Hardware User Manual

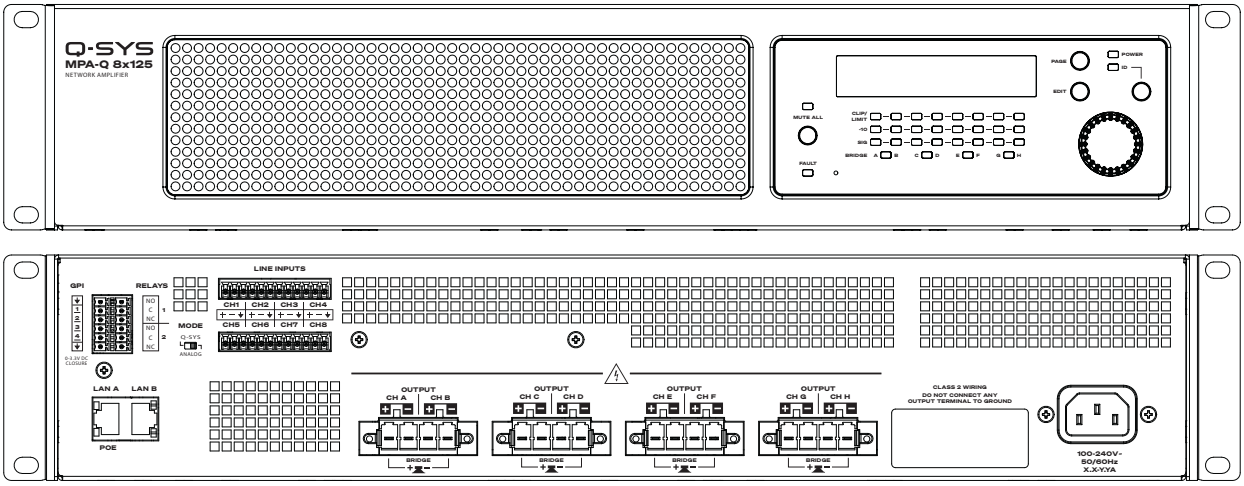
MPA-Q Series Network Amplifiers

MPA-Q 4×250 — 4 Channel, 250W/ch Network Amplifier

MPA-Q 4×500 — 4 Channel, 500W/ch Network Amplifier

MPA-Q 8×125 — 8 Channel, 125W/ch Network Amplifier

MPA-Q 8×250 — 8 Channel, 250W/ch Network Amplifier



WA-001015-01-A

EXPLANATION OF 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 lightning flash with arrowhead symbol in a triangle alerts 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 a triangle alerts the user to the presence of important safety, operating, and maintenance instructions in this manual.

IMPORTANT SAFETY INSTRUCTIONS

WARNING!: TO REDUCE THE RISK OF 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 is not exceeded – refer to the "Environmental" on page 3.
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.

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. Ensure that the maximum allowed operating temperature is not exceeded – see the "Environmental" on page 3.

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. Clean only with a dry cloth.
7. Do not block any ventilation opening. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.
9. To reduce the risk of electrical shock, the power cord shall be connected to a mains socket outlet with a protective earthing connection.
10. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
11. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
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. The appliance coupler, or the AC Mains plug, is the AC mains disconnect device and shall remain readily operable after installation.
16. Adhere to all applicable, local codes.
17. Consult a licensed, professional engineer when any doubt or questions arise regarding a physical equipment installation.
18. Do not use any aerosol spray, cleaner, disinfectant or fumigant on, near or into the apparatus. Clean only with a dry cloth.
19. Do not unplug the unit by pulling on the cord, use the plug.
20. Do not submerge the apparatus in water or liquids.
21. Keep ventilation opening free of dust or other matter.

WARNING!: The amplifier must have an earth ground connection. QSC is not responsible for damages caused to persons, things or data due to an improper or missing ground connection.

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. In the event of malfunction, contact QSC Customer Support for assistance.

FCC Statement

NOTE: 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 in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Environmental

- **Expected Product Life Cycle:** 10 years
- **Storage Conditions:** Temperature from -20 ° C (-4 ° F) to + 70 ° C (158 ° F), humidity 5% - 85% RH.
- **Maximum Operating Conditions:** 0 ° C (32 ° F) to 40 ° C (104 ° F), humidity 5% - 85% RH.

CAUTION!: Environmental Contamination: Amplifiers must be installed in an environment where they are provided adequate supply of fresh cooling air that is free from excessive amounts of chemical and/or solid particulate matter contaminants. Excess contamination buildup from environmental factors may cause adverse performance due to high internal voltages experienced during operation.

If you wish to discard electronic equipment, please contact your dealer or supplier for further information.

RoHS Statement

The QSC MPA-Q Series Amplifiers are in compliance with “China RoHS” directives. The following chart is provided for product use in China and its territories:

	QSC MPA-Q Series Amplifiers					
	有毒有害物质或元素 (Toxic or hazardous Substances and Elements)					
部件名称 (Part Name)	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	O	O	O	O	O
机壳装配件 (Chassis Assemblies)	X	O	O	O	O	O

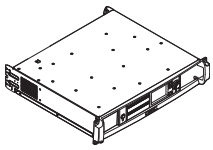
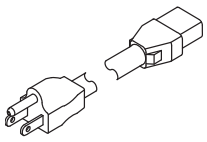
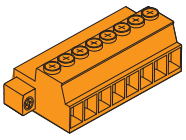
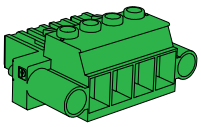
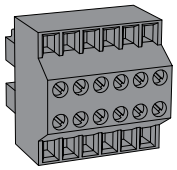
O：表明这些有毒或有害物质在部件使用的同类材料中的含量是在 SJ/T11363_2006 极限的要求之下。
(O: Indicates that this toxic or hazardous substance contained in all of the homogeneous materials for this part is below the limit requirement in SJ/T11363_2006.)

X：表明这些有毒或有害物质在部件使用的同类材料中至少有一种含量是在 SJ/T11363_2006 极限的要求之上。
(X: Indicates that this toxic or hazardous substance contained in at least one of the homogeneous materials used for this part is above the limit requirement in SJ/T11363_2006.)

海拔和热带条件

≤2000m	仅适用于海拔2000m 以下地区安全使用	Only suitable for safe use in areas below 2000m above sea level
	仅适用于非热带气候条件下地区安全使用	Only suitable for safe use in non-tropical climates

What's in the Box

 (1x) Amplifier	 (1x) AC Cord	 (8x or 4x) Inputs (3-Pins)	 (4x or 2x) Outputs (4-Pins)
 (1x) GPIO (12-Pins)	 (1x) Warranty	 (1x) Safety Information	

Compatibility

Q-SYS MPA-Q Series amplifiers require Q-SYS Designer Software (QDS) for configuration and operation. QDS version compatibility information can be found here. Information about the QDS components related to these devices, including their properties and controls, can be found in Q-SYS Help. Or, simply drag an MPA-Q component from the Inventory into the Schematic and press F1.

