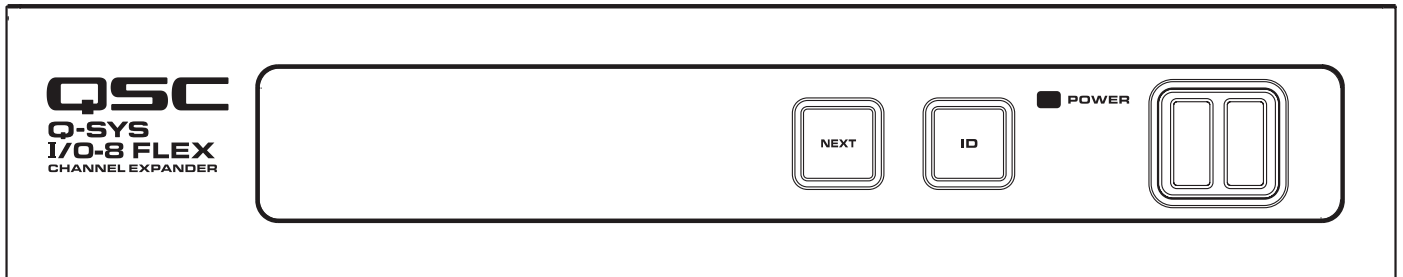


Hardware User Guide

I/O-8 Flex – Channel Expander



TD-000520-00-A



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, it may result in damage to the equipment 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**” is used to indicate additional useful information.



The intent of the lightning flash with arrowhead symbol in a triangle is to alert the user to the presence of un-insulated "dangerous" voltage within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to humans.



The intent of 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.

EN



IMPORTANT SAFETY INSTRUCTIONS



WARNING!: TO PREVENT FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

- **Elevated Operating Ambient** - If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than room ambient. Consideration should be given to ensure that the maximum operating temperature range (0°C to 50°C (32°F to 122°F)) is not exceeded.
- **Reduced Air Flow** – Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Do not submerge the apparatus in water or liquids.
7. Do not use any aerosol spray, cleaner, disinfectant or fumigant on, near or into the apparatus.
8. Clean only with a dry cloth.
9. Install in accordance with the manufacturer's instructions.
10. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
11. Do not unplug the unit by pulling on the cord, use the plug.
12. Only use attachments/accessories specified by the manufacturer.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Adhere to all applicable, local codes.
16. Consult a licensed, professional engineer when doubt or questions arise regarding a physical equipment installation.

Maintenance and Repair



WARNING!: Advanced technology, e.g., the use of modern materials and powerful electronics, requires specially adapted maintenance and repair methods. To avoid a danger of subsequent damage to the apparatus, injuries to persons and/or the creation of additional safety hazards, all maintenance or repair work on the apparatus should be performed only by a QSC authorized service station or an authorized QSC International Distributor. QSC is not responsible for any injury, harm or related damages arising from any failure of the customer, owner or user of the apparatus to facilitate those repairs.

FCC Statement

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.



IMPORTANT!: PoE+ Power Input - Requires IEEE 802.3at Class 4 PSE able to source full power (25.5W at LAN A port on the I/O-8 Flex channel expander).



IMPORTANT!: The Q-SYS I/O-8 Flex may operate at elevated temperatures and therefore its exterior may become noticeably warm. This is normal. The Q-SYS I/O-8 Flex is designed with convection cooling in mind and therefore incorporates industrial high-temp components to accommodate higher operating temperatures.

Expected Product Life Cycle: 20 years, **Storage Temperature range:** -20°C to + 70°C, **Relative Humidity:** range of 5 - 85% RH non-condensing.

Warranty

For a copy of the QSC Limited Warranty, visit the QSC, LLC. website at www.qsc.com

Para una copia de la Garantía Limitada de QSC, visite el sitio web de QSC, LLC., en www.qsc.com

Pour obtenir une copie de la garantie limitée de QSC, visitez le site de QSC, LLC. à www.qsc.com

Besuchen Sie die Webseite von QSC, LLC. (www.qsc.com) um eine Kopie der beschränkten Garantie von QSC zu erhalten.

如果您想要QSC有限保修的複印本, 請造訪QSC音頻產品的網站www.qsc.com

Для получения копии ограниченной гарантии QSC посетите веб-сайт QSC, LLC., расположенный по адресу www.qsc.com.

للحصول على نسخة من الضمان المحدود الخاص بـQSC، قم بزيارة الموقع الإلكتروني لشركة QSC للمنتجات الصوتية على www.qsc.com

QSC限定保証の複製には、QCSのウェブサイトwww.qsc.comにアクセスしてください。

RoHS Statement

The QSC Q-SYS I/O-8 Flex is in compliance with European Directive 2011/65/EU – Restriction of Hazardous Substances (RoHS2).

The QSC Q-SYS I/O-8 Flex is in compliance with “China RoHS” directives. The following chart is provided for product use in China and its territories:

		QSC Q-SYS I/O-8 Flex				
部件名称 (Part Name)	有害物质 (Hazardous Substances)					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(vi))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
电路板组件 (PCB Assemblies)	X	0	0	0	0	0
机壳装配件 (Chassis Assemblies)	X	0	0	0	0	0

本表格依据 SJ/T 11364 的规定编制。

O: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。

X: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。

(目前由于技术或经济的原因暂时无法实现替代或减量化。)

This table is prepared following the requirement of SJ/T 11364.

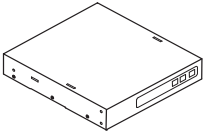

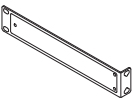

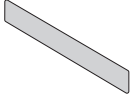
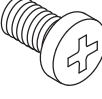


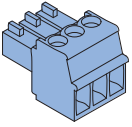
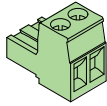
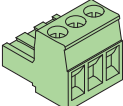
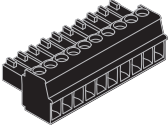


O: Indicates that the concentration of the substance in all homogeneous materials of the part is below the relevant threshold specified in GB/T 26572.

