RDL®
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

HALF-RACK SERIES
Model HR-ADC1
Analog to Digital Audio Converter

- Broadcast Quality Analog to Digital Audio Conversion
- Inputs: Balanced and Unbalanced Stereo Audio
- Output: AES/EBU, Coaxial S/PDIF, AES-3ID
- External Sync Inputs: AES/EBU, Coaxial S/PDIF, AES-3ID
- Adjustable Audio Input Gain Trim
- Peak or Average Ballistic Metering with Selectable 0 dB Reference
- Peak Metering with Selectable Hold or Peak Store Modes
- Operation Up to 24 bits, 192 kHz
- Selectable Internally Generated Sample Rate and Bit Depth
- Front-Panel External Sync Enable Selector and Indicator
- Sample Rate, Bit Depth, External Sync Lock Indicators
- Transformer Isolated AES/EBU Output

The HR-ADC1 is an RDL HALF-RACK product, featuring an all metal chassis and the advanced circuitry for which RDL products are known. HALF-RACKs may be operated free-standing using the included feet or may be conveniently rack mounted using available rack-mount adapters.

APPLICATION: The HR-ADC1 is a broadcast quality A/D converter that provides exceptional audio accuracy and clarity with any audio source or style. Superior analog performance fine tuned through audiophile listening practices produces very low distortion (0.0006%), exceedingly low noise (-135 dB) and remarkably flat frequency response (+/- 0.05 dB). This performance is coupled with unparalleled metering flexibility and programmability with average mastering level monitoring and peak value storage. With external sync capability plus front-panel settings up to 24 bits and up to 192 kHz sample rate, the HR-ADC1 is the single instrument needed for A/D conversion in demanding applications.

The HR-ADC1 accepts balanced +4 dBu or unbalanced -10 dBV stereo audio through rear-panel XLR or RCA jacks or through a detachable terminal block. An external AES/EBU, AES-3ID or S/PDIF sync source may be connected through a rear-panel XLR, RCA or BNC jack. Digital audio outputs are provided in AES/EBU, AES-3ID or S/PDIF formats. The rear-panel switch-selected output format is available on the corresponding XLR, RCA or BNC jack.

Front panel **LEFT** and **RIGHT** controls permit input gain adjustment to produce the desired average signal level for the digital conversion. The zero decibel (0 dB) reference level of the audio metering string may be set to -14, -16, -18 or -20 dBFS. The meter may also be set to display peak or VU average audio levels. Audio peaks between -10 dBFS and 0 dBFS (clipping) are displayed separately to the right of the standard audio level meter. The peak display may be set to either flash or store the peak values. Flash duration settings provide for instantaneous, 1/3 second hold or 2/3 second hold. If the peak display is set to **STORE** then the highest peak recorded remains displayed until the **PEAK RESET** button is pushed.

The HR-ADC1 provides rear-panel inputs for an external sync source. If valid external sync is connected, the **EXTERNAL SYNC LOCK** LED illuminates. The front-panel **SYNC** button sets the converter to synchronize to the external source. When external sync is active, the **EXTERNAL SYNC** LED illuminates. If external sync is selected but unavailable, the **EXTERNAL SYNC** LED flashes. When external sync is not used, the HR-ADC1 converts at the sample rate selected using the front-panel **RATE** button. The number of **BITS** is user-selectable on the front panel. The peak LEDs double as the programming indicators during setup. The **MODE MENU** has four selection categories: **METERING RSP** (response) allows selection of **PEAK** or **AVG** (average) for the main audio metering display; **METERING 0 REF** allows setting the meter scaling to -14, -16, -18 or -20 dBFS for a reading of 0 dB; **DISPLAY BRT** (brightness) allows the LED display brightness to be set to **NORM** or **BRT** (bright) depending on the ambient light; **DISPLAY PEAK** allows the peak LED string to be set to **FLASH**, hold the peak reading **1/3** second, hold the peak reading **2/3** second, or **STORE** the maximum peak reading. Programming selections are automatically stored after five seconds and are retained in memory when the HR-ADC1 is re-powered.

The HR-ADC1 is powered from 24 Vdc, which may be connected through the detachable terminal block or through the dc power jack. A front-panel power switch is provided.

