

Control Panels

D9412GV4/D7412GV4/D7212GV4 v1.00



en Approved Applications Compliance Guide

Listings and Approvals

Fire

UL

The D9412GV4 and D7412GV4 Control Panels are UL Listed for Central Station, Local, Auxiliary, Proprietary, and Household Fire Alarm.

Underwriters Laboratories, Inc. (UL) lists the D7212GV4 Control Panel as a Control Unit for Household Fire Warning.



The D7212GV4 is not UL Listed for Commercial Fire (UL864).

CSFM

The California State Fire Marshal (CSFM) approved the D9412GV4/D7412GV4/D7212GV4 Control Panel for Household Fire Warning.

The California State Fire Marshal (CSFM) approved the D9412GV4/D7412GV4 Control Panel for Fire Control Unit (Commercial).

Burglary

UL

The D9412GV4/7412GV4/D7212GV4 Control Panels are UL listed for Central Station, Local, Police Station Connect, Holdup, Bank Safe and Vault, Mercantile Safe and Vault, and Household Burglar Alarm and Encrypted line Security when communicating via a network.

Department of Defense (DoD)

The D9412GV4/D7412GV4 Control Panel was granted approval for Department of Defense (DoD) installations in Sensitive Compartmented Information Facilities (SCIF).

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1.0 Introduction

The UL System Chart (*Table 3* on page 16) references the components that are evaluated and listed by UL for compatibility with the GV4 Series control panel. These components meet the basic system requirements for the applicable standard.

The System Wiring Diagrams, (refer to 6.0 System Wiring Diagrams on pages 17 to 21) show the relationship between the control panel and the accessory components referred to in *Figure 4* on page 17.

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.

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 batteries in the control panel enclosure. Refer to *Figure 1* for battery placement information.

Use a separate D8108A for the 12 V 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 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.

2.2.4 System Configuration Requirements

The following configuration and programming options are required for UL Bank Safe and Vault Systems. Refer to the D9412GV4/D7412GV4/D7212GV4 Program Entry Guide (P/N: F01U218312) 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 *D9412GV4/D7412GV4/D7212GV4 Program Entry Guide* (P/N: F01U218312) 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

D9412GV4/D7412GV4/D7212GV4 Program Entry Guide (P/N: F01U218312) 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 with authority to arm the safe or vault and also send a Closing Report 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.

2.2.5 Exit Delay

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

2.2.6 Equipment Requirements

- GV4 Series Control Panel
- Two (2) D126 12 V, 7 Ah batteries
- Two (2) D1218 12 V 18 Ah batteries
- D8132 Battery Charger Module
- Two (2) D8108A Enclosures
- D122 Dual Battery Harness
- D122L Dual Battery Harness
- D133 Relay Module
- EVD System (Listed Safe/Vault)

2.2.7 Wiring the Rothenbuhler 5110/4001-42 High Security Bell to the GV4 Series Control Panel



Warning: 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.
- Use six-conductor 1.2 mm (18 AWG) 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.



² Use a D113 Battery Lead Supervision Module to supervise the battery connections.



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.



The D7212GV4 is not UL Listed for Commercial Fire.

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

UL requires that power outputs are not shared between fire and nonfire devices unless all devices are in conduit within 20 ft and are in the same room (D9412GV4/D7412GV4).

The expansion bus can be shared between fire and non-fire devices where the POPIT module is providing data isolation between the input and the bus connections (D9412GV4/D7412GV4).

2.3.1 Four-Wire Smoke Detectors

When using four-wire smoke detectors, install a power supervision device according to the manufacturer's instructions. You can connect any number of four-wire smoke detectors to the GV4 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 D9127 Modules when used with a GV4 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 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 10 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.



Consult the UL Listed Two-Wire Smoke Detectors Compatible with the D125B section 2.3.6 to determine which product best fits your application.

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.

You can also consult the smoke detector manufacturer to determine if a particular smoke detector is UL Listed for use with the D9412GV4 and D7412GV4 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 (for control panel, detector, and base)

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 GV4 Series Control Panel:

- Use a D125B Powered Loop Interface Module with two-wire initiating devices for a D9412GV4/D7412GV4/D7212GV4 Control Panel).
- 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 D9127U or D9127T POPIT Modules to connect four-wire smoke detectors when using a GV4 Series Control Panel.

