FEDERAL SIGNAL
Safety and Security Systems

G-Series

Modular Platform Audible and Visual Product Family

850000454 Rev A2 0325

Limited Warranty: This product's limited warranty can be found at www.fedsig.com/SSG-Warranty.

WARNING - Failure to follow all safety precautions and instructions may result in property damage, serious injury, or death to you or others.

MESSAGES TO INSTALLERS AND USERS ⚠ People's lives depend on your safe installation of our products. It is important to follow all instructions shipped with the products. This device is to be installed by a trained electrician who is thoroughly familiar with the National Electric Code and will follow the NEC guidelines as well as local codes.

The selection of the mounting location for the device, its controls and routing of the wiring is to be accomplished under the direction of the Facilities Engineer and the Safety Engineer. Listed below are some other important safety instructions and precautions you should follow.

- Read and understand instructions before installing or operating equipment.
- Do not connect this unit to the system when power is on.
- All effective warning speakers produce loud sounds which may cause, in certain situations, permanent hearing loss. You should take appropriate precautions such as wearing hearing protection.
- After installation, test the sound system to ensure proper operation.
- All effective warning speakers produce loud sounds, which may cause, in certain situations, permanent hearing loss. The device should be installed far enough away from potential listeners to limit their exposure while still maintaining its effectiveness.
- The OSHA Code of Federal Regulations 1910.95 Noise Standard provides guidelines which may be used regarding permissible noise exposure levels.
- Show these instructions to your Safety Engineer and then file them in a safe place and refer to them when maintaining and/or reinstalling the unit.
- After installation and completion of initial system test, a program of periodic testing of this device must be established. Refer to NFPA 72G, local Fire Codes and the authority having jurisdiction for this information.
- Consult the authority having jurisdiction in your area regarding the proper use and installation of this product.

SHOCK HAZARD - To avoid electrical shock hazards, do not connect wires when power is applied.

Scope

This document is intended to be used by internal technical support, sales personnel, and outside design and engineering resources responsible for the planning of future G-Series product installations. It documents what feature options are available for various product configurations, and details field wire termination for various applications. This document is intended to supplement the instruction manuals for the various signals. (Reference the Applicable and/or Referenced Documents section for specific document identification.)

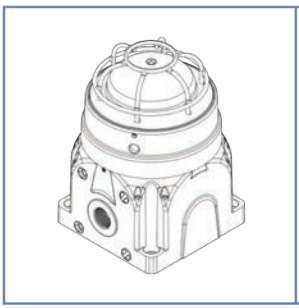
Applicable and/or Referenced Documents

The documents listed below pertain in some way to the design, construction, sourcing, testing, or performance of the G-Series Audible and Visual Product Family:

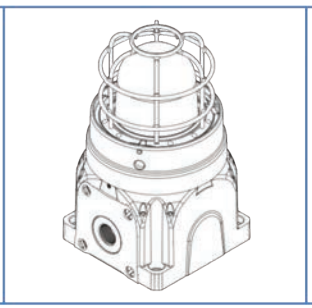
Instruction Manuals

- 25500186 Instruction Manual, G-Series LED (G-LED)
- 25500187 Instruction Manual, G-Series Sounder (G-SND)
- 25500188 Instruction Manual, G-Series Amplified Speaker (G-SPA)
- 25500189 Instruction Manual, G-Series Loudspeaker (G-SPK)
- 25500185 Instruction Manual, G-Series Strobe (G-STR)
- 25500259 Instruction Manual, G-Series Multi-Signal Fixtures, Accessories, and Service Parts

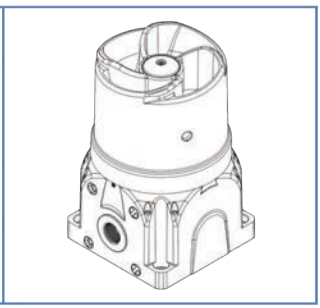
Overview - The G-Series Modular Platform is a highly versatile and rugged collection of effective and compact audible and visual signaling devices, constructed with non-metallic material and stainless steel hardware and accessories. Each product can be further customized with colored indicator rings (simulating a painted product), legend plates (for custom application labeling) and a variety of field termination and entry options. The can be surface mounted using the M6 holes in the base, or suspended from the mounting surface with a trunnion bracket and positioned to target a specific area. In addition, all G-Series devices can be combined together to form application-specific alerting modules, simplifying field wiring and increasing coherence of the over-all alarm and alerting system. Several combinations are available directly from the factory.



G-Series LED



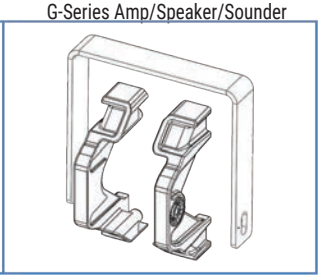
G-Series Strobe



G-Series Amp/Speaker/Sounder

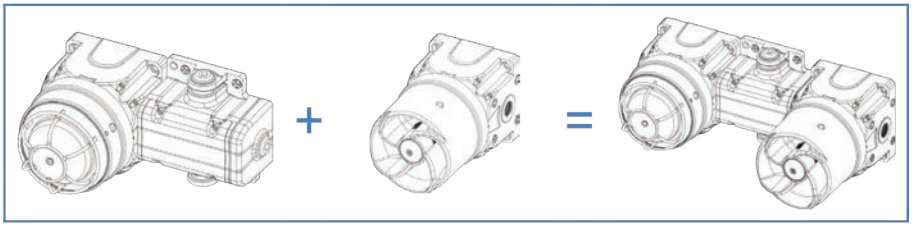
G-Series Indicator Ring

G-Series Legend Plate



G-Series Trunnion Mount

All G-Series Modular Platform products comes from the factory in three (3) standard enclosure varieties: "Ex d", "Ex de", and Dual "de d" units. The flameproof "Ex d" versions come standard with two (2) M20 entries for field cable gland connections. The increased safety "Ex de" versions include a separate terminal chamber for quick field termination, pass-through wiring, and accept three (3) M20 entries in a standard configuration. An optional flanged end cap for coupling an additional increased safety "Ex de" is also available. Two G-Series units can be combined into a Dual "de d" device. This assembly will accept two (2) M20 entries in a standard configuration. G-Series Dual "de d" devices are available only from the factory.



"Ex de" G-Series LED
(Increased Safety)

"Ex d" G-Series Sounder
(Flameproof)

G-Series Dual "de d"
Increased Safety Combination Unit

Audible Products

Amplified Loudspeaker

Feature Set

Multi-voltage input with loop-out terminal positions

- AC or DC (selection based on field termination location)
- 120 Vac or 230 Vac (selector switch)

Input audio terminals

- 0.8 V_{RMS} or 2.8 V_{RMS} input levels (jumper selectable)

Cable Entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

Installing and Wiring the Flameproof "Ex d" Housing

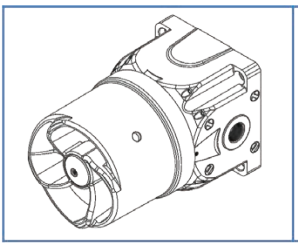


Figure 1
Amplified Loudspeaker 'd'

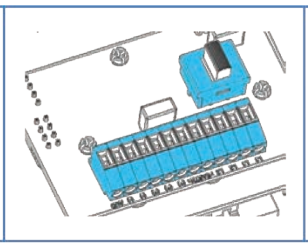


Figure 2
Terminal Block and AC Switch

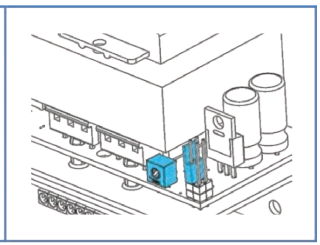


Figure 3
Volume and Input Level Jumper

	Connection	Locations	Description
1	L1	2	AC Power ("Hot/L1")
2	L2	2	AC Return ("Neutral/L2")
3	EARTH	2	Earth Ground Termination Point
4	(+)	3	DC Power ("+")
5	(-)	2	DC/Audio Return ("-")
6	AUD	1	Input Audio
		12	

SW1	Position	Description
1	120	Amplifier is configured to operate at 110 Vac-120 Vac
2	230	Amplifier is configured to operate at 220 Vac-240 Vac (Factory Set)

	JP1 Position	Description
1	0.8	Amplifier is configured to amplify standard line-level audio (0.8 V_{RMS})
2	2.8	Amplifier is configured to amplify ECHO product-level audio (2.8 V_{RMS})

Wiring the G-Series Amplified Loudspeaker "Ex de" terminal chamber for AC power requires five (5) conductors: three (3) for input power (with an earth conductor) and two (2) for input audio and return (twisted pair recommended). In DC products, the audio return and input power return can be commonized, which reduces the conductor requirement to four (4). The G-Series Amplified Loudspeaker setup and wiring within the "Ex de" terminal chamber is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

To change the AC input power

1. Locate the power configuration switch (SW1) on the connector PCBA.
2. Slide the switch to “120” for 120 Vac power, and “240” for 220-240 Vac

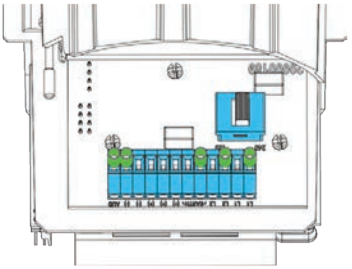


Figure 4
230 Vac Amplified Loudspeaker
Typical Field Wiring Locations

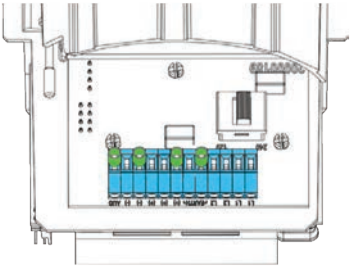


Figure 5
24 Vdc Amplified Loudspeaker
Typical Field Wiring Locations

The G-Series Amplified Loudspeaker includes a volume potentiometer (located on the transformer PCBA) that allows for field adjustment of the output level (see Ill 1-10 on page 10). While the G-Series Amplified Loudspeaker is shipped from the factory at full volume, field reduction of the output level might be required or desired in certain applications.

To adjust the sound output level:

1. Locate the volume potentiometer (VR1) on the connector PCBA (see Ill 1-3 on page 7)
2. Rotate the dial on the volume potentiometer counter-clockwise to reduce the volume (or clockwise to increase the volume).

While the G-Series Amplified Loudspeaker allows for loop-in and loop-out connections through the "Ex de" terminal chamber, loop-in and loop-out of the audio signal is not recommended. Wiring line-level audio connections in parallel over long distances degrades the quality and perceptibility of the audio signal.

If a nearby product requires AC or DC power loop-through, the G-Series Amplified Loudspeaker "Ex de" terminal chamber supports power loop-out field termination. As the "Ex de" terminal chamber provides three (3) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry, or that input cabling occupies two entries but only one entry is required for loop-out cabling, before architecting a loop-in/loop-out topology.

