

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



**Perceptual SoundMax™
Model Q24 - 6111
and the new
Model Q24 - 6111HD**

**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
- ❖ Digital Composite MPX available at 192 kHz
- ❖ In box RDB/RBDS Encoder

New Processing Paths for multi-channel HD/Digital broadcasts (Model Q24-6111HD):

- ❖ Digital Out 2 with accurate & independent diversity delay and level control.
- ❖ Aux1/Aux2 Independent processing paths with Digital I/O for HD2/HD3 channels.

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

Nielsen™ Watermarking Support In-Box

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 - 6111/6111HD

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

Dual Digital Audio Output (AES/EBU):

Configuration: Two Stereo Outputs with Individual Software Level and Delay Control on the 2nd Output (Use first as MAIN/MPX and second as HD1 Output)
Output Level: -20.0 to 0 dBFS
Delay (2nd Output): 0-8 sec in steps of 100 msec
Sampling Rate Output 1 (MAIN/MPX): 32, 44.1, 48 kHz (stereo) OR 192 kHz (Digital MPX)
Sampling Rate Output 2 (HD1): 32, 44.1, 48 kHz (stereo)
Connectors: AES – XLR Male

Audio Over IP Input:

Configuration: Stereo, Livewire, Ravenna, Wheatnet, Input, supports AES67 standard.
Connectors: RJ-45, EMI-Suppressed

AUX1/AUX2 Digital Audio Input/Output:

Configuration: 2 pairs of digital input/outputs for HD2/HD3 processing
AUX1/AUX2 Inputs: XLR-Female connectors for AES digital input with auto sensed sample rate (44.1/48 kHz allowed)
AUX1/AUX2 Outputs: XLR-Male connectors for AES digital outputs, sample-rate follows AUX1 and AUX2 inputs respectively.

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 output

Encapsulation Format: ADTS

Streams: .aac, .mp3, .m3u8 (HLS with 2-rate chunks)

Streaming Media Formats: HLS, Icecast

Distribution Servers: HLS, In-built HTTP/HLS, Icecast

Distribution Modes: push (TCP/UDP/FTP), post/pull (HTTP)

Player Compatibility: iPhone / Android, VLC, WMP

Browser Compatibility: Edge, Chrome, Safari, Mozilla

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: 2U (3.5")

Depth: 16.9"

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

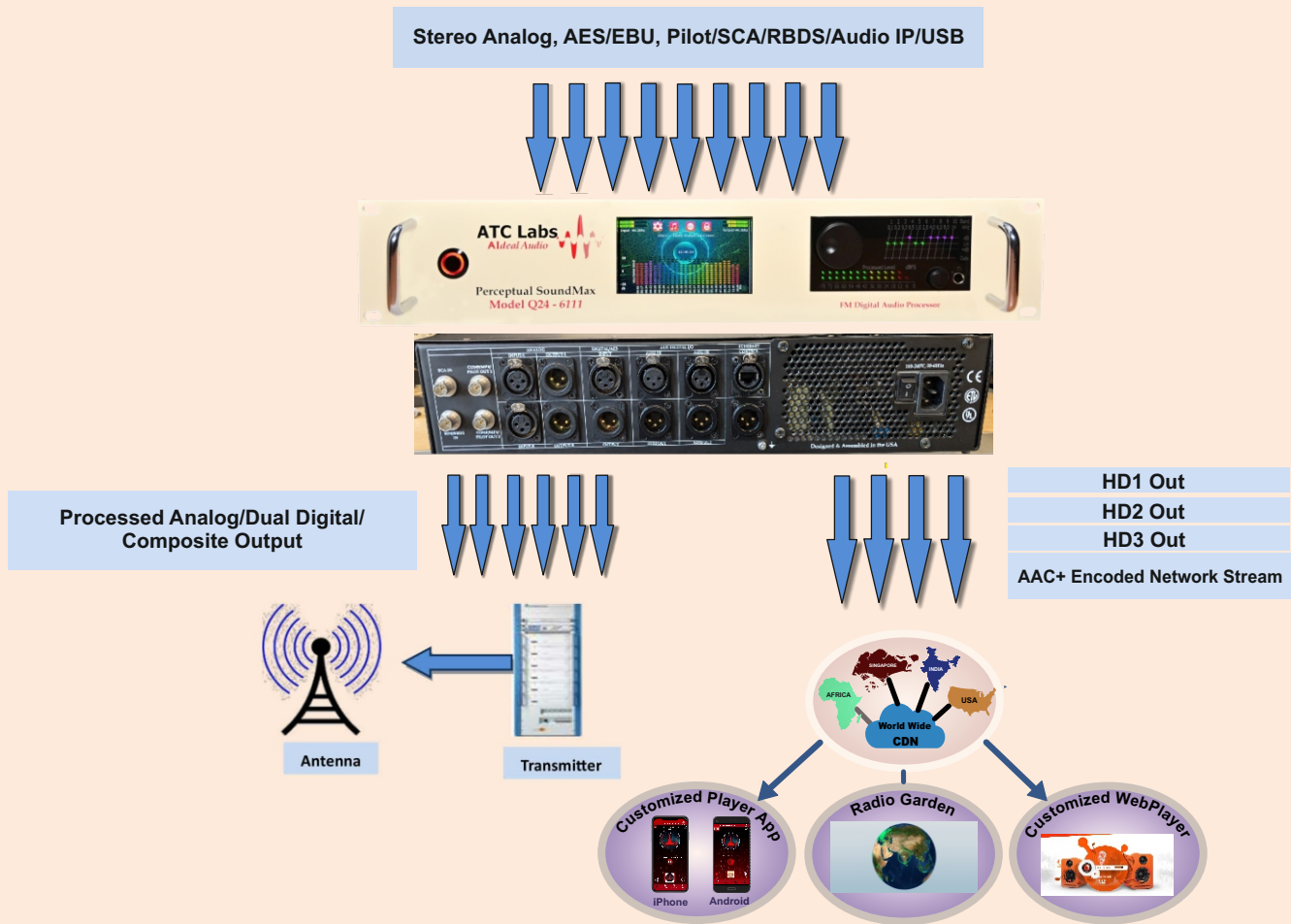
Weight: About 5.5 Kg

Working Altitude: 3000 meter AMSL

Operating Temperature range: 0° to 50° C

Relative Humidity: 95%

Note: Due to constant upgradation the above specifications are subject to change without intimation.



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>](mailto:support@atc-labs.com)

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