



Distributed Audio Amplifiers

NFC-50DA/E

NFC-125DA/E

NFC-50/100DA

Installation Manual

Document LS10027-001NF-E
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Fire Alarm & Emergency Communication System Limitations

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

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

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

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

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

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

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

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

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

Smoke detectors cannot be expected to provide adequate warning of fires caused by arson, children playing with matches (especially in bedrooms), smoking in bed, and violent explosions

(caused by escaping gas, improper storage of flammable materials, etc.).

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

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

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

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

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

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

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

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

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Installation Precautions

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

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

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

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

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

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

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

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

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

This system contains static-sensitive components.

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

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

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FCC Warning

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

Canadian Requirements

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

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le ministère des Communications du Canada.

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Section 1: NFC-50DA Remote Amplifier

1.1 Installation

This section provides information on how to install the NFC-50DA for use with the NFC-50/100 FirstCommand Center.



NOTE: The term NFC-50DA is used in this manual to refer to both the NFC-50DA (120 VAC version) and the NFC-50DAE (240 VAC version) amplifier unless specified.

SW2 on the NFC-50/100's display board must be set to the UP position if any NFC-50DAs are installed in the system. Refer to the *NFC-50/100 Instruction Manual*, P/N LS10001-001NF-E, for more information. The NFC-50DA must also be enabled in user programming. 70 volt operation of the NFC-50DA is also set up in user programming. Refer to the programming section of the *NFC-50/100 Instruction Manual*, LS10001-001NF-E.

1.1.1 Board Layout

Figure 1.1 shows the location of terminals, dip switch, and circuit expander connection, used in the installation of the NFC-50DA.

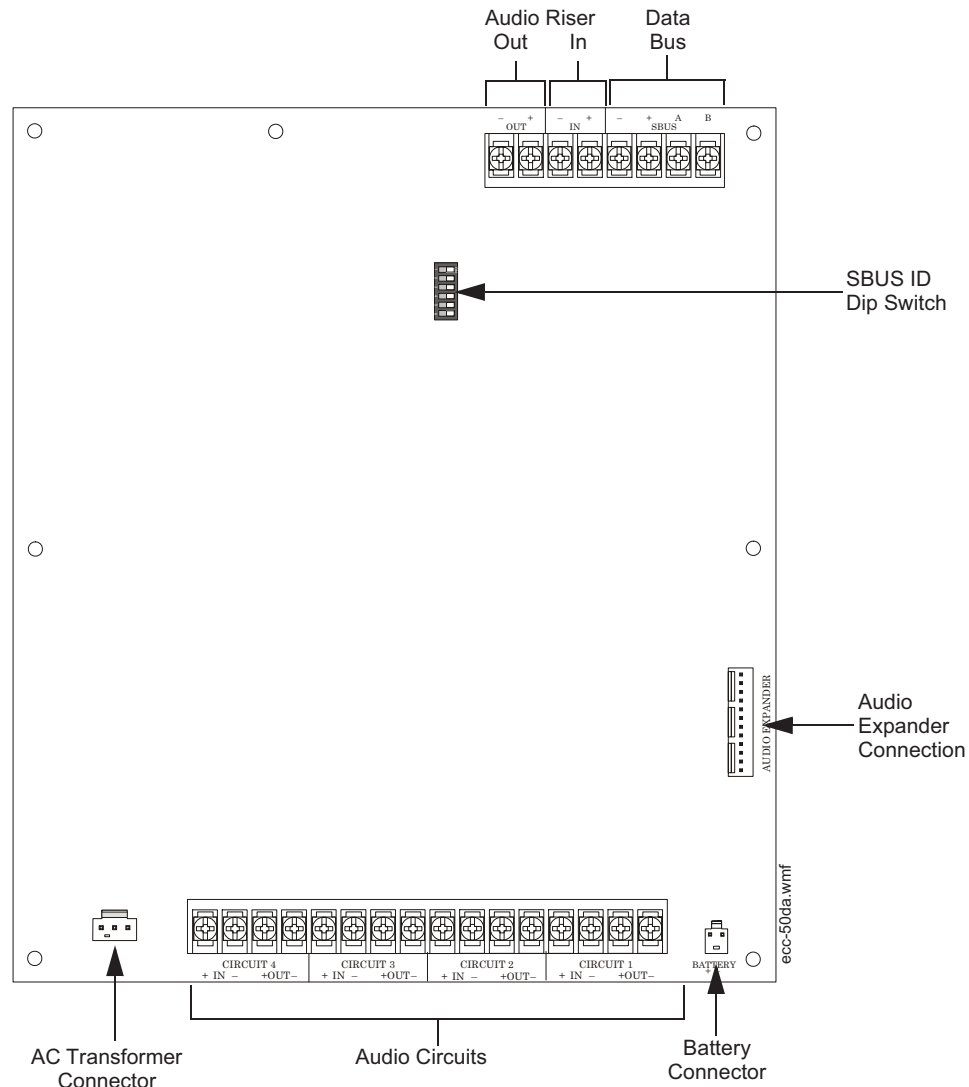


Figure 1.1 NFC-50DA Board Layout

1.1.2 Mounting the Cabinet

Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately five feet above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices to be installed. Sufficient knockouts are provided for wiring convenience. Select the appropriate knockout(s) and pull the required conductors into the box. Note that knockouts are also located on the back of the cabinet. All wiring should be in accordance with the National and/or Local codes for fire alarm systems.

The cabinet can be surface or flush-mounted. For flush-mount installation of the cabinet, the hole for the enclosure should be 14.5" W x 24.75" H x 3.438" D (36.8cm W x 62.9cm H x 8.73cm D). Do not flush-mount in a wall designated as a fire break. The outside dimensions of the cabinet are 16" W x 26.25" H x 4.125" D (40.64cm W x 66.68cm H x 10.48cm D).

Follow these steps to properly mount the cabinet.

1. Mark and predrill holes for the top two backbox keyhole mounting bolts using the dimensions shown.
2. Install two upper fasteners in the wall with the screw heads protruding.
3. Using the upper 'keyholes', mount the backbox over the two screws.
4. Mark and drill the lower two holes.
5. Install the remaining fasteners and tighten all fasteners to complete backbox mounting.

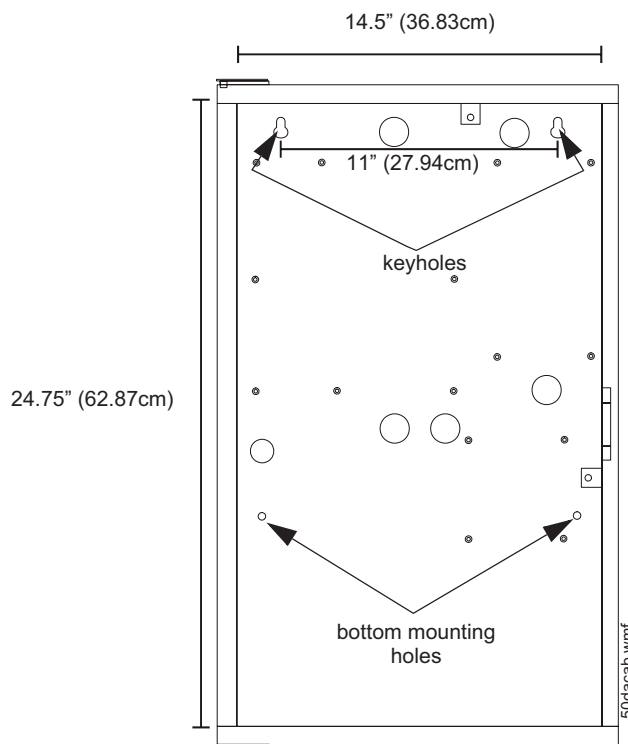


Figure 1.2 Cabinet Flush-Mount Dimensions and Mounting Hole Locations

1.1.3 Wiring Specifications

To avoid induced noise (transfer of electrical energy from one wire to another), keep input wiring isolated from high-current output and power wiring. Avoid pulling one multiconductor cable for the entire panel. Power-limited, nonpower-limited, and audio circuit wiring must remain separated in the cabinet. Maintain at least 0.25" (6.35 mm) spacing. Power-limited, nonpower-limited, and audio circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. For the same reasons, wiring within the cabinet should be routed around the perimeter of the cabinet. It should not cross the printed circuit board where it could induce noise into the sensitive microelectronics or pick up unwanted RF noise from the high speed circuits.

High frequency noise, such as that produced by the inductive reactance of a speaker or bell, can also be reduced by running the wire through ferrite beads or by wrapping it around a ferrite toroid core. Figure 1.3 provides an example.

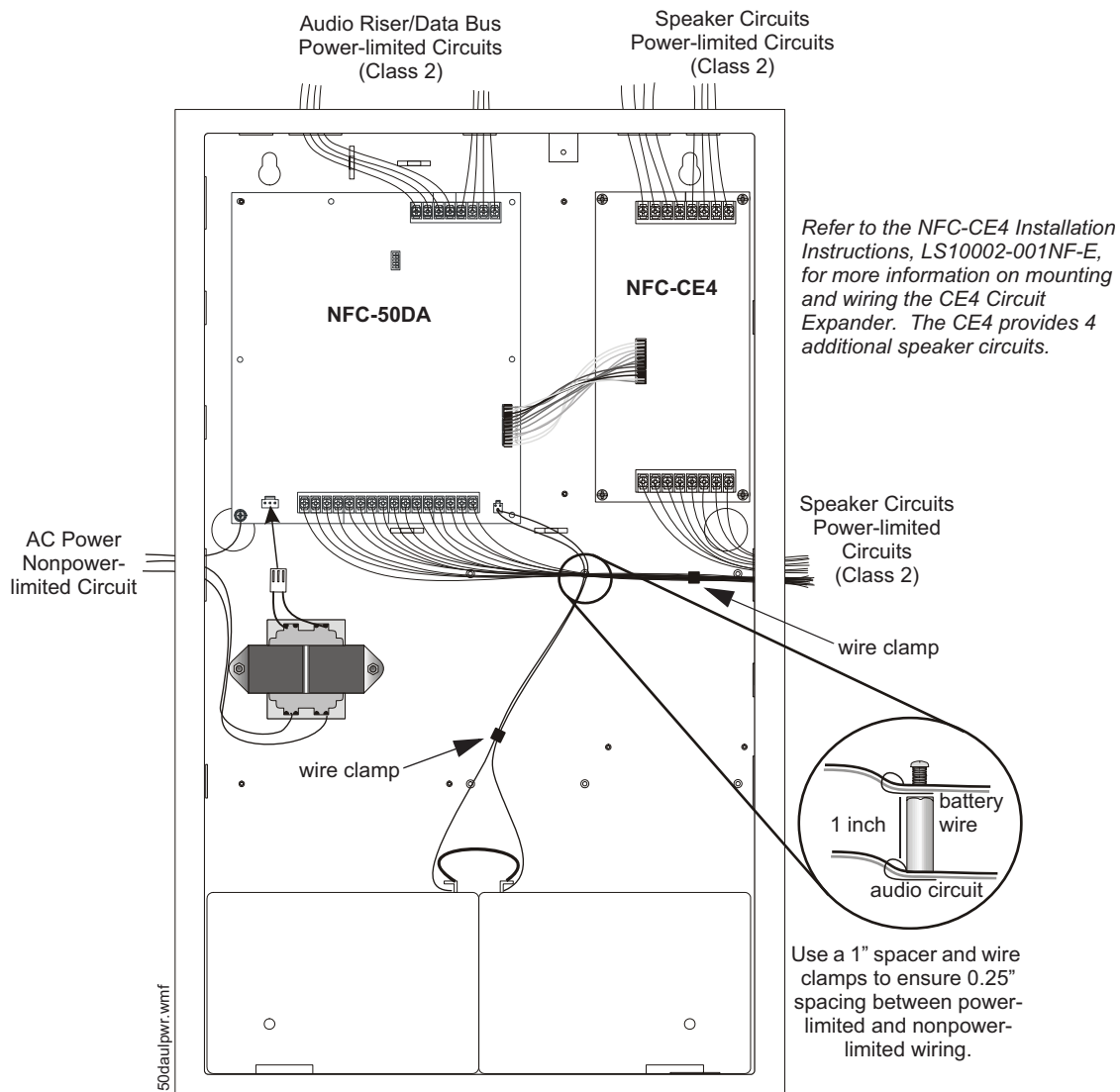


Figure 1.3 Wire Routing Example for NFC-50DA

1.1.4 Speaker Wiring

Each NFC-50DA supplies four NAC (Notification Appliance Circuit) for speaker connection. The speaker circuit can be supervised and wired Class B (Style Y) or Class A (Style Z). The speaker circuit is capable of 50 watts of power at 25 Vrms or 70.7 Vrms.

