



**RDL**<sup>®</sup>  
Radio Design Labs

SPECIALISTS IN PRACTICAL PRECISION ENGINEERING™

## RACK-UP<sup>®</sup> SERIES Model RU-PA40D 40 W Stereo Audio Power Amplifier with VCA Control and Power Supply

- VCA Controlled Stereo Audio Power Amplifier
- 20 W RMS / Channel into 8  $\Omega$  – 40 Watts Total
- 15 W RMS / Channel into 4  $\Omega$  – 30 Watts Total
- Unbalanced Inputs on RCA Phono Jacks
- Balanced Inputs on Detachable Terminal Block
- Switch-Selectable Stereo or Mono Operation
- VCA Control on Detachable Terminal Block
- Compatible with RDL Remote Level Controls
- External Control Using 10 K $\Omega$  Potentiometer or 0 to 10 Vdc
- Compressor/Limiter Controls Clipping
- Studio Quality, Aurally Transparent Compressor/Limiter
- Compressor Produces Maximized Average Output Power
- Compression Enabled Using Input Level Adjustments
- LED to Indicate Audio Compression Threshold
- High-Efficiency Class D Operation
- Thermal and Short-Circuit Protection



### TYPICAL APPLICATIONS:

- ▶ Projector-Mounted Amplification
- ▶ Boardrooms
- ▶ Classrooms
- ▶ Restaurant or Residential Patios
- ▶ Audio / Visual Carts
- ▶ Video Conferencing
- ▶ Localized Stereo Sound
- ▶ Foreground Sound in Retail Store Zone

The RU-PA40D is a utility power amplifier in the convenient line of RACK-UP products, featuring the superior engineering and components common to RDL products. The RU-PA40D may be rack or surface mounted with optional RACK-UP series accessories. The RU-PA40D gives you the advantages of a quality, high efficiency stereo audio power amplifier with the added convenience of remote control!

**APPLICATION:** The RU-PA40D is the ideal choice in many applications where a high quality, high-efficiency utility amplifier is needed to drive a pair of 4  $\Omega$  or 8  $\Omega$  speakers. It is specifically suited to amplification applications where users need to adjust the gain. Examples include projectors or monitors with fixed audio outputs used in classrooms, boardrooms and video conferencing. The RU-PA40D is ideal for foreground sound amplification in small to medium rooms or in a specific zone within a retail space.

The RU-PA40D features two balanced line-level inputs on a detachable terminal block. Two unbalanced line level inputs are available on high-reliability gold plated phono (RCA) jacks. A front-panel gain control trimmer permits setting the maximum gain for each channel. The gain range accommodates the range of typical balanced and unbalanced audio signal levels. Each of the two RU-PA40D outputs will drive a 4  $\Omega$  or 8  $\Omega$  speaker or multiple speakers connected to present a 4  $\Omega$  or 8  $\Omega$  load to the amplifier. The output impedance is switch-selectable on the front panel of the module.

The RU-PA40D is equipped with an internal stereo VCA for setting the output level on both amplifier channels. A detachable terminal block provides for the connection of an external 10 K $\Omega$  potentiometer or a 0 to 10 Vdc control voltage. RDL remote controls are available to provide single-turn, multi-turn (rotary encoder) or pushbutton (ramp or fixed level selection) user level control. VCA control insures long term noise-free level adjustment. Remote control is possible using audio, control or common computer network wire.

A front-panel switch is provided to sum the audio inputs to mono. In the **STEREO** mode, the RU-PA40D independently amplifies each audio channel, left (L) and right (R). If speaker placement in the specified installation is incompatible with stereophonic amplification, the **INPUT MODE** switch may be set to **SUMMED MONO**.