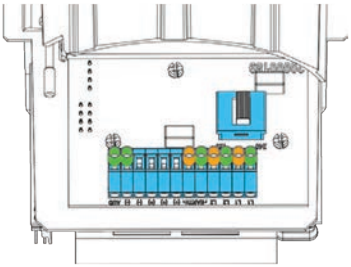


Figure 6
230 Vac Amplified Loudspeaker
Wiring with Power Loop-Out

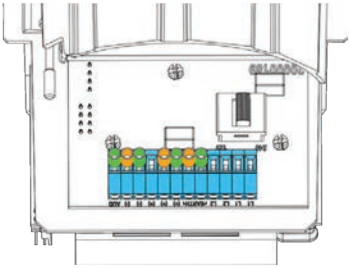


Figure 7
Vdc Amplified Loudspeaker
Wiring with Power Loop-Out

Installing and Wiring the Increased Safety "Ex de" Housing

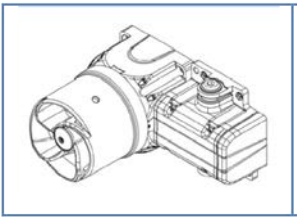


Figure 8
Ex de" Amplified Loudspeaker

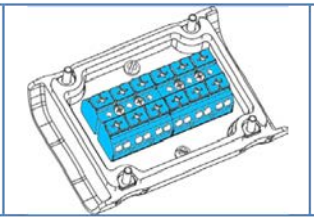


Figure 9
"Ex de" Terminal Block

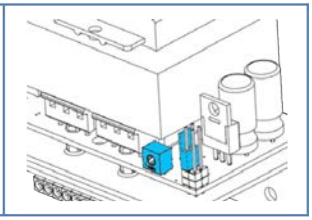


Figure 10
Volume and Input Level Jumper

	Connection	Locations	Description
1	L1	2	AC Power (“Hot/L1”)
2	L2	2	AC Return (“Neutral/L2”)
3	EARTH	2	Earth Ground Termination Point
4	(+)	3	DC Power (“+”)
5	(-)	2	DC/Audio Return (“-“)
6	AUD	1	Input Audio
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SW1	Position	Description
1	120	Amplifier is configured to operate at 110 Vac-120 Vac
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	JP1 Position	Description
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Wiring the G-Series Amplified Loudspeaker "Ex de" terminal chamber for AC power requires five (5) conductors: three (3) for input power (with an earth conductor) and two (2) for input audio and return (twisted pair recommended). In DC products, the audio return and input power return can be commonized, which reduces the conductor requirement to four (4). The G-Series Amplified Loudspeaker setup and wiring within the "Ex de" terminal chamber is configured at the factory to-order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

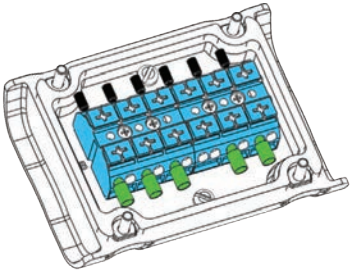


Figure 11F
Vac Dual-Unit with Amplified Loudspeaker (AL) Wiring Locations

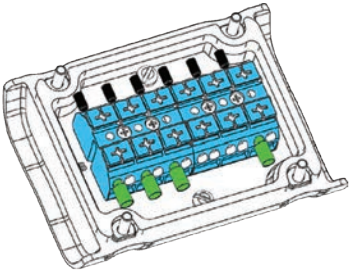


Figure 12
24 Vdc Dual-Unit with Amplified Loudspeaker (AL) Wiring Locations

The G-Series Amplified Loudspeaker includes a volume potentiometer (located on the transformer PCBA) that allows for field adjustment of the output level (see Ill 1-10 on page 10). While the G-Series Amplified Loudspeaker is shipped from the factory at full volume, field reduction of the output level might be required or desired in certain applications.

To adjust the sound output level:

1. Locate the volume potentiometer (VR1) on the connector PCBA (see Ill 1-3 on page 7)
2. Rotate the dial on the volume potentiometer counterclockwise to reduce the volume (or clockwise to increase the volume).

While the G-Series Amplified Loudspeaker allows for loop-in and loop-out connections through the "Ex de" terminal chamber, loop-in and loop-out of the audio signal is not recommended. Wiring line-level audio connections in parallel over long distances degrades the quality and perceptibility of the audio signal.

If a nearby product requires AC or DC power loop-through, the G-Series Amplified Loudspeaker "Ex de" terminal chamber supports power loop-out field termination. As the "Ex de" terminal chamber provides three (3) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry, or that input cabling occupies two entries but only one entry is required for loop-out cabling, before architecting a loop-in/loop-out topology.

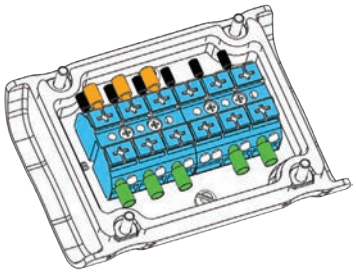


Figure 13230 Vac Amplified Loudspeaker Wiring Locations with Power Loop-Out

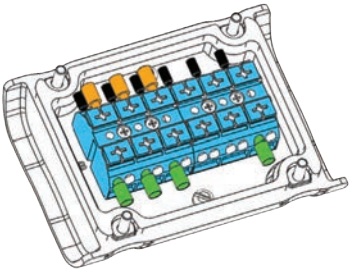


Figure 14
24 Vdc Amplified Loudspeaker Wiring Locations with Power Loop-Out

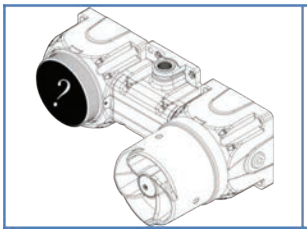


Figure 15
Amplified Loudspeaker (AL) and Unspecified Device (UD)

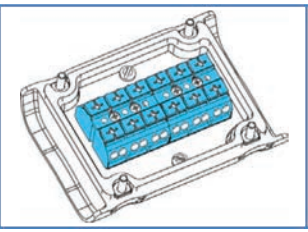


Figure 16
Dual "de d" Terminal Block (Common Between Devices)

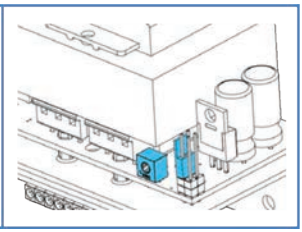


Figure 17
Volume and Input Level Jumper (AL Only)

	Connection	Locations	Description
1	L1/+	4	Input Power In (“Hot/L1/DC+”)
2	L2/-	4	Input Power Return (“Neutral/L2/DC-”)
3		4	Earth Ground Termination Point
4	L3/Alt+	4	Secondary Power In (“Hot/L3/DC+”)
5	Aud+	4	Input Audio
6	Aud-	4	DC/Audio Return (“-”)
		24	

G-Series combination devices require wiring practices dependent on the devices combined. When combining the G-Series Amplified Loudspeaker with other audible or visual products, the Amplified Loudspeaker occupies a majority of the available terminal locations. As a result, the input power to the combination device must be shared between the two devices. This constrains the combination device to the following operation:

- The combination device must be energized as a whole
- The Unspecified Device (UD) can be deployed independently if audio is withheld from the amplified loudspeaker (AL)
- Applying an audio signal to the combination device will deploy both the Unspecified Device (UD) and the amplified loudspeaker (AL)

Wiring a G-Series Amplified Loudspeaker Dual "de d" Terminal Chamber for AC power in the requires five (5) conductors: three (3) for input power (with an earth conductor) and two (2) for input audio and return (twisted pair recommended). In DC products, the audio return and input power return can be commonized, which reduces the conductor requirement to four (4). The G-Series Amplified Loudspeaker setup and wiring within the "Ex d" housing is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

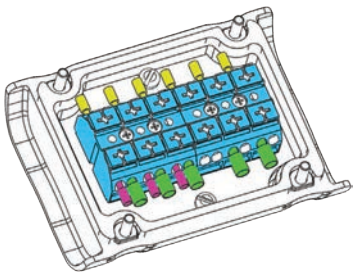


Figure 18
230 Vac Dual-Unit with Amplified Loudspeaker (AL) Wiring Locations

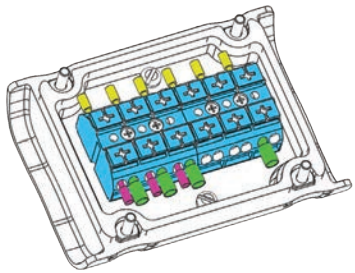


Figure 19
24 Vdc Dual-Unit with Amplified Loudspeaker (AL) Wiring Locations

While G-Series combination units allow for loop-in and loop-out connections through the Dual "de d" Terminal Chamber, loop-in and loop-out of the audio signal is not recommended. Wiring line-level audio connections in parallel over long distances degrades the quality and perceptibility of the audio signal.

If a nearby product requires AC or DC power loop-through, the G-Series Dual "de d" Terminal Chamber supports power loop-out field termination. As the terminal chamber provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/ loop-out topology.

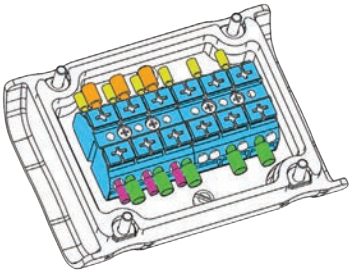


Figure 20
230 Vac Dual-Unit with Amplified Loudspeaker (AL) Wiring with Power Loop-Out

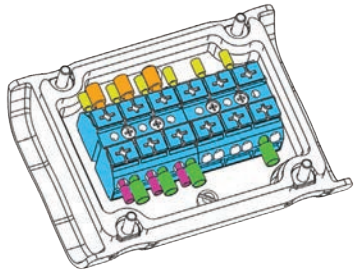


Figure 21
24 Vdc Dual-Unit with Amplified Loudspeaker (AL) Wiring with Power Loop-Out

Loudspeaker

Feature Set

70 V_{RMS} and 100 V_{RMS} models

- Loop-In and Loop-Out terminal positions
- Five (5) tapping positions at two (2) power levels for local level attenuation
  - High Power: 15 W, 10 W, 7 W, 5 W, 2 W
  - Low Power: 1 W, 0.7 W, 0.5 W, 0.2 W, 0.1 W

Cable Entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

Installing and Wiring the Flameproof "Ex d" Housing

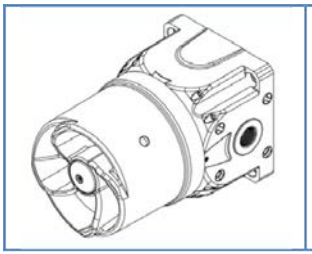


Figure 22
Loudspeaker 'd'

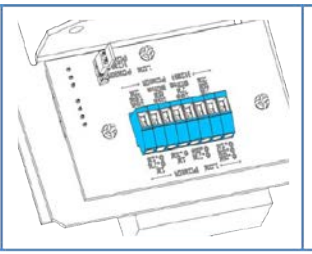


Figure 23
Terminal Block

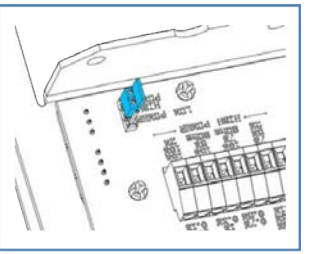
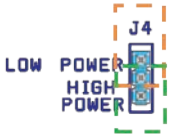


Figure 24
Power Level Jumper (JP1)

	Connection	Locations	Description
1	"1"	2	Available Taps: 7 W/5 W/2 W or 0.5 W/0.3 W/0.1 W
2	"2"	2	Available Taps: 10 W/7 W or 0.7 W/0.5 W
3	"3"	2	Available Taps: 15 W/5 W or 1.0 W/0.3 W
4	"4"	2	Available Taps: 15 W/10 W/2 W or 1.0 W/0.7 W/0.1 W
		8	

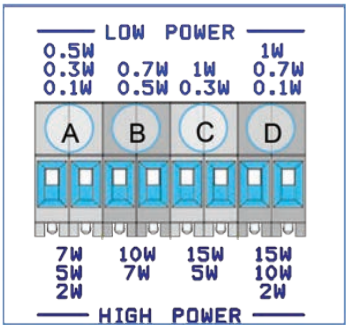
	JP4 Position	Description
1	High Power	The high-power taps are available on the terminal block J3 (Factory Set)
2	Low Power	The low-power taps are available on the terminal block J3

Wiring the G-Series Loudspeaker "Ex d" housing requires two (2) conductors terminated at the desired power tap locations. To run multiple tap connections to an external junction box (e.g., for remote taping or selective attenuation), terminate four (4) wires to each of the four (4) positions on the terminal block.



When choosing a power level to operate the G-Series Loudspeaker:

- Choose "LOW POWER" with JP4 to access the lower power taps
- Choose "HIGH POWER" with JP4 to access the higher power taps
- The G-Series Loudspeaker is factory-set to "HIGH POWER"



When selecting a single tap level:

- Choose the "HIGH" or "LOW" power level (using JP4).
- Terminate each of the two (2) conductors in the terminal positions matching the desired power level.

  Example 1: To drive the speaker output at 10 W levels, set JP4 to "HIGH POWER," and then terminate one of the audio conductors to position "B" and the other to position "D."

  Example 2: To drive the speaker output at 0.5 W levels, first set JP4 to "LOW POWER," and then terminate one of the audio conductors to position "A" and the other to position "B."

