Radius AoIP Console

Maximum mixer... minimum price

New consoles out of reach? Radius is within your grasp.

Everybody knows you get what you pay for. And sometimes, quite a bit less. Have you ever noticed how "affordable" radio consoles are usually missing stuff? Important stuff. Trying to do a radio show with a board like that is like trying to open a can with a spoon: you might succeed eventually, but you sure won't enjoy it.

At Axia, we believe that having a reasonable equipment budget shouldn't mean having to settle for a stripped-down, poorly built, featureless plastic excuse of a console. We've decided you should get more than you pay for — much more. Introducing Radius, the new IP console that proves you can have your cake and eat it, too.

About Axia networks.

Axia is the AoIP division of Telos Systems, a technology leader in professional audio equipment for radio broadcasters since 1984. In 2003, we introduced the world's first Ethernet-based console system for broadcasting. At the time this was a new idea, but VoIP showed the telecom industry how powerful, flexible and cost-efficient it was to move audio via IP, and the idea caught on fast with broadcasters, too. AoIP (sometimes called IP-Audio) is mainstream technology now, with more than 2,000 radio studios around the world equipped with Axia networks.

Axia helps you build studio facilities to meet today's most demanding broadcasting applications. With Axia, you can quickly and easily connect a few rooms, or an entire facility. Axia networks have a total system capacity of more than 10,000 audio streams, and can carry hundreds of digital stereo channels (plus machine logic and PAD) over a single CAT-6 cable, eliminating much of the cost normally associated with wiring labor and infrastructure.

For example: a couple of Axia interface nodes, connected together, can move a group of audio signals over an Ethernet cable from one room to another. Connect with fiber and you can go across campus. Attach a few more nodes and a switch and you have a distributed multi-room routing switcher. Plug in a mixing surface and console engine to add a powerful networked broadcast console. Add intercom stations for broadcast-quality plant communications that can be taken to air. Plug in your delivery system PC and you can transfer files, live audio, and associated data all over the same network. And since Axia audio is networked, Analog and digital signals are merged seamlessly; cross-point switching from any source to any destination is fast and easy.

But there's much more to Axia than just the network. Once all of your consoles, peripheral devices and computer workstations are connected together for unlimited sharing, it's easy to add phone systems, audio processors, codecs, satellite receivers, program delay units, or any audio device from the ever-growing list of Axia Partners. All of these devices work together in tight integration, which leads to more intuitive and intelligent operation. By taking advantage of the efficiencies of computer networking, Axia simplifies, saves you money, gives you choices, and prepares you for the computer and data-centric studios of today — and tomorrow.

Everything you need, in one elegant package.

Radius is the easiest AoIP console ever. Just connect the 8-fader mixing surface to the QOR.16 (a sophisticated, integrated console engine), plug in sources and power, and you're ready to make great radio!

Radius features three stereo Program buses and a stereo utility bus that can be used for recording phone calls and off-air bits, or as a fourth Program bus. Radius generates automatic mix-minus for phone callers and remote talent, helping ensure seamless, error-free shows. Bright multi-segment LED meters are switchable between VU and PPM styles, and high-resolution OLED displays for each fader show source assignments, audio options and more. Show Profiles can be saved and recalled to instantly load frequently-used console configurations. Need additional I/O? Just plug in Axia audio nodes. Radius also has four GPIO logic ports for machine control of studio peripherals, six 100Base-T ports for Livewire devices, and two Gigabit ports with SFP for connection to the outside world.

Because it's so compact, Radius is the perfect standalone console, but those Gigabit ports can connect to other studios too. Radius' network gateway lets you load up to 8 audio sources from anywhere in your Livewire network, while sending up to 8 local streams back out to the net.

Like all Axia consoles, Radius is built for long-lasting reliability, ready to stand up to anything your operators throw at it, with an EM-tight machined aluminum frame, silky-smooth conductive- plastic faders, aircraft-quality switches and rotary controls, and OLED high-rez displays on every fader.

