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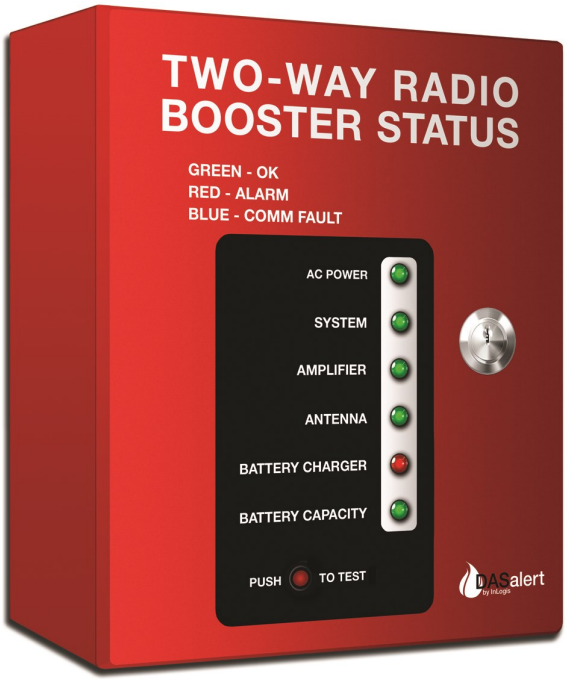
User & Installation Manual

Models NFPA 1221-A, NFPA 1221-B
Public Safety DAS Annunciator Panel

Revision E 61117

For use only with Panels shipped after 5/9/17
Applicable to Serial Numbers 530171 and Higher



For Customer Support
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CAUTION: (Read This First)

This panel has been designed to make it nearly bullet proof to mistakes made when wiring it to your DAS equipment and to the supplied 15 VDC power supply and 12 VDC backup battery, but please observe the following basic procedure which will prevent any damage if something is wired wrong. It also makes it easy to troubleshoot if there are any problems.

1. Wire the 15 VDC DC power supply to connector J5 as shown in Figure 11. Before connecting anything else, plug the power supply into a 120 VAC outlet. When power is applied the LEDS will turn RED, GREEN and BLUE for a few seconds as the unit goes through its self-test routine. It will also repeat this every time the “PUSH to Test” button is pressed and released.

2. Once you have verified that DC power is correctly wired, you can unplug the DC supply and wire everything else to the other connectors except the panel’s backup battery and its outboard charger. **The panel’s charger and 12 VDC battery should be the very last things to get plugged in and connected once you have verified that everything else is working as expected.**

TOOLS REQUIRED

Standard Voltmeter

Tools and hardware for wall mounting

INCLUDED TOOLS:
The screw driver for the connector clamps is included in the accessories

A trim pot adjustment tool is included with the accessories

Cable Lengths

This panel is designed to work with standard Cat 5 or Cat 6 cable that typically has a DC resistance of about 2.5 ohms per 100 ft for a single wire strand.

For all the connections to standard dry relay contacts in the DAS equipment the length of the cable between the panel and the DAS equipment is not critical because the current in the loop is only about 1 milliamp. So cable runs up to 5000 feet or longer can easily be accommodated.

This is not true however for only the Model 1221-A interface connections that are used to sense the status of the outdoor Donor Antenna. The panel has a circuit in it that measures the DC resistance of a 50-ohm terminator installed at the outdoor antenna via a bias-T fitting. If the resistance is too high indicating an open circuit or too low indicating a short circuit an alarm is triggered. So the DC resistance of the coax cable, any connectors and surge protectors in line and the Cat 5 or Cat 6 cabling leading to the panel can be a significant factor in the overall DC resistance that the panel measures. To null these variables out of the equation there is a trim pot adjustment that must be made when the panel is first installed, but there is a limit to how much resistance can be nulled. **For this circuit to work well a single twisted pair of cat 5 / cat 6 cable can be used up to 1000 feet in length.** If the cable run is longer than this (for example 2000 feet) then two twisted pairs should be used in parallel to lower the cable resistance. Please consult our customer service for additional advice and information.

Other Available Options

There are other optional powering methods available that will allow the unit to be powered from the same DC supply or backup battery that the DAS equipment uses. It is available in either 24 or 48 VDC. Please contact us for more information.

An additional module can be purchased that provides SNMP communications. It operates on a local area network providing ethernet / Internet SMTP or MODBUS alarm monitoring with e-mail notification, event logging and temperature / humidity sensing. Please contact us for more information.

Special BDA Configurations and Settings

If your BDA does not conform to the standard alarm relay configuration shown in Figures 2 or 3, please contact us. We have designed into the panel several special DIP switch settings that can accommodate almost any non-standard alarm set up . For example the CommScope NODE A requires some special settings to deal with some issues when power is disconnected. Please contact us for more information.

Model 1221-A and 1221-B Independent DAS Annunciator Panel

Included Items:

QTY	Description
1	Main Alarm Panel
4	16 pin cable connector
1	8 pin cable connector
1	6 pin DC Power connector
1	Screw Driver for mating wires to connectors
1	8 Ahr 12 vdc SLA backup battery
1	AC socket mount battery charger
1	Trim pot adjustment tool
1	Installation Manual
10	10 k Ohm 0.25 watt end-of -line resistor
1	15 VDC wall mount power supply
1	Spare 1 amp battery fuse
1	Door latch key

This panel is designed to meet the requirements of NFPA -72 (versions 2010, 2013 and 2016), and the 2016 version of NFPA-1221.

It consists of several component sections that enable its use with many different types of BDA's and backup power supplies / UPS. It also has the capability to support DAS installations that have multiple amplifiers and donor antennas. Physically the panel modules consist of two printed circuit boards: the LED Board which is mounted on the back side of the door and the Mother Board that is mounted inside the main body of the enclosure. There is a shelf / cavity that holds the included 8 Ahr 12 vdc SLA emergency backup battery. A battery charger and 15 VDC power supply are also included that can be connected to any 120 VAC electrical outlet. Figure 1 shows the main components. Figure 12 shows the other supplied items. **(NOTE: If the included key is lost you can open the panel with a standard set of needle nose pliers.)**

The main system sections are as follows:

1. HIGH Brightness 3-color (Red, Green, Blue) LED Annunciator Displays

- Main AC power Loss
- BDA / Amplifier Alarm
- Summary System Alarm
- Antenna Failure
- DAS Battery Charger Failure
- DAS Battery Capacity Low (less than 30%)

It also provides individual LED indications if there is a communications error (open, disconnected or shorted cable between the panel and the DAS equipment).

2. Communications Integrity Sensors

For each alarm input from the BDA or backup power supply a sensor is provided that detects if the cables connecting to these devices are open or disconnected. A set of dry relay Form-C contacts are also provided to communicate this problem to the main fire alarm panel (MFAP).

3. FORM- C Dry Relay Contacts to mate with common Fire Alarm Panels (See Figure 5)

These alarm contacts are rated at 1 amp and include provisions for easily installing End of Line Resistors (EOLR) inside the panel. These relays utilize the same signaling format as smoke detectors. So that in the event of an alarm or panel failure the relays will close shorting the end-of line resistor.

4. ANTENNA Failure (Model 1221-A See Figure 6)

Since many BDA's lack the capability to detect problems with the donor antenna or its lead-in cable, this panel includes the internal circuitry to provide this functionality if the BDA does not provide it. It mates with user supplied bias –T fittings to sense common donor antenna feed problems.

Figure 1. Main Components

Main Panel

Backup Battery (mounts inside panel)

15 VDC Power Supply

Battery charger

5. DAS Backup Battery Charger Failure (Model 1221-A)
If the DAS backup battery charger or UPS does not have a failure sensor, the panel can provide alternative functionality.

6. DAS Backup Battery Capacity less than 30% (Model 1221-A)
If the backup power supply or UPS does not have this alarm capability, the panel can provide alternative capability.

7. Backup 24 Hour Panel Power
The panel is powered via an external wall mounted 15 VDC power supply. There is also an external Charger provided that keeps an internally mounted 8 Ahr 12 vdc SLA battery charged. In the event of AC power loss, the panel will continue normal operation for at least 24 hours. Although these types of batteries in our application have a lifetime of 4-5 years, best practices call for replacement on an annual basis. Its five-stage charger has LED indicators showing if the battery needs to be replaced or if it has failed for any reason. The panel is designed for a battery with these maximum dimensions: 5.96" L x 2.58" W x 3.65" H or smaller. The replacement battery is available from Amstron (Model AP-1280 F1).

The panel's battery also has a method of reporting its failure or its need for replacement to the Main Fire Alarm Panel. This feature can be turned OFF or ON since some installations with alternate backup power do not need this battery. The default mode for this is OFF. (DIP switch SW4-10 ON)

8. NEMA-4 rated wall mounted enclosure
The fire codes require that this panel meet the NEMA-4 water resistant requirements. It has four thermoplastic knockouts on the bottom of the panel that provide four openings for standard ½" and ¾" EMT conduit fittings. The panel is provided with brackets to mount it to any wall. Its dimensions are 5.85 "H x 7.87" W x 3.98" D and it weighs 11.7 pounds.

9. Test Features
A "push to test" button is provided that will illuminate each of the 3 color LEDs (red , green and blue) for a few seconds in each color. During this test the alarm relays to the main fire alarm panel (MFAP) are also actuated. To statically test the alarm relays there are internal DIP switch settings that will simulate alarms or normal status for the these relays. (see Table 1).

Model Differences
The panel is available in two different configurations. Model 1221-A and 1221-B. The table below shows the differences.

Module	Model 1212 A	Model 1221 B
Annunciator Panel with FORM-C relay outputs to	✓	✓
Alternative Donor Antenna Failure Sense Module	✓	
Alternative DAS Battery Capacity Sense Module	✓	
Alternative DAS Battery Charger Failure Sense Module	✓	
Panel Backup Battery (8Ahr)	✓	✓
Panel Power Supply and battery Charger	✓	✓

Mating with DAS Equipment

Figure 2 shows the standard method of mating this panel with a BDA and UPS. The standard method is the same as that used to connect to most Fire Alarm Panels where an end- of- line- resistor (EOLR) is used to sense the alarm status and detect if the cables are open, disconnected or shorted. Most BDA and UPS units are provided with Form- C dry relay contacts that can be connected so if there is an alarm or power failure the relay will close providing a short across the end-of-line resistor. For this panel the EOLR is 10 k Ohms and these are provided with the panel accessories for connection at the DAS equipment.

Some BDA or UPS suppliers do not provide Form-C dry relay alarm contacts (See Figure 3). Instead they use Form-A contacts which open when there is an alarm. In this case the panel can be programmed to accommodate this mode by closing the appropriate DIP switch as shown Table 1 in the APPENDIX.

Figure 4 shows how to wire to the panel if multiple BDA's or UPS units are utilized in the system. In this configuration, the EOLR is located at the last unit in the daisy chain.

In the event it is not possible to install the 10k Ohm EOLR at the DAS equipment, these can be simulated by closing the appropriate DIP switch as shown in Table 1. This method can also be utilized for testing to simulate an 'OK' status input when the DAS equipment is not connected or if one or some of the DAS inputs are not used.

Connections to Main Fire Alarm Panel

Figure 5 shows the output cable connections from the internal relays to the Main Fire Alarm Panel (MFAP). **NOTE: Connectors J2 and J7 on the LED PC board are designed to be directly wired to the MFAP. Connectors J4 and J3 on the LED PC Board are internally connected pin-for-pin to the relays and are intended to hold and connect the end-of-line resistors specified by the MFAP supplier to the relay contacts (See Figure 20).** Figure 5 shows the relays in their "not energized" power off (Alarm) positions. The plugs for these connectors are mated with their headers on the PC boards. To connect them to external wiring a miniature screw driver is included that is used to tighten the wire clamp on each pin. (See Figure 17) The wire clamps will accommodate wire sizes up to 16 AWG in diameter and as small as 26 AWG. **Note that these connectors are NOT keyed, so careful attention must be paid to the pin numbers that are marked on the PC board when mating the connector. You also must check that the connector is not offset to insure that all of the appropriate pins of the header are mated with the plug. This is an easy error to make when mating this type of connector.**

The relays are shown connected to a master fire panel that uses the normal conventional alarm configuration (i.e. when the relays signal an alarm, they are closed causing the EOLR to be shorted). In the unlikely event you are connecting to a panel that uses the opposite convention, the unused contacts on the output relays are also available to connect to and conform to this non-standard convention.

