

....An Audio Processor Incorporating the latest in
Sound Perception and Audio Analysis AI



Perceptual SoundMax™
Model Q24 - 1111 Plus

*24-band FM Audio Broadcast Processor with Internet Streaming
now with
SpatialMax Immersive Audio*



Perceptual SoundMax™

Lively, Crispy, Clear and Loud Sound:

Craft a breathtakingly detailed, consistent, and balanced sound for your FM and Digital Broadcasts using Perceptual SoundMax™ 24 Band Audio Processor developed by ATC Labs. This product brings out novel innovations in audio processing & AI/ML based sound-quality enhancements. It is specifically designed for Professional Broadcasters by a team of some of the world's leading audio and speech scientists (former Bell Labs alumni) specializing in audio signal modeling & AI based analysis, psychoacoustics, and signal processing.

Perceptual SoundMax™ is actually a many-in-one audio processing platform featuring unmatched 24 - band dynamics processing along with independent processing of Digital channels, noise reduction, and Internet Streaming. The product comes ready with highest quality HE-AAC V1/V2 encoding and HLS encapsulation for internet streaming and links seamlessly with many distribution servers.

Audio Processing Tools Powered by Latest Research in Sound Perception:

- ❖ **Multi-band (24-band) high-resolution Dynamic Range Compression (DRC)** detailed time-frequency sound analysis.
- ❖ **Intelligent Loudness Control (ILC):** Intelligent Loudness Control algorithm with enhanced subjective loudness models.
- ❖ **Vocal Enhancement (VE):** Vocal, and dialog enhancement.
- ❖ **Bass Enhancement:** Tunable bass boost module with 2-independent stages.
- ❖ **High Frequency enhancement and Stereo Enhancement.**
- ❖ **High Quality Noise Reduction:** Adaptive Wide Band Noise Removal (AWNR) that does not distort the audio.
- ❖ **Final Look Ahead Limiting** A sophisticated final SmoothClip look-ahead limiting algorithm ensures distortion free look ahead limiting.

Features Optimized for FM Broadcasts:

- ❖ Composite FM/MPX signal Generation with accurate 75 micro-sec or 50 micro-sec pre-emphasis and accurate peak limiting for maximizing *modulate index* of FM broadcasts
- ❖ In box RDS/RBDS Encoder

Audio Encoding Powered by Latest Research in Sound Perception:

- ❖ Industry standard HE-AAC/AAC-LC encoder enhanced by advanced ATC Labs Psychoacoustic Models. Supports 32 kbps - 256 kbps encoding and HLS encapsulation for streaming.
- ❖ Inbuild distribution server supports HTTP Pull/Push/Post, UDP/TCP/Multicast/ Icecast

Full Remote Control Through Networked PC Interface:

Allow for remote control of the processor using **SoundMax™ Manager** running on any PC present on the same Ethernet which automatically senses all available SoundMax hardware. Remote control features include:

- ❖ Tuning of profiles: basic/advanced tuning
- ❖ Profile exports/import
- ❖ Configuration of Internet streaming parameters



TECHNICAL SPECIFICATIONS

Model : Perceptual SoundMax Q24-1111 Plus **24 Band Audio Processing for Audio Quality Optimization**

Analog Audio Input:

Configuration: Left and Right/Stereo
Maximum Input Level/Impedance: +24dBu/ >10kΩ
Nominal Input Level: Adjustable -10.0 to +12.0 dBu
A/D Converter Resolution: 24-bit
EMI Suppressed: Yes
Connectors: Balanced XLR Female

Analog Audio Output:

Configuration: Left and Right /Stereo
Output Level: Adjustable -6.0 to +20 dBu
SNR: ≥ 90 dB (20 Hz to 20 kHz)
Crosstalk: ≤ -90 dB (20 Hz to 20 kHz)
Distortion: THD ≤ 0.01% (20 Hz to 20 kHz)
D/A Converter Resolution: 24-bit
EMI Suppressed: Yes
Connectors: Balanced XLR Male

