

T H E

Low-Latency

Flexible

Simple

Ether
IES
Sound

Open

Elegant

Developing

S T A N D A R D

Open



"EtherSound's non-proprietary platform already enables NEXO loudspeaker systems to seamlessly network with most Yamaha digital products, InnovaSON consoles and CAMCO amplifiers. Our professional clients demand this kind of integrated control: it's one of the key reasons we engineered EtherSound into our systems."

Anthony McLean,
Director of Marketing



Opening Ethernet for Audio Professionals

EtherSound's mission is to open Ethernet to all audio professionals: manufacturers, systems integrators, rental system owner/operators, broadcast, film & video engineers, recording studios, anyone who needs to transport digital audio in real time. Standard Ethernet components are the foundation of every EtherSound network. EtherSound can also run within a Virtual Local Area Network (VLAN) using existing Ethernet infrastructure. Fully compliant with the evolving IEEE 802.3x Ethernet standard, EtherSound leverages the huge, ongoing investments of Ethernet developers like Cisco, HP, and 3Com with a device-independent FPGA (Field Programmable Gate Array) architecture. Licensees can evolve and/or customize both new and existing products with a firmware download instead of the lengthy design/test/fabricate cycle required for a new ASIC (Application-Specific Integrated Circuit).

EtherSound licensees and end users are ready to take full advantage of technological advances driven by high-tech corporate R&D investments. Ethernet continues to expand available bandwidth from 100 Mbps to 1 Gbps and beyond. EtherSound is keeping pace by developing both ES-100 Audio Transport and ES-Giga System Transport technologies.

Open Control Framework

For too long, systems integrators have been locked into closed architectures wherever system control or monitoring has been required. EtherSound gives you freedom to choose the products you want to network - and how you want to control them. EtherSound includes a device control protocol and extensible API (Application Programming Interface) as part of the technology. The EtherSound SDK simplifies the design of everything from product-specific commands to "platform-agnostic" control protocols that allow a single interface to control devices from multiple manufacturers.

Live Sound is Real-Time: So Is EtherSound

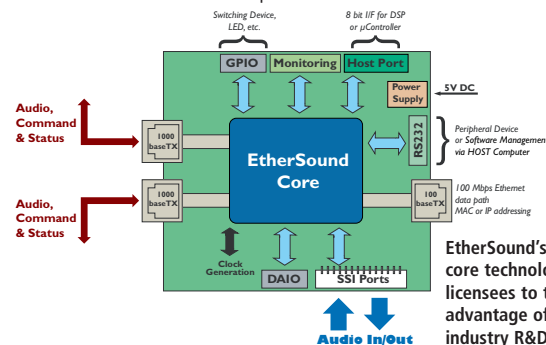
Smaller venues and portable system owner/operators are realizing the inherent efficiencies and cost savings of digital networks. For these applications, latency absolutely has to be inaudible. In a stadium or arena, a pre-recorded program feed or announcement from the control room can take its own time to reach the loudspeakers and the audience. But when a live event stage is erected at one end of this same venue, both the performers and the audience are listening in real time. If the audio network delays the signal above the threshold of audibility, it becomes unusable. EtherSound was engineered from the start for professional applications: minimizing latency was a key design requirement. No other protocol offers such low latency with such a high channel count and sample rates. The end-to-end transmission time between an EtherSound ES-100 (100 Mbps) Audio Transport network input and a network output is five samples, or 104 microseconds at 48 kHz. EtherSound's latency is independent of the number of channels transmitted. Every device between the network input and network output introduces latency, but each daisy-chained EtherSound module adds less than 1.4 microseconds, while switches contribute 2 to 20 microseconds. Even complex EtherSound ES-Giga (1 Gbps) System Transport networks operate with a network latency of less than half a millisecond - well below the threshold of audibility for critical listeners. In a system including microphones, loudspeakers and other analog devices, the biggest contributors to overall system latency are the analog-to-digital and digital-to-analog converters.

Low-Latency

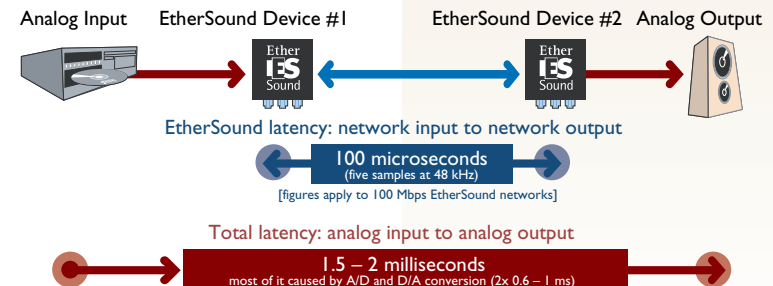


"Without a doubt, Ethersound is the leading technology for audio over Ethernet in the pro audio industry. It's the only technology to offer a thoroughly stable, deterministic network latency that is low enough for live sound. We see great value for our customers."