Wiring Lengths

Number Of Speakers		Total Load		Wire Distance in Feet			
@1/2 W	@1 W	Vrms	Watts	18 AWG	16 AWG	14 AWG	12 AWG
10	5	25Vrms	5W	3900	6200	9860	15680
		70Vrms		25000	39700	63200	100520
20	10	25Vrms	10W	2125	3380	5375	8540
		70Vrms		15200	24150	38400	61100
30	15	25Vrms	15W	1460	2320	3690	5870
		70Vrms		11000	17500	27800	44200
40	20	25Vrms	20W	1100	1750	2780	4420
		70Vrms		8500	13510	21500	34175
52	26	25Vrms	26W	760	1200	1920	3050
		70Vrms		6100	9700	15400	24520
80	40	25Vrms	40W	550	875	1390	2200
		70Vrms		4100	6500	10360	16480
100	50	25Vrms	50W	450	715	1130	1800
		70Vrms		3500	5560	8850	14070

Table 1.1 Wire Lengths



NOTE: The above table assumes a uniform distribution of the speakers, and that a max of 20% voltage drop on the last speaker is allowed.

Class B (Style Y)

Figure 1.4 illustrates how to wire speakers to the NFC-50/100 using Class B (Style Y) supervision.

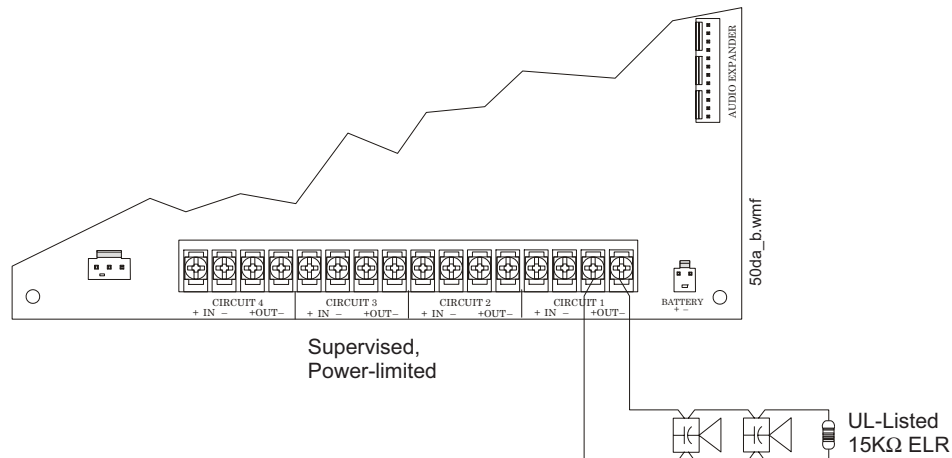


Figure 1.4 Class B (Style Y) Speaker Configuration

Class A (Style Z)

Figure 1.5 illustrates how to wire speakers to the NFC-50/100 using Class A (Style Z) wiring.

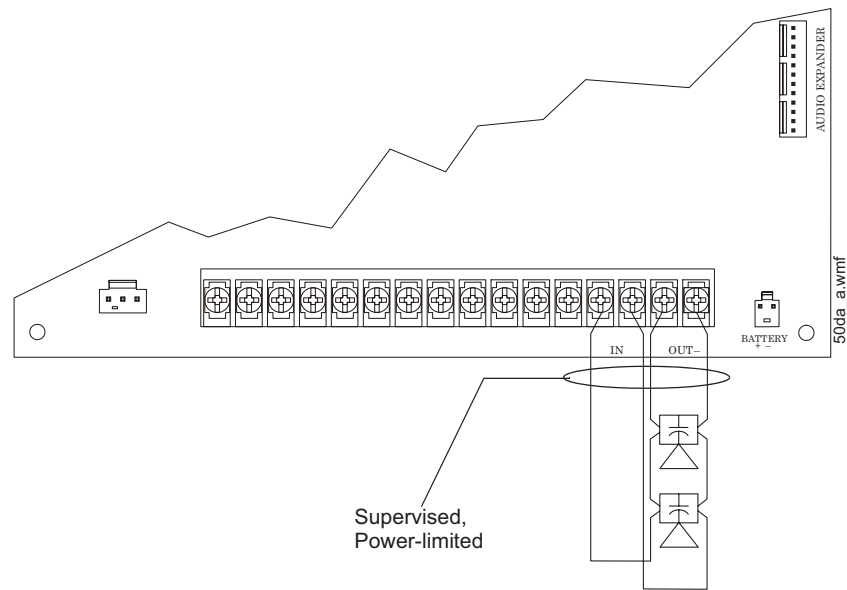


Figure 1.5 Class A (Style Z) Speaker Configuration

1.1.5 Audio Riser Wiring

The Audio Riser is an analog voice bus that carries the recorded voice messages from the display board to the NFC-50DAs, or the voice messages generated from a system microphone to the NFC-50DAs. The maximum resistance on the Audio Riser is 20Ω .

Connect the Audio Riser from TB22 on the NFC-50/100 main control board to the NFC-50DAs as shown in Figure 1.6.

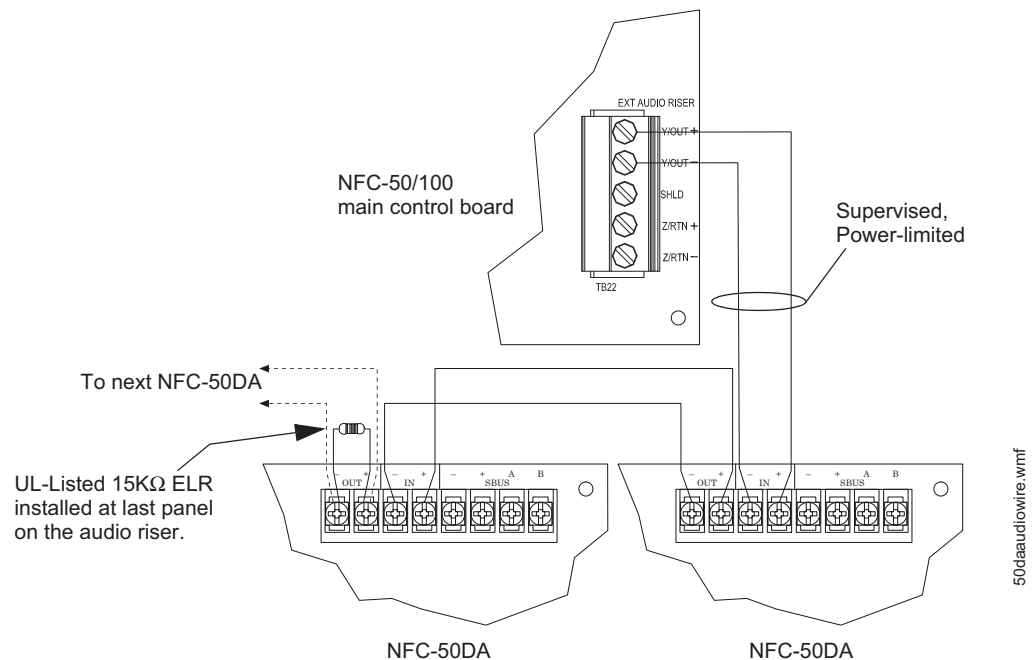


Figure 1.6 NFC-50DA Audio Riser Wiring

1.1.6 Data BUS Wiring

This section contains information on how to connect NFC-50DAs (up to 8) onto the main control Data BUS. Refer to the *NFC-50/100* and/or *FACP Manual* for Data BUS specifications. Wire the Data BUS from TB12 on the main control board to the NFC-50DA shown in Figure 1.7 or Figure 1.8.

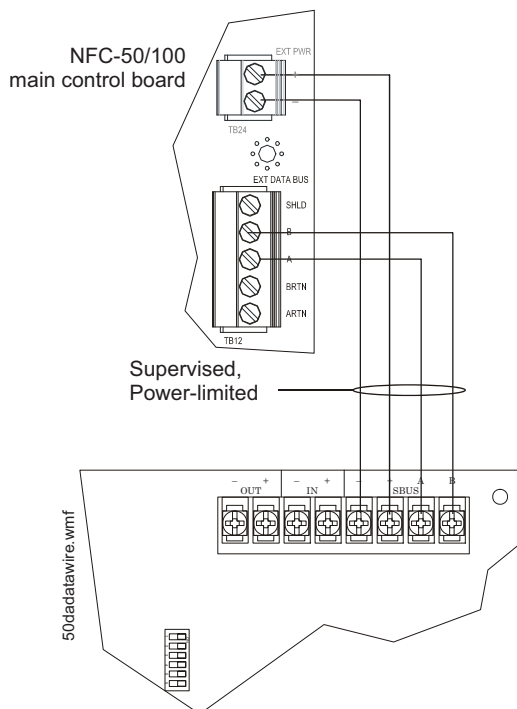


Figure 1.7 Data BUS Connections of the NFC-50DA

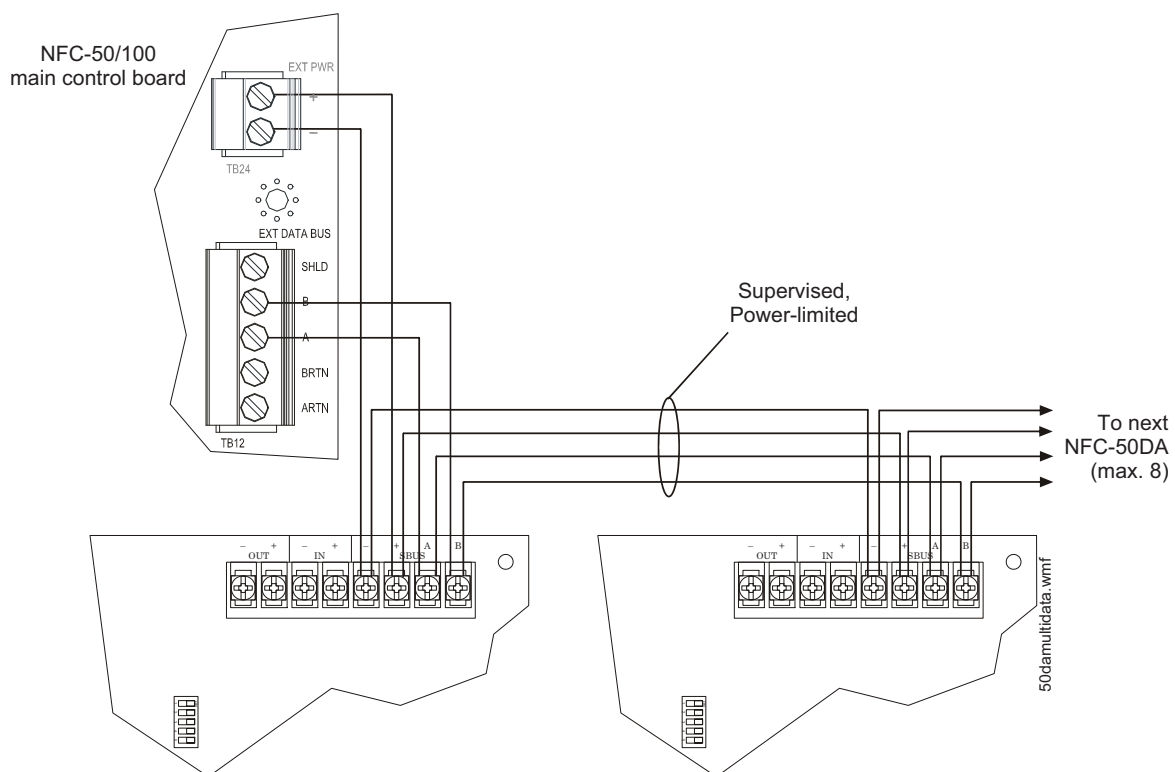


Figure 1.8 Connecting Multiple NFC-50DAs to the Data BUS

1.1.7 Connecting AC Power

Module	Voltage	Transformer P/N	Standby Current	Alarm Current
NFC-50DA 25V	120 VAC, 60 Hz	115061	350 mA	1100 mA
NFC-50DAE 25V	230 VAC, 50 Hz	115031	200 mA	600 mA
NFC-50DA 70V	120 VAC, 60 Hz	115061	350 mA	1200 mA
NFC-50DAE 70V	230 VAC, 50 Hz	115031	200 mA	600 mA

Table 1.2 NFC-50DA AC Current Draw

To install the AC transformer into the NFC-50DA cabinet, follow these steps:

1. Open the cabinet door.
2. To access cabinet interior, open the dress panel by removing the upper screw and the mid-door retaining screw.
3. Mount the transformer onto the threaded cabinet transformer mounting studs using the supplied locking hex nuts as shown in Figure 1.9.