Features

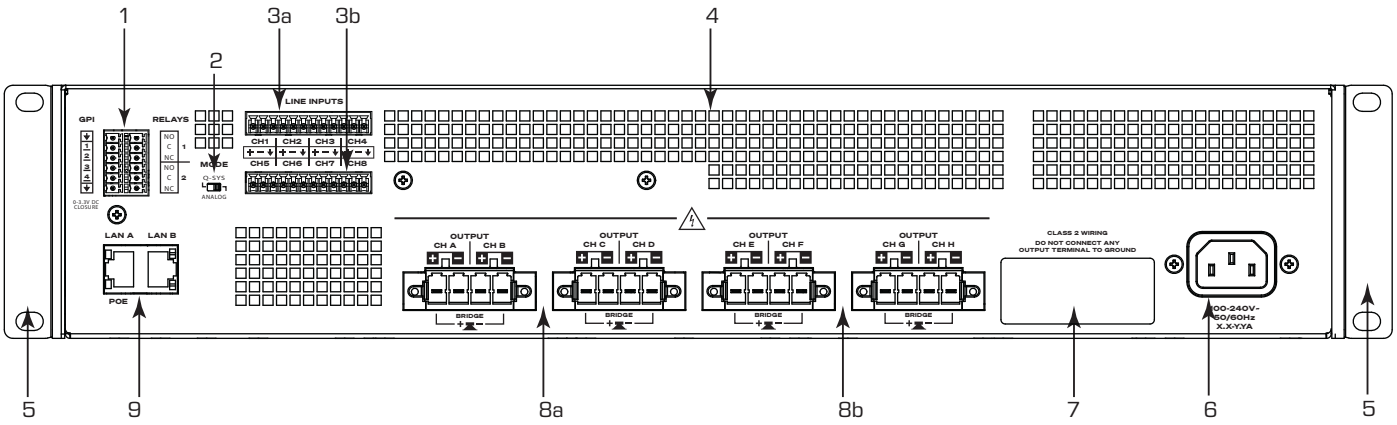
Amplifier Front Panel

Refer to "Amplifier Controls and Indicators" on page 10.

Amplifier Rear Panel

Refer to Figure 1.

WARNING!: Dangerous voltage possible on output terminals. Disconnect AC Mains before connecting or disconnecting output wiring.



— Figure 1 — 8-Channel Model Shown

1. GPIs and Relays. Euro connector, 12-pin
2. Mode Switch – See "Amplifier Operation Mode" on page 9 for information.
3. Analog Inputs – Line level. 3-pin Euro connectors:
   a. Inputs 1-4: all MPA-Q models
   b. Inputs 5-8: 8-channel models only
4. Cooling fan vents
5. Front rack-mount brackets
6. IEC power connection
7. Product information: Model, LAN interface MAC addresses, serial number, country of origin
8. Outputs – Loudspeaker connection. 4-pin Euro connectors:
   a. Outputs A–D: all models
   b. Outputs E–H: 8-channel models only
9. RJ-45 – Q-SYS Q-LAN A / B

Installation

The following steps are written in the recommended installation order.

Rack-Mount the Amplifier

The amplifiers come shipped with rack ears installed on the front corner and are designed only for mounting in a standard rack-mount unit. Abnormal mounting positions (e.g., vertical, face-up, face-down) are not supported. The MPA-Q amplifiers are 2RU high and 381 mm (15 in.) deep.

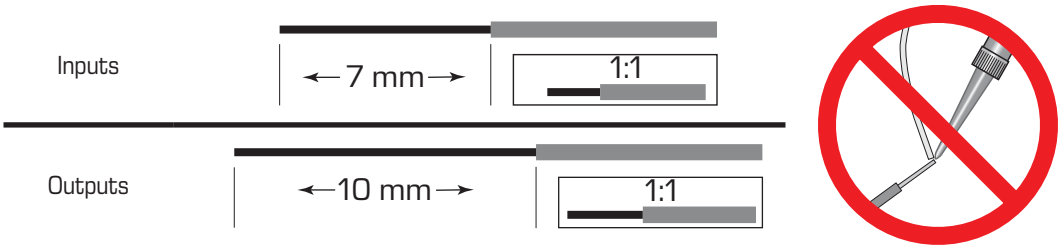
Secure the amplifier in the rack with four screws (not supplied).

CAUTION!: Be sure that nothing is blocking the front or rear ventilation openings, and that each side has a minimum of 2 cm clearance.

The rack ears are designed to be removed, if desired, or moved to the center position for table top or under table mounting.

Wire Preparation

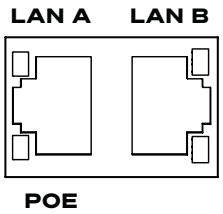
Use an appropriate wire-stripping tool to remove 7 mm of insulation from Input wiring and 10 mm of insulation from the Output wiring. Do not tin the stripped wire ends.



— Figure 2 —

Network

Connect the amplifier's LAN A, and optionally LAN B, to the Q-LAN network (Figure 3). Refer to the Q-SYS Help for network requirements.



— Figure 3 —

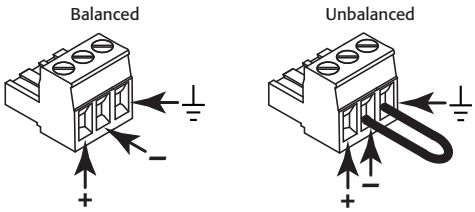
Inputs

If the amplifier is in Q-SYS mode, **Analog Inputs** are converted to digital audio in the amplifier, and then routed to the Q-SYS Core processor over the Q-LAN network. The digital signals show up in Q-SYS Designer at the input component where they can be routed as needed. Refer to the Q-SYS documentation.

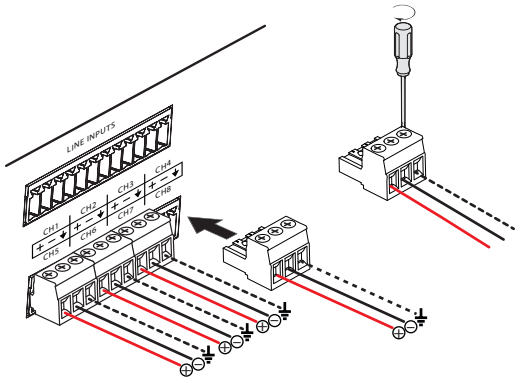
1. Make sure your audio source devices are powered off.
2. Wire the audio line-level source to up to eight (8-Channel amplifiers) or four (4-Channel amplifiers) Euro connectors (supplied). You can use either balanced inputs (Figure 4) or unbalanced inputs (Figure 5).
3. Plug the connectors into the appropriate receptacles (Line Inputs 1, 2, 3, 4, 5, 6, 7, 8) Figure 6.

If the amplifier is in Analog mode, Analog Inputs are sent directly to the amplifier's corresponding outputs and are not sent over the network at all.

NOTE: Inputs are line-level only, and cannot be used with microphone-level signals.



— Figure 4 — — Figure 5 —



— Figure 6 —

GPI and Relays

GPI and Relay information can be found in Q-SYS Help.

Outputs and Output Configuration

The amplifiers have either four channels or eight channels. When in Q-SYS Mode, the configuration of the amplifier is defined in Q-SYS Designer Software and is sent to the physical amplifier when the Name and Type of the amplifier in the design matches the Name and Type of the physical amplifier. When in Analog Mode, the configuration of the amplifier is defined using the front panel display.

Amplifier channels can be combined in Bridged mode for higher voltage needs. Figure 7and Figure 8 are examples of how the 4-Channel amplifier blocks can be combined to drive higher power requirements under different loads. Reference the power output ratings for more information.

Use the diagrams shown in Figure 7 and Figure 8 as a reference for planning your loudspeaker configuration.