Alarm relays are provided for: loss of AC POWER, AMPLIFIER malfunction, DONOR ANTENNA malfunction, DAS Backup battery CHARGER failure, and DAS BATTERY CAPACITY low. **Optional alarm relays are provided to signal a COMMUNICATIONS FAULT with the DAS equipment (open, severed or disconnected cable between the annunciator panel and DAS equipment) and a SYSTEM summary alarm that is triggered when any of the other alarms are active. This relay can also be connected to an audible external alarm instead of the fire alarm panel.**

DIP Switch Settings

DIP switches are used to program the functionality of the panel. Unless we have advised you otherwise, the panel is shipped with the standard default factory settings shown in the table on the next page. Details regarding the function of each switch are shown in the APPENDIX.

DEFAULT FACTORY SETTINGS FOR DIP SWITCHES

DIP SWITCH	SETTING	LOCATION
SW1-1	OFF	Mother Board
SW1-2	OFF	Mother Board
SW1-3	OFF	Mother Board
SW1-4	OFF	Mother Board
SW1-5	OFF	Mother Board
SW1-6	OFF	Mother Board
SW1-7	OFF	Mother Board
SW1-8	OFF	Mother Board
SW1-9	OFF	Mother Board
SW1-10	OFF	Mother Board
SW2-1	OFF	Mother Board
SW2-2	OFF	Mother Board
SW2-3	OFF	Mother Board
SW2-4	OFF	Mother Board
SW2-5	OFF	Mother Board
SW2-6	OFF	Mother Board
SW2-7	ON	Mother Board
SW2-8	ON	Mother Board
SW2-9	OFF	Mother Board
SW2-10	OFF	Mother Board
SW3-1	OFF	Mother Board
SW3-2	OFF	Mother Board
SW3-3	OFF	Mother Board
SW3-4	OFF	Mother Board
SW3-5	OFF	Mother Board
SW3-6	ON	Mother Board
SW3-7	OFF	Mother Board
SW3-8	ON	Mother Board
SW3-9	OFF	Mother Board
SW3-10	ON	Mother Board
SW4-1	OFF	LED Board
SW4-2	OFF	LED Board
SW4-3	OFF	LED Board
SW4-4	OFF	LED Board
SW4-5	ON	LED Board
SW4-6	ON	LED Board
SW4-7	OFF	LED Board
SW4-8	OFF	LED Board
SW4-9	OFF	LED Board
SW4-10	ON	LED Board

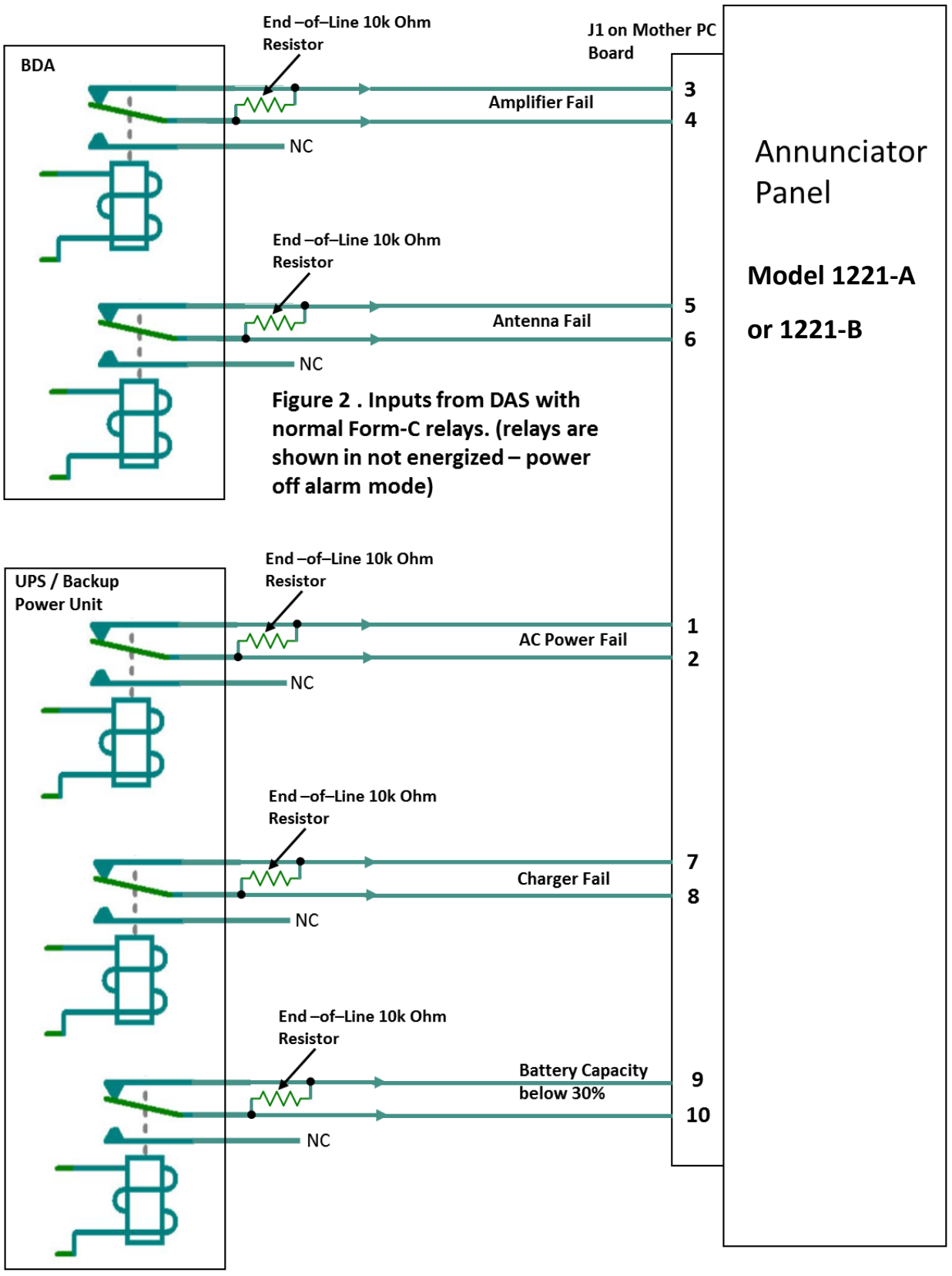


Figure 2 . Inputs from DAS with normal Form-C relays. (relays are shown in not energized – power off alarm mode)

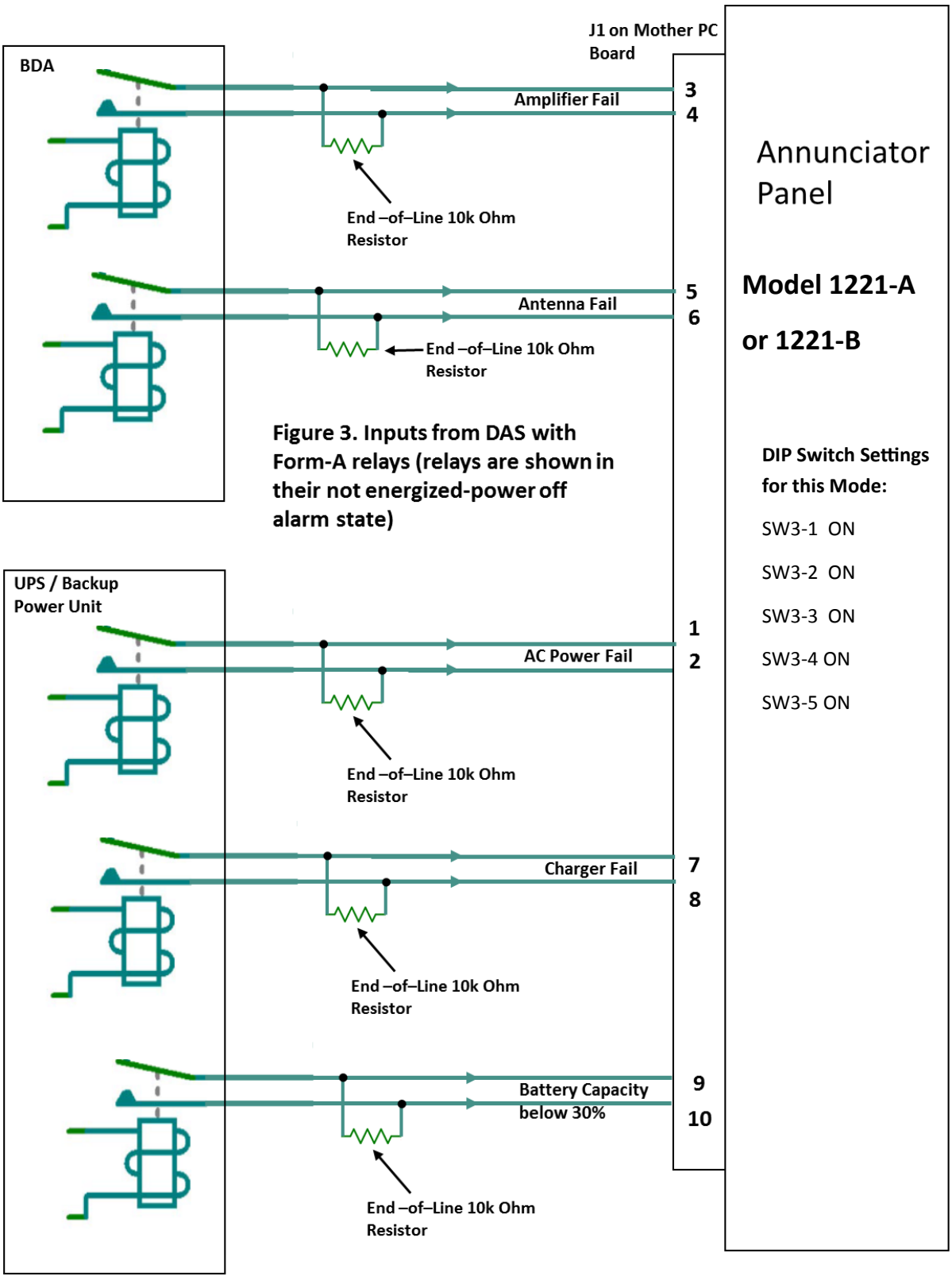


Figure 3. Inputs from DAS with Form-A relays (relays are shown in their not energized-power off alarm state)

