/N: 270487	FILE NAME: 270487.CDR
REVISION LEVEL: 2.0	APPROVED BY: K. Patterson
DATE: 12/17/98	REVISED BY: D. Miner

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PRODUCT INFORMATION

The 3-CHAS7 chassis provides the mounting, internal power, and data distribution for up to seven plug-in local rail modules. Mounting studs for two power supplies and one interface module are provided on each chassis. Chassis design facilitates separation of power limited and non-power limited circuits by locating power limited circuitry toward the front of the chassis and non-power limited wiring at the rear of the chassis.

The 3-CHAS7 chassis mounts to the back wall of 3-CAB7, 3-CAB14, 3-CAB21, RCC-7, RCC-14, and RCC-21 cabinets. Multiple 3-CHAS7 chassis are interconnected within a cabinet using the supplied cables. The chassis are suitable for direct mounting in a standard EIA 19" rack.

SPECIFICATIONS

19" Rack Installation Dimensions (HWD)	12.0" x 19.0" x 5.25" (30.48 cm x 48.26 cm x 13.34 cm)
Capacity	7 Local Rail Modules Spaces 2 Power Supplies 1 Interface Module

INSTALLATION

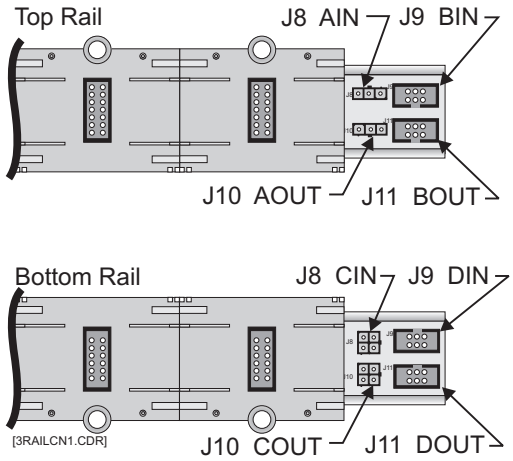
Mount the chassis assembly on the six #6-32 studs at the rear of the cabinet. Secure the chassis to the cabinet with the washers and nuts provided. An 11/32" nut driver simplifies chassis installation.

If a primary or booster power supply is used with this chassis, mount the heat sink on the four threaded stand-offs under the rails, then secure the PC board to the four threaded stand-offs.

Connect the DC power cable (P/N 250187) to connector J2 on the power supply. For the 3-PPS, connect the 16 pin data ribbon cable (P/N 250188) to connector P3 on the power supply. For the 3-BPS, connect a 14 pin data ribbon cable (P/N 250189) to connector P3 on the power supply. Route both cables up through the rails for later connection to the power supply/booster monitor module.

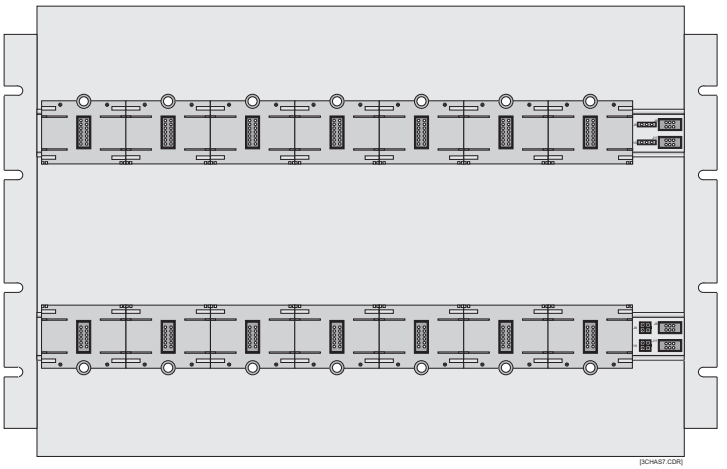
Chassis Power and Data Cables

When more than one chassis is installed within a single cabinet, the chassis power and data circuits must be interconnected. The chassis has four data connectors and four power connectors. The 3-CHAS7 has two power (J8 AIN and J11 AOUT) and two data (J9 BIN and J11 BOUT) connectors on the top rail. Two power (J8 CIN and J10 COUT) and two data (J9 DIN and J11 DOUT) connectors are on the bottom rail, as shown below.



Installation instructions are continued on following two pages.

3-CHAS7



INSTALLATION SHEET:

3-CHAS7
Seven Local Rail Module Chassis

INSTALLATION SHEET P/N: 270484	FILE NAME: 270484.CDR
REVISION LEVEL: 2.0	APPROVED BY: K. Patterson
DATE: 06/14/99	REVISED BY: D. Miner

EDWARDS SYSTEMS TECHNOLOGY, INC.
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CHESHIRE, CT: 203-699-3000 FAX 203-699-3075
OWEN SOUND, CANADA: 519-376-2430 FAX 519-376-7258
INTERNATIONAL, CANADA: 905-270-1711 FAX 905-270-9553

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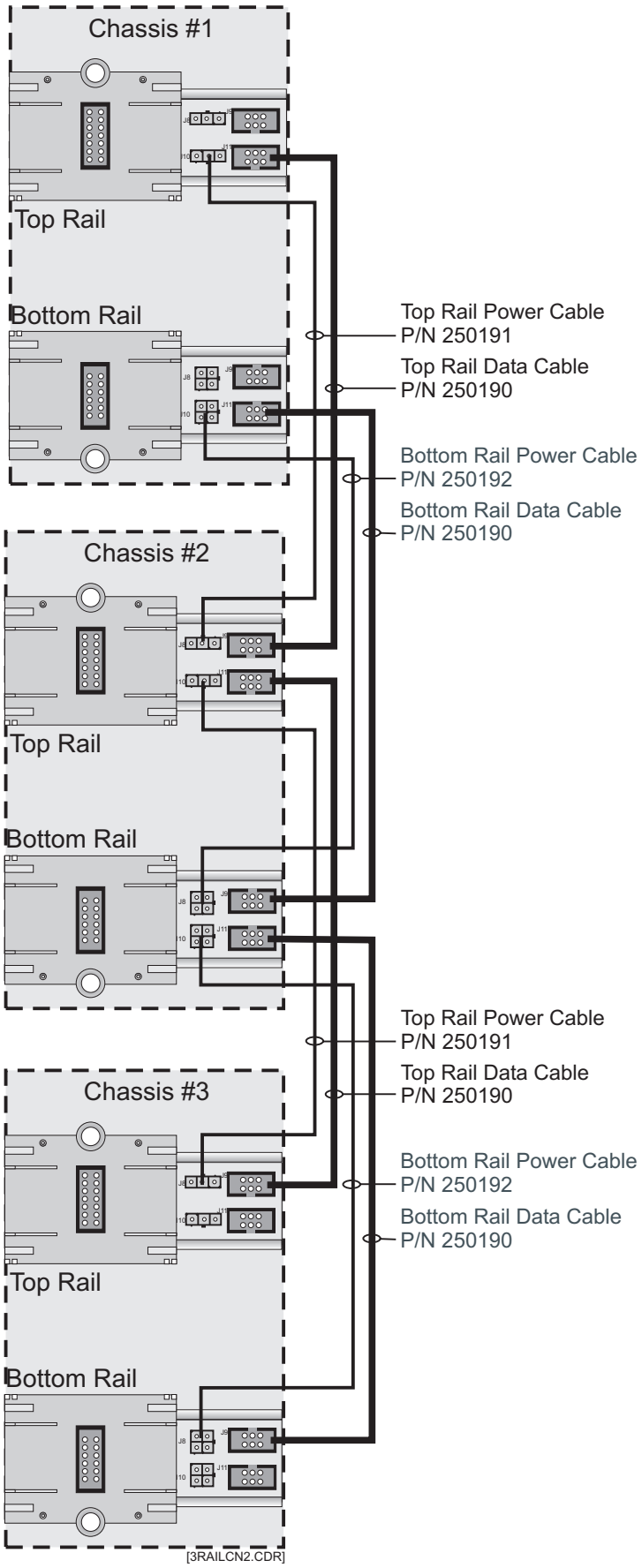

The figure on the left shows three 3-CHAS7 chassises in a common cabinet. Connect the power and data cables as follows:

1. Connect a top rail power cable (3 pin connector) to connector J10 AOUT on the top rail of chassis #1. Route the cable down to chassis #2, and connect to J8 AIN on the chassis #2 top rail.

2. Connect a top rail data cable (6 pin ribbon cable connector) to connector J11 BOUT on the top rail of chassis #1. Route the cable down to chassis #2 and connect to J9 BIN on the chassis #2 top rail.

3. Connect a bottom rail power cable (4 pin connector) to connector J10 COUT on the bottom rail of chassis #1. Route the cable down to chassis #2 and connect to J8 CIN on the chassis #2 bottom rail.

4. Connect a bottom rail data cable (6 pin ribbon cable connector) to connector J11 DOUT on the bottom rail of chassis #1. Route the cable down to chassis #2 and connect to J9 DIN on the chassis #2 bottom rail.

5. Repeat this process between chassis #2 and chassis #3.

NOTE: The chassis containing the 3-CPU1 Central Processor can only have chassis power and data connections made to connectors J10 AOUT and J11 BOUT on the top rail and J10 COUT and J11 DOUT on the bottom rail. The chassis containing the 3-CPU can never have connections coming into connectors J8 AIN, J9 BIN, J8 CIN or J9 DIN.

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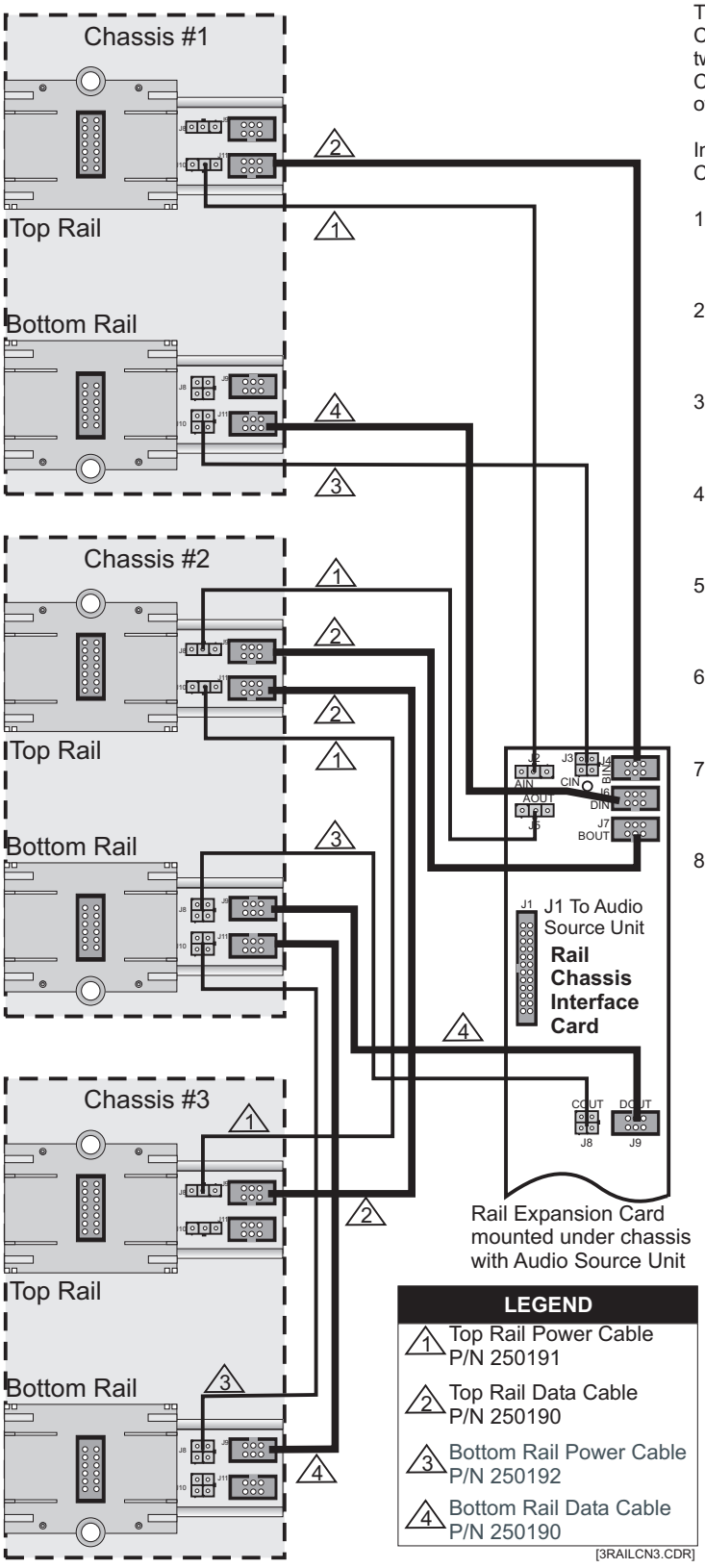

The figure to the left shows an Audio Source Unit (ASU) and two 3-CHAS7 chassis in a common cabinet. The ASU unit is connected to the two rails using a Rail Chassis Interface Card. The Rail Chassis Interface Card is mounted below the rails in the 1/2 footprint IRC-3 module space of the ASU unit chassis.

In this example, the ASU can be either the top or middle chassis. Connect the power and data cables as follows:

1. Connect the top rail power cable (3 pin connector) to connector J10 AOUT on the top rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J28 AIN.
2. Connect the top rail data cable (4 pin connector) to connector J11 COUT on the top on bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J4 BIN.
3. Connect the bottom rail power cable (4 pin connector) to connector J10 COUT on the bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J3 CIN.
4. Connect the bottom rail data cable (6 pin ribbon cable connector) to connector J11 DOUT on the bottom rail of chassis #1. Route the cable down to the Rail Chassis Interface Card and connect to J6 DIN.
5. Connect a top rail power data cable to connector J5 AOUT on upper left side of the Rail Chassis Interface Card. Route the cable up to connector J8 AIN on the top rail of chassis #2.
6. Connect a top rail data cable to connector J7 BOUT on the upper right side of the Rail Chassis Interface Card. Route the cable up to connector J9 BIN on the top rail of chassis #2.
7. Connect a bottom rail power cable to connector J8 COUT on the left center of the Rail Chassis Interface Card. Route the cable up to connector J8 CIN on the bottom rail of chassis #2.
8. Connect a bottom rail data cable to connector J9 DOUT on the right center of the Rail Chassis Interface Card. Route the cable up to connector J9 DIN on the bottom rail of chassis #2.

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PRODUCT INFORMATION

3-CPU1 Central Processor Module

The 3-CPU1 Central Processor module is the control element for all other rail modules and contro/display modules installed within an enclosure. The 3-CPU1 processes all information from modules installed within the cabinet as well as data received from other panels over the network data riser.

The 3-CPU1 has a 16-bit microprocessor and 1 MB of RAM and 1 MB of non-volatile memory. An internal calendar/clock with leap year function provides date/time event stamping and initiates timed events. The 3-CPU1 automatically identifies and supervises all modules installed on the rail chassis and has an integral watchdog to identify both hardware and software faults. The module has Form-C common alarm, trouble and supervisory relay contacts that operate whenever any alarm, supervisory, or fault condition is detected on the network.

The 3-CPU1 communicates with other CPU1 modules on the network over an RS-485 or fiber optic network data circuit. Class A or B wiring configuration may be used for the network data circuit and digital audio circuits. An optically isolated RS-232 port is provided for data upload/download and system maintenance. An optional optically isolated RS-232 port card is available to support a printer or an external command system. The 3-CPU1 also provides the command and control functions for the 8-channel audio subsystem installed on the rail chassis.

The 3-CPU1 occupies the two left-most positions on the rail chassis assembly (logical address 0). In this position it functions as the local bus master and supervises all traffic on the rail bus and implements ground fault detection.

The controller is secured to the rail chassis using snap rivet fasteners. All field wiring connections to the 3-CPU1 module are made via plug-in connectors that permit termination of field wiring without removing the module from the enclosure. All external connections are power-limited and transient protected. The plug-in connectors and snap rivet mounting also facilitate rapid remove and replace troubleshooting. The 3-CPU1 module panel provides support brackets for mounting the 3-LCD displayor a protective cover plate.

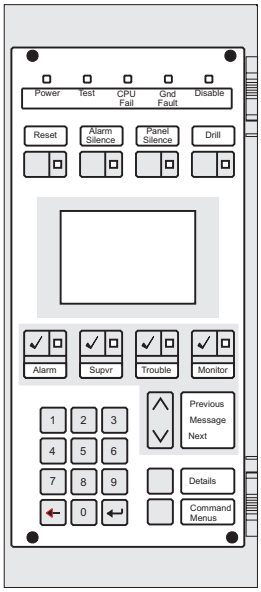
3-LCD Main LCD Display for the 3-CPU1

The 3-LCD Display provides the operator interface for the network. The 3-LCD mounts on the 3-CPU1 panel support brackets and is connected to the module with a ribbon cable. Only one 3-LCD Display is required to provide point of control for the entire network. Additional displays may be added to any3-CPU1 module located throughout the network, providing an additional point of control and/or annunciation.

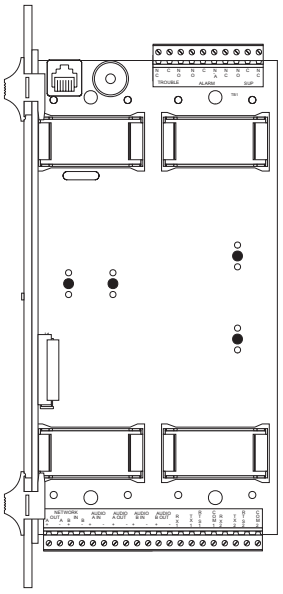
The display provides a 64 by 128-pixel back-lit liquid crystal display for displaying text. LEDs are provided for: power, test, CPU fail, ground fault and disable functions. Switches with integral LED feedback are provided for reset, trouble silence, alarm silence, and drill functions. Message queue select switches with integral LEDs are provided for the alarm, supervisory, trouble, and monitor message queues. Next and Previous message queue switches scroll through the selected message queue. The display is also equipped with a 10-digit numeric key pad with enter and delete keys.

Note: 3-CPU1 Boot and Application code must be version 1.33 or greater

3-LCD



3-CPU1



INSTALLATION SHEET:

3-CPU1 Central Processor Module &
3-LCD Main LCD Display for 3-CPU1

INSTALLATION SHEET P/N: 387465	FILE NAME: 387465.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 26OCT99	CREATED BY: G. Sutton

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SPECIFICATIONS

3-CPU1 Central Processor Module

Processor: 16-bit, RISC

Memory: 1 MB RAM - volatile static
1 MB Flash - non-volatile
32K EEPROM

Installation: Occupies first 2 spaces on rail chassis

Internal RS-232 Serial Port: Isolated, Class B
Connector, RJ-11

Common Control Relays: 3 Form C relays rated at 24 Vdc @ 1A for alarm, supervisory, and trouble

Operating Environment
- Temperature: 32 to 120 °F (0 to 49 °C)
- Humidity: 93% RH, non-condensing

Power Requirements
- Standby Current: 100 mA
- Alarm Current: 110 mA

3-LCD Display for 3-CPU1:

Installation: Plugs into connector J1 on 3-CPU1 module. Mounts on the front of the 3-CPU1 module.

LCD Display: 64 x 128 pixels, back-lit liquid crystal

Indicators:

Power	Green LED
CPU Failure	Yellow LED
Test	Yellow LED
Ground Fault	Yellow LED
Disable	Yellow LED
Reset	Yellow LED, integrated with Reset switch
Trouble Silence	Yellow LED, integrated with Trouble Silence switch
Alarm Silence	Yellow LED, integrated with Alarm Silence switch
Drill	Yellow LED, integrated with Drill switch
Alarm	Red LED
Supervisory	Yellow LED
Trouble	Yellow LED
Monitor	Yellow LED

Operator Controls:

Reset Switch	10-digit keypad w/ Enter and Delete keys
Alarm Silence Switch	Message queue scroll switches
Trouble Silence Switch	Custom function switch
Drill Switch	

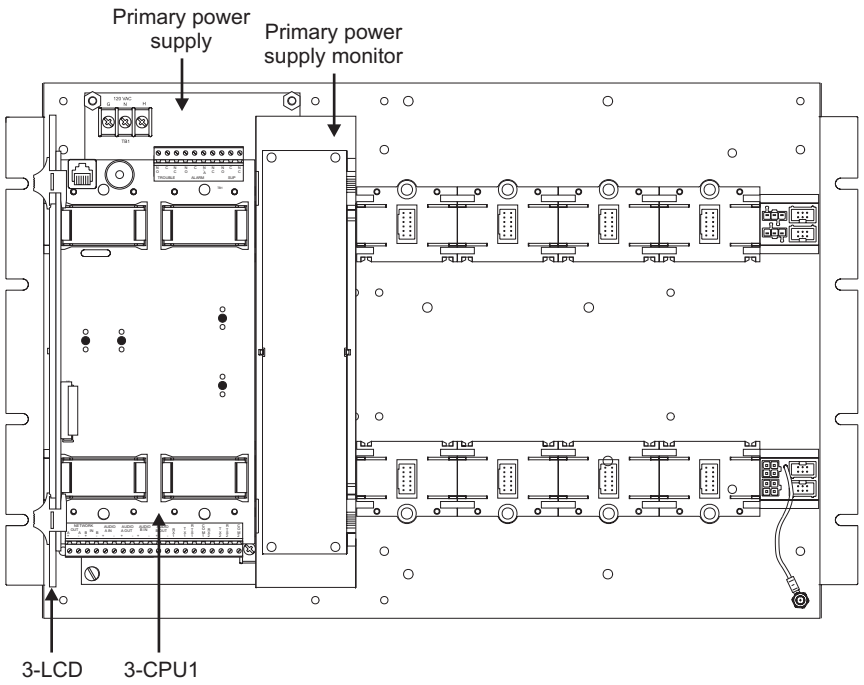
Operating Environment
- Temperature: 32 to 120 °F (0 to 49 °C)
- Humidity: 93% RH, non-condensing

Power Requirements

Standby Current	53 mA
Alarm Current	53 mA

INSTALLATION

1. Install the 3-LCD display module (if required).
   - Remove the blank front panels from the support brackets on the 3-CPU1.
   - Connect the ribbon cable on the 3-LCD to J1 on the 3-CPU1. The colored edge is pin 1.
   - Connect the ground cable on the 3-LCD to the 2-pin header on the 3-CPU1. The 2-pin header is located just above the Network B terminals on TB2.
   - Snap the 3-LCD onto the left mounting brackets provided on the 3-LCD.
2. Install any 3-CPU1 option cards, if required. Refer to the respective installation sheets for the option card being installed.
3. Slide the 3-CPU1 into the first two rail slots on the rail chassis assembly. Be careful to line the option cards into the card guides.
4. Gently push the 3-CPU1 until it is firmly seated into the rail connectors.
5. Secure the module to the rail by pushing the top and bottom snap rivet fasteners until they lock in place.
6. Connect the field wiring.



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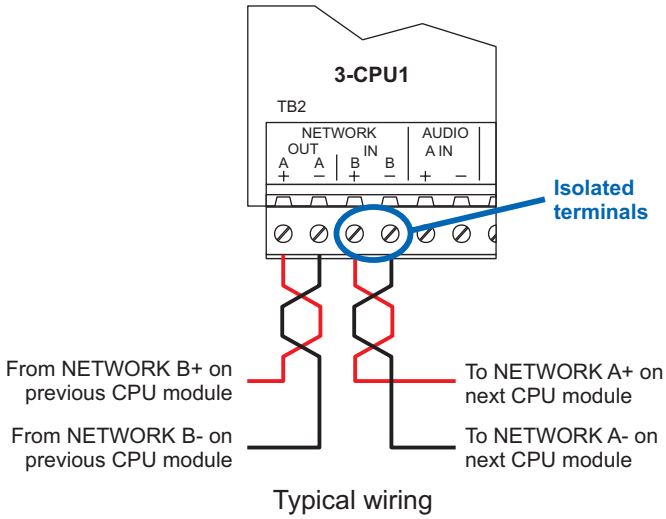
Network data riser connections

A 3-CPU1 equipped with a 3-RS485A or 3-RS485B card can communicate with other similarly equipped CPU modules by way of the network data riser. TB2 on the 3-CPU1 provides the terminal connections for connecting to the network data riser.

Connect the network data riser to the 3-CPU1 as shown. The NETWORK B terminals provide an isolated connection. The NETWORK A terminals are not isolated.

Notes

- All network data riser wiring is supervised and power-limited.
- When connecting the network wiring, always wire the isolated terminals on one CPU module to the non-isolated terminals of another.
- On Class B network data risers, the panel that does not have wires connected to the Network A terminals should be designated as the service panel and located accordingly.



Typical wiring

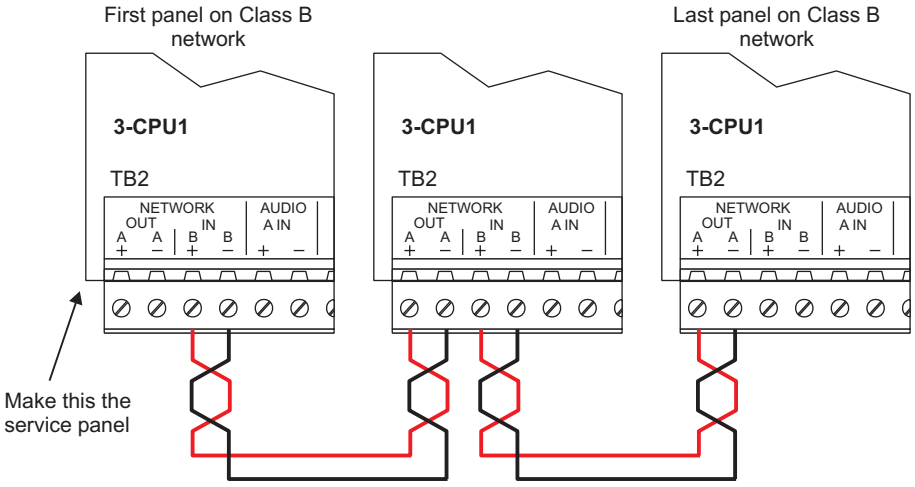


Figure-1: Class B network data riser wiring (requires 3-RS485A or 3-RS485B)

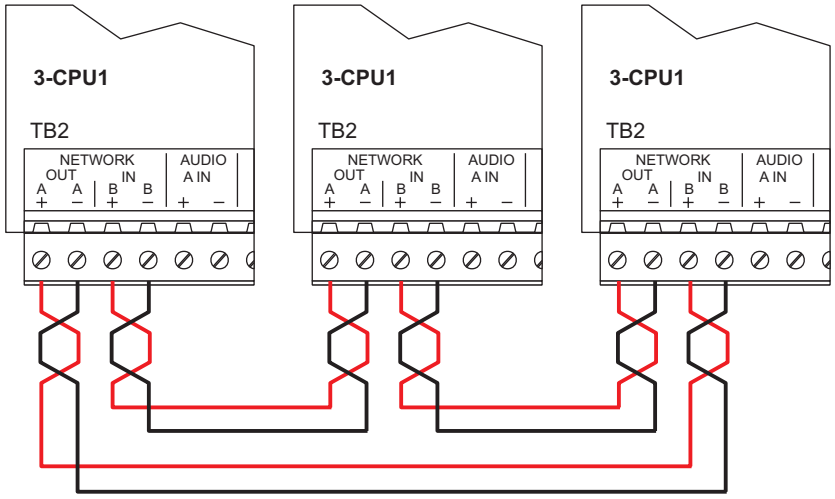


Figure-2: Class A network data riser wiring (requires 3-RS485A or 3-RS485B)

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Network audio riser connections

A 3-CPU1 equipped with a 3-RS485A or 3-RS485B card can distribute audio messages to other similarly equipped 3-CPU1 modules by way of the network audio riser. TB2 on the 3-CPU1 provides the terminal connections for connecting to the network audio riser.

Connect the network audio riser to the 3-CPU1 as shown. The AUDIO IN terminals provide an isolated connection. The AUDIO OUT terminals are not isolated.

Notes

- All network audio riser wiring is supervised and power-limited.
- When connecting the network wiring, always wire the isolated terminals on one CPU module to the non-isolated terminals of another.

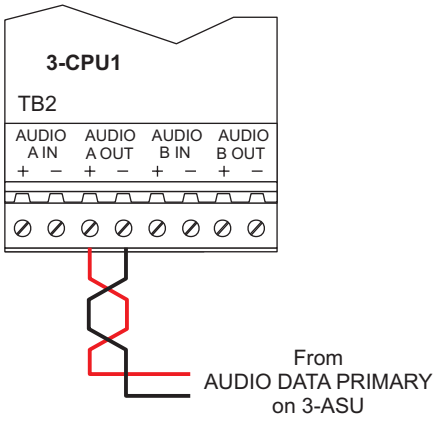

Figure-3: 3-CPU1 to 3-ASU wiring for single panel audio applications (no RS-485 card required)

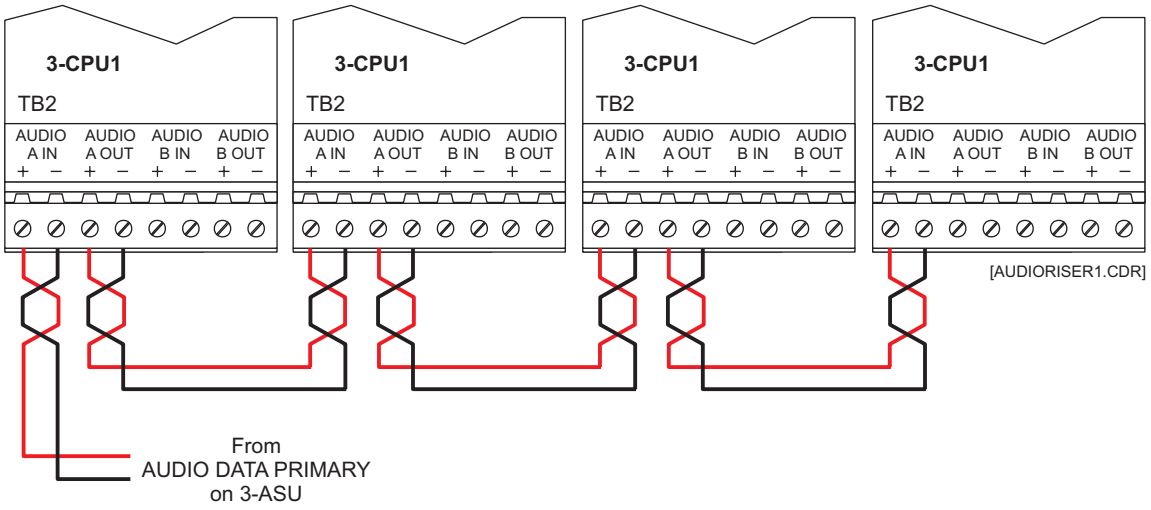

Figure-4: Typical Class B network audio riser wiring (requires a 3-RS485A or 3-RS485B card)

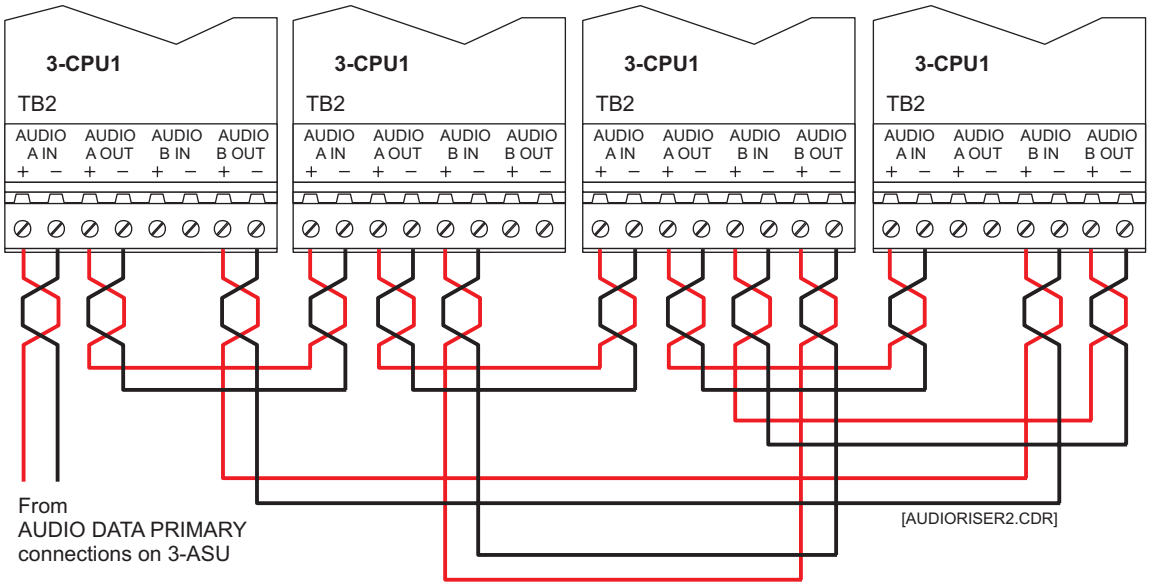

Figure-5: Typical Class A network audio riser wiring (requires a 3-RS485A card)

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Common relay connections

The 3-CPU1 provides three Form C relays that can be used to activate a circuit when any alarm, trouble, or supervisory point in the system activates. The connector pin designations reflect the state of the relay contacts while the panel is operating in its standy mode (all conditions normal). The trouble relay contacts also switch on loss of power.

Note: All common relay wiring is power-limited when connected to a power-limited source.

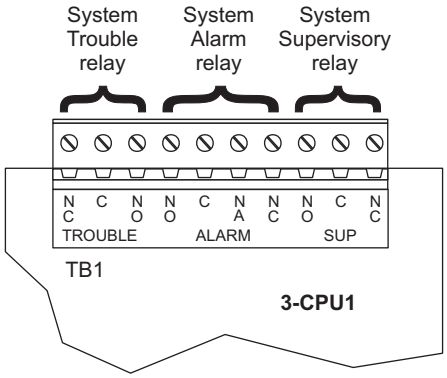


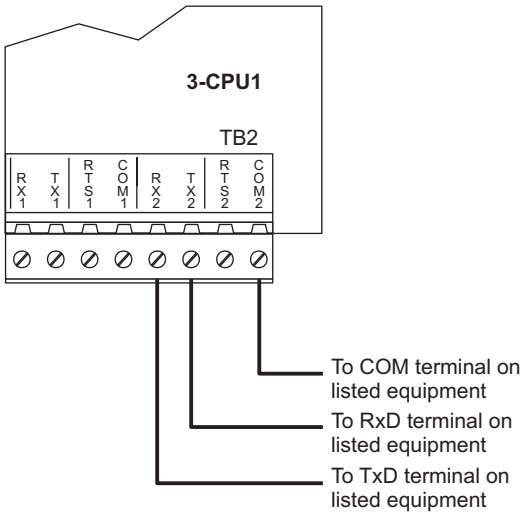
Figure-6: Common relay wiring

RS-232 serial port connections

A 3-CPU1 equipped with a 3-RS232 card can connect to ancillary devices that use RS-232 data communication. TB2 on the 3-CPU1 provides the terminal connections for connecting to the 3-RS232 devices.

