

D9412G/D7412G



Security Systems

EN | Operation & Installation Guide
Control Panels

BOSCH

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Notes:

1.0 Introduction

This manual addresses the operation and installation of the D9412G/D7412G Control Panels only, and should not be used in conjunction with the D9412, D9112, D9112B1, D7412, D7212G, D7212, or D7212B1 Control Panels.

Throughout this guide, unless expressly stated, the words “panel” and “control panel” refer to both panels (D9412G and D7412G).

Section 2.1 9000G Series Panel Differences provides an overview of the differences between the D9412G and D7412G panels.

1.1 Document Organization

This guide is divided into sections and appendices, summarized in *Table 1*.

1.2 Related Documentation

Table 2 is a comprehensive list of all documentation (with part numbers) directly related to the D9412G/D7412G Control Panels. Throughout this guide, references are made to this documentation. If it is necessary to obtain one (or more) of these documents, please contact Bosch Security Systems Technical Support and request the documentation by its corresponding part number.

Table 1: Manual Organization

Section	Description
1	Introduction. Information on the structure of the guide. Lists other literature related to these control panels and describes the FCC rules with which they comply.
2	Overview. Summary of the D9412G/D7412G Control Panels, including operational specifications, standards, and new features.
3	Installation. Instructions for connecting the power terminals, plus the status and battery LEDs.
4	Power Supply. Information on the primary and secondary modules. Instructions on connecting and programming them.
5	Power Outputs. Information on the power outputs and instructions on installing the transformer; explains the status and battery LEDs.
6	Telephone Connections. Instructions on connecting the phone line and programming it for use.
7	On-Board Points. Information on the on-board points and their parameters.
8	Off-Board Points. Details on the off-board points and their parameters, including the installation, wiring, and testing of OctoPOPITs.
9	Off-Board Relays. Installation and wiring of the D8129 OctoRelay and the D811 Arm Status Relay Module.
10	Arming Devices. Description of the installation, wiring, programming, and operation of independent zone control modules.
11	SDI Devices. Description and installation instructions for various SDI device modules.
12	Programmer and Accessory Connections. Explanation of the Programmer Connector and the Accessory Connector.
13	Faceplates. Illustration of each of the control panels (D9412G and D7412G).
Appendix A	System Wiring Diagrams. Illustrations showing the terminal wiring connections for each of the control panels.
Appendix B	Point Address Charts. ZONEX point addresses for POPITs.

Table 2: Related Documentation

Name of Documentation	Part Number
<i>D1255 Installation Instructions</i>	74-06819-000
<i>D1256/D1257 Installation Instructions</i>	74-06925-000
<i>D1260 Installation Guide</i>	48101
<i>D1260 Owner's Manual</i>	50410
<i>D5200 Operation Manual</i>	74-06176-000
<i>D720 Installation Instructions</i>	74-06918-000
<i>D7412G Release Notes</i>	43856
<i>D8125MUX Operation & Installation Guide</i>	36796
<i>D9210B Operation and Installation Guide</i>	32206
<i>D9412G Release Notes</i>	43821
<i>D9412G/D7412G Approved Applications Compliance Guide</i>	43494
<i>D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide</i>	43700
<i>D9412G/D7412G New Features</i>	43746
<i>D9412G/D7412G Operation and Installation Guide (this document)</i>	43488
<i>D9412G/D7412G Point Chart Label</i>	79-06660-000
<i>D9412G/D7412G Program Entry Guide</i>	47775
<i>D9412G/D7412G Program Record Sheet</i>	47488
<i>RPS Operations Manual</i>	38849
<i>Security System Owner's Manual</i>	71-06633-000
<i>Security System Owner's Manual Supplement</i>	33267
<i>9000/9000G Series Technical Service Note: UL Certificated Bank Safe and Vault Applications</i>	73-07302-000
<i>9000/9000G Series Technical Service Note: Smoke Detector Compatibility</i>	33284
<i>D8128D Installation Guide</i>	41343

1.3 Documentation Conventions

1.3.1 Type Styles Used in the Text

Special type styles are used to help identify the objects being described in this guide.

Table 3: Text Type Styles

Bold text	Usually indicates selections you may use while programming your panel. It may also indicate an important fact that should be noted.
<i>Bold Italicized</i>	Denotes notes, cautions, and/or warnings.
<i>Italicized text</i>	Refers the user to another part of this guide or another document entirely. It is also used to symbolize names for records the user will create.
Courier Text	Indicates what may appear on the D5200 Programmer display, command center/keypad, or internal printer.
[CAPITALIZED TEXT]	Indicates a specific key that should be pressed.

1.3.2 Tips, Notes, Cautions, and Warnings

Throughout this document, helpful tips and notes are presented concerning the entire application and/or programming of the unit. These conventions are set off as follows:



This is a Warning. It describes the possibility of physical damage to the operator, equipment, and/or proper execution of the program.



This is a Caution. Informs the operator that physical damage to the equipment or improper execution of the program may occur.



This is an Important Note that should be heeded for successful operation and programming. Helpful tips and/or shortcuts may be included here.

1.4 FCC Rules

1.4.1 Part 15

This equipment was tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.

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.

Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user is required to correct the interference at his/her own expense.

1.4.2 Part 68

This equipment complies with Part 68 of FCC rules. A label contains, among other information, the FCC registration number and ringer equivalence number (REN). If requested, this information must be provided to the telephone company.

The Bosch Security Systems D9412G/D7412G Control Panels are registered for connection to the public telephone network using an RJ38X or RJ31X jack.

The REN is used to determine the number of devices that can be connected to the telephone line. Excessive RENs on the telephone line may result in the devices not ringing in response to an incoming call. In most, but not all areas, the sum of the RENs should not exceed five. To be certain of the number of devices that may be connected to the line, as determined by the RENs, contact the telephone company to determine the maximum REN for the calling area.

If trouble is experienced with the D9412G/D7412G Control Panels, please contact Bosch Security Systems Customer Service for repair and/or warranty information. If the trouble is causing harm to the telephone network, the telephone company may request that the equipment be removed from the network until the problem is resolved. User repairs must not be made, and doing so will void the user's warranty.

If the D9412G/D7412G Control Panels cause harm to the telephone network, the telephone company will attempt to notify you in advance. If advance notice is not practical, the telephone company will notify you as soon as possible. Also, you will be advised of your right to file a complaint with the FCC if you believe it is necessary.

The telephone company may make changes in its facilities, equipment, operations, or procedures that could affect the operation of the equipment. If this happens, the telephone company will provide advance notice in order for the necessary modifications to be made in order to maintain uninterrupted service.

This equipment cannot be used on public coin service provided by the telephone company. Connection to Party Line service is subject to state tariffs. (Contact your state public utilities commission for information.)

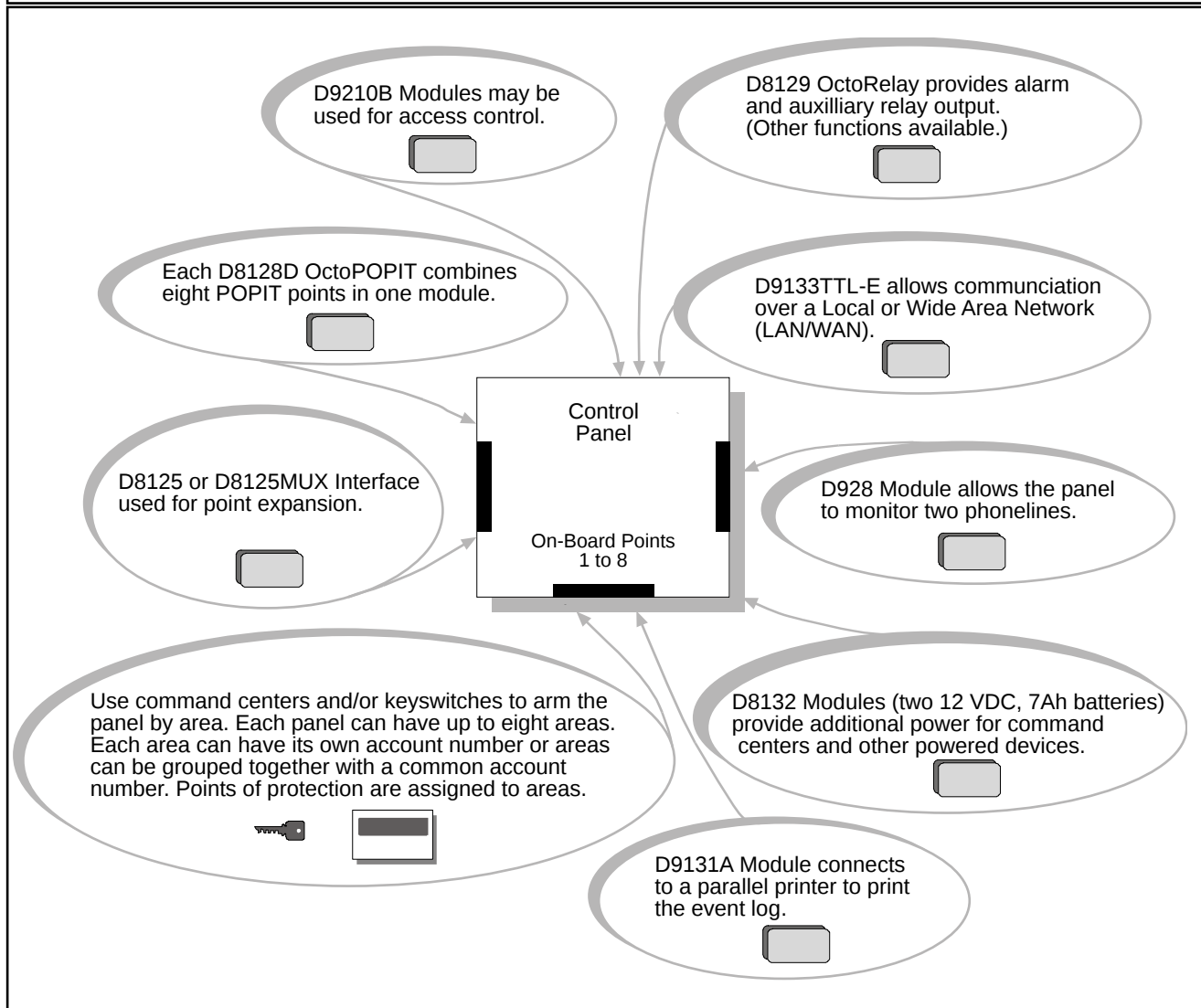
FCC Registration Number: AJ9MUL-46532-AL-E
Service Center in USA: National Repair Center
130 Perinton Parkway
Fairport, NY 14450
(585) 223-4220

Ringer Equivalence: 0.1B

Notes:

2.0 Overview

Figure 1: System Configuration



2.1 9000G Series Panel Differences

Table 4 provides an overview of the differences between the D9412G, D7412G, and D7212G Control Panels.

Table 4: 9000G Series Panel Differences

New Features	D9412G	D7412G	D7212G
Access Control	Yes 8 doors	Yes 2 doors	No
Expanded Users			
Arm/Disarm Passcodes	249	99	99
Cards/Tokens	996	396	N/A
Passcode-Protected Custom Functions	16	4	4
Number of Printers	3	1	1
Number of Points	246	75	40
Number of Relays	128	64	24

2.2 Specifications

Table 5: Specifications

Voltage Input* (Power Supply)	Primary:	①②	16.5 VAC 40 VA class 2 plug-in transformer (D1640)
	Secondary:	④⑤	Sealed lead-acid rechargeable battery (12 VDC, 7 Ah or 12 VDC, 17.2 or 18 Ah). The panel supports a maximum of two 12 VDC, 7 Ah batteries using the D122 Dual Battery Harness or two D1218 (12 VDC, 17.2 or 18 Ah) batteries using a D122.
Current Requirements	Panel : 500 mA alarm, 200 mA idle See Section 4.1 Current Rating Chart for Standby Battery Calculations in the D9412G/D7412G Approved Applications Compliance Guide for the current draw requirements of other system components.		
Power Outputs*	All external connections are inherently power-limited except battery terminals.		
	Continuous Power Outputs	③②④③②	1.4 A maximum at 10.2 VDC to 13.9 VDC (continuous supply) total for all devices and outputs supplied at Terminals 3, 24, and 32 and at the Accessory and Programming Connectors.
	Alarm Power Output	⑥⑦	2.0 A maximum at 10.2 VDC to 13.9 VDC output. Output may be steady or one of three pulsed patterns depending on programming. See Relays in the D9412G/D7412G Program Entry Guide.
	Switched Aux Power	⑧	1.4 A maximum at 10.2 VDC to 13.9 VDC output. Continuous output is interrupted by Sensor Reset or alarm verification depending on programming. See Relays in the D9412G/D7412G Program Entry Guide.
	Fire and Fire/Burglary Systems	To comply with UL 985 and 864 listing standards for fire alarm systems (effective March 1, 1989), the total combined continuous and alarm current draw for the system during alarm conditions must be limited to 1.4 A (1400 mA) provided by the primary power supply (rectified AC). If current draw for the system exceeds 1.4 A, remove connected devices until the current draw falls below 1.4 A. Then, connect the removed devices to a D8132 Battery Charger Module or to an external power supply (see Figure 26).	
Minimum Operating Voltage	10.2 VDC		
SDI Bus	SDI Bus A (+): SDI Bus B (-):	9 VDC 4572 m (15000 ft.) maximum 9 VDC 4572 m (15000 ft.) maximum	
Telephone Connections	Connection: Two TelCo Lines:	RJ31X or RJ38X jack can be interfaced with the panels. Bosch Security Systems D928 Dual Phone Line Module required for two phone line service. Supervision supplied by the panel.	
Battery Discharge/ Recharge Schedule	Discharge	13.9 VDC	Charging float level.
	Cycle	13.8 VDC	Charging status LED on.
		12.1 VDC	Low Battery and AC Fail Reports if programmed. Low Battery LED on.
		10.2 VDC	Battery load shed (processing functions continue if AC is present).
	Recharge Cycle	AC ON	Load shed relay resets, battery charging begins, Battery Trouble and AC Restoral Reports sent.
		13.7 VDC	Battery Restoral Report sent, Low Battery LED off.
		13.9 VDC	Charging status LED off, battery float charged.
Environmental	Temperature: Relative Humidity:	0°C to +50°C (+32°F to +122°F) 5% to 85% at +30°C (+86°F) non-condensing	
Arming Stations	D720 Command Center, D1255 Command Center, D1256 Fire Command Center; D1257 Fire Alarm Annunciator; D1260 Alpha V Command Center; Keyswitch		
Point Thresholds	On-board Points 1 to 8	Open Normal Short	Greater than 3.7 VDC, but less than 5.0 VDC. Greater than 2.0 VDC, but less than 3.0 VDC. Greater than 0.0 VDC, but less than 1.3 VDC.
Compatible Enclosures	D8103 Universal Enclosure, D8109 Fire Enclosure, D8108A Attack Resistant Enclosure		
*The black and white circles with numbers indicate the specific panel terminal.			

2.2.1 Compatible Accessories

See the *Bosch Security Systems Product Catalog* for additional information.

Table 6: Compatible Accessories

Model	Title	Model	Title
D122	Dual Battery Harness	D1257	Fire Annunciator
D125B	Powered Loop Interface Module	D1260	Alpha V Command Center
D127	Reversing Relay	D1640	16.5 VAC 40 VA Transformer
D129	Dual Class A Initiation Circuit Module	D5500	Remote Account Manager IV
D130	Relay Module	D8004	Transformer Enclosure
D136	Plug-In Relay	D8124A, D8122	Derived Channel STU
D161	Phone Cord	D8125	POPEX Module
D162	Phone Cord	D8125MUX	Multiplex Bus Interface
D185	Reverse Polarity Module	D8125INV*	Wireless Interface Module
D192C/D192G	Bell Circuit Supervision Module	D8128D	OctoPOPIT Module
D268/D269	Independent Zone Control (On-Board and OctoPOPIT Points)	D8129	OctoRelay Module
D279A	Independent Zone Control (On-Board and OctoPOPIT Points)	D8130	Release Module
D442	Bells (4 cm/10 in.)	D8132	Battery Charger Module
D448/D449	Mini-Horns	D9002-5	Accessory Module Mounting Skirt
D720	Command Center (Area LED)	D9127U/T	POPIT Module
D720R	LED Command Center (red)	D9131A	Parallel Printer Interface Module
D720W	LED Command Center (white)	D9210B	Access Control Interface Module
D928	Dual Phone Line Switcher	ZX776Z	PIR Motion Sensor (15 m/50 ft.) with POPIT
D1218	12 V, 17.2 Ah Rechargeable Battery	ZX794Z	PIR Motion Sensor (24 m/80 ft.) with POPIT
D1255	Command Center (General Purpose)	ZX865	PIR/Microwave Motion Sensor (1.7°C/35°F) with POPIT
D1255R	LED Command Center (red)	ZX938Z	PIR Motion Sensor (18 m/60 ft.) with POPIT
D1255RW	LED Command Center (white)	ZX970	PIR/Microwave Motion Sensor (1.7°C/35°F) with POPIT
D1256	Fire Command Center	* The D8125INV has not been investigated by UL. Not to be used in UL Listed installations.	

2.3 New Features in D9412G/D7412G

2.3.1 Introduction

Eventually, the D9412G will replace the D9412 and D9112, and the D7412G will replace the D7412 and D7212. The suffix “G” indicates the control panel’s ability to detect ground fault conditions. All other software feature sets that were available in the 9000 Series Control Panels remain the same as in the D9412G/D7412G.

2.3.2 Ground Fault Detect

For the D9412G/D7412G to detect ground fault conditions, the Earth Ground Terminal on the control panels were electrically isolated from all other terminals. A Ground Fault Detect Enable switch (S4) was added to the panel and is located just under

Terminal 10, Earth Ground. See *Section 3.5.2 Ground Fault Detect Enable* for information on operating this function.

2.3.3 Added Feature When Using Ground Fault Detect

When Ground Fault Detect is enabled (S4 closed), Points 1 to 8 can be used for non-powered fire-initiating devices such as heat detectors, 4-wire smoke detectors, pull stations, and so on. A D125B Powered Loop Interface or a D129 Dual Class A Interface Module is no longer required when connecting the non-powered fire-initiating devices to Points 1 to 8.

2.3.4 NetCom Functionality

The D6600 NetCom System supports data network communications. NetCom allows the D6600 receiver to connect to various network topologies, specifically Ethernet and Token Ring. NetCom also lets this receiver process messages to and from most networks using TCP/IP protocols. Connection to a data network can be implemented using the COM4 and/or a COM1 connection from the D6600 receiver to the D6680 Network Adapter. Reports from alarm control panels via phone lines **or** Ethernet and Token Ring data networks can be sent to the D6600 receiver and on to the central station automation software and/or the network printer via LAN or WAN. Alarm control panels can be monitored on the network for their status.

2.4 Standard Features

2.4.1 Points

The Bosch Security Systems D9412G Control Panel provides a maximum of 246 points of protection. The D7412G Control Panel provides up to 75 points of protection. Point programming parameters determine the panel's response to open and shorted conditions on the point's sensor loop. Points are programmed individually with several options to custom-fit the protection to the installation.

Points 1 to 8 are located on the circuit board (on-board points). They are standard sensor loops. The remaining off-board points are POPIT points using D8128D OctoPOPITs, D8125 POPEX Modules and D9127/D8127 POPITs.

2.4.2 Areas and Accounts

The system supports a maximum of eight separate areas. All points can be assigned to a single area or spread out over up to eight areas.

The panel is armed/disarmed by area, and several areas can be armed and disarmed with one menu function. A passcode can also be assigned an authority level that allows a user to arm an area from a remote command center in another area. Assigning each area its own account number creates eight separate accounts in one panel. Assigning the same account number to different areas groups them together in a single account.

Area options include exit tone and delay, separate fire and burglary outputs, and multiple opening and closing windows. Area type can be used to create area interdependencies.

2.4.3 Communicator

The control panel uses a built-in digital communicator to send reports to the receiver. The panel transmits reports in either the Modem IIIa² or BFSK format. The D6500 receiver's MPU and line cards must have software revision 8.00 (or greater) installed to accept Modem IIIa² reports from the panel. Cycle the receivers down to print the software revision numbers.

The panel connects to an RJ31X or RJ38X jack for phone line seizure. Connection to the RJ31X complies with FCC regulations for using the public telephone network. The panel can be programmed to direct reports to four separate phone numbers. Adding the D928 Dual Phone Line Switcher Module allows the connection and supervision of a second phone line.

The system has routing capabilities allowing groups of Event Reports to be directed to four different destinations. Each report group can be programmed to report to one or more destinations. Primary and backup reporting paths can be programmed for each destination and each report group. A custom option allows specification of individual Event Reports to be sent.

2.4.4 Command Centers

A maximum of 32 unsupervised command centers can be connected to the system. The available power, number of supervised command centers, and number of areas used affect the total number of command centers that can be connected.

The system can supervise up to eight command centers. The panel transmits a Serial Device Trouble Report SDI Failure in the Modem IIIa² format or Trouble ZN D in the BFSK format if it loses communication with a supervised command center. More command centers can be added, but only eight can be supervised. *Table 7* shows the command centers compatible with the D9412G/D7412G Control Panels. See *Command Center* in the *D9412G/D7412G Program Entry Guide* for complete details on programming command center options.

Table 7: Compatible Command Centers

Model	Display	Application
D1255	16-character alphanumeric	Fire/Burglary/Access
D1256	16-character alphanumeric	Fire
D1257	16-character alphanumeric	Fire
D1260	4-line by 20-character alphanumeric	Fire/Burglary
D720	8 LED	Fire/Burglary

2.4.5 Keyswitch

Any of the eight available areas can be armed/disarmed with maintained or momentary closure devices such as keyswitches. Point programming determines loop responses and the area a keyswitch controls.

2.4.6 Access Control

The D9412G can control eight access doors (each requiring the optional D9210B Wiegand Control Interface Module) with up to 996 uniquely identified cards/tokens. The D7412G can control two access doors with up to 396 uniquely identified cards/tokens. Access can be granted from a Wiegand style access control device (card reader) connected to the D9210B Access Control Interface Module. Access can also be granted from a “request to enter” or a “request to exit” input, or from a command center.

The access control features of the D9412G/D7412G can deny access during armed periods. It can also grant access only to certain authorized users depending on whether the area is master armed, perimeter armed, or disarmed. The alarm system can be programmed to automatically disarm when designated authorized users are granted access.

2.4.7 Event Memory

The system uses event memory to store events for each area. The events for an area can be viewed at a D1255 Command Center assigned to the area. The panel clears the events for an area from event memory and starts storing new events when the area is master armed.

2.4.8 Event Log

The system stores 500 to 1000 events and event modifiers from all areas in its event log. Event modifiers add information about an event to the log. Some events are always followed by a modifier. For example, the system adds at least two items to the log each time an area is armed or disarmed, the open (or close) event and an event modifier showing the previous arming state.

All events and their modifiers can be stored even if the panel does not send a report for them. The log can be viewed at a command center, printed locally using the D9131A Parallel Printer Interface Module and a parallel printer, or uploaded to the Remote Account Manager (RAM) IV.

See the appendix in the command center’s *User’s Guide* for a listing of log events and event modifiers.

2.4.9 EMI and Lightning Transient Protection

The D9412G/D7412G Control Panels maintain the Bosch Security Systems’ level of quality and field dependability. Their design significantly reduces electromagnetic interference and malfunction generally caused by lightning.

2.4.10 Programming

Use the Bosch Security Systems D5200 Programmer or the Remote Programming Software (RPS) to program the D9412G/D7412G Control Panels. Refer to the *D9412G/D7412G Program Entry Guide* for programming options.

2.4.11 Other Features

D9412G/D7412G Control Panels have many programmable features. Some of the features are listed below. Complete details on all features are in the *D9412G/D7412G Program Entry Guide*.

- Supervision of AC (primary power), battery (secondary power), ZONEX, and SDI buses, Central Processing Unit (CPU), a maximum of three printers, and two telephone lines
- Automatic System Test Reports
- Remote access for programming, diagnostics, and log uploads using the RPS
- Fire alarm verification
- Programmable alarm output
- Programmable relay output using the D8129 OctoRelay Module
- Opening and closing windows
- Skeds (scheduled events)

2.4.12 Control Panel Assembly

The D9412G/D7412G Control Panel is shipped pre-assembled from the factory with the following parts:

Literature Pack

- *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide*
- *D9412G/D7412G Program Record Sheet*
- *9000/9000G Series Technical Service Note: UL Smoke Detector Compatibility*
- *7000/9000 Series Point Chart Label*

Assembly

- PC board
- Faceplate shield
- Mounting skirt
- One #6 x 1/4-in. screw

2.4.13 Available by Separate Order

Order the following components separately to complete a basic 8-point installation.

- D1255, D1256, D1257, D1260, D720 Command Center (or keyswitch)
- D1640 Transformer
- D126 or D1218 Battery
- D161 or D162 Phone Cord (order two cords if using the D928 Dual Phone Switcher)
- D8103, D8108A, or D8109 Enclosure

Configured packages are also available. Please consult the *Bosch Security Systems Product Catalog*.

The following literature is available in a separate literature package for dealers.

- *D9412G/D7412G Operation and Installation Guide*
- *D9412G/D7412G Approved Applications Compliance Guide*
- *D9412G/D7412G Program Entry Guide*
- *D9412G/D7412G Program Record Sheet*

2.4.14 Listings and Approvals

The D9412G/D7412G Literature Pack includes the *D9412G/D7412G Approved Applications Compliance Guide*. Refer to this guide for additional guidelines on installing the control panels in Underwriters Laboratories (UL) and fire specific applications (see *Table 8*).

Table 8: Listings

Fire	
UL	UL lists the D9412G/D7412G Control Panels as Signal System Control Unit for Central Station, Local, Auxiliary, Remote Station, and Household Fire Warning.
CSFM	Approved by the California State Fire Marshal for high-rise and non high-rise.
Burglary	
UL	UL lists the D9412G/D7412G Control Panels for: Central Station, Local, Police Connect, Bank Safe and Vault, Mercantile Safe and Vault, Grade A Household Systems, Access Control, and Proprietary.
Department of Defense (DOD)	The D9412G/D7412G Control Panels are approved for DOD installations in Sensitive Compartmented Information Facilities (SCIF).

3.0 Installation

3.1 Before Beginning

This section contains a general installation procedure and refers to other sections of the document for detailed instructions.

