

# Control Panels

B9512G/B8512G (B9512G-E/B8512G-E)



**BOSCH**

en UL Installation Guide



# 1 Introduction

This section includes an introduction to documents for this product and other document-related instructions.

## 1.1 About documentation

This document contains instructions for a trained installer to properly install, configure, and operate this control panel, and optional peripheral devices. Review this document before beginning the installation to determine the hardware and wiring requirements for the features used.

(Bosch Security Systems, Inc. recommends that installers follow good wiring practices such as those described in NFPA 731, Standard for the Installation of Electronics Premises Security Systems.)

Throughout this document, the words “control panel” refer to all control panels covered by this document (B9512G/B8512G/B9512G-E/B8512G-E).

### Notifications

This document uses Notices, Cautions, and Warnings to draw your attention to important information.



#### Notice!

These include important notes for successful operation and programming of equipment, or indicate a risk of damage to the equipment or environment.



#### Caution!

These indicate a hazardous situation which, if not avoided, could result in minor or moderate injury.



#### Warning!

These indicate a hazardous situation which, if not avoided, could result in death or serious injury.

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### 1.1.1 Related documentation

#### Control panel documents

*Control Panels (B9512G/B8512G) Release Notes* \*

*Control Panels (B9512G/B8512G) Installation and System Reference Guide* (P/N: F01U303996)\*

*Control Panels (B9512G/B8512G/B5512/B4512/B3512) Owner's Manual* (English) (P/N: F01U307371)\* \*

*Control Panels (B9512G/B8512G) Program Entry Guide* (P/N: F01U303998)\*

*Control Panels (B9512G/B8512G) UL Installation Guide*\* (this document) (P/N: F01U304001)\*  
+

*Control Panels (B9512G/B8512G) SIA Quick Reference Guide (P/N: F01U304000)\* \**

*Control Panels (B9512G/B8512G/B6512/B5512/B4512/B3512) ULC Installation Guide (P/N: F01U321698)*

\*Shipped with the control panel.

\*Located on the documentation CD shipped with the control panel.

### Keypad documents

*Basic Keypad (B915) Installation Guide (P/N: F01U297873)\**

*Two-line Alphanumeric Keypad (B920) Installation Guide (P/N: F01U265450)\**

*Fire Keypads (B925F/B926F) Installation Guide (P/N: F01U305193)\**

*Two-line Capacitive Keypad with Inputs (B921C) Installation Guide (P/N: F01U297887)\**

*ATM Style Alphanumeric Keypad (B930) Installation Guide (P/N: F01U265451)\**

*Touch Screen Keypad (B942/B942W) Installation Guide (P/N: F01U294527)\**

\*Shipped with the keypad.

### Optional module documents

*Octo-input Module (B208) Installation and Operation Guide (P/N: F01U265456)\**

*POPEX Module (B299) Installation Guide (P/N: F01U300043)\**

*Octo-output Module (B308) Installation and Operation Guide (P/N: F01U265458)\**

*Conettix Ethernet Communication Module (B426) Installation and Operation Guide (P/N: F01U281208)\* \**

*Plug-in Telephone Communicator (B430) Installation Guide Installation Guide (P/N: F01U265454)\**

*Conettix Plug-in Cellular Communicator (B440) Installation and Operation Guide (P/N: F01U265455)\**

*Conettix Plug-in CDMA Cellular Communicator (B441) Installation and Operation Guide (P/N: F01U282233)\**

*Conettix Plug-in GPRS Cellular Communicator (B442) Installation and Operation Guide (P/N: F01U283180)\**

*Conettix Plug-in HSPA+ Cellular Communicator (B443) Installation and Operation Guide (P/N: F01U283181)\**

*Conettix Plug-in Communicator Interface (B450) Installation and Operation Guide (P/N: F01U300740)\* \**

*Auxiliary Power Supply (B520) Installation and Operation Guide (P/N: F01U265445)\**

*Retrofit ZONEX Module (B600) Installation Guide (P/N: F01U300237)*

*RADION receiver SD (B810) Installation Guide (P/N: F01U261834)\**

*SDI2 Inovonics Interface Module (B820) Installation Guide (P/N: F01U265460)\**

*Access Control Module (B901) Installation Guide (P/N: F01U300416)*

*Dual Class B Initiating Module (D125B) Installation Instructions (P/N: F01U036340)*

*Multiplex Bus Interface (D8125MUX) Operation and Installation Guide (P/N: F01U034973)*

OctoPOPIT Module (D8128D) Installation Guide (P/N: F01U070537)

Access Control Interface Module (D9210C) Installation and Operation Guide (P/N: F01U215232)

\*Shipped with the module.

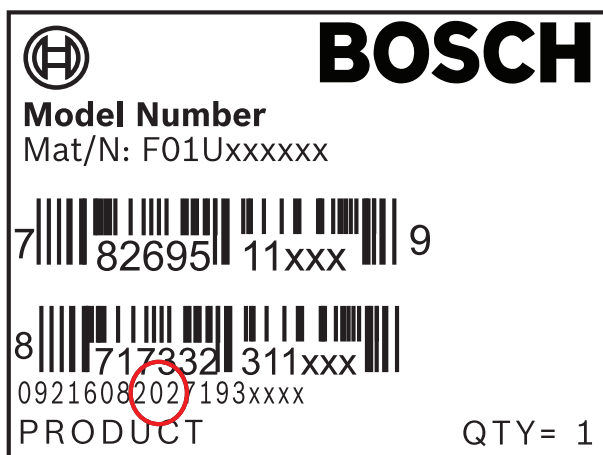
\*Located on the documentation CD shipped with the module.

## 1.2

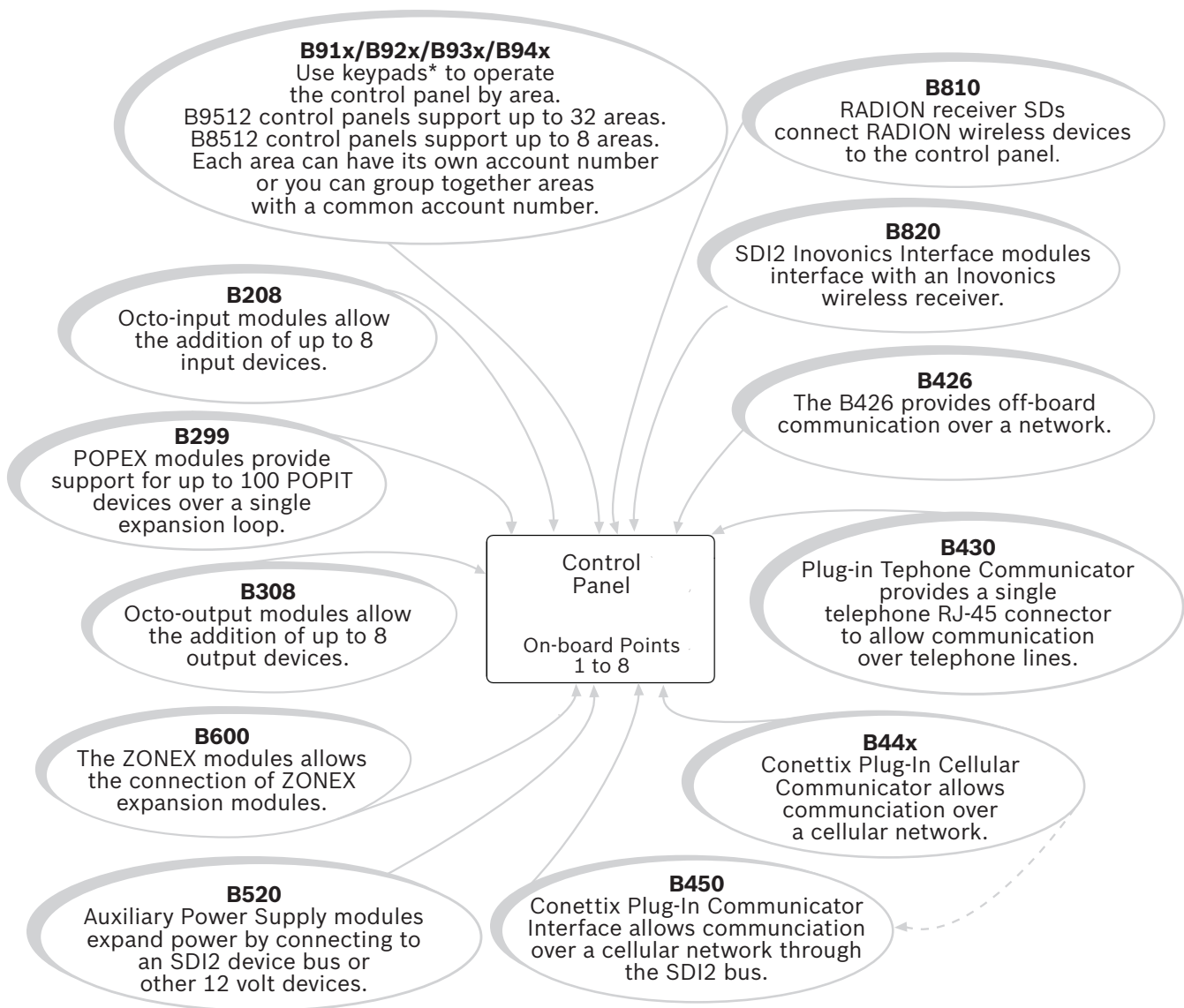
### Bosch Security Systems, Inc. product manufacturing dates

Use the serial number located on the product label and refer to the Bosch Security Systems, Inc. website at <http://www.boschsecurity.com/datecodes/>.

The following image shows an example of a product label and highlights where to find the manufacturing date within the serial number.



## 2 System overview



### 3 Control panel installation

This section explains how to mount the control panel enclosure, how to mount the control panel into the enclosure, and provides an overview of how to wire modules to the control panel.

**Enclosure overview**

Before you begin, review the overview figure:

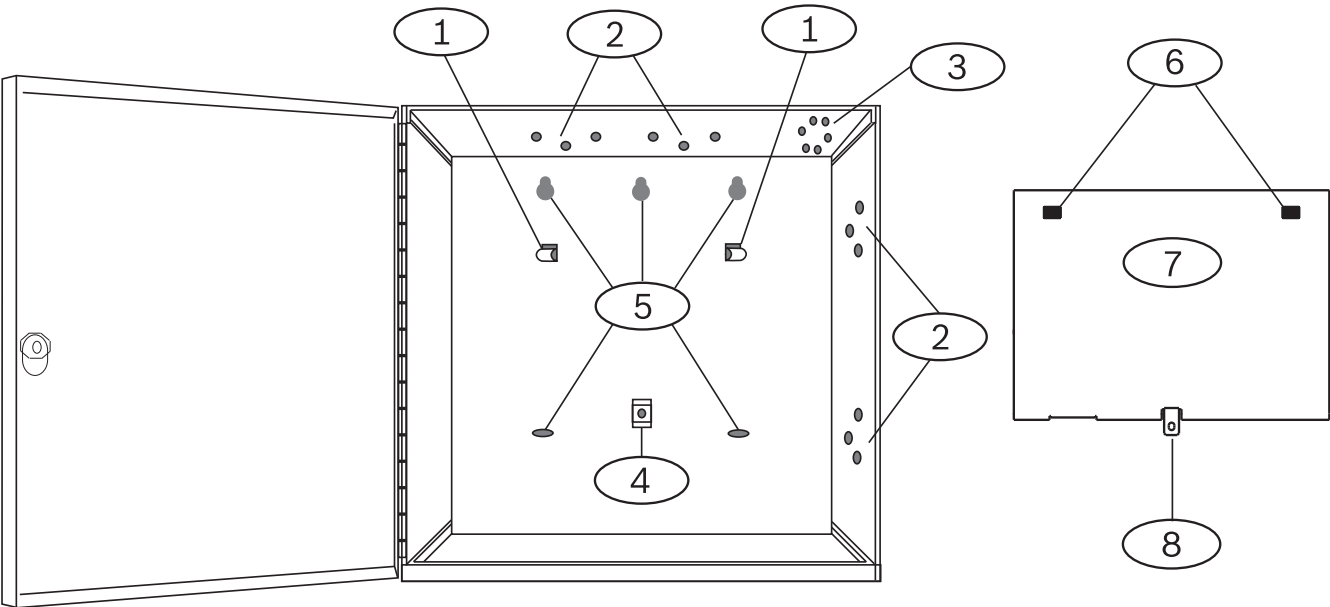


Figure 3.1: Enclosure and control panel mounting overview

Callout — Description	Callout — Description
1 — Mounting skirt attachment hooks (2)	5 — Enclosure mounting holes (5)
2 — Module mounting three-hole pattern (4)	6 — Mounting skirt attachment holes (2)
3 —Tamper switch mounting location	7 — Back of the control panel mounting skirt
4 — Mounting skirt screw location (1)	8 — Mounting skirt screw tab

#### 3.1 Install the enclosure

Refer to Enclosures to determine if the application requires a specific enclosure.

