

# Radius NX 12x8

Radius NX 12x8 is an excellent choice for installed applications requiring flexibility, processing power, and audio quality. Audio connections include 12 analog mic/line inputs, 8 analog outputs, up to 8x8 channels of USB audio, a flexible audio card slot, and optional 128 (64x64) channels of redundant Dante networked audio. Radius NX 12x8 and Radius NX 4x4 feature identical DSP resources differing in analog I/O, logic output, and external control input capacity. An optional AEC coprocessor provides up to 16 channels of full-bandwidth acoustic echo cancelling.

## SERIES FEATURES

- Next-generation SHARC dual-core processor
- Optional 128 (64x64) redundant Dante channels
- Configurable 4-port Gigabit switch
- Ultra-low noise preamps
- Digitally-controlled 3 dB gain steps
- Expansion card slot

## ARCHITECT & ENGINEER SPECIFICATIONS

The device shall provide twelve analog mic/line inputs that are adjustable from line to mic level with coarse gain, fine trim, phantom power, invert and mute, and eight analog line outputs that are adjustable with fine gain and mute. All signal processing, mixing and routing functions (including I/O levels) shall be controllable via software. Audio inputs and outputs shall be accessed via rear panel 3.81 mm terminal block connectors.

An expansion card slot may accommodate either a two-line VoIP interface card, two-line analog telephone interface card, 8x8 USB audio I/O card, four-channel digital input card, four-channel digital output card, four-channel mic/line input card, four-channel AEC input card, four-channel analog output card, or remain empty.

An internal DSP coprocessor module may be installed for additional application-specific processing such as acoustic echo cancellation (AEC).

A USB 2.0 audio I/O port with class 1.0 legacy modes on a high-retention Type B connection is configurable for up to 8x8 line I/O as well as 2x2 line I/O, 1x1 speakerphone, or 1x1 echo-cancelling speakerphone profiles.

Network audio expansion shall be provided by an optional factory installed Dante card with a capacity of 128 (64x64) channels. Primary and secondary Dante network audio connections shall be provided for redundant network implementation. Connectors shall be 1000 Base-T RJ45 utilizing CAT5/6 cable.

## SYSTEM SPECIFICATIONS

Processor	1 x Analog Devices Griffin ADSP-SC587 dualcore DSP @ 500 MHz
Raw Processing Capacity	500 MIPS, 6 GFLOPS, 2 GMACS
Sampling Rate	48 kHz, $\pm$ 100 ppm.
Frequency Response (A/D/A)	20 Hz – 20 kHz, $\pm$ 0.5 dB
Dynamic Range (A/D/A)	> 114 dB, A-weighted
THD + Noise	< -95 dB (22.4 kHz BW, unweighted); 1 kHz @ +15 dBu with 0 dB gain
Channel Separation (A/D/A)	> 110 dB @ 1 kHz, +24 dBu
Latency (A/D/A)	1.04 ms, inputs routed to outputs
Delay Memory	174 mono seconds
Analog Control Inputs	0-3.3 VDC
Recommended External Control Potentiometer	10k Ohm, linear
Logic Outputs	Low (0 V) when active, pulled high (5 V) when inactive
Logic Output Maximum External Power Supply Voltage/Current Sinking	24 VDC / 50 mA
Logic Output Maximum Output Current	10 mA
RS-232 Accessory Serial I/O	57.6 kbaud (default), 8 data bits, 1 stop bit, no parity, no flow control wired straightthrough, only pins 2, 3, and 5 required
RS-485 Serial I/O	38.4 kbaud (default) 8 data bits, 1 stop bit, no parity, no flow control. May be broken out of ARC port
Ethernet Cable	Standard CAT5/6, maximum device to device length = 328 ft / 100 m
Dante Cable	Standard CAT5/6, maximum device to device length = 328 ft / 100 m
ARC Cable	Standard CAT5/6, distance dependent upon load and number of devices
Maximum Stored Presets	1,000

A designer software application shall be provided that operates on a Windows computer, with network interface installed, running Windows 7® or higher operating system. Computer connection for configuration shall be via the device's rear panel Ethernet connector. All internal processing shall be digital (DSP). Available DSP components shall include but not be limited to various forms of: mixers, equalizers, filters, crossovers, dynamics/gain controls, routers, delays, remote controls, meters, generators, onboard logic, and diagnostics.

The front panel shall include a display and a momentary switch. The display shall provide communications and system status, I/O metering, and fault messages.