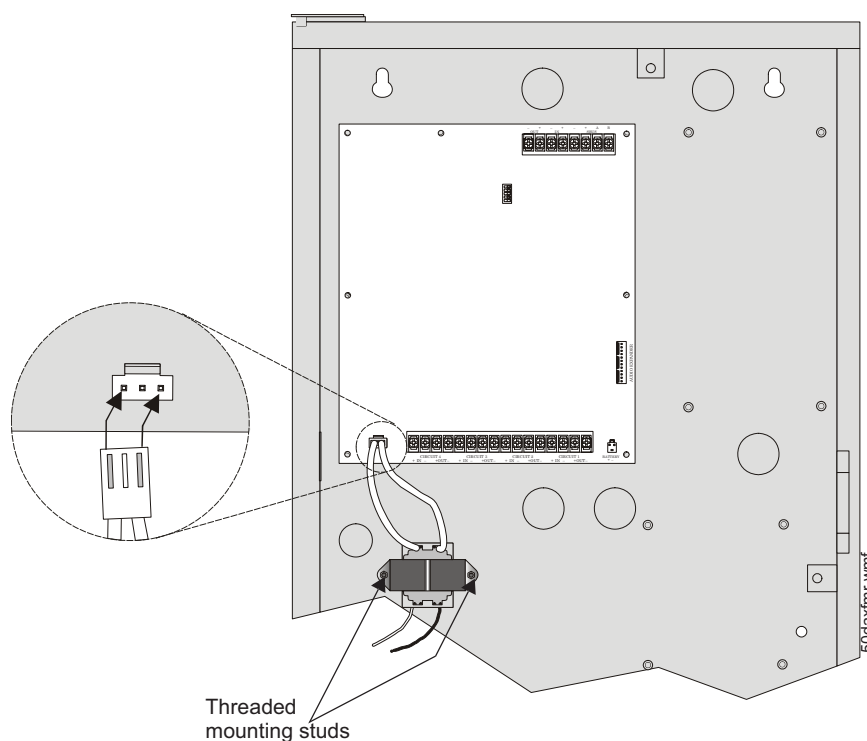


Figure 1.9 Transformer Mounting

4. Connect AC power to the transformer, making sure to properly ground the unit. Then, plug the transformer output to the AC connector on the control panel. See Figure 1.10 below.

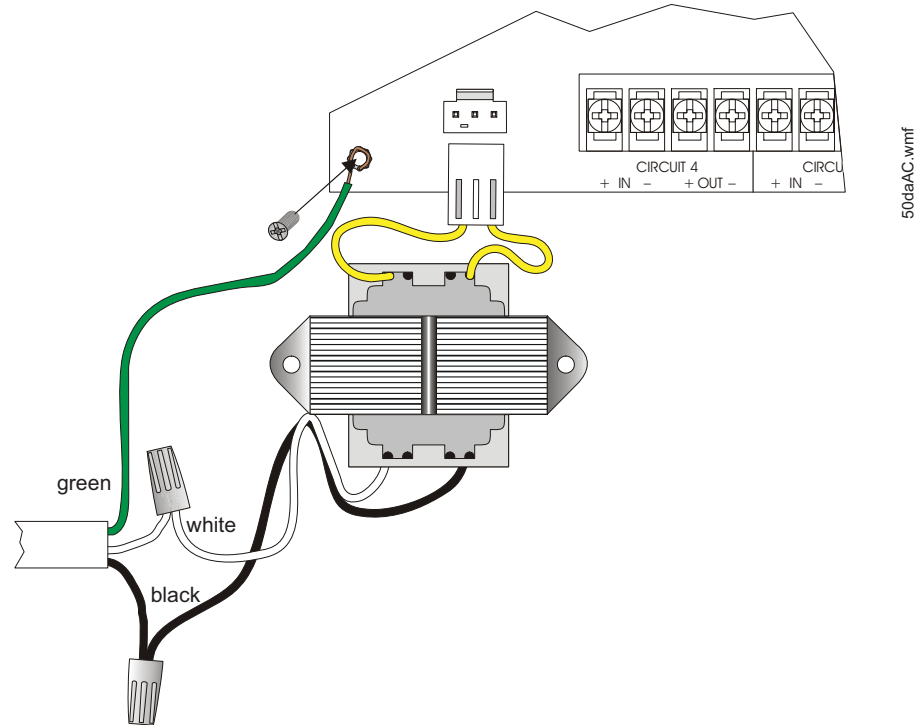


Figure 1.10 AC Connections

1.1.8 Backup Battery

The following steps explain how to connect the batteries (refer to Figure 1.11):

1. Connect the black wire of the battery harness to the negative (-) side of battery #2.
2. Connect the jumper wire provided from the positive (+) side of battery #2 to the negative side (-) of battery #1.

3. Connect the red wire from the battery harness to the positive (+) side of battery #1.

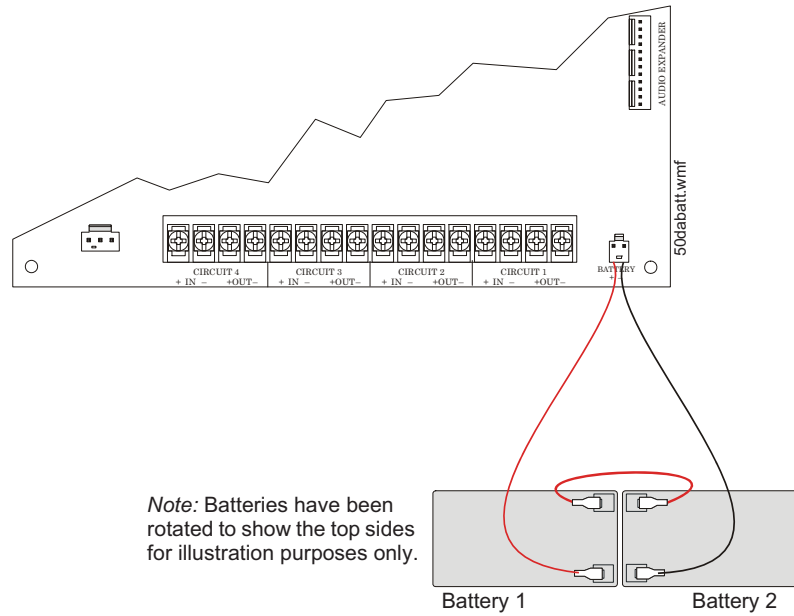


Figure 1.11 Battery Connections to the NFC-50DA

1.1.9 Calculating Current Draw and Standby Battery

This section helps determine the current draw and standby battery needs for your installation (18 Ampere Hours max. will fit in cabinet). Complete the remaining instructions in Table 1.3.

For batteries larger than 18 AH, use the BB-26 or NFS-LBB Battery Box. A maximum of 33 Ampere Hours is allowed per system.

Device	No. of Devices	Current Per Device	Standby Current	Alarm Current
NFC-50DA (25V system)	1	Standby: 85 mA	85 mA	
		Alarm: 525 mA		525 mA
NFC-50DA (70.7V system)	1	Standby: 100 mA	100 mA	
		Alarm: 580 mA		580 mA
NFC-CE4	0 or 1	Standby: 20 mA		
		Alarm (All Channels): 180 mA		mA
A Current Subtotals:			mA	mA
Notification Devices	Refer to device manual for number of devices and current ratings.			
B Current Subtotals:			mA	mA
C Total current rating of all devices in system (Line B) X .001			A	A
D Number of standby hours (24 or 60 for NFPA 72)			H	
E Multiply line C (standby current) and D: Total standby AH			AH	
F Alarm sounding period in hours (For example, 5 minutes = .0833 hours):				H
G Multiply line C (alarm current) and F: Total alarm AH				AH
H Add lines E and G (AH = Ampere Hours): Total AH required			AH	

Table 1.3 Current Draw Calculations

Notes

Section 2: NFC-125DA Remote Amplifier

2.1 Installation

This section provides information on how to install the NFC-125DA for use with the NFC-50/100 FirstCommand Center.



NOTE: The term NFC-125DA is used in this manual to refer to both the NFC-125DA (120 VAC version) and the NFC-125DAE (240 VAC version) amplifier unless specified.

SW2 on the NFC-50/100's display board must be set to the UP position if any NFC-125DAs are installed in the system. Refer to the *NFC-50/100 Instruction Manual* for more information. The NFC-125DA must also be enabled in user programming. Refer to the programming section of the *NFC-50/100 Instruction Manual*, LS10001-001NF-E.

2.1.1 Board Layout

Figure 2.1 shows the location of terminals, dipswitches, and expander connection, used in the installation of the NFC-125DA.

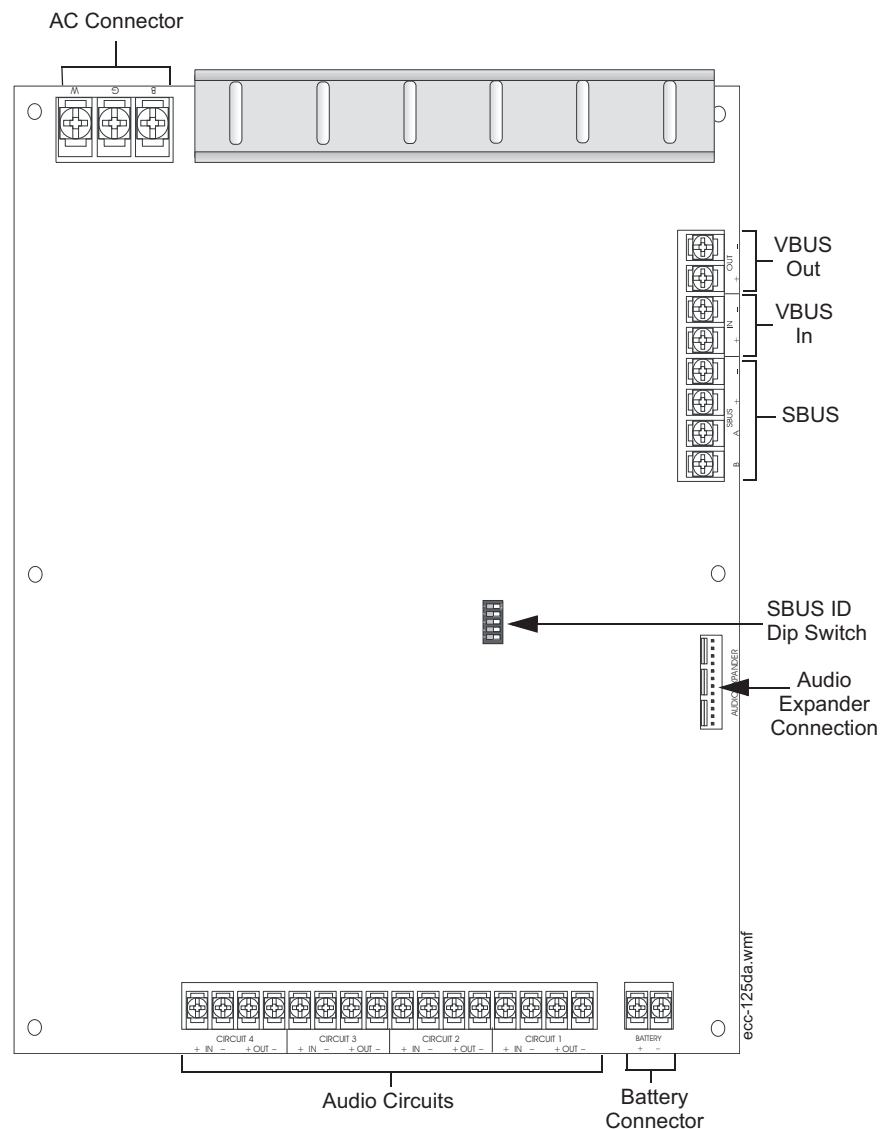


Figure 2.1 Components Layout of NFC-125DA

2.1.2 Mounting the Cabinet

Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately five feet above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices to be installed. Sufficient knockouts are provided for wiring convenience. Select the appropriate knockout(s) and pull the required conductors into the box. Note that knockouts are also located on the back of the cabinet. All wiring should be in accordance with the National and/or Local codes for fire alarm systems.

The cabinet can be surface or flush-mounted. For flush-mount installation of the cabinet, the hole for the enclosure should be 14.5" W x 24.75" H x 3.438" D (36.8cm W x 62.9cm H x 8.73cm D). Do not flush-mount in a wall designated as a fire break. The outside dimensions of the cabinet are 16" W x 26.25" H x 4.125" D (40.64cm W x 66.68cm H x 10.48cm D).

