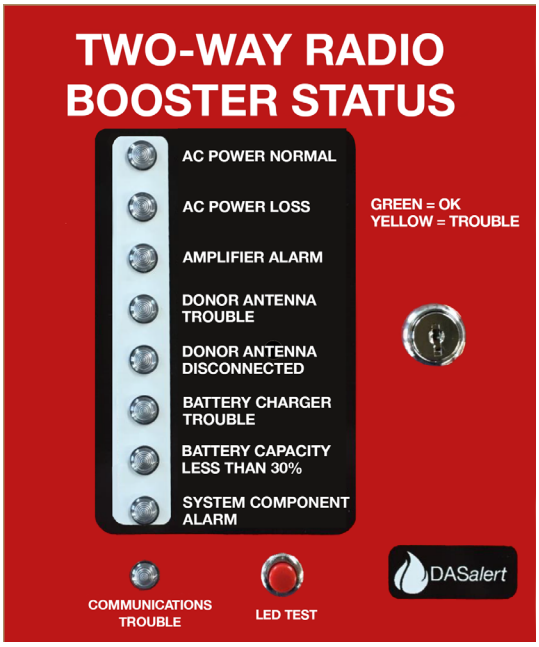

Model 1221 Public Safety DAS Annunciator Panel

Installation Instructions

2/1/2023 Rev C

DASalert

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8:am - 5:pm (Mountain)

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Included Items

QTY	DESCRIPTION
1	Model 1221 Annunciator Panel
6	8-Pin Plug
1	2-Pin DC Power Plug
1	2-Pin Test Plug
1	48 VDC Wall Socket Mount power supply with 10' cable
1	Screwdriver for mating wires to plugs
4	Tenergy Premium Rechargeable High Capacity 2500mAH NiMH AA Battery Model 90430
1	3/6" drill bit
4	Drywall anchor
4	Drywall screw
10	10K 1% 0.25 watt end-of-line resistor (EOLR)
3	Wire zip tie
3	Wire tie mounting pad
2	Key
1	Wall Mount Drill Template
3	Knockout Plugs
1	Instructions

Compatibility

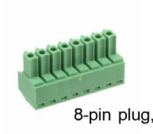
This annunciator panel meets or exceeds all UL-2524, IFC< NFPA and Local Requirements. It is functionally backwards-compatible with all previous versions of the Model 1221 series and has an internal universal DC power converter that enables operation from any DC input voltage between 12-55 VDC.

Main PC Board

Figure 2 shows the layout of the main PC board and the locations of the DIP switches (shown in factory default settings, and in Table 4). Figure 2 also shows connector locations that are connected to the DAS equipment and the building's Fire Panel.