X: Indicates that the concentration of the substance in at least one of all homogeneous materials of the part is above the relevant threshold specified in GB/T 26572.

(Replacement and reduction of content cannot be achieved currently because of the technical or economic reason.)

EN

What's in the Box

 <p>I/O-8 Flex</p> <p>1</p>	 <p>Rack-Ear Spacer</p> <p>(2x)</p>	 <p>Rack Ear</p> <p>(2x)</p>	 <p>Joining Plate</p> <p>(2x)</p>
 <p>Rack-Ear Cover Label</p> <p>(1x)</p>	 <p>Phillips Pan Head M4 x 7 mm</p> <p>(6x)</p>	 <p>Phillips Flathead M3 x 6 mm</p> <p>(6x)</p>	 <p>Foam Spacer</p> <p>(4x)</p>
 <p>Flex Channels (blue)</p> <p>(8x)</p>	 <p>External Power (green)</p> <p>1</p>	 <p>RS232 Tx/Rx (green)</p> <p>1</p>	 <p>GPIO (black)</p> <p>(2x)</p>
 <p>QSC Warranty TD-000453</p> <p>1</p>	 <p>Safety and Regulatory Statments TD-001514</p> <p>1</p>		

EN

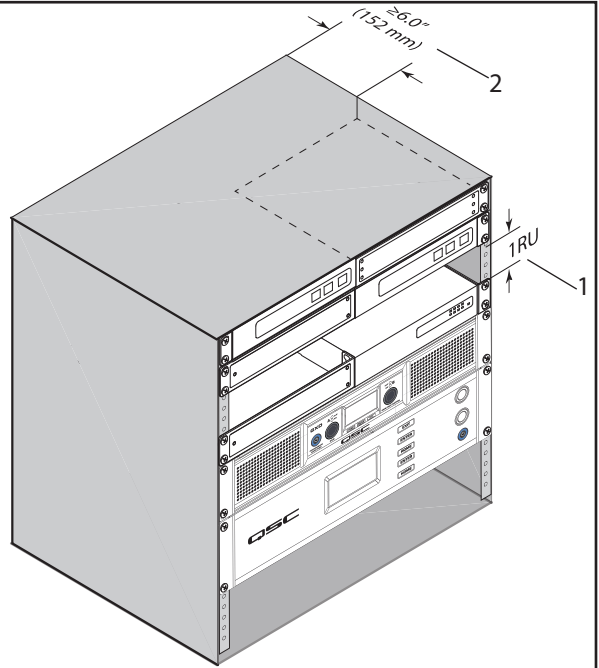
Installation

Ventilation

- Recommend 1RU (1.75 in / 44.45 mm) space above I/O-8 Flex.
- Minimum open space of 6 inches measured from back of I/O-8 Flex.



NOTE: In order to provide adequate dissipation of heat, keep the space directly above and to the rear of the I/O-8 Flex free of obstacles.



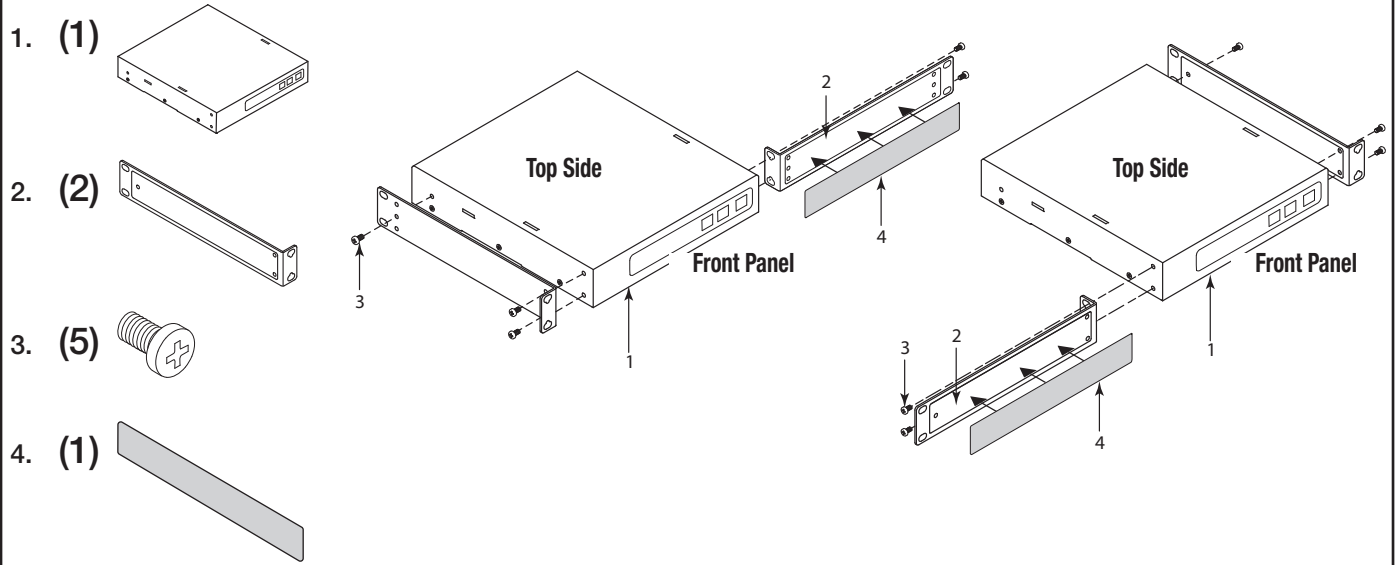
EN

Select the I/O-8 Flex Installation Configuration

Choose one of the following configuration options:

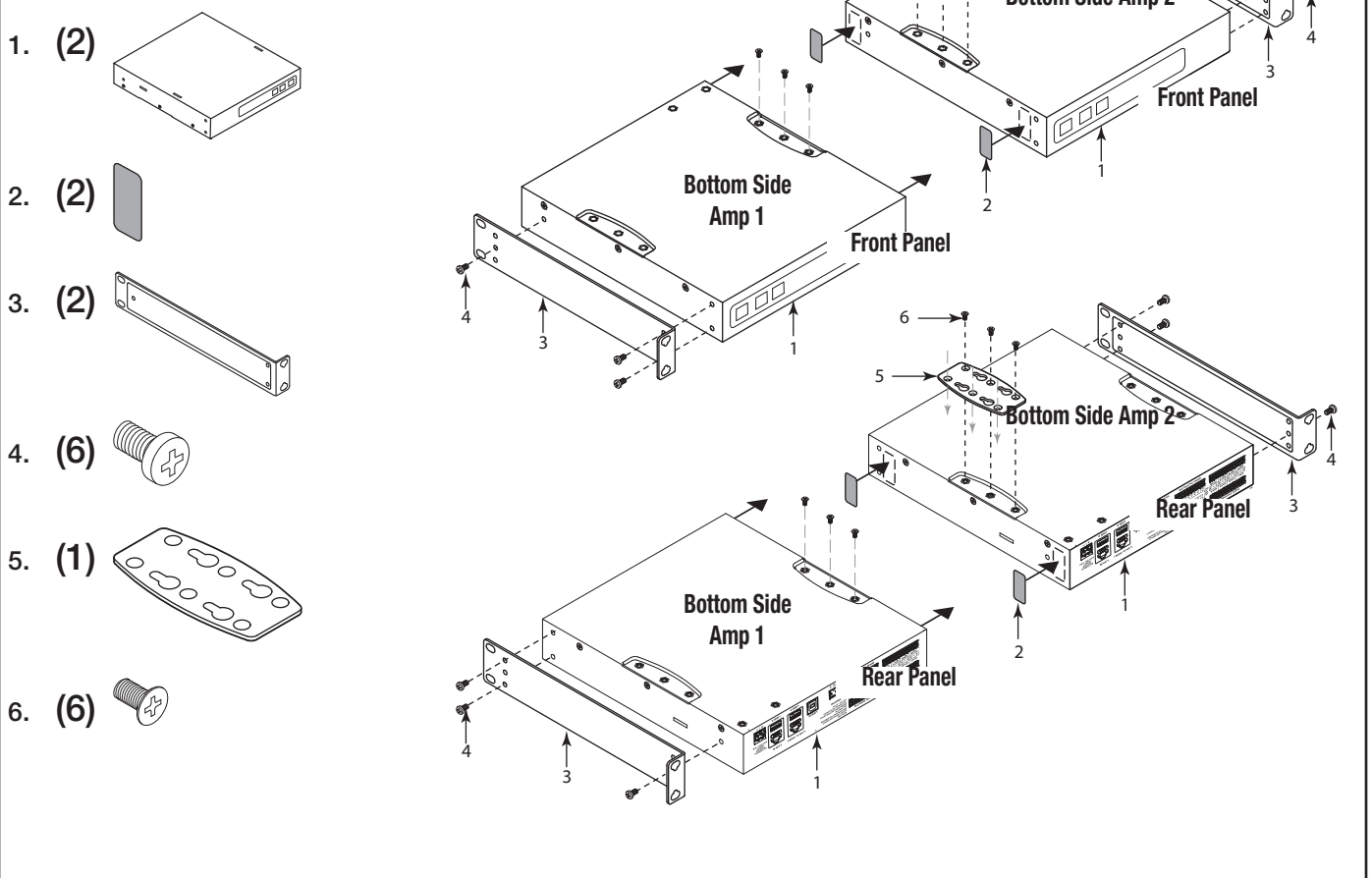
- A. One I/O-8 Flex 19-inch Rack (Left or Right Mount)
- B. Two I/O-8 Flex 19-inch Rack (Front or Rear Facing Out)
- C. One I/O-8 Flex Half Rack (Front or Rear Facing Out)
- D. Under Table or on Wall
- E. Free-Standing on Desk/Table

A. One I/O-8 Flex 19-inch Rack (Left or Right Mount)

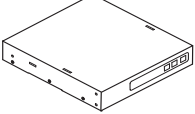
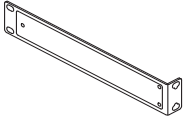



