

# CXD-Q Amplifier



## Quick Start Guide

### EXPLANATION OF TERMS AND SYMBOLS

The term “**WARNING!**” indicates instructions regarding personal safety. If the instructions are not followed the result may be bodily injury or death.

The term “**CAUTION!**” indicates instructions regarding possible damage to physical equipment. If these instructions are not followed, damage to the equipment could result that may not be covered under the warranty.

The term “**IMPORTANT!**” indicates instructions or information that are vital to the successful completion of the procedure.

The term “**NOTE**” indicates additional useful information..



The lightning flash with arrowhead symbol in a triangle is to alert the user to the presence of uninsulated dangerous voltage within the product's enclosure that may constitute a risk of electric shock to humans.



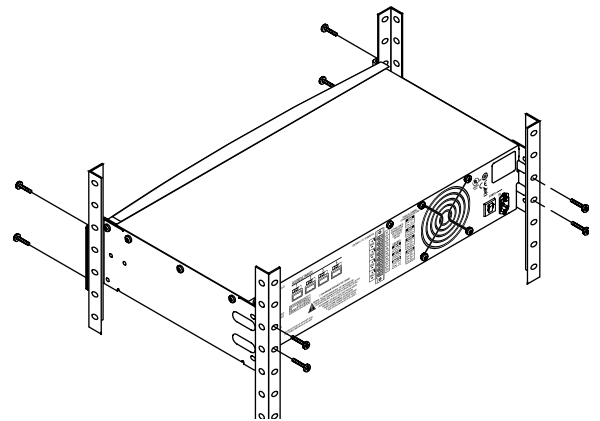
The exclamation point within an equilateral triangle is to alert the user to the presence of important safety, and operating and maintenance instructions in this manual..



**NOTE:** This Quick Start Guide assumes starting with the amplifier's basic factory configuration, with four separate inputs and four separate outputs. For detailed instructions for custom configurations refer to the CXD-Q User Guide (TD-000438).

### Rack Mount the Amplifier

1. Secure the amplifier in the rack with eight screws (not supplied)—four in front, four in back.



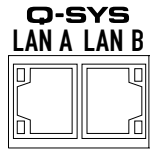
– Figure 1 –



# Connections

## Q-SYS Q-LAN

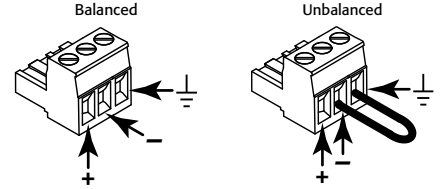
Connect LAN A, and if available, LAN B, to the Q-LAN network. (Figure 2) Refer to your Q-SYS documentation for network requirements and connection detail.



– Figure 2 –

## Inputs

The CXD-Q amplifiers convert the analog input signals into digital audio streams and then route them over the network to the Q-SYS Core Processor for routing and processing. In the Q-SYS design, the digital signals appear at the CXD-Q input component. From there they can be directed as needed. Refer to the Q-SYS documentation.



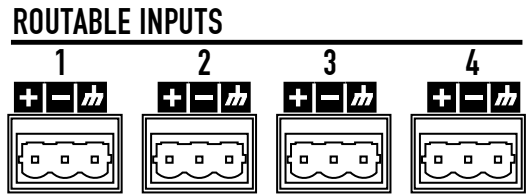
– Figure 3 –

– Figure 4 –

1. Wire the audio line-level sources to up to the Euro-style connectors (supplied). You may use either balanced inputs (Figure 3) or unbalanced inputs (Figure 4).
2. Plug the connectors into the appropriate receptacles (Routable Inputs 1, 2, 3, 4) Figure 5.



**WARNING!** Do not turn the amplifier on yet.



– Figure 5 –

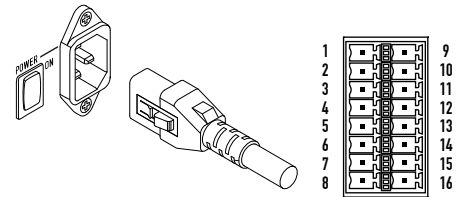
3. Plug the IEC power cord into the AC receptacle on the rear of the amplifier. (Figure 6)

## GPIO

Refer to "GPIO" on page 8 for details about using the GPIO.