The 3-RS232 card provides two independent ports for connecting serial devices.

Note: All serial port wiring is power-limited and not supervised.



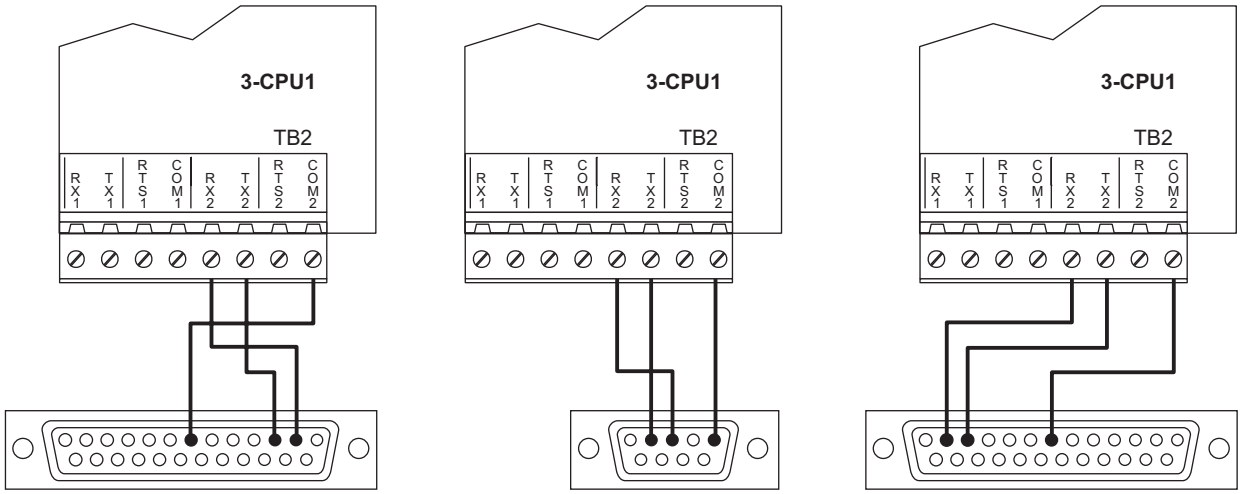


Figure-7: Serial port wiring (requires a 3-RS232 card)

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PRODUCT DESCRIPTION

The 3-FIB and 3-FIBA fiber optic communications interface modules are used to connect two 3-CPU1 panel controllers together.

The 3-FIB module provides two supervised Class B (Style 4) fiber optic circuits; one for network data communications and the other for network audio. The 3-FIBA module provides two fiber optic circuits for Class B (Style 4) or Class A (Style 7) network data communications and two fiber optic circuits for Class B (Style 4) or Class A (Style 7) network audio communications.

Note: The 3-FIBA does not provide Class A audio when used with a 3-CPU panel controller module. The 3-FIBA only provides Class A audio when used with a 3-CPU1.

Each fiber optic circuit consists of two 62.5/125 or 100/140 multimode fiber optic cables. The 3-FIB/3-FIBA also supports copper wire connections so the network data and audio communications format can easily be changed to and from copper and optical fiber, as job conditions require.

The fiber optic interface module consists of two cards. The electronics card plugs into the rear of the 3-CPU1 panel controller. The electronics card is connected to the fiber card by a ribbon cable. The fiber card mounts below the 3-CHAS7 chassis. The fiber card provides type ST fiber optic connectors and a secondary power option, permitting communications to flow through the module, even with panel power disconnected. The interface receives and re-transmits network and audio data information. This permits a fiber optic budget of 14dB between any two interfaces. In the event a panel needs to be powered down for service, a 24V battery can be connected to the module to maintain network and audio communications during servicing.

SPECIFICATIONS

Installation
Connector J2 of 3-CPU1. Fiber card mounts on bracket under 3-CHAS7 chassis or on a 3-MPFIB bracket in the 3-CAB5 enclosure.

Fiber Optics (network and audio)

Budget	14dB between 2 interfaces
Cable Type	62.5/125 or 100/140 multimode
Connectors	Type ST

Network Data Circuit

Circuit Configuration	Class B (Style 4) or Class A (Style 7)
Data Rate	9600, 19.2K, 38.4K
Isolation	From "previous" 3-CPU1 using copper, total isolation using fiber optics.

Digitized Audio Data Circuit

Circuit Configuration	Class B (Style 4) Class A (Style 7) only available on 3-FIBA.
Data Rate	327 KB
Isolation	From "previous" 3-CPU1 using copper, total isolation using fiber optics.

Copper Wired Network Data Circuit Segment

Circuit Length	5,000 ft (1,524 m) max. between any three panels
Circuit Resistance	90 Ω, max.
Circuit Capacitance	0.3 μF, max.
Wire Type	Twisted Pair, 18 AWG (0.75 mm^2) min.

Copper Wired Audio Data Circuit

Circuit Length	5,000 ft (1,524 m) max. between any three panels
Circuit Resistance	90 Ω, max.
Circuit Capacitance	0.09 μF, max (includes shield capacitance, if required)
Wire Type	Twisted pair, 18 AWG (0.75 mm^2) min.

Current Rating

Standby	105 mA (both models)
Alarm	105 mA (3-FIB) 110 mA (3-FIBA)

WARNINGS

This product contains components which are sensitive to static electricity. Failure to follow proper handling procedures to prevent damage from electrostatic discharge may result in equipment failure.

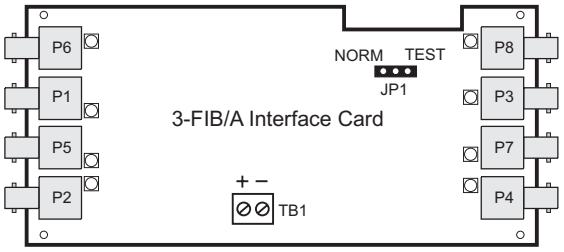
NOTES

1. All wiring and fiber optic cable are supervised.
2. All wiring is power limited.

FIBER TESTING

To test the fiber optic connection, place JP1 in the TEST position. The 3-FIB/3-FIBA will transmit a constant signal which can be used for fiber optic budget measurements and troubleshooting. Return JP1 to the NORM position when testing is finished.

3-FIB/3-FIBA



Note: P7 and P4 on 3-FIBA only

INSTALLATION SHEET:

3-FIB/3-FIBA
Fiber Optic Communications Interface Module

INSTALLATION SHEET P/N: 387333	FILE NAME: 387333.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Munn
DATE: 29JAN99	CREATED BY: G. Sutton

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GS BUILDING SYSTEMS CORPORATION

GS BUILDING SYSTEMS CORPORATION

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Canada N4K 5P8

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INSTALLATION INSTRUCTIONS

Refer to Figure 2. Connect one end of the ribbon cable (4) to connector J2 on the 3-FIB/A electronics card (2) using the end of the ribbon cable which allows the cable to exit at a right angle to the board as shown in the inset in Figure 1. Install the 3-FIB/A electronics card in J2 of the 3CPU1 (1). The card should be firmly seated in its connector, then secured to the 3-CPU1 controller board by pressing the snap rivet (3) on the front side of the controller. Route the ribbon cable to the bottom of the chassis.

To install the 3-FIB/A in a 3-CHAS7, mount the 3-FIB/A interface card (5) on its mounting bracket (6), on the four standoffs (7) provided. Connect the free end of the ribbon cable from J2 of the 3-CPU1 to J1 on the 3-FIB/A interface card. Place jumper JP1 in the NORM (normal) position.

Refer to Figure 3. Mount the bracket (2) on the two board mounting studs (1) located at the bottom of the chassis. The top of the bracket fits in the slot at the bottom of the lower rail extrusion (3), as detailed in the inset.

To install the 3-FIB/A in a CAB5 enclosure, snap the 3-FIB/A interface card (5) on the 3-MPFIB mounting bracket (8) studs. Connect the free end of the ribbon cable from J2 of the 3-CPU1 to J1 on the 3-FIB/A interface card. Place jumper JP1 in the NORM (normal) position. Mount the bracket (8) on the two interface mount studs located on the right side of the CAB5 enclosure, under the rails.

Figure 1

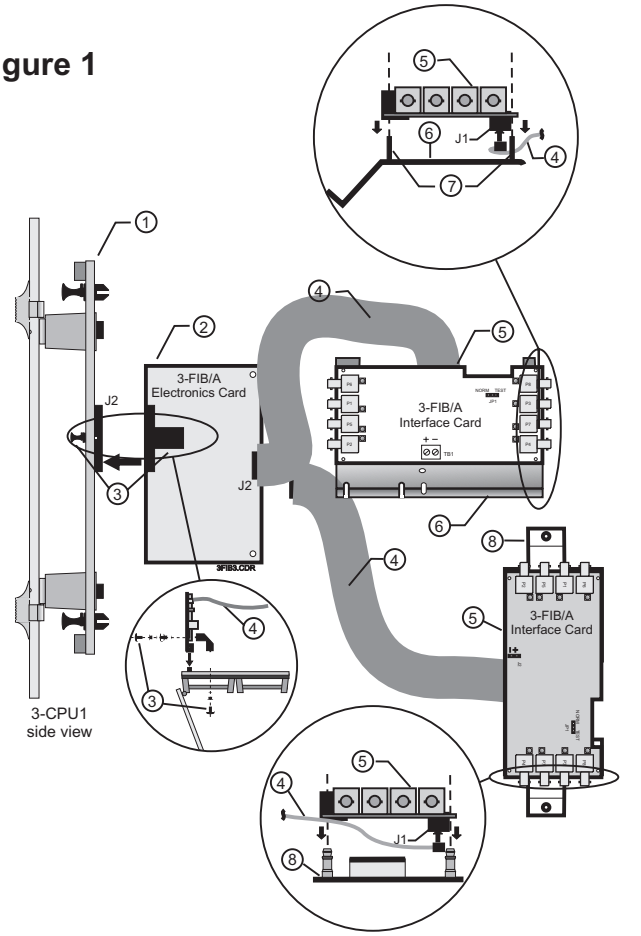


Figure 2

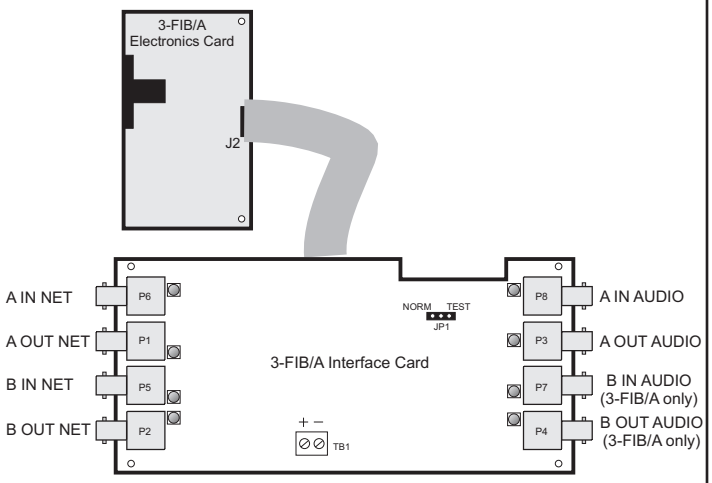
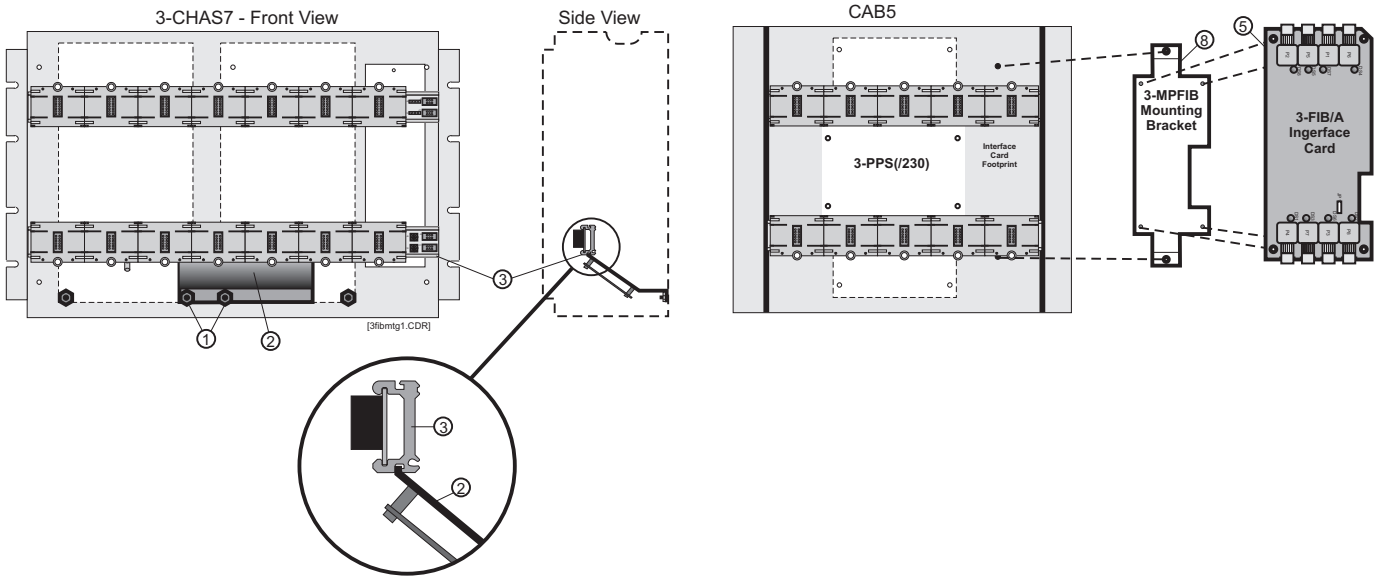


Figure 3



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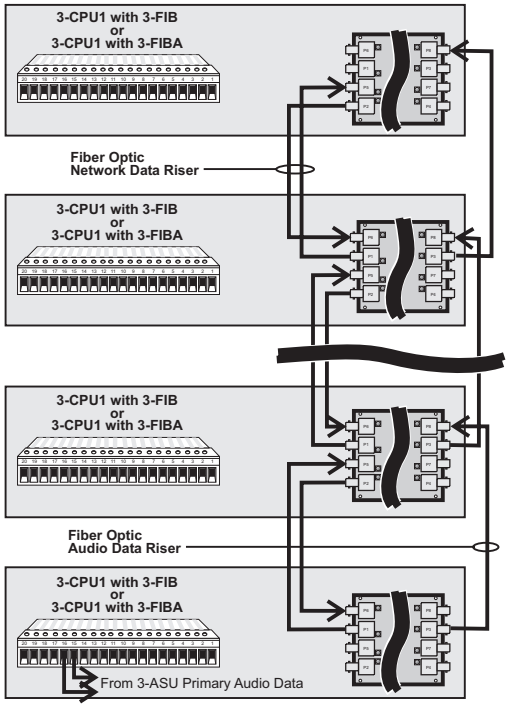

Figure-4A: 3-FIB(/A) Class B Network and Audio Fiber Optic Connections

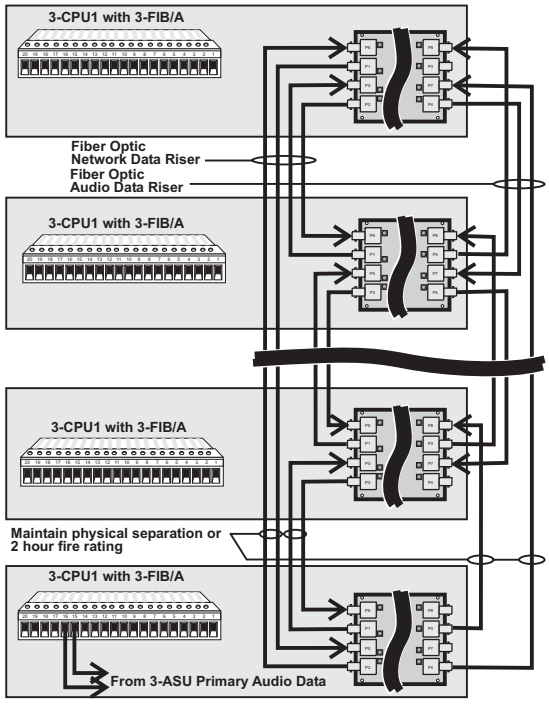

Figure-4B: 3-CPU1 Class A Network and Audio Fiber Optic Connections

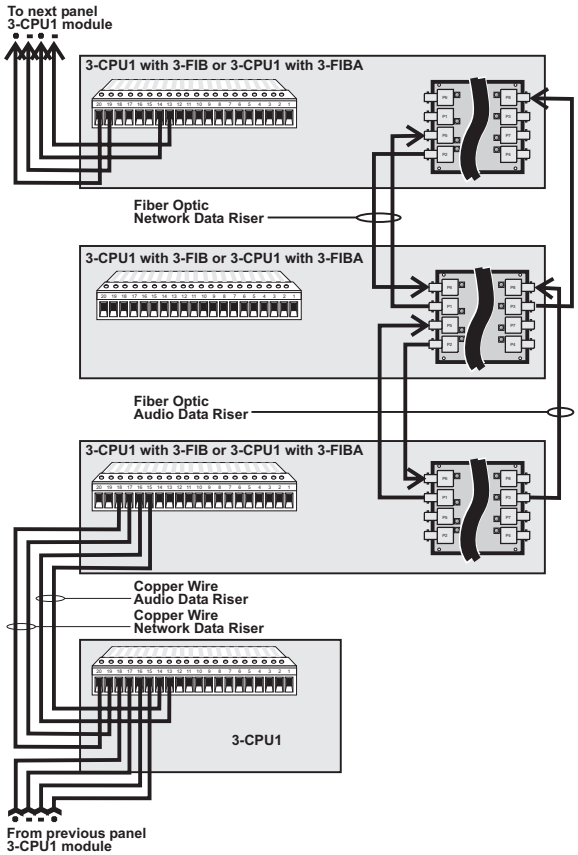

Figure-4C: Class B Hybrid Fiber Optic/Copper Wire Network and Audio Connections

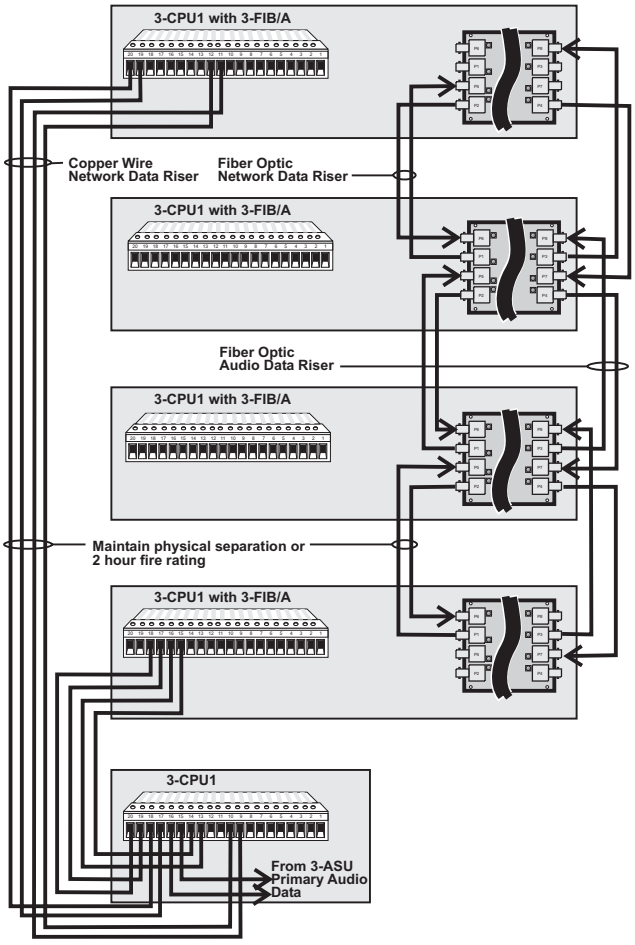

Figure-4D: 3-CPU1 Hybrid Fiber Optic/Copper Wire Network and Class A Fiber Optic/Copper Wire Audio Connections

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PRODUCT INFORMATION

The Traditional Zone module provides eight Class B (Style B) traditional direct connect Initiating Device Circuits (IDC) for compatible 2-wire smoke detectors and dry contact initiating devices. Four of the eight IDCs may be converted to Class B (Style Y) Notification Appliance Circuits (NAC). Each pair of NAC circuits may be configured to provide a 24 VDC or signals from an external source for audio and telephone applications.

Each IDC may be set for latching/non-latching operation and verified/non-verified operation. Each IDC can support up to 30 model 6270B photoelectric smoke detectors or 50 model 6250B ionization detectors. Each NAC is rated at 24 VDC @ 3.5 A or 70 Vrms @ 100 W. 24 VDC power for the notification appliances is available directly from the rail chassis. NOTE: Each NAC pair is limited to a total of 3.5 A per two circuits. When the rail chassis is used as the 24 VDC source, the module is limited to a 7 A total current draw. Input terminals are provided to supply the external signal source.

The Traditional Zone module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. All field wiring connections to the Traditional Zone module are made via plug-in connectors, permitting termination of field wiring without the module installed in the enclosure. The plug-in connectors and snap rivet mounting also facilitate rapid remove and replace troubleshooting without the use of tools. The module features a hinged front panel for mounting displays or a blank protective faceplate.

SPECIFICATIONS

Installation	1LRM space on the rail chassis
Module Configuration	8 Initiating Device Circuits, 4 of which are convertible to Notification Appliance Circuits
Initiating Device Circuit (IDC)	
Wiring Configuration	Class B (Style B)
Detector Voltage	16.23 to 25.4 Vdc, Max. ripple 400 mV
Short Circuit Current	75.9mA Max.
Circuit Resistance	50Ω Max.
Capacitance	100 μF Max.
EOL Resistor	4.7KΩ
Detector Load	Refer to compatibility listings in the EST3 Installation and Service Manual (P/N 270380)
Notification Appliance Circuit (NAC)	
Wiring Configuration	Class B (Style Y)
Voltage	24 Vdc Nominal, 70 Vrms Max.
Current	3.5A @ 24 Vdc
Power	60 W @ 25 Vrms 100 W @ 70 Vrms
EOL Resistor	15 KΩ
Maximum Wire Size	12 AWG (2.5 mm^2)
Termination	Removable plug-in terminal strips on module
Current Requirements (does not include LED/Switch module on NAC)	
Standby	50 mA @ 24 Vdc
Alarm	330 mA @ 24 Vdc
Operating Environment	
Temperature	32°F (0°C) to 120°F (49°C)
Humidity	93% RH, non-condensing

INSTALLATION

If a Control/LED Display is required on this module, mount it in the recess on the front of the module. Secure the display to the module with the four supplied plastic rivets. Connect the display ribbon cable (P/N 250186) from connector J1 on the display to connector P1 on the module.

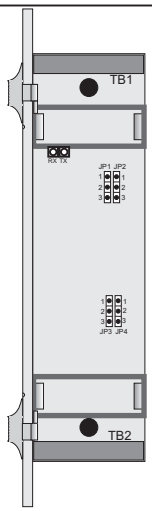
The 3-IDC8/4 has four dedicated Class B Initiating Device Circuits (IDCs) labeled IDC3 & IDC4, and IDC7& IDC8. The module also has two pairs of configurable Class B circuits. IDC/NAC1/2 and IDC/NAC5/6 are configurable as either two Initiating Device Circuits or two Notification Appliance circuits (NACs). When configured as NACs, circuits IDC/NAC1 and IDC/NAC2 share a common signal source. When configured as NACs, circuits IDC/NAC5 and IDC/NAC6 share a common signal source. Two jumpers on the module select the signal source for each pair of NACs. Set jumpers JP1, JP2, JP3, & JP4, then install the module on the rail. The jumpers have no effect when IDC/NAC circuits are used as input circuits.

Before connecting the Traditional I/O Zone Module to the field wiring, test the field wiring. When a circuit checks out properly, connect it to the appropriate terminals. Polarity for NAC circuits is indicated for normal monitoring of the circuit's electrical integrity.

TB1 and TB2 are removable for ease of wiring. All wiring is power limited and should be routed through the notches at the right front of the chassis.

Close the module display door. Latch the door by sliding the upper latch up and the lower latch down.

3-IDC8/4



INSTALLATION SHEET:

3-IDC8/4
Traditional Zone I/O Module

INSTALLATION SHEET P/N: 270492	FILE NAME: 270492.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 12/17/98	CREATED BY: D. Miner

EDWARDS SYSTEMS TECHNOLOGY, INC.
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CHESHIRE, CT: 203-699-3000 FAX 203-699-3075
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INTERNATIONAL, CANADA: 905-270-1711 FAX 905-270-9553

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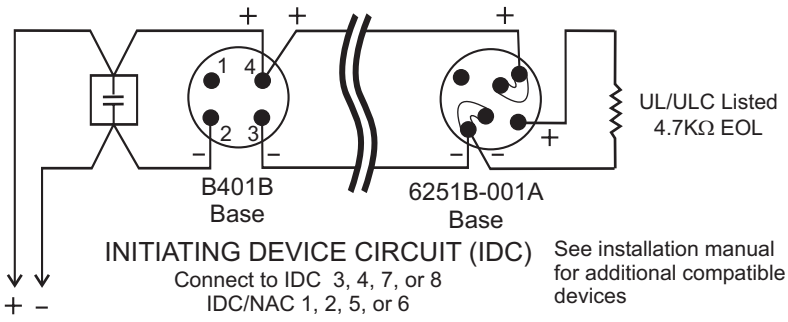
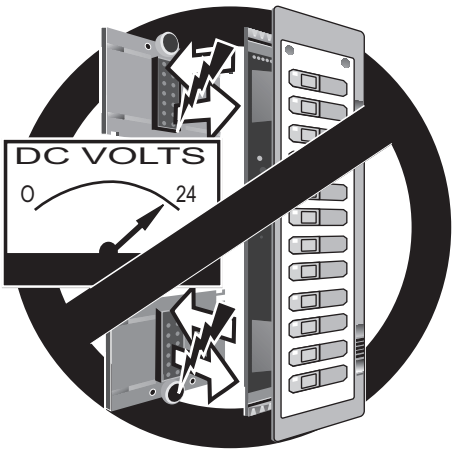
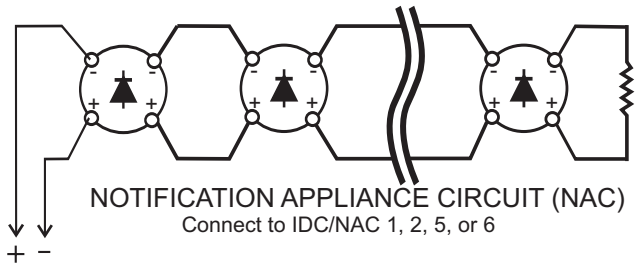
WIRING



INITIATING DEVICE CIRCUIT (IDC)
Connect to IDC 3, 4, 7, or 8
IDC/NAC 1, 2, 5, or 6

See installation manual for additional compatible devices

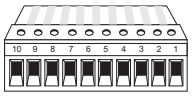




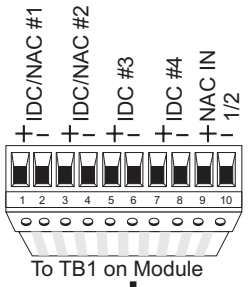
NOTIFICATION APPLIANCE CIRCUIT (NAC)
Connect to IDC/NAC 1, 2, 5, or 6

NOTE

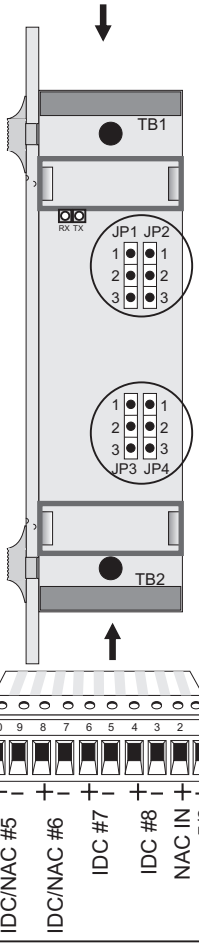
WHEN WIRING MODULE FIELD WIRING PLUG, SCALLOPED EDGE MUST FACE DOWN AND TERMINAL CLAMP SCREWS FACE UP. PINS ARE NUMBERED RIGHT T0 LEFT.

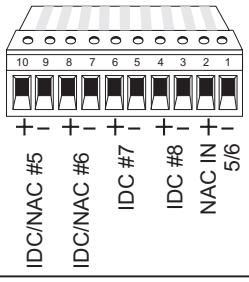


Observe static sensitive material handling practices.



To TB1 on Module





JUMPER SETUP

Circuits	Signal Source	
	External via Terminals	Internal 24 VDC (3.5A max. per NAC pair)
IDC/NAC 1/2	JP1 to 1 & 2 JP2 to 1 & 2	JP1 to 2 & 3 JP2 to 2 & 3
IDC/NAC 5/6	JP3 to 2 & 3 JP4 to 2 & 3	JP3 to 1 & 2 JP4 to 1 & 2

Wiring Notes

1. For maximum wire resistance, refer to the appendix.
2. Maximum #12 AWG (2.5 mm^2) wire; minimum #18 AWG (0.75 mm^2).
3. Shields (if used) must be continuous and free from Earth Ground.
4. IDC/NACs 1 & 2 share the same input source. Set both JP1 & JP2 to 1/2 for the external source (TB1-9 & 10). Set JP1 & JP2 to 2/3 for the internal 24 VDC source. NOTE: There is a 3.5 amp total limit for both NAC1 and NAC2. External sources must be power limited.
5. IDC/NACs 5 & 6 share the same input source. Set both JP3 & JP4 to 2/3 for the external source (TB2-1 & 2). Set JP3 & JP4 to 1/2 for the internal 24 VDC source. NOTE: There is a 3.5 amp total limit for both NAC5 and NAC6. External sources must be power limited.
6. All wiring is supervised and power limited.
7. Polarity shown in supervisory mode.

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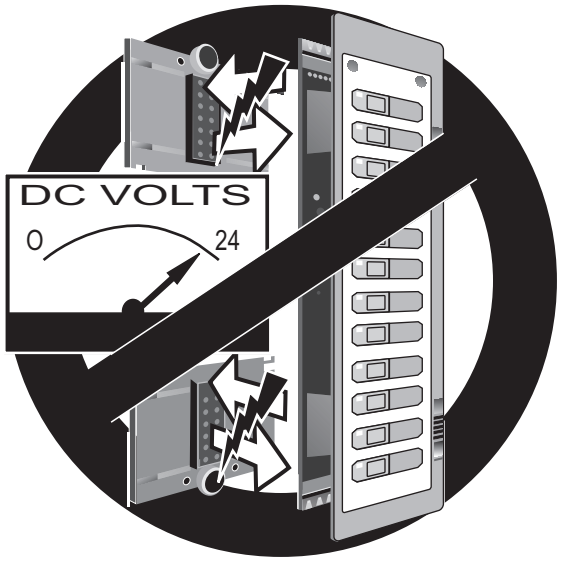
PRODUCT INFORMATION

The 3-LDSM LED Display Support Local Rail Module provides the circuitry required to operate a Control/LED display when the cabinet does not have enough modules installed on a rail chassis to support the number of displays required.

INSTALLATION

1. Mount the Control/LED Display in the recess on the front of the module.
2. Secure the display to the module with the four supplied plastic rivets.
3. Connect the display ribbon cable (P/N 250186) from connector J1 on the display to connector J1 on the module.
4. Install the module on the rail.
5. Close the module display door. Latch the door by sliding the upper latch down, and the lower latch up.

Observe static sensitive material handling practices.



SPECIFICATIONS

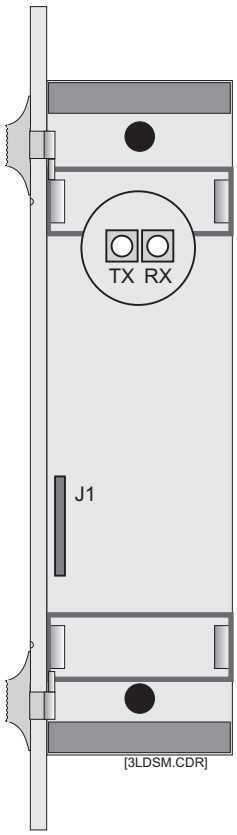
Installation

1 LRM space

Operating Environment

32°F to 120°F (0°C to 49°C)
93% RH, non-condensing

3-LDSM



INSTALLATION SHEET:

3-LDSM
LED Display Support Local Rail Module

INSTALLATION SHEET P/N: 270485	FILE NAME: 270485.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 06/14/99	REVISED BY: D. Miner

EDWARDS SYSTEMS TECHNOLOGY, INC.
SARASOTA, FL: 941-739-4300 FAX 941-753-1806
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PRODUCT INFORMATION

The Off Premise Signaling module provides three independent reverse polarity circuits for transmitting alarm, supervisory, and trouble signals to compatible receivers. Reversing a circuit's polarity indicates an active alarm condition; loss of circuit continuity indicates circuit trouble. As an alternate to three independent circuits, the reverse polarity alarm circuit may be configured to transmit panel trouble by removing circuit continuity, when using a compatible single circuit reverse polarity receiver. A supervised local energy master box trip circuit is also provided to activate a 14.5-ohm master box trip coil. A configurable NO/NC trouble contact is provided on the module.

The 3-OPS module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. All field wiring connections to the 3-OPS module are made via plug-in connectors, permitting termination of field wiring without the module installed in the enclosure. The plug-in connectors and snap rivet mounting also facilitate rapid remove and replace trouble shooting without the use of tools. The module features a hinged front panel for mounting displays or a blank protective faceplate.

TROUBLE RELAY/JUMPER SETUP

Contact Configuration (system normal)	Jumper JP1 Setting
Closed	2/3
Open	1/2

Trouble Relay Operation:

3 circuit and local energy configurations: independant of alarm

1 circuit configuration: remains closed during alarm

INSTALLATION

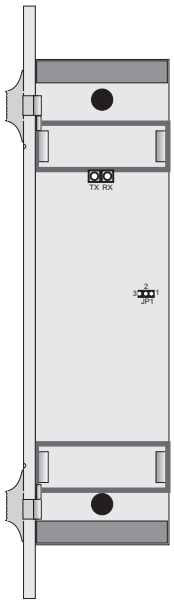
1. Set jumpers as required.
2. Install a display or blank faceplate on the front of the module.
3. Mount the 3-OPS module to one connection on the rail chassis.
4. Install the provided snap rivet fasteners.
5. Install all wiring using the wiring diagram on this sheet.

