
**Galvanic Isolated Grounding**
**Equipment Rack Chassis Metal Ground**

## General RAD Description

The entire family of RAD models interface with HAL for digital conversion at the wall. Each converts analog audio to and/or from 24-bit, 48 kHz digital audio. Shielded CAT 5e (or better) cable and termination transport four digital audio channels – two channels each direction – as well as power, ground and a communications channel, with status indicators at each RAD, HAL, EXP unit, and in Halogen software. The host HAL auto-checks the CAT 5 crimp and verifies audio. All RADs are both “location-aware” and hot-swappable with 500-foot homerun connections (66% farther than Ethernet).

## RAD16 to RAD16z Improvements

- New universal Mic / Line / Line-Plus Inputs.
- Adds 2 Logic Inputs and 2 Logic Outputs.
- Power on/off transient suppression.
- 500 V galvanic isolation.

## RAD16z

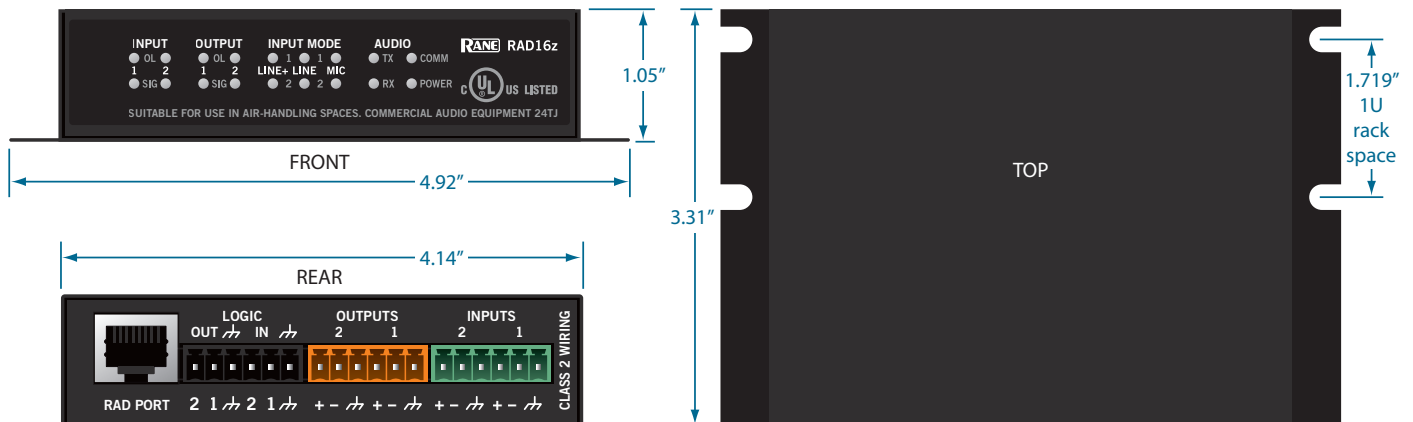
A RAD16z is an alternative to standard switch boxes for impractical areas such as in stage floor pockets or above ceilings. Its form factor is a rugged metal box with flexible surface mounting options. The RAD16z is plenum-rated UL 2043.

It contains two balanced Mic / Line / Line-Plus inputs and two balanced line outputs on Euroblock connectors. Line-Plus allows an unbalanced stereo source to connect to a single balanced input and be mono'ed. Inputs are individually software switchable to Mic, Line or Line-Plus. The Halogen software can enable 24V phantom power for a condenser mic on either input. LEDs indicate input mode, Input and Output level, as well as RAD connectivity to the HAL.

Two Logic Inputs and Outputs interface other devices to HAL with toggles or commands, such as push-to-talk or mute switches, projectors, lights, alarms, etc. Logic In connects a device contact switch between pin 1 or 2 to ground. Logic Outs are 5 V high or 0 V low.

Galvanic isolation prevents current flow between the RAD and host technical grounds from interfering with audio. The Euro connections accept wire between 30 and 14 AWG.

The RAD16z is only available in black. Mountable to any flat surface, it measures 4.92" x 3.31" x 1.05" (12.5 x 8.4 x 2.7 cm).