Bosch Security Systems recommends you review this document and the *D9412G/D7412G Program Entry Guide* before beginning the installation to determine the hardware and wiring requirements for the features that will be used.

Have the following documentation available when reading through this guide:

- *D9412G/D7412G Program Record Sheet*
- *Security System Owner's Manual* and *Security System Owner's Manual Supplement*
- *Command Center Installation Manual (D1255, D1256, D1257, D1260, or D720)*

Before installation, become familiar with the operation of the D5200 Programmer or the RPS.

3.2 Enclosure Options

Mount the control panel assembly in any of the Bosch Security Systems enclosures listed:

- D8103 Universal Enclosure (tan)
- D8109 Fire Enclosure (red)
- D8108A Attack Resistant Enclosure (tan)

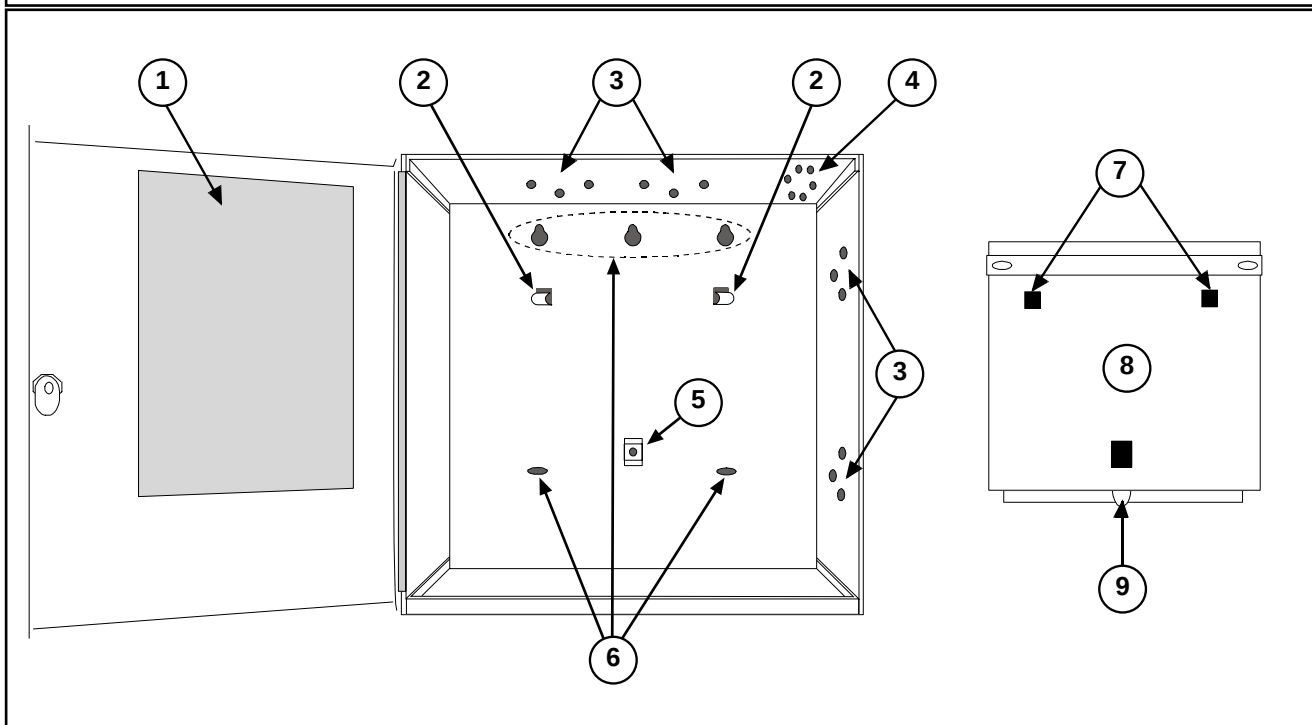
Refer to the *D9412G/D7412G Approved Applications Compliance Guide* to determine if the application requires a specific enclosure.

3.3 Beginning the Installation

1. Mount the enclosure in the desired location. Use all five enclosure mounting holes (see *Figure 2*).
2. Run the necessary wiring throughout the premises and pull the wires into the enclosure.

Electro-Magnetic Interference (EMI) may cause problems. Refer to *EMI on Long Wire Runs* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide*.

Figure 2: Enclosure Mounting



1 - Point chart label

2 - Mounting skirt hook (2)

3 - Module mounting hole (12)

4 - Tamper switch mounting hole (5)

5 - Skirt mounting hole (1)

6 - Enclosure mounting hole (5)

7 - Mounting skirt hook hole (2)

8 - Back of D9412G/D7412G Control Panel

9 - Lock down tab

3.4 Installing the Assembly

1. Place the assembly over the inside back of the enclosure, aligning the large rectangular openings of the mounting skirt with the mounting hooks of the enclosure. Slide the assembly down so it hangs on the hooks. See *Figure 2*.
2. Remove the tape from the #6 x 1/4-in. screw in the mounting tab on the assembly. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure. Tighten the screw to secure the assembly in the enclosure.
3. Connect earth ground to the panel before making any other connections. See *Section 3.5 Connecting Earth Ground*.

3.5 Connecting Earth Ground

3.5.1 Terminal 10

To help prevent damage from electrostatic charges or other transient electrical surges, connect the system to earth ground at Terminal 10 before making other connections. A grounding rod or cold water pipe are recommended earth ground references.



Do not use telephone or electrical ground for the earth ground connection. Use 1.8 mm (14 AWG) to 1.5 mm (16 AWG) wire when making the connection.
Do not connect other panel terminals to earth ground.

3.5.2 Ground Fault Detect Enable



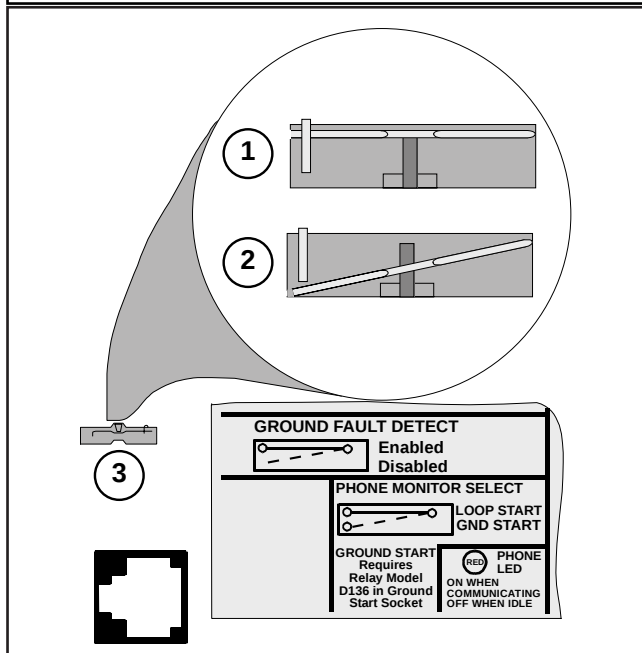
Ground fault detect capability is available only on firmware versions 6.10 or higher.

Ground Fault is defined as “a circuit impedance to Earth Ground of approximately 95 kilohms or less.” The panel detects a ground fault on Terminals 1 to 9 and Terminals 11 to 32 if the Ground Fault Detect Enable jumper (S4) (see *Figure 3*) is locked (closed) and a non-zero value is entered in Area 5 Silent Alarm Relay. See the *D9412G/D7412G Program Entry Guide*. When the jumper is in the unlocked (open) position, the panel does not detect ground fault conditions. If a ground fault condition occurs, the command centers display **SERVC GND FAULT** and the panel transmits a Trouble Report Ground Fault Area (Modem IIIa² format only). For the panel to detect a ground fault condition, the panel must see the ground fault for a minimum of 30 consecutive seconds. When the panel recognizes the ground fault condition is corrected, a Restoral Report is sent. For the restoral condition to be met, the ground fault must be corrected for between 5 and 45 consecutive seconds.



The 9000 Series Control Panels log and print a Ground Fault event as a Trouble Point 256.

Figure 3: Ground Fault Detect



1 - With S4 closed, panel detects ground faults.

2 - With S4 open, panel does not detect ground faults.

3 - S4, Ground fault detect enable.

3.5.3 Locking the Reset Pin

Locking the reset pin disables the panel (see *Figure 4*). The system ignores the command centers and points while disabled. **CALL FOR SERVICE** appears in command center displays while the pin is locked down.

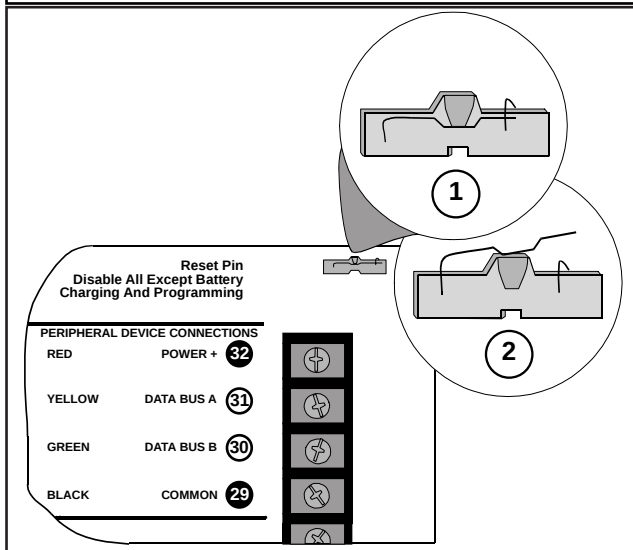
On-board relays (Terminals 6, 7, and 8) and off-board relays deactivate when the panel is reset. There is power at Terminal 8 when the relay is deactivated. Activation interrupts power at that terminal. The relays remain deactivated while the reset pin is locked in the disable position.

Releasing the reset pin from the closed position resets the panel. The panel resets all its timers, counters, indexes, and buffers. Any points that restore after a reset is performed do not generate Restoral Reports.

If the reset pin is placed in the disable position when all areas are armed, there must be an entry in the Answer Armed program item. See *RAM Parameters* in the *D9412G/D7412G Program Entry Guide*.

Locking the pin in the disable position allows powering up of the panel and charging the battery while the detection devices and command centers are being installed.

Figure 4: Reset Pin



1 - Reset pin locked (closed).

2 - Reset pin normal (open).

3.6 Finishing the Installation

If not already complete, make the earth ground connection to Terminal 10 and lock the reset pin in the closed position.

3.6.1 Charge the Battery While Finishing

Connect the battery and then the transformer so the panel can charge the battery while the installation is being completed. See *Section 4.0 Power Supply* for instructions.

On-board Buzzer Sounds at Power Up and Reset:

The system performs a series of self-diagnostic tests of hardware, software, and program at power up and at reset. The buzzer on the panel sounds during the tests. The self-diagnostics takes approximately 1 second to 3 seconds to complete.

If the panel fails any test, the buzzer continues sounding and a System Trouble message appears at the command centers. See *Problems Found During Self Diagnostics* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* for a description of each system trouble message.

Touch Terminal 10 First: If the on-board buzzer sounds briefly when the panel is touched, any static charge that may be carried is being discharged to the panel. The panel may generate Watchdog Reset and/or Param Fail events. See *Watchdog Reset Reports* in the *D9412G/7412G/D7212G Installation and Troubleshooting Quick Reference Guide* for a description of these events. Always touch Terminal 10, the panel's earth ground connection, before beginning work on the panel.

3.6.2 Install and Wire Detection Devices

Install and wire detection devices and command centers at their locations throughout the premises. **Do not** make the connections at the panel end of the wiring yet.

Section 7.0 On-board Points contains instructions for wiring the on-board points to detection devices. *Section 10.0 Arming Devices* contains instructions for wiring the command centers.

Instructions for wiring the off-board point POPIT sensor loops are found in the instructions packaged with the POPIT modules.

3.6.3 Install Modules and Relays

1. Power down the unit by unplugging the transformer and disconnecting the battery. Always power down the unit when installing modules or relays, or when making wiring connections to the panel.
2. Install and wire any modules required for the installation as described in the module's installation instructions.

Instructions for the D8125 POPEX Module, D8128D OctoPOPIT Module, D8129 OctoRelay Module, D811 Arm Status Relay Module, and D928 Dual Phone Line Switcher appear in this guide.

See *Section 8.0 Off-board Points* for D8125 and D8128D instructions. See *Section 9.0 Off-board Relays* for D8129 and D811 instructions. See *Section 6.12 D928 Dual Phone Line Switcher* for instructions for the D928.

3. If using the power outputs at Terminals 7 or 8, install a D136 relay in the appropriate sockets. See *Section 5.4 Programmable Power Outputs Terminals* for instructions.
4. If using a ground start phone system, insert a D136 relay in the ground start check socket and set the ground start pin in the ground start position. See *Section 6.11 Ground Start* for more information.

3.6.4 Make the Telephone Connections

See *Section 6.0 Telephone Connections*. If connecting the panel to a ground start phone system, install a D136 relay (*Section 3.6.3 Install Modules and Relays*).

3.6.5 Connect the On-board Points and Command Centers

Connect the on-board points and command center wiring to the system. See *Section 7.0 On-board Points* and *Section 10.0 Arming Devices* for instructions.

3.6.6 Power Up

Reconnect the battery and then plug in the transformer. Remember the buzzer sounds for 2 seconds when the panel is first powered up. For now, leave the reset pin locked down.

Yellow Charging Status LED Does Not Go Dark: If the yellow charging status LED does not darken within 5 minutes of powering up the panel, the battery may be deeply discharged or too many powered devices have been connected to the panel. Combined continuous current draw for Terminals 3, 8, 24, and 32, and the accessory connector cannot exceed 1.4 A. See *Section 5.0 Power Outputs* for help.

3.7 Programming the Panel

If a program is not created for the panel, review the *D9412G/D7412G Program Entry Guide*. Confirm all required accessory modules that are to be installed for desired features are available. Place the reset pin in the locked position to copy or send information to and from the panel.

Use the D5200 Programmer or the RPS to load a custom program into the panel.

Move the reset pin to the normal position (see *Figure 3*). The panel transmits Reboot and Battery Reports to the receiver if programmed for reporting.

3.8 Install the Point Chart Label

A point chart label is provided in the literature pack. Fill it out and install it on the inside of the enclosure door for all systems.

Point Chart Label Required for Fire Systems with

Verification Points: The point chart label is required for fire systems with verification points. Install the point chart label for fire or combined fire/burglary systems using verification points.

Use the *D9412G/D7412G Program Record Sheet* to gather the information needed to complete the point chart. Install the label on the enclosure door seen in *Figure 2*. Avoid smearing the entries on the chart by using the label's peel-off backing to press the label in place.

3.9 Testing the System

After installing and programming the panel, make a complete functional test of the system. Test the panel and all devices for proper operation. Test after initially programming the panel and after subsequent programming sessions.

Service Walk Test Shows Extra Points: The Service Walk Test shows extra points. Use this test at a panel wide command center to perform a complete test of the panel. This test function is similar to the ordinary Walk Test function, with the added ability to display points that are not properly programmed.

During a Service Walk Test, a tested POPIT with its switches set for a point with a blank point index and/or no area assignment appears as an extra point.

If a device is tested and the panel does not respond, there may be a problem with the device, wiring, POPIT ID setting, or programming for the point. If the switches on a POPIT are set incorrectly, it can create both a missing and extra point. When a missing point is found, performing a Service Walk Test for extra points can help diagnose the problem.

See the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* for complete Service Walk Test instructions.

Clear After Test: To clear the event memory and report buffer, momentarily close the reset pin. Events stored in the panel's event log are not cleared.

4.0 Power Supply

4.1 Primary Power Terminals ①②

4.1.1 Primary (AC) Power Circuit

A 16.5 VAC, 40 VA internally-fused transformer (Bosch Security Systems Model D1640) is the primary power source. The AC power circuit provides 1.9 A of rectified AC power. The panel reserves 500 mA of this power for internal operations, leaving 1.4 A for powered devices.

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at Terminal 10. Make sure to connect Terminal 10 to a proper ground (see *Section 3.5 Connecting Earth Ground*).

AC Power Failure

The system indicates an AC power failure when the power at Terminals 1 and 2 is missing. The AC Fail Time program item sets the number of minutes or seconds that AC must be missing before the panel acknowledges the failure and the number of minutes or seconds after the power returns before the panel acknowledges the restoration of power. See the *D9412G/D7412G Program Entry Guide* for additional information regarding AC Fail Time.

4.1.2 Installing the Transformer



Do Not Short Transformer Terminals: Shorting the terminals opens the internal fuse causing permanent failure. Connect the transformer to Terminals 1 and 2 of the panel before plugging it into the power source.

Connect the transformer to the panel using 1.22 mm (18 AWG) wire (minimum). Keep wire length as short as possible. The maximum length is 15 m (50 ft.).

AC wiring can induce both noise and low level voltage into adjacent wiring. Route phone and sensor loop wiring away from any AC conductors, including the transformer wire. Route data wiring away from AC and phone wiring.

Connect the Battery and Plug in the Transformer:

Always connect the battery first and then plug in the transformer. See *Section 4.2.2 Installing the Battery*.

Plug the transformer into an unswitched, 120 VAC, 60 Hz power outlet only. Secure the transformer to the outlet with the screw provided.

D8004 Transformer Enclosure Required for Fire Systems: Use the D8004 Transformer Enclosure for the D1640 Transformer in fire and combined fire/burglary applications. Check with the Authority Having Jurisdiction (AHJ) on mounting transformers on specific circuits.

4.2 Secondary Power Terminals ④⑤

4.2.1 Secondary (DC) Power

A 12 V, 7 Ah (up to 14 Ah) sealed lead-acid rechargeable battery (D126) supplies secondary power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

Use Lead Acid Batteries Only: The charging circuit is calibrated for lead-acid batteries. Do not use gel-cell or nicad batteries.

Extra Batteries Increase Back-up Time: To increase battery back-up time, connect a second 12 V, 7 Ah battery in parallel to the first battery to form a 12 V, 14 Ah battery. Use a D122 Dual Battery Harness to ensure proper and safe connection.

D1218 Battery

The D1218 is a 12 V, 17.2 or 18 Ah battery and can be used in applications requiring extended battery standby time. Up to two D1218 batteries can be connected when used with a D122 Dual Battery Harness.



When connecting two D1218 Batteries to the control panel, both must have the same capacity (use two 17.2 Ah batteries or two 18 Ah batteries).

4.2.2 Installing the Battery

Place the battery upright in the base of the enclosure. Locate the red and black leads supplied in the literature pack. Connect the black battery lead to Terminal 4, and then to the negative (-) side of the battery. Connect the red battery lead to Terminal 5, and then to the positive (+) side of the battery.

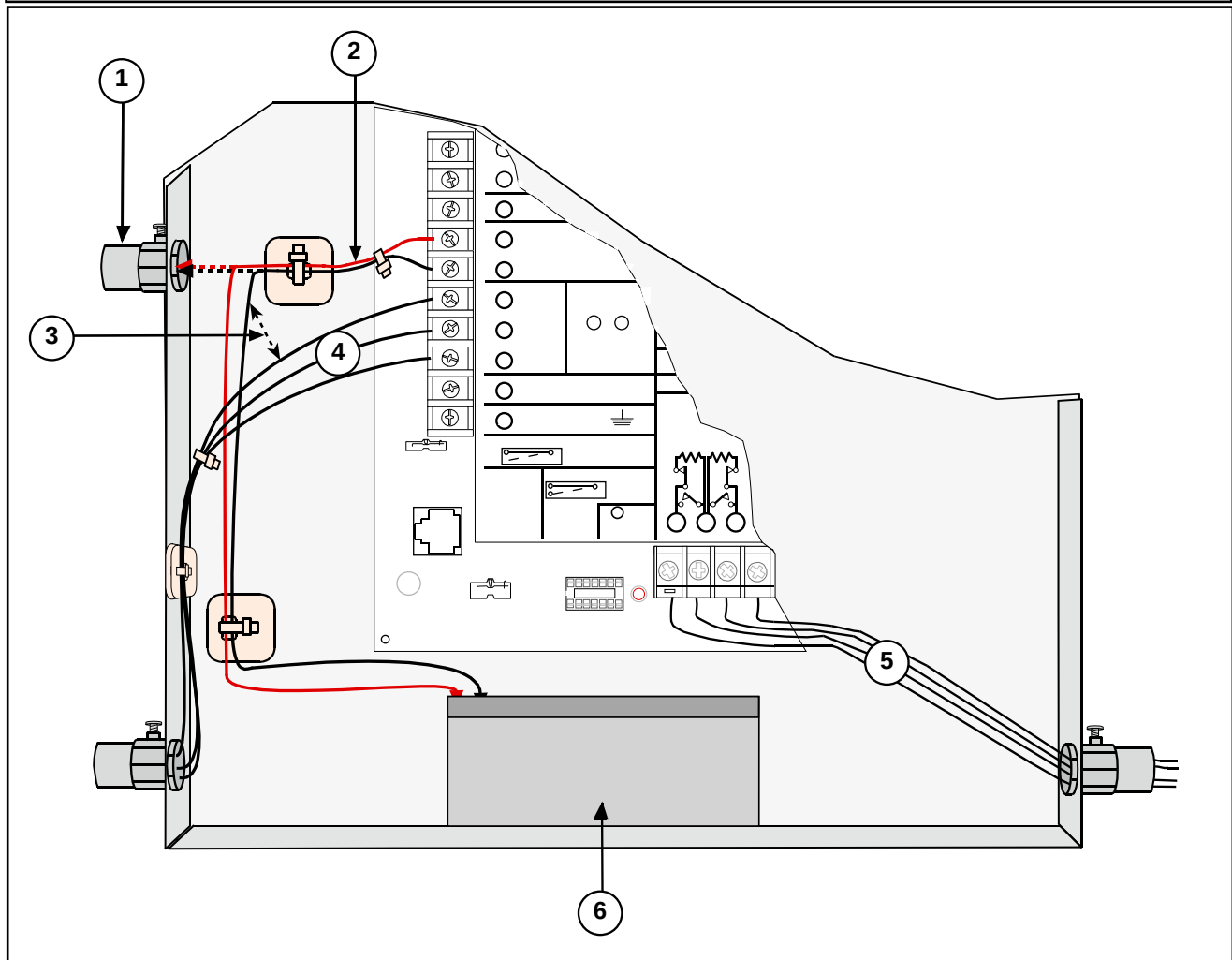


High current arcs are possible. The positive (red) battery lead and Terminal 5 can create high current arcs if shorted to other terminals or the enclosure. Use caution when working with the positive lead and Terminal 5. Always disconnect the positive (red) lead from the battery before removing it from Terminal 5.



The battery terminals and wire are not power limited. A 6.4 mm (0.250 in.) spacing must be maintained between the battery terminals, battery wiring, and all other wiring. Battery wiring may not share the same conduit, conduit fittings, or conduit knock-outs with other wiring. See *Figure 5*.

Figure 5: Non-Power Limited Wiring



- 1 - Only required if external batteries are used.
- 2 - Battery wires
- 3 - 6.4 mm (0.25 in.) minimum. To ensure proper spacing, secure wires using Tie-Wraps or similar devices.

- 4 - Option wires
- 5 - Output or zone wires
- 6 - Standby battery

4.2.3 Replacing the Battery

Replace batteries every 3 to 5 years under normal use. Record the date of installation directly on the battery.



Exceeding the maximum output ratings or installing the transformer in an outlet that is routinely switched off causes heavy discharges. Routine heavy discharges can lead to premature battery failure.

D8132 Boost Battery Backup: Adding a D8132 Battery Charger Module supports additional batteries of up to 27 Ah capacity, if required.

The D8132 Battery Charger Module can be used to connect two additional batteries for a total of four. The

panel plus any connected D8132 Modules and AUX power supplies must be on the same AC circuit to discharge evenly if AC power fails. The number of D8132 Modules is determined by the number of available outlets on the same circuit. Refer to the Standby Battery and Current Rating Chart in the *D9412G/D7412G Approved Applications Compliance Guide* for battery standby time calculations.



In applications where the supervision of two batteries is required by the AHJ, use a D113 Battery Supervision Module.

4.2.4 Battery Supervision

When battery voltage drops to 13.8 VDC, the yellow charging status LED lights. When the battery drops to 12.1 VDC, the red low battery LED lights and the panel (if programmed for power supervision) transmits a Battery Low Report in the Modem IIIa² communication format. It transmits a Trouble Zn 9 Report in the BFSK format.

If the battery is missing or shorted, the red low battery LED flashes at the same rate as the green operation monitor LED. If the panel is programmed for power supervision, it transmits a Battery Missing Report in the Modem IIIa² communication format, or Trouble Zn 9 Report in the BFSK format.

When battery voltage returns to 13.7 VDC, the low battery LED darkens. If the panel is programmed for power supervision, it transmits a Battery Restoral Report in the Modem IIIa² communication format or Restoral Zn 9 Report in the BFSK format. At 13.9 VDC, the charging status LED darkens.

Investigate Low Battery Reports Immediately: If primary (AC) power is off and the discharge continues, the panel becomes inoperative when the battery voltage drops below 10.2 VDC.

4.2.5 Battery Charging Circuit

Float Charge

The float voltage for the battery charging circuit is 13.5 VDC to 13.9 VDC at a maximum current of 1.4 A. If float voltage drops below 13.5 VDC, the charging status LED illuminates.

Loss of AC Load Shed Relay Protects Battery: During an AC power loss, the battery supplies all power to the security system. If the battery voltage falls below 10.2 V during an AC power loss, a load shed relay isolates the battery from the panel and disables the panel. Load shed protects the battery from being damaged by deep discharge. When AC power restores, the load shed relay resets and battery voltage is again available.

Overcharge Load Shed With AC Present: If more than 1.4 A of current draw from the panel is detected, the panel shuts down. Remove all loads to the panel and disconnect AC power. Add a new battery and reconnect AC power.

Reset the panel by momentarily placing the reset pin in the disable position. See *Figure 4*. The red low battery LED continues flashing until the panel is reset.

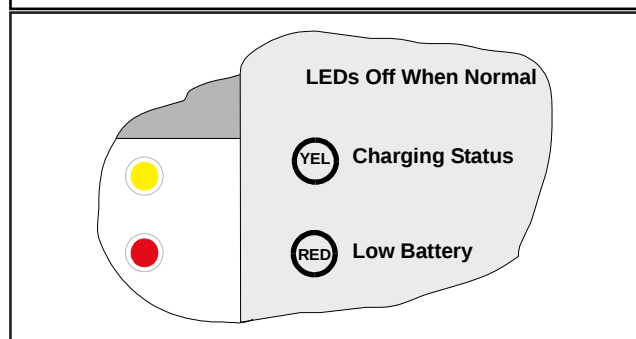
A shorted battery condition is created either by a shorted cell inside the battery or by a short on Terminals 4 and 5. A shorted battery may generate Watchdog Reset Reports.