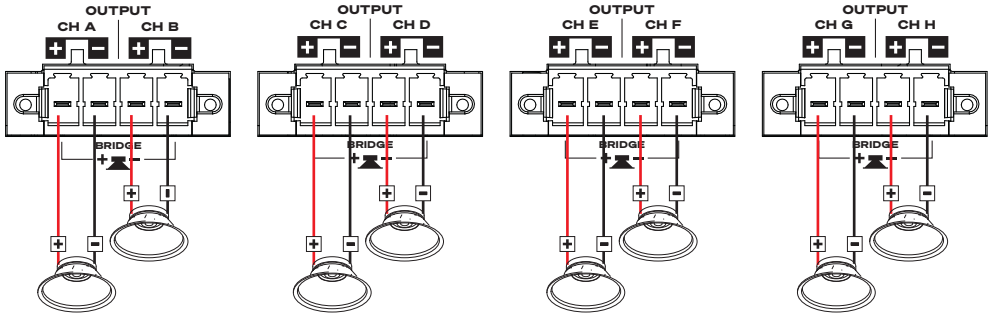
CAUTION!: Before applying power to the amplifier, double check your output connections to be sure they are connected properly based on the output configuration specified in Q-SYS Designer Software.
If you change the output configuration of the amplifier you must change the loudspeaker connections before applying power to the amplifier!

Figure 7 and Figure 8 are examples of the two types of output configurations: Separate and Bridged.

The following diagrams show the 8-Channel models. 4-Channel models have outputs A through D only.

A B C D 4-Channel	E F G H 4-Channel
Separate Channels (A B C D) and (E F G H)	

For Separate Loudspeakers
Use eight 2-wire cables and connect loudspeakers as shown.

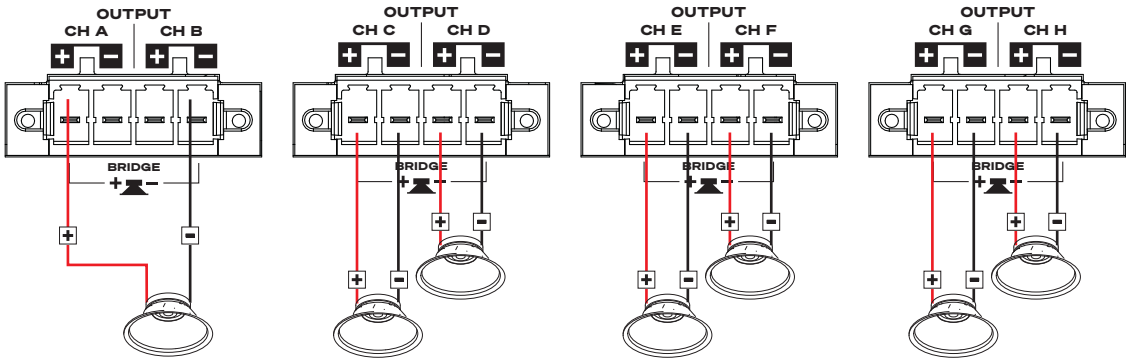


— Figure 7 —

A+B C D 3-Channel, A B Bridged	E F G H 4-Channel
Any combination of bridged, adjacent (A+B), (C+D), (E+F), (G&H) Channels	

For A+B (Bridged) One Loudspeaker
Use one 2-wire cable for each bridged channel and connect loudspeaker as shown.

For C D (E F G H) (Separate) Two and Four Loudspeakers
Use one 2-wire cable for each separate channel and connect loudspeakers as shown.



— Figure 8 —

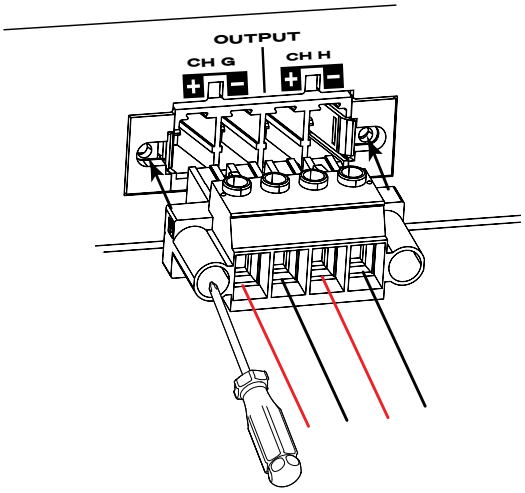
NOTE: Any channel pair can be bridged independent of the other channels around it.

Connect the Loudspeakers

There is a potential of having dangerous voltage at the output terminals on the rear of the amplifier. Use caution not to touch these contacts. Remove power prior to making any connections.

NOTE: The output connector can accept up to 10 AWG stranded wire (all grades) and 8 AWG stranded wire (some grades). The maximum outer diameter of the wire insulation must be less than ~6.35 mm (0.25 in).

1. Connect the loudspeaker wiring to the 4-pin Euro connector as needed for your amplifier's configuration.
2. Install the 4-pin Euro connector into the Output connector on the rear of the amplifier as shown in Figure 9.
3. Use a Phillips screwdriver to secure the connector.



— Figure 9 —

IMPORTANT!: The amplifiers are high power amplifiers designed for installation use in both Lo-Z and Hi-Z applications. Proper wiring class/size is required to ensure safe operation.

Amplifier Operation Mode

Select the amplifier's operation mode before powering on the amplifier. On the rear panel of the amplifier is a Mode switch that can be set either in Q-SYS Mode or Analog Mode.

- **Q-SYS Mode** means that the amplifier will be configured and managed by the Q-SYS Core in the system, and it will send/receive its audio to/from the Q-SYS Core processor.

NOTE: Q-SYS Mode enables the option of Standalone Mode, configurable in Q-SYS Designer Software. In this mode, the amplifier normally receives digital audio signals via the network over Q-LAN; however, in the case of a network disruption, the amplifier can switch to using the analog audio inputs as the audio source. When network connectivity is restored, the amplifier then switches back to using network audio.

- **Analog Mode** means that the amplifier will act as a simple analog amplifier, and will not send/receive any audio over the network. Instead, it will route the analog line level inputs directly to the corresponding amplifier outputs. In Analog Mode, some basic controls become available from the front-panel display (like gain, mute, impedance, and bridge mode).

NOTE: The Mode switch on the rear panel of the unit is only checked when the amplifier boots up. Changing the position of the switch while the amplifier is already running will not have any effect until the amplifier is rebooted.

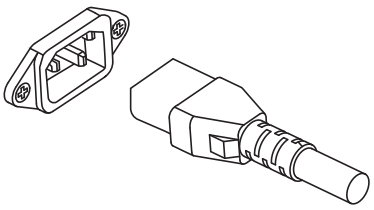
AC Power-On

NOTE: When the AC Power is on, there is a potential of having dangerous voltage at the output terminals on the rear of the amplifier. Use caution not to touch these contacts. Remove power prior to making any connections.

After connecting loudspeakers and selecting an operation Mode:

1. Make sure the output gain settings for all audio-source devices (CD Players, Mixers, Instruments, etc.) are at the lowest output (max attenuation).
2. Turn on all audio sources.

3. Apply power to the amplifier by connecting the IEC power cord to the AC receptacle. (Figure 10) The amplifier starts in the state it was in when power was removed.
4. You can now bring up the outputs of your audio sources.

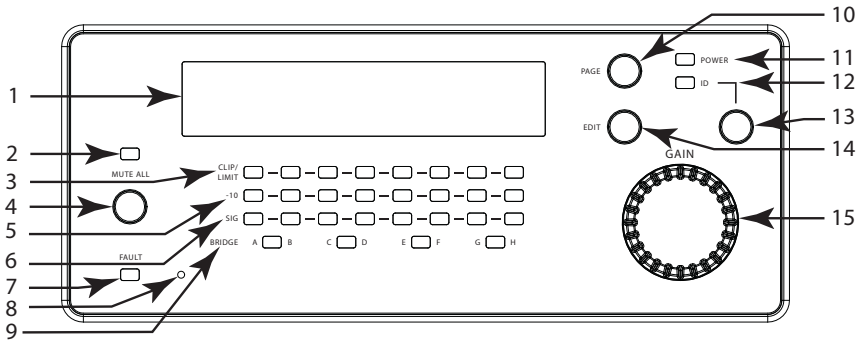


— Figure 10 —

NOTE: When the amplifier is not connected to the Q-SYS Core processor, it is in a Fault mode and not operational unless previously configured for failover or standalone mode as part of a Q-SYS design.

