



Radionics[®]

D7022 Fire Alarm Control Panel

Installation and Programming Guide



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Installation and Programming Guide

1.0 Notices

1.1 FCC Compliance Notice

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

1.2 Notice

The Industry Canada label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational, and safety requirements. Industry Canada does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users should ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions might not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together.



Users should not attempt to make such connections themselves, but should contact the appropriate electrical inspection authority, or electrician.

1.3 Installation Guidelines for UL Listed Systems

1.3.1 D7022 UL Listings

The D7022 is UL listed for Commercial and Household Fire Alarm (Type service: Auxiliary, Local, Remote Station, Central Station; Type Initiating: Automatic, Manual, Sprinkler Supervisory and Waterflow), UL Standard UL864, UL985.

The control panel should be installed in accordance with NFPA 72 for Commercial Fire installations.

1.3.2 Installation Considerations



Failure to install and program the D7022 in accordance with the requirements in this section voids the listing mark of Underwriters Laboratories, Inc.

- For Local and Central Station applications, the maximum standby battery capacity is 17AH @ 12VDC or 24VDC.
- For Remote Station applications, using the D185 Reverse Relay Module, the panel must use 26AH batteries in a 24V configuration only. Smoke power is derated to 250mA for this application.
- The total nominal current **must not exceed** 750mA in standby or 1.80A when in alarm.
- The D7022 must be mounted indoors and within the protected area.
- Grounding must be in accordance with Article 250 of the NEC (NFPA 70).
- The ground wire provided with the enclosure must be connected between the door and the enclosure using the supplied screw and clamp terminal.
- Only use UL Listed compatible smoke detectors (refer to Technogram P/N: 34445) and UL Listed compatible notification appliances (refer to Technogram P/N: 40374) with the D7022 FACP.

2.0 D7022 Overview

1.3.3 Configuration

When used in UL listed installations, the D7022 must be installed in conformance to certain requirements. The following details the required program entries and required accessories for specific UL listed installations.

Required Accessories for Commercial Fire Alarm and Local:

- At least one compatible Radionics two-wire smoke detector (for example, a D285 with a D287, D288, D292 or D293 series base or another UL Listed compatible smoke detector), or at least one four-wire compatible Radionics four-wire smoke detector (for example, a D285 with a D292 or D293 Series base). **Four-wire detectors must be used with UL Listed power supervision devices.**
- At least one Radionics horn/strobe or bell will provide 85dB for UL985 and NFPA 72 requirements. Refer to Technogram P/N: 40374 for listed compatible devices.
- All zones must be latching.
- All zones and the NAC must be used with the provided EOL resistor (Radionics by Detection Systems, Inc. P/N:25899).
- A full system check must be performed after panel programming or panel maintenance has been performed.

2.0 D7022 Overview

2.1 System Overview

The D7022 Control is a fully integrated hard-wire fire alarm system with the following features:

- 12/24 Volt operation (field configurable)
- Two powered Class B input zones
- One NAC output (EOL supervised)
- Five open collector outputs
- DIP Switch programming
- LED indicators
- Three on-board control switches:
 - **SILENCE**
 - **DISABLE**
 - **RESET**
- UL Listed, FCC approved

2.2 Specifications

2.2.1 Enclosure

The standard enclosure is manufactured from 18 Ga., cold-rolled steel, and measures 12.75 in. Wide, by 14.75 in. High, by 3.5 in. Deep (32.4 cm Wide by 37.5 cm High, by 8.9 cm Deep). A keyed lock is included and the LEDs are visible through the door.



A separate enclosure (model # AE4) is required for installation when using batteries larger than 7AH in a 24V configuration.

2.0 D7022 Overview

2.2.2 Hardware

See Table 1 for a listing of the hardware shipped with the D7022 FACP.

Table 1: Contents of D7022 Shipping Box

Main Part/(Quantity)	Containing	
	Part	Item/(Quantity)
Cabinet (1)	Panel Box	Control Board (1)
		Installation Guide (1)
		Two-Wire Technogram (1)
		NAC Technogram (1)
		Operating Instructions (1)
	Hardware Bag	½ in. Self-Tapping Screws (2)
		¼ in. Screw (1)
		#8 Washer (1)
		Battery Jumper (1)
		Earth Ground Wire (1)
		Black Support Posts (2)
		White Standoffs (3)
		Lock Set with Key (1)
		End-of-Line Resistors (3)
Transformer (1)	120 VAC @ 60Hz	
Viewing Bezel (1)		

2.2.3 Power

See Table 2 for power specifications.

Table 2: Power Specifications

D7022 Power Specification	Value
Brownout Conditions	92VAC Normal Standby, 95VAC Alarm.
Input Power	120VAC, 60Hz, 1.5A AC max. (20A fused).
Output Power	Overall 1.8A capacity (NAC, auxiliary power, smoke power, initiating circuit power).
NAC Power	12/24Vrms nominal, unfiltered, unregulated (special application) with up to 1.0A. Refer to Technogram P/N: 40374 for compatible devices.
Auxiliary Power	12/24Vrms nominal, unfiltered, unregulated (special application) with up to 300mA.
Initiating Circuit (Smoke) Power	12/24VDC nominal; 10.2VDC to 14.1VDC (12V configuration); 20.4VDC To 28.2VDC (24V configuration) with up to 500mA. Refer to Technogram P/N: 34445 for compatible devices.
Standby Batteries	One 12V, 7 – 17AH for 12V configuration; two 12V (in series), 7 – 17AH for 24V configuration (see Section 4.1 "Power Supply Connections" for battery installation information).



When used in Remote Station application for direct wire connection using a D185 Reversing Relay Module, 26AH batteries must be used and the panel must be configured for 24V operation.

2.0 D7022 Overview

2.2.4 Outputs

One on-board notification circuit - NAC: This is a 12/24V output for notification devices with up to 1.0A capacity.

- Wired for standard Class B, Style Y operation.

Open Collector (O/C) outputs: (5) rated at 100mA up to 30V max.

- Open Collector (O/C) outputs short to panel ground when activated; can sink up to 100mA; can be connected up to a voltage source of 30V max.
- The Trouble (TRBL) O/C output is normally shorted to panel ground. It is open when active.

2.2.5 Temperature

Storage and Operating Temperature: +32° to 120°F (0° to +49°C).

2.2.6 Lightning Protection

MOV's and spark gaps provide protection from lightning surges and static discharges.

2.2.7 Compatible Accessories

Refer to Section 9.0 of this manual for detailed information on accessory installation and operation.

- D185 Reverse Polarity Module
- D7025 Alarm/Trouble Relay Module
- D2071A Fire Control/ Communicator (DACT)

2.2.8 Zones (Initiating Circuits)

Both zones work with two- or four-wire detectors. For a list of compatible detectors, refer to Radionics Technogram P/N: 34445.

See Table 3 for zone specifications.

Table 3: Zones (Initiating Circuits) Specifications

D7022 Zones Specification	Value
Number of Two-Wire Circuits	Two circuits
Type of Circuit	Class B, Style B
EOL Resistor	2.21K ohms, Radionics by Detection Systems, Inc. P/N: 25899B, UL Listed
Supervisory Current	4 – 10mA (12V configuration); 8 – 20mA (24V configuration)
Required Current for Alarm	12mA (12V configuration); 24mA (24V configuration)
Max. Short Circuit Current	44 mA
Max. Line Resistance	50 ohms (12V configuration); 150 ohms (24V configuration)
Circuit Voltage Range	10.2 to 14.1VDC (12V configuration); 20.4 to 28.2VDC (24V configuration)
Max. Detectors per Zone	20 detectors (two-wire)
Total Two-Wire Detector Standby Current	1.5mA max (12V configuration); 3.0mA max (24V configuration)
Response Time	500 milliseconds

2.0 D7022 Overview

2.2.9 Backup Battery Calculation

First use Table 4, as required by NFPA, to calculate the standby battery capacity for the DS9422. Then use either Method 1 or Method 2 to calculate backup batteries.

Table 4: Standby Battery Capacity

Device	Quantity	Standby Current Per Device	Total Standby Current (Quantity x Standby Current per Device)	Alarm Current per Device	Total Alarm Current (Quantity x Alarm Current per Device)
D7022 Control	1	160mA	160mA	225mA	225mA
D7025 Relay Module					
D185 Reverse Relay Module					
Smoke Detectors					
Bells, horns, etc.					
Other sensors					
Other					
		Grand Total Standby Current		Grand Total Alarm Current	

Method 1 for Backup Battery Calculation

The required battery size to support the system can be calculated using the formulas shown below. Check current requirements for modules in their installation guides (for example, D185, D7025).

Grand Total Standby Current (in amps):	CS	<input type="text"/>
Total Hours of Standby required (usually 24 or 60):	HS	<input type="text"/>
Total Standby Capacity (multiply CS x HS):	TS = CS x HS	<input type="text"/>
Grand Total Alarm Current (in amps):	CA	<input type="text"/>
Total Hours of Alarm Time Required (5 min., 10 min., 15 min.): <u>xxmin./60</u>	HA	<input type="text"/>
Total Alarm Capacity (multiply CA x HA):	TA = CA x HA	<input type="text"/>
Total Capacity Required (add TS + TA):	TC = TS + TA	<input type="text"/>
Required Capacity with 20% Derating (TC x 1.2):	C = TC x 1.2	<input type="text"/>

2.0 D7022 Overview

Method 2 for Backup Battery Calculation

Use Table 5 to estimate the size of the battery required to support the standby load. Use Table 6 to estimate the size of the battery required to support the alarm load. Add the two results together for the total battery size. Select the next larger standard battery for the system. If the result shows a requirement for a battery over 26AH, the current must be reduced.