Digital Audio Input (AES/EBU):

Configuration: Stereo
Sampling Rate: 32, 44.1 or 48 kHz (Auto Sense)
Word Length: 16 bit or 24 bit
Input Reference Level: -25.0 to 0 dBFS
Connector: AES- XLR Female

Digital Audio Output (AES/EBU):

Configuration: Stereo Outputs with Software Level Control
Output Level: -20.0 to 0 dBFS
Sampling Rate Output: 32, 44.1, 48 kHz (stereo)
Connectors: AES - XLR Male

Composite Baseband Output:

Configuration: Two Outputs with Individual software level Control
Maximum Output Level (unbalanced): +12dBu
D/A Conversion: 24 Bits
Signal to Noise Ratio: ≥ 90 dB (20Hz-15kHz)
THD : ≤ 0.01% (20 Hz to 15 kHz)
Stereo Separation: ≥ 60 dB (20 Hz to 15 kHz)
Cross Talk: ≤ 90 dB, channel to channel
38 kHz Suppression: > 90 dB
Pilot Protection: 65 dB relative to 9% injection, +/- 500 Hz
57 kHz (RDS) Protection: >60 dB relative to 4% injection, +/- 2 kHz
Connectors: Coaxial BNC, EMI-Suppressed

Streaming Audio Output:

Configuration: 1 Internet stream out.
Encoding Format: Enhanced AAC+ with ADTS encapsulation
Bit Rates: 32 kbps – 256 kbps
Player Compatibility: VLC, Windows Media, Real Player
Browser Compatibility: IE, Chrome, Safari, Mozilla
Protocols: Unicast, Multicast, TCP, UDP
Distribution Servers: Icecast, Shoutcast

USB Connection:

Connector: 1 USB 2.0 (EMI-Suppressed)

Management Control:

Powerful SoundMax Manager Software on any networked PC for auto sense monitoring configuration and control.

Ethernet & Remote PC Control:

Configuration: Auto Presence Broadcast on Ethernet
Connectors: RJ-45, EMI-Suppressed

Dimensions:

Width: 19"
Height: 1.75"
Depth: 20"