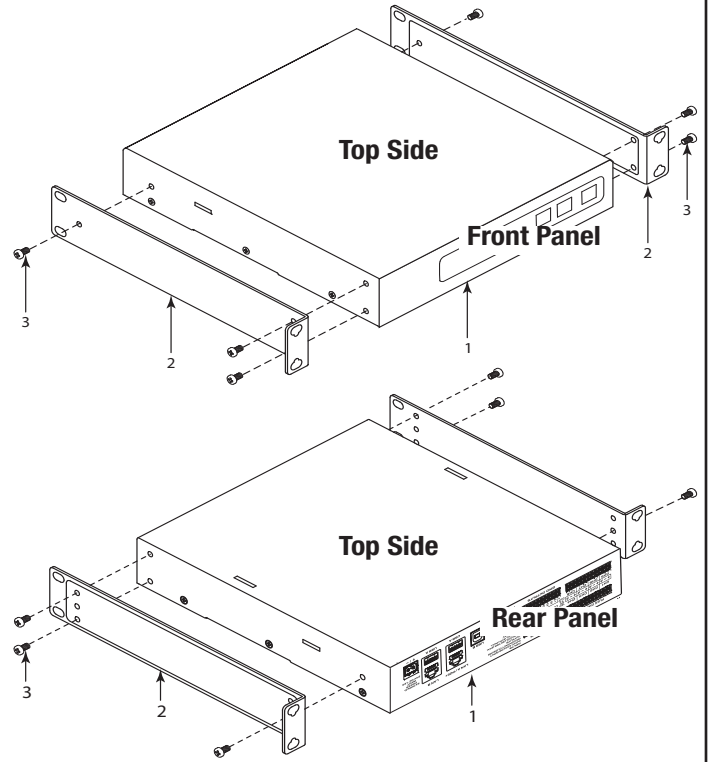
EN

B. Two I/O-8 Flex's 19-inch Rack (Front or Rear Facing Out)



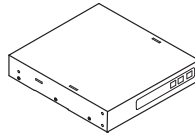



C. One I/O-8 Flex Half Rack (Front or Rear Facing Out)

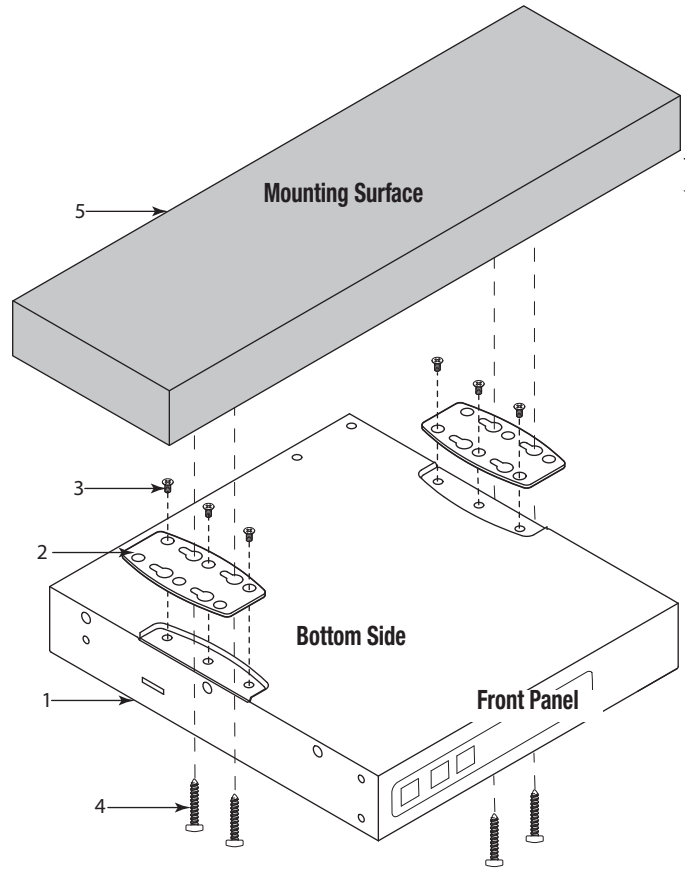
- 1. (1) 
- 2. (2) 
- 3. (6) 



EN

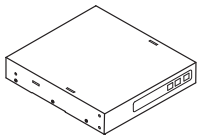
D. Under Table or on Wall

- 1. (1) 
- 2. (2) 
- 3. (6) 
- 4. (4)  Not supplied – use appropriate screws for mounting surface.
- 5. Mounting Surface

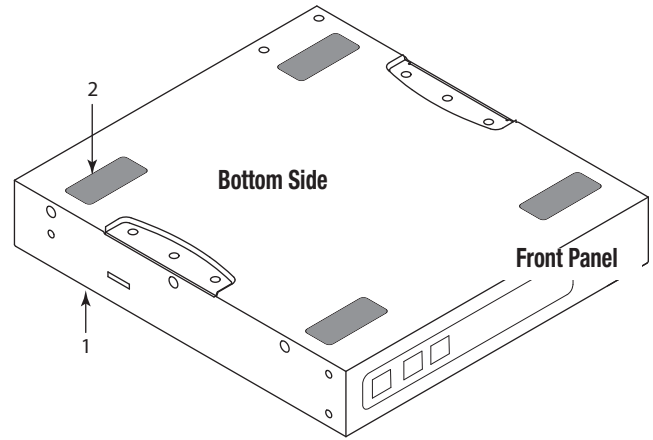


E. Free-Standing on Desk/Table

1. (1)



2. (4)