SPECIFICATIONS

Installation	1 space on the rail chassis
Circuit Configuration:	
Reverse Polarity	3 independent reverse polarity circuits for alarm, supervisory, and trouble notification
Local Energy	14.5-ohm coil
Maximum Wire Size	12 AWG (2.5 mm^2)
Trouble Relay	NO or NC configuration rated 24 Vdc @ 1 A
Termination	Removable plug-in termination strips on module
Open Circuit Voltage	24 Vdc, nominal
Short Circuit Current	7 mA Max.
Current Requirements (does not include LED/Switch module):	
Standby current	53 mA @ 24 Vdc
Alarm current	147 mA @ 24 Vdc
Operating Environment:	
Temperature	32°F (0°C) to 120°F (49°C)
Humidity	93% RH, non-condensing

Observe static sensitive material handling practices.

3-OPS



INSTALLATION SHEET:

3-OPS
Off Premise Signal Module

INSTALLATION SHEET P/N: 270494	FILE NAME: 270494.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 12/17/98	CREATED BY: D. Miner

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Owen Sound, ON, Canada

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WIRING

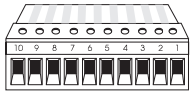
A. Three Reverse Polarity Circuit Configuration

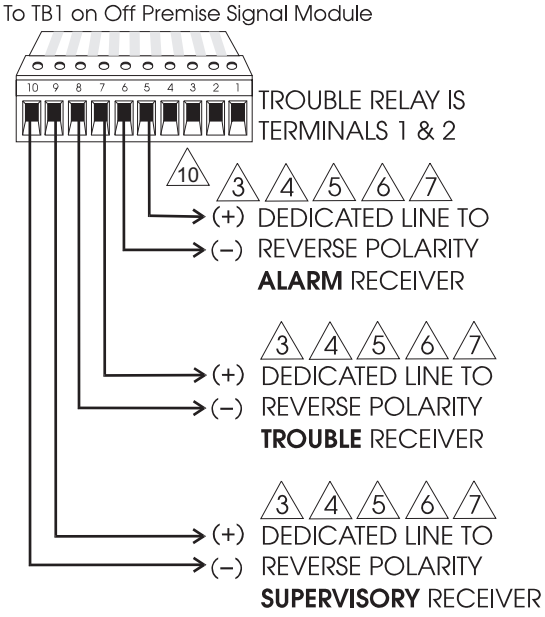
OFF PREMISE SIGNAL MODULE

Observe static sensitive material handling practices.

NOTE

WHEN WIRING MODULE FIELD WIRING PLUG, SCALLOPED EDGE MUST FACE DOWN AND TERMINAL CLAMP SCREWS FACE UP. PINS ARE NUMBERED RIGHT TO LEFT.

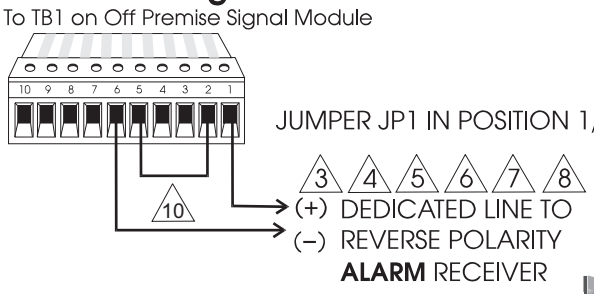




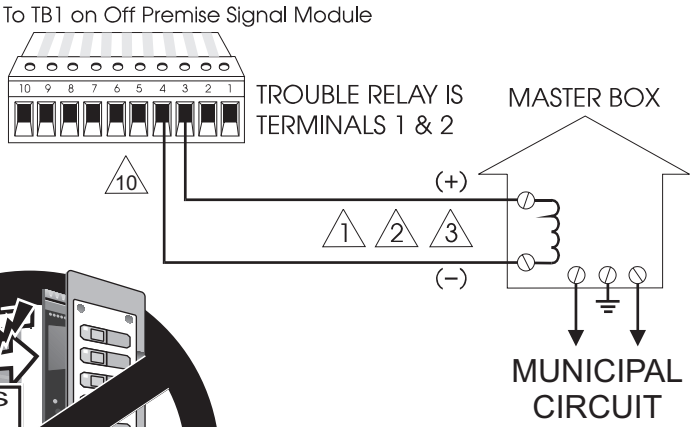
Wiring Notes

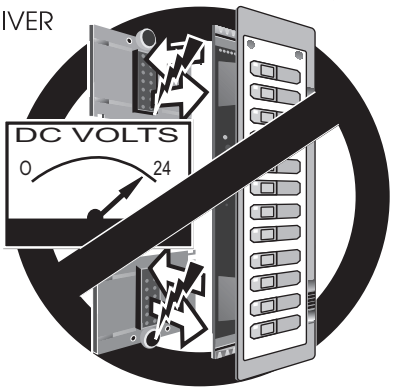
1. 250 mA INTO A 14.5 OHM TRIP COIL. MAX. LOOP RESISTANCE= 25 OHMS.
2. NON POWER LIMITED CIRCUIT IS SUPERVISED FOR OPENS
3. POLARITY SHOWN IN NORMAL STATE.
4. MAXIMUM LINE RESISTANCE 1500 OHMS.
5. CURRENT RANGE IS 2.6 - 9.5 mA.
6. COMPLIES WITH NEMA SB3-1969.
7. POWER LIMITED.
8. USE THE ALARM CIRCUIT WHEN SET IN THE "OLD STYLE" SINGLE CIRCUIT CONFIGURATION.
9. INSTALL UL LISTED SECONDARY PROTECTOR, DITECK MODEL DTK-36VLPSCP ACROSS ALL OUTSIDE WIRING.
10. 15 kohm EOL resistor required across TB1-3 & TB1-4 when 3-OPS is configured as Local Energy Municipal Box AND NOT wired to Municipal Circuit. Remove for all other applications.

B. Single Reverse Polarity Circuit Configuration



C. Local Energy Municipal Box Configuration





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PRODUCT DESCRIPTION

3-PPS/M and 3-PPS/M-230 primary power supply

The 3-PPS/M(-230) primary power supply provides the required power and related supervision functions for the panel. The supply is comprised of two major components: the power supply monitor module, model 3-PSMON, which mounts on the rail chassis, and the heat sink assembly, model 3-PPS, which mounts on the rear of the rail chassis. The primary power supply provides filtered, regulated power to power all modules connected to the rail chassis as well as 24 Vdc for auxiliary applications. The primary power supply is rated at 24 Vdc @ 7.0A for all outputs. Two independent, power limited, supervised 24 Vdc, 3.5 A auxiliary power outputs are provided on the primary supply. 24 Vdc auxiliary output is available on plug-in terminals on the primary power supply module. AC power and battery connections are made to fixed terminals on the heat sink assembly, remote from the panel's power limited wiring.

The primary power supply supervises the standby batteries and provides a dual rate constant current battery charger featuring automatic temperature compensation. The charger is capable of charging batteries up to 65 Ah. A battery monitor circuit disconnects the batteries from the system when battery voltage drops below acceptable limits, which prevents memory problems and a total discharge of the batteries.

The power supply checks the ac input source and initiates the automatic transfer to batteries in the event of a brownout or loss of ac power. In the event of a failure of one or more booster power supplies, the primary power supply determines its ability, along with the surviving booster supplies, to supply the load. Should the load ever exceed the ability of the primary and surviving booster supplies to meet the demand, the standby batteries are automatically switched in. The supply will transfer to battery should an overload cause its heat sink temperature to reach a high level.

The 3-PPS/M (-230) offers a comprehensive level of supervision. Dynamic battery load testing periodically disables the battery charger, loads the battery, then monitors the battery voltage over a predetermined time period. Battery failure is annunciated if the battery fails to maintain an acceptable voltage level. Load testing continues periodically, until the battery capacity is sufficient to meet the load test criteria.

The primary power supply monitor module provides the interface between the power supply and the panel making the required data and power connections to and from the rail chassis. The monitor module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. The module features a hinged front panel for mounting displays or a blank protective faceplate.

3-BPS/M and 3-BPS/M-230 Power Supply Booster

The 3-BPS/M(-230) power supply booster module is used to provide additional power over and above the primary power supply. Up to three additional 24 Vdc, 7.0 A power boosters may be added in each enclosure, making a total of 28A available for both internal and external applications. The power supply booster is comprised of two major components: the booster monitor module which mounts on the rail chassis, and the heat sink assembly, which mounts on the rear of the rail chassis. Each booster provides filtered, regulated power to power all modules connected to the rail chassis as well as 24 Vdc for auxiliary applications. Each booster is rated at 24 Vdc @ 7.0 A for all outputs. Two independent, power limited, supervised 24 Vdc, 3.5 A auxiliary power outputs are provided on the booster. The power boosters share a common standby battery with the primary power supply. Each booster supervises its own connection to the battery, however, all battery charging and monitoring is done by the primary power supply. The power supply boosters share the panel's 24 Vdc electrical load with the primary power supply. In the event of a failure of a booster power supply, a trouble is annunciated, and the panel load is distributed among the operational power sources. Should the load ever exceed the ability of the operable power sources to supply the power, as in the event of an alarm, the system will automatically transfer to standby batteries.

The power supply booster monitor module provides the interface between a power supply booster and the panel, making the required data and power connections to and from the rail chassis. The booster monitor module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. The module features a hinged front panel for mounting displays or a blank protective faceplate.

SPECIFICATIONS

3-PPS/M (-230) and 3-BPS/M (-230)

Installation	Heat sink assembly mounts behind chassis rails Monitor module requires one module space
Power Input	120 Vac, -10%, +15%, 3.0 A, 50 - 60 Hz 230 Vac, -10%, +15%, 1.5 A, 50 - 60 Hz (-230 only)
Brownout Level	≤ 102 Vac ≤ 195 Vac (-230 only)
Outputs	
Total	24 Vdc @ 7.0 A, internal and auxiliary outputs
Internal DC	24 Vdc @ 7.0 A max.
Auxiliary DC	Two 24 Vdc @ 3.5 A max. ground fault and short supervised, power limited outputs
Termination	
AC Input	Terminals on heat sink assembly
Batteries	Terminals on heat sink assembly
Internal DC Output	LRM chassis rails via monitor module
Auxilary DC Output	Removable plug-in terminal strips on monitor module
Operating Environment	
Temperature	32 °F to 120 °F (0 °C to 49 °C)
Rel. Humidity	93% RH non-condensing

3-PPS/M and 3-PPS/M-230 only

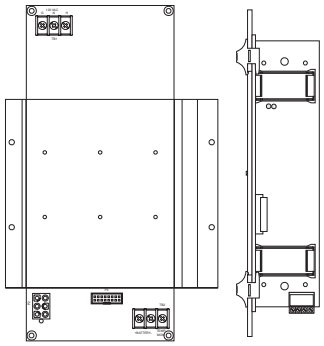
Battery Charging	
Capacity	10 - 65 Amp-hours
Type	Temperature compensated dual rate

Supervision
- Low AC
- Low Battery (≤ 22.5 Vdc)
- High Battery
- Discharged Battery (≤ 18 Vdc)
- Ground Fault (≤ 10 kΩ)

3-BPS/M and 3-BPS/M-230 only

Supervision
- Low AC
- Low Battery (≤ 22.5 Vdc)
- Ground Fault (≤ 10 kΩ)

3-PPS/M (-230) and 3-BPS/M (-230)



INSTALLATION SHEET:

3-PPS/M (3-PPS/M-230) Primary power supplies
3-BPS/M (3-BPS/M-230) Booster power supplies

INSTALLATION SHEET P/N: 270495	FILE NAME: 270495.CDR
REVISION LEVEL: 2.0	APPROVED BY: J.W.
DATE: 25OCT99	CREATED BY: G. Sutton

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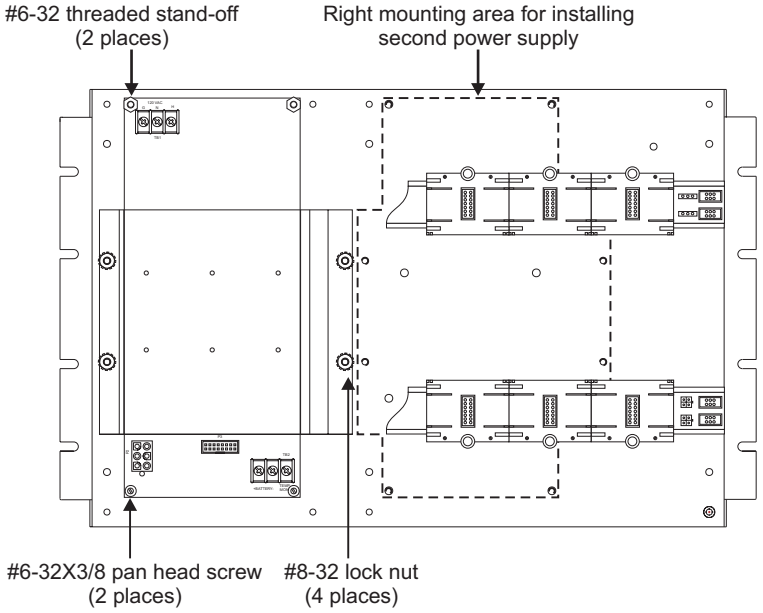
INSTALLATION INSTRUCTIONS

Step I. Mounting the power supply assembly:

1. Position the power supply assembly behind the rails on the rail chassis assembly.
2. Attach the power supply assembly to the 4 threaded mounting studs.
3. Screw the bottom edge of the power supply assembly to the threaded stand-offs on the rail chassis assembly.
4. Secure the top edge of the power supply assembly to the rail chassis assembly using the stand-offs provided in the hardware kit.
5. Screw the power supply cover (not shown) to the stand-offs on the top edge of the power supply assembly.

Notes:

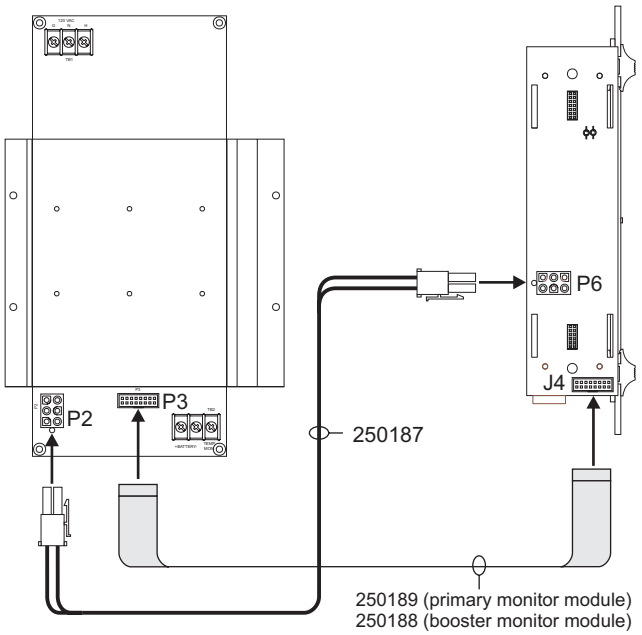
1. The primary power supply must always be mounted in the left mounting position of the chassis containing the panel controller.
2. Monitor modules for power supplies mounted in the left mounting position may only be installed in rail slot position 3. Monitor modules for power supplies mounted in the right mounting position may be installed in rail slot positions 4, 5, or 6.



Caution: This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures to prevent damage from electro-static discharge may result in equipment damage.

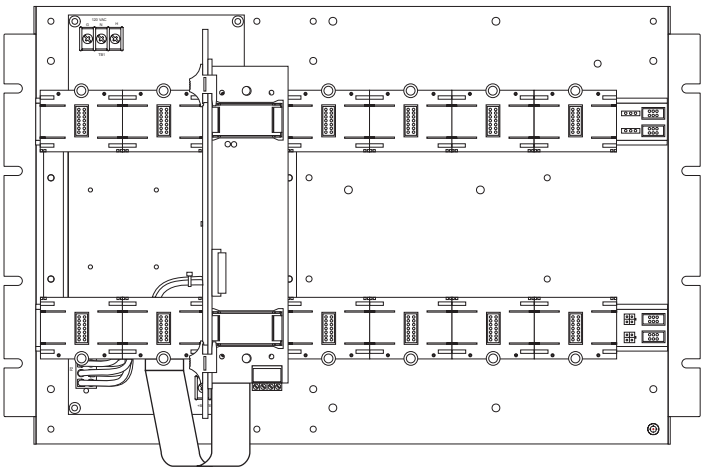
Step 2. Installing the power supply monitor module:

1. Connect the 6-wire cable harness to P6 on the power supply monitor. Push in until the connector clicks.
2. Connect the ribbon cable to J4 on the power supply monitor.
3. Align the power supply monitor to the slot 3 guide posts on the rail chassis assembly.
4. Route the 6-wire cable harness over and behind the bottom rail and connect to P2 on the primary power supply. Push in until the connector clicks.
5. Route the ribbon cable under the bottom rail and connect to P3 on the primary power supply.
6. Slide the module into the slot 3 rail connectors and lock into place using the snap rivet fasteners.



Step 3. Wiring the power supply:

1. Ensure that the mains ac circuit is deenergized. Connect the mains ac conductors to TB1 on the power supply assembly. Refer to Figure-1 on page 3.
2. Connect the standby battery conductors to TB2 on the power supply assembly. Refer to Figure-2 on page 3.
3. If a remote battery cabinet is used, connect the temperature sensor conductor to TB2 on the primary power supply assembly. Refer to Figure-2 on page 3.
4. Connect the 24 Vdc auxiliary power riser conductors to TB1 on the power supply monitor module. Refer to Figure-3 on page 4.



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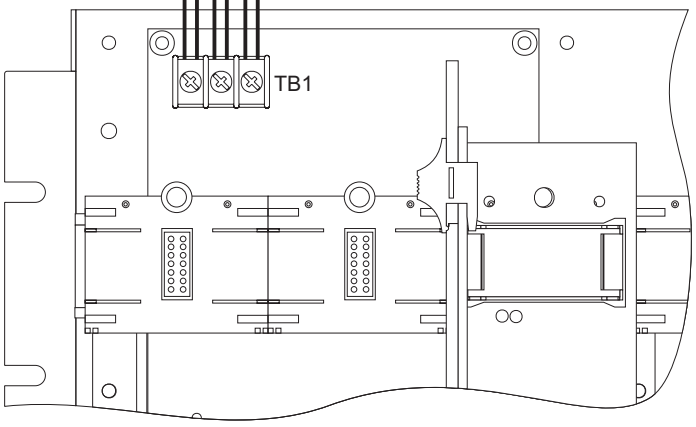
From dedicated mains ac power distribution (if primary power supply) or from previous power supply in same cabinet (if booster power supply)

To next booster power supply in same cabinet



120 VAC
G N H
TB1

230 VAC
G L2 L1
TB1

Power supply assembly TB1 terminal designations

WARNING: High voltage levels capable of causing injury or death may be present. Precautionary measures must be taken to ensure that the mains ac circuit is deenergized and prevented from being switched on inadvertently.

Notes:

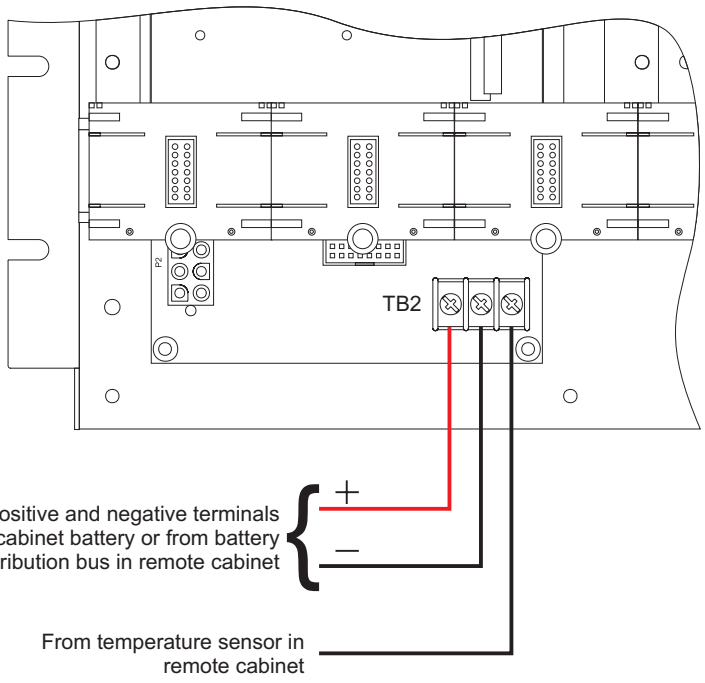
1. Install wiring in accordance with the National Electrical Code and all other local requirements.
2. Up to 4 primary or booster supplies may be connected to a single ac source circuit.

Figure-1: Mains ac wire connections

Caution: Disconnecting the battery from the power supply while the cabinet is deenergized may damage the battery.

Notes:

1. Each power supply shall have its own separate pair of conductors going to the battery.
2. The batteries must already be connected to the primary power supply when the cabinet is energized in order to activate the battery charging circuit.



Power supply assembly TB2 terminal designations

Figure-2: Standby battery wire connections

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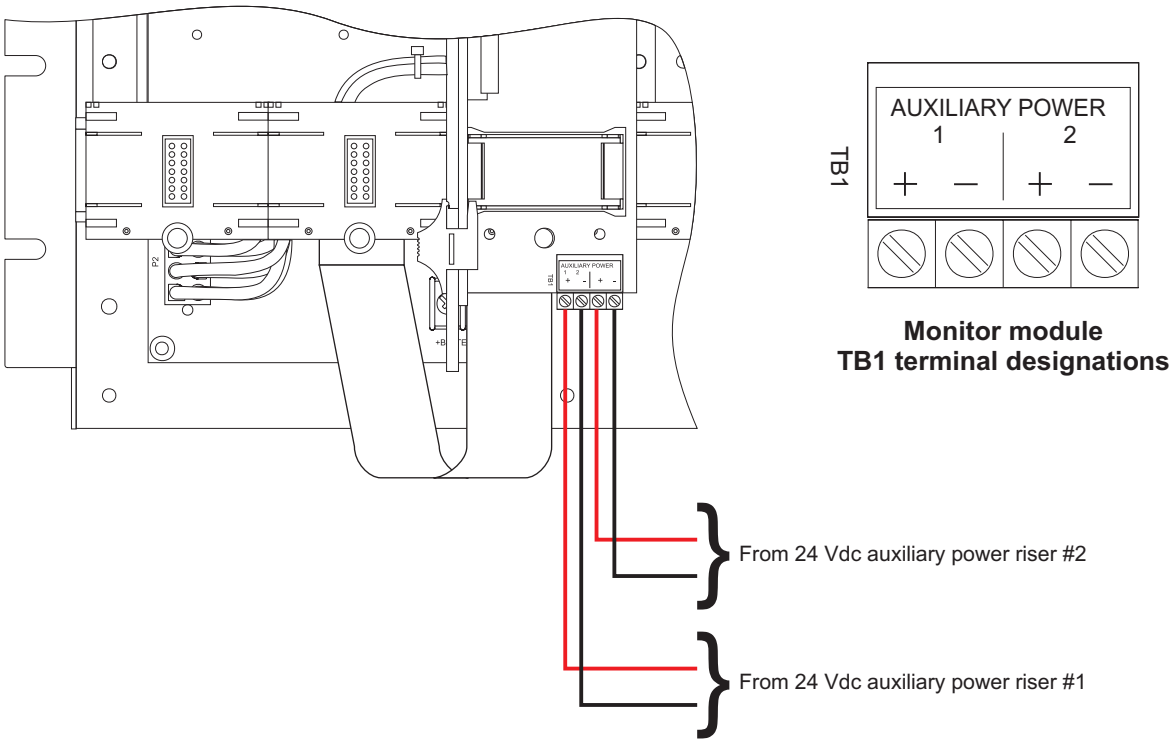

Monitor module
TB1 terminal designations

Figure-3: 24 Vdc auxiliary power riser wire connections

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PRODUCT DESCRIPTION

3-PPS/M-230-E Primary power supply

The 3-PPS/M-230-E primary power supply provides the required power and related supervision functions for the panel. The supply is comprised of three major components: the power supply monitor module, model 3-PSMON, which mounts on the rail chassis, and the heat sink assembly, model 3-PPS, which mounts on the rear of the rail chassis, and the ac power distribution assembly. The primary power supply provides filtered, regulated power to power all modules connected to the rail chassis as well as 24 Vdc for auxiliary applications. The primary power supply is rated at 24 Vdc @ 7.0A for all outputs. Two independent, power-limited, supervised 24 Vdc, 3.5 A auxiliary power outputs are provided on the power supply monitor module. AC power and battery connections are made to fixed terminals on the heat sink assembly, remote from the panel's power limited wiring.

The primary power supply supervises the standby batteries and provides a dual rate constant current battery charger featuring automatic temperature compensation. The charger is capable of charging batteries up to 17 Ah. A battery monitor circuit disconnects the batteries from the system when battery voltage drops below acceptable limits, which prevents memory problems and a total discharge of the batteries.

The power supply checks the ac input source and initiates the automatic transfer to batteries in the event of a brownout or loss of ac power. In the event of a failure of one or more booster power supplies, the primary power supply determines its ability, along with the surviving booster supplies, to supply the load. Should the load ever exceed the ability of the primary and surviving booster supplies to meet the demand, the standby batteries are automatically switched in. The supply will transfer to battery should an overload cause its heat sink temperature to reach a high level.

The primary power supply monitor module provides the interface between the power supply and the panel making the required data and power connections to and from the rail chassis. The monitor module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. The module features a hinged front panel for mounting displays or a blank protective faceplate.

3-BPS/M-230-E Booster power supply

The 3-BPS/M-230-E booster power supply is used to provide additional power over and above the primary power supply. Up to three additional 24 Vdc, 7.0 A power boosters may be added in each enclosure, making a total of 28A available for both internal and external applications. The power supply booster is comprised of two major components: the booster monitor module which mounts on the rail chassis, and the heat sink assembly, which mounts on the rear of the rail chassis. Each booster provides filtered, regulated power to power all modules connected to the rail chassis as well as 24 Vdc for auxiliary applications. Each booster is rated at 24 Vdc @ 7.0 A for all outputs. Two independent, power limited, supervised 24 Vdc, 3.5 A auxiliary power outputs are provided on the booster. The power boosters share a common standby battery with the primary power supply. Each booster supervises its own connection to the battery, however, all battery charging and monitoring is done by the primary power supply. The power supply boosters share the panel's 24 Vdc electrical load with the primary power supply. In the event of a failure of a booster power supply, a trouble is annunciated, and the panel load is distributed among the operational power sources. Should the load ever exceed the ability of the operable power sources to supply the power, as in the event of an alarm, the system will automatically transfer to standby batteries.

The power supply booster monitor module provides the interface between a power supply booster and the panel, making the required data and power connections to and from the rail chassis. The booster monitor module requires one connection on the rail chassis and is secured to the assembly using snap rivet fasteners. The module features a hinged front panel for mounting displays or a blank protective faceplate.

SPECIFICATIONS

3-PPS/M-230-E and 3-BPS/M-230-E

Installation	Power distribution assembly mounts behind chassis rail (3-PPS/M-230-E only) Heat sink assembly mounts behind chassis rail Monitor module requires one module space
Power Input	230 Vac, +10%, -15%, 2.0 A, 50 Hz
Brownout Level	≤ 188 Vac
Outputs	
Total	24 Vdc @ 7.0 A, internal and auxiliary outputs
Internal DC	24 Vdc @ 7.0 A max.
Auxiliary DC	Two 24 Vdc @ 3.5 A max. ground fault and short supervised, power limited outputs
Termination	
AC Input	Terminals on heat sink assembly
Batteries	Terminals on heat sink assembly
Internal DC Output	LRM chassis rails via monitor module
Auxilary DC Output	Removable plug-in terminal strips on monitor module
Operating Environment	
Temperature	23 to 104 °F (-5 to 40 °C)
Rel. Humidity	93% RH non-condensing

3-PPS/M-230-E only

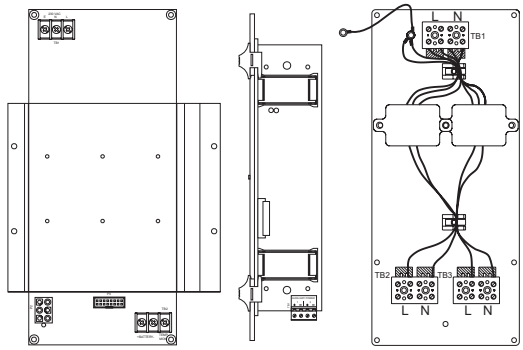
Battery Charging	
Capacity	10 - 17 Ah
Type	Temperature compensated dual rate, 1.5 A/3.0 A

Supervision
- Low AC
- Low Battery (≤ 22.5 Vdc)
- High Battery
- Discharged Battery (≤ 18 Vdc)
- Ground Fault (≤ 10 kΩ)

3-BPS/M-230-E only

Supervision
- Low AC
- Low Battery (≤ 22.5 Vdc)
- Ground Fault (≤ 10 kΩ)

3-PPS/M-230-E and 3-BPS/M-230-E



INSTALLATION SHEET:

3-PPS/M-230-E Primary power supplies
3-BPS/M-230-E Booster power supplies

INSTALLATION SHEET P/N: 387555	FILE NAME: 387555.CDR
REVISION LEVEL: 1.0	APPROVED BY: D. Munn
DATE: 30JUN99	CREATED BY: G. Sutton

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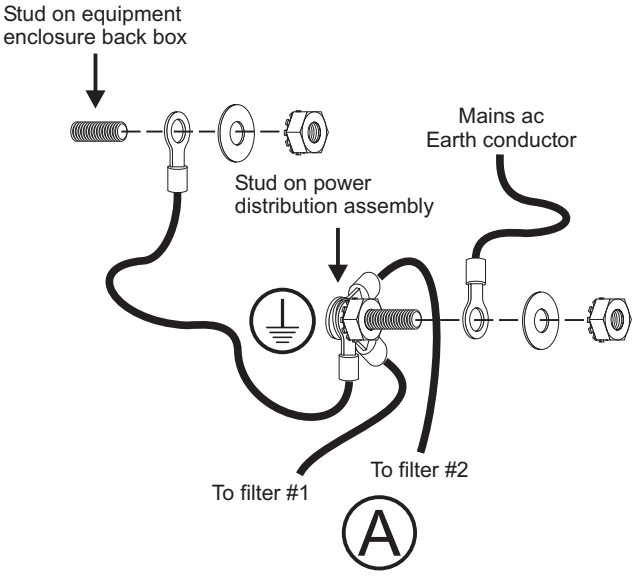
Step I. Mount the power distribution assembly.

1. Screw the power distribution assembly to the threaded stand-offs on the rail chassis assembly (see Figure-1).
2. Attach the Earth ground braid to the back box ground stud located just above the power distribution assembly (see detail A).

Note: The power distribution assembly must always be mounted in the rail chassis at the top of the equipment enclosure in the location shown.



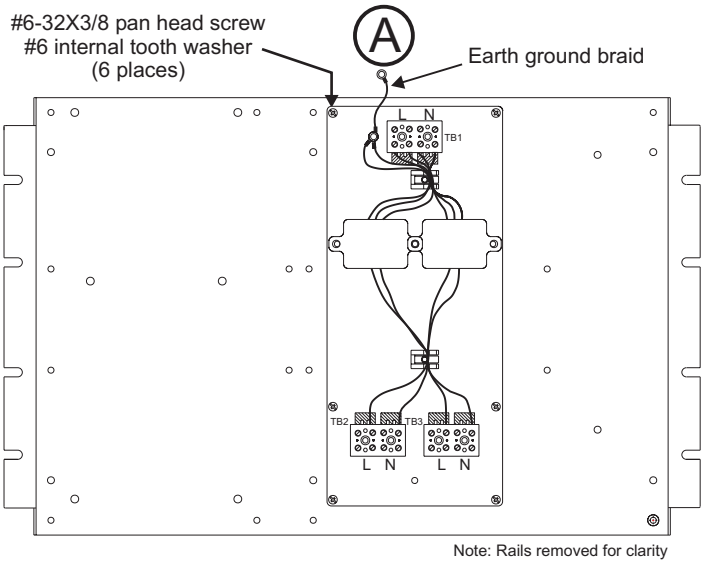


Figure-1: Power distribution assembly mounting

Step 2. Mount the power supply assembly.

1. Attach the power supply assembly to the 4 threaded mounting studs on the rail chassis assembly (see Figure-2).
2. Screw the bottom edge of the power supply assembly to the threaded standoffs on the rail chassis assembly.
3. Secure the top edge of the power supply assembly to the rail chassis assembly using the threaded studs and standoffs provided in the hardware kit.

Notes:

1. The primary power supply must always be mounted in the left mounting position of the chassis containing the panel controller.
2. Booster supplies, if required, may be mounted in any rail chassis, but no more than three booster supplies may exist in any one cabinet.

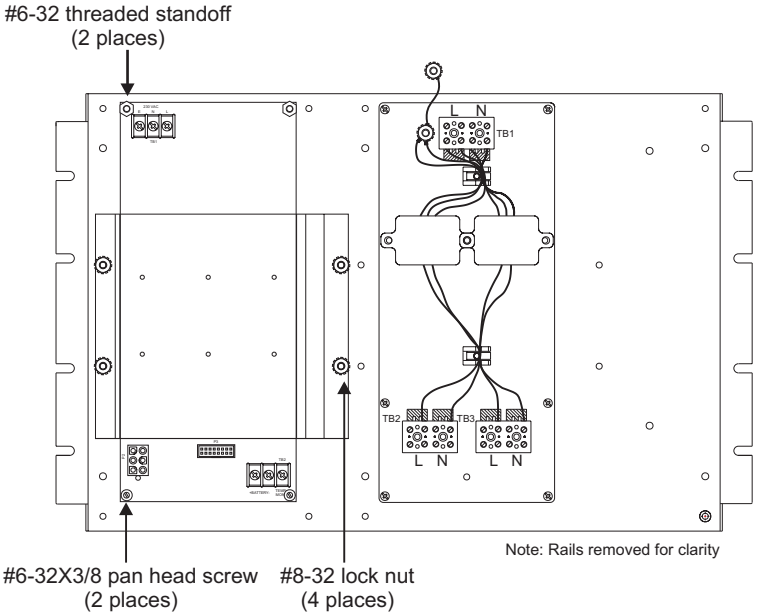


Figure-2: Power supply assembly mounting

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Step 3. Connect filtered ac power to the supplies.

1. Using double-insulated wire, connect the filtered ac Line and Neutral conductors to the power supplies as follows (see Figure-3):

From Power distribution assembly	To Power supply assemblies 1 and 2
TB2-L	TB1-L
TB2-N	TB1-N

From Power distribution assembly	To Power supply assemblies 3 and 4
TB3-L	TB1-L
TB3-N	TB1-N

2. Using double-insulated wire, connect a separate earth conductor from the Earth ground lug on the power distribution assembly to TB1-E on each of the power supplies installed in the cabinet (see detail B).
3. Place flat washer on conductors then tighten with lock nut to ensure a secure mechanical connection to earth ground.
4. Secure the power supply cover to the standoffs on the top edge of the power supply.

