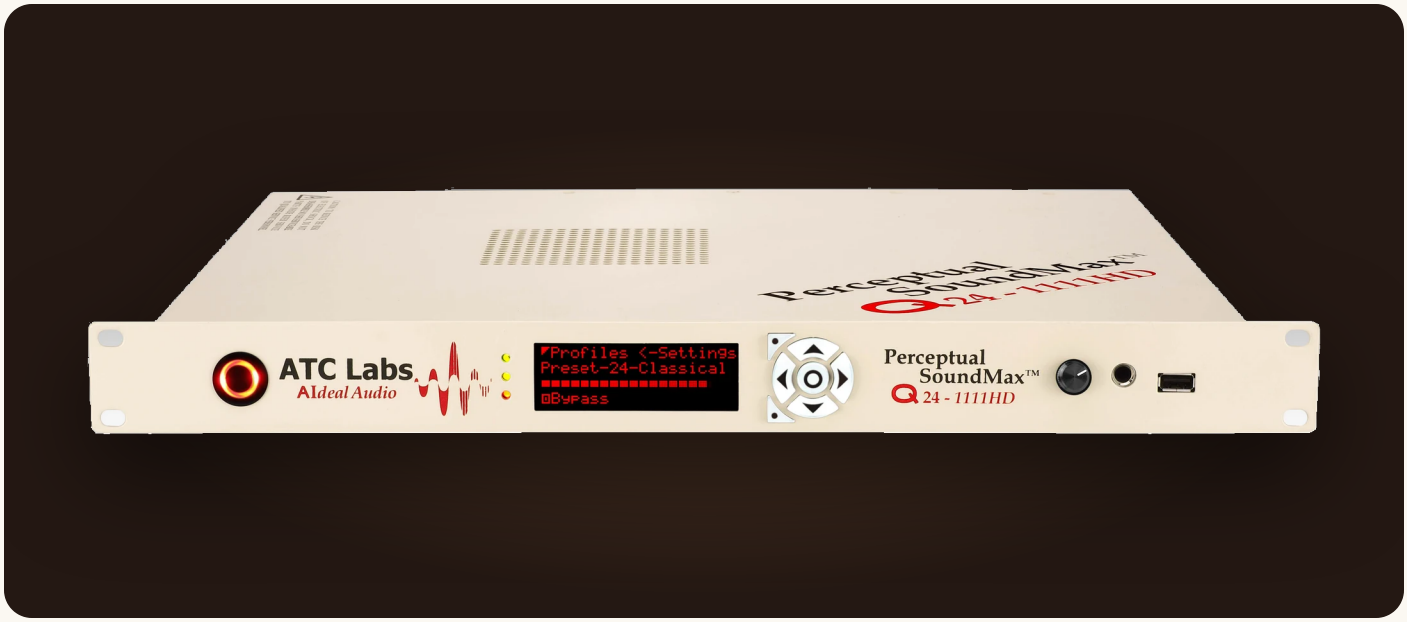
PERCEPTUAL SOUNDMAX™

Q24-1111HD

FM and HD Radio or DRM *in one rack unit.*

Your Station Shines with Its Own Signature SoundMax Sound.



24-band
Signature SoundMax audio processing

1U
FM or AM plus HD1 or DRM — composite MPX and a built-in RDS encoder

UP TO 12 s
diversity delay, accurate to ±2 samples

1
StreamMax™ stream

AIDEAL AUDIO™ PROCESSING

The Signature SoundMax sound — *with AI at its side.*

01
Enhanced consistent loudness
24-band processing packs far more audio density than 5- or 6-band processors — higher average modulation and wider coverage.

02
Crisp & clear sound
Free of phase distortion and never over-processed: clarity, loudness and presence together.

03
Lively broadcasts
Vocal, stereo-image and bass enhancement, and the sweetening tools, make the sound livelier and pleasing.

04
Embedded deep audio AI
Patent-pending real-time multi-class classification — noise, speech, music, genre — adapts the processing.

The 24-band high-resolution core
Linear-phase processing in 24 psychoacoustically tailored bands; compression, limiting, expansion and gating in a single stage.

Aided by AI
Deep-learning models read noise profile, content, mood and genre, and adapt the processing — true to your profile.

Dynamic Listening Fatigue Reduction
Unique to SoundMax: conditions the audio envelope in six bands to minimise listener fatigue.

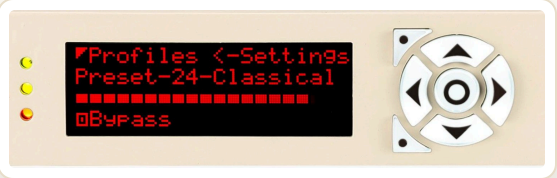
Intelligent Loudness Control
Steady, filling and consistent loudness, held at your target on every programme.

SmoothClip™ look-ahead limiting
Loud, clean peaks, with the final level set for your transmitter or your codec.

Noise reduction & SpatialMax™
Wideband noise removal, noise gating across the 24 bands, and SpatialMax™ to widen the sound stage.

Bass, vocal & stereo enhancement
Two stages of bass enhancement, harmonic vocal enhancement, high-frequency and stereo processing.

18 genre presets + custom profiles
Refine any preset with 1000+ parameters and save unlimited custom profiles.



The front-panel display and keypad: pick a profile — auditioned live as you scroll — switch bypass, and set levels, the HD1 trim, composite and RDS. A headphone jack has its own level knob.

1000+ parameters, tuned from your desk.
Basic and Advanced tuning in SoundMaxManager™ — per-band thresholds, attack and release, compression, expansion and the 24-band graphic EQ — for the main path and the stream.

THREE IN ONE

Three broadcast technologies, *one 1U box.*

24-band multiband processing
Optimised for FM, AM and a digital-radio channel, with psychoacoustic modelling, AI-based analysis and harmonic analysis.

StreamMax™ streaming simulcast
A full stream encoder with multi-rate