## Outputs and Configuration

The configuration of the amplifier must match that of its corresponding amplifier component in the Q-SYS design. Double check them, and if necessary change the amplifier configuration by following the instructions on its front panel. Note that changing the output configuration of the amplifier changes the outputs to the loudspeakers accordingly. Use the diagrams shown in Figure 8 thru Figure 10 as references for wiring the loudspeakers. After you connect the outputs to the loudspeakers you may turn the amplifier on.



– Figure 6 –

– Figure 7 –

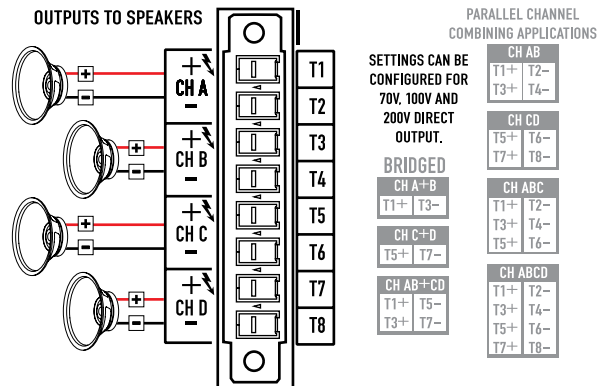
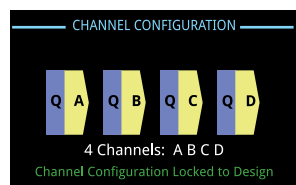
Figure 8 through Figure 11 illustrate three types of output channel configurations: separate, bridged, and parallel. The tables to the right of the loudspeaker connections show all the configurations possible and how to connect them.

## Separate Channels (A B C D)

### Up to four separate loudspeaker loads

Use up to four 2-wire cables; connect to:

- T1+/T2- (Loudspeaker 1)
- T3+/T4- (Loudspeaker 2)
- T5+/T6- (Loudspeaker 3)
- T7+/T8- (Loudspeaker 4)



– Figure 8 –

## Bridged (A+B) and Separate (C D) Channels

### For A+B (bridged) to one loudspeaker load

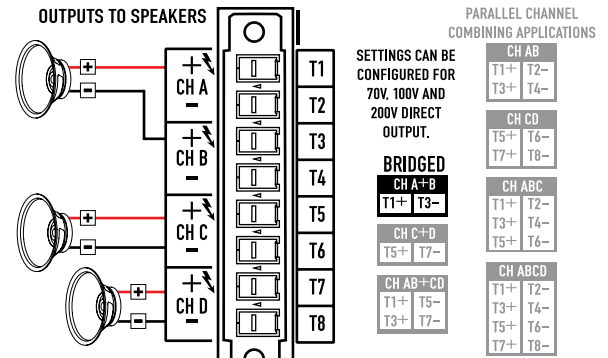
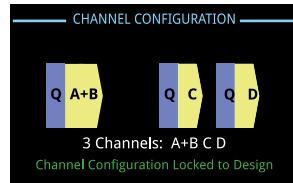
Use one 2-wire cable; connect to:

- T1+/T3-

### For C & D (separate) to two loudspeaker loads

Use two 2-wire cables; connect to:

- T5+/T6- for CH C
- T7+/T8- for CH D



– Figure 9 –

## Parallel Channels (ABCD)

### One loudspeaker load

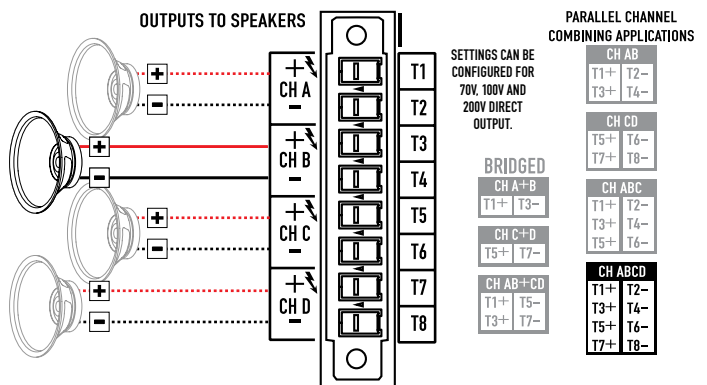
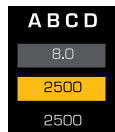
Use one 2-wire cable; connect to:

- T3+/T4- (or T5+/T6-)

### Multiple loudspeaker loads

Use up to four 2-wire cables; connect to:

- T3+/T4-
- T5+/T6-
- T1+/T2-
- T7+/T8-



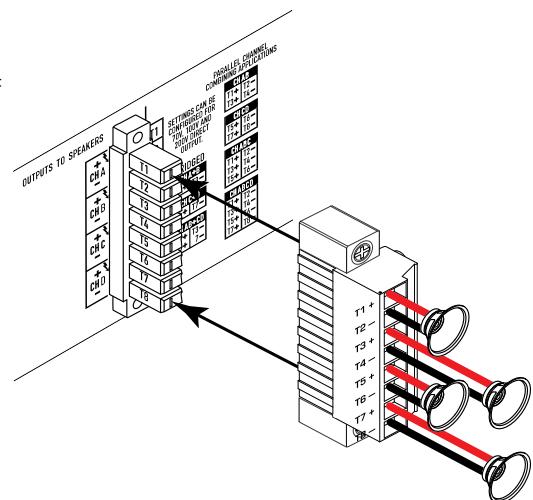
In this mode:

- T1+, T3+, T5+, and T7+ are connected together electrically
- T2-, T4-, T6-, and T8- are connected together electrically

– Figure 10 –

## Connect the Loudspeakers

1. Connect the loudspeaker wiring to the 8-pin Euro-style connector as needed for your amplifier's configuration.
2. Install the female 8-pin Euro-style connector onto the male connector on the rear of the amplifier as shown in Figure 11.
3. Use a Phillips screwdriver to secure the connector.



– Figure 11 –

# Amplifier Control



**NOTE:** The following scenarios assume that the amplifier is connected to the Q-SYS Core Processor via Q-LAN. When the amplifier is not connected to the Core Processor it goes into a Fault mode, and becomes non-operational.

## Off Mode



- Rear power switch is off; the amplifier is not operable. The power switch is the AC mains disconnect.
- The power button is not lit.
- Turn the power switch on. The amplifier enters the mode in which it was when power was removed – Run, Mute All, or Standby.

## Run Mode



- From Standby or Mute All mode, press and release the power button on the front panel. The amplifier is in Run Mode.
- The power button lights green.
- The amplifier is fully operable; audio can pass.

## Standby Mode



- From Mute All or Run mode, press and hold the power button on the front panel for approximately four seconds.
- The power button lights solid red.
- The amplifier is not operable; audio will not pass.

## Mute All Mode



- From the Run Mode, quickly press and release the power button.
- The power button flashes red; all the output Mute buttons are red.
- The amplifier output is disabled but the front panel is fully operable.

## Master Control Knob



- Adjusts gain for the selected channel or channels. At least one channel must be selected.
- When one or more channels are selected, turn the Master Control knob to jump to the Gain screen. After a few seconds with no activity, it will return to the earlier screen.
- If more than one channel is selected and their gains are different, the knob will adjust their gains while maintaining the relative difference between or among them, up until one of the channels reaches its upper or lower gain limit.

## NEXT and PREV Buttons



- Navigates forward and backwards through the screens.

## ID Button



- Press this button to display the amplifier's network name. At the same time, the ID buttons on the associated Q-SYS Amplifier component and the associated Q-SYS Configurator item will flash. Press the ID Button again or click one of the other ID buttons to stop the flashing and exit the screen.
- Use this button also when prompted to synchronize the amplifier configuration to the associated Q-SYS design.