The units shown in the table are amp hours, and the figures include a 20% derating factor.

Table 5: Standby Load Battery Size (In amp hours)

	Capacity Required for 24 Hours	Capacity Required for 48 Hours	Capacity Required for 60 Hours	Capacity Required for 72 Hours
Grand Total Standby Current				
100 - 200mA	5.8	6.7	14.4	17.3
201 - 300mA	8.6	10.1	21.6	25.9
301 - 400mA	11.5	13.4	X	X
401 - 500mA	14.4	16.8	X	X
501 - 600mA	17.3	20.2	X	X
601 - 700mA	20.2	23.5	X	X
701 - 800mA	23.0	X	X	X
801 - 900mA	25.9	X	X	X
901 - 1000mA	X	X	X	X
1001 - 1100mA	X	X	X	X
1101 - 1200mA	X	X	X	X

Table 6: Alarm Load Battery Size (In amp hours)

	Capacity Required for 5 Minutes	Capacity Required for 10 Minutes	Capacity Required for 15 Minutes
Grand Total Alarm Current			
250 - 500mA	0.1	0.1	0.2
501 - 999mA	0.1	0.2	0.3
1.0 - 1.5A	0.2	0.3	0.5
1.6 - 2.0A	0.2	0.4	0.6
2.1 - 2.5A	0.3	0.5	0.8
2.6 - 3.0A	0.3	0.6	0.9
3.1 - 3.5A	0.4	0.7	1.1
3.6 - 4.0A	0.4	0.8	1.2
4.1 - 4.5A	0.5	0.9	1.4
4.6 - 5.0A	0.5	1.0	1.5
5.1 - 5.5A	0.5	1.1	1.7

3.0 Installation

3.0 Installation

3.1 Mounting the Enclosure

The D7022 control panel and the enclosure are shipped together. The control panel needs to be installed into the enclosure. Hardware for mounting the control panel to the enclosure is located in the hardware pack.

Knock out the lock hole on the enclosure door and install the lock set.

Knock out the desired wire entrances on the enclosure.

Use the enclosure as a template and mark the top mounting slots on the mounting surface.

Pre-start the mounting screws for these two holes. Slide the enclosure onto these mounting screws so that the screws move up into the thinner section of the slots. Tighten the screws.

Screw in the remaining two screws in either set of bottom mounting slots.

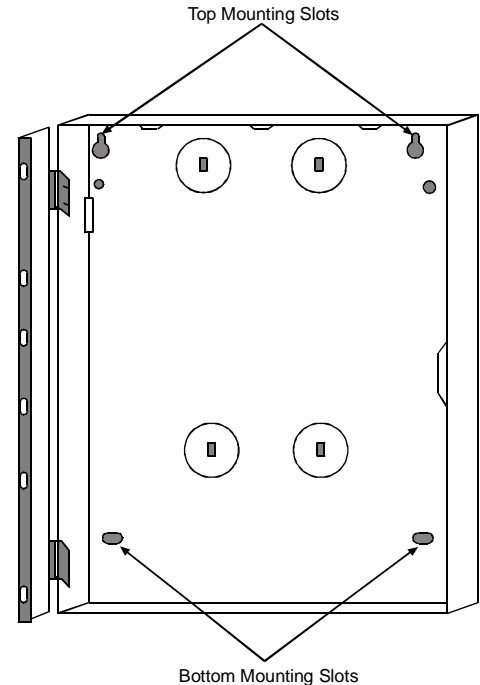


Figure 1: Mounting the Enclosure

3.2 Installing the Viewing Bezel

Insert the bezel into the bezel opening from the front of the enclosure door.

Tilt the bezel to properly align the bezel keys into the bezel opening notches.

Pull on the top of the bezel until it snaps firmly into place.

To remove the bezel, push up on the bottom teeth until it pops out of the opening. See Figure 2 for details.

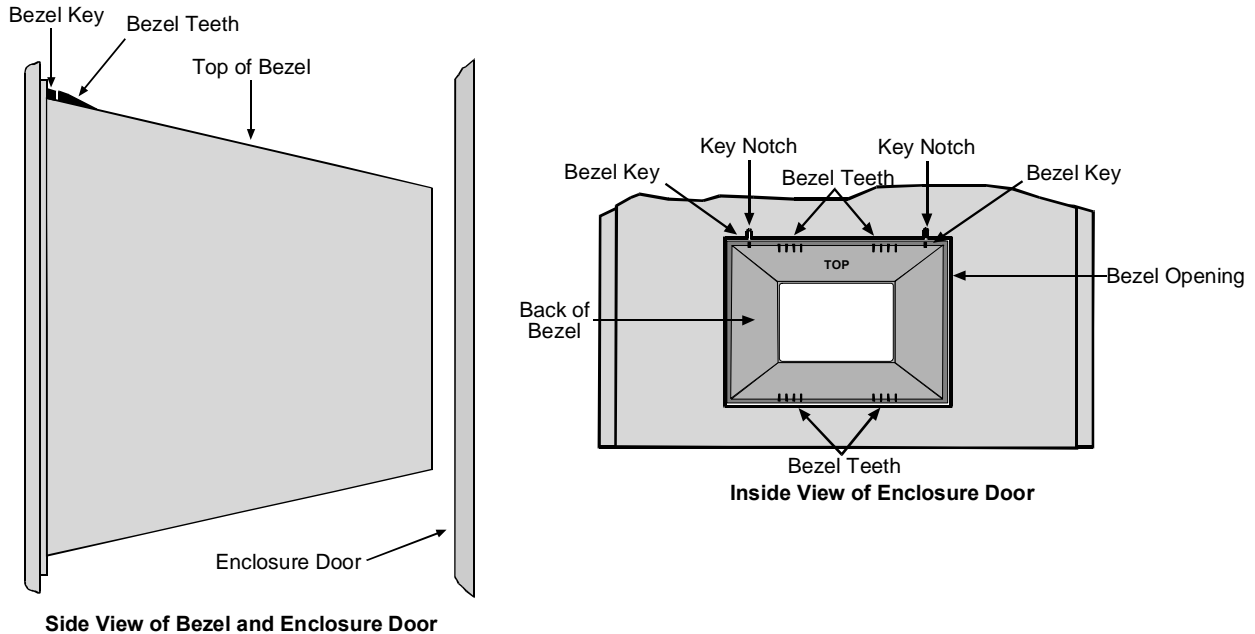


Figure 2: Installing the Viewing Bezel

3.0 Installation

3.3 D7022 Control Panel

The D7022 Control Panel is the printed circuit board (PCB)/central processing unit (CPU). The control panel and the transformer are mounted inside the enclosure.

See Figure 5 in Section 4.1 "Power Supply Connections" for 12V or 24V configuration.

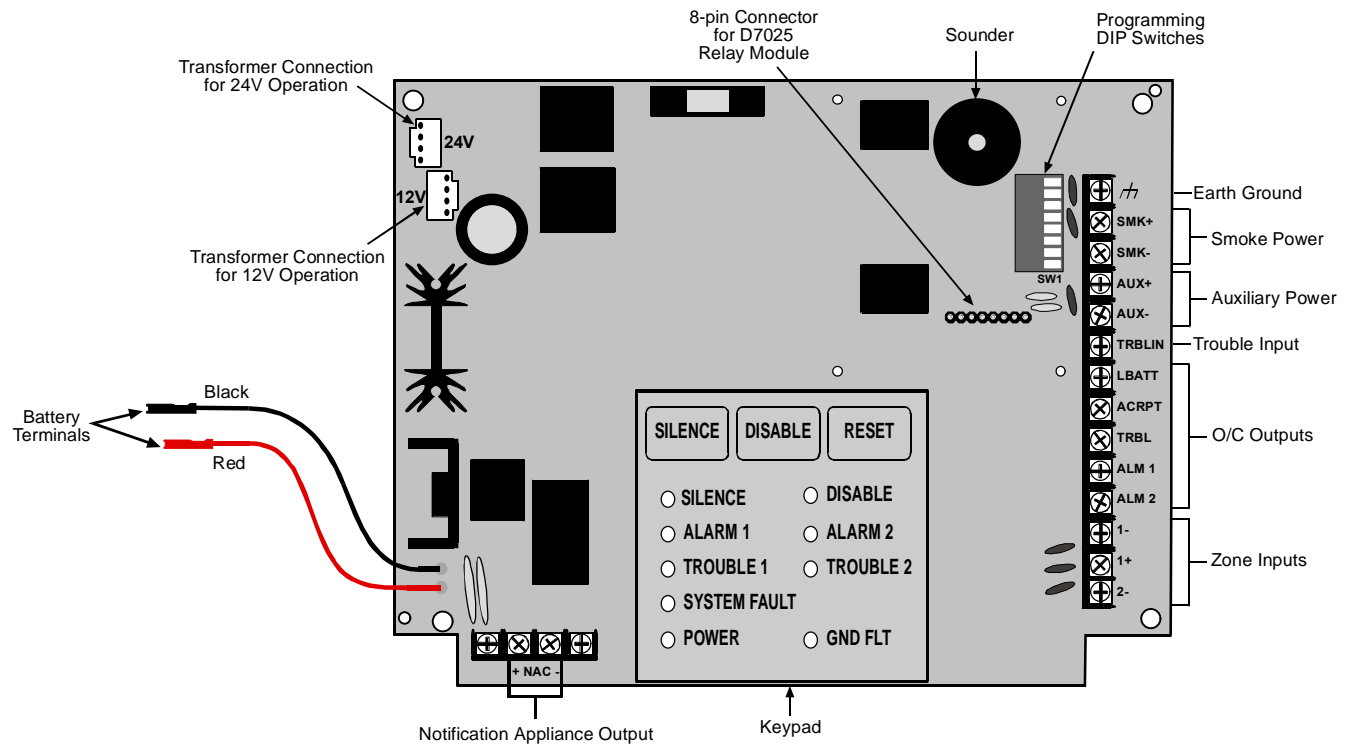


Figure 3: D7022 Control Panel

3.0 Installation

3.4 Installing the D7022 Control Panel



The D7022 Control Panel is static sensitive. Make sure you touch ground before handling the control panel. This will discharge any static electricity in your body.