Follow these steps to properly mount the cabinet.

1. Mark and predrill holes for the top two backbox keyhole mounting bolts using the dimensions shown.
2. Install two upper fasteners in the wall with the screw heads protruding.
3. Using the upper 'keyholes', mount the backbox over the two screws.
4. Mark and drill the lower two holes.
5. Install the remaining fasteners and tighten all fasteners to complete backbox mounting.

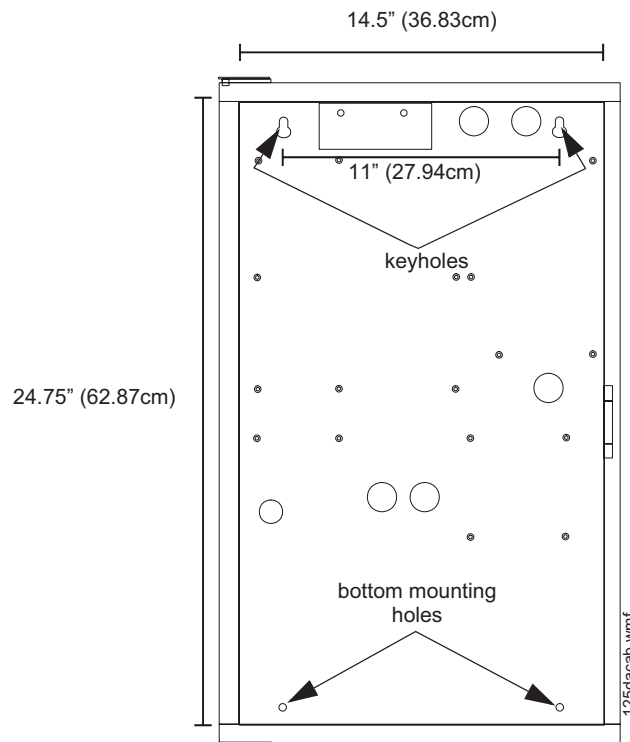


Figure 2.2 Cabinet Flush-Mount Dimensions and Mounting Hole Locations

2.1.3 Wiring Specifications

To avoid induced noise (transfer of electrical energy from one wire to another), keep input wiring isolated from high-current output and power wiring. Avoid pulling one multiconductor cable for the entire panel. Power-limited, nonpower-limited, and audio circuit wiring must remain separated in the cabinet. Maintain at least 0.25" (6.35 mm) spacing. Power-limited, nonpower-limited, and audio circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. For the same reasons, wiring within the cabinet should be routed around the perimeter of the cabinet. It should not cross the printed circuit board where it could induce noise into the sensitive microelectronics or pick up unwanted RF noise from the high speed circuits.

High frequency noise, such as that produced by the inductive reactance of a speaker or bell, can also be reduced by running the wire through ferrite beads or by wrapping it around a ferrite toroid core. Figure 2.3 provides an example.

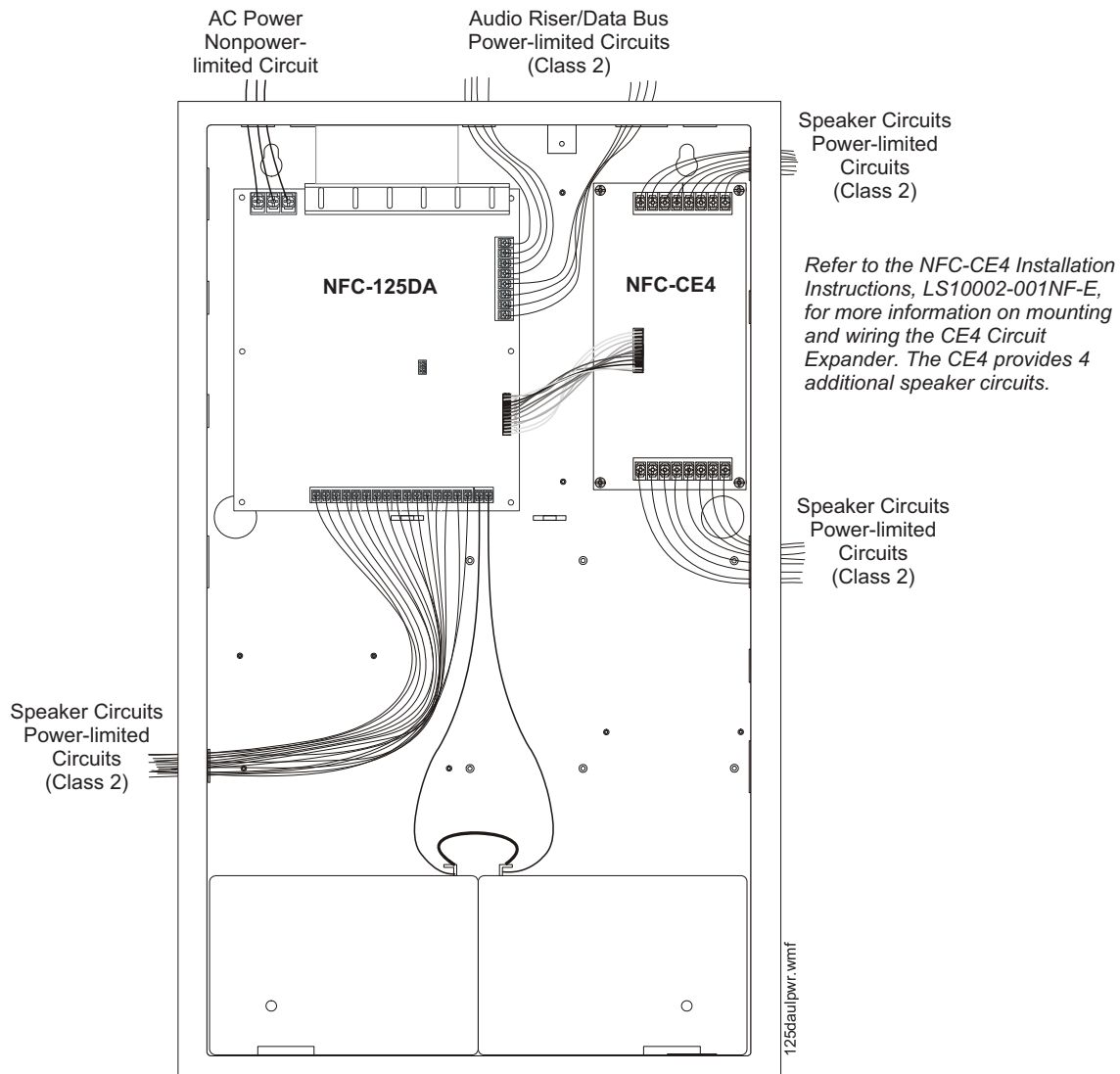


Figure 2.3 Wire Routing Example for NFC-125DA

2.1.4 Speaker Wiring

Each NFC-125DA supplies four NAC (Notification Appliance Circuit) for speaker connection. The speaker circuit can be supervised and wired Class B (Style Y) or Class A (Style Z). Speaker circuit 1 is capable of 100 watts of power at 25 Vrms. Speaker circuit 2-4 are capable of 50 watts (each) at 25 Vrms.

Wiring Lengths

Number Of Speakers		Total Load		Wire Distance in Feet			
@1/2 W	@1 W	Vrms	Watts	18 AWG	16 AWG	14 AWG	12 AWG
10	5	25Vrms	5W	3900	6200	9860	15680
20	10	25Vrms	10W	2125	3380	5375	8540
30	15	25Vrms	15W	1460	2320	3690	5870
40	20	25Vrms	20W	1100	1750	2780	4420
52	26	25Vrms	26W	760	1200	1920	3050
80	40	25Vrms	40W	550	875	1390	2200
100	50	25Vrms	50W	450	715	1130	1800
150	75	25Vrms	75W	300	476	753	1200
200	100	25Vrms	100W	225	357	565	900
250	125	25Vrms	125W	180	285	452	720

Table 2.1 Wire Lengths



NOTE: The above table assumes a uniform distribution of the speakers, and that a max of 20% voltage drop on the last speaker is allowed.

Class B (Style Y)

Figure 2.4 illustrates how to wire speakers to the control panel using Class B (Style Y) supervision.

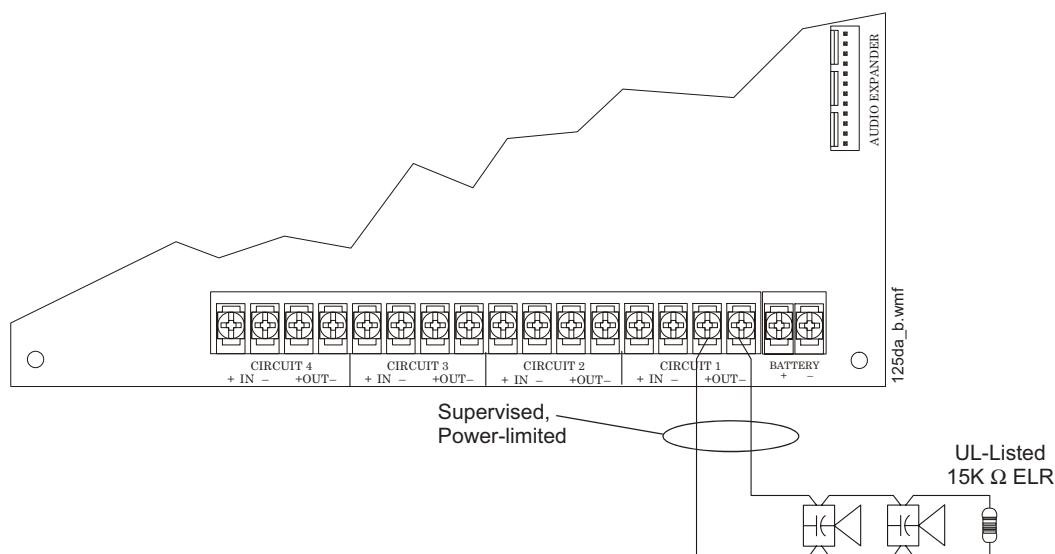


Figure 2.4 Class B (Style Y) Speaker Configuration

Class A (Style Z)

Figure 2.5 illustrates how to wire speakers to the control panel using Class A (Style Z) wiring.

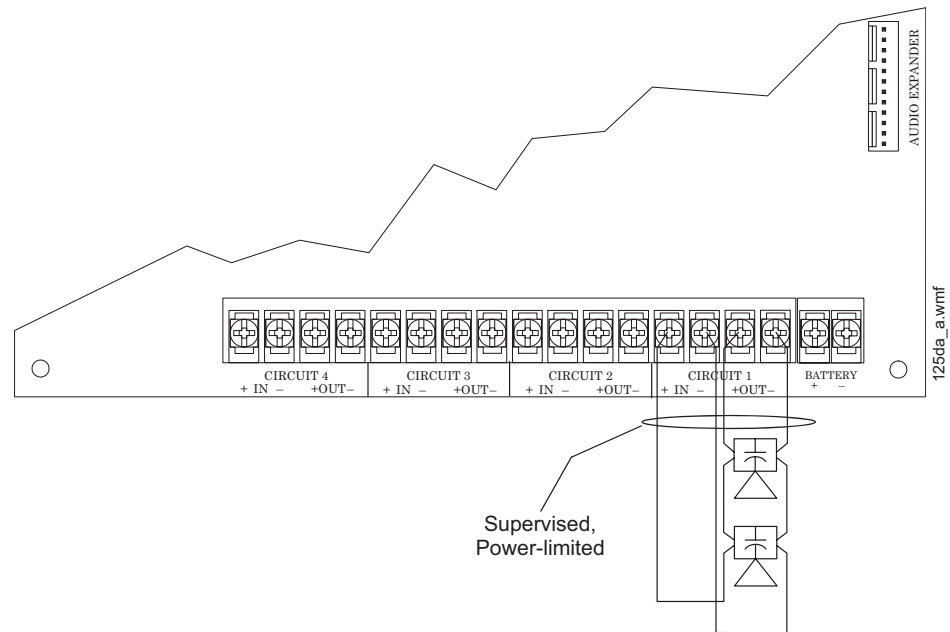


Figure 2.5 Class A (Style Z) Speaker Configuration

2.1.5 Audio Riser Wiring

The Audio Riser is an analog voice bus that carries the recorded voice messages from the display board to the NFC-125DAs, or the voice messages generated from a system microphone to the NFC-125DAs. The maximum resistance on the Audio Riser is 20Ω .

Connect the Audio Riser from TB22 on the main control board to the NFC-125DAs as shown in Figure 2.6.