The Radius System

Radius control surface:

Radius is the AoIP console you've been waiting for. Small enough to fit any desktop - it's just 20 inches square, with no cutout required. Easy to install? It couldn't be easier: there's just one cable for power, logic and control that connects to the DSP mixing engine. Plug it in, turn it on, perform some fast Web-based config with your laptop's browser, and you're ready to rock.

Aircraft-quality switches and rotary encoders are used throughout. An anodized, machined-aluminum surface and extruded aluminum frame to trap RF. Dimmable LED lighting in all keys. Hi-rez OLED displays on every fader. Automatic mix-minus on every fader, too. One-touch Record Mode for instant off-air recording. Four Show Profile "snapshots" for instant settings recall. Responsive LED bargraph meters with switchable VU or PPM metering styles. And the list goes on, and on, and on...

QOR.16 integrated audio engine:

Audio I/O, GPIO, console CPU, super-duty power supply, even a network switch, are all built into the QOR.16. Just plug in your mics, CD players, codecs, profanity delays, and other audio gear. There are 16 audio I/O ports, plus an Ethernet switch and logic ports:

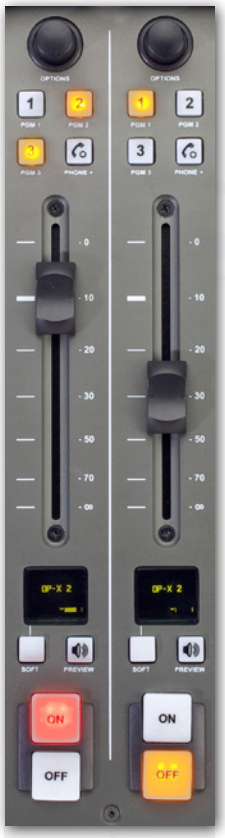
- Two Mic inputs with switchable Phantom power
- Eight Analog inputs and four Analog outputs
- One AES/EBU input and output
- Four GPIO logic ports for machine control of studio peripherals
- Six 100Base-T ports for Livewire devices
- Two Gigabit ports with SFP connections

Information Rich.

OLED (Organic Light-Emitting Diode) technology is something Axia is pretty excited about. Unlike ordinary LED or LCD displays, OLEDs are high-resolution displays that are extremely bright, high contrast, and razor-sharp. Axia designers placed an OLED on every Radius fader strip and packed it full of information.

For instance, press the Options knob at the top of any fader strip, and the OLED at the bottom lights up. Twist the knob to scroll through a list of audio sources, highlight the one you want, and push again. You can also choose and modify pan, balance and backfeed settings. Adjust source gain. Correct phase errors. Toggle between stereo and summed input modes. The bottom of the OLED displays context-sensitive options such as the ability to Talkback to the selected source, or to momentarily mute the Operator's mic. There are no external monitors to clutter up your studio — all the information your operators need is right below their fingertips.

The Radius System (Cont.)



Fader Channels:

Radius has a friendly, easy-to-operate interface that virtually erases the operator learning curve. Options knob gives fast access to source selection, pan & balance, and other frequently-used controls. High-resolution OLED (Organic Light-Emitting Diode) displays show source name and status information; context-sensitive Soft key changes function to match the selected audio source. Premium components include smooth 100mm. conductive-plastic faders, LED button lighting and long-life rotary encoders.

Monitor Section:

Radius has features you'd expect to find in consoles costing twice as much. For instance, Talkback — board-ops can talk to in-studio guests, remote codecs or Phone callers using the Talk To Backfeeds function. Four Show Profile "snapshots" recall preset console configurations instantly. A Record Mode that facilitates instant off-air recording of phone bits or interviews. Monitor selection keys for all four Program buses and two external sources complete the package.