4.2.6 Battery Discharge/Recharge Schedule

Table 9: Battery Discharge/Recharge Schedule

Discharge Cycle	
AC Off:	AC Fail Report when AC fails if panel is programmed to report AC failure at occurrence.
13.9 VDC:	Charging float level.
13.8 VDC:	Charging status LED on.
12.1 VDC:	Low Battery and AC Fail Reports if programmed. Low battery LED on.
10.2 VDC:	Battery load shed (processing functions continue if AC is present).
Rescharge Cycle	
AC On:	Load shed relay reset; battery charging begins; Battery Trouble and AC Restoral Reports sent.
13.7 VDC:	Battery Restoral Reports sent. Low battery LED off.
13.9 VDC:	Charging status LED off; battery float charged.

Figure 6: Charging and Battery LEDs



4.3 Charging Status and Low Battery LEDs

Table 10: Charging Status and Low Battery LEDs

Type	LED Color	LED State	Action
Charging Status LED	Yellow		Shows the charging status of the battery. See <i>Figure 6</i> for location.
	Yellow	Off	Battery is fully charged.
			If the battery is missing, shorted, or reversed, the Charging Status LED is off, but the red Low Battery LED is flashing.
	Yellow	On	Battery float charge is below 13.8 VDC. If AC is present, the battery is charging. Indicates the combined current draw from all outputs exceeds 1.4 A. This is normal under alarm conditions for non-fire systems with sirens or bells drawing more than 1.4 A. If the LED lights regularly for extended periods or does not go out, check the current draw for devices connected to the power outputs. Refer to <i>Section 5.0 Power Outputs</i> for instructions.
	Yellow	Flash once per minute	System is checking the battery.
	Yellow and Red	Flash once per minute	Indicates when the current draw for devices connected to the power outputs exceed 1.4 A and/or the battery is missing.
Low Battery LED	Red		Shows the condition of the battery. See <i>Figure 6</i> for location.
	Red	Off	Battery is fully charged.
	Red	On	Battery voltage has fallen below 12.1 VDC. LED darkens when voltage reaches 13.7 VDC.
	Red	Flash (same as green LED)	Green LED is Operation Monitor LED. Battery is missing or shorted.
	Red and Yellow	Flash once per minute	Indicates the current draw for devices connected to the power outputs exceeds 1.4 A and/or the battery is missing.

5.0 Power Outputs

5.1 Circuit Protection

Three Positive Temperature Coefficients (PTCs) protect the panel from short circuits on both the continuous and programmable power outputs. If the panel is programmed for power supervision and short is sustained on one of the power outputs, the panel transmits a BATTERY LOW or BATTERY MISSING for Bosch Security Systems Modem IIIa² Communication Format, or TROUBLE ZN 9 for BFSK.

One PTC protects Terminal 3: Auxiliary Power and Terminal 24: ZONEX Power. A short on one disrupts the power to the others.

One PTC protects Terminal 6: Alarm Power Output, Terminal 7: Alternate Alarm Power Output, and Terminal 8: Switched Auxiliary Power. A short on one of these terminals disrupts the power to the other two.

One PTC protects Terminal 32: Power +.

5.2 Total Available Power

The system produces up to 1.4 A of combined power at 10.2 VDC to 13.9 VDC for all powered devices. The outputs listed below share the available power. These outputs are shown as red circles on the faceplate.

Terminal 3 - Auxiliary Power. Use this terminal to power devices requiring continuous power.

Terminal 6 (Relay A) - Alarm Power Output. Normally open, power on alarm.

Terminal 7 (Relay B) - Alternate Alarm Power Output. Normally open, power on alarm.

Terminal 8 (Relay C) - Switched Auxiliary Power. Normally open, power off on reset.

Terminal 24 - ZONEX Power. Use this terminal to power ZONEX Modules such as the D8125, D8128D, and D8129 Modules.

Terminal 32 - Power + Use this terminal to power Serial Device Interface (SDI) devices such as command centers, the D9131A Parallel Printer Interface Module, and the D9210B Wiegand Control Interface Module.

Accessory Connector The D928 Dual Phone Line Switcher connects to the accessory connector.

5.3 Continuous Power Outputs Terminals

③ ⑧ ②④ ③②

5.3.1 Continuous Current Draw

The continuous current draw for powered devices connected to Terminals 3, 8, 24, and 32, and the accessory connector must not exceed 1.4 A. Devices powered from these outputs must operate over a range of 10.2 VDC to 13.9 VDC.

Power Restricted for Fire and Combined Fire/Burglary Systems: Use the *Fire System Power Formula* to calculate the current available for fire and combined fire/burglary systems (see section 5.4 *Programmable Power Outputs Terminals*).

5.4 Programmable Power Outputs Terminals ⑥ ⑦ ⑧

5.4.1 Programming

The power outputs at Terminals 6, 7, and 8 are programmed as Relays A, B, and C. All relays are programmed in the relays section of the program.

Relays are assigned a relay type, (Fire Bell, for example) when they are assigned to an area. Relays can be assigned to one or more areas.

The Bosch Security Systems defaults set Relay A (Terminal 6) as a Steady Alarm Bell output, Relay B (Terminal 7) as a Pulsed Fire Bell output, and Relay C (Terminal 8) as a Verification/Reset output for smoke detectors. The *D9412G/D7412G Program Entry Guide* contains complete instructions for programming relays. Descriptions of the functional characteristics of each terminal appear on the next page.

See the *Bell Parameters* section of the program to set the Fire Bell, Alarm Bell output responses for relays. Four annunciation patterns are available: Steady, Pulsed, California Standard, and Temporal Code 3.

Voltage Output at Terminals 6, 7, and 8: If Terminals 6, 7, and 8 do not provide the expected output:

- Check the programming for Relays A, B, and C in the *Relays* section of the program.
- Check the *Bell Parameters* section of the program to verify the Alarm and Fire Bell responses are programmed for the expected duration and pattern.
- Check the *Point Assignments* to verify each point is programmed for the expected local response.

5.4.2 Optional Relays Required

Install an optional D136 Plug-in Relay into the ALT ALARM socket to enable the output at Terminal 7. Install a D136 in the SW AUX socket to enable the output at Terminal 8. The relay sockets are under the faceplate as shown in *Figure 7*.

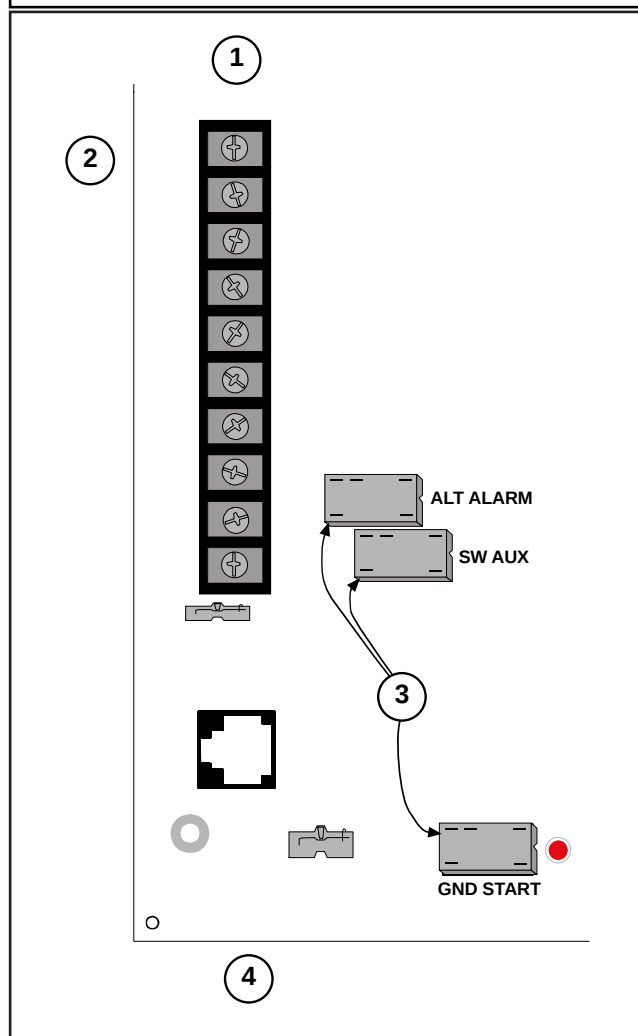
Relay Installation

Power down the system before inserting the D136 Relays. The plug-in relays are shorter than the sockets they plug into. See *Figure 7*. They can be installed in either the left or right end of the socket.

Do not Rely on Relay Labelling: Do not rely on the labelling to install D136 Relays. Check for the side with three pins. The three pins go on the top side of the socket.

Incorrect insertion does not damage the relay or the system; however, the related circuits do not function properly.

Figure 7: Relays for Terminals 7, 8, and Ground Start



1 - Top of panel.

2 - Left side of panel.

3 - The D136 Relays are inserted with the three pins toward the top of panel.

4 - Bottom of panel.

5.4.3 Terminals 6 and 7

When activated, Terminals 6 (Relay A) and 7 (Relay B), provide positive (+) 10.2 VDC to 13.9 VDC power output. Use the power at Terminals 6 and 7 to power bells, siren drivers, piezo fire sounders, electronic horns, or other devices. Programming determines the format of the output and the conditions that activate it. One PTC protects Terminals 6, 7, and 8 against shorts.

Available Power

The system combines the 1.4 A of primary power produced by the power supply with the secondary power source (the battery) to produce a total of 2.0 A of alarm power at 10.2 VDC to 13.9 VDC. Terminals 6 and 7 share the available alarm power.

Power Restricted for Fire and Combined Fire/Burglary Systems:

Fire systems are prohibited from using the battery for determining alarm power. Use the fire system power formula below to calculate the current available for fire and combined fire/burglary systems.

5.4.4 Fire System Power Formula

To calculate the current available at Terminals 6 and 7 for fire and combined fire/burglary systems:

1. Add together the current draws for all devices connected to Terminals 3, 8, 24, and 32, and the accessory connector. This is the total current required for the Normal Standby Condition (NSC).
2. The current available for NSC is 1.4 A. Subtract the NSC current required calculated in Step 1 from the NSC current available, 1.4 A. The difference is the alarm current available for Terminals 6 and 7.

In formula format:

$$1.4 \text{ A} - \text{NSC current required (Step 1)} = \text{Alarm current available}$$

Refer to the *D9412G/D7412G Approved Applications Compliance Guide* for module/accessory current requirements.

5.4.5 Terminal 8

Terminal 8 provides continuous positive (+) 10.2 VDC to 13.9 VDC power. Relay C interrupts the power at Terminal 8 when activated. Use Terminal 8 to power smoke detectors or other devices that are reset by interrupting power. One self-resetting circuit breaker protects Terminals 6, 7, and 8 against shorts.

Verification/Reset Relay

The default program sets Relay C (Terminal 8) as a verification/reset relay. See *Relay Parameters* and *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for instructions on programming verification/reset relays and points.

Performing a sensor reset at a command center produces a 5-second relay activation of verification/reset relays. The panel ignores verification/reset points during the 5 seconds of relay activation.

6.0 Telephone Connections

6.1 Registration

The Bosch Security Systems D9412G/D7412G Control Panels are registered with the Federal Communication Commission (FCC) under Part 68, for connection to the public telephone system using an RJ31X or RJ38X jack installed by the local phone company.



An RJ31X jack can be modified by placing a jumper wire between Terminals 2 and 7 to become an RJ38X jack.

6.2 Notification

Do not connect registered equipment to party lines or coin-operated telephones. The local telephone company must be notified and given the following information before connecting the panel to the telephone network:

- The particular line to which the panel will be connected
- Make (Bosch Security Systems), model (D9412G or D7412G), and serial number of the panel
- FCC registration number and ringer equivalence for the panel:

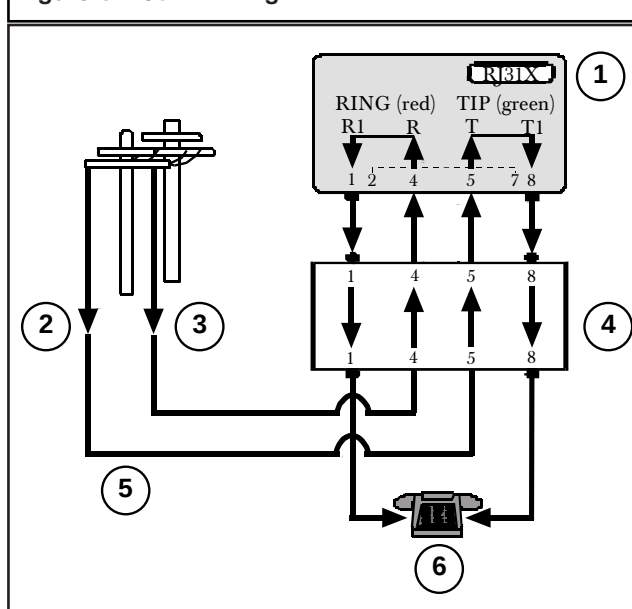
FCC Registration Number: AJ9MUL-46532-AL-E

Ringer Equivalence: 0.1B

6.3 Location

To prevent jamming of signals, wire the RJ31X or RJ38X jack before the in-house phone system to support line seizure (see *Figure 8*). Install the jack on the street side of the phone switch, wired ahead of any PBX equipment. Line seizure provides for a temporary interruption of normal phone usage while the communicator transmits data. After installation, confirm the panel seizes the line, acquires dial tone, reports correctly to the receiver, and releases the phone line to the in-house phone system.

Figure 8: RJ31X Wiring



1 - RJ31X Jack

2 - (TIP)

3 - (RING)

4 - TelCo Connector Block

5 - Outside TelCo

6 - Premises telephone

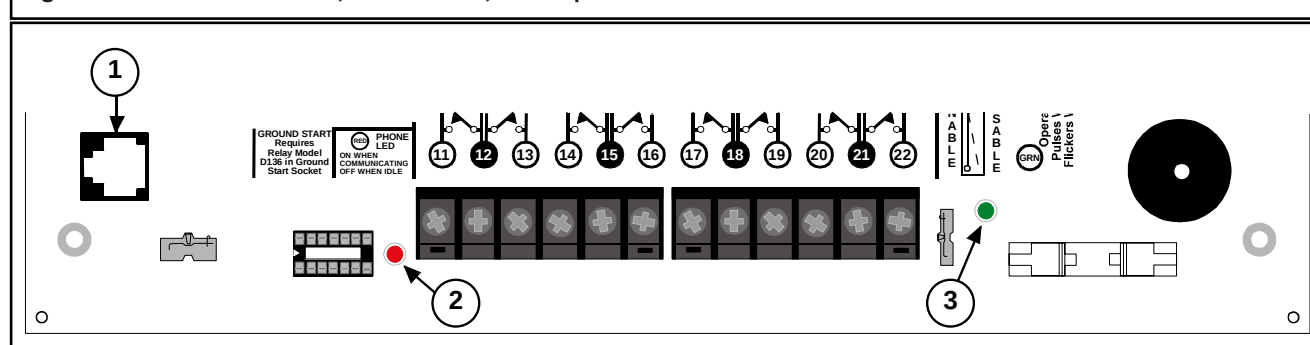
6.4 Phone Cord Connection

Connect one end of a D161 (2.1 m [7 ft.]) or a D162 (61 cm [2 ft.]) Telephone Cord to the TELCO cord connector located on the bottom left corner of the panel. See *Figure 9*. Connect the other end to the RJ31X or RJ38X jack.



To supervise the phone cord, use an RJ38X jack.

Figure 9: Phone Connector, Phone LED, and Operation Monitor LED Locations



1 - Telephone cord connector

2 - Phone LED (red)

3 - Operation Monitor LED (green)

6.5 Phone LED (Red)

The red Phone LED lights when the panel seizes the phone line and remains lit until the panel returns the phone line. See *Figure 9* for the location of the red LED.

6.6 Operation Monitor LED (Green)

The green Operation Monitor LED indicates the operation of the central processing unit (CPU). When the CPU is operating normally, the LED flashes 0.5 second on, 0.5 second off.

This green LED also serves as a ring indicator. The LED is located on the lower right side (see *Figure 9*). When there is ring voltage on the phone line (the phone is ringing), the green LED flickers at a faster rate for the duration of each ring. Ring voltage must reach a minimum of 45 VAC before the system detects it.

6.7 Dialing Format

The system can be programmed to use DTMF or pulse dialing. See *Phone Parameters* in the *D9412G/D7412G Program Entry Guide*.

6.8 Phone Line Monitor

The control panel has a built-in phone line monitor that tests the phone line for voltage. If the D928 Dual Phone Line Switcher is used to connect two phone lines to the panel, the panel monitors both lines. The normal voltage on a telephone line is approximately 48 VDC (24 VDC for some phone systems). The phone line monitor senses trouble when voltage on the line falls below 3.0 VDC.

If the monitor senses trouble, it starts a programmable phone line trouble timer, which continues to run as long as the monitor senses trouble. It resets to zero when the panel senses a normal line. If the timer reaches the delay time in the Phone Supervision program item, it begins a phone line trouble response. Programming determines what the response is. See *Phone Parameters* in the *D9412G/D7412G Program Entry Guide*.

Any time the D9412G/D7412G uses the phone line to make a call or is on-line with RPS, it ceases to monitor the phone line during this process. Once the phone line on the D9412G/D7412G is no longer in use, it begins once again to monitor the phone line.

Bad Line May Test OK: The telephone line monitor uses voltage levels to test the status of the phone line. In some instances, a given telephone line may be out of service without affecting the voltage on the line. The phone line monitor cannot recognize this trouble condition.

6.9 Called Party Disconnect

Telephone companies provide “called party disconnect” to let the called party terminate a call. The called party must go on hook (hang up) for a fixed interval before a dial tone is available for a new call. This interval varies with telephone company equipment. D9412G/D7412G firmware allows for “called party disconnect” by adding a 35-second, “on hook” interval to the dial tone detect function. If the panel does not detect a dial tone in 7 seconds, it puts the phone line on hook for 35 seconds to activate “called party disconnect,” goes off hook, and begins a 7-second dial tone detect. If no dial tone is detected, the panel dials the number anyway. Each time the number is dialed, the panel records this as an attempt.

6.10 Communication Failure

After two attempts to reach the receiver, a COMM FAIL PH # event is generated. This event is sent first, followed by the original event.

After ten attempts to reach the receiver, the control panel goes into communication failure. The control panel clears any reports in its phone buffer and COMM FAIL RTE # event is generated, which appears in the display at command centers. A trouble sounder can be programmed to annunciate at the command centers.

One hour after the COMM FAIL RTE # is generated, the panel attempts to send this event, if programmed. If the COMM FAIL RTE # event is the only event in the queue and is unable to reach the central station, the command centers do not turn on the trouble sounder again.

If the D928 Dual Phone Line Switcher is used, the D9412G/D7412G makes a total of ten attempts before going into communication failure.

6.10.1 Enhanced Communication

The D9412G/D7412G Control Panels can transmit events over the SDI Bus to a D9133TTL-E Network Interface Module. For more information on the enhanced communications capabilities, refer to *RADX AUX1* in the *D9412G/D7412G Program Entry Guide*.

6.11 Ground Start

Some telephone systems require a momentary ground input to initiate dial tone. To interface with a ground start system, insert a D136 Plug-in Relay into the GND START socket and set the phone monitor select jumper to the **GND START** position.



Ground start is not for use in NFPA applications. You cannot use ground start telephone systems for NFPA Central Station Protective Signaling or Remote Station applications.



Terminal 10 must be connected to an earth ground for ground start phone systems to operate properly on the D7412G/D7412G.

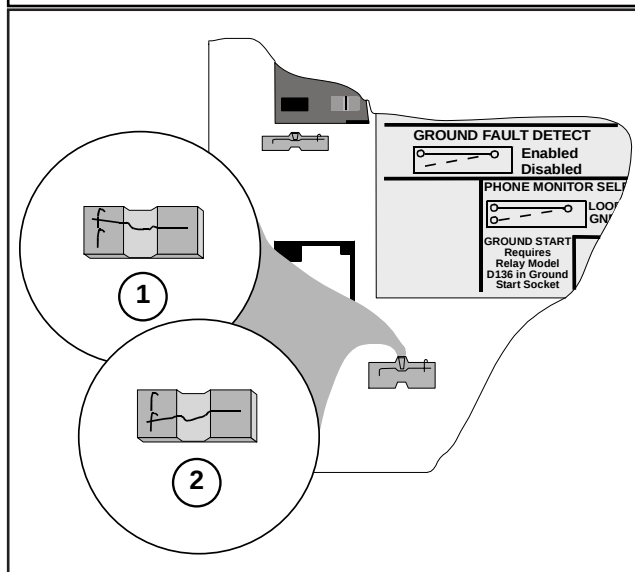
6.11.1 Relay Installation

Power down the system before inserting the D136 Relay into the GND START socket. The relay socket is in the lower left corner as shown in *Figure 7*. The plug-in relay is shorter than the socket it plugs into, and can be installed in either the left or right end of the socket.

Do Not Rely on Relay Labelling: Do not rely on the labelling to install D136 Relays. Check for the side with three pins that go on the top side on the socket.

Incorrect insertion does not damage the relay or the panel; however, the related circuits do not function properly. Do not insert a ground start relay if the ground start jumper is in the loop start position (see *Figure 10*).

Figure 10: Phone Monitor Select



1 - Loop start position

2 - Ground start position

6.12 Phone Monitor Select Jumper

The phone monitor select jumper is located above the TELCO connector point at the lower left corner of the panel. Set it in the GND START position (see *Figure 10*).

6.12 D928 Dual Phone Line Switcher

6.12.1 Description

The optional D928 Dual Phone Line Switcher allows the panel to transmit reports over two separate phone lines. The panel monitors both lines. If a signal is generated and the panel senses that a line is bad, then it attempts to use the other phone line to send the message. If trouble is detected, the panel keeps the faulty phone line in memory.

Set the Ring Count Above 2 on Answering Machines:

The panel's RPS line monitor feature may not operate correctly if an answering machine with a ring count of less than two rings is connected to a phone line used by the D928 Module.

6.12.2 Operation

See *Phone* in the *D9412G/D7412G Program Entry Guide* for phone supervision and reporting options. To use the D928, set the **Two Phone Lines** prompt to **Yes**.

When the D928 is installed, the panel alternates between Phone Line 1 and Phone Line 2 to send its first report. For example, on day one the panel first attempts to communicate on Phone Line 1. On day two, the panel switches and attempts to communicate on Phone Line 2.



Any time the panel is reset or powered down/up, the next reported event always attempts to call out on Phone Line 1 first.

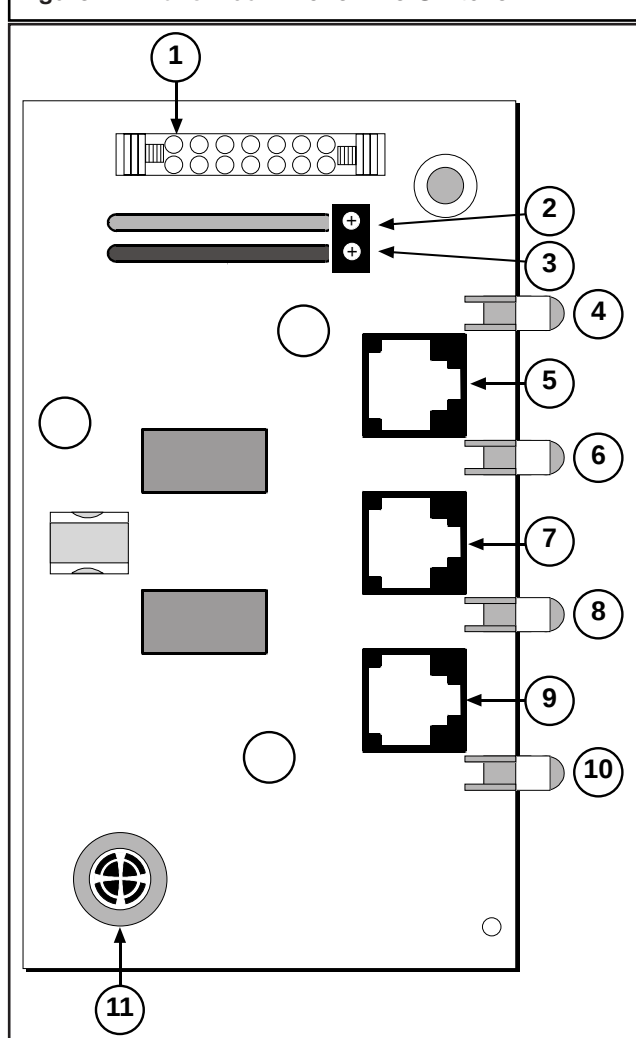


If Phone Line 2 is not in service on "Day 2", the panel switches to the primary phone line to send the report.

With the D928 Dual Phone Line Switcher installed, the panel uses two phone lines (primary and secondary) to dial up to four phone numbers.

When using a primary and backup device within a Route Group #, the panel makes two attempts on the primary phone line using the Primary Device # as programmed. If these two attempts fail, the panel switches to the secondary phone line using the Backup Device # as programmed. This pattern continues for a total of ten attempts. After ten unsuccessful attempts, the panel generates a Comm Fail event for the given Route Group #.

Figure 11: D928 Dual Phone Line Switcher



- 1 - Connect to ACCESSORY CONNECTOR with ribbon cable.
- 2 - Green to Terminal 1
- 3 - Black to Terminal 9
- 4 - AC Power LED (green)
- 5 - Phone jack to primary phone line - RJ31X
- 6 - Primary Fail LED (yellow)
- 7 - Phone jack to secondary phone line
- 8 - Secondary Fail LED (yellow)
- 9 - Phone jack to TELCO Connector
- 10 - Communications Fail LED (yellow)
- 11 - Buzzer

6.12.3 Watchdog Feature

The D928 Watchdog circuit monitors the panel's CPU for proper operation. If the CPU fails, the buzzer on the D928 sounds, as does the sounder on the panel. This sounder cannot be reset while the CPU is failed. The D928 stops sounding only when the panel's CPU returns to normal operation.