Installing the enclosure:

1. Remove any knockouts prior to installing the control panel.
2. Mount the enclosure in the desired location. Use all enclosure mounting holes. Refer to the mounting instructions supplied with the selected enclosure.
3. Pull the wires into the enclosure.
4. Optionally install the supplied point label chart on the inside of the enclosure door.



**Notice!**

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

## 3.2 Install the control panel

This section includes instructions to mount the control panel in the enclosure, connect earth ground, and make other control panel connections.

### 3.2.1 Mount the control panel

Refer to the figure *Enclosure overview*, page 7.

Mounting 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 enclosure mounting attachment hooks. Slide the control panel down so that it hangs on the hooks.
2. Remove the tape from the #6 x 1/4-in screw in the mounting skirt screw tab on the control panel. The screw passes through the mounting tab and into the skirt mounting hole in the enclosure.
3. Tighten the screw to secure the control panel in the enclosure.



#### Notice!

Connect earth ground to the control panel before making any other connections.

### 3.2.2 Connect earth ground

To help prevent damage from electrostatic discharges or other transient electrical surges, connect the system to earth ground before making other connections. The  $\perp$  icon (Terminal 10) indicates the earth ground terminal. Use a recommended earth ground reference, such as a grounding rod or a cold water pipe. Make the connection using 14 AWG (1.8 mm) to 16 AWG (1.5 mm) wire.



#### Notice!

Do not use telephone or electrical ground for the earth ground connection. Do not connect other control panel terminals to earth ground.



#### Caution!

Avoid electrostatic discharge. Always touch the earth ground connection with the  $\perp$  icon first, before beginning work on the control panel.

### 3.2.3 Ground Fault Detect enable

To meet UL 864 requirements, enable Ground Fault Detect.

A ground fault is a circuit impedance to ground sufficient to result in the annunciation of a trouble condition.

The control panel has a ground fault detection circuit that when enabled, detects ground faults on Terminals 1 to 9 and 11 to 30.

If a ground fault condition occurs, the keypads annunciate a ground fault and the control panel transmits a trouble message.

When the control panel recognizes that the ground fault condition is corrected, and remains corrected for between 5 to 45 consecutive seconds, the control panel clears the fault from the keypad display and sends a restoral report.

The control panel detects ground fault at  $\leq 300 \Omega$ .



**Enable Ground Fault Detect**

To enable fault detection, use RPS. Refer to *RPS Help*.

**3.2.4****Ground fault detection troubleshooting**

Measure earth ground (Terminal 10) and common (Terminal 9) to determine whether the control panel has the necessary -2.1 V decay to 0.

Measuring and comparing voltage for ground fault detection:

1. Set your digital voltmeter (DVM) to measure VDC.
2. Connect the red DVM lead to control panel Terminal 10, and the black DVM lead to Terminal 9.
3. Compare this voltage to the following table:

Control panel voltage at Terminals 9 and 10)	Terminal potentially causing ground fault
~ 0 VDC	4, 9, 12, 15, 17, 21
~ 13.65 VDC	5, 6, 7, 8, 26, 30
~ 2.51 VDC	11, 13, 14, 16, 17, 19, 20, 22
~ 2.44 to 3.2 VDC	24
~ 10.9 to 11.2 VDC	25
~ 7.2 VDC	28
~ 5.8VDC	29
~ 7.35 VDC	1, 2

**3.3****Control panel to module wiring overview**

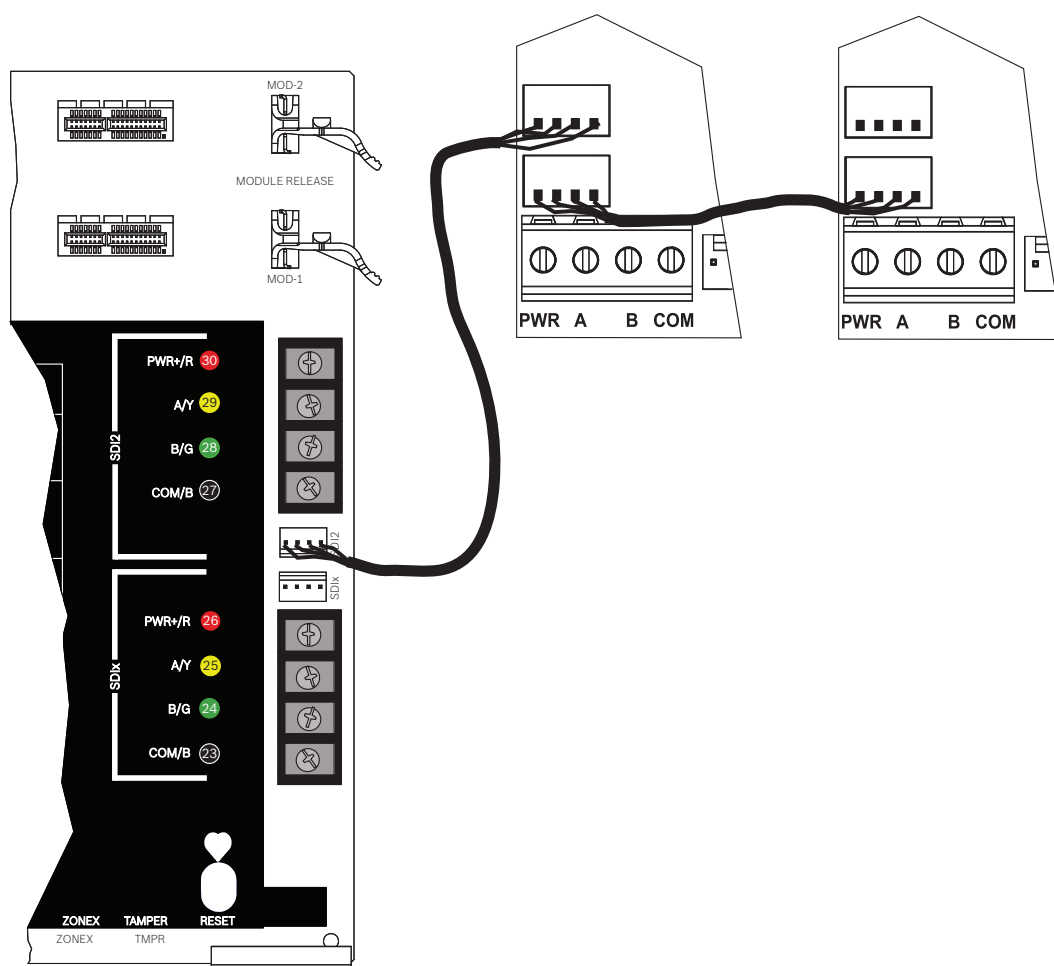
In the following sections, this document provides instructions for wiring devices to your control panel. You can use interconnect or terminal wiring.

If SDIx is configured for SDI2, use either SDI2 bus.

**Using terminal wiring**

For terminal wiring, use 18 AWG to 22 AWG (1.02 mm to 0.65 mm) wire.



**SDI2 devices daisy chained with interconnect wiring**

## 4 Power supply

This section provides information on installing and maintaining primary power, batteries, and auxiliary power.

### 4.1 Primary (AC) power



The control panel uses a 16.5 VAC, 40 VA, internally-fused transformer (D1640) for its primary power source. The control panel draws 190 mA when idle and 265 mA when in the alarm state.

The auxiliary power available for powered devices is 1.4 A.

#### Surge protection

Transient suppressors and spark gaps protect the circuit from power surges. This protection relies on the ground connection at the earth ground terminal (Terminal 10), marked with the  $\perp$  icon. Ensure that you connect the terminal to a proper ground.

Refer to *Connect earth ground*, page 8.

#### AC power fail

The system indicates an AC power failure when the transformer input terminals do not have sufficient voltage. The AC Fail Time parameter sets the amount of time without AC power before the control panel reports the failure, and the amount of time after the power returns before the control panel reports restored power.

When the control panel loses AC power long enough for the battery to become low, the control panel adds a Battery Low event to the event log. If the battery continues to discharge below the load shed threshold, the system ceases to operate and generates no further events.

#### 4.1.1 Install the transformer



##### Caution!

Do not short-circuit the terminals of the transformer: Shorting the terminals opens the internal fuse, causing permanent failure. Connect the transformer to the control panel's AC power terminals before plugging it into the power source.



##### Notice!

Plan ahead

Route telephone, SDI2 bus wiring, 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.

1. Use 18 AWG (1.02 mm) wire minimum (12 AWG [2 mm] maximum) and connect the transformer to the control panel. Make the wire length as short as possible. Do not exceed 50 ft (15 m).
2. Connect the wire to the control panel.
3. Connect the wire to the transformer.
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 (not applicable in Canada).

**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.

**4.2****Secondary (DC) power**

A 12 V sealed lead-acid rechargeable battery (such as the D126/D1218) supplies secondary power to maintain system operation during interruptions of primary (AC) power.

**Notice!****Use sealed lead acid batteries only**

The charging circuit is calibrated for lead-acid batteries. Do not use gel-cell or NiCad batteries.

**Extra batteries**

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 Standby battery requirements and calculations.

**D1218 Battery**

The D1218 is a 12 V, 18 Ah battery for use in applications requiring extended battery standby time. The control panel does not support more than 38 Ah of battery.

**4.2.1****Install the battery**

1. Place the battery upright in the base of the enclosure.
2. Locate the red and black leads supplied in the hardware 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.

**Caution!**

The battery terminals and wire are not power limited. Maintain a 0.250 in (6.4 mm) space between the battery terminals, battery wiring, and all other wiring. Battery wiring cannot share the same conduit, conduit fittings, or conduit knockouts with other wiring.