## SEL Buttons



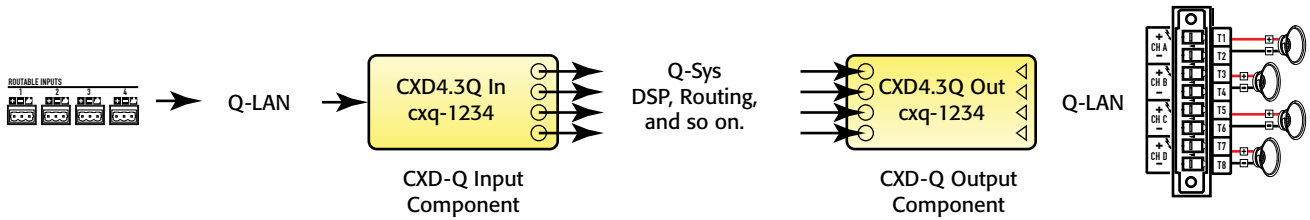
- Use these buttons to select an output channel whose gain you wish to change.
- Select more than one channel to change multiple gain settings at the same time.
- If two or more output channels are bridged or in parallel, selecting any channel in the group will select the others as well.

# Inputs and Outputs

The CXD-Q amplifiers have four mic/line inputs and four amplified outputs on the rear of the amplifier. The inputs and outputs are not connected inside the amplifier.

The CXD-Q amplifiers convert the analog input signals into digital audio streams and then route them over the Q-LAN network (LAN A and/or LAN B) to the Q-SYS Core Processor for routing and processing. In the Q-SYS design, the digital signals appear at the CXD-Q input component. From there they can be directed as needed. Refer to the Q-SYS documentation.

In the Q-SYS design, digital signals meant for amplification are received via Q-LAN from the Core Processor at the CXD-Q Output component. The CXD-Q Output component may have one to four outputs, depending on the configuration of the amplifier. Use the amplifier Properties menu to select the desired configuration and use the amplifier's ID button to accept the configuration.

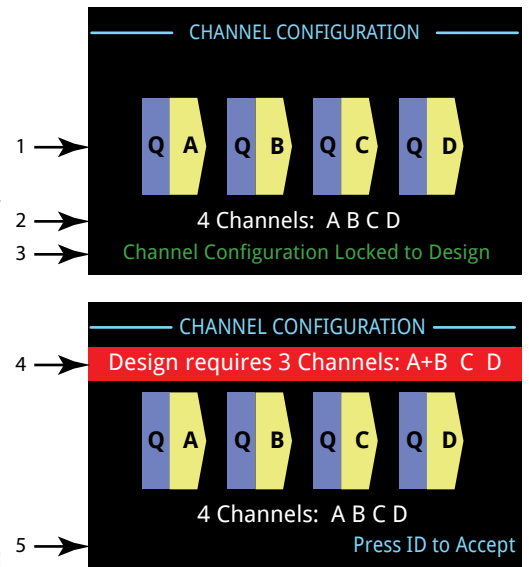


– Figure 12 –

## Screens

### Channel Configuration Screens

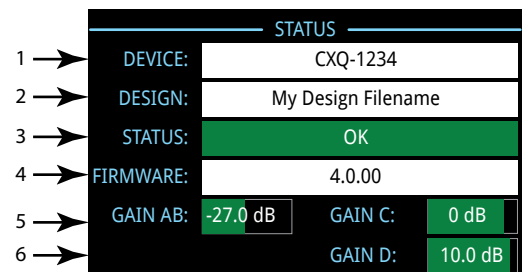
1. **Graphic representation of the assignments of audio streams to output channels** – Signals (Q) are audio streams from the Q-LAN network, and the output channels are A through D.
2. **Number of individual channel outputs and their configuration** – See the Q-SYS help for the CXD-Q Amplifier component to review all available configurations.
3. **Indication that the Q-SYS design and the amplifier are in sync.**
4. **Indication that the amplifier is not synchronized to the Q-SYS design; user action is required.**
5. **Indication that user action—pressing the amplifier's ID button—is required to accept the amplifier configuration.**