The RU-PA40D includes a stereo analog compressor/limiter for audio fidelity noticeably superior to conventional class D amplifiers with digital limiting. The input **GAIN** settings determine whether the limiter alone is used for clipping suppression, or if the full compressor/limiter will be used to substantially increase the average output power beyond that of a standard 40 W amplifier. A red front-panel LED flashes when the limiter is preventing output clipping. Normal audio level signals remain unaffected by the compressor thereby preserving audio dynamics. If the input level is increased so that the compressor is active, the LED remains dimly lit between peak flashes. The audio is compressed according to three dynamic time constants providing aural transparency while maintaining clean, unclipped amplified audio for input overloads of up to 20 dB. The RU-PA40D, with compression, is capable of producing average audio output levels and clarity normally expected from stereo amplifiers with a much higher output power rating.

A blue **POWER** LED illuminates when the RU-PA40D is powered from its external 24 Vdc power supply (included). The module is equipped with both thermal and output short-circuit protection. The high-efficiency Class D output stages produce minimal heat for all levels of expected voice or music modulation. Continuous full-power operation with audio tones will not damage the amplifier, but is not recommended.

Wherever an ultra-compact, high quality, high efficiency audio power amplifier is needed to provide reliability and unsurpassed versatility, the RU-PA40D is the ideal choice. Use the RU-PA40D individually, or combine it with other RDL products as part of a complete audio/video system.



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**RACK-UP® SERIES**

**Model RU-PA40D**

**40 W Stereo Audio Power Amplifier with VCA Control & Power Supply**

**Installation/Operation**

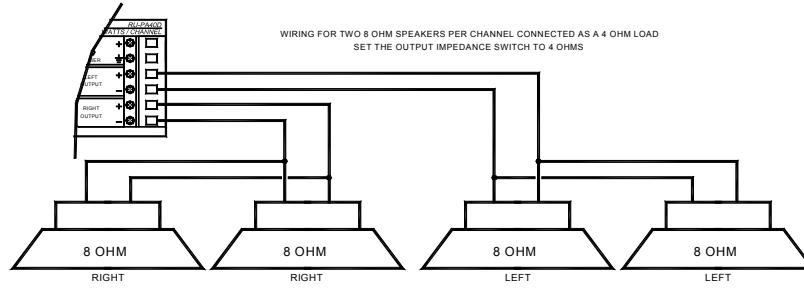
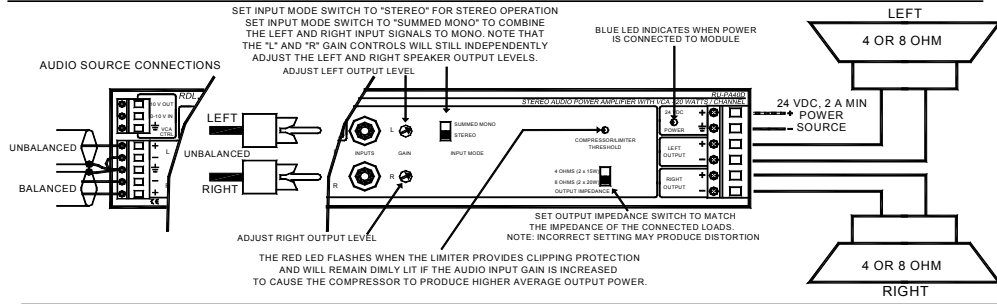
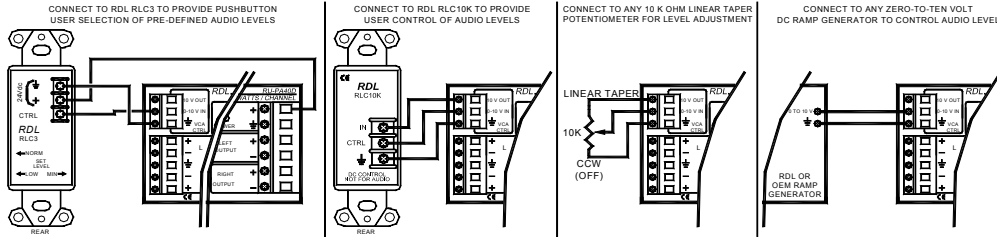
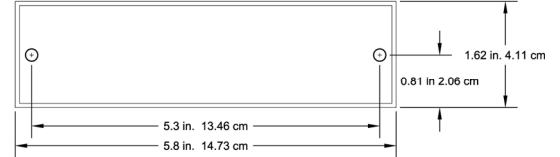
EN55103-1 E1-E5; EN55103-2 E1-E4  
Typical Performance reflects product at publication time exclusive of EMC data, if any, supplied with product. Specifications are subject to change without notice.