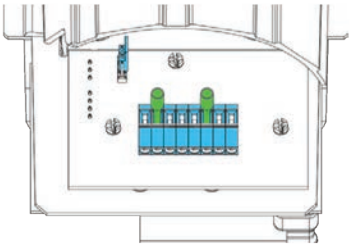


Figure 25
10 W Field Wiring Location (70 V_{RMS} or 100 V_{RMS})

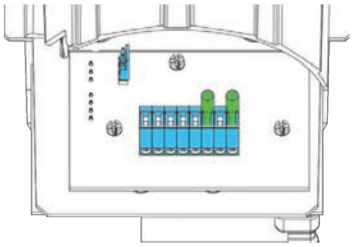


Figure 26
0.5 W Field Wiring Location (70 V_{RMS} or 100 V_{RMS})

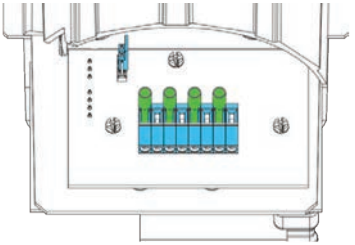


Figure 27
Loudspeaker Wired for Remote Tapping
(High Power, 70 V_{RMS} or 100 V_{RMS})

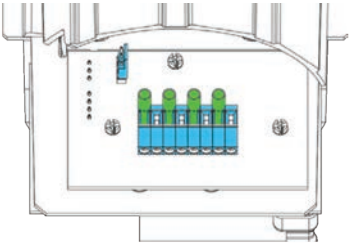


Figure 28
Loudspeaker Wired for Remote Tapping
(Low Power, 70 V_{RMS} or 100 V_{RMS})

The G-Series Loudspeaker allows for loop-in and loop-out connections through "Ex d" housing, where connecting another G-Series Loudspeaker assembly or loop-back supervision is desired or required. As the "Ex d" housing provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/loop-out topology.

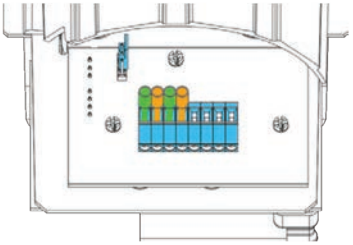


Figure 29
15 W Loudspeaker Wiring Location
(Loop-In/Loop-Out, 70 V_{RMS} or 100 V_{RMS})

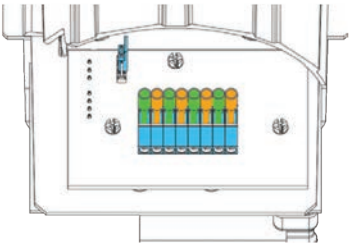


Figure 30
Loudspeaker Wired for Remote Tapping
(Loop-In/Loop-Out, High Power, 70 V_{RMS} or 100 V_{RMS})

Installing and Wiring the Increased Safety "Ex de" Housing

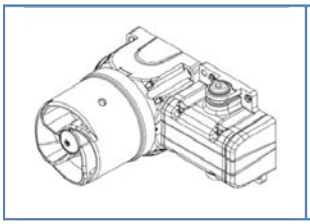


Figure 31
"Ex de" Loudspeaker

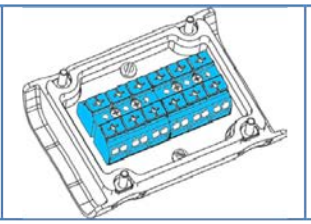


Figure 32
"Ex de" Terminal Block

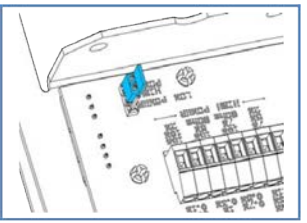


Figure 33
Power Level Jumper (JP1)

	Connection	Locations	Description
1	L1/+	4	(Not Used)
2	L2/-	4	(Not Used)
3	Alt1	4	Available Taps: 15 W/10 W/2 W or 1.0 W/0.7 W/0.1 W (Position “D”)
4	Alt2	4	Available Taps: 15 W/5 W or 1.0 W/0.3 W (Position “C”)
5	Alt3	4	Available Taps: 10 W/7 W or 0.7 W/0.5 W (Position “B”)
6	Alt4	4	Available Taps: 7 W/5 W/2 W or 0.5 W/0.3 W/0.1 W (Position “A”)
		24	

	JP4 Position	Description
1	High Power	The high-power taps are available on the terminal block (Factory Set)
2	Low Power	The low-power taps are available on the terminal block

Wiring the G-Series Loudspeaker "Ex de" terminal chamber requires two (2) conductors terminated at the desired power locations. To run multiple tap connections to an external junction box (for remote taping or selective attenuation), terminate four (4) wires to each of the four positions on the terminal block.

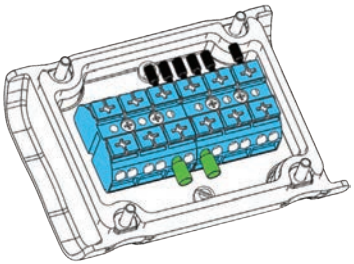


Figure 34
15 W Loudspeaker Wiring Location (70 V_{RMS} or 100 V_{RMS})

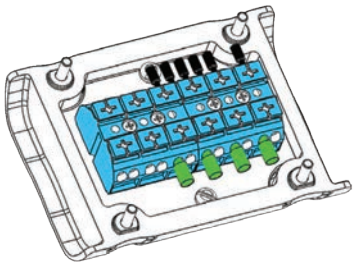


Figure 35
Loudspeaker Wired for Remote Tapping (70 V_{RMS} or 100 V_{RMS})

The G-Series Loudspeaker allows for loop-in and loop-out connections through the "Ex de" terminal chamber, where connecting another G-Series Loudspeaker assembly or loop-back supervision is desired or required. As the terminal chamber provides three (3) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry, or that input cabling occupies two entries but only one entry is required for loop-out cabling, before architecting a loop-in/loop-out topology.

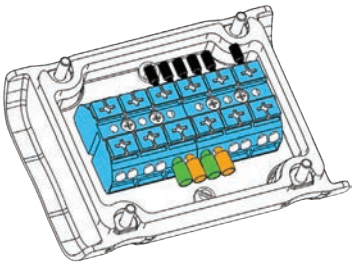


Figure 36
15 W Loudspeaker Wiring Location (Loop-In/Loop-Out, 70 V_{RMS} or 100 V_{RMS})

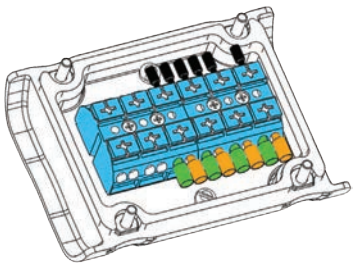


Figure 37
Loudspeaker Wired for Remote Tapping (Loop-In/Loop-Out, 70 V_{RMS} or 100 V_{RMS})

Installing and Wiring Dual "de d" Combination Unit Housings

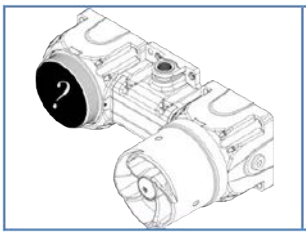


Figure 38
Loudspeaker (LD) and Unspecified Device (UD)

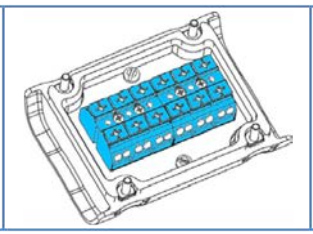


Figure 39
Dual "de d" Terminal Block (Common Between Devices)

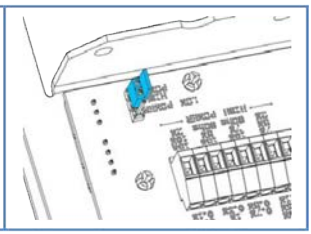


Figure 40
Audio Level Jumper (Specific to Loudspeaker))

	Connection	Locations	Description
1	L1/+	4	(Reserved for secondary device)
2	L2/-	4	(Reserved for secondary device)
3	Alt1	4	(Reserved for secondary device)
4	Alt2	4	Available Taps: 15 W/10 W or 1.0 W/0.7 W (Position “D”)
5	Alt3	4	Available Taps: 15 W or 1.0 W (Position “C”)
6	Alt4	4	Available Taps: 10 W or 0.7 W (Position “B”)
		24	

G-Series combination devices require wiring practices dependent on the devices combined. When combining the G-Series Loudspeaker with other audible or visual products, the Loudspeaker can occupy either the first or the second half of the Dual "de d" terminal block (depending on the second device (UD) type); the remaining half is dedicated to powering the Unspecified Device (UD). This constrains the combination device to the following operation:

The G-Series Loudspeaker (LD) leaves the factory with the 15 W and 10 W taps available in the terminal chamber.

- These taps are available for remote selection.
- The additional tap levels are available, but the "Ex d" housing wiring must be re-configured
- The low power levels are available, but JP4 on the PCBA in the "Ex d" housing must be re-configured. Moving JP4 from “HIGH POWER” to “LOW POWER” in the field will make available the 1.0 W and 0.7 W taps on the "Ex de" terminal block without additional rewiring

The Unspecified Device (UD) can be energized independently of the G-Series Loudspeaker (LD)

Wiring a G-Series Dual "de d" terminal chamber for use with a Loudspeaker (LD) as one of the two devices requires six (6) conductors. If the Unspecified Device (UD) requires AC or DC power to function, three (3) conductors are required for input power (with an earth conductor), leaving three (3) for the Loudspeaker (LD) audio. If the Unspecified Device (UD) is an additional Loudspeaker, the terminal chamber wiring will be duplicated. The Loudspeaker cannot be combined with an Amplified Loudspeaker. The product setup and wiring within "Ex d" housing of both devices is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

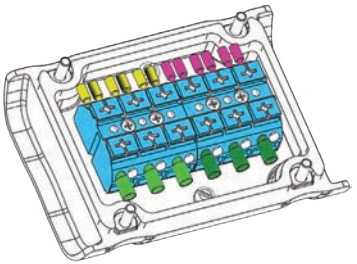


Figure 41
Dual-Unit (LD) Wiring Configuration 100 V_{RMS} or 70 V_{RMS}

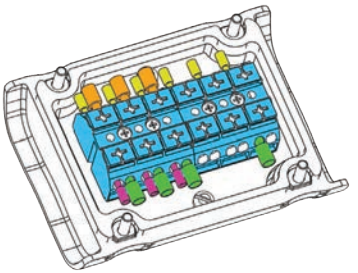


Figure 42
Dual-Unit (LD) Power and Remote Tapping (Loop-In/Loop-Out, 70 V_{RMS} or 100 V_{RMS})

G-Series Combination Devices allow for loop-in and loop-out connections through the Dual "de d" terminal chamber, intended for connecting to other G-Series combination units or other G-Series products and assemblies. As with the other G-Series devices, if a nearby product requires AC or DC power loop-through (and if the Unspecified Device (UD) uses AC or DC power), the G-Series Dual "de d" terminal chamber supports power loop-out connection from the Unspecified Device’s (UD) input power connection. In addition, should the application require connecting another G-Series Loudspeaker or Loudspeaker assembly, or loop-back supervision is desired or required, the terminal chamber allows for Loudspeaker audio loop-out. As the G-Series "Ex d" terminal chamber provides two (2) M20 entries for cable passage, at least one entry must be dedicated for all incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/loop-out topology.

Sounder

Feature Set

Multi-voltage input with loop-out terminal positions

- AC or DC (selection based on field termination location)
- 120 Vac or 230 Vac (selector switch)

15 On-board tones

- Single-tone selection with operation on power-up
- Remote tone selection of all 15 on-board tones possible
- Output attenuation adjustment for all on-board tones

Cable Entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

Installing and Wiring the Flameproof "Ex d" Housing

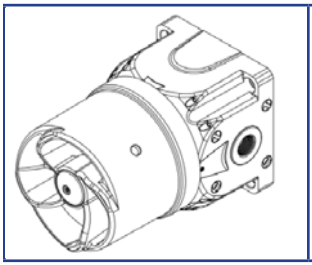


Figure 43
"Ex d" Sounder

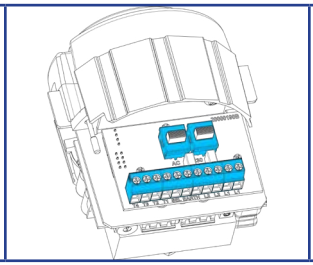


Figure 44
Terminal Block and AC Switch

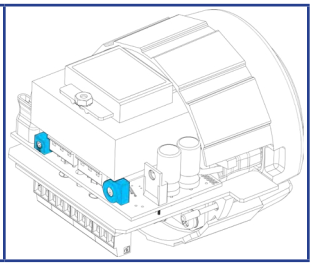


Figure 45
Level Adjust and Tone Selection

	Connection	Locations	Description
1	L1	2	AC Power (“Hot/L1”)
2	L2	2	AC Return (“Neutral/L2”)
3	EARTH	2	Earth Ground Termination Point
4	SEL	1	Contact voltage for remote tone selection
5	T1-T4	4	Remote tone selection termination points
		11	

SW1	Position	Description
1	120	Amplifier is configured to operate at 110 Vac-120 Vac
2	230	Amplifier is configured to operate at 220 Vac-240 Vac (Factory Set)

SW2	Position	Description
1	DC	Amplifier is configured to operate at DC voltage
2	AC	Amplifier is configured to operate at AC voltage (Factory Set)

Table 1 Terminal Wiring

	Hex SW	Freq. Range	Sel[1]	T4	T3	T2	T1	Description
-	0	--						Off (Use for remote access to all tones)
1	1	588-714	x				x	Tone Up
2	2	520	x			x		Sleeping Quarters EVAC
3	3	1000-1400	x			x	x	Warble
4	4	700	x		x			Tone (Low)
5	5	--	x		x		x	Bell
6	6	600-2600	x		x	x		Sweep Down (High)
7	7	1000-700	x		x	x	x	Pulse Down
8	8	700	x	x				Pulse (Low)
9	9	400-1600	x	x			x	Sweep Bounce
10	A	500-770	x	x		x		Sweep Up (Low)
11	B	1000	x	x		x	x	Pulse (High)
12	C	1000	x	x	x			Tone (High) (Factory default)
13	D	700-500	x	x	x		x	Tone Down
14	E	1000-1400	x	x	x	x		Warble
15	F	1200-400	x	x	x	x	x	Sweep Down (Low)
		Conductor Sum[2]:						
		Common Sum[3]:						

Wiring the G-Series Sounder "Ex d" housing to play a single tone on AC or DC power requires three (3) conductors for input power (with an earth conductor). Wiring the G-Series Sounder "Ex d" housing for remote tone selection on AC power requires a minimum of six (6) conductors; the full range of tones can be accessed with eight (8) conductors. Wiring the G-Series Sounder "Ex d" housing for remote tone selection on DC power requires a minimum of four (4) conductors; the full range of tones can be accessed with six (6) conductors. The G-Series Sounder is factory set to the "C" tone position (1 kHz steady), and the power switch is set to the 230 Vac position.

