

Axia-Approved Ethernet Switches



We get asked a lot about which switches work best with Axia IP-Audio Networks. The answer is "that depends," primarily on the size of the system you're planning. We've taken a lot of the work out of network planning by putting the world's first **zero-configuration, purpose-built-for-Broadcasting** Ethernet switches inside our PowerStation, QOR.32 and QOR.16 console engines, as well as the industry's first standalone Ethernet switch custom-built for IP-Audio: [xSwitch](#).

But if you want to build a conventional Ethernet network for your Axia studios, we can recommend a variety of Cisco switches to suit the needs of different-sized installations. Why Cisco? We have tested other switches and quite frankly, theirs are the best we've tested in all ways. After all, this is your program audio we're talking about, and these companies' reputations for uptime in critical applications is unmatched; Cisco switches are used by [hospitals](#) , [banks](#) , [stock exchanges](#) , [airlines](#) all 24/7 applications that need bulletproof reliability. These companies also offer a wide range of switches at all price points to meet individual users' needs. (For further reading, check out http://en.wikipedia.org/wiki/Catalyst_switch .)

Switches Commonly Used in Axia Systems

Here's a full, long-as-your-arm list of switches we've approved for use in Axia systems (so far). There's a lot of choices, and they can be bewildering! An Axia Applications Engineer will be happy to assist you in determining the correct switch for your application – please [contact us for assistance](#).

For single-studio applications:



Axia xSwitch [2001-00357 Ethernet Switch for Livewire](#) is

a Zero-configuration Ethernet switch optimized for Livewire IP-Audio applications. A front-panel display provides port link status, PoE usage and SFP status, plus system temperature. 9.5" x 11" half-rack form factor allows two xSwitches to be racked side-by-side. Features 8 10/100MBit Ethernet ports — 4 with PoE. Two Gigabit ports are provided for trunking, both with RJ-45 (copper) and SFP (fiber) connections; supports redundant copper/SFP Gigabit connections with auto-switching. Supports 2,000 Multicast groups and 2,000 ARP table entries (8x more than other small-form Ethernet switches).



Cisco Catalyst [WS-C2960CG-8TC-L](#) Compact Switches are

perfect for small applications, like single-studio facilities, transmitter-building networks or home production setups. It's a fan-free, small-footprint switch with eight 10/100/1000 Ethernet ports and two dual-purpose Gigabit ports; can be rack-mounted with an accessory kit. Because all eight ports are 1000Base-T capable, it can also be used as a small edge switch in larger facilities. It does not contain PoE capability, but can "pass-through" PoE supplied by an external power supply or another PoE-capable switch.

Cisco Catalyst [WS-C3560CG-8PC-S](#) Compact Switch is another small form-factor Gigabit switch, with the added benefit of PoE+ capability. Like its brother the C2960G-8TC (above), it is ideal as an edge switch, or for single-studio installations. It is fan-free and has 8 100/1000 Gigabit ports and 2 1G copper or SFP ports for trunking.

For small and medium-sized studio networks:

Cisco Catalyst [2960 Series Switches](#) provide 10/100 Ethernet and Gigabit connectivity for one or two studios.



- Catalyst [WS-C2960S-48TS-L](#) has 48 10/100/1000 + 4 SFP ports, LAN Base Image
- Catalyst [WS-C2960S-24TS-L](#) has 24 10/100/1000 + 4 SFP ports, LAN Base Image

Switches with PoE (Power over Ethernet) capability:

- Catalyst [WS-C2960S-48LPS-L](#) has 48 Ethernet 10/100/1000 PoE+ ports, 4 One Gigabit Ethernet SFP ports, 730 Watts of PoE power, LAN Base Image
- Catalyst [WS-C2960-24PC-L](#) has 24 Ethernet 10/100 PoE ports, 2 Dual Purpose Gigabit Ethernet Uplinks, 370 Watts of PoE power, LAN Base Image.
- Catalyst [WS-C2960S-24PS-L](#) has 24 Ethernet 10/100/1000 PoE+ ports, 4 One Gigabit Ethernet SFP ports, 370 Watts of PoE power, LAN Base Image

For medium-to-large studio networks:

Edge (studio) Ethernet Switches:

Axia xSwitch [2001-00357 Ethernet Switch for Livewire](#) features 8 10/100MBit Ethernet ports (4 with PoE). two Gigabit ports, both with RJ-45 (copper) and SFP (fiber) connections; supports redundant copper/SFP Gigabit connections with auto-switching. Supports 2,000 Multicast groups and 2,000 ARP table entries.

