



STREAMBLADE & WHEATSTREAM

MULTI-CHANNEL IP STREAMING AND PROCESSING INTERFACES

The screenshot shows the StreamBlade software interface with the following sections:

- MAIN MENU:** Includes a 'Wheatstone STREAMBLADE' logo, a 'CONNECT' button, and a list of audio sources like 'Sports A', 'Country 22', and 'Easy 105'.
- STREAM NAME:** Set to 'Easy 105'.
- DSP PRESET:** Set to 'All Natural w EQ'.
- PARAMETRIC EQ:** A frequency response graph with sliders for various frequencies (34.1 Hz, 98.4 Hz, 426.9 Hz, 1.50K Hz, 1.87K Hz, 10.0K Hz).
- MULTIBAND AGC:** Controls for Speed, Density, and Gate Threshold across multiple bands.
- DUALBAND LIMITER:** Controls for Attack, Release, Threshold, Stereo Width, and Bass Enhance.
- DESTINATIONS:** A table for configuring streaming destinations (HLS, ICECAST, RTMP, RTP) with fields for Name, URL, Mount, User, and Password.
- STATUS:** A log window showing active streams and system events.

The front panel of the Wheatstone BLADE-3 hardware device features:

- A multi-channel LED display showing signal levels for 16 channels.
- Labels for 'IN', 'OUT', 'LINK', 'ROUTE MASTER', 'CLOCK MASTER', and 'ERROR'.
- Logos for 'Wheatstone BLADE-3 NETWORK STREAMING BLADE' and 'The Intelligent Network'.
- A 'NAVIGATE ADJUST ENTER' knob.
- Text at the bottom: 'WHEATNET-IP <-> AUDIO OVER IP NETWORK'.

The front panel of the Wheatstone WHEATSTREAM hardware device features:

- A large, stylized 'W' logo.
- Labels for 'POWER' and '1 2'.
- Text at the bottom: 'WHEATNET-IP <-> AUDIO OVER IP NETWORK'.

STREAMBLADE & WHEATSTREAM

Multichannel IP streaming and processing that sounds amazing



StreamBlade addresses the unique challenges of multiple program streams. It is a 1 RU BLADE unit for streaming applications that features key Wheatstone AoIP, audio processing and codec bandwidth optimization technology.

“Putting all processing and bandwidth optimization functions in one box that talks native IP audio just makes sense for studios today that are managing five, six or more streams,” said Rick Bidlack, Wheatstone systems and lead StreamBlade design engineer.

Unique to StreamBlade is its five-band AGC with RMS density driven time constants for establishing tonal balance and level consistency between incoming music sources. Unlike the conventional approach of applying multiband gain control followed by fast compression to build uniform loudness and density from one music source to the next, this AGC is designed specifically for streaming applications and eliminates aggressive RMS attack times that can interfere with codec performance.

“Fast time constants (compression) can add intermod sidebands around a sustained note or bass note, which the codec has to spend bits on instead of the signals that are actually part of the program. That can be bad for any stream, but it’s especially bad for low bit-rate streams that don’t have a lot of data bits to begin with,” explained Jeff Keith, Senior Product Development Engineer for Wheatstone’s audio processing line.

Also unique to StreamBlade is a two-band final limiter section made for streaming that removes hard limiting or clipping from the processing chain. “Clipping creates harmonics that the

encoder wants to throw bits at, and much of that isn’t particularly pleasant to the ear,” added Keith.

Also onboard is a stereo width management section that produces a perceived stereo field yet eliminates the big swings in dynamic L-R that can skew the codec algorithm as well as bass boost and monaural bass features for optimizing the quality of the bit stream.

A selectable six-band parametric equalizer with peak and shelf functions, high and low pass filtering for removing noise or hum, and two-stage phase rotator to correct voice asymmetry are also included in StreamBlade.

StreamBlade can be configured and managed from a laptop and web browser using WheatNet-IP NAVIGATOR software. It has two Ethernet ports, one for direct connectivity into the WheatNet-IP audio network on one end and another for connectivity into a WAN for streaming to a CDN or other service provider.