Figure 1. Included Items

Main Panel



8-pin plug, QTY: 6

DC Power Plug, QTY: 1

2 –pin Test Plug, QTY: 1

Drywall Anchor, QTY :4

3/16" drill Bit , QTY: 1

Drywall Screws, QTY 4

AA rechargeable NiMH Batteries, Model 90403, QTY 4
Available from AMAZON

Wire mounting pad, QTY 3

ZIP Tie, QTY 3

10k 1% End-of-Line Resistors, QTY 10

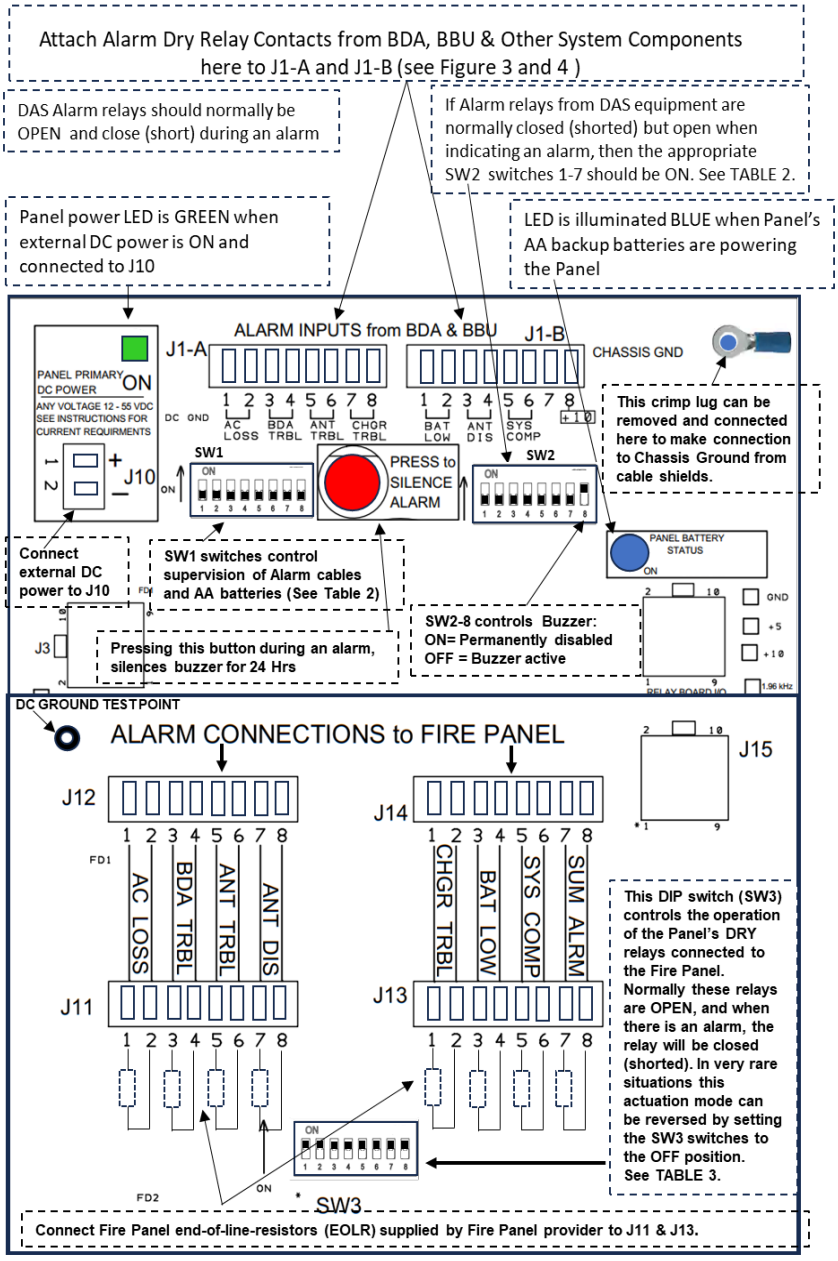
Screwdriver

48 VDC Power Supply with 10' output cord

Keys, QTY 2

Knockout Plugs QTY: 3

Figure 2. Connector and DIP Switch Locations



LED Panel Indicators

This annunciator panel has 9 LEDs on it that show the status of the equipment in the DAS. The functions are described below:

LED Functions

LED	DESCRIPTION
1	**AC Power Normal** (Green when AC power is on to the DAS equipment)
2	**AC Loss** (normally OFF, Amber if AC power is down)
3	**BDA Trouble** (Normally OFF, Amber if there is a BDA problem)
4	**Donor Antenna Trouble** (Normally OFF, Amber if there is a problem)
5	**Donor Antenna Disconnected** (Normally OFF, Amber if the antenna is disconnected)
6	**Battery Charger Alarm** (Normally Off, Amber if there is trouble)
7	**Battery Capacity** (Normally OFF. If the DAS backup battery has less than 30% capacity, this LED is Amber)
8	**System Component Alarm** (Normally OFF. If other system components have alarm troubles, this LED is Amber)
9	**Communications or Panel Trouble** (Normally OFF, Amber if the panel has any kind of problem such as AA batteries dead, or a short (or open) on any alarm wires connected to it from the DAS equipment)

If there is a communications fault with one of the alarms, the specific alarm LED will designate the problem by turning RED.

The **Push-to-Test Button** on the panel's front illuminates all of the LEDs. Unlike previous versions of the Model 1221, it does not actuate the relays going to the Fire Panel.

