LX-IP Synchronous AoIP & MADI Multichannel Sound Card

Key Workflow: Bridges professional audio software applications to the ultra-low latency, phase-accurate and high precision clock management of AES67 and RAVENNA AoIP networks

LX-IP provides the perfect gateway from mission critical applications to RAVENNA and AES67 AoIP networks. Its 64 channels, 0.5 ms latency and phase accuracy match all requirements for high density, ultra-low latency on-air or production studio workflows. Hardware-based architecture maintains performance regardless of the computational load of other applications running on the host system.

LX-IP with MADI optional interface provides a seamless migration path from legacy digital audio to AoIP and provides all MADI features described below.

At a glance

The LX-IP sound cards provide:

- High channel count, ultra-low latency and phase-accurate audio distribution on synchronous AoIP networks
- Phase-accurate clock synchronization between digital audio and AoIP networks
- Interoperability with traditional digital audio
- Performance & stability independent of PC applications
- Mission critical reliability
- Play/record 64 audio channels between a DAW (Digital Audio Workstation) or automation application and AES67 or RAVENNA synchronous AoIP network
- Play/record 64 channels between a DAW or automation application and digital audio MADI equipment
- Provides zero-latency routing on-board between 2*64 RAVENNA/AES67 channels, 64 DAW channels and (option) 64 MADI channels
- Provides PTP Grand Master clock to synchronous AES67 or RAVENNA AoIP network. This Grand Master can be

slaved to WordClock or MADI inputs

- Synchronises RAVENNA/AES67 AoIP streams on external PTP clock. The MADI output and WordClock clocks can be slaved to the external PTP clock

Key features

- 64/64 Record/Play channels on PCIe bus
- 64/64 AES67/RAVENNA I/O channels on each of the two Gigabit Ethernet interfaces
- 64/64 I/O MADI (AES10) optical channels (option)
- Ultra-low sub-millisecond round trip latency
- Fully compliant with AES67 interoperability recommendations, including Unicast SIP support
- Packet size from 128 down to 1 audio sample per RAVENNA packet
- Local clock eligible as PTP Grand Master
- Zero delay embedded routing matrix for AoIP / MADI / PC channels
- Performance maintained regardless of the computational load of applications running on the host system
- Fully configurable through Web user interface and EMBER+ protocol

Configuration

- Bus/Format: PCI Express(R) x1 (compatible x1, x4, x8, x16 slots)
- Size: 111.15 mm x 167.65 mm x 20 mm
- Power requirements (+3.3V/+12V): 0.4 A / 0.12 A
- Operating: temp / humidity (non-condensing): 0°C / +50°C • 5% / 90%
- Storage: temp / humidity (non-condensing): -5°C / +70°C • 0% / 95%

Inputs & Outputs

- **Connectors**
  – 2 Gigabit Ethernet RJ45 ports for RAVENNA I/O (dual port or Primary / Back up mode)
  – 1 optical connector for MADI I/O (Factory option) (multimode, 1300nm)
  – 1 BNC for Word Clock In / Out
- **RAVENNA I/O channels**: 2 banks of 64/64 I/O (Mono) channels at 44.1 kHz or 48 kHz (64/64 I/O on each Gigabit Ethernet interface)
- **RAVENNA packet size**: From 128 down to 1 (ultra-low latency profile) audio samples per RAVENNA packet
- **AES67 compliance**: Full compliance in all respects with AES 67
- **Supported audio payload formats**: PCM16 / PCM24 / PCM32 / AM824 (PCM24+AES3 channel status)
- **PC Record/Play channels**: 64/64 simultaneous Record/Play (Mono) channels to/from PC
- **MADI (Multichannels Audio Digital Interface) inputs and outputs:**
  – Optical I/O connector, 64/64 I/O (Mono) at 48 kHz sampling frequency and 32/32 I/O (Mono) at 96 kHz
  – (Factory option)
- **Word Clock input or output**
  – BNC connector, Input or Output position selectable by software.
  – Input : TTL , impedance selectable by jumper (75 Ohms / HighZ).
  – Output : Max 5 Vpp, 75 Ohms output impedance
- **Clock sources:**
  – PTPv2 (IEEE1588-2008) from network or internal clock or Word Clock or MADI input

– Local clock eligible as GrandMaster PTP

– Local clock precision : better than 10 ppm

- **Sampling frequencies:**

  – From local clock: 44.1 kHz, 48 kHz and 96 kHz (MADI)

  – From network or Word Clock: 44.1 kHz, 48 kHz and 96 kHz (MADI)

  – From MADI: 44.1 kHz, 48 kHz, 96 kHz

Control and routing

- **Control**

  – HTTP (web pages from embedded server)

  – EMBER+

- **Routing**: Zero latency on-board routing matrix between RAVENNA, PC Rec/Play and optional MADI channels

Environment

- **Latency:** Round trip time down to 0.8 ms (excluding IP network)
- **Supported operating systems:** Windows 10, 8 and 7 32/64bits, Windows server 2003/2008, Linux
- **Supported drivers:** ASIO, WASAPI / low latency WDM DirectSound, ALSA