Mounting

The RU-PA40D should be mounted in a location with good ventilation. If the module is mounted using a box that does not provide ventilation, the amplifier should be secured to the outside surface of the box using the two mounting screws provided. The spacing between the mounting screws is 5.3 in. (13.46 cm); the recommended hole diameter is 0.187 in. (.475 cm). The ambient operating environment must not exceed 40 degrees C.

Connection and Adjustment

1. Set the GAIN controls fully counter-clockwise.
2. Connect the audio inputs, speakers and 24 Vdc (2 A minimum) power supply.
3. Connect an external dc ramp generator, 10 K potentiometer or RDL remote control to the VCA input.
4. Set the VCA external control to its maximum level.
5. Set the OUTPUT IMPEDANCE switch (4 or 8 Ohms) corresponding to the speaker load.
6. For overshoot protection only, adjust the two GAIN controls for the desired audio level with the THRESHOLD LED flashing only occasionally on audio peaks.
7. For maximum audio output level with compression, increase the two GAIN controls for the desired audio level with the THRESHOLD LED lit dimly between peak flashes.
8. If summed mono operation is desired, set the INPUT MODE switch to SUMMED MONO.



**TYPICAL PERFORMANCE**

Inputs (4):  
Input Impedance:  
Gain Adjustments (2):  
Minimum Input Levels:  
Maximum Input Levels:  
VCA Control:  
  
Frequency Response:  
THD+N:  
  
Compressor:  
Crosstalk:  
Noise (below 20 W RMS):  
Selectors (2):  
Output Power:  
Output Circuit:  
Ambient Operating Environment:  
Indicators (2):  
  
Power Supply (included):

Line level: Balanced (+4 dBu) Left and Right, Unbalanced (-10 dBV) Left and Right  
50 kΩ balanced, 20 kΩ unbalanced  
Single turn, one per channel  
-11 dBu balanced, -18 dBV unbalanced (to cross compressor threshold)  
+22 dBu balanced, +12 dBV unbalanced  
External 0 to 10 Vdc (linear), 10 KΩ linear taper potentiometer, RDL remote controls  
10 Vdc VCA reference voltage output provided  
20 Hz to 20 kHz (+/- 1 dB, 4 or 8 Ohms)\*  
< 0.1% (1 kHz, 1 W, 4 or 8 Ohms); < 1% (50 Hz to 20 kHz.)  
\*measured at compressor threshold level equaling 12 W RMS (8 Ohms) output power  
Threshold nominally 2 dB below rated output, automatically adjusting attack and release times  
Better than 60 dB (1 kHz, no compression)  
< -80 dB (VCA control at 6.25V; output level 6 dB below max.) < -70 dB (VCA control at max.)  
Side switches: Output Impedance 4 Ohms or 8 Ohms; Input Mode **SUMMED MONO** or **STEREO**  
20 W RMS into 8 Ω per channel, 40 W RMS total; 15 W RMS into 4 Ω per channel, 30 W RMS total  
Class D  
0° C to 40° C Maximum; 20° C Recommended  
Red LED: **THRESHOLD** LED indicates compressor activity  
Blue LED: **POWER** on  
100 to 240 Vac, 50-60 Hz, 1.5A; 24 Vdc output to module

**Models**  
  
**RU-PA40D** includes:  
Amplifier, Power Supply, North American Power Cord  
  
**RU-PA40DE** includes:  
Amplifier, Power Supply (without Power Cord)

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