Non-power-limited wiring

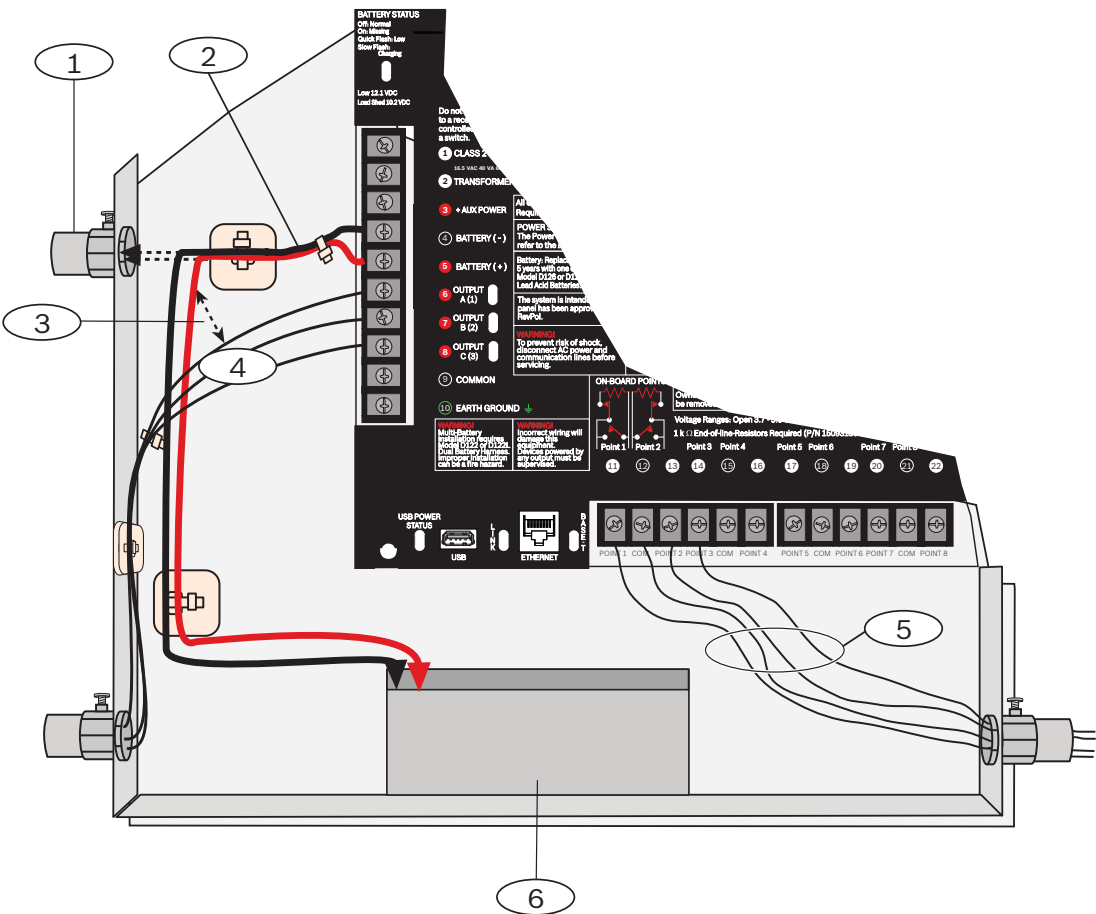


Figure 4.1: Non-power-limited wiring

Callout — Description
1 — Conduit required for use with external batteries
2 — Battery wires
3 — 0.25 in (6.4 mm) minimum. To ensure proper spacing, use tie-wraps or similar devices to secure wires.
4 — Output wires
5 — Sensor loop wires
6 — 12 V sealed lead-acid rechargeable battery (D126/D1218)





Charge the battery

Connect the battery and then the transformer to allow the control panel to charge the battery while you complete the installation.

4.2.2

BATTERY STATUS LED

The control panel includes one BATTERY STATUS LED with 4 LED patterns to indicate the battery status.

LED pattern	Function	Refer to
 Off	Battery is fully charged.	N/A
 Flashing slowly	Battery charge is below 13.4 VDC and the battery is recharging.	<i>Low battery, page 15 and Battery restoral, page 15</i>
 Flashing quickly	Battery voltage dropped to between 12.1 VDC and 10.2 VDC. LED turns off when voltage reaches at least 13.4 and > 200 mA.	<i>Low battery, page 15 and Battery restoral, page 15</i>
 On Steady	Battery is missing, shorted, or reversed.	<i>Missing battery, page 15</i>

### 4.2.3

#### Battery maintenance

Use 12 VDC sealed lead-acid rechargeable battery (7 Ah, 18 Ah, or 38 Ah). The control panel supports up to 38 Ah of battery. If you use two batteries, they must have the same capacity and you must connect them using the D122/D122L Dual Battery Harness.

Replace the batteries every 3 to 5 years. If you install two batteries, replace them both at the same time.

Record the date of installation directly on the battery.



#### Caution!

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

### 4.2.4

#### Battery supervision

##### Low battery

If the control panel is programmed for power supervision, it sends a Battery Low report in the Modem4 communication format or a Low System Battery (302) report in the Contact ID format.

##### Missing battery

If the control panel is programmed for power supervision, it sends a Battery Missing/Dead report in the Modem4 communication format, or a Control Panel Battery Missing (311) report in the Contact ID format.

##### Battery restoral

When AC returns and the battery is charged, If the control panel is programmed for power supervision, it sends a Low System Battery Restore report in the Modem4 communication format or a Control Panel Battery Restored to Normal (302) report in the Contact ID format.

### 4.2.5

#### Battery charging circuit float charge

The float voltage for the battery charging circuit is 13.65 VDC when operating within load range.

**Load shed**

Load shed relay protects battery: During an AC power loss, the battery supplies all power to the security system. If the battery voltage falls below 10.0 V during an AC power loss, a load shed relay disconnects the battery from the control panel and disables the control panel. Load shed protects the battery from being damaged by deep discharge.

When AC power restores, the load shed relay reconnects the charging circuit on the control panel to the battery and the battery begins to recharge.

**Over load with AC present**

If devices draw more than 1.6 A of auxiliary current from the control panel with AC applied, the control panel indicates a Panel Over-current system trouble. Unless corrected, this condition prevents the control panel from properly maintaining the battery charge level, and leaves the system vulnerable to failing during power outages.

To correct the issue, remove all loads to the control panel and disconnect the battery and AC power. Fix the condition creating the over current and reconnect AC power.

A shorted battery condition (created either by a shorted cell inside the battery or by a short on Terminals 4 and 5), might prevent the control panel from operating, or might cause the control panel to detect a missing battery condition.

**Caution!**

Shorting the battery terminals is dangerous.

#### 4.2.6 Battery discharge and recharge schedule

Battery discharge/recharge schedule	Discharge Cycle	13.30 VDC 12.1 VDC  10.2 VDC 10.2 VDC	BATTERY STATUS LED slow flash. Low Battery Report, if programmed. BATTERY STATUS LED quick flash. Minimum operational voltage. Battery load shed.
	Recharge Cycle	AC ON 12.50 VDC (under load) 13.4 VDC and charging current < 200 mA	Load shed relay resets, battery charging begins. Battery Restoral Report sent, BATTERY STATUS LED off. Battery float charged. BATTERY STATUS LED off.

### 4.3 B520 Auxiliary Power Supply

The optional B520 Auxiliary Power Supply Module provides up to 2 A of 12 VDC standby power for Fire and Burglar applications. For Burglar applications, an additional 2 A of alarm power is available, allowing 2 A of standby current and up to 4 A of alarm current.

The B9512G control panels support up to 8 B520 modules. The B8512G control panels support up to 4 B520 modules.

Connect B520 Auxiliary Power Supply Modules to the SDI2 bus on the control panel using terminals 27 through 30 (or 23 through 26 if configured for SDI2). This section includes basic installation instructions. For detailed installation instructions, refer to the *Auxiliary Power Supply Module (B520) Installation Guide* for complete installation instructions, and for battery standby time calculations, refer to the *B520 Auxiliary Power Supply Module Battery Standby Chart* within the installation guide.



### 4.3.1 SDI2 address settings

**Notice!**

The module reads the address switch setting only during module power up. If you change the setting after you apply power to the module, you must cycle the power to the module in order for the new setting to take effect.

If multiple B520 modules reside on the same system, each B520 module must have a unique address.

### 4.3.2 Supervision

The control panel supervises B520 Auxiliary Power Supply Modules on the SDI2 bus. With any failure to receive an expected response from a B520, all keypads show a system fault. The control panel sends a module trouble report to the central station (if configured for module trouble reports).

### 4.3.3 Auxiliary power supply trouble conditions

Each auxiliary power supply module on the SDI2 bus monitors several conditions including AC status, battery status, over current status, and a tamper input. Each of these conditions produces a unique system trouble condition at all keypads. The control panel sends a module trouble report to the central station (if configured for module trouble reports).

### 4.3.4 Installation and control panel wiring (B520)

The power supply draws approximately 15 mA (+/- 1 mA) from the control panel. Ensure that there is enough power for the module and other powered devices you want connected to the system.

Refer to *On-board outputs*, page 20.

**Caution!**

Remove all power (AC and battery) before making any connections. Failure to do so might result in personal injury and/or equipment damage.

**Install the module**

1. Set the module address using the address switches before you install it in the enclosure.
2. Insert the plastic mounting clips onto the appropriate standoff locations inside the enclosure or on a mounting skirt, when required.
3. Mount the module onto the plastic mounting clips and then secure it using the supplied mounting screws.

**Wire to earth ground**

To help prevent damage from electrostatic charges or other transient electrical surges, connect the system to earth ground before making other connections. Recommended earth ground references are a grounding rod or a cold water pipe. When grounding, run wire as close as possible to grounding device.

**Caution!**

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

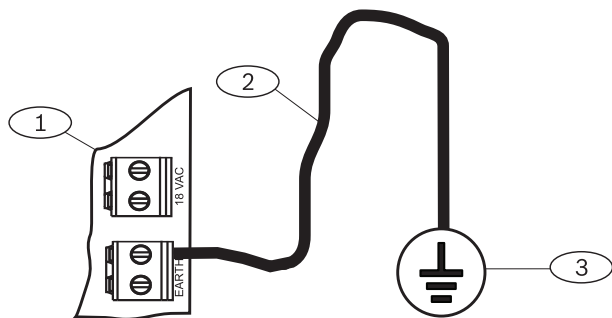


Figure 4.2: B520 earth ground wiring

Callout	Description
1	B520 Auxiliary Power Supply Module
2	14 AWG - 16 AWG (1.8 mm - 1.5 mm) wire
3	Ground device (grounding rod or cold water pipe)

**Wire to the control panel**

When wiring a module to a control panel, use the terminal strip labeled with PWR, A, B, and COM for SDI2 IN to wire to corresponding control panel terminals 27 through 30 (or 23 through 26 if configured for SDI2).

Use 12 AWG to 22 AWG (2 mm to 0.65 mm) wire.

4.3.5

**Powered device and battery wiring**

**Wire to SDI2 powered devices**

When wiring the output of a B520 to a SDI2 module, you can use either the SDI2 OUT terminal strip labeled with PWR, A, B, and COM to wire to terminals labeled PWR, A, B, and COM on the next module, or you can use the interconnect cable (included). Wiring the output of a B520 to a SDI2 device provides power to the device while passing through data between the control panel and the device.