6.12.4 Installing the D928

Mounting

Mount the D928 on the lower right side of the enclosure using the screws provided with the switcher.

Wiring

The D928 has two flying leads. The green lead monitors AC power and the black lead provides surge protection for the two incoming phone lines. The black lead is also the ground reference for the AC PowerLED.

1. Connect the green lead from the D928 to Terminal 1.
2. Connect the black lead from the D928 to Terminal 9.

Phone Connections

1. Plug one end of the ribbon cable (provided with the D928) into J4 on the D928. Plug the other end into the accessory connector on the panel.
2. Plug one end of the D162 (61 m [2 ft.]) phone cord provided with the D928 into J3 on the D928. Plug the other end into TELCO on the panel.
3. Plug one end of a D161 (2.1 m [7 ft.]) or a D162 [61 cm (2 ft.)] phone cord into J1 on the D928. Plug the other end into the RJ31X or RJ38X for the primary phone line.
4. Plug one end of a D161 or D162 phone cord into J2 on the D928. Plug the other end into the RJ31X or RJ38X for the secondary phone line.



There is an issue regarding D928 Modules purchased before November 19, 2001.

If you installed a D928 on a Bosch Security Systems D9412G or D7412G, test for the condition by disconnecting AC power from the panel (battery must remain connected) and observing the green LED. If this LED glows dimly, the module can be replaced at no charge (contact Customer Service at (800) – 289-0096).

6.12.5 D928 Status LEDs

Four LEDs mounted on the front edge of the D928 Module show the status of AC power for the panel, the status of the two phones lines, and communication failure (see *Figure 11*). When programmed and operating normally, only the green AC power status LED is lit.

AC Power LED

The green AC Power Status LED lights when there is AC power at Terminals 1 and 2 on the panel.

Phone Line Fail LEDs

Two yellow Phone Line Status LEDs (one for the primary phone line, one for the secondary phone line) light when phone line voltage drops below 3.0 VDC. The panel monitors the faulty phone line for the programmed interval before indicating a trouble condition. See *Section 6.8 Phone Line Monitor* for a description of phone line monitor operation.

Communication Failure LED

The yellow Communication Failure LED lights when the system is in communication failure. The LED darkens when communication restores. See *Section 6.10 Communication Failure*.

Notes:

7.0 On-Board Points

7.1 Description Terminals (11) to (22)

The panel provides eight on-board points. Each point functions independently and does not interfere with the operation of the others. The panel monitors the sensor loops for normal, shorted, or open conditions between an input terminal (11, 13, 14, 16, 17, 19, 20, or 22) and any of the point common terminals (12, 15, 18, and 21).

Programming for the point determines how the panel responds to those conditions. See the *D9412G/D7412G Program Entry Guide* for point programming options. The panel also monitors the sensor loops for ground fault conditions if S4 is latched (ground fault detect enabled).

7.2 Point Sensor Loops

When wiring the on-board points (see *Figure 12*), install a 1 k Ω resistor at the far end of the sensor loop to provide a reference for supervision. Dry-contact sensing devices can be connected in series (normally-closed) and/or in parallel (normally-open) to any of these loops.

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. The total resistance for the wire length and contacts, minus the end-of-line (EOL) resistor, must not exceed 100 Ω .

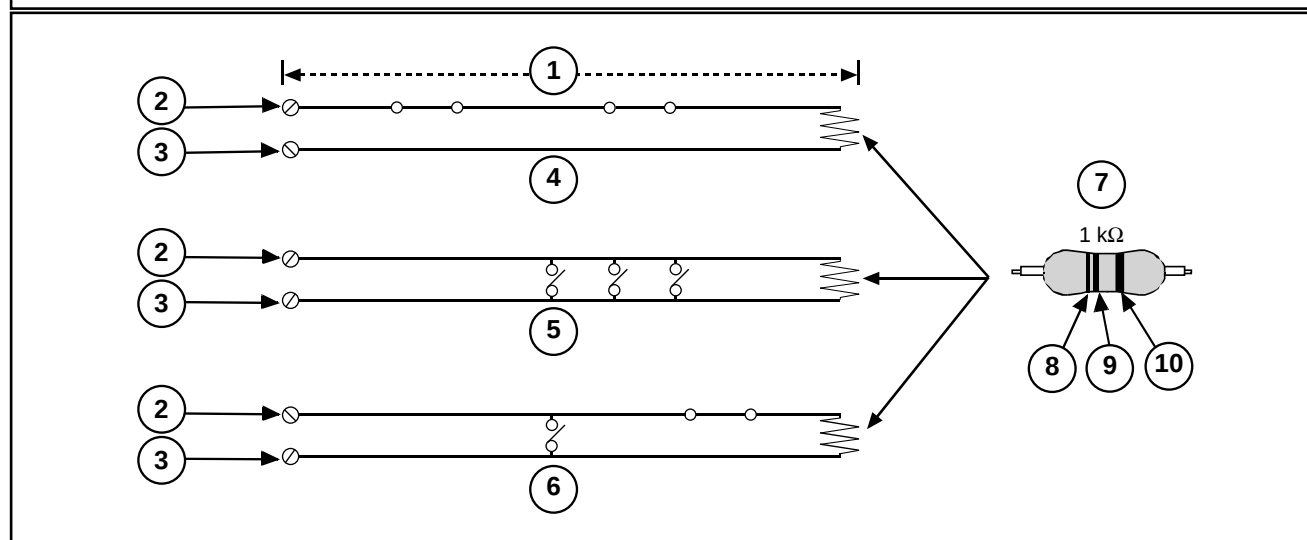
7.3 Point Parameters

The condition of on-board Points 1 to 8 is determined by measuring the voltage across the point input terminal and one of the common terminals. The sensor loops must be connected and the 1 k Ω EOL resistor in place.

Table 11: Point Parameters

Loop	Voltage Range
Open	Greater than 3.7 VDC, but less than 5.0 VDC.
Normal	Greater than 2.0 VDC, but less than 3.0 VDC.
Shorted	Greater than 0.0 VDC, but less than 1.3 VDC.

Figure 12: On-board Point Sensor Loop Wiring



- 1 - 100 Ω maximum
- 2 - Point input terminal
- 3 - Common
- 4 - Normally-Closed Contacts (NCC)
- 5 - Normally-Open Contacts (NOC)
- 6 - Combination: Normally-Open Contacts and Normally-Closed Contacts (NONC)
- 7 - Bosch Security Systems' D105F or F105BL (UL Listed burglar applications EOL resistor)
- 8 - Brown
- 9 - Black
- 10 - Red

7.4 Point Response Time

The panel scans both on-board and off-board point sensor loops every 300 milliseconds. The Debounce Count program item in the *Point Assignment* section determines point response time by setting the number of scans that a point must be faulted before the panel initiates an alarm.

The debounce count can range from 2 to 15; therefore, point response time ranges from 600 milliseconds to 4.5 seconds. The Bosch Security Systems default for debounce count is 2.



Increasing debounce may cause missed alarms.

If you increase the debounce count, detection devices may go into alarm and reset without exceeding the point response time.

Bosch Security Systems recommends a debounce count of 2 for all points except for Interior Follower points, which should be programmed as a 3. In addition, door points connected to a D9210B Access Control Interface Module should be programmed with a debounce of 4.

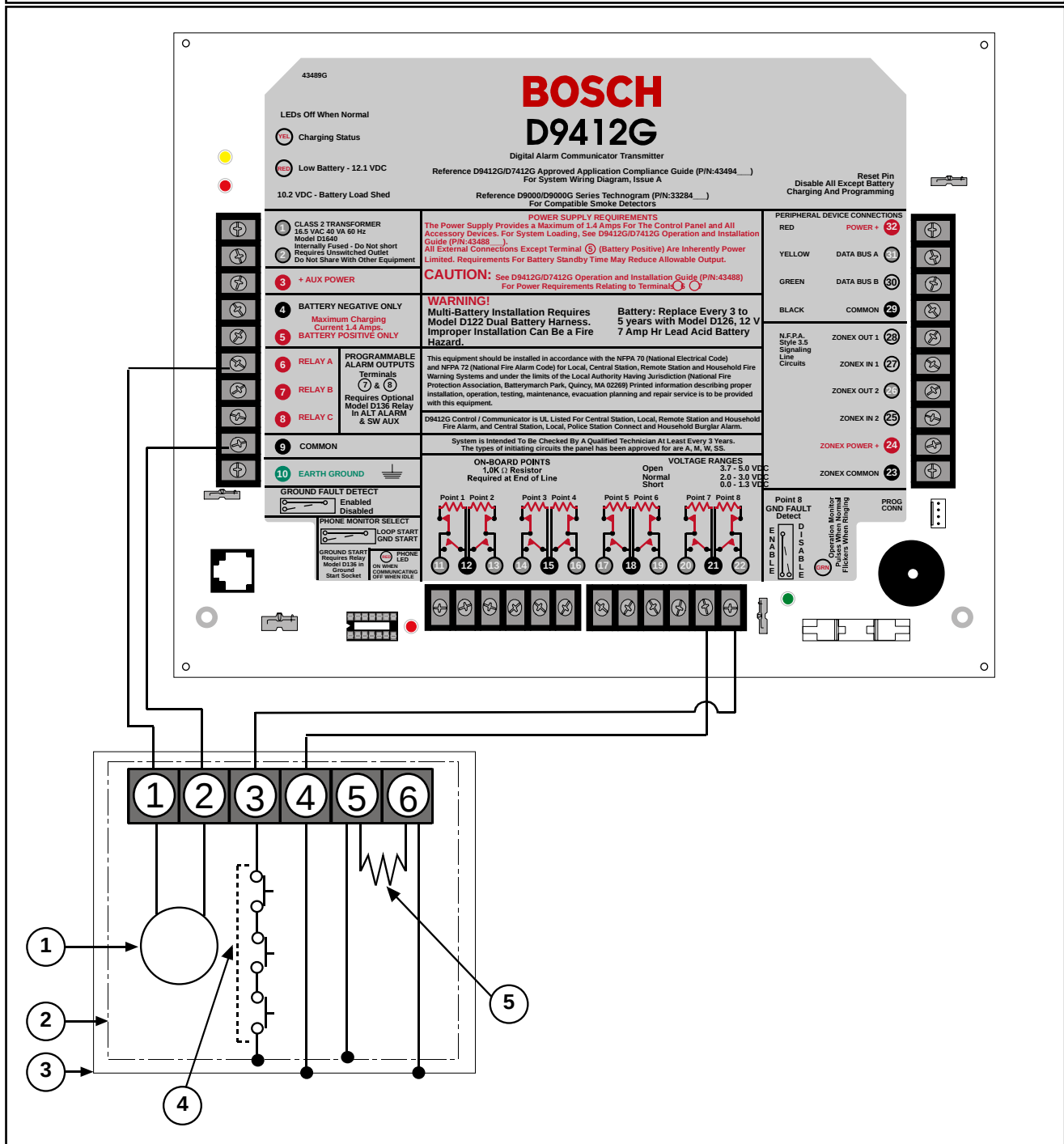
7.5 Wiring Information for Installations Using the Ademco AB-12 Bell/Housing

1. Disconnect the wire jumper from Terminal 4 to the inner housing of the Bell Box to prevent a ground fault condition.
2. Connect wiring between the control and Bell Box as shown in *Figure 13*.

To use the AB-12 Bell/Housing, place the S3 switch in the disabled (open) position. The EOL used in the AB-12 Bell/Housing must be a 220 k Ω , 0.5 W resistor.

3. Program Point 8 as 24-hour, ALARM on open and short. (PT TYPE 0, PT RESPONSE 0).

Figure 13: Wiring for Installation Using the Ademco AB-12 Bell/Housing



- 1 - Bell
- 2 - Inner bell box lining
- 3 - Outer bell box
- 4 - Bell tampers
- 5 - 220 kΩ 0.5 W EOL

Notes:

8.0 Off-Board Points

8.1 Point (ZONEX) Bus D9412G

Terminals 23 to 28

D7412G Terminals 27 to 28

The D9412G can use Point of Protection Input Transponder (POPIT) Modules to provide a maximum of 238 off-board points, bringing the total number of points the D9412G can monitor to 246. The D7412G provides up to 67 off-board points, bringing the total number of points the D7412G monitors to 75. Each off-board point requires a POPIT Module.

POPITs connect to supervised two-wire data expansion loops run from POPIT to POPIT throughout the premises. Data expansion loops connect to a D8125 Point of Protection Expander (POPEX) Module. POPEX Modules connect to the point bus on the panel, Terminals 23 and 24 for power (3 and 9 on the D7412G), and Terminals 25 and 26 (D9412G only), or 27 and 28 for data.

If a programmed POPIT is disconnected from the expansion loop, a missing condition appears immediately and the event is logged. The missing condition may also be transmitted to a central station or printed to an on-site printer, if programmed to do so. See the *D9412G/D7412G Program Entry Guide* for programming options.

Extra Point events are generated when a POPIT is connected to the data expansion bus but does not have a Point Index assigned to it. Shown below are instances when an Extra Point event is or is not generated.

If a POPIT is connected to the data expansion bus but does not have a Point Index assigned to it and...

- the data expansion bus becomes disconnected, no trouble condition is annunciated or displayed at command centers and the Extra Point event is not generated. (However, POPITs programmed with a Point Index immediately go missing.)
- the data expansion bus restores to a normal condition from an open, a trouble condition annunciates and displays at the command center. In addition, an Extra Point event is generated, logged, and may be programmed to be sent to the central station or printed to an on-site printer.
- the point input goes from an electrically normal state to an open or shorted state, the command center neither annunciates nor displays a trouble condition. No Extra Point event is generated.

- the system is presently in a Service Walk Test and the point input goes from an electrically normal state to an open or shorted state, the command center neither annunciates nor displays a trouble condition. However, an Extra Point event is logged and printed to an on-site printer, if programmed. Note: The Service Walk Test never displays a points' electrical state as 'Extra'.

If the positive or negative leg of the data expansion bus is shorted to earth ground and Ground Fault Detect is enabled, a general Ground Fault event is generated.

If the positive or negative leg of the data expansion bus becomes disconnected, all POPITs beyond the break report as a missing condition.

If the data expansion bus becomes shorted, all POPITs report a missing condition and a Pt Bus Trouble event is generated. When the data expansion bus restores from a shorted condition, a Pt Bus Restore event is generated, and if there are POPITs connected to the data expansion bus without a Point Index assigned to it, an Extra Point event is generated.

If the positive or negative leg of the data expansion bus becomes shorted to a Common terminal on the D7212G, all POPITs report a missing condition. In addition, a Pt Bus Trouble event is also generated.

If Terminal 28 becomes shorted to a Common terminal, a Pt Bus Trouble event is not generated. However, a short between Terminal 27 and a Common terminal generates a Pt Bus Trouble event and the command center displays **SERVZ ZONEX 1**. If Terminal 27 and Terminal 28 are shorted together, a Pt Bus Trouble event is generated and the command center displays **SERVZ ZONEX 1**.

The D7212G responds to missing point conditions based on how the points are programmed and which armed state the area is in the point is assigned to. For example, if an interior motion detector point went missing during a disarmed state, a Missing Trouble event is generated. However, if the point went missing while the area was Master Armed, a Missing Alarm event is generated. Non-fire, 24-hour points always generate a Missing Alarm event whereas Fire points always generate a Missing Fire Trouble event.

8.2 D8125, D8127 and D9127 POPIT Modules

D8127 and D9127 POPITs use the D8125 POPEX Module to report to the panel. Each D8125 supports up to 119 POPIT points. Connect two D8125 Modules to the D9412G to bring the combined total number of POPIT and on-board points to 246. Points 9 to 127 connect to the first POPEX Module. Points 129 to 247 connect to the second POPEX Module. The D9412G reserves Points 128 and 248 for internal use. The panel only annunciates activity for each POPIT, not each detection device connected to the sensor loop.

There are two versions of the D8127 and D9127 Modules. Both module enclosures are made of UL Listed fire resistant material. D8127T and D9127T Modules contain tamper switches. D8127U and D9127U Modules include untampered covers. Unless the module is mounted in a tampered enclosure, UL requires D8127T and D9127T Modules for certificated accounts.

8.2.1 Listings

The D8125 POPEX and the D8127 and D9127 POPIT Modules are UL Listed for Local or Police Connected Burglar Alarm, Central Station Burglar Alarm, Household Burglar Alarm, Central Station Fire, Local Fire, Remote Station Fire, Household Fire, and Electrically Actuated Transmitter Applications.

See the *D9412G/D7412G Approved Applications Compliance Guide* to determine the required equipment and enclosures for the application.

8.3 Installing the D8125 POPEX Module



For information on the Multiplex Bus Interface, see the *D8125 Multiplex Bus Interface Operation and Installation Guide*.

Save the POPIT Label Sheets: The D8125 is packaged with two sets of POPIT label sheets. One is marked for use with the D9412/D9112. Save this set for use with the D9412G/D7412G; it is used later to label the POPITs.

8.3.1 Mounting

To install the D8125 in the enclosure with the panel:

1. Align the D8125 POPEX Module with any of the four mounting locations in the enclosure (see *Figure 2*).
2. Using the screws provided with the module, secure it in the enclosure.

8.3.2 Wiring the D8125 to the Control Panel

To wire one or two D8125 Modules to the panel (see *Figure 14* and *Figure 15*):

Power Down First: Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.

For Points 9 to 127 (9 to 75 on D7412G):

1. Connect the GND terminal of the D8125 to Terminal 23 on the D9412G or to Terminal 9 on the D7412G.
2. Connect the OUT terminal of the D8125 POPEX Module to ZONEX IN 1, Terminal 27.
3. Connect the IN terminal of the D8125 POPEX Module to ZONEX OUT 1, Terminal 28.
4. Connect the AUX terminal of the D8125 to Terminal 24 on the D9412G or to Terminal 3 on the D7412G.

For Point numbers from 129 to 247 (D9412G only):

1. Connect the GND terminal of the D8125 to Terminal 23.
2. Connect the OUT terminal of the D8125 POPEX Module to ZONEX IN 2, Terminal 25.
3. Connect the IN terminal of the D8125 POPEX Module to ZONEX OUT 2, Terminal 26.
4. Connect the AUX terminal of the D8125 to Terminal 24.

See *Section 8.3.4 Wiring Data Expansion Loops to POPEX Modules* for instructions on connecting POPITs to the D8125 POPEX Module.

8.3.3 Wiring POPITs to the Data Expansion Loop

Use one 2-wire data expansion loop or distribute the POPITs on up to three loops. Setting DIP switches on the POPIT Modules assigns them to point numbers. See *Section 8.3.6 POPIT Module Point Assignments*.

Review *Section 3.6.2 Install and Wire Detection Devices* to determine if shielded wire is required. Determine the required wire gauge for the length of each data expansion loop using *Table 12*.

Table 12: Data Expansion Loop Wire Specifications

Maximum Length of All Data Expansion Loops Combined	
AWG	Length in Meters (Feet)
22	548 (1800)
20	881 (2890)
18	1402 (4600)
16	2231 (7320)
14	3551 (11,650)

Figure 14: Connecting the D8125 POPEX to the D9412G Panel

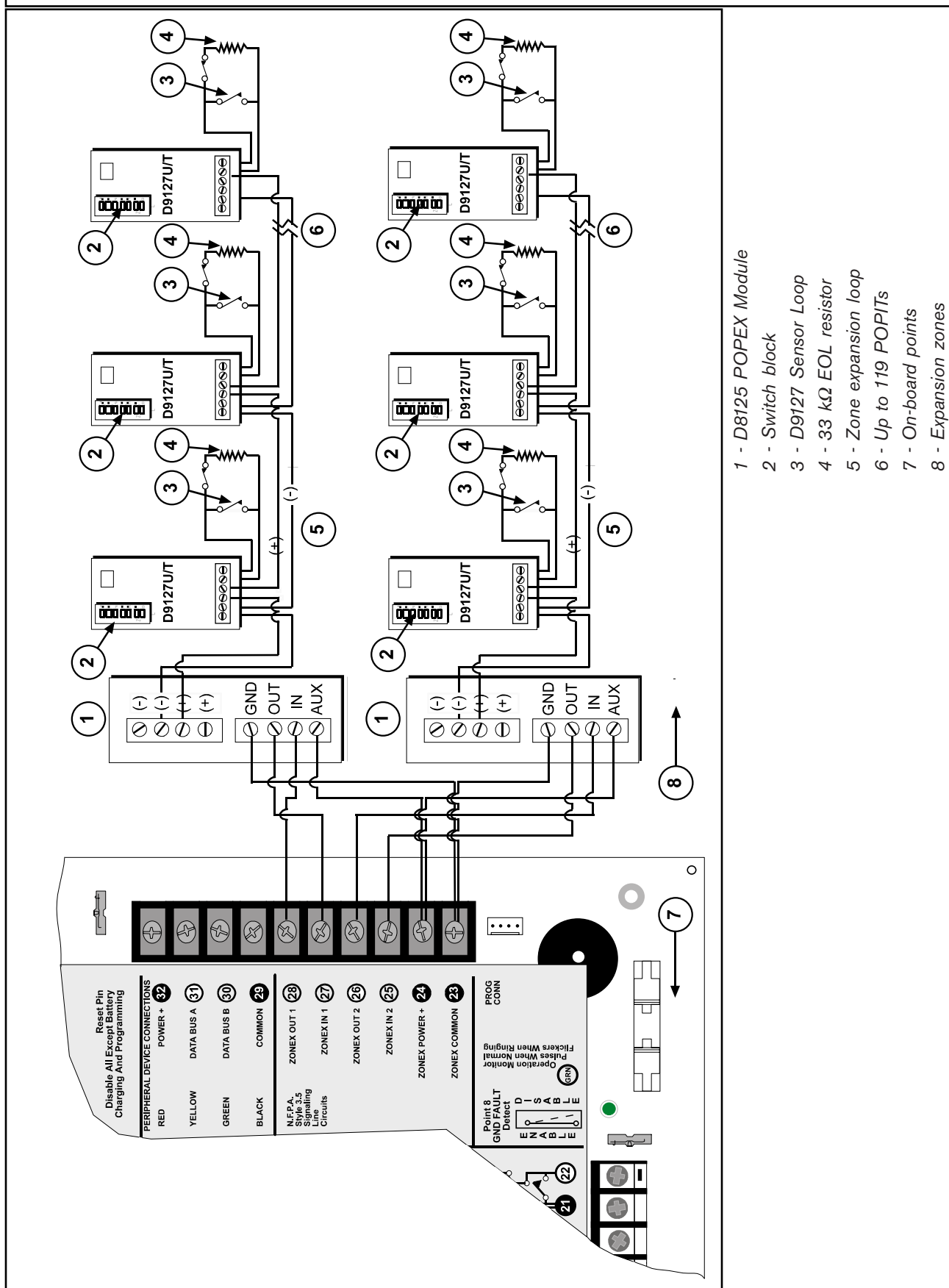
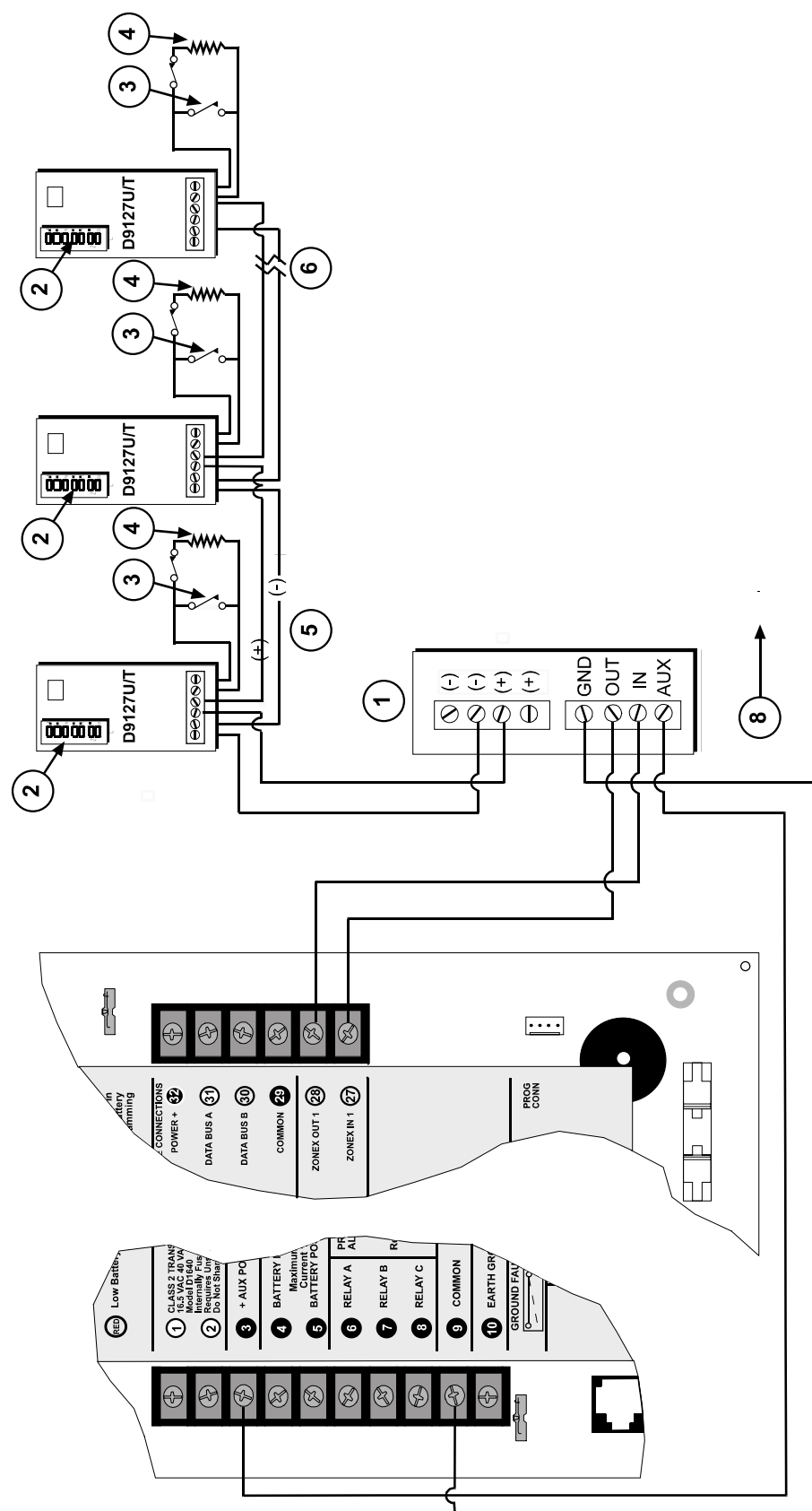


Figure 15: Connecting the D8125 POPEX to the D7412G Panel



- 1 - D8125 POPEX Module
- 2 - Switch block
- 3 - D9127 Sensor Loop
- 4 - 33 k Ω EOL resistor
- 5 - Zone expansion loop
- 6 - Up to 67 POPITs
- 7 - Expansion zones

Combine Data Expansion Loops: The maximum lengths shown in *Table 11* are for all data expansion loops connected to the same POPEX Module combined.