– Figure 13 –

### Status Screen

1. **DEVICE:** This is the hostname (network name) of the amplifier. A default name is assigned at the factory, but you may change it in the Q-SYS Configurator.
2. **DESIGN:** This is the name of the Q-SYS design containing the amplifier. The amplifier will only operate if it is in a running Q-SYS design.
3. **STATUS:** The color of the bar and the text display the current status of the amplifier.
  - **OK** – Green bar; means both audio and hardware are good.
  - **Compromised** – Orange bar; audio is good but a redundancy mechanism is active (one LAN down but the other is still up) or a non-fatal hardware problem exists (fans too slow, temperature higher than expected, etc.)
  - **Fault** – Red bar; audio is stopped, or hardware is malfunctioning or misconfigured (amplifier off, audio streams broken, amplifier fault, loudspeaker short circuit, etc.)
  - **Initializing** – Blue bar; indicates initialization or design start. Audio does not pass.
4. **FIRMWARE:** Indicates the Q-SYS firmware version. To update the firmware:
  - a. Open the Q-SYS Designer Software version associated with the desired firmware version.
  - b. Connect the amplifier to the network and turn it on.

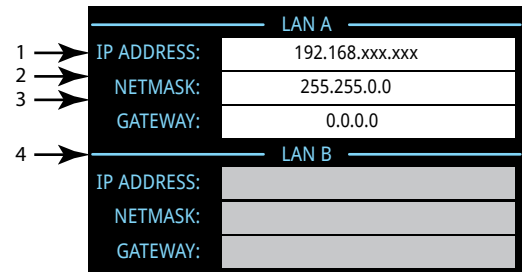


– Figure 14 –

- c. Open the Q-SYS design that contains the amplifier. Select **File > Save to Core and Run**.
- d. The amplifier, Core Processor, and any other Q-SYS peripherals included in the design will automatically update.
5. **GAIN A - D:** Displays the current gain setting of each channel. Combined channels (bridging or parallel) are displayed together. The green background is a bargraphical representation of the gain setting as well.

### LAN A / LAN B Screen (Figure 15)

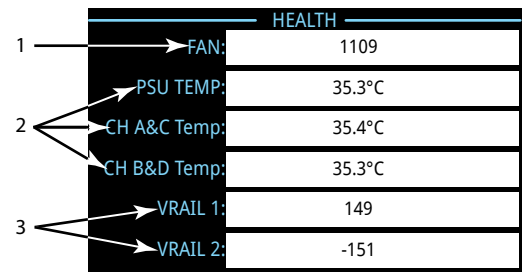
1. **IP Address**—Use Q-SYS Configurator to edit parameters. LAN A is required and cannot be turned off.
2. **Netmask**.
3. **Gateway**.
4. **LAN B** – LAN B is not required but if it is used, the network parameters appear here..



– Figure 15 –

### Health Screen

1. FAN – Speed in RPM; varies with internal temperature.
2. PSU TEMP; CH A&C Temp; CH B&D Temp – The amplifier monitors three different temperatures and automatically triggers limiting or shutdown at these thresholds:
  - Thermal limiting starts at 69° C
  - Thermal shutdown at 80° C
3. VRAIL 1; VRAIL 2 – Indicate the output section rail voltages. These are the normal values:
  - VRail 1 = +147 VDC +/- 5V (typical)
  - VRail 2 = -147 VDC +/- 5V (typical)

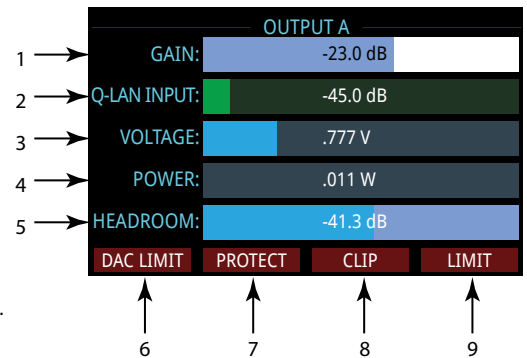


– Figure 16 –

### Output Screens

Each output or group of outputs has a dedicated screen. Figure 17 is an example.

