D9412GV2/D7412GV2

Security Systems

Approved Applications Compliance Guide

EN Control Panels

BOSCH

Listings and Approvals

Fire

UL

Underwriters Laboratories Inc. (UL) lists the D9412GV2/D7412GV2 Control Panels as Signal System Control Units for: Central Station, Local, Auxiliary, Remote Station, Proprietary, and Household Fire Warning.

CSFM

Approved by the California State Fire Marshal (CSFM) for high-rise and non-high-rise.

Burglary

UL

UL lists the D9412GV2/D7412GV2 Control Panels for: Central Station, Local, Police Connect, Bank Safe and Vault, Mercantile Safe and Vault, and Grade A Household Systems.

Department of Defense (DOD)

The D9412GV2/D7412GV2 was granted approval for Department of Defense (DoD) installations in Sensitive Compartmented Information Facilities (SCIF).

Contents

Figures

Tables

1.0 Introduction

The UL System Chart (*Table 2* on page 12) references the components that are evaluated and listed by UL for compatibility with the control panel. These components meet the basic system requirements for the applicable standard.

The System Wiring Diagrams, Issue A (*Figure 5* to *Figure 10* on pages 13 to 18) show the relationship between the control panel and the accessory components referred to in *Figure 5*.

2.0 Optional Compatible Equipment

UL Listed components not requiring evaluation for electrical compatibility can be used in many applications when installed according to the manufacturer's instructions.

2.1 Burglary Applications

UL Listed burglary alarm sensors not requiring evaluation for electrical compatibility can be used in burglary applications. In some cases, a UL Listed interface module must be used with the sensors. Consult the individual component specification and installation documents to determine suitability.

Test Weekly: UL Standard 1023 requires a weekly test for residential burglary applications.

2.2 Bank Safe and Vault Applications

The UL Listed Model 5110 Bell and Model 4001-42 External Line Balancer (both made by Rothenbuhler) must be used for the bell and balanced line module in bank safe and vault applications. Modify the D8108A Attack-Resistant Enclosure to meet UL Standard 681.

Bell Test at Arming: UL Standard 365 requires a Bell Test at arming for bank safe and vault applications.

2.2.1 Control Panel Enclosure Requirements

UL Standard 681 for Installation and Classification of Mercantile and Bank Burglary Alarm Systems requires foil lining or equivalent protection of the control unit enclosure. The D8108A Attack-Resistant Enclosure does not have a foil lining, but acceptable protection is provided by mounting electronic vibration sensors inside the enclosure. Refer to *Figure 1* on page 6.

Do not use proximity alarms (capacitance) to protect the control panel enclosure.

Install the same electronic vibration sensors in the D8108A that are used to protect the safe or vault. Mount the Sentrol 5402, Potter EVD-S, or Arrowhead S-3810 electronic vibration detection (EVD) system inside the D8108A to meet the UL 681 requirements.

Mount the EVD sensor directly inside the metal cabinet of the D8108A as shown in *Figure 1*.

Do not install the EVD sensor within 6.4 mm (0.25 in.) of the components or traces of the printed circuit assembly.

Install and test the EVD sensor according to the manufacturer's instructions.

2.2.2 Battery Connections

Using a D122 Dual Battery Harness, connect two 12 V, 7 Ah batteries in the control panel enclosure. Refer to *Figure 1* for battery placement information.

Use a separate D8108A for the 12 V, 18 Ah batteries. When using a D122L Dual Battery Harness, wire the batteries in parallel and connect the harness to Terminals 4 and 5 of the control panel.

Auxiliary power, limited to 300 mA for 72 h, is required for standby.

2.2.3 Transmitter

For UL Listed Grade AA Safe and Vault Applications, connect a D8122 Derived Channel STU or UL Listed Grade AA Transmitter to the control panel. This combination of components creates an alarm response at the central station that is not easily defeated by field interference.

2.2.4 Bell Requirements

Use the following Rothenbuhler bell and balanced line modules with the control panel:

- UL Listed Model 5110 Bell
- UL Listed Model 4001-42 External Line Balancer

Bell Test at Arming: UL Standard 365 requires a Bell Test at arming for bank safe and vault applications.

2.2.5 System Configuration Requirements

The following configuration and programming options are required for UL Bank Safe and Vault Systems. Refer to the *D9412GV2/D7412GV2 Control Panel Program Entry Guide* (P/N: F01U003636) for programming information.

Safe and Vault Protective Circuits

To test the devices that protect the safe(s) or vault(s) without sounding the bell, specify the devices' points as controlled zones and supervised for trouble conditions. Refer to *Point Index* in the *D9412GV2/D7412GV2 Control Panel Program Entry Guide* (P/N: F01U003636) for more information.

Bell Configuration

UL 365 requires the bell time to be 15 to 30 min. The Rothenbuhler 5110 Bell provides selectable bell time through manipulation of its jumpers. Refer to the manufacturer's installation instructions for more information.

In addition to the jumper settings inside the bell, you can activate the control panel for a bell time of 15 min.

UL 365 requires a Bell Test at arming and must be enabled in control panel programming.

Refer to *Bell Parameters* in the *D9412GV2/D7412GV2 Control Panel Program Entry Guide* (P/N: F01U003636) for more bell time and test programming information.

Bell Test

To enable the bell test feature, you enable an unused area of the control panel. Enable the bell test feature for the unused area **only**. Program Relay B as the area bell relay for the unused area. All pass codes that have authority to the safe or vault protection must be valid in this area. Program the area for a five-second exit delay. Refer to *Figure 1* on page 6 for test connections. To complete the installation for this feature, connect the output to a D133 Relay Module.

2.2.6 Exit Delay

The control panel's programmed maximum exit delay must not exceed 30 sec.

2.2.7 Equipment Requirements

- D9412GV2 or D7412GV2 Control Panel
- Two (2) D126 12 V, 7 Ah batteries
- Two (2) D1218 12 V 18 Ah batteries
- Two (2) D8108A Enclosures
- D122 Dual Battery Harness
- D122L Dual Battery Harness
- D133 Relay Module
- EVD System (Listed Safe/Vault)

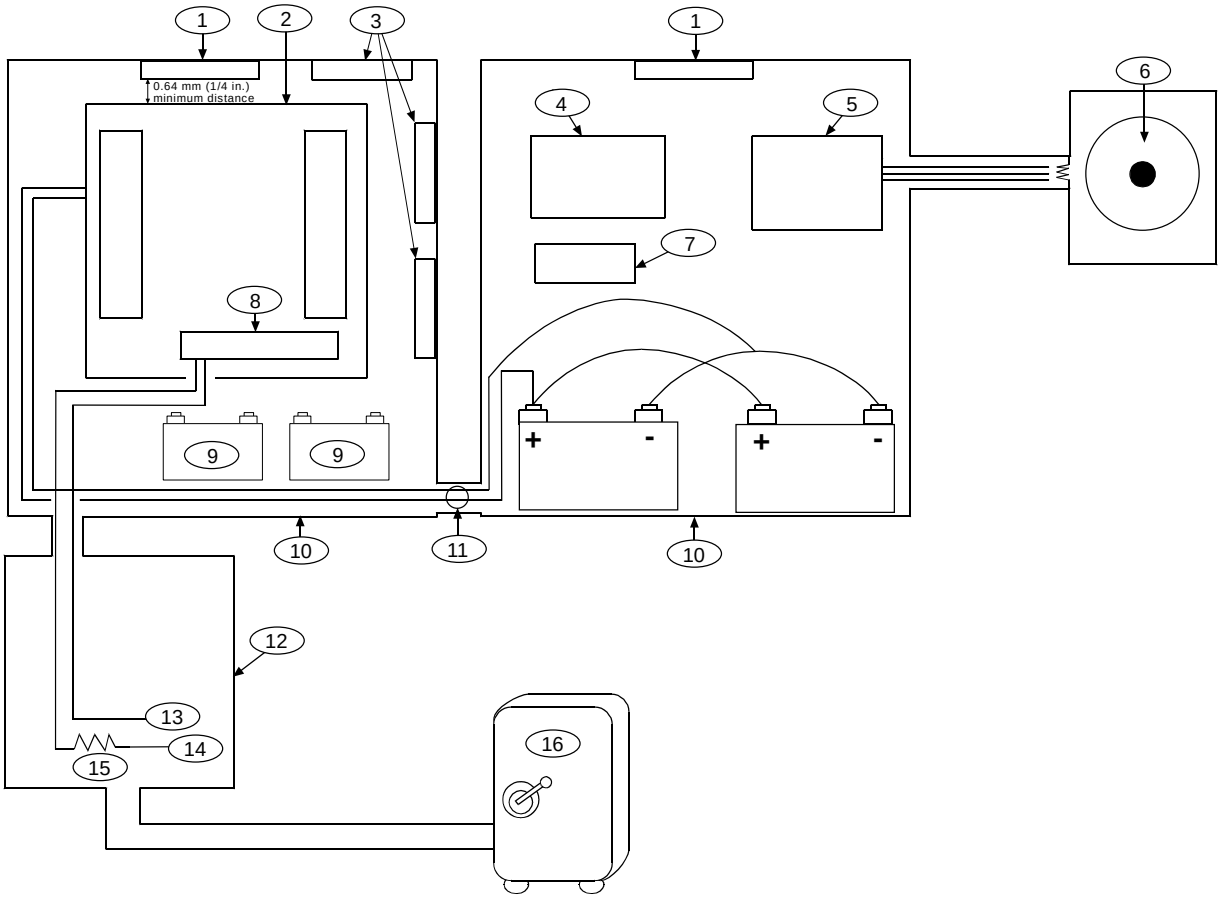
2.2.8 Wiring the Rothenbuhler 5110/4001-42 High Security Bell to the D9412GV2 or D7412GV2 Control Panel