To discharge any static electricity that may be built up in your body, run the ground wire to the enclosure before handling the control panel. Continue holding the ground wire while installing the control panel.

Insert the two support posts into the control retainer holes as shown in Figure 4.

Press the 1/8 in. nylon standoffs into the control retainer holes as shown. This provides support behind the control.

Slide the top of the control into the retainer tabs (the slots under the top of the frame).

Once in the retainer tabs, the control will rest on the two support posts.

Secure the bottom of the control by screwing the 2 bottom corners through the support posts and through to the control retainer holes.

Once the D7022 Control Panel is installed, connect the ground wire between the door and the enclosure. See Figure 4.

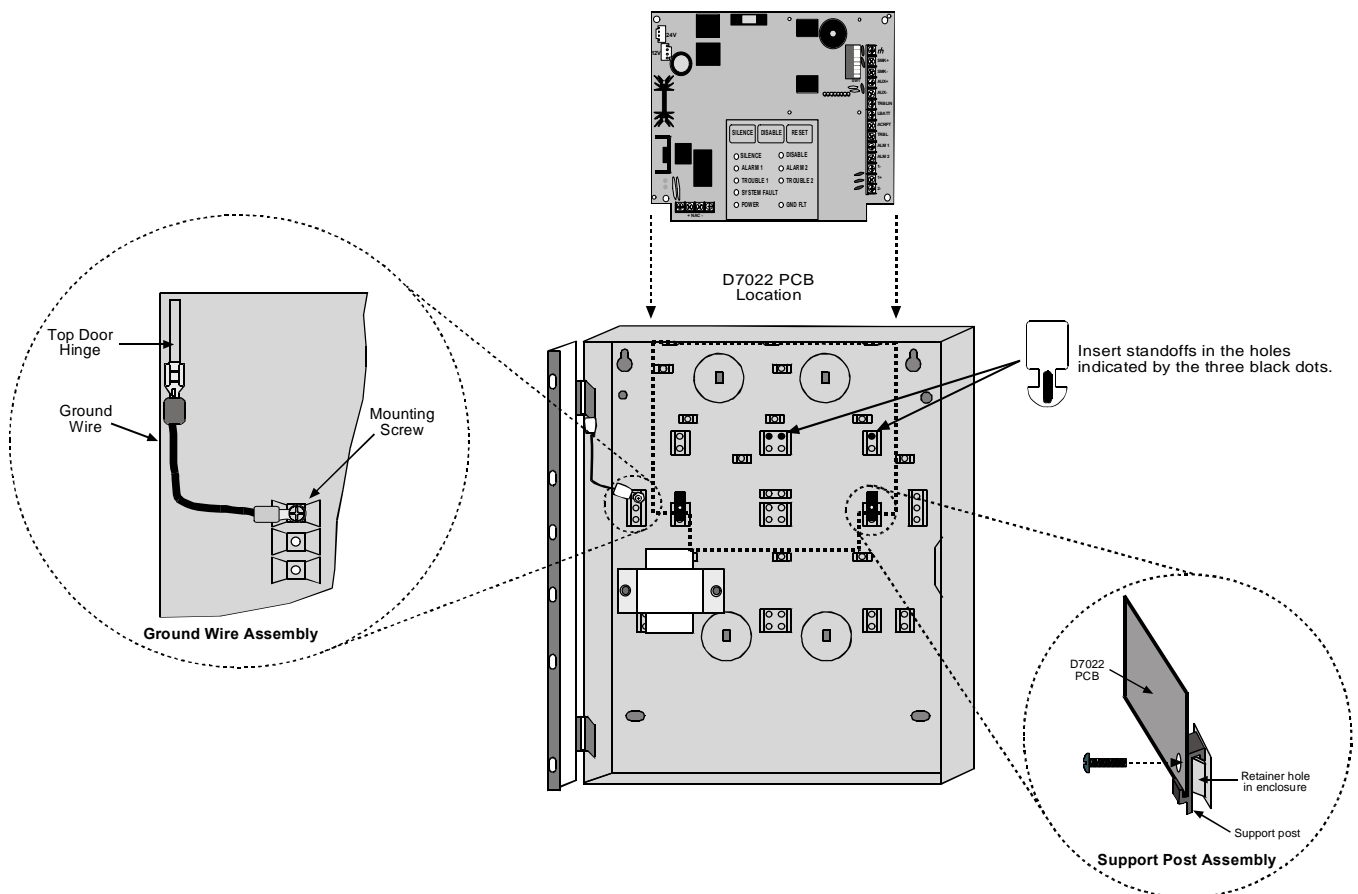


Figure 4: D7022 Control Panel Installation

4.0 D7022 Control Panel Wiring

4.0 D7022 Control Panel Wiring

4.1 Power Supply Connections



Disconnect all main circuit breakers and battery connections before making or breaking any connections with the control panel. Incorrect connections may result in damage to the unit.



Before servicing this equipment, remove all power including the transformer and battery. A complete functional test is required after any programming or maintenance.

See Figure 5 to connect the transformer to the D7022 Control Panel.

Connect the primary side of the transformer (black and white wires) to unswitched 120V, 60Hz circuit using wire nuts. Connect the earth ground to the green ground wire next to the transformer.

All wiring except battery terminal and primary AC power is power limited.

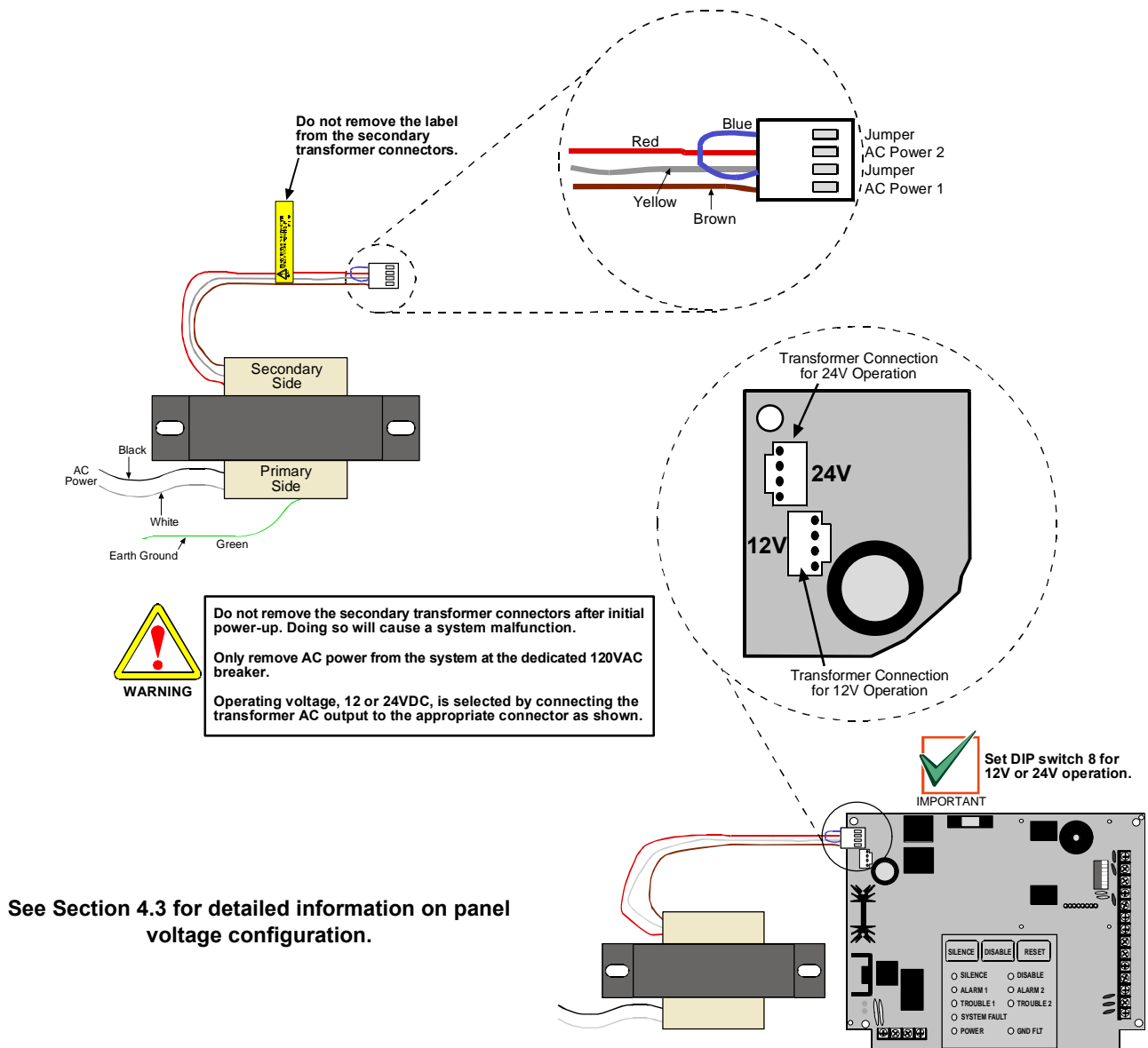


Figure 5: Connecting the Transformer to the D7022

4.0 D7022 Control Panel Wiring

4.2 Battery Connections

24V operation requires two 12V batteries in series for a combined voltage of 24V. Use the provided battery jumper wire for the series connection. Only one battery is required for 12V operation.