Wiring POPITs Together: Do **not** connect POPITs to each other in series or with a T-tap. Doing so may cause random missing POPIT conditions.

To connect POPITs to one another in parallel.

1. Connect the positive (+) data terminal from one POPIT to the positive (+) data terminal on the next POPIT.
2. Connect the negative (-) data terminal from one POPIT to the negative (-) data terminal on the next POPIT.
3. Repeat Steps 1 and 2 to connect all POPITs to the expansion loop. It is not necessary to wire the POPITs in any particular order on the loop. The switch setting on each POPIT assigns it a point number, regardless of its physical location.



Before installing the POPITs, make sure the resistance on the data expansion loop is no more than 40 Ω .

Three-inch Clearance for Tampered POPITs: Mount tampered POPIT Modules at least 7.6 cm (3 in.) apart to prevent the tamper magnets from interfering with each other.

8.3.4 Wiring Data Expansion Loops to POPEX Modules

There are two positive (+) and two negative (-) data expansion loop terminals on each POPEX Module. Remember, a maximum of 119 POPITs can be connected to one D8125 on the D9412G; 67 for the D7412G (see *Figure 14* and *Figure 15*).

To connect the data expansion loops to the D8125 POPEX Module:

1. Connect the positive (+) data terminal from the first POPIT on the data expansion loop to one of the D8125's positive (+) terminals.
2. Connect the negative (-) data terminal from the first POPIT on the data expansion loop to one of the D8125's negative (-) terminals.

8.3.5 POPIT Sensor Loops

The number of normally-open and/or normally-closed detection devices each sensor loop can supervise is limited only by the resistance on the loop. Resistance on each sensor loop must be less than 100 Ω not including the EOL resistor.

Certain UL and NFPA applications can limit the number of detection devices. Consult the appropriate UL or NFPA standards.

POPITs detect open, shorted, normal, and grounded circuit conditions on their sensor loops. They transmit the condition of their loops to the panel. A ground on the sensor loop reports as a general system ground fault condition (see *Ground Fault* in the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide*). Each POPIT is programmed and transmits to the panel separately.

Terminate each POPIT sensor loop with the 33 k Ω EOL resistor (D106F) included with each POPIT.

Use a twisted-pair wire (six twists per foot) in all POPEX/POPIT installations for both the data expansion loop wiring and the POPIT sensor loops. Run wires away from AC sources to prevent AC induction. If a noisy environment is suspected, use shielded cable. See *Section 8.3 Installing the D8125 POPEX Module*.

8.3.6 POPIT Module Point Assignments

Six switches on each POPIT assign the module to a point number. POPIT switch settings are found in *Point Assignment* in the *D9412G/D7412G Program Record Sheet*. See *Figure 16*.



For the D9412G, Points 73 to 127 and 193 to 247 must use the D9127 POPITs. Points 9 to 72 and 129 to 192 can use either D8127 or D9127 POPITs.

For the D7412G, Points 9 to 72 can use either D8127 or D9127 POPITs; however, D9127 POPITs must be used for Points 73 to 75.

8.3.7 Program Record Sheet

The first column on the *D9412G/D7412G Program Record Sheet* contains the switch settings for the D8127 POPITs. Switches are numbered 1 to 6, left to right on the D8127 POPIT. Switches are numbered 0 to 6, left to right on the D9127 POPIT. Set the switches whose numbers appears in the setting to the ON position. Set the switches with a dash (-) in the switch position to the OFF position. See *Figure 16*.

The second column contains the translation of the point number into the ZONEX format. See *Point User Flag* in the *D9412G/D7412G Program Entry Guide* for an explanation of this feature.

The third column contains the point number as it is displayed at command centers.

The fourth column contains the point index. See *Point Index Parameters* in the *D9412G/D7412G Program Entry Guide* for an explanation of the point index.

The fifth column of the *Program Record Sheet* shows the area the point is assigned to.

The sixth column shows the debounce count for the point. See *Debounce Count* in the *D9412G/D7412G Program Entry Guide*.

The seventh column shows the BFSK report code, which is the point number reported for this point when the panel is using the BFSK format.

The eighth column contains the text displayed at command centers for the point. The text is transmitted to the receiver when the panel is using the Modem IIIa² format.

POPIT Labels

D9412G off-board points are numbered 9 to 127 and 129 to 247 (D7412G uses Points 9 to 75 only). The D9412G reserves Points 128 and 248 for internal use. POPITs must be connected for Points 129 to 247 to expansion loops connected to POPEX #2.

Two sheets of peel-off POPIT labels are supplied with the D8125 POPEX Module. Use the sheet marked “Bank1” for Points 9 to 127. Use the sheet marked “Bank2” for Points 129 to 247.

Each label has two parts. Place the smaller part (with only the point number) on the chip. Place the larger part (with the switch settings) on the base of the POPIT. Set the switches and cover the POPIT.

Do not program two POPITs for the same point number. After programming all the points, perform a Service Walk Test. The *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* contains instructions for performing a Service Walk Test. If a point does not test, check the programming for a duplicated address.

Walk Test Does Not Show Extra Points: Only the Service Walk Test shows extra points. If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it can create both missing and extra points. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number test correctly.

Figure 16: Program Record Sheet

D9412G/D7412G Program Record Sheet RADXPNTS Handler							EN 25
Default values are shown in () or ibold							
Point Assignments (001 through 040)							
POPIT Switch Setting	Translation	Point #	Point Index	Area Assign	Debounce	BFSK/Relay	Custom Point Text
0 1 2 3 4 5 6	100	001	(3) _ _	(1) _ _	(2) _ _ _	(1) _ _ _	P1 FIRE _ _ _ _ _
	200	002	(1) _ _	(1) _ _	(2) _ _ _	(2) _ _ _	P2 PANIC _ _ _ _ _
	300	003	(25) _ _	(1) _ _	(2) _ _ _	(3) _ _ _	P3 DELAY _ _ _ _ _
	400	004	(13) _ _	(1) _ _	(2) _ _ _	(4) _ _ _	P4 FOLLOW _ _ _ _ _
	500	005	(7) _ _	(1) _ _	(2) _ _ _	(5) _ _ _	P5 INSTANT _ _ _ _ _
	600	006	(7) _ _	(1) _ _	(2) _ _ _	(6) _ _ _	P6 INSTANT _ _ _ _ _
	700	007	(7) _ _	(1) _ _	(2) _ _ _	(7) _ _ _	P7 INSTANT _ _ _ _ _
	800	008	(7) _ _	(1) _ _	(2) _ _ _	(8) _ _ _	P8 INSTANT _ _ _ _ _
	101	009	_ _ _	(1) _ _	(2) _ _ _	(1) _ _ _	P9 _ _ _ _ _

8.4 D8128D OctoPOPIT Module



Modules D8128, D8128A, or D8128B are not compatible with the D9412G or D7412G. Only use the D8128D OctoPOPIT Module. Using Modules D8128, D8128A, or D8128B can cause intermittent Missing and Restoral Reports.

8.4.1 Description

The D8128D OctoPOPIT Module combines the functions of the D8125 POPEX Module and the D8127/D9127 POPIT Modules to provide eight off-board points in a single module. You can wire both D8128D OctoPOPIT and D8125 POPEX Modules in parallel to the ZONEX Bus terminals on the same panel.

Review *Section 5.0 Power Outputs* to ensure there is enough power for the OctoPOPITs and other powered devices that will be connected to the system.

A maximum of thirty D8128D Modules can be connected to the D9412G Control Panel. A maximum of nine D8128Ds can be connected to the D7412G Control Panel (three points can be used on the last OCTOPopit).

8.4.2 Listings

The D8128D OctoPOPIT Module is UL Listed for Local or Police Connected Burglary Alarm, Central Station Burglary Alarm, Household Burglary Alarm applications, and commercial fire applications (UL 864 and NFPA 72). The D8128D is also suitable for fire supervisory applications, such as indicating circuit supervision (using the D192C/D192G Bell Circuit Supervision Module), sprinkler supervision, and valve tamper protection.

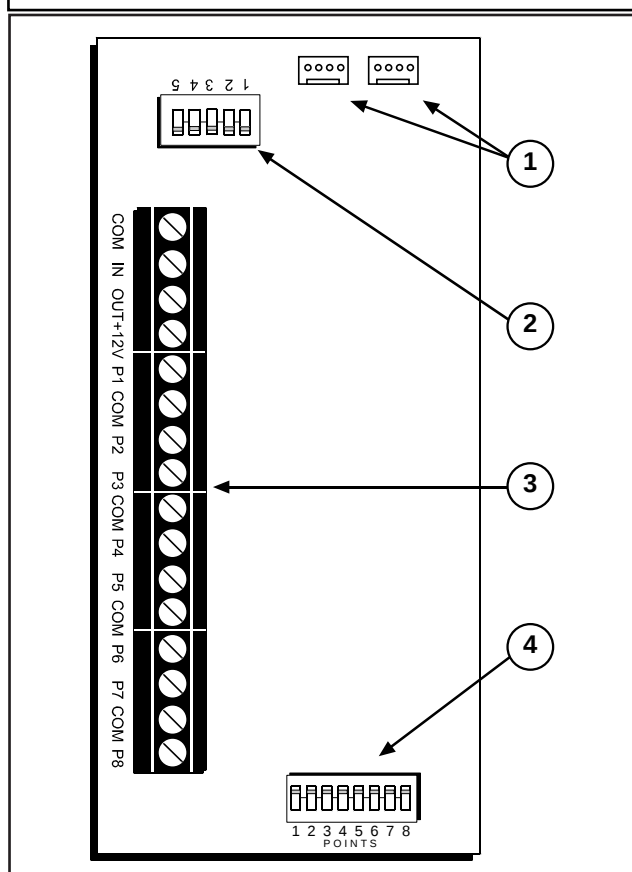
Requirements for Fire Initiation Applications

Non-powered, fire initiating devices such as pull-stations, heat detectors, and UL Listed four-wire smoke detectors can be connected directly to the point inputs on the D8128D.

The D125B Dual Powered Loop Interface Module or the D129 Dual Class "A" Module zone outputs can be connected directly to the point inputs on the D8128D. Use the D125B to connect two-wire smoke detectors. Typically, the D129 is used for connecting waterflow switches.

The D125B or D129 and the OctoPOPIT can be mounted in the same enclosure with the panel or in a separate enclosure connected to the panel's enclosure by conduit not more than 6 m (20 ft.) in length.

Figure 17: D8128D OctoPOPIT Layout



- 1 - Molex Connectors
- 2 - Address DIP switches
- 3 - Terminal strip
- 4 - Point DIP Switches

8.4.3 Installation

Bosch Security Systems recommends the following four-step process for the most effective installation:

1. Set the OctoPOPIT switches.
2. Physically Mount the OctoPOPIT to the enclosure.
3. Wiring the OctoPOPIT.
4. Wiring OctoPOPIT sensor loops.

Each step is explained in more detail in *Sections 8.4.4 through 8.4.7*.

8.4.4 Setting the OctoPOPIT Switches

The D8128D OctoPOPIT has two sets of DIP switches (see *Figure 14*). The DIP switches on the top of the unit (with the terminal strip along the left edge) are used to set the OctoPOPIT's address. The DIP switches at the bottom of the unit are used to enable or disable individual points connected to the OctoPOPIT.

Address Switches

The switches on the D8128D OctoPOPIT set point assignments and line termination. These switches are easier to set before mounting the D8128D in the enclosure.

Switches 1, 2, 3, and 4 assign the OctoPOPIT sensor loops to point numbers on the panel. *Table 13* shows the OctoPOPIT switch settings for point assignments.

Table 13: D8128D OctoPOPIT Switch Settings for D8412G/D7412G

ZONEX 1 Points 9 to 127	D8128D Address Switches					ZONEX 2 Points 129 to 247
	1	2	3	4	5	
9 to 16	ON	ON	ON	ON	*	129 to 136
17 to 24	ON	ON	ON	OFF	*	137 to 144
25 to 32	ON	ON	OFF	ON	*	145 to 152
33 to 40	ON	ON	OFF	OFF	*	153 to 160
41 to 48	ON	OFF	ON	ON	*	161 to 168
49 to 56	ON	OFF	ON	OFF	*	169 to 176
57 to 64	ON	OFF	OFF	ON	*	177 to 184
65 to 72	ON	OFF	OFF	OFF	*	185 to 192
73 to 80	OFF	ON	ON	ON	*	193 to 200
81 to 88	OFF	ON	ON	OFF	*	201 to 208
89 to 96	OFF	ON	OFF	ON	*	209 to 216
97 to 104	OFF	ON	OFF	OFF	*	217 to 224
105 to 112	OFF	OFF	ON	ON	*	225 to 232
113 to 120	OFF	OFF	ON	OFF	*	233 to 240
121 to 127	OFF	OFF	OFF	ON	*	241 to 247
* Line Termination Switch						



For the D8128D OctoPOPITs assigned to Points 121 to 127, 241, and 247, set Point Input Switch 8 to the OPEN position.

D9412G uses Points 9 to 127 on ZONEX 1 and Points 129 to 247 on ZONEX 2.

D7412G uses Points 9 to 75 on ZONEX 1 only.

Switch 5 sets line termination.

- If there is no D8125 POPEX Module connected to ZONEX 1, set switch 5 of only one D8128D connected to those terminals to the **ON** position.

- If there is a D8125 POPEX Module connected to ZONEX 1, set switch 5 of all D8128Ds connected to those terminals to the **OFF** position.
- If there is no D8125 POPEX Module connected to ZONEX 2, set switch 5 of only one D8128D connected to those terminals to the **ON** position.
- If there is a D8125 POPEX Module connected to ZONEX 2, set switch 5 of all D8128Ds connected to those terminals to the **OFF** position.

Point DIP Switches

Each point connected to the D8128D is enabled or disabled by turning its respective DIP switch to the closed or open position, respectively. For example, to disable a device connected to the P3 Terminal (Point 3), move DIP switch number 3 to the OPEN position.

Use the point DIP switches to disable conflicting points, such as when a D9210B Access Control Module must be assigned to a point that falls within the range of the D8128D OctoPOPIT. In this example, a D9210B is assigned to Point 20. On the same system, a D8128D OctoPOPIT is assigned to Points 17 through 24. Moving the DIP switch for Point 4 to the OFF position would effectively disable Point 20, allowing normal operation of the D9210B and the OctoPOPIT.

Terminate each OctoPOPIT sensor loop with a 1 kΩ EOL resistor. Attach a resistor even if you don't enable the loop.

8.4.5 Mounting

The D8128D OctoPOPIT Module can be installed in the enclosure with the panel using standard four-conductor 0.8 mm (22 AWG) wire, or in a separate enclosure (Model D8103, D8103A, or D8109) up to 61 m (200 ft.) from the panel using shielded (recommended) standard four-conductor 0.8 mm (22 AWG) wire. If using the D125B or D129, refer to the *Specifications* section of the *D8128D Installation Guide* for cabling requirements.

For UL Listed systems, mount the D8128D in a tamper-proof enclosure.

To install OctoPOPITs in the panel's enclosure, complete the following procedure. Use the D137 Mounting Bracket to install OctoPOPITs in enclosures with no module-mounting locations available.

- Align the OctoPOPIT module using any of the four mounting locations in the enclosure (refer to *Figure 2*).
- Use the screws provided with the module to secure it in the enclosure.

8.4.6 Wiring OctoPOPITs



Disconnect all power to the control panel before beginning any work with the internal components. Serious injury could result from electrical shock.

Power down the panel by disconnecting the positive (red) battery lead at the battery and unplugging the transformer.

The D8128D can be installed up to 61 m (200 ft.) from the control panel. There are two methods for connecting the D8128D to a control panel: wire the OctoPOPIT to

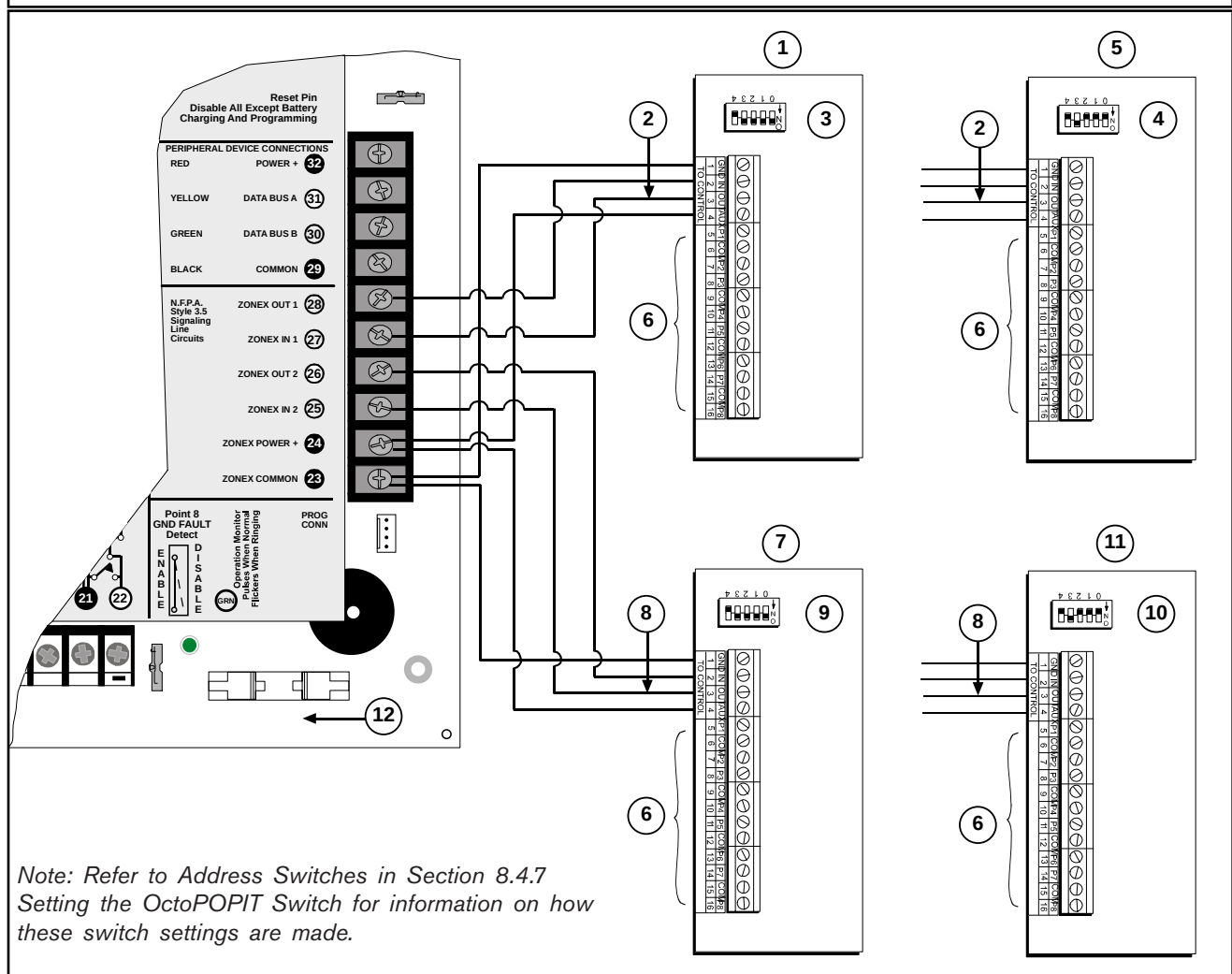
the control panel using the terminal strip on the side of the module or connect using the Molex connectors (P1 and P2).

AC INDUCTION: Avoid installing ZONEX data wires and ZONEX input (sensor loop) wires around any AC conduit/wiring or electrical devices that emit fields of EMI.

Using the Terminal Strip

Refer to *Table 14*, *Figure 18*, and *Figure 19* when connecting the D8128D to the control panel via the OctoPOPIT's terminal strip.

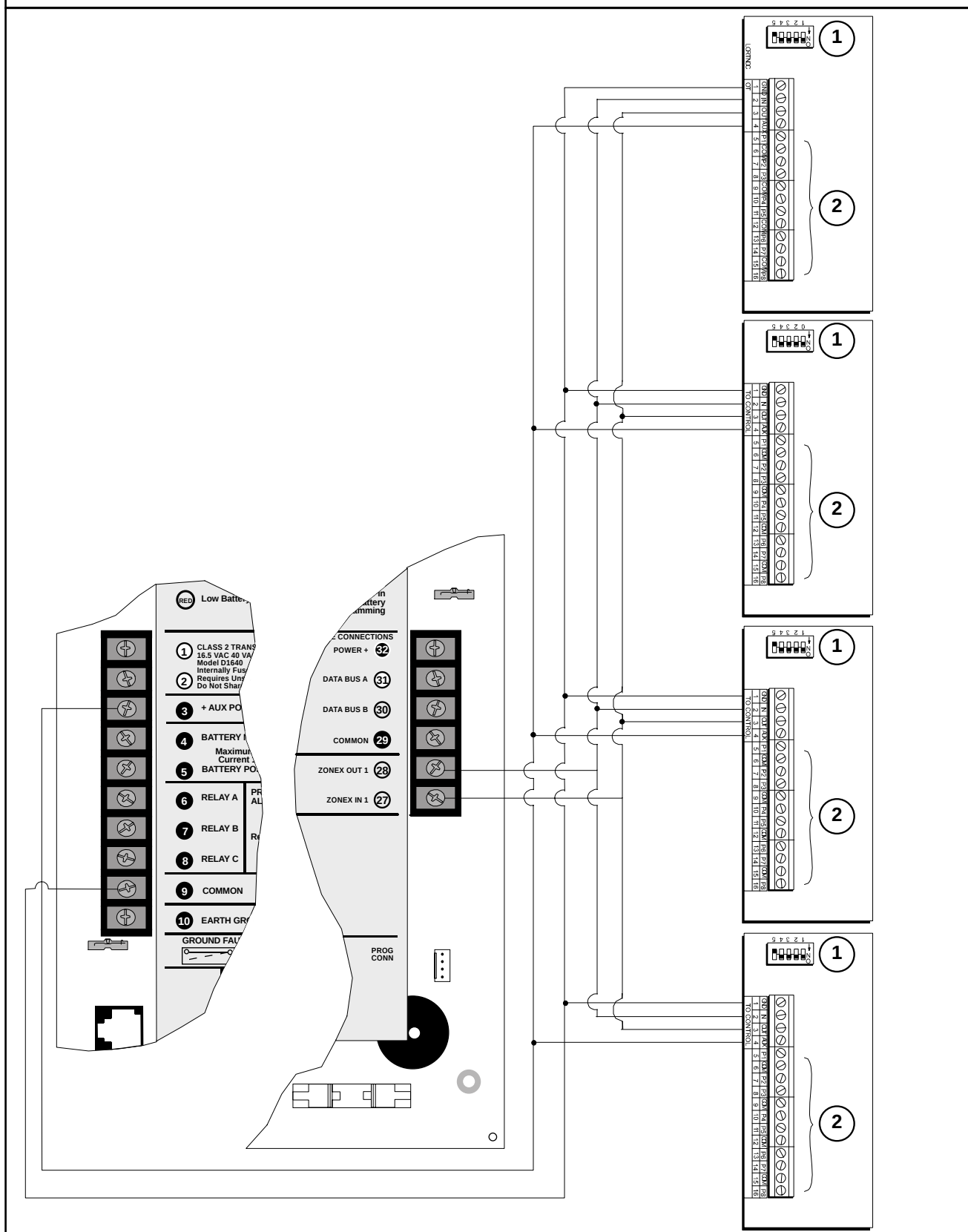
Figure 18: Connecting D8128D OctoPOPITs to the D9412G



- 1 - ZONEX Bus 1, Switch "0" ON (Points 9 to 72)
- 2 - Bus 1
- 3 - First address on ZONEX Bus 1
- 4 - Last address on ZONEX Bus 1
- 5 - ZONEX Bus 1, Switch "0" OFF (Points 73 to 127)
- 6 - Sensor loops

- 7 - ZONEX Bus 2, Switch "0" ON (Points 129 to 192)
- 8 - Bus 2
- 9 - First address on ZONEX Bus 2
- 10 - Last address on ZONEX Bus 2
- 11 - ZONEX Bus 2, Switch "0" OFF, Points 193 to 240)
- 12 - On-board points

Figure 19: Connecting D8128D OctoPOPITs to the D7412G



Note: Refer to Address Switches in Section 8.4.7 Setting the OctoPOPIT Switches for information on how these switch settings are made.

1 - First address on ZONEX Bus 1
2 - Sensor loops

Table 14: Terminal Strip Connections

D8128D	D9412G	D7412G
Common	Terminal 23	Terminal 9
Out	ZONEX 1 = Terminal 27 ZONEX 2 = Terminal 25	Terminal 27
In	ZONEX 1 = Terminal 28 ZONEX 2 = Terminal 26	Terminal 28
+12 V	Terminal 24	Terminal 3

Using Molex Connectors

Each D8128D Module is supplied with a 30 cm (12 in.) female-to-female Molex cable assembly.

P1 and P2 are Molex connectors that parallel the COM, IN, OUT, and +12 VDC terminals on the terminal strip. In installations with multiple D8128Ds, use these connectors (as opposed to terminals) with the supplied cable. However, when connecting D8128D Modules directly to the panel, the terminal strip is easier to use.

The Molex connectors provided are "keyed" (Molex plug can only fit in one direction). Ensure the connector is attached correctly: the red wire is on the bottom of P1 (or P2) and the black wire is on the top.

When connecting multiple D8128Ds to a control panel, you may connect the control panel terminals to P1 or the COM, IN, OUT, and +12V terminals on the first D8128D. Then connect P2 of the first D8128D to P1 of the second D8128D and so on (see *Figure 20*).

8.4.7 OctoPOPIT Sensor Loops

Only the resistance on the loop limits the number of normally-open and/or normally-closed detection devices each sensor loop can supervise. Resistance on each sensor loop must be less than 100 Ω with the detection devices connected.