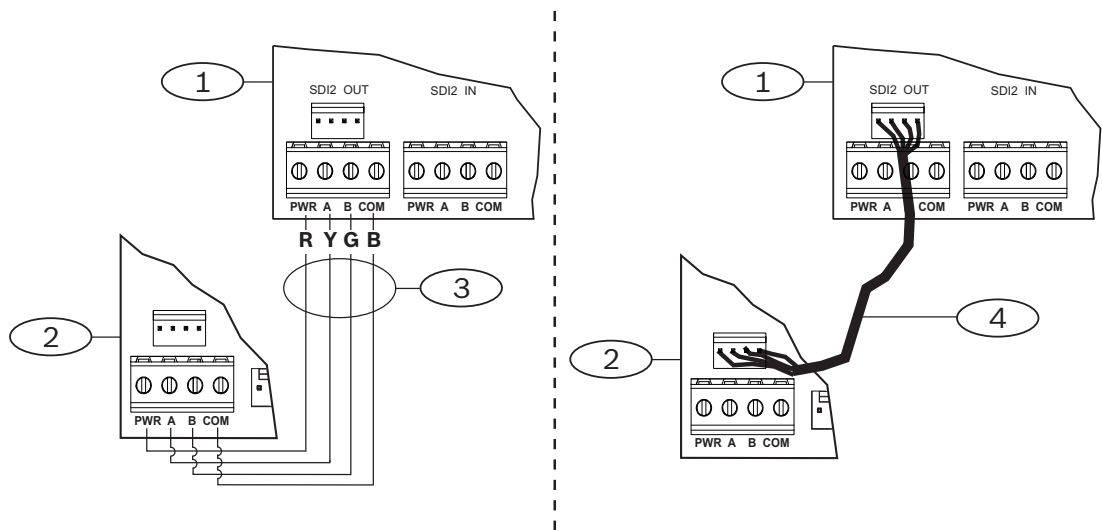


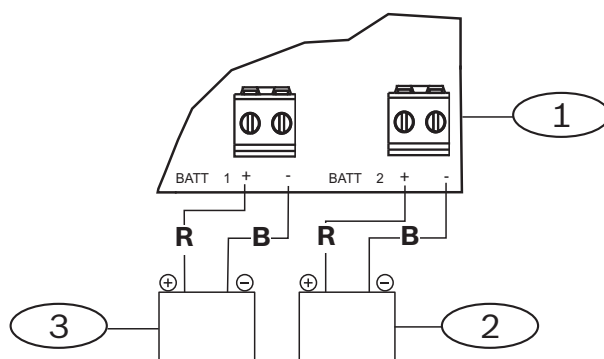
Figure 4.3: B520 to powered devices - terminal strip or interconnect wiring connector

**Callout — Description**

- |   |
|---|
| 1 — B520 Auxiliary Power Supply Module    |
| 2 — Powered device (SDI2 module)          |
| 3 — Terminal strip wiring                 |
| 4 — Interconnect wiring (P/N: F01U079745) |

**Wire to batteries**

Wiring the B520 to BATT 1 is required for proper operation of standby power for the B520 module. Wiring the second battery (BATT 2) is optional. If a B520 is configured for two batteries as the standby power source, then BATT 2 is also required for proper operation. BATT 2 must have the same capacity and rating as BATT 1. Maximum standby power cannot exceed 36 Ah.



**Figure 4.4: B520 BATT terminals wiring**

**Callout — Description**

- |   |
|---|
| 1 — B520 Auxiliary Power Supply Module            |
| 2 — Battery 2 (BATT 2) - (12 V nominal lead acid) |
| 3 — Battery 1 (BATT 1) - (12 V nominal lead acid) |

## 5 On-board outputs

The control panel provides three powered relay outputs.

### 5.1 Circuit protection

The powered outputs come with circuit protection.

Four self-resetting circuit breakers protect the control panel from short circuits on the continuous and programmable power outputs.

The self-resetting circuit breakers include:

- One self-resetting circuit breaker protects Terminal 3, auxiliary power.
- 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 terminal disrupts power to the other two terminals.

- The third self-resetting circuit breaker protects Terminals 26 and 30, power +.
- The fourth self-resetting circuit breaker protects the ZONEX connection.



#### Notice!

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

### 5.2 Total available power

The system produces up to 1.4 A of combined power at 12.0 VDC nominal. The outputs in this section share the available power. These outputs appear as shown on the faceplate.

3

#### Auxiliary power

Power devices requiring continuous power.

6

#### Output A (1), Alarm power output

Programmable output normally open, power on alarm.

7

#### Output B (2), Alternate alarm power output

Programmable output normally open, power on alarm.

8

#### Output C (3), Switched auxiliary power

Programmable output normally closed, switches power off when the Sensor Reset command is executed.

26

#### SDIx Power+ / R

Powers serial device interface (SDI) keypads, or use to power serial device interface 2 (SDI2) devices, such as keypads and expansion modules.

30

**SDI2 Power+ / R**

Powers serial device interface 2 (SDI2) devices, such as keypads and expansion modules.

ZONEX

**ZONEX Power**

Powers ZONEX modules such as the D8125, D8128D, and D8129 connected through the B600.

**5.3****Continuous power outputs**

3

26

30

ZONEX

The continuous current draw for powered devices connected to Terminals 3, 26, and 30, and the ZONEX connector must not exceed 1.4 A. Devices powered from these outputs operate at 12.0 VDC Nominal.

**Notice!****Power Restricted for Fire and Combined Fire and Burglary Systems**

Use the *Fire system power formula*, page 22 to calculate the current available for fire and combined fire and burglary systems

**5.4****Programmable power outputs**

6

7

8

The power outputs at Terminals 6, 7, and 8 are programmed as Outputs A (1), B (2), and C (3).

Assign each output an output type (Fire Bell, for example), when assigning it to an area. You can assign an output to one or more areas.

The defaults are:

- Output A (1) - Terminal 6 - as a Steady Alarm Bell output
- Output B (2) - Terminal 7 - as a Pulsed Fire Bell output
- Output C (3) - Terminal 8 - as a Verification or Reset output for smoke detectors

The Program Entry Guide contains complete instructions for programming outputs. **Refer to the Bell Parameters section of the program to set the Fire Bell, Alarm Bell output responses for outputs. Four annunciation patterns are available: Steady, Pulsed, California Standard, and Temporal Code 3.**

If Terminals 6, 7, and 8 do not provide the expected output, check:

- The *Outputs* section of the program for Outputs A (1), B (2), and C (3).
- The *Bell Parameters* section of the program to confirm that the Alarm and Fire Bell responses are programmed for the expected duration and pattern.
- The *Point Assignments* section to confirm that each point is programmed for the expected local response.

**5.4.1****Terminals 6 and 7**

6

7

When activated, Terminals 6 (Output A) and 7 (Output B), provide a 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.

When using Output A or Output B to activate notification appliance circuits in UL Listed fire alarm applications, install a D192G Notification Appliance Circuit (NAC) Module.

#### **Power restricted for Fire and Combined Fire and Burglary Systems**

Fire systems are prohibited from using the battery for supplying alarm power. Use the fire system power formula that follows to calculate the current available for fire and combined fire and burglary systems.

#### **Fire system power formula**

Calculating 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, 26, and 30, and the ZONEX 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 Approved applications for module or accessory current requirements

## 5.4.2

### **Terminal 8**



Terminal 8 provides continuous positive (+) 12.0 VDC Nominal power. Output C interrupts the power at Terminal 8 when activated. Use Terminal 8 to power smoke detectors or other devices that reset by interrupting power.

#### **Verify and reset Output C**

The default program sets Output C (Terminal 8) as a verification and reset output. Refer to *Output Parameters* and *Point Assignments* in the control panel *Program Entry Guide* for instructions on programming verification and resetting outputs and points.

Performing a sensor reset at a keypad produces a five-second activation of verification and reset outputs. The control panel ignores verification and resettable points during the five seconds.

## 5.5

### **USB power**

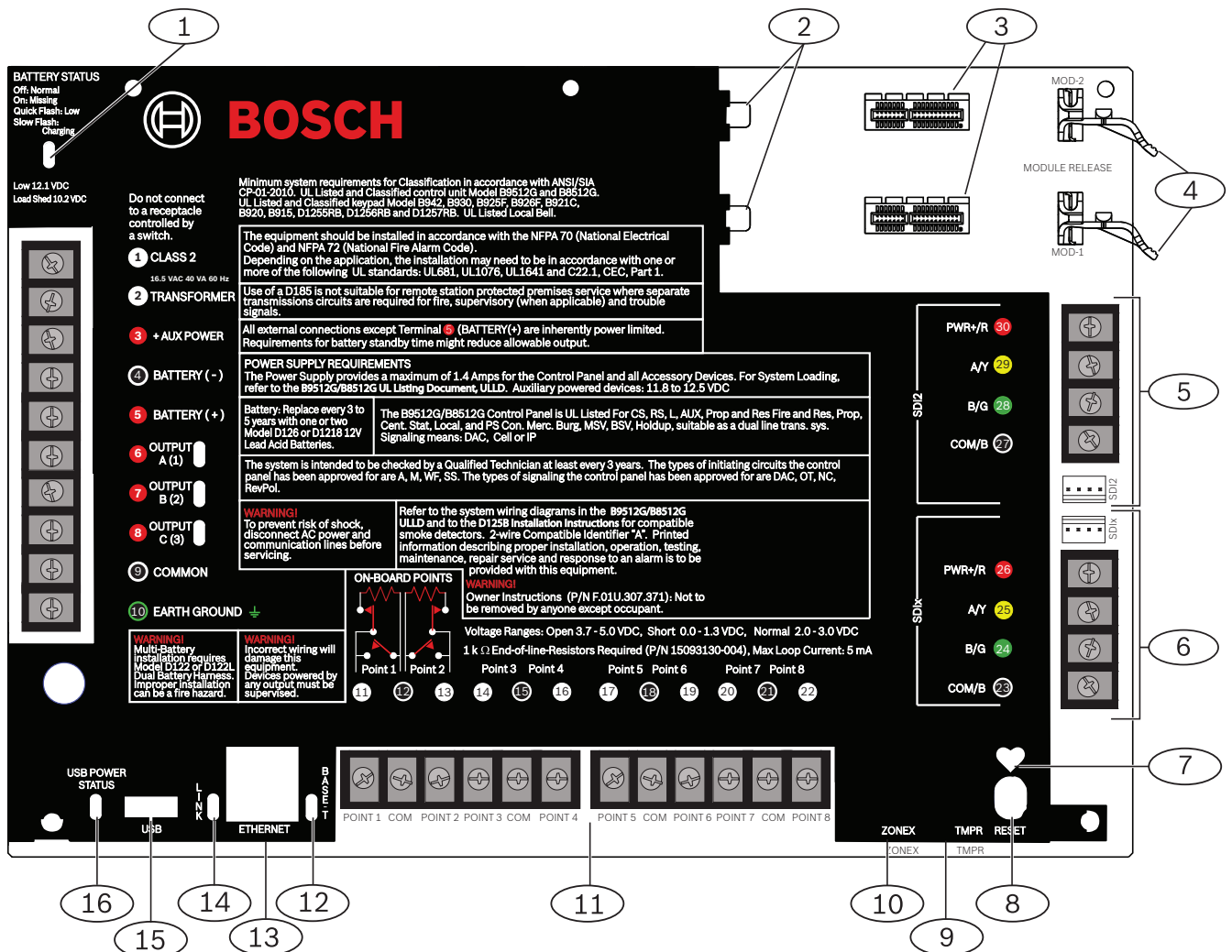


In addition to connecting RPS to the control panel for programming, you can use the USB port on the control panel to power USB-powered devices.

When enabled, the USB port provides 500 mA of 5 V power, which it draws from the control panel. Ensure that there is enough power for all the powered devices you want to connect to the system.

Enable USB power by pressing the control panel RESET button 3 times, or using the keypad Installer menu (refer to [7] USB Power). The USB POWER STATUS LED lights when power to the USB is turned on. Press the control panel RESET button 3 times to turn power off, if desired.