Do not connect batteries for 12V operation if the panel is configured for 24V operation, or vice versa. Failure to connect the batteries properly for the appropriate configuration will cause equipment malfunction or damage to the equipment.

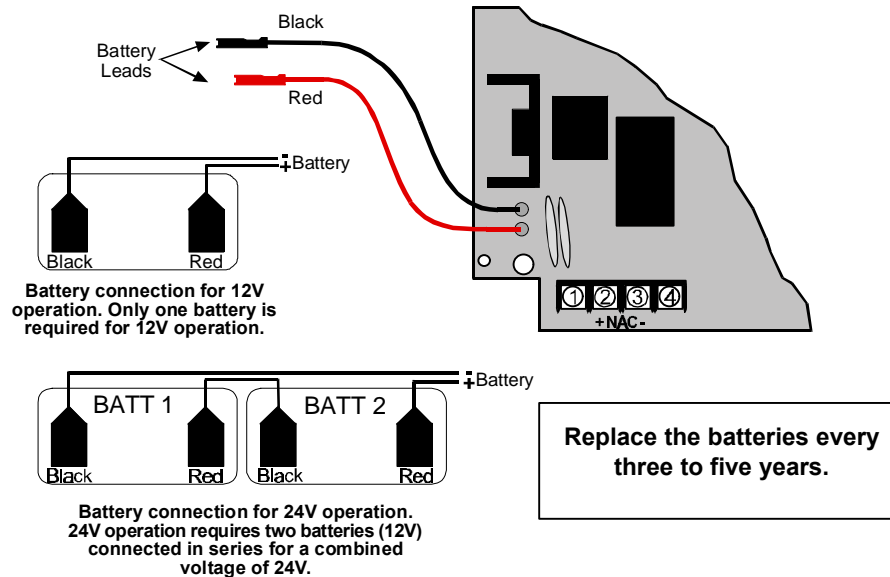


Figure 6: Battery Connections

Table 7: D7022 Battery Specifications

Application	Battery Capacity	Charge Current
Local Station	7.0Ah min., 17.0Ah max.	500mA max.
Central Station	7.0Ah min., 17.0Ah max.	500mA max.
Remote Station	26Ah in 24V configuration only.	750mA max.

4.3 Voltage Configuration (12V or 24V)

Make sure the appropriate battery connections are made for 12V or 24V operation.

Make sure the appropriate AC connection is made for 12V or 24V operation.

Set DIP Switch 8 to the appropriate voltage configuration setting (open for 12V, closed for 24V). See Section 5.0 "Programming the D7022" for more information on DIP Switch 8.

The factory default setting is for 24V operation.



It is critical that the system is configured with an operating voltage that matches the installed detectors and notification appliances (12V or 24V). Configuring the system with the wrong voltage may result in equipment damage or malfunction.

Important!


- Please carefully follow the voltage configuration information listed above for reliable panel operation. Failure to follow these instructions will cause the panel to malfunction or may cause damage to the panel and equipment.

4.0 D7022 Control Panel Wiring

4.4 D7022 Terminal Strip Connections

Table 8 defines each of the terminals shown in Figure 7. For terminals 8 – 12, the normal standby states are indicated in parentheses.

Table 8: Terminal Strip Descriptions

Terminal Number	Terminal Label	Terminal Description
18		Earth Ground.
17	SMK+	Smoke Power. 12V/24V. Supervised 500mA.
16	SMK-	Refer to Technogram P/N: 34445.
15	AUX+	Auxiliary Power. 12V/24V. Unfiltered. Unsupervised 300mA.
14	AUX-	
13	TRBLIN	Trouble Input. May be used by external devices to indicate a system fault.
12	LBATT	Low Battery. Indicating O/C output used for reporting. (Off)
11	ACRPT	AC Report. Indicating O/C output used for reporting. (Off)
10	TRBL	Trouble. Indicating O/C output used for reporting. (Active during normal standby)
9	ALM1	Alarm Zone 1. Indicating O/C output used for reporting. (Off)
8	ALM2	Alarm Zone 2. Indicating O/C output used for reporting. (Off)
7	1-	Zone 1. Supervised. Suitable for Class B operation. Refer to Technogram P/N: 34445. All EOL resistors are P/N: 25899, UL Listed. Initiating circuits in Class B, Style B.
6	L+	Loop Power.
5	2-	Zone 2. Supervised. Suitable for Class B operation. Refer to Technogram P/N: 34445. All EOL resistors are P/N: 25899, UL Listed. Initiating circuits in Class B, Style B.

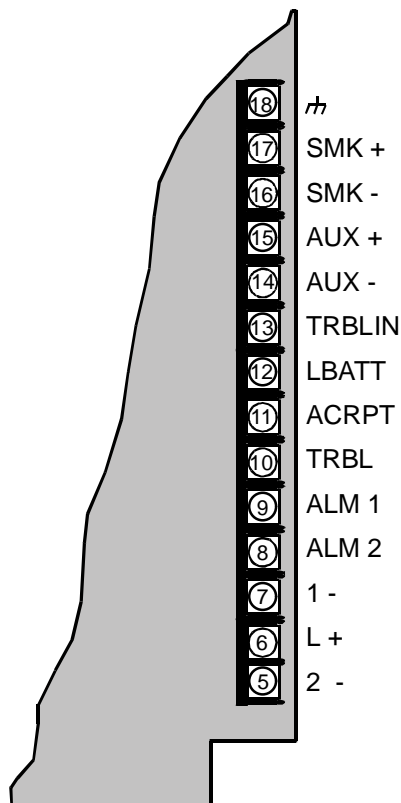


Figure 7: D7022 Terminal Strip Descriptions

4.0 D7022 Control Panel Wiring

Terminals 8 – 12: 100mA @ 30VDC max., not overcurrent protected or supervised.

- Open Collector (O/C) outputs (5) rated at 100mA up to 30V max.
- Open Collector (O/C) outputs short to panel ground when activated; can sink up to 100mA; can be connected up to a voltage source of 30V max.
- See Figure 8 for typical wiring diagrams for powering an LED or a relay from the O/C outputs.

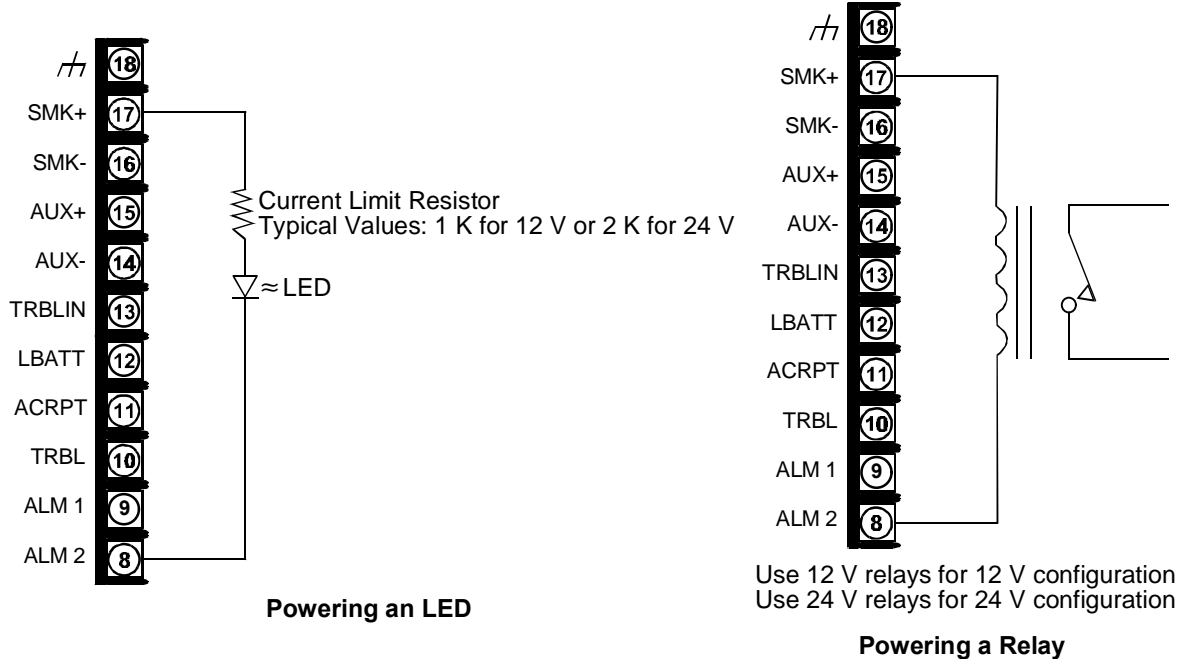


Figure 8: Typical O/C Output Wiring Diagrams

Terminal 13: Shorting this input to the panel ground will cause a system fault indication on the panel. Short with either dry contact relay or open collector type output.

Figure 9 shows the typical wiring connections for the trouble input.

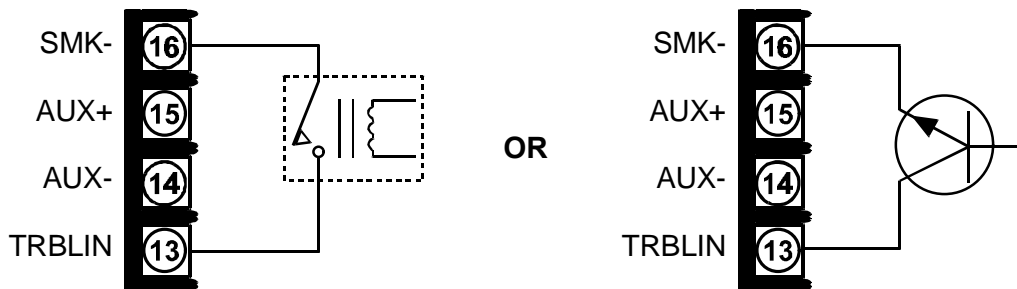


Figure 9: Typical Wiring for the Trouble Input

Figure 10 shows the typical fire wiring connections for two-wire detectors and notification appliances.