To change the AC input power

1. Locate the power configuration switch (SW1) on the connector PCBA (see Ill 3-2 on page 23)

2. For AC power, slide the voltage selector switch to AC, and slide the switch to "120" for 120 Vac power or "240" for 220-240 Vac. For DC power, slide the voltage selector switch to DC, and slide the switch to 230 Vac.

1 Select line ("SEL") required to make tone selections with sounders powered from AC voltage; loop back to T1/T4 through a contact closure to select a tone

2 Use "Conductor Sum" to count up the number of conductors required to remotely activate (a) tone(s). First, select the tone(s) desired. Second, for every column with an "x", place a "1" in the corresponding Conductor Sum column. Sum the columns for a conductor count.

3 Use "Common Sum" to determine if the HEX switch can be used to reduce the total conductor count. First, select the tone(s) desired. Second, complete the "Conductor Sum" count. Third, inspect all columns (excluding "SEL") of the selected tone(s) marked with an "x"; if all of the tones share a column (eg: all tones have "x" for column "T1"), place a "1" in the corresponding column. Sum the columns for a conductor count and subtract from "Conductor Sum". Lastly, replace all "1"s in the "Common Sum" row with "x", and match to a HEX position; this will correspond to the required HEX switch setting

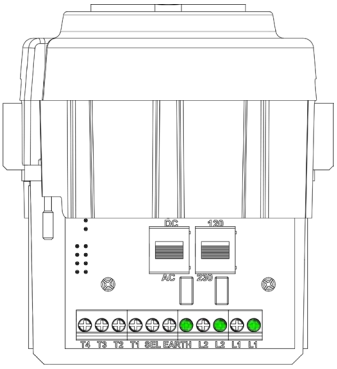


Figure 46
230 Vac Sounder Single-Tone Wiring Locations

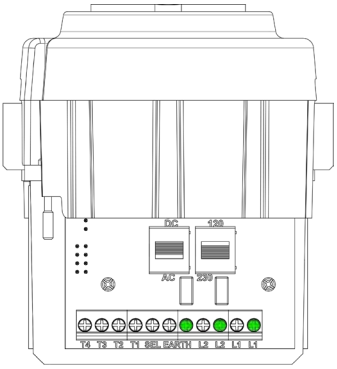


Figure 47
24 Vdc Sounder Single-Tone Wiring Locations

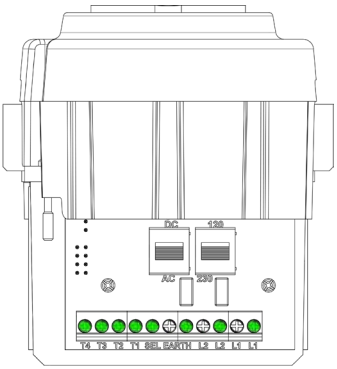


Figure 48
230 Vac Sounder with Full Remote Selection

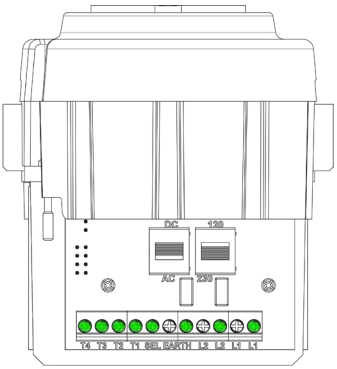


Figure 49
24 Vdc Sounder with Full Remote Selection

The G-Series Sounder includes a volume potentiometer (located on the transformer PCBA) that allows for field adjustment of the output level (see Ill 3-3 on page 23). While the G-Series Sounder is shipped from the factory at full volume, field reduction of the output level might be required or desired in certain applications.

To adjust the sound output level:

1. Locate the volume potentiometer (VR1) on the connector PCBA (see Ill 3-3 on page 23)
2. Rotate the dial on the volume potentiometer counterclockwise to reduce the volume (or clockwise to increase the volume).

While the G-Series Sounder allows for loop-in and loop-out power connections through the "Ex d" housing, it does not support loop-in and loop-out wiring of the tone selection lines. If a nearby product requires AC or DC power loop-through, the G-Series Sounder "Ex d" housing supports power loop-out connection. As the "Ex d" housing provides two (2) M20 entries for cable passage, one entry must be dedicated for incoming conductors, and one entry for outgoing conductors.

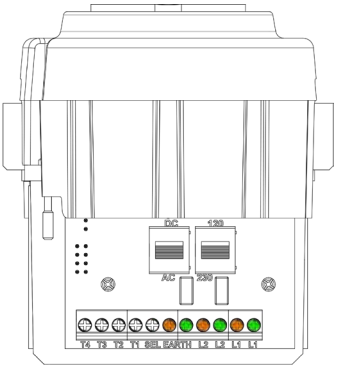


Figure 50
230 Vac Single-Tone Sounder Wiring with Power Loop-Out

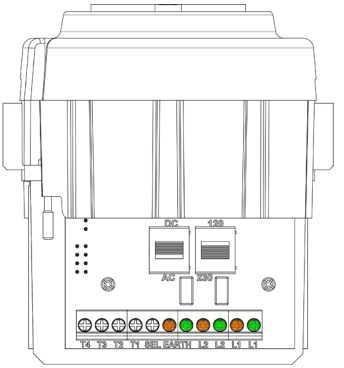


Figure 51
24 Vdc Single-Tone Sounder Wiring with Power Loop-Out

Remote tone selection is limited by the number of available conductors entering the "Ex d" housing. The tables that follow help identify tones available with limited numbers of conductors, based on the type of G-Series Sounder product.

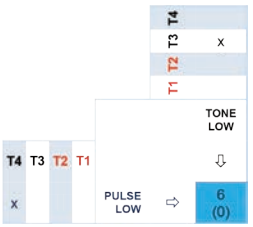
To use the table:

1. Identify two tones for remote selection.
2. Note the square where the two tones intersect.
3. Follow the color code and cell contents for further instructions.

n (H)	This tone can be selected with the number of conductors “n” shown. To accomplish this task, the HEX switch must be first set to position “H.”
n (H)	This tone is a duplicate selection.
	This tone is not available with the limited number of conductors.

4. Access to tone selection pins (T#) marked in red requires device rewiring

For example, consider the following tone selection of “Tone Low” and “Pulse Low” in an AC Sounder application:



This tone can be selected using a total of six conductors (three for AC power and ground, one for SEL, and two for tone select), and the tone select wires should be landed at T4 (shown with an “x” on the left of “Pulse Low”) and T3 (shown with an “x” above “Tone Low”), and the HEX switch should be set to position “0.”

G-Series AC Sounder "Ex d" Housing Products, Limited to 6 or Fewer Conductors

T4	T3	T2	T1		[6]	OFF	BELL	PULSE LOW	PULSE HIGH	PULSE DOWN	WARBLE	SWEEP BOUNCE	SWEEP DOWN LOW	SWEEP DOWN HIGH	SWEEP UP LOW	SQ EVAC	TONE DOWN	TONE UP	TONE LOW	TONE HIGH	WARBLE
						(0)	(5)	(8)	(B)	(7)	(3)	(9)	(F)	(6)	(A)	(2)	(D)	(1)	(4)	(C)	(E)
				(0)	OFF	4 (0)	6 (0)	5 (0)			6 (0)	6 (0)		6 (0)	6 (0)	5 (0)		5 (0)	5 (0)	6 (0)	
	x		x	(5)	BELL	6 (0)	4 (5)			5 (5)	6 (1)	6 (1)	6 (5)	6 (4)			5 (5)	5 (1)	5 (4)	6 (4)	
x				(8)	PULSE LOW	5 (0)		4 (8)	6 (8)			5 (8)			5 (8)	6 (0)	6 (8)	6 (0)	6 (0)	5 (8)	6 (8)
x		x	x	(B)	PULSE HIGH			6 (8)	4 (B)	6 (3)	5 (3)	5 (9)	5 (B)		5 (A)	6 (2)	6 (9)	6 (1)			6 (A)
	x	x	x	(7)	PULSE DOWN		5 (5)		6 (3)	4 (7)	5 (3)		5 (7)	5 (6)		6 (2)	6 (5)	6 (1)	6 (4)		6 (6)
		x	x	(3)	WARBLE	6 (0)	6 (1)		5 (3)	5 (3)	4 (3)	6 (1)	6 (3)	6 (2)	6 (2)	5 (2)		5 (1)			
x			x	(9)	SWEEP BOUNCE	6 (0)	6 (1)	5 (8)	5 (9)		6 (1)	4 (9)	6 (9)		6 (8)		5 (9)	5 (1)		6 (8)	
x	x	x	x	(F)	SWEEP DOWN LOW		6 (5)		5 (B)	5 (7)	6 (3)	6 (9)	4 (F)	6 (6)	6 (A)		5 (D)			6 (C)	5 (E)
	x	x		(6)	SWEEP DOWN HIGH	6 (0)	6 (4)			5 (6)	6 (2)		6 (6)	4 (6)	6 (2)	5 (2)			5 (4)	6 (4)	5 (6)
x		x		(A)	SWEEP UP LOW	6 (0)		5 (8)	5 (A)		6 (2)	6 (8)	6 (A)	6 (2)	4 (A)	5 (2)				6 (8)	5 (A)
		x		(2)	SQ EVAC	5 (0)		6 (0)	6 (2)	6 (2)	5 (2)			5 (2)	5 (2)	4 (2)		6 (0)	6 (0)		6 (2)
x	x		x	(D)	TONE DOWN		5 (5)	6 (8)	6 (9)	6 (5)		5 (9)	5 (D)				4 (D)	6 (1)	6 (4)	5 (C)	6 (C)
			x	(1)	TONE UP	5 (0)	5 (1)	6 (0)	6 (1)	6 (1)	5 (1)	5 (1)				6 (0)	6 (1)	4 (1)	6 (0)		
	x			(4)	TONE LOW	5 (0)	5 (4)	6 (0)		6 (4)				5 (4)		6 (0)	6 (4)	6 (0)	4 (4)	5 (4)	6 (4)
x	x			(C)	TONE HIGH	6 (0)	6 (4)	5 (8)				6 (8)	6 (C)	6 (4)	6 (8)		5 (C)		5 (4)	4 (C)	5 (C)
x	x	x		(E)	WARBLE			6 (8)	6 (A)	6 (6)			5 (E)	5 (6)	5 (A)	6 (2)	6 (C)		6 (4)	5 (C)	4 (E)