2.3.5 Other Devices

Use a D130 Relay Module, D8129 OctoRelay, or Switched Aux (Terminal 8) to provide reset capability to other initiating devices such as:

- D125B Powered Loop Interface Module (2-wire smoke detector module)
- D129 Dual "Class A" Initiation Circuit Module (4wire smoke detector)
- D9127T/U POPITs
- On-board points

Install devices according to the manufacturer's instructions. Refer to *Off-Board Relays* in the *D9412GV4/D7412GV4/D7212GV4 Installation and Operation Guide* (P/N: F01U201527).

For battery calculations, refer to *Table 7* on page 24 and *Section 8.0 NFPA 72 Fire Alarm Applications* on page 31.



Test Weekly: Perform a Fire Test weekly. Both the AC power and battery are tested according to UL 864 (D9412GV4/D7412GV4/D7212GV4)

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



The D7212GV4 is not UL Listed for Commercial Fire (UL 864).

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

			Maximum Numb	er of Detectors per Loop			
Manufacturer	Detector Model	Base Model	D125B				
			12 VDC	24 VDC ¹			
Bosch Security	D262	D260	25	N/A			
Systems, Inc.	D263	N/A	10	10			
	D263TH	N/A	10	10			
	D263S	N/A	10	10			
	D263THS	N/A	10	10			
	D281	D280	N/A	80			
	D282	D280	N/A	80			
	D283	D280	N/A	80			
	D285	D287, D288	10	10			
	D285DH	D340	10 ²	10			
	D285TH	D287, D288	10	10			
	D340	N/A	10	10			
	D286	D287, D288	10	10			
	D603	D287, D288	10	10			
	D604	D287, D288	10	10			
	D605	D287, D288	10	10			
	DS230	MB2W, MB2WL	10	10			
	DS230F	MB2W, MB2WL	10	10			
	DS233F	MB2W, MB2WL	10	10			
	DS250	MB2W, MB2WL	10	10			
	DS250TH	MB2W, MB2WL	10	10			
	DS260	MB2W, MB2WL	10	10			
	DS282	N/A	10	10			
	DS282TH	N/A	10	10			
	DS282S	N/A	10	10			
	DS282THS	N/A	10	10			
	DS290	N/A	10	10			
	F220P	F220-B6	10	10			
	F220PTH	F220-B6	10	10			
	F220PC	F220-B6	10	10			
	F220PTHC	F220-B6	10	10			
	F220-135	F220-B6	10	10			
	F220-135F	F220-B6	10	10			
	F220-190F	F220-B6	10	10			

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

¹ Requires a UL1481 regulated power-limited Power Supply.

 $^{\rm 2}$ $\,$ Remote Test Station works only when used at 24 VDC.

			Maximum Num	ber of Detectors per Loo			
Manufacturer	Detector	Base Model	D125B				
	Model		12 VDC	24 VDC ¹			
Detection	DS200	MB200-2W	20	60			
Systems	DS200HD	MB200-2W	20	60			
	DS230	MB2W, MB2WL	10	10			
	DS230F	MB2W, MB2WL	10	10			
	DS233F	MB2W, MB2WL	10	10			
	DS250	MB2W, MB2WL	10	10			
	DS250DH	DS290	10 ²	10			
	DS250TH	MB2W, MB2WL	10	10			
	DS260	MB2W, MB2WL	10	10			
	DS282	N/A	10	10			
	DS282TH	N/A	10	10			
	DS282S	N/A	10	10			
	DS282THS	N/A	10	10			
	DS290	N/A	10	10			
Radionics	D262	D260	10	N/A			
	D263	N/A	25	10			
	D263TH	N/A	10	10			
	D263S	N/A	10	10			
	D263THS	N/A	10	10			
	D281	D280	10	80			
	D282	D280	N/A	80			
	D283	D280	N/A	80			
	D285	D287, D288	N/A	10			
	D285DH	D340	10 ²	10			
	D285TH	D287, D288	10	10			
	D340	N/A	10	10			
	D286	D287, D288	10	10			
	D603	D287, D288	10	10			
	D604	D287, D288	10	10			
	D605	D287, D288	10	10			
Honeywell	TC805C-1000	14506587 and 14506587-	10	40			
	TC804C-1001	004	10	40			
	TC804C-1019	14506587 and 14506587-	10	40			
		004					
		14506587 and 14506587-					
		004					
System Sensor	1499	N/A	10	40			
	2400	N/A	10	40			
	2400TH	N/A	10	40			
	1451DH	DH400	10	40			

 Table 1:
 UL Listed Two-Wire Smoke Detectors Compatible with the D125B (Continued)

Requires a UL 1481 regulated power-limited Power Supply.

