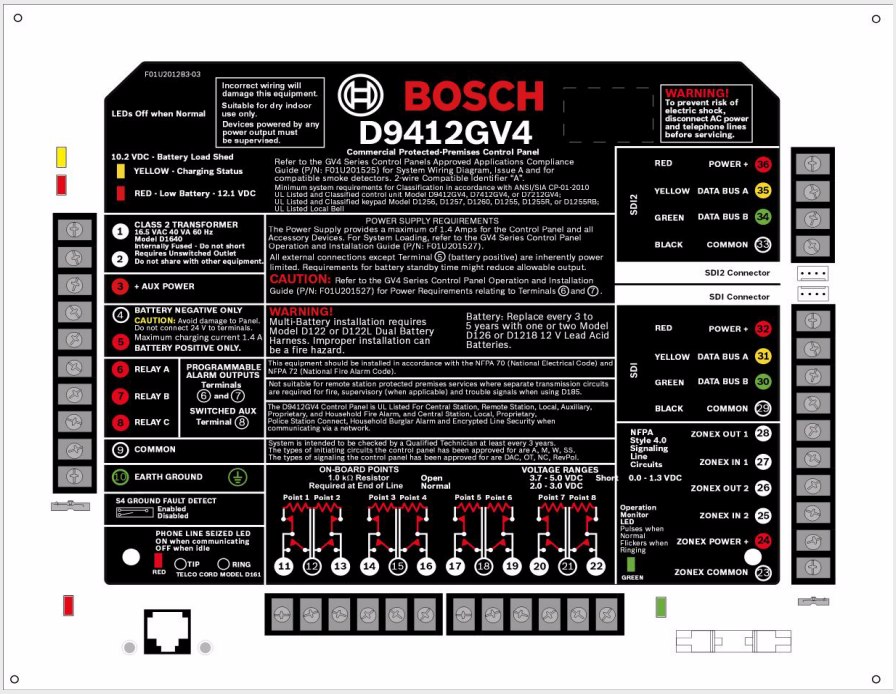

Control Panels

D9412GV4/D7412GV4/D7212GV4

BOSCH

en UL Installation Instructions

Table of Contents

1 Installation

1.1 Installation Preparation

This section contains a general installation procedure and refers to other sections of the document for detailed instructions. Review this document and the *D9412GV4/D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312) before beginning the installation to determine the hardware and wiring requirements for the features used. Have the following documentation available when reading through this guide:

– *D9412GV4/D7412GV4/D7212GV4 Program Record Sheet* (P/N: F01U214958)
– *Security System Owner's Manual* (P/N: 71-06633-000) and *GV4 Series Owner's Manual Supplement* (P/N: F01U245224)
– Installation manual for keypad or annunciator (D1255 all models, D1255RB, D1256, D1256RB, D1257, D1257RB, or D1260 all models)

1.2 Enclosure Options

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

– D8103 Universal Enclosure (tan)
– D8109 Fire Enclosure (red) for the D9412GV4 and D7412GV4 Control Panels
– D8108A Attack Resistant Enclosure (tan)

Refer to the *D9412GV4/D7412GV4/D7212GV4 Approved Applications Compliance Guide* (P/N: F01U201525) to determine if the application requires a specific enclosure.

1.3 Mounting Enclosure

1. Run the necessary wiring throughout the premises.
2. Mount the enclosure in the desired location. Use all five enclosure mounting holes. Refer to *Figure 1.1, Page 5*.
3. Pull the wires into the enclosure.

NOTICE!
Electromagnetic interference (EMI) can cause problems on long wire runs.

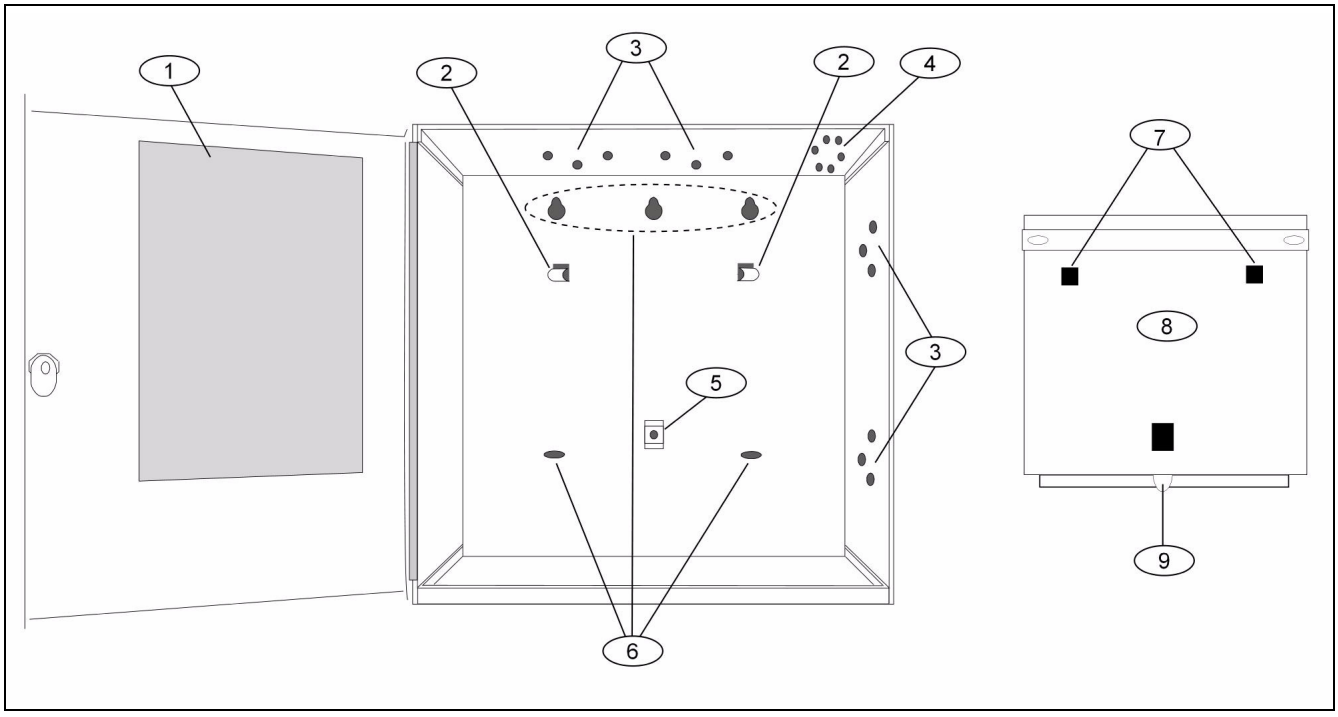

Figure 1.1 Enclosure Mounting

Callout	Description
1	Point chart label
2	Mounting skirt hooks (2)
3	Module mounting holes (12)
4	Tamper switch mounting holes (5)
5	Skirt mounting hole (1)
6	Enclosure mounting holes (5)
7	Mounting skirt hook holes (2)
8	Back of the control panel
9	Lock down tab

1.4 Installing the Control Panel

1. Place the control panel 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 control panel down so that it hangs on the hooks. Refer to *Figure 1.1, Page 5*.
2. Remove the tape from the #6 x 1/4-in. screw in the mounting tab on the control panel. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure. Tighten the screw to secure the control panel in the enclosure.
3. Connect earth ground to the control panel before making any other connections. Refer to *Section 1.5 Connecting Earth Ground, page 5*.

1.5 Connecting Earth Ground

1.5.1 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. Recommended earth ground references are a grounding rod or a cold water pipe.

WARNING!

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 control panel terminals to earth ground.

1.5.2 Ground Fault Detect Enable

NOTICE!

To meet UL 864 requirements, enable Ground Fault Detect.

A ground fault is a circuit impedance to earth ground. The control panel has a ground fault detection circuit that, when enabled, detects ground faults on Terminals 1 to 9 and 11 to 32. The control panel also detects and annunciates ground faults on any device connected to it. If a ground fault condition occurs, the keypads display SERVC GND FAULT and the control panel sends a GROUND FAULT TROUBLE, AREA 1. When the control panel recognizes that the ground fault condition is corrected, and remains corrected for between 5 to 45 consecutive seconds, a Restoral Report is sent.

NOTICE!

The GV4 Series Control Panels log and print a Ground Fault event as a Trouble Ground Fault if communicating in Modem IIIa^2 format. If communicating in Contact ID format, the D7212GV4 generates a Ground Fault (310) event.

1.5.3 Enabling Ground Fault Detection

To enable the Ground Fault Detect Enable feature, lock (close) the S4 Ground Fault Detect Pin on the control panel (refer to *Figure 1.2, Page 6*).