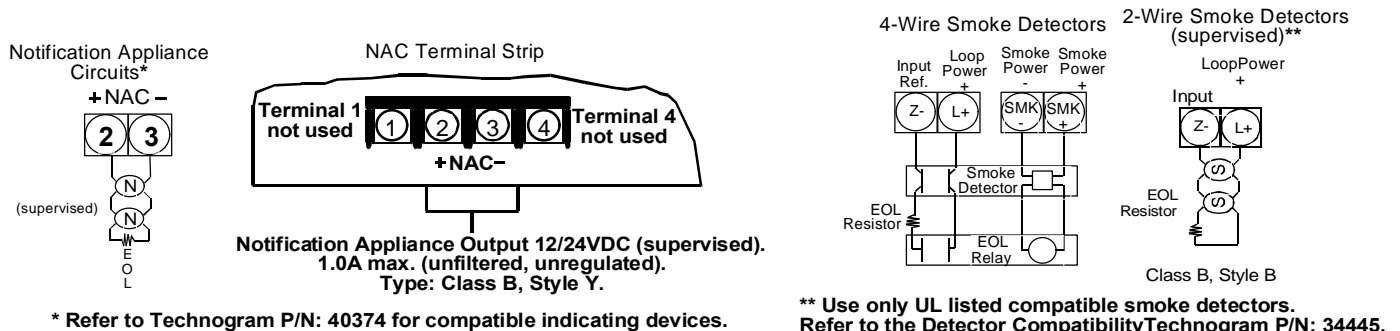


Figure 10: Typical Fire Wiring for Two-Wire Detectors and Notification Appliances

5.0 Programming the D7022

5.0 Programming the D7022

The D7022 is programmed by setting DIP switches on the DIP switch bank (see Figure 3 for the location of the DIP switch bank on the D7022 PCB).

Important!

When changes are made to the switches, the panel must be reset or re-powered for the changes to become active.

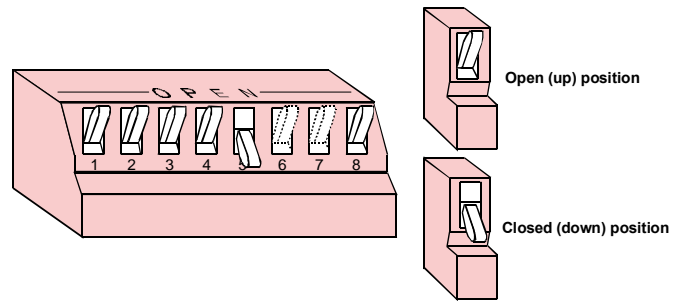


Figure 11: DIP Switch Orientation

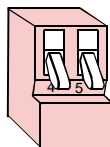
Table 9 defines the functions of DIP switches 1 – 8.

Table 9: D7022 DIP Switch Functions

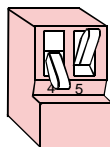
DIP Switch	Function
1	Controls latching in Zone 1 . * Closed = latching, Open = auto restore.
2	Controls latching in Zone 2 . * Closed = latching, Open = auto restore.
3	Controls AC Fail Report Time. Closed = 6 hours, Open = 12 hours.
4	Works together with DIP switch 5 to control the NAC output cadence. **
5	Works together with DIP switch 4 to control the NAC output cadence. **
6	Not used.
7	Not used.
8	Controls 12V or 24V operation mode.

* **Latching:** Setting DIP switches 1 and 2 determine whether the zones are automatically reset when the alarm condition stops or if the alarm latches on until the entire system is reset.

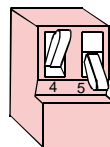
** **NAC Cadence:** The NAC output can be programmed for three modes of operation (Temporal Code 3, Steady, Wheelock). See Figure 12 for the DIP switch positions for each mode of operation.



Temporal: Both DIP switches 4 and 5 are closed when the system is turned on. The NAC will pulse according to ANSI Standard 3.41 (three pulses followed by a pause).

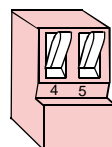


Steady: DIP switch 4 is closed, DIP switch 5 is open when the system is turned on. The NAC will activate steadily in alarm.



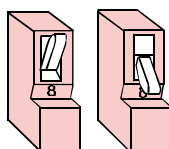
Wheelock

OR



Wheelock

Wheelock: DIP switch 4 is open, DIP switch 5 is closed when the system is turned on.
Wheelock: Both DIP switches 4 and 5 are open when the system is turned on.



AC Operation Mode: 12V operation mode is selected when DIP switch 8 is open. 24V operation mode is selected when DIP switch 8 is closed.

Figure 12: DIP Switch Settings for the Modes of Operation

6.0 System Startup

When the D7022 is shipped from the factory, all of the DIP switches will be in the closed (down) position. See Table 10 for a listing of the factory default settings.

Table 10: DIP Switch Factory Default Settings

DIP Switch	Function	Factory Setting
1	Zone 1	Latching
2	Zone 2	Latching
3	AC Fail Report Time	Six hours
4	NAC Output Cadence	Temporal
5	NAC Output Cadence	Temporal
6	Not Used	Not Used
7	Not Used	Not Used
8	12/24V Operation	24V operation

6.0 System Startup

6.1 System Power Up

The following startup and troubleshooting section is **NOT** intended for use as an acceptance testing procedure. The following information is provided as a general guide to determine, recognize and resolve a system problem upon installation, maintenance and during normal standby.

A full system check is required after initial Installation and any subsequent maintenance.



The D7022 control will not power up on battery only. AC power must be applied first. The transformer primary must be connected through a dedicated breaker.

Before power up:

- Make sure that the primary AC power is OFF.
- Make sure that the AC connector has been correctly plugged onto the appropriate voltage header on the board (12V or 24V operation). Make sure that the connector is firmly seated onto the header.
- The appropriate batteries are connected (12V or 24V operation).
- DIP switch 8 has been correctly set: OPEN for 12V operation or CLOSED for 24V operation.
- The panel has been wired with both Zones and NAC properly terminated with the provided EOL supervision resistor.
- Smoke power is not overloaded or shorted.
- Aux. Power is not overloaded or shorted.

When primary AC power is applied:

- All LEDs will be lit and the sounder will be on for two seconds while the panel goes through a system check.
- After two seconds, the panel should enter a normal standby state: The green power LED is on, all other LEDs are off and the sounder is off.

6.0 System Startup

6.2 System Troubleshooting

Refer to Table 11 when troubleshooting the D7022 for possible problems.

Table 11: Troubleshooting the D7022

Problem Description	Problem Cause	Problem Remedy
1) All LEDs are ON; sounder is continuously ON.	System is in hard reset.	<p>Check voltage configuration settings:</p> <ul style="list-style-type: none"> • Make sure that DIP switch 8 is set correctly. • Make sure the AC connector is in the correct header. • Make sure the appropriate battery is connected. • Make sure the battery is not connected in reverse.
2) Green power LED is blinking; System Fault LED is OFF; sounder beeps every ten seconds	<p>AC power is not nominal:</p> <p>A brownout condition exists and the 6 or 12 hour AC Fail Report timer has not expired. The panel indicates AC brownout when AC is below 95VAC.</p>	<ul style="list-style-type: none"> • Check AC power for nominal 120VAC. If there is no AC or if AC is in brownout, the system will continue to operate using backup batteries. • Wait for AC to come back. • The AC fail condition may be silenced locally by pressing the [Silence] key.
3) Green power LED is ON or blinking; System Fault LED is ON; sounder beeps every ten seconds	<p>The System Fault LED is ON if any of the following conditions exist:</p> <ul style="list-style-type: none"> • Low AC voltage (after 6 or 12 hour report timer has expired). The panel indicates AC brownout when AC is below 95VAC. 	<ul style="list-style-type: none"> • Check AC power for nominal 120VAC. If there is no AC or if AC is in brownout, the system will continue to operate using backup batteries. • Wait for AC to come back. • The AC fail condition may be silenced locally by pressing the [Silence] key.
	<ul style="list-style-type: none"> • Low or missing battery. The panel indicates a low battery condition below: 10V in a 12V configuration; 20V in a 24V configuration 	<ul style="list-style-type: none"> • Check battery power for nominal voltage. • Make sure the appropriate battery is connected. • Make sure the battery is not missing or connected in reverse.
	<ul style="list-style-type: none"> • Smoke power not nominal. Nominal smoke power should be above: 10V in a 12V configuration; 20V in a 24V configuration 	<ul style="list-style-type: none"> • Check for appropriate smoke power across the SMK(+) and SMK(-) terminals – it should be above nominal levels. • To verify, remove field wiring from the SMK(+) and SMK(-) terminals. • Press the [Reset] key and wait for eight seconds. Smoke power should return to normal. • Make sure there are no short(s) on field circuit(s) connected to smoke power.
	<ul style="list-style-type: none"> • Zone(s) in trouble; zones indicate trouble whenever there are open loop problems. 	<ul style="list-style-type: none"> • To verify, remove field wiring from zone(s) and attach the provided EOL resistor at the zone terminals. • Press the [Reset] key and wait for eight seconds. Loop troubles should clear. • Make sure there are no open(s) on field circuit(s) connected to zone(s) before connecting back to the panel.