Installation

1. Remove the required plastic knockouts (see page 10) for the installation and cable routing method and install any required ½" conduit fittings, **being careful not to damage or scrape the PC board with any installation tools.**
2. Mount the unit to a wall using the Mounting Kit and Drill Template.
3. Attach the alarm connections from the DAS equipment per the wiring diagrams shown in Figures 3 and 4 using CAT 5 or CAT 6 cables up to 5000 feet in length. If longer cable is required, contact Technical Support. Use the supplied screwdriver to connect wires to the plugs.
4. Use the supplied zip ties and mounting pads to organize all wire bundles so they do not cause interference or crimping when the door is shut and locked.
5. Install the four AA batteries into the holder and apply DC power to J10. If the unit is not going to be powered after the installation for a long period of time, remove at least one of the batteries to avoid depleting the battery pack when power is off.

Self-Test

The included 2-pin test connector can be used to independently check the Panel and confirm its operation without any other DAS equipment connected.

To do the self-tests, remove plugs J1-A and J1-B, then set the DIP switches (1-7) on SW1 to ON and SW2 to the factory default settings shown in Table 3, Page 8. Confirm that all LEDs are OFF, except AC Power Normal which should be GREEN. The test plug can be connected between the input ports on J1-A and J-1B to simulate alarm signals for each type of alarm. The corresponding AMBER LEDs on the Panel front should illuminate for each type of alarm. Don't discard this plug; keep it in the Panel to enable further troubleshooting if required.

Buzzer

One of the requirements of UL-2524 is that an audible alarm be included as part of the Panel that can ONLY be silenced for up to 24 hours by unlocking the Panel and pressing the silence button inside. This requirement is to keep unauthorized persons from turning the buzzer off. If the DAS*Alert* Panel is located close to the building's Fire Panel (which has an audible alarm triggered by the DAS alarms) then the DAS*Alert* buzzer can be permanently disabled by setting DIP switch SW-2 (switch 8) to the ON position. If the key is lost, contact Technical Support for alternative ways to silence the buzzer.

The buzzer has three audible modes:

- It will beep once every 10 seconds if any alarm is triggered.
- It will beep once per second if there is a communications fault of if the Panel's backup AA battery pack is dead or not installed.
- It will beep continuously if there is no alarm when the silence button is depressed.

DC Power for the Panel

The Panel has an internal universal DC power converter that enables operation from any DC input voltage on connector J10 between 12 -55 VDC. This DC voltage can also be supplied from the Backup Battery Unit (BBU) that powers the BDA. There is an indicator that glows GREEN when DC power is present. The current consumption is very low so the wires providing this power can be very long, especially if the supplied 48 VDC power supply is used. The current consumption is as follows at typical voltages:

Maximum Current Consumption:

12 VDC 148 milliamps
24 VDC 71 milliamps
48 VDC 36 milliamps

Figure 3. Connections using two CAT 5 or CAT 6 Cables

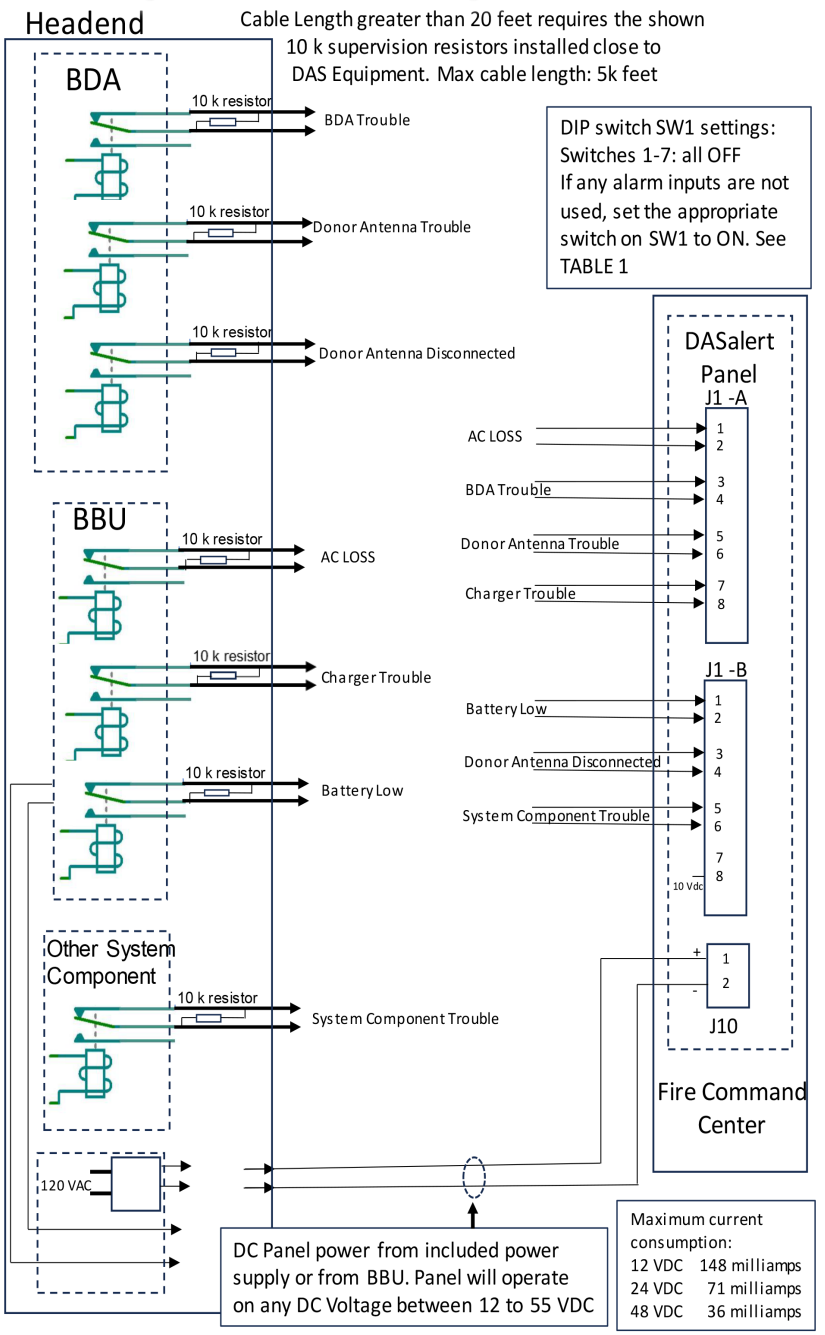
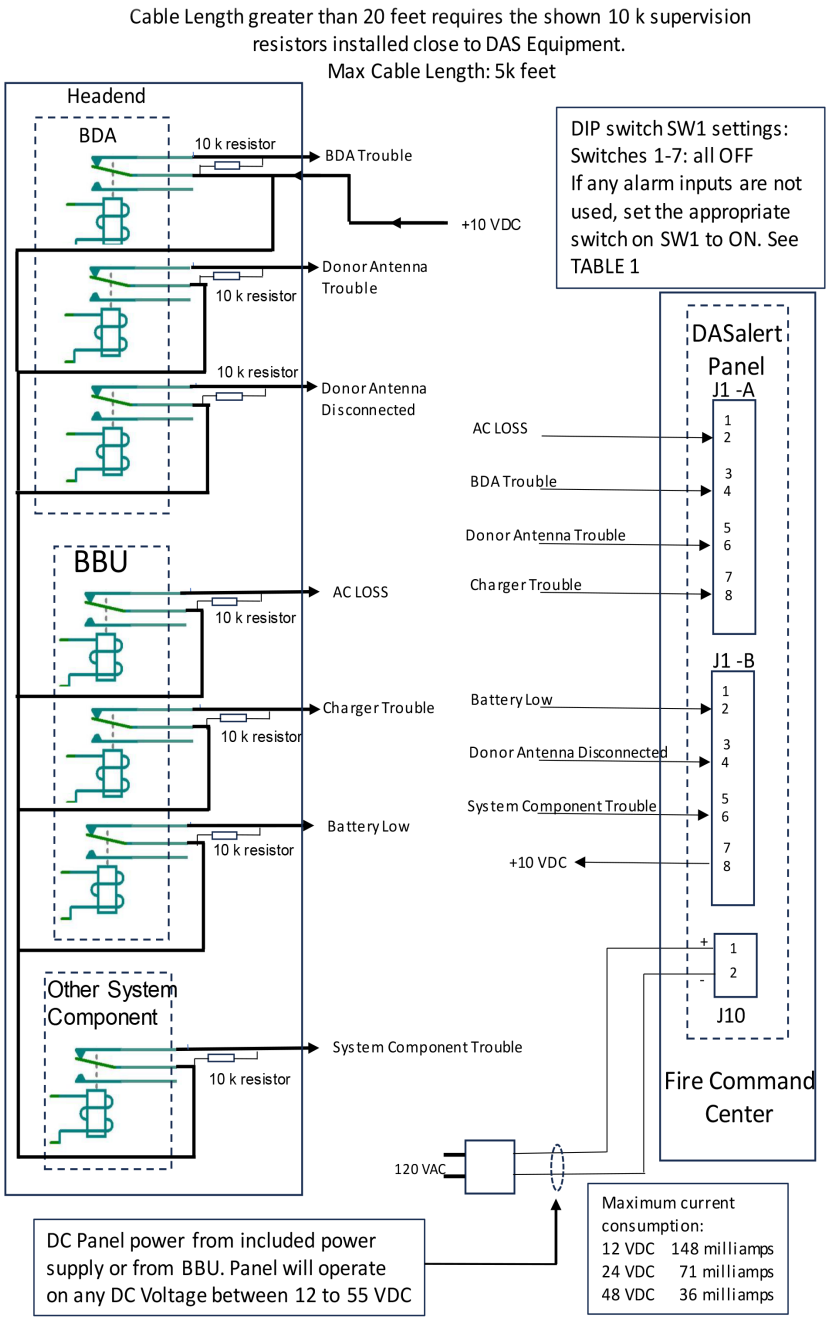