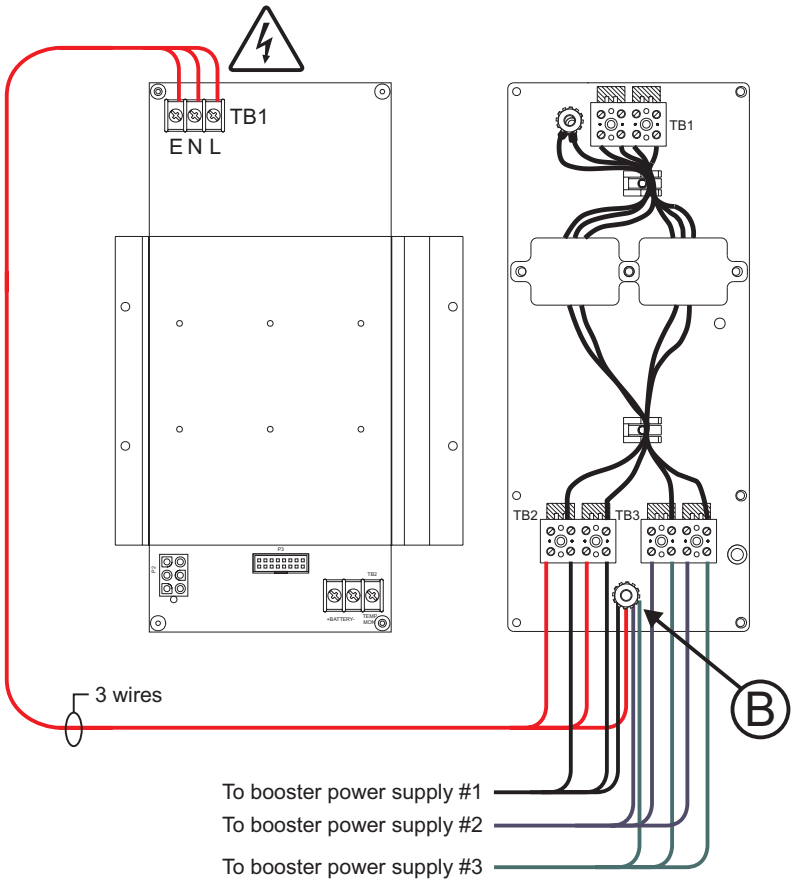
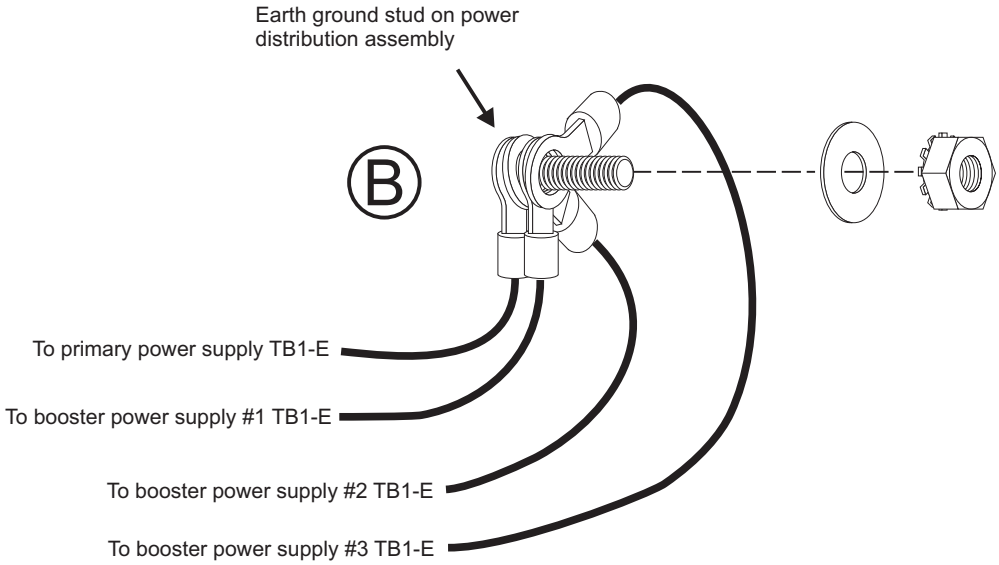


Figure-3: Filtered ac power distribution



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Step 4. Install the power supply monitor module.

Caution: This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures will result in equipment damage.

1. Connect the 6-wire cable harness to P6 on the power supply monitor (see Figure-6). Push in until the connector clicks.
2. Connect the ribbon cable to J4 on the power supply monitor.
3. Align the power supply monitor to the guide posts on slot 3 of the rail chassis assembly.
4. Route the 6-wire cable harness over and behind the bottom rail and connect to P2 on the primary power supply. Push in until the connector clicks.
5. Route the ribbon cable under the bottom rail and connect to P3 on the primary power supply.
6. Slide the module into the slot 3 rail connectors and lock into place using the snap rivet fasteners.
7. Apply a Kapton label over the rail communication LEDs.

Note: Kapton labels are included in the hardware kit and are required for every rail module installed in the cabinet. Save labels for future use.

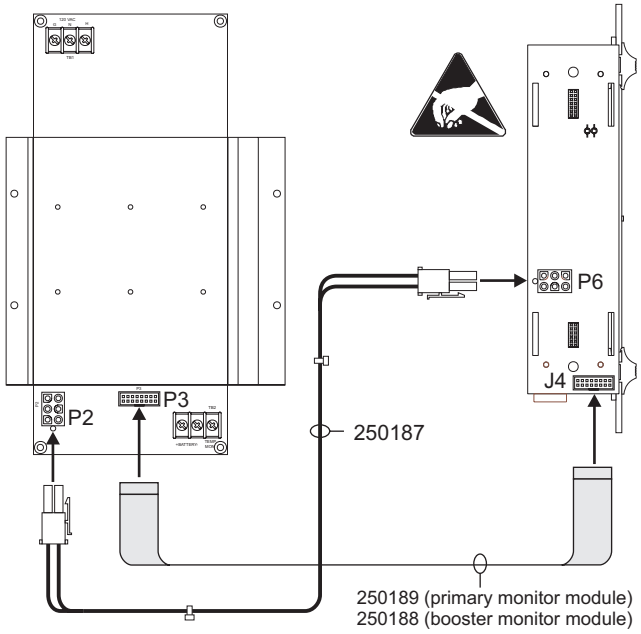
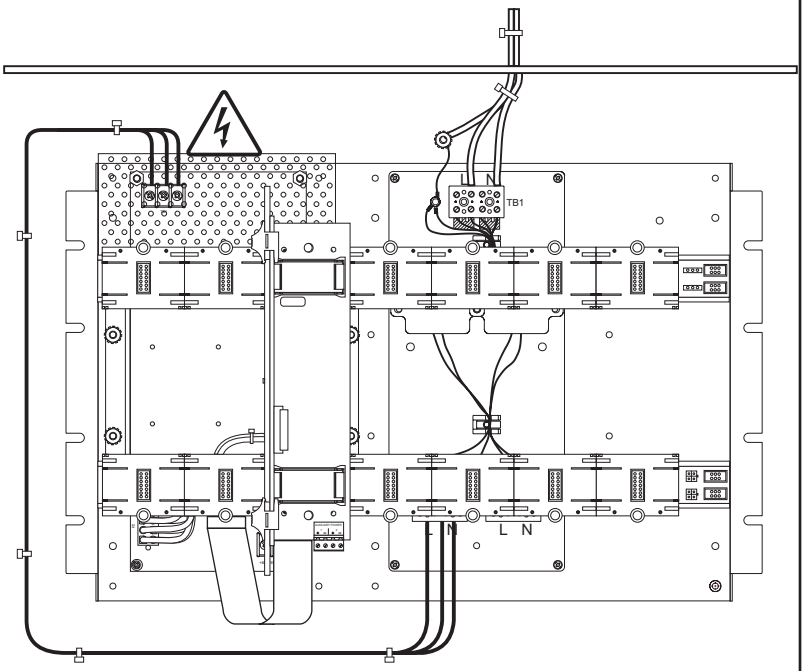


Figure-6: Cable connections

Step 5. Wire the power supply.

1. Ensure that the mains ac circuit is deenergized. Connect the mains ac conductors to TB1 on the power distribution assembly. Refer to Figure-7 on page 5.
2. Connect the standby battery conductors to TB2 on the power supply assembly. Refer to Figure-8 on page 5.
3. If a remote battery cabinet is used, connect the temperature sensor conductor to TB2 on the primary power supply assembly. Refer to Figure-8 on page 5.
4. Connect the 24 Vdc auxiliary power riser conductors to TB1 on the power supply monitor module. Refer to Figure-9 on page 6.



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WARNING: High voltage levels capable of causing injury or death may be present. Precautionary measures must be taken to ensure that the mains ac circuit is deenergized and prevented from being switched on inadvertently.

Notes:

1. Install wiring in accordance with the Electrical Code and all other local requirements.
2. Up to 4 primary or booster supplies may be connected to a single mains ac source circuit.

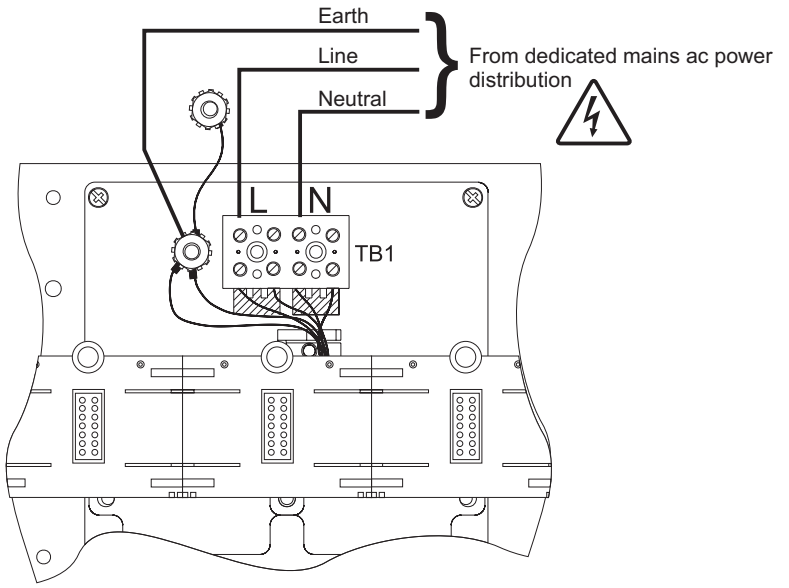
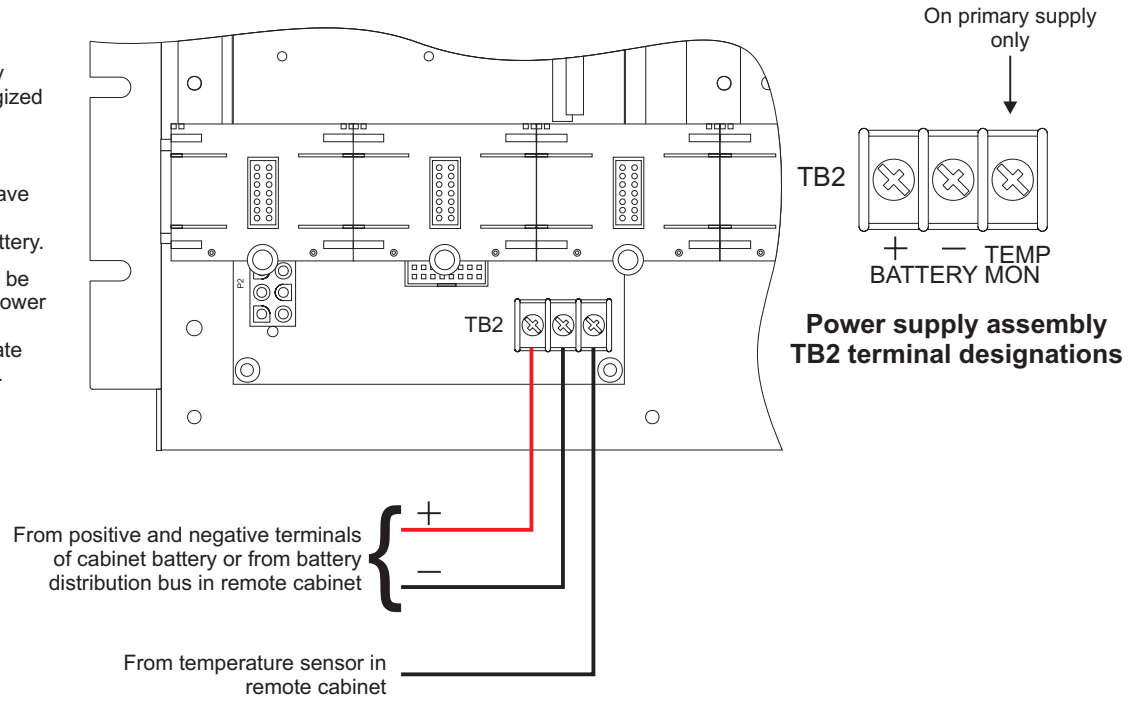


Figure-7: Mains ac wire connections

Caution: Disconnecting the battery from the power supply while the mains ac is deenergized may damage the battery.

Notes:

1. Each power supply shall have its own separate pair of conductors going to the battery.
2. The batteries must already be connected to the primary power supply when the cabinet is energized in order to activate the battery charging circuit.



Power supply assembly TB2 terminal designations

Figure-8: Standby battery wire connections

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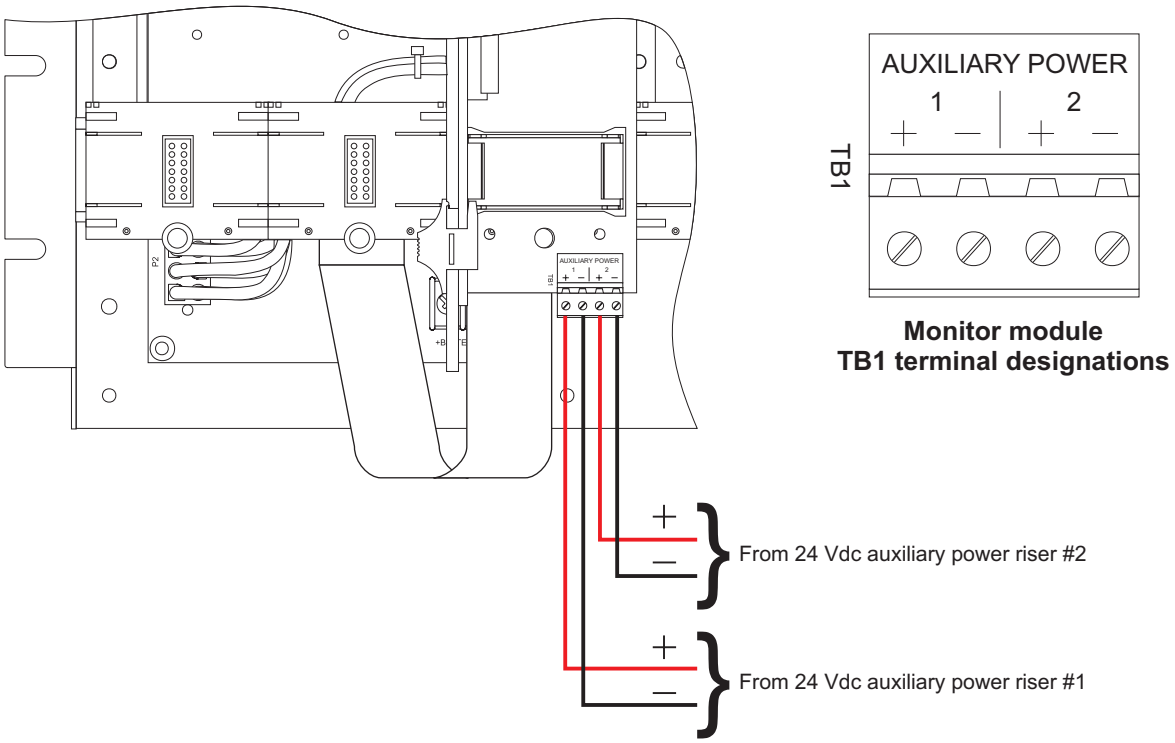

Figure-9: 24 Vdc auxiliary power riser wire connections

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PRODUCT INFORMATION

The Remote Closet Cabinets, RCC Series, are designed for applications where viewing windows are not required, such as remote equipment closets. The RCC7R cabinet provides space for a single chassis, the RCC14R cabinet provides space for two chassis, and the RCC21R provides space for three chassis. All cabinets provide space for up to 50 amp-hour standby batteries. The backboxes are fabricated of 14 gauge steel and finished with a red textured enamel. The enclosures are designed for surface mounting. Conduit and nail knockouts, keyhole style mounting holes, and wide wiring troughs facilitate quick installation. Cabinet design facilitates separation of power limited and non-power limited circuits by locating power limited wiring toward the front of the cabinet and non-power limited wiring at the rear of the cabinet. The removable hinged doors mount on the left side of the backboxes and are secured with key locks.

SPECIFICATIONS

RCC7R Cabinet

Backbox and Door - Dimensions (HWD)
23.25" x 25.0" x 6.75"
(59.1 cm x 63.5 cm x 17.15 cm)
Capacity
Chassis One chassis
Battery Two 50 AH @ 12 Vdc
Door Finish
Red textured enamel

RCC14R Cabinet

Backbox and Door - Dimensions (HWD)
35.47" x 25.0" x 6.75"
(90.1 cm x 63.5 cm x 17.15 cm)
Capacity
Normal Configuration
Two chassis and and two 50 AH @ 12 Vdc
Battery Cabinet Configuration
Two 3-BTS battery shelves with one 65AH @ 12 Vdc battery per shelf
Door Finish
Red textured enamel

RCC21R Cabinet

Backbox and Door - Dimensions (HWD)
47.72" x 25.0" x 6.75"
(121.2 cm x 63.5 cm x 17.15 cm)
Capacity
Normal Configuration
Three chassis and and two 50 AH @ 12 Vdc
Battery Cabinet Configuration
One chassis and two 3-BTS battery shelves with one 65AH @ 12 Vdc battery per shelf
Door Finish
Red textured enamel

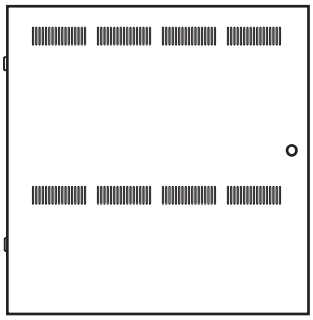
CABINET INSTALLATION

1. Mount the backbox at the required location. Cabinet installation dimensions are on the back page. A dedicated 120 VAC (for systems using model 3-PPS/M power supplies), or 230 VAC (for system using model 3-PPS/M-230 power supplies) 50/60 Hz circuit is required for each cabinet. Install all conduit and pull all wiring into the backbox before proceeding to the next step.

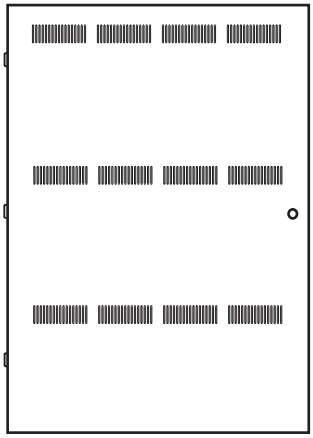
2. Install the equipment chassis. Refer to chassis installation sheet for details.

3. Connect the door ground strap between the stud on the door and the backbox using the hardware provided.

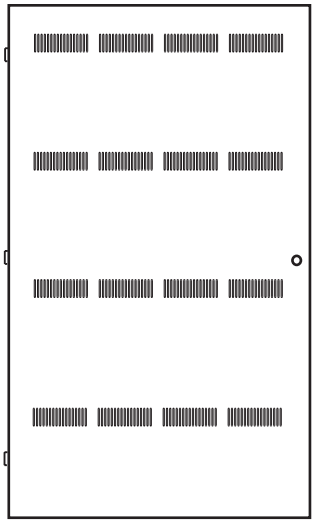
PRODUCT DIAGRAM



3-RCC7R



3-RCC14R



3-RCC21R

INSTALLATION SHEET

3-RCC Series
Remote Closet Cabinets

INSTALLATION SHEET P/N: 270486	FILE NAME: 270486.CDR
REVISION LEVEL: 2.0	APPROVED BY: K. Patterson
DATE: 28MAY99	CREATED BY: M. Rimes

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CHESHIRE, CT: 203-699-3000 FAX 203-699-3075
OWEN SOUND, CANADA: 519-376-2430 FAX 519-376-7258
INTERNATIONAL, CANADA: 905-270-1711 FAX 905-270-9553

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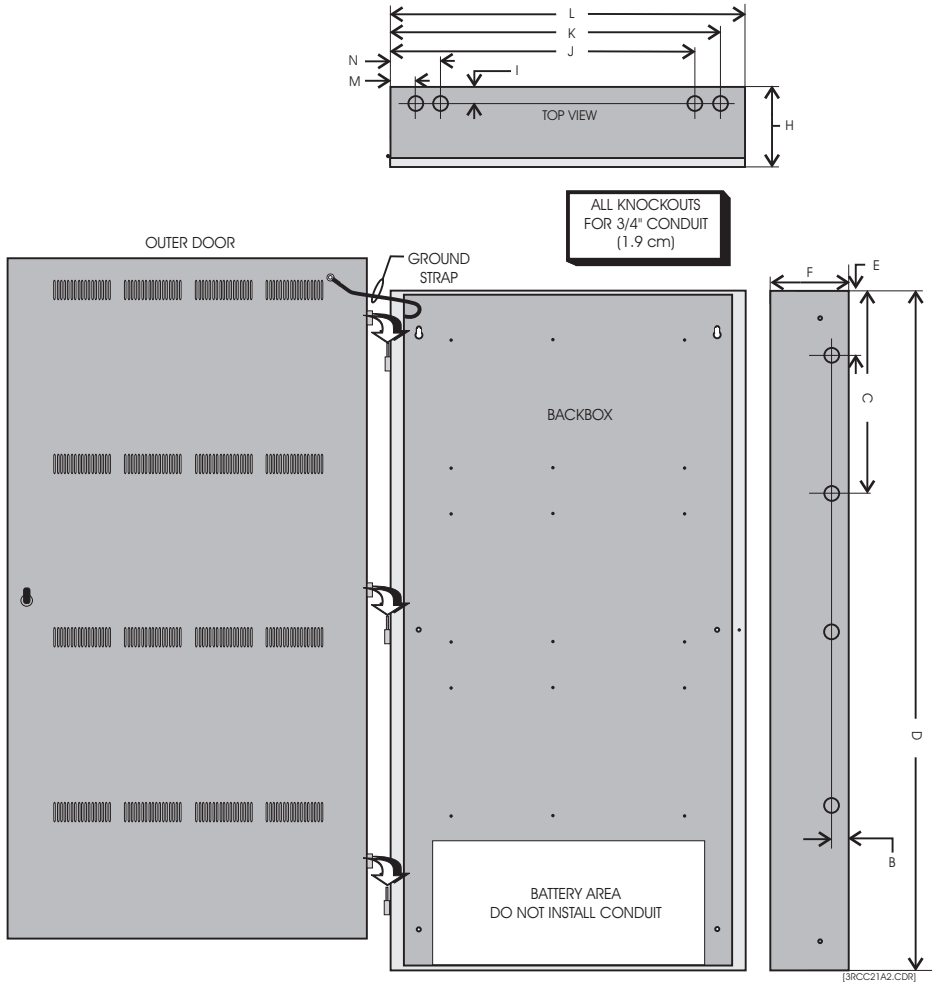
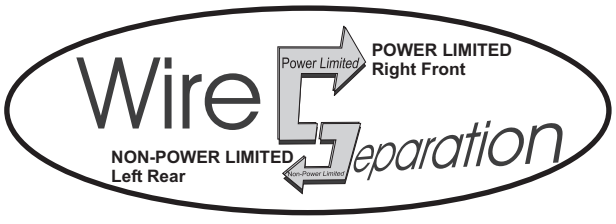
CABINET INSTALLATION DIMENSIONS

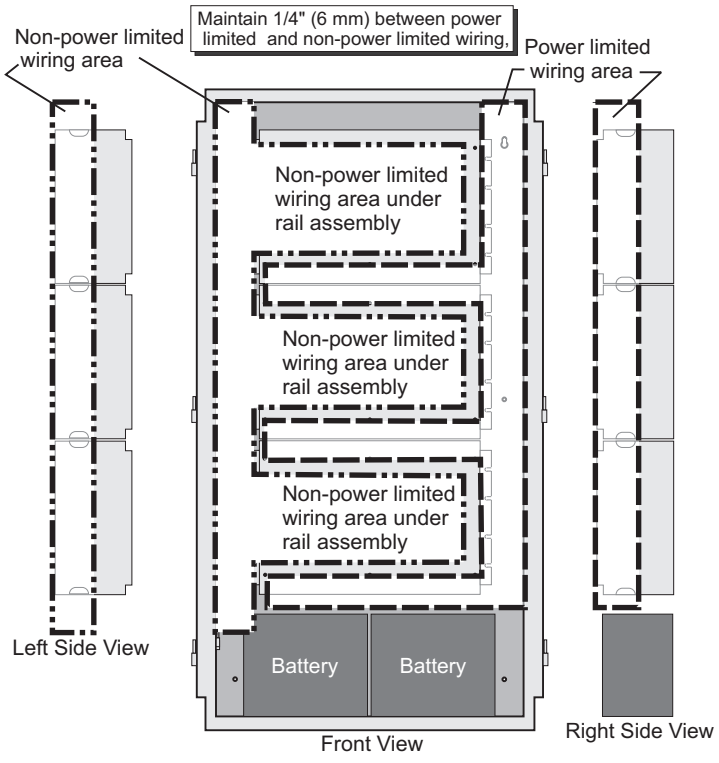


	RCC7R	RCC14R	RCC21R
A	23.36 in (59.3 cm)	35.61 in (90.4 cm)	47.75 in (121.29 cm)
B	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
C	14.1 in (35.8 cm)	14.1 in (35.8 cm)	14.1 in (35.8 cm)
D	23.25 in (59.1 cm)	35.47 in (90.1 cm)	47.72 in (121.21 cm)
E	4.37 in (11.1 cm)	4.37 in (11.1 cm)	4.37 in (11.1 cm)
F	5.5 in (13.97 cm)	5.5 in (13.97 cm)	5.5 in (13.97 cm)
G	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
H	5.5 in (13.97 cm)	5.5 in (13.97 cm)	5.5 in (13.97 cm)
I	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
J	21.44 in (54.46 cm)	21.44 in (54.46 cm)	21.44 in (54.46 cm)
K	23.25 in (59.03 cm)	23.25 in (59.03 cm)	23.25 in (59.03 cm)
L	25.0 in (63.5 cm)	25.0 in (63.5 cm)	25.0 in (63.5 cm)
M	1.75 in (4.45 cm)	1.75 in (4.45 cm)	1.75 in (4.45 cm)
N	3.55 in (9.01 cm)	3.55 in (9.01 cm)	3.55 in (9.01 cm)

POWER LIMITED AND NON-POWER LIMITED WIRING REQUIREMENTS

Fire Alarm System wiring is classified as either Power Limited or Non-Power Limited per NEC Article 760. All power limited wiring must be separated from all non-power limited wiring by a minimum distance of 1/4 in (6 mm). The system enclosures and chassis assemblies are designed such that non-power limited wiring is at the left rear of the cabinet and the power limited wiring is at the front of the cabinet. When installing non-power limited wiring, use the feed through notches at the left rear of the chassis. When installing power limited wiring, use the feed through notches at the right front of the chassis.





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PRODUCT INFORMATION

The Remote Closet Cabinets, RCC-E Series, are designed for applications where viewing windows are not required, such as remote equipment closets. The RCC7R-E cabinet provides space for a single chassis, the RCC14R-E cabinet provides space for two chassis, and the RCC21R-E provides space for three chassis. All cabinets provide space for up to 50 amp-hour standby batteries. The backboxes are fabricated of 14 gauge steel and finished with a red textured enamel. The enclosures are designed for surface mounting. Conduit and nail knockouts, keyhole style mounting holes, and wide wiring troughs facilitate quick installation. The removable hinged doors mount on the left side of the backboxes and are secured with key locks.

SPECIFICATIONS

RCC7R-E Cabinet

Backbox and Door - Dimensions (HWD)
23.25" x 25.0" x 6.75"
(59.1 cm x 63.5 cm x 17.15 cm)
Capacity
Chassis One chassis
Battery Two 50 AH @ 12 Vdc
Door Finish
Red textured enamel

RCC14R-E Cabinet

Backbox and Door - Dimensions (HWD)
35.47" x 25.0" x 6.75"
(90.1 cm x 63.5 cm x 17.15 cm)
Capacity
Normal Configuration
Two chassis and and two 50 AH @ 12 Vdc
Battery Cabinet Configuration
Two 3-BTS battery shelves with one 65AH @ 12 Vdc battery per shelf
Door Finish
Red textured enamel

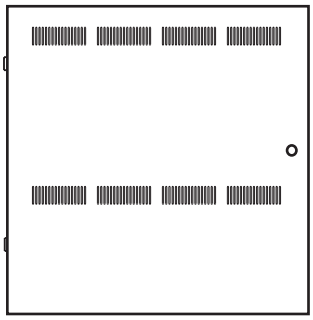
RCC21R-E Cabinet

Backbox and Door - Dimensions (HWD)
47.72" x 25.0" x 6.75"
(121.2 cm x 63.5 cm x 17.15 cm)
Capacity
Normal Configuration
Three chassis and and two 50 AH @ 12 Vdc
Battery Cabinet Configuration
One chassis and two 3-BTS battery shelves with one 65AH @ 12 Vdc battery per shelf
Door Finish
Red textured enamel

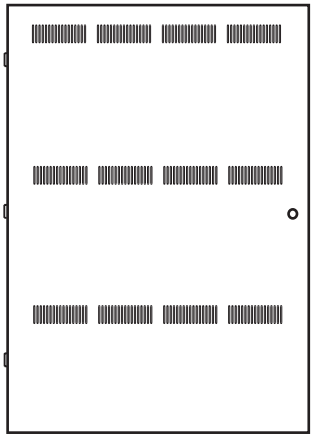
CABINET INSTALLATION

1. Mount the backbox at the required location. Cabinet installation dimensions are on the back page. A dedicated 230 VAC 50/60 Hz circuit is required for each cabinet. Install all conduit and pull all wiring into the backbox before proceeding to the next step.
2. Install the equipment chassis. Refer to chassis installation sheet for details.
3. Connect the door ground strap between the stud on the door and the backbox using the hardware provided.

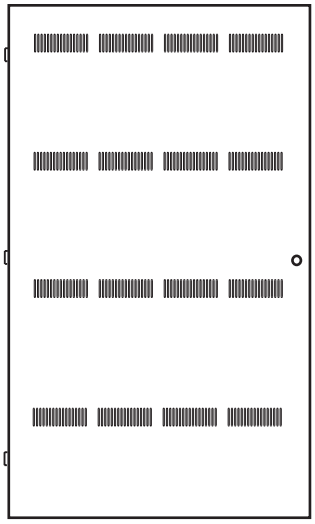
PRODUCT DIAGRAM



3-RCC7R-E



3-RCC14R-E



3-RCC21R-E

INSTALLATION SHEET

3-RCC-E Series
Remote Closet Cabinets

INSTALLATION SHEET P/N: 387551	FILE NAME: 387551.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 28MAY99	CREATED BY: M. Rimes

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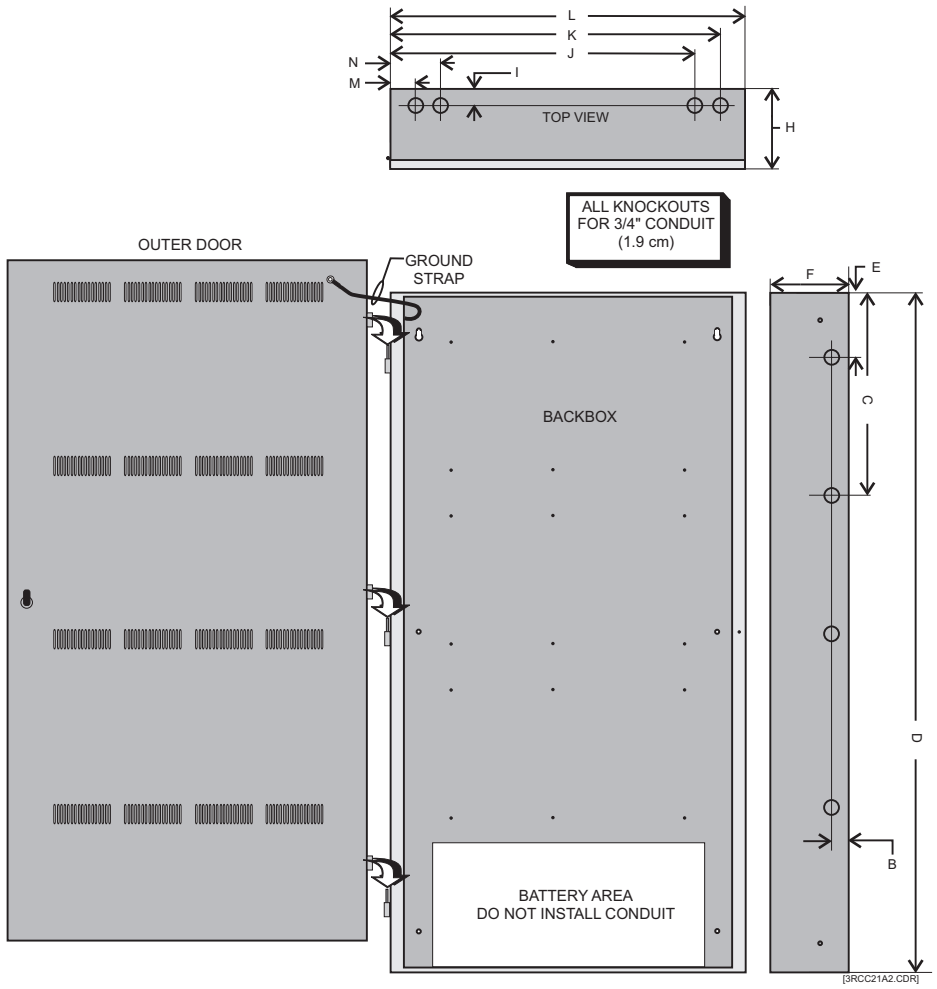
CABINET INSTALLATION DIMENSIONS



	RCC7R-E	RCC14R-E	RCC21R-E
A	23.36 in (59.3 cm)	35.61 in (90.4 cm)	47.75 in (121.29 cm)
B	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
C	14.1 in (35.8 cm)	14.1 in (35.8 cm)	14.1 in (35.8 cm)
D	23.25 in (59.1 cm)	35.47 in (90.1 cm)	47.72 in (121.21 cm)
E	4.37 in (11.1 cm)	4.37 in (11.1 cm)	4.37 in (11.1 cm)
F	5.5 in (13.97 cm)	5.5 in (13.97 cm)	5.5 in (13.97 cm)
G	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
H	5.5 in (13.97 cm)	5.5 in (13.97 cm)	5.5 in (13.97 cm)
I	1.25 in (3.18 cm)	1.25 in (3.18 cm)	1.25 in (3.18 cm)
J	21.44 in (54.46 cm)	21.44 in (54.46 cm)	21.44 in (54.46 cm)
K	23.25 in (59.03 cm)	23.25 in (59.03 cm)	23.25 in (59.03 cm)
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M	1.75 in (4.45 cm)	1.75 in (4.45 cm)	1.75 in (4.45 cm)
N	3.55 in (9.01 cm)	3.55 in (9.01 cm)	3.55 in (9.01 cm)

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PRODUCT DESCRIPTION

The 3-REMICA provides remote paging capability at stations located throughout a building or campus. The 3-REMICA can be connected to other remote microphone units to provide up to 63 stations on the paging circuit.