6.0 System Startup

Problem Description	Problem Cause	Problem Remedy
3) Green power LED is ON or blinking; System Fault LED is ON; sounder beeps every ten seconds	<ul style="list-style-type: none"> NAC short or overcurrent; nominal NAC supervision voltage should be $-2.45V$ in normal standby and above: 10V in a 12V configuration; 20V in a 24V configuration 	<ul style="list-style-type: none"> Check for appropriate NAC voltage across the NAC (+) and NAC (-) terminals. To verify, remove field wiring from zone(s) and attach the provided EOL resistor at the NAC terminals Press the [Reset] key and wait for eight seconds. NAC trouble should clear. Make sure there is no open or short circuit condition on field wiring or components before connecting back to the panel.
	<ul style="list-style-type: none"> Remote trouble input has been activated. Shorting it to the panel ground activates this output. 	<ul style="list-style-type: none"> If the remote trouble input (TRBLIN) is used, verify if it has been activated. To check, measure the voltage across the TRBLIN and AUX (-) terminals (should be +5V in normal standby and less than +1V in trouble). To verify, remove the field wiring from the TRBLIN input. System Fault should clear. Restore the output of the module(s) connected to the panel to normal. Make sure there is no trouble condition before connecting to the panel.
	<ul style="list-style-type: none"> Disable is active. 	<ul style="list-style-type: none"> If DISABLE LED is ON, then deactivate DISABLE by depressing the [Disable] key on the control.
4) Alarm condition(s) do not clear.	<ul style="list-style-type: none"> The zone(s) can trip into alarm if more than the recommended number of initiating devices are connected on Zone(s). Defective initiating devices on Zone(s). 	<ul style="list-style-type: none"> Reduce the number of initiating devices on Zone(s). Locate and replace defective initiating device(s).
5) Ground fault LED is ON.	<ul style="list-style-type: none"> There is a ground fault in the system. The LED will be ON if the fault is less than 20K ohms to 90K ohms (depending on the grounded terminal). 	<ul style="list-style-type: none"> Disconnect all input/output wire terminals until the ground fault condition clears.

Contact the Radionics Technical Support department at (800) 538-5807 if any problems that are not addressed in this section are encountered when operating the D7022.

7.0 Operating the D7022

7.0 Operating the D7022

7.1 Understanding the Built-in Keypad

The built-in keypad enables the user to silence, disable and reset the panel. A built-in sounder is used to announce keystroke entries.

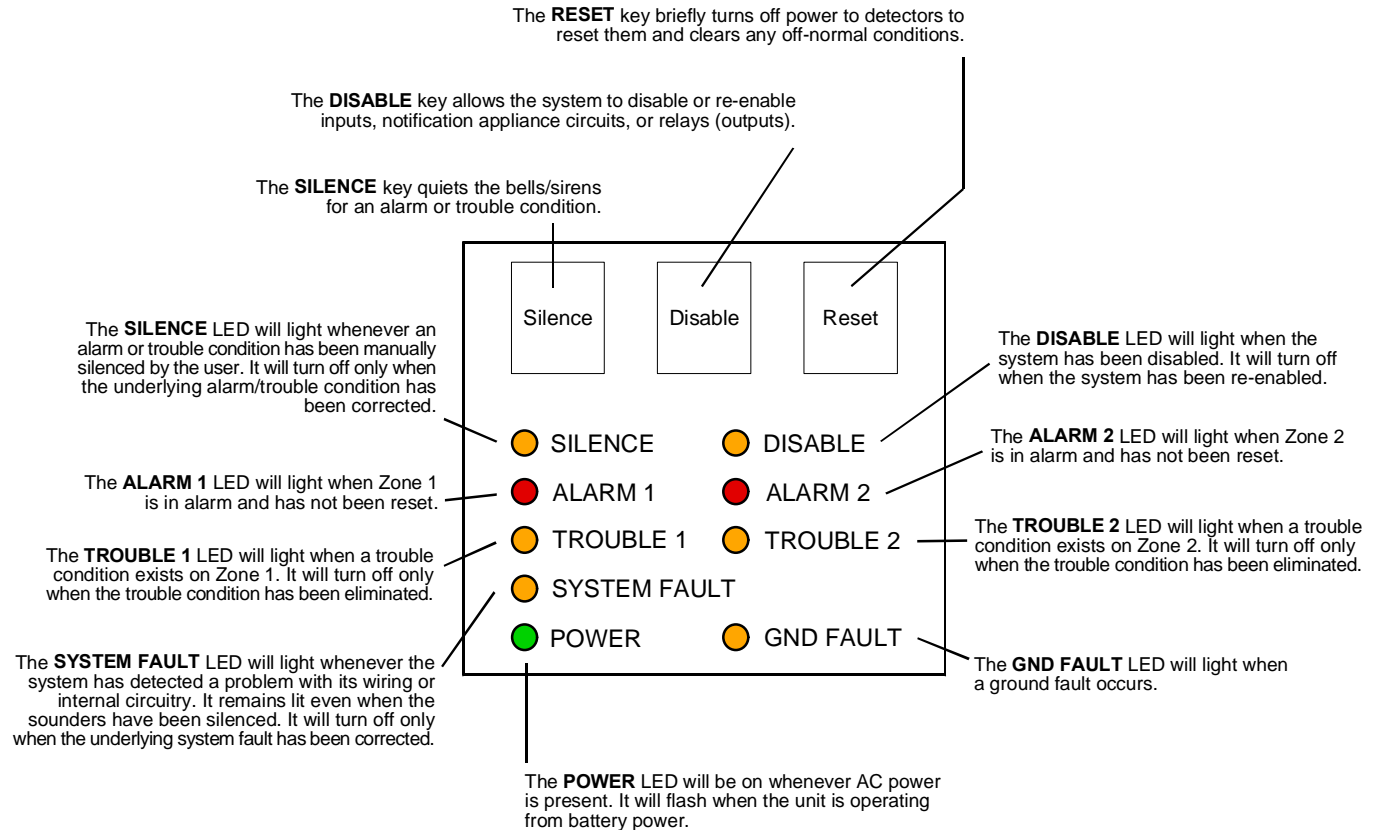


Figure 13: The D7022 Built-In Keypad

7.2 System Operation

7.2.1 Modes of Operation

Normal Operation: When the system is operating normally, the Power LED will be on, all other LEDs will be off and the sounder will be off.

Alarm Operation: When an alarm occurs, one or both of the Alarm LEDs will be lit. If Zone 1 is in alarm, the Alarm 1 LED will be lit. If Zone 2 is in alarm, the Alarm 2 LED will be lit. If both zones happen to be in alarm, both LEDs will be lit. The built-in sounder will turn on with a steady tone, and the NAC and the corresponding O/C outputs will activate in conjunction with the zone in alarm.

Trouble Operation: When a trouble condition occurs (for example, wiring for a zone is cut, AC power fails, etc.), the sounder will activate briefly every 10 seconds. The System Fault LED will light and depending on the condition, the Ground Fault, Trouble 1 or Trouble 2 LEDs may also light.

7.0 Operating the D7022

7.3 Fire Silence/Reset/Disable

During a fire alarm, exit the premises immediately. Do not enter the premises unless accompanied by the appropriate Emergency Services personnel, or after they have given the OK to enter. When it has been determined that there is no fire, you may silence the horns/bells to allow further investigation of the devices that initiated the alarm, or you may reset the system to return it to normal operation.



Before the [Reset] key is pressed, determine which smoke detector has alarmed so the monitoring company may verify its operation.

The [Silence] key turns off the horns/bells, but does not reset the alarm status and does not return the tripped input to normal service. Detectors that were tripped will stay in alarm and can be checked (usually by means of an LED on the device) to see which detector caused the alarm. Once the detectors causing the alarm have been identified, the system should be reset to return it to normal service.

The [Reset] key clears the system alarm status, and briefly turns off power to the detectors to reset them. This command is required after any fire alarm affecting a zone programmed for latching operation (which is the normal configuration).

The [Disable] key inhibits alarms and trouble from operating the NAC output and from operating the O/C outputs. The Disable condition is considered a trouble condition and will activate the sounder for a period of no more than 10 seconds. The Disable mode should only be used during system installation or during maintenance.

7.4 System Fault

A system fault will be indicated by a short beep from the panel sounder every ten seconds. The System Fault LED will light for problems with wiring or internal circuitry.

Notify your installing company immediately when the System Fault LED lights.

The system fault beep can be silenced with the Silence key.

7.5 LED Displays

Table 12 describes the functions of the D7022 LEDs.

Table 12: D7022 LED Display Functions

LED	Function
Silence	The SILENCE LED will light whenever the user has manually silenced an alarm or trouble condition. It will turn off only when the underlying Alarm/Trouble condition has been corrected.
Alarm 1	The ALARM 1 LED will light when Zone 1 is in alarm and has not been reset.
Alarm 2	The ALARM 2 LED will light when Zone 2 is in alarm and has not been reset.
Trouble 1	The TROUBLE 1 LED will light when a trouble condition exists on Zone 1. It will turn off only when the trouble condition has been eliminated.
Trouble 2	The TROUBLE 2 LED will light when a trouble condition exists on zone 2. It will turn off only when the trouble condition has been eliminated.
System Fault	The SYSTEM FAULT LED will light whenever the system has detected a problem with its wiring or internal circuitry. It remains lit even when the sounders have been silenced. It will turn off only when the underlying system fault has been corrected.
Power	The POWER LED will be on whenever AC power is present. It will flash to indicate a low battery and/or during an AC fail condition.
Disable	The DISABLE LED will light when the system has been disabled. It will turn off when the system has been re-enabled.
GND Fault	The GND FAULT LED will light when a ground fault occurs.