² Remote Test Station works only when used at 24 VDC.

2.3.7 UL Listed Synchronization (Sync) Modules and Strobes Compatible with the D9412GV4/D7412GV4



To be UL 864 compliant, you must use only these models of synchronization modules and strobes with the D9412GV4 and D7412GV4 Control Panels.



The D7212GV4 is not UL Listed for Commercial Fire (UL 864).

Table 2: Synchronization Module and Strobe Compatibility

Manufacturer	Synchronizatio n Module Model	Strobe Model	Input Power Source	Candelas (cd)	Number of Strobes
System Sensor	MDL	S1224MC	Control panel (12 VDC)	15 cd	8
			External power supply (12 VDC)*	15 cd	23
			External power	15 cd	50
			supply (24 VDC)*	110 cd	28
Wheelock	DSM-12/24	RSS-121575-FW	Control panel (12 VDC)*	15 cd	4
			External power supply (12 VDC)*	12 cd	11
		RSS-241575-FW	External power supply (24 VDC)*	75 cd	33

* Requires a UL 1481 regulated power-limited Power Supply.

2.4 Enclosures

Bosch Security Systems offers three optional enclosures for the control panel. *Sections 2.4.1 D8103 Enclosure, 2.4.2 D8108A Enclosure,* and *2.4.3 D8109 Red Fire Enclosure* describe the three options.

2.4.1 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 3* on page 16 for acceptable applications.

2.4.2 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.

2.4.3 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

3.1 Required Components (D9412GV4/D7412GV4 only)

To install a D9412GV4 or D7412GV4 that is UL and NFPA compliant, the following items must be included:

- D8109 Red Fire Enclosure
- D192G Bell Supervision Module
- D928 Dual Phone Line Module
- D8004 Transformer Enclosure

• Ground Fault Detect enabled on the control panel Refer to *Table 3* on page 16 for specific application installation requirements.

3.2 Installing Combination Fire and Intrusion Alarm Systems



When installing a combination fire and intrusion alarm system, you must adhere to the following requirements in order to comply with Sections 56.1, 56.2, and 56.4 of the 9th Edition of UL 864.

The D7212GV4 is not listed for commercial fire applications.

3.2.1 SDI Bus Devices Keypads (Command Centers)

 Keypads used exclusively for intrusion system operation must be kept separate from fire keypads. The use of an ICP-SDI-9114 is required to separate fire and intrusion devices on the SDI bus. All fire points must be within the scope of a fire keypad (unless otherwise required by local Authority Having Jurisdiction (AHJ).

Interface Modules

- Connect the DX4020 Network Interface Module and the D9210C Access Control Interface Module to the SDI bus only if the interface module is located within the control panel enclosure or in a separate enclosure in the same room within 6.1 m (20 ft) of the main control panel.
- Route all SDI bus wiring in EMT (electrical metallic tubing) conduit.

3.2.2 Zonex Bus Devices

D8125 POPEX Modules

The expansion bus can be shared between fire and non-fire devices where the POPIT module provides data isolation between the input and the bus connections.

D8125MUX Multiplex Interface Modules

- When connecting a D8125MUX module to Zonex Bus 1 or 2, all multiplex modules should supervise only all fire or all non-fire devices.
- **Do not connect** fire and non-fire devices to the same D8125MUX module.
- Using Zonex Bus 1 exclusively for fire devices and Zonex Bus 2 exclusively for non-fire devices is acceptable.

D8128D OctoPOPIT Modules

- **Do not connect** fire and non-fire devices to the same D8128D OctoPOPIT Module.
- Using Zonex Bus 1 exclusively for fire devices and Zonex Bus 2 exclusively for non-fire devices is acceptable.
- Install all D8128D OctoPOPIT Modules used for fire devices within the control panel enclosure or in a separate enclosure in the same room within 6.1 m (20 ft) of the main control panel.
- Route all Zonex bus wiring in EMT (electrical metallic tubing) conduit.
- For system supervision, do not use looped wire terminals.