Amplifier Controls and Indicators

Refer to Figure 11 for the locations of the front-panel controls.



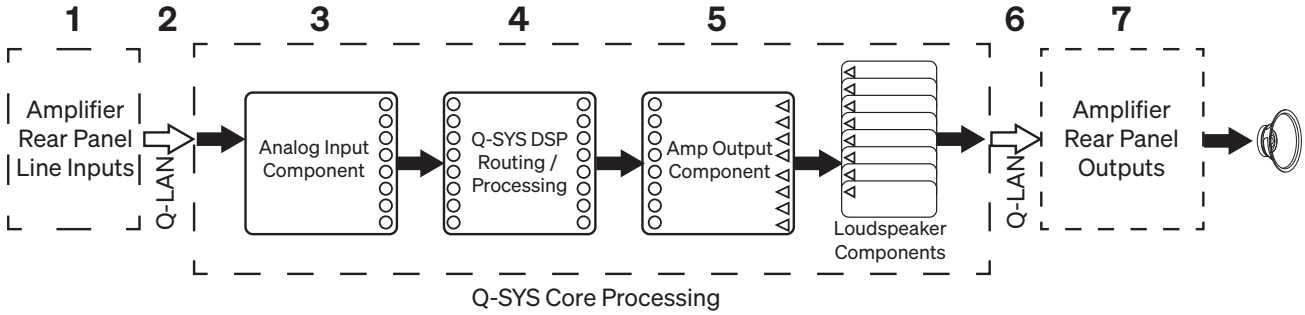
— Figure 11 — MPA-Q 8-Channel Shown

1. Status/Configuration screen
2. Mute All indicator (red)
3. CLIP/LIMIT LEDs (red)
4. Mute All button
5. Output Channel -10 dB below maximum amplifier output (yellow)
6. Input Channel Signal-Present LEDs (green)
7. FAULT LED (red)
8. Pinhole Reset: Refer to support.qsys.com for reset information
9. BRIDGE LED indicators (yellow)
10. PAGE button
11. Power indicator (blue)
12. ID indicator (green)
13. ID button
14. Edit button
15. Selector knob

Input and Output Signal Flow

When the amplifiers are in Q-SYS mode, the amplifier's inputs and outputs are not physically (or electrically) connected in the amplifier giving you the flexibility to use any available source in Q-SYS for the amplified outputs, and to route the inputs to any output. The inputs and outputs can be connected in your Q-SYS design as shown in Figure 12.

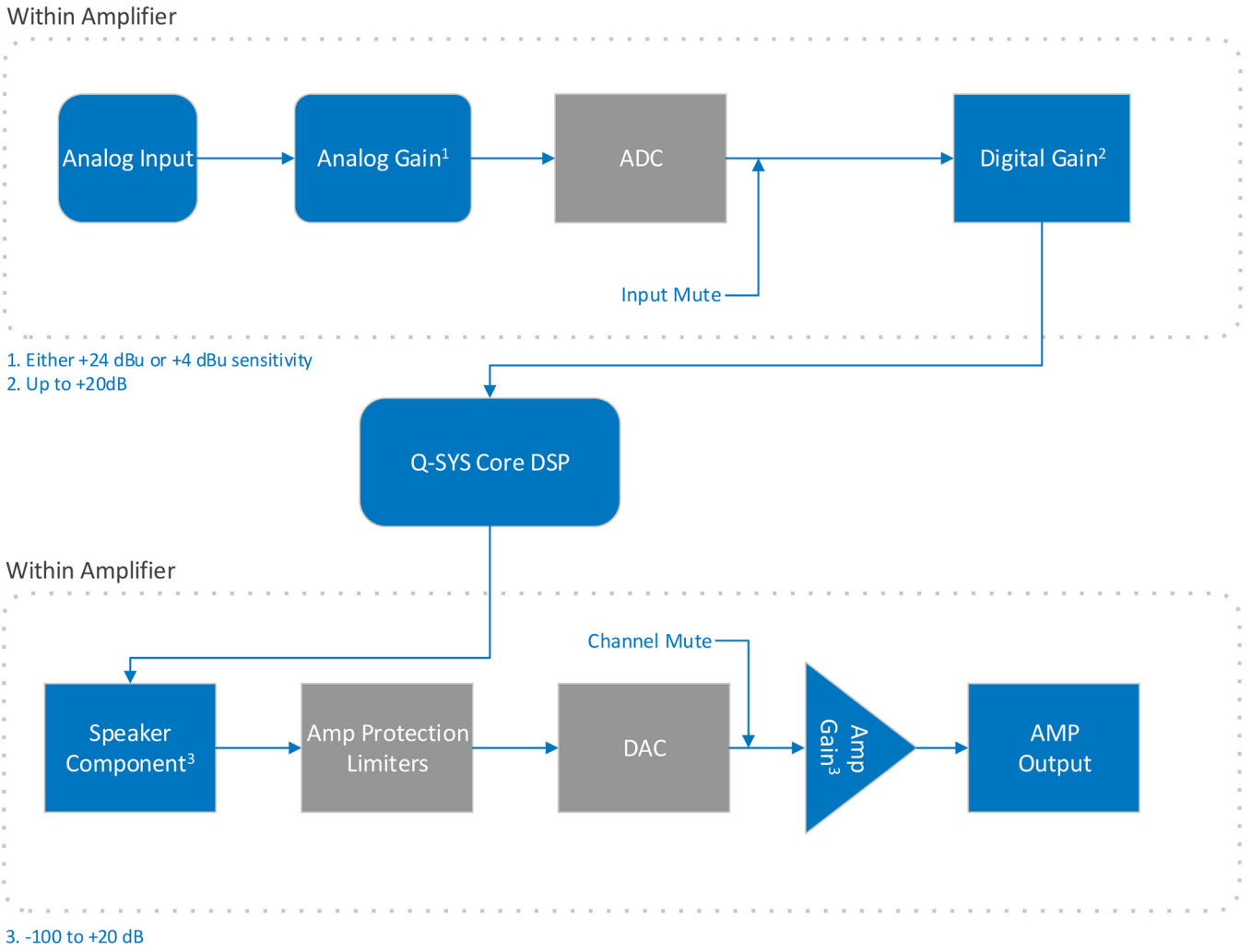
1. The analog inputs are converted to digital audio in the amplifier.
2. The converted audio is then routed to the Q-SYS Core via Q-LAN (LAN A, LAN B).
3. The digital signals are brought into the design via the amplifier's Analog Input component.
4. From the Analog Input component the signals can be sent for processing and can be sent anywhere within the Q-SYS system.
5. In the Q-SYS Core digital audio, signals (not necessarily from the amp's inputs) are sent to the Q-SYS Amp Output component.
6. The digital audio is then sent from the Q-SYS Core via Q-LAN to the amplifier.
7. Digital signals are converted to analog, amplified, and sent to outputs of the amplifier.