Bus Masters:

On the left, you see one of Radius' three big, bright LED bargraph meters. We made them that way to be sure jocks' attention stays fixed on the job at hand — namely, riding gain. Both VU and PPM metering styles are built-in; simply choose the one you wish to use by clicking the appropriate option in the Radius Setup web page (any browser on a PC connected to your QOR.16 will do).

Radius has two dedicated meters for Program 1 and Program 2; the third is a "soft" meter that you can switch to meter Program 3, Program 4 / Phone / Record, or Monitor at the touch of a button.

Why meter the Monitor? In addition to speed keys that select direct monitoring of all four Program buses, Radius has two EXT monitor keys (see left). You can assign any source to these keys, either on-the-fly or pre-loaded in a Show Profile. So when you need to check the level of an incoming remote line, phone interview, or that iPod the morning guy brought in, all you have to do is quickly assign it to an EXT Monitor key, make it active and meter the results.

On the right, the time of day (NTP slavable) and the event timer (auto reset or manual) are shown. They're big and bright, too.

No Sawzall required:

Radius was designed to sit right on your desktop — no cutouts to measure and trace or countertops to cut (although you can make it a drop-in if you like). Since Radius needs no external monitor, and a single cable connection between the mixing surface and the QOR.16 engine carries power, logic and control, a 1" pass-through in your furniture is the only hole you'll have to drill.

Vertical Mount:

If you'd like to rack up your Radius for industrial, mobile or limited-space applications, you can quickly convert it to fit in a standard 18" rack using the included hardware. Our special silky-smooth conductive-plastic faders stay where you put 'em, even in vertical-mount applications.

The Radius System (Cont.)

No external monitors needed; easy-to-read segmented LED meters are built right in.

Three stereo mixing buses plus a stereo utility bus for plenty of mixing capacity.

Silky-smooth, 100mm. conductive-plastic faders for long life and superior performance.

LED button lighting means no bulbs to burn out or replace.

High-resolution OLED displays show source assignments, pan and balance information, Soft Key actions and more.

Clock and event timer, right where you expect them.

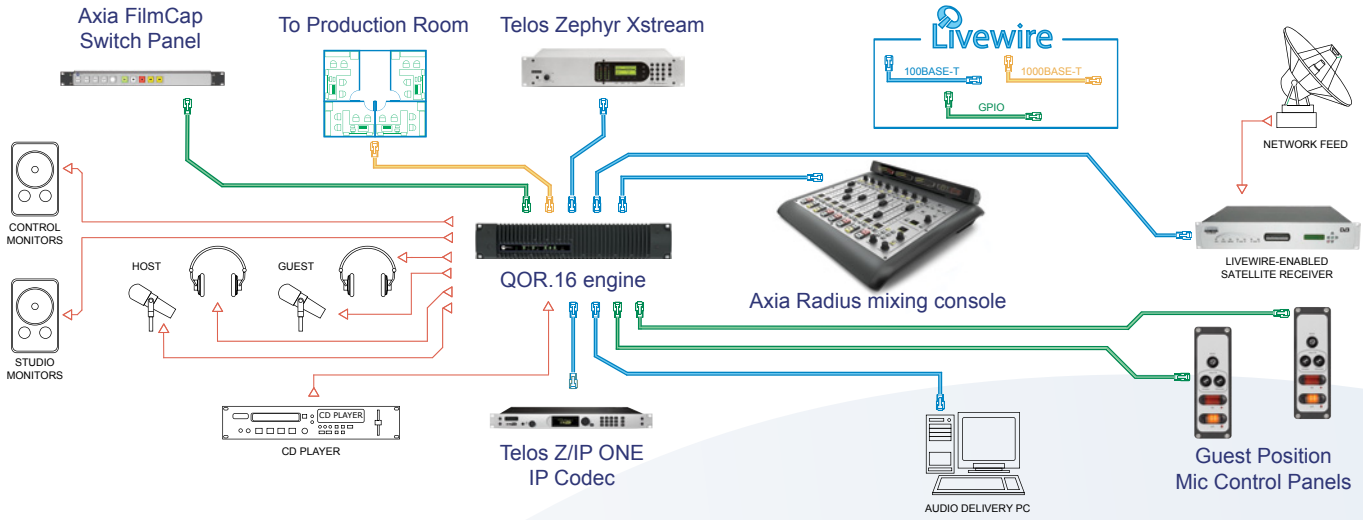
Quickly record phone bits or off-air segments using one-touch Record Mode.