Wear ear protection when installing and testing the Rothenbuhler High Security Bell.

Sound levels greater than 95 dBA at 3 m (10 ft) can occur

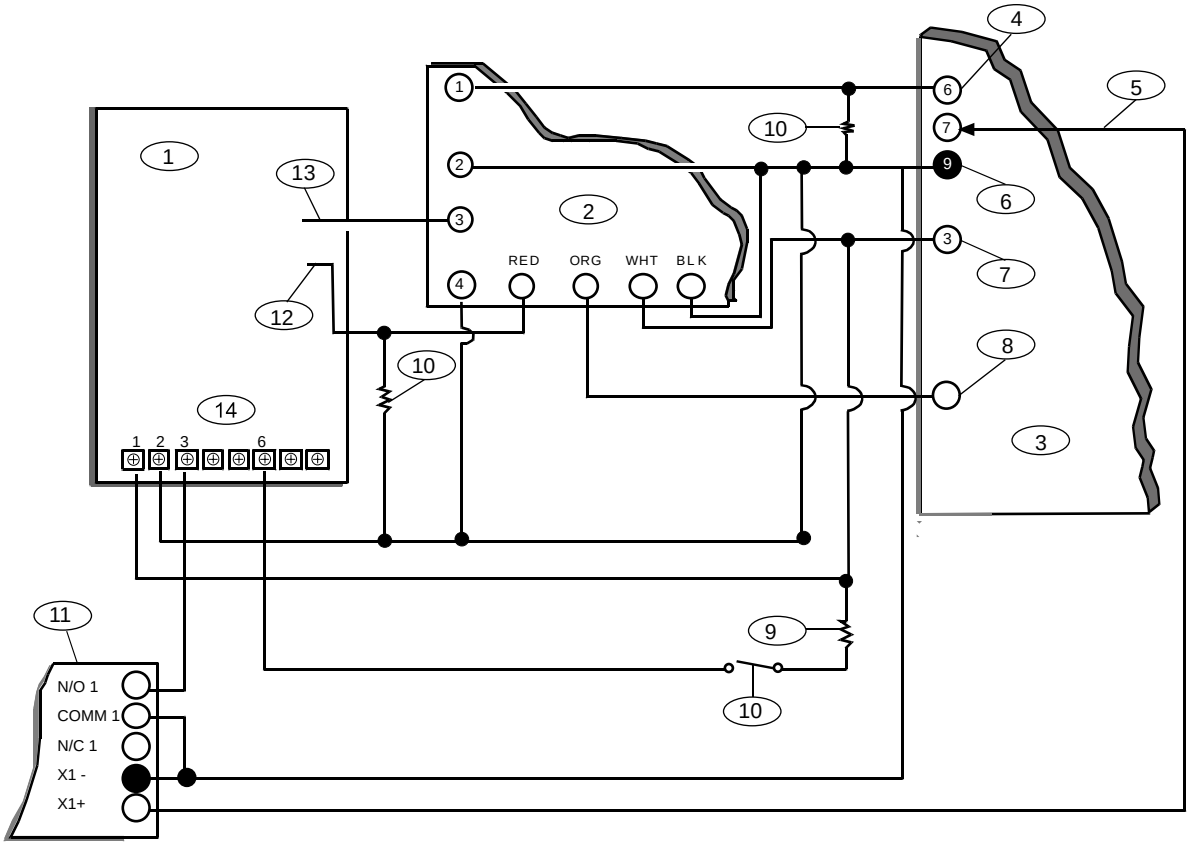
1. Remove all power from the control panel.
2. Use six-conductor 1.2 mm (18 AWG) shielded stranded wire between the control panel and the 5110 Logic Board (located in the bell enclosure).
3. If you do not have a Silence switch, temporarily install a 1 Ω resistor across TB1-1 and TB1-6 on the 5110 Logic Board. The resistor keeps the 5110's bell silent during the installation and alignment procedures. Also place a temporary wire jumper across the TB1-6 Bell Relay and TB1-7. Refer to *Figure 2* on page 7 for wiring a Silence switch.
4. Mount the D8108A's 4001-42 External Balanced Line Module and wire it to the 5110 Logic Board using two-conductor 0.8 mm (22 AWG) cable.
5. Wire the 4001-42 to the control panel. Refer to *Figure 2* and the Rothenbuhler installation manual.
6. Before supplying AC and DC power to the control panel and bell, ensure you are wearing ear protection. The bell sounds for 2 sec and then silences during power up.

Figure 1: Rothenbuhler 5110/4001-42 High Security Bell Wiring Configuration



1 - Self-contained vibration sensor	*9 - D126 Battery*
2 - Control panel	*10 - D8108A Enclosure*
3 - Accessory modules	*11 - D122L Battery Harness*
4 - High line security module	*12 - Proximity/control unit*
5 - 4001-42 Balanced Line Module	*13 - Normally open (NO)*
6 - 5110 Bell	*14 - Normally closed (NC)*
7 - D133 Relay	*15 - End-of-line (EOL) resistor*
8 - Zone input	*16 - Safe*

Figure 2: Wiring the Rothenbuhler 5110/4001-42 High Security Bell to the D9412GV2 or D7412GV2 Control Panel



1 - 5110 Logic Board
2 - 4001-42 External Line Balancing Module
3 - D9412GV2 or D7412GV2 Control Panel
4 - Alarm output
5 - Alternate alarm
6 - Common
7 - +12 VDC
*8 - Alarm zone input**
9 - 10 kΩ resistor
10 - Optional Silence switch
11 - D133 Relay Module
12 - BBL In 4
13 - BBL Out 5
14 - Terminal TB1

** Use Terminal 11, 13, 14, 17, 19, 20, or 22. (Select only one.)*

2.3 Fire Applications

UL Listed fire initiating devices not requiring electrical compatibility evaluation can be used in any application. For example, the four-wire smoke detectors, heat detectors, waterflow switches, and manual pull stations are suitable fire initiating devices. Consult the individual component specification and installation documents to determine suitability.

2.3.1 Four-Wire Smoke Detectors

When using four-wire smoke detectors, install a suitable power supervision device according to the manufacturer's instructions. You can connect any number of four-wire smoke detectors to the 9000GV2 Series Control Panels (subject to available auxiliary power).

The Reset Sensor command is available from the keypads when the Reset Sensor is enabled. Connect the smoke detectors to a suitable interface such as the D125B or D129, or to the D8127/D9127 Modules when used with a 9000GV2 Series Control Panel. Smoke detectors can also be connected to the on-board points to meet UL and NFPA requirements.

When using four-wire smoke detectors, install a suitable power supervision unit according to the manufacturer's instructions. Refer to *Section 2.3.5 Other Devices.*

2.3.2 Two-Wire Smoke Detectors

Two-wire smoke detectors connect to the control panel only through the D125B Powered Loop Interface. Two-wire detectors must be evaluated for electrical compatibility, and be UL Listed for use with the control panel. Refer to *Table 1* on page 9 for the two-wire smoke detectors that are UL Listed for compatibility and the maximum number of detectors that can be connected to each loop of the D125B Powered Loop Interface Module.