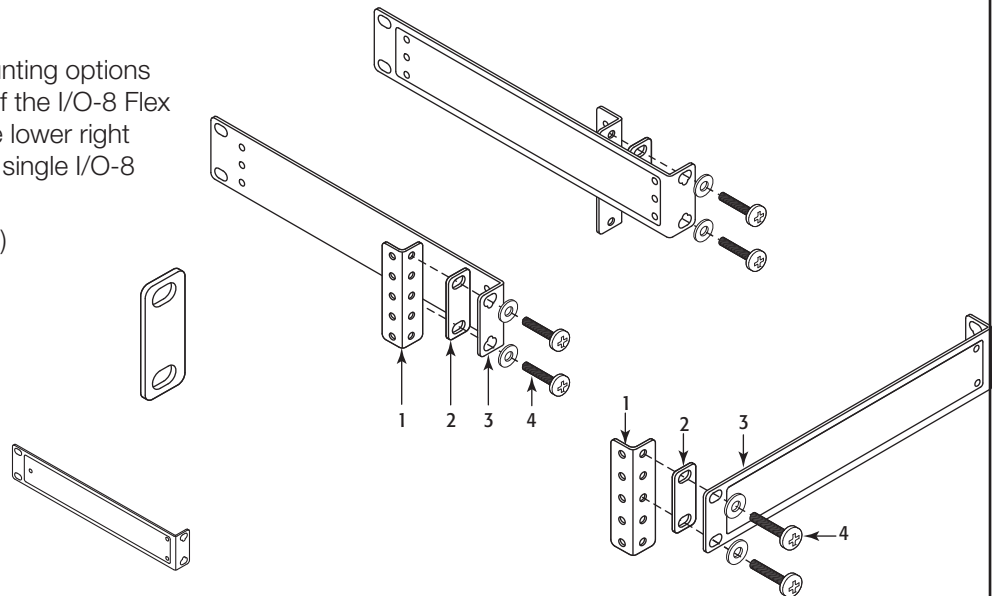


Rack Mounting Options

All Configurations

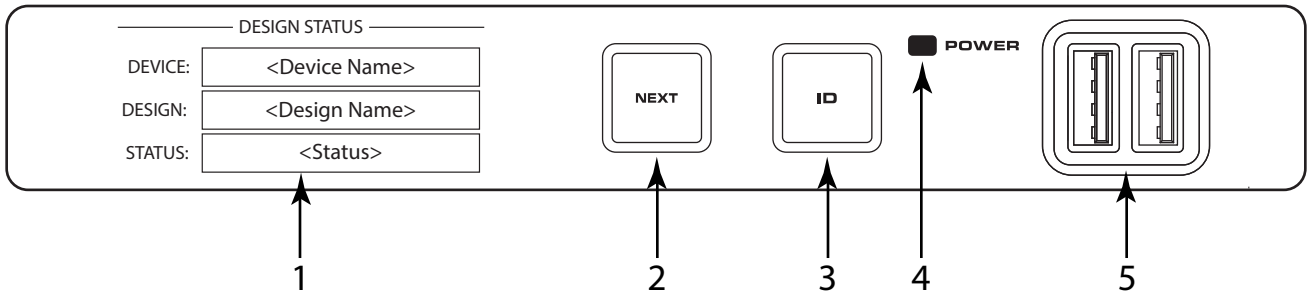
Using the examples shown in mounting options A through E, you can mount any of the I/O-8 Flex configurations. The example at the lower right can be flipped to accommodate a single I/O-8 Flex on the left side.

1. Equipment Rack (not supplied)
2. (2) Rack Ear Spacer
3. (2) Rack Ear
4. (4) Rack-Mounting Screws and Washers (not supplied)



Features

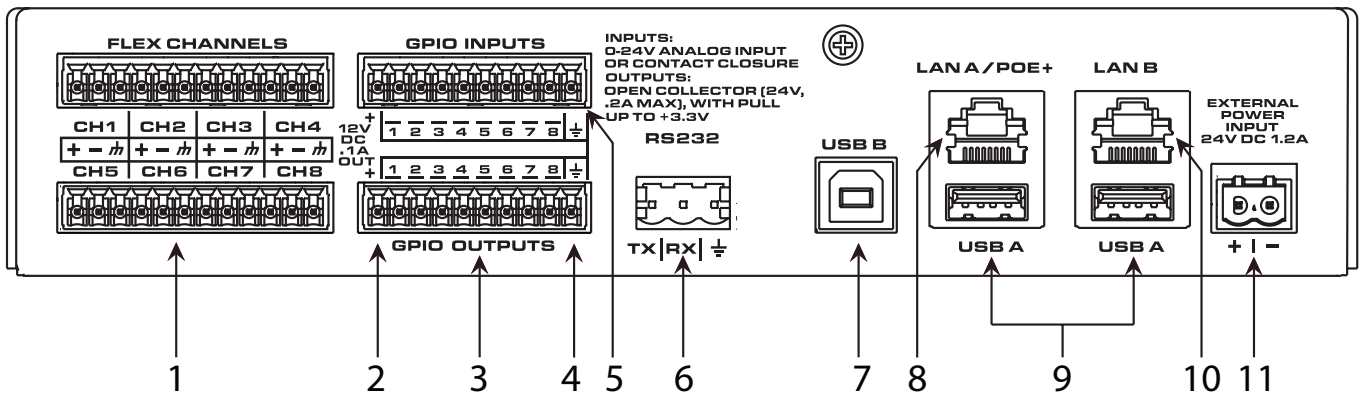
Front Panel



- OLED Display** – Displays information about the I/O-8 Flex’s settings and status.
- NEXT button** – Cycles through the OLED information pages
- ID button** – Locates the I/O-8 Flex in Q-SYS Designer GUI and Configurator
- POWER LED** – Illuminates blue when the I/O-8 Flex is on
- USB Ports** – USB Type A Host connectors (2)

EN

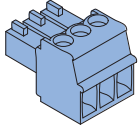
Rear Panel



- Flex Channels** – Eight user-configurable audio channels (mic/line input with optional phantom power or line output), balanced or unbalanced - blue connectors
- 12VDC, .1A OUT** – The + connection uses the farthest left pins (not numbered) for both GPIO INPUTS and GPIO OUTPUTS
- GPIO OUTPUT** – 8 outputs, open collector (24V, 0.2A maximum) with pull up to +3.3V (pins 1-8 equal pins 1-8 in the Q-SYS Designer GPIO Output component)
- Earth Ground** – The ground connection uses the farthest right pins (not numbered) for both GPIO INPUTS and GPIO OUTPUTS
- GPIO INPUTS** – 8 inputs, 0-24V analog input or contact closure (pins labeled 1-8 equal pins 1-8 in the Q-SYS Designer GPIO Input component)
- RS232** – Transmit and receive, 3-pin, 5mm, Euro connector
- USB B** – USB Type B Device connector
- LAN A/PoE+** – PoE+ power in, Q-LAN, control, VoIP, WAN streaming, AES67, etc., RJ45
- USB A** – USB Type A Host connectors
- LAN B** – Redundancy, Q-LAN, control, VoIP, WAN streaming, AES67, etc., RJ45
- EXTERNAL POWER INPUT 24VDC 1.2A** – Auxiliary power, 24VDC, 1.2A, 2-pin, 5mm, Euro connector