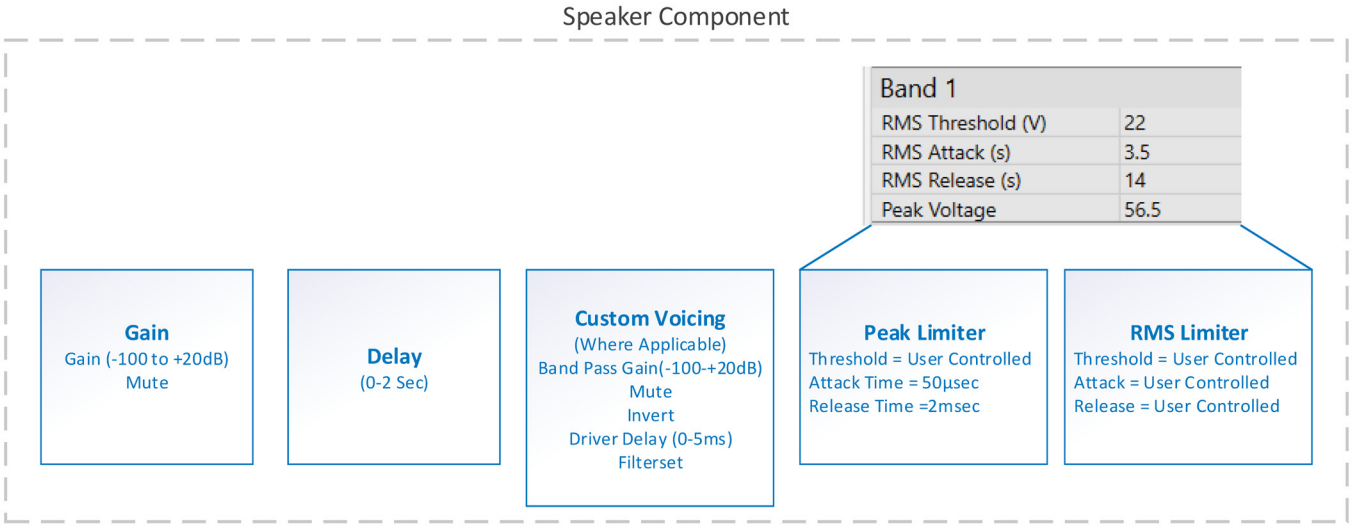


— Figure 12 — 8-Channel Model Shown

The Q-SYS Amp Output component can have four or eight inputs/outputs depending on the amplifier model.

Figure 13 shows where gain, muting, and limiting are applied within the signal flow.





— Figure 13 —

Amplifier Sensitivity

Amplifier sensitivity is set to provide full output voltage swing for the max power (@8 Ohms), with a 0dBFS PEAK input. This means that MAX DAC Out = MAX AMP Out, with a SINE WAVE (0dBFS = -3dBFS RMS for a sine wave).

- 0dBFS pk Input on 4×500 = Amp Output of 92Vpk/65Vrms
- 0dBFS pk Input on 4×250 = Amp Output of 65Vpk/46Vrms
- 0dBFS pk Input on 8×250 = Amp Output of 92Vpk/65Vrms
- 0dBFS pk Input on 8×125 = Amp Output of 65Vpk/46Vrms

For 70V/100Vrms systems, there are required gain adjustments for full output that occur in the High-Z Speaker component. This happens when the Amp Output component is wired to a High-Z Speaker component. In addition, there is an HPF that is automatically applied at 50Hz to avoid transformer saturation. The HPF is user adjustable in the Generic Speaker component.

Limiters

There are several limiters within the MPA-Q output:

- Speaker Component Limiters – These have controls exposed to the end user. Attack and Release Times in the Peak limiter are hard-coded. All other limiters are set by QSC. Speaker-related limiters are not indicated within the Amp Output block or front panel.
- Amp Protection Limiters – These are not adjustable and are meant only to protect the amplifier from unsafe conditions. Amp protection limiters are slow-moving and adjust over longer periods of time. Indicators for this limiter can be found on the individual amplifier channel or the front of the amplifier.
- DAC Limiters – These limiters engage approximately 1dB before clipping. It is normal to have some level of DAC clipping during operation. There are no controls over this limiter.

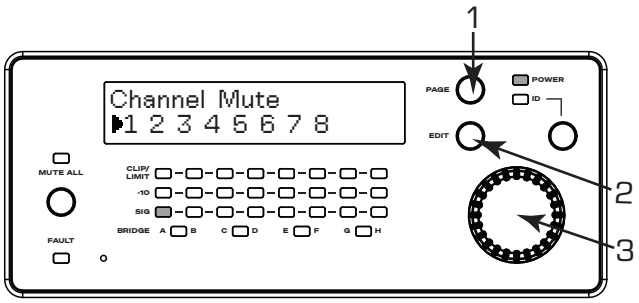
Analog Mode Screens

There are four analog pages—mute, gain, impedance, and bridging—which allow the user to control an amplifier operating in analog mode and are not available in Q-SYS mode. The system will roll back to the status pages after the user cycles through the analog pages.

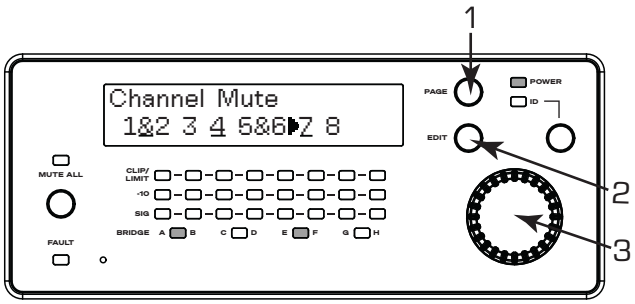
Mute Page

Muted channels are underlined.

Controls



— Figure 14 —
Mute Page - All channels Unmuted, Unbridged

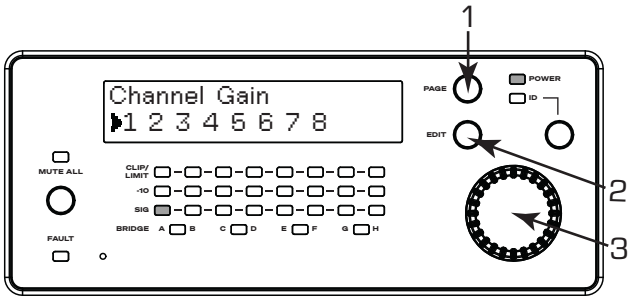


— Figure 15 —
Channels 1&2, 4, and 7 Muted - 1&2 Bridged, 5&6 Bridged

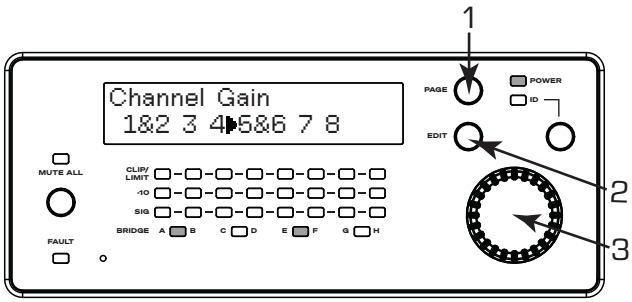
1. Page: Next Page (Gain)
2. Edit: Toggle Mute state
3. Selector knob: Scroll through channels