You can also consult the smoke detector manufacturer to determine if a particular smoke detector is UL Listed for use with the 9000GV2 Series Control Panels. The Reset Sensor command is available from the keypads when Reset Sensor is enabled.

2.3.3 Two-Wire Smoke Detector Specifications

- Voltage Range: 8.0 VDC to 14 VDC
- UL Compatibility Identifier: Type A

The control panel does not support multiple detectors in alarm. The control panel is intended to handle detectors with optional features. Detectors from different manufacturers cannot be mixed on the same circuit.

2.3.4 NFPA Style A (Class "B") Circuit

Loops A and B on the D125B Module are NFPA Style A (Class "B") initiating circuits suitable for connecting any fire alarm initiating device, including two-wire and four-wire smoke detectors. To connect initiating devices to on-board points (1 through 8) on the D9412GV2 or D7412GV2 Control Panel:

- Use a D125 or D125B Powered Loop Interface Module with any type of initiating device.
- Use a D129 Dual Class "A" (NFPA Style D) Initiating Circuit Module with any type of initiating device, **except** a two-wire smoke detector.

Use the following guidelines when connecting fire alarm initiating devices to off-board points:

- Do not connect two-wire smoke detectors to POPITs or MUX bus inputs.
- Use the D8127U, D8127T, D9127U, or D9127T POPIT Modules to connect four-wire smoke detectors when using a D9412GV2 or D7412GV2.

2.3.5 Other Devices

Other initiating devices, including four-wire smoke detectors, connect to the control panel through the D129 Dual Class "A" Initiation Circuit Module, the D125B Powered Loop Interface, D8127 or D9127 POPITs, or on-board points. When using four-wire smoke detectors, install a suitable power supervision unit according to the manufacturer's instructions. Use the D130 Relay Module, D8129 OctoRelay Module, or Terminal 8, Switched Aux Power to provide reset capability. Refer to *Off-Board Relays* in the *D9412GV2/D7412GV2 Operation and Installation Guide* (P/N: F01U003641).

For battery calculations, refer to *Table 4* on page 20 and *Section 8.0 NFPA 72 Fire Alarm Applications* on page 21.

Test Weekly: Perform a Fire Test weekly. Both the AC power and battery are tested according to UL 864.

2.3.6 UL Listed Two-Wire Smoke Detectors Compatible with the D125 or D125B

A D125 or D125B Powered Loop Interface Module is required to connect smoke detectors to the on-board points (1 to 8).

Table 1: UL Listed Two-Wire Smoke Detectors Compatible with the D125 or D125B Modules

Manufacturer	Detector Model	Base Model	Maximum Number of Detectors per Loop		
			D125	D125B	
			12 VDC	12 VDC	24 VDC
Bosch Security Systems	D262	D260	20	25	N/A
	D281	D280	N/A	N/A	80
	D282	D280	N/A	N/A	80
	D283	D280	N/A	N/A	80
Radionics	D262	D260	20	25	N/A
	D281	D280	N/A	N/A	80
	D282	D280	N/A	N/A	80
	D283	D280	N/A	N/A	80
Detection Systems	DS200	MB200-2W	10	20	60
	DS200HD	MB200-2W	10	20	60
	DS250	MB2W, MB2WL	10	10	10
	DS250TH	MB2W, MB2WL	10	10	10
	DS282	N/A	10	10	10
	DS282TH	N/A	10	10	10
Honeywell	TC805C-1000	14506587 and 14506587-004	10	10	40
	TC804C-1001	14506587 and 14506587-004	10	10	40
	TC804C-1019	14506587 and 14506587-004	10	10	40
System Sensor	1400	N/A	10	10	40
	2400	N/A	10	10	40
	2400TH	N/A	10	10	40
	1451DH	DH400	10	10	40

2.4 Enclosures

Bosch Security Systems offers three optional enclosures for the control panel:

D8103 Enclosure

The D8103 is suitable for residential fire and burglary installations and commercial burglary applications that do not require attack resistance or the approval by Factory Mutual (FM) or New York City – Materials and Equipment Acceptance (NYC-MEA). Refer to *Table 2* on page 12 for acceptable applications.

D8108A Enclosure

The D8108A is attack resistant and intended primarily for UL commercial burglar alarm and mercantile safe and vault applications requiring a local bell. This enclosure can be used in any burglar or fire alarm application where the D8109 Enclosure is suitable. The D8108A, with some modification, can be used for bank safe and vault applications as described in *Section 2.2 Bank Safe and Vault Applications* on page 4. UL lists the D8108A for all commercial fire alarm applications. It is approved by FM, CSFM, and the NYC-MEA.

D8109 Red Fire Enclosure

Generally, the D8109 is used for fire alarm applications. UL lists the D8109 for all commercial fire alarm applications. It is approved by FM, CSFM, and the NYC-MEA.

All references to NFPA and related requirements are based on compliance with the NFPA 72, National Fire Alarm Code. Because installation specifications are generally based on a specific edition of a standard that was legally adopted by the authority having jurisdiction (AHJ), consult with the appropriate AHJ for confirmation.

3.0 UL/NFPA Compliant Installations

To install a D9412GV2 or D7412GV2 that is UL and NFPA compliant, the following items must be included:

- D8109 Red Fire Enclosure
- D192C or D192G Bell Supervision Module
- D928 Dual Phone Line Module
- D8004 Transformer Enclosure
- Ground Fault Detect enabled on the control panel

Refer to *Table 2* for specific application installation requirements.

4.0 Ground Fault Detect Enable

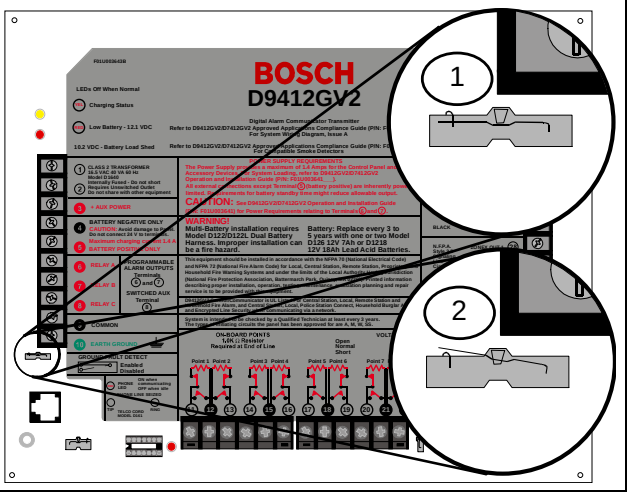
To enable the Ground Fault Detect Enable feature:

1. Lock (close) the S4 Ground Fault Detect Pin on the control panel as shown in *Figure 3*.
2. Program the Area 5 Silent Alarm Relay to a non-zero value (1 to 128).

   In remote programming software (RPS), the Area 5 Silent Alarm Relay is located in RELAY PARAMETERS,