Four Show Profile slots let operators recall frequently used console snapshots.

Monitor section gives board ops control of control room and studio monitor sources and volume.

Machined aluminum construction is tough enough to stand up under 24/7/365 use.

Simple Setup



Easy standalone installation. Scalable studio networking.

Radius is powered by the latest Axia technology — the QOR.16 engine. It's much more than just a simple power supply: the QOR.16 is a self-contained, integrated console engine. Its rock-solid, EM-tight chassis houses an ultra-reliable DSP mixing platform (not a common PC motherboard) and a hardened power supply designed for unfailing service. In addition, the QOR.16 contains enough audio and logic I/O for an average studio: mic inputs with switchable Phantom power, analog ins and outs, a pair of AES/EBU inputs and outputs, and four GPIO ports for machine logic control of your studio devices. (Of course, if you need more I/O, it's yours — just connect Axia Audio Nodes to expand your ins and outs).

Simple Setup (Cont.)

But that's not all. Radius is perfect for standalone studios, but it's from Axia — so naturally, it networks. Inside the QOR.16 is a built-for-broadcast, zero-configuration Ethernet switch, so you can plug in Livewire network devices like phone systems, remote codecs, audio processors, playout systems, satellite receivers and more. One CAT-5 connection provides the pathway for all required audio and control data. There are two Gigabit ports too, so you can connect to other studios if you want. Simple Networking lets you daisy-chain up to four QORs without the need for an external Ethernet switch. And of course, QOR.16 is fan-free, so you can mount it in your studio without fear of any sort of ambient noise.

Features at a glance

- 8 faders, each with instant access to any source. Assign any type of source to any channel with a simple twist of the Options knob.
- Four main stereo outputs (Program-1 through Program-4).
- Built-in EQ for "sweetening" of microphone sources.
- Alpha-numeric OLED displays below each fader always show the current audio source, and, when the Options knob is pressed, offer fast adjustment of fader gain trim, voice EQ, pan and balance, phase correction and other features without panel clutter or intimidating controls. Channel-input confidence meters assure talent of audio presence.
- Each channel is equipped with a context-sensitive Soft key which can be used to activate talkback or other special functions.
- Every channel has a stereo Preview ("cue") function, with a unique interlock system for fast cuing of multiple sources.
- Smooth, long-life 100mm. conductive-plastic are of side-loading design to protect against dirt and contaminant entry.
- Reconfigurable CR monitor section with direct-selection of Program buses and reassignable buttons that allow monitoring of external sources.
- An additional monitor section provides monitor volume, source selection and Talkback controls for an associated air studio.
- Flexible talkback system lets board op talk to studio guests or any Phone or Codec source with an associated backfeed.
- Up to 8 automatic mix-minuses may be used simultaneously for phones, remote talent, etc.
- A unique Record Mode enables one-button setup of record mixes for phone bits or off-air interviews.
- Bright, readable bar-graph displays provide responsive, readable VU or PPM metering styles. Switchable displays allow metering any Program bus or Monitor selection.
- Meter-bridge display includes a precision event timer that may be operated manually or triggered by starting pre-selected sources, and a time-of-day clock that can be synchronized to network time using NTP.
- Four custom Show Profile "snapshots" can be saved to instantly recall frequently-used console setups – useful to quickly prepare for interview segments, music-intensive programming, call-in talk shows, etc.
- All functions can be accessed remotely for configuration, management and diagnostic purposes using any standard Web browser.
- Radius surface is field-convertible to rack-mounted operation. Special faders provide smooth operation, yet hold their positions in vertical orientation.
- Easy-to-deploy QOR.16 integrated console engine includes console CPU and power supply, DSP mixing engine, custom Ethernet switch with 6 Livewire ports and 2 Gigabit ports for studio networking, 8 analog inputs and 4 analog outputs, 1 AES input and 1 AES output, 2 Mic inputs with switchable Phantom power, and 4 GPIO ports for machine control. I/O can be expanded using Axia Audio Nodes.
- Fan-free, convection-cooled power supply for noiseless in-studio operation.
- Network gateway enables loading up to 8 sources from the Axia network while exporting up to 8 outputs to the network, simultaneously.
- Proven surface-and-core architecture separates control from mixing processes. No audio passes directly through Radius; all mixing and processing is performed in the QOR.16 Integrated Console Engine – so studio "accidents" don't turn into off-air events.