Figure 4. Connections using one CAT 5 or CAT 6 Cable



DIP Switch Settings

Figure 2 and Table 3 show he factory default DIP switch settings for SW1, SW2 and SW3. The following tables show the detailed functioning of all the DIP switches.

Table 1

DIP SWITCH SW1 simulates 10k EOLR terminations. These switches are normally OFF. If cable length is shorter than 20 feet set the designated switch ON.

Switch	DESCRIPTION
1	AC Loss (Factory Default: OFF)
2	BDA Trouble (Factory Default: OFF)
3	Donor Antenna Trouble (Factory Default: OFF)
4	Charger Trouble (Factory Default: OFF)
5	Battery Low (Factory Default: OFF)
6	Donor Antenna Disconnected (Factory Default: OFF)
7	Other System Component Trouble (Factory Default: OFF)
8	ON disables supervision of Panel's AA batteries (Factory Default: OFF)

Table 2

DIP SWITCH SW2 (switches 1-7) are used to set the Alarm Detection mode for the signals from the dry relay alarm contacts in the DAS equipment. If the relay closes (is shorted) when there is an Alarm, set the switch OFF. If the alarm relay is normally closed (shorted), but is open when there is an Alarm, turn the switch ON.

Switch	DESCRIPTION
1	System Component (Factory Default: OFF)
2	Donor Antenna Disconnected (Factory Default: OFF)
3	Battery Low (Factory Default: OFF)
4	Charger Trouble (Factory Default: OFF)
5	Donor Antenna Trouble (Factory Default: OFF)
6	BDA Trouble (Factory Default: OFF)
7	AC Power Loss (Factory Default: OFF)
8	**Buzzer Permanently Disabled (Default: ON)**

Table 3 Factory Default DIP Switch Settings

DIP SWITCH SW1

SW	Factory Default
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	OFF

DIP SWITCH SW2

SW	Factory Default
1	OFF
2	OFF
3	OFF
4	OFF
5	OFF
6	OFF
7	OFF
8	ON

Table 4

DIP SWITCH SW3 sets the mode of operation for the DRY relays that connect to the building's Fire Panel. If the switches are ON, the relay contacts will close (are shorted) during an alarm. Very rarely, some Fire Panels will need to reverse this. In this case, set the required switch to OFF.