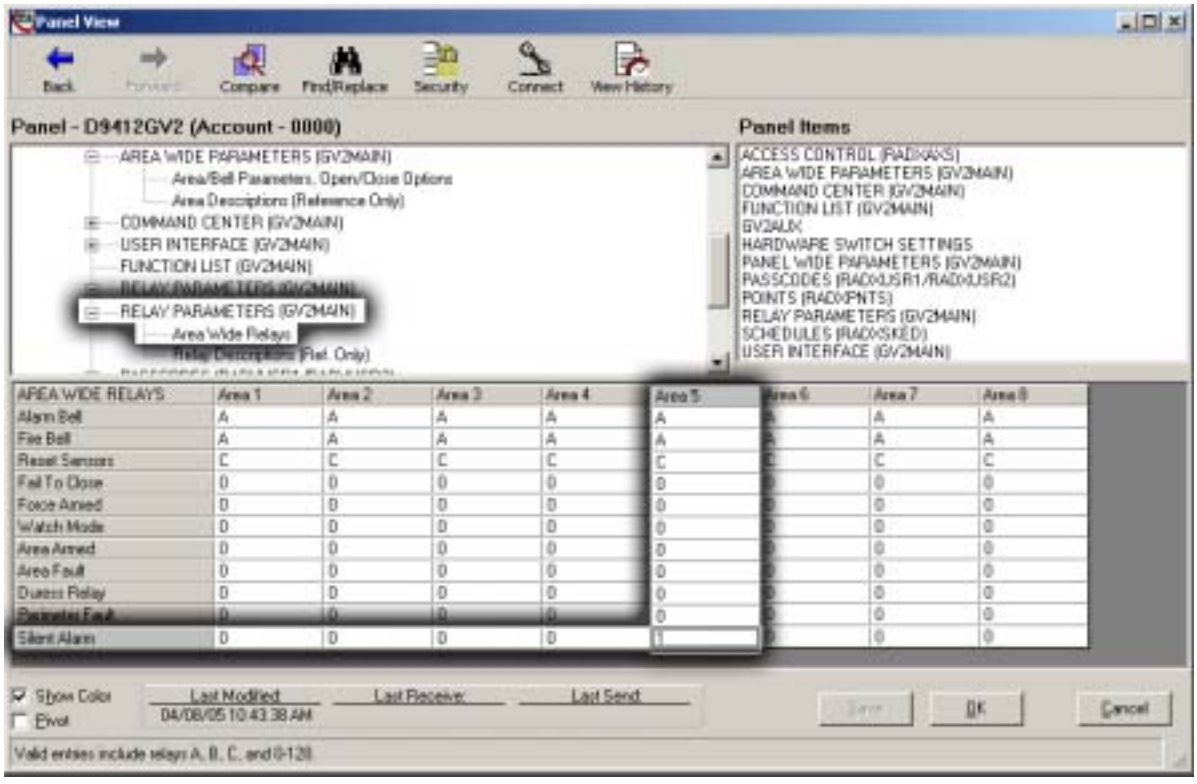
   Area Wide Relays, and Silent Alarm Area 5 as shown in *Figure 4*.

Figure 3: Ground Fault Detect (S4)



1 - Locked (Closed) 2 - Unlocked (Open)

Figure 4: Area 5 Silent Alarm Relay in RPS



For more information, refer to the D9412GV2/D7412GV2 Operation and Installation Guide (P/N: F01U003641) and the D9412GV2/D7412GV2 Program Entry Guide (P/N: F01U003636).

5.0 Compatible UL Listed Components

Table 2: UL Listed Components Compatible with the D9412GV2 and D7412GV2 Control Panels

	Household Burglary	Household Fire	Household Fire/ Burglary Combined	Central Station Burglary (Grade C)	Police Connected Burglary	Local Burglary	Remote Station or Auxiliary Fire	Local Fire/Burglary Combined	Local Fire	Local and Central Station Fire Combined	Local and Central Station Fire/ Burglary (Grade C)	Central Station Fire/ Burglary Combined	Central Station Fire	Electrically Actuated Transmitter
Minimum Hours of Standby Battery	4	24 + 4 min alarm		4	4	4	60 + 5 min alarm	24 + 5 min alarm						
D8103 Enclosure	Choose one. The D101 lock is required for the enclosure.				No	No	No	No	No	No	No	No	No	No
D8108A Enclosure					Req.	Req.	Choose one.	Req.	Choose one.					
D8109 Enclosure					No	No		No						
D122 and D122L Dual Battery Harness	Calculate the current draw to determine if a second battery is required.						Req.	Calculate the current draw to determine if a second battery is required.						
D125B Class B, Style A Powered Loop Interface	Opt.	#	#	Opt.	Opt.	Opt.	# The D125 and D129 are required to connect fire alarm initiating devices to Zones 1 to 8. The D125 provides two powered loops for connecting listed two-wire smoke detectors. The D129 provides two non-powered Class "A" initiating circuits.							
D129 Class A, Style D Initiating Module		#	#											
D126/D1218 Battery	1+	1+	1+	1+	1+	1+	2+	1+	1+	1+	1+	1+	1+	1+
D127 Reversing Relay	Opt.	No	Opt.	Opt.	Opt.	Opt.	No	Opt.	No	No	Opt.	Opt.	No	No
D928 Dual Phone Line Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Required for communication on two telephone lines and/or CPU watchdog function.							
D161 Telephone Cord	Required to connect control panel to RJ31X telco block.						2 Req.			Required to connect the control panel to the RJ31X telephone block.				
D185 Auxiliary Interface Kit							*							
D192A/D192C/D192G Class "B", Style W Bell Circuit Supervision	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Required for indicating circuits.					Opt.	Opt.	
Smoke Detector Base		1++	1++				Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D268/D269H Independent Zone Control	Optional. **Only** connect to Zones 1 to 8.													
Indicating Device	1+	1+	1+	Opt.	**	**	1+	1+	1+,**	1+	1+	Opt.	Opt.	
D461 Pull Station	Optional. Might be required by job specifications or AHJ.													
D1255/D1260 Command Center	1+	1+	1+	1+	1+	1+	1+	1+	1+	1+	1+	1+	Opt.	
D1256	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D1257	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D1640 Transformer	Required for **all** applications.													
D8004 Transformer Enclosure	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Required.							
D8122 Derived Channel STU	Optional. Contact the telephone company for availability of derived channel service.													
D8125 Class B, Style 3.5 POPEX Module	Required for the D8127T/U and D9127T/U POPITs.													
D8125MUX	Required for MUX devices. Refer to *Section 7.1 D8125MUX* on page 19.													
D8127T/U & D9127T/U Class B, Style A POPIT Modules	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D8128D OctoPOPIT	Opt.	No	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D8129 OctoRelay	Optional. For remote annunciation of system functions.													
D8130 Release Module	Optional.													
D8132 Battery Charger	Refer to *Table 4* on page 20 to determine if the system requires a D8132 Module for increased battery standby.													
D9131A Parallel Printer Interface	Optional. Use with the parallel printer to print events from the control panel log locally.													
D9210B Access Control Interface	No	No	No	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No

No = Not acceptable for this application. Req. = Required for this application. Opt. = Optional for this application.

 # The D125B and D129 are required to connect fire alarm initiating devices to Zones 1 to 8. The D125B provides two powered loops for connecting listed two-wire smoke detectors. The D129 provides two non-powered Class "A" initiating circuits.

1+ = One or more required for this application. Consult the appropriate standard.

2+ = Two or more required for this application. Consult the appropriate standard.

1++ = At least one detector required. You can substitute other two-wire detectors listed for use with the D125. You can also use the D262 with the D270 four-wire base and a listed power supervision relay.

** = Auxiliary requires the D184 Auxiliary Local Energy Interface Kit.*

*** = Listed bell (siren) housing required for burglary alarm bell or siren.*

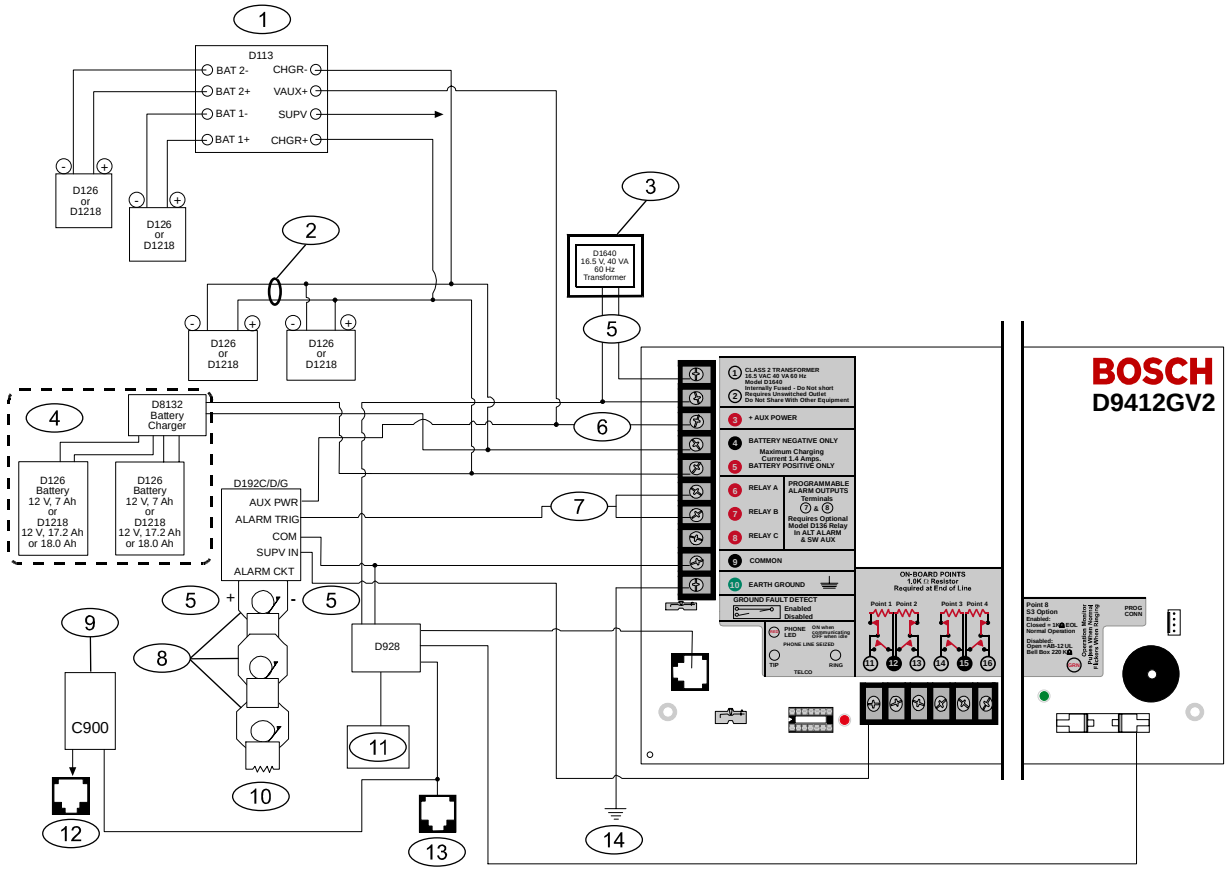
[Empty Box] = Not used for this application.