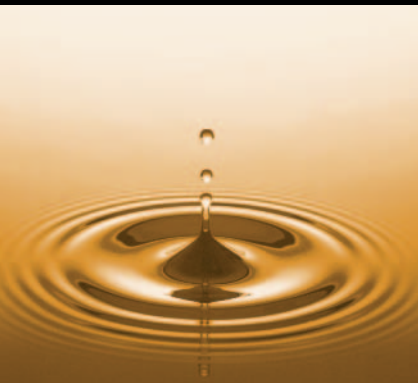
Rainer Sassmann,
Managing Director



EtherSound's FPGA-based core technology empowers licensees to take full advantage of computer industry R&D investments.



Simple



"At www.stardraw.com, you can see a demo of our strategic partnership with EtherSound providing single-screen control of a multi-vendor digital audio network. Configuring networked audio systems and remotely managing devices from multiple manufacturers can be easy – simply use Stardraw Control and EtherSound."

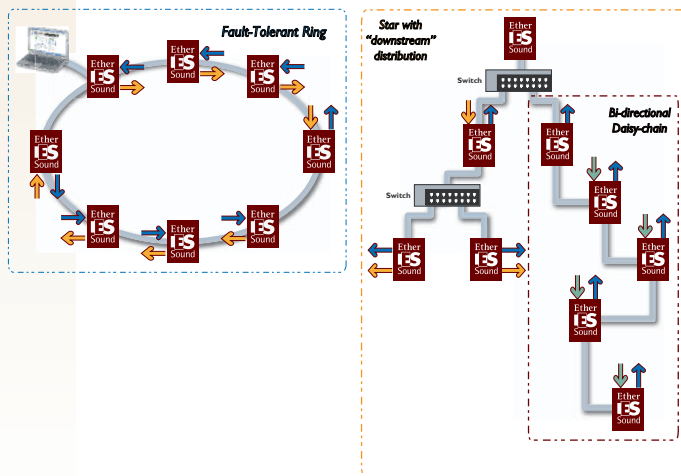
David Snipp
CEO, Stardraw.com



Simple Application

EtherSound now provides two network technologies for different application sets. Both use standard Ethernet components – CAT5e or CAT6 cables, fiber optics, switches, media converters, etc. Hardware-specific Media Access Control (MAC) addresses enable each node to identify itself to the network. Off-the-shelf Ethernet switches can be used to adapt network design for specific applications. Media converters and fiber optics can extend the network's length beyond 100 meters. Installation, configuration and operation are simpler and more cost-effective than equivalent analog systems.

An EtherSound ES-100 Audio Transport network delivers up to 64 bi-directional channels of 48 kHz 24-bit digital audio, plus control and monitoring data, to a virtually infinite number of physically separate devices. Setup is quick and easy: use off-the-shelf Ethernet hardware to build a dedicated 100 Mbps network, or run ES-100 within a VLAN (Virtual Local Area Network) on an existing Gigabit backbone. EtherSound ES-Giga System Transport networks use a full 1 Gbps dedicated network to transmit up to 512 channels of 48 kHz 24-bit PCM (Pulse Code Modulation) audio, plus 100 Mbps of IP-addressable control and monitoring data. EtherSound enables optimum audio distribution solutions for all types of professional sound reinforcement applications: portable and installed systems, high-end residential, broadcast, corporate communications, etc.



Flexible Configuration

EtherSound accommodates mixed sample rates. 96 kHz audio streams use two EtherSound network channels simultaneously and 192 kHz streams occupy four channels. Any combination is possible up to the total number of available channels

Flexible topologies and signal routing

EtherSound networks replace traditional point-to-point connections with architectures that are easier to design, install, and maintain: daisy-chain, star, or combinations of both, as well as fault-tolerant ring. All channels are available to all connected devices in a bi-directional daisy chain. In star architectures, all channels are available to all devices "downstream" of the input device. System configuration and control of all connected devices are available from any network node.

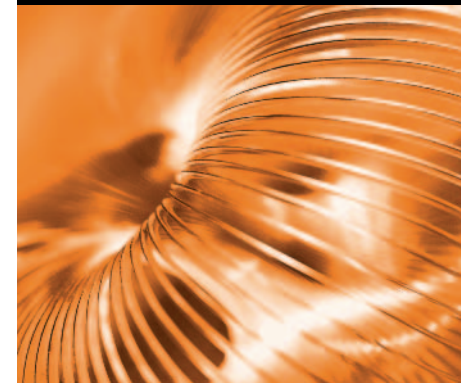
Flexible Implementation three licensing tiers, full development support

Three levels of EtherSound licensing are available. All include technology specifications and the complete Software Development Kit.

- **Entry level:** network your products with EtherSound using standard or custom hardware modules from Digigram or Authorized Implementors.
- **Advanced level:** Manufacture-Only Intellectual Property (MOIP) includes reference schematics and bills of materials, and the FPGA binary file. Both may be customized by Authorized Implementors. Hardware manufacturing may be subcontracted.
- **Developer level:** Design and Manufacture Intellectual Property (DMIP) includes reference designs and FPGA source code (with the EtherSound kernel as an object file). Reference designs may be customized by the licensee or Authorized Implementors. Hardware and/or firmware design may be subcontracted. Royalties are per product and per channel, with a strong advantage for high-channel-count devices.