WHEATSTREAM

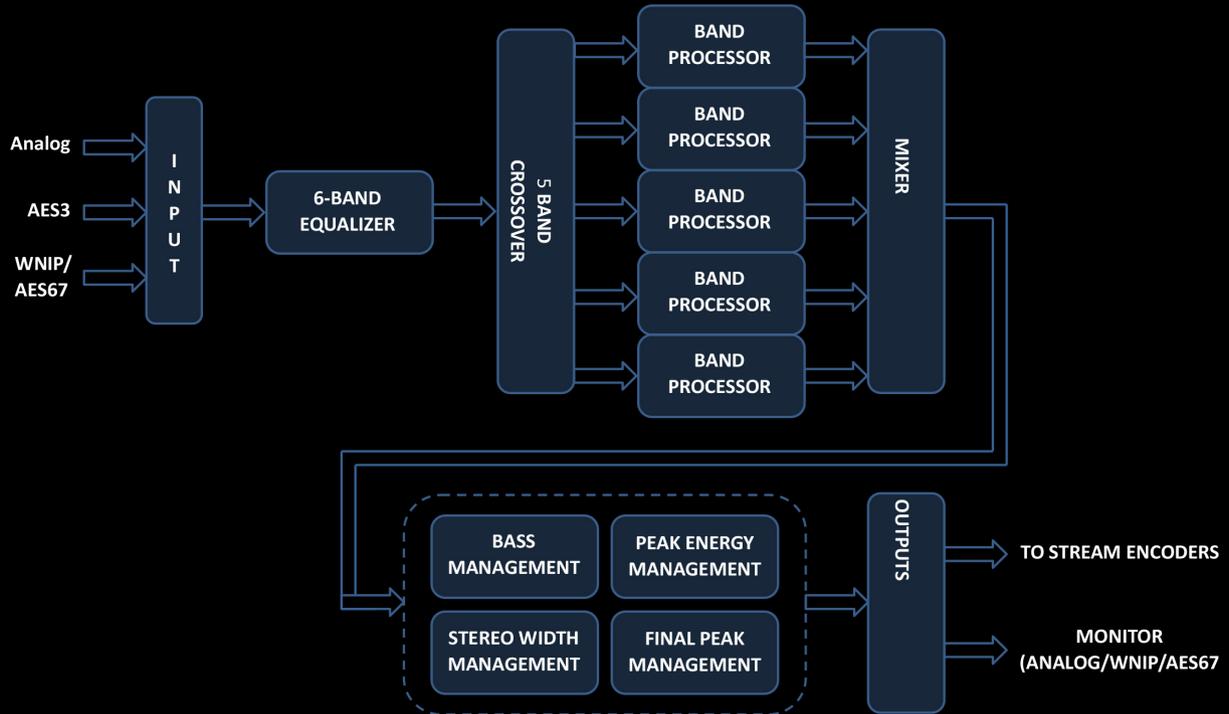
Need the power of Streamblade, but not the rest of the marvelous functions of a Blade? Wheatstream is just what you’re after. It too is a single rack space device that has the streaming and processing functionality of Streamblade, but without all of the usual Blade functions and I/O, for a lower cost. Wheatstream features WheatNet-IP and AES67 input (via IP).