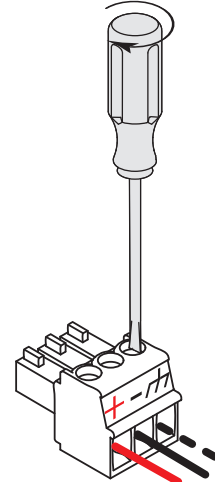
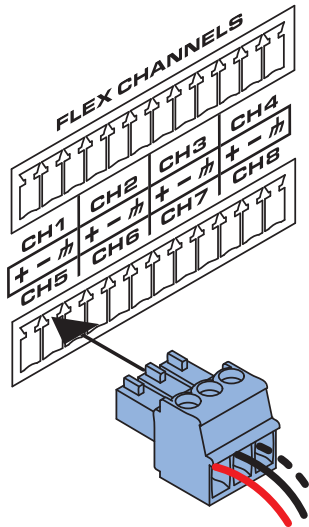
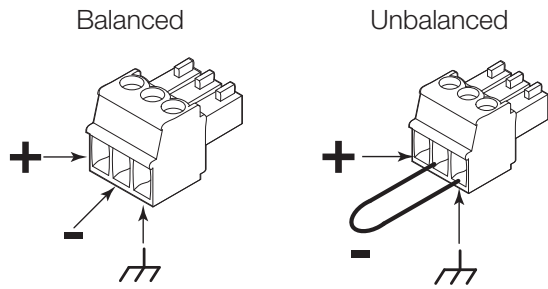
Input / Output Connectors

3-Pin, color-coded, Euro Connectors



- Flex Channels (8 blue)


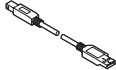
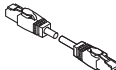
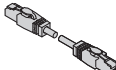

CAUTION!: a

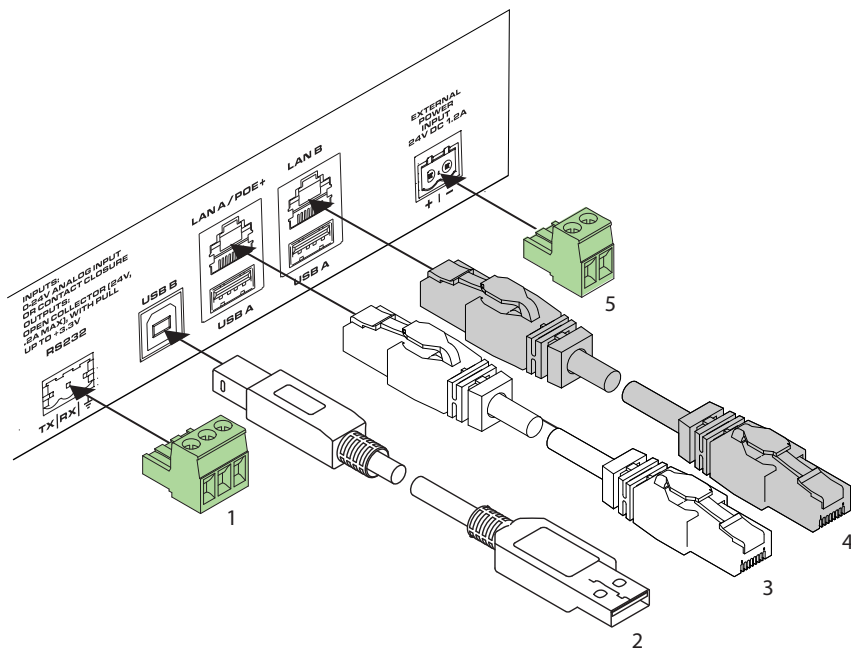


EN

Communication and Power Connectors

Make the following connections as required.

- 
 3-pin Euro connector – for RS232 TX and RX
- 
 USB Type B – for external devices, not supplied
- 
 RJ45/Cat6 – PoE+, audio, & control, not supplied
- 
 RJ45/Cat6 – audio, & control, redundant network, not supplied
- 
 2-pin Euro connector – for +24V DC 1.2A external power, redundant power for PoE+



Front Panel OLED Screens

Design Status

- **Device** – The name of the I/O-8 Flex as defined in Q-SYS Designer.
- **Design** – The name of the currently running design.
- **Status** – Indicates health of the I/O-8 Flex in design:
 - OK** – Audio is good, hardware is good.

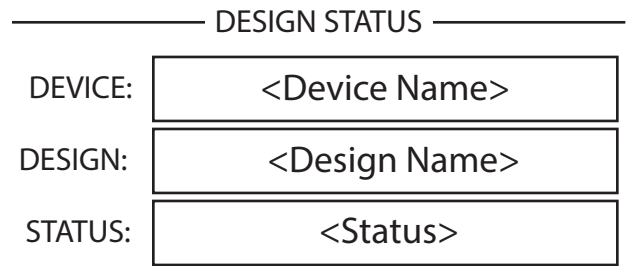
Compromised – Audio is good but a redundancy mechanism is active (one LAN down but the other is still up) or a non-fatal hardware problem exists (temperature higher than expected, etc.)

Fault – Audio is not passing, or hardware is malfunctioning or mis-configured.

Missing – A piece of hardware, defined in the design, has not been discovered. Audio is not passing through that piece of hardware.

Initializing – Starting the firmware, configuration update, or design update.

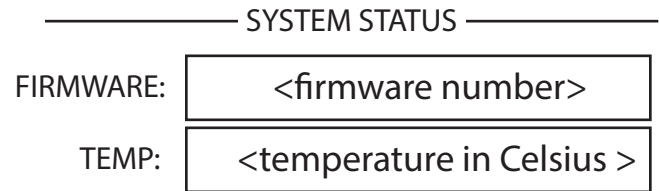
Not Present – A virtual component in the design, that is designated as Dynamically Paired, and Not Required, has no hardware assigned to it.



EN

System Status

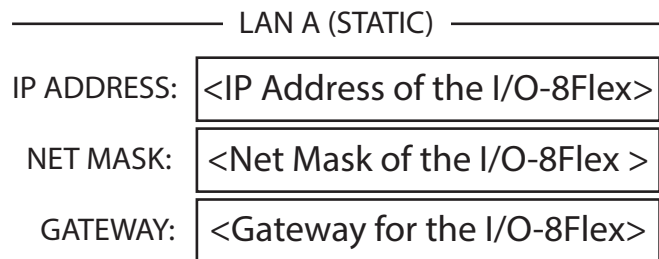
- **Firmware** – A three-section number identifying the major release, minor release, and maintenance release. For example, 6.0.0.
- **Temp** – The current chassis temperature of the peripheral.