6.0 System Wiring Diagrams, Issue A

The System Wiring Diagrams, Issue A (*Figure 5* on page 13 to *Figure 10* on page 18) show the relationship between the control panel and the accessory components referred to in *Table 2* on page 12).

6.1 D9412GV2 Wiring Diagrams

Figure 5: D9412GV2 System Wiring Diagram, Power Supply Side



1 - If required by local AHJ, connect the D113 Battery Lead Supervision Module.

2 - D122 Dual Battery Harness, as required.

3 - D1640 Transformer and D8004 Transformer Enclosure required for NFPA applications

4 - D8132 Dual Battery Charger with two batteries (Batteries are not supervised).

5 - Power limited, supervised

6 - Power limited

7 - To Relay A or Relay B

8 - Listed audible signaling devices rated at 10.2 VDC to 13.8 VDC (Do not use vibrating type horns)

9 - Optional

10 - 560 Ω, 2 W EOL resistor (P/N: 15-03130-005)

11 - RJ31X, secondary phone line

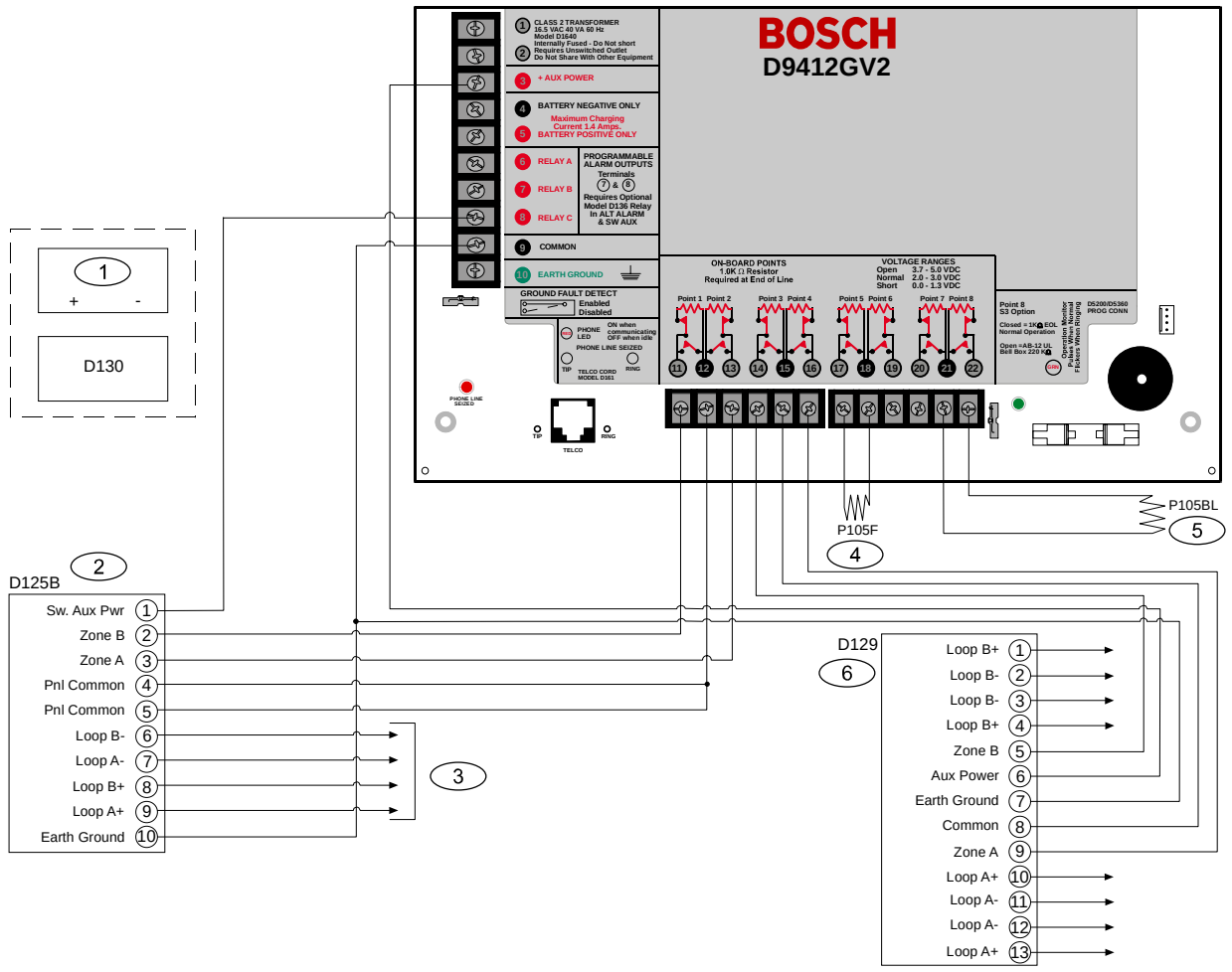
12 - RJ31X jack

13 - RJ31X, primary phone line

14 - To earth ground

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

Figure 6: D9412GV2 System Wiring Diagram, Input Points, and Peripheral Devices



1 - *(Optional): For 24 V applications use a UL Listed 24 VDC power supply with a D130 Relay Module. Refer to the* D130 Installation Instructions *(P/N: 74-06262-000) for correct wiring requirements.*

2 - *D125B Powered Loop Interface Module*

3 - *To UL Listed two-wire smoke detectors. Refer to* Section 2.3.2 Two-Wire Smoke Detectors *on page 8 for a listing of compatible two-wire smoke detectors.*

4 - *P105 1 kΩ EOL resistor (P/N: 14-03130-004): Suitable for non-powered initiating and supervisory devices such as pull stations, heat sensors, and valve tampers.*