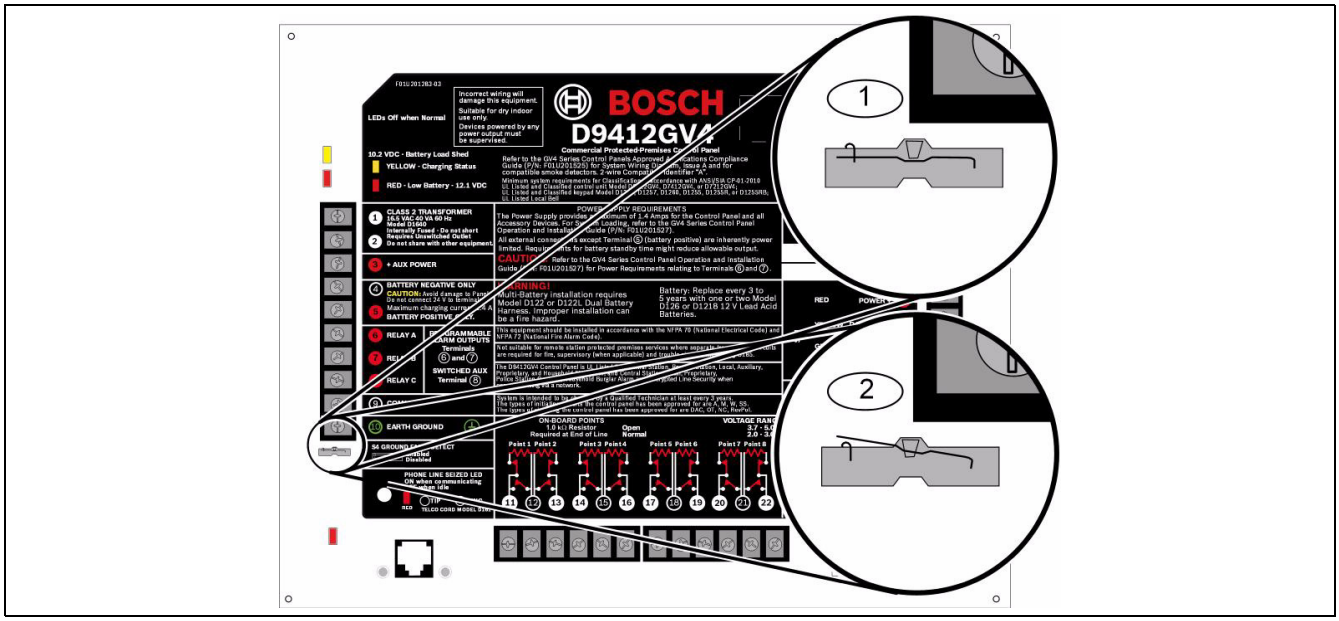

Figure 1.2 Ground Fault Detect (S4)

Callout	Description
1	S4 Locked (Closed). Control panels detects ground faults.
2	S4 Unlocked (Open). Control panel does not detect ground faults.

1.5.4 GV4 Series Ground Fault Impedance Specifications

Table 1.1, Page 7 provides the impedance specifications for detecting ground faults when any terminal or field wiring is shorted to ground.

Impedance	Control Panel Detects Ground Fault
≤ 300 Ω	Yes
300 Ω to 200 k Ω	Detection depends upon the terminal
≥ 200 k Ω	No

Table 1.1 Ground Fault Impedance Specifications

1.5.5 Locking the Reset Pin

Locking the reset pin disables the control panel (refer to *Figure 1.3, Page 7*). When the control panel is disabled, the system ignores the keypads and points. CALL FOR SERVICE appears in keypad displays when the pin is locked down.

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

Releasing the reset pin from the closed position resets the control panel. The control panel resets all its timers, counters, indexes, and buffers. Any points that restore after a reset 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. Refer to *RPS Parameters* in the *D9412GV4/ D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312).

Locking the pin in the disable position applies power to the control panel and charges the battery while the detection devices and keypads are installed.

When the Reset Switch (labeled S1) is closed, all network communication modules will be disabled. While in this mode, remote programming communication is only supported by the communication module at SDI Address 88.

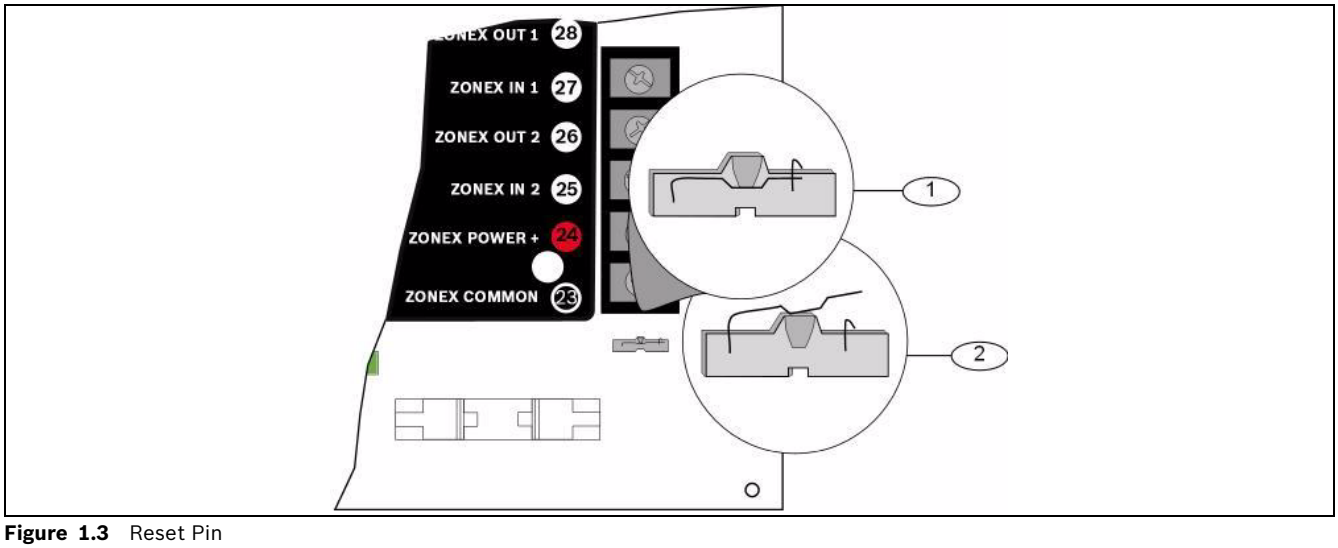

Figure 1.3 Reset Pin

Callout	Description
1	Reset pin locked (closed)
2	Reset pin normal (open)

2 Diagrams

2.1 Faceplates

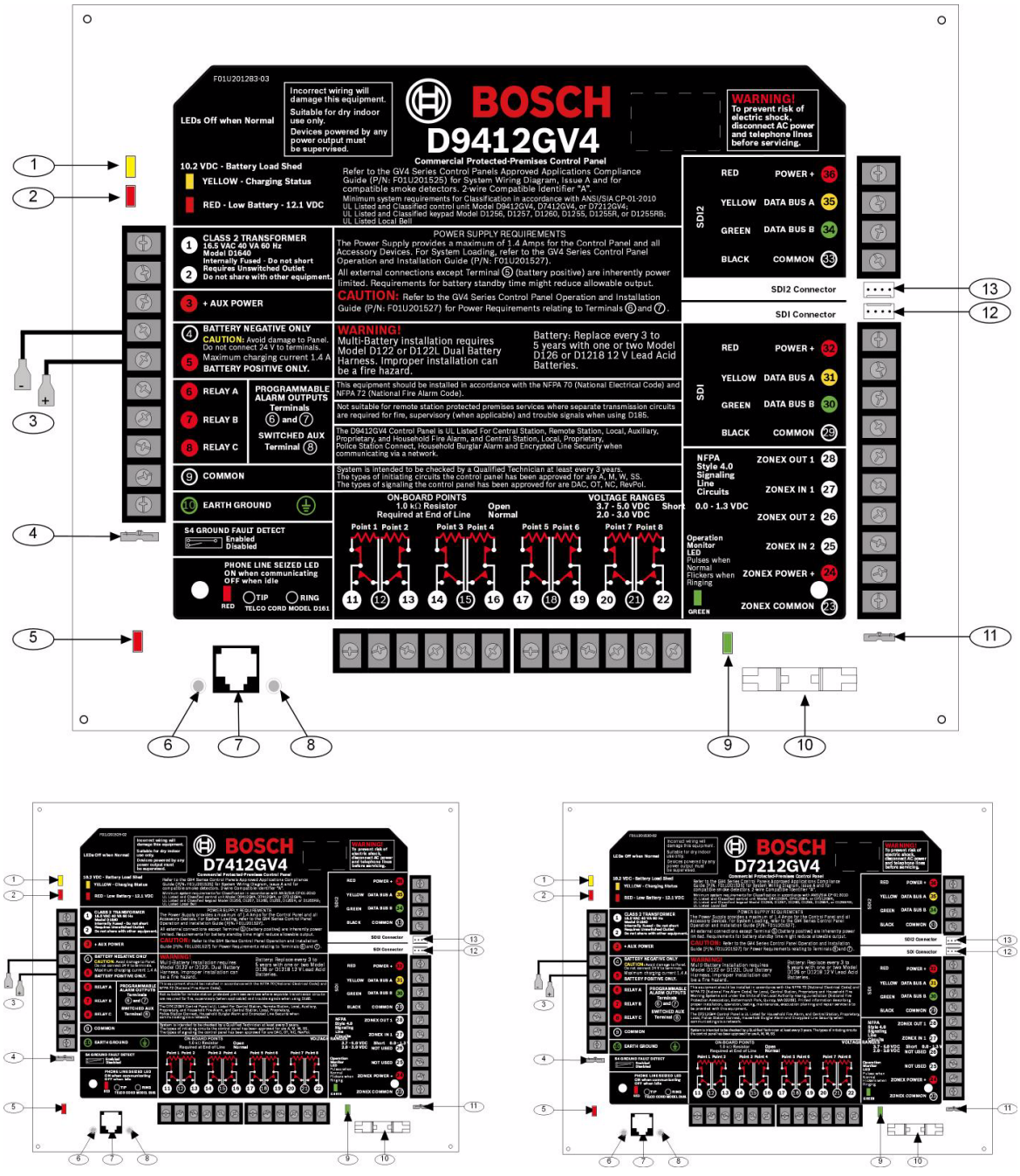

Figure 2.1 Faceplates

Callout	Description	Callout	Description
1	Charging status LED (yellow)	8	Ring
2	Low battery LED (red)	9	Operation monitor LED (green)
3	Color-coded battery leads	10	Accessory connector
4	Ground fault detect enable	11	Reset pin
5	Phone LED (red)	12	SDI interconnect wiring connector
6	Tip	13	SDI2 interconnect wiring connector
7	Telephone cord connector		