## 6 Control panel board overview



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## 7 System wiring diagrams

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**Notice!**

For UL Certificated accounts, add additional power using only a UL Listed 12.0 VDC regulated, power-limited power supply such as the B520 Auxiliary Power Supply Module. All terminals except Outputs A (1), B (2), and C (3) (Terminals 6, 7, and 8) are supervised. For proper supervision, do not loop wire under terminals. Break the wire run to provide supervision of connections.

---



## 7.1 Power supply side wiring

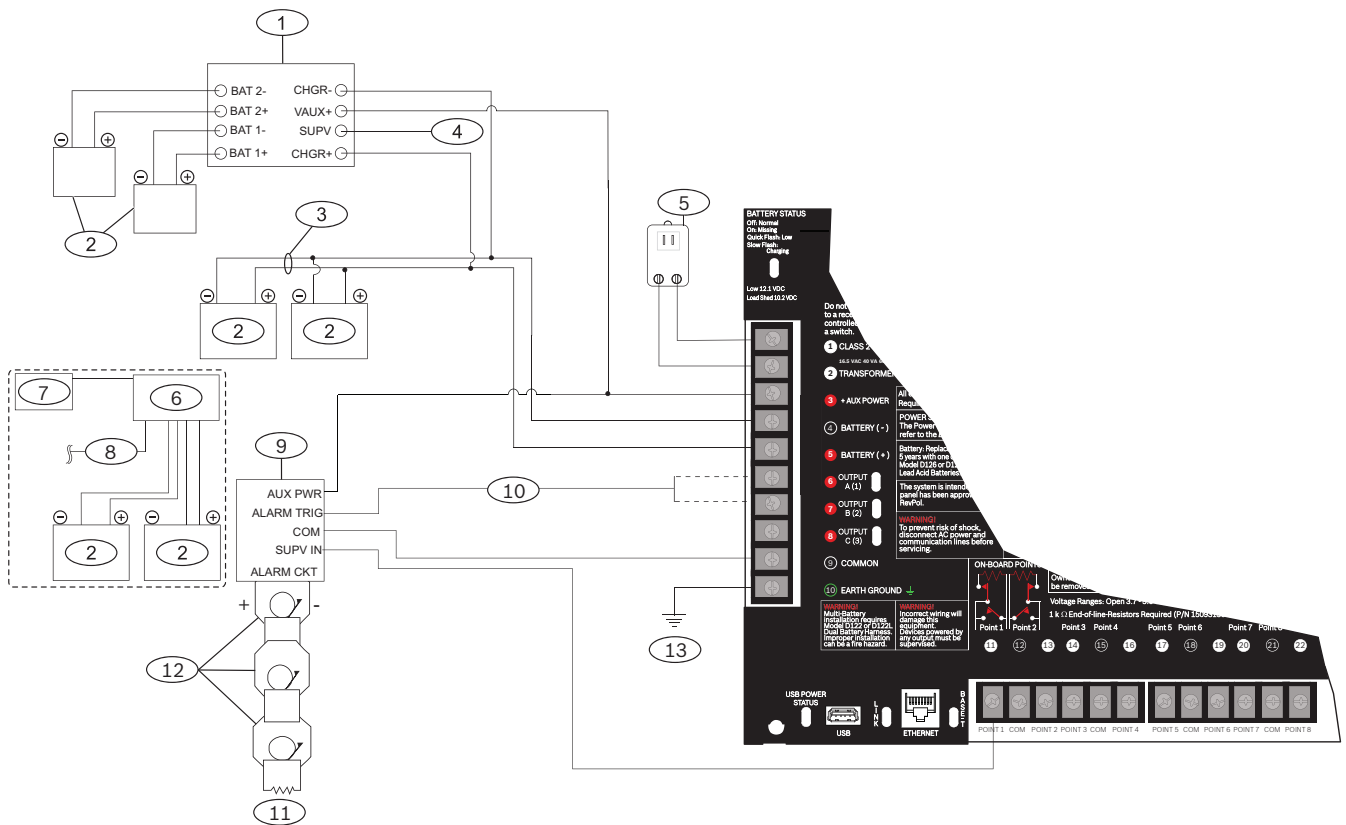


Figure 7.1: Power supply side wiring

Callout — Description	Callout — Description
1 — D113 Battery Lead Supervision Module, if required by local AHJ	8 — To control panel SDI2 wiring
2 — Batteries	9 — D192G Bell Supervision Module
3 — D122/D122L Dual Battery Harness, as required	10 — To OUTPUT A (1) or OUTPUT B (2)
4 — To supervision point	11 — 560 Ω, 2 W EOL resistor (P/N: 15-03130-005)
5 — D1640 Transformer	12 — Listed audible signaling devices rated at 12.0 VDC nominal (do not use vibrating type horns)
6 — B520 Auxiliary Power Supply Module	13 — To earth ground
7 — To powered devices	

7.2 Input points wiring with D125B, D130, or D129

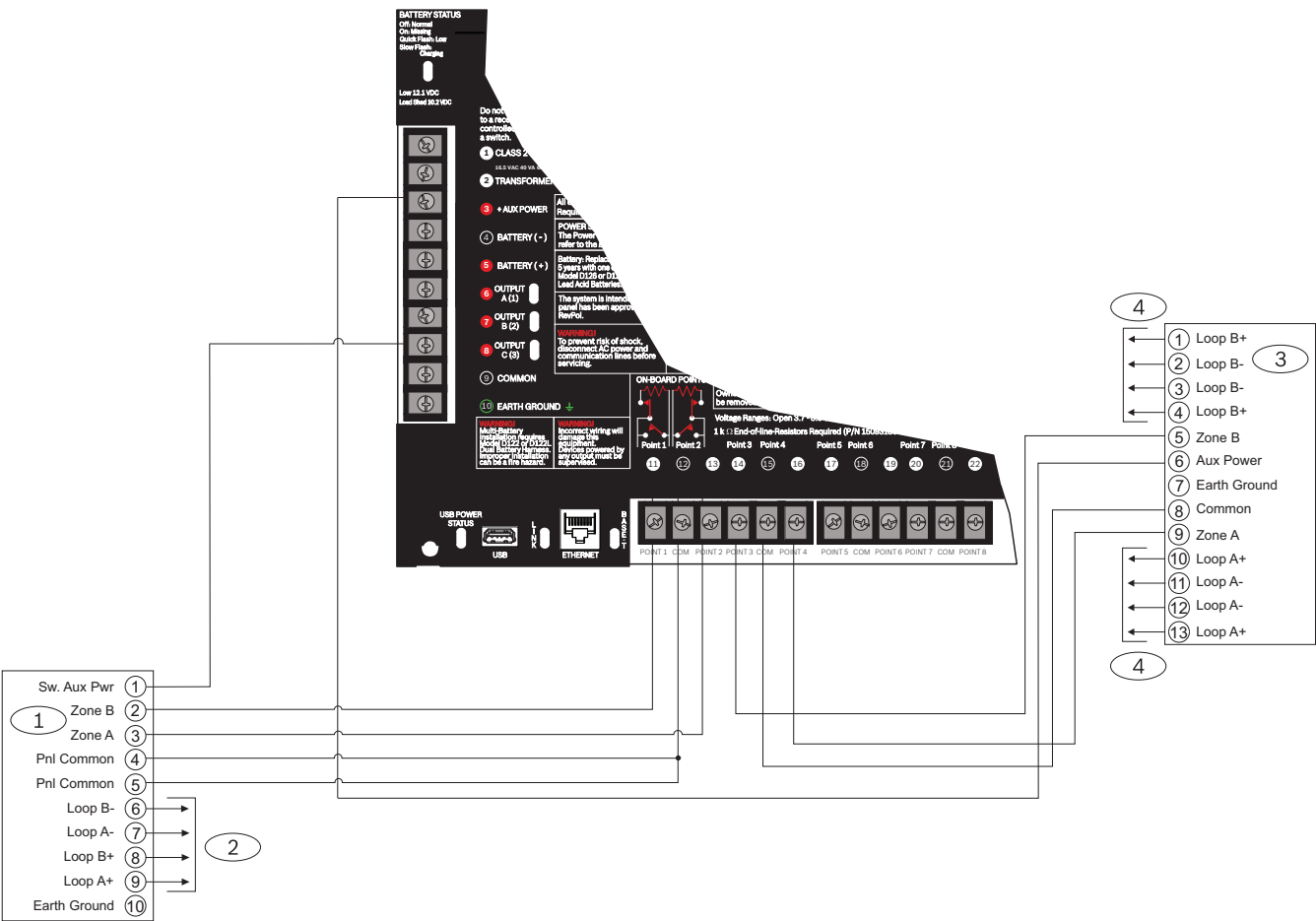


Figure 7.2: Input wiring with a D125B and a D129

Callout — Description
1 — D125B Dual Class B Initiating Module
2 — To compatible UL listed two-wire smoke detectors. Refer to the <i>D125B Installation Instructions</i> for a listing of compatible two-wire smoke detectors.
3 — D129 Dual Class A Initiation Circuit Module
4 — For wiring instructions, refer to the <i>D129 Dual Class A Initiation Circuit Module Installation Instructions</i> .

Notice!



Use zero retard except for waterflow devices.

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

Optionally, 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* for correct wiring requirements.

## 7.3 Input points wiring with or without EOL resistors



### Notice!

For the dual EOL resistor circuit style order ICP-1K22AWG-10, package of 10 1.0 k $\Omega$  EOL resistors.

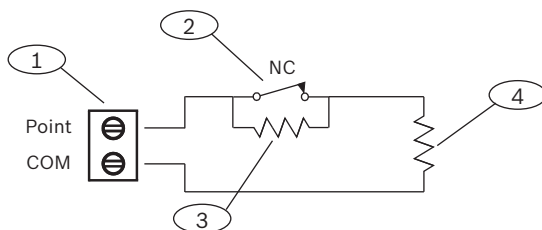


Figure 7.3: Input wiring with dual EOL resistors

### Callout - Description

- |  |
|--|
| 1 - Point sensor loop terminals                  |
| 2 - Normally closed device (contact)             |
| 3 - 1.0 k $\Omega$ resistor at device            |
| 4 - 1.0 k $\Omega$ resistor at EOL (end-of-line) |

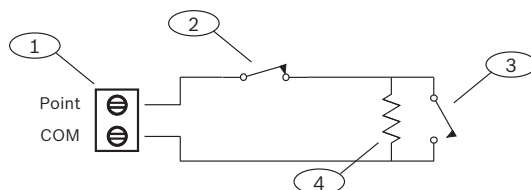


Figure 7.4: Single EOL (NC or NO)

### Callout - Description

- |  |
|--|
| 1 - Point sensor loop terminals  |
| 2 - Normally closed device (contact)                                   |
| 3 - Normally open device (contact)                                     |
| 4 - EOL Resistor – 1.0 k $\Omega$ (2.0 k $\Omega$ and No EOL optional) |



### Notice!

The No EOL option does not support the use of NO and NC contacts simultaneously.