FAQs

How many faders can a Radius have?

Radius has 8 faders. If you need more faders, consider its "big brother", iQ, which can have up to 24 faders.

I see that Radius connects to a "console engine" with audio I/O built in. What if I need more inputs or outputs than what's provided? Can I add more?

Sure! The QOR.16 console engine comes with enough analog , mic-level and AES/EBU I/O to power a well-equipped small studio. But if you need more, you can plug in Axia audio nodes. They connect with just a single Ethernet cable.

Ethernet? I have a small studio. Why do I need a fancy network?

Radius was designed as an easy-to-install console for small studios. That's why we put a power supply, CPU, DSP mixing engine, audio I/O, GPIO and Livewire inputs into a single integrated console engine – the QOR.16. So Radius is perfect for standalone studios. But, like all Axia gear, it networks, too. So if your studios expand, you can make your Radius a part of a larger studio network.

How much I/O does Radius' console engine have?

QOR.16 comes with 8 Analog inputs, 1 AES/EBU input, 2 Mic inputs with selectable Phantom power, 4 Analog outputs and 1 AES/EBU output. There are also 4 GPIO ports and 6 Ethernet ports for connection of Livewire-enabled audio devices.

Are you sure that's enough I/O for an on-air studio?

Clients have been telling us that the growing number of Livewire-ready devices helps shrink the need for conventional I/O. For instance, more than 30 Livewire partners are now making profanity delay units, satellite receivers, high-end audio cards and content delivery systems that integrate with Axia networks using an Ethernet cable to transport all audio, logic and messaging. To see a list of Axia partners, visit www.AxiaAudio.com/partners/ .

What if I need more I/O than is built-in to the QOR.16?

No problem; it's easy to expand your I/O by adding an Axia audio node. In fact, you can connect as many as 6 Livewire devices to any QOR.16. Even your playout or production PCs that use the Livewire Audio Driver can plug into the Ethernet ports on the back of each QOR.16.

OK, what if I want to connect two Radius consoles together? Do I need an Ethernet switch?

Not necessarily. There's an Ethernet switch with Simple Networking built into the QOR.16 engine, so you can daisy-chain up to four consoles without the need for an external switch. If your network grows bigger than four consoles, you will need a switch – just ask us and we'll help you select one that's right for your facility's needs.

We have some studios built with other Axia consoles. Will Radius work with them?

Absolutely! Radius plugs right into existing Axia networks, and other Axia gear connects to and works seamlessly with Radius. All Axia products use standard switched Ethernet for audio and logic transport. This guarantees that our future products will always work perfectly with even the earliest Axia equipment.

Someone told me that Radius can't load very many networked inputs. Is that true?

Actually, the gateway inside the QOR.16 lets you load as many as 8 audio sources from the network, i.e., sources located outside your studio. You can also simultaneously share up to four sources for use in other studios. Radius is a self-contained, standalone console. But, because it's made by Axia, it networks, too! If 8 networked sources are too few for your needs, consider our Element 2.0 console – it can load up to 80 networked sources at a time.