LAN A

You can edit this information in the Q-SYS Configurator.

- **Static or Auto** – Displays next to LAN A, indicates if the peripheral's IP Address is Static or Automatic.
- **IP Address** – The IP Address assigned to the peripheral's LAN A. LAN A is the primary Q-LAN connection and is required.
- **Net Mask** – The Net Mask assigned to the Core.
- **Gateway** – The Gateway assigned to the Core.



LAN B

LAN B is used for redundancy, and is not required. The information is displayed in the same format as LAN A.

Flex In Channel Status



NOTE: If a Flex channel is set to Input, there is no information shown under the same channel on the Flex Out screen. If the Flex channel is set to Output, there is no information for that channel on the Flex In screen.

Flex In	1	2	3	4	5	6	7	8
Mute								
Clip	●	○	○				○	○
Signal	●	○	○				○	○
+48V	○	●	○				○	○

The Flex Input screens show the Mute, Clip, Signal, and +48V (phantom power) for the eight Mic/Line input channels.

- **Mute** – Displays a "muted loudspeaker" when the channel is muted.
- **Clip** – Displays a solid circle under the channel having an output signal over driving the associated channel output.
- **Signal** – Displays a solid circle when there is a signal present on the associated channel.
- **+48V** - Displays a solid circle when phantom power is active on the associated channel.

Flex Out Channel Status

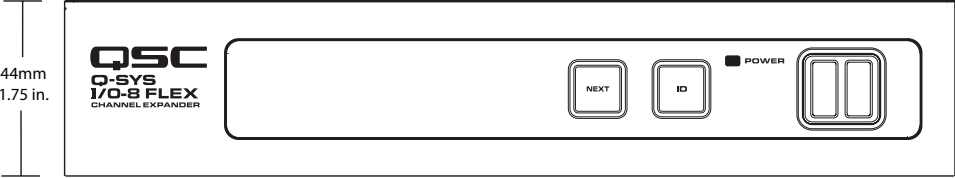
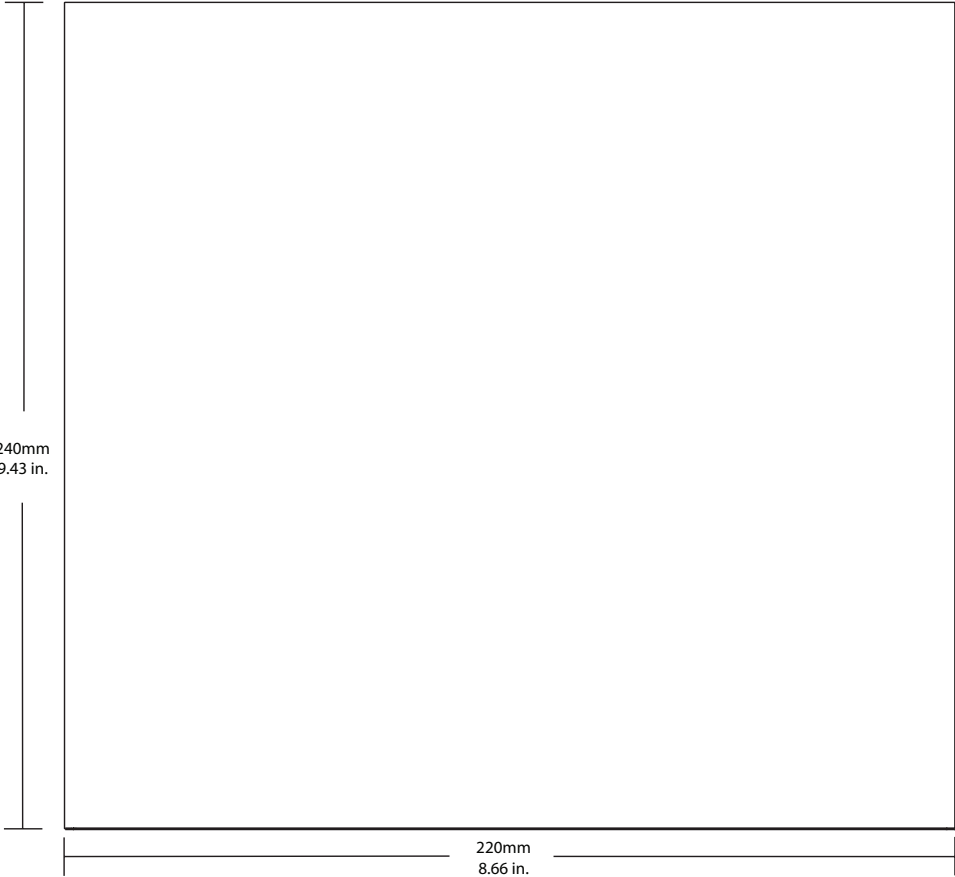
The Flex Output screens show the Mute, Clip, and Signal, for the eighth Line output channels.

Flex Out	1	2	3	4	5	6	7	8
Mute								
Clip				○	○	○		
Signal				●	●	○		

- **Mute** – Displays a "muted loudspeaker" when the channel is muted.
- **Clip** – Displays a solid circle under the channel having an output signal over driving the associated channel output.
- **Signal** – Displays a solid circle when there is a signal present on the associated channel.