SWITCH	DESCRIPTION
1	AC Loss
2	BDA Trouble
3	Donor Antenna Trouble
4	Donor Antenna Disconnected
5	Charge Trouble
6	Battery Low
7	Other System Component Trouble
8	Summary of all Alarms

Panel AA Backup Batteries

This Panel includes four AA batteries to provide at least 12 hours of operation in the event of the loss of all AC and DC power. The batteries are high-capacity rechargeable Nickel Metal Hydride (NiMH) type, manufactured by Tenergy (Model 90430) and should replaced at least every 5 years. They are low-cost and are available from AMAZON. Typically, the best practice is to replace them annually when the rest of the DAS is tested. The backup batteries to operate, DC primary power must be on first. After that, the battery power will cut in automatically if primary DC power on J10 is lost.

There is an internal charger that keeps the batteries fully charged. The Panel includes a low voltage cutoff switch that disconnects the battery if it drains beyond a preset level. Once the battery reaches this level it typically requires 24 hours to recharge. If the batteries are not installed or are drained, an alarm is generated indicating Panel trouble. An indicator LED inside the Panel illuminates BLUE when the Panel primary power is off and the battery is providing power. There is an LED on the PC board attached to the back of the door and next to the battery holder. It flashes RED if the batteries are dead or need to be installed.

If the AA batteries are lost, defective or not immediately available to be replaced, DIP SW1-8 can be set to ON to turn off the monitoring of these batteries, silence the buzzer and turn off the Panel Trouble LED on the front panel. In some jurisdictions, the Panel's AA backup batteries are not required if the Panel's DC power is provided directly from the DAS Backup Battery Unit (BBU). In this case, DIP Switch SW1 position 8 can be permanently set to ON and no AA batteries need to be installed.

Connections to Building's Fire Panel (See Figure 5)

The Fire Panel should be connected to J12 and J14 at the bottom of the panel's main PC board. The connectors as shown will mate with the panel's independent internal dry relays to indicate alarms to the Fire Panel. Under normal conditions these relay dry contacts are OPEN, but in the event of an alarm they will be CLOSED (shorted). This mode of operation can be reversed for individual relays. This is a very rare requirement but the switches on DIP SW3 enable this feature as shown in Table 4 on Page 9. If all primary power and all battery backup power is depleted, all of the relays will be closed (shorted), indicating an alarm condition.

The single pole relays are rated for a max current of 400 ma and 60 Volts (AC or DC). If these values are exceeded, self-resetting fuses in series with the relay contacts are triggered to protect them.

Figure 5 shows how the Fire Panel's end-of-line resistors (EOLR supplied by panel provider) can be installed on J11 and J13 if they are not installed elsewhere outboard of the DAS*Alert* Panel on the wires connected to the Fire Panel.

Removal of the Knock outs

There are a total of 15 holes on the top, bottom, sides and back of the Panel that are compatible with standard ½" conduit fittings. All of these holes (except the three in the back) are plugged with plastic knockouts that can be removed as shown below. Three spare plugs are included with the accessories.