1. **GAIN** – The gain applied to the signal in the output section. It is controlled by the GAIN knob on the front panel of the amplifier or the GAIN control in the CXD-Q Output component in the Q-SYS Design.
2. **INPUT** – The audio signal level applied to the CXD-Q Output component in the Q-SYS design. This meter reading can be changed from RMS to Peak in the Amplifier Out component in the Q-SYS design.
3. **VOLTAGE** - The output voltage delivered to the loudspeaker. This reading can be RMS or peak depending on the Meter Select setting in the Q-SYS design for the associated channel.
4. **POWER** – The power of the amplifier / loudspeaker circuit. This reading can be average (“RMS”) or peak depending on the Meter Select setting in the Q-SYS design.
5. **HEADROOM** – The headroom, referenced to the amplifier's maximum output before clipping.
6. **DAC LIMIT** – Indicates that the signal to the D to A converter is too high and the limiter has engaged to prevent clipping. This is a sign that the gain structure is not correct.
7. **PROTECT** – Indicates that the channel is in Protect Mode. The usual cause is an excessively low load impedance or short circuit.
8. **CLIP** – Indicates that the output signal exceeds the amplifier's maximum output voltage capability.
9. **LIMIT** – Indicates the amplifier limiter is acting on the signal. Clipping, excessive output current, short circuits, or excessive operating temperature will trigger the limiter.



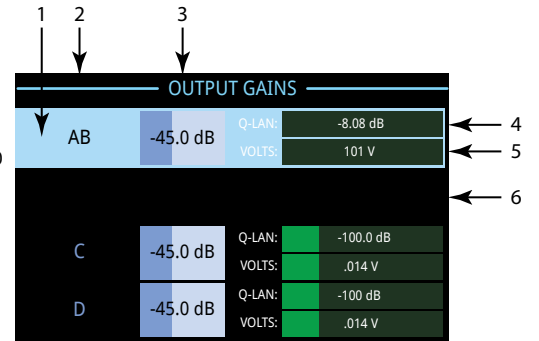
– Figure 17 –

## Output Gains Screen

The Output Gains screen provides a quick overview of all outputs. Adjust output gains here.

To access this screen, use the NEXT or PREV buttons or press one or more of the SEL buttons. Then adjust gain for the selected channels. If you press one or more of the SEL buttons but do not make any gain adjustments, this screen will remain visible for a short time but then return to the previous screen.

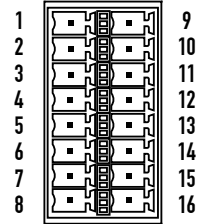
1. The highlighted background indicates the channel selected.
2. The channels are displayed according to the configuration of the amplifier.
3. The output gain is controlled by the GAIN knob on the amplifier or by the Gain control in the CXD-Q Output component in the Q-SYS design.
4. The level of the Q-LAN digital audio stream applied to the channel, referenced to digital full-scale.
5. The output voltage of the channel or group of channels.
6. In this example, channels A and B are parallel, while C and D are separate.



