WHEATSTREAM DUO

EVERYTHING YOU NEED TO PROVISION, PROCESS AND MANAGE TWO CHANNELS

Wheatstone

Meet Wheatstream Duo

Wheatstream Duo is designed for every broadcaster, podcaster, or content streamer who has ever wanted a professional audio streaming appliance but couldn't afford it. This full-featured streaming appliance has all the reliability, audio processing, and metadata tools found in the high-capacity Wheatstream appliance, but for one or two channel applications.

As a Linux appliance, there is no need to run a dedicated software application to configure the box. Wheatstream Duo has an easy-to-navigate HTML 5 web browser interface, is compatible with standard CDN and streaming platforms, and can adapt metadata input from most playback automation systems for one simple workflow from automation to content delivery.

Wheatstream Duo can be added to any analog, digital or AoIP studio, including WheatNet IP and AES67-compatible systems.


WHEATSTREAM DUO
WHEATNET-IP <----> AUDIO OVER IP NETWORK

Overview

Wheatstream Duo is a Linux appliance for provisioning, processing and managing the metadata for two program channels, each capable of four output streams for a total of 8. Wheatstream Duo can adapt metadata input from most major automation systems and is compatible with standard CDN and streaming platforms for one easy workflow from automation to content delivery.

Like all Wheatstone streaming appliances, Wheatstream Duo includes audio processing tools designed specifically to optimize the performance of streamed audio through the streaming encoder and across a wide variety of Internet links.

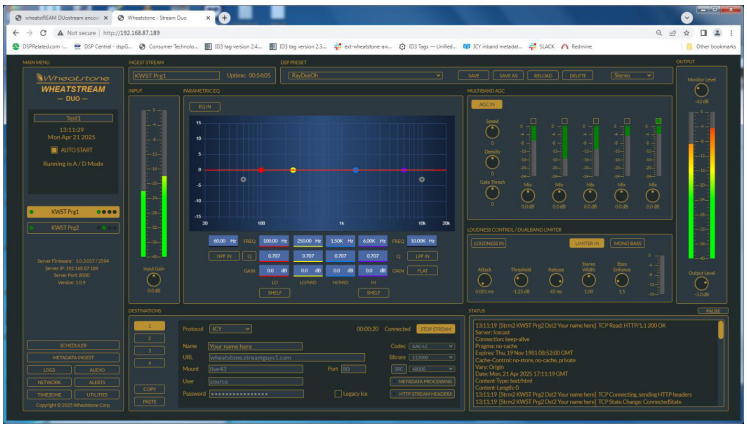
Wheatstream Duo can be added to any analog, digital or AoIP studio, including WheatNet IP and AES67-compatible systems.

Features

- **All-Inclusive Linux and AoIP Appliance:** No Windows® drivers or need to run a dedicated software application to configure the box.
- **Easy to Navigate:** HTML 5 web browser interface
- **8 Output Streams:** Accepts two input streams of analog, AES3, AES67 or native AoIP such as WheatNet IP, each capable of four output streams for a total of 8 output streams.
- **Audio Processing Designed Specifically for Streaming:** Full suite of audio processing tools developed specifically for streaming. Optimize the performance of encoded audio content with the right amount and type of processing for maintaining uniform levels, spectral balance and absolute peak control.
- **Optimized Quality/Loudness for the Bitstream:** Final limiting occurs separately in two bands, above and below 180Hz, to provide the ideal balance between perceived quality and loudness for a given finite bitstream. For low bitrate streams especially, separately managing low frequencies means being able to selectively remove them in the stereo difference channel (L-R). This leaves more bits available for encoding those frequencies that are more perceptible.
- **Multiple Encoding Options:** Provides selectable AAC, MP3 or Opus encoders targeting high to low bit rates for reaching a broad range of end user devices and players.
- **Metadata Agnostic**: Lua transformation filters adapt metadata input from any automation system into any required output format for streaming of song title, artist and album art.
- **Compatible With Standard Protocols, CDNs and Streaming Platforms:** Supports Triton, HLS, Icecast, RTMP, and RTP streaming protocols.
- **BS.1770 Compliant Loudness Control:** Manages loudness from -24 to -10 LUFS.
- **Add to Any Studio:** Add to any analog, digital or AoIP studio, including WheatNet IP and AES67-compatible systems.