The 3-REMICA occupies 2 slot positions in a 2-space, 6-space or 10-space remote annunciator cabinet. When installed in a cabinet with an annunciator controller, the 3-REMICA must occupy the slot positions next to the controller.

The 3-REMICA housing assembly provides standoffs for mounting a Signature single input module when the system application requires electrical supervision. The 3-REMICA trouble relay contacts change state whenever an electrical short or open is detected on either the microphone or audio inputs, or whenever power is interrupted to the unit.

SPECIFICATIONS

Power Requirements
- Voltage: 21 - 27 Vdc
- Current: 52 mA

Space Requirements: 2 spaces in annunciator enclosure

Audio Output: 1 Vrms @ 400 Hz - 4 kHz

Trouble Relay Contacts
- Current: 1 A @ 30 Vdc resistive

Wiring
- Termination: All wiring connects to terminal block
- Size: 14 AWG (1.5 mm^2) max.
- Resistance: 210 Ω max
- Capacitance: 0.1 μF

Operating Environment
- Temperature 32 - 120 °F (0 - 49 °C)
- Humidity 93% non-condensing

WARNINGS

1. This product contains components which are sensitive to static electricity. Failure to follow proper handling procedures to prevent damage from electrostatic discharge may result in equipment failure.
2. Ensure the 24VDC riser is deenergized before making cable connections.

JUMPER SETTINGS

Jumper JP1 and JP2:

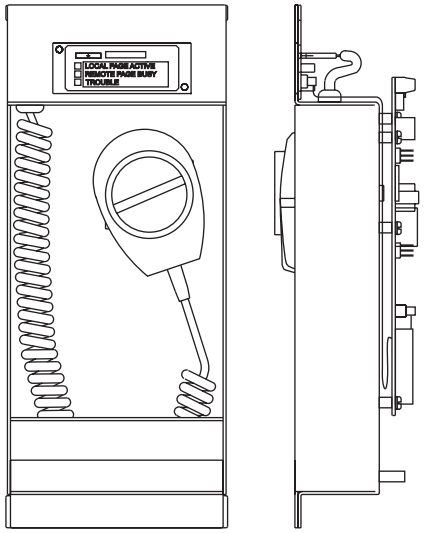
Position A: Selects ac supervision when connecting the audio output to 3-ASU.

Position B: Selects dc supervision when connecting the audio output to 3-REMICA.

INSTALLATION INSTRUCTIONS

1. Remove the top module retainer bracket on the inner door of the remote annunciator enclosure.
2. Loosen the bottom module retainer bracket.
3. Insert the bottom of the 3-REMICA into the bottom module retainer bracket next to the annunciator panel controller.
4. Tilt the 3-REMICA forward until the top touches the inner door.
5. Tighten the bottom module retainer bracket.
6. Secure the top module retainer bracket to the inner door.
7. Connect the cable assembly from P3 on the annunciator panel controller to P4 on the 3-REMICA.

3-REMICA



FRONT SIDE

INSTALLATION SHEET:

3-REMICA Remote Microphone

INSTALLATION SHEET P/N: 387466	FILE NAME: 387466.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Munn
DATE: 19JAN00	CREATED BY: M. Rimes

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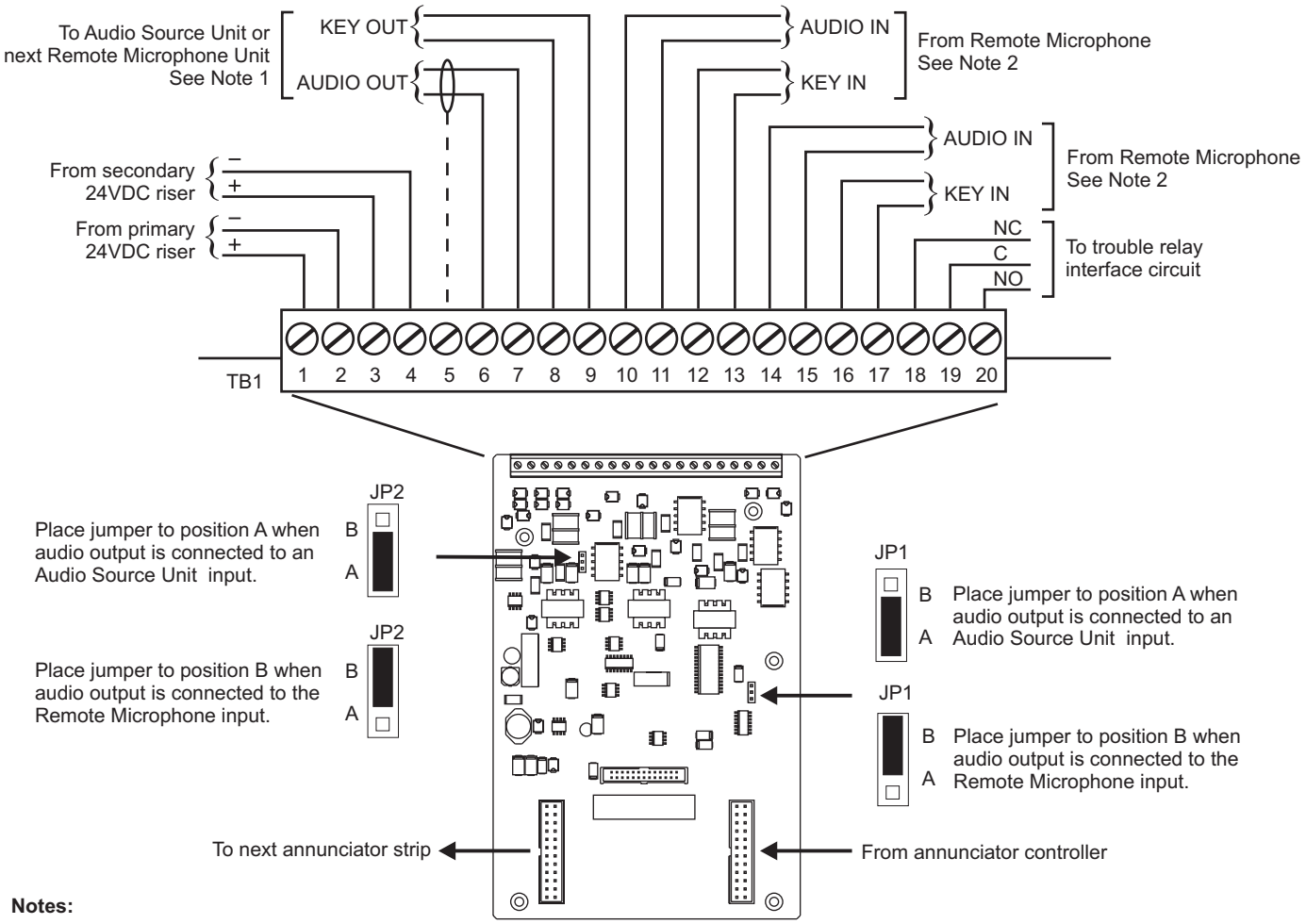
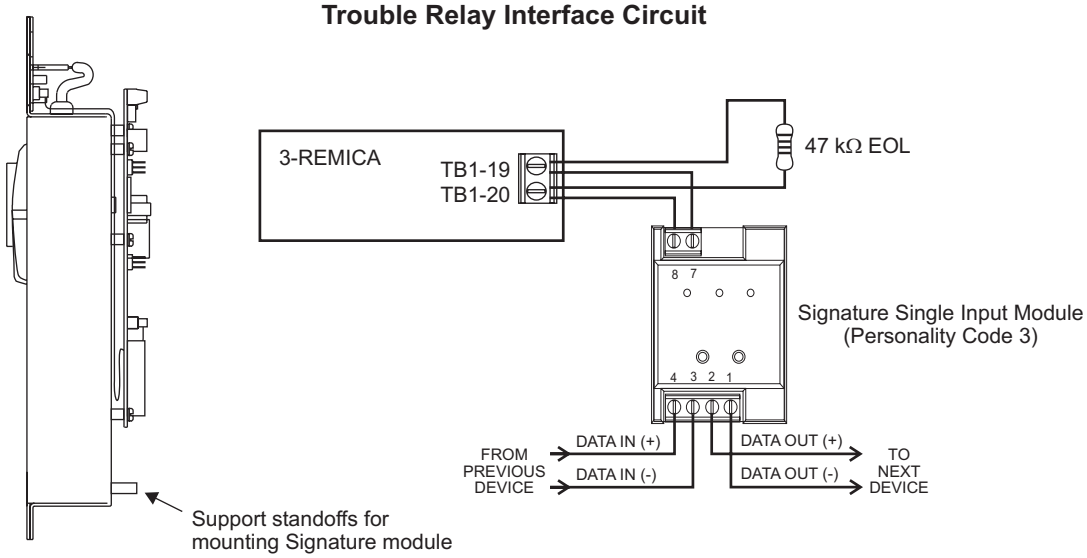
FIELD WIRING



Notes:

1. Power-limited and supervised.
2. Terminate KEY IN input with 1.8 kΩ EOL resistor when not used.

Trouble Relay Interface Circuit



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PRODUCT DESCRIPTION

The 3-REMICP provides remote paging capability throughout a building or campus. Each 3-REMICP has two inputs for cascading other remote microphone units. Connecting remote microphones in this manner provides up to 63 stations on the paging circuit.

Note: Remote microphone units may not be cascaded more than 6 deep (more than 6 units in a single circuit path).

The 3-REMICP consists of a page control housing assembly and separate circuit card. The 3-REMICP installs onto a 3-CHASS4 chassis assembly (ordered separately).

Trouble relay contacts provided on the 3-REMICP change state whenever an electrical short or open is detected on either the microphone or audio inputs, or whenever power is interrupted to the unit.

JUMPER SETTINGS

Jumper JP1 and JP2:

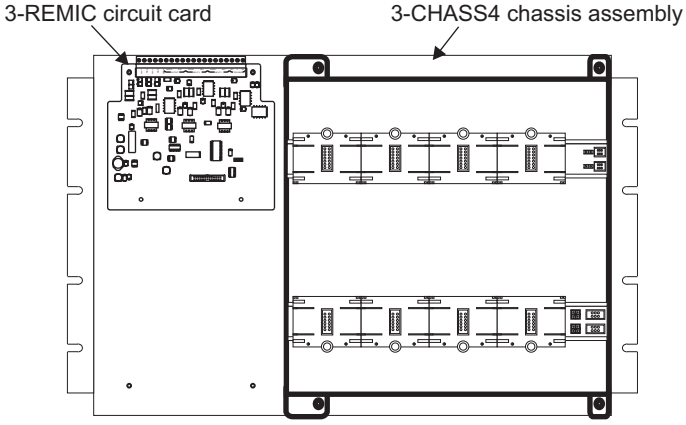
Position A:	Selects ac supervision when connecting the audio output to 3-ASU.
Position B:	Selects dc supervision when connecting the audio output to another remote microphone module.

WARNINGS

1. This product contains components which are sensitive to static electricity. Failure to follow proper handling procedures to prevent damage from electrostatic discharge may result in equipment failure.
2. Ensure the 24VDC riser is deenergized before making cable connections.

INSTALLATION INSTRUCTIONS

1. On the 3-REMIC circuit card assembly, configure JP1 and JP2 for the type of supervision required.
2. Screw the 3-REMIC circuit card to the 3-CHASS4 chassis assembly using four #6-32 X 1/2 pan head screws. See below.
3. Connect field wiring to 3-REMIC circuit card.
4. Connect the ribbon cable on the page control housing assembly to J1 on the 3-REMIC circuit card.
5. Position the page control housing on the threaded studs and secure using the four washers and nuts provided.



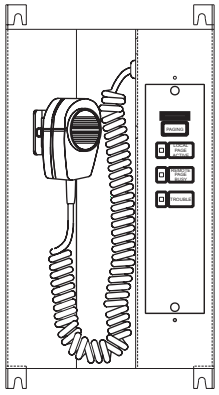
SPECIFICATIONS

Power Requirements	
Voltage:	21 - 27 Vdc
Current:	52 mA
Audio Output:	1 Vrms @ 400 Hz - 4 kHz
Trouble Relay Contacts	
Current:	1 A @ 30 Vdc resistive
Wiring	
Termination:	All wiring connects to terminal block
Size:	14 AWG (1.5 mm^2) max.
Resistance:	210 Ω max from output of last cascaded remote microphone to input of audio source unit
Capacitance:	0.1 μf
Operating Environment	
Temperature:	32 - 120 °F (0 - 49 °C)
Humidity:	93% non-condensing

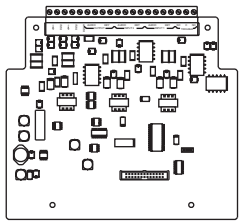
LED INDICATORS

Local page active:	lights when paging microphone is keyed and no other remote microphones are keyed.
Remote page busy:	lights when another remote microphone unit has control of the paging circuit.
Paging:	lights when speaking into the microphone while the key is pressed.
Trouble:	lights when trouble detected with paging circuit.

3-REMICP



Page Control Housing Assembly



3-REMIC Assembly

INSTALLATION SHEET:

3-REMICP Remote Microphone

INSTALLATION SHEET P/N: 387519	FILE NAME: 387519.CDR
REVISION LEVEL: 1.0	APPROVED BY: D. Munn
DATE: 15FEB99	CREATED BY: G. Sutton

A UNIT OF GENERAL SIGNAL
GS BUILDING SYSTEMS CORPORATION

GS BUILDING SYSTEMS CORPORATION

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625 6th Street East
Owen Sound, Ontario
Canada N4K 5P8

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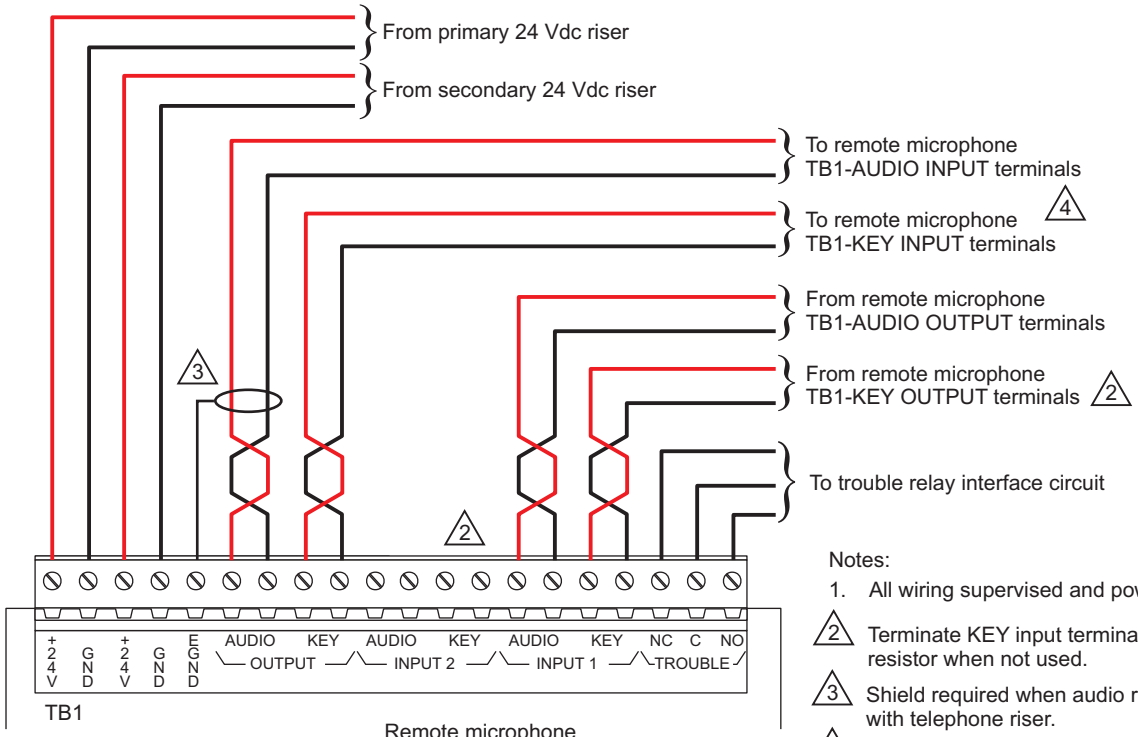
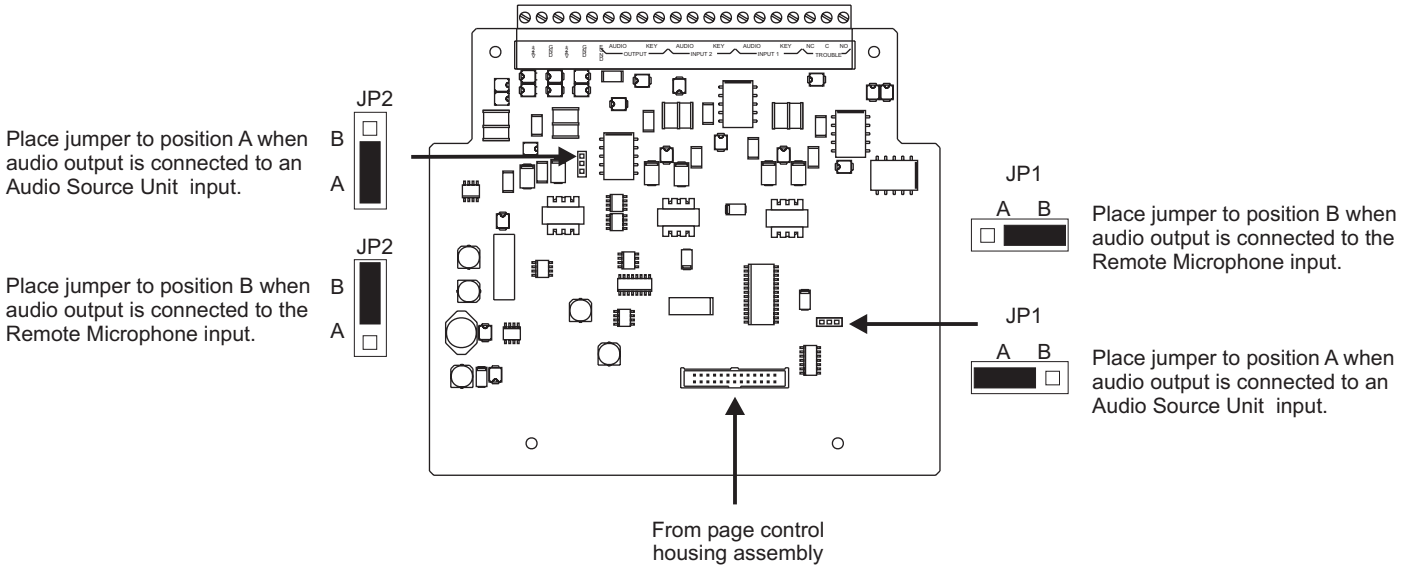
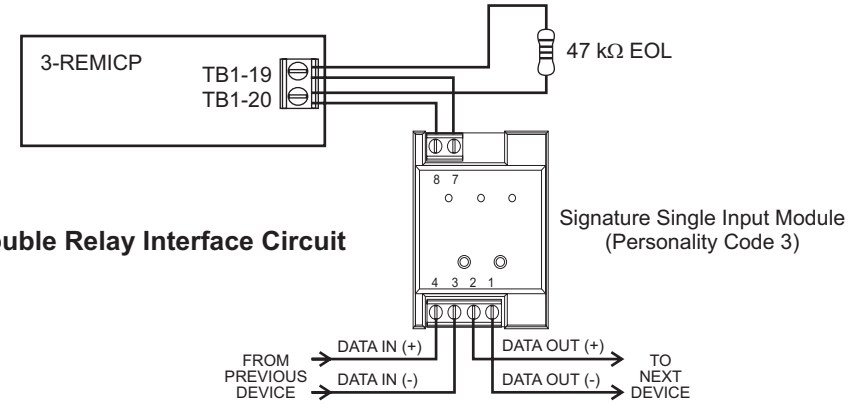
FIELD WIRING



Notes:

1. All wiring supervised and power-limited.
2. Terminate KEY input terminals with 1.8 kΩ EOL resistor when not used.
3. Shield required when audio riser shares conduit with telephone riser.
4. Connect to audio source unit TB1-REMOTE MIC AUDIO and -REMOTE MIC KEY input terminals when last remote microphone unit in chain.





Trouble Relay Interface Circuit

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INSTALLATION INSTRUCTIONS

1. With the wallbox securely mounted, attach the outer door to the outer door mounting studs as shown in Figure-1.

2. Attach a grounding strap from the ground strap stud on the wallbox to the outer door.

3. On semi-flush mounted wallboxes attach the inner door to the inner door mounting studs. See Figure-2. On surface mounted wallboxes screw the inner door to the mounting holes.

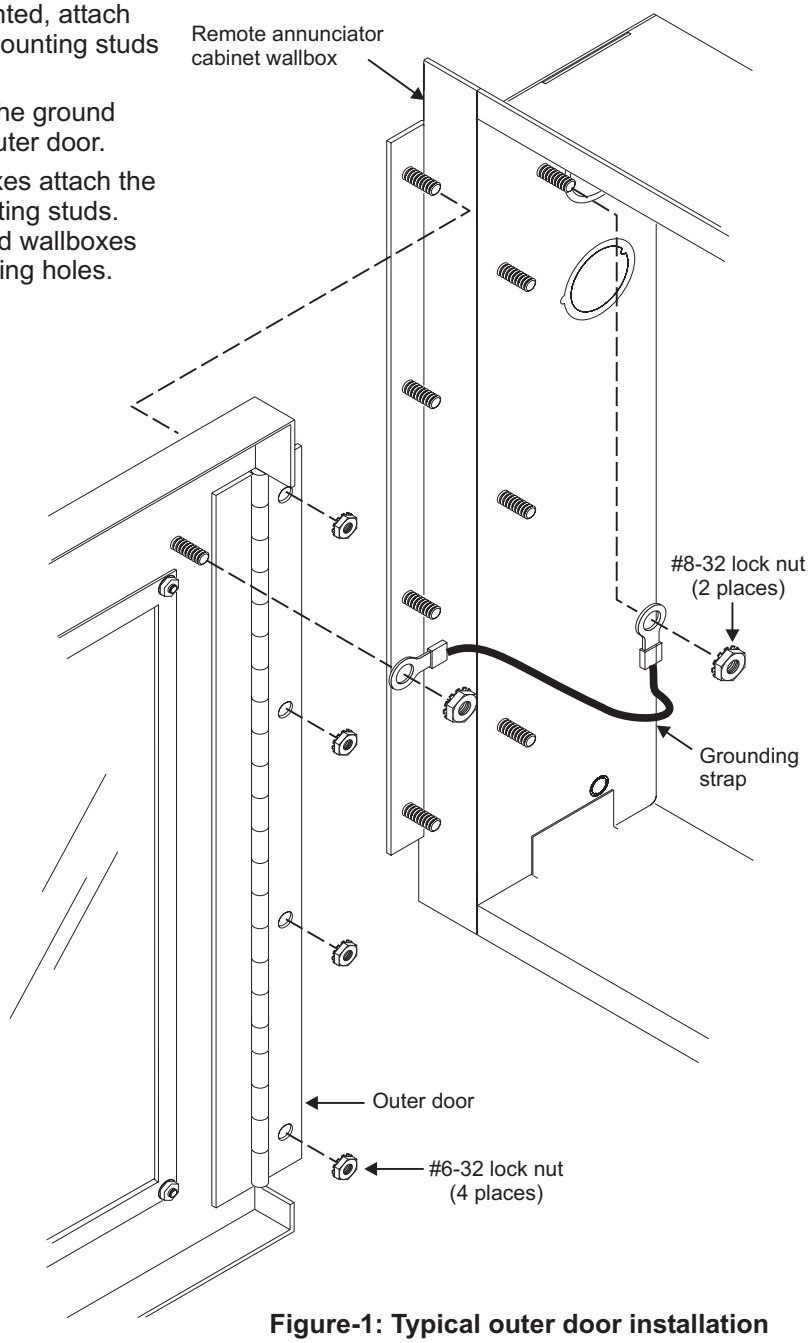

Figure-1: Typical outer door installation

PRODUCT DESCRIPTION

The remote annunciator cabinet door assembly consists of an inner door and an outer door. The outer door has a viewing window and is secured in the closed position with a key lock. The inner door provides mounting space for the panel electronics and is secured in the closed position with a captive screw.

The line of remote annunciator cabinet door assemblies include:

Model	Description
3-RLCM/D	Grey door with window for the 3-LCDANN semi-flush and surface mount cabinets
3-6ANN/D	Grey door with window for the 6-ANN semi-flush and surface mount cabinets
3-10ANN/D	Grey door with window for the 10-ANN semi-flush and surface mount cabinets

INSTALLATION SHEET:

3-RLCM/D, 3-6ANN/D, and 3-10ANN/D Remote Annunciator Cabinet Doors

INSTALLATION SHEET P/N: 387310	FILE NAME: 387310.CDR
REVISION LEVEL: 2.0	APPROVED BY: K. Patterson
DATE: 06DEC99	CREATED BY: G. Sutton

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Note: Figure-2 shows how the inner door attaches to a wallbox designed for semi-flush mount applications. Surface mount wallboxes use self-tapping screws and pre-drilled holes to attach the inner door to the wallbox.

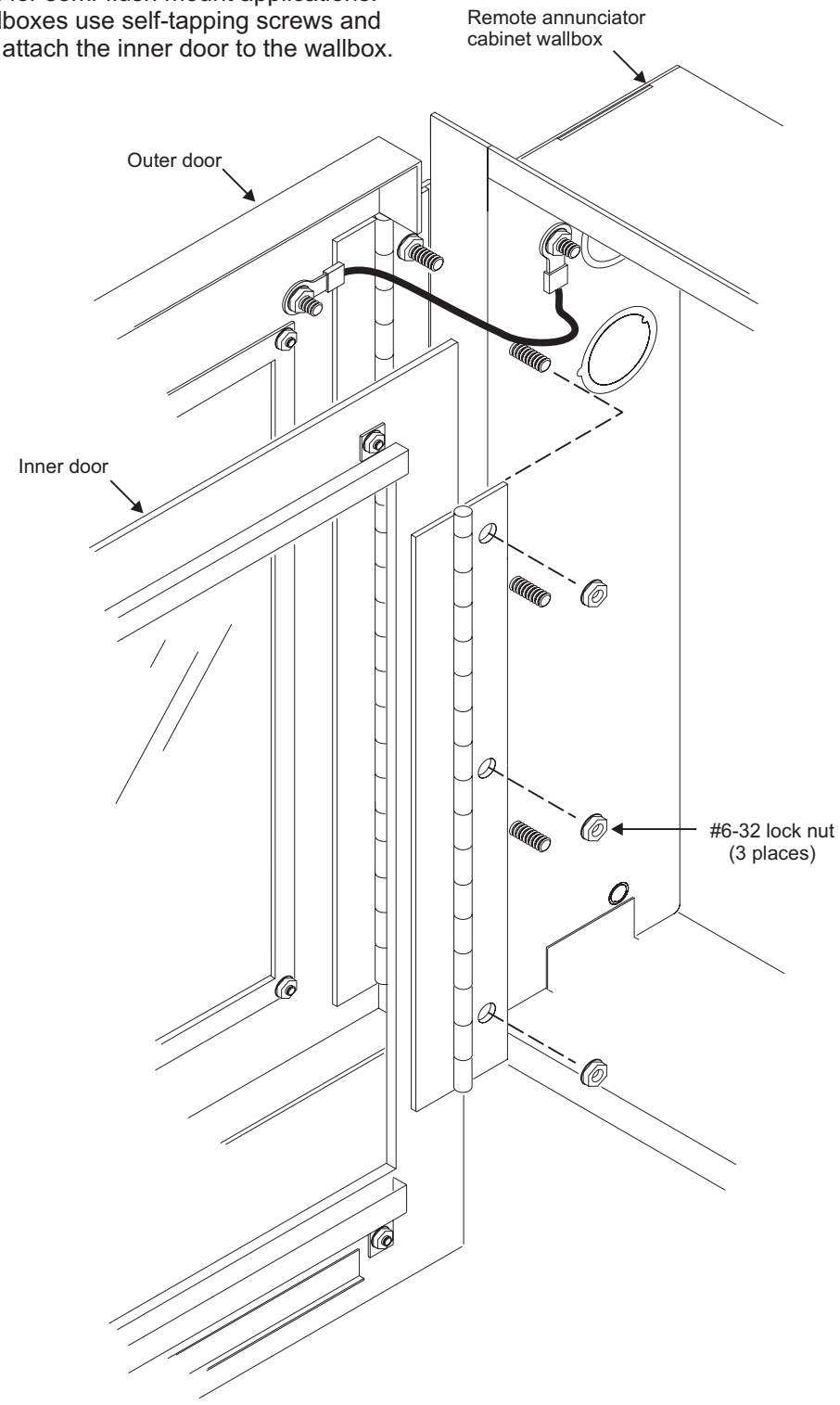

Figure-2: Typical inner door installation (semi-flush mount wallbox shown)

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INSTALLATION INSTRUCTIONS

1. With the wallbox securely mounted, attach the outer door to the outer door mounting studs as shown in Figure-1.

2. Attach a grounding strap from the ground strap stud on the wallbox to the outer door.

3. On semi-flush mounted wallboxes attach the inner door to the inner door mounting studs. See Figure-2. On surface mounted wallboxes screw the inner door to the mounting holes.

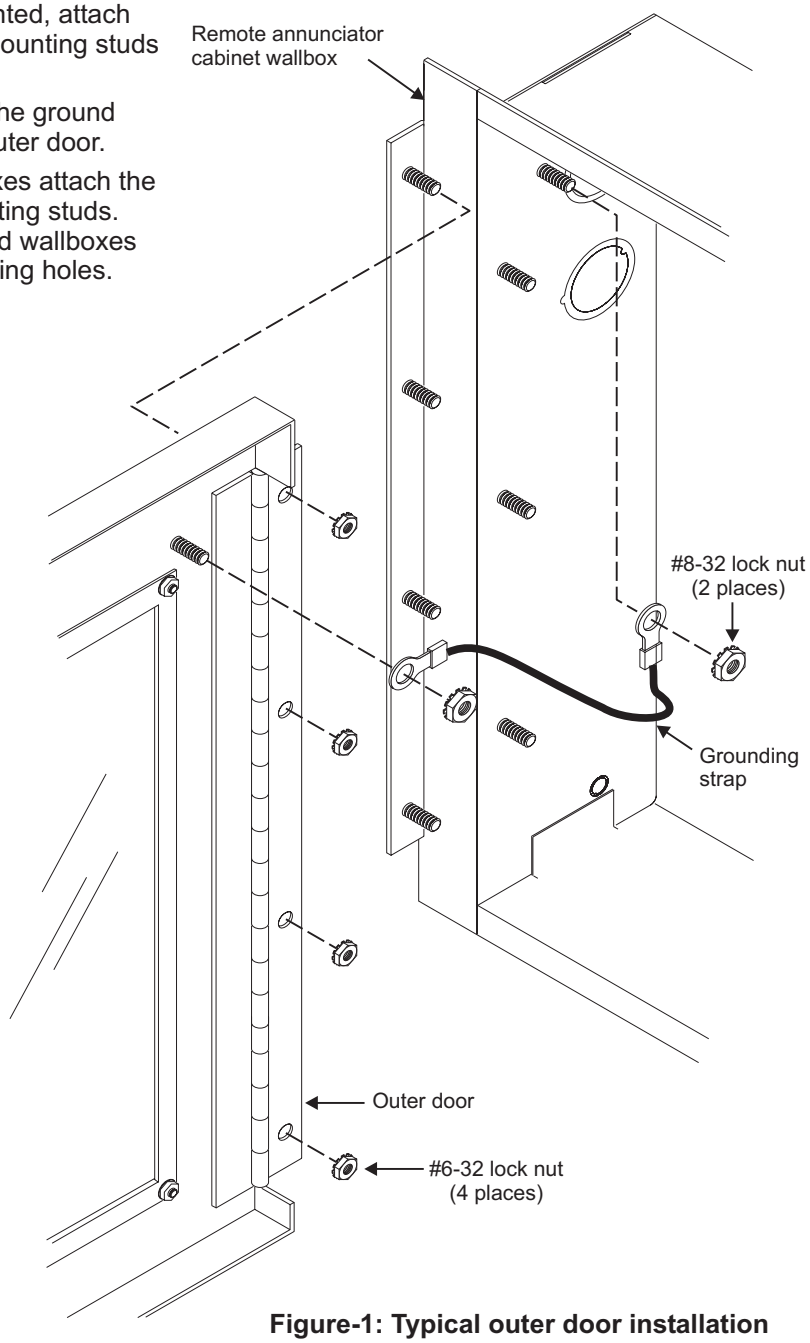

Figure-1: Typical outer door installation

PRODUCT DESCRIPTION

The remote annunciator cabinet door assembly consists of an inner door and an outer door. The outer door has a viewing window and is secured in the closed position with a turn knob lock. The inner door provides mounting space for the panel electronics and is secured in the closed position with a captive screw.

The line of remote annunciator cabinet door assemblies include:

Model	Description
3-RLCM/D-E	Grey door with window for the 3-LCDANN-E semi-flush and surface mount cabinets
3-6ANN/D-E	Grey door with window for the 3-6ANN-E semi-flush and surface mount cabinets
3-10ANN/D-E	Grey door with window for the 3-10ANN-E semi-flush and surface mount cabinets

INSTALLATION SHEET:

3-RLCM/D-E, 3-6ANN/D-E, and 3-10ANN/D-E Remote Annunciator Cabinet Doors

INSTALLATION SHEET P/N: 387553	FILE NAME: 387553.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 06DEC99	CREATED BY: G. Sutton

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Note: Figure-2 shows how the inner door attaches to a wallbox designed for semi-flush mount applications. Surface mount wallboxes use self-tapping screws and pre-drilled holes to attach the inner door to the wallbox.