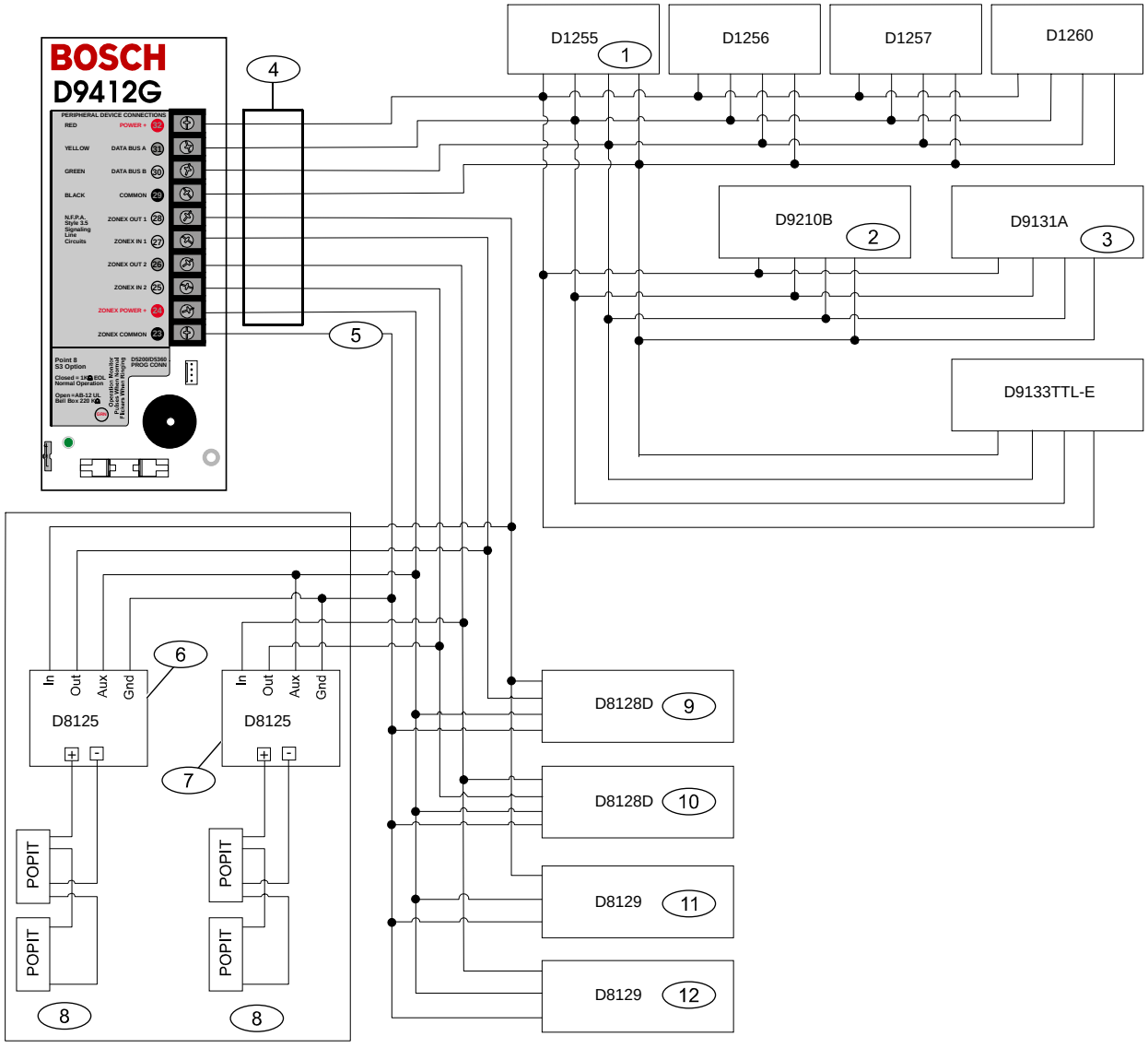
5 - *P105BL1 1kΩ EOL resistor: For typical burglar alarm applications.*

6 - *D129 provides optional Waterflow Alarm Retard feature. Not suitable for two-wire smoke detectors.*

Use zero retard except for waterflow devices.

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

Figure 7: D9412GV2 System Wiring Diagram, SDI Devices

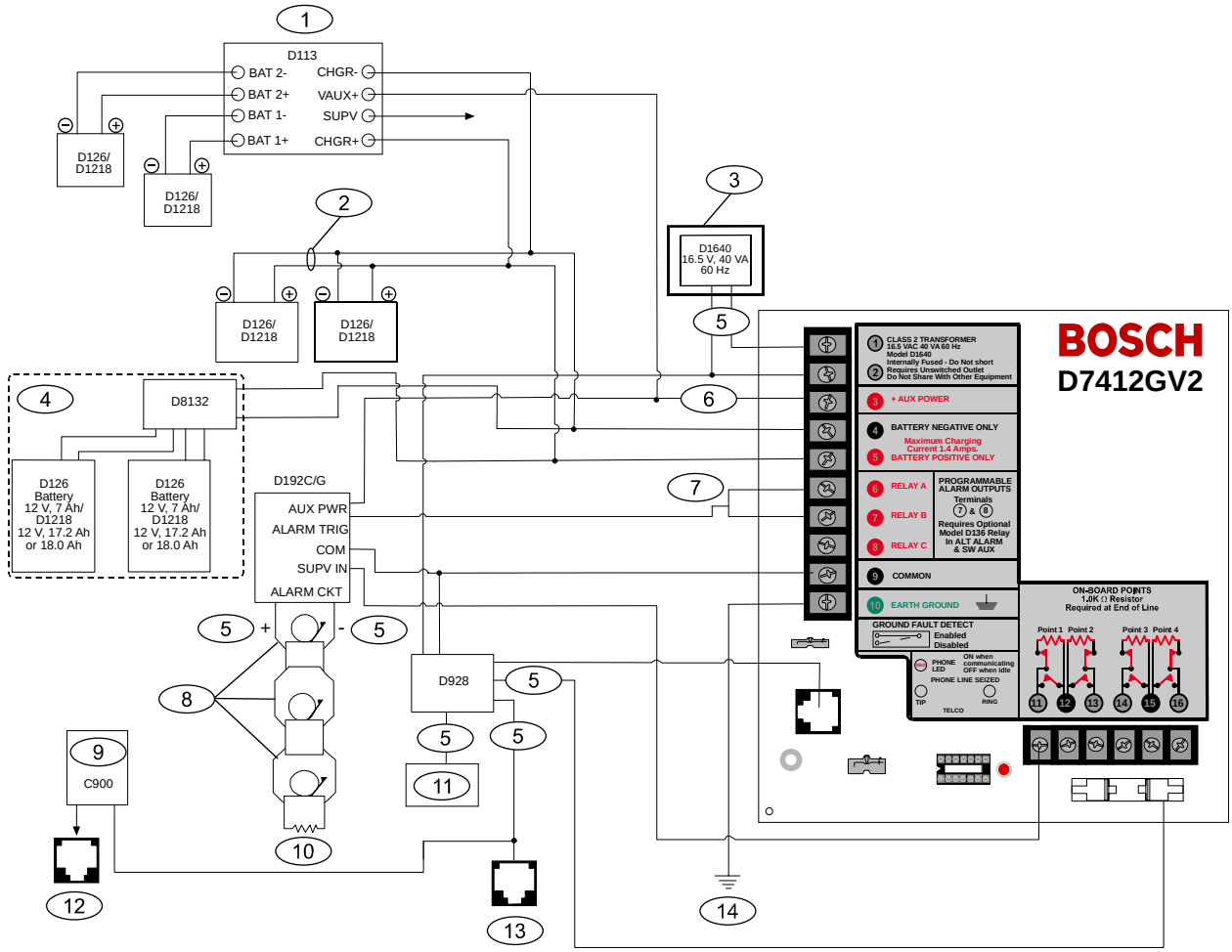


1 - Up to 8 supervised keypads
2 - Up to 8 D9210Bs
3 - Up to 3 supervised D9131As
4 - Power limited, supervised
5 - Power limited
6 - POPEX 1
7 - POPEX 2
8- Up to 119 D9127U/T POPITs or up to 63 D8127U/T POPITs
9 - ZONEX 1: up to 15 D8128Ds
10 - ZONEX 2: up to 15 D8128Ds maximum
11 - ZONEX 1: Up to 8 D8129s maximum
12 - ZONEX 2: Up to 8 D8129s maximum

All external connections except Terminal 5 (battery position) are power limited.

6.2 D7412GV2 Wiring Diagrams

Figure 8: D7412GV2 System Wiring Diagram, Power Supply Side



1 - If required by local AHJ, connect the D113 Battery Lead Supervision Module.

2 - D122 Dual Battery Harness, as required.

3 - D1640 Transformer and D8004 Transformer Enclosure required for NFPA Applications

4 - D8132 Dual Battery Charger with two batteries (batteries are not supervised)

5 - Power limited, supervised

6 - Power limited

7 - To Relay A or Relay B

8- Listed audible signaling devices rated at 10.2 VDC to 13.8 VDC (Do not use vibrating type horns.)