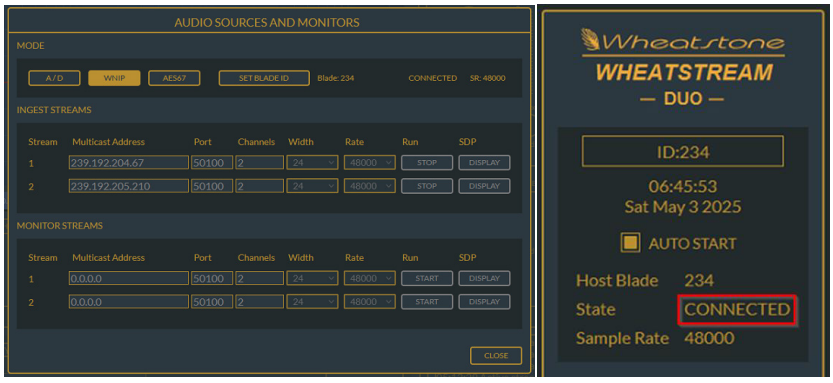
WHEATSTREAM DUO GUI'S

EASY ACCESS HTML 5 BROWSER INTERFACE



Remote into Wheatstream Duo from anywhere through an HTML 5 web browser interface for easy and ready access to provisioning, processing, metadata management and more.

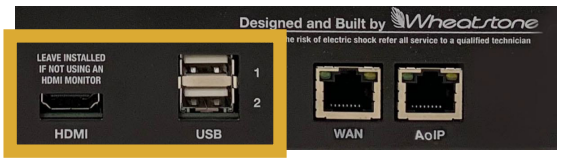
ADD WHEATSTREAM DUO TO ANY STUDIO



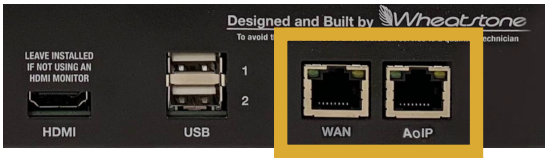
Wheatstream Duo can be added to any analog, digital or AoIP studio, including WheatNet IP and AES67-compatible systems.

As part of the WheatNet IP audio network, Wheatstream Duo has access to all routing, logic and elements in the studio.

HDMI AND USB CONNECTIVITY



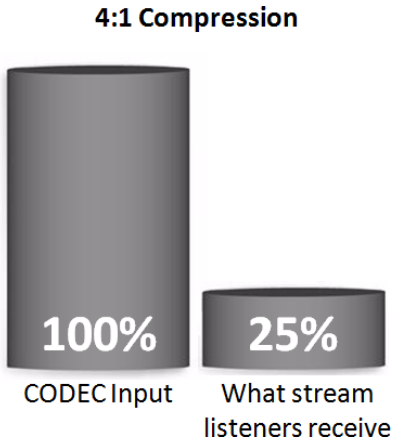
WAN AND AOIP CONNECTIVITY



PEAK LIMITING, GAIN CONTROL AND PROCESSING DESIGNED SPECIFICALLY FOR STREAMING

Streamed audio requires audio processing to keep levels consistent and to maintain absolute peak control. These tasks encounter unique challenges due to the role of the streaming codec, whose job is to remove bits from the audio stream to get it to "fit" within the constraints of the typical internet link. The lower the bitrate, the more aggressively it must remove data to make the data fit. Furthermore, problems arise when introducing noise, hum, and distortion byproducts, which the codec can mistake for perceptible audio. Not only does the codec often pass these on as listenable content, but it can also multiply these artifacts to the exclusion of listenable audio.

Wheatstone streaming appliances use audio processing techniques designed specifically to optimize the performance and achieve the best sound across even the lowest bitrates.



Codecs can remove up to 75% of the audio "data" in a bitstream depending on the internet link. It's the job of Wheatstone streaming appliances to optimize the listenability of the remaining bitstream.

WHAT MAKES WHEATSTONE STREAMING APPLIANCES DIFFERENT?

- Consistent loudness across widely varied program levels and content.
- Consistent spectral balance under all program conditions.
- Absolute peak control to keep the codec input level away from 0dBFS (there's nothing above 0dBFS but distortion, i.e. you're "out of bits!").
- All without excessive audio byproducts that can set off the perceptual codec.

CODEC FRIENDLY AUDIO

Unlike other techniques that can cause distortion, Wheatstone streaming appliances use RMS density algorithms as part of a five-band intelligent AGC to smooth out source transitions and feed a steady diet of consistent audio levels.