Certain UL and NFPA applications can limit the number of detection devices. Consult the appropriate UL or NFPA standards.

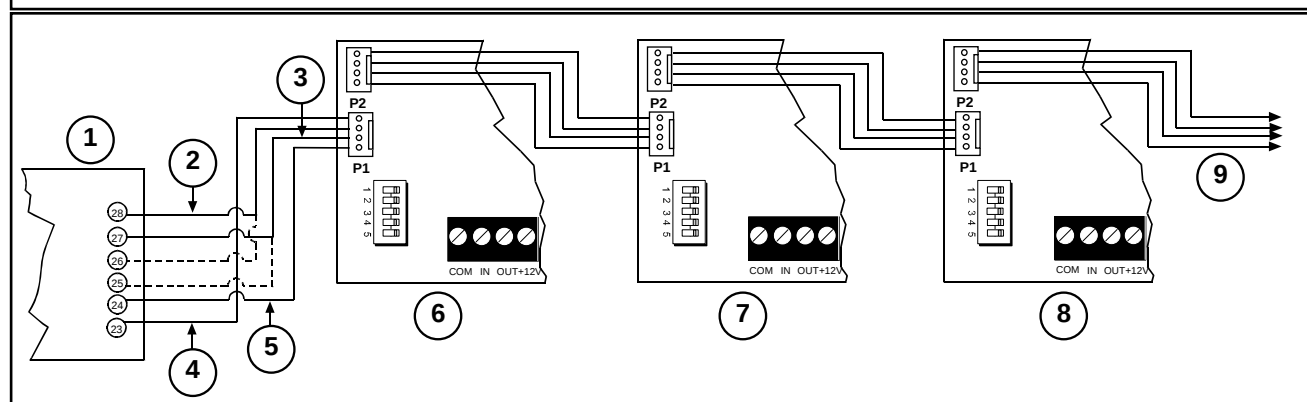
The OctoPOPIT detects open, short, closed, normal, and grounded circuit conditions on its sensor loops and transmits the conditions to the panel. Each sensor loop is assigned a point number and transmits to the panel separately.

Use twisted-pair wire for the OctoPOPIT sensor loops to avoid EMI problems. Run wires away from the premises telephone and AC wiring. If you suspect a noisy environment, use shielded cable.

There are two rows of terminal numbers on the OctoPOPIT. In the row closest to the terminal blocks, the positive outputs for the sensor loops are labeled P1 to P8. Sensor loop outputs P1 and P2, P3 and P4, P5 and P6, and P7 and P8 share common terminals. The common terminals for each pair are labeled **COM**.

Terminate each OctoPOPIT sensor loop with a 1 k Ω EOL resistor. Attach a resistor even if you do not enable the loop. The OctoPOPIT includes a D105BL resistor for each sensor loop.

Do not duplicate point assignments. Points do not function properly if assigned to both an OctoPOPIT sensor loop and a POPIT, two OctoPOPIT sensor loops, or to two POPITs.

Figure 20: Wiring Multiple D8128Ds Using Molex Connectors

1 - D9412G/D7412G Control Panel

2 - Yellow

3 - Green

4 - Black

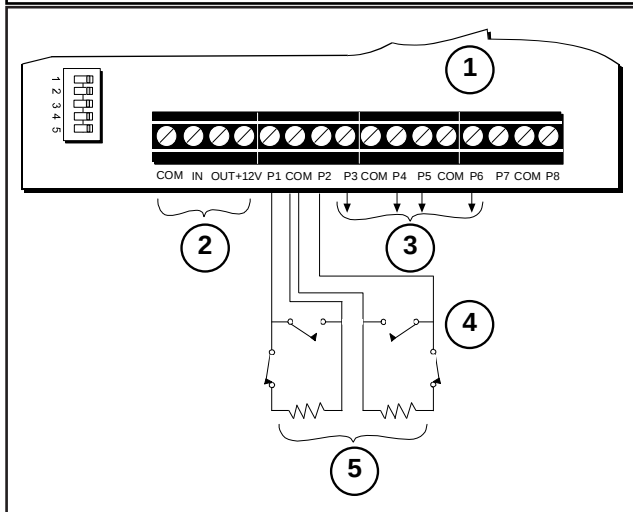
5 - Red

6 - First D8128D

7 - Second D8128D

8 - Third D8128D

9 - Up to 15 per ZONEX Bus

Figure 21: D8128D OctoPOPIT Sensor Loops

- 1 - D8128D OctoPOPIT
- 2 - To control panel
- 3 - To additional OctoPOPIT sensor loops
- 4 - OctoPOPIT sensor loops
- 5 - 1 kΩ EOL resistor (D105BL)

8.5 Testing Off-Board Points

Use the Service Walk Test to test off-board points. See the *D9412G/D7412G/D7212G Installation and Troubleshooting Quick Reference Guide* for instructions. Test to ensure all off-board points operate properly.

Walk Test Does Not Show Extra Point: Only the Service Walk Test shows extra points. If the point assignment switches on a POPIT or OctoPOPIT are set incorrectly, it can create both missing and extra points. If the same point number is assigned to two or more POPITs or OctoPOPITs, none of the points with that number test correctly.

9.0 Off-Board Relays

9.1 D8129 OctoRelay

The D8129 OctoRelay allows the addition of relay outputs to the system in groups of eight. On the D9412G, a maximum of 128 OctoRelay outputs (relay numbers 1 to 128) can be added to the system using 16 OctoRelays. D7412G allows a maximum of 64 relay outputs. Review *Section 5.0 Power Outputs* to ensure enough power is provided for the OctoRelays and other powered devices that will be connected to the system.

OctoRelays for relay numbers 1 to 64 connect to ZONEX 1, Terminal 28. OctoRelays for relay numbers 65 to 128 connect to ZONEX 2 (D9412G only), Terminal 26 on the D9412G. See *Figure 22* and *Figure 23*.

Alarm output, auxiliary relay, sensor reset, arming status, point status, alarm memory, or remote functions can be assigned to the OctoRelay outputs individually. See *Relay Parameters* in the *D9412G/D7412G Program Entry Guide* for programming details.

D8129 Restricted for Fire Systems: D8129 relay outputs are not supervised and cannot be used in fire or combined fire/burglary installations for primary indicating devices.

9.1.1 Configuring the D8129 OctoRelay

Five switches on the OctoRelay determine the relay numbers for the eight relay outputs. *Table 15* shows the switch settings.

Table 15: D8129 OctoRelay Switch Settings

Panel Relay Number	D8129 OctoRelay Switch Setting	On Panel, Connect D8129 to:
1 to 8	Off-On-On-On-On	ZONEX 1 Terminal 28
9 to 16	On-Off-On-On-On	ZONEX 1 Terminal 28
17 to 24	Off-Off-On-On-On	ZONEX 1 Terminal 28
25 to 32	On-On-Off-On-On	ZONEX 1 Terminal 28
33 to 40	Off-On-Off-On-On	ZONEX 1 Terminal 28
41 to 48	On-Off-Off-On-On	ZONEX 1 Terminal 28
49 to 56	Off-Off-Off-On-On	ZONEX 1 Terminal 28
57 to 64	On-On-On-Off-On	ZONEX 1 Terminal 28
D7412G Maximum		
65 to 72	Off-On-On-On-On	ZONEX 2 Terminal 26
73 to 80	On-Off-On-On-On	ZONEX 2 Terminal 26
81 to 88	Off-Off-On-On-On	ZONEX 2 Terminal 26
89 to 96	On-On-Off-On-On	ZONEX 2 Terminal 26
97 to 104	Off-On-Off-On-On	ZONEX 2 Terminal 26
105 to 112	On-Off-Off-On-On	ZONEX 2 Terminal 26
113 to 120	Off-Off-Off-On-On	ZONEX 2 Terminal 26
121 to 128	On-On-On-Off-On	ZONEX 2 Terminal 26

9.1.2 Relay Outputs



Relay outputs can activate while setting the OctoRelay switches or programming the panel. Disconnect equipment connected to relay outputs while performing these functions.

Each OctoRelay output provides a Form C dry contact rated for 1.0 A at 12 VDC. Normally-open, common, and normally-closed terminals are available for each relay output. When an individual output is activated, there is continuity between the normally-open and common terminals. When the output is not activated, there is continuity between the normally-closed and common terminals.

9.1.3 Installation

Set the switches on the OctoRelay before installing it in the enclosure. See *Section 9.1.1 Configuring the D8129 OctoRelay*.

Install the OctoRelay in the enclosure with the panel (see *Figure 2*) or in an adjacent enclosure that is no more than 1.5 m (5 ft.) from the panel. Use 1.5 mm (16 AWG) to 0.8 mm (22 AWG) wire.

To install OctoRelays in the enclosure with the panel:

1. Align the module with one of the mounting locations in the enclosure (see *Figure 2*).
2. Using the screws provided with the module, secure it in the enclosure.

Use the D137 Mounting Bracket or D9002 Mounting Skirt to install OctoRelays in enclosures with no available module mounting locations.

9.1.4 Wiring Connections

Power down the panel to connect OctoRelays as shown in *Figure 22* and *Figure 23*. Note that OctoRelays for relay numbers 1 to 64 connect to ZONEX 1, Terminal 28. OctoRelays for relay numbers 65 to 128 connect to ZONEX 2, Terminal 26 on the D9412G.

Only one OctoRelay is shown wired to each ZONEX bus in *Figure 22* and *Figure 23*. Wire additional OctoRelays in parallel. Review *Section 5.0 Power Outputs* to be sure to provide enough power for the relays.

The number of D8129 OctoRelays that can be connected to each Zonex terminal on the D9412G panels is limited by the number of D8128D OctoPOPITs connected.

-

- Bosch Security Systems | 10/03 | 43488E



Using D8129 OctoRelays and D8128D OctoPOPITs together on the same ZONEX Terminals is limited and depends on the number of D8128D OctoPOPITs and D81289 OctoRelays connected to a single ZONEX Bus.

Refer to *Table 16* for information on the maximum number of D8128Ds and D8129s that can be connected to a single ZONEX Bus.

Table 16: Number of D8128Ds Used with D8129s

If the Number of D8128Ds Connected to a Single Zonex Bus Is:	Do Not Connect More Than this Number of D8129s:
9	6
10	5
11	4
12	3
13	1
14	1

9.2 D811 Arm Status Relay Module

The D811 Arm Status Relay Module allows the addition of a single off-board relay output to the system. Alarm output, auxiliary relay, sensor reset, arming status, point status, alarm memory, or remote functions can be assigned to the D811 relay output. It is not restricted to the Arming Status Mode only.

Relay Numbers for D811 Not Programmable: If the D811 is connected to ZONEX 1, Terminal 28, use relay number 53 for the relay output. If the D811 is connected to ZONEX 2, Terminal 26 on the D9412G, use relay number 117 for the relay output.

D811 Modules connect as shown in *Figure 24* and *Figure 25*. Review *Section 5.0 Power Outputs* to ensure enough power is provided for the powered devices that will be connected to the system. See *Relay Parameters* in the *D9412G/D7412G Program Entry Guide* for programming details.

D811 Restricted for Fire Systems: The D811 relay output is not supervised and cannot be used in fire or combined fire/burglary installations for primary indication devices.

9.2.1 Relay Output

Each D811 relay output provides a Form C dry contact rated for 1.0 A at 12 VDC. Normally-open, common, and normally-closed terminals are available. When an individual output is activated, there is continuity between the normally-open and common terminals. When the output is not activated, there is continuity between the normally-closed and common terminals.



Relay outputs can activate while programming the panel. Disconnect equipment connected to relay outputs while performing these functions.

9.2.2 Installation

Install the D811 in the enclosure with the panel (see *Figure 2*) or in an adjacent enclosure no more than 1.5 m (5 ft.) from the panel. Use 1.5 mm (16 AWG) to 0.8 mm (22 AWG) wire.

To install D811 Modules in the enclosure with the panel:

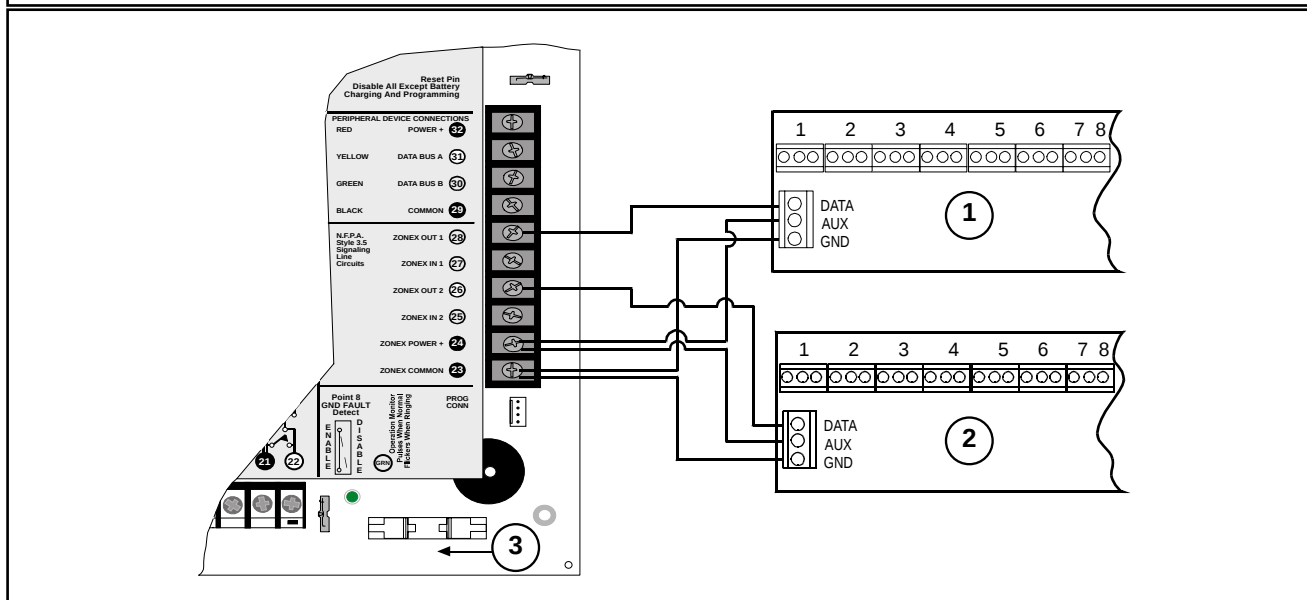
1. Align the D811 Module with any of the four mounting locations in the enclosure. See *Figure 2*.
2. Using the screws provided with the module, secure it in the enclosure.

Use the D137 Mounting Bracket or D9002 Mounting Skirt to install D811 Modules in enclosures with no module available mounting locations.

9.2.3 Wiring Connections

Power down the panel to connect D811 Modules as shown in *Figure 24* and *Figure 25*. Note that the D811 for relay number 53 connects to ZONEX 1. The D811 for relay number 117 connects to ZONEX 2 on the D9412G.

Figure 24: D811 Module Wiring to the D9412G

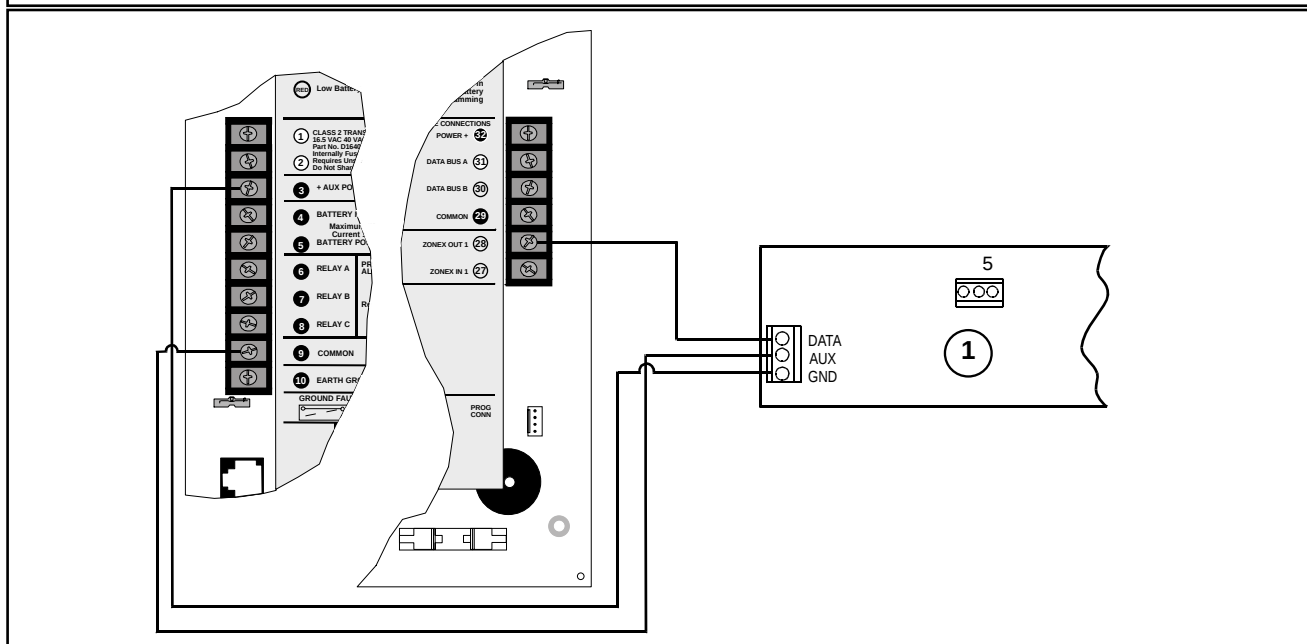


1 - D811 for relay number 53

2 - D811 for relay number 117

3 - On-board points

Figure 25: D811 Module Wiring to the D7412G



1 - D811 for relay number 53

10.0 Arming Devices

10.1 Description

Command centers, maintained or momentary contact keyswitches, or a combination of the two are used to arm and disarm areas. The panel can contain a maximum of eight areas. See *Section 2.4.2 Areas and Accounts* for a description of areas.

10.2 Command Center Terminals 29 to 32

The Bosch Security Systems command center is a 4-wire powered device used to arm and disarm areas, annunciate complete system status, initiate system tests, and control many functions of the security system.

The system can supervise a maximum of eight command centers. The panel transmits a Serial Device Trouble Report, SDI FAILURE in the Modem IIIa² format or TROUBLE ZN D in the BFSK format, if it loses communication with a supervised command center. CALL FOR SERVICE appears in any command center with text display capability that loses communication with the panel. SERVC KEYPAD appears at all other command centers connected to the system.

A total of 32 command centers can be connected to the system. The number of supervised command centers, number of areas, and the available power affect the total number of command centers that can be connected to the system. See *Command Center* in the *D9412G/D7412G Program Entry Guide* for complete programming details on command center options.

There are five types of command centers available for use with the system. The D1255 features a 16-character alphanumeric display for general use. The D1256 is also a text display command center with functional keys optimized for local fire alarm control. The D1257 is a text display command center for fire annunciation. The D1260 boasts an easy-to-read, 4-line by 20-character LCD display with eight “soft” keys to display simple selections. The D720 is an LED display command center appropriate for use as a single area command center with up to eight points.

The D1255 and D720 are also available in white (D1255W and D720W) or red (D1255R and D720R) versions.

See the command center’s *User’s Guide* for operational information.

10.2.1 Assigning the Command Center an Address

Switches on the command center assign an address (1 to 8) to the command center. The address determines if the command center is supervised, command center’s scope, and what area the command center is assigned to. See *Command Center Assignment* in the *D9412G/D7412G Program Entry Guide* for a complete description of addresses.

Table 17 shows the correct switch setting for each address.

Table 17: Command Center Address Settings						
Address	Switch					
	1	2	3	4	5	6
Address #1	ON	ON	ON	ON	Tone ON/OFF Encoding	ON
Address #2	OFF	ON	ON	ON		ON
Address #3	ON	OFF	ON	ON		ON
Address #4	OFF	OFF	ON	ON		ON
Address #5	ON	ON	OFF	ON		ON
Address #6	OFF	ON	OFF	ON		ON
Address #7	ON	OFF	OFF	ON		ON
Address #8	OFF	OFF	OFF	ON		ON

10.2.2 Installation

Consult the command center *Installation Manuals* for installation and mounting instructions. Command centers connect to the panel in parallel (see *Table 18*).

Table 18: Command Center Connections			
D9412G	Command		
Terminal	Function	Wire Color	Function
32*	POWER +	Red	12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common

* Connect with at least 1.5 m (5 ft.) of 0.8 mm (22 AWG) wire (4.3 m [14 ft.] of 1.2 mm [18 AWG] wire).

Switching the Green and Yellow Wires Affects

Other Command Centers: Incorrectly connecting the green wire from the command center to Terminal 31 and the yellow wire to Terminal 30 causes other command centers connected to the panel to go blank and/or sound random beep tones.

You can connect devices to the data bus (Terminals 30 and 31) by parallel wire run from the panel to each device, wire from device to device, or a combination of the two using a maximum of 4572 m (15000 ft.) of 0.8 mm (22 AWG) wire for all devices connected to the SDI Bus combined.

Limit command centers to 610 m (2000 ft.) per run;
limit D9210B Modules to 457 m (1500 ft.) per run
(762 m [2,500 ft.] if using an external power supply),
and D9131A Modules to 305 m (1000 ft.) per run.

Extra Power Needed for More Command Centers:

The D1255 Command Center draws 104 mA when idle. It draws 206 mA with the keys lit and the sounder activated. Review *Section 5.0 Power Outputs* to determine the total power output requirements for the system.

One or more D8132 Battery Charger/Power Supply Modules may be added for the number of command centers used. *Figure 26* shows the D8132 powering command centers in a stand-alone configuration.

For UL Certificated accounts, use a UL Listed auxiliary 12 VDC or 24 VDC regulated, power limited power supply for Fire Protective Signaling Units and Commercial/Residential Burglar Units. The D8132 is not UL Listed as a stand-alone power supply.

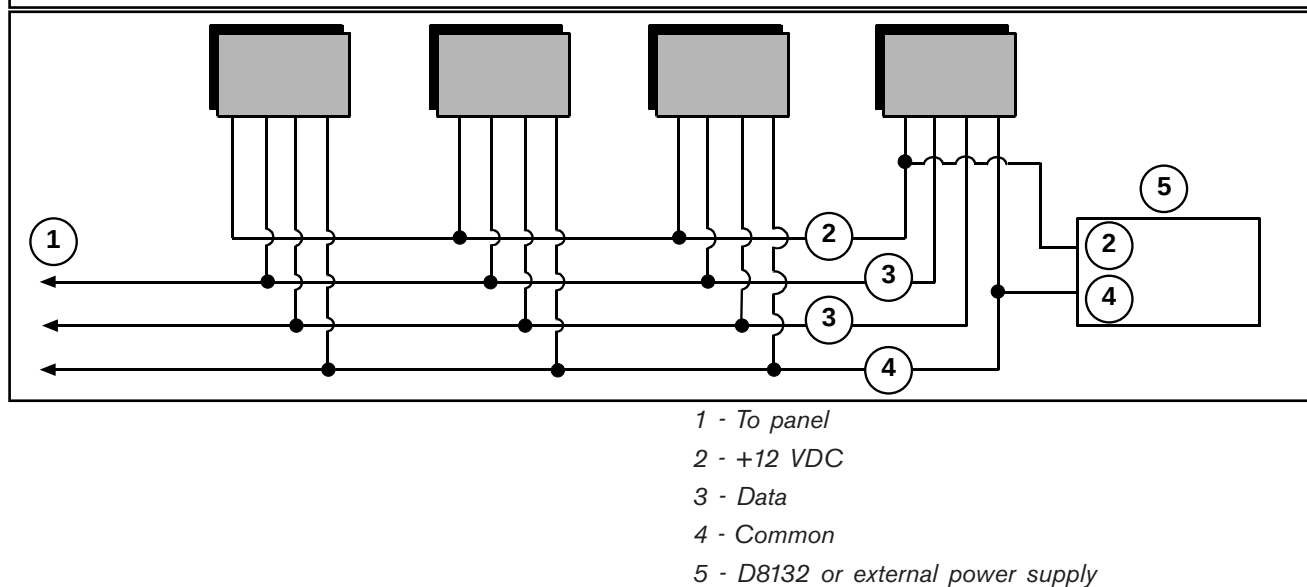


Control Panel and D8132 (or other power supply) must share COMMON: Note that

Figure 26 shows the common from the D8132 Module connected to both the command center's common and the common on the control panel. Any stand-alone power supply powering any device connected to the panel must also be connected to a common terminal on the panel.

If using the Ground Fault Detect capability on the D9412G/D7412G Control Panels and an external power supply, make sure the external selected power supply isolates its Earth Ground connection from the negative side of the Aux Power output. External power supplies not isolating Earth Ground cause ground fault conditions on the control panel.

Figure 26: Power at Command Centers



10.3 D268/D269 Independent Zone Control, D279A Independent Zone Control

Any on-board or OctoPOPIT point can be programmed so the D268/D269 or D279A Independent Zone Control operates as independent point control (arms and disarms the point).

See *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for programming information. Refer to the *D268/D269 Operation and Installation Instructions* or the *D279A Operation and Installation Instructions* for wiring and operation instructions.

10.4 Keyswitch

10.4.1 Description

A maintained or momentary contact arming station (keyswitch) can be connected to master arm/disarm any of the areas in the system. The keyswitch is connected to an on-board or off-board point's sensor loop. Relays can be programmed to activate arming status LEDs for keyswitch arming stations. See *Relays* in the *D9412G/D7412G Program Entry Guide*.

10.4.2 Programming

See *Point Assignments* in the *D9412G/D7412G Program Entry Guide* for the correct programming for points used for keyswitches.

10.4.3 Installation

For maintained switches, connect the EOL resistor for the point at the keyswitch so the switch opens the circuit when it operates. A short on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 27*.

For momentary switches, connect the EOL resistor for the point at the keyswitch so the switch shorts the resistor when it operates. An open on the circuit produces an alarm if the area is armed and a trouble if it is disarmed. See *Figure 27*.

10.4.4 Keyswitch Operation

Maintained Contact

If the point to which the keyswitch is connected is programmed for a maintained contact, an open on the arming circuit arms the area. All faulted points are force armed, regardless of the entry in the FA Bypass Max program item. Returning the circuit to normal disarms the area. See *Area Parameters* and *Point Assignments* in the *D9412G/D7412G Program Entry Guide*.