D8129 Octo-relay Modules

- If any fire devices are connected to Zonex Bus 1 (or Zonex Bus 2), you must use all D8129 OctoRelay Modules connected to Zonex Bus 1 (or Zonex Bus 2) only for fire applications.
- Install all D8129 OctoRelay Modules used for fire devices within the control panel enclosure or in a separate enclosure in the same room within 1.52 m (5 ft) of the main control panel.
- Route all Zonex bus wiring in EMT (electrical metallic tubing) conduit.

3.2.3 SDI2 Bus Devices

GV4 Series Control Panels can support a number of accessory devices from the SDI2 Bus using Terminals 33 through 36. Some devices include the B208 Octoinput Module, the B308 Octo-output Module, and the B820 SDI2 Inovonics Interface Module.

B208 Octo-input Module

• **Do not connect** fire and non-fire devices to the same B208 Octo-input Module.

• B208 Octo-input module is fully supervised.

B308 Octo-output Module

• **Do not connect** fire and non-fire devices to the same B308 Octo-input Module.

4.0 Ground Fault Detect Enable

To enable ground fault detection, lock (close) the S4 GROUND FAULT DETECT pin on the control panel as shown below.



5.0 Compatible UL Listed Components

In Table 3, the text in the columns and rows for GV4 Series Control Panel have the following meanings:

No = Not acceptable for this application

Req. = Required for this application

Opt. = Optional for this application.

[Empty box] = Not used for this application

	Household Burglary	Household Fire	. Household Fire/ . Burglary Combined	Central Station Burglary	Police Connected Burglary	Local Burglary	Local Fire/Burglary Combined D9412GV4/D7412GV4	Local Fire D9412GV4/D7412GV4	Local and Central Station Fire Combined D9412GV4/D7412GV4	Local and Central Station Fire/ Burglary D9412GV4/D7412GV4	Central Station Fire/ Burglary Combined D9412GV4/D7412GV4	Central Station Fire D9412GV4/D7412GV4	Electrically Actuated Transmitter D9412GV4/D7412GV4
Minimum Hours of Standby Battery	4	24 + 4	min alarm	4	4	4	24 + 5 r	nin alarm	1		1		
D8103/D8109 Enclosure	Opt.	Opt.	Opt.	Opt.	No	Opt.	No	Opt.	Opt.	No	No	Opt.	No
D8108A Enclosure	Opt.	Opt.	Opt.	Opt.	Req.	Opt	Req.	Opt.	Opt.	Req.	Req.	Opt.	Opt.
D125B Class B, Style A Powered Loop Interface*	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D129 Class A, Style D Initiating Module*	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D928 Dual Phone Line Module**	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Require	d if using	g two tele	phone lin	es for co	mmunica	tion.
D192G Class "B", Style Y Bell Circuit Supervision	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Req.	Req.	Req.	Req.	Req.	Req.	
D268/D269H Independent Zone Control	Optio	nal. Onl	connect to	Zones 1	to 8.		No	No	No	No	No	No	No
DS7432 Eight Input Remote Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7457iF Single Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7560i Dual Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7461i Single Zone Input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
DS7465i Input/Output Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
B208 Octo-input Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
B308 Octo-output Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
B420 Ethernet Communication Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
B426 Ethernet Communication Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
DX4020 Network Interface Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
ITS-DX4020-G Network Interface Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
ICP-SDI-9114 SDI Splitter	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
B820 Inovonics Interface Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	NA	NA	NA	NA	NA	NA	NA
D130 Relay Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D1255 and D1260 Keypads	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1256 Command Center and D1257 Annunciator	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1255B and D1260B Keypads	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No	No	No	No	No	No	No
D1255RB, D1256RB, D1257RB	No	Opt.	Opt.	No	No	No	Req.	Req.	Req.	Req.	Req.	Req.	
D1640 Transformer	Requ	ired for a	II applicatio	ns.	•						•		
D8004 Transformer Enclosure	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Req.	Req.	Req.	Req.	Req.	Req.	
D8125 Class B, Style 4.0 POPEX Module	Requ	ired for t	he D9127T/	U POPIT	s.						•		
D8125MUX Class B, Style 4.0	Requ	ired for M	/UX device:	s. Refer t	o Section	7.1 D812	25MUX or	n page 22	2.				
D9127T/U Class B, Style A POPIT Modules	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	
D8128D OctoPOPIT	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D8129 OctoRelay	Optio	nal. For	remote anni	unciation	of syster	n function	s.		•		•		
D8130 Release Module	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D8132 Battery Charger	Refei Batte	to Table ry Calcul	7: Curren	t Rating (Chart for	Standby	No	No	No	No	No	No	No
D9131A Parallel Printer Interface	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.
D9210C Access Control Interface**	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	Opt.	No
* The D125B is required to connect two-wire f The D129 provides two non-powered Class "A	re alarr ' initiatii	n initiatin ng circuit	g devices. 1 s.	Fhe D125	B provide	es two po	wered loo	ps for co	nnecting	listed two	o-wire sm	oke dete	ctors.