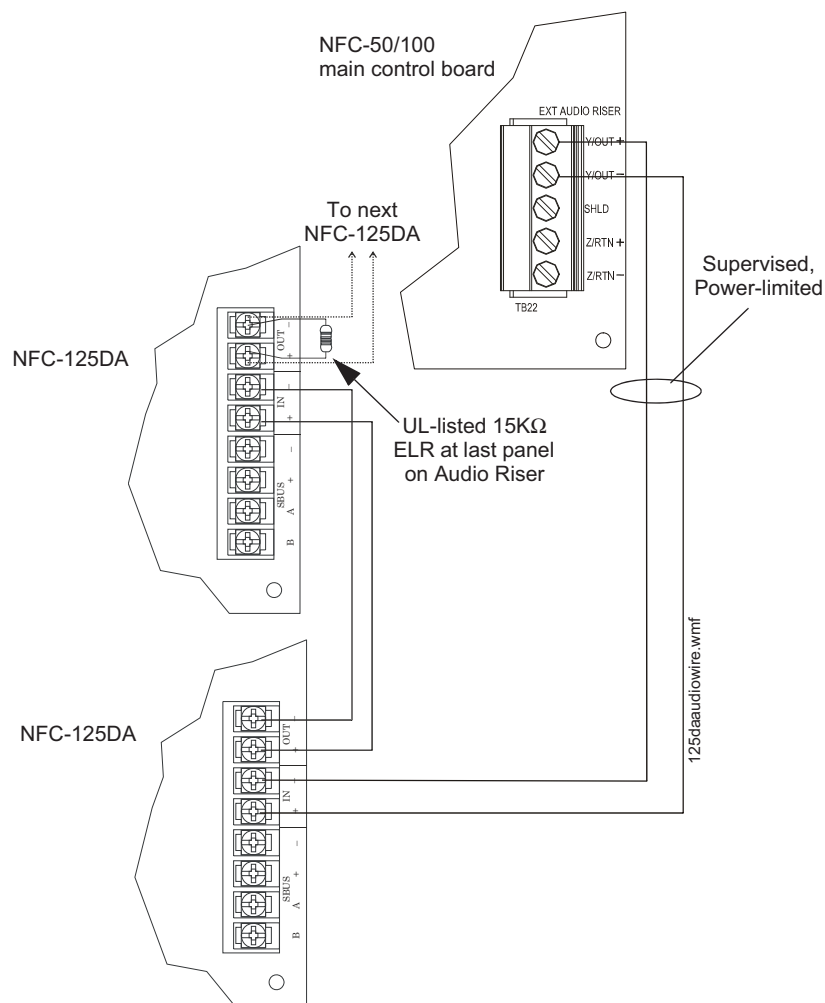


Figure 2.6 NFC-125DA Audio Riser Wiring

2.1.6 Data BUS Wiring

This section contains information on how to connect NFC-125DAs (up to 8) onto the main control Data BUS. Refer to the *NFC-50/100 Manual* for Data BUS specifications. Wire the Data BUS from TB12 on the main control board to the NFC-125DA as shown in Figure 2.7 or Figure 2.8.

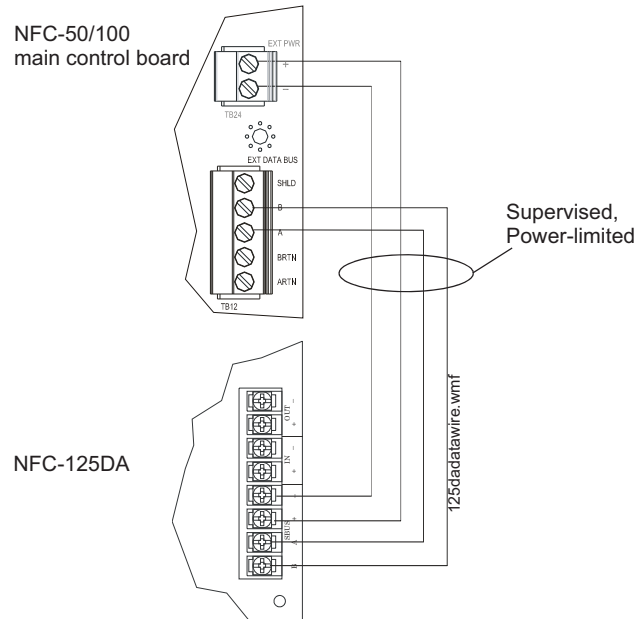


Figure 2.7 Data BUS Connections of the NFC-125DA

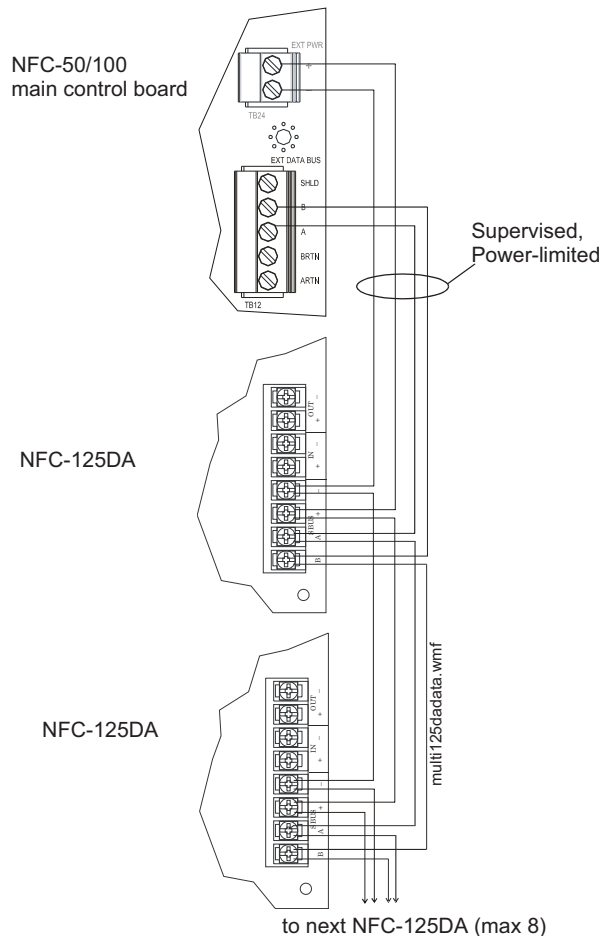


Figure 2.8 Connecting Multiple NFC-125DAs to the Data BUS

2.1.7 Connecting AC Power

Module	Voltage	Standby Current	Alarm Current
NFC-125DA	120 VAC, 60 Hz	300 mA	2200 mA
NFC-125DAE	240 VAC, 50 Hz	250 mA	1250 mA

Figure 2.9 NFC-125DA AC Current Draw

At installation, connect the AC terminals to the power source as shown in Figure 2.10. It may be necessary for a professional electrician to make this connection.

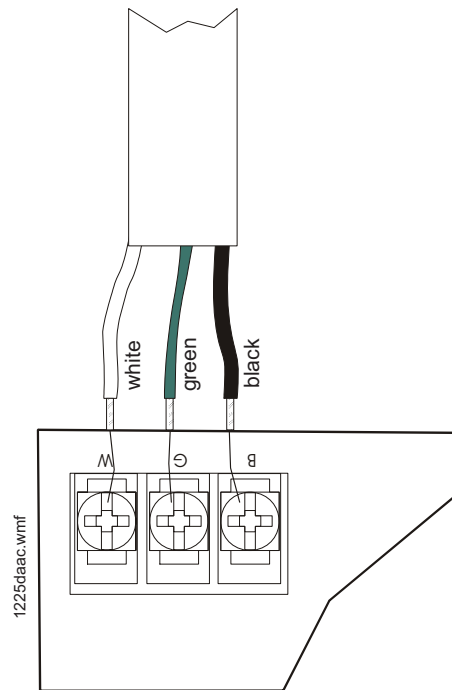


Figure 2.10 AC Connection

2.1.8 Backup Battery

The following steps explain how to connect the batteries (refer to Figure 2.11):

1. Connect the black wire of the battery harness to the (-) side of the battery #2.
2. Connect the jumper wire provided from the positive (+) side of battery #2 to the negative side of battery #1.
3. Connect the red wire from the battery harness to the positive (+) side of battery #1.

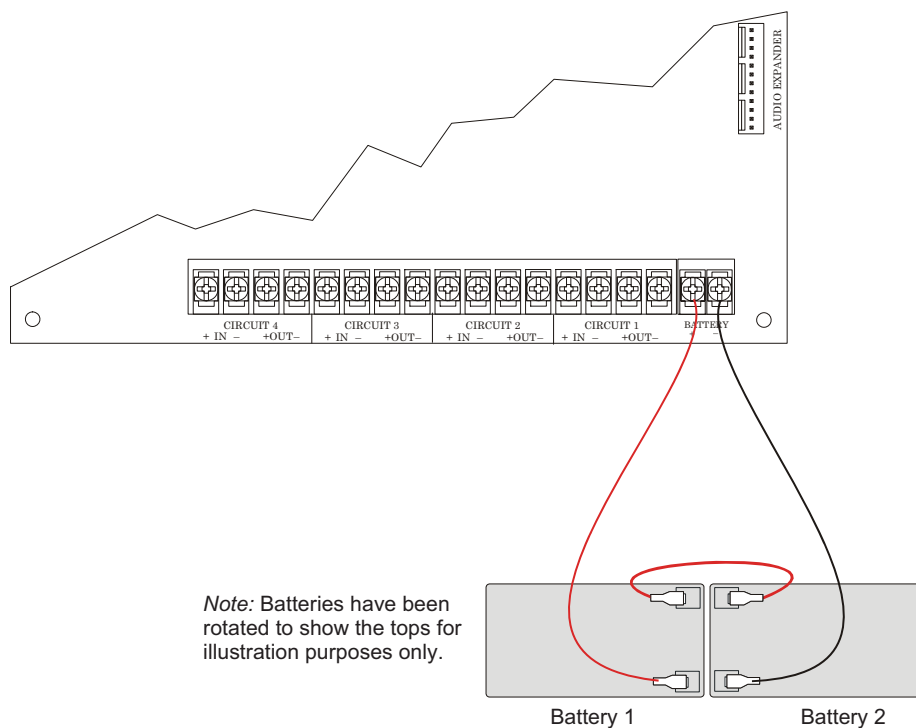


Figure 2.11 Battery Connection to NFC-125DA

2.1.9 Calculating Current Draw and Standby Battery

This section helps determine the current draw and standby battery needs for your installation (18 Ampere Hours maximum will fit in cabinet). Complete the remaining instructions in Table 2.2.

For batteries larger than 18 AH, use the BB-26 or NFS-LBBBattery Box. A maximum of 35 Ampere Hours is allowed per system.

Device	No. of Devices	Current Per Device	Standby Current	Alarm Current
NFC-125DA	1	Standby: 375 mA	375 mA	
		Alarm: 700 mA		700 mA
NFC-CE4	0 or 1	Standby: 20 mA		
		Alarm (All Channels): 180 mA		mA
A	Current Subtotals:		mA	mA
Notification Devices		Refer to device manual for number of devices and current ratings.		
B	Current Subtotals:		mA	mA
C	Total current rating of all devices in system (Line B) X .001		A	A
D	Number of standby hours (24 or 60 for NFPA 72)		H	
E	Multiply line C (standby current) and D: Total standby AH		AH	
F	Alarm sounding period in hours (For example, 5 minutes = .0833 hours):			H
G	Multiply line C (alarm current) and F: Total alarm AH			AH
H	Add lines E and G (AH = Ampere Hours): Total AH required		AH	

Table 2.2 Current Draw Calculations

Section 3: NFC-50/100DA Backup Remote Amplifier

3.1 UL 464 Low Frequency Sounders

This product complies with the requirements for a low frequency sounder (520Hz) as specified in UL 464 when used as part of a system with the following items.

Amplifiers:

Amplifier/Audio Product	Description
NFC-50/100	Main console
NFC-50/100 with NFC-BDA-25V	Main console with optional second 25V amplifier installed
NFC-50/100 with NFC-XRM-70V	Main console with 70V transformer installed
NFC-50/100 with NFC-XRM-70V and NFC-BDA-70V	Main console with 70V transformer and optional second 70V amplifier installed
NFC-50/100 with NFC-50/100DA	Main console with 50/100 watt remote amplifier (with or without internal options listed above), 25V or 70V
NFC-50/100 with NFC-50/100DA and NFC-BDA-BU	Main console with 50/100 watt remote amplifier and optional backup amplifier (with or without internal options listed above), 25V or 70V

Audio File:

The 520 Hz audio file is available for download at esd.notifier.com.