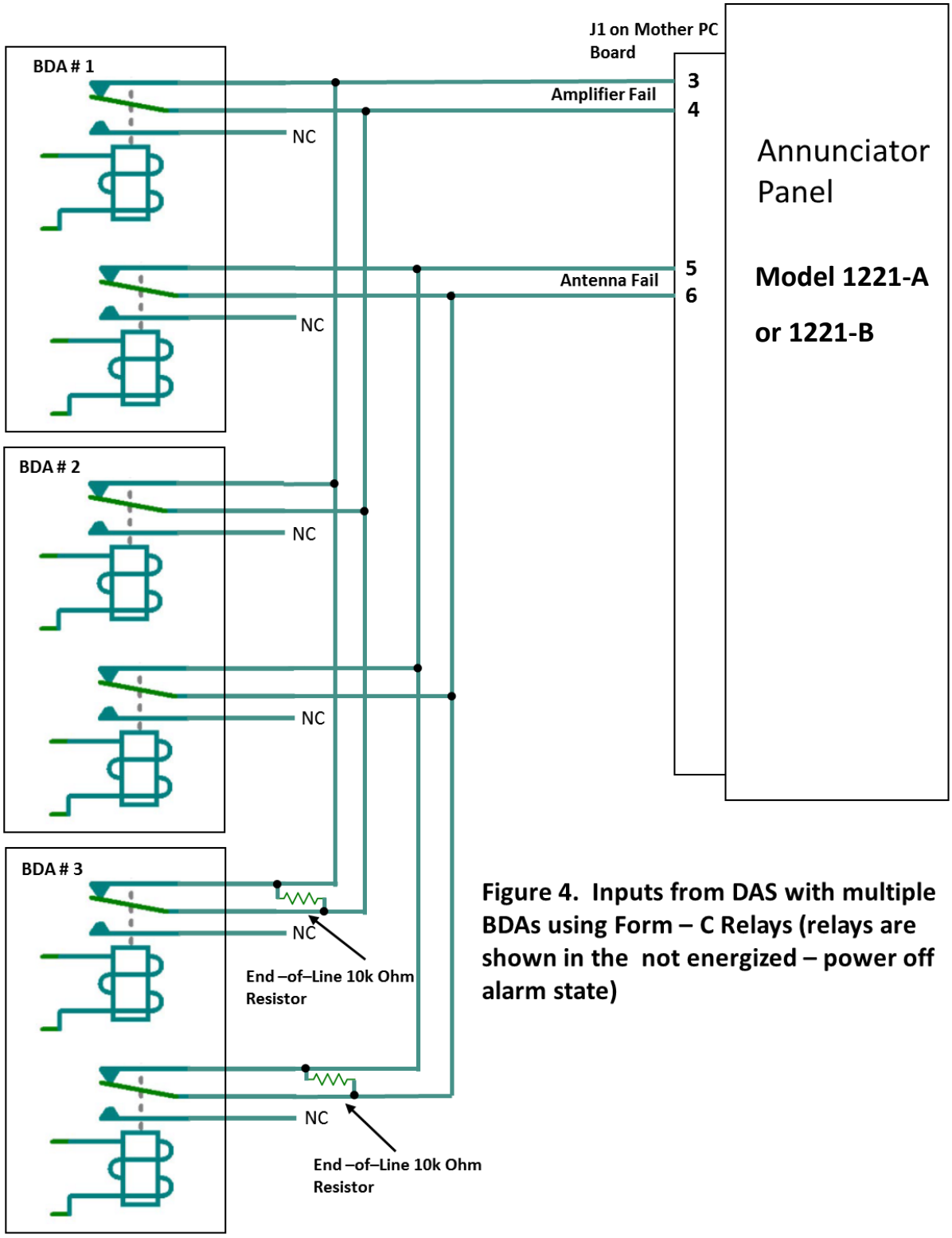
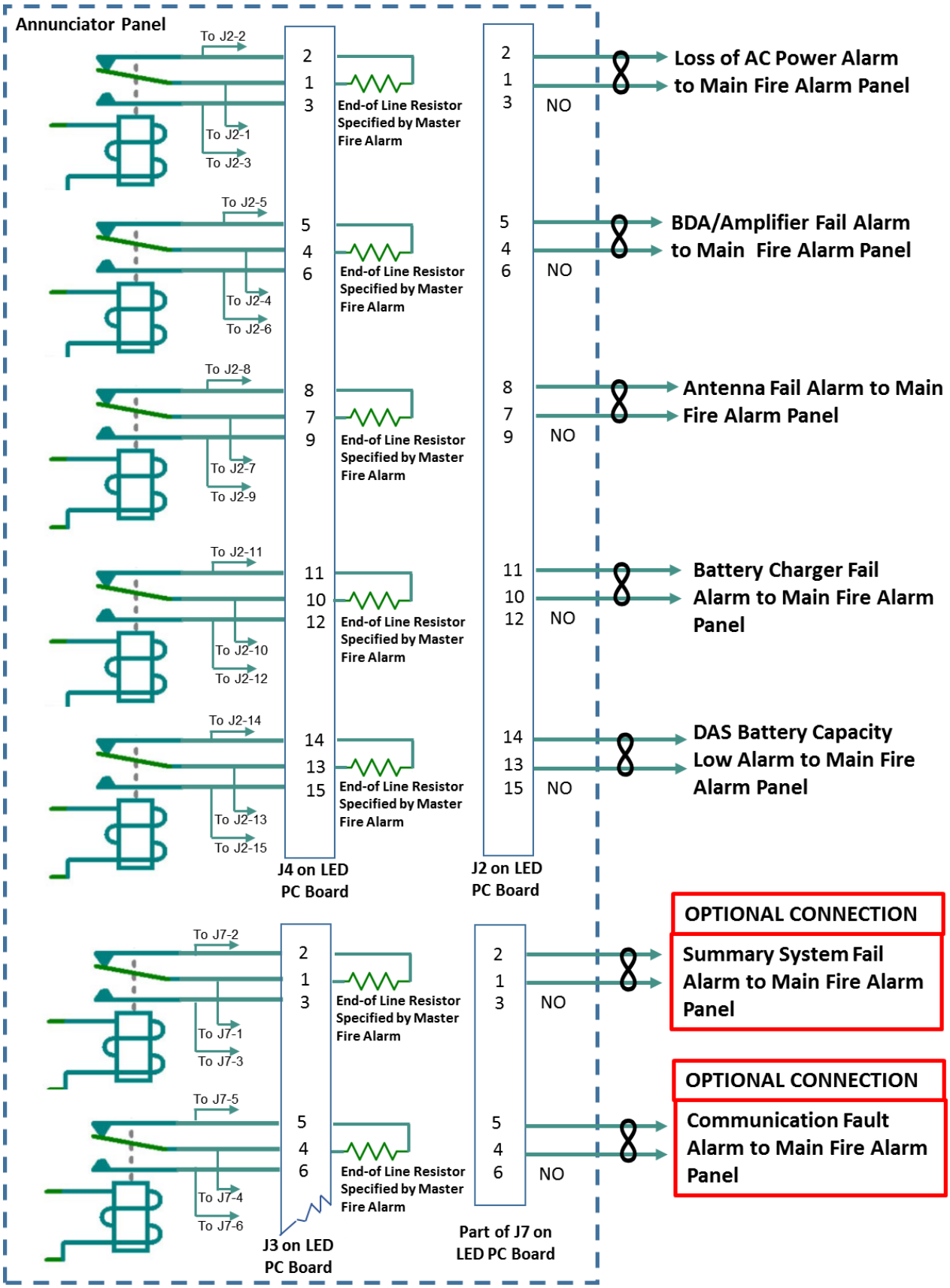


Figure 4. Inputs from DAS with multiple BDAs using Form – C Relays (relays are shown in the not energized – power off alarm state)

Figure 5. Relay and End-of-Line-Resistor Connections to Main Fire Alarm Panel (Model 1221-A or 1221-B)



Antenna Failure Sense

If the BDA in your system does not have the capability to test antenna and lead-in cable failures, this panel can provide an alternative method for detecting most common problems (cable shorted or disconnected). It should be noted that up until the release of the 2016 version of NFPA-1221 there was some ambiguity in the codes relative to this requirement relating to the need to test all the antennas in the system (both indoor and outdoor) or if the code required addressing only the outdoor donor antenna. In the 2016 version, the requirement is clearly stated for the outdoor donor antenna. Detecting problems with the indoor antennas is optional.

The method we use involves injecting a DC voltage (10 VDC) onto the lead-in cable at the input to the BDA using a user supplied bias-T. Another bias-T (user supplied) is used outdoors at the antenna to provide a 50 Ohm DC load (See Figure 6). A typical bias-T can be purchased from Mini-Circuits Part # ZNBT-60-1W+.

If the cable is shorted or open the detector will sense this and trigger an alarm. If multiple antennas are to be sensed, connect them as shown in Figure 7. Since cable and connector DC resistance may vary in each installation there is a trim pot adjustment provided to null these variables out. The procedure is as follows.

- On the Mother Board set the DIP switches as follows:

  SW1-3 ON

  SW3-6 OFF

  SW3-7 ON

- Connect a DC voltmeter to the test points labeled ANT and GROUND.on the LED Board
- Adjust the trim pot labeled ANT TRIM (R35) on the LED board until the DC voltage reads 5.0 VDC. This voltage has an acceptable window of ±1 VDC, but you should try to adjust it as close to 5.0 VDC as possible

This method obviously does not detect all antenna problems such as the antenna being blown down in a storm or a new building being constructed between the donor antenna and the public safety repeater, but it will detect common faults such as a short circuit, a severed cable or a loose connector and it will pass the test that most inspectors employ by simply disconnecting the cable connected to the outdoor donor antenna.

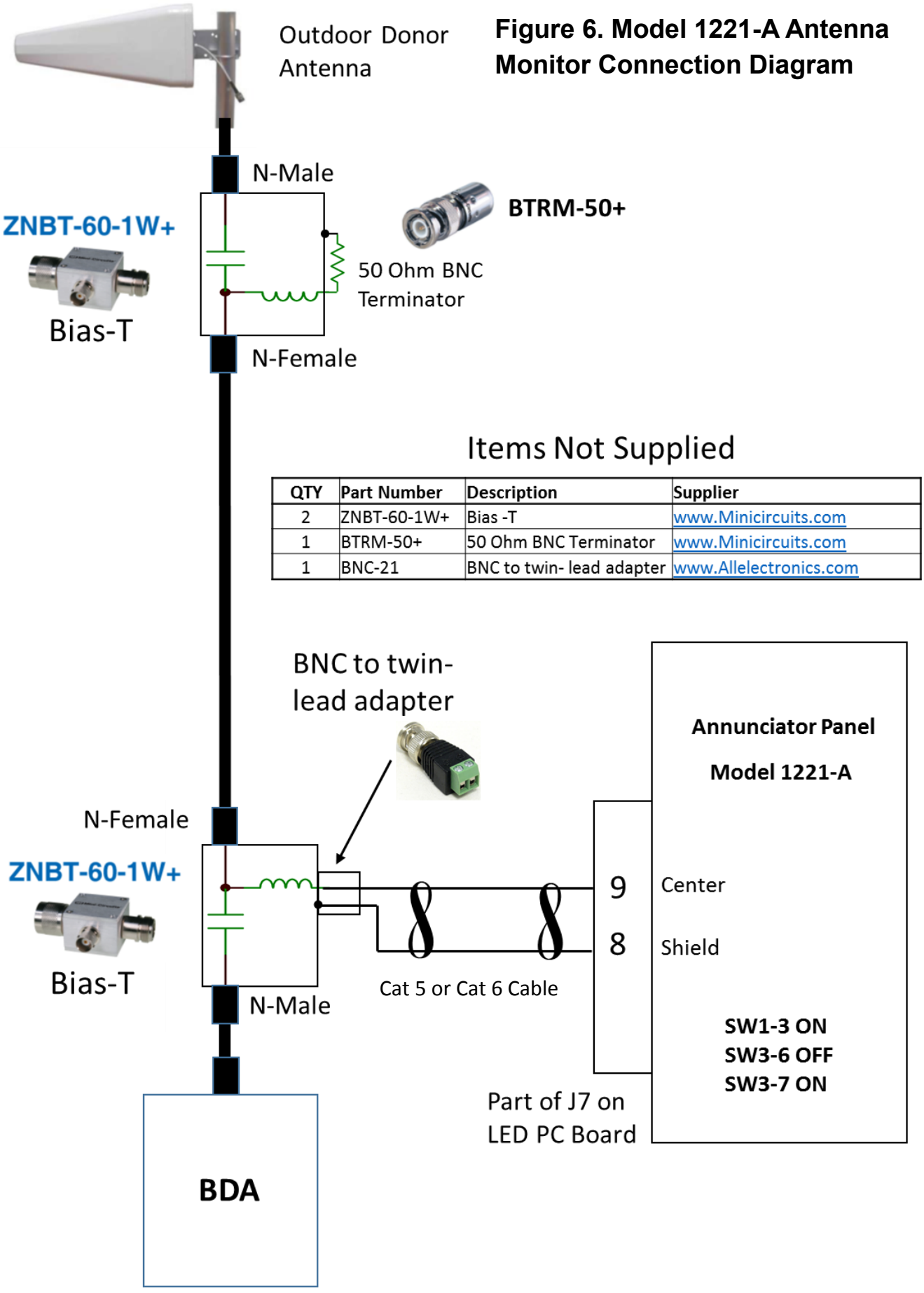
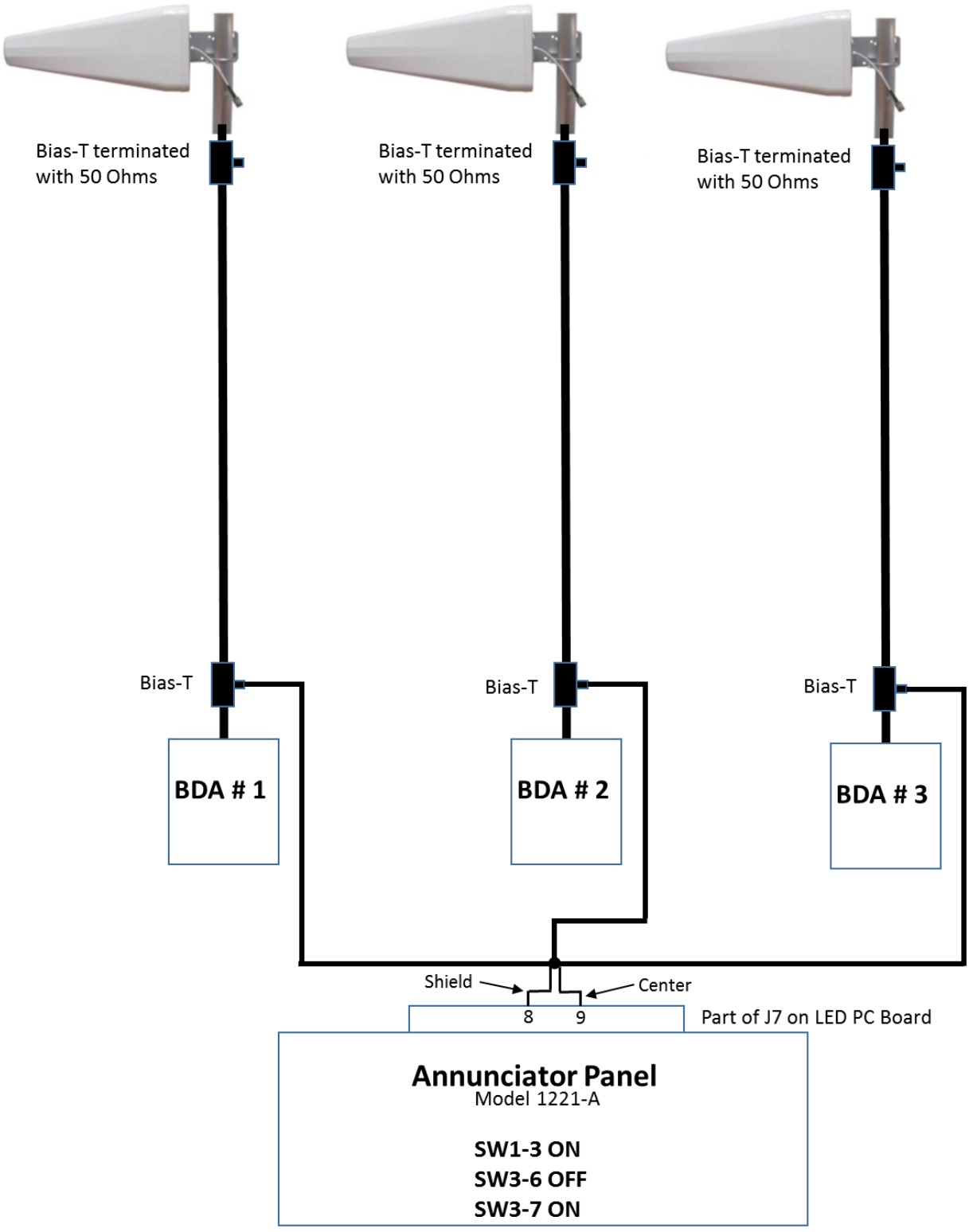