– Figure 18 –

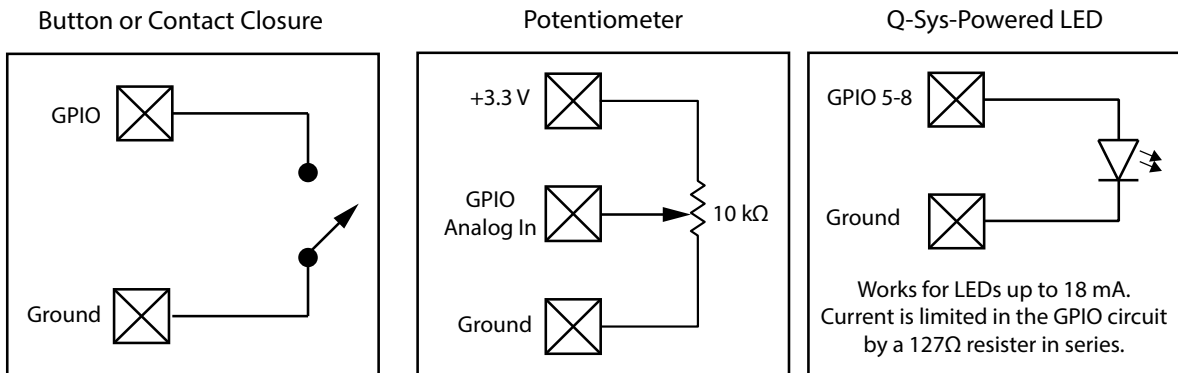
# GPIO

Connector Pin	GPIO # and Function	Specifications
1	3.3 V	100 mA max (power cycle to reset current limiting IC)
2	GPIO 1	5 mA in/out, 3.3 V max; 127 ohm resistor in series
3	GPIO 2	5 mA in/out, 3.3 V max; 127 ohm resistor in series
4	GND	Ground
5	GPIO 3	5 mA in/out, 3.3 V max; 127 ohm resistor in series
6	GPIO 4	5 mA in/out, 3.3 V max; 127 ohm resistor in series
7	GND	Ground
8	GPIO 5	18 mA in/out max, 3.3 V max; 127 ohm resistor in series
9	RELAY NO	Relay Normally Open
10	RELAY COM	Relay Common
11	RELAY NC	Relay Normally Closed
12	GND	Ground
13	GPIO 6	18 mA in/out max, 3.3 V max; 127 ohm resistor in series
14	GPIO 7	18 mA in/out max, 3.3 V max; 127 ohm resistor in series
15	GND	Ground
16	GPIO 8	18 mA in/out max, 3.3 V max; 127 ohm resistor in series



– Figure 19 –

## Examples



– Figure 20 –





## Contact

### Mailing Address

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### FAX

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### E-mail

[info@qsc.com](mailto:info@qsc.com)

## Support

### 24/7 Support

QSC offers 24/7 support only on Q-SYS™  
Networked Audio Systems.

### Full Support for all QSC Products

Business Hours: 6 AM to 5 PM Pacific Time (Mon-Fri)

Tel. 800-772-2834 (U.S. only)

Tel. +1 (714) 957-7150

Fax. +1 (714) 754-6173

### Q-SYS Emergency-only After-Hours and Weekend Support\*

Tel: +1-888-252-4836 (U.S./Canada)

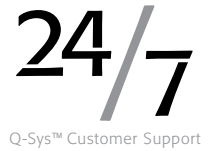
Tel: +1-949-791-7722 (non-U.S.)

\* After-hours calls are guaranteed a 30 minute response time from a Q-SYS Support Team member. For Q-SYS ONLY!

### E-mail

[qsysupport@qsc.com](mailto:qsysupport@qsc.com)

(An immediate e-mail response is not guaranteed. For URGENT issues use the phone numbers above.)



If you would like a full copy of the CXD-Q User manual, visit the QSC website at [www.qsc.com](http://www.qsc.com), or contact Customer Service +1 714 957-7150 or toll free (USA only) (800) 772-2834 to receive a copy by mail.

Si desea obtener una copia completa del manual del usuario de la CXD-Q, visite el sitio web de QSC en [www.qsc.com](http://www.qsc.com), o póngase en contacto con el Servicio al Cliente al +1 714 957-7150 o sin costo (sólo en EE.UU.) al (800) 772-2834 para recibir una copia por correo.

Pour obtenir un exemplaire complet du manuel d'utilisation de la CXD-Q, allez sur le site Web QSC à [www.qsc.com](http://www.qsc.com) ou contactez le service clientèle au +1 714 957-7150 ou au (800) 772-2834 (numéro vert - USA seulement) pour recevoir un exemplaire par courrier.

Ein vollständiges Exemplar des Benutzerhandbuchs für die CXD-Q finden Sie auf der QSC-Website unter [www.qsc.com](http://www.qsc.com). Sie können sich unter +1 714 957-7150 oder unter der (nur in den USA) gebührenfreien Nummer +1 (800) 772-2834 auch an den Kundendienst wenden, um sich ein Exemplar zuschicken zu lassen.

如果您需要 CXD-Q 产品用户手册的完整副本，请访问 QSC 网站 [www.qsc.com](http://www.qsc.com)，或致电客户服务部门 +1 714 957-7150，或拨打免费电话（仅限美国）(800) 772-2834 通过邮件获取副本。