9- Optional

10- 560 Ω, 2 W EOL resistor (P/N: 15-03130-005)

11- RJ31X, secondary phone line

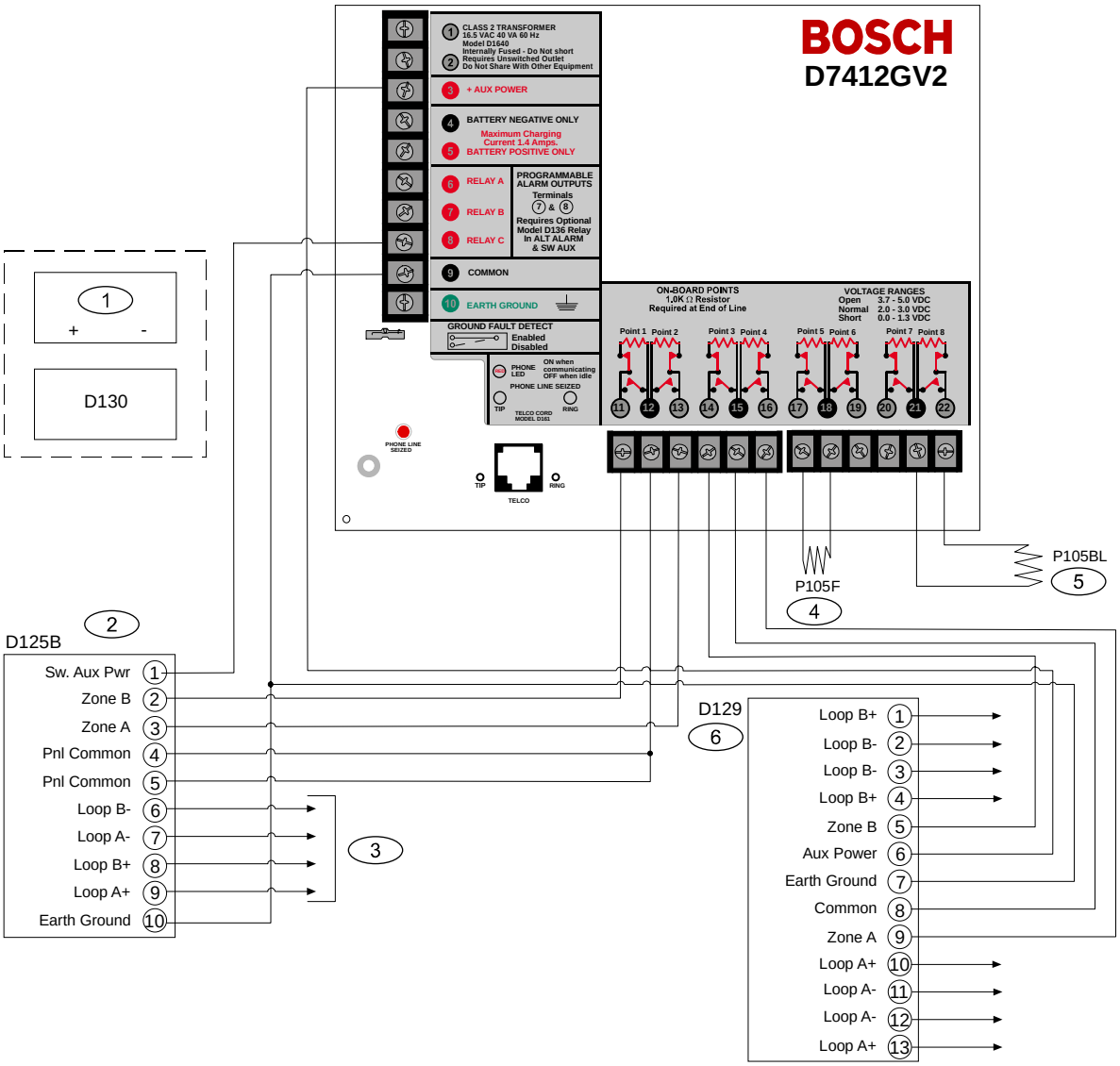
12- RJ31X, jack

13- RJ31X, primary phone line

14- To earth ground

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

Figure 9: D7412GV2 System Wiring Diagram, Input Points, and Peripheral Devices



1 - (Optional): For 24 V applications use a UL Listed 24 VDC power supply with a D130 Relay Module. Refer to the D130 Installation Instructions *(P/N: 74-06262-000) for correct wiring requirements.*

2 - D125B Powered Loop Interface Module

32 - To UL Listed 2-wire smoke detectors. Refer to the 9000/9000G/9000GV2 Series Technical Service Note: Smoke Detector Compatibility *(P/N: 33284) for a listing of compatible two-wire smoke detectors.*

4 - P105 1 kΩ EOL resistor: Suitable for non-powered initiating and supervisory devices such as pull stations, heat sensors, and valve tampers.

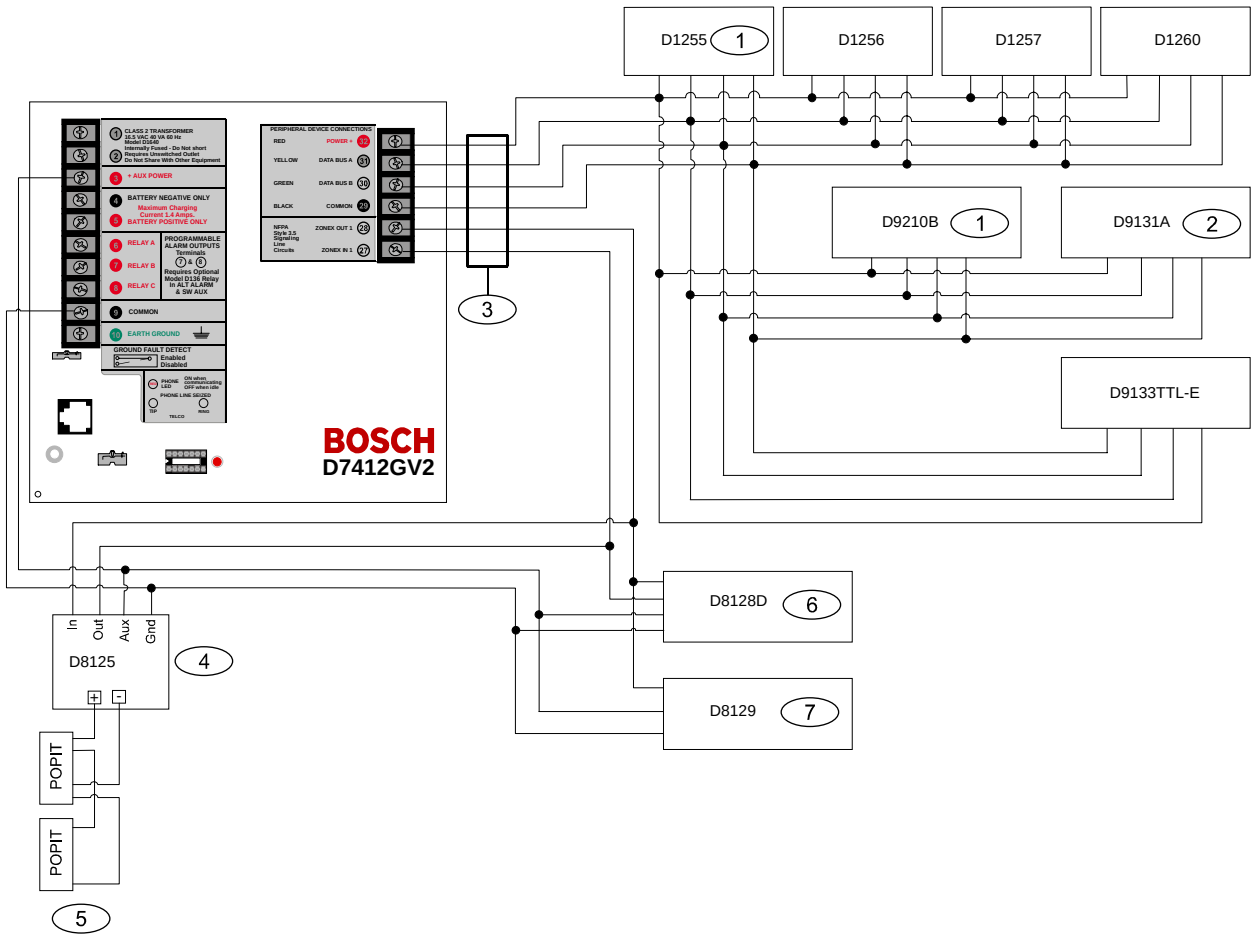
5- P105BL1 1kΩ EOL resistor: For typical burglar alarm applications.

6 - D129 provides optional Waterflow Retard feature. Not suitable for two-wire smoke detectors.