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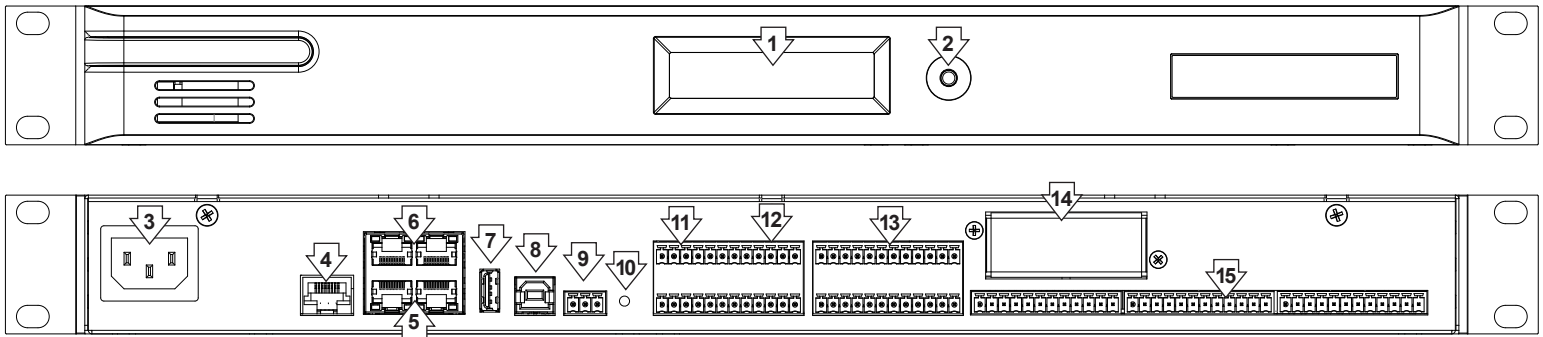
External control shall include dedicated software screens as well as preset selection, I/O level control and muting using the optional wall panel remote controls via industry-standard CAT5/6 cable with RJ45 connectors. A built-in web server shall provide four instances of ARC-WEB, which allows for user control from nearly any web browser or mobile device. Logic I/O shall consist of eight contact closures or four potentiometer inputs along with eight logic outputs. The logic outputs may be used to drive LEDs directly or control external relays or switchers. All program memory shall be non-volatile and provide program security should power fail. The device shall provide an on-board real time clock to facilitate automatic, timed changing of presets and may sync to NTP. Third-party control systems may interface over IP and RS-232 using a published ASCII control protocol.

Audio conversion shall be 24-bit, 48 kHz and internal processing shall be 32-bit or 40-bit floating point, 48 kHz. The dynamic range shall not be lower than 115 dB, A-weighted with a maximum input level of +24 dBu and maximum output level of +24 dBu.

The device shall have an IEC power input socket for 120-240 VAC. The device shall meet UL/CSA and CE safety requirements and comply with CE and FCC Part 15 emissions limits. The device shall be RoHS compliant. The chassis shall be constructed of Galvalume and molded plastic, and mount into a standard 19" 1U EIA rack using detachable rack ears.

The device shall be a Symetrix Radius NX 12x8.

## DEVICE DRAWINGS - FRONT AND REAR



1. **Display:** Shows either an overview of system parameters or level meters for analog inputs, analog outputs, USB I/O, and expansion card I/O. The overview contains IP address, DHCP status, and communication LEDs for Ethernet, Dante, and ARC. Meters are scaled from -72 dBFS to 0 dBFS. Each segment represents 12 dB. If signal reaches clipping, the meter will get wider.
2. **Wake / Navigation Button:** A single momentary push button cycles through the dashboard and system pages or dismisses fault notifications. A short press scrolls through menus or dismisses a fault notification. A long press toggles between the dashboard and system pages.
3. **Power:** Accepts power from detachable IEC power cable (100-240 VAC, 50-60 Hz, 60 Watts max). Connect only to a grounded power outlet.
4. **ARC:** Distributes power and RS-485 data to one or more ARC devices.
5. **A&B Ethernet Ports:** 1000 Base-T Ethernet ports for Composer host control, and third-party accessory controllers over IP. Features auto-crossover sensing for direct device-to-device connections.
6. **C&D Dante Ports:** 1000 Base-T Ethernet ports provide 128 (64x64) channels of Dante network audio. Requires optional Dante card.
7. **USB Host:** USB 2.0 host port connects to external flash drive providing up to 8 channels of .wav file playback and recording.
8. **USB Audio:** USB 2.0 audio I/O interface with Class 1.0 legacy profiles on a high-retention Type B connection for interfacing with soft codecs, recording, and playback software, on Windows, Mac, or Linux platforms. Configurable for up to 8x8 line I/O as well as 2x2 line I/O, 1x1 speakerphone, or 1x1 echo cancelling speakerphone profiles.
9. **RS-232:** Serial communications interface for third-party accessory controller. Tx = Transmit or data out, Rx = Receive or data in. Port Settings: 57.6 kbaud (default), 8 data bits, 1 stop bit, no parity, no flow control.
10. **Factory Reset Switch:** To be used under the supervision of technical support, it has the ability to reset the unit's network configuration and completely reset the unit to factory defaults.
11. **Logic Outputs:** Eight (8) logic outputs with four (4) paired common ground pins. Logic Outputs go low (0 V) when active and are internally pulled high (5 V) when inactive and can drive external LED indicators directly.
12. **External Control Inputs:** Four (4) analog control inputs able to be used as 4 potentiometer inputs or as 8 switch inputs (+3.3 VDC reference voltage supplied).
13. **Analog Line Outputs:** Eight (8) balanced analog line level audio outputs, with individually software-controllable +/- 24 dB of digital trim and mute.
14. **Expansion Card Slot:** I/O card slot accepts any of the available cards providing up to 4 channels of local I/O. Please refer to individual I/O card data sheets for details.
15. **Analog Mic/Line Inputs:** Twelve (12) balanced analog audio inputs, with individually software-controllable pre-amp gain, +/- 24 dB of digital trim, phantom power, signal inversion and mute.

