Overview

The Rio3224-D I/O rack employs Dante network audio protocol for exceptional flexibility and freedom in setup and placement, while delivering natural, musical sound that brings out the full sonic potential of mixing consoles and other system components.

Rear Panel

Features

- 5U size, 32 inputs, 16 outputs, and four AES/EBU outputs.
- Dante network protocol contributes to greater system scalability and flexibility
- Support for CL/QL series consoles as well as other Dante based systems
- Automatic digital-stage compensation for analog gain changes (CL/QL series only)
- Four models (Rio3224-D, Rio1608-D, Ri8-D and Ro8-D) flexibly accommodate any system requirements

Specifications

General Specifications

Sampling Frequency	Internal	44.1kHz 48kHz 88.2kHz 96kHz	
	External	44.1kHz +4.1667%, +0.1%, –0.1%, –4.0%	±200ppm
		48kHz +4.1667%, +0.1%, –0.1%, –4.0%	±200ppm
		88.2kHz +4.1667%, +0.1%, –0.1%, –4.0%	±200ppm
		96kHz +4.1667%, +0.1%, –0.1%, –4.0%	±200ppm
Signal Delay	Less than 3ms INPUT to OUTPUT, connect with CL5 using Dante, Dante Receive Latency set to 0.25ms (one way), Fs=48kHz		
Frequency Response	+0.5, –1.5dB 20Hz-20kHz, refer to +4dBu output @1kHz, INPUT to OUTPUT, Fs= 44.1kHz, 48kHz +0.5, –1.5dB 20Hz-40kHz, refer to +4dBu output @1kHz, INPUT to OUTPUT, Fs= 88.2kHz, 96kHz		
Total Harmonic Distortion*1	Less than 0.05% 20Hz-20kHz@+4dBu into 600Ω, Fs= 44.1kHz, 48kHz Less than 0.05% 20Hz-40kHz@+4dBu into 600Ω, Fs= 88.2kHz, 96kHz INPUT to OUTPUT, Input Gain= Min.		
Hum&Noise*2	–128dBu typ., Equivalent Input Noise, Input Gain= Max. –88dBu Residual output noise, ST master off.		
Dynamic Range	112dB typ., DA Converter, 108dB typ., INPUT to OUTPUT, Input Gain= Min.		
Crosstalk@1kHz	–100dB*3, adjacent INPUT/OUTPUT channels, Input Gain= Min.		
Dimensions	480mm x 232mm*4 x 361.5mm (18.9'' x 9.1'' x 14.23'')		
Net Weight	12.4kg (27.3lbs)		
Power Requirements (wattage)	120W		
Power Requirements (voltage and hertz)	US/Canada: 120V 60Hz Japan: 100V 50/60Hz China: 110-240V 50/60Hz Korea: 220V 60Hz Other: 110-240V 50/60Hz		
Temperature Range	Operating temperature range: 0 - 40°C Storage temperature range: –20 - 60°C		
Included Accessories	Owner's Manual, Power Cord, Dante Virtual Soundcard Token leaflet		

*1 Total Harmonic Distortion is measured with 18dB/octave filter @80kHz
*2 Hum & Noise are measured with A-Weight filter.
*3 Crosstalk is measured with a 30dB/octave filter @22kHz
*4 Including rubber feet.

Analog Input Characteristics

Input Terminals	GAIN	Actual Load Impedance	For Use With Nominal	Input Level		Connector
				Nominal	Max. before clip	
INPUT 1-16	+66dB	7.5kΩ	50-600Ω Mics & 600Ω Lines	–62dBu (0.616mV)	–42dBu (6.16mV)	XLR-3-31 type (Balanced)*1
	–6dB			+10dBu (2.45V)	+30dBu (24.5V)	
INPUT 17-32	+66dB	7.5kΩ	50-600Ω Mics & 600Ω Lines	–62dBu (0.616mV)	–42dBu (6.16mV)	XLR-3-31 type (Balanced)*1
	–6dB			+10dBu (2.45V)	+30dBu (24.5V)	

*1 XLR-3-31 type connectors are balanced.(1=GND, 2=HOT, 3=COLD)
* In these specifications, 0dBu = 0.775 Vrms.
* All input AD converters are 24bit linear, 128times oversampling.
* +48V DC (phantom power) is supplied to INPUT XLR type connectors via each individual software controlled switch.