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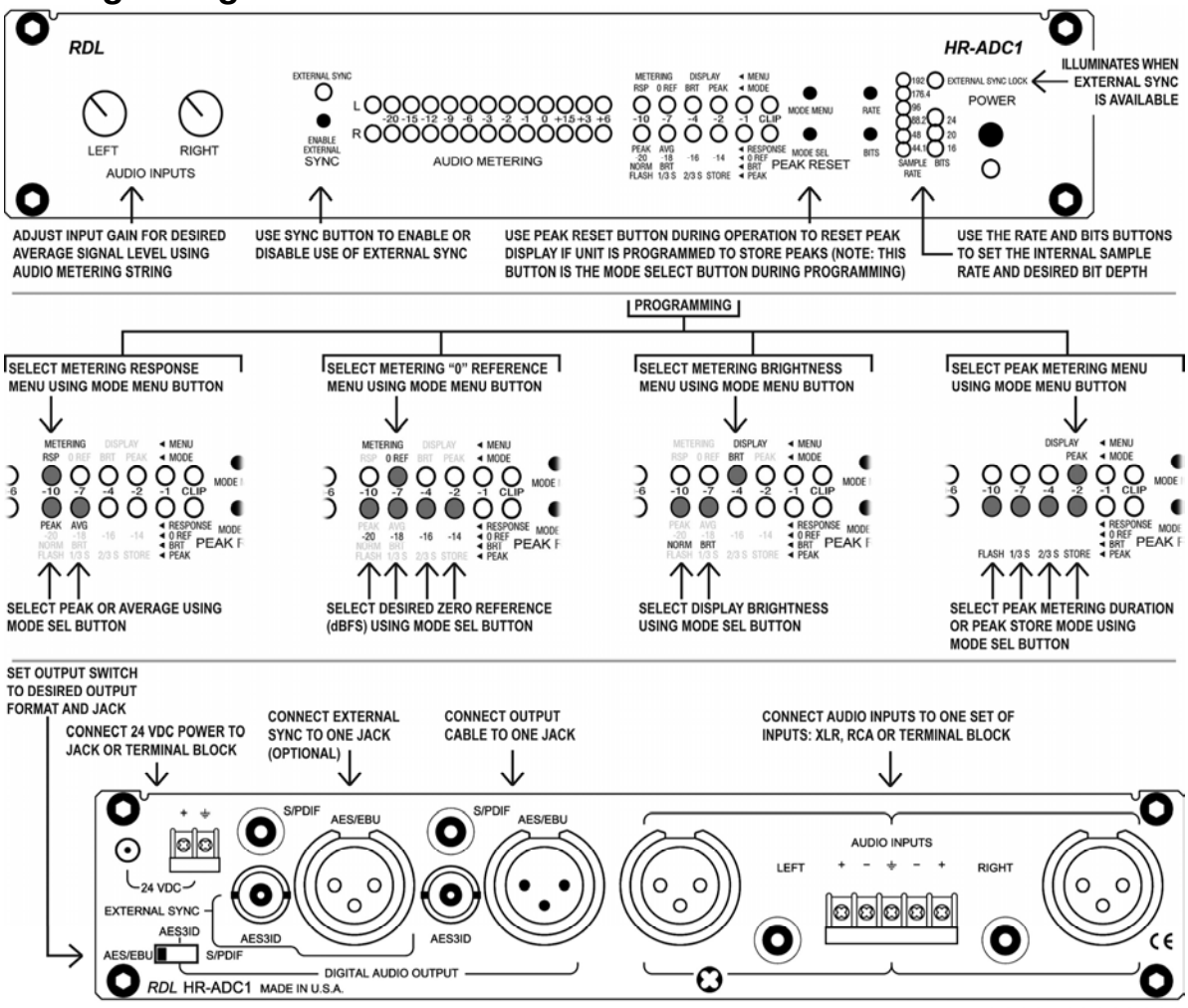
Installation/Operation

CE **EN55103-1 E1-E5; EN55103-2 E1-E4**

Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.



MOUNTING

For free-standing operation, use the four provided machine screws to mount the feet to the bottom of the module as shown, OR Use the four provided machine screws to secure the module to an optional RDL mount, such as an HR-RA2 Rack Adapter.

TYPICAL PERFORMANCE

Audio Inputs (5):	Balanced (2): 30 kΩ XLR (Left and Right); Balanced terminal block; Unbalanced (2): 30 kΩ RCA jacks (Left and Right)
Input Level:	Left and Right front-panel user controls, Balanced: +4 dBu nominal; +2 dBu to +26 dBu (for 0 dBFS) ubalanced: -10 dBV nominal; -11 dBV to +11 dBV (for 0 dBFS)
External Sync Inputs (3):	110 Ω AES/EBU XLR, transformer isolated; 75 Ω S/PDIF coaxial phono jack; 75 Ω AES-3ID BNC (automatically selected)
Outputs (3):	110 Ω AES/EBU XLR, transformer isolated; 75 Ω S/PDIF coaxial phono jack; 75 Ω AES-3ID BNC rear-panel switch selectable)
Sample Rates:	44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz (internal, front-panel selectable; external sync rate is displayed if external sync is enabled)
Resolution:	16, 20 or 24 bits (front-panel selectable)
Frequency Response:	10 Hz to 20 kHz (+/- 0.125 dB); 20 Hz to 20 kHz (+/- 0.05 dB)
THD+N:	< -105 dBFS (0.0006%, 20 Hz to 20 KHz, internal sample rate); <-100 dBFS (0.001%, 20 Hz to 20 KHz, external sync)
Crosstalk:	< -115 dB (50 to 60 Hz); < -105 dB (15 kHz)
Residual Noise:	< -135 dB (10 Hz to 20 kHz)
Dynamic Range:	> 114 dB (resolution 24-bit unweighted)
Programmable Features Menus (4):	Metering Ballistic (2): Peak or Average; Meter Reference (4): -20, -18, -16, -14 dBFS; Peak hold (4): Momentary flash, 1/3 s., 2/3 s., store; Display intensity (2): Normal or bright
Indicators (49):	**POWER** LED **EXTERNAL SYNC LOCK** LED (locked to valid input signal) **SAMPLE RATE** (6): 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz; **BITS** (3): 16, 20, 24 **AUDIO METERING** (26): Audio present, -20, -15, -12, -9, -6, -3, -2, -1, 0, +1.5, +3, +6 dB **PEAK** METERING (12): -10, -7, -4, -2, -1 dBFS, CLIP
Measurement Reference:	0 dBFS (+22 dBu = 0 dBFS @ 1 kHz, Operating level: -2 dBFS, 24 bits, 192 kHz internal sample rate unless otherwise noted)
Standards:	AES3-2003, IEC60958
Power Requirement:	24 to 33 Vdc @ 300 mA, Ground-referenced
Mounting:	Rack-mount using optional rack adapters such as HR-RA2; or operate free-standing (feet included)
Dimensions:	Height: 1.7 in, 4.3 cm; Length: 8.6 in, 20.6 cm; Depth: 4.59 in, 11.66 cm

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rule. These limits are designed to provide reasonable protection against harmful interference in a residential installation. The 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 an 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 which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Radio Design Labs Technical Support Centers
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