6.0 System Wiring Diagrams

The System Wiring Diagrams, (refer to Figure 4: GV4 Series Power Supply Side System Wiring (Power and Phone) on page 17 to show the relationship between the control panel and the accessory components referred to in Table 3 on page 16).

6.1 Power Supply Side System Wiring Diagrams



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



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

6.2 Input Points and Peripheral Devices System Wiring Diagrams



6.3 SDI and Zonex Devices System Wiring



or the D8129 Operation and Installation Guide (P/N: F01U036302) for specific information.



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).



* 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.



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).

6.4 SDI2 Devices System Wiring



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).

Table 4: SDI2 Modules Capacities Per Control Panel

Module	D9412GV4	D7412GV4	D7212GV4
B208 Octo-input Modules	24	7 ¹	31
B308 Octo-output Modules	12	6 ¹	2 ²
B420 Ethernet Communication Module	2 ³	2 ³	2 ³
B820 Inovonics Interface Module	1	1	1

¹For 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 one can be used for reporting / RPS communications and the other can be used for automation.

7.0 Current Ratings Charts

7.1 D8125MUX

Complete the chart in *Table 5* to determine the maximum currents for the D8125MUX and its accessories. Transfer the total figures to *Table 7* on page 24.



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

Table 5: Current Rating Chart for D8125MUX

		Max	AC Power imum Curre	Off ent (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	Fotal =		Column B T	otal =						
* Refer to the device's	installation gu	ide for current o	draw values.									

7.2 Standby Battery Calculations

UL 365 requires 72 h of standby battery capacity. Limit the auxiliary power current for all devices, including keypads, to 300 mA or less to meet this requirement.

Table 6: Standby Battery Requirements										
Туре	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.									
Remote Station or Auxiliary Fire Alarm	60 h + 5 min of alarm operation.									
Household Fire Warning Equipment	24 h + 4 min of alarm operation.									

Table 7: Current Rating Chart for Standby Battery Calculations										
			Α					С		
			AC Power On			AC Power C	off	In Alarm		
		Nor	mal Curre	ent (mA)	Minimum Current (mA)		Max	Maximum Current (mA		
Model Number	Qty Used	Each Unit	Qty	Total	Each Unit	Qty	Total	Each Unit	Qty	Total
D9412GV4/ D7412GV4		225	x 1	= 225	225	x 1	= 225	300	x 1	= 300
B208		25	v Otv	-	25	v Otv	_	25	x Otv	-
B208		22	x Qty	-	22	x Qty	-	22	x Qty	
B420 ⁵		90	x Qty	-	90	x Qty		90	x Qty	-
B820		100	x Qty	-	100	x Qty		110	x Qty	-
D125B		25	x Qty	-	25	x Qty	-	168	x Qty	
D123D		5	x Qty	-	5	x Qty		55	x Qty	-
D127		23	x Qty	-	23	x Qty	-	25	x Qty	
D125		2.5	x Qty	=	2.5	x Qiy	=	200	x Qty	-
D103		245	x Qty	-	245	x Qty	=	100	x Qty	
D132G		104	x Qty		106	x Qty		206	x Qty	-
D1256/D1253D		104	x Qty	-	106	x Qty	-	200	x Qty	-
D1255PR		104	x Qty	=	106	x Qty	=	200	x Qty	=
D1256PB		104	x Qty	-	106	x Qty	-	225	x Qty	-
D1257RB		104	x Qty		106	x Qty		225	x Qty	-
D1260/D1260B		140	x Qty		140	x Qty	-	250	x Qty	
D720		20	x Qty	-	20	x Qty		100	x Qty	-
D8125		60	x Oty	-	60	x Oty	-	60	x Oty	-
D8125		140	x Qty	-	140	X Qty		140	X Qty	-
D8128D		25	x Qty	-	25	x Qty	-	50	x Qty	
D8129		20	x Qty	-	20	x Qty	-	Bofor to f		-
D8130		7	x Oty	-	7	x Qty	-	60	x Otv	-
D9127T/U		0.8	x Qty	-	0.8	x Qty	-	0.8	x Qty	-
D91314		21	x Oty		21	x Oty		23	x Otv	
D9210C		110	x Qty	-	110	x Qty		110 ²	x Qty	-
D928		20	x Oty	-	20	x Oty	-	100	x Qty	-
DX4010V2 ³		50	x Oty	-	50	x Oty		55	x Oty	
DX4020		80	x Oty	=	80	x Oty		84	x Otv	
ITS-DX4020-G		50	x Oty		50	x Oty		200	x Oty	
Ratings of other devices	in the system	n that are no	t shown at		50	x Qty		200	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	: =