Analog Output Characteristics

Output Terminals	Actual Source Impedance	For Use With Nominal	Max.Output Level Select SW*1	Output Level		Connector
				Nominal	Max. before clip	
OUTPUT 1-8	75Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.3V)	XLR-3-32 type (Balanced)*2
			+18dB	–2dBu (616mV)	+18dBu (6.16V)	
OUTPUT 9-16	75Ω	600Ω Lines	+24dB (default)	+4dBu (1.23 V)	+24dBu (12.3V)	XLR-3-32 type (Balanced)*2
			+18dB	–2dBu (616mV)	+18dBu (6.16V)	

*1 There are switches inside the body to preset the maximum output level.
*2 XLR-3-32 type connectors are balanced. (1=GND, 2=HOT, 3=COLD)
* All output DA converters are 24bit, 128times oversampling.
* There are switches inside the body to preset the maximum output level.

Digital I/O Characteristics

Terminals	Format	Data length	Level	Audio	Connector
Primary/ Secondary	Dante	24bit or 32bit	1000Base-T	24ch Input/32ch Output	EtherCON Cat5e

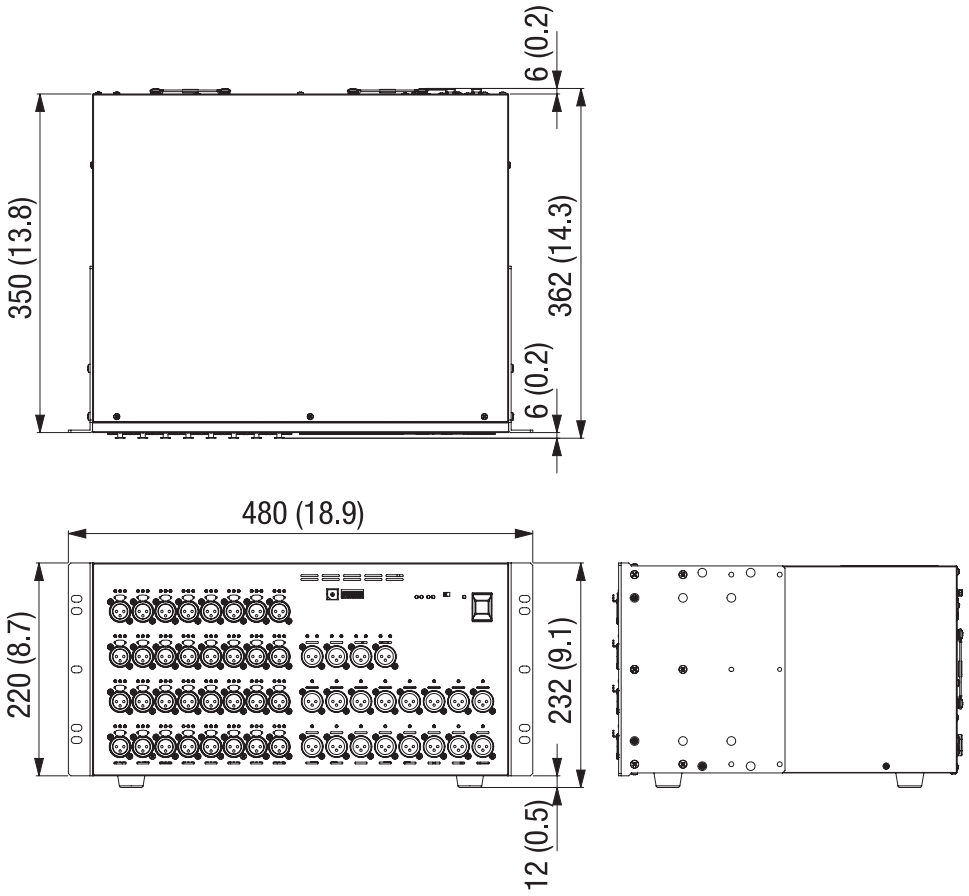
Digital Output Characteristics

Terminal		Format	Data Length	Level	Connector
AES/EBU OUT 1-4	AES/ EBU	AES/EBU Professional use	24bit	RS422	XLR-3-32 type (Balanced)*2

*2 XLR-3-32 type connectors are balanced. (1= GND, 2= HOT, 3= COLD)

Dimensions

Unit: mm (inch)



Software

- R Remote

Architectural and Engineering Specifications

The Yamaha Rio3224-D shall be a 5U-size I/O rack with 32 analog inputs, 16 analog outputs, and 4 AES/EBU digital outputs. It shall have built-in Dante digital audio networking capability. When used with a Yamaha CL or QL series digital mixing console it shall allow easy I/O patching from the console interface. Remote head amp control of up to 8 I/O rack units from the console shall be possible per system (Ro8-D not included). A Gain Compensation function that allows the I/O rack head amplifiers to be shared by an FOH console and monitor console on the same network, and other features that enhance system versatility, shall be included. An “R Remote” software application shall be provided to allow remote control of R series I/O rack head amplifiers from a computer. Dimensions shall be 480 (W) x 232 (H) x 362 (D) mm. Weight shall be 12.4 kg.

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