## 7.4 SDI and ZONEX wiring



### Notice!

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

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

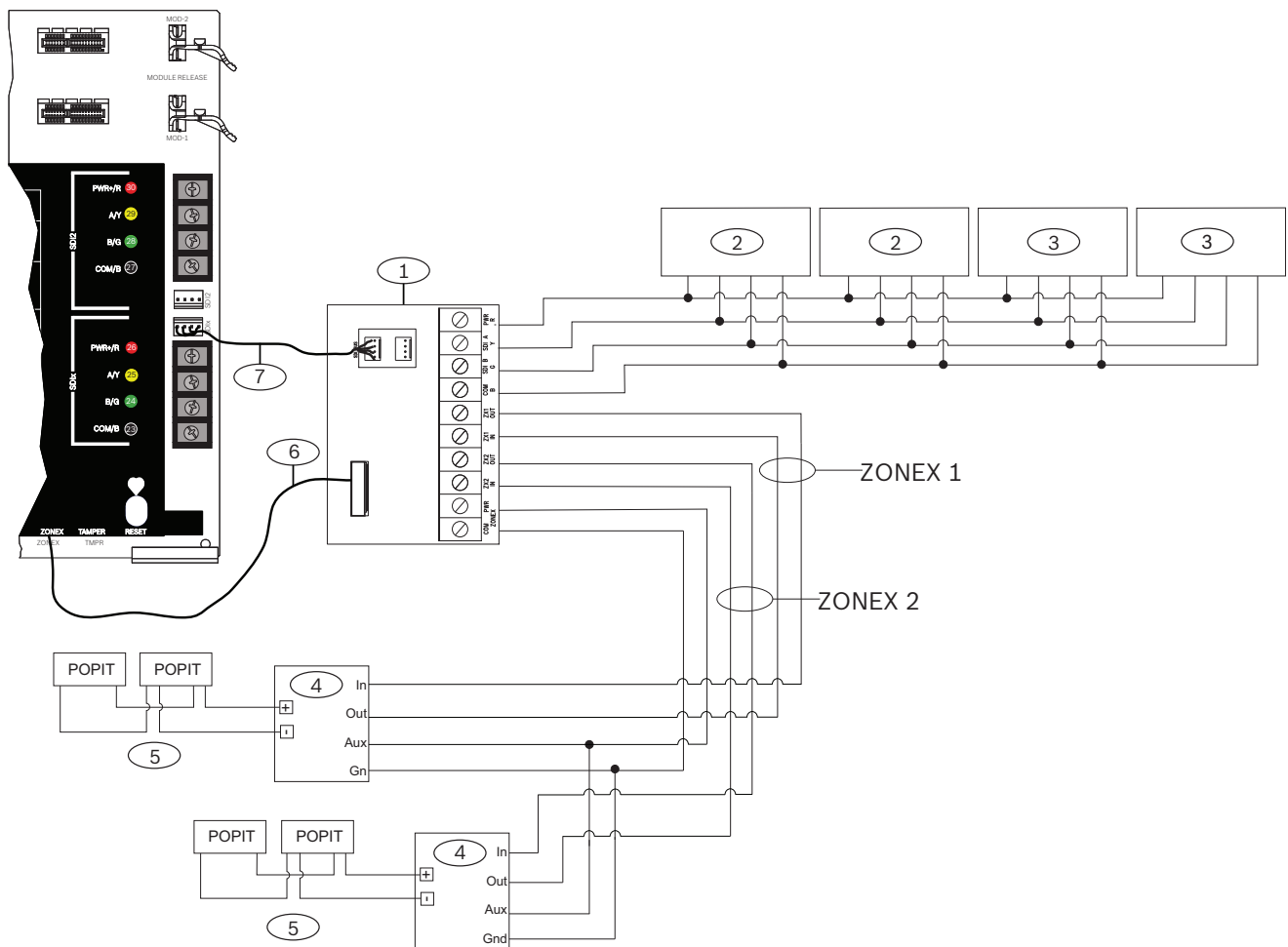


Figure 7.5: SDI and ZONEX wiring

Callout — Description	Callout — Description
1 — B600	5 — Up to 119 D9127U/T POPITs
2 — SDI keypads when configuring SDIx for SDI (refer to System power/size)	6 — ZONEX connection cable (P/N: F01U295103) (included)
3 — Up to 8 D9210C Access Control Interface Modules	7 — Interconnect cable (P/N: F01U079745) (included)
4 — D8125 POPEX Modules	
*The number of D8129 Octo-relay modules allowed for each ZONEX terminal on the B600 is limited by the number of D8128D OctoPOPITs connected to the same terminal. Refer to the <i>D8128D Installation Guide</i> (P/N: F01U070537) or the <i>D8129 Operation and Installation Guide</i> (P/N: F01U036302) for specific information.	

## 7.5 SDI2 devices general system wiring

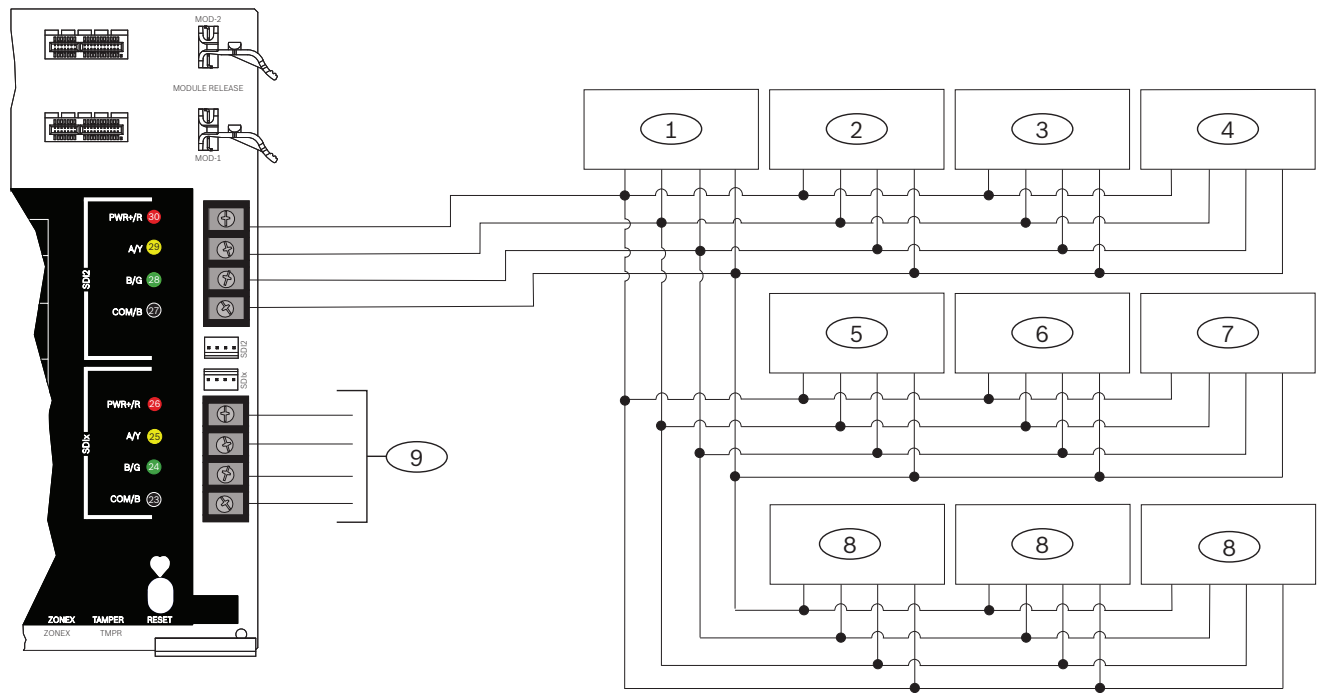


Figure 7.6: SDI2 devices system wiring

Callout — Description	B9512G/B9512G-E Capacity	B8512G/B8512G-E Capacity
1 — B208 Octo-input Modules	59	9
2 — B299 POPEX Module	6	1
3 — B308 Octo-output Modules	59	9
4 — B426 Conettix Ethernet Communication Modules or B450 Conettix Plug-in Communicator Interfaces	2	2
5 — B520 Auxiliary Power Supply Modules	8	4
6 — B810 wireless receivers or B820 SDI2 Inovonics Interface Modules	1	1
7 — B901 Access Control Modules	32	8
8 — SDI2 keypads	32	16
9 — Configurable for SDI keypads and access control interface modules, or SDI2 devices		



### Notice!

Each SDI2 bus supports up to 99 devices.

The SDI2 power terminal (PWR+/R) is power limited. The SDI2 terminals are supervised.

7.5.1 SDI2 bus wiring recommendations

Use the following SDI2 bus wiring recommendations for SDI2 installation. The control panel and SDI2 modules use the SDI2 bus to communicate with one another.

You can wire modules via home run, daisy chain, or single level T-tap anywhere on the SDI2 bus.

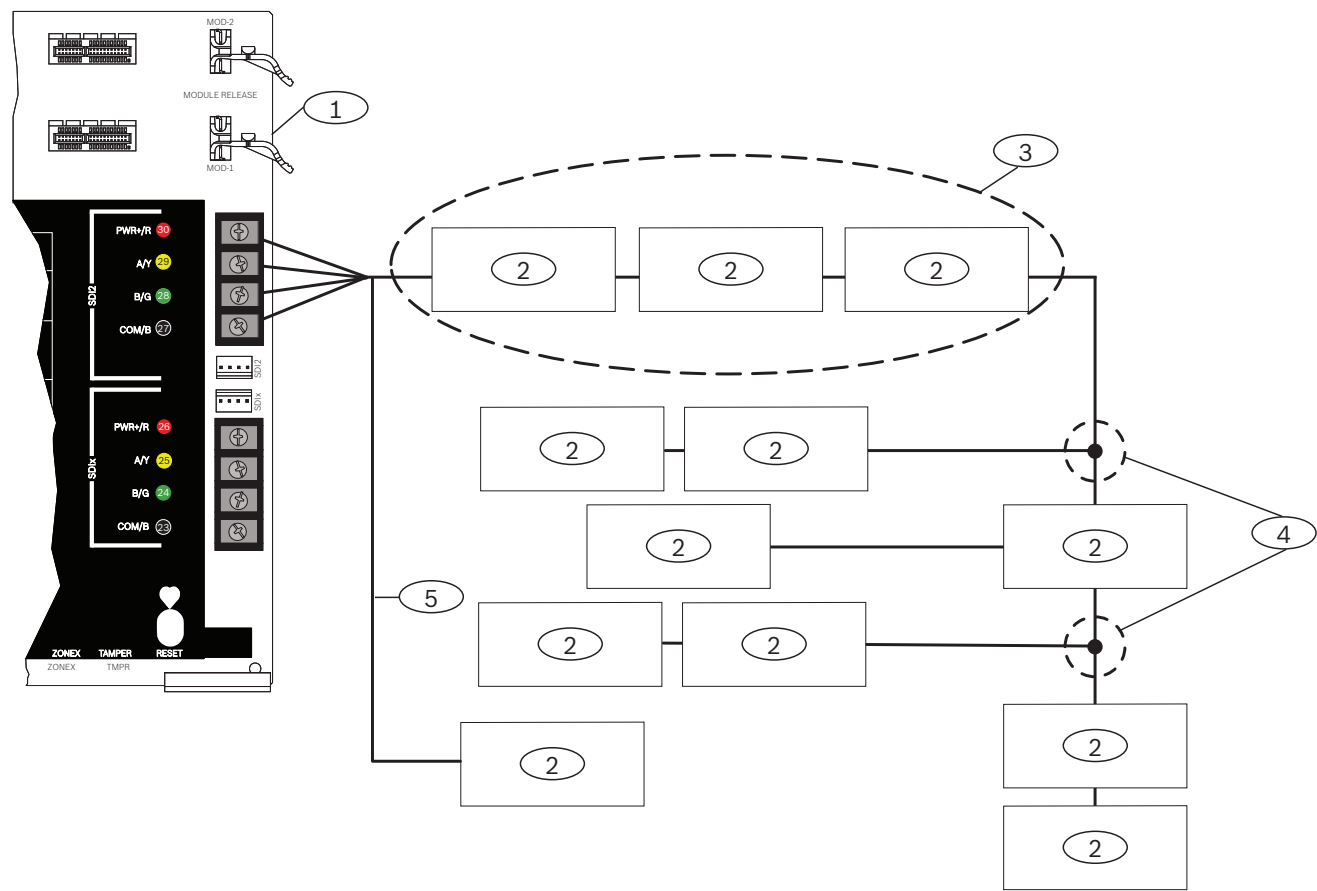


Figure 7.7: SDI2\_Wiring\_Recommendations

Callout — Description
1 — Control panel
2 — SDI2 device (module or keypad)
3 — Daisy chain wiring
4 — Single-level T-tapped wiring
5 — Home run wiring



**Notice!**

There can only be a difference of 2 volts (maximum) between the AUX power terminals of the control panel or power supply and the device for the modules and keypads to work properly under all conditions.