Speakers:

For a complete list of speakers that can be used in a Notifier FirstCommand system with the above specifications, refer to the current version of the Device Compatibility document, p/n 15378.

3.2 Installation

This section provides information on how to install the NFC-50/100DA for use with the NFC-50/100 FirstCommand Center.



NOTE: The term NFC-50/100DA is used in this manual to refer to both the NFC-50/100DA (120 VAC version) and the NFC-50/100DAE (240 VAC version) amplifier unless specified.

SW2 on the NFC-50/100's display board must be set to the UP position if any NFC-50/100DAs are installed in the system. Refer to the *NFC-50/100 Instruction Manual*, P/N LS10001-001NF-E, for more information. The NFC-50/100DA must also be enabled in user programming. 70 volt operation of the NFC-50/100DA is also set up in user programming. Refer to the programming section of the *NFC-50/100 Instruction Manual*, LS10001-001NF-E.

3.2.1 Board Layout

Figure 3.1 shows the location of terminals, dip switch, and circuit expander connection, used in the installation of the NFC-50/100DA.

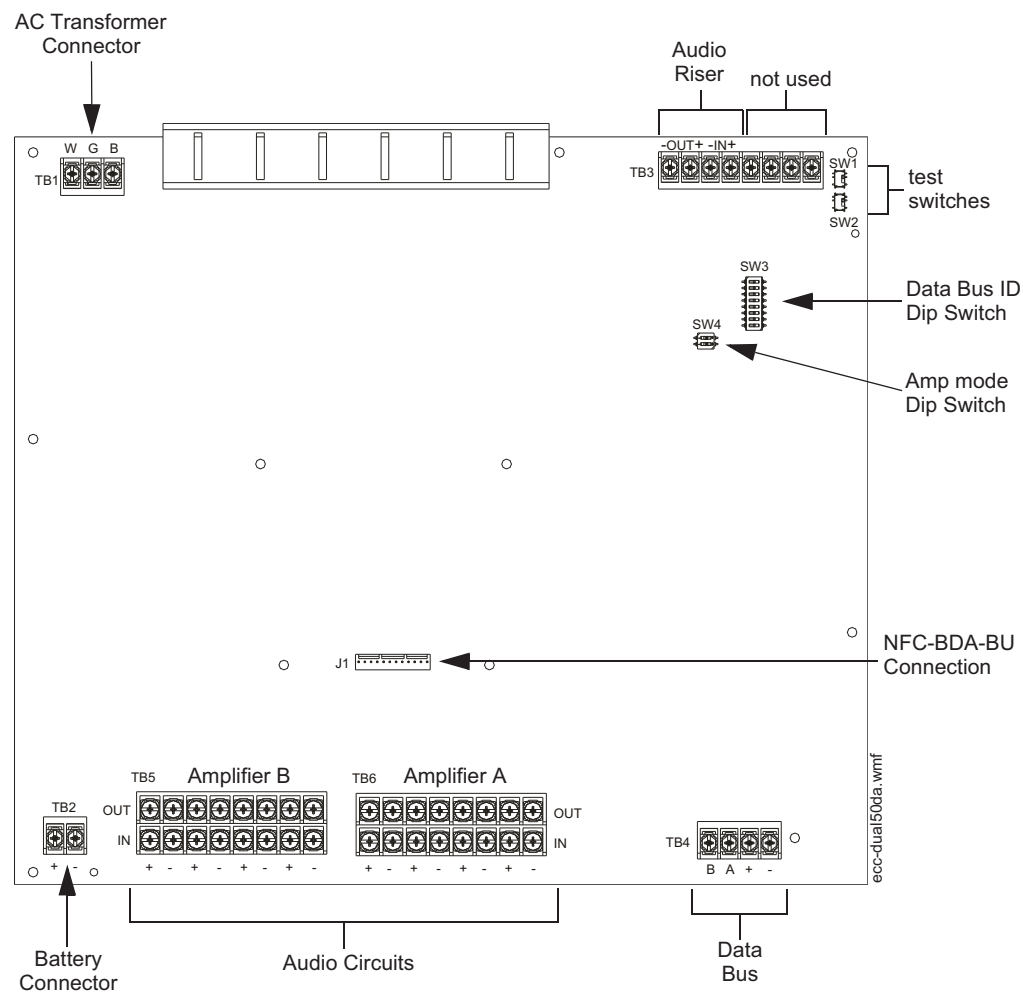


Figure 3.1 NFC-50/100DA Board Layout

3.2.2 Mounting the Cabinet

Carefully unpack the system and check for shipping damage. Mount the cabinet in a clean, dry, vibration-free area where extreme temperatures are not encountered. The area should be readily accessible with sufficient room to easily install and maintain the panel. Locate the top of the cabinet approximately five feet above the floor with the hinge mounting on the left. Determine the number of conductors required for the devices to be installed. Sufficient knockouts are provided for wiring convenience. Select the appropriate knockout(s) and pull the required conductors into the box. Note that knockouts are also located on the back of the cabinet. All wiring should be in accordance with the National and/or Local codes for fire alarm systems.

The cabinet can be surface or flush-mounted. For flush-mount installation of the cabinet, the hole for the enclosure should be 14.5" W x 24.75" H x 3.438" D (36.8cm W x 62.9cm H x 8.73cm D). Do not flush-mount in a wall designated as a fire break. The outside dimensions of the cabinet are 16" W x 26.25" H x 4.125" D (40.64cm W x 66.68cm H x 10.48cm D).

Follow these steps to properly mount the cabinet.

1. Mark and predrill holes for the top two backbox keyhole mounting bolts using the dimensions shown.
2. Install two upper fasteners in the wall with the screw heads protruding.
3. Using the upper 'keyholes', mount the backbox over the two screws.
4. Mark and drill the lower two holes.
5. Install the remaining fasteners and tighten all fasteners to complete backbox mounting.

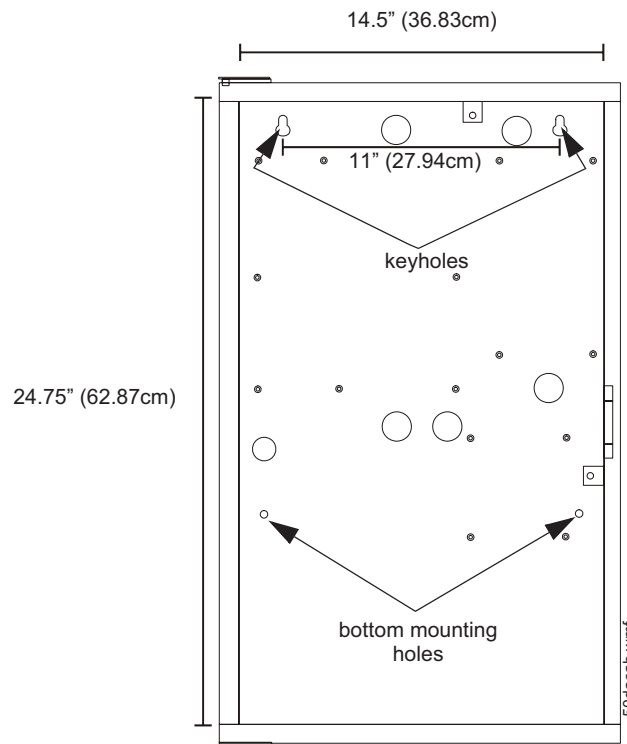


Figure 3.2 Cabinet Flush-Mount Dimensions and Mounting Hole Locations

3.2.3 Installing the Optional NFC-BDA-BU

The NFC-BDA-BU provides backup capability when the NFC-50/100DA is set for the 100 watt mode with backup.

The NFC-BDA-BU mounts onto the NFC-50/100DA board with the standoffs provided. Figure 3.3 shows the location of the NFC-BDA-BU on the NFC-50/100DA board.

To install the NFC-BDA-BU,

1. Make sure that all power supplied to the NFC-50/100DA has been removed.
2. Insert the supplied M/F standoffs in the locations shown below.
3. Connect the backup amplifier cable harness (P/N 50116775-001) to the connector labeled “Backup Amplifier” on the NFC-50/100DA.
4. Lay the NFC-BDA-BU over the standoffs installed in step 2 and secure with supplied screws.
5. Connect the other end of the cable harness to the header on the NFC-BDA-BU.

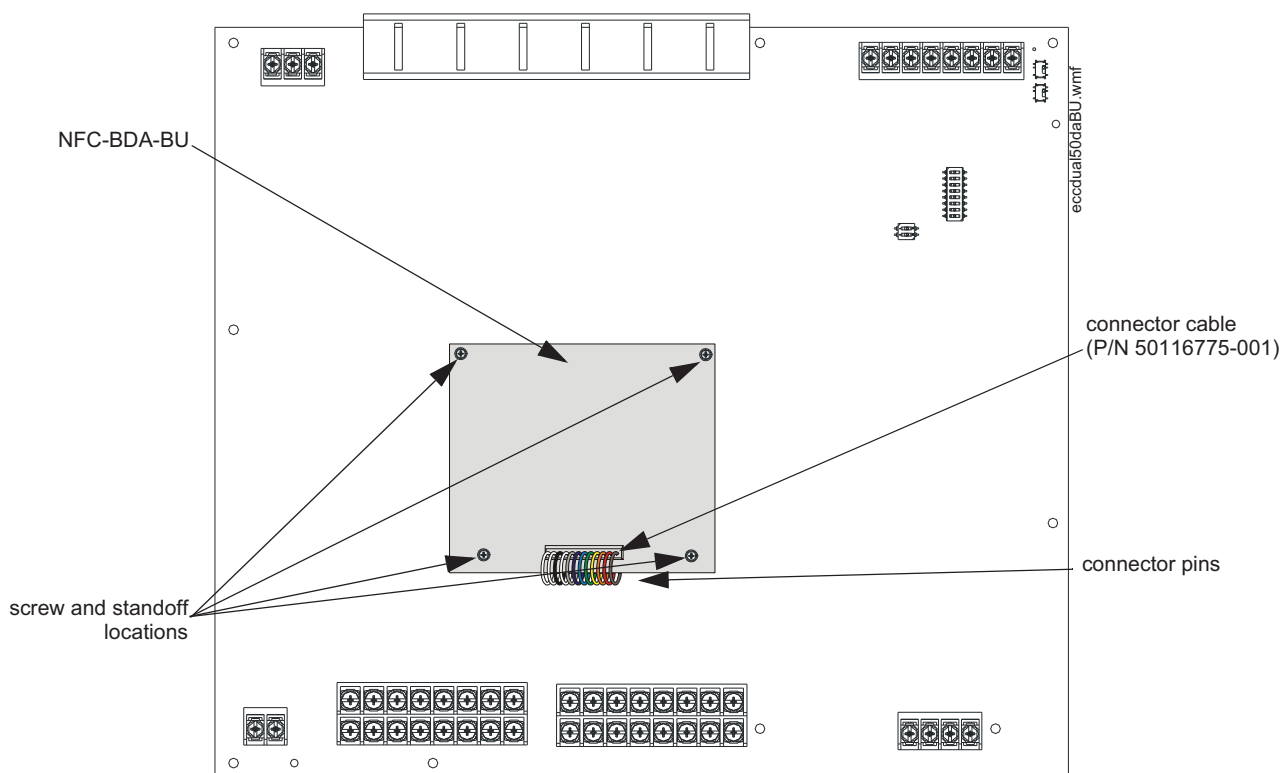


Figure 3.3 Installing the NFC-BDA-BU onto the NFC-50/100DA

3.2.4 Wiring Specifications

To avoid induced noise (transfer of electrical energy from one wire to another), keep input wiring isolated from high-current output and power wiring. Avoid pulling one multiconductor cable for the entire panel. Power-limited, nonpower-limited, and audio circuit wiring must remain separated in the cabinet. Maintain at least 0.25" (6.35 mm) spacing. Power-limited, nonpower-limited, and audio circuit wiring must enter and exit the cabinet through different knockouts and/or conduits. For the same reasons, wiring within the cabinet should be routed around the perimeter of the cabinet. It should not cross the printed circuit board where it could induce noise into the sensitive microelectronics or pick up unwanted RF noise from the high speed circuits.

High frequency noise, such as that produced by the inductive reactance of a speaker or bell, can also be reduced by running the wire through ferrite beads or by wrapping it around a ferrite toroid core. Figure 3.4 provides an example.