2.2 Power Supply Side Wiring Diagrams

2.2.1 D9412GV4/D7412GV4/D7212GV4 Power Supply Side System Wiring Diagram (Power and Phone)

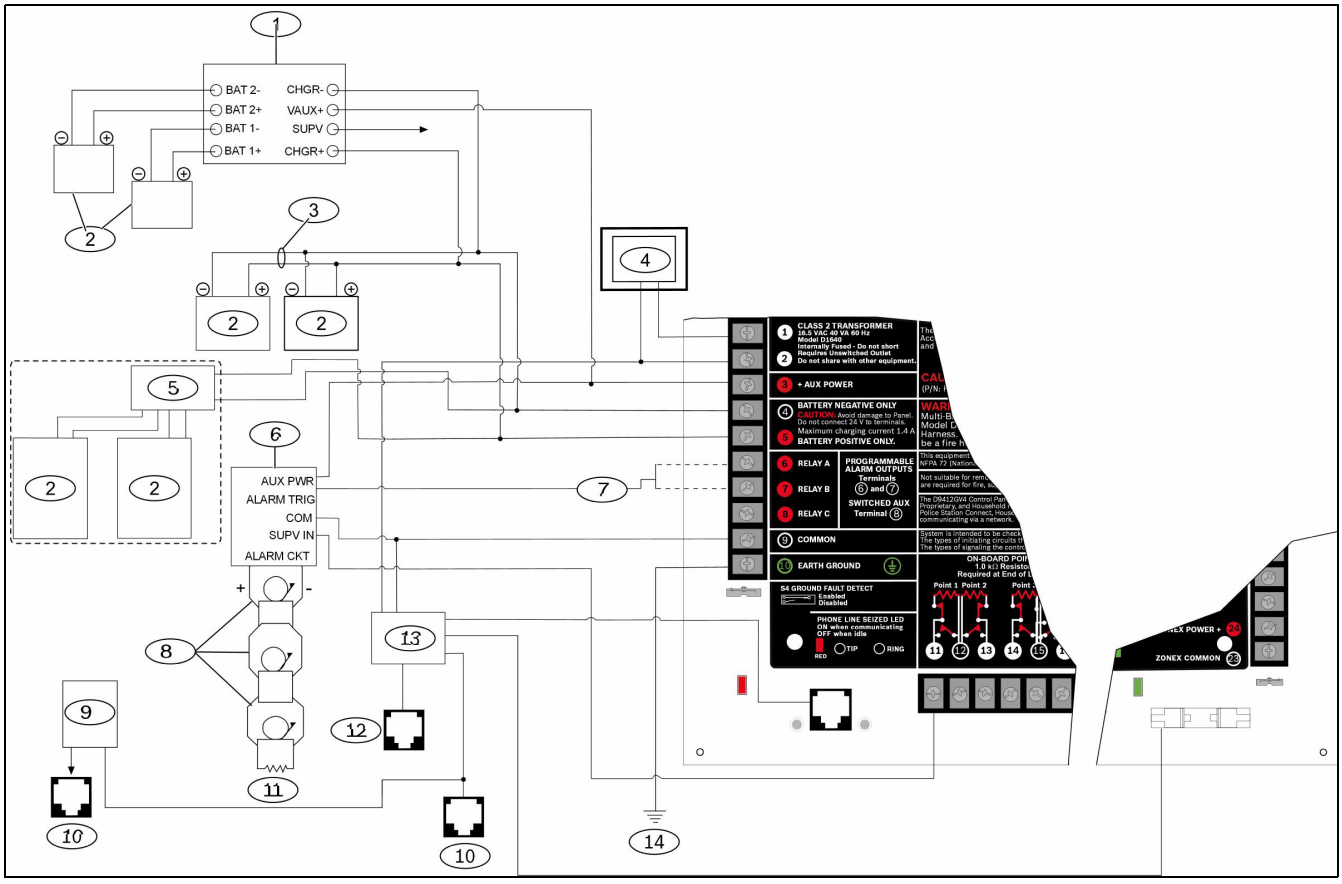

Figure 2.2 Side System Wiring Diagram

Callout	Description	Callout	Description
1	If required by local AHJ, connect D113 Battery Lead Supervision Module.	8	Listed Audible Signaling Devices rated at 12.0 VDC nominal (do not use vibrating type horns)
2	Batteries	9	C900V2 (optional)
3	D122/D122L Dual Battery Harness, as required	10	RJ31X, secondary phone line (not available on the D7212GV4)
4	D1640 Transformer and D8004 Transformer Enclosure required for NFPA Applications	11	560 Ω, 2 W end-of-life (EOL) Resistor (P/N: 15-03130-005)
5	D8132 Dual Battery Charger with two batteries (Batteries are not supervised.)	12	RJ31X, primary phone line
6	D192G Bell Supervision Module	13	D928 (not available on the D7212GV4)
7	To Relay A or Relay B	14	To earth ground

NOTICE!
Terminals 1, 2, and 11 and the Accessory Connector are power limited, supervised. All external connections except Terminal 5 (battery positive) are power limited.