Table 7: Current Rating Chart for Standby Battery Calculations

¹ The **In Alarm** calculation for the D8129 is: 20 x Qty + (16.25 x number of relays)

² Use 110 mA + reader current. **Do not exceed 260 mA**.

 $^{\rm 3}$ UL requires that the DX4010V2 be used for programming only.

 4 (digital section = 22mA) + (Qty of relays x 16 mA)= total current. (Add 16 mA for each relay being used)

⁵ 10BaseT Ethernet: 90mA max, 100BaseT Ethernet: 100mA max



Because of changing regulations, verify the necessary time with your local authority having jurisdiction (AHJ).

Refer to *Table 7* on page 24 for totals B and C used in the formulas below. When connecting two batteries, use either the D122/D122L Dual Battery Wiring Harness or the D8132 Battery Charger Module.

8.0 NFPA 72 Fire Alarm Applications

8.1 Household Burglary and Commercial Burglary

Four hours of standby battery capacity are required.

8.2 Bank Safe and Vault



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Because of changing regulations, verify the necessary time with your local authority having jurisdiction (AHJ).

UL 365 requires 72 h of standby battery capacity. Limit the auxiliary power current for all devices, including keypads, to 300 mA or less to meet this requirement.

Table 8: Standby Battery Requirements									
Туре	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 <i>Table 10</i> on page 32.								
Remote Station or Auxiliary Fire Alarm	60 h + 5 min of alarm operation. Refer to <i>Table 11</i> on page 33.								
Household Fire Warning Equipment	24 h + 4 min of alarm operation. Refer to <i>Table 12</i> on page 33.								

8.3 Standby Battery Calculation

Because of changing regulations, verify the necessary time with your local authority having jurisdiction (AHJ).

Refer to *Table 7* on page 24 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.

Table 9:	General Am	pere-H	our (Ah) Ca	alculati	ion Formula				
Total B ¹	Hours		Total C ¹		Alarm Operation ²		Contingency		Total Ah ³
(x 24)	+	(х	0.083)	+	10%	=	
1 Refer to 2 2 Value = <u>N</u>	l <i>able 7</i> on page 24. <u>linutes of alarm op</u> 60	<u>eration</u>							
3 Total Ah i One D Two D One D Two D	requirements must 126 Battery = 7 Ah 126 Batteries = 14 1218 Battery = 17. 1218 Batteries = 3	Ah 2 or 18 Ał 4.4 or 36	ed the Ah capa n Ah	icity of ba	atteries:				

8.4 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 10* 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.



Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 10: Central Stations or Local Systems Ah Calculation Formula										
Total B ¹	Hours	Total C ¹		Alarm Operation ²		Contingency		Total Ah ³		
(×	24)	+ (х	0.083)	+	10%	=			
 Refer to Table 7 on page 24. Value = Minutes of alarm operation 60 										
3 Total Ah rec One D12 Two D12 One D12 Two D12	uirements mu 3 Battery = 7 4 3 Batteries = 1 18 Battery = 1 18 Batteries =	ust not exceed the A Ah 14 Ah 7.2 or 18 Ah : 34.4 or 36 Ah	h capac	ity of batteries:						