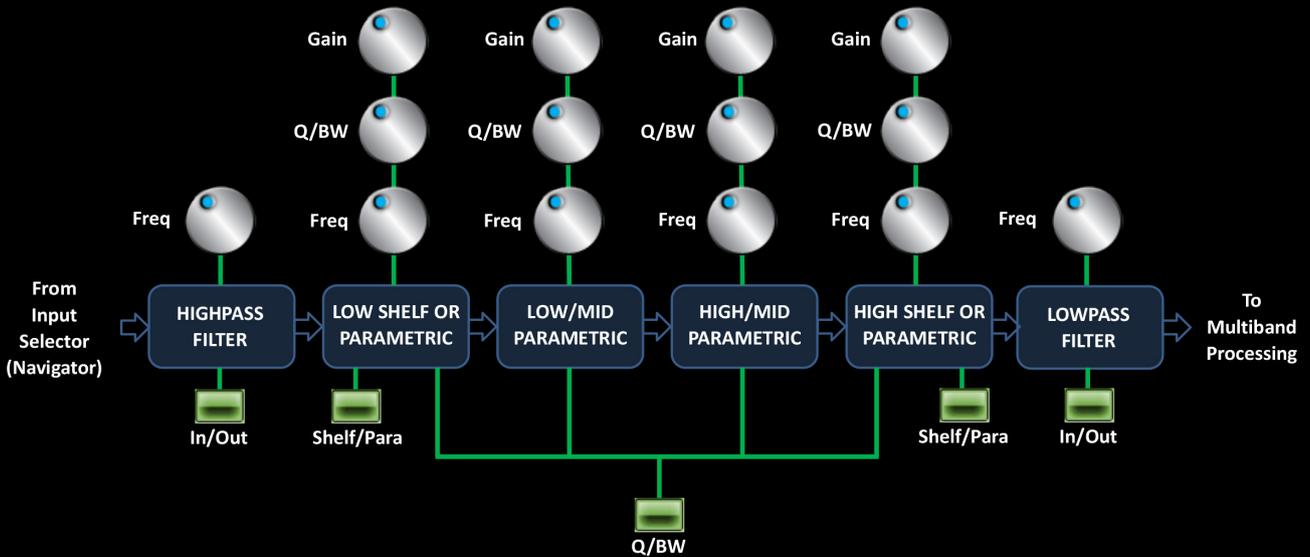
- Selectable AAC, Opus, and MP3 encoders targeting high to low bit rates for reaching a broad range of end user devices and players.
- Accepts eight input streams of native WheatNet-IP audio directly from a soundcard or AoIP driver as well as RTP sources, each capable of four outputs for a total of 32 total output streams.
- Five-band intelligent AGC, dual-band limiter and other audio processing designed to optimize the performance of encoded audio content.
- Cloud-ready and compatible with standard CDN and streaming platforms. Supports HLS, Icecast, RTMP, and RTP streaming protocols.
- Lua transformation filters adapt metadata input from any automation system into any required output format for transmission to the CDN server.
- Local I/O connectivity for other than WheatNet-IP audio network applications.
- Streamblade: WheatNet-IP, Analog, AES3 and AES67 inputs
- Wheatstream: WheatNet-IP and AES67 input (via IP)
- Nielsen encoder optionally available. The PPM watermark is inserted after the dual-band limiter to avoid interference with codec performance
- BS.1770-compliant loudness control manages loudness between -24 and -10 LUFS
- Wheatstone's streaming appliances and Layers cloud streaming software are now available with Triton Digital's streaming protocol.