Digigram, the licensor, has a 20-year track record of successful relationships with 100+ OEM partners and a highly trained international OEM support team. The EtherSound Evaluation Kit is a ready-to-use platform for testing and evaluating EtherSound technology.

Flexible



"EtherSound is evolving in parallel with Gigabit Ethernet and other extensions of IEEE 802.3x. EtherSound also has internal developments such as bi-directional audio, mixed sample rates and data transmission. We can update and upgrade both new and existing products very quickly and easily since the core technology is FPGA firmware, not ASIC hardware."

Yves Ansade, Managing Director



Elegant



"EtherSound delivers deterministic transmission with stable and extremely low latency, high data capacity at mixed sample rates, plus flexible control and monitoring. The elegance of EtherSound is its ability to achieve professional audio network performance within the IEEE 802.3x Ethernet specification."

Lee Minich,
President/Design Engineer

LabX
Technologies, LLC

EtherNetworking Professional Audio

Around the world, across the spectrum of audio-related professions, our industry is moving to network signal distribution. Digital audio is the professional standard in recording, production, broadcast, and now sound reinforcement. Design and installation costs are lower, operation is more flexible and systems can adapt to changing client needs more quickly and easily.

EtherSound enables any manufacturer to capitalize on this accelerating trend. The open EtherSound protocol provides deterministic, synchronous, bi-directional transmission of both control and monitoring data and PCM-encoded digital audio with minimal latency, while maintaining full compatibility with the IEEE's 802.3x Ethernet standard. With low latency plus simple installation and operation of flexible network configurations, the elegant EtherSound technology offers an open standard for all audio professionals who want full control and free choice of the devices they connect to a digital audio network.

EtherSound makes the design, setup or installation and operation of multi-vendor networks simple. Control or audio data can be inserted into the network anywhere and is available everywhere. Devices identify themselves to the network automatically. Flexible topologies include point-to-point and daisy chain, star and fault-tolerant rings, alone and in combination.

EtherSound makes product development quick, easy and cost effective. With a 3-tier licensing program and extensive 3rd-party engineering support available, many licensees are able to network existing products in a matter of months. These companies are seizing the competitive advantage that interoperable network-ready products enjoy in today's transitional marketplace. We invite you to join them in leading the professional audio industry into the future.

Technology Advances: So Does EtherSound

Every year, global high-tech corporations invest billions of dollars, Euros and yen as they race to bring technology closer to magic. Today's silicon chips are so small they're nearly invisible, so fast they're virtually instantaneous, so powerful they seem to think for themselves. Tomorrow's technology will be even more compact, responsive and versatile. And Ethernet will remain a global standard, an essential link and a driving force enabling the convergence of computer, communications and entertainment technologies.

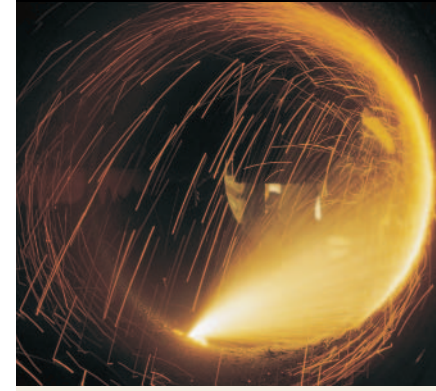
EtherSound developers have a clear focus – ride the wave of Ethernet evolution, enabling professional audio manufacturers and end users to capitalize on high-tech R&D investments that would otherwise be unthinkable. Since its inception, EtherSound has added new capabilities as soon as IEEE 802.3x Ethernet standards make them available. The software kernel has been made device-independent, allowing Developer Licensees to use a variety of FPGAs. The available choices continue to follow Moore's Law, gaining in speed and power, falling in price. Now in version 3.0, the 100 Mbps ES-100 Audio Transport has added management of multiple sample rates, multiple logical daisy chains, network



control from any connected device, and fault-tolerant ring topologies. The ES-Giga System Transport protocol includes all of the capabilities of ES-100, plus an independent 100 Mbps data stream for control/monitoring data, TCP/IP, etc. Gigabit Ethernet's enormous bandwidth has been developed for the transmission of video as well as audio, and the EtherSound development team is already working to implement multimedia capabilities in future generations of the EtherSound standard.

Thanks to its elegant engineering, EtherSound is able to keep pace with new developments in the Ethernet standard. EtherSound's leadership is clear today and will become even more compelling in the future.

Developing



"The rapid evolution of EtherSound has been very impressive. Bidirectional transmission, mixed sample rates, fault-tolerant ring topologies, Gigabit bandwidth – these and more have all been added to the standard in the last year. We're going with the leader in digital audio networking as our connectivity standard for Allen & Heath digital audio products."

Glenn Rogers
Managing Director

ALLEN & HEATH

For further information on EtherSound –

technology • protocol • products • applications • Evaluation Kit • licensing program
visit: www.ethersound.com • email: info@ethersound.com • phone: +1 949 643 1114