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

2.3 D9412GV4/D7412GV4/D7212GV4 Input Points and Peripheral Devices System Wiring Diagram

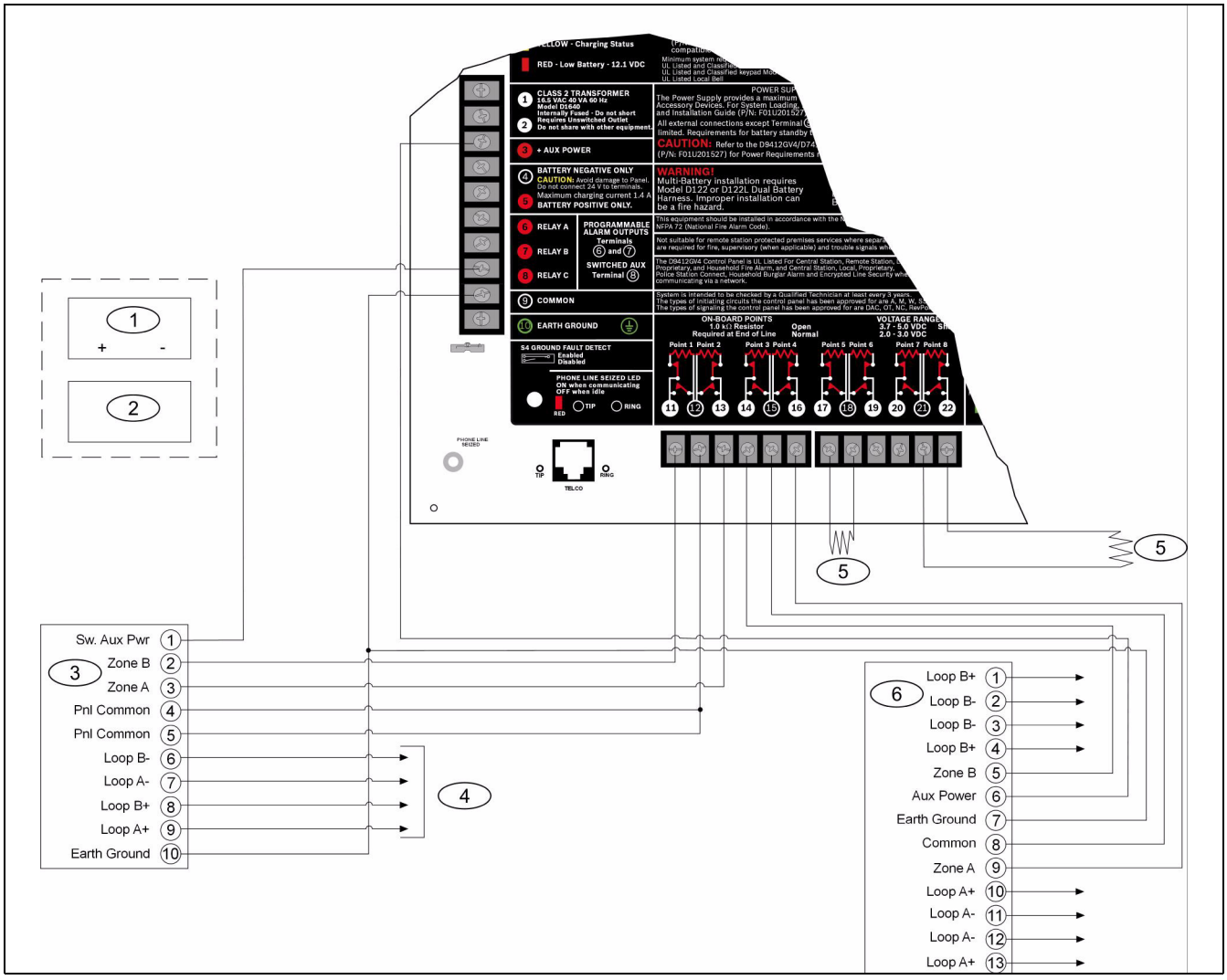

Figure 2.3 Input Points and Peripheral Devices System Wiring Diagram

Callout	Description
1	(Optional): For 24 V applications use a UL 1481 Listed regulated, power-limited 24 VDC power supply with a D130 Relay Module. Refer to the *D130 Installation Instructions (P/N: F01U072455)* for correct wiring requirements.
2	D130 Relay Module
3	D125B Powered Loop Interface Module
4	To UL Listed two-wire smoke detectors. Refer to *Two-Wire Smoke Detectors* in the *D9412GV4/D7412GV4/D7212GV4 Approved Applications Compliance Guide* (P/N: F01U201525) for a listing of compatible two-wire smoke detectors.
5	P105BL1 1 kΩ EOL resistor (P/N: F01U033966): For typical burglar alarm applications.
6	D129 Dual Class A Initiation Circuit Module: Provides optional Waterflow Alarm Retard feature. Not suitable for two-wire smoke detectors.

NOTICE!
Use zero retard except for waterflow devices.
All external connections except Terminal 5 (battery positive) are power limited.

2.4 SDI Devices Wiring Diagrams

2.4.1 D9412GV4 SDI and Zonex Devices System Wiring Diagram

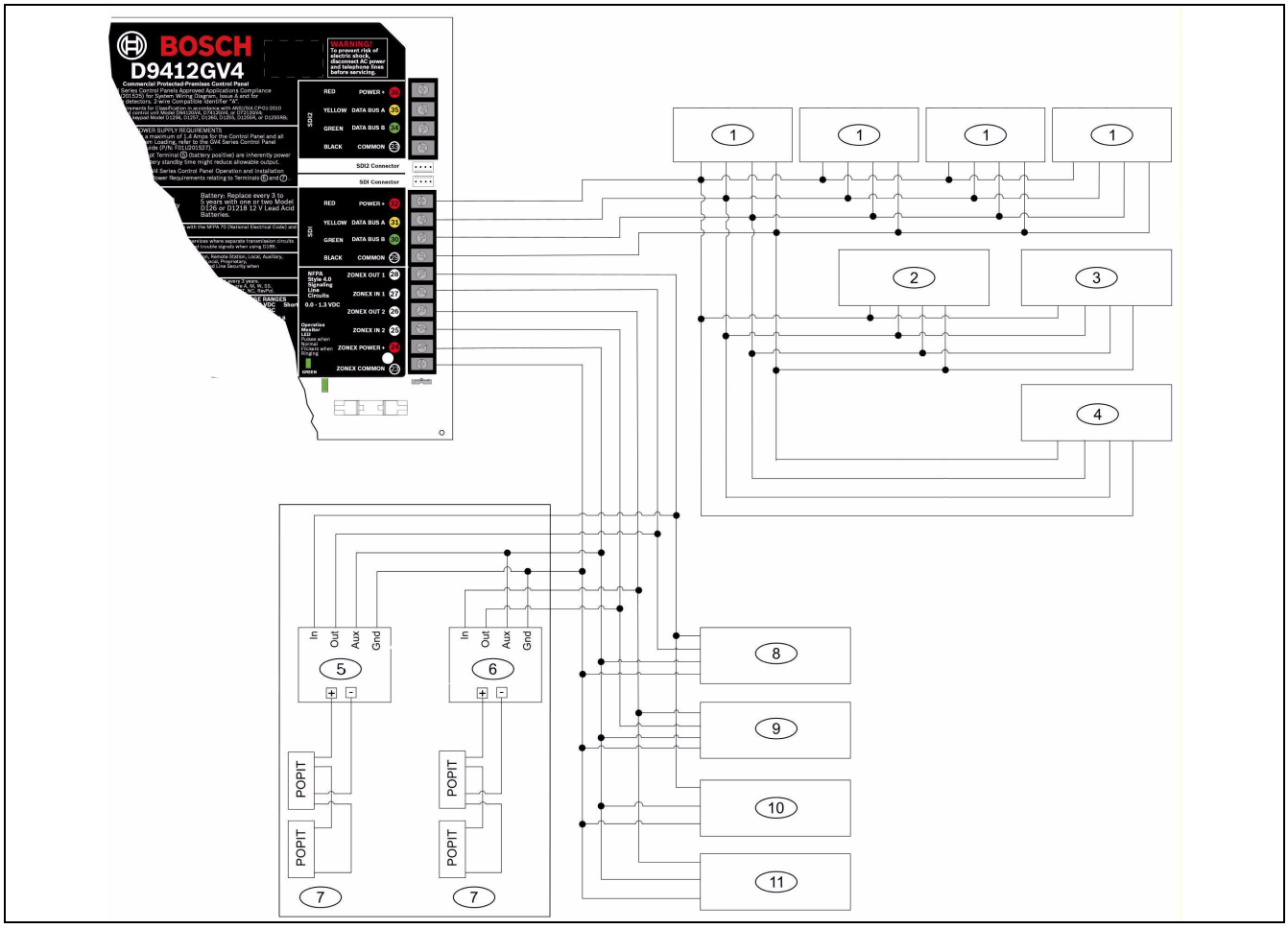

Figure 2.4 D9412GV4 SDI and Zonex Devices System Wiring Diagram

Callout	Description	Callout	Description
1	Up to 16 supervised D1255 (all versions), D1255RB, D1256, D1256RB Keypads or D1257RB or D1257 Fire Annunciators, or up to 8 supervised D1260 Keypads (all versions)	7	Up to 119 D9127U/T POPITs
2	Up to 8 D9210C Access Control Interface Modules	8	Zonex 1: 15 D8128Ds maximum[1]
3	Up to 3 supervised 9131A Parallel Printer Interface Modules, or other SDI devices	9	Zonex 2: 15 D8128Ds maximum[1]
4	DX4020, ITS-DX4020-G, or B420 Ethernet Communication Module	10	Zonex 1: Up to 8 D8129s maximum[1]
5	D8125 POPEX No. 1	11	Zonex 2: Up to 8 D8129s maximum[1]
6	D8125 POPEX No. 2		

[1] The number of D8129 OctoRelays that can be connected to each Zonex terminal on the control panel is limited by the number of D8128D OctoPOPITs connected to the same terminal. Refer to the *D8128D Installation Guide* (P/N: F01U070537) or the *D8129 Operation and Installation Guide* (P/N: F01U036302) for specific information.

NOTICE!
Terminals 24 through 36 are power limited, supervised. Fire and Intrusion devices must be on separate circuits. Refer to *ICP-SDI-9114 Installation Instructions* (P/N: F01U030068)