G-Series DC Sounder "Ex d" Housing Products, Limited to 4 or Fewer Conductors

						T4			x	x			x	x		x		x			x	x
						T3		x			x			x	x			x		x	x	x
						T2				x	x	x		x	x	x	x					x
						T1		x		x	x	x	x	x				x	x			
							(0)	(5)	(8)	(B)	(7)	(3)	(9)	(F)	(6)	(A)	(2)	(D)	(1)	(4)	(C)	(E)
T4	T3	T2	T1		[4]		OFF	BELL	PULSE LOW	PULSE HIGH	PULSE DOWN	WARBLE	SWEEP BOUNCE	SWEEP DOWN LOW	SWEEP DOWN HIGH	SWEEP UP LOW	SQ EVAC	TONE DOWN	TONE UP	TONE LOW	TONE HIGH	WARBLE
				(0)		OFF	2 (0)	4 (0)	3 (0)			4 (0)	4 (0)		4 (0)	4 (0)	3 (0)		3 (0)	3 (0)	4 (0)	
	x		x	(5)		BELL	4 (0)	2 (5)			3 (5)	4 (1)	4 (1)	4 (5)	4 (4)			3 (5)	3 (1)	3 (4)	4 (4)	
x				(8)		PULSE LOW	3 (0)		2 (8)	4 (8)			3 (8)			3 (8)	4 (0)	4 (8)	4 (0)	4 (0)	3 (8)	4 (8)
x		x	x	(B)		PULSE HIGH			4 (8)	2 (B)	4 (3)	3 (3)	3 (9)	3 (B)		3 (A)	4 (2)	4 (9)	4 (1)			4 (A)
	x	x	x	(7)		PULSE DOWN		3 (5)		4 (3)	2 (7)	3 (3)		3 (7)	3 (6)		4 (2)	4 (5)	4 (1)	4 (4)		4 (6)
		x	x	(3)		WARBLE	4 (0)	4 (1)		3 (3)	3 (3)	2 (3)	4 (1)	4 (3)	4 (2)	4 (2)	3 (2)		3 (1)			
x			x	(9)		SWEEP BOUNCE	4 (0)	4 (1)	3 (8)	3 (9)		4 (1)	2 (9)	4 (9)		4 (8)		3 (9)	3 (1)		4 (8)	
x	x	x	x	(F)		SWEEP DOWN LOW		4 (5)		3 (8)	3 (7)	4 (3)	4 (9)	2 (F)	4 (6)	4 (A)		3 (D)			4 (C)	3 (E)
	x	x		(6)		SWEEP DOWN HIGH	4 (0)	4 (4)			3 (6)	4 (2)		4 (6)	2 (6)	4 (2)	3 (2)			3 (4)	4 (4)	3 (6)
x		x		(A)		SWEEP UP LOW	4 (0)		3 (8)	3 (A)		4 (2)	4 (8)	4 (A)	4 (2)	2 (A)	3 (2)				4 (8)	3 (A)
		x		(2)		SQ EVAC	3 (0)		4 (0)	4 (2)	4 (2)	3 (2)			3 (2)	3 (2)	2 (2)		4 (0)	4 (0)		4 (2)
x	x		x	(D)		TONE DOWN		3 (5)	4 (8)	4 (9)	4 (5)		3 (9)	3 (D)				2 (D)	4 (1)	4 (4)	3 (C)	4 (C)
			x	(1)		TONE UP	3 (0)	3 (1)	4 (0)	4 (1)	4 (1)	3 (1)	3 (1)				4 (0)	4 (1)	2 (1)	4 (0)		
	x			(4)		TONE LOW	3 (0)	3 (4)	4 (0)		4 (4)				3 (4)		4 (0)	4 (4)	4 (0)	2 (4)	3 (4)	4 (4)
x	x			(C)		TONE HIGH	4 (0)	4 (4)	3 (8)				4 (8)	4 (C)	4 (4)	4 (8)		3 (C)		3 (4)	2 (C)	3 (C)
x	x	x		(E)		WARBLE			4 (8)	4 (A)	4 (6)			3 (E)	3 (6)	3 (A)	4 (2)	4 (C)		4 (4)	3 (C)	2 (E)

Installing and Wiring the Increased Safety "Ex de" Housing

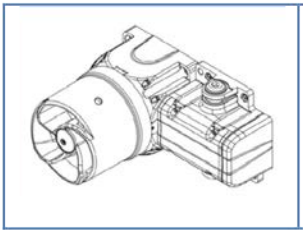


Figure 52
"Ex de" Sounder

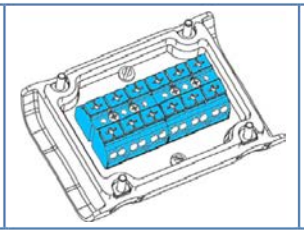


Figure 53
"Ex de" Terminal Block

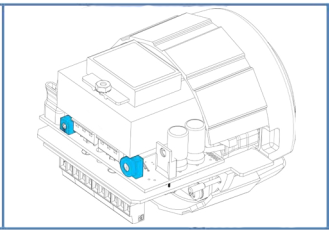


Figure 54
Level Adjust and Tone Selection

	Connection	Locations	Description
1	L1/+	4	Input Power In (“Hot/L1/DC+”)
2	L2/-	4	Input Power Return (“Neutral/L2/DC-”)
3	Alt1	4	Earth Ground Termination Point
4	Alt2	4	(AC): SEL Terminal Location (DC): T2 Terminal Location
5	Alt3	4	T3 Terminal Location
6	Alt4	4	T4 Terminal Location
		24	

SW1	Position	Description
1	120	Amplifier is configured to operate at 110 Vac-120 Vac
2	230	Amplifier is configured to operate at 220 Vac-240 Vac (Factory Set)

Table 2 Terminal Wiring

	Hex SW	Freq. Range	Sel[1]	T4	T3	T2	T1	Description
-	0	--						Off (Use for remote access to all tones)
1	1	588-714	x				x	Tone Up
2	2	520	x			x		Sleeping Quarters EVAC
3	3	1000-1400	x			x	x	Warble
4	4	700	x		x			Tone (Low)
5	5	--	x		x		x	Bell
6	6	600-2600	x		x	x		Sweep Down (High)
7	7	1000-700	x		x	x	x	Pulse Down
8	8	700	x	x				Pulse (Low)
9	9	400-1600	x	x			x	Sweep Bounce
10	A	500-770	x	x		x		Sweep Up (Low)
11	B	1000	x	x		x	x	Pulse (High)
12	C	1000	x	x	x			Tone (High) (Factory default)
13	D	700-500	x	x	x		x	Tone Down
14	E	1000-1400	x	x	x	x		Warble
15	F	1200-400	x	x	x	x	x	Sweep Down (Low)
		Conductor Sum[2]:						
		Common Sum[3]:						

Wiring the G-Series Sounder "Ex de" terminal chamber for a single-tone on AC or DC power requires three (3) conductors for input power (with an earth conductor). The G-Series Sounder setup and wiring within the "Ex d" housing is configured at the factory to match the input power ordered, and tone “C” is preselected. If this is the desired tone, the only field requirement for installation is wire termination to the proper position. If single-tone operation is desired other than the 1 kHz tone “C”, the "Ex d" housing must be opened and the HEX switch set to the desired tone.

The G-Series Sounder includes a volume potentiometer (located on the transformer PCBA) that allows for field adjustment of the output level (see Ill 3-12 on page 30). While the G-Series Sounder is shipped from the factory at full volume, field reduction of the output level might be required or desired in certain applications.

To adjust the sound output level

1. Locate the volume potentiometer (VR1) on the connector PCBA (see Ill 3-12 on page 30)
2. Rotate the dial on the volume potentiometer counterclockwise to reduce the volume (or clockwise to increase the volume).

4 Select line (“SEL”) required to make tone selections with sounders powered from AC voltage; loop back to T1/T4 through a contact closure to select a tone.

5 Use “Conductor Sum” to count up the number of conductors required to remotely activate (a) tone(s). First, select the tone(s) desired. Second, for every column with an “x”, place a “1” in the corresponding Conductor Sum column. Sum the columns for a conductor count.

6 Use “Common Sum” to determine if the HEX switch can be used to reduce the total conductor count. First, select the tone(s) desired. Second, complete the “Conductor Sum” count. Third, inspect all columns (excluding “SEL”) of the selected tone(s) marked with an “x”; if all of the tones share a column (eg: all tones have “x” for column “T1”), place a “1” in the corresponding column. Sum the columns for a conductor count and subtract from “Conductor Sum”. Lastly, replace all “1”s in the “Common Sum” row with “x”, and match to a HEX position; this will correspond to the required HEX switch setting.

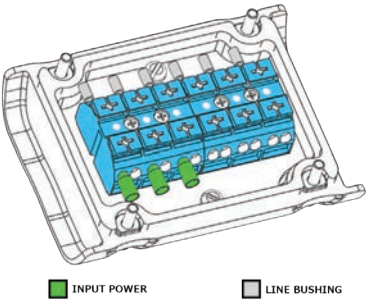


Figure 55
230 Vac Sounder Single-Tone Wiring Locations

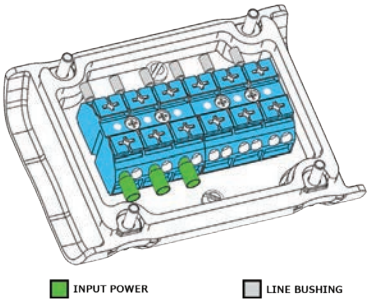


Figure 56
24 Vdc Sounder Single-Tone Wiring Locations

The G-Series Sounder "Ex de" terminal chamber can be wired for limited remote tone selection. For AC products, the remote tone select line SEL is made available, as well as tone select lines T3 and T4. For DC products, T2, T3, and T4 are made available.

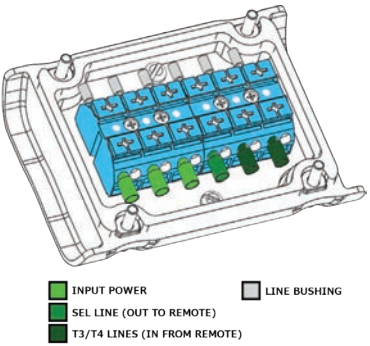


Figure 57
230 Vac Sounder with Limited Remote Selection

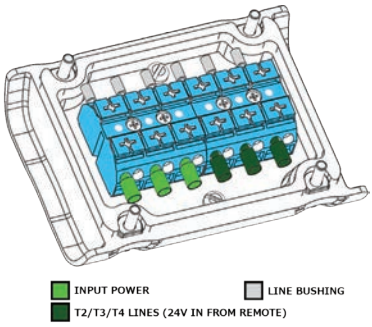


Figure 58
24 Vdc Sounder with Limited Remote Selection

Remote tone selection is also limited by the number of available conductors entering the "Ex de" terminal chamber. The tables that follow help identify tones available with limited numbers of conductors, based on the type of G-Series Sounder product.

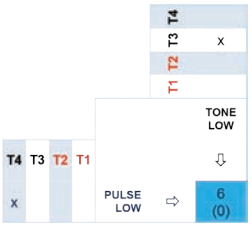
To use the table:

1. Identify two tones for remote selection.
2. Note the square where the two tones intersect.
3. Follow the color code and cell contents for further instructions.

n (H)	This tone can be selected with the number of conductors “n” shown. To accomplish this task, the HEX switch must be first set to position “H.”
n (H)	This tone is a duplicate selection.
	This tone is not available with the limited number of conductors.

4. Access to tone selection pins (T#) marked in red requires device rewiring.

For example, consider the following tone selection of “Tone Low” and “Pulse Low” in an AC Sounder application:



This tone can be selected using a total of six conductors (three for AC power and ground, one for SEL, and two for tone select), and the tone select wires should be landed at T4 (shown with an “x” on the left of “Pulse Low”) and T3 (shown with an “x” above “Tone Low”), and the HEX switch should be set to position “0.”