Cisco Catalyst [2960 Series Switches](#) provide 10/100 Ethernet and Gigabit connectivity for one or two studios.

- Catalyst [WS-C2960-24TC-L](#) has 24 10/100 + 2 Dual Purpose Gigabit Ethernet Uplinks, LAN Base Layer 2
- Catalyst [WS-C2960-48TC-L](#) has 48 10/100 + 2 Dual Purpose Gigabit Ethernet Uplinks, LAN Base Image

Switches with PoE (Power over Ethernet) capability:

- Catalyst [WS-C2960-48PST-L](#) has 48 Ethernet 10/100 PoE ports, 2 One Gigabit Ethernet SFP ports and 2 fixed Ethernet 10/100/1000 ports, 370 Watts of PoE power, LAN Base Image
- Catalyst [WS-C2960-24PC-L](#) has 24 Ethernet 10/100 PoE ports, 2 dual-purpose ports (10/100/1000 or SFP), 370 Watts of PoE power, LAN Base Image
- Catalyst [WS-C2960S-48FPS-L](#) has 48 Ethernet 10/100/1000 PoE+ ports, 740W PoE capacity, 2 1 Gigabit Ethernet SFP uplink ports, Optional Cisco FlexStack stacking support, LAN Base image

- Catalyst [WS-C2960S-48LPS-L](#) has 48 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 2 1 Gigabit Ethernet SFP uplink ports, Optional Cisco FlexStack stacking support, LAN Base image
- Catalyst [WS-C2960S-24PS-L](#) has 24 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 2 1 Gigabit Ethernet SFP uplink ports, Optional Cisco FlexStack stacking support, LAN Base image
- Catalyst [WS-C2960S-48TS-L](#) has 24 Ethernet 10/100/1000 PoE+ ports, 370W PoE capacity, 2 1 Gigabit Ethernet SFP uplink ports, Optional Cisco FlexStack stacking support, LAN Base image

Dual-purpose Core and Edge Ethernet Switches:



Cisco Catalyst 3560X Switches provide 10/100 Ethernet and Gigabit connectivity, and are available with the Enhanced Multilayer Software image (EMI) that makes them perfect for hardware-based IP unicast and IP Multicast routing. Also has advanced QoS functions and centralized administration tools. Good as an edge switch for larger studio systems, or as a core for small to medium studio complexes.

- Catalyst 3560X [WS-C3560X-24P-L](#) has 24 10/100/1000 Ethernet ports and Modular 4x1 Gigabit or 2x10 Gigabit uplink ports with 350W AC power supply 1 RU, LAN Base image
- Catalyst 3560X [WS-C3560X-48T-L](#) has 48 10/100/1000 Ethernet ports and Modular 4x1 Gigabit or 2x10 Gigabit uplink ports with 350W AC power supply 1 RU, LAN Base image

Switches with PoE (Power over Ethernet) capability:

- Catalyst 3560X [WS-C3560X-24T-L](#) has 24 10/100/1000 Ethernet ports with PoE+ and Modular 4x1 Gigabit or 2x10 Gigabit uplink ports with 715W dual-modular AC power supply and 370W PoE capacity. 1 RU, LAN Base image
- Catalyst 3560X [WS-C3560X-48T-L](#) has 48 10/100/1000 Ethernet ports with PoE+ and Modular 4x1 Gigabit or 2x10 Gigabit uplink ports with 715W dual-modular AC power supply and 370W PoE capacity. 1 RU, LAN Base image

The **Cisco Catalyst [WS-C4948E-E](#)** may also be used in this role. The 4948E features up to 8,000 IGMP groups, making it an excellent core switch choice. Exceptional performance and reliability with 48 ports of wire-speed 10/100/1000BASE-T and 4 alternative wired ports that can accommodate optional 1000BASE-X, Small Form-Factor Pluggable (SFP+) optics, and optional internal AC or DC 1 + 1 hot-swappable power supplies and a hot-swappable fan tray with redundant fans for exceptional reliability and serviceability.

For "OMG-size" studio networks:



Building the next radio Taj Majal? Switches such as those from the the **Cisco Catalyst [4500 family](#)** have the modularity and scalability that can help prepare your build for today's needs *and* tomorrow's. We've helped select switches for very large studio complexes built by MPR, Univision, Radio Free Asia and others. [Drop us a line](#) ... we're happy to help discuss your needs.