Also unique to Wheatstone streaming appliances is a two-band final limiter section that removes hard limiting or clipping from the processing chain, yet keeps programming within the codec's 0dBFS limit. Also included is a stereo width management section that eliminates the dynamic left-right (L-R) stereo swings that can skew the codec algorithm at the expense of quality programming. It also includes bass boost and monaural bass features for optimizing low bitrate streams.

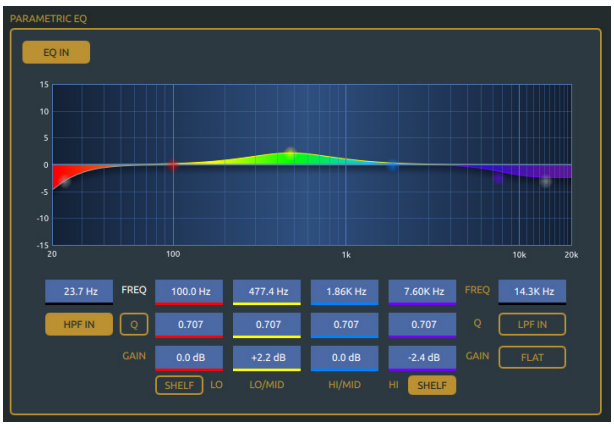
TOOLS FOR LOW BITSTREAMS

Mono bass:

This helpful feature removes energy below 250Hz in the L-R stereo difference channel only! With such energy removed, the codec doesn't see or try to encode it, leaving more bits available for encoding those audio frequencies that are more perceptible. Your listeners will never know what's missing because our ears are less sensitive to stereo separation at low frequencies anyway.

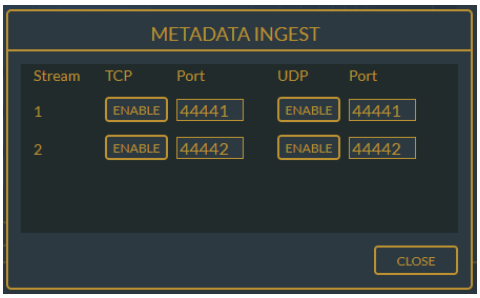
Six-Band Equalizer and phase rotator:

A two-stage phase rotator that corrects voice asymmetry and removes noise and hum and a four-band parametric equalizer with peak and shelf functions help you stream the best quality possible at various bitrates.



The six-band EQ can be used in shelf mode for boosting overall bass or brightness or in parametric mode for enhancing or reducing a narrow band of energy.

METADATA ADAPTABILITY



Wheatstone streaming appliances ingest 'now playing' and other relevant metadata from most playback automation systems for one simple workflow from automation to content delivery. Raw metadata is ingested via TCP or UDP and adapted to the accepted format of the CDN, which then passes on standard metadata such as song titles and artist names as well as specialty metadata such as album art, song lyrics, and clickable URLs as part of the streamed content.

To adapt metadata to any of the variety of formats used by CDNs, Wheatstream Duo uses Lua transformation filters to re-format metadata from any automation system into any required CDN format.

Lua is a programmable scripting language embedded into Wheatstream Duo and excels at the kind of search and pattern-matching tasks required to extract the desired information from the incoming text and then to rearrange it according to the requirements of the CDN.

SUPPORT FOR A VARIETY OF STREAMING STANDARDS AND PLATFORMS:

TRITON DIGITAL

TRITON (MRV2):

MRV2 is the proprietary streaming protocol developed by Triton Digital to provide a high degree of resilience to errors and packet loss, built-in redundancy, and accurate synchronization of metadata with the audio stream. Metadata values are collected from the incoming event messages and arranged into a string of simple key=value pairs, which is then passed to the MRV2 manager for injection into the audio stream.

HLS

HLS:

In HLS streams, metadata is primarily conveyed by means of ID3v2 frames interjected between AAC frames, which keeps the metadata synchronized with the audio stream with a precision of about 20 milliseconds. Each HLS segment is also prefixed with the most recent ID3v2 frame, so that players connecting to the stream between metadata events are nonetheless updated immediately.

ID3v2 frames may carry common metadata such as artist, title, album, duration, ISRC, and URL. They may also carry custom data of any sort, a capability which may be used to trigger ad insertions.

Icecast

ICY:

Icecast is an open-source streaming protocol that has proliferated as one of the first streaming protocols introduced. Many variations on the original server architecture exist, which has led to an equal number of variations in the structure of metadata updates. Metadata is conveyed to the Icecast server as out-of-band data – that is, it is neither part of, nor embedded into, the audio stream, but rather takes its own route over the public internet to the server, without benefit of timestamps or any other synchronization mechanism.

