Gateway

The Highest Density DSP-based
1RU IP Audio Codec

AoIP Interfaces

AES67

ST 2110-30

WHEATNET

www.tieline.com

Tieline®
The Codec Company

Gateway Multichannel IP Codec (TLR6200)

Networking flexibility like never before…

The Tieline Gateway is the most powerful DSP-based 1RU IP codec enabling transport of multiple channels of mono or stereo audio across the Public Internet or any QoS-enabled IP network, including T1 and T3 connections and private WANs with MPLS. The Gateway streams up to 16 IP audio channels with support for AES67, ST 2110-30, AES3 and analog I/O as standard. Gateway also supports AES67 and ST 2110-30 interoperability with AoIP protocols including WheatNet, Ravenna®, Dante® and Livewire+™. An optional WheatNet-IP card can be purchased.
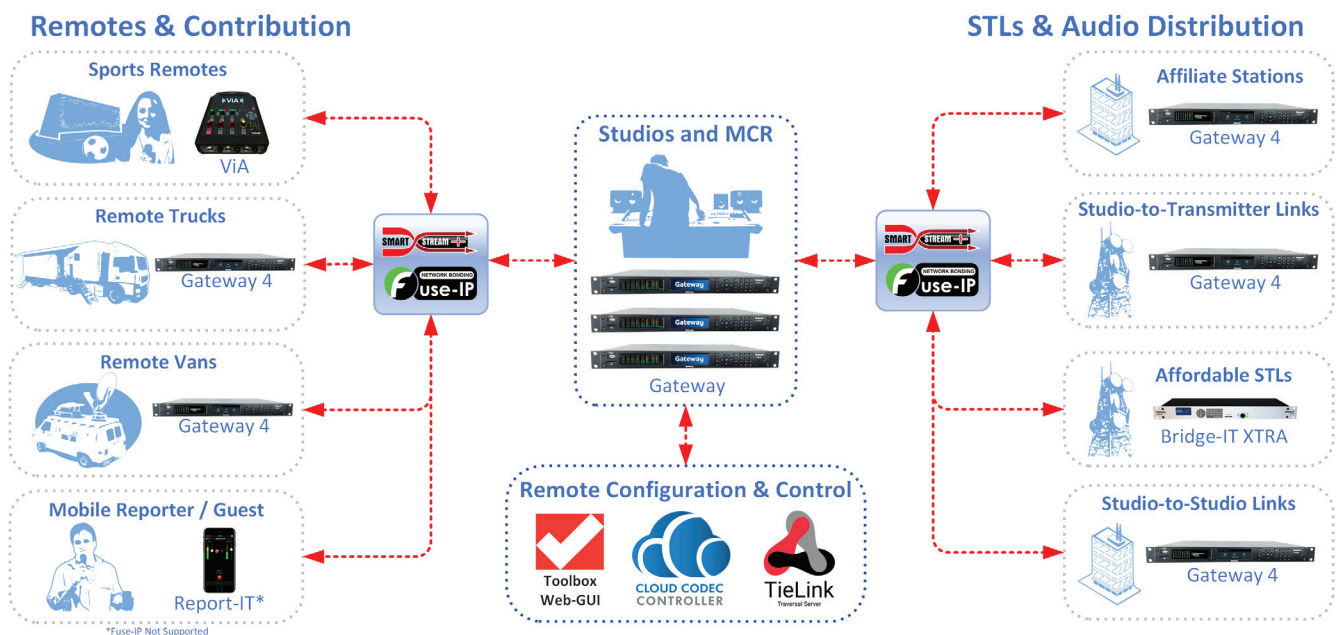
Applications