G-Series AC Sounder "Ex de" Terminal Chamber Products, Limited to 6 or Fewer Conductors

T4	T3	T2	T1		[6]	OFF	BELL	PULSE LOW	PULSE HIGH	PULSE DOWN	WARBLE	SWEEP BOUNCE	SWEEP DOWN LOW	SWEEP DOWN HIGH	SWEEP UP LOW	SQ EVAC	TONE DOWN	TONE UP	TONE LOW	TONE HIGH	WARBLE
				(0)	OFF	4 (0)	6 (0)	5 (0)			6 (0)	6 (0)		6 (0)	6 (0)	5 (0)		5 (0)	5 (0)	6 (0)	
	x		x	(5)	BELL	6 (0)	4 (5)			5 (5)	6 (1)	6 (1)	6 (5)	6 (4)			5 (5)	5 (1)	5 (4)	6 (4)	
x				(8)	PULSE LOW	5 (0)		4 (8)	6 (8)			5 (8)			5 (8)	6 (0)	6 (8)	6 (0)	6 (0)	5 (8)	6 (8)
x		x	x	(B)	PULSE HIGH			6 (8)	4 (B)	6 (3)	5 (3)	5 (9)	5 (B)		5 (A)	6 (2)	6 (9)	6 (1)			6 (A)
	x	x	x	(7)	PULSE DOWN		5 (5)		6 (3)	4 (7)	5 (3)		5 (7)	5 (6)		6 (2)	6 (5)	6 (1)	6 (4)		6 (6)
		x	x	(3)	WARBLE	6 (0)	6 (1)		5 (3)	5 (3)	4 (3)	6 (1)	6 (3)	6 (2)	6 (2)	5 (2)		5 (1)			
x			x	(9)	SWEEP BOUNCE	6 (0)	6 (1)	5 (8)	5 (9)		6 (1)	4 (9)	6 (9)		6 (8)		5 (9)	5 (1)		6 (8)	
x	x	x	x	(F)	SWEEP DOWN LOW		6 (5)		5 (B)	5 (7)	6 (3)	6 (9)	4 (F)	6 (6)	6 (A)		5 (D)			6 (C)	5 (E)
	x	x		(6)	SWEEP DOWN HIGH	6 (0)	6 (4)			5 (6)	6 (2)		6 (6)	4 (6)	6 (2)	5 (2)			5 (4)	6 (4)	5 (6)
x		x		(A)	SWEEP UP LOW	6 (0)		5 (8)	5 (A)		6 (2)	6 (8)	6 (A)	6 (2)	4 (A)	5 (2)				6 (8)	5 (A)
		x		(2)	SQ EVAC	5 (0)		6 (0)	6 (2)	6 (2)	5 (2)			5 (2)	5 (2)	4 (2)		6 (0)	6 (0)		6 (2)
x	x		x	(D)	TONE DOWN		5 (5)	6 (8)	6 (9)	6 (5)		5 (9)	5 (D)				4 (D)	6 (1)	6 (4)	5 (C)	6 (C)
			x	(1)	TONE UP	5 (0)	5 (1)	6 (0)	6 (1)	6 (1)	5 (1)	5 (1)				6 (0)	6 (1)	4 (1)	6 (0)		
	x			(4)	TONE LOW	5 (0)	5 (4)	6 (0)		6 (4)				5 (4)		6 (0)	6 (4)	6 (0)	4 (4)	5 (4)	6 (4)
x	x			(C)	TONE HIGH	6 (0)	6 (4)	5 (8)				6 (8)	6 (C)	6 (4)	6 (8)		5 (C)		5 (4)	4 (C)	5 (C)
x	x	x		(E)	WARBLE			6 (8)	6 (A)	6 (6)			5 (E)	5 (6)	5 (A)	6 (2)	6 (C)		6 (4)	5 (C)	4 (E)

G-Series DC Sounder "Ex de" Terminal Chamber Products, Limited to 4 or Fewer Conductors

T4	T3	T2	T1		[4]	OFF	BELL	PULSE LOW	PULSE HIGH	PULSE DOWN	WARBLE	SWEEP BOUNCE	SWEEP DOWN LOW	SWEEP DOWN HIGH	SWEEP UP LOW	SQ EVAC	TONE DOWN	TONE UP	TONE LOW	TONE HIGH	WARBLE
						(0)	(5)	(8)	(B)	(7)	(3)	(9)	(F)	(6)	(A)	(2)	(D)	(1)	(4)	(C)	(E)
				(0)	OFF	2 (0)	4 (0)	3 (0)			4 (0)	4 (0)		4 (0)	4 (0)	3 (0)		3 (0)	3 (0)	4 (0)	
	x		x	(5)	BELL	4 (0)	2 (5)			3 (5)	4 (1)	4 (1)	4 (5)	4 (4)			3 (5)	3 (1)	3 (4)	4 (4)	
x				(8)	PULSE LOW	3 (0)		2 (8)	4 (8)			3 (8)			3 (8)	4 (0)	4 (8)	4 (0)	4 (0)	3 (8)	4 (8)
x		x	x	(B)	PULSE HIGH			4 (8)	2 (B)	4 (3)	3 (3)	3 (9)	3 (B)		3 (A)	4 (2)	4 (9)	4 (1)			4 (A)
	x	x	x	(7)	PULSE DOWN		3 (5)		4 (3)	2 (7)	3 (3)		3 (7)	3 (6)		4 (2)	4 (5)	4 (1)	4 (4)		4 (6)
		x	x	(3)	WARBLE	4 (0)	4 (1)		3 (3)	3 (3)	2 (3)	4 (1)	4 (3)	4 (2)	4 (2)	3 (2)		3 (1)			
x			x	(9)	SWEEP BOUNCE	4 (0)	4 (1)	3 (8)	3 (9)		4 (1)	2 (9)	4 (9)		4 (8)		3 (9)	3 (1)		4 (8)	
x	x	x	x	(F)	SWEEP DOWN LOW		4 (5)		3 (B)	3 (7)	4 (3)	4 (9)	2 (F)	4 (6)	4 (A)		3 (D)			4 (C)	3 (E)
	x	x		(6)	SWEEP DOWN HIGH	4 (0)	4 (4)			3 (6)	4 (2)		4 (6)	2 (6)	4 (2)	3 (2)			3 (4)	4 (4)	3 (6)
x		x		(A)	SWEEP UP LOW	4 (0)		3 (8)	3 (A)		4 (2)	4 (8)	4 (A)	4 (2)	2 (A)	3 (2)				4 (8)	3 (A)
		x		(2)	SQ EVAC	3 (0)		4 (0)	4 (2)	4 (2)	3 (2)			3 (2)	3 (2)	2 (2)		4 (0)	4 (0)		4 (2)
x	x		x	(D)	TONE DOWN		3 (5)	4 (8)	4 (9)	4 (5)		3 (9)	3 (D)				2 (D)	4 (1)	4 (4)	3 (C)	4 (C)
			x	(1)	TONE UP	3 (0)	3 (1)	4 (0)	4 (1)	4 (1)	3 (1)	3 (1)				4 (0)	4 (1)	2 (1)	4 (0)		
	x			(4)	TONE LOW	3 (0)	3 (4)	4 (0)		4 (4)				3 (4)		4 (0)	4 (4)	4 (0)	2 (4)	3 (4)	4 (4)
x	x			(C)	TONE HIGH	4 (0)	4 (4)	3 (8)				4 (8)	4 (C)	4 (4)	4 (8)		3 (C)		3 (4)	2 (C)	3 (C)
x	x	x		(E)	WARBLE			4 (8)	4 (A)	4 (6)			3 (E)	3 (6)	3 (A)	4 (2)	4 (C)		4 (4)	3 (C)	2 (E)

If the desired tones are accessible with the number of conductors available, but the tone selection positions are shown in red for one or more of the positions, the G-Series Sounder "Ex d" housing terminal block will need to be rewired.

To rewire the terminal block, locate the T1-T4 terminal locations on the sounder PCBA. Note the factory locations for bushing wires “5” and “6” (installed in positions “T3” and “T4”, respectively). In addition, note the location of bushing wires “5” and “6” on the "Ex de" terminal chamber.

To allow access to the desired tone(s), move bushing wires “5” and/or “6” to the designated “T” terminal locations on the "Ex d" housing PCBA. Once these wires have been relocated, the desired “T” terminal locations will also be available on the "Ex de" terminal block.

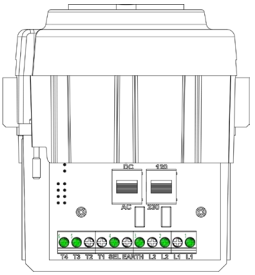


Figure 59
230 Vac Sounder "Ex d" Housing
Factory Wiring Locations

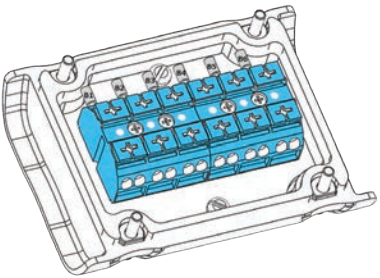


Figure 60
230 Vac Sounder "Ex de" Terminal Block
Factory Wiring Locations

It is possible to wire a 24 Vdc G-Series Sounder for complete remote tone selection through the "Ex de" terminal chamber. To accomplish this, both the "Ex d" housing and the "Ex de" terminal chamber wiring must be re-configured. All 15 remote tones will now be available, and the device will be powered through the tone select lines T1-T4. To activate a tone, apply 24 Vdc on the desired tone pin(s).

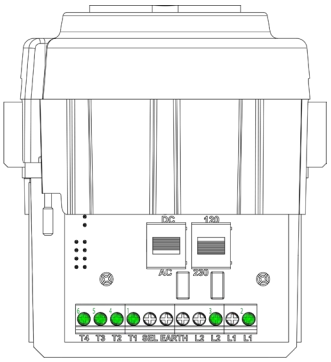


Figure 61
G-Series Sounder Single-Tone Wiring
with Power Loop-Out

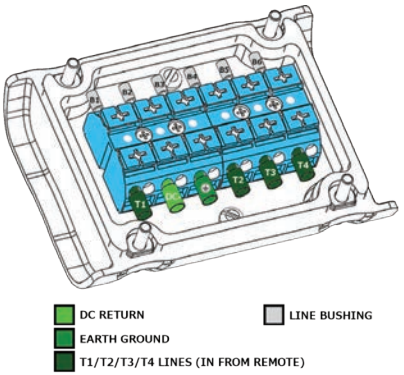


Figure 62
G-Series Sounder Wired for Limited Remote Selection
with Power Loop-Out

While the "Ex de" G-Series Sounder does accommodate loop-in and loop-out connections through the terminal chamber, it is not intended to facilitate loop-in and loop-out wiring of the tone selection lines.

If a nearby product requires AC or DC power loop-through, the G-Series Sounder "Ex de" terminal chamber supports power loop-out field termination. As the terminal chamber provides three (3) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry, or that input cabling occupies two entries but only one entry is required for loop-out cabling, before architecting a loop-in/loop-out topology.

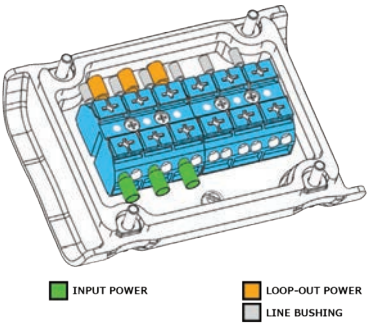


Figure 63
G-Series Sounder Single-Tone Wiring Locations with Power Loop-Out

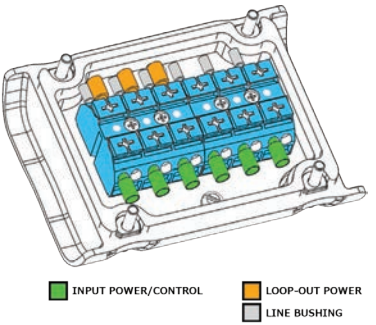


Figure 64
G-Series Sounder with Limited Remote Selection and Power Loop-Out

Installing and Wiring Dual "de d" Combination Unit Housings

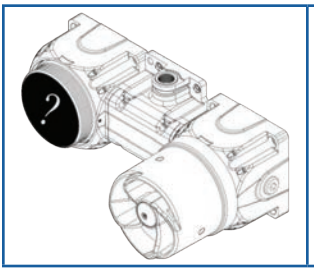


Figure 65
Sounder (SD) and Unspecified Device (UD)

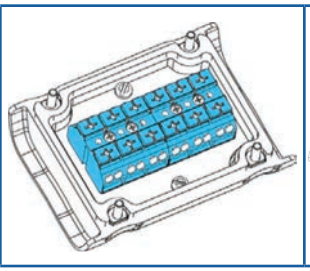


Figure 66
Dual "de d" Terminal Block (Common between devices)

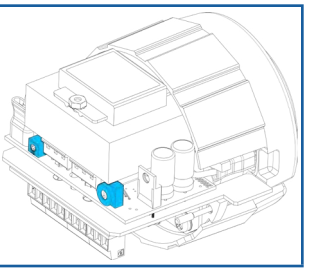


Figure 67
Level Adjust and Tone Selection (Sounder Only)

	Connection	Locations	Description
1	L1/+	4	Input Power In (“Hot/L1/DC+”)
2	L2/-	4	Input Power Return (“Neutral/L2/DC-”)
3	Alt1	4	Earth Ground Termination Point
4	Alt2	4	(Reserved for secondary device)
5	Alt3	4	(Reserved for secondary device)
6	Alt4	4	(Reserved for secondary device)
		24	

G-Series combination devices require wiring practices dependent on the devices combined. When combining the G-Series Sounder with other audible or visual products, the sounder can occupy either first or the second half of the "Ex de" terminal block; the Unspecified Device (UD) will occupy the other half. This constrains the combination device to the following operation:

- The sounder (SD) leaves the factory with tone ‘C’ pre-selected on the HEX switch.
- The unspecified device (UD) can be energized independently of the sounder (SD).