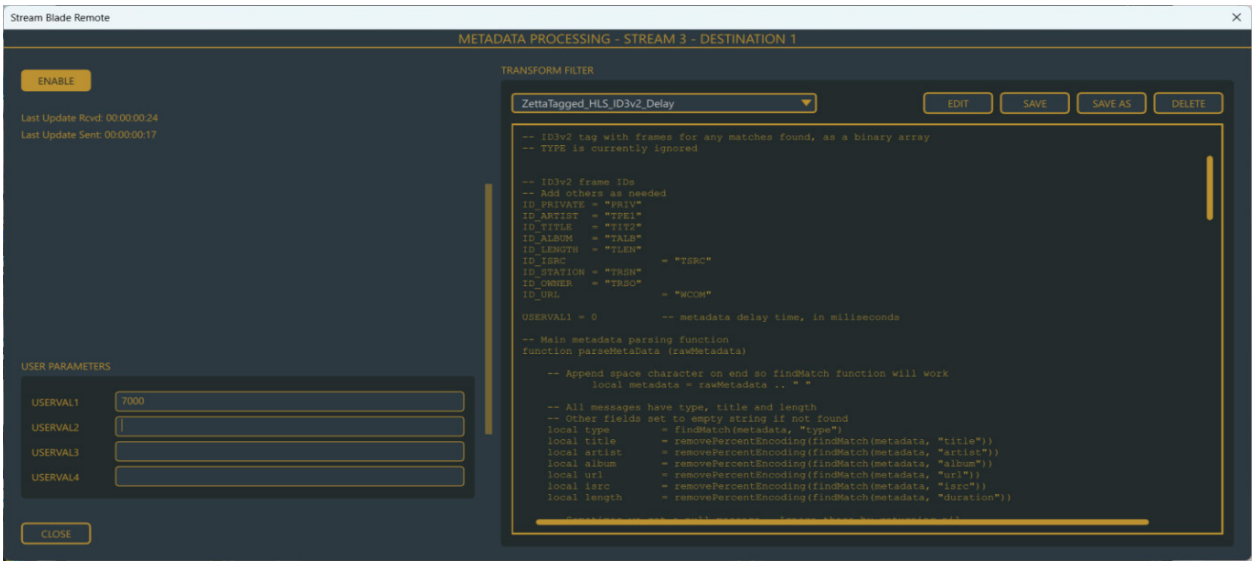
RTMP

RTMP:

The Real-Time Messaging Protocol (RTMP) developed originally by Adobe (Macromedia) for transport of Flash video is still widely used to transport audio data of any format, although most commonly used for backhaul up to a CDN or distribution center. Metadata can be embedded into the audio stream by means of so-called "setDataFrame" packets. These packets have a particular format which involves setting values for three different "properties," which are Title, Artist and URL.

METADATA DELAY IN SYNC WITH AUDIO

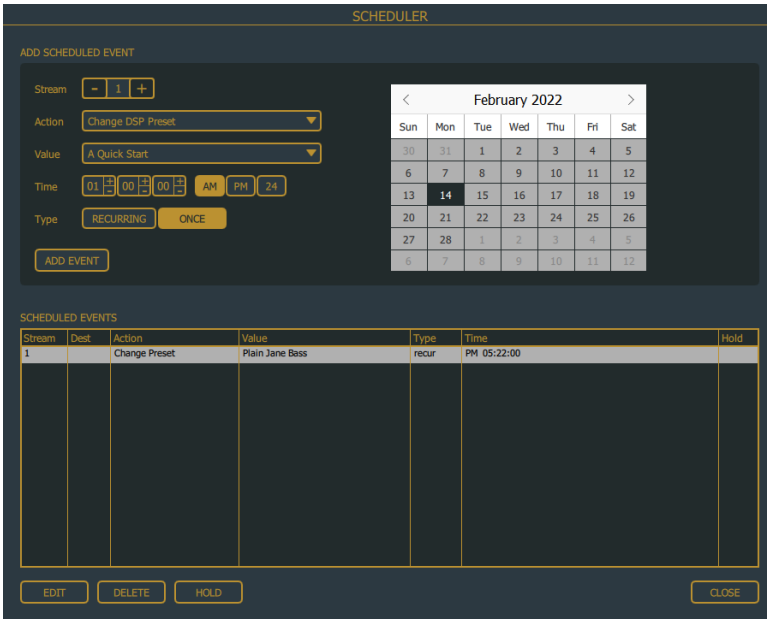
Wheatstream Duo provides for metadata to remain in sync with audio being delayed during certain conditions, such as profanity delay.