## ANALOG INPUTS AND OUTPUTS

Number of Inputs	Twelve (12) switchable balanced mic or line level
Connectors	3.81 mm terminal blocks
Nominal Input Level	+4 dBu
Maximum Input Level	+24 dBu
Mic Pre-amp Gain	0 to 51 dB in 3 dB steps with $\pm 24$ dB digital trim
Mic Pre-amp EIN	< -125 dB with 150 Ohm source impedance, 22.4 kHz BW
Input Impedance	2k Ohms balanced, 1k Ohms unbalanced
Phantom Power (per input)	+48 VDC @ 10 mA maximum
Dynamic Range	> 115 dB, A-weighted
THD + Noise	< -100 dB (22.4 kHz BW, unweighted); 1 kHz @ +15 dBu with 0 dB gain.
Latency	0.31 mS
Number of Outputs	Eight (8) balanced line level
Connectors	3.81 mm terminal blocks
Nominal Output Level	+4 dBu with 20 dB of headroom
Maximum Output Level	+24 dBu (+22.8 dBu into a 2k Ohm minimum load)
Output Impedance	300 Ohms balanced, 150 Ohms unbalanced
Dynamic Range	> 117 dB, A-weighted
THD + Noise	< -97 dB (22.4 kHz BW, unweighted); 1 kHz, 0 dB gain +8 dBu output
Latency	0.65 mS.

## USB AUDIO INPUTS AND OUTPUTS

Connector	One (1) high-retention Type B
Interface	2.0 with Audio class 1.0 legacy modes
Capacity	1×1 (echo cancelling speakerphone and non-echo cancelling speakerphone modes) - driverless, 2×2 line I/O mode - driverless, and 8×8 line I/O mode - driver included
Sample Rate	48 kHz
Bit Depth	16-bit, speakerphone modes; 16 or 24-bit, line modes

## AEC (Optional coprocessor required. Single- and dual-core available.)

Number of Channels	Up to sixteen (16) for dual-core module (up to 8 references), up to eight (8) for single-core module (up to 4 references)
Tail Length	400 ms maximum, dependent on channel and reference count
Convergence Rate	Typically > 90 dB/sec
Latency	16 mS
Processors	1 x Analog Devices Griffin ADSP-21584 dualcore DSP @ 500 MHz
Raw Processing Capacity	500 MIPS, 6 GFLOPS, 2 GMACS

## MECHANICAL DATA

Space Required	1U (WDH: 18.91 in. x 9.5 in. x 1.72 in. / 48.02 cm x 24.13 cm x 4.37 cm). Depth does not include connector allowance. Allow at least 3 inches additional clearance for rear panel connections. Additional depth may be required depending upon your specific wiring and connections.
Electrical	100-240 VAC, 50/60 Hz, 60 Watts maximum, universal input.
Ventilation	Maximum recommended ambient operating temperature is 30 C / 86 F. Ensure that the left and right equipment sides are unobstructed (5.08 cm, 2 in. minimum clearance). The ventilation should not be impeded by covering the ventilation openings with items such as newspapers, tablecloths, curtains, etc.
Shipping Weight	13 lbs. (5.9 kg).
Certifications and Compliance	Safety: UL 60065, cUL 60065, IEC 60065; EMC: EN 55103-1, EN 55103-2, EN55032, EN 61000-3-2, EN 61000-3-3, ICES-003, FCC Part 15 (all Class A); Environmental: RoHS