Gain Page

Controls



— Figure 16 —
Gain Page - No Channels Bridged



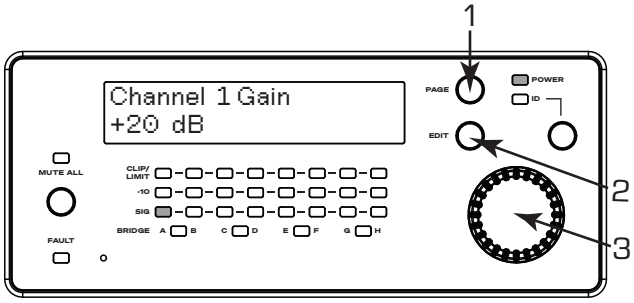
— Figure 17 —
Gain Page - Channels 1&2, 5&6 Bridged

1. Page: Next Page (Impedance)
2. Edit: Enter ‘Gain Selection Page’ for selected channel
3. Selector knob: Scroll through channels

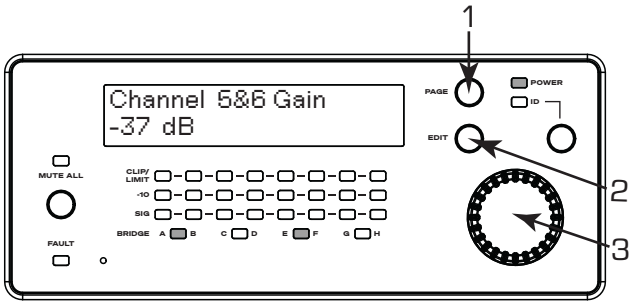
Gain Page - Gain Selection Page

NOTE: The selector knob is does not double as a button to confirm gain selection. Gain is applied in real time as the user scrolls.

Controls



— Figure 18 —
Gain Select Page - Channel 1 at +20 dB

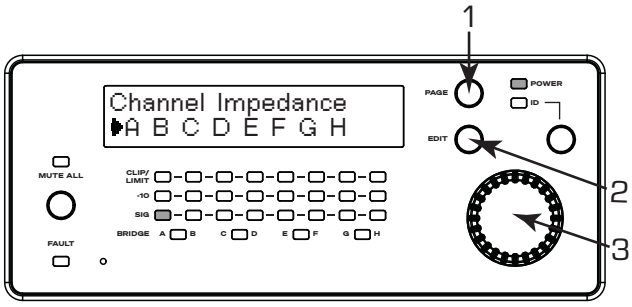


— Figure 19 —
Gain Select Page - Bridged Channels 5&6 at -37 dB

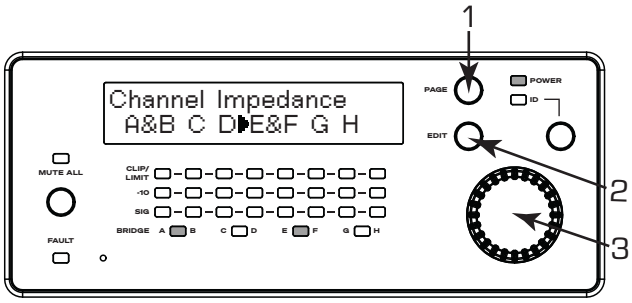
1. Page: Go back
2. Edit: Go back
3. Selector knob: Scroll through Gain values (-120 dB to +20 dB) ugh channels

Impedance Page

Controls



— Figure 20 —
Impedance Page - No Channels Bridged



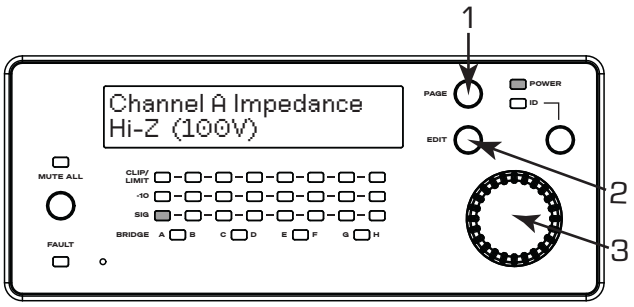
— Figure 21 —
Impedance Page - Channels 1&2, 5&6 Bridged

1. Page: Next Page (Bridging)
2. Edit: Enter ‘Impedance Selection Page’ for selected channel
3. Selector knob: Scroll through channels

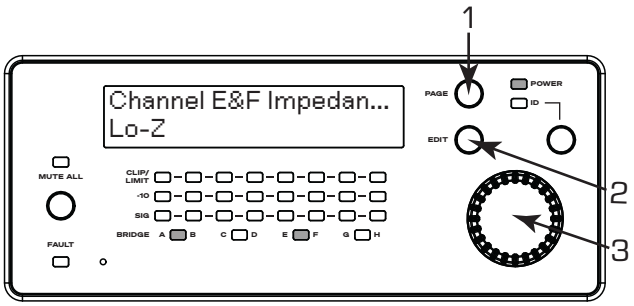
Impedance Page - Impedance Selection Page

NOTE: The selected impedance is only applied upon exiting the selection page. There is no confirmation mechanism.

Controls



— Figure 22 —
Impedance Select Page - Channel A at Hi-Z (100V)



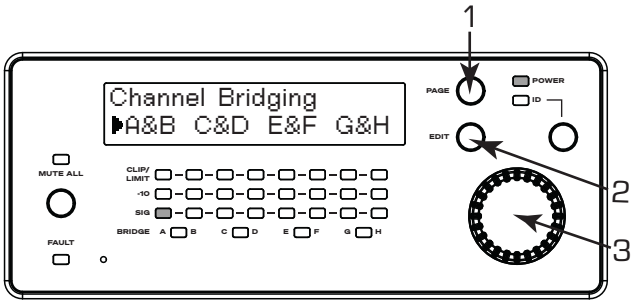
— Figure 23 —
Impedance Select Page - Bridged Channels E&F at Lo-Z

1. Page: Go back
2. Edit: Go back
3. Selector knob: Scroll through Impedance options (Lo-Z, Hi-Z (70V), Hi-Z (100V))

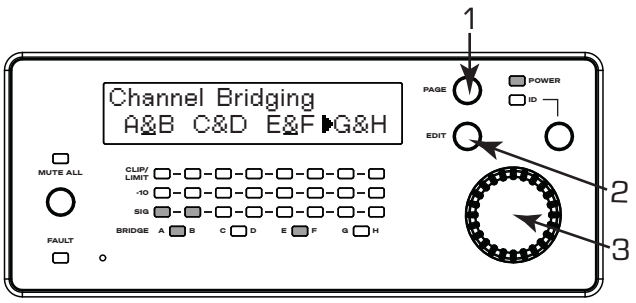
Bridging Page

Bridged channels are underlined.

Controls



— Figure 24 —
Bridging Page - No Channels Bridged



— Figure 25 —
Bridging Page - Channels A&B, E&F Bridged

1. Page: Next Page (Status)
2. Edit: Toggle Bridge state
3. Selector knob: Scroll through channels

Specifications [1]

Power Specifications – 4-Channel Models

Configuration	Loads	MPA-Q 4x250		MPA-Q 4x500	
		Max Power [2]	Continuous Power [3]	Max Power	Continuous Power
All Channels Driven A, B, C, D	100 V	250 W	150 W	500 W	300 W
	70 V	250 W	150 W	500 W	300 W
	8 Ω	250 W	150 W	500 W	300 W
	4 Ω	250 W	150 W	500 W	300 W
	2 Ω	250 W	150 W	500 W	300 W
Single Channel Driven A or B or C or D	100 V	500 W	150 W	1000 W	300 W
	70 V	500 W	150 W	1000 W	300 W
	8 Ω	500 W	150 W	1000 W	300 W
	4 Ω	500 W	150 W	1000 W	300 W
	2 Ω	500 W	150 W	1000 W	300 W
2 Channels Bridged A+B or C+D	100 V	500 W	300 W	1000 W	600 W
	70 V	500 W	300 W	1000 W	600 W
	8 Ω	500 W	300 W	1000 W	600 W
	4 Ω	500 W	300 W	1000 W	600 W
	2 Ω	Not Supported		Not Supported	