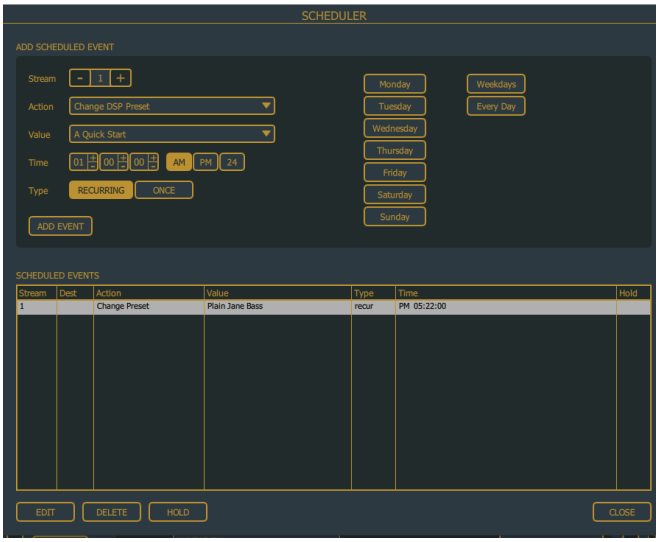


POWERFUL SCHEDULER INCLUDED

While most stations will stream whatever is on their terrestrial on-air signal all the time, performance rights rules sometimes make things more complicated. For example, if your station carries sporting events, some leagues won't allow you to stream that programming. Or perhaps your station streams local sporting events that aren't carried on your on-air signal several times a week, or your station carries a mix of music and talk, and you want to optimize the stream's processing to match the source material.

With the scheduling software that's built into Wheatstream Duo, you don't need to count on a board operator going in to click the right button at the right time.





EVENTS THAT YOU CAN SCHEDULE

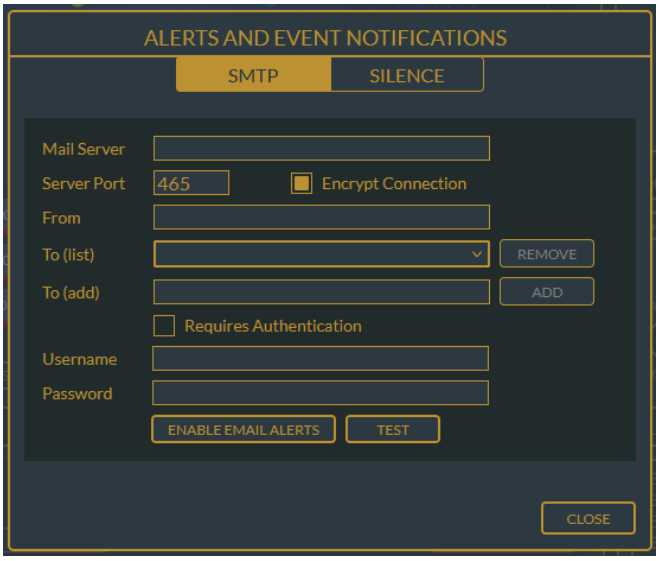
- Change DSP Preset
- Start Destination Stream
- Stop Destination Stream
- Set Metadata Filter (4 user variables available)

Events can be scheduled to happen once at a specific day and time, or to happen on a recurring basis. Recurring events can happen at a time on a specific day of the week, or at a specific time on weekdays only, or at the same time every day.

SILENCE DETECTION AND ERROR ALERTING

Wheatstream Duo's silence detection feature monitors input levels on a per-ingest-stream basis. An alert is issued based on a silence threshold as well as how long the signal remains below that threshold.

Email (SMTP) alerts can be set up to send notifications about socket errors, send and receive errors, and silence detection as well as stream starts, disconnects and restart attempts.



SOUND. SIMPLE. SMART.

Wheatstone Corporation makes broadcast quality control surfaces, on-air audio processors, virtual mixers, audio editors, streaming appliances, voice/mic processors, and 200+ interconnected AoIP studio elements — all engineered, manufactured, and supported under one roof by industry pros. Celebrating 50 years of innovating audio solutions for broadcast, commercial, and live sound excellence, Wheatstone markets products under VoxPro, Wheatstone, and Audioarts Engineering brand names.

Designed and built by

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