Dimensions

EN



Q-SYS I/O-8 Flex Channel Expander Specifications

Inputs/Outputs

Audio Flex Channel Capacity	8
Audio Flex Channel Assignments	Each channel can be configured as a mic/line input or as a line output (configured through Q-SYS Designer software)
Rear Panel Indicators	"Link", "Speed", and "Activity" LEDs on all LAN ports
A/D Converters	24 bit, 48KHz
Input Impedance (Balanced)	10.5K Ohm, nominally
Input Sensitivity Range (1 dB steps)	-39 dBu to +24 dBu
Maximum Input Level for Unbalanced Signals	+12 dBu
Input Frequency Response	
20Hz to 20KHz @ +24 dBu	-0.1 dB / +0.5 dB
Input THD+N @ 1KHz	
@ +24 dBu Sensitivity and @ +24 dBu Input Level	< 0.05%
Input to Input Crosstalk @ 1KHz	
@ +24 dBu Input Sensitivity	-110 dB typical, -90 dB maximum
@ +12 dBu Input Sensitivity	-120 dB typical, -90 dB maximum
Input Dynamic Range	
@ +24 dBu Input Sensitivity	> 107 dB
@ +12 dBu Input Sensitivity	> 107 dB
Mic Preamp EIN	< -125 dBu
Phantom Power	IEC 61938 P48 compliant, 48V @ 10mA per channel
D/A Converters	24 bit, 48KHz
Output Impedance (Balanced)	100 Ohm nominally
Output Level Range (1 dB steps)	-40 dBu to +12 dBu
Output Frequency Response	
@ +12 dBu	+0.08 dB / -0.5 dB
@ 0 dBu	+0.08 dB / -0.5 dB
Output THD+N (typical)	
+12 dBu @ 1KHz	< 0.004%
Output to Output Crosstalk	
+12 dBu @ 20KHz	-102 dB maximum
Output Dynamic Range	
@ +12 dBu	> 107 dB

USB Inputs/Outputs

USB Audio Bridging	Up to 8 x 8 channels of digital audio in/out via software defineable USB instances advertised to the USB Host operating system (presently, audio bridging is only available via the Device port)
USB B (Device port):	
USB Bit Depth	24Bit
USB Channel Capacity	8 x 8
USB Sample Rate	48KHz

EN

Q-SYS I/O-8 Flex Channel Expander Specifications

Controls and Indicators

Front Panel Controls	"NEXT" OLED page forward capacitive touch button "ID" device identification capacitive touch button "Clear Network Settings" invoked when "NEXT" and "ID" are pressed simultaneously
Front Panel Connectors	AUX USB: USB Host x 2 (Type A connectors)
Front Panel Indicators	Blue "POWER" LED 304 x 96 monochrome OLED display
Rear Panel Connectors	Audio Flex I/O: 12-pos blue Euro Block x 2 GPIO: 10-pos black Euro Block x 2 (GPI = 1 x 10, GPO = 1 x 10) RS232: 3-pos black Euro Block AUX USB Host: USB Host x 2 (Type A connectors) AUX USB Device: USB Device (Type B connector) Media Network LAN A/PoE+ Power In: RJ45 1000 Mbps Media Network LAN B RJ45 1000 Mbps AUX PWR In: 2-pos: green Euro Block

GPIO

General Purpose Inputs	0-24VDC analog input or contact closure, with configurable 5.11K pullup to +12V
General Purpose Outputs	Open collector, 24VDC at 200mA max, internal 1.0K pullup to 3.3V
GPIO 12VDC Power Pins	12VDC out at 100mA max

Miscellaneous

PoE+ Power Input	IEEE 802.3at class 4 compliant PD, requires full power from an IEEE 802.3at class 4 compliant PSE via LAN A port
External Power Input	24VDC, 1.2A supplied via external power input, may be used as the primary power source or as a backup to the PoE+ source
Operating Temperature Range	0°C - 50°C
BTU/Hour	70 BTUs (power conversion estimate under typical load)
Cooling	Convection
Humidity	5 - 85% RH, non-condensing
Vibration	> 20 Grms
Regulatory	FCC 47 CFR Part 15 Class A, IC ICES-003, CE (EN55032, EN55035), EU RoHS directive 2011/65/EU, WEEE directive 2012/19/EU, China RoHS directive GB/T26572, EAC, EFUP 10 YR, RCM
Estimated Product Life Cycle	20 years
Product Dimensions	8.66" x 9.43" x 1.75" (220mm x 240mm x 44mm), 1RU half rack
Shipping Carton Dimensions	20" x 12" x 4" (508mm x 305mm x 102mm)
Shipping Weight	6 lbs
Included Accessories	Connector kit, rack ears, surface mount kit, safety instructions and regulatory statements document warranty statement

Specifications subject to change without notice.



Mailing Address:

QSC, LLC
1675 MacArthur Boulevard
Costa Mesa, CA 92626-1468 U.S.
Main Number: +1.714.754.6175
World Wide Web: www.qsc.com

Sales & Marketing:

Voice: +1.714.957.7100 or toll free
(U.S. only) +1.800.854.4079
FAX: +1.714.754.6174
E-mail: info@qsc.com

QSC

Technical Services
1675 MacArthur Blvd.
Costa Mesa, CA 92626 U.S.
Tel: +1.800.772.2834 (U.S. only)
Tel: +1.714.957.7150
FAX: +1.714.754.6173

Q-SYS™ Customer Support:

Application Engineering and Technical Services

Monday - Friday 7 AM to 5 PM PST (Excludes Holidays)
Tel. +1.800.772.2834 (U.S. only)
Tel. +1.714.957.7150

Q-SYS 24/7 Emergency Support*

Tel: +1.888.252.4836 (U.S./Canada)
Tel: +1.949.791.7722 (non-U.S.)



*Q-SYS 24/7 Support is for Emergency assistance with Q-SYS systems only. 24/7 support guarantees a call back within 30 min after a message is left. Please include, Name, Company, Call Back Number and description of the Q-SYS emergency for prompt call back. If calling during business hours please use the standard support numbers above.

Q-SYS Support Email

qsyssupport@qsc.com
(Immediate email response times not guaranteed)

EN

© 2017 QSC, LLC. All rights reserved. QSC and the QSC logo are registered trademarks of QSC, LLC in the U.S. Patent and Trademark office and other countries. Q-SYS, Q-LAN and, Q-SYS Designer are trademarks of QSC, LLC. Patents may apply or be pending.

All other trademarks are the property of their respective owners.

<http://patents.qsc.com>