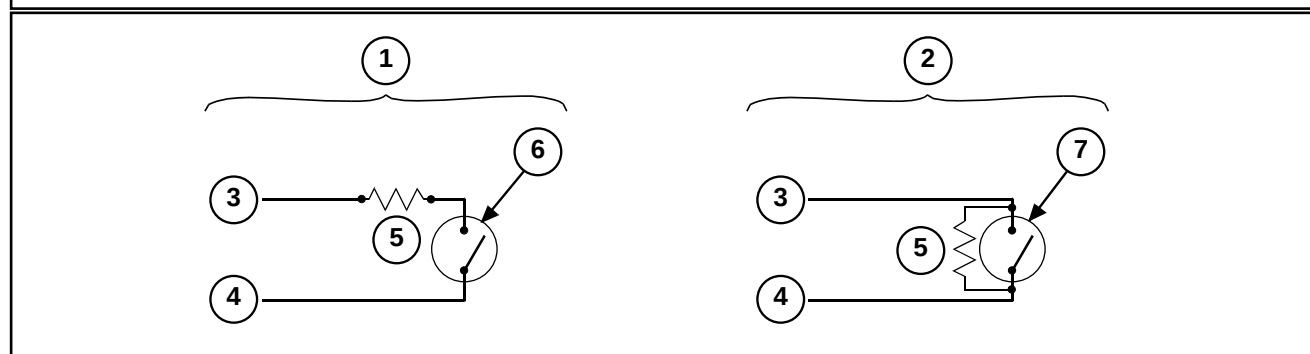
Momentary Contact

If the point to which the keyswitch is connected is programmed for a momentary contact, shorting the arming circuit toggles the area's arming state between armed and disarmed. All faulted points are force armed, regardless of the entry in the FA Bypass Max program item. See *Point Assignments* in the *D9412G/D7412G Program Entry Guide*.

Silencing the Bell

To silence the bell (stop Alarm Bell output) if the system is armed, position the keyswitch to disarm the area. If the area is disarmed, turn the keyswitch once to start the arming process. Turning the keyswitch a second time stops the arming process, silencing the bell.

Figure 27: Keyswitch Wiring



1 - Maintained keyswitch

2 - Momentary keyswitch

3 - Common

4 - Point input

5 - 1 k Ω or 33 k Ω *

6 - Open on circuit arms area

7 - Short on circuit toggles arming state

* Use 1 k Ω EOL resistors if using one of the zones on the panel or an OctoPOPIT. Use a 33 k Ω resistor if using a POPIT.

Notes:

11.0 SDI Devices

11.1 Description

D9412G/D7412G Control Panels can support a number of accessory devices from the SDI Bus using Terminals 29 through 32. Some devices include the D1255 Command Center (discussed in the previous section), D9131A Parallel Printer Interface Module, D9210B Wiegand Control Interface Module, D9133 Serial Interface Module, and D9133TTL-E Network Interface Module.

11.2 Installation

Consult the specific SDI device *Operation and Installation Guide* for complete installation instructions. SDI devices connect to the panel in parallel as shown in *Table 19*.

These devices can share power with the panel or be

Table 19: SDI Device Connections			
D9412G/D7412G		SDI Devices	
Terminal	Function	Wire Color	Function
32	POWER +	Red	+12 VDC
31	DATA BUS A	Yellow	Data-In
30	DATA BUS B	Green	Data-Out
29	COMMON	Black	Common



A stand-alone power supply powering the SDI device must also be connected to a common terminal on the panel. Do not connect the stand-alone power supply's earth ground to Terminal 10 on the panel.

11.3 D9131A Parallel Printer Interface Module

The Bosch Security Systems D9131A Parallel Printer Interface Module is a 4-wire powered device used to connect a standard parallel printer to a panel. D9412G can supervise three printers and D7412G can supervise one printer. Each printer requires a separate D9131A Parallel Printer Interface Module. The D9131A connects to the printer using a standard parallel printer cable.

11.3.1 Switch Settings

Switches on the D9131A assign a unique address (17 to 19) to each printer. The address determines if the printer is supervised, the printer's scope, and the area to which the printer is assigned. See *Printer Parameters* in the *D9412G/D7412G Program Entry Guide* for a complete description of addresses.

Table 20 shows the correct switch setting for each address.

Table 20: Printer Address Switch Settings

Printer	Switch					
	1	2	3	4*	5	6
17	ON	ON	ON	ON	ON	ON
18 [†]	OFF	ON	ON	ON	ON	ON
19 [†]	ON	OFF	ON	ON	ON	ON
† = D9412G only						
*Switch 4: ON = Header and form feed, OFF = No header and form feed						

11.3.2 Supervision

Supervision includes the proper operation of the SDI Bus, proper connection of the printer cable between the printer and the D9131A, printer paper supply, printer selected (on-line), and printer power.

The panel sends an SDI Failure Report to the receiver if it fails to communicate with the printer interface and SERVC PRINTER displays at the command center. The report to the receiver includes the address of the troubled D9131A to indicate which printer needs service.

If an SDI device is supervised and SDI A becomes disconnected, the device can continue to operate normally, depending upon environmental conditions.

11.4 D9210B Wiegand Control Interface Module

The Bosch Security Systems D9210B Wiegand Control Interface Module is a 4-wire powered device providing connections for an access door point and door strike. The D9412G can supervise eight Wiegand Control Modules, the D7412G can supervise two. Each D9210B supports one door to control access. Programming allows each access door to be configured independently.

Using Wiegand style cards or tokens, the D9210B can allow access for up to 996 cards/tokens on the D9412G, 396 on the D7412G. User access authority can be configured to restrict access to certain doors or to certain periods of time. The reading of access cards, in addition to granting access, can control whether the system will disarm. Used with the D9412G, the D9210B recognizes 249 master users by user name, passcode, and access authority. The D9210B recognizes 99 master users when used with the D7412G. Each master user supports three sub-users with unique cards/tokens having the same access level as the master user.

11.4.1 Switch Settings

Switches on the D9210B assign a unique address (1 to 8) to each module. *Table 21* shows the correct switch setting for each D9210B address.

Table 21: Access Control Module Address Switch Settings

Door Module Addresses	DIP Switch Settings					
	1	2	3	4	5**	6**
1	ON	ON	ON	*	ON	ON
2	OFF	ON	ON	*	ON	ON
-----D7412G Maximum-----						
3	ON	OFF	ON	*	ON	ON
4	OFF	OFF	ON	*	ON	ON
5	ON	ON	OFF	*	ON	ON
6	OFF	ON	OFF	*	ON	ON
7	ON	OFF	OFF	*	ON	ON
8	OFF	OFF	OFF	*	ON	ON
<i>*Switch 4, Fail Safe Mode: ON = If SDI Bus fails, relay energizes OFF = If SDI Bus fails, relay de-energizes **Switches 5 and 6 MUST remain in the ON position.</i>						

11.5 SDI Address 80

SDI Address 80, available on the D9412G/D7412G panels, allows for bi-directional SDI to RS-232 information. This address is used with home or building automation software. A D9133 Serial Interface Module is required for this application.

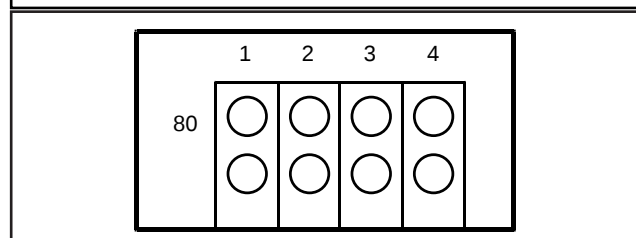
11.5.1 D9133 Serial Interface Module

The D9133 Serial Interface Module is a 4-wire powered SDI device providing connection for RS-232 devices to the D9412G/D7412G Control Panels. D9133 uses a specific communication protocol that is provided upon request. Contact Bosch Security Systems Technical Support Monday through Friday from 5 AM to 5 PM EST at 888-886-6189.

The D9133 can be installed up to 305 m (1000 ft.) from the panel using 1.2 mm (18 AWG) wire. D9133 is not UL Listed.

11.5.2 Address Settings

There are no jumper settings required for the D9133 (SDI Address 80) for home or building automation purposes (see *Figure 28*). Remove jumper shunts for this setting.

Figure 28: D9133 Jumper Settings

11.5.3 Supervision

Supervision of the D9133 is available through programming that includes proper operation between the D9133 and the control panel.

If supervised and the D9133 does not respond to panel supervision polls, the panel sends an SDI Failure Report to the receiver. If it fails to communicate with the D9133, SERVC SDI 80 displays at the command center. The SDI Failure Report includes the address of the troubled module to indicate which module needs service.

11.6 SDI Address 88

SDI Address 88 is available with the D9412G/D7412G panels and is used for several different applications. When using SDI Address 88, only connect one listed devices at a time.

11.6.1 D9133DC Direct Connect Programming Module

Use the D9133DC Direct Connect Programming Module to locally program the D9412G/D7412G panels. In addition, the D9133DC allows diagnostic and history retrieval. D9133DC is not UL Listed.

Connecting the D9133DC

1. Configure D9133DC for SDI Address 88. To program the panel when the reset pin is in the unlocked position, program Enable SDI RAM to **Yes** in the RADXAUX1 handler.
2. Connect D9133DC to Com Port 1 or Com Port 2 on the PC. The D9133DC has a DB-9 female serial connector. A null modem cable must be purchased separately to connect the D9133DC to a PC.
3. Using 0.8 mm (22 AWG) or 1.2 mm (18 AWG) wire, connect the D9133DC SDI terminals (SDI PWR, SDI A, SDI B, and SDI COM) to the panel's SDI terminals (Terminals 29 to 32).

To send or receive the panel's program, place the Reset Pin in the **Locked** or **Unlocked** position.



Locking the Rest Pin when programming the panel improves upload/download time.

Used as an External Modem

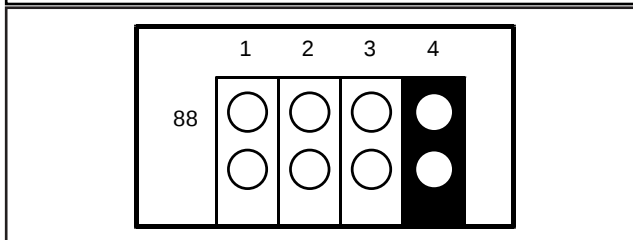
The D9133DC can operate as an external modem when using RAM IV with the panel. See the *D9412G/D7412G Program Entry Guide* for programming details.

11.6.2 D9133TTL-E Network Interface Module

The Bosch Security Systems D9133TTL-E Network Interface Module is a 4-wire powered SDI device that provides connection for bi-directional communication over Ethernet networks to D9412G/D7412G Control Panels. For programming information on enhanced communications, see the *D9412G/D7412G Program Entry Guide*.

The D9133TTL-E can be installed up to 305 m (1000 ft.) from the panel using 18 AWG (1.2 mm) wire.

Figure 29: D9133TTL-E Jumper Settings



11.6.3 Address Settings

Place a jumper over Pin 8 for the D9133TTL-E (SDI Address 88) to be used for RAM IV and/or enhanced communications in a LAN/WAN environment.

11.6.4 Supervision

Supervision of the D9133DC, D9133TTL-E, and D9133TTL-TR at SDI Address 88 is available through programming that ensures operation between the module and the control panel.

If supervised and the module does not respond to panel supervision polls, **SERV SDI 88** displays at the command center. The report to the receiver includes the address of the troubled module to indicate which module needs service.

Notes:

12.0 Programmer/Accessory Connections

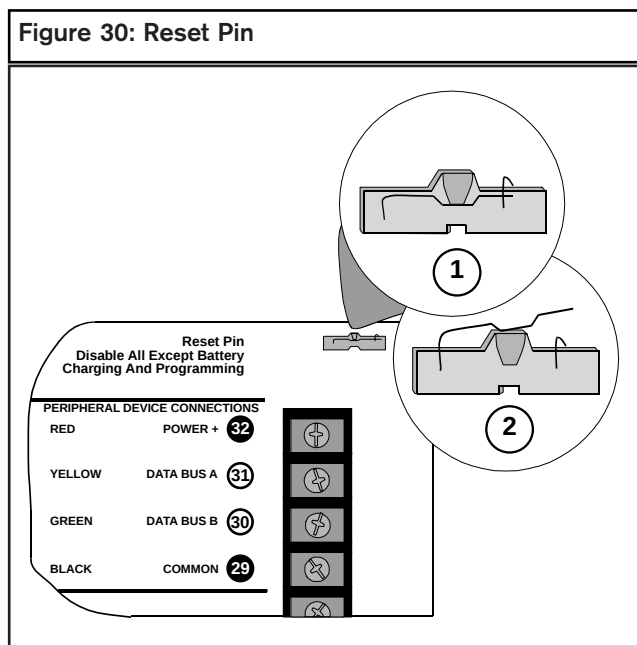
12.1 Programmer Connector

Refer to the *D5200 Operation Manual* for complete information on using the D5200 programmer.

To connect and disconnect the programmer:

1. Lock the Reset Pin (see *Figure 30*).
2. Connect the D5200 Data/Power cord into the programmer connector.
3. Perform the desired programming function (send or receive program).
4. Disconnect the programmer.

Figure 30: Reset Pin



1 - Reset Pin locked (closed)

2 - Reset Pin normal (open) for normal panel operation

12.1.1 Programmer Access Reports

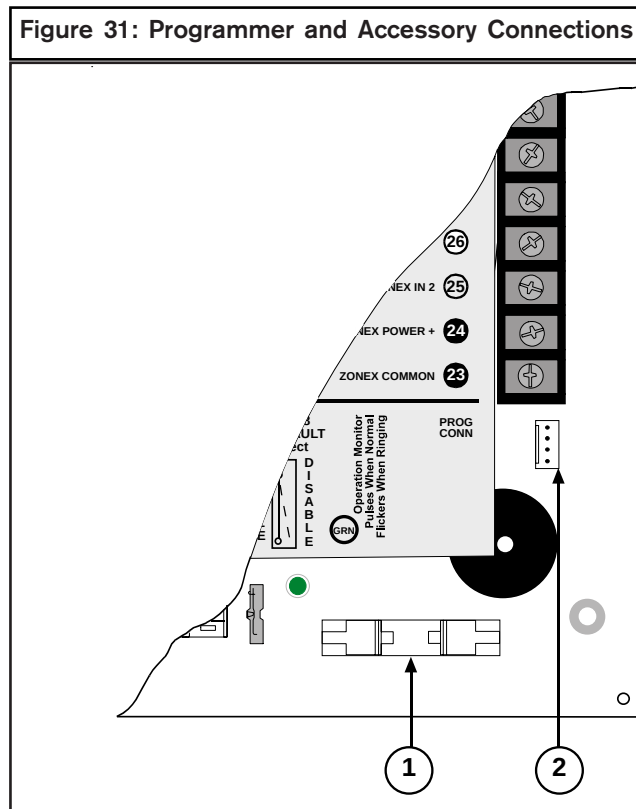
When a program is sent to the panel, the panel sends a Prog Access OK Report 10 seconds after the handler exits or when the programmer disconnects. The prompt in routing must be programmed **YES** to send this report.

12.2 Accessory Connector

Use the accessory connector to connect the panel to the D928 Dual Phone Line Switcher. The accessory connector is on the bottom right corner of the I/O board (see *Figure 31*). The D928 lets the panel use two telephone lines to transmit reports.

See *Section 6.12 D928 Dual Phone Line Switcher* for installation and operating instructions.

Figure 31: Programmer and Accessory Connections



1 - Accessory connector

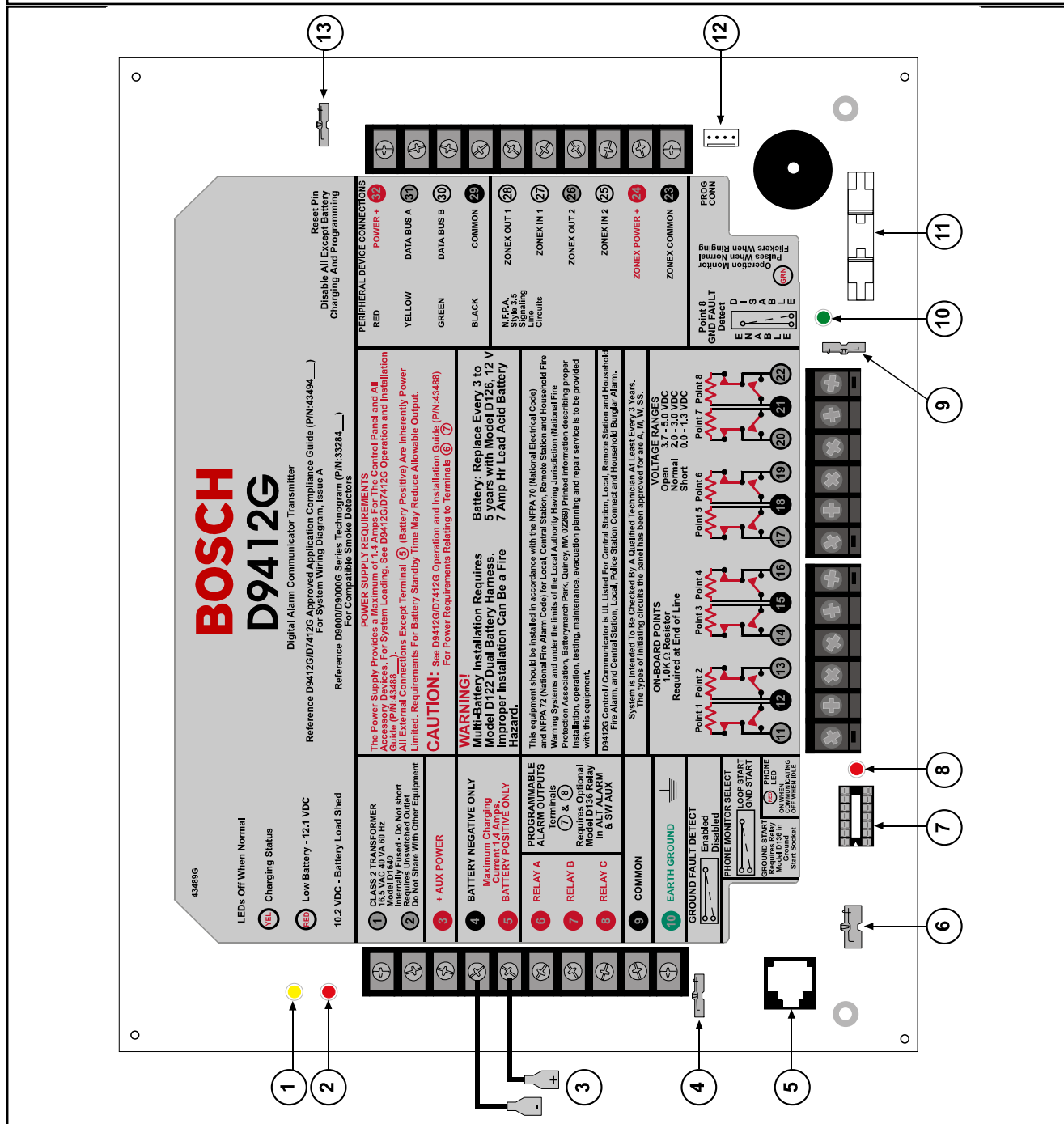
2 - Programming connector

Notes:

13.0 Faceplates

13.1 D9412G Faceplate

Figure 32: D9412G Faceplate

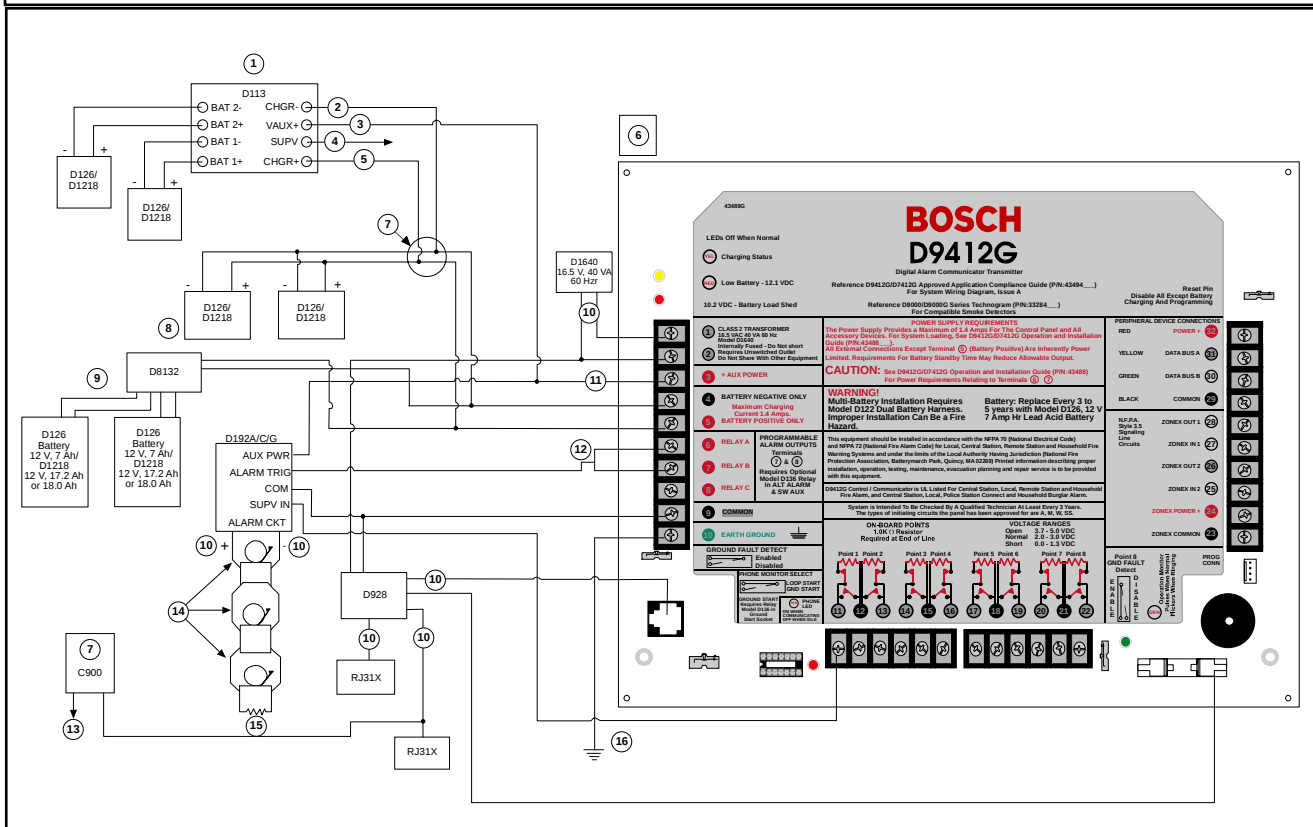


- | | |
|-------------------------------------|--|
| 1 - Charging status LED (yellow) | 8 - Phone LED (red) |
| 2 - Low Battery LED (red) | 9 - Point 8 ground fault detect enable/disable |
| 3 - Color coded battery leads | 10 - Operation monitor LED (green) |
| 4 - Ground fault detect enable | 11 - Accessory connector |
| 5 - Telephone cord connector | 12 - Programming connector |
| 6 - Phoneline monitor select jumper | 13 - Reset pin |
| 7 - Ground start relay | |

Appendix A: System Wiring Diagrams, Issue A

A.1 D9412G Control Panel, 1 of 3

Figure 34: D9412G System Wiring Diagram, 1 of 3

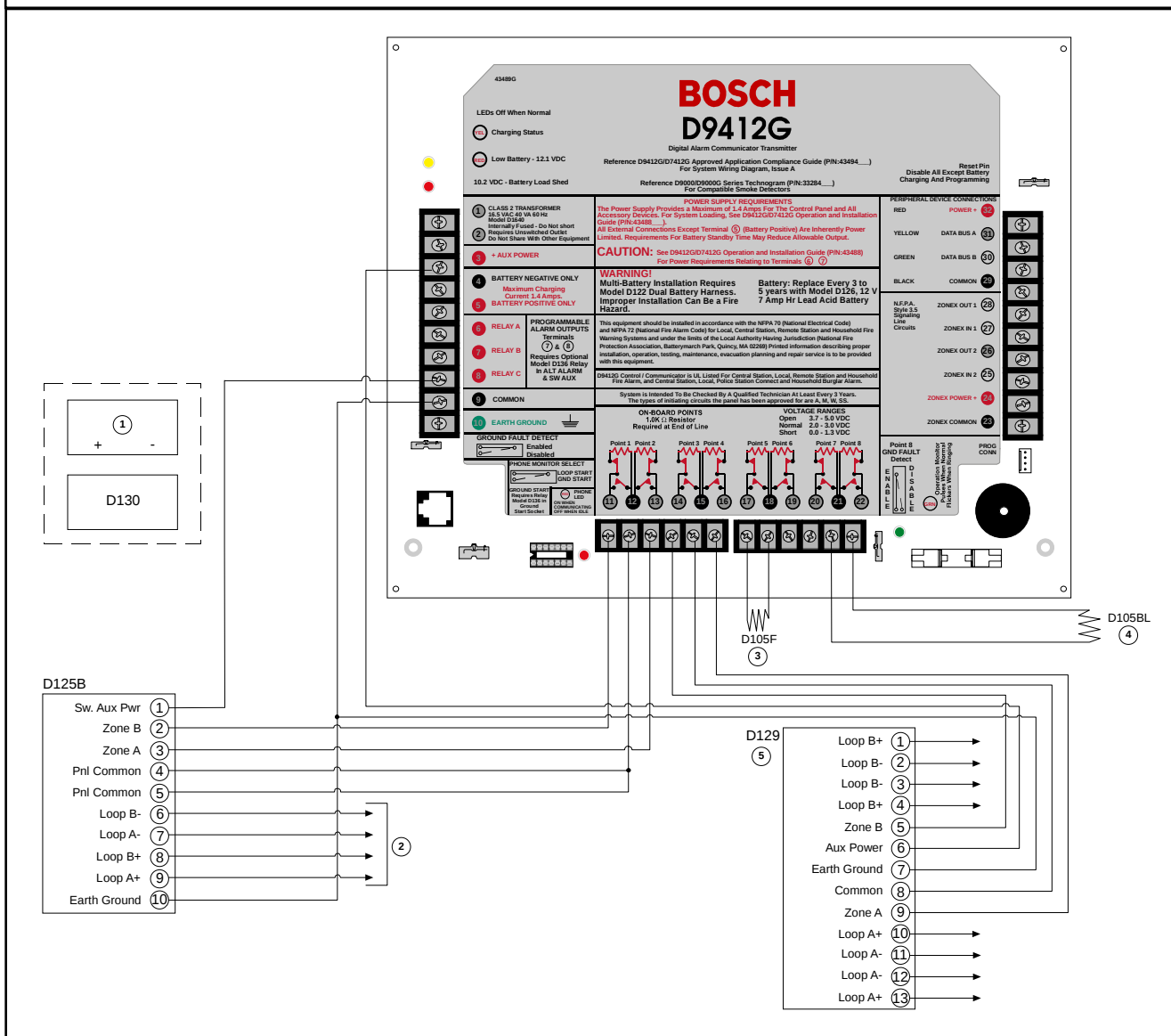


Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - If required by local AHJ, connect D113 Battery Lead Supervision Module.
- 2 - To battery negative
- 3 - To AUX-
- 4 - To point input
- 5 - To battery positive
- 6 - D8004 Transformer Enclosure required for NFPA applications.
- 7 - Optional
- 8 - D122 Dual Battery Harness, as required
- 9 - See D113 for BATT SUPV
- 10 - Power limited, supervised
- 11 - Power limited
- 12 - To Relay A or Relay B
- 13 - Listed audible signaling devices rated at 10.2 VDC to 13.8 VDC (do not use vibrating type horns).
- 14 - To RJ31X Jack
- 15 - EOL device (P/N: 15-03130-001)
- 16 - To Earth Ground