Figure 6. Model 1221-A Antenna Monitor Connection Diagram

Items Not Supplied

QTY	Part Number	Description	Supplier
2	ZNBT-60-1W+	Bias -T	www.Minicircuits.com
1	BTRM-50+	50 Ohm BNC Terminator	www.Minicircuits.com
1	BNC-21	BNC to twin- lead adapter	www.Allelectronics.com

Figure 7. Model 1221-A Antenna Monitor Connection Diagram for Multiple Antennas



DAS Secondary Power Backup Battery Capacity Test (Model 1221-A)

The code requires monitoring the DAS backup secondary battery to determine when it has less than 30 % capacity left under normal full load emergency backup conditions (no AC power). If the UPS in the system does not have the capability to do this, the panel provides an alternative technique. (see Figure 8 which shows appropriate connections to the external DAS backup power battery). This method measures the battery voltage and when it reaches a predetermined threshold an alarm is triggered. To enable this mode connect the DAS battery as shown in Figure 8 and set the DIP switches on the Mother board as follows:

SW1-10 ON

SW3-10 OFF

Battery suppliers provide specifications that show how the nominal battery voltage varies as a function of load current and capacity. Different types of batteries from different vendors will have varying specifications. To accommodate this variability a trim pot adjustment is provided on the LED PC board. The table below shows the appropriate DIP switch settings for 48, 24 and 12 VDC systems. Once these switches are set, connect a DC voltmeter to the test points labeled "Battery Low Threshold Test Point" and Ground. Adjust the trim pot labeled "DAS BAT Threshold Adjust (R41)" to set the 30% threshold to the require voltage. **NOTE: The test point provides the threshold voltage scaled down by a factor of 10. For example, a threshold trigger point of 45 VDC will read 4.50 VDC on your voltmeter.**

DIP Switch SW-4 on LED Board Settings

	12 VDC Battery	24 VDC Battery	48 VDC Battery
SW4-1	ON	OFF	OFF
SW4-2	ON	OFF	OFF
SW4-3	OFF	ON	OFF
SW4-4	OFF	ON	OFF
SW4-5	OFF	OFF	ON
SW4-6	OFF	OFF	ON

DAS Battery Charger Failure (Model 1221-A)

(On mother Board set SW3-8 OFF and SW3-9 ON)

The code requires monitoring the charger used to keep the DAS secondary power battery at full charge in case of AC Power failure. If the UPS in the system does not have the capability to do this, the panel provides an alternative technique. This method measures the battery voltage and when it reaches a predetermined voltage threshold, an alarm is triggered. To enable this mode set DIP Switch SW3-8 on the Mother board to OFF and SW3-9 on the Mother board to the ON position. Different types of batteries and chargers from different vendors will have varying performance. To accommodate this variability a trim pot adjustment is provided on the LED PC board. The table above shows the appropriate DIP switch settings for 48, 24 and 12 VDC systems. Once these switches are set, connect a DC voltmeter to the test points labeled "Charger Bad Threshold" and Ground. Adjust the trim pot labeled "DAS Charger Threshold Adjust" to set the desired threshold to the require voltage. **NOTE: The test point provides the threshold voltage scaled down by a factor of 10. For example, a threshold trigger point of 52 VDC will read 5.20 VDC on your voltmeter.**

To determine the appropriate threshold, you should run a test to measure the nominal battery voltage when the charger is on vs when the charger is turned off or disconnected. The battery voltage should be lower when the charger is off and the battery is under load.

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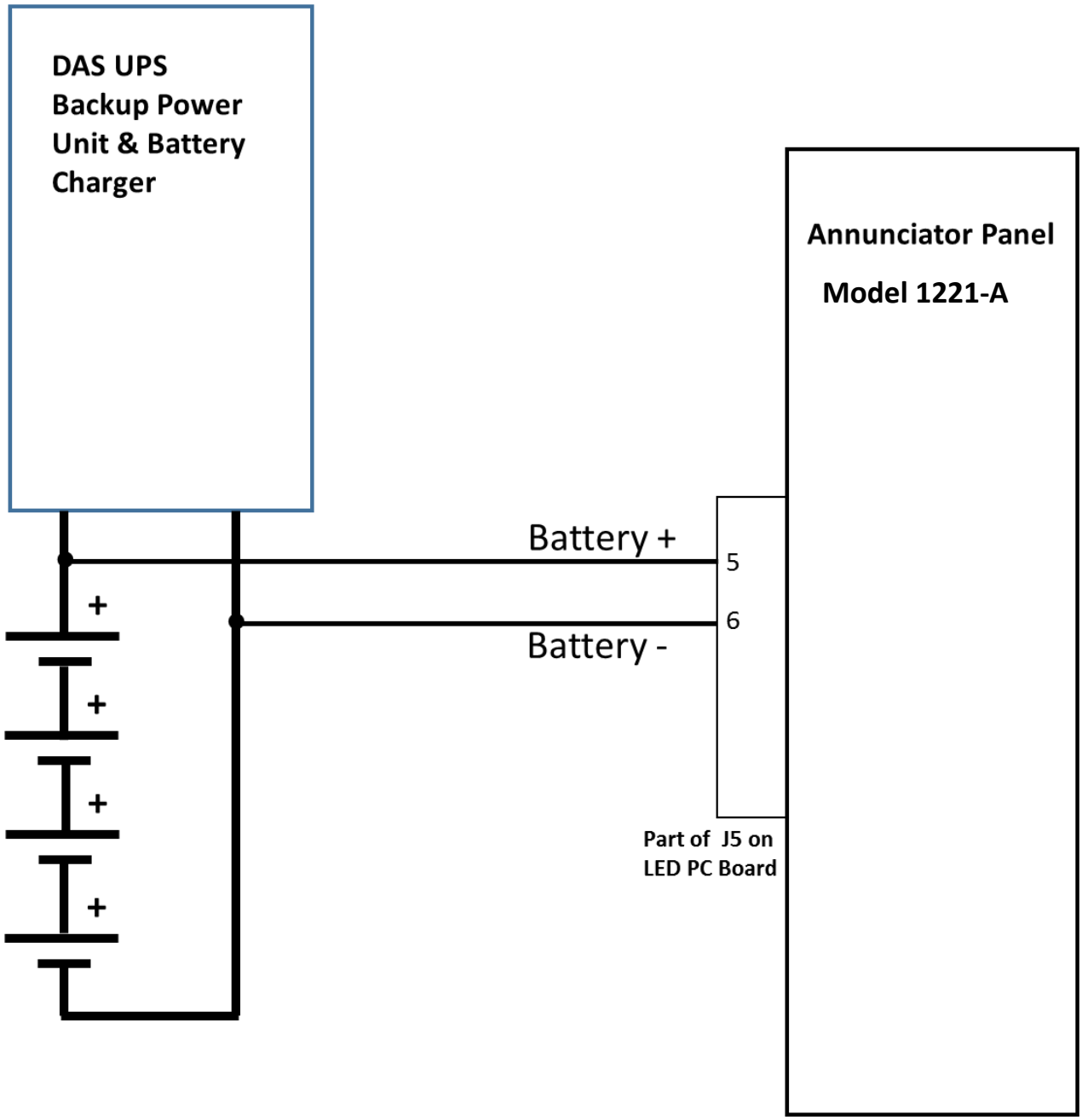
Figure 8. Model 1221-A Battery and Charger Monitor Connection Diagram



AC Power Loss Alarm (Model 1221-A and Model 1221-B)

There are two methods that can be used to detect loss of AC Power:

1. Connect the panel to an external DAS device (BDA or UPS) that provides Form-C relay contacts to signal an alarm. Figure 2 shows these connections. **This is the default mode and the panel is shipped with the DIP switches set to enable this mode.**

2. Use the loss of AC power to the panel's 15 VDC power supply to sense AC power loss. To enable this mode, on the Mother Board set DIP switch SW1-1 ON and SW1-6 to ON

Panel Power Supply and Battery Charger

The panel's backup battery charger is shown in Figure 10. **When doing an installation connect these items last after you have determined that everything else is working correctly on the 15 VDC power supply. This will help eliminate the possibility that the battery's external fuse might blow if something is not wired correctly.**

The G750 charger is a direct wall plug-in charger, with 12 feet of DC cable attached. The red lead is the positive (nominally +12 to 15 Vdc) output while the black lead is the negative or ground connection. Figure 11 shows how it should be connected to the panel and attached to pins 3 and 4 of the J5 connector on the LED PC Board.

Attach the battery to the red and black leads that are soldered to the LED board as shown in Figure 11. **Place the battery into its holder making sure that all wire connections and the battery's 1 amp fuse are routed around and below the surface of the battery case to ensure they will not interfere with closing the door of the panel or damage any components on the LED PC board when the door is completely closed and latched. See Figures 13, 14 and 19.**

When the battery is connected and the charger is powered, the charger LED after a few seconds will blink red to indicate the battery is charging. When the battery is nearly charged it will blink green and eventually turn solid green when the battery is fully charged. The diagnostics LED on the charger provides the following indications:

- Single Flash: Battery will not hold a charge
- Double Flash: Possible battery short
- Triple Flash: Battery voltage is too high for the selected charge mode. Double check the battery is a 12 VDC Sealed Lead Acid type.
- LED Solid Red: Reverse polarity. Reverse the connections to the battery.

The standby LED will be solid Orange if the battery is not connected or its voltage is too low for the charger to detect.