Core Ethernet Switches:

Cisco Catalyst [4500 Series Switches](#) are high-density modular switches that can provide any combination of 10/100/1000/Gigabit ports on copper or fiber interfaces using 24- and 48-port [interchangeable line cards](#) . A centralized architecture allows for the easy upgrade of all system ports to higher level functions; includes Web-based management. Very high-performance scalable system with up to 102Mpps nonblocking performance.

- [Catalyst 4510R](#) is a 10-slot frame with redundancy capabilities
- [Catalyst 4507R](#) is a 7-slot frame with redundancy capabilities
- [Catalyst 4506](#) is a 6-slot frame
- [Catalyst 4503](#) is a 3-slot frame

Cisco Catalyst [4900M Switch](#) provides an ideal solution for space constrained deployments that require high performance wire speed services, high availability, and the modular flexibility of deploying Gigabit Ethernet and 10 Gigabit Ethernet, all in a small 2RU

form factor. The 4900M provides low latency, 10/100/1000 Ethernet, 10 Gigabit Ethernet and a top-of-rack access layer switching solution for rack-optimized servers. With a unique semi-fixed architecture, the 4900M provides the flexibility to deploy Gigabit Ethernet now, and cost-effectively migrate to 10 Gigabit Ethernet as requirements change.

The Catalyst 4900M offers eight fixed wire-speed 10 Gigabit Ethernet ports, and two half-slots which you can fill with any combination of the following: * 20-port wire-speed 10/100/1000 (RJ-45) half-card * 8-port (2:1) 10 Gigabit Ethernet (X2) half-card (Cisco TwinGig Converter Module compatible) * 4-port wire-speed 10 Gigabit Ethernet (X2) half-card.

Cisco Catalyst [6500 series Switches](#) are Cisco's flagship LAN switching platform. online diagnostics proactively detect hardware and software faults; redundant system components provide hardware-level resiliency. The Catalyst 6500 Series currently supports up to 1152 10/100-Mbps, 576 10/100/1000-Mbps, or 64 10-Gbps Ethernet ports in a single chassis, and system scalability up to 720 Gbps, providing 40 Gbps/slot (half-duplex). Additional choices include 3, 4, 6, 9, and 13-slot chassis options and several WAN interface module options.

"Are those my only choices?"

The switches listed above will be perfect for 99% of all Axia users, but not everyone's needs are the same. [Contact an Axia Applications Engineer](#) if you have questions about which switch is right for you.

Switch Mini-FAQ

"Why can't I just use my favorite switch with Axia?"

People ask us this question every so often. We have standardized on Cisco because their reliability, feature sets and performance are the best we've found. They also offer a wide range of switches at all price points to meet individual users' needs.

How come other manufacturers' switches don't measure up? This is mostly due to individual manufacturers' differing implementation of the same "standards". For file transfers and e-mail, these differences are immaterial. But for VoIP and, most especially, IP-Audio, these implementations become more important. It's quite possible for a given switch to "work" with just a few nodes attached, but when a more robust test of Axia's capabilities is applied, that same switch can fail.

For example, we found a nice, inexpensive switch from a well-known manufacturer which, on paper, met all specs and worked with small systems in the lab. However, it turned out to not actually meet its own published specs when deployed for rigorous service in a large Livewire system.

For this reason, we recommend and qualify only selected Cisco switches for Axia clients.

"Why does Axia recommend EMI switch software versus SMI?"

Many Cisco switches are available with either the standard multilayer software image (SMI) or the enhanced multilayer software image (EMI). The SMI feature set includes advanced QoS, rate-limiting, ACLs, and basic routing functionality. The EMI provides a richer set of enterprise-class features, including advanced hardware-based IP unicast and IP Multicast routing as well as policy-based routing (PBR).

While SMI-equipped switches perform well in systems of limited scale, EMI software is needed in a core switch to make sure this switch provides multicast router function for the Axia LAN. Without multicast routing, SMI switches cannot negotiate core/edge relationships properly. This is needed to make sure the selected core switch will be the root of the IGMP multicast distribution tree and IGMP querier.

"Can I use Cisco switches with 'LAN Lite' software loads?"

Sorry, no. 'LAN Lite' software does not support many of the commands essential to the operation of Axia networks. Only switches with full 'LAN Base' software will power your Axia network correctly.