Power Specifications [1] – 8-Channel Models

Configuration	Loads	MPA-Q 8X125		MPA-Q 8X250	
		Max Power [2]	Continuous Power [3]	Max Power	Continuous Power
All Channels Driven A, B, C, D	100 V	125 W	75 W	250 W	150 W
	70 V	125 W	75 W	250 W	150 W
	8 Ω	125 W	75 W	250 W	150 W
	4 Ω	125 W	75 W	250 W	150 W
	2 Ω	125 W	75 W	250 W	150 W
Single Channel Driven A or B or C or D	100 V	250 W	75 W	500 W	150 W
	70 V	250 W	75 W	500 W	150 W
	8 Ω	250 W	75 W	500 W	150 W
	4 Ω	250 W	75 W	500 W	150 W
	2 Ω	250 W	75 W	500 W	150 W
2 Channels Bridged A+B or C+D	100 V	250 W	150 W	500 W	300 W
	70 V	250 W	150 W	500 W	300 W
	8 Ω	250 W	150 W	500 W	300 W
	4 Ω	250 W	150 W	500 W	300 W
	2 Ω	Not Supported		Not Supported	

1 *Specifications are subject to change without notice.*

2 *Max Power: 20 ms, 1 kHz sine wave burst; this data is most useful for asymmetrical loading of amplifier channel and maximizing power utilization of the amplifier. The Max Power specification is achieved with a 0 dBFS signal at all loads. To achieve the maximum power sharing / single channel specification at 8 Ω, add 3 dB of gain.*

3 *Continuous Power: 20 Hz - 20 kHz bandwidth, all channels driven with same load; this data is most useful for estimating longer-term power output across all amplifier channels.*

Peak Voltage Specifications – 4-Channel Models

		MPA-Q 4x500		MPA-Q 4x250	
Configuration	**Loads**	**Max Peak Voltage**	**Max Peak Current**	**Max Peak Voltage**	**Max Peak Current**
Independent Channels (SE) A, B, C, D	**8 Ω**	126V	15.8A	89V	11.2A
	4 Ω	89V	22.4A	63V	15.8A
	2 Ω	63V	31.6A	45V	22.4A
BTL/Bridged Channels (x2) A+B or C+D Doubles Voltage	**8 Ω**	179V	22.4A	126V	15.8A
	4 Ω	126V	31.6A	89V	22.4A
Do NOT use for 70 V or 100 V	**2 Ω**	N/R		N/R	

N/R = Not Recommended
N/A = Not Available
Gray cells = mode or rating n/a

NOTE: *Data indicates the maximum voltage and current potential for any amplifier single amplifier channel. The data in the table above has been measured for these specific conditions. N/A indicates data is not available. NR indicates that this configuration is not recommended.*

Peak Voltage Specifications – 8-Channel Models

		MPA-Q 8x250		MPA-Q 8x125	
Configuration	**Loads**	**Max Peak Voltage**	**Max Peak Current**	**Max Peak Voltage**	**Max Peak Current**
Independent Channels (SE) A, B, C, D	**8 Ω**	89V	11.2A	63V	7.9A
	4 Ω	63V	15.8A	45V	11.2A
	2 Ω	45V	22.4A	31V	15.8A
BTL/Bridged Channels (x2) A+B or C+D Doubles Voltage	**200 V**	N/A	N/A	N/A	N/A
	140 V	N/A	N/A	N/A	N/A
	8 Ω	126V	15.8A	89V	11.2A
Do NOT use for 70 V or 100 V	**4 Ω**	89V	22.4A	63V	15.8A
	2 Ω	N/R		N/R	

N/R = Not Recommended
N/A = Not Available
Gray cells = mode or rating n/a

NOTE: *Data indicates the maximum voltage and current potential for any amplifier single amplifier channel. The data in the table above has been measured for these specific conditions. N/A indicates data is not available. NR indicates that this configuration is not recommended.*

Audio Specifications

	MPA-Q 4x250	MPA-Q 4x500	MPA-Q 8x125	MPA-Q 8x250
Amplifier Output				
Freq response @ 20 Hz - 20 kHz 8Ω	+0.2 dB / -0.7 dB			
Output THD+N @1kHz	0.01%-0.03% typical; 1% max			
SNR @ 20Hz-20kHz, A-weighted	>110 dB			
Gain @ +4 dBu input	31 dB	34 dB	28 dB	31 dB
Damping Factor	>160			
Analog Inputs (Line Level Only)				
Input Dynamic Range	>108 dB			
Input Impedence @ 1kHz	>11k balanced and >5.5k unbalanced			
Sample Rate	48 kHz			
DSP				
DSP Processing	Gain, Polarity, IIR Filters (HPF, Parametric, Shelf, Array Correction), FIR Filters (1024 taps per channel), Delay (up to 2020 milliseconds per channel), Limiters (narrow-band, RMS, and peak limiters)			

Environmental Specifications

	MPA-Q 4x250	MPA-Q 4x500	MPA-Q 8x125	MPA-Q 8x250
Operating temp	32° to 104° F (0° to 40° C)			
Storage temp	-4° to 158° F (-20° to 70° C)			
Humidity range	5% - 85% RH			
Fan noise (idle & max)	34dBA typical, 50dBA max			
Cooling	Forced air cooling, thermally regulated fan speed, front-to-rear airflow			

Physical Specifications

	MPA-Q 4x250	MPA-Q 4x500	MPA-Q 8x125	MPA-Q 8x250
Audio I/O connections	Output: 4x channels (Euro 7.62 mm) Input: 4x channels (Euro 3.5 mm)	Output: 4x channels (Euro 7.62 mm) Input: 4x channels (Euro 3.5 mm)	Output: 8x channels (Euro 7.62 mm) Input: 8x channels (Euro 3.5 mm)	Output: 8x channels (Euro 7.62 mm) Input: 8x channels (Euro 3.5 mm)
Networking	2x 1 Gbps Ethernet ports LAN A optionally accepts PoE (802.3af Type 1) for quick time-to-audio following a power interruption			
GPI	0-3.3V DC Closure			
Mounting	Front rack ears come installed for rack mount installation (rack ears can also be used for chassis-supported surface-mounting)			
Controls and Indicators (Front)	Buttons: Page, Edit, ID, Mute All Pin: Reset Control Knob OLED Screen Clip, Limit, Bridge LED Indicators			
Controls and Indicators (Back)	Q-SYS / Analog Mode switch			
AC Power Input	100-240 V, 50/60 Hz, 2.8-1.8 A	100-240 V, 50/60 Hz, 4.6-2.5 A	100-240 V, 50/60 Hz, 3.2-2.0 A	100-240 V, 50/60Hz, 5.2-2.8 A
Product Dimensions (L x W x H)	15.0 x 19.0 x 3.5 in (381 x 483 x 89 mm)			
Package Dimensions (L x W x H)	20.4 x 23.3 x 7.7 in (519 x 592 x 192 mm)			
Product Weight	19.4 lbs (9.0 kg)	20.7 lbs (9.4 kg)	22.5 lbs (10.2 kg)	22.9 lbs (10.4 kg)
Package Weight	25 lbs (11.4 kg)	26 lbs (11.8 kg)	28 lbs (12.7 kg)	28 lbs (12.7 kg)
Agency Approvals	TUV, CE, ROHS/WEEE compliant, FCC Class A (conducted and radiated emissions)			
Included Accessories	1x AC mains power cord (country specific) Removable rack ears for rack- or surface-mounting 4-position 7.62mm pitch Euroblock connectors (Qty 4) 3-position 3.5mm pitch Euroblock connectors (Qty 8) 12-position (2-row) 3.5mm pitch Euroblock connector (Qty 1)		1x AC mains power cord (country specific) Removable rack ears for rack- or surface-mounting 4-position 7.62mm pitch Euroblock connectors (Qty 8) 3-position 3.5mm pitch Euroblock connectors (Qty 16) 12-position (2-row) 3.5mm pitch Euroblock connector (Qty 1)	