FAQs (Cont.)

Can I load any audio source to any fader? What about networked sources?

Yes, you can. Any source plugged into the QOR.16 engine, or any source available on the Livewire network, can be assigned to any fader on the console.

Does logic follow audio? When I load a source to a fader, do the ON/OFF buttons control that source?

Yes! In a Livewire system, logic and audio are always routed together. Radius has GPIO ports for machine control of four standard audio devices. If you're using a Livewire device, audio and control travel over the same Ethernet cable, so no additional logic connections are needed.

Does Radius have a redundant power supply option?

Radius is designed for smaller studios, with cost-efficiency in mind, so no power backup is available. If redundant power is necessary for you, consider an iQ or Element console, both of which have available backup power.

I heard Radius is made in China. Why?

Some console companies seem to think that they can only build an inexpensive console by taking out features until they hit a price point. Our philosophy is just the opposite: to see how many capabilities we can pack into a console, and still keep the price low. To do this, Radius is fabricated in China, in an ISO-9002 facility just like those used to build iPads, Droids, 3D LED TVs, and other high-tech electronics.

But you used cheaper components, right?

No! We understand that your console is the critical link in your studio. So we use only premium components throughout, like high-resolution OLED displays, aircraft-quality switches and buttons, 100mm. conductive-plastic faders with side-loading design to keep dirt and grunge out, high-quality mechanical rotary controls and LED lighting under every switch.

What about construction? Your competition says Radius looks "plasticky."

Like all Axia consoles, Radius is made of RF-proof steel and machined aluminum. As with all broadcast mixers (even those made by our competitor!), Radius has some plastic parts – the molded end bumpers, for example, and the clear meter overlay, and of course the fader knobs and channel switches. But unlike those consoles, Radius' mixing surface is made of machined, anodized aluminum with laser-etched markings. That means there's no plastic overlay to crack, curl or peel, and no paint markings to rub off, ever.

You say that Radius is a "standalone console that networks." What does that mean?

Radius' integrated console engine, the QOR.16, was designed after listening carefully to clients who asked for an easy way to set up one or two independent studios. It combines audio I/O, machine logic, mix engine, console CPU, Ethernet switch and power supply into one fan-free box. This dramatically cuts setup time, since there's only one piece of equipment to configure. Consequently, you can use Radius to quickly build a self-contained studio that operates all by itself.

Of course, if you want to connect your Radius to an IP-Audio network, you can, with one easy Ethernet connection.

Some of QOR.16's Ethernet ports have PoE. Why?

Many new Ethernet devices use PoE (Power over Ethernet) to eliminate wall-warts or ride-along power supplies. Some of the newest Telos phone gear, like the VX broadcast VoIP system, use PoE to power the VSet telephones that work with the system. Axia anticipates that a lot of future, connected, broadcast gear will use PoE as well.

Radius Specifications

Like all Axia products, Radius uses only premium, studio-grade audio components to guarantee maximum fidelity.

Microphone Preamplifiers
- Source Impedance: 150 ohms
- Input Impedance: 4 k ohms minimum, balanced
- Nominal Level Range: Adjustable, -75 dBu to -20 dBu
- Input Headroom: >20 dB above nominal input
- Output Level: +4 dBu, nominal

Analog Line Inputs
- Input Impedance: 20 k Ohms
- Nominal Level Range: Selectable, +4 dBu or -10dBv
- Input Headroom: 20 dB above nominal input

Analog Line Outputs
- Output Source Impedance: <50 ohms balanced
- Output Load Impedance: 600 ohms, minimum
- Nominal Output Level: +4 dBu
- Maximum Output Level: +24 dBu