It is perfect for large-scale audio distribution to single or multiple locations, as well as managing multiple incoming remotes at the studio with hitless packet switching using SmartStream PLUS redundant streaming and bandwidth aggregation using Fuse-IP technologies over internet connections. It supports 16 bidirectional mono or 8 bidirectional stereo streams of IP audio in 1RU to increase channel density and reduce rack space requirements.
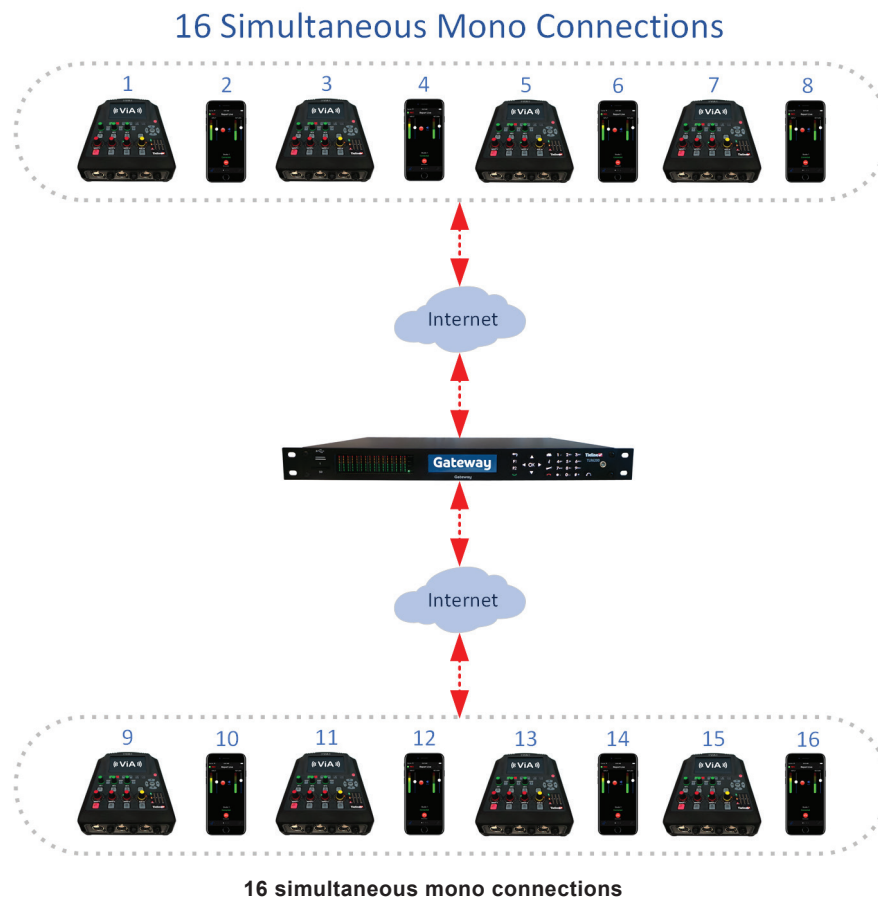
The Gateway is ideal for:

➤ Audio contribution and managing multiple incoming remotes.

➤ Studio-to-Transmitter Links.

➤ Network syndication of programming.

➤ Multi-channel links to remote studios.

Remotes & Contribution

Sports Remotes
ViA

Remote Trucks
Gateway 4

Remote Vans
Gateway 4

Mobile Reporter / Guest
Report-IT*

*Fuse-IP Not Supported

Studios and MCR
Gateway

Remote Configuration & Control
Toolbox Web-GUI
CLOUD CODEC CONTROLLER
TieLink
Traversal Server

STLs & Audio Distribution

Affiliate Stations
Gateway 4

Studio-to-Transmitter Links
Gateway 4

Affordable STLs
Bridge-IT XTRA

Studio-to-Studio Links
Gateway 4

Key Features

- High channel density with 16 bidirectional mono or 8 bidirectional stereo IP streams

- 16 hardware GPIOs, plus 3 virtual inputs, 112 logical outputs, and 64 WheatNet Logic Inputs/Outputs

- Features Dante®, Livewire+™ and Ravenna® AES67/ST 2110-30 interoperability.

- 10 Band EQ, Compressor and IGC Limiting on all analog inputs

- Ideal for contribution/remotes and audio distribution applications

- Stream IP audio over WANs using dual Ethernet ports

- Fully AES67 and ST 2110-30 compliant for AoIP streaming

- WheatNet-IP interface option available

- Supports multicasting and multi-unicasting, multi-multicasting & multiple multi-unicasts

- 128GB Internal SSD supports record, store & forward [2]

- Dual DSP based platform with dual internal power supplies, dual Ethernet ports, dual [1] AoIP ports, and dual USB ports for firmware upgrades, memory or Wi-Fi modems.