2.4.2 D7412GV4/D7212GV4 SDI and Zonex Devices System Wiring Diagram

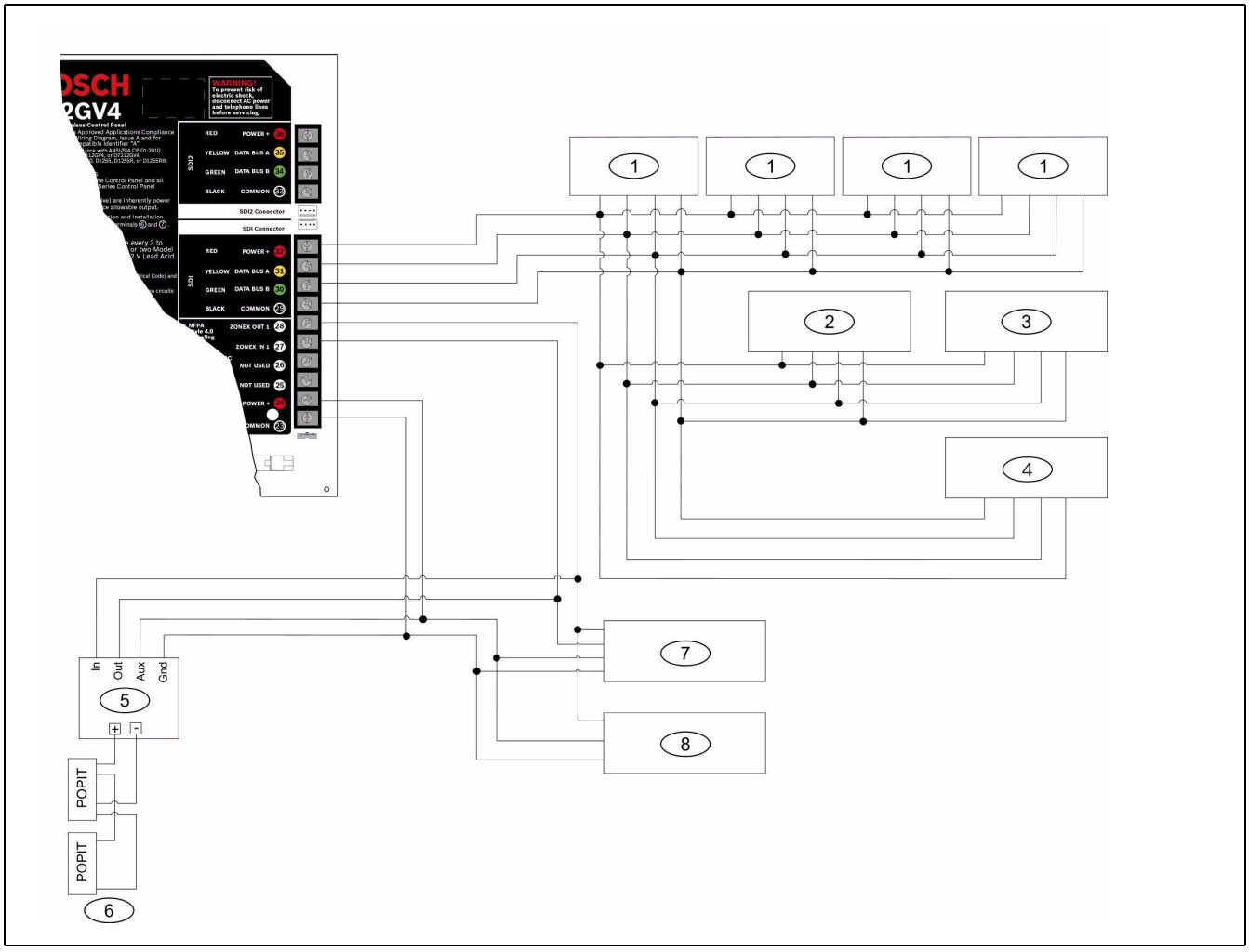

Figure 2.5 D7412GV4/D7212GV4 SDI and Zonex Devices System Wiring Diagram

Callout	Description
1	Up to 16 supervised D1255 (all versions), D1255RB, D1256, D1256RB Keypads, or D1257RB or D1257 Fire Annunciators, or up to 8 supervised D1260 Keypads (all versions)
2	Up to 2 D9210C Access Control Interface Modules
3	Up to 1 supervised 9131A Parallel Printer Interface Module, or other SDI device
4	DX4020, ITS-DX4020-G, or B420 Ethernet Communication Module
5	D8125 POPEX No. 1
6	Up to 67 D9127U/T POPITs for D7412GV4, up to 32 D9127U/T POPITs for D7212GV4
7	Zonex 1: Up to 9 D8128Ds maximum for D7412GV4, up to 4 D8128Ds for D7212GV4[1]
8	Zonex 1: Up to 8 D8129s maximum, up to 3 D8128Ds for D7212GV4[2]
9	Zonex 1: Up to 9 D8128Ds maximum[1]
10	Zonex 1: Up to 8 D8129s maximum[1]

[1] The number of D8129 OctoRelays that can be connected to each Zonex terminal on the control panel is limited by the number of D8128D OctoPOPITs connected to the same terminal. Refer to the *D8128D Installation Guide* (P/N: F01U070537) or the *D8129 Operation and Installation Guide* (P/N: F01U036302) for specific information.

NOTICE!

Terminals 24 through 36 are power limited, supervised.

Fire and Intrusion devices must be on separate circuits. Refer to *ICP-SDI-9114 Installation Instructions* (P/N: F01U030068).

2.5 D9412GV4/D7412GV4/D7212GV4 SDI2 Devices System Wiring

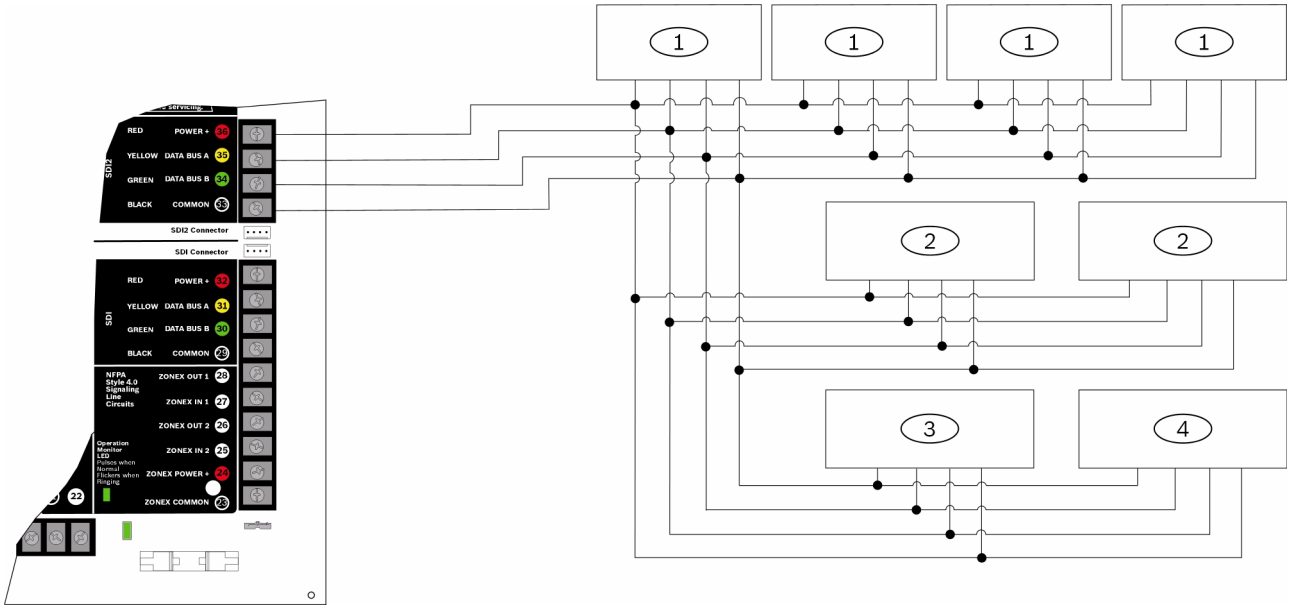

Figure 2.6 SDI2 Devices Systems Wiring Diagram

Callout	Description
1	B208 Octo-input Modules[1]
2	B308 Octo-output Modules[1]
3	B420 Ethernet Communication Modules[1]
4	B820 Inovonics Interface Module[1]

[1] Refer to Table 2.1 for information on the capacity of each GV4 Series Control Panel for SDI2 modules.

Module	D9412GV4	D7412GV4	D7212GV4
B208 Octo-input Modules	24	7[1]	3[1]
B308 Octo-output Modules	12	6[1]	2[2]
B520 Aux Power Supplies	8	8	8
B420 Ethernet Communication Modules	2[3]	2[3]	2[3]
B820 Inovonics Interface Module	1	1	1

[1] For the D7412GV4, only 5 inputs are available on the Octo-input at address 7 and for the D7212GV4, only 2 inputs are available on the Octo-input at address 3.

[2] For the D7412GV4, only 4 relays are available on the Octo-output at address 6 and for the D7212GV4 only 4 relays are available on the Octo-output at address 2.

[3] The maximum number of communication devices to be used on the control panel (both SDI and SDI2 buses) is 3. Of the two devices that can be used on the SDI2 bus, both can be used for reporting/RPS communications, or can be used for reporting/RPS communications and the other can be used for automation.

NOTICE!
Terminals 33 through 36 are power limited, supervised.
Fire and Intrusion devices must be on separate circuits. Refer to *ICP-SDI-9114 Installation Instructions* (P/N: F01U030068).

2.5.1 SDI2 Bus Wiring Recommendations

Use the following SDI2 bus wiring recommendations for SDI2 installation. The SDI2 bus is used by the GV4 Control Panel and corresponding modules to communicate with one another. Modules can be connected via home run, daisy chain, or single level T-shaped anywhere on the SDI2 bus. Please reference Figure 2.7 below.

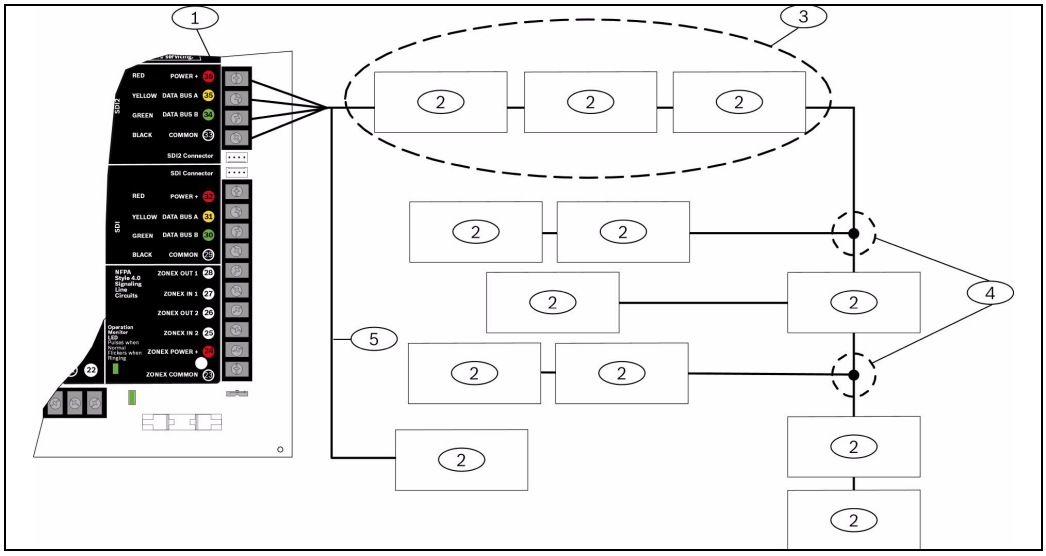

Figure 2.7 SDI2 Bus Wiring

Callout	Description	Callout	Description
1	Control panel	4	Single-level T-tapped wiring
2	SDI2 module	5	Home run wiring
3	Daisy chained wiring		

If the voltage at any device is below the minimum, you must add an auxiliary power supply to the system to power these devices.