Digital Audio Inputs and Outputs
- Reference Level: +4 dBu (-20 dB FSD)
- Impedance: 110 Ohm, balanced (XLR)
- Signal Format: AES-3 (AES/EBU)
- AES-3 Input Compliance: 24-bit with selectable sample rate conversion, 20 kHz to 216kHz input sample rate capable.
- AES-3 Output Compliance: 24-bit
- Digital Reference: Internal (network timebase) or external reference 48 kHz, +/- 2 ppm
- Internal Sampling Rate: 48 kHz
- Output Sample Rate: 48 kHz
- A/D Conversions: 24-bit, Delta-Sigma, 256x oversampling
- D/A Conversions: 24-bit, Delta-Sigma, 256x oversampling
- Latency <3 ms, mic in to monitor out, including network and processor loop

Frequency Response
- Any input to any output: +0.5 / -0.5 dB, 20 Hz to 20 kHz

Dynamic Range
- Analog Input to Analog Output: 102 dB referenced to 0 dBFS, 105 dB "A" weighted to 0 dBFS
- Analog Input to Digital Output: 105 dB referenced to 0 dBFS
- Digital Input to Analog Output: 103 dB referenced to 0 dBFS, 106 dB "A" weighted
- Digital Input to Digital Output: 125 dB

Equivalent Input Noise
- Microphone Preamp: -128 dBu, 150 ohm source, reference -50 dBu input level

Total Harmonic Distortion + Noise
- Mic Pre Input to Analog Line Output: <0.005%, 1 kHz, -38 dBu input, +18 dBu output
- Analog Input to Analog Output: <0.008%, 1 kHz, +18 dBu input, +18 dBu output
- Digital Input to Digital Output: <0.0003%, 1 kHz, -20 dBFS
- Digital Input to Analog Output: <0.005%, 1 kHz, -6 dBFS input, +18 dBu output

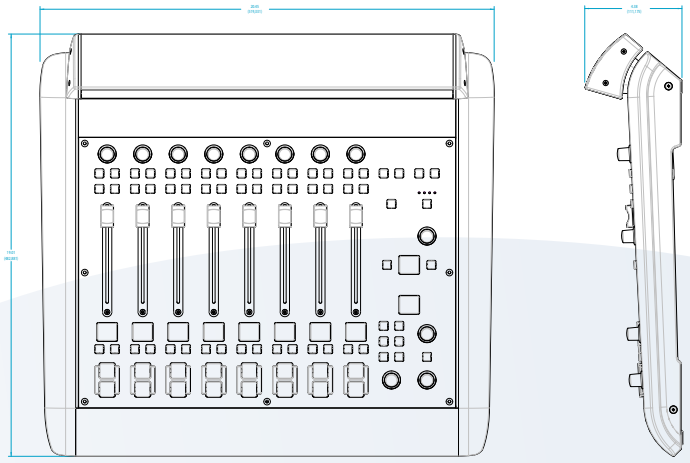
Crosstalk Isolation, Stereo Separation and CMRR
- Analog Line channel to channel isolation: 90 dB isolation minimum, 20 Hz to 20 kH
- Microphone channel to channel isolation: 80 dB isolation minimum, 20 Hz to 20 kHz
- Analog Line Stereo separation: 85 dB isolation minimum, 20Hz to 20 kHz
- Analog Line Input CMRR: >60 dB, 20 Hz to 20 kHz
- Microphone Input CMRR: >55 dB, 20 Hz to 20 kHz

Power Supply AC Input, iQ Core with iQ Console
- Auto-sensing supply, 90VAC to 240VAC, 50 Hz to 60 Hz, IEC receptacle, internal fuse
- Power consumption: 300 Watts (Preliminary Estimate)

Operating Temperatures
- -10 degrees C to +40 degrees C, <90% humidity, no condensation

Dimensions
- Radius mixer 20.5" x 19" x 4.5" (desktop to meter bridge)
- QOR.16 integrated console engine 2.625" x 19" x 15"

Radius AoIP Console (8 faders + monitor controls)



Rev 10/2011
Specifications subject to change without notice