There is an option to monitor the status of this battery and notify the building's main fire alarm panel if it is low or needs replacement. This can be done by setting DIP SW4-10 on the LED board to the OFF position. If the battery needs to be replaced or if it is disconnected the SYSTEM LED will flash on and off once per second and the SYSTEM alarm relay will signal an alarm to the building's main fire alarm panel. The circuit that senses this battery's status has a time lag of about 10 seconds. So once the panel's battery is connected or disconnected it will take about 10 seconds before the LED on the panel reacts.

Figure 11 also shows how the 15 VDC power supply is attached.

End to End Testing.

DIP switch settings on the Mother board are provided to simulate various alarm conditions:

- DIP switch SW1-7 (Normally OFF, when ON all LEDs will be Red and all relay signals to the main fire alarm panel will be forced to the alarm state except the Communications Fault Alarm
- DIP switch SW1-8 (Normally OFF, when ON all LEDs will be Green and all relay signals to the main fire alarm panel will be forced to the normal non-alarm state.

Test Points (TP)

Test Points (TP) are provided on the LED board to use for troubleshooting and system setup (see Figure 18). These TPs are designed to mate with standard voltmeter probes. Each TP is isolated from the main circuits via a 10k resistor so if a TP is inadvertently shorted, no damage will result. The table below shows the nominal DC signals that can be measured at each TP.

Name	DC Voltage	Comments
+14 VDC	11-15 VDC	Approximately 12 VDC when running on panel backup battery. 14 VDC when power supply is active
10 VDC	10 VDC	Output of panel's 10 VDC regulator
Antenna	5 VDC	Nominal level is 5.0 VDC. Will vary as a function of antenna cable length and number of antennas that are monitored.. Use the Antenna trim pot to adjust this voltage to a nominal 5 VDC value
DAS Charger Threshold	varies	Depends on threshold value set to detect DAS Charger failure
DAS Battery Low	varies	Depends on threshold value set to detect DAS battery capacity
DAS Battery +	Depends on DAS Battery. Either 12 , 24 or 48 VDC	Connected to DAS battery positive and negative terminals so the status of the DAS Backup Battery can be measured
DAS Battery -		
Ground	0 vdc	Connected to circuit ground and enclosure chassis

Figure 10. Panel Battery Charger

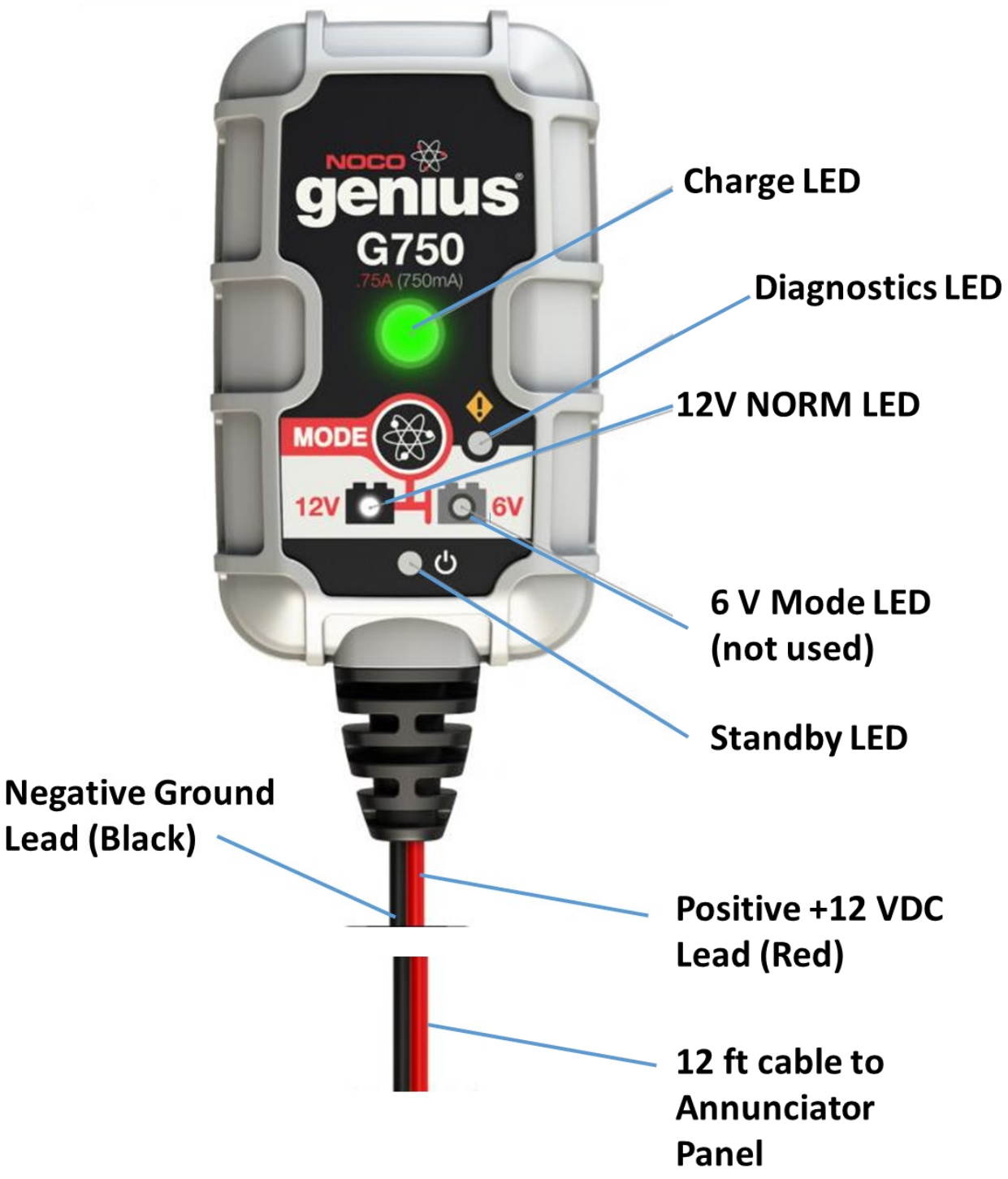


Figure 11. Panel Power Supply and Backup Battery Connections

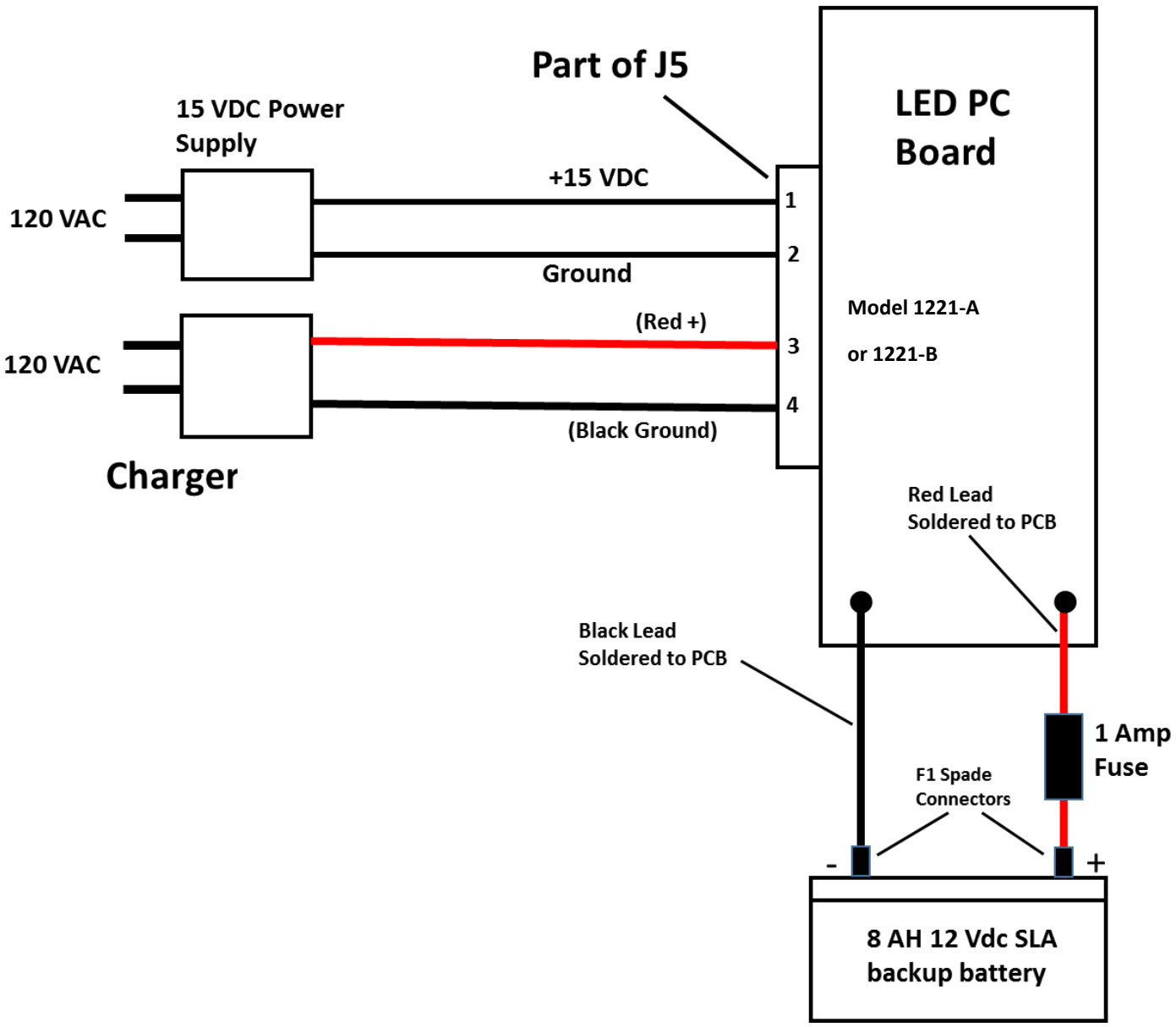
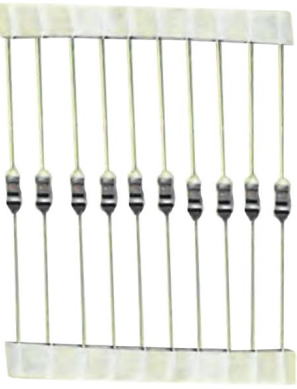