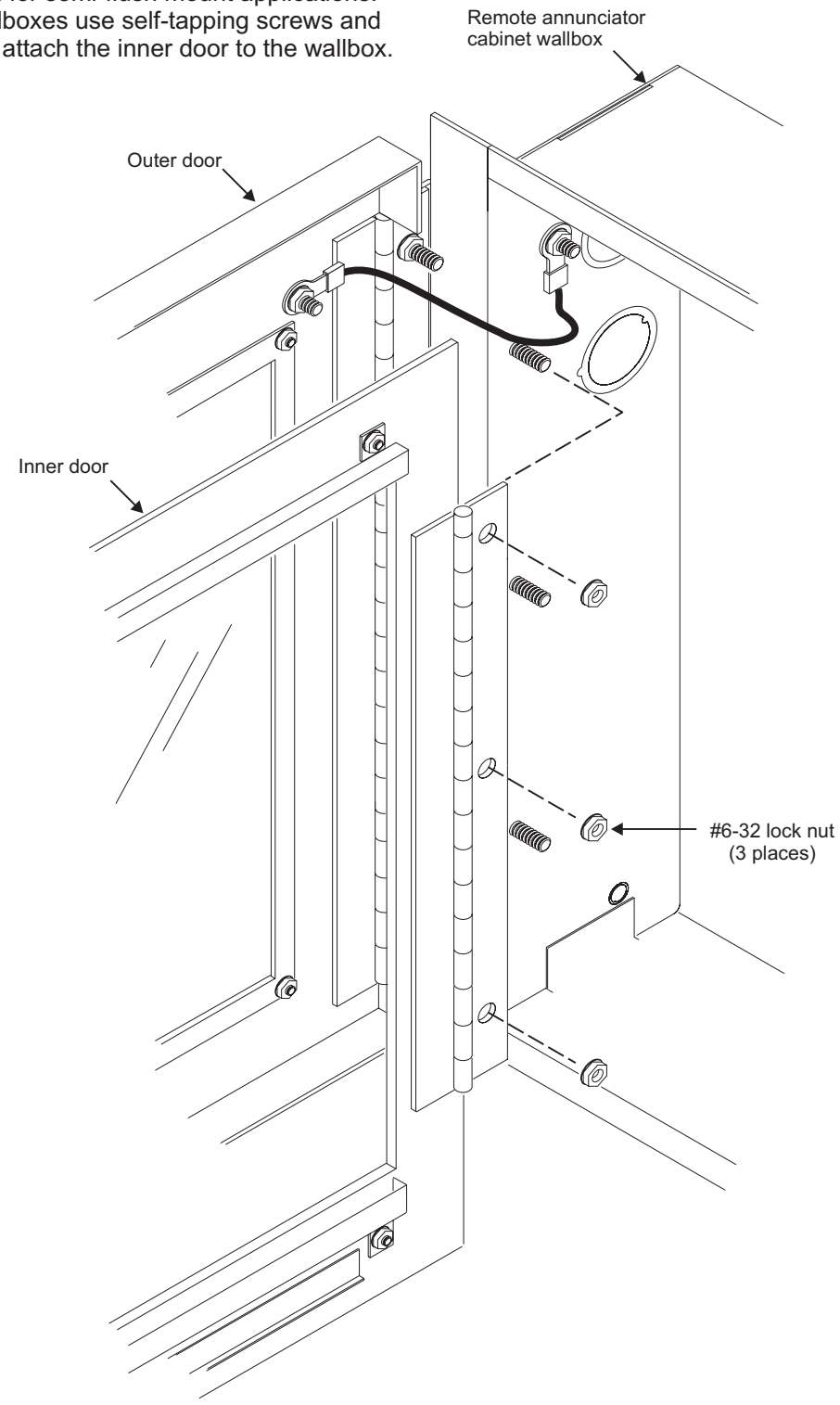

Figure-2: Typical inner door installation (semi-flush mount wallbox shown)

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SPECIFICATIONS

3-RS485B, 3-RS485A, 3-RS485R Network Communications Card

Note: The 3-RS485R is only available as a direct service replacement for older 3-RS485 assemblies (P/N 240626 and P/N 240971).

Installation:	Plugs into connector J2 on the 3-CPU1
Network Data Circuit:	
Circuit Configuration:	Class A (3-RS485A and 3-RS485B) Class B (3-RS485A and 3-RS485B)
Isolation:	Network A port not isolated Network B port isolated
Wire Type:	Twisted pair,18 AWG (0.75 mm^2) min.
Circuit Length:	5,000 ft (1,524 m) between any 3 panels
Circuit Resistance:	90 Ω, max
Circuit Capacitance:	0.3 μF, max.
Network Audio Circuit:	
Circuit Configuration:	Class A (3-RS485A only) Class B (3-RS485A and 3-RS485B)
Isolation:	Audio AIN and Audio BIN isolated Audio AOUT and Audio BOUT not isolated
Wire Type:	Twisted pair,18 AWG (0.75 mm^2) min.
Circuit Length:	5,000 ft (1,524 m) between any 3 panels
Circuit Resistance:	90 Ω, max
Circuit Capacitance:	0.09 μF, max.
Operating Environment	
Temperature:	32 - 120 °F (0 - 49 °C)
Humidity:	93% RH, non-condensing
Current Requirements	
Standby:	55 mA
Alarm:	55 mA

3-RS232 Ancillary Communications Card

Installation:	Plugs into connector J3 of the 3-CPU1
Circuit Configuration:	Class B
Circuit Type:	Two optically-isolated RS-232 serial
Baud Rate:	300, 1200, 2400, 4800, 9600, 19200, 38400
Max. Circuit Length:	50 ft (15.2 m)
Minimum Wire Size:	18 AWG (0.75 mm^2)
Operating Environment	
Temperature:	32 - 120 °F (0 - 49 °C)
Humidity:	93% RH, non-condensing
Current Requirements	
Standby:	48 mA
Alarm:	48 mA

INSTALLATION INSTRUCTIONS

1. Plug the option card into the appropriate connector on the back side of the 3-CPU1 (see figure on page 2 of this installation sheet). The card should be firmly seated in its connector.
2. Secure the card to the controller by pressing the push fastener on the front side of the 3-CPU1.
3. Plug the 3-CPU1 into the rail chassis assembly.
4. Connect the field wiring. Refer to installation sheet P/N 387465.

PRODUCT DESCRIPTION

3-RS485B, 3-RS485A, 3-RS485R Network Communications Card

When installed, the 3-RS485B and 3-RS485A network communication cards add networking capability to the 3-CPU1 central processor module. Each card provides two independent RS-485 circuits for network data communications and digital audio communications. The 3-RS485B supports Class A (Style 7) or Class B (Style 4) data circuits and Class B (Style 4) audio circuits. The 3-RS485A supports Class A (Style 7) or Class B (Style 4) data circuits and Class B (Style 4) or Class A (Style 7) audio circuits.

Note: The 3-RS485R is a direct replacement for older 3-RS485 assemblies (P/N 240626 and P/N 240971). Failure to replace these assemblies with the 3-RS485R may result in system audio troubles.

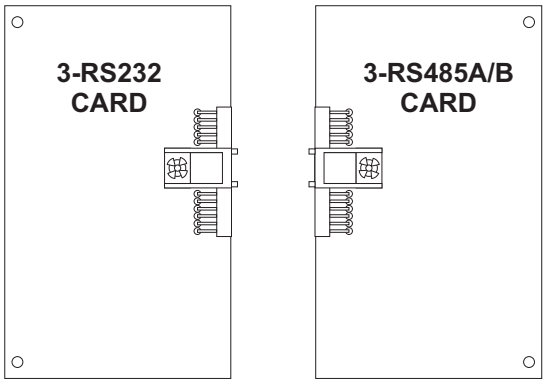
3-RS232 Ancillary Communications Card

When installed, the 3-RS232 ancillary communications card adds two RS-232 serial ports to the 3-CPU1 central processor module. These ports are used to connect serial devices such as printers, modems, and external command and control equipment.

WARNINGS

1. This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures may cause equipment damage.
2. Rail modules may not be plugged into the rail chassis assembly while voltages are present on the rail. Failure to de-energize the panel before plugging in the rail module may result in equipment damage.

OPTION CARDS



INSTALLATION SHEET:

Option cards

3-RS485(A/B/R) Network communications card
3-RS232 Ancillary communications card

INSTALLATION SHEET P/N: 270489	FILE NAME: 270489.CDR
REVISION LEVEL: 3.0	APPROVED BY: D. Munn
DATE: 05FEB00	CREATED BY: G. Sutton

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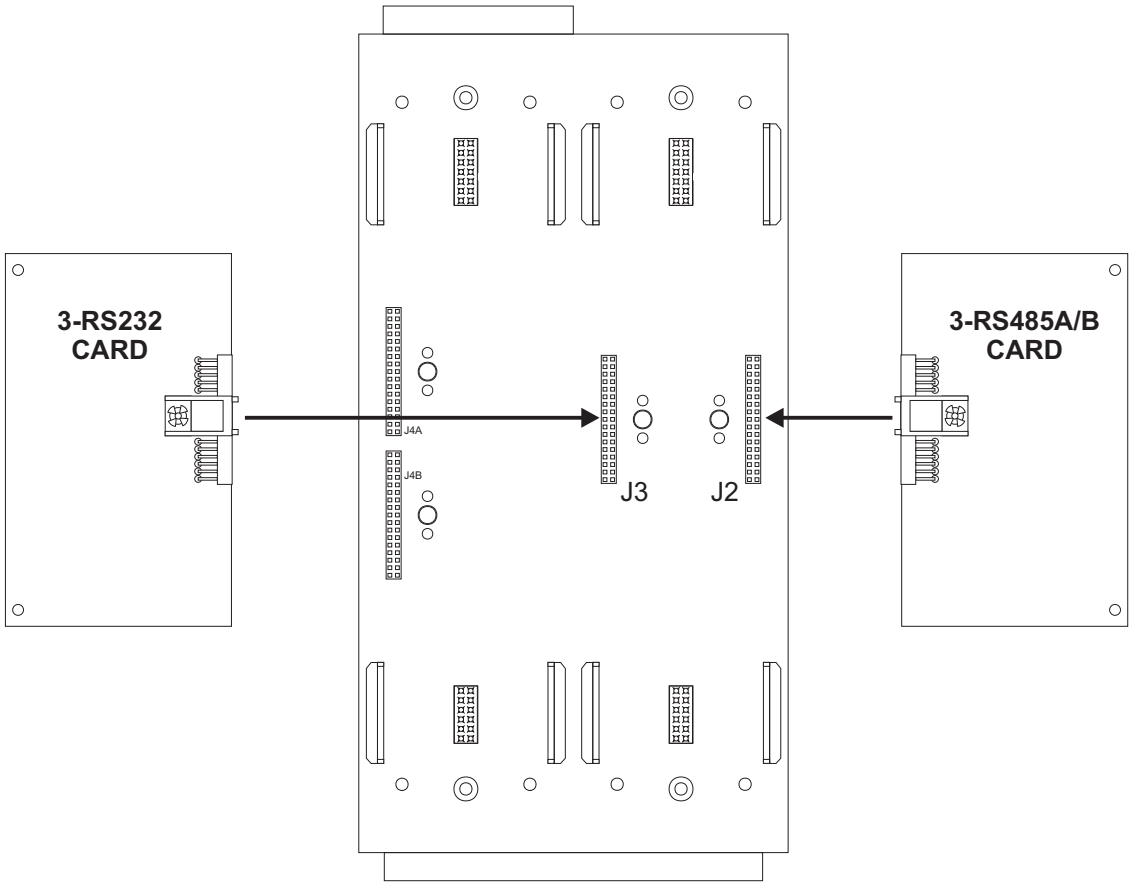

3-CPU1
Rear view

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PRODUCT INFORMATION

The 3-SSDC Single Signature Driver Controller module provides one Class A or Class B Signature data circuit for Signature Series detectors and modules. The module also provides a connection for powering conventional 2-wire smoke detector circuits on Signature Series modules.

The 3-SSDC module supports the full complement of Signature diagnostic features including mapping. The module features a hinged front panel for mounting displays or a blank protective faceplate.

The 3-SSDC module requires one connection on the rail chassis and is secured to the rail assembly using snap rivet fasteners. All field wiring connections are made via plug-in connectors that permit termination of field wiring without the module installed in the enclosure. The plug-in connectors and snap rivet mounting also facilitate rapid troubleshooting without the use of tools.

INSTALLATION INSTRUCTIONS

1. Connect the SDC card to CIRCUIT 1 on the back side of the rail module assembly. See Figure-1 on reverse side.
2. If a control/display module is required install it at this time. Refer to the instructions provided with the control/display module.
3. Carefully plug in the filter board into the connector on the rail module and install the module on the rail.
4. Before connecting the field wiring, test the field wiring for opens or shorts. When a circuit checks out properly, connect it to the appropriate terminals as shown in the diagram on the next page. Polarity is indicated for normal monitoring of the circuit's electrical integrity.

WARNINGS

This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures may result in equipment damage.

Rail modules may not be plugged into the rail chassis assembly while voltages are present on the rail. Failure to de-energize the panel before plugging in the rail module may result in equipment damage.

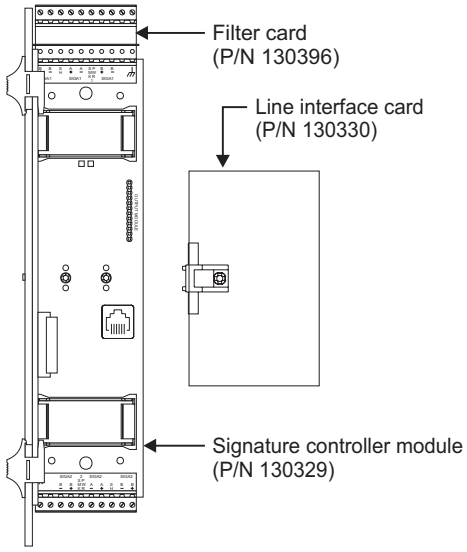
Do not flex the filter card or exert excessive pressure on the field wiring connectors when installing the filter card.

Do not connect field wiring or connect/disconnect the terminal block without supporting the back edge of the filter card to avoid flexing the filter card.

SPECIFICATIONS

Installation:	1 LRM Space on rail chassis
Module Configuration:	1 Signature Data Circuit
Smoke Power:	24 Vdc @ 85 mA
Maximum Wire Size:	12 AWG (1.5 mm^2)
Termination:	Removable plug-in terminal strips on module
Operating Environment:	32 - 120 °F (0 - 49 °C) 93% RH, non-condensing
Circuit Configuration:	Class B (Style 4) or Class A (Style 6)
Circuit Capacity:	125 Signature Series detectors and 125 Signature Series modules per circuit.
Circuit Resistance:	79 Ω, max.
Circuit Capacitance:	0.33 μF, max
Current Requirements	
Standby:	158 mA
Alarm:	177 mA

PRODUCT DIAGRAM



INSTALLATION SHEET

3-SSDC Single Signature Driver Controller

INSTALLATION SHEET P/N: 270491	FILE NAME: 270491.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 04OCT99	CREATED BY: G. Sutton

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GS BUILDING SYSTEMS CORPORATION

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625 6th Street East
Owen Sound, Ontario
Canada N4K 5P8

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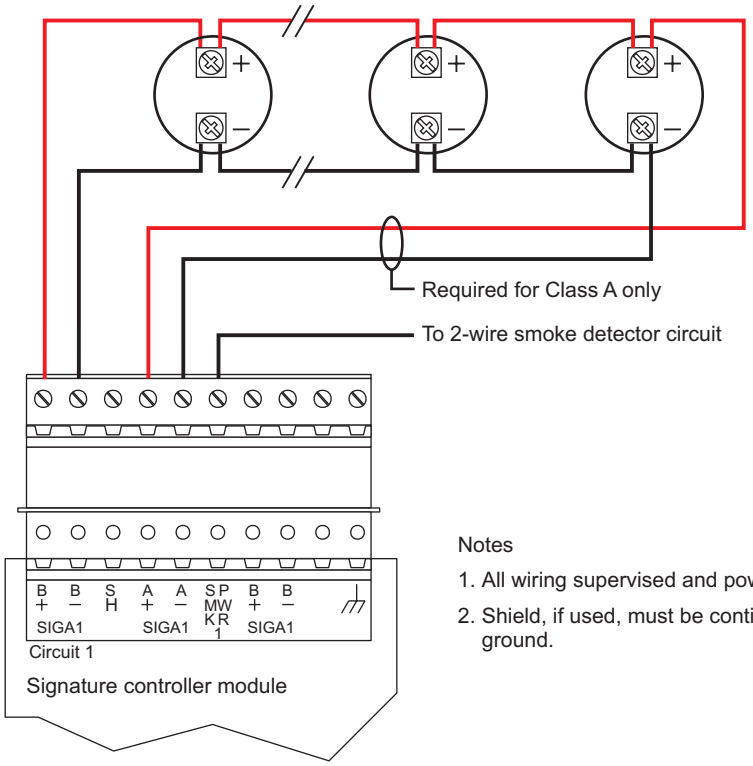
WIRING DIAGRAM



Notes

1. All wiring supervised and power-limited.
2. Shield, if used, must be continuous and free from earth ground.

INSTALLATION INSTRUCTIONS (CONT.)

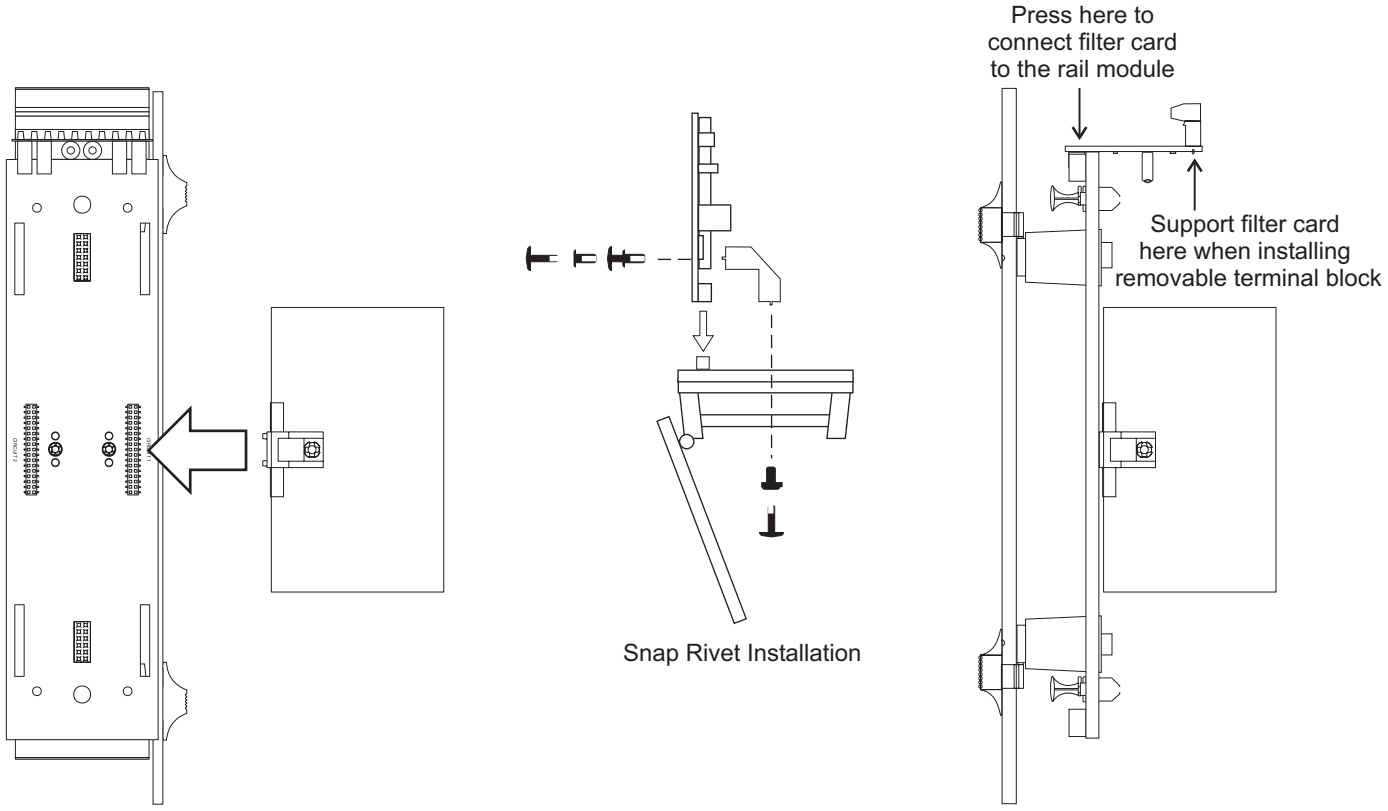


Figure-1: Filter card and LIM card installation

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PRODUCT DESCRIPTION

Tamper switches are used to detect an open cabinet door. Three models are available:

- the 3-TAMP5 for the CAB5
- the 3-TAMP for the CAB series of equipment enclosures
- the 3-TAMPRCC for the RCC series of equipment enclosures

Two end-of-line resistors are soldered to the switch terminal connections. Use the 4.7 kΩ resistor when connecting to a IDC8/4 initiating device circuit module. Use the 47 kΩ end-of-line resistor when connecting to a Signature input signal module.

The tamper switch plunger can be extended to place the switch in its bypass position and make it appear that the cabinet door is closed.

INSTALLATION INSTRUCTIONS

1. Mount the tamper switch to the cabinet (see below).
2. Do one of the following:
   - If the tamper switch is being connected to a IDC8/4 initiating device circuit module, cut out the 47 kΩ end-of-line resistor.
   - If the tamper switch is being connected to a Signature input signal module, cut out the 4.7 kΩ resistor.
3. Wire the tamper switch to the initiating device circuit.

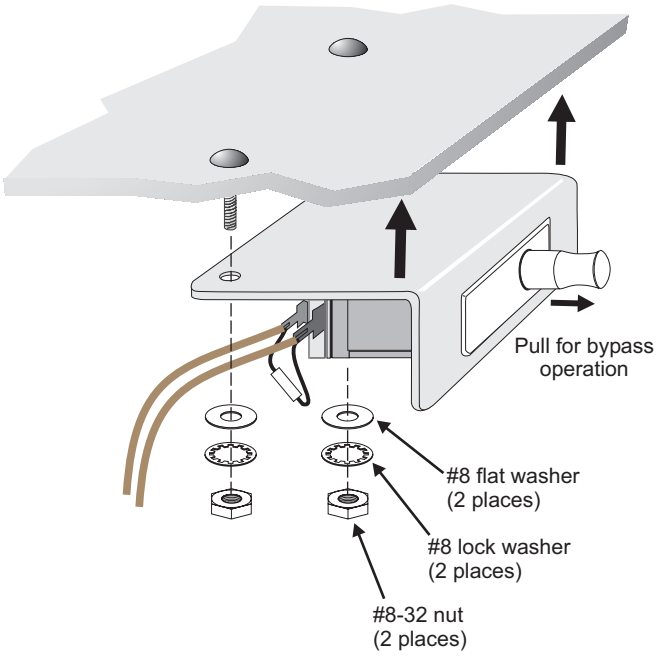
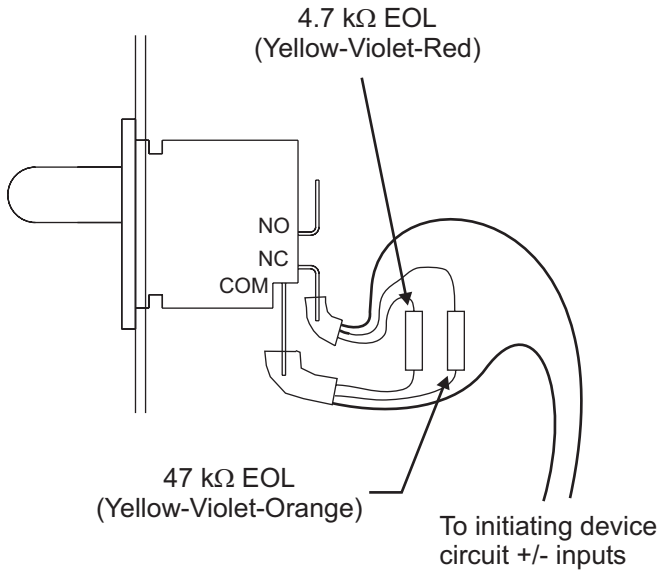
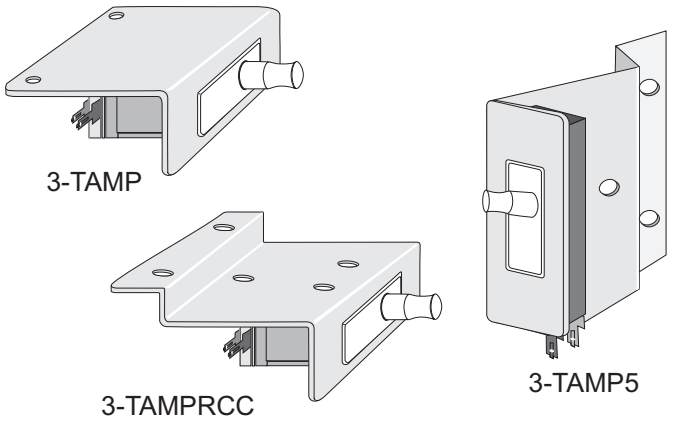


Figure-1: Tamper switches mount to the top or side of their respective cabinets and are secured using hardware provided in the hardware kit. This figure shows the installation of a 3-TAMP.

FIELD WIRING



PRODUCT DIAGRAM



INSTALLATION SHEET

3-TAMP, 3-TAMP5, 3-TAMPRCC Cabinet Tamper Switches

INSTALLATION SHEET P/N: 387422	FILE NAME: 387422.CDR
REVISION LEVEL: 2.0	APPROVED BY: B. Shivers
DATE: 17NOV99	CREATED BY: G. Sutton

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PRODUCT DESCRIPTION

The model 3-ZA20A/B and 3-ZA40A/B audio amplifiers demultiplex the 8 multiplexed audio signals on the network audio riser. Under command of the network, 1 of the 8 available signals is distributed over the speaker circuit. Command and control signals for the amplifier are sent and received via the network data riser in response to network programming.

Amplifers are in 20- and 40-Watt, Class A and Class B versions. Supervised, power-limited 25 Vrms or 70 Vrms outputs are available on both versions. Amplifiers use a Class D switch mode design to provide better than 80% efficiency. Each amplifier's output is directly wired to a single speaker zone.

Each amplifier has a 1 kHz temporal (3-3-3) tone generator for use as an evacuation signal in the event of a fault with the network audio circuit. A standby amplifier may be configured for automatic replacement of any online amplifier configuration, in the event of an online amplifier failure. The standby amplifier must be the same wattage as the largest amplifier within the enclosure. The amplifiers draw power from the primary and booster power supplies which must be sized according to the enclosure electrical load.

Each amplifier is also provided with an independently controlled supervised, power limited 24 VDC Notification Appliance Circuit (NAC) rated at 3.5 A. This facilitates the addition of visual notification appliances to audio notification circuits.

Each amplifier requires one LRM space on the rail chassis and is secured to the assembly using snap rivet fasteners. All field wiring connections to the amplifier module are made via plug-in connectors, permitting termination of field wiring without the module installed in the enclosure.

WARNINGS

1. This product contains components that are sensitive to static electricity. Failure to follow proper handling procedures may cause equipment failure.
2. Rail modules should not be plugged into the rail chassis assembly while 24 Vdc is present on the rail. Failure to remove 24 Vdc may damage the equipment.
3. Operating the amplifier at an output greater than that required by the speaker may overdrive the speaker circuit and result in damage to the equipment.

INSTALLATION INSTRUCTIONS

1. If the panel is already in service, disconnect the storage battery then deenergize the mains ac circuit supplying power to the panel.
2. Set jumpers JP1 and JP2 on the audio power module subassembly for 25 or 70 Vrms, depending on the input required by the audio circuit speakers.

	JP1	JP2
25 Vrms	2 to 3	2 to 3
70 Vrms	1 to 2	1 to 2

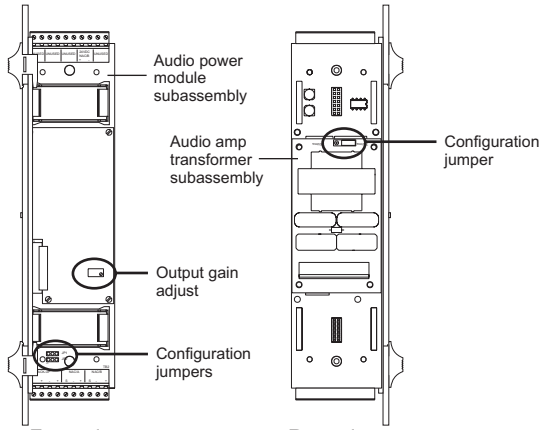
3. Set the jumper on the audio amp transformer subassembly for 25 or 70 Vrms, depending on the input required by the audio circuit speakers.
4. Slide the amplifier module into the required rail chassis slot position.
5. Gently push the zone amplifier module into the connectors to ensure good contact.
6. Secure the zone amplifier module to the rail by pushing in the top and bottom snap rivet fasteners.
7. Connect the field wiring.

Note: The gain control pot may be adjusted later for desired output level. Fully CCW is maximum gain and fully CW is minimum gain.

SPECIFICATIONS

Installation:	1 rail chassis slot position
Frequency Response:	400 Hz to 4 kHz at -3 dB
Harmonic Distortion:	< 7%
Audio Circuit:	
Wiring Configuration	
3-ZA20B/40B	Class B (Style Y)
3-ZA20A/40A	Class A (Style Z) or Class B (Style Y)
EOL Resistor	15 kΩ (internal on 3-ZA20A/40A)
Outputs:	
3-ZA20A/20B	20 watts @ 25 Vrms or 70 Vrms
3-ZA40A/40B	40 watts @ 25 Vrms or 70 Vrms
Current Rating	
Standby	35 mA (all models)
Alarm	1.25 A (3-ZA20A/20B) 2.30 A (3-ZA40A/40B)
24 Vdc NAC Circuit:	
Wiring Configuration	
3-ZA20B/40B	Class B (Style Y)
3-ZA20A/40A	Class A (Style Z) or Class B (Style Y)
Voltage	24 Vdc nominal
Current	3.5 A
EOL Resistor	15 kΩ (internal on 3-ZA20A/40A)
Termination	Removable plug-in terminal strips
Maximum Wire Size	12 AWG (2.5 mm^2)
Backup Tone	1 kHz temporal (3-3-3)
Operating Environment	
Temperature	32 - 120 °F (0 - 49 °C)
Humidity	93% RH, non-condensing

3-ZA20A/B, 3-ZA40A/B



INSTALLATION SHEET:

3-ZA20A, 3-ZA20B, 3-ZA40A, 3-ZA40B Zoned Audio Amplifiers

INSTALLATION SHEET P/N: 387463	FILE NAME: 387463.CDR
REVISION LEVEL: 2.0	APPROVED BY: E. Onstine
DATE: 05FEB00	CREATED BY: G. Sutton

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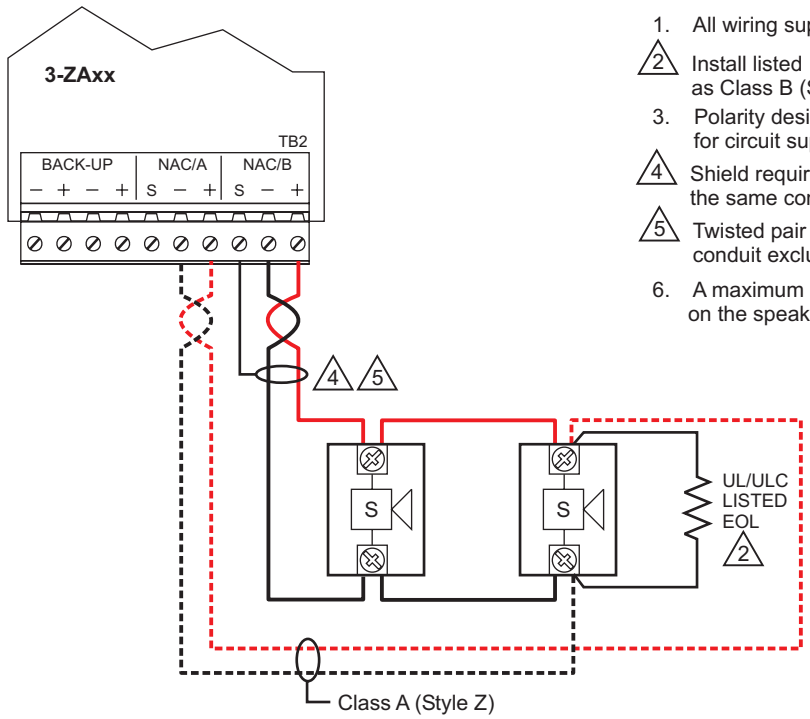

Notes:

1. All wiring supervised and power-limited.
2. Install listed 15k ohm EOL resistor on last device only when wired as Class B (Style Y) riser.
3. Polarity designations on connector indicate output signal polarity for circuit supervision. The polarity reverses in an alarm condition.
4. Shield required when audio riser and telephone riser share the same conduit.
5. Twisted pair not required only when audio circuit riser shares conduit exclusively with 24 Vdc riser or in conduit by itself.
6. A maximum of 10 SIGA-CC1s or SIGA-CC2s may be installed on the speaker circuit.