NOTICE!
The absolute lowest voltage for the SDI2 devices is 10 VDC at the device terminals when in normal operation, with a fully charged battery on the system.

Maximum cable lengths

The following rules must be followed when wiring the SDI2 bus.

- The SDI2 bus requires the use of **non-shielded** cable from 12 AWG to 22 AWG.
- Maximum overall cable length based on the table listed below:

Cable Capacitance	Overall Cable Length	Cable Capacitance	Overall Cable Length	Cable Capacitance	Overall Cable Length	Cable Capacitance	Overall Cable Length
pf/ft	ft	pf/ft	ft	pf/ft	ft	pf/ft	ft
< 17	7500	22	6363	27	5185	32	4400
18	7500	23	6086	28	5000	33	4242
19	7350	24	5800	29	4828	34	4100
20	7000	25	5600	30	4700	35	4000
21	6666	26	5385	31	4516	36	3800

Table 2.1 Maximum cable length

NOTICE!
Use Non-shielded cable only.

NOTICE!
Maximum capacitance of 140nF (140,000 pf) per system. Contact the wire manufacturer for the capacitance ratings of the wire being used.

Recommended cable types

Use the following table for recommended cable types and electrical parameters.

AWG	MFG/PN	Capacitance pF/ft	Resistance /1000 ft	Max Run	NEC Type	Definition
22	Belden 5541	18	16.3	7500	CL3P, CL3R, CL3, CL3X, CL2P, CL2, CL2R, CL2X, CM	Class 2 and Class 3 remote control, communications, signaling and power limited cables
	Belden 1242	15	17.6	7500		
	Belden 5502	20	16.2	7000		
	Belden 5522	19	15.7	7350		
18	Belden 5302	22	6.5	6363		
	Belden 5322	22	6.4	6363		
16	Belden HC2758	19.9	4.0	7000		
	Belden 5202	23.5	4.2	5800		
12	Belden 5002	32	1.56	4400		

Table 2.2 Maximum cable length

NOTICE!
Fire alarm applications require NEC cable type FPLR, FPLP, or FPL or the equivalent power limited fire alarm cables (refer to article 760 of the NFPA 70 code).

2.6 Keyswitch Wiring

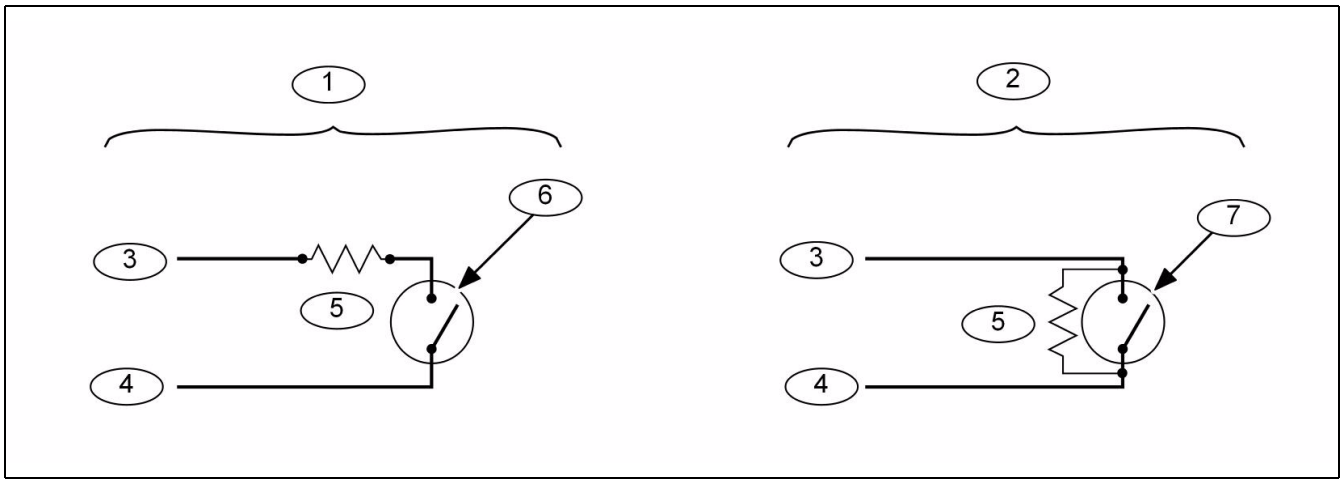

Figure 2.8 Keyswitch Wiring

Callout	Description
1	Maintained keyswitch
2	Momentary keyswitch
3	Common
4	Point Input
5	1 kΩ or 33 kΩ resistor*
6	Open on a circuit arms the area
7	Short on a circuit toggles the arming state
*Use 1 kΩ EOL resistors if using one of the zones on the control panel or an OctoPOPIT. Use a 33 kΩ resistor if using a POPIT.	

3 Power Supply and Power Outputs

3.1 Power Supply - Primary

3.1.1 Primary (AC) Power Circuit

The primary source is a 16.5 VAC, 40 VA, internally-fused transformer (Bosch Security Systems, Inc. Model D1640). The control panel draws 225 mA when idle and 300 mA when in an alarm state. The total available auxiliary current is 1.4 A. Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at Terminal 10. Ensure that you connect Terminal 10 to a proper ground. Refer to *Section 1.5 Connecting Earth Ground, page 5*.

AC Power Fail

The system indicates an AC power failure when Terminals 1 and 2 do not have power. The AC Fail Time parameter sets the number of minutes or seconds without AC power before the control panel acknowledges the failure and the number of minutes or seconds after the power returns before the control panel acknowledges restored power.
Refer to the *D9412GV4/D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312) for additional information about AC Fail Time and UL 864 requirements.

Reference the table below to view the Modem IIIa^2 communication format signals.

Modem IIIa^2 Events	Modem IIIa^2 code D6500 Modes	Modem IIIa^2 Code Bosch SIA Mode	Contact ID Events	Contact ID Codes
AC Fail - mains power supply	Pssss	NAT	AC Loss	1 301 00 000
AC Restore - mains power supply	Rsss0	NAR	AC Loss	3 301 00 000

Table 3.1 AC Power Fail

3.1.2 Installing the Transformer

NOTICE!
Do not short-circuit the terminals of the transformer. Shorting the terminals opens the internal fuse, causing permanent failure. Connect the transformer to Terminals 1 and 2 of the control panel before plugging it into the power source.

1. Use 1.22 mm (18 AWG) wire (minimum) to connect the transformer to the control panel. The wire length should be as short as possible. The maximum length is 15 m (50 ft). Connect the battery and plug in the transformer.
2. Route telephone and sensor loop wiring away from any AC conductors, including the transformer wire.
   AC wiring can induce noise and low level voltage into adjacent wiring. Route data wiring away from AC and telephone wiring.

NOTICE!
Always connect the battery first and then plug in the transformer.

3. Connect the battery. Refer to *Section 3.2.2 Installing the Battery, page 18*.
4. Plug the transformer into an unswitched, 120 VAC 60 Hz power outlet only.
5. 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 and burglary applications.

NOTICE!

Check with the Authority Having Jurisdiction (AHJ) about mounting transformers on specific circuits.

3.2 Power Terminals - Secondary

3.2.1 Secondary (DC) Power

A 12 V, 7 Ah (up to 18 Ah) sealed lead-acid rechargeable battery supplies secondary power for auxiliary and alarm outputs, and powers the system during interruptions in primary (AC) power.

WARNING!

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 battery in parallel to the first battery. Use a D122/D122L Dual Battery Harness to ensure proper and safe connection. Refer to the *Standby Battery and Current Rating Chart* in the *D9412GV4/D7412GV4/D7212GV4 Approved Applications Compliance Guide* (P/N: F01U201525) for battery standby time calculations.

D1218 Battery

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

WARNING!

When connecting two D1218 Batteries to the control panel, the control panel can charge up to 36 Ah of battery.

NOTICE!

When using two D1218 batteries, use a separate enclosure, a D122L Dual Battery Harness, and long leads.

3.2.2 Installing the Battery

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

WARNING!

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.

WARNING!

The battery terminals and wire are not power limited. A 6.4 mm (0.250 in.) space must be maintained between the battery terminals, battery wiring, and all other wiring. Battery wiring cannot share the same conduit, conduit fittings, or conduit knock-outs with other wiring. Refer to *Figure 3.1, Page 19*.