Wiring G-Series combination unit Dual "de d" terminal chamber requires six (6) conductors. With an AC or DC combination unit, three (3) conductors are required for input power (with an earth conductor) to the sounder, and three (3) conductors are required for input power (with an earth conductor) to the unspecified device (UD). The product setup and wiring within the "Ex d" housing is configured at the factory to-order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

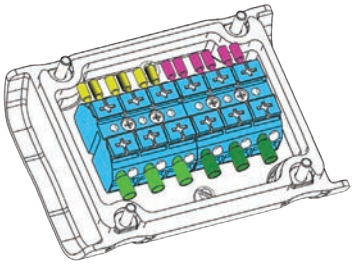


Figure 68
Dual-Unit (SD) Configuration

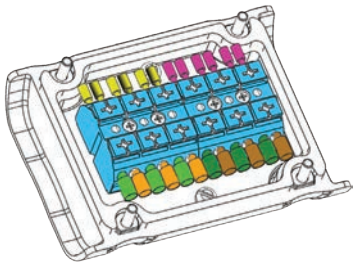


Figure 69
Dual-Unit (SD) with Power Loop-In/Loop-Out

G-Series combination devices allow for loop-in and loop-out connections through the "Ex de" terminal chamber, for connecting another G-Series combination unit, or another G-Series product. As with the other devices, if a nearby product requires AC or DC power loop-through, the G-Series "Ex de" terminal chamber supports power loop-out connection from the unspecified device's input power connection. As the "Ex de" terminal chamber provides two (2) M20 entries for cable passage, one entry must be dedicated for all incoming conductors, and one entry for all outgoing conductors.

Visual Products

LED Beacon

Feature Set

Multi-voltage input with loop-out terminal positions

- Universal AC (100-265VAC, 50/60Hz) with loop-out
- 24 Vdc with loop-out

Eight built-in light patterns with three (3) pattern speeds

	Pattern	Auto-Sync*
1	Steady-on	--
2	Flashing (60/75/90 FPM)	Yes
3	Swell (60/75/90 FPM)	Yes
4	Strobe (60/75/90 FPM)	Yes
5	Rotate Clockwise (60/75/90 RPM)	No
6	Rotate Counterclockwise (60/75/90 RPM)	No
7	Rotate Bounce (60/75/90 RPM)	No
8	Double Rotate Clockwise (60/75/90 RPM)	No

* Auto-Sync synchronizes devices powered from the same AC source/phase at 60Hz, when activated simultaneously.

Cable Entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

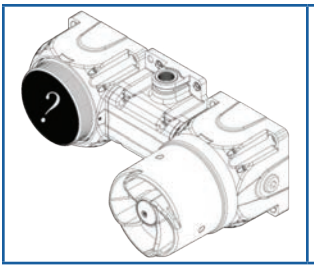


Figure 70
Sounder (SD) and Unspecified Device (UD)

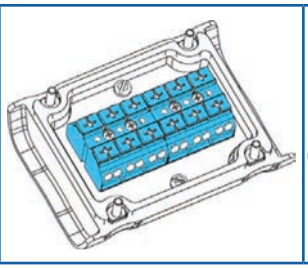


Figure 71
Dual "de d" Terminal Block (Common between devices)

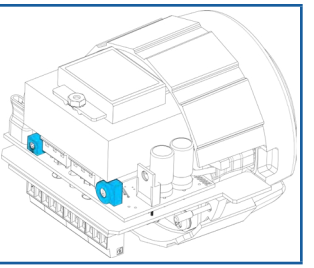


Figure 72
Level Adjust and Tone Selection (Sounder Only)

Xenon Strobe Beacon

Feature Set

Model-specific voltage input with loop-out terminal positions

- 110/120 Vac with loop-out
- 220-240 Vac with loop-out
- 24 Vdc with loop-out

Cable entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

Installing and Wiring the Flameproof "Ex d" Housing

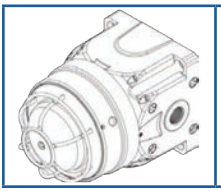


Figure 73
"Ex d" LED Beacon

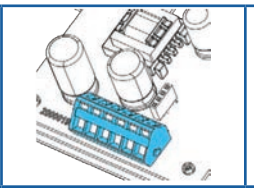


Figure 74
AC Input Power Terminal Block

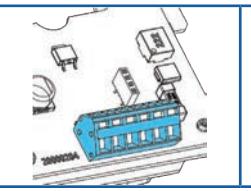


Figure 75
DC Input Power Terminal Block

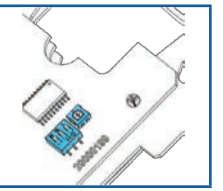


Figure 76
LED Pattern Select and Speed Dial

	Connection	Locations	Description
1	L1 or +	1	AC Power (“Hot/L1”) or DC Power (“+”)
2	L2 or -	1	AC Return (“Neutral/L2”) or DC Return (“-”)
3	Earth	1	Earth Ground Termination Point
4	L1 or +	1	AC Power (“Hot/L1”) or DC Power (“+”)
5	L2 or -	1	AC Return (“Neutral/L2”) or DC Return (“-”)
6	Earth	1	Earth Ground Termination Point
		6	

Wiring the G-Series LED Beacon "Ex d" housing for AC or DC power requires three (3) conductors for input power (with an earth conductor). The AC LED Beacon will accept a universal AC input (100-265 Vac, 50/60 Hz), and the DC LED Beacon will accept 24 Vdc.

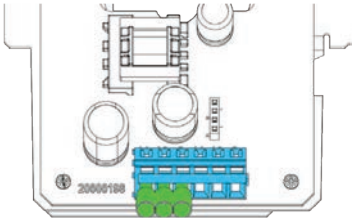


Figure 77
AC LED Beacon Wiring Locations

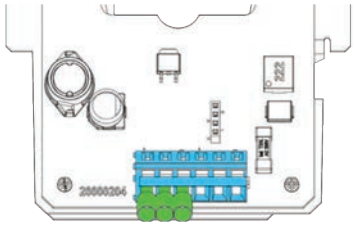


Figure 78
DC LED Beacon Wiring Locations

The G-Series LED Beacon is capable of displaying eight discrete visual patterns at three selectable speeds. These selections must be made during or prior to installation. (I.e., they are not remotely changeable.)

To adjust the LED pattern selection:

1. Locate the pattern switch on the 20000199 PCBA.
2. Modify the switch positions "1," "2," and "3" to match the desired pattern selection.

To adjust the LED pattern rate:

1. Locate the pattern rate potentiometer on the 20000199 PCBA.
2. Align the "dot" on the potentiometer dial with the desired rate. Select patterns on AC LED Beacons are capable of auto-synchronization.

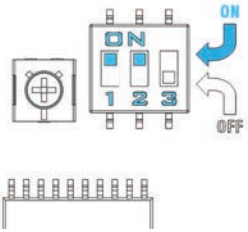


Figure 79
LED Flash Pattern Configuration (Set to Strobe Position)

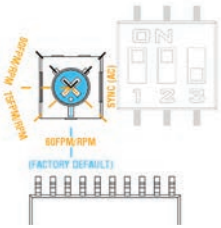


Figure 80
LED Flash Pattern Rate Configuration (Set to 75FPM Position)

Switch Position	Auto-Sync*	Pattern Name	Pattern Description
ON	--	Steady On	All five segments active 100% duty cycle.
ON	Yes	Flash	Light flashes at 66% duty cycle 60/75/90 FPM
ON	Yes	Swell	Light gradually fades on and off 60/75/90 FPM
ON	Yes	Strobe Simulation	Three 10ms pulses with 10ms pauses 60/75/90 FPM
ON	No	Rotate (Clockwise)	Simulated reflector rotate (smooth) 60/75/90 RPM
ON	No	Rotate (Counter-Clockwise)	Simulated reflector rotate (smooth) 60/75/90 RPM
ON	No	Half-Rotate "Bounce"	Simulated reflector rotate (smooth) Stop and reverse at ±90° 60/75/90 RPM
ON	No	Dual-Rotate (Clockwise)	Simulated dual light source reflector rotate (pinwheel) 60/75/90 RPM

* Auto-Sync synchronizes devices powered from the same AC source/phase at 60Hz when activated simultaneously.

If a nearby product requires AC or DC power loop-through, the G-Series "Ex d" housing supports power loop-out field termination. As the "Ex d" housing provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/loop-out topology.

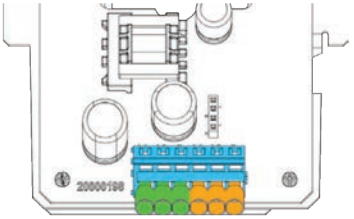


Figure 81
AC LED Beacon Wiring with Power Loop-Out

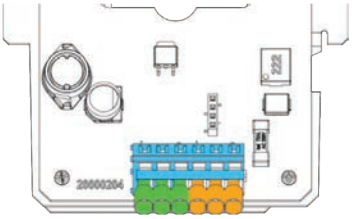


Figure 82
DC LED Beacon Wiring with Power Loop-Out

Installing and Wiring the Increased Safety "Ex de" Housing

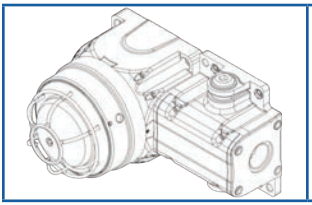


Figure 83
LED Beacon 'd'

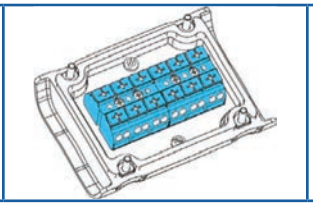


Figure 84
Terminal Block

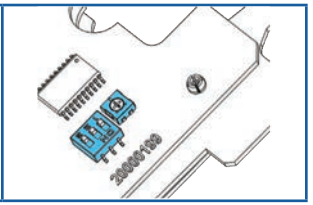


Figure 85
LED Pattern Select and Speed Dial

	Connection	Locations	Description
1	L1/+	4	Input Power In ("Hot/L1/DC+")
2	L2/-	4	Input Power Return ("Neutral/L2/DC-")
3		4	Earth Ground Termination Point
4	L3/Alt+	4	(Not Used)
5	Aud+	4	(Not Used)
6	Aud-	4	(Not Used)
		24	

Wiring the G-Series LED Beacon "Ex de" terminal chamber for AC or DC power requires three (3) conductors for input power (with an earth conductor). The G-Series LED Beacon setup and wiring within the "Ex d" housing is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

If a nearby product requires AC or DC power loop-through, the G-Series LED Beacon "Ex de" terminal chamber supports power loop-out field termination. As the "Ex de" terminal chamber provides three (3) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry, or that input cabling occupies two entries but only one entry is required for loop-out cabling, before architecting a loop-in/loop-out topology.

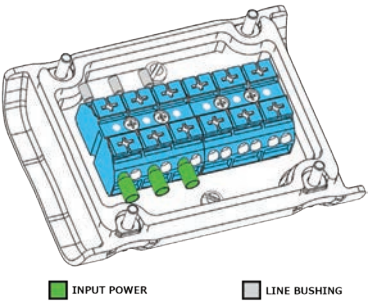


Figure 86
LED Beacon Wiring Locations (AC or DC)

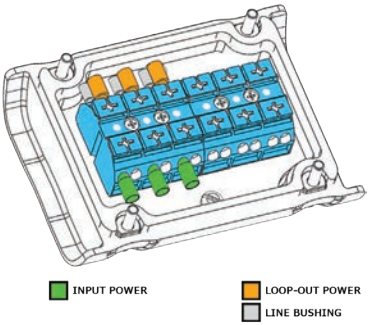


Figure 87
LED Beacon with Power Loop-Out (AC or DC)

Installing and Wiring Dual "de d" Combination Unit Housings

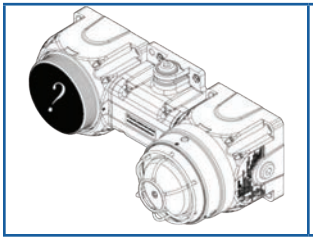


Figure 88
LED Beacon (LB) and Unspecified Device (UD)

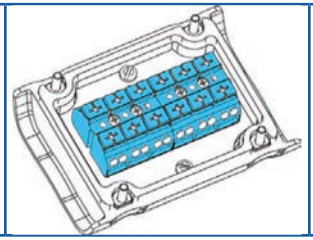


Figure 89
Terminal Block (Common between devices)

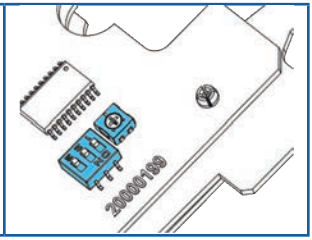


Figure 90
LED Pattern Select and Speed Dial (LED Device)

	Connection	Locations	Description
1	L1/+	4	Input Power In (“Hot/L1/DC+”)
2	L2/-	4	Input Power Return (“Neutral/L2/DC-”)
3	Alt1	4	Earth Ground Termination Point
4	Alt2	4	Input Power In (“Hot/L1/DC+”)
5	Alt3	4	Input Power Return (“Neutral/L2/DC-”)
6	Alt4	4	Earth Ground Termination Point
		24	

Wiring an AC or DC G-Series Combination Unit Dual "de d" terminal chamber with an LED Beacon requires three (3) conductors are required for input power (with an earth conductor), leaving three (3) terminal locations open for the unspecified device (UD). The product setup and wiring within the "Ex d" housing is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

If a nearby product requires AC or DC power loop-through, G-Series combination unit Dual "de d" terminal chamber supports power loop-out field termination. As the Dual "de d" terminal chamber provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/loop-out topology.