TO REMOVE KNOCKOUTS, CUT THE RETAINING TABS OFF FIRST

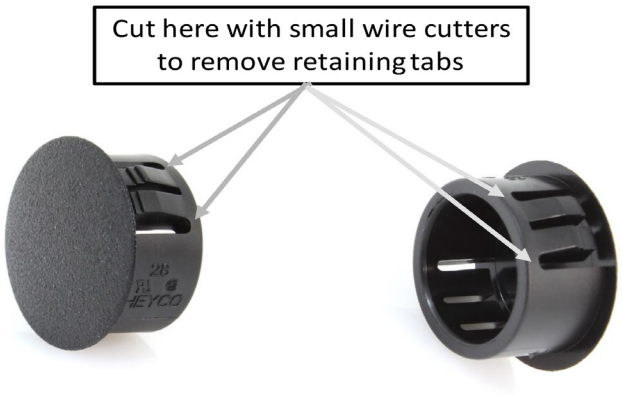


Figure 5. Relay and End-of-Line Resistor Connections to Fire Panel

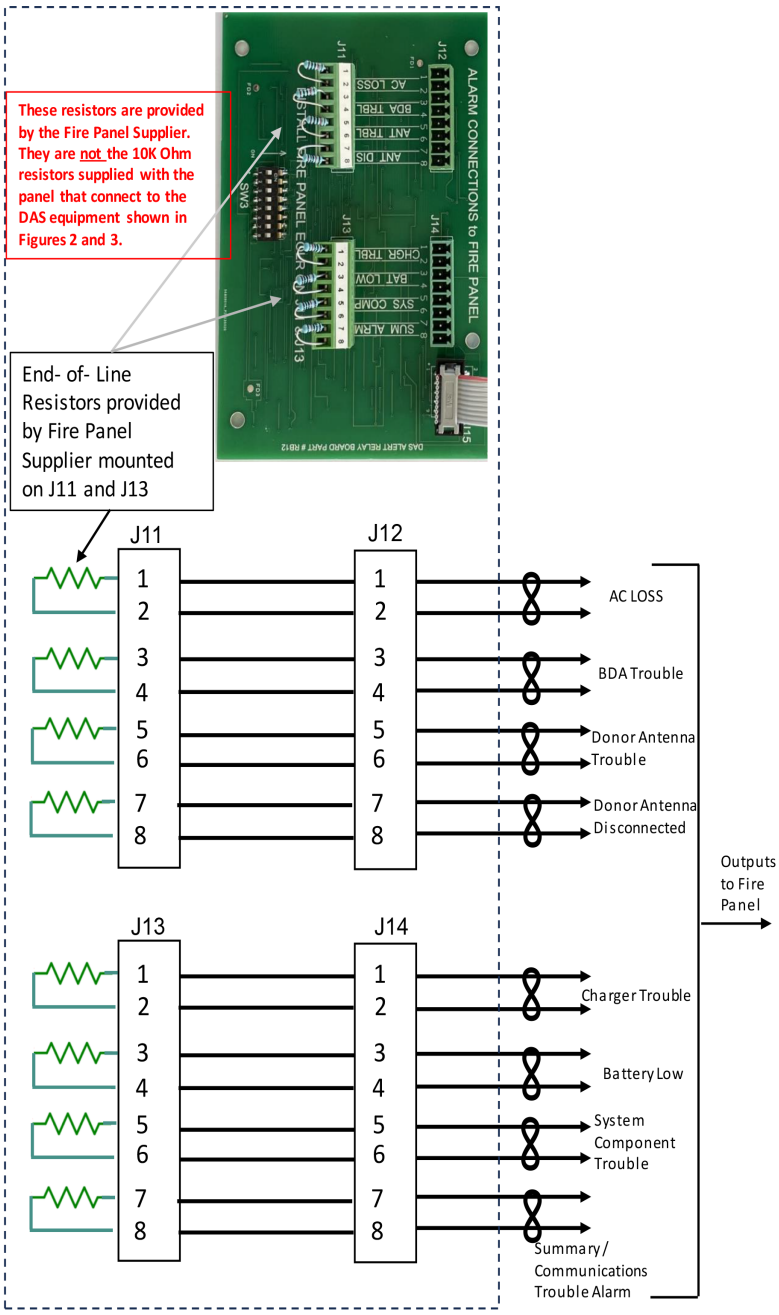
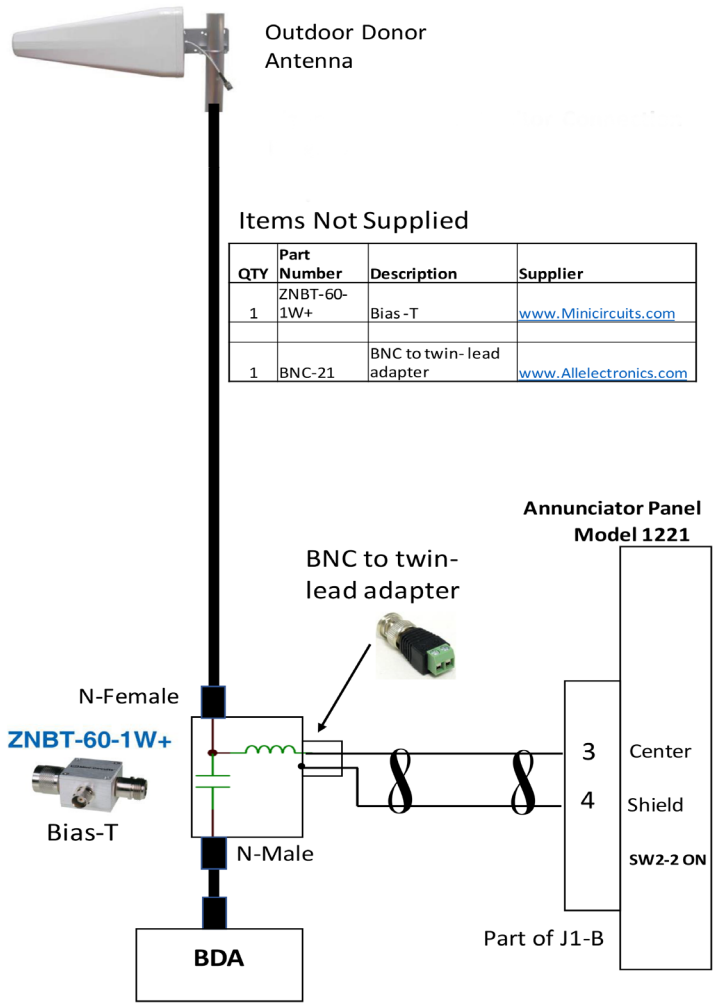