Figure-1: Typical 25 or 70 Vrms notification appliance circuit wiring

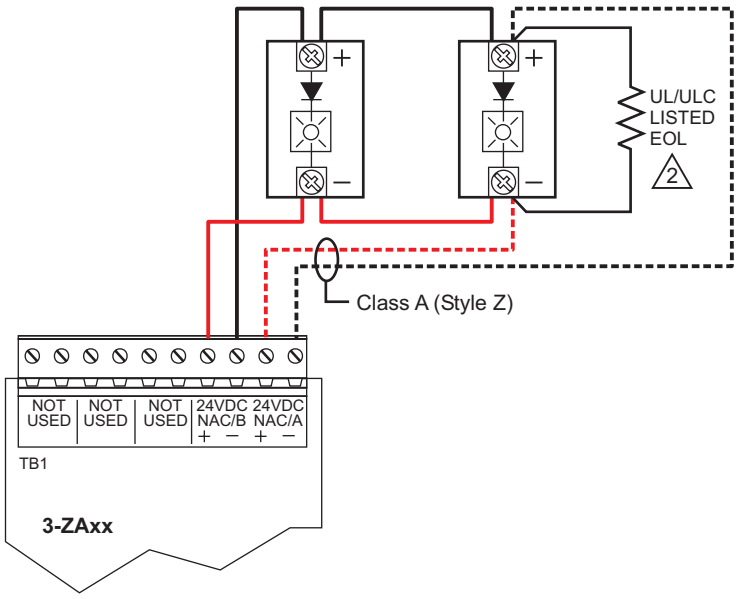

Figure-2: Typical 24 Vdc notification appliance circuit wiring

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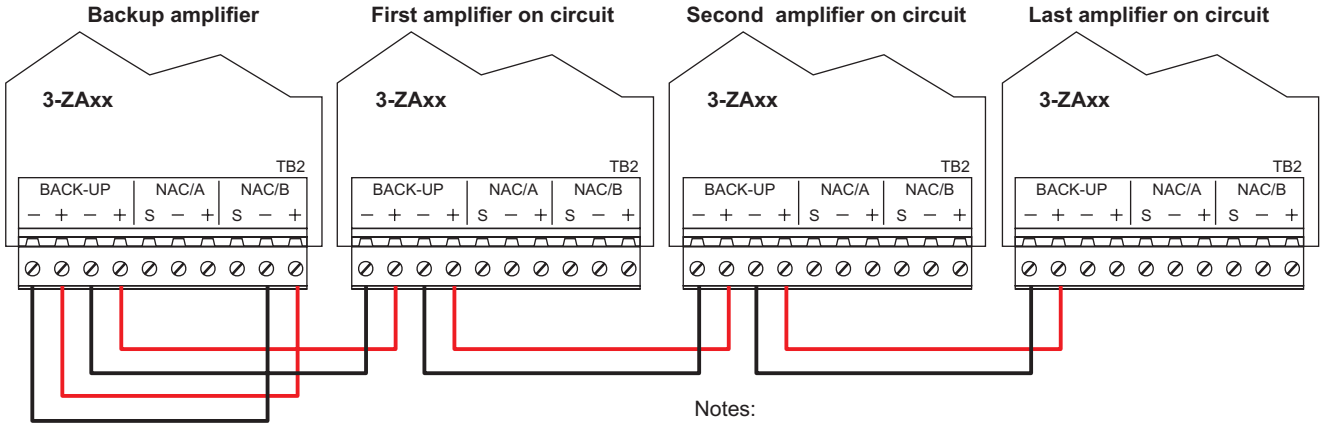
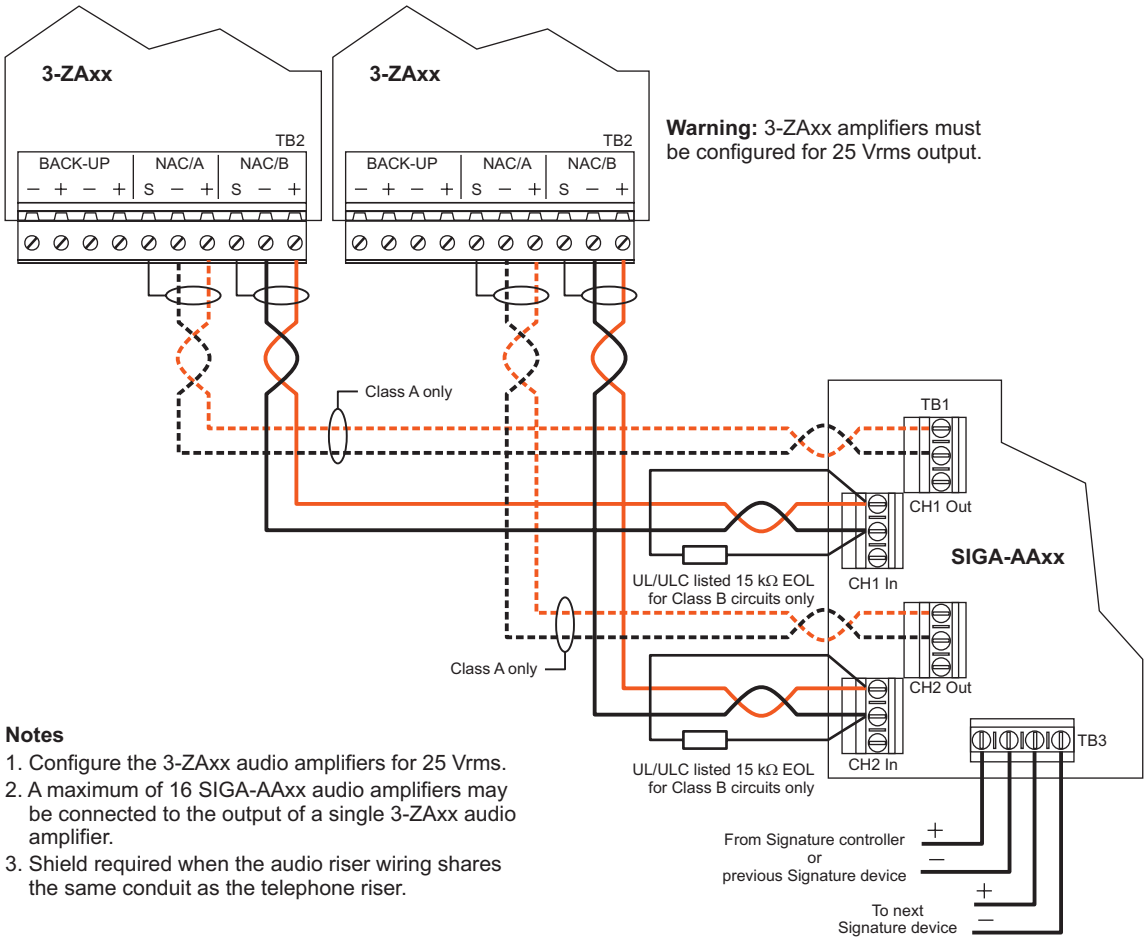


Notes:

1. All wiring supervised and power-limited.
2. Backup amplifier must be rated greater than or equal to the other amplifiers to which it is connected and be installed in the same enclosure.
3. Backup amplifier wiring must be rated greater than or equal to field wiring used on amplifiers connected to the backup amplifier.

Figure-3: Typical backup amplifier wiring



Warning: 3-ZAxx amplifiers must be configured for 25 Vrms output.

Notes

1. Configure the 3-ZAxx audio amplifiers for 25 Vrms.
2. A maximum of 16 SIGA-AAxx audio amplifiers may be connected to the output of a single 3-ZAxx audio amplifier.
3. Shield required when the audio riser wiring shares the same conduit as the telephone riser.

Figure-4: Typical wiring connecting to SIGA-AAxx audio amplifier

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PRODUCT DESCRIPTION

The 3-ZA90 zoned audio amplifier module is a key component in an emergency communication system that consists of audible notification appliances (speakers only). The 3-ZA90 provides the following:

- 90 watts of power
- standard output line levels of 25 Vrms or 70 Vrms
- a 1 kHz temporal (3-3-3) tone to use as an evacuation signal in the event of a fault in the audible notification appliance circuit

In addition, the 3-ZA90 provides connections and mounting brackets for two control/display modules. The 3-ZA90 zoned audio amplifier module requires 2 spaces on the rail chassis assembly.

WARNINGS

1. This product contains components which are sensitive to static electricity. Failure to follow proper handling procedures to prevent damage from electrostatic discharge may result in equipment failure.
2. Ensure that all power is removed from the panel

JUMPER SETTINGS

JP1: Selects the amplified signal output voltage.
JP2: Selects the amplifier output voltage configuration to report to the panel controller.
Note: JP1 and JP2 must be set for the same output

INSTALLATION INSTRUCTIONS

1. Remove all power from the panel.
2. Set configuration jumpers as required.
3. Slide the module into the required rail/slot position.
4. Gently push the module into the connectors to ensure good contacts.
5. Secure the module to the chassis by pushing in all four fasteners.
6. Connect field wiring.

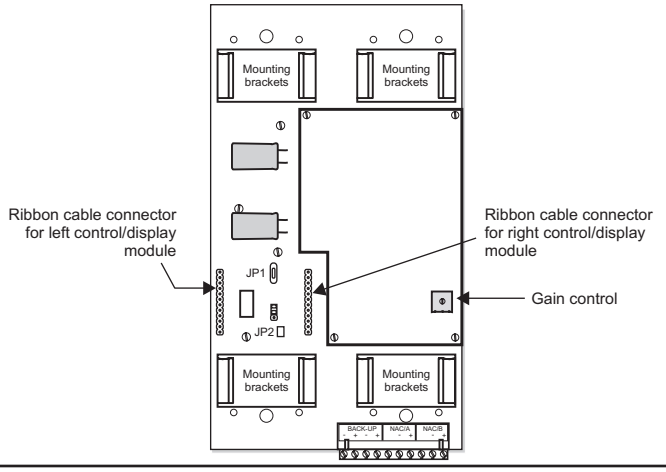
Notes:

1. This product should only be installed in a CHAS7 containing a primary or booster power supply.
2. The gain control pot may be adjusted later for desired output level. Fully CCW is maximum gain and fully CW is minimum gain.
3. When using Signature Series CC1 or CC2 modules to switch amplifier output branch circuits, a maximum of 10 modules may be connected to the output of an amplifier.

SPECIFICATIONS

Space Requirements:	2 rail spaces
Frequency Response:	400 Hz - 4 kHz at -3 dB
Harmonic Distortion:	< 7%
Audio Circuit:	
Input	8-channel, multiplexed digitized audio
Wiring	Class B (Style Y) or Class A (Style Z)
Output	90 W at 25 or 70 Vrms
EOL resistor	15 kΩ
Wiring:	
Termination	All wiring connects to removable terminal block
Max wire size	12 AWG (2.5 mm^2)
Operating Environment:	
Temperature	32 - 120 °F (0 - 49 °C)
Humidity	93% RH, non-condensing
Current ratings:	
Standby	35 mA
Alarm	5.3 A

3-ZA90



INSTALLATION SHEET:

3-ZA90 Zoned Audio Amplifier

INSTALLATION SHEET P/N: 387516	FILE NAME: 387516.CDR
REVISION LEVEL: 2.0	APPROVED BY: S. Moiseev
DATE: 20JAN00	CREATED BY: M. Rimes

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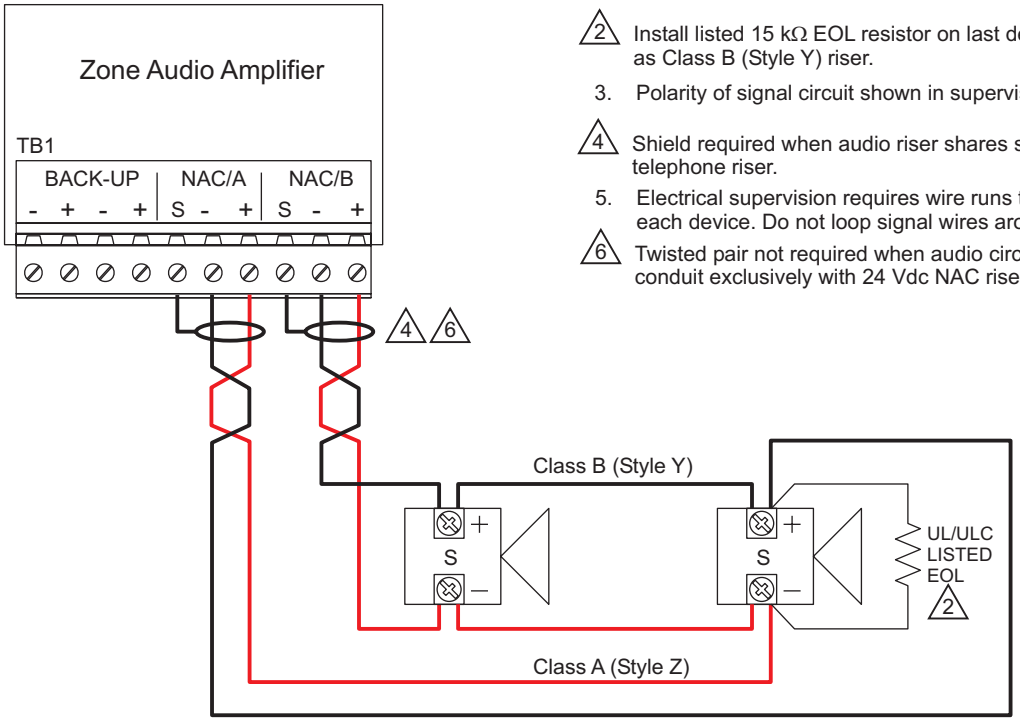
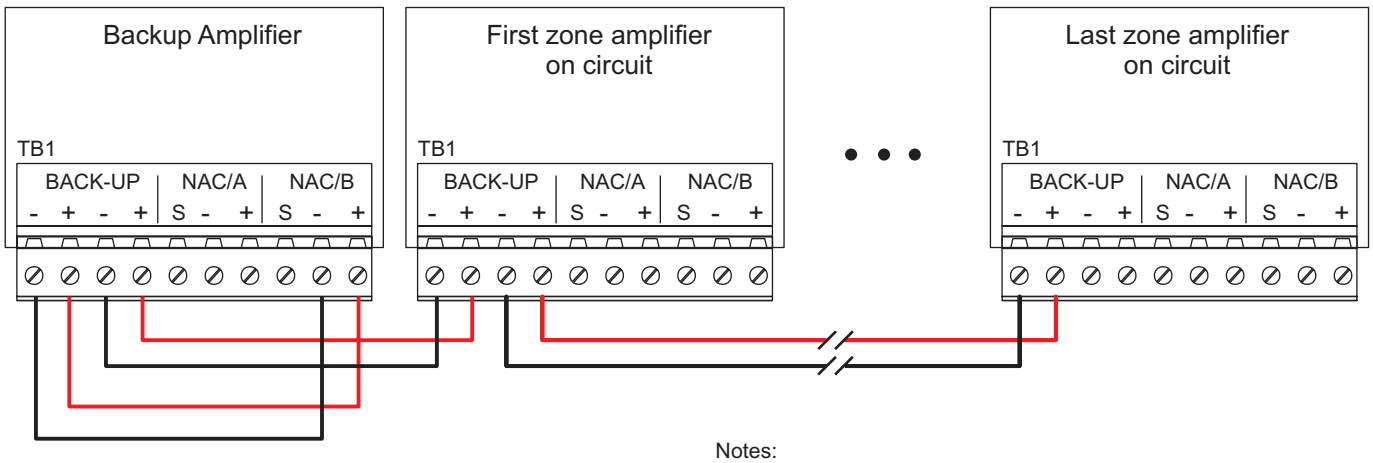


Notes:

1. All wiring supervised and power-limited.
2. Install listed 15 kΩ EOL resistor on last device only when wired as Class B (Style Y) riser.
3. Polarity of signal circuit shown in supervisory state.
4. Shield required when audio riser shares same conduit as telephone riser.
5. Electrical supervision requires wire runs to be broken at each device. Do not loop signal wires around device terminals.
6. Twisted pair not required when audio circuit riser shares conduit exclusively with 24 Vdc NAC riser.

Figure-1: Typical notification appliance circuit wiring



Notes:

1. All wiring supervised and power-limited.
2. Backup amplifier must be rated greater than or equal to the other amplifiers to which it is connected and be installed in the same enclosure.
3. Backup amplifier wiring must be rated greater than or equal to field wiring used on amplifiers connected to the backup amplifier.

Figure-2: Backup amplifier wiring

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PRODUCT DESCRIPTION

The 6ANN/B(-S) and the 10ANN/B(-S) are wallboxes constructed of 16 guage steel with a textured, gray enamel finish. The wallboxes house remote annunciator CPUs and optional modules that interface with other network components.

6ANN/B(-S)

The following models identify the same wallbox:

Model	Mounting
6ANN/B	Surface
6ANN/B-S	Semi-flush

10ANN/B(-S)

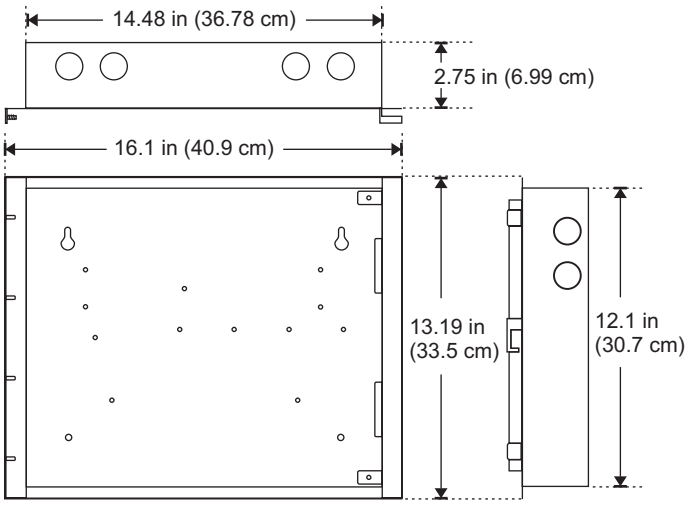
The following models identify the same wallbox:

Model	Mounting
10ANN/B	Surface
10ANN/B-S	Semi-flush

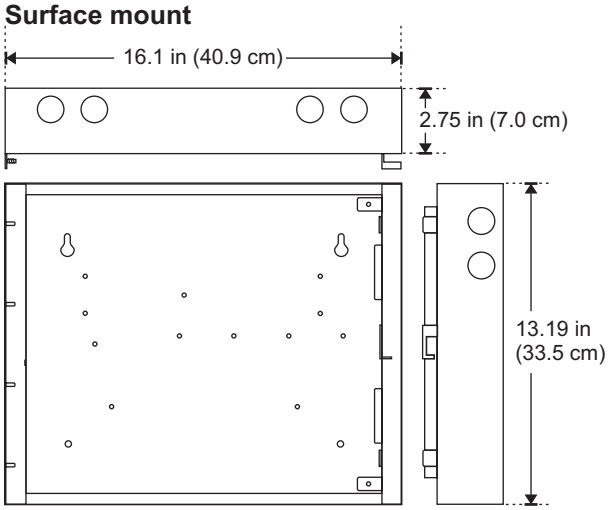
DIMENSIONS

6ANN/B(-S)

Semi-flush

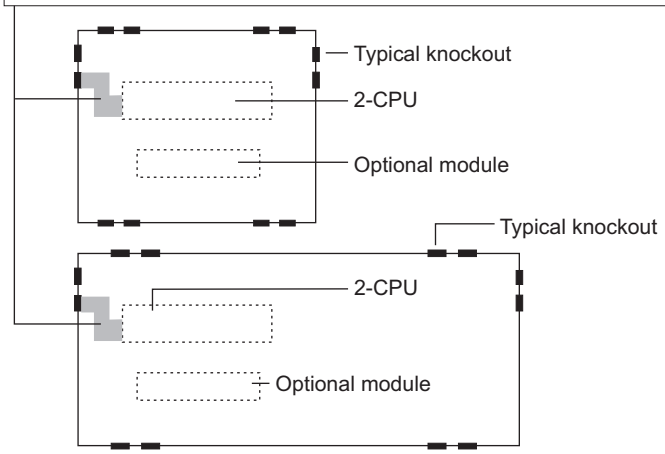


Surface mount

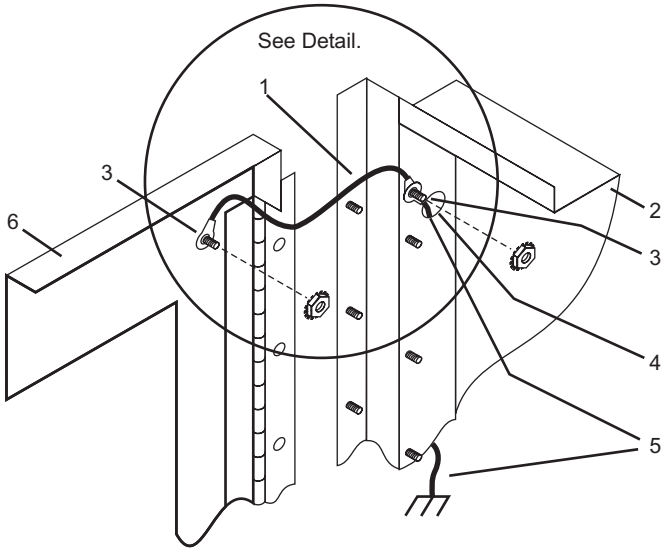


WIRE ROUTING

If a nonpower-limited source feeds the 2-CPU relay contacts, the wiring must remain within this area. All other wiring shall be power-limited.

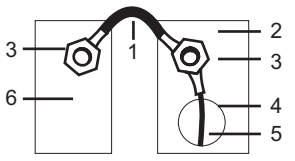


Earth ground connection



Detail

1 Ground Strap
2 Wallbox
3 Ground Lug
4 Typical Knockout
5 Earth Ground Wire
6 Outer Door



INSTALLATION SHEET:

6ANN/B(-S) and 10ANN/B(-S)
Remote Annunciator Cabinet Wallboxes

INSTALLATION SHEET P/N: 387586	FILE NAME: 387586.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 07DEC99	CREATED BY: B. Graham

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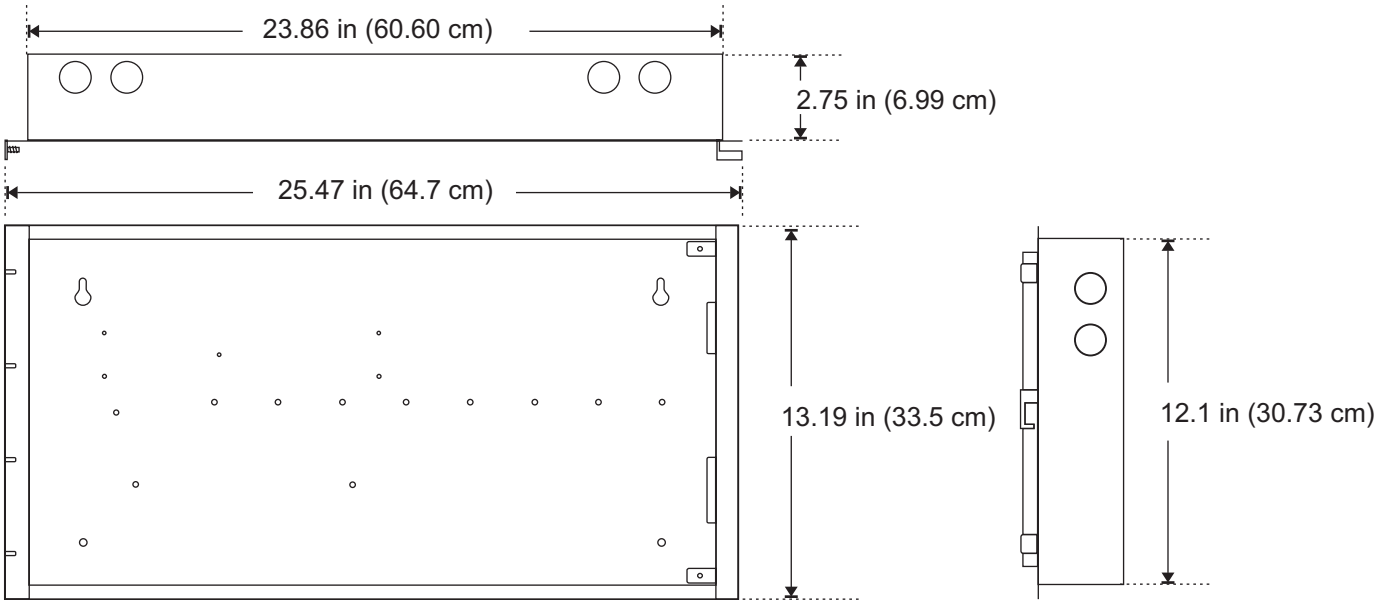
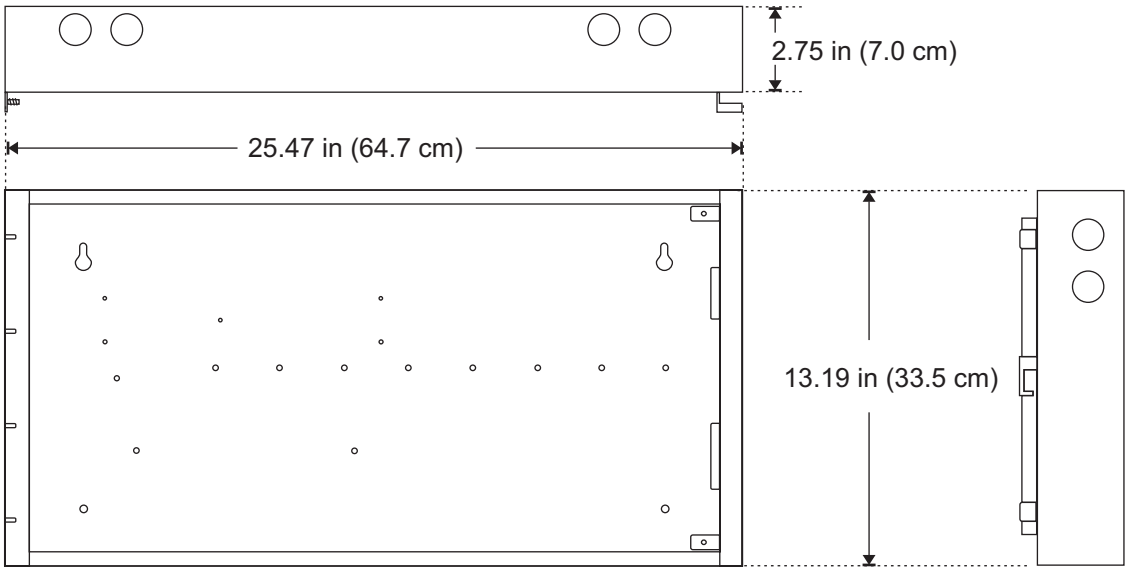
DIMENSIONS

10ANN/B(-S)

Semi-flush



Surface mount



All conduit knockouts support 3/4 inch (1.9 cm) conduit.

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PRODUCT INFORMATION

The Control/LED Displays provide additional operator interface capability for the EST3 network as individual, designer assignable LEDs and touch-pad switches. Control/LED displays mount any module's hinged front panel, except for the 3-CPU module. All Control/LED displays are compatible with the lamp test function.

LED Display, model 3-24x LED, provides 24 LEDs. Adjacent to each LED is a slip-in label for LED function identification. A typical application is zone annunciation.

Control/LED Display, models 3-12/SG, 3-12/SR, and 3-12/SY provide 12 LEDs, each grouped with one switch. Adjacent to each LED/Switch is a slip-in label for LED/Switch function identification. A typical application is monitoring and control of auxiliary systems.

Control/LED Display, models 3-12/S1GY, 3-12/S1RY, 3-12/S2Y provide 24 LEDs. Each pair of LEDs is grouped with one switch. Adjacent to each LED/Switch group is a slip-in label for LED/Switch function identification. A typical application is monitoring and control of auxiliary systems.

Control/LED Display, model 3-6/3S1G2Y and 3-6/3S1GYR provide 18 LEDs. Each triad of LEDs is grouped with three software interlocked switches. Adjacent to each LED/Switch group is a slip-in label for LED/Switch function identification. A typical application is "Hand-Off-Auto" HVAC control.

A blank faceplate is supplied with each module when no display is used.

SPECIFICATIONS

Model	LED Configuration	Switch Config.
3-24R	24 Red	None
3-24Y	24 Yellow	None
3-24G	24 Green	None
3-12RY	12 Red-over-Yellow pairs	None
3-12SG	12 Green	12
3-12SR	12 Red	12
3-12SY	12 Yellow	12
3-12/S1GY	12 Green-over-Yellow pairs	12
3-12/S1RY	12 Red-over-Yellow pairs	12
3-12/S2Y	24 Yellow	12
3-6/3S1G2Y	6 Green-over-Yellow-over-Yellow triads	6 triads
3-6/3S1GYR	6 Green-over-Yellow-over-Red triads	6 triads

Current Requirements:

Standby current	2.0 mA (base) + 1.5 mA/LED ON @ 24 Vdc
Alarm current	2.0 mA (base) + 1.5 mA/LED ON @ 24 Vdc

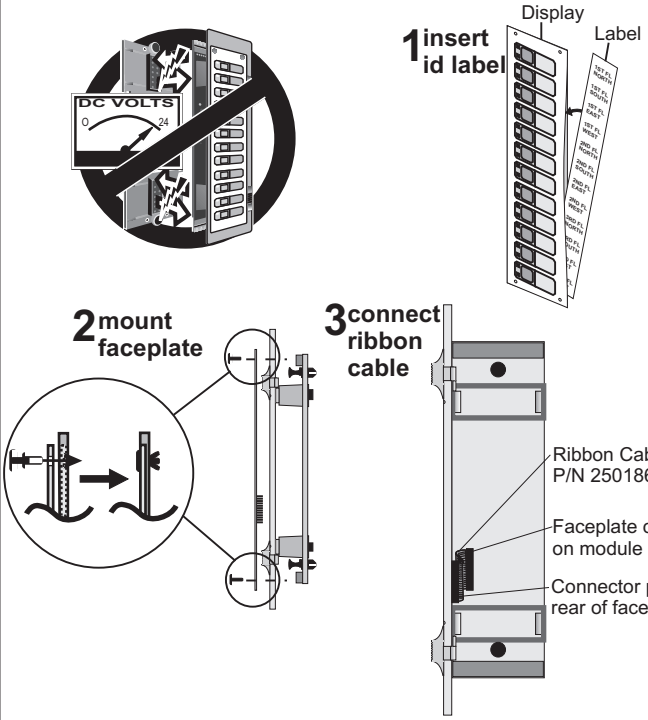
Operating Environment:

Temperature	32°F (0°C) to 120°F (49°C)
Humidity	93% RH, non-condensing
Mounting	Front of any LRM module except the 3-CPU Panel Controller.

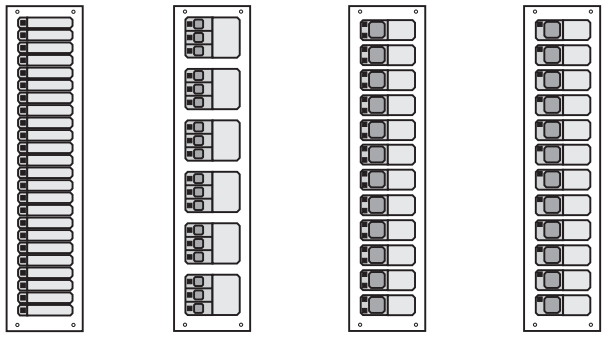
INSTALLATION

Fill out identification label and insert it between the front membrane and the circuit board. Mount the display in the recess on the front of the module. Secure the display to the module with the four supplied plastic rivets. Connect the display ribbon cable (P/N 250186) between connector P1 on the display and connector P1 on the module. No other wiring is required.

Observe static sensitive material handling practices.



CONTROL/LED DISPLAYS



3-24R, 3-24Y, 3-24G | 3-6/3S1G2Y, 3-6/3S1GYR | 3-12SG, 3-12SR, 3-12SY, 3-12RY | 3-12S1GY, 3-12/S1RY, 3-12/S2Y

INSTALLATION SHEET:

Control/LED Displays

INSTALLATION SHEET P/N: 270493	FILE NAME: 270493.CDR
REVISION LEVEL: 2.0	APPROVED BY: D. Becker
DATE: 04/06/99	CREATED BY: D. Miner

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PRODUCT INFORMATION

The IOP3A isolator card is designed to electrically isolate a fire alarm control panel's RS-232 ports from peripheral devices. The IOP3A provides two isolated RS232 connections, as well as a DB9 and RJ12 connector for downloading. A select mode allows both a printer and modem to be connected when used on EST2 systems.

The IOP3A should be used in ALL applications which require the connection of external devices (CCA, CGP, VDU, and external modems) to properly isolate the fire alarm control panel from earth ground connections.

INSTALLATION

The IOP3A module requires 1/2 standard module footprint.

FIELD WIRING:

To Control Module:

TB1-1	(+) 24VDC
TB1-2	(-) 24VDC
TB1-3	Port Selection/Supervision
TB1-4	Common
TB1-5	RXD IN
TB1-6	TXD OUT

To Peripheral Device:

TB2/3-1	Supervision / (+) 12VDC
TB2/3-2	Common
TB2/3-3	TXD OUT
TB2/3-4	RXD IN

Notes:

1. When in RDU mode, TB2 must be used for the modem and TB3 must be used for a printer.
2. All RS-232 connections should be within the same room or within 50 feet of the fire panel they are connected to.

SWITCH SETUP

SW1	UP	Outputs 1 and 2 enabled. RJ12 and DB9 connectors disabled.
	DOWN	Download setting. RJ12 and DB9 connectors enabled. Outputs 1 and 2 disabled.

Note diagram below for UP and DOWN switch positions.

SPECIFICATIONS

Current Requirement	60mA

JUMPER SETUP

JB1	1-2	Select Mode
	2-3	Supervision Mode
JB2	IN	Output #1 supervision disable / (+) 12VDC on TB2-1
	OUT	Output #1 supervision enable (TB2)
JB3	IN	Output #2 supervision disable / (+) 12VDC on TB3-1
	OUT	Output #2 supervision enable (TB3)
JB4	IN	Supervision Mode
	OUT	Select Mode

NOTE: JB1 and JB4 settings must agree.