8.0 Fire Safety

8.0 Fire Safety



No fire detection device or system should be considered 100% foolproof.

This fire alarm system can provide early warning of a developing fire. Such a system, however, does not ensure protection against property damage or loss of life resulting from a fire. Any fire alarm system may fail to warn for any number of reasons (for example, smoke not reaching a detector that is behind a closed door or an electrical failure).

This system must be regularly tested (when installed, when modified and at least once annually thereafter) to ensure continued reliable operation.

When considering detectors for residential applications, refer to NFPA Standard 72, "The National Fire Alarm Code." This standard is available at a nominal cost from The National Fire Protection Association, Batterymarch Park, Quincy, MA 02269.

8.1 If Installed in Family Residences

Adherence to NFPA Standard 72 can lead to reasonable fire safety when the following items are practiced:

- **Minimize hazards:** Smoking in bed, leaving children home alone and cleaning with flammable liquids are the three traditional fire killers.
- **Providing a fire warning system:** Most fire deaths occur in the home, the majority during sleeping hours. The minimum level of protection requires smoke detectors to be installed outside of each separate sleeping area and on each additional story of the dwelling.

For added early warning protection, it is recommended that detectors be installed in all separated areas including the basement, bedrooms, dining room, utility room, furnace room and hallways.

8.2 Having a Practical Escape Plan

A fire warning may be wasted unless the family has planned in advance for a rapid and safe exit from the building.

Draw a floor plan of the entire house showing **two** exits from each bedroom and **two** from the house. Since stairwells and hallways may be blocked during a fire, the plan should provide exits from bedroom windows. Make copies of the plan and practice it with all family members.

Pre-arrange a meeting place **outside and away from** the residence. Once out of the building, all occupants should immediately go to the pre-selected location and be accounted for.

Provide a barricade between family members and fire, smoke, and toxic gases (e.g. close all bedroom doors before retiring).

Children should be instructed on opening their bedroom windows and exiting safely from the building. If exiting is not possible, they should be taught to stay at the open window and shout for help until it arrives.

In the event of a fire alarm after retiring, wake the children by shouting to them from behind your closed door. Tell them to keep their bedroom doors closed.

If the top of your bedroom door is uncomfortably hot, do not open it. There is most likely fire, intolerable heat, or smoke on the other side. Shout to all family members to keep their bedroom doors closed and to exit the building via alternate routes.

If the top of the door is not uncomfortably hot, brace the bottom of the door with your foot, and the top with one hand, then open the door about one inch. Be prepared to slam the door shut if there is any pressure against the door or if any hot air rushes in.

If there is no evidence of excessive heat or pressure, **leave the room and close the door behind you.** Shout appropriate instructions to all family members and immediately leave the building via the pre-planned routes. If heavy smoke is present, drop to your hands and knees, or crawl to remain below the smoke level.

8.0 Fire Safety

8.3 Installation Considerations

Proper location of detection devices is one of the most critical factors in a fire alarm system. The following are some general considerations:

- Smoke detectors should **not** be installed in “dead air” spaces or close to ventilating or air conditioning outlets because smoke may be circulated away from the detector. Locations near air inlets should be favored.
- Avoid areas subject to normal smoke concentrations such as kitchens, garages or near fireplaces.
- Do not install smoke detectors where normal area temperatures are above 100° F (38° C) or below 32° F (0° C).
- Areas of high humidity and dust concentrations should be avoided.
- The edge of ceiling mounted detectors should be no closer than 4 inches (10 cm) from any wall.
- Place the top edge of wall mounted detectors between 4 and 12 inches (10 and 30 cm) from the ceiling.

For exact mounting information, refer to the instructions provided with the smoke detectors and NFPA 72.

Consult Figure 14 when planning the location of smoke detectors.

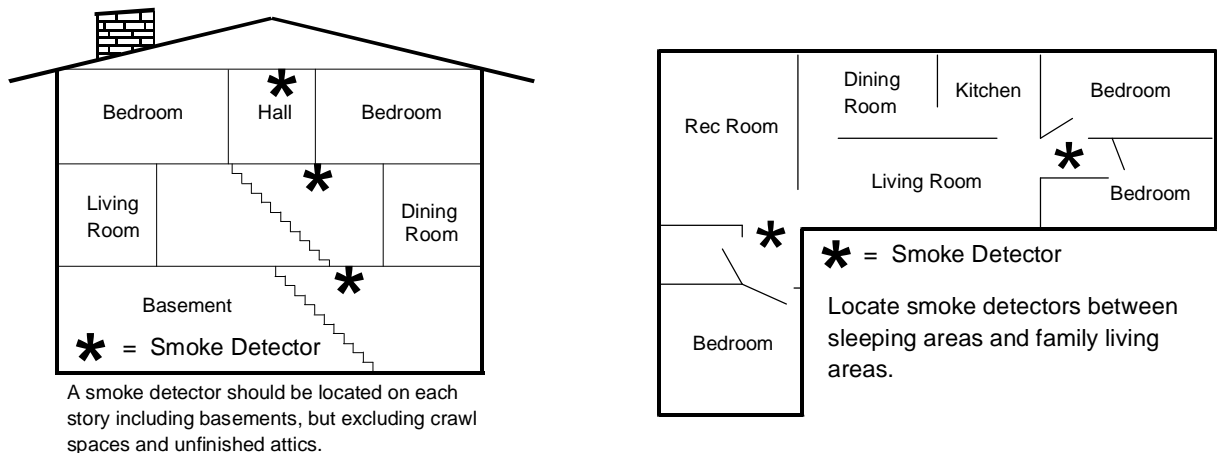


Figure 14: Smoke Detector Location Sites

9.0 Compatible Accessories

The following sections detail the accessories that can be used in conjunction with the D7022 FACP.

9.1 D7025 Alarm/Trouble Relay Module



The D7025 contains static sensitive components and must be handled with care. Follow anti-static procedures when handling this module.

The D7025 Alarm/Trouble Relay Module allows the D7022 FACP to support two auxiliary Form C relays for connection of external devices. One ALARM relay and one TROUBLE relay are provided. The D7025 plugs into the D7022 and is powered directly from the D7022.

Consult the D7025 Installation Guide (P/N: 40129) for detailed instructions on connecting the D7025 to the D7022.

See Figures 15 and 16 for installation references.



Make sure to connect the ground wire from the D7025 to the D7022 before applying power to the D7022.

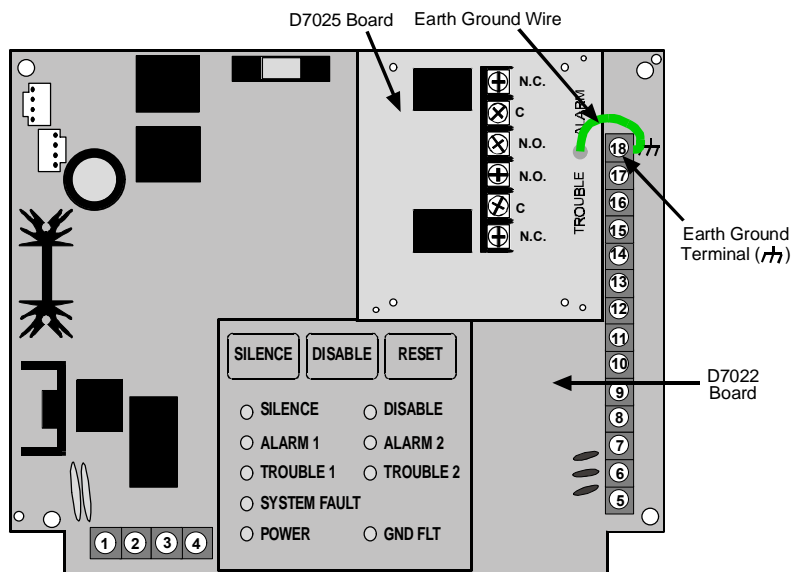


Figure 15: Locating the D7025 on the D7022

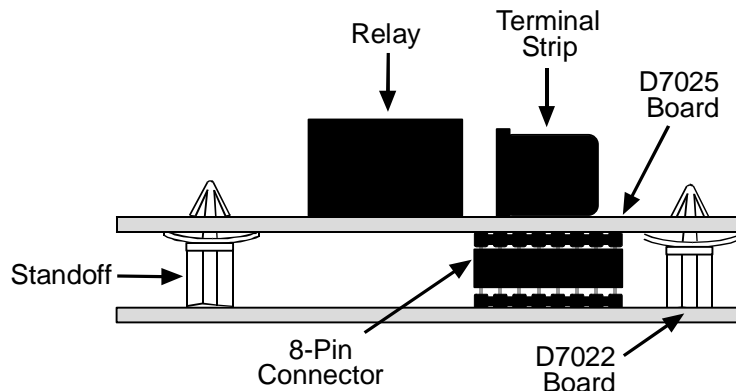


Figure 16: Connecting the D7025 to the D7022

9.0 Compatible Accessories

9.2 D185 Reverse Polarity Signaling Module



Inform the operator and the local authority before installing the D185 into an existing system. Disconnect all power to the FACP before installing the D185.

The D185 Reverse Polarity Signaling Module is a UL Listed module that connects an FACP with either a single set or a pair of dual-leased Telephone Company (Telco) lines in NFPA 72 Remote Station applications. It relays system alarm information from the panel to a monitoring station. The D185 operates with either a 12VDC or 24VDC supply. All circuits are power-limited.

Remove AC power from the system at the dedicated 120VAC breaker and remove the standby battery power before making or removing any connections to the FACP.

The D185 mounts on a "Snap-Track", and installs in the FACP or in a separate adjacent enclosure connected to the FACP by conduit. Refer the *D185 Installation Guide* (P/N: 32906) for mounting, installation and function information.