Figure 12. Included Accessories

Trimpot adjustment tool



10k Ohm End-of-line-resistors

Screw Driver for Connector Clamps

Locking Key

Spare Battery Fuse

Figure 13. Mother Board Model 1221-A or 1221-B

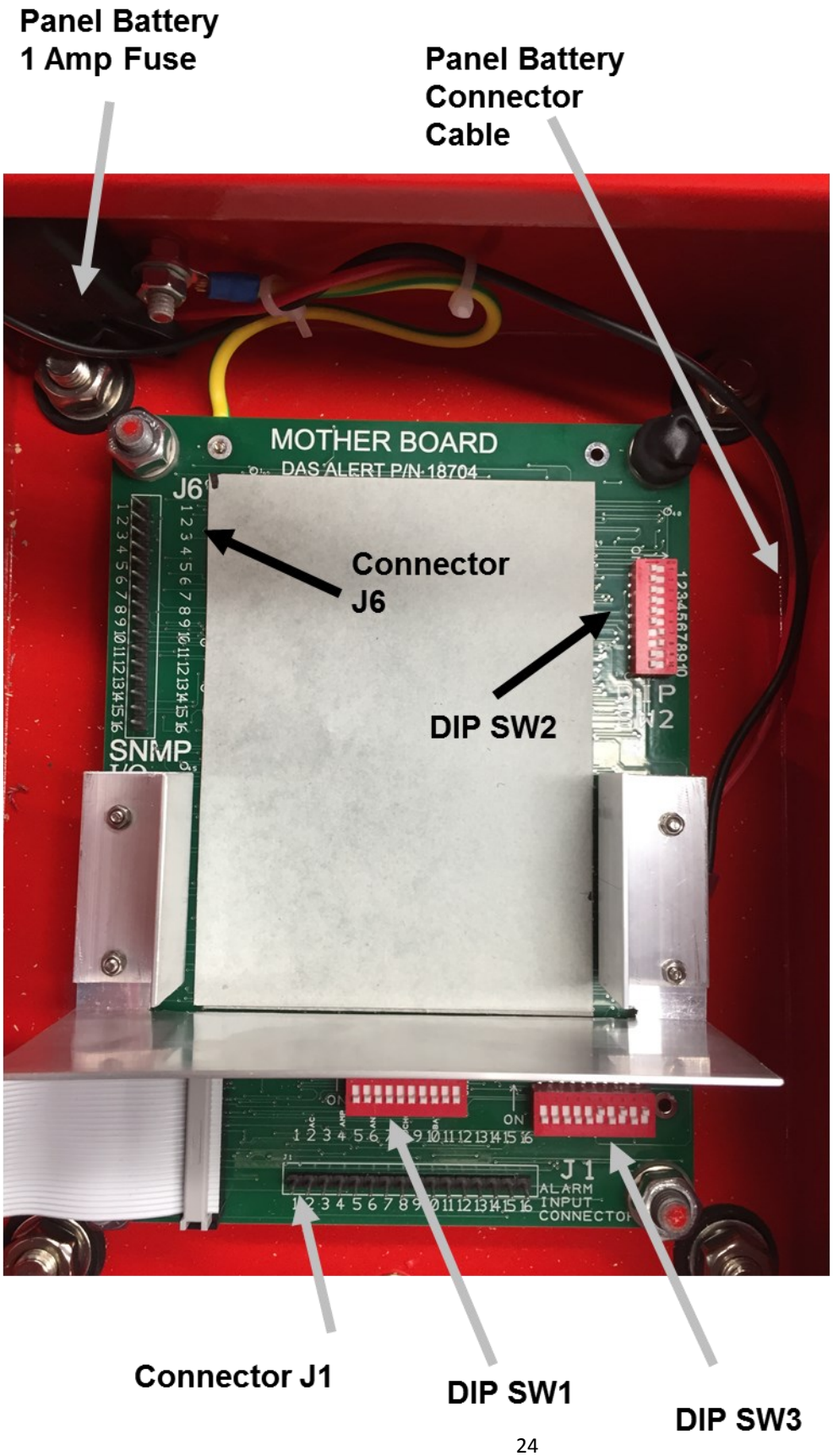


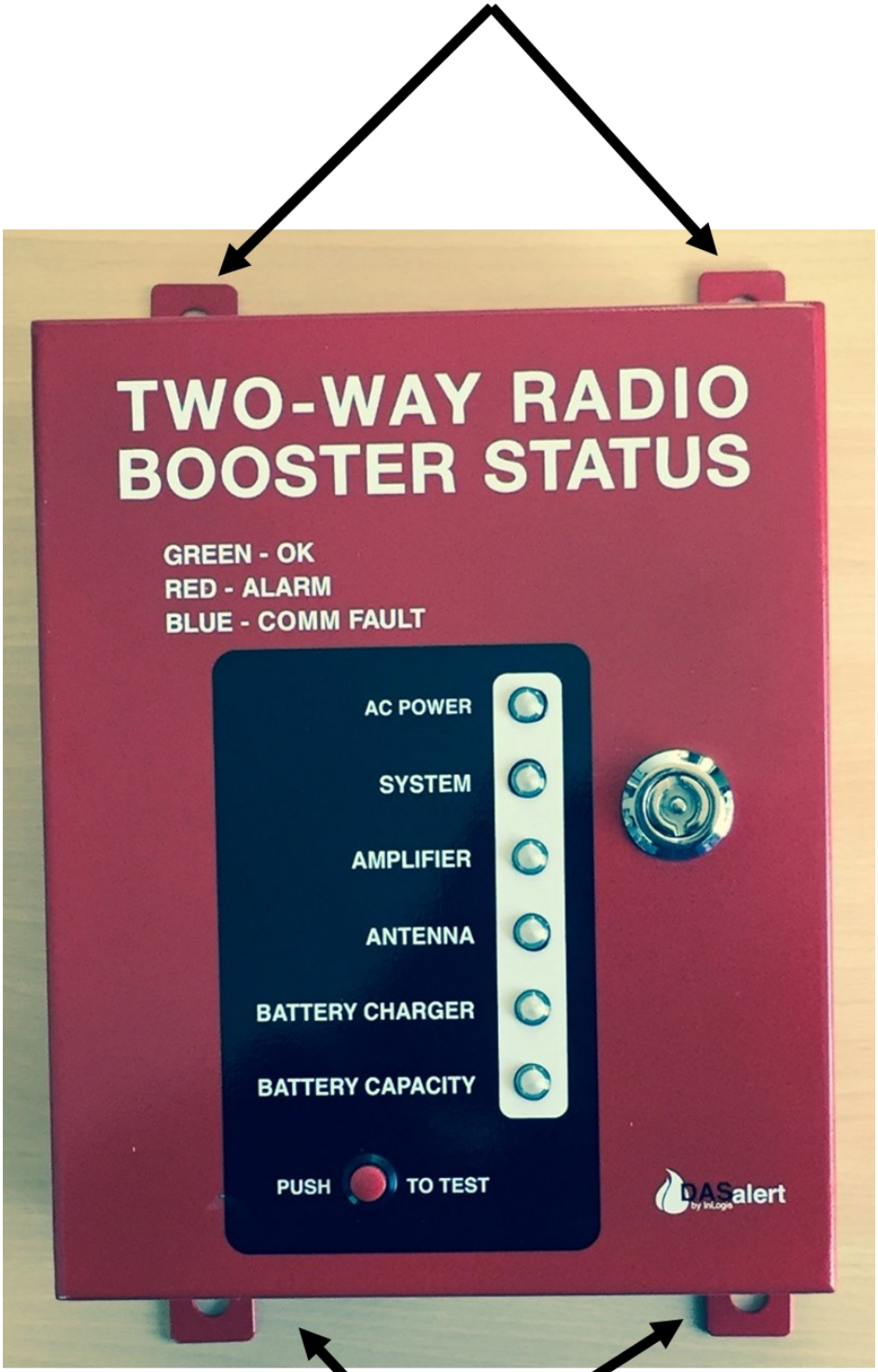
Figure 14. Backup Panel Battery Installation

IMPORTANT: Insure battery is firmly depressed towards back of enclosure to eliminate interference with door when closed.

Do <u>not</u> route any wires over surface of battery.

Battery Connection Lugs

Figure 15 Mounting Brackets



Mounting Brackets

Figure 16. Removable plugs for standard conduit and cable fittings in bottom of enclosure

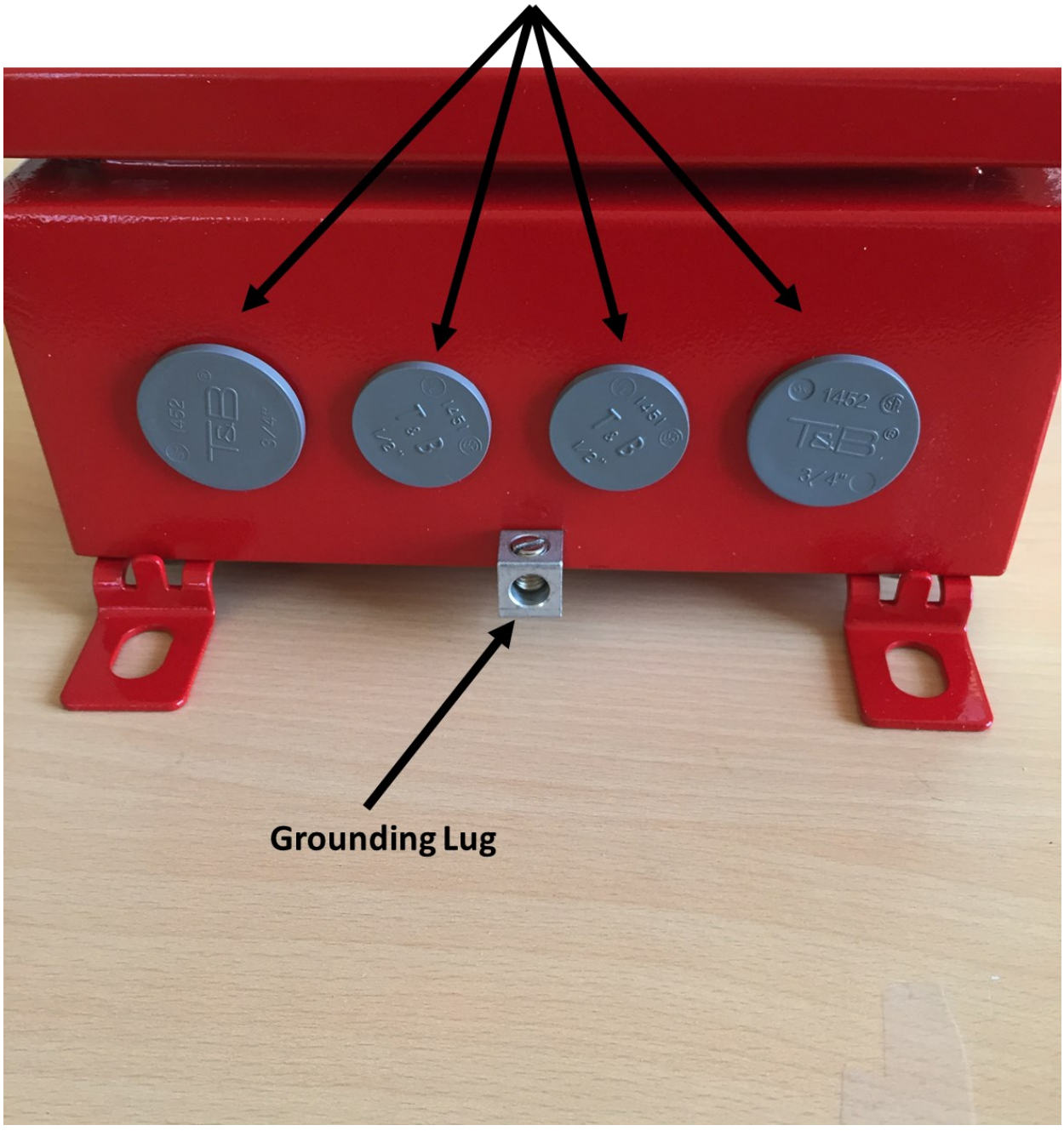
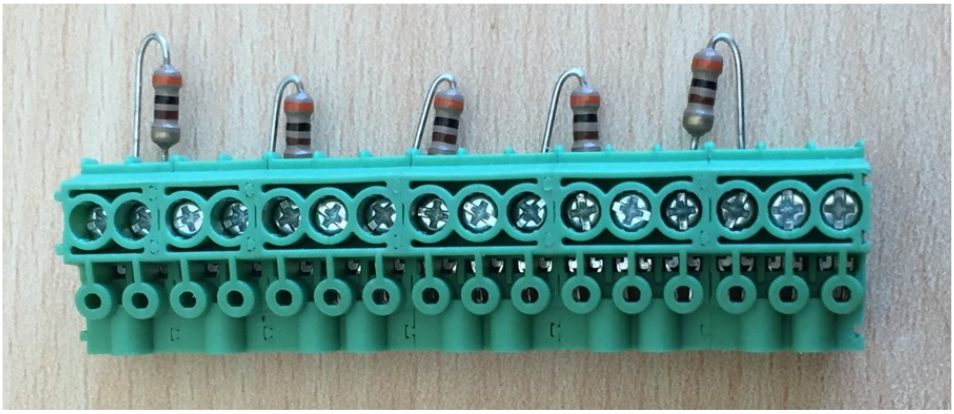
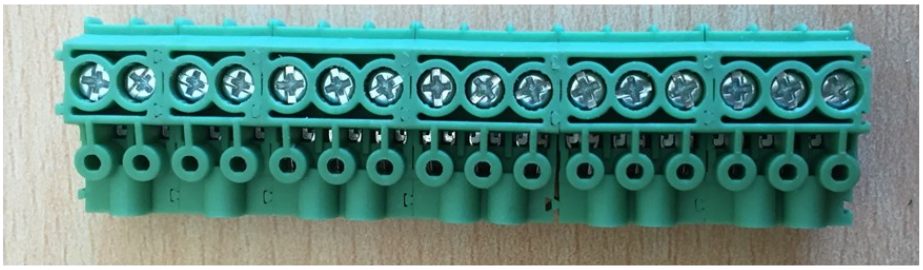