- Supports uncompressed audio or a huge range of encoding options

- USB 2.0 port supports firmware upgrades, Wi-Fi modems and USB memory sticks. USB 3.0 will support record and playback [2]

- SD card slot for firmware upgrades and memory options

- Fully SIP EBU N/ACIP 3326, 3368 and 3347 compliant to operate with 3rd party codecs

- Module slot for future technologies and hardware upgrades

- Fully remote control using the Toolbox HTML5 Web-GUI, or the Cloud Codec Controller, plus SNMP support

- Connect simply using the TieLink Traversal Server [2]

16 Simultaneous Mono Connections

16 simultaneous mono connections

[1] AoIP Port 2 Future Release [2]Future Release

A Flexible Upgrade Path

The Gateway has two standard versions:

➤ Gateway supporting 8 Channels in/out (8 Mono or 4 Stereo)

➤ Gateway supporting 16 Channels in/out (16 Mono or 8 Stereo)

The codec also supports a flexible upgrade path that allows you to buy a Gateway with 8 channels and upgrade the codec over time as needs change or your network expands.

Order 8 Channels Now and Upgrade Later…

Order a Gateway with 8 channels and immediately have access to 8 input and output channels and stream up to 8 mono or 4 stereo streams of IP audio. If you need to expand channel and stream capacity, simply purchase an upgrade license and expand capacity in pairs up to 16 channels in total. Options include:

Gateway: 8 channels in/out with the following licence options or combination thereof:
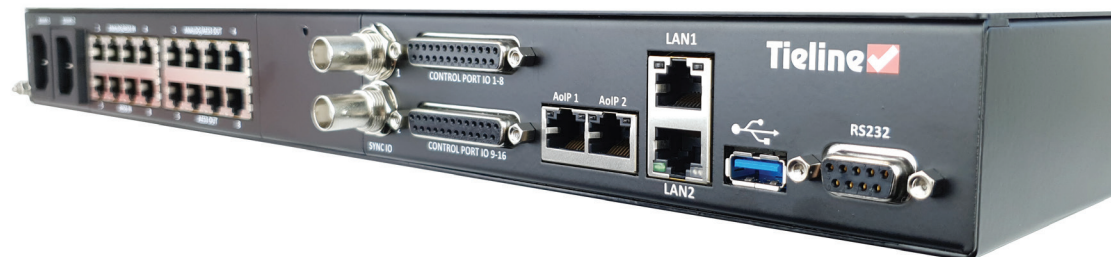
➤ 2 Channel Upgrade: TLR6200-LIC1ST

➤ 4 Channel Upgrade: TLR6200-LIC2ST

➤ 8 Channel Upgrade: TLR6200-LIC4ST

Contact Tieline or your favorite dealer for pricing and to purchase an upgrade license.

WheatNet-IP

Order an optional WheatNet-IP card for the Gateway when you purchase the codec. The WheatNet-IP card delivers interoperability with Wheatstone's WheatNet-IP Environment and allows codec sources and destinations to be controlled using Navigator software.

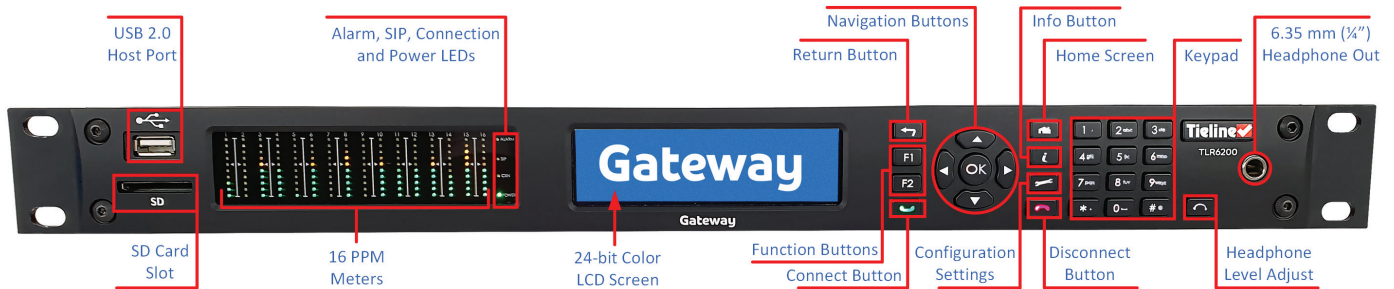## Interoperability and Remote Control

Its feature-rich and compact design is interoperable with all Tieline IP codecs and compatible over SIP with all EBU N/ACIP Tech 3326 and 3368 compliant codecs and devices. The codec is also fully AES67 and ST 2110-30 compliant for AoIP streaming. An optional WheatNet-IP card is available and the codec features Dante®, Livewire+™ and Ravenna® AES67/ST2110-30 interoperability.

The Gateway is also NMOS IS-04 and IS-05 compliant for AoIP discovery, registration and connection management, simplifying setup and configuration of networked AoIP devices and systems.