A.2 D9412G Control Panel, 2 of 3

Figure 35: D9412G System Wiring Diagram, 2 of 3

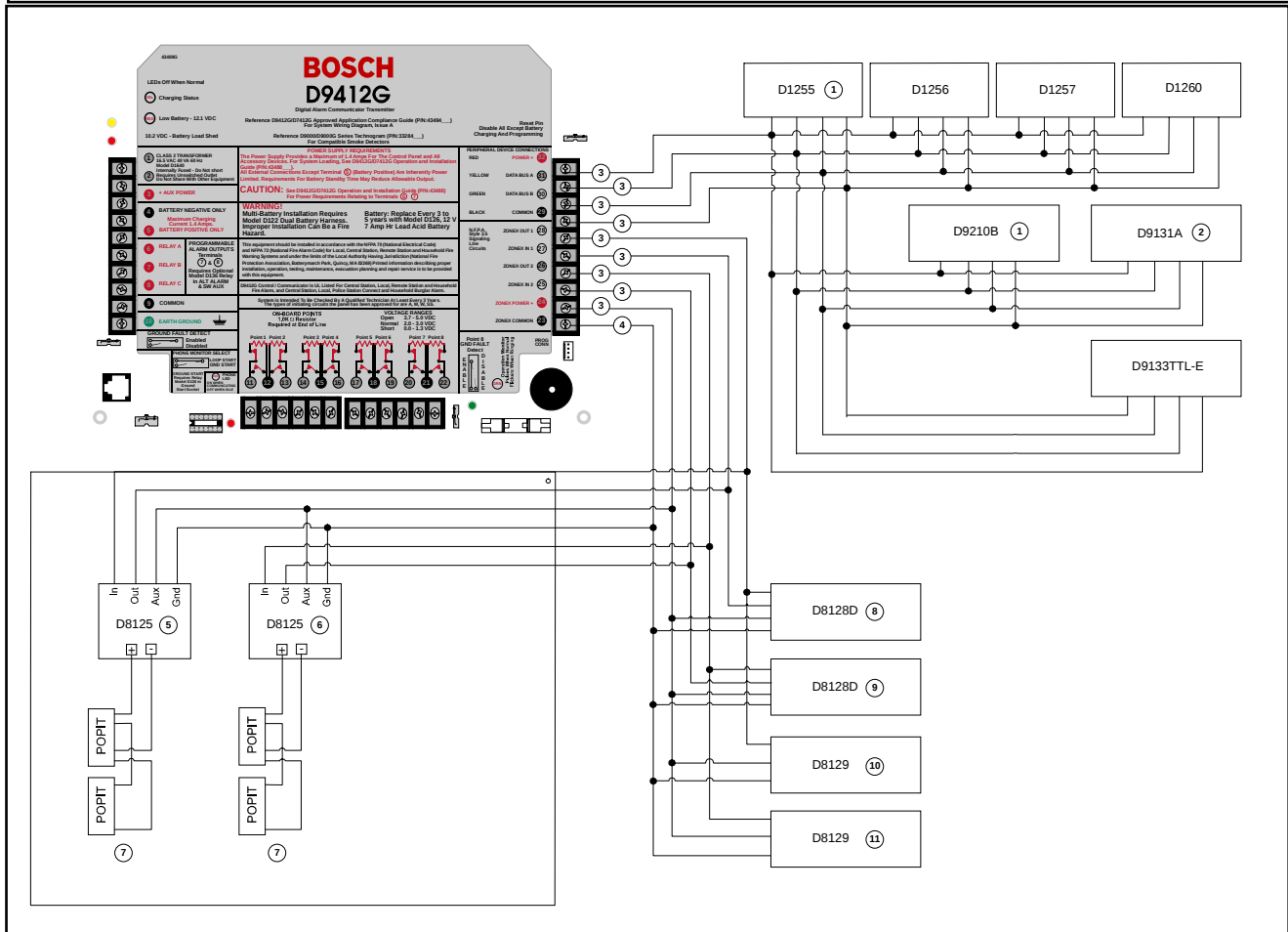


Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - (Optional): For 24 V applications, use a UL Listed 24 VDC Power Supply with a D130 Relay Module. Please refer to the D130 Operation and Installation Guide for correct wiring requirements.
- 2 - To UL Listed 2-wire smoke detectors. Refer to the 9000/9000G Series Technical Service Note: Smoke Detector Compatibility for a listing of compatible 2-wire smoke detectors.
- 3 - D105F EOLR: Suitable for non-powered initiating and supervisory devices such as pull stations, heat sensors, and valve tampers.
- 4 - D105BL EOLR: For typical burglar alarm applications.
- 5 - D129 provides optional Waterflow Retard feature. Not suitable for 2-wire smoke detectors. (Note: Use Zero Retard except for waterflow devices.)

A.2 D9412G Control Panel, 3 of 3

Figure 36: D9412G System Wiring Diagram, 3 of 3

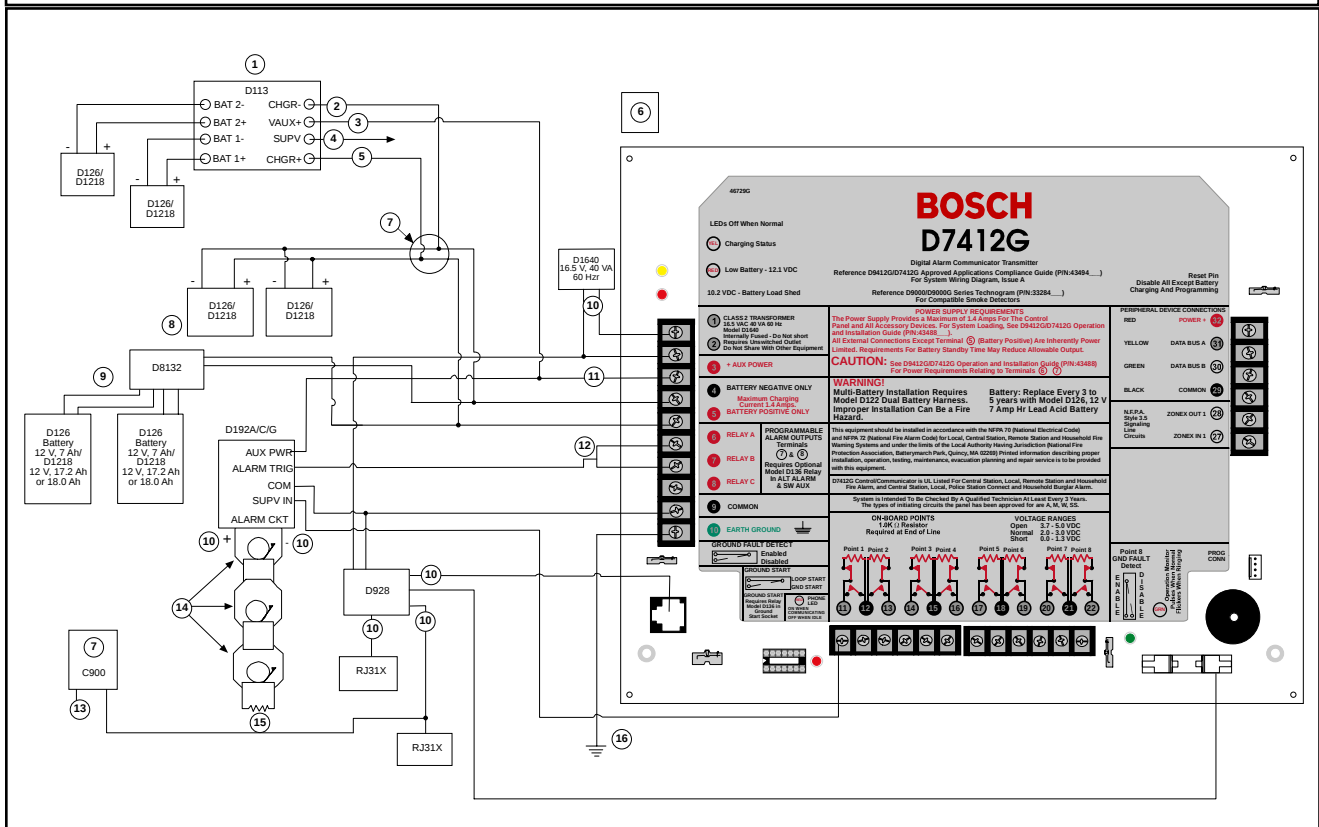


Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - Up to 8 supervised
- 2 - Up to 3 supervised
- 3 - Power limited, supervised
- 4 - Power limited
- 5 - POPEX #1
- 6 - POPEX #2
- 7 - Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs.
- 8 - Zx 1: 15 D8128Ds
- 9 - Zx 2: 15 D8128Ds
- 10 - Zx 1: Up to 8 maximum
- 11 - Zx 2: Up to 8 maximum

A.4 D7412G Control Panel, 1 of 3

Figure 37: D7412G System Wiring Diagram, 1 of 3

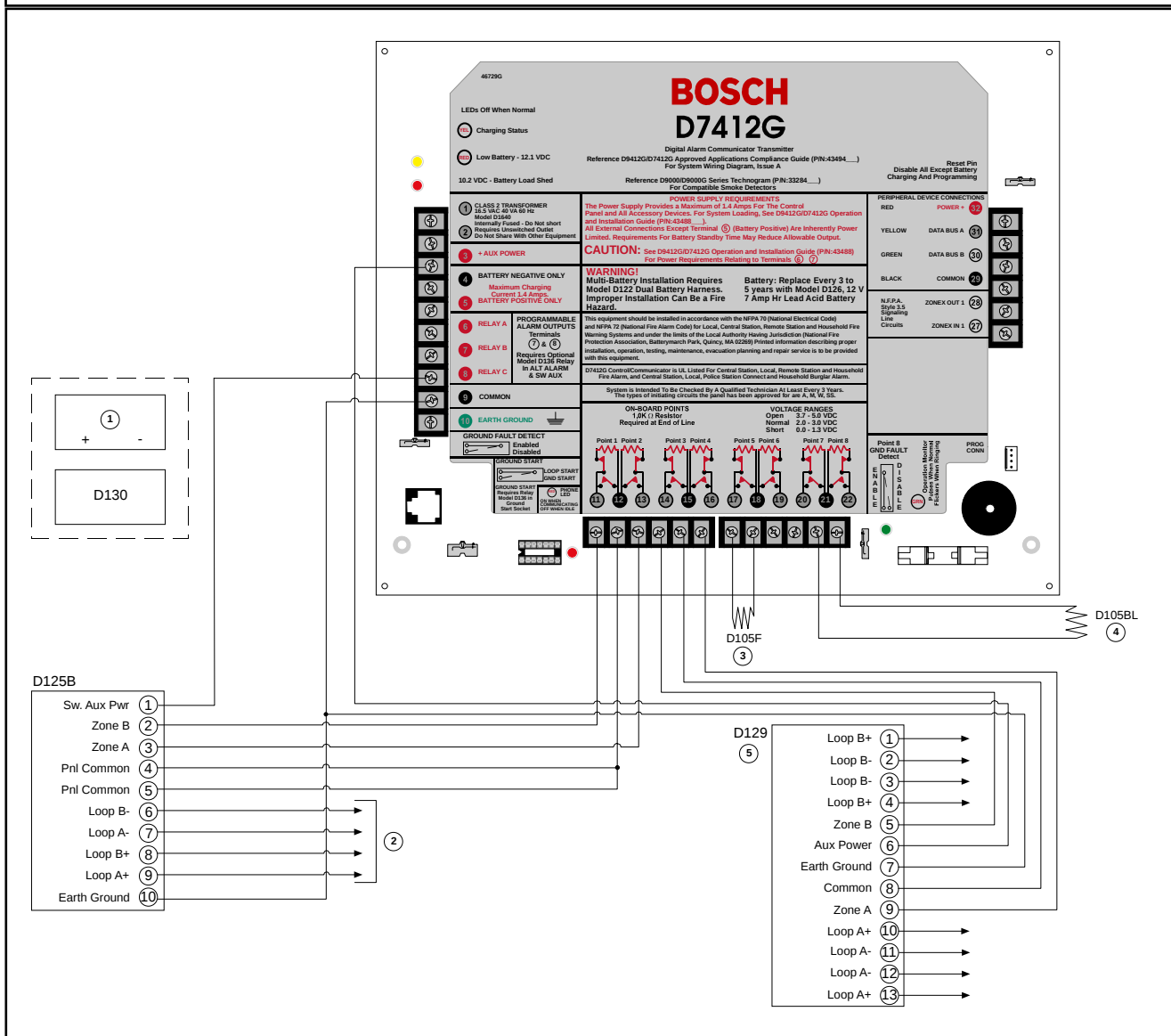


Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - If required by local AHJ, connect D113 Battery Lead Supervision Module.
- 2 - To battery negative
- 3 - To AUX-
- 4 - To point input
- 5 - To battery positive
- 6 - D8004 Transformer Enclosure required for NFPA applications.
- 7 - Optional
- 8 - D122 Dual Battery Harness, as required
- 9 - See D113 for BATT SUPV
- 10 - Power limited, supervised
- 11 - Power limited
- 12 - To Relay A or Relay B
- 13 - Listed audible signaling devices rated at 10.2 VDC to 13.8 VDC (do not use vibrating type horns).
- 14 - To RJ31X Jack
- 15 - EOL device (P/N: 15-03130-001)
- 16 - To Earth Ground

A.5 D7412G Control Panel, 2 of 3

Figure 38: D7412G System Wiring Diagram, 2 of 3

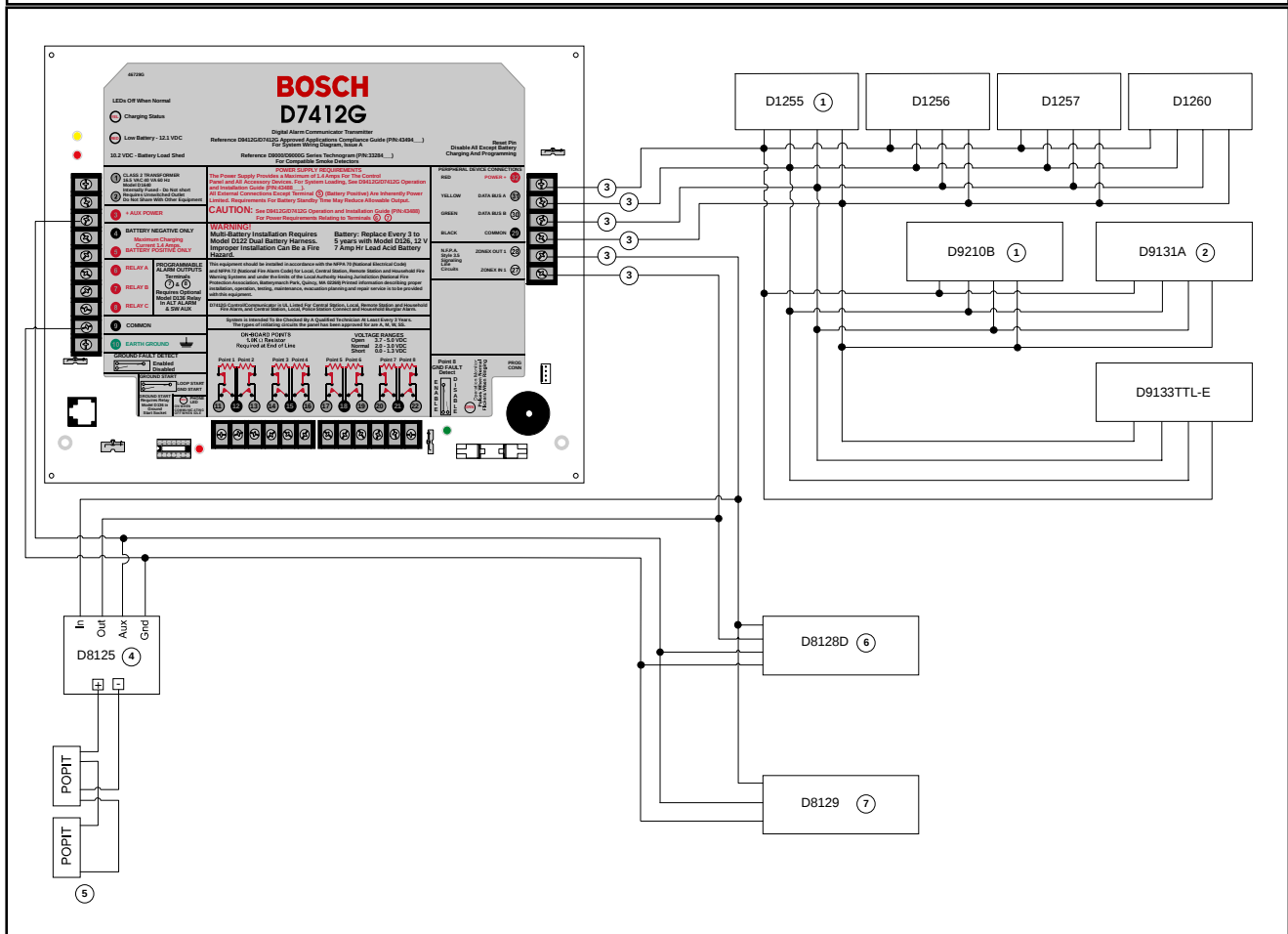


Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - (Optional): For 24 V applications, use a UL Listed 24 VDC Power Supply with a D130 Relay Module. Please refer to the D130 Operation and Installation Guide for correct wiring requirements.
- 2 - To UL Listed 2-wire smoke detectors. Refer to the 9000/9000G Series Technical Service Note: Smoke Detector Compatibility for a listing of compatible 2-wire smoke detectors.
- 3 - D105F EOLR: Suitable for non-powered initiating and supervisory devices such as pull stations, heat sensors, and valve tampers.
- 4 - D105BL EOLR: For typical burglar alarm applications.
- 5 - D129 provides optional Waterflow Retard feature. Not suitable for 2-wire smoke detectors. (Note: Use Zero Retard except for waterflow devices.)

A.6 D7412G Control Panel, 3 of 3

Figure 39: D7412G System Wiring Diagram, 3 of 3



Note: All external connections except Terminal 5 (battery positive) are inherently power limited.

- 1 - Up to 8 supervised
- 2 - Up to 3 supervised
- 3 - Power limited, supervised
- 4 - POPEX #1
- 5 - Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs.
- 6 - Zx 1: 15 D8128Ds
- 7 - Zx 1: Up to 8 maximum

Appendix B: Point Address Charts

B.1 ZONEX 1, Points 9 to 127 (D9412G); ZONEX 1, Points 9 to 75 (D7412G)



Place the labels on the base of the POPIT.
Do **not** attach labels to the POPIT cover.

A number in the switch column indicates the switch is set to **ON**.

D8127 or D9127 POPITs can be used for Points 9 to 72; however, only D9127 POPITs can be used for Points 73 to 127.

D8127 POPITs have DIP switches 1 to 6, whereas D9127 POPITs have DIP switches 0 to 6.

Table 22: ZONEX 1 Point Address Chart

Switch								Switch								Switch							
Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6
009	0	1	2	3	4	5	6	049	0		2		4	5	6	089	1			3	4	5	6
010	0	1	2	3	4	5		050	0		2		4	5		090	1			3	4	5	
011	0	1	2	3	4		6	051	0		2		4		6	091	1			3	4		6
012	0	1	2	3	4			052	0		2		4			092	1			3	4		
013	0	1	2	3		5	6	053	0		2			5	6	093	1			3		5	6
014	0	1	2	3		5		054	0		2			5		094	1			3		5	
015	0	1	1	3			6	055	0		2				6	095	1			3			6
016	0	1	2	3				056	0		2					096	1			3			
017	0	1	2		4	5	6	057	0			3	4	5	6	097	1				4	5	6
018	0	1	2		4	5		058	0			3	4	5		098	1				4	5	
019	0	1	2		4		6	059	0			3	4		6	099	1				4		6
020	0	1	2		4			060	0			3	4			100	1				4		
021	0	1	2			5	6	061	0			3		5	6	101	1					5	6
022	0	1	2			5		062	0			3		5		102	1					5	
023	0	1	2				6	063	0			3			6	103	1						6
024	0	1	2					064	0			3				104	1						
025	0	1		3	4	5	6	065	0				4	5	6	105			2	3	4	5	6
026	0	1		3	4	5		066	0				4	5		106			2	3	4	5	
027	0	1		3	4		6	067	0				4		6	107			2	3	4		6
028	0	1		3	4			068	0				4			108			2	3	4		
029	0	1		3		5	6	069	0					5	6	109			2	3		5	6
030	0	1		3		5		070	0					5		110			2	3		5	
031	0	1		3			6	071	0						6	111			2	3			6
032	0	1		3				072	0							112			2	3			
033	0	1			4	5	6	073		1	2	3	4	5	6	113			2		4	5	6
034	0	1			4	5		074		1	2	3	4	5		114			2		4	5	
035	0	1			4		6	075		1	2	3	4		6	115			2		4		6
036	0	1			4			076		1	2	3	4			116			2		4		
037	0	1				5	6	077		1	2	3		5	6	117			2			5	6
038	0	1				5		078		1	2	3		5		118			2			5	
039	0	1					6	079		1	2	3			6	119			2				6
040	0	1						080		1	2	3				120			2				
041	0		2	3	4	5	6	081		1	2		4	5	6	121				3	4	5	6
042	0		2	3	4	5		082		1	2		4	5		122				3	4	5	
043	0		2	3	4		6	083		1	2		4		6	123				3	4		6
044	0		2	3	4			084		1	2		4			124				3	4		
045	0		2	3		5	6	085		1	2			5	6	125				3		5	6
046	0		2	3		5		086		1	2			5		126				3		5	
047	0		2	3			6	087		1	2				6	127				3			6
048	0		2	3				088		1	2					128*							

* The panel reserves Point 128 for internal use.

B.2 ZONEX 2, Points 129 to 247 (D9412G Only)



Place the labels on the base of the POPIT.
Do **not** attach labels to the POPIT cover.

A number in the switch column indicates that the switch is set to **ON**.

Table 23: ZONEX 2 Point Address Chart

Switch								Switch								Switch							
Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6	Address	0	1	2	3	4	5	6
129	0	1	2	3	4	5	6	169	0		2		4	5	6	209	1			3	4	5	6
130	0	1	2	3	4	5		170	0		2		4	5		210		1		3	4	5	
131	0	1	2	3	4		6	171	0		2		4		6	211		1		3	4		6
132	0	1	2	3	4			172	0		2		4			212		1		3	4		
133	0	1	2	3		5	6	173	0		2			5	6	213		1		3		5	6
134	0	1	2	3		5		174	0		2			5		214		1		3		5	
135	0	1	1	3			6	175	0		2				6	215		1		3			6
136	0	1	2	3				176	0		2					216		1		3			
137	0	1	2		4	5	6	177	0			3	4	5	6	217		1			4	5	6
138	0	1	2		4	5		178	0			3	4	5		218		1			4	5	
139	0	1	2		4		6	179	0			3	4		6	219		1			4		6
140	0	1	2		4			180	0			3	4			220		1			4		
141	0	1	2			5	6	181	0			3		5	6	221		1				5	6
142	0	1	2			5		182	0			3		5		222		1				5	
143	0	1	2				6	183	0			3			6	223		1					6
144	0	1	2					184	0			3				224		1					
145	0	1		3	4	5	6	185	0				4	5	6	225			2	3	4	5	6
146	0	1		3	4	5		186	0				4	5		226			2	3	4	5	
147	0	1		3	4		6	187	0				4		6	227			2	3	4		6
148	0	1		3	4			188	0				4			228			2	3	4		
149	0	1		3		5	6	189	0					5	6	229			2	3		5	6
150	0	1		3		5		190	0					5		230			2	3		5	
151	0	1		3			6	191	0						6	231			2	3			6
152	0	1		3				192	0							232			2	3			
153	0	1			4	5	6	193		1	2	3	4	5	6	233			2		4	5	6
154	0	1			4	5		194		1	2	3	4	5		234			2		4	5	
155	0	1			4		6	195		1	2	3	4		6	235			2		4		6
156	0	1			4			196		1	2	3	4			236			2		4		
157	0	1				5	6	197		1	2	3		5	6	237			2			5	6
158	0	1				5		198		1	2	3		5		238			2			5	
159	0	1					6	199		1	2	3			6	239			2				6
160	0	1						200		1	2	3				240			2				
161	0		2	3	4	5	6	201		1	2		4	5	6	241				3	4	5	6
162	0		2	3	4	5		202		1	2		4	5		242				3	4	5	
163	0		2	3	4		6	203		1	2		4		6	243				3	4		6
164	0		2	3	4			204		1	2		4			244				3	4		
165	0		2	3		5	6	205		1	2			5	6	245				3		5	6
166	0		2	3		5		206		1	2			5		246				3		5	
167	0		2	3			6	207		1	2				6	247				3			6
168	0		2	3				208		1	2					248*							

* The panel reserves Point 248 for internal use.

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