Figure 17. Connectors





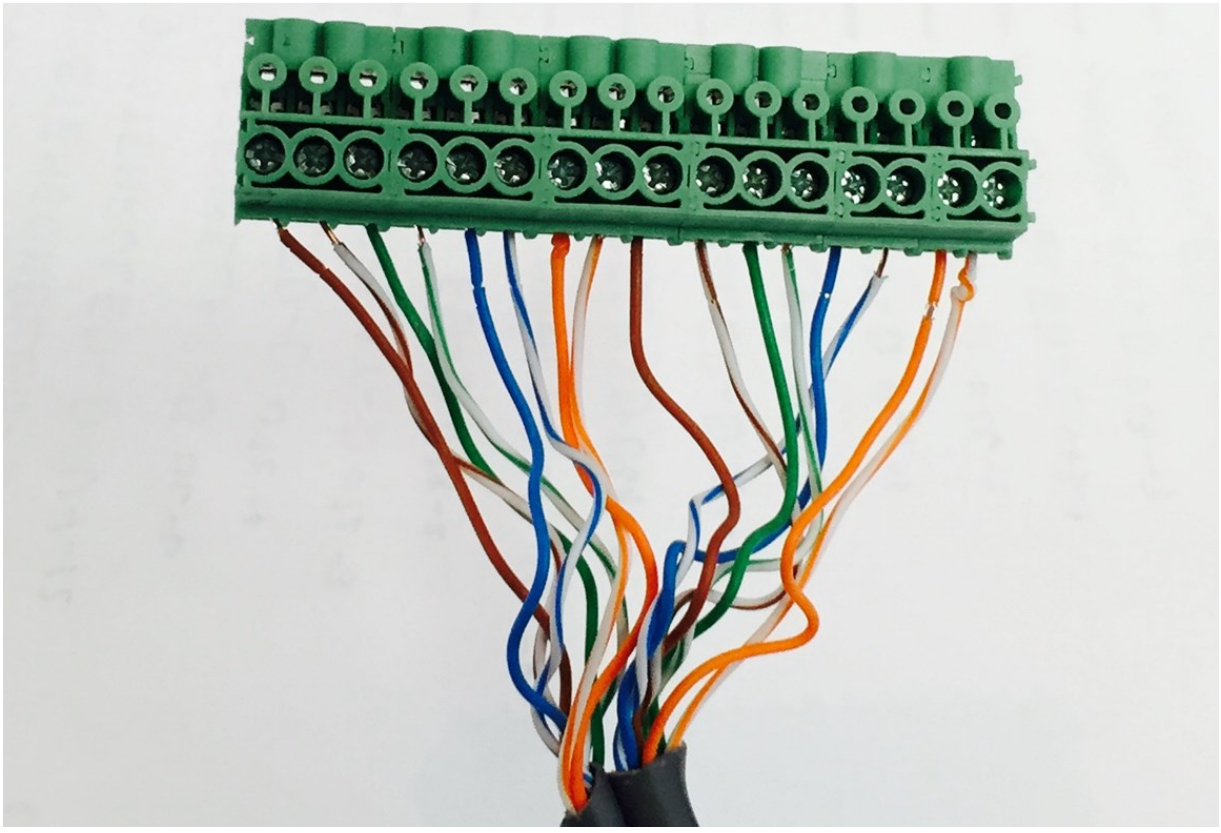


Figure 18. LED Board

Model 1221-A or 1221-B

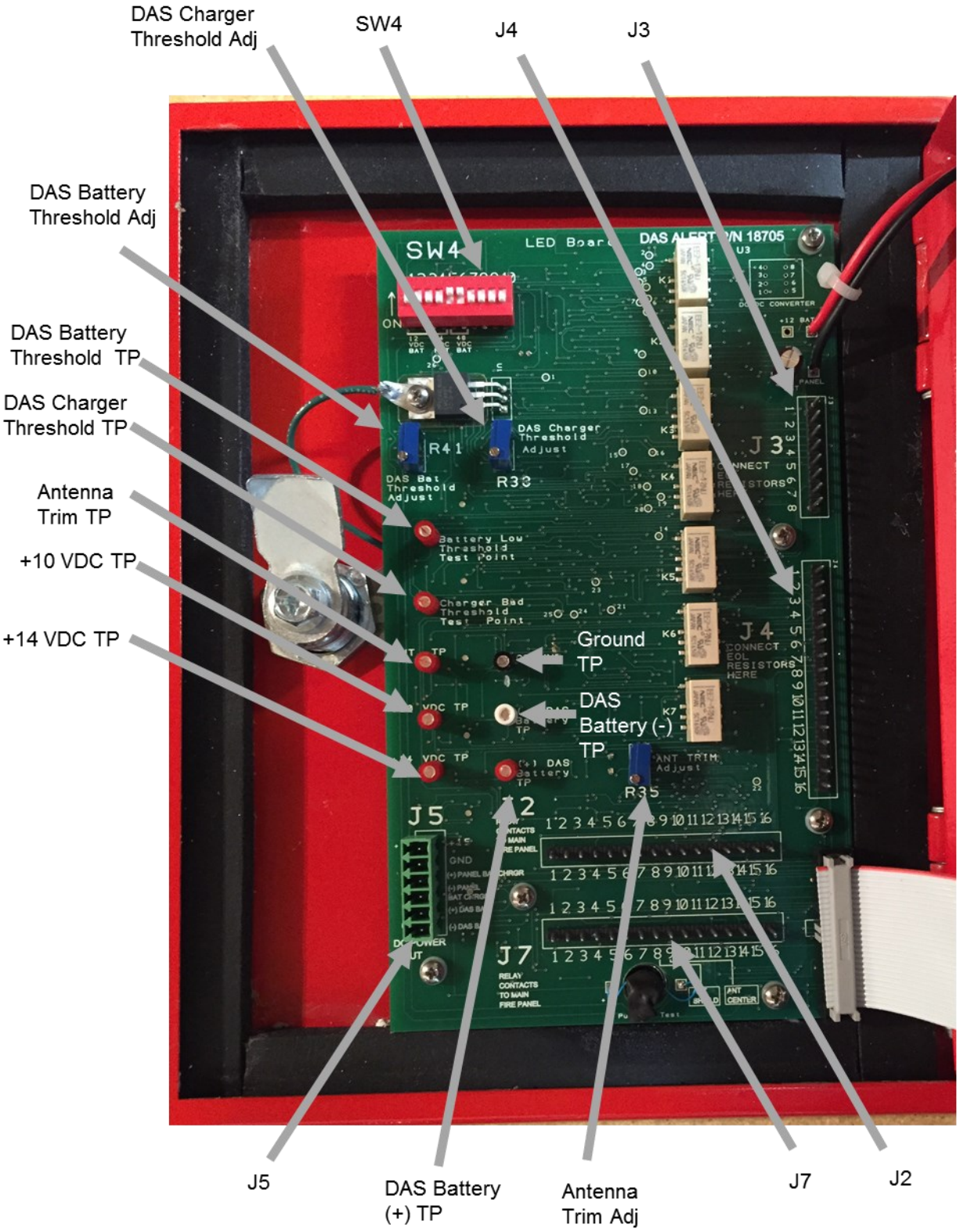
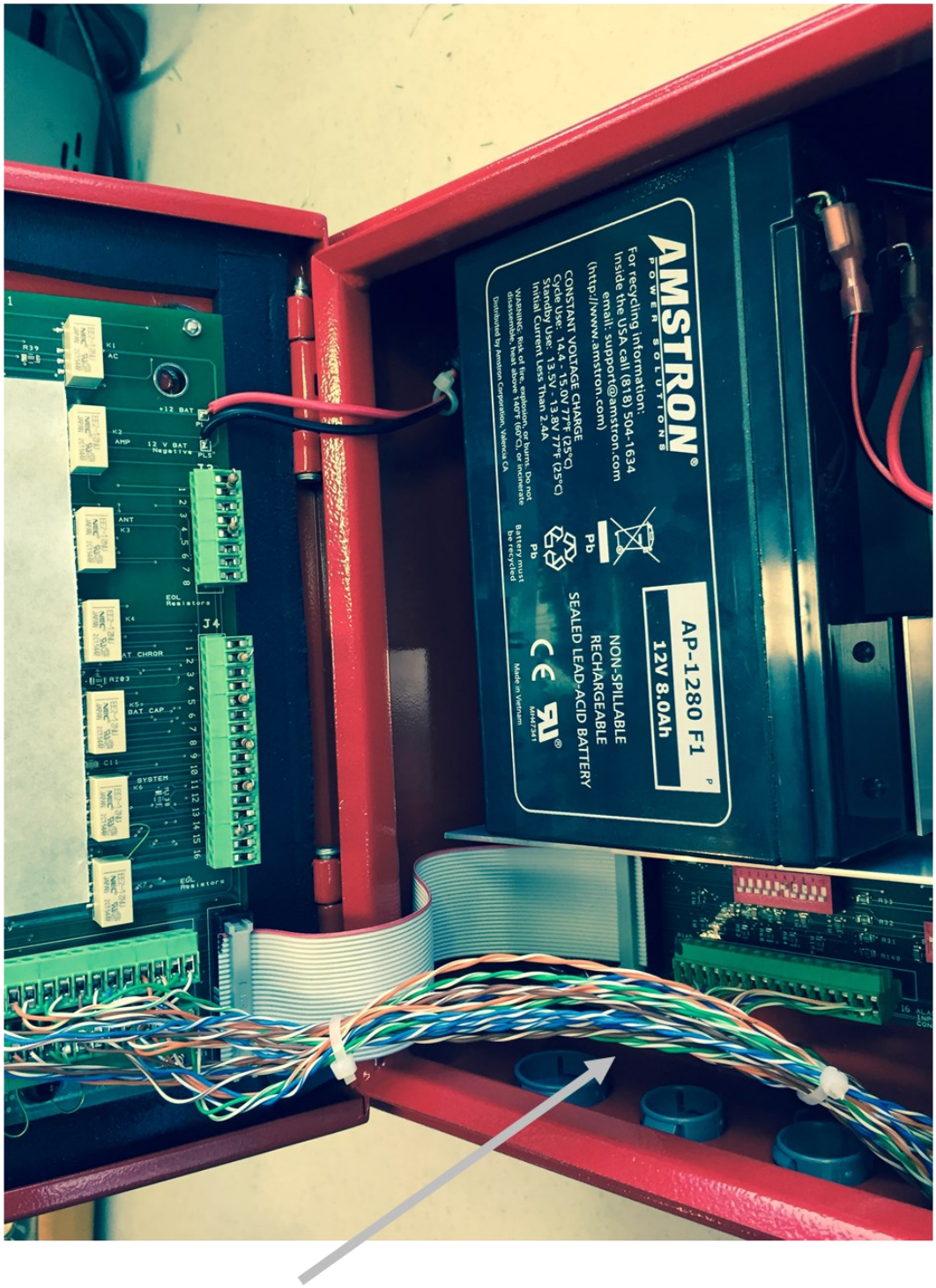


Figure 19. Wire Routing Inside Panel



Keep these wire bundles below battery shelf to avoid interference with door when panel is closed

Figure 20. End of Line Resistor Installation for Alarm Signals Going to Main Fire Alarm Panel