**Maximum cable lengths**

Follow these rules when wiring the SDI2 bus:

- The SDI2 bus requires the use of **unshielded** cable from 12 AWG to 22 AWG.
- Refer to the SDI2 device or keypad documentation for the allowable maximum distance from the control panel.
- Maximum overall cable lengths are listed in the following table:

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

**Table 7.1: Maximum cable length**

**Notice!**

Use unshielded cable only.

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





## 8 B925F Fire Keypad operating instructions

This keypad is a full-function system controller and annunciator. The illuminated keypad has a display and a sounder that emits distinct condition tones to alert you to fire alarm, fire trouble, or fire supervisory events as they occur. In conjunction with the display and sounder, seven status indicators provide the following system status information as described below.

Required: Mount this document in view of the fire keypad.

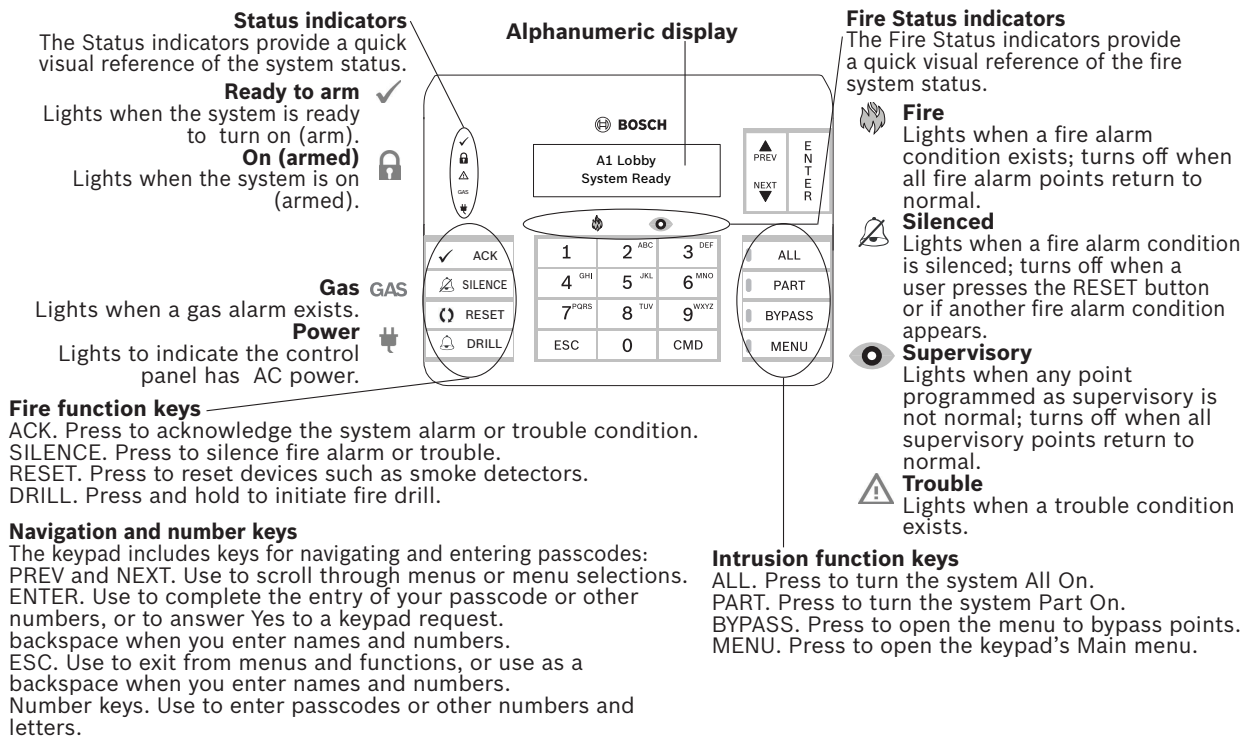
### Local Service Representative

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

### Overview



### Operation

#### Normal operation

When in normal operation and off (disarmed), the keypad shows programmed idle text, such as \*Fire System\*, or System Ready.

#### Fire Alarm operation

When a fire alarm occurs, the Fire indicator lights, and the keypad emits a pulsing high-pitched fire tone (\_\_\_\_\_\_). The tone sounds for the duration set by your security company. The keypad shows the first point that entered alarm and its area. Press ACK to acknowledge the alarm. The keypad shows the next point in alarm, if applicable. Press SILENCE to silence the alarm.

#### Fire Trouble operation

When a trouble condition occurs (such as wiring for a point is cut or AC power fails), the keypad sounder activates briefly approximately every six seconds. The Trouble indicator lights and the keypad shows the highest priority trouble. Press ACK to acknowledge the trouble. To view and acknowledge additional system or point troubles, press NEXT repeatedly.

#### Fire Supervisory operation

When a supervisory condition occurs, the sounder activates briefly approximately every six seconds. The Supervisory indicator lights and the keypad shows a fire supervisory message. Press ACK to acknowledge the supervisory condition. To view and acknowledge point supervisory conditions, press NEXT repeatedly.

#### Silence and reset

Alarm or Trouble silence. Press SILENCE and enter your passcode.

Detector reset. Press RESET and enter your passcode (if required). You can also use [CMD][4][7], or the Menu to reset detectors.

## 9 B926F Fire Keypad operating instructions

This keypad is a full-function system controller and annunciator. The illuminated keypad has a display and a sounder that emits distinct condition tones to alert you to fire alarm, fire trouble, or fire supervisory events as they occur. In conjunction with the display and sounder, seven status indicators provide the following system status information as described below.

Required: Mount this document in view of the fire keypad.

### Local Service Representative

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

### Overview

**Status indicators**  
The Status indicators provide a quick visual reference of the system status.

**Ready to arm** ✓  
Lights when the system is ready to turn on (arm).

**On (armed)** 🔒  
Lights when the system is on (armed).

**Gas** GAS  
Lights when a gas alarm exists.

**Power** ⚡  
Lights to indicate the control panel has AC power.

**Alphanumeric display**

**Fire Status indicators**  
The Fire Status indicators provide a quick visual reference of the fire system status.

**Fire** 🔥  
Lights when a fire alarm condition exists; turns off when all fire alarm points return to normal.

**Silenced** 🔔  
Lights when a fire alarm condition is silenced; turns off when a user presses the RESET button or if another fire alarm condition appears.

**Supervisory** 👁️  
Lights when any point programmed as supervisory is not normal; turns off when all supervisory points return to normal.

**Trouble** ⚠️  
Lights when a trouble condition exists.

**Fire function keys**  
 ACK. Press to acknowledge the system alarm or trouble condition.  
 SILENCE. Press to silence fire alarm or trouble.  
 RESET. Press to reset devices such as smoke detectors.  
 DRILL. Press and hold to initiate fire drill.

**Navigation and number keys**  
 The keypad includes keys for navigating and entering passcodes:  
 PREV and NEXT. Use to scroll through menus or menu selections.  
 ENTER. Use to complete the entry of your passcode or other numbers, or to answer Yes to a keypad request.  
 backspace when you enter names and numbers.  
 ESC. Use to exit from menus and functions, or use as a backspace when you enter names and numbers.  
 Number keys. Use to enter passcodes or other numbers and letters.

### Operation

#### Normal operation

When in normal operation and off (disarmed), the keypad shows programmed idle text, such as \*Fire System\*, or System Ready.

#### Fire Alarm operation

When a fire alarm occurs, the Fire indicator lights, and the keypad emits a pulsing high-pitched fire tone (\_\_\_\_\_\_). The tone sounds for the duration set by your security company. The keypad shows the first point that entered alarm and its area. Press ACK to acknowledge the alarm. The keypad shows the next point in alarm, if applicable. Press SILENCE to silence the alarm.

#### Fire Trouble operation

When a trouble condition occurs (such as wiring for a point is cut or AC power fails), the keypad sounder activates briefly approximately every six seconds. The Trouble indicator lights and the keypad shows the highest priority trouble. Press ACK to acknowledge the trouble. To view and acknowledge additional system or point troubles, press NEXT repeatedly.

#### Fire Supervisory operation

When a supervisory condition occurs, the sounder activates briefly approximately every six seconds. The Supervisory indicator lights and the keypad shows a fire supervisory message. Press ACK to acknowledge the supervisory condition. To view and acknowledge point supervisory conditions, press NEXT repeatedly.

#### Silence and reset

Alarm or Trouble silence. Press SILENCE and enter your passcode.  
 Detector reset. Press RESET and enter your passcode (if required). You can also use [CMD][4][7], or the Menu to reset detectors.

## 10 D1255RB operating instructions

This keypad is a system controller and annunciator. The illuminated keypad has a 16-character vacuum fluorescent display (VFD) and a sounder that emits distinct condition tones to alert you to fire alarm, fire trouble, or fire supervisory events as they occur. In conjunction with the VFD and the sounder, four status LEDs provide the following system status indications: Fire, Silenced, Supervisory, and Trouble.

Required: Mount this document in view of the fire keypad.

### Local Service Representative

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

### Overview

#### Status indicators

The Status indicators provide a quick visual reference of the system status.

**Fire:** Lights when a fire alarm condition exists; turns off when all fire alarm points return to normal.

**Silenced:** Lights after a fire alarm is silenced; turns off when a PIN and ESC is entered. This clears the alarm or trouble memory from the keypad display, when all points are in a normal state.

**Supervisory:** Lights when any point programmed as supervisory is not normal; turns off when all supervisory points return to normal.

**Trouble:** Lights when any system trouble or point trouble exists; turns off when the system and all points return to normal.

#### Alphanumeric display

#### Built-in sounder

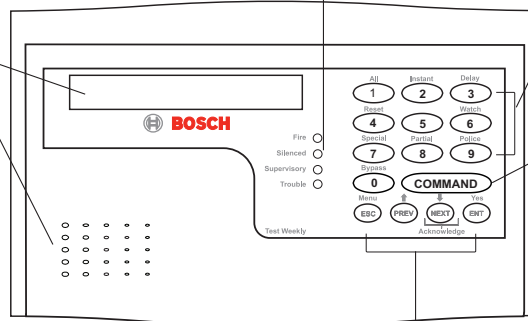
The built-in sounder emits the following warning tones:

**Fire signal:** pulsed, high-pitched bell tone during fire alarm.

**Trouble signal:** two-tone warble during a trouble event.

**Invalid key buzz:** buzz tone when invalid key is pressed.

**Keypad encoding tone:** muted beep tone as each key is pressed.



#### Number keys

Use one or two in combination with the COMMAND bar to perform a function, or use to enter a PIN before pressing the ENT key.

#### COMMAND bar

Use in combination with one or two numeric keys to perform a function.