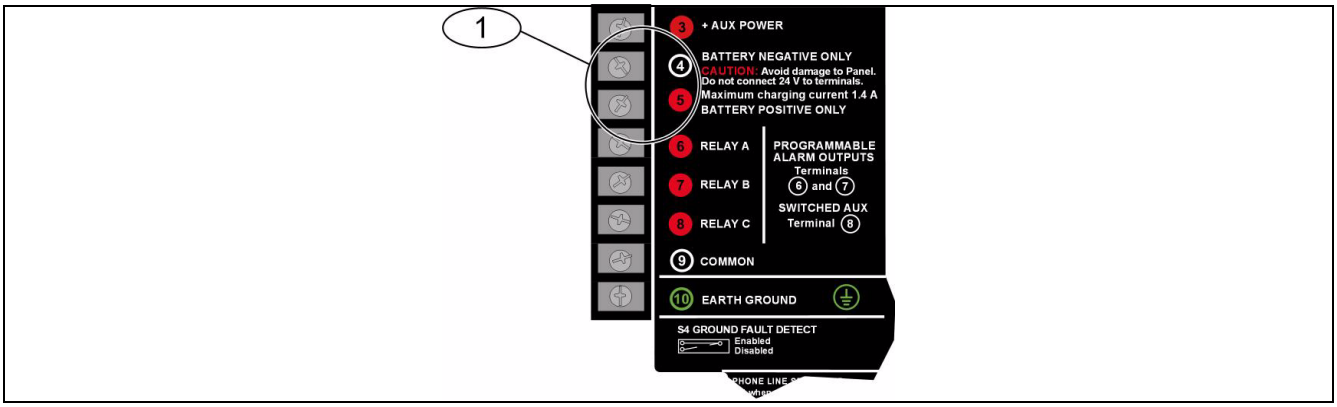

Figure 3.1 Battery Terminals

Callout	Description
1	Battery terminals. Terminal 5 is non-power limiting.

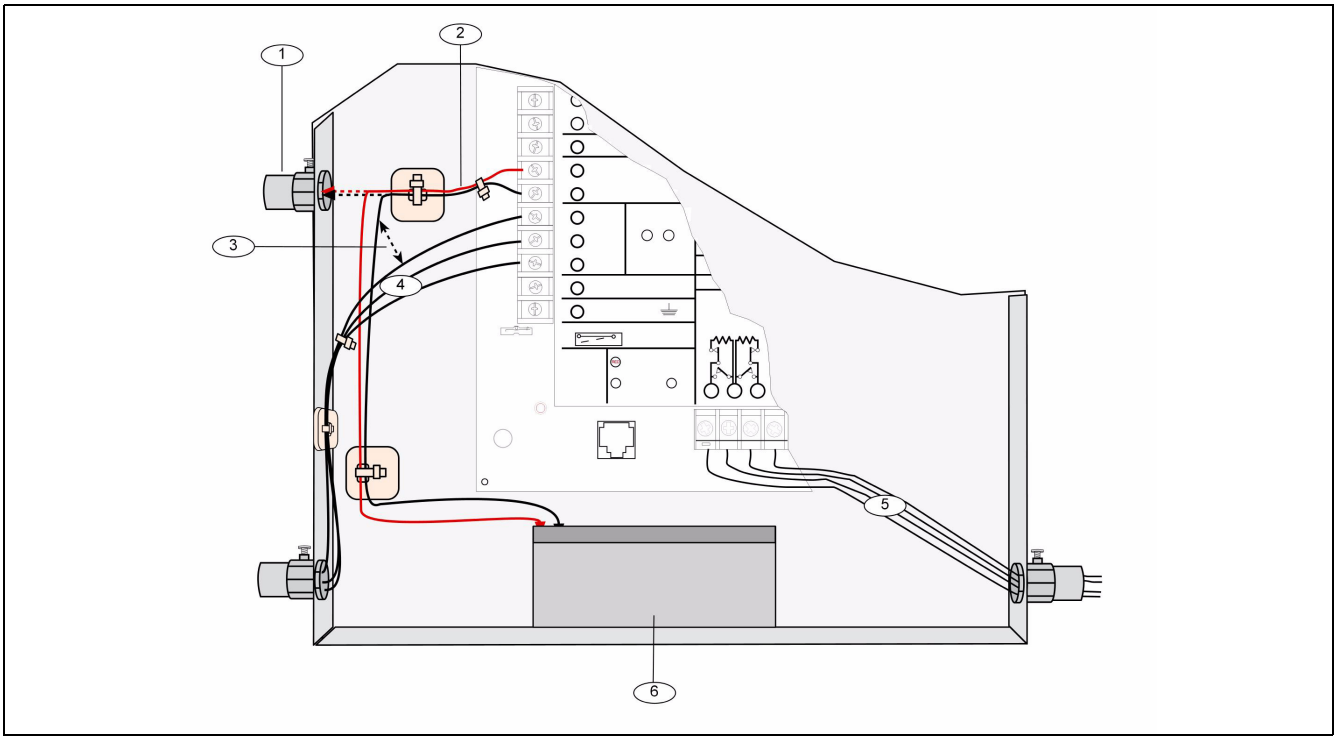

Figure 3.2 Non-Power-Limited Wiring

Callout	Description
1	Conduit required for use with external batteries.
2	Battery wires
3	6.4 mm (0.25 in) minimum. To ensure proper spacing, use tie-wraps or similar devices to secure wires.
4	Relay output wires
5	Input or Zone wires
6	Standby battery

3.3 Power Outputs - Circuit Protection

Three self-resetting circuit breakers protect the control panel from short circuits on the continuous and programmable power outputs. If the control panel is programmed for power supervision and a short circuit occurs on one of the power outputs, the control panel sends a BATTERY LOW or BATTERY MISSING for Bosch Security Systems Modem IIIa^2 Communication Format, or a Battery Missing/Dead (311) or Low System Battery (302) for Contact ID Format.
One self-resetting circuit breaker protects:

- Terminal 3: Auxiliary Power
- Terminal 24: Zonex Power.

NOTICE!
A short circuit on one terminal disrupts power to the other terminal.

Another self-resetting circuit breaker protects:

- Terminal 6: Alarm Power Output
- Terminal 7: Alternate Alarm Power Output
- Terminal 8: Switched Auxiliary Power.

NOTICE!
A short circuit on one of the terminals disrupts power to the other two terminals.

The third self-resetting circuit breaker protects Terminal 32: Power +.

NOTICE!
UL requires any device powered from a power output to be supervised.

NOTICE!
UL requires that power outputs are not shared between fire and non-fire devices unless all devices are in conduit within 20 ft and are in the same room.

3.4 Power Outputs - Total Available Power

The system produces up to 1.4 A of combined power at 12.0 VDC Nominal 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.** Programmable relay normally open, power on alarm.
- **Terminal 7 (Relay B) - Alternate Alarm Power Output**. Programmable relay normally open, power on alarm.
- **Terminal 8 (Relay C) - Switched Auxiliary Power.** Programmable relay normally closed, switches power off when the Sensor Reset command is executed.
- **Terminal 24 - Zonex Power.** Use this terminal to power Zonex modules such as the D8125, D8128D, and D8129 Modules.

- **Terminal 32 - SDI Power +.** Use this terminal to power serial device interface (SDI) devices such as keypads, the D9131A Parallel Printer Interface Module, and the D9210C Wiegand Control Interface Module.
- **Terminal 36 - SDI2 Power +.** Use this terminal to power serial device interface 2 (SDI2) devices such as B820 SDI2 Inovonics Interface modules and other compatible accessories.

3.5 Power Outputs - Continuous Power Output Terminals 3, 8, 24, 32, and 36

The continuous current draw for powered devices connected to Terminals 3, 8, 24, 32, and 36, and the accessory connector must not exceed 1.4 A. Devices powered from these outputs must operate at 12.0 VDC Nominal.

Power Restricted for Fire and Combined Fire and Burglary Systems

Use the Fire System Power Formula to calculate the current available for fire and combined fire and burglary systems (refer to *Section 3.6 Power Outputs - Programmable Power Output Terminals 6, 7, and 8, page 21*).

3.6 Power Outputs - Programmable Power Output Terminals 6, 7, and 8

3.6.1 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. 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 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 or Reset output for smoke detectors. The *D9412GV4/D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312) contains complete instructions for programming relays. Refer to *Section 3.6.2 Terminals 6 and 7, page 21*, *Section 3.6.3 Fire System Power Formula, page 22*, and *Section 3.6.4 Terminal 8, page 22* for descriptions of the functions of each terminal. Refer to 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:

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

3.6.2 Terminals 6 and 7

When activated, Terminals 6 (Relay A) and 7 (Relay B), provide positive (+) 12.0 VDC Nominal power output. Use the power at Terminals 6 and 7 to power bells, siren drivers, piezoelectric fire sounders, electronic horns, or other devices.

Programming determines the format of the output and the conditions that activate it. One self-resetting circuit breaker protects Terminals 6, 7, and 8 against shorts. When using Relay A or Relay B to activate notification appliance circuits in UL Listed fire alarm applications, install a D192G Indicating Circuit Module.

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 12.0 VDC Nominal. Terminals 6 and 7 share the available alarm power.

Power Restricted for Fire and Combined Fire and Burglary Systems

Fire systems are prohibited from using the battery for determining alarm power. Use the fire system power formula described in *Section 3.6.3 Fire System Power Formula, page 22* to calculate the current available for fire and combined fire and burglary systems.