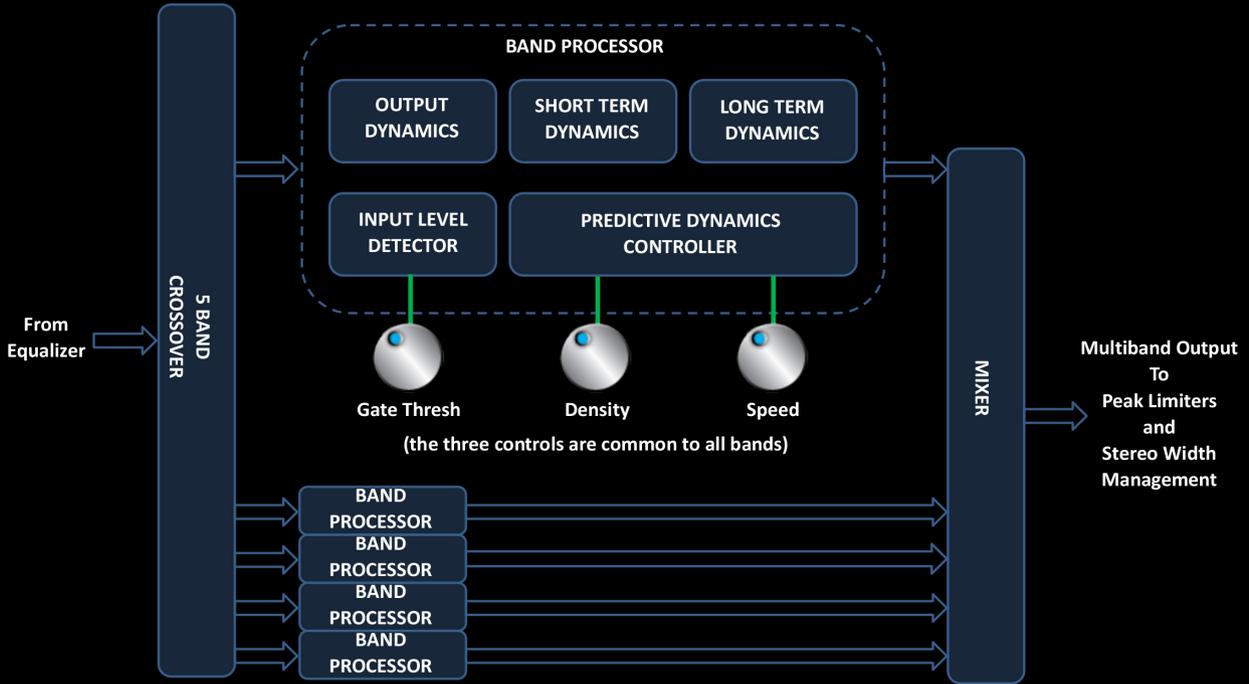
Streamblade Audio Processing Overall Signal Flow



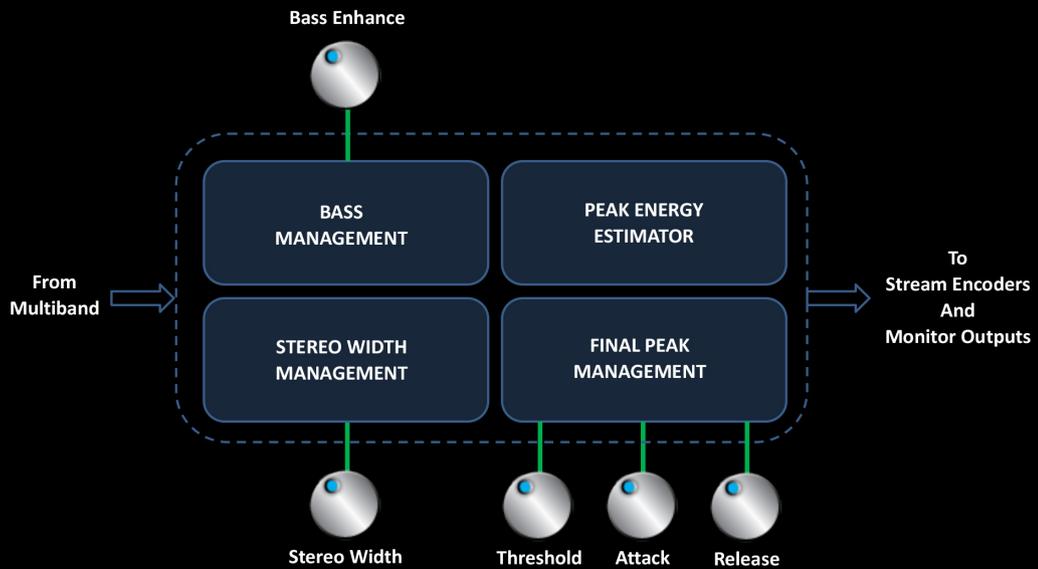
Streamblade Audio Processing Six Band Equalizer



Streamblade Audio Processing Multiband Processing



Streamblade Audio Processing Final Limiting





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