Figure 17 shows the wiring connections between the D7022 FACP, the D7025 Alarm and Trouble Relay Module and the D185.

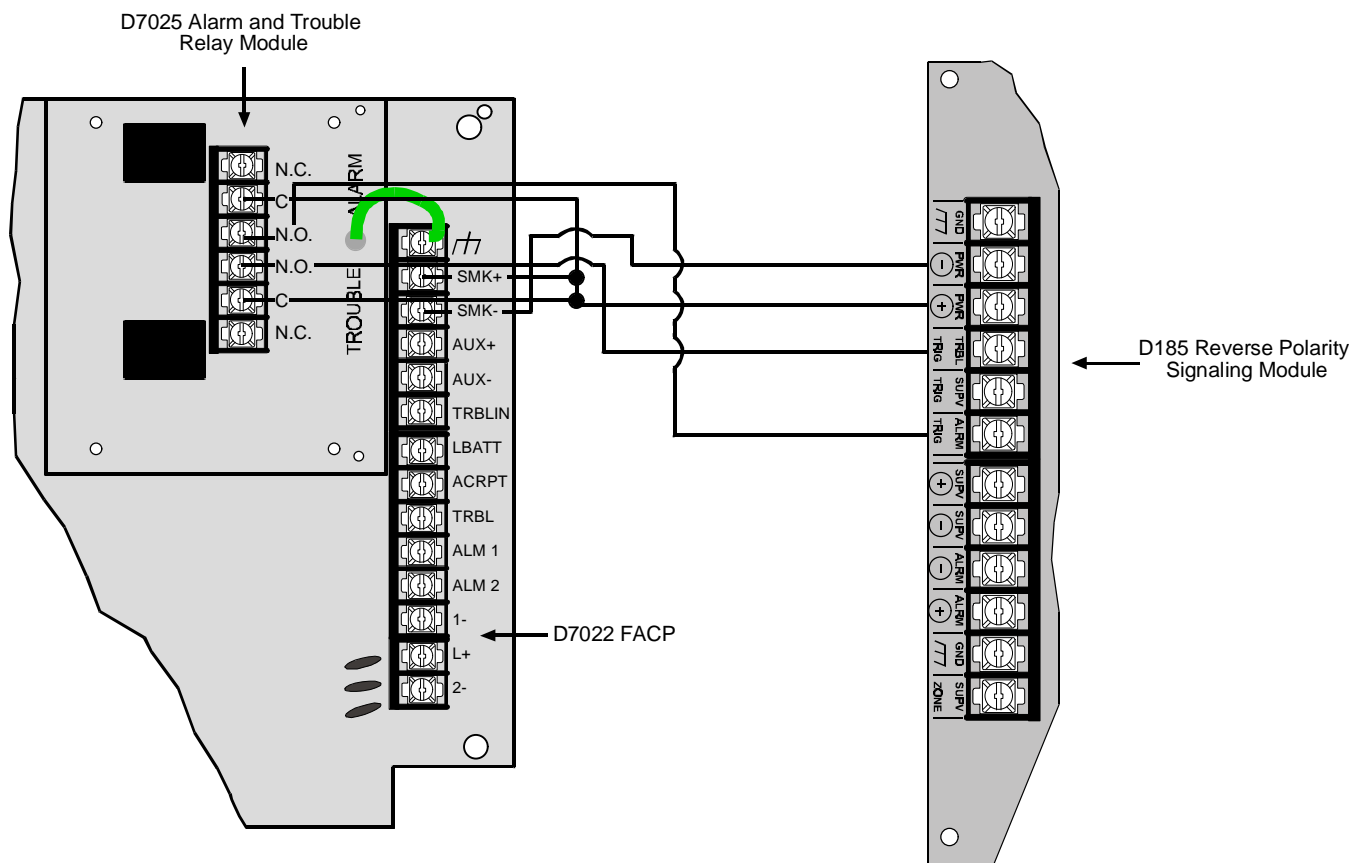


Figure 17: Wiring the D185 to the D7022

9.0 Compatible Accessories

9.3 D2071A Fire Control/ Communicator (DACT)



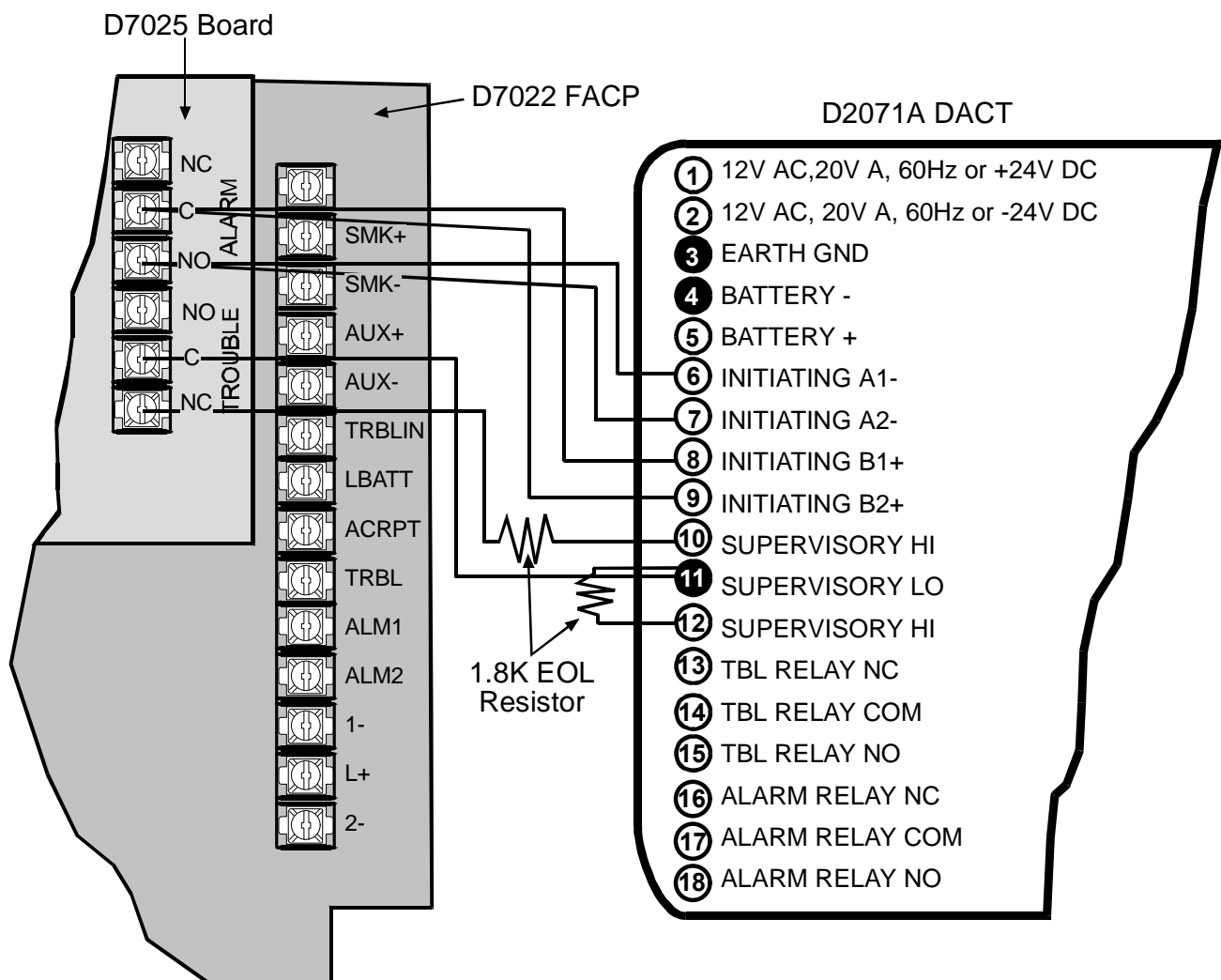
Inform the operator and the local authority before installing the D2071A into an existing system. Disconnect all power to the FACP before installing the D2071A.

The D2071A is a three-zone digital alarm communicator transmitter (DACT). It uses two phone lines to transmit to a receiver for central station and remote applications. A phone Fail LED and buzzer annunciate phone line failures. In this application, Zone 1 (Initiating) monitors the alarm output of the FACP. Zone 2 (Supervisory) monitors the trouble output of the FACP. Zone 3 is not used.

Remove AC power from the system at the dedicated 120V AC breaker, "lock out" the breaker and remove the standby battery power before making or breaking any connections to the FACP.

The D2071A must be mounted in an accessory enclosure. Refer to the *D2071A Installation and Programming Manual* (P/N: 74-06200-000) for mounting, installation and function information.

Figure 18 shows the wiring connections between the D7022 FACP and the D2071A.



Refer to the Stand-Alone Installation figure in the *D2071A Installation and Programming Manual* (P/N:74-06200-000) for power hook-up information.

Figure 18: Wiring the D2071A to the D7022

10.0 System Worksheet

Account Number _____ Information

Name _____ Contact Person _____
 Address _____ Voice Phone Number _____

 City, State, Zip _____

Equipment Location and Notes

AC Voltage _____ VAC Battery Voltage _____ VDC Aux. Current _____ mA Smoke Current _____ mA
 Control Panel _____
 Earth Ground Connection _____
 Notification Appliances _____
 Initiating Devices _____

Miscellaneous Notes

Zone Location and Notes

	Device(s)	Location(s)	Latching/Non-latching	2-Wire/4-Wire	Model #
Zone 1					
Zone 2					

Configuration

AC Delay (Circle One)	6 hours	12 hours	
NAC Pattern (Circle One)	NFPA	Steady	Wheelock



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