3.6.3 Fire System Power Formula

To calculate the current available at Terminals 6 and 7 for fire and combined fire and 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 A - NSC current required (Step 1) = Alarm current available

Refer to the *D9412GV4/D7412GV4/D7212GV4 Approved Applications Compliance Guide* (P/N: F01U201525) for module or accessory current requirements.

3.6.4 Terminal 8

Terminal 8 provides continuous positive (+) 12.0 VDC Nominal 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 and reset relay. Refer to *Relay Parameters and Point Assignments* in the *D9412GV4/D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312) for instructions on programming verification/reset relays and points. Performing a sensor reset at a keypad produces a five-second relay activation of verification/reset relays. The control panel ignores verification and reset points during the five-second relay activation.

4 Specifications

Voltage Input (Power Supply)[1]	Primary:	Terminals 1 and 2	16.5 VAC 40 VA class 2 plug-in transformer (D1640)
	Secondary:	Terminals 4 and 5	Sealed lead-acid rechargeable battery (12.0 VDC, 7 Ah or 12.0 VDC, 17.2 or 18 Ah). The control panel supports up to two 12.0 VDC, 7 Ah batteries using the D122/D122L Dual Battery Harness or two D1218 (12.0 VDC, 17.2 or 18 Ah) batteries using a D122/D122L.
Current Requiremrent	Control Panel: Idle 225 mA; Alarm 300 mA. Refer to the *Current Rating Chart for Standby Battery Calculations* section in the *D9412GV4/D7412GV4/D7212GV4 Approved Applications Compliance Guide* (P/N: F01U201525) for the current draw requirements of other system components.		
Power Outputs[2]	All external connections are power-limited except battery terminals.		
	Continuous Power Outputs	Terminals 3, 24, 32, 36	1.4 A maximum at 12.0 VDC Nominal (continuous supply) total for all devices and outputs supplied at Terminals 3, 24, 32, and 36.
	Alarm Power Output	Terminals 6 and 7	2.0 A maximum at 12.0 VDC Nominal output. Output can be steady or one of three pulsed patterns depending on programming. Refer to *Relays* in the Online Help for RPS.
	Switched Aux Power	Terminal 8	1.4 A maximum at 12.0 VDC Nominal output. Continuous output is interrupted by Sensor Reset or alarm verification depending on programming. Refer to *Relays* in the Online Help for RPS.
	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 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 (refer to *Section 2.6 Keyswitch Wiring, page 16*).	
[1] Requires a UL Listed power supply. This does not include the B520 Auxillary Power Supply. [2] For UL 864 applications, refer to 6.0 Compatibilities for compatible devices.			
Minimum Operating Voltage	10.2 VDC		
SDI Bus	SDI Bus A:	9 VDC 4572 m (15000 ft) maximum	
	SDI Bus B:	9 VDC 4572 m (15000 ft) maximum	
SDI2 Bus	SDI2 Bus A:	12 VDC nominal (7500 ft) maximum[2]	
	SDI2 Bus B:	12 VDC nominal (7500 ft) maximum[2]	
Telephone Connections	Connection:	RJ31X or RJ38X jack can connect the control panels.	
	Two telco lines:	Bosch Security Systems, Inc. D928 Dual Phone Line Module required for two phone line service. Supervision supplied by the control panel.	
[2] See *Section 2.5.1 SDI2 Bus Wiring Recommendations, page 14* for more details			

Battery Discharge/ Recharge Schedule	Discharge Cycle	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	Minimum operational voltage.
		10.0 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:	0°C to +50°C (+32°F to +122°F)	
	Relative Humidity:	Maximum 93% non-condensing	
Arming Stations	D720/D720B Keypads, D1255/D1255B/D1255RB Keypads, D1256/D1256RB Fire Command Centers; D1257/D1257RB Fire Alarm Annunciators; D1260/D1260B Keypads; 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, BATB-40 Battery Box		

[2] See *Section 2.5.1 SDI2 Bus Wiring Recommendations, page 14* for more details

4.1 Terminal Wiring Requirements

Terminal No	Terminal Description	Requirements
1	AC	18 AWG min (up to 14 AWG max)
2	AC	18 AWG min (up to 14 AWG max)
3	+ AUX POWER	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current.
4	BATTERY -	Bosch supplied wire lead, included with panel.
5	BATTERY +	Bosch supplied wire lead, included with panel.
6	RELAY A	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current.
7	RELAY B	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current.
8	RELAY C	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current.
9	COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current.
10	EARTH GROUND	14 to 16 AWG
11	POINT 1	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
12	POINT 1/2 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
13	POINT 2	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.

Terminal No	Terminal Description	Requirements
14	POINT 3	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
15	POINT 3/4 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
16	POINT 4	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
17	POINT 5	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
18	POINT 5/6 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
19	POINT 6	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
20	POINT 7	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
21	POINT 7/8 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
22	POINT 8	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 Ω.
23	ZONEX COMMON	22 AWG min (up to 14 AWG max)
24	ZONEX POWER	22 AWG min (up to 14 AWG max)
25	ZONEX IN 2*	22 AWG min (up to 14 AWG max)
26	ZONEX OUT 2*	22 AWG min (up to 14 AWG max)
27	ZONEX IN 1	22 AWG min (up to 14 AWG max)
28	ZONEX OUT 1	22 AWG min (up to 14 AWG max)
29	SDI COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current.
30	SDI DATA BUS B	22 AWG min (up to 14 AWG max)
31	SDI DATA BUS A	22 AWG min (up to 14 AWG max)
32	SDI POWER	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current.
33	SDI2 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current.
34	SDI2 DATA BUS B	22 AWG min (up to 14 AWG max)
35	SDI2 DATA BUS A	22 AWG min (up to 14 AWG max)
36	SDI2 POWER	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current.
*D9412GV4 only. Terminals 25 and 26 are NOT USED on D7412GV4 and D7212GV4 Control Panels.		

4.2 Compatible Accessories

NOTICE!
Where the fire alarm transmitter is sharing on-premise communications equipment, the shared equipment must be UL Listed (ITE or fire protective signaling).

Model	Title	UL 864	Fire	Intrusion
B208	Octo-input Module	X	X	X
B308	Octo-output Module	X	X	X
B420	Ethernet Communication Module	X	X	X
B520	Auxiliary Power Supply Module	X	X	X
B820	Inovonics Interface Module	X	X	X
D113	Battery Lead Supervision Module	X	X	X
D122/D122L	Dual Battery Harness	X	X	X
D125B	Powered Loop Interface Module	X	X	X
D126	Standby Battery (12V, 7Ah)	X	X	X
D127	Reversing Relay	X	X	X
D129	Dual Class A Initiation Circuit Module	X	X	X
D130	Relay Module	X	X	X
D185	Reverse Polarity Module	X	X	X
D192G	Bell Circuit Supervision Module	X	X	X
D279A	Independent Zone Control (On-Board and OctoPOPIT Points)			X
D720R	LED Keypad (red)		X	X
D720W	LED Keypad (white)		X	X
D928	Dual Phone Line Switcher	X	X	X
D1255RB	Fire Keypad	X	X	X
D1256RB	Fire Keypad	X	X	X
D1257RB	Fire Alarm Annunciator	X	X	X
D1218	12 V, 17.2 Ah Rechargeable Battery	X	X	X
D1255/D1255B	Keypads (General Purpose)		X	X
D1255R	Text Keypad (red)		X	X
D1255W	Text Keypad (white)		X	X
D1256	Fire Keypad		X	
D1257	Fire Alarm Annunciator		X	
D1260/D1260B[1]	Keypads		X	X
D1640	16.5 VAC 40 VA Transformer	X	X	X
D8004	Transformer Enclosure	X	X	X
D8125	POPEX Module	X	X	X
D8125MUX	Multiplex Bus Interface	X	X	X
D8128D	OctoPOPIT Module	X	X	X
D8129	OctoRelay Module	X	X	X
D8130	Release Module	X	X	X

Model	Title	UL 864	Fire	Intrusion
D8132	Battery Charger Module		X	X
D9127U/T	POPIT Module	X	X	X
D9131A	Parallel Printer Interface Module	X	X	X
D9210C	Access Control Interface Module	X	X	X
DX4010V2	Network Interface Module	X	X	X
DX4020	Network Interface Module	X	X	X
ITS-DX4020-G	GPRS/GSM Communicator	X	X	X
ICP-SDI-9114	SDI Splitter	X	X	X
ZX776Z	PIR Motion Sensor [15 m (50 ft)] with POPIT			X
ZX794Z	PIR Motion Sensor [24 m (80 ft)] with POPIT			X
ZX865	PIR/Microwave Motion Sensor [+1.7?C (+35?F)] with POPIT			X
ZX938Z	PIR Motion Sensor [18 m (60 ft)] with POPIT			X
ZX970	PIR/Microwave Motion Sensor [+1.7?C (+35?F)] with POPIT			X
[1] Version 1.03 or above				

4.3 Circuit Classes

Onboard Points

Onboard points, points 1 to 8, are Class B, Style B Initiating-Device Circuits.

Zonex Bus or Buses

Zonex buses are Class B, Style 4 Signaling Line Circuits.

Notification Appliance Circuit (NAC)

The control panels do not have an onboard NAC.

A D192G can be added to the control panel and is Class B, Style W.

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