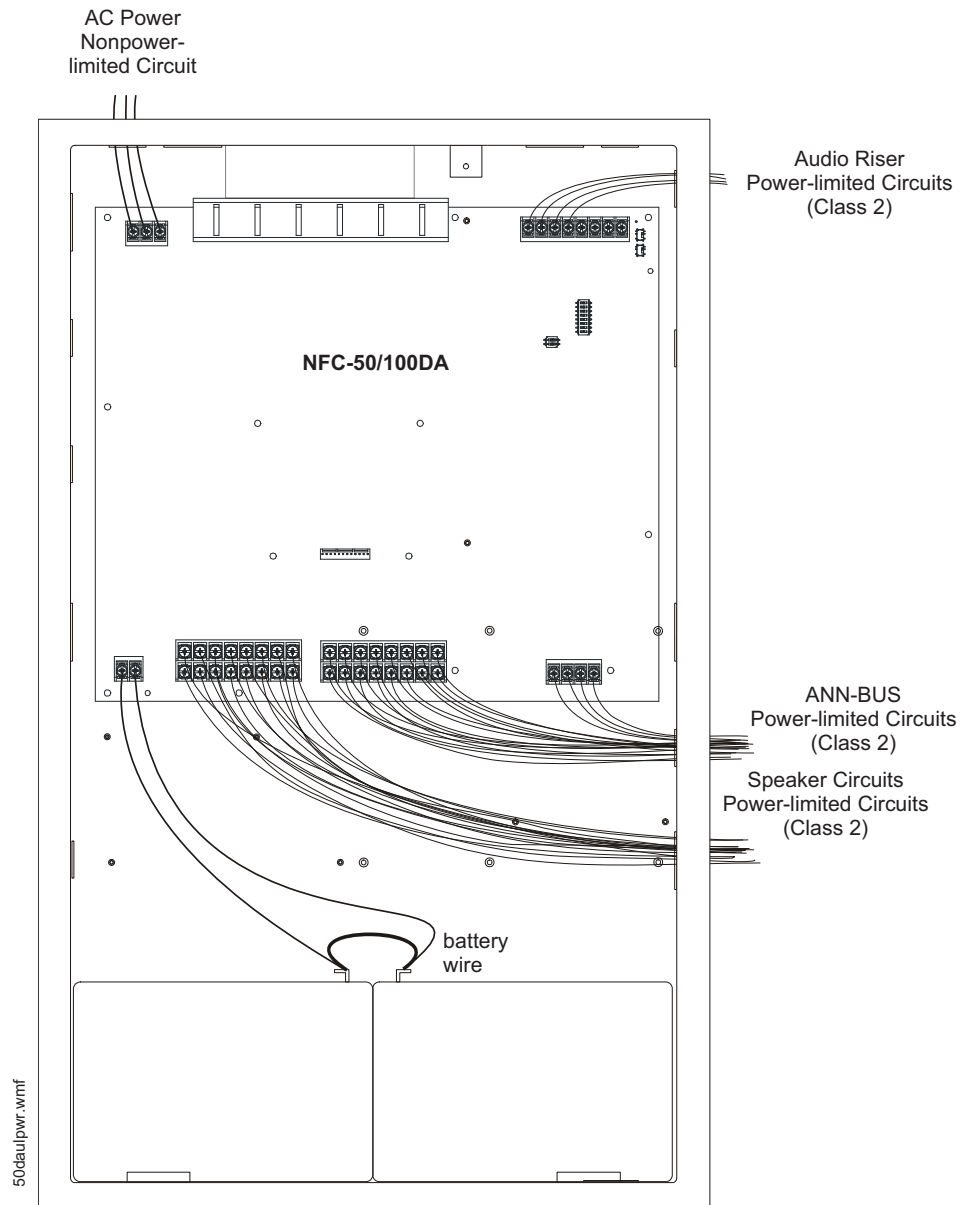


Figure 3.4 Wire Routing Example for NFC-50/100DA

3.2.5 Speaker Wiring

Each NFC-50/100DA supplies eight NAC (Notification Appliance Circuit) for speaker connection. The speaker circuit can be supervised and wired Class B (Style Y) or Class A (Style Z). The speaker circuits are capable of 50 watts (each) at 25 Vrms or 70.7 Vrms.

Wiring Lengths

Number Of Speakers		Total Load		Wire Distance in Feet			
@1/2 W	@1 W	Vrms	Watts	18 AWG	16 AWG	14 AWG	12 AWG
10	5	25Vrms	5W	3900	6200	9860	15680
		70Vrms		25000	39700	63200	100520
20	10	25Vrms	10W	2125	3380	5375	8540
		70Vrms		15200	24150	38400	61100
30	15	25Vrms	15W	1460	2320	3690	5870
		70Vrms		11000	17500	27800	44200
40	20	25Vrms	20W	1100	1750	2780	4420
		70Vrms		8500	13510	21500	34175
52	26	25Vrms	26W	760	1200	1920	3050
		70Vrms		6100	9700	15400	24520
80	40	25Vrms	40W	550	875	1390	2200
		70Vrms		4100	6500	10360	16480
100	50	25Vrms	50W	450	715	1130	1800
		70Vrms		3500	5560	8850	14070

Table 3.1 Wire Lengths



NOTE: The above table assumes a uniform distribution of the speakers, and that a max of 20% voltage drop on the last speaker is allowed.

Class B (Style Y)

Figure 3.5 illustrates how to wire speakers to the control panel using Class B (Style Y) supervision.

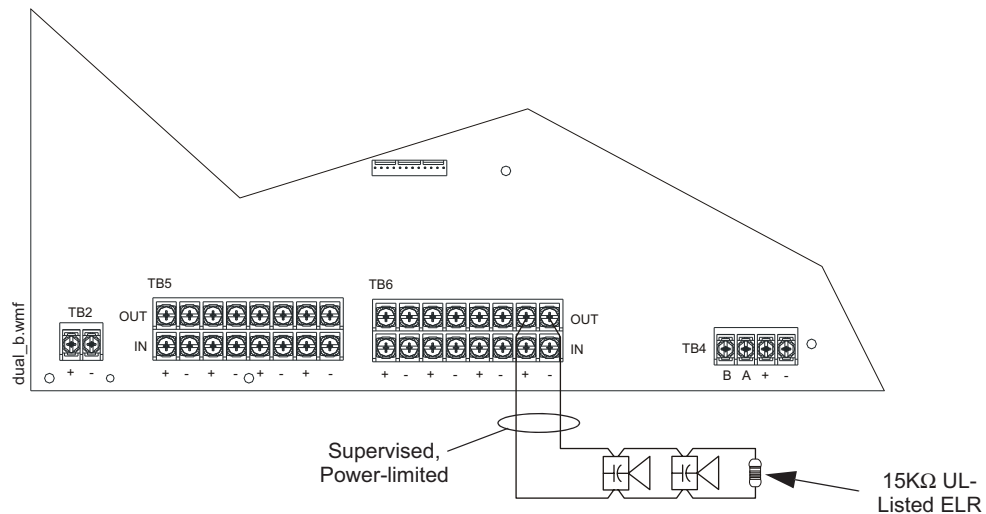


Figure 3.5 Class B (Style Y) Speaker Configuration

Class A (Style Z)

Figure 3.6 illustrates how to wire speakers to the control panel using Class A (Style Z) wiring.

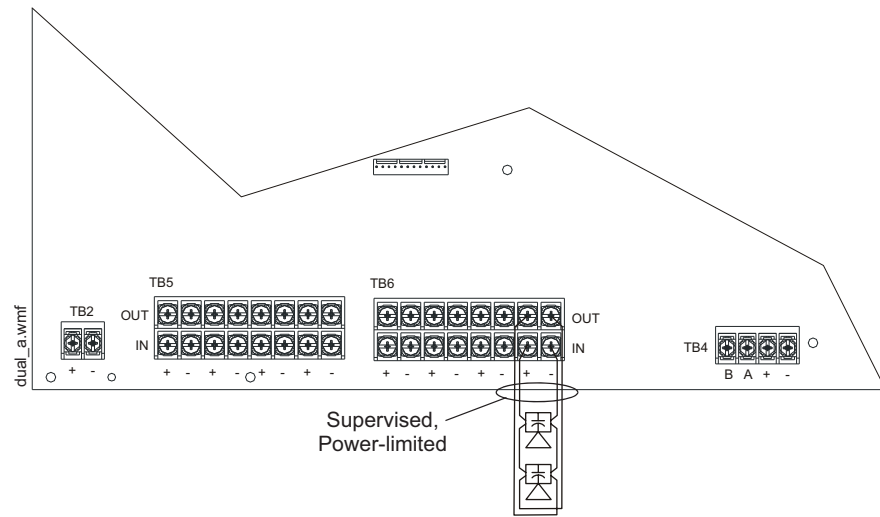


Figure 3.6 Class A (Style Z) Speaker Configuration

Audio Riser Wiring

The Audio Riser is an analog voice bus that carries the recorded voice messages from the NFC display board to the NFC-50/100DAs, or the voice messages generated from a system microphone to the NFC-50/100DAs. The maximum resistance on the audio riser is 20Ω . The NFC-50/100DA supports two audio riser channels. The wiring method is the same for both channels. Audio Riser 1 and Audio Riser 2 should never be wired together.

Connect the Audio Riser from TB22 on the main control board to the NFC-50/100DAs as shown in Figure 3.7.

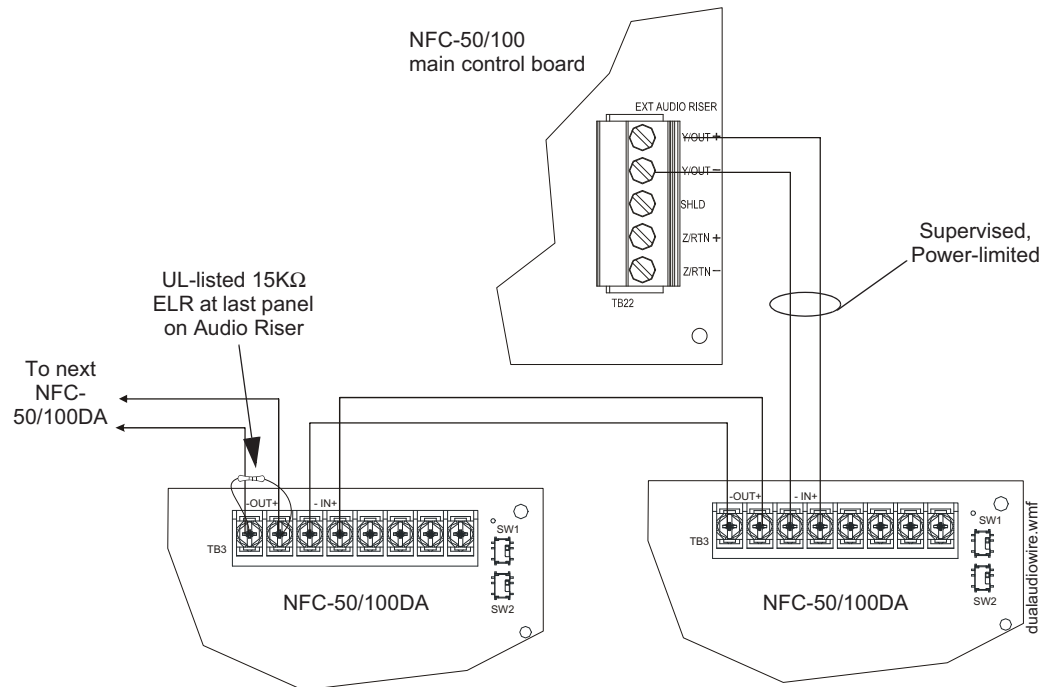


Figure 3.7 Audio Riser Wiring

3.2.6 Data Bus Wiring

This section contains information on how to connect up to eight (8) NFC-50/100DAs onto the main control Data BUS. Refer to the *NFC-50/100 Manual* for Data BUS specifications. Wire the Data BUS from TB12 on the main control board to the NFC-50/100DA as shown in Figure 3.8 or Figure 3.9.