Power

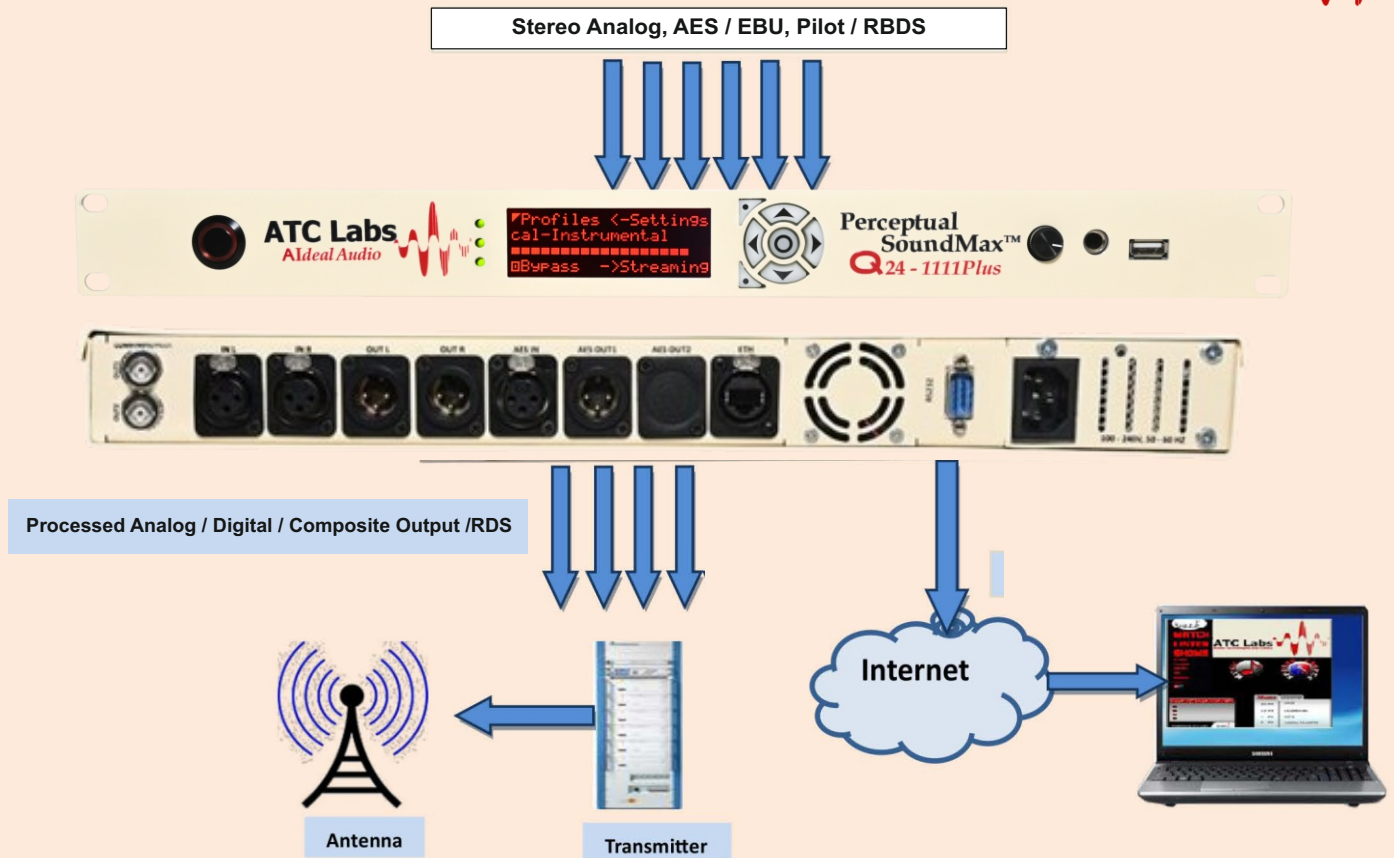
Power Requirements: 105-260 V AC Single Phase, 45-60 Hz
Connector: IEC, EMI Suppressed, Detachable 3-wire chord with earthing.
Safety Standards: UL, CE

Weight: About 5.5 Kg

Working Altitude: 3000 meter AMSL

Operating Temperature range: 0° to 50° C

Relative Humidity: 95%



Perceptual SoundMax™ Advantage:

- ❖ **Enhanced Consistent Loudness:** 24 Band Audio Processing allows packing in much higher audio density as compared to 5/6 band processing; thus significantly boosting the overall Sound consistency which results in much higher average modulation and enhanced coverage.
- ❖ **Crisp & Clear Sound:** State of art signal processing ensures that the processing output is free of any phase distortions and doesn't sound over-processed. Thus, it enhances clarity in addition to loudness and presence.
- ❖ **Lively Broadcasts:** Vocal Enhancement, Stereo Image Enhancement, Bass Enhancement, and available Sweetening tools make the sound livelier and pleasing to listen to.
- ❖ **Embedded Deep Audio AI Technology:** Incorporates novel optimized AI/ML based Audio classifiers and analysis. This Patent pending Real-Time Multi-Class Hierarchical Audio Classification Deep ML model accurately Classifies signal into Noise, Speech, Instrumental Music, Vocal Music, genres with high accuracy and high resolution. Useful in adaptively changing processing parameters for best quality.

After Sales & Service support :

ATC Labs provides to its customer the unique benefits of 24x7 After Sales & Service support through its team of experts. As such you don't have to wait long for attending to any complaints/Faults/repairs. Also, the Software Upgrades are incorporated regularly by ATC Labs (being the OEM) as part of the after sales support.

For After Sales Support you can reach us at <support@atc-labs.com>

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