Figure 6. Antenna Monitor Connection Diagram



External Detection of Donor Antenna Disconnection

UL-2524 requires that if the outdoor donor antenna is disconnected an alarm should be triggered. In the event that the BDA in use does not sense this condition to output an alarm relay closure, an external method using a bias-T can be configures as shown in Figure 6.

Specifications

Dry relay alarm outputs to building's fire panel:	SP relay 0.4 amps max, 60 VAC RMS or DC max
Normal AC power	
Loss of normal AC power	
DAS backup Battery Charger failure	
DAS backup battery capacity to 70% depletion	
Donor antenna malfunction	
BDA malfunction	
Donor antenna disconnection	
System component malfunction	
Communications and panel status	

Power Requirements:	
Supplied 48 VDC power supply (120 VAC input) or user supplied DC power between 12-55 VDC	71 mA@ 24 VDC, 36 mA @ 48 VDC

Physical Characteristics:	
Panel	7″W x 8″ H x 3.7″ D Weight 4 lbs
Optional in-wall mounting surround	9″W x 10″ H

Meets or exceeds the following specifications:	
UL-2524	IEC320-C14
NFPA 72 / NFPA 1221	UL60950-1

Visible Annunciators:	
Normal AC power	Green when AC power is normal, off when AC power is bad
Loss of normal AC power	Normally off, amber in alarm
DAS backup Battery Charger failure	Normally off, amber in alarm
DAS backup battery capacity to 70% depletion	Normally off, amber in alarm
Donor antenna malfunction	Normally off, amber in alarm
BDA malfunction	Normally off, amber in alarm
Donor antenna disconnection	Normally off, amber in alarm
system component malfunction	Normally off, amber in alarm
Communications and panel status	Normally off, amber in alarm

Audible Annunciator:	Triggers every 10 seconds when any alarm condition exists
Silence Button:	Housed in locked panel. Silences audible alarm for 24 hrs. Reactivates automatically if alarm is not cleared
AA Batteries: Built in Charger keeps 4 AA NiMH batteries charged	Powers Panel for at least 12 hrs in event of complete loss of all AC and DC power

Alarm inputs from DAS equipment dry contact relays:	
AC power status	2 wire input
DAS backup Battery Charger failure	2 wire input
Loss of DAS backup battery capacity to 70% depletion	2 wire input
Donor antenna malfunction	2 wire input
BDA malfunction	2 wire input
Donor antenna disconnection (from BDA or outboard bias-T)	2 wire input
System component malfunction	2 wire input