IRC-3 Printer Mode:

JB1	2-3	IN
JB2		IN
JB3		IN
JB4		IN

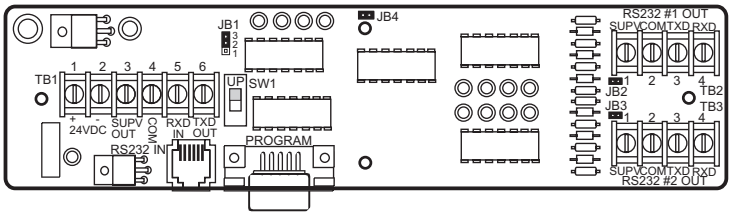
FireWorks Mode:

JB1	2-3	IN
JB2		IN
JB3		IN
JB4		IN
P1 on 2-MCM		OUT

RDU Mode:

JB1	1-2	IN
JB2		OUT
JB3		OUT
JB4		OUT
P1 on 2-MCM		IN

IOP3A



INSTALLATION SHEET:

IOP3A
Isolator RS-232 Card

INSTALLATION SHEET P/N: 270758	FILE NAME: 270758.CDR
REVISION LEVEL: 1.0	APPROVED BY: D.P.
DATE: 10/04/99	CREATED BY: DRM

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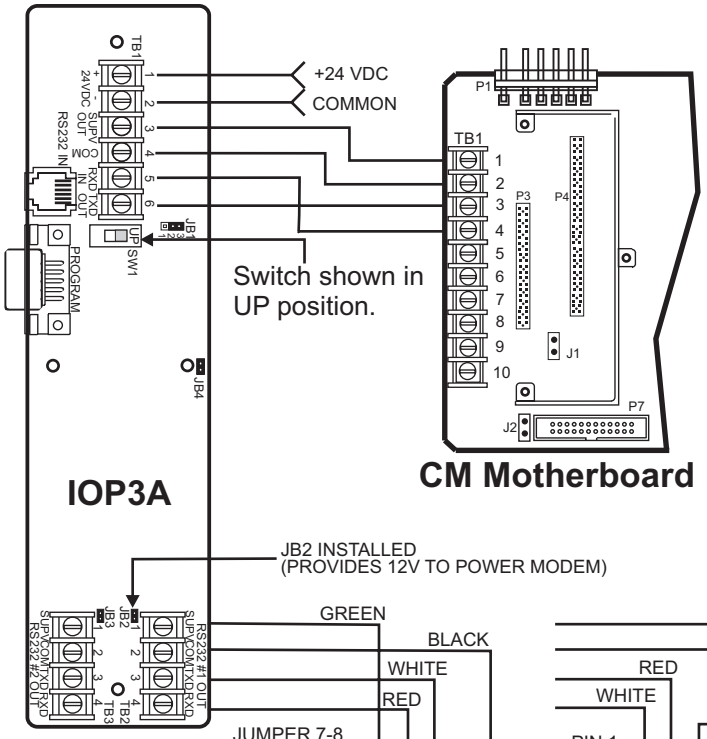
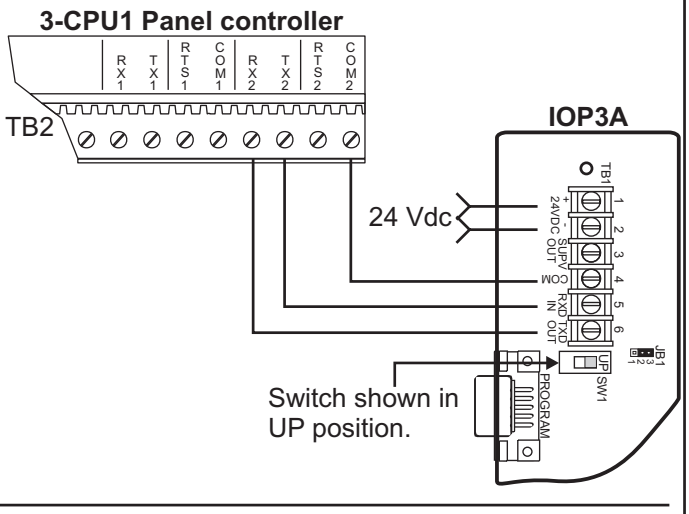
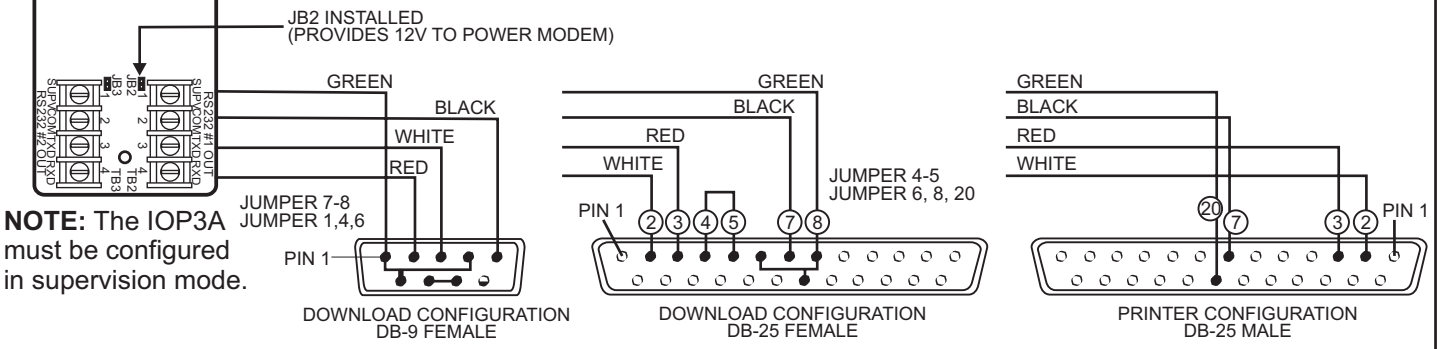
APPLICATION DRAWINGS

IOP3A to CM motherboard wiring



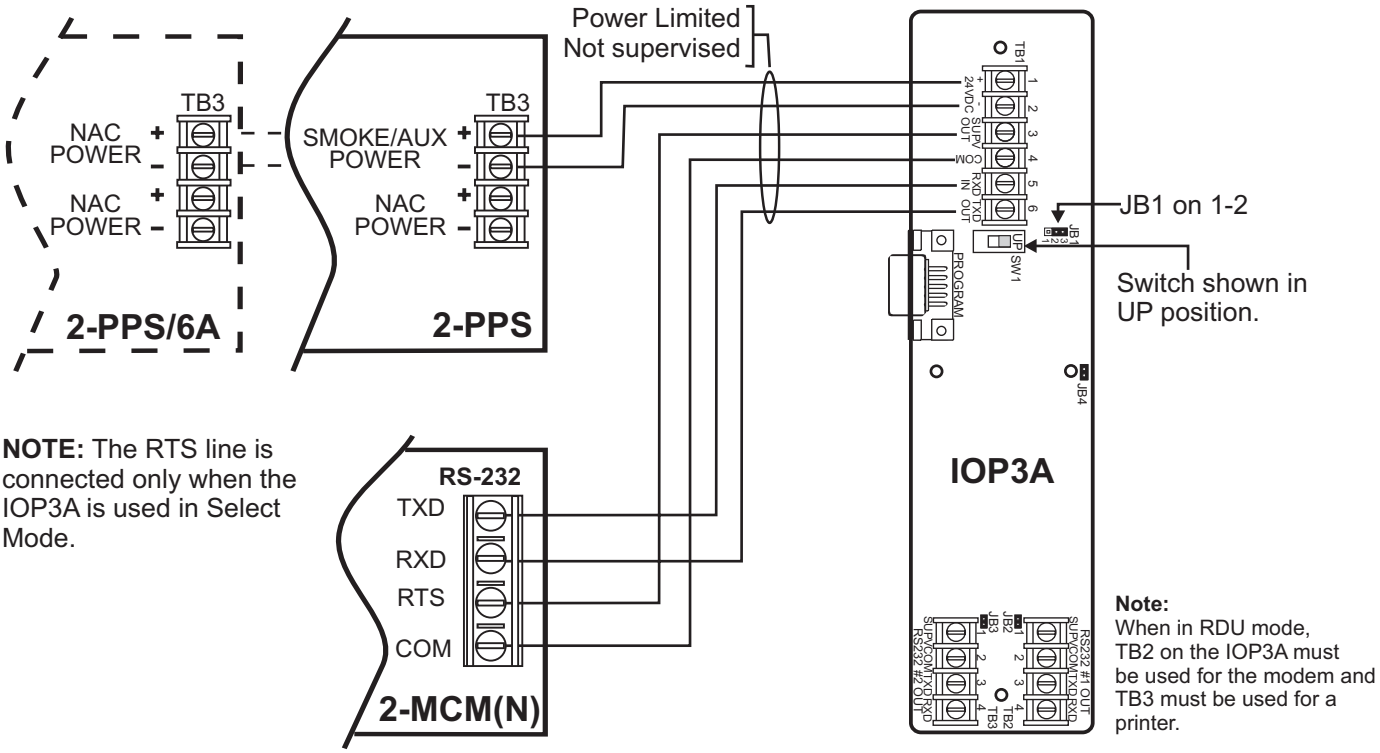
IOP3A to 3-CPU1 wiring





NOTE: The IOP3A must be configured in supervision mode.

IOP3A to 2-MCM(N) wirng



NOTE: The RTS line is connected only when the IOP3A is used in Select Mode.

Note:
When in RDU mode, TB2 on the IOP3A must be used for the modem and TB3 must be used for a printer.

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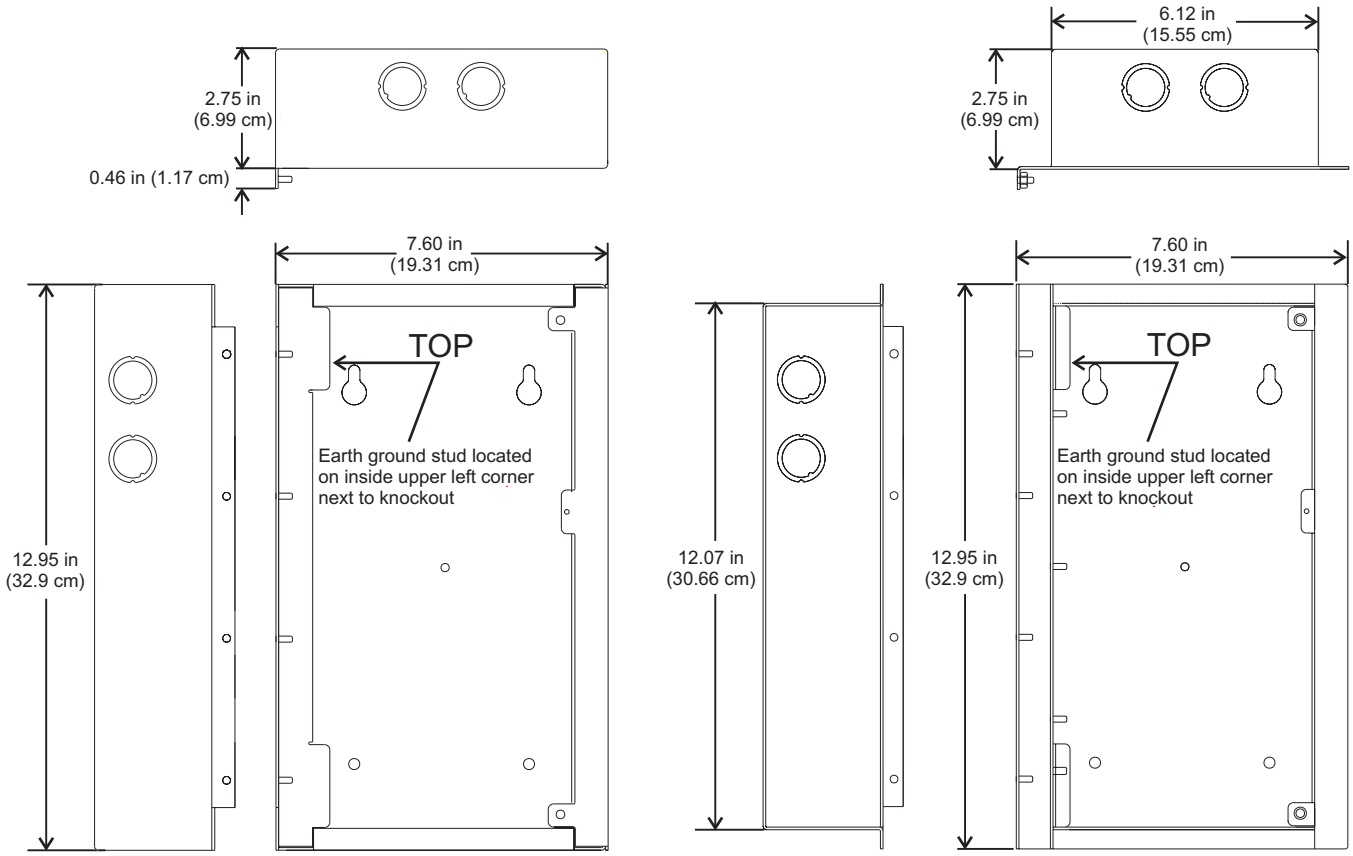
CABINET DIMENSIONS



RCLM/B-S **RCLM/B**

Notes

1. Make sure that the wallbox is level and at the proper height and location before securing. Use fasteners of acceptable size and type.
2. All wiring shall be power-limited.

PRODUCT INFORMATION

The RLCM/B(-S) Remote Annunciator Cabinet wallbox houses the electronics for the 3-LCDANN(-E) Remote LCD Command Module Annunciator. The RLCM/B is used in semi-flush mount applications. The RLCM/B-S is used for surface mountings.

INSTALLATION SHEET

RLCM/B(-S)
Remote Annunciator Cabinet Wallbox

INSTALLATION SHEET P/N: 387559	FILE NAME: 387559.CDR
REVISION LEVEL: 1.0	APPROVED BY: K. Patterson
DATE: 08DEC99	CREATED BY: G. Sutton

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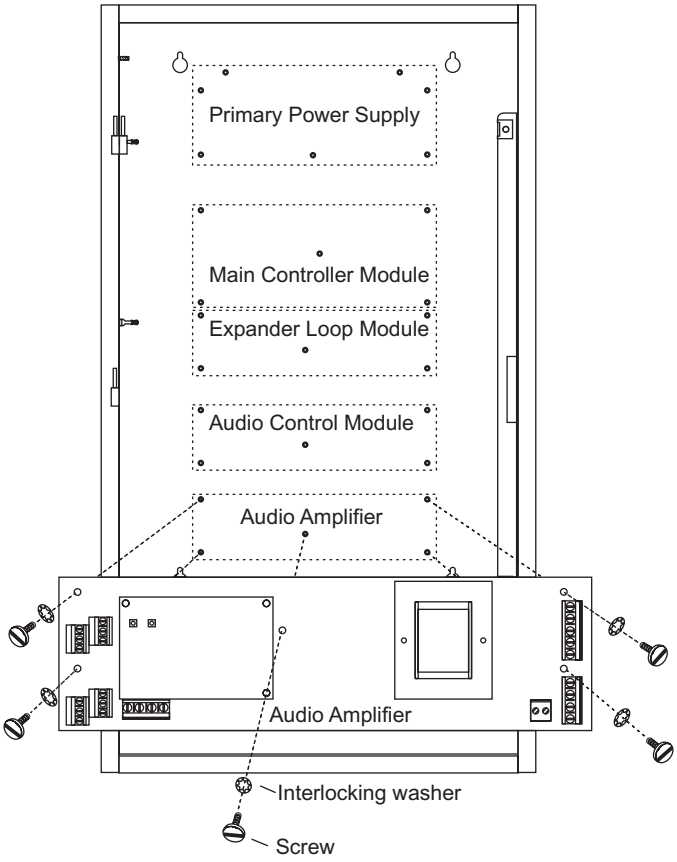
PRODUCT DESCRIPTION

The SIGA-AAXX is a high-efficiency, dual-input, switch-mode audio amplifier. The amplifier comes in two versions: 30 watt (SIGA-AA30) and 50 watt (SIGA-AA50), and has both 1 V and 25 V input levels. The output is supervised, power-limited, and user-selectable for 25 Vrms or 70 Vrms output voltage.

An integral Signature module under software control selects the amplifier input channel. The amplifier reports its status to the Main Controller Module to reduce the need for additional field wiring. The amplifier also features a backup amplifier connection, which supports one-to-one or banked backup amplifiers.

INSTALLATION

1 Mount the amplifier with the screws and washers provided.



Note: See the installation sheets listed in the title box for other places to mount the Audio Amplifier.

2 Configure the amplifier

a. Set JP2 (output voltage) to 25 Vrms or 70 Vrms as required.

b. Set JP3 on the back of the daughter board for the backup mode.

Jumper Settings

JP2	Pins 1 and 2: 70 Vrms Pins 2 and 3: 25 Vrms
JP3	In: TB5 signal before 1 kHz backup tone Out: 1 kHz backup tone before TB5 signal

SPECIFICATIONS

Power requirements	
Standby	1 mA @ 24 Vdc
Active SIGA-AA30	1.7 A @ 24 Vdc
Active SIGA-AA50	3.2 A @ 24 Vdc
Frequency response	400 Hz to 4 kHz at -3 dB (ULC) 800 Hz to 2.8 kHz (ULI)
Harmonic distortion	< 5%
Input	
Channel 1 dual input	1 Vrms or 25 Vrms maximum
Channel 2 dual input	1 Vrms or 25 Vrms maximum
Output	
SIGA-AA30	30 watts @ 25 Vrms or 70 Vrms
SIGA-AA50	50 watts @ 25 Vrms or 70 Vrms
Configuration	Class B (Style Y) or Class A (Style Z)
EOL resistor	47 kΩ
Signature Data Circuit	
Addresses	2 module addresses
Emulation	Signature series CC2 module
Maximum wire size	12 AWG (2.5 mm^2)
Backup tone	1 kHz
Operating temperature	32 to 120 °F (0 to 49 °C)
Humidity	0 to 93%, noncondensing

Warning!

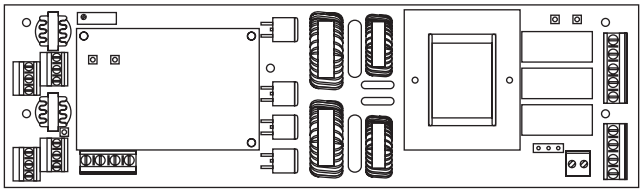
Disconnect power to cabinets before installing or removing components. Failure to do so may result in serious injury or loss of life.

Caution!

Observe static-sensitive material handling practices.

LED indicators

LED	Color	Pattern	Description
DS1	Green	Steady	Power amp disabled
DS2	Yellow	Steady	Backup mode
DS3	Green	Steady	Amplifier active
DS4	Green	Flashing	Normal communications (daughterboard)
DS5	Red	Flashing	Active condition (daughterboard)



INSTALLATION SHEET:

SIGA-AA30/SIGA-AA50 Audio Amplifiers

INSTALLATION SHEET P/N: 387343	FILE NAME: 387343.CDR
REVISION LEVEL: 2.0	APPROVED BY: J. Massing
DATE: 30MAR00	CREATED BY: B. Graham

Related documentation: WB3(R) Wallbox installation sheet, WB7(R) Wallbox installation sheet, RACCR Remote Audio Closet Cabinet installation sheet

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WIRING

3 Wire the amplifier

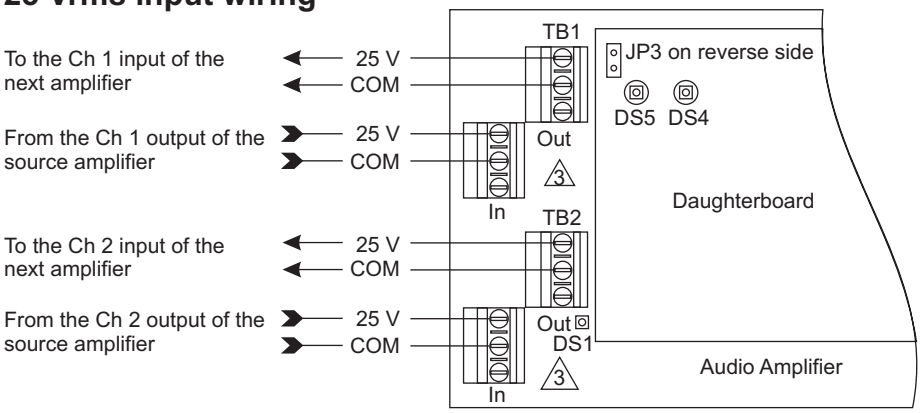
a. Connect the power, the Signature Data Circuit (SDC) , the input risers, and the backup risers as required.

b. Test the circuit before you connect the amplifier to the output wiring.

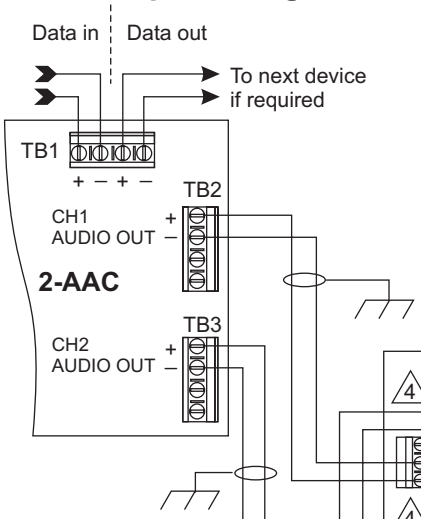
c. Connect the circuits that check out good to the appropriate amplifier terminals.

Note: The terminal blocks indicate the polarity for normal monitoring of the circuit's electrical integrity.

25 Vrms input wiring



1 Vrms input wiring

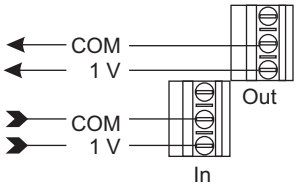


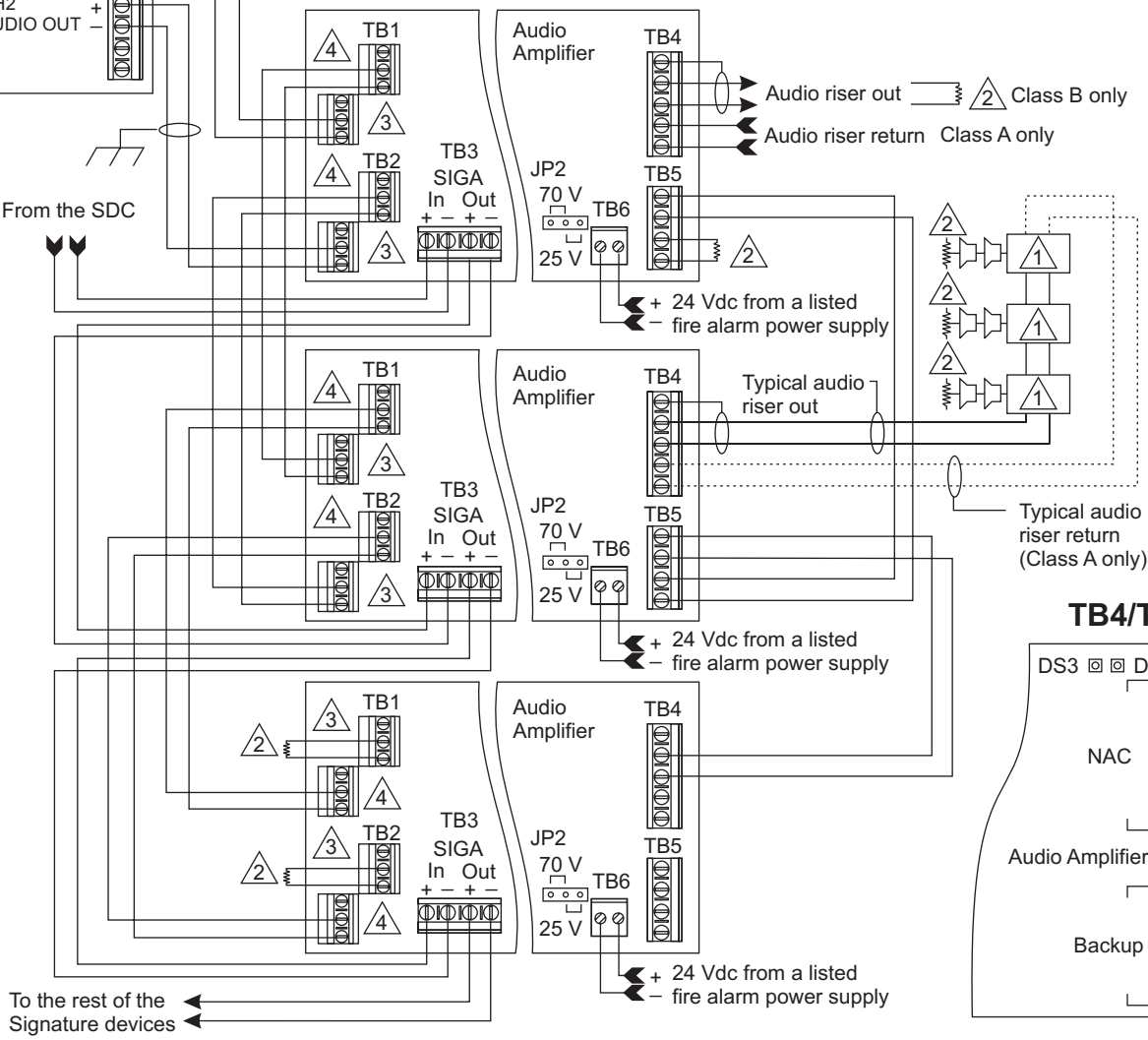
Notes

1. Signature series module: CC1, CC2, or UM
2. UL/ULC Listed 47 kΩ EOL
3. The actual placement of the TB1 and TB2 output terminals is almost directly behind the input terminals. Note also that the output terminals are taller than the input terminals.
4. See the detail for 1 volt connections.
5. All wiring is supervised and power-limited.

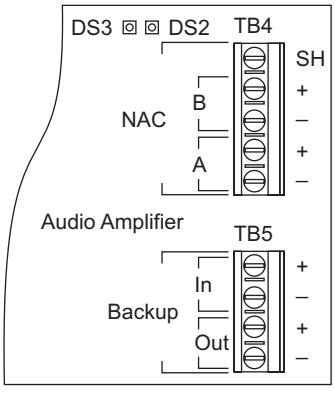
Detail

1 volt connections





TB4/TB5 wiring



Technical Manuals Online! - http://www.tech-man.com

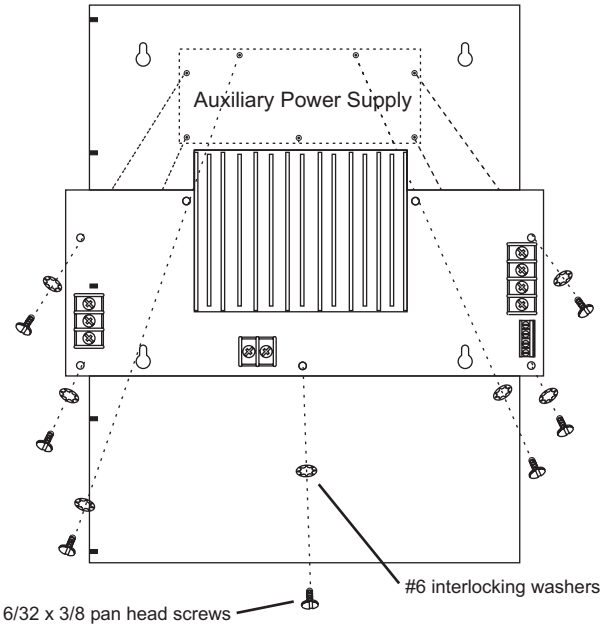
PRODUCT DESCRIPTION

The SIGA-APS is a switch-mode auxiliary power supply designed to provide additional power for audio components and external Notification Appliance Circuits (NACs). The power supply monitors the AC line, performs ground fault testing, and charges batteries (up to 10 Ah). The SIGA-APS also provides a smooth and uninterrupted transition to batteries in the event of an AC power loss.

All trouble conditions detected by the SIGA-APS are transmitted to the fire alarm control panel through its connection to the Signature Data Circuit (SDC), eliminating the need for additional devices. All connections intended to leave the cabinet are fully protected against direct and induced transient voltage conditions.

INSTALLATION

Mount the SIGA-APS with the screws and washers provided.



SPECIFICATIONS

AC Input voltage	
SIGA-APS	120 Vac @ 300 W maximum, 50/60 Hz
SIGA-APS-220	220 Vac @ 300 W maximum, 50/60 Hz
Maximum wire size	12 AWG (2.5 mm^2)
Output voltage	
Nominal rating	24 Vdc @ 6.75 A total
Output circuits	Two power-limited circuits rated at 24 Vdc @ 3.2 A each
Maximum wire size	12 AWG (2.5 mm^2)
Battery charging	
Charge current	1.0 A
Charge capacity	10 Ah
Signature	
Addressing	Two module addresses
Personality Code	03 (Emulates SIGA-CT2)
Maximum wire size	14 AWG (1.5 mm^2)
Environmental Conditions	
Temperature range	32 to 120 °F (0 to 49 °C)
Humidity	93%, Non-condensing

Warning!

Disconnect power to cabinets before installing or removing components. Failure to do so may result in serious injury or loss of life.

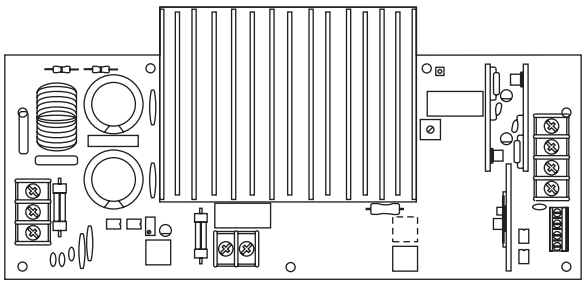
Caution!

Observe static-sensitive material handling practices.

WIRE ROUTING

The routing of power-limited and nonpower-limited wiring differs with each cabinet. For more information on the routing of power-limited and nonpower-limited wiring, see the cabinet's installation sheet.

PRODUCT DIAGRAM



INSTALLATION SHEET:

SIGA-APS (-220)
Auxiliary Power Supply Module

INSTALLATION SHEET P/N: 387342	FILE NAME: 387342.CDR
REVISION LEVEL: 2.0	APPROVED BY: J. Massing
DATE: 30MAR00	CREATED BY: B. Graham

EDWARDS SYSTEMS TECHNOLOGY, INC.
SARASOTA, FL: 941-739-4300 FAX 941-753-1806
CHESHIRE, CT: 203-699-3000 FAX 203-699-3075
OWEN SOUND, CANADA: 519-376-2430 FAX 519-376-7258
INTERNATIONAL, CANADA: 905-270-1711 FAX 905-270-9553

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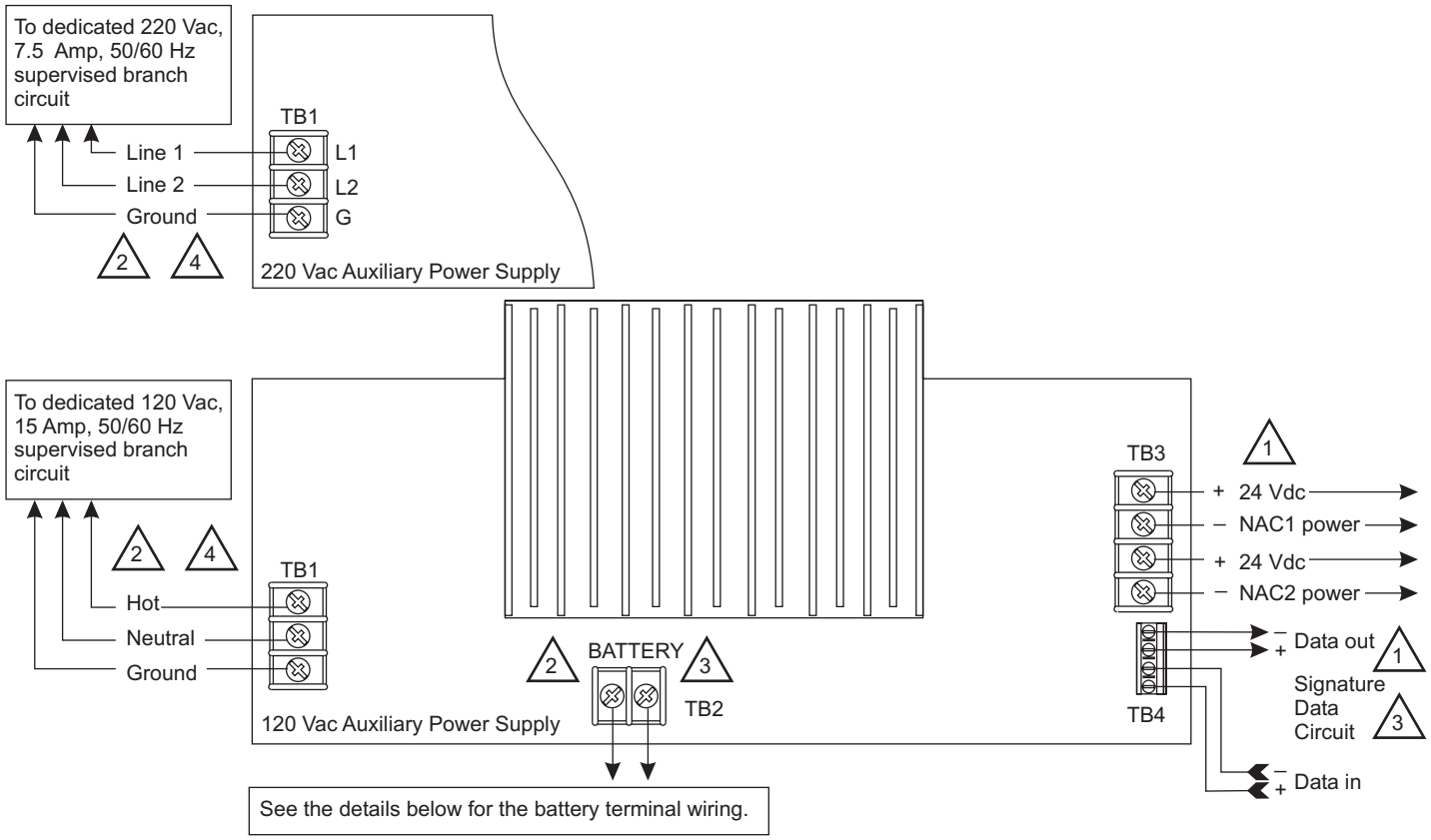
WIRING

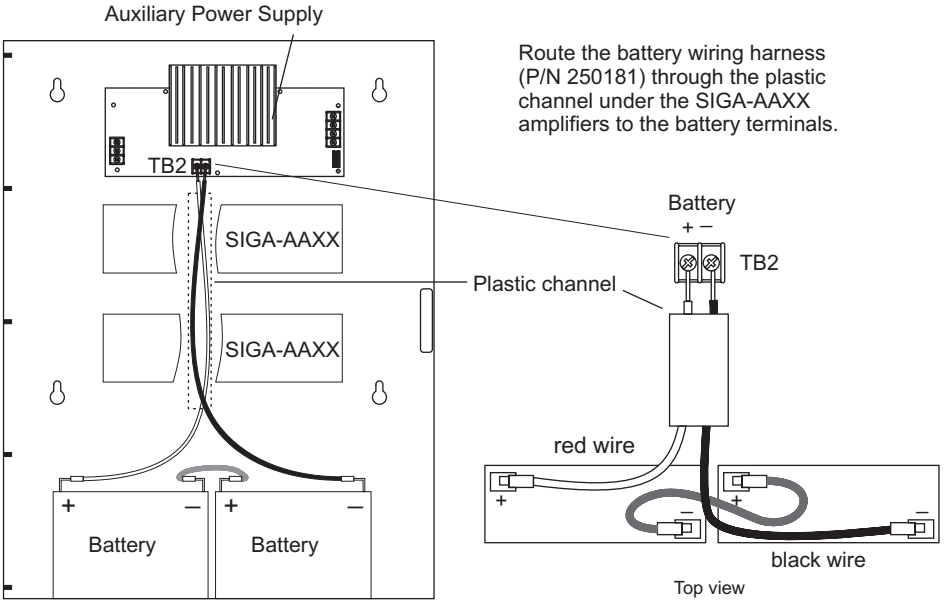
Wire Stripping Guide

Strip 1/4 inch from the ends of ALL wires that connect to the terminal blocks of the module.

Caution:
Exposing than 1/4 inch of wire may cause a ground fault.
Exposing than 1/4 inch of wire may result in a faulty connection.



See the details below for the battery terminal wiring.



Notes

1. Power-limited
2. Nonpower-limited
3. Supervised
4. Nonsupervised

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