Use zero retard except for waterflow devices.

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

Figure 10: D7412GV2 System Wiring Diagram, SDI Devices



1 - Up to 8 supervised

2 - Up to 1 supervised

3 - Power limited, supervised

4 - POPEX 1

5 - Up to 67 D9127U/T POPITs or up to 63 D8127U/T POPITs

6 - ZONEX 1: Up to 8 D8128Ds

7- ZONEX 1: Up to 8 D8129s maximum

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

7.0 Current Ratings Charts

7.1 D8125MUX

Complete the chart in *Table 3* to determine the maximum currents for the D8125MUX and its accessories. Transfer the total figures to *Table 4* on page 20.

> The maximum current draw for each MUX Bus is 75 mA.

Table 3: Current Rating Chart for D8125MUX

		AC Power Off Maximum Current (mA)			In Alarm Maximum Current (mA)		
Accessory Module	**Qty. Used**	**Each Unit**	**Qty.**	**Total System**	**Each Unit**	**Qty.**	**Total System**
DS7432	________	10	x Qty. =	________	10	x Qty. =	________
DS7457i	________	0.35	x Qty. =	________	0.35	x Qty. =	________
DS7460i	________	1	x Qty. =	________	1	x Qty. =	________
DS7465i	________	1	x Qty. =	________	1	x Qty. =	________
Ratings of other devices on the MUX Buses that are not shown above*:							
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
______________	________	________	x Qty. =	________	________	x Qty. =	________
		Column A Total =		________	**Column B Total =**		________
* Refer to the device's installation guide for current draw values.							

7.2 Standby Battery Calculations

Table 4: Current Rating Chart for Standby Battery Calculations

		A AC Power On Normal Current (mA)			B AC Power Off Minimum Current (mA)			C In Alarm Maximum Current (mA)		
Model Number	**Qty. Used**	**Each Unit***	**Qty.**	**Total**	**Each Unit***	**Qty.**	**Total**	**Each Unit***	**Qty.**	**Total**
D9412GV2/ D7412GV2	_____	225	x 1	= 225	225	x 1	= 225	300	x 1	= 300
D125B	_____	22	x Qty	= _____	22	x Qty	= _____	150	x Qty	= _____
D127	_____	5	x Qty	= _____	5	x Qty	= _____	55	x Qty	= _____
D129	_____	22	x Qty	= _____	22	x Qty	= _____	23	x Qty	= _____
D185	_____	245	x Qty	= _____	245	x Qty	= _____	300	x Qty	= _____
D192C	_____	25	x Qty	= _____	25	x Qty	= _____	50	x Qty	= _____
D192G	_____	35	x Qty	= _____	35	x Qty	= _____	100	x Qty	= _____
D1255	_____	104	x Qty	= _____	106	x Qty	= _____	206	x Qty	= _____
D1256	_____	104	x Qty	= _____	106	x Qty	= _____	206	x Qty	= _____
D1257	_____	104	x Qty	= _____	106	x Qty	= _____	206	x Qty	= _____
D1260	_____	200	x Qty	= _____	200	x Qty	= _____	250	x Qty	= _____
D720	_____	20	x Qty	= _____	20	x Qty	= _____	100	x Qty	= _____
D8125	_____	50	x Qty	= _____	50	x Qty	= _____	50	x Qty	= _____
D8125MUX[1]	_____			= _____			= _____			= _____
D8127T/U	_____	3	x Qty	= _____	3	x Qty	= _____	4	x Qty	= _____
D8128D	_____	51	x Qty	= _____	51	x Qty	= _____	51	x Qty	= _____
D8129	_____	20	x Qty	= _____	20	x Qty	= _____	Refer to footnote[2]		= _____
D8130	_____	7	x Qty	= _____	7	x Qty	= _____	60	x Qty	= _____
D9127T/U	_____	0.5	x Qty	= _____	0.5	x Qty	= _____	0.8	x Qty	= _____
D9131A	_____	21	x Qty	= _____	21	x Qty	= _____	23	x Qty	= _____
D9210B	_____	110	x Qty	= _____	110	x Qty	= _____	110[3]	x Qty	= _____
D928	_____	18	x Qty	= _____	18	x Qty	= _____	100	x Qty	= _____
DX4010i	_____	50	x Qty	= _____	50	x Qty	= _____	55	x Qty	= _____
DX4020i	_____	80	x Qty	= _____	80	x Qty	= _____	84	x Qty	= _____
Ratings of other devices in the system that are not shown above:										
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
____	_____	_____	x Qty	= _____	_____	x Qty	= _____	____	x Qty	= _____
			Total A	= _____		**Total B**	= _____		**Total C**	= _____

[1] Refer to *Table 3* on page 19 to determine maximum currents for the D8125MUX and its accessories.

[2] The **In Alarm** calculation for the D8129 is: 20 x Qty + 22.5 x number of relays

[3] Use 110 mA + reader current. **Do not exceed 260 mA**.

8.0 NFPA 72 Fire Alarm Applications

Table 5: Standby Battery Requirements

Type	Required Capacity	Calculations
Household Burglary and Commercial Burglary	4 h	
Bank Safe and Vault	72 h (UL 365). Auxiliary power current for all devices, including keypads, must be limited to 300 mA or less to meet this requirement.	
Central Station or Local Fire Alarm	24 h + 5 min of alarm operation. Refer to *Table 6*.	
Remote Station or Auxiliary Fire Alarm	60 h + 5 min of alarm operation. Refer to *Table 7*.	
Household Fire Warning Equipment	24 h + 4 min of alarm operation. Refer to *Table 8* on page 22.	

8.1 Standby Battery Calculation for NFPA 72 Fire Alarm Applications

Refer to *Table 3* on page 19 for totals B and C used in the formulas below. When connecting two batteries, use either the D122 Dual Battery Wiring Harness or the D8132 Battery Charger Module.

8.2 Central Station or Local Systems

Central Station or Local Systems require 24 h of standby plus 5 min of alarm operation at the end of the 24-hour period. A single battery is sometimes adequate for central station systems, but two batteries must be installed to meet the basic standby requirements for a local system installation. Use the battery ampere-hour (Ah) calculations to confirm compliance. The formula in *Table 6* includes the calculation for 5 min of alarm operation at the end of the 24-hour period, as well as a 10% contingency factor that allows for depletion of battery capacity with age.

Table 6: Central Stations or Local Systems Ah Calculation Formula

Total B		Hours		Total C		Hours		Contingency		Total Ah*
(_____	x	24)	+	(_____	x	.083)	+	10%	=	_____

*Total Ah requirements must not exceed Ah capacity of batteries:
two D126 Batteries = 14 Ah;
one D1218 Battery = 17.2 or 18 Ah.

8.3 Remote Station or Auxiliary Systems

Remote Station or Auxiliary Systems require 60 h of standby plus 5 min of alarm operation at the end of the 60-hour period. A D8132 Battery Charger Module with additional batteries installed in a separate D8109 or D8108A Enclosure might be required in the system to meet the basic standby requirements for a remote station or auxiliary system installation. Use battery Ah calculations to confirm compliance. The formula in *Table 7* includes the calculation for 5 min of alarm operation at the end of the 60-hour period, as well as a 10% contingency factor that allows for depletion of battery capacity with age.

Table 7: Remote Station or Auxiliary Systems Ah Calculation Formula

Total B		Hours		Total C		Hours		Contingency		Total Ah*
(_____	x	60)	+	(_____	x	.083)	+	10%	=	_____

*Total Ah requirements must not exceed Ah capacity of batteries:
two D126 Batteries = 14 Ah;
one D1218 Battery = 17.2 or 18 Ah.

8.4 Household Fire Warning Equipment

The Household Fire Warning Equipment Standard requires 24 h of standby current plus 4 min of alarm operation at the end of the 24-hour period. Use battery Ah calculations to confirm compliance. The formula in *Table 8* includes the calculation for 4 min of alarm operation at the end of the 24-hour period, as well as a 10% contingency factor that allows for depletion of battery capacity with age.

Table 8: Household Fire Ah Calculation Formula

Total B		Hours		Total C		Hours		Contingency		Total Ah*
(_____	x	60)	+	(_____	x	.067)	+	10%	=	_____

*Total Ah requirements must not exceed Ah capacity of batteries:
two D126 Batteries = 14 Ah;
one D1218 Battery = 17.2 or 18 Ah.

Notes

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