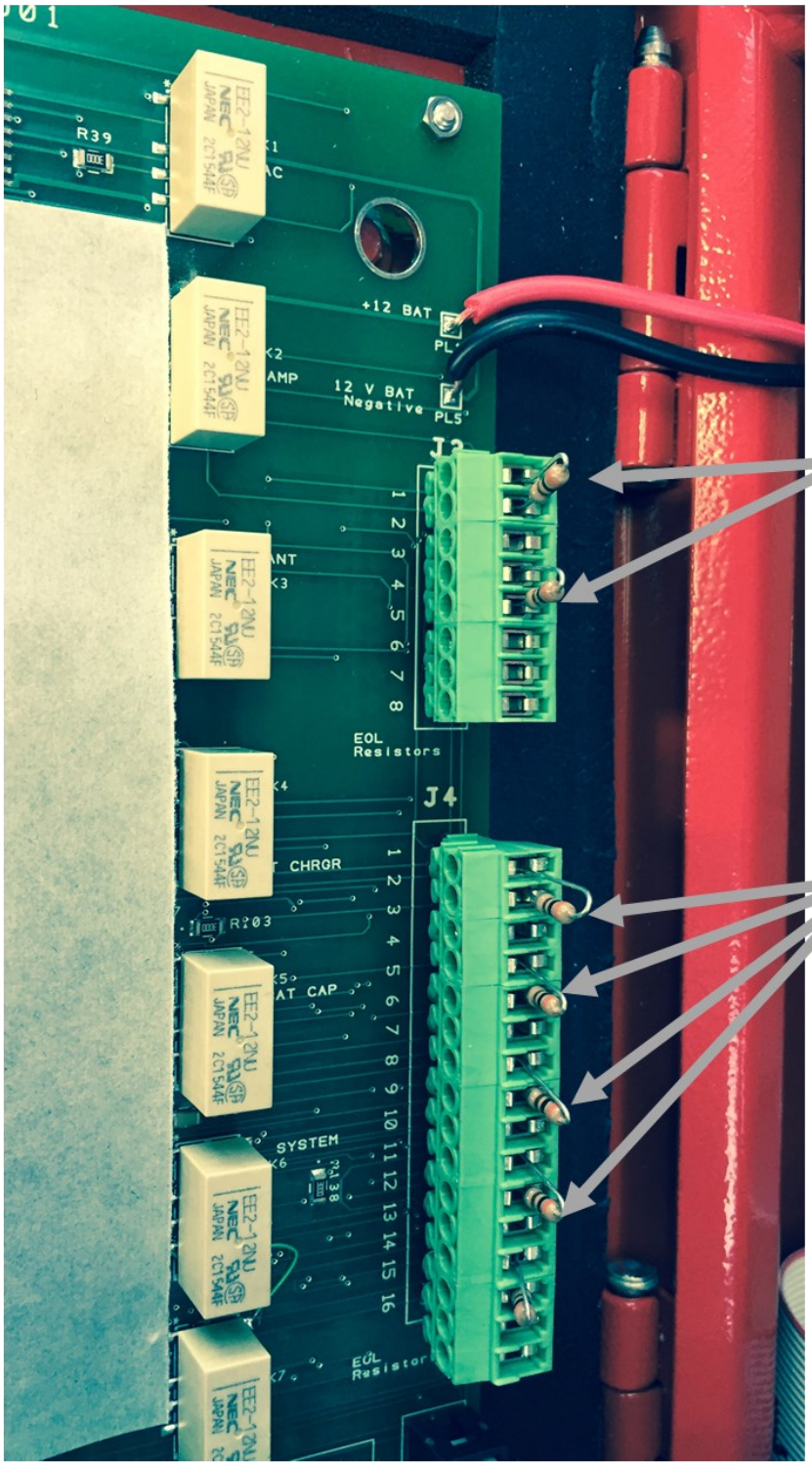


Table 1. DIP Switch Settings

LED PC Board	
DIP Switch	**Function**
SW4-1	12 VDC Battery
SW4-2	12 VDC Battery
SW4-3	24 VDC Battery
SW4-4	24 VDC Battery
SW4-5	48 VDC Battery
SW4-6	48 VDC Battery
SW4-7	Not Used
SW4-8	Not Used
SW4-9	Not Used
SW4-10	Normally ON, OFF enables monitoring of Panel Battery Status

Mother PC Board	
DIP Switch	**Function**
SW1-1	Normally OFF, ON places 10 k Ohm EOLR across AC Alarm input
SW1-2	Normally OFF, ON places 10 k Ohm EOLR across BDA-Amplifier Alarm input
SW1-3	Normally OFF, ON places 10 k Ohm EOLR across Antenna Alarm input from BDA
SW1-4	Normally OFF, ON places 10 k Ohm EOLR across DAS Battery Charger Alarm input
SW1-5	Normally OFF. ON places 10 k Ohm EOLR across DAS Battery Capacity Alarm input
SW1-6	Normally OFF, ON enables 15 VDC Power Supply to trigger AC power loss Alarm. SW1-1 must be also be ON
SW1-7	Normally OFF, ON forces all output relays into Alarm mode (RED LEDS)
SW1-8	Normally OFF, ON forces all output relays to the MFAP into the OK state (GREEN LEDS)
SW1-9	Normally OFF, ON forces a Communications Fault Alarm to the MFAP (BLUE LEDS)
SW1-10	Normally OFF, ON connects internal Battery Capacity sensor to MFAP, In the ON state SW3-10 must be OFF.
SW2-1	Normally OFF, ON disables AC Power Blue LED
SW2-2	Normally OFF, ON disables AMPLIFIER Blue LED
SW2-3	Normally OFF, ON disables ANTENNA Blue LED
SW2-4	Normally OFF, ON disables CHARGER Blue LED
SW2-5	Normally OFF, ON disables BATTERY CAPACITY Blue LED
SW2-6	Normally OFF, ON for use with CommScope NODE A amplifiers
SW2-7	Normally ON, OFF for use with CommScope NODE A amplifiers
SW2-8	Normally ON, OFF for use with some UPS's
SW2-9	NOT USED
SW2-10	ALWAYS OFF
SW3-1	Normally OFF, ON reverses polarity of external AC power loss alarm input from DAS
SW3-2	Normally OFF, ON reverses polarity of DAS BDA-Amplifier alarm input
SW3-3	Normally OFF, ON reverses polarity of external DAS Antenna fail alarm input
SW3-4	Normally OFF, ON reverses polarity of external DAS Battery Charger alarm input
SW3-5	Normally OFF, ON reverses polarity of external DAS Battery Capacity low alarm input
SW3-6	Normally ON to connect external DAS Antenna Fail alarm to the MFAP. In the ON state SW3-7 must be OFF
SW3-7	Normally OFF, ON connects internal DAS Antenna Fail sensor alarm to the MFAP. In the ON state SW3-6 must be OFF
SW3-8	Normally ON to connect external DAS Battery Charger Fail alarm to the MFAP. In the ON state SW3-9 must be OFF
SW3-9	Normally OFF, ON connects internal DAS Battery Charger Fail sensor alarm to the MFAP. In the ON state SW-3-8 must be OFF.
SW3-10	Normally ON, connects external Battery Capacity sensor to the MFAP. In the ON state SW1-10 must be OFF

Connector Pin Assignments and Functions

J1 on Mother PC Board (Inputs from DAS Equipment)	
PIN #	**Function / Name**
1	AC Power Loss +10 VDC Excite (to UPS)
2	AC Power Loss input (from UPS)
3	BDA-Amplifier Fail +10 VDC Excite (to BDA)
4	BDA-Amplifier Fail input (from BDA)
5	Antenna Fail Alarm +10 VDC Excite (to BDA)
6	Antenna Fail Alarm input (from BDA)
7	DAS Battery Charger Fail +10 VDC Excite (to UPS)
8	DAS Battery Charger Fail Alarm (from UPS)
9	DAS Battery Capacity Low +10 VDC Excite (to UPS)
10	DAS Battery Capacity Low Alarm (from UPS)
11	Not used
12	Not used
13	Not used
14	Not used
15	+ 14 VDC Power for SNMP Module
16	Not used

J2 on LED PC Board (Relay outputs to Main Fire Alarm Panel)	
PIN #	**Function / Name**
1	AC Fail (COMMON) Alarm relay
2	AC Fail (N.C.) Alarm Relay Contact (closed to common when in alarm or not powered)
3	AC Fail (N.O.) alarm Relay Contact (open to common when in alarm or not powered)
4	BDA-Amplifier (COMMON) Fail Alarm relay
5	BDA-Amplifier (N.C.) Fail Alarm Relay Contact (closed to common when in alarm or not
6	BDA-Amplifier (N.O) Fail Alarm Relay Contact (open to common when in alarm or not
7	Antenna (COMMON) Alarm Relay
8	Antenna Alarm (N.C.) Relay Contact (closed to common when in alarm or not powered)
9	Antenna Alarm (N.O) Relay Contact (open to common when in alarm or not powered)
10	DAS Charger (COMMON) Alarm Relay
11	DAS Charger (N.C.) Alarm Relay Contact (closed to common when in alarm or not pow-
12	DAS Charger Alarm Relay (N.O.) Contact (open to common when in alarm or not
13	DAS Battery Capacity (COMMON) Alarm Relay
14	DAS Battery Capacity (N.C.) Alarm Relay Contact (closed to common when in alarm or not
15	DAS Battery Capacity (N.O.) Relay Contact (open to common when in alarm or not
16	Not used

Connector Pin Assignments and Functions (continued)

J4 on LED PC Board (End of Line Resistor-EOLR contacts)	
PIN #	**Function / Name**
1	EOLR (COMMON) connection for AC Fail Alarm relay
2	EOLR (N.C.) connection for AC Fail Alarm Relay Contact (closed to common when in alarm or not powered)
3	EOLR (N.O.) connection for AC Fail Alarm Relay Contact (open to common when in alarm or not powered)
4	EOLR (COMMON) connection for BDA-Amplifier Fail Alarm relay
5	EOLR (N.C.) connection for BDA-Amplifier Fail Alarm Relay Contact (closed to common when in alarm or not powered)
6	EOLR (N.O.) connection for BDA-Amplifier Fail Alarm Relay Contact (open to common when in alarm or not powered)
7	EOLR (COMMON) connection for Antenna Alarm Relay
8	EOLR (N.C.) connection for Antenna Alarm Relay Contact (closed to common when in alarm or not powered)
9	EOLR (N.O.) connection for Antenna Alarm Relay Contact (open to common when in alarm or not powered)
10	EOLR (COMMON) connection for DAS Charger Alarm Relay common
11	EOLR (N.C.) connection for DAS Charger Alarm Relay Contact (closed to common when in alarm or not powered)
12	EOLR (N.O.) connection for DAS Charger Alarm Relay Contact (open to common when in alarm or not powered)
13	EOLR (COMMON) connection for DAS Battery Capacity Alarm Relay
14	EOLR (N.C.) connection for DAS Battery Capacity Alarm Relay Contact (closed to common when in alarm or not powered)
15	EOLR (N.O.) connection for DAS Battery Capacity Relay Contact (open to common when in alarm or not powered)
16	Not used

Connector Pin Assignments and Functions (continued)

J7 on LED PC Board (Relay outputs to Main Fire Alarm Panel)	
PIN #	**Function / Name**
1	System Summary (COMMON) Alarm relay
2	System Summary (N.C.) Alarm Relay Contact (closed to common when in alarm or not
3	System Summary (N.O.) Alarm Relay Contact (open to common when in alarm or not
4	Communications Fault (COMMON) Alarm relay
5	Communications Fault (N.C.) Alarm Relay Contact (closed to common when in alarm
6	Communications Fault (N.O) Alarm Relay Contact (open to common when in alarm or
7	Not used
8	Shield connection from Bias- T
9	Center conductor connection from Bias-T
10	Not used
11	Not Used
12	Ground
13	Ground
14	+14 VDC Output
15	+14 VDC output
16	Not used

J3 on LED PC Board (End of Line Resistor-EOLR contacts)	
PIN #	**Function / Name**
1	EOLR (COMMON) connection for System Summary Alarm relay
2	EOLR (N.C.) connection for System Summary Alarm Relay Contact (closed to common when in alarm or not powered)
3	EOLR (N.O.) connection for System Summary Alarm Relay Contact (open to common when in alarm or not powered)
4	EOLR (COMMON) connection for Communication fault Alarm relay
5	EOLR (N.C.) connection for Communications fault Contact (closed to common when in alarm or not powered)
6	EOLR (N.O.) connection for Communications fault Contact (open to common when in alarm or not powered)
7	Not used
8	Not used

Connector Pin Assignments and Functions (continued)

J5 on LED PC Board (DC Power)	
PIN #	**Function / Name**
1	+15 VDC from external power supply
2	Ground from external power supply
3	Panel Battery Charger (+) RED
4	Panel Battery Charger (-) BLACK
5	DAS Backup Battery (+) positive terminal
6	DAS Backup Battery (-) negative terminal

Specifications

Dimensions	9.84" H x 7.87" W x 3.98"D
Weight	11.7 Lbs
Form-C (1 amp) dry relay outputs to Main Fire Alarm Panel	120 VAC Power
	System Fault
	Amplifier
	Antenna
	Battery Charger
	Battery Capacity
	Communications Error
Alarm Inputs from DAS	Antenna OK / Fail
	Amplifier / BDA OK/ Fail
	Charger OK /Fail
	Battery capacity OK / Low
	120 VAC OK / Fail
Analog inputs	Antenna sense
	DAS Backup Battery +/-
Power	15 VDC @160 milliamps from supplied external power supply
	24 HR backup SLA Battery supplied
Certifications	UL : E194432, ETL 4001276