Maintain connectivity and interoperability with legacy ISDN networks as required with the optional Euro ISDN module and integrate with IP audio streams simultaneously. Gateway is configurable through an embedded HTML5 Toolbox Web-GUI interface and is also fully controllable using Tieline's Cloud Codec Controller.
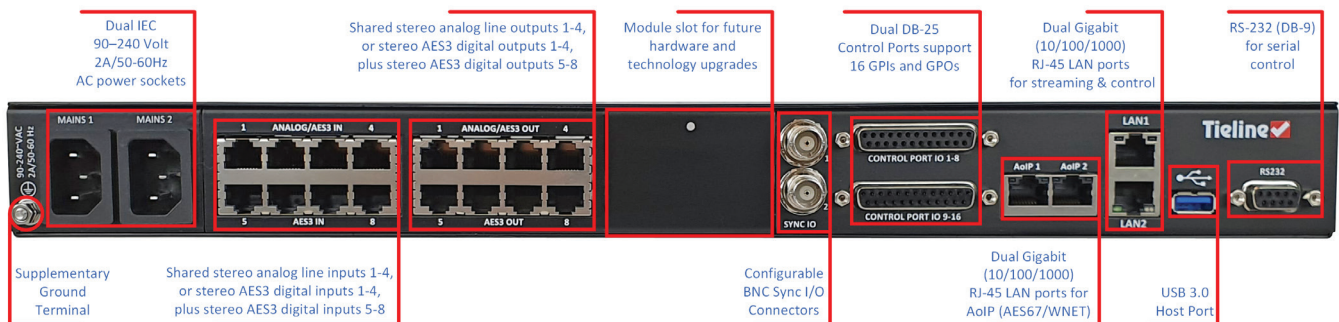
Front Panel Interfaces

The Gateway front panel features a high-quality color LCD screen for at-a-glance monitoring and configuration. Silicon menu, navigation and keypad buttons deliver simple configuration, control and audio monitoring. An SD card slot and USB port allow simple access for firmware upgrades, attaching Wi-Fi USB modems, and additional memory.

Rear Panel Interfaces

The Gateway rear panel facilitates maximum flexibility with support for analog, AES3 and AES67 / ST 2110-30 I/O. Tieline also offers optional WheatNet-IP compatibility. The codec supports 16 GPIOs as well as software logic I/Os. The module slot enables future hardware innovation upgrades to maximize codec capability over time.

[1]LAN2 Port future release   [2]Future Release

Specifications

Input and Outputs

RJ45 Analog Inputs 1-4/AES3 Inputs 1-4	Shared analog stereo line inputs 1-4, or stereo AES3 digital inputs 1-4
RJ45 Analog Outputs 1-4/AES3 Outputs 1-4	Shared analog stereo line outputs 1-4, or stereo AES3 digital outputs 1-4
RJ45 AES3 Inputs 5-8	Stereo AES3 digital inputs 5-8
RJ45 AES3 Outputs 5-8	Stereo AES3 digital outputs 5-8
Gigabit LAN Ports	2 x Gbit Ethernet ports for IP streaming over WANs (16 bidirectional mono or 8 bidirectional stereo)
Gigabit AoIP Streaming Ports	2 x Gbit Ethernet ports for AES67/ ST-2110-30/ ST-2022-7[2] or Optional WheatNet-IP streaming over AoIP1 (16 bidirectional mono or 8 bidirectional stereo); port 2 not operational in early releases
USB 2.0 Host Port	Front panel host port (supports firmware upgrades, Wi-Fi USB modems and memory sticks)
USB 3.0 Host Port	Rear panel host port supports record and playback[2]
Front Panel Headphone Output	1 x 6.35mm (1/4") headphone Jack
Front Panel SD Card Slot	Full size push-pull SD card slot for firmware upgrades [2]
Internal SSD Storage	128GB Internal Storage supports record, store and forward use cases for network syndication applications[2]
BNC Sync Input/Output	2 configurable input/output BNC sync connectors (Wordclock, AES3 Input, AES11id, PTP Sample Clock, and Fixed)
Control Port In/Out	Dual DB-25 Control Ports support 16 CMOS control inputs and 16 opto-isolated solid-state relay outputs
Analog Input Impedance	> 10k ohm
Analog Output Impedance	< 30 ohm balanced
Clipping Level	Nominal output level +4dBu with maximum output + 24 dBu
A/D & D/A Converters	24 bit
AES3 (AES/EBU)	24 bit inputs with support for sample rates from 32kHz to 192 kHz[2]; 24 bit outputs
Frequency Response	20Hz to 22kHz
Total Harmonic Distortion	<0.002% at +22dBu unweighted
Signal to Noise Ratio	>100dB at +24dBu, unweighted, 20Hz − 20kHz
Crosstalk	< -95dB between adjacent channels