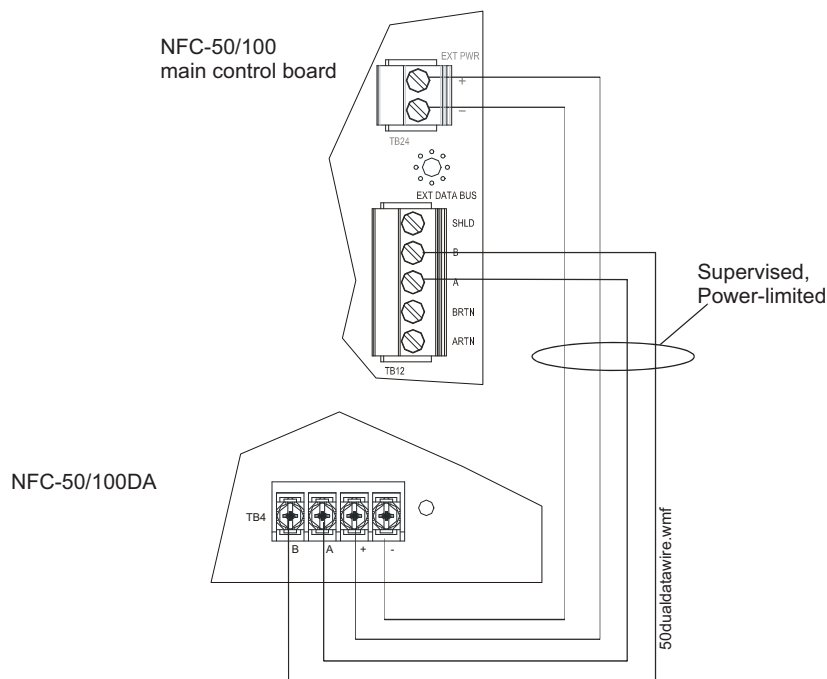


Figure 3.8 Data Bus Connections of the NFC-50/100DA

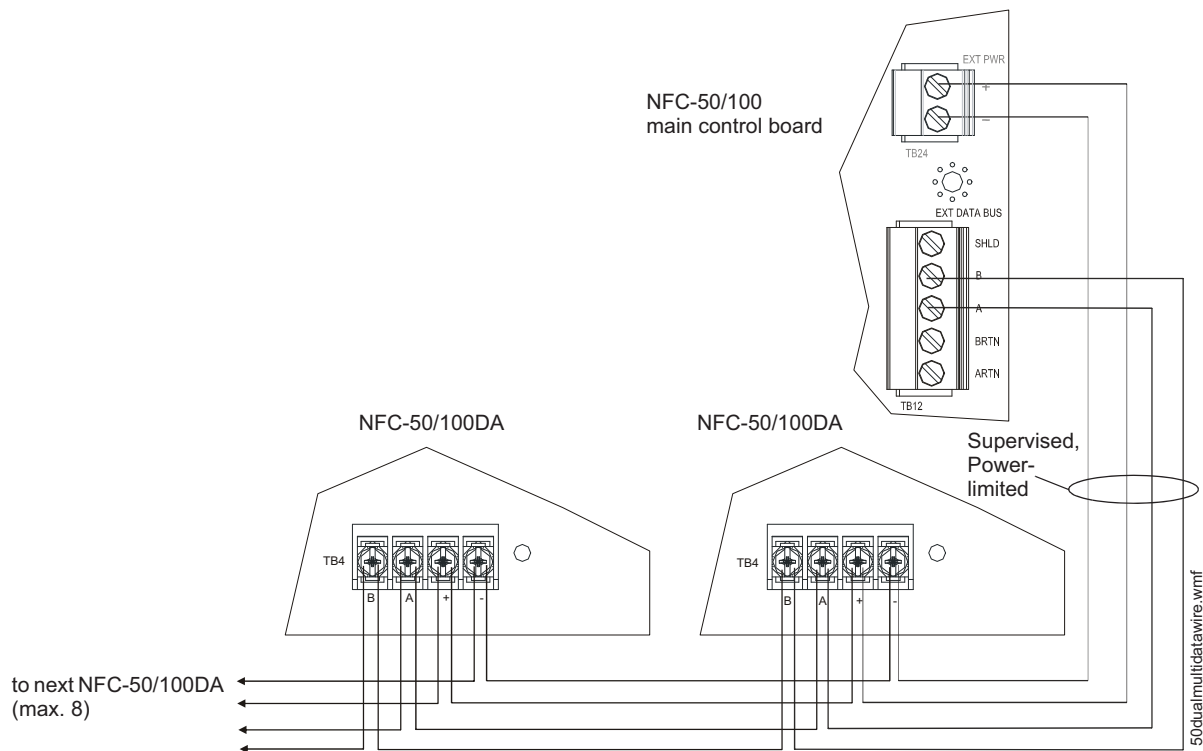


Figure 3.9 Connecting Multiple NFC-50/100DAs to the Data Bus

Refer to section 2 of the *NFC-50/100 Manual* for information on setting SBUS addresses.

3.2.7 Setting the NFC-50/100DA Amplifier Mode

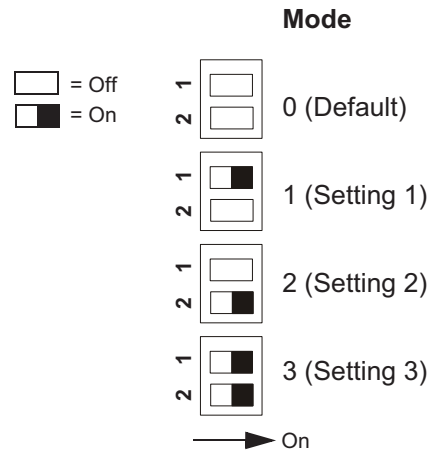


Figure 3.10 Amplifier Mode Dip Switch SW4 Settings

Set the amplifier dip switch SW4 for use with the NFC-50/100. The amplifier modes are as follows:

- 50 Watt with Backup - Amplifier A powers audio circuits 1 - 8. Amplifier A is backed up by onboard Amplifier B. Set the dip switch to setting 2.
- 100 Watt with no Backup - Amplifier A powers audio circuits 1 - 4. Amplifier B powers audio circuits 5 - 8. There is no backup in this configuration. Set the dip switch to setting 1.
- 100 Watt with Backup (requires NFC-BDA-BU) - Amplifier A powers audio circuits 1 - 4. Amplifier B powers audio circuits 5 - 8. The NFC-BDA-BU will backup either Amplifier A *or* Amplifier B. Set the dip switch to setting 3.

3.2.8 Test Switch Use

SW1 - AMPLIFIER A

Switch should be moved to the “ON” position for normal operation. Move this switch to the “Test” position to test backup amplifier.

SW2 - AMPLIFIER B

Switch should be moved to the “ON” position for normal operation. Move this switch to the “Test” position to test backup amplifier.



NOTE: Allow up to 3 minutes for the backup amplifier to engage.

3.2.9 Connecting AC Power

At installation, connect the AC terminals to the power source as shown in Figure 3.11. It may be necessary for a professional electrician to make this connection.

Module	Voltage	Standby Current	Alarm Current
NFC-50/100DA 25V	120 VAC, 60 Hz	190 mA	2380 mA
NFC-50/100DAE 25V	240 VAC, 50 Hz	200 mA	1260 mA
NFC-50/100DA 70V	120 VAC, 60 Hz	190 mA	2470 mA
NFC-50/100DAE 70V	240 VAC, 50 Hz	200 mA	1310 mA

Table 3.2 NFC-50/100DA AC Current Draw

The AC terminals are rated as 120 VAC, 60 Hz or 240 VAC, 50 Hz.

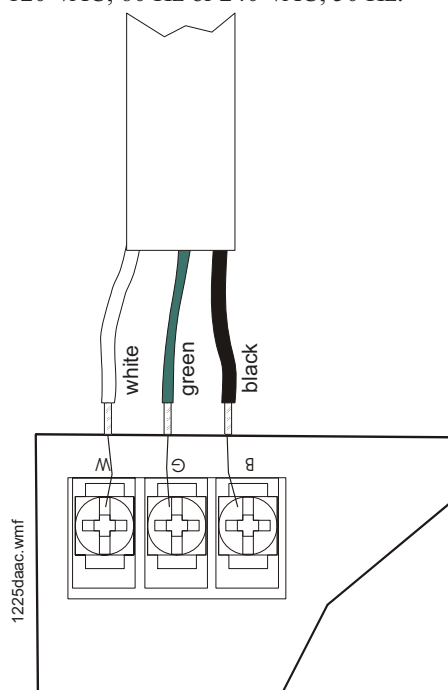


Figure 3.11 AC Connection

3.2.10 Backup Battery for NFC-50/100DA

The following steps explain how to connect the batteries (refer to Figure 3.12):

1. Connect the black wire of the battery harness to the (-) side of the battery #2.
2. Connect the jumper wire provided from the positive (+) side of battery #2 to the negative (-) side of battery #1.
3. Connect the red wire from the battery harness to the positive (+) side of battery #1.

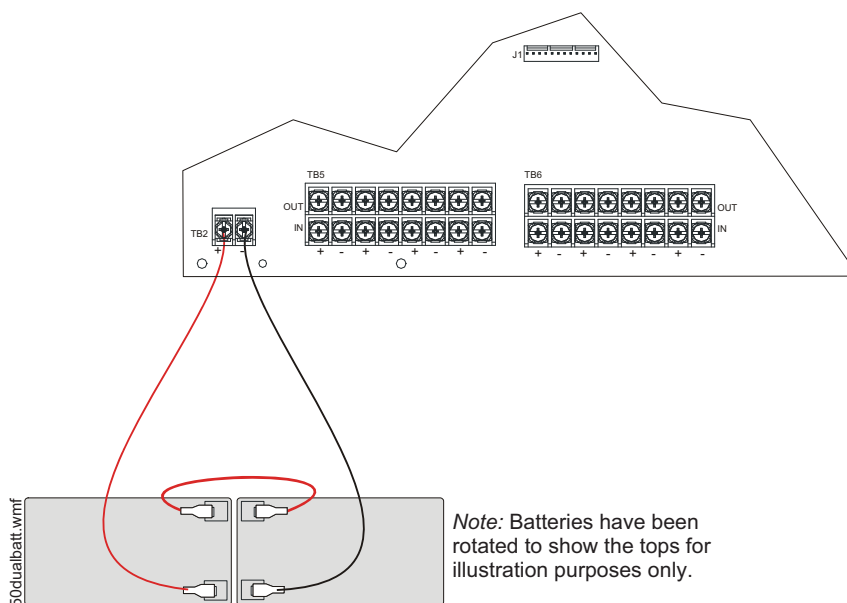


Figure 3.12 Battery Connection to NFC-50/100DA

3.2.11 Calculating Current Draw and Standby Battery

This section helps determine the current draw and standby battery needs for your installation (18 Ampere Hours maximum will fit in cabinet). Complete the remaining instructions in Table 3.3.

Batteries larger than 18 AH will not fit in the main control cabinet and must be housed in the BB-26 or NFS-LBB Battery Box. A maximum of 35 AH is allowed per system.

Device	No. of Devices	Current Per Device	Standby Current	Alarm Current
NFC-50/100DA 25V	1	Standby: 110 mA	110 mA	
		Alarm: 1.2 A		1.2 A
NFC-50/100DA 70.7V	1	Standby: 110 mA	110 mA	
		Alarm: 1.4 A		1.4 A
NFC-BDA-BU	1	Standby: 40 mA	40 mA	
		Alarm: 110 mA		110 mA
A	Current Subtotals:		mA	mA
Notification Devices		Refer to device manual for number of devices and current ratings.		
B	Current Subtotals:		mA	mA
C	Total current rating of all devices in system (Line B) X 0.001		A	A
D	Number of standby hours (24 or 60 for NFPA 72)		H	
E	Multiply line C (standby current) and D: Total standby AH		AH	
F	Alarm sounding period in hours (For example, 5 minutes = 0.0833 hours):			H
G	Multiply line C (alarm current) and F: Total alarm AH			AH
H	Add lines E and G (AH = Ampere Hours): Total AH required		AH	

Table 3.3 Current Draw Calculations

Manufacturer Warranties and Limitation of Liability

Manufacturer Warranties. Subject to the limitations set forth herein, Manufacturer warrants that the Products manufactured by it in its Northford, Connecticut facility and sold by it to its authorized Distributors shall be free, under normal use and service, from defects in material and workmanship for a period of thirty six months (36) months from the date of manufacture (effective Jan. 1, 2009). The Products manufactured and sold by Manufacturer are date stamped at the time of production. Manufacturer does not warrant Products that are not manufactured by it in its Northford, Connecticut facility but assigns to its Distributor, to the extent possible, any warranty offered by the manufacturer of such product. This warranty shall be void if a Product is altered, serviced or repaired by anyone other than Manufacturer or its authorized Distributors. This warranty shall also be void if there is a failure to maintain the Products and the systems in which they operate in proper working conditions.

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Warranty Claims. Manufacturer shall replace or repair, at Manufacturer's discretion, each part returned by its authorized Distributor and acknowledged by Manufacturer to be defective, provided that such part shall have been returned to Manufacturer with all charges prepaid and the authorized Distributor has completed Manufacturer's Return Material Authorization form. The replacement part shall come from Manufacturer's stock and may be new or refurbished. THE FOREGOING IS DISTRIBUTOR'S SOLE AND EXCLUSIVE REMEDY IN THE EVENT OF A WARRANTY CLAIM.

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