Current Consumption and Heat Loss

Heat losses are the thermal emissions from an amplifier while it is operating. It comes from dissipated waste power—i.e., real AC power in minus audio power out. Measurements are provided for various loads at idle, 1/8 of average full power, 1/3 of average full power, and full power, with all channels driven simultaneously. For typical usage, use the idle and 1/8 power figures. This data is measured from representative samples; due to production tolerances, actual heat emissions may vary slightly from one unit to another. For bridged channels driving an 8-ohm load, use the 4-ohm/channel heat dissipation data. For bridged channels driving a 4-ohm load, use the 2-ohm/channel heat dissipation data.

Idle

Thermal loss at idle or with very low signal level.

1/8 Power

Thermal loss at 1/8 of full power is measured with a pink noise signal. It approximates operating with music or voice with light clipping and represents the amplifier's typical "clean" maximum level, without audible clipping. Use these figures for typical maximum level operation.

1/3 Power

Thermal loss at 1/3 of full power is measured with 1 kHz sine. It approximates operating with music or voice with very heavy clipping and a very compressed dynamic range.

Full Power

Thermal loss at full power is measured with a 1 kHz sine wave. However, it does not represent any real-world operating condition.

Current Draw

The amount of AC current an amplifier demands while it is operating. Measurements are provided for various loads at idle, 1/8 of average full power, 1/3 of average full power, and full power, with all channels driven simultaneously. The data shown in the following tables is listed for 100 VAC, 120 VAC and 230 VAC operation. For typical usage, use the idle and 1/8 power data.

Current Consumption

NOTE: Thermal Dissipation minimally varies between 100 and 240 VAC. This data is based on all operating voltages (100-240 VAC). High power applications will see benefits in efficiency, power output, and reduced power consumption when operated from 208, 230, 240 VAC mains.

MPA-Q 4x500

			120 VAC Mains		230 VAC Mains		Thermal Dissipation	
Output Level	Load	100 VAC Current	AC Current (Amps)	Losses (Watts)	AC Current (Amps)	Losses (Watts)	BTU/h	kcal/h
Standby		0.4	0.5	16	0.6	17	56	14
Mute All		0.5	0.5	26	0.7	27	90	23
Idle		0.8	0.8	53	0.8	58	181	46
1/8 Rated Power (Pink Noise)	100 V /Channel	2.6	2.4	109	1.7	118	372	94
	70 V / Channel	2.8	2.4	111	1.7	118	379	95
	8 Ω / Channel	2.6	2.2	88	1.6	104	301	76
	4 Ω / Channel	2.7	2.3	100	1.6	109	340	86
	2 Ω / Channel	2.8	2.4	106	1.7	114	362	91
1/3 Rated Power (1kHz Sine Wave)	100 V / Channel	5.3	4.5	115	2.6	120	392	99
	70 V / Channel	5.4	4.5	119	2.7	121	406	102
	8 Ω / Channel	5.2	4.4	106	2.6	111	362	91
	4 Ω / Channel	5.4	4.6	123	2.7	128	420	106
	2 Ω / Channel	5.8	4.9	167	2.9	171	569	143

MPA-Q 4x250

			120 VAC Mains		230 VAC Mains		Thermal Dissipation	
Output Level	Load	100 VAC Current	AC Current (Amps)	Losses (Watts)	AC Current (Amps)	Losses (Watts)	BTU/h	kcal/hr
Standby		0.4	0.5	16	0.6	17	56	14
Mute All		0.5	0.5	26	0.7	27	90	23
Idle		0.8	0.8	53	0.8	58	181	46
1/8 Rated Power (Pink Noise)	100 V /Channel	1.9	1.7	101	1.4	109	343	87
	70 V / Channel	1.8	1.6	87	1.3	96	297	75
	8 Ω / Channel	1.4	1.6	77	1.3	84	263	66
	4 Ω / Channel	1.8	1.6	85	1.3	91	289	73
	2 Ω / Channel	1.8	1.7	95	1.3	93	323	81
1/3 Rated Power (1kHz Sine Wave)	100 V / Channel	2.9	2.5	79	1.8	82	270	68
	70 V / Channel	3.0	2.6	82	1.8	86	280	71
	8 Ω / Channel	3.1	2.7	95	1.8	96	325	82
	4 Ω / Channel	3.2	2.8	107	1.9	110	365	92
	2 Ω / Channel	3.5	3.0	133	2.0	137	454	114

MPA-Q 8x250

			120 VAC Mains		230 VAC Mains		Thermal Dissipation	
Output Level	Load	100 VAC Current	AC Current (Amps)	Losses (Watts)	AC Current (Amps)	Losses (Watts)	BTU/h	kcal/hr
Standby		0.6	0.6	27	0.7	27	91	23
Mute All		0.7	0.7	38	0.7	44	131	33
Idle		1.3	1.2	98	0.9	100	335	84
1/8 Rated Power (Pink Noise)	100 V /Channel	3.5	3.0	179	2.0	188	611	154
	70 V / Channel	3.3	2.8	154	1.9	164	526	132
	8 Ω / Channel	3.1	2.6	135	1.8	142	461	116
	4 Ω / Channel	3.3	2.8	147	1.8	156	502	126
	2 Ω / Channel	3.3	2.9	162	1.9	171	553	139
1/3 Rated Power (1kHz Sine Wave)	100 V / Channel	5.7	4.8	144	2.8	147	491	124
	70 V / Channel	5.7	4.8	150	2.8	152	512	129
	8 Ω / Channel	5.9	4.9	163	2.9	166	556	140
	4 Ω / Channel	6.1	5.1	186	3.0	190	635	160
	2 Ω / Channel	6.6	5.5	241	3.2	245	823	207

MPA-Q 8x125

			120 VAC Mains		230 VAC Mains		Thermal Dissipation	
Output Level	Load	100 VAC Current	AC Current (Amps)	Losses (Watts)	AC Current (Amps)	Losses (Watts)	BTU/h	kcal/h
Standby		0.6	0.6	26	0.7	27	89	22
Mute All		0.7	0.7	39	0.7	44	133	34
Idle		1.2	1.2	92	1	96	313	79
1/8 Rated Power (Pink Noise)	100 V / Channel	2.6	2.3	167	1.6	175	570	144
	70 V / Channel	2.4	2.1	140	1.5	146	478	120
	8 Ω / Channel	2.1	1.8	111	1.4	116	379	95
	4 Ω / Channel	2.2	1.9	121	1.4	125	413	104
	2 Ω / Channel	2.3	2.0	135	1.5	140	459	116
1/3 Rated Power (1kHz Sine Wave)	100 V / Channel	3.4	2.9	113	1.9	118	386	97
	70 V / Channel	3.3	2.8	110	1.9	115	375	95
	8 Ω / Channel	3.5	3.0	126	1.9	128	430	108
	4 Ω / Channel	3.8	3.2	160	2.1	160	544	137
	2 Ω / Channel	4.2	3.6	200	2.2	202	683	172

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