Data and Control

Configuration and connectivity	HTML5 Toolbox Web-GUI, Cloud Codec Controller (CCC), TieLink Traversal Server[2]
Web Audio Monitoring	Selectable web audio monitoring[2] of IP audio streams
Serial (DB-9)	RS232 up to 115kbps with or without CTS/RTS flow control can be used as a proprietary data channel
Software Logic I/Os (SLIO)	16 hardware GPIOs, plus 3 virtual inputs, 112 logical outputs, and 64 WheatNet Logic Inputs/Outputs

Encoding and IP Streaming

Encoding Formats	Tieline Music, Tieline MusicPLUS, Opus, G.711, G.722, MPEG Layer 2, MPEG Layer-3 LC-AAC, HE-AAC, HE-AACv.2, AAC-LD, AAC-ELD, 16/24 bit aptX® Enhanced algorithm, MPEG audio technologies licensed by Fraunhofer IIS (http://www.iis.fraunhofer.de/audio)
Uncompressed IP	Linear PCM16/24 bit 32kHz, 44.1kHz, 48kHz, 96kHz sampling
IP Sample Frequencies	8kHz, 16kHz, 32kHz, 44.1kHz, 48kHz, 96kHz
Phase-locked Surround Sound Channels	Stream 4, 6 and 8 digital channels in phase-locked mode to deliver live content in both stereo and surround sound formats
Asymetric encoding	Supports asymetric multi-format encoding
Protocols	RTP, DHCP, SNMP, DNS, HTTP, IGMP, IPv4/IPv6, RTCP, STUN, SSL Security Certificate
SmartStream PLUS	Primary plus 3 redundant streams supported (algorithm dependant) Note: only 1 redundant stream available using TieLink[2]
Multi-unicasting	Support for Multi-unicast and 1, 2, 3, or 8 Multiple multi-unicast streams (80 connections in total)
Multicasting	Support for Multicast and Multi-multicast (8-16) streams over compatible IP networks
Fuse-IP	Bond IP interfaces to aggregate data

AoIP Standards & Specifications

EBU N/ACIP 3326	Audio Contribution Over IP Compliant
I3P EBU Tech 3347	Intercom Over IP Compliant
EBU N/ACIP 3368	SIP Profiles Compliant
AES67 Compliant	44.1.kHz, 48kHz, 96kHz Sample rates; 16 & 24 Bit, 1-8 Channels, SDP, SAP
ST 2110-30 Compliant	Class A, Ax, B, Bx Sender and Receiver Compliant
ST 2022-7 Seamless Protection Switching[2]	Compliant with requirements for sending multiple redundant streams of RTP packets to enable seamless protection switching
NMOS Compliant	NMOS IS-04 & IS-05 Discovery, Registration and Connection Management
Supported Audio Frames	125us, 250us, 333µs, 1ms, 4ms
Clock Modes Supported	Primary Leader [2] (Master), Follower (Slave), Follower Only (Slave Only)

Advanced Networking

VLAN Tagging	IEEE 802.1Q,802.1p
Quality of Service (QoS)	Support for DiffServ (DSCP)
Synchronization	IEEE 1588-2008(PTPv2)
Multicasting	IGMP v2 and v3
SAP	SAP v2 (Session Announcement Protocol) as defined in RFC 2974

General

Display	24-bit Color LCD Screen (480 x 128 pixels)
Keypad	26 button silicon keypad
Navigation	5 navigation and selection buttons
Size	1U x 19" Rackmount
Dimensions	19" x 1 3/4" x 11 13/16" [482mm (W) x 44.45mm (H) x 300mm (D)] excluding rear connectors
Weight	4 Kg /8 lb 13.100 oz
AC Power	Dual AC 90-240V IEC power inlets; 2A 50-60 Hz
Operating Temperature	0°C to 45°C (32°F to 113°F)
Humidity Operating Range	20% ≤ RH ≤ 70% (0 to 35°C/32°F to 95°F), non-condensing

[2] Future release

Extensive dealer network with global telephone support in 2 strategic locations around the world

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