#### Navigation keys

Use ESC/Menu to enter the command menu, to complete a command entry, or to return to idle text.

Use PREV to return to the previously viewed menu item.

Use NEXT/Acknowledge to acknowledge an alarm or off-normal condition, or to move to the next menu item.

Use ENT/Yes to complete a PIN entry, or to select a menu item.

### Operation

#### Normal operation

When the system is operating normally and is disarmed, the display shows the programmed idle text. The default system normal message is \* FIRE SYSTEM \*.

#### Fire Alarm operation

When an alarm occurs, the Fire LED activates, and the keypad emits a pulsing high-pitched fire tone. The tone sounds for a pre-programmed length of time. A display message appears that describes the first point that entered an alarm. Press the NEXT key to acknowledge the alarm. To view and acknowledge additional points that are in alarm, press NEXT repeatedly. The display shows Ax ## FIRE ALARM (x = the area number; ## = the number of fire alarms in Area x).

#### Fire Trouble operation

When a trouble condition occurs (such as wiring for a point is cut, AC power fails, and so on), the keypad sounder activates briefly approximately every six seconds. The Trouble LED illuminates and Ax ## FIRE TRBL or the highest priority system trouble appears in the display. Press the NEXT key to acknowledge the trouble. To view and acknowledge additional system or point troubles, press NEXT repeatedly.

#### Fire Supervisory operation

**Fire Supervisory Operation.** When a supervisory condition occurs, the sounder activates briefly approximately every six seconds. The Supervisory LED illuminates and Ax ## FIRE SUPV appears in the display. Press the NEXT key to acknowledge the supervisory condition. To view and acknowledge point supervisory conditions, press NEXT repeatedly.

#### Silence and reset

**Alarm silence.** Enter PIN (if required) and press ENT.

**Trouble silence.** Press the COMMAND bar and select 4.

**Detector reset.** Press the COMMAND bar and select 4 + 7.

**Annunciating reset.** Enter PIN (if required) and press ESC. This clears alarm or trouble memory from the keypad display, when all points are in a normal state.

# 11 D1256RB operating instructions

This keypad is a system controller and annunciator. The illuminated keypad has a 16-character vacuum fluorescent display (VFD) and a sounder that emits distinct condition tones to alert you to fire alarm, fire trouble, or fire supervisory events as they occur. In conjunction with the VFD and the sounder, four status LEDs provide the following system status indications: Fire, Silenced, Supervisory, and Trouble.

Required: Mount this document in view of the fire keypad.

## Local Service Representative

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone \_\_\_\_\_

## Overview

### Status indicators

The Status indicators provide a quick visual reference of the system status.

**Fire:** Lights when a fire alarm condition exists; turns off when all fire alarm points return to normal.

**Silenced:** Lights after a fire alarm is silenced; turns off when a PIN and ESC is entered. This clears the alarm or trouble memory from the keypad display, when all points are in a normal state.

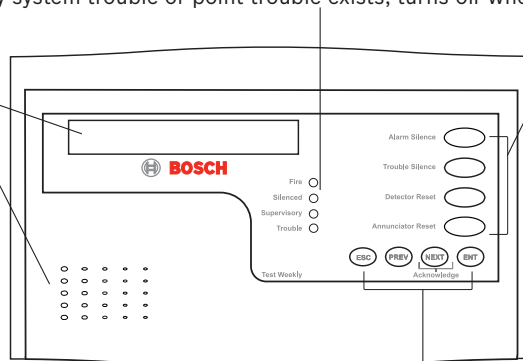
**Supervisory:** Lights when any point programmed as supervisory is not normal; turns off when all supervisory points return to normal.

**Trouble:** Lights when any system trouble or point trouble exists; turns off when the system and all points return to normal.

### Alphanumeric display

### Built-in sounder

The built-in sounder emits the following warning tones:  
**Fire signal.** Pulsed, high-pitched bell tone during fire alarm.  
**Trouble signal.** Two-tone warble during a trouble event.  
**Invalid key buzz.** Buzz tone when invalid key is pressed.  
**Keypad encoding tone.** Muted beep tone as each key is pressed.



### Function keys

Use one or two in combination with the COMMAND bar to perform a function, or use to enter a PIN before pressing the ENT key.

### Navigation keys

Use ESC/Menu to enter the command menu, to complete a command entry, or to return to idle text.

Use PREV to return to the previously viewed menu item.

Use NEXT/Acknowledge to acknowledge an alarm or off-normal condition, or to move to the next menu item.

Use ENT to complete a PIN entry, or to select a menu item.

## Operation

### Normal operation

When the system is operating normally and is disarmed, the display shows the programmed idle text. The default system normal message is \* FIRE SYSTEM \*.

### Fire Alarm operation

When an alarm occurs, the Fire LED activates, and the keypad emits a pulsing high-pitched fire tone. The tone sounds for a pre-programmed length of time. A display message appears that describes the first point that entered an alarm. Press the NEXT key to acknowledge the alarm. To view and acknowledge additional points that are in alarm, press NEXT repeatedly. The display shows Ax ## FIRE ALARM (x = the area number; ## = the number of fire alarms in Area x).

### Fire Trouble operation

When a trouble condition occurs (such as wiring for a point is cut, AC power fails, and so on), the keypad sounder activates briefly approximately every six seconds. The Trouble LED illuminates and Ax ## FIRE TRBL or the highest priority system trouble appears in the display. Press the NEXT key to acknowledge the trouble. To view and acknowledge additional system or point troubles, press NEXT repeatedly.

### Fire Supervisory operation

**Fire Supervisory Operation.** When a supervisory condition occurs, the sounder activates briefly approximately every six seconds. The Supervisory LED illuminates and Ax ## FIRE SUPV appears in the display. Press the NEXT key to acknowledge the supervisory condition. To view and acknowledge point supervisory conditions, press NEXT repeatedly.

### Silence and reset

**Alarm silence.** Press the Alarm Silence key to silence a fire alarm.

**Trouble silence.** Press the Trouble Silence key to silence a fire trouble.

**Detector reset.** Press the Detector Reset key to reset detection devices.

**Annunciating reset.** Press the Annunciator Reset key to clear all alarm, trouble, and supervisory messages when all points are in a normal state.

## 12 Specifications

### Control panel power supply specifications

Voltage input (power supply)	Primary	Terminals 1 and 2	16.5 VAC 40 VA class 2 plug-in transformer (D1640)
	Secondary	Terminals 4 and 5	Use 12 VDC sealed lead-acid rechargeable battery (7 Ah, 18 Ah, or 38 Ah). The control panel supports up to 38 Ah of battery. If you use two batteries, they must have the same capacity and you must connect them using the D122/D122L Dual Battery Harness.
Current requirements	Control Panel: Idle 190 mA; Alarm 265 mA Refer to the <i>Current Rating Chart for Standby Battery Calculations</i> section in the <i>Control Panels (B9512G/B8512G) Installation and System Reference Guide</i> for the current draw requirements of other system components.		
Power outputs <sup>2</sup>	All external connections are power-limited except battery terminals.		
	Continuous Power Outputs	1.4 A maximum at 12.0 VDC nominal (continuous supply) total for all devices and outputs including the ZONEX connection, the plug-in module connector, and Terminals 3, 26, and 30.	
	Alarm Power Output	2.0 A maximum (1.4 A max for commercial fire) at 12.0 VDC nominal output for all devices and outputs including the ZONEX connection, the plug-in module connector, and Terminals 3, 6, 7, 26, and 30. Output can be steady or one of three pulsed patterns depending on programming. Refer to <i>Relays</i> 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 <i>Relays</i> in <i>RPS Help</i> or the <i>Control Panels (B9512G/B8512G) Program Entry Guide</i> .
	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 an external power supply <sup>1</sup> (such as B520).	
<sup>1</sup> Requires a UL Listed power supply.			
<sup>2</sup> For UL 864 applications, refer to US1B Llt differences compatible devices.			
Minimum operating voltage	10.2 VDC		
SDI bus	SDI bus A: SDI bus B:	9 VDC 4572 m (15000 ft) maximum 9 VDC 4572 m (15000 ft) maximum	
SDI2 bus	SDI2 bus A: SDI2 bus B:	12 VDC nominal (7500 ft) maximum <sup>2</sup> 12 VDC nominal (7500 ft) maximum <sup>2</sup>	

Network	Built-in 10/100 Ethernet LAN (RJ-45 connector)		
USB	USB 2.0 full speed		
Environmental	Temperature:	0°C to +49°C (+32°F to +120°F)	
	Relative Humidity:	Maximum 93% non-condensing	
Arming stations	B942/B942W keypads, B930 keypads, B926F Fire keypads, B925F Fire keypads, B921C keypads, B920, B915/B915I, D1260 keypads, D1257/D1257RB Fire Alarm Annunciators, D1256/D1256RB, D1255/D1255R/D1255RB keypads, Keyswitch		
Point thresholds (Single EOL resistor circuit style) On-board points 1 to 8	With 1.0 kΩ resistors	Open - 3.7 to 5.0 VDC Normal - 2.0 to 3.0 VDC Short - 0.0 to 1.3 VDC Short circuit current - 5 mA	
	With 2.0 kΩ resistors	Open - 4.1 to 5.0 VDC Normal – 3.0 to 4.1 VDC Short - 0.0 to 3.0 VDC Short circuit current - 5 mA	
	No EOL	Open - 2.6 to 5.0 VDC Short - 0.0 to 2.4 VDC Short circuit current - 5 mA	
Point thresholds (Dual EOL on-board points)	Dual EOL (1.0 kΩ + 1.0 kΩ)	Short - 0 to 1.67 VDC Open - 4.12 to 4.95 VDC Normal - 1.69 to 2.94 VDC Fault - 2.95 to 4.10 VDC Short circuit current - 5 mA	
Compatible enclosures	B8103 Universal Enclosure, D8103 Universal Enclosure, D8109 Fire Enclosure, D8108A Attack Resistant Enclosure, BATB-40 and BATB-80 Battery Boxes.		
Battery discharge/ recharge schedule	Discharge Cycle	13.30 VDC 12.1 VDC  10.2 VDC 10.2 VDC	BATTERY STATUS LED slow flash. Low Battery Report, if programmed. BATTERY STATUS LED quick flash. Minimum operational voltage. Battery load shed.
	Recharge Cycle	AC ON 12.50 VDC (under load) 13.4 VDC and charging current < 200 mA	Load shed relay resets, battery charging begins. Battery Restoral Report sent, BATTERY STATUS LED off. Battery float charged. BATTERY STATUS LED off.

## 12.1 Wire requirements

Terminal label	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 control panel.
5	BATTERY +	
6	Output A (1)	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on current
7	Output B (2)	
8	Output C (3)	
9	COMMON	
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 $\Omega$
12	POINT 1/2 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
13	POINT 2	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
14	POINT 3	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
15	POINT 3/4 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
16	POINT 4	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
17	POINT 5	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
18	POINT 5/6 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
19	POINT 6	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
20	POINT 7	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
21	POINT 7/8 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
22	POINT 8	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on loop resistance less than 100 $\Omega$
ZONEX	ZONEX	Bosch supplied wire, included with the optional B600
23	SDIx COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current
24	SDIx DATA BUS B	22 AWG min (up to 14 AWG max)
25	SDIx DATA BUS A	



26	SDIx POWER	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current
27	SDI2 COMMON	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current
28	SDI2 DATA BUS B	22 AWG min (up to 14 AWG max)
29	SDI2 DATA BUS A	
30	SDI2 POWER	Terminal accommodates 14 to 22 AWG, use appropriate wire size based on peripheral device current









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