8.5 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 60hour 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 11* includes the calculation for 5 min of alarm operation at the end of the 60-hr period, as well as a 10% contingency factor that allows for depletion of battery capacity with age. V

Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 11: Remote Station or Auxiliary Systems Ah Calculation Formula									
Total B ¹	Hours		Total C ¹		Alarm Operation ²		Contingency		Total Ah ³
(>	(60)	+	(х	0.083)	+	10%	=	
1 Refer to Tal	ble 7 on page	24.							
2 Value - Minutes of alarm operation									
2 10100	60	operat							
3 Total Ah requirements must not exceed the Ah capacity of batteries:									
One D126 Battery = 7 Ah									
Two D126 Batteries = 14 Ah									
One D1218 Battery = 17.2 or 18 Ah									
Two D1218 Batteries = 34.4 or 36 Ah									

8.6 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 12* includes the calculation for 4 min of alarm operation at the end of the 24-hour period, and a 10% contingency factor that allows for depletion of battery capacity with age.



Because of changing regulations, verify the necessary time with your local AHJ (authority having jurisdiction).

Table 12: Household Fire Ah Calculation Formula										
Total B ¹	Hours	Total C ¹		Alarm Operation ²	2	Contingency	1	Total Ah ³		
(x 24)	+ (х	0.067)	+	10%	=			
1 Refer to 7	able 7 on page	24.								
2 Value = <u>Minutes of alarm operation</u> 60										
3 Total Ah r One D1 Two D1 One D1 Two D1	equirements m 26 Battery = 7 26 Batteries = 218 Battery = 2 218 Batteries =	ust not exceed the A Ah 14 Ah 17.2 or 18 Ah = 34.4 or 36 Ah	h capaci	ty of batteries:						

8.7 UL 609 (D9412GV4/D7412GV4/D7212GV4)

The leads providing operating power to the alarm sounding device shall be electrically and mechanically protected as required in the Standard for Installation and Classification of Mercantile and Bank Burglar-Alarm Systems, UL 681, or the circuit shall be constructed so that the system is not defeated by cutting or short-circuiting connections between the control unit and the alarm housing.

The alarm housing for a bank alarm system without a remote alarm transmission connection shall be mounted on the outside of the building, visible from a public street or highway. It shall be accessible for examination and repair. It shall also be located not more than four stories above the street level unless:

- A second alarm sounding device and housing, intended for outside service [see 3.3(a)], is mounted adjacent to the premises or area of the building in which the alarm system is installed or
- A second alarm sounding device, intended for inside service [see 3.3(b)], is mounted within the premises.

In either case, the outside alarm sounding device and housing may be mounted as high as the seventh floor.

8.8 UL 365 (D9412GV4/D7412GV4/D7212GV4)

In a mercantile burglar alarm system, a mercantile alarm sounding device located within a building but outside the protected area, is acceptable, provided it is rated for outside service and alarm conditions are transmitted to:

- a. The dispatch location of the law enforcement agency having jurisdiction over the protected property or
- b. A central station or residential monitoring station complying with the Standard for Central-Station Alarm Services, UL 827.

In a mercantile burglar alarm system, an alarm sounding device located within the area of greatest protection, or outside the area of greatest protection but within an area protected by an alarm system and that shares a common control unit with the system installed in the area of greatest protection, is acceptable provided it is rated for inside service and alarm conditions are transmitted to:

- a. The dispatch location of the law enforcement agency having jurisdiction over the protected property or
- b. A central station or residential monitoring station complying with the Standard for Central-Station Alarm Services, UL 827.

An inside sounding device shall be mounted at least 10 feet (3.05 m) above the floor or at the surface of the ceiling. When there is a fixed construction within the area that could provide access for an intruder, the alarm sounding device shall also be mounted at least 4 ft (1.2. m) as measured horizontally, away from the edges of the fixed construction or at least 10 ft (3.05 m) above it so as to minimize access by an intruder.

8.9 UL 636 (D9412GV4/D7412GV4/D7212GV4)

To comply with UL 636, UL Standard for Holdup Alarm Units and Systems, the GV4 Series control panels must be installed with the Bosch Model B820 Inovonics Interface Module, Inovonics EchoStream Model EN4200 Serial Receiver and any of the following Inovonics EchoStream transmitters: EN1235SF, EN1235DF, or EN1249.



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