### Specifications

Parameter	Specification	Limit	Units	Conditions/Comments
Cable Length	500 feet / 153 meters			Shielded CAT 5e or better.
Signal Indicator	-50	typ.	dBFS	Unbalanced / balanced output, green LED, peak-reading
Overload Indicators	-0.5	typ.	dBFS	Unbalanced / balanced output, red LED, peak-reading
<b>Microphone Input Specs (level set in software)</b>				
Input Impedance	2.16 k	1%	$\Omega$	Balanced, 1.08 k + 1.08 k
Gain Range Dynamic Mic	26 to 46	typ.	dB	In 1 dB Steps
Gain Range Condensor Mic	14 to 34	typ.	dB	In 1 dB Steps
Max. Input Level Dynamic Mic	-16	min.	dBu	Balanced, Gain = 26 dB
Max. Input Level Condensor Mic	-4	min.	dBu	Balanced, Gain = 14 dB
Equivalent Input Noise	-121	typ.	dBu	20 kHz BW, $R_s = 150 \Omega$ , Gain = 26 dB
CMRR	-70	typ.	dB	$R_s = 150 \Omega$ , 1 kHz, Gain = 26 dB
Frequency Response	20 to 20k	typ.	Hz	+0, -0.5 dB, at all Gain settings
THD+Noise	0.010% typ.	@ 1 kHz, 20 kHz BW, $R_s = 150 \Omega$ , Output = -6 dBFS, Gain = 26 dB		
Phantom Power	+24	2%	V	10 mA Max.
<b>Balanced Line-Level Input Specs</b>				
Input Impedance	10 k	1%	$\Omega$	Balanced
Gain Range	0-20	typ.	dB	
Max. Input Level	14	min.	dBu	<1% THD
Dynamic Range	103	typ.	dB	re: 0 dBFS, 20 kHz BW, A-weighted, Unity Gain
CMRR	-50	typ.	dB	$R_s = 150 \Omega$ , 1 kHz
Frequency Response	20 to 20k	typ.	Hz	+0, -0.5 dB
<b>Line+ Mode</b>	Active Summer			Left ("+") and Right ("-") signals summed to mono
Max. Input Level L+R	14	typ	dBu	@ 1 kHz
<b>Balanced Line-Level Output Specs (Active Balanced)</b>				
Output Impedance	200	1%	$\Omega$	Each Leg
Max. Output Level	14	min.	dBu	<1% THD, Load = 10 k $\Omega$
Dynamic Range	106	typ.	dB	re: 0 dBFS, 20 kHz BW, A-weighted
Frequency Response	20 to 20k	typ.	Hz	+0, -0.5 dB
THD+Noise	0.008% typ.	@ 1 kHz, 20 kHz BW, Output = -6 dBFS, RAD16z Input to Output		
<b>Logic Specs</b>				
<b>Logic Inputs</b>	2			Contact closure to ground
...Internal Pull-up	51.1 k $\Omega$ , 5.0 V		$\Omega$	Protected to +24 V
...Logic High Input Level	> 2.0	min	V	Normal state
...Logic Low Input Level	< 0.9	max	V	External circuit must sink > 80 $\mu$ A to assert
<b>Logic Outputs</b>	2			Relay drive, LED or logic level output
...Internal Pull-up	1.0 k $\Omega$ , 5.0 V		$\Omega$	Protected to +30 V, reverse polarity protected
...Sink Current	200	max	mA	Output FET on
...LED Drive Current	2		mA	Output FET off, Driving an LED with $V_f = 2.0$ V
...Logic High Output Level	4.7	min	V	Output FET off, Output Current = 0 mA
...Logic Low Output Level	0.1	max	V	Output FET on, Sink Current < 200 mA
<b>Unit</b>				
Conformity	CE, FCC, cULus			
Size	4.92"W x 3.31"D x 1.05"H			12.5 x 8.4 x 2.7 cm
...Weight	11.9 oz			337 g
Shipping Size	9.6" x 6" x 3.2"			24.4 x 15.2 x 8.1 cm
...Weight	1 lb 2 oz (18.2 oz)			517 g