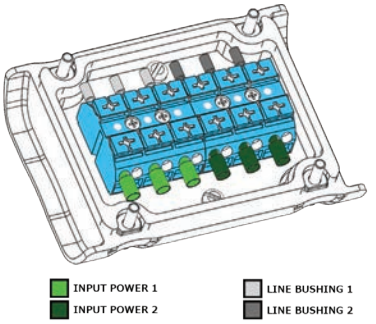


Figure 91
Dual-Unit (LB) Wiring Locations

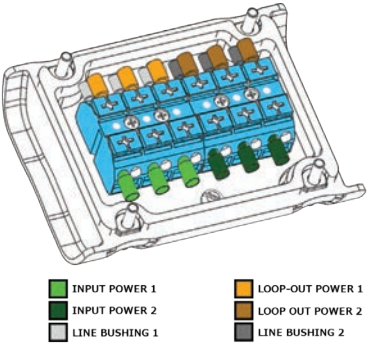


Figure 92
Dual-Unit (LB) with Power Loop-Out

Xenon Strobe Beacon

Feature Set

Model-specific voltage input with loop-out terminal positions

- 110/120 Vac with loop-out
- 220-240 Vac with loop-out
- 24 Vdc with loop-out

Cable Entries

- Flameproof "Ex d": 2 x M20 entries (opposing sides)
- Increased Safety "Ex de": 3 x M20 entries (opposing sides and base)
- Dual "de d" Combination Devices: 2 x M20 entries (opposing sides)

Installing and Wiring the Flameproof "Ex d" Housing

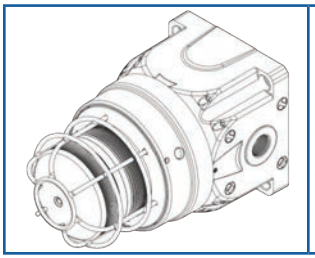


Figure 93
"Ex d" Xenon Strobe Beacon

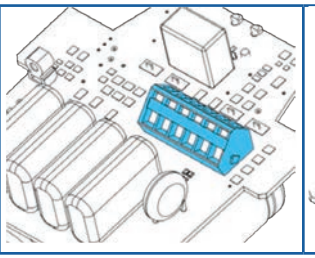


Figure 94
C Terminal Block

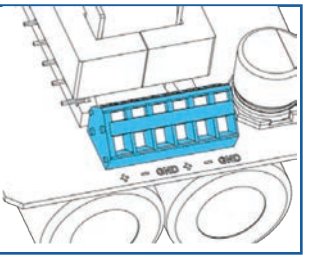


Figure 95
DC Terminal Block

	Connection	Locations	Description
1	L1 or +	1	AC Power (“Hot/L1”) or DC Power (“+”)
2	L2 or -	1	AC Return (“Neutral/L2”) or DC Return (“-”)
3	Earth	1	Earth Ground Termination Point
4	L1 or +	1	AC Power (“Hot/L1”) or DC Power (“+”)
5	L2 or -	1	AC Return (“Neutral/L2”) or DC Return (“-”)
6	Earth	1	Earth Ground Termination Point
		6	

Wiring the G-Series Xenon Strobe Beacon "Ex d" housing for AC or DC power requires three (3) conductors for input power (with an earth conductor). Depending on the model ordered, the Xenon Strobe Beacon will accept either 110 Vac, 50/60 Hz; or 220 Vac, 50/60 Hz. The DC Xenon Strobe Beacon will accept 24 Vdc.

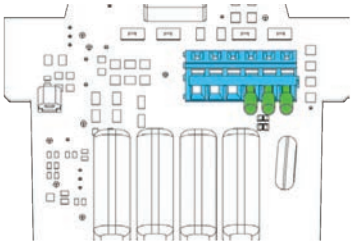


Figure 96
AC Xenon Strobe Beacon Wiring Locations

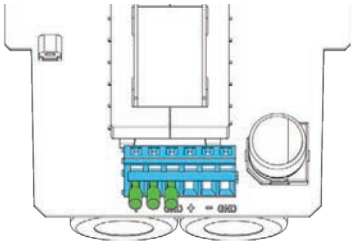


Figure 97
DC Xenon Strobe Beacon Wiring Locations

If a nearby product requires AC or DC power loop-through, the G-Series Xenon Strobe Beacon "Ex d" housing supports power loop-out field termination. As the "Ex d" housing provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying that the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/ loop-out topology.

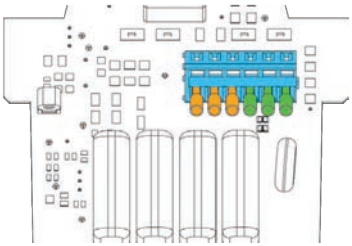


Figure 98
AC Xenon Strobe Beacon with Power Loop-Out

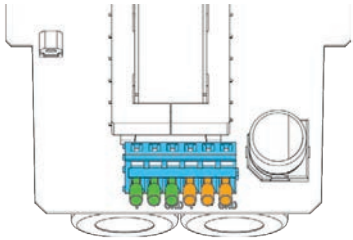


Figure 99
DC Xenon Strobe Beacon with Power Loop-Out

Installing and Wiring the Increased Safety "Ex de" Housing

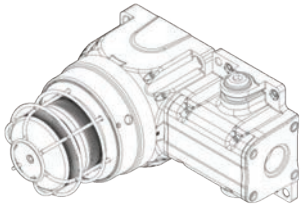


Figure 100
Xenon Strobe Beacon 'de'

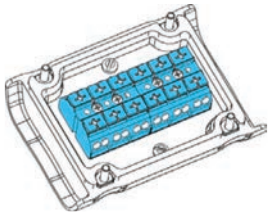


Figure 101
Terminal Block

	Connection	Locations	Description
1	L1/+	4	Input Power In ("Hot/L1/DC+")
2	L2/-	4	Input Power Return ("Neutral/L2/DC-")
3		4	Earth Ground Termination Point
4	L3/Alt+	4	(Not Used)
5	Aud+	4	(Not Used)
6	Aud-	4	(Not Used)
		24	

Wiring an AC or DC G-Series combination unit Dual "de d" terminal chamber with a Xenon Strobe Beacon (SB) requires three (3) conductors are required for input power (with an earth conductor), leaving three (3) terminal locations open for the unspecified device (UD). The product setup and wiring within the "Ex d" housing is configured at the factory to-order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

If a nearby product requires AC or DC power loop-through, G-Series combination Dual "de d" terminal chamber supports power loop-out field termination. As the Dual "de d" terminal chamber provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/ loop-out topology.

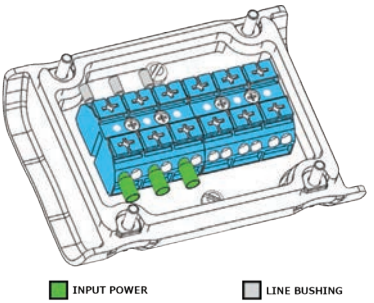


Figure 102
Xenon Strobe Beacon Wiring Locations (AC or DC)

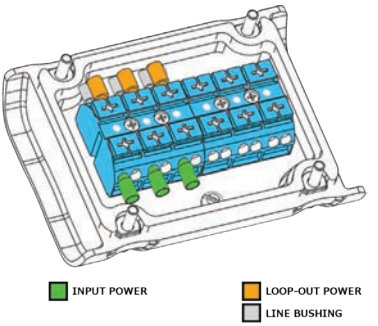


Figure 103
Xenon Strobe Beacon with Power Loop-Out (AC or DC)

Installing and Wiring Dual "de d" Combination Unit Housings

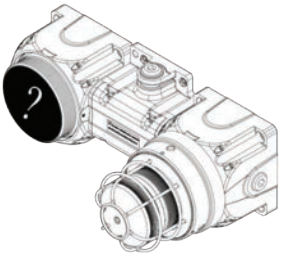


Figure 104
Xenon Strobe Beacon (SB) and Unspecified Device (UD)

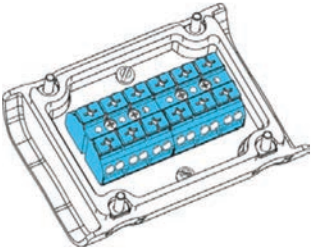
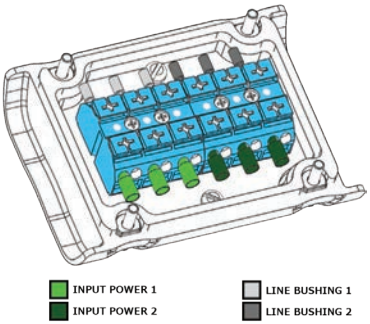


Figure 105
Dual "de d" Terminal Block (Common Between Devices)

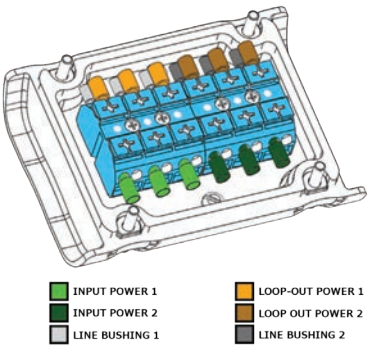
	Connection	Locations	Description
1	L1/+	4	Input Power In (“Hot/L1/DC+”)
2	L2/-	4	Input Power Return (“Neutral/L2/DC-”)
3	Alt1	4	Earth Ground Termination Point
4	Alt2	4	Input Power In (“Hot/L1/DC+”)
5	Alt3	4	Input Power Return (“Neutral/L2/DC-”)
6	Alt4	4	Earth Ground Termination Point
		24	

Wiring an AC or DC G-Series combination unit Dual "de d" terminal chamber with a Xenon Strobe Beacon (SB) requires three (3) conductors are required for input power (with an earth conductor), leaving three (3) terminal locations open for the unspecified device (UD). The product setup and wiring within the "Ex d" housing is configured at the factory to order; the only installation requirement for device operation is field wire termination to the proper terminal block position.

If a nearby product requires AC or DC power loop-through, G-Series combination Dual "de d" terminal chamber supports power loop-out field termination. As the Dual "de d" terminal chamber provides two (2) M20 entries for cable passage, at least one entry must be dedicated for incoming conductors. Federal Signal recommends verifying the application wiring requirements and cable conductor count allow for input cabling to occupy a single entry before architecting a loop-in/ loop-out topology.



Dual-Unit (SB) Wiring Locations



Dual-Unit (SB) with Power Loop-Out

Service

Unauthorized repair/servicing of the unit may result in degradation of performance and/or property damage, serious injury, or death to you or others. If a malfunctioning unit is encountered, do not attempt any field repair/retrofit of parts.

Federal Signal will service your equipment or provide technical assistance with any problems that cannot be handled locally.

Technical Assistance: Contact our Technical Support Team at +1 708-587-3587 or Federal01signalsupport@fedsig.com.

Repair Service: A return authorization is required. Contact your Authorized Distributor or Federal Signal Customer Support at +1 708-534-4756 or iordersup@fedsig.com. Defective products under warranty will be repaired or replaced at Federal Signal's discretion. Lamp failures excluded.

Product Returns: A return authorization is required from Federal Signal prior to returning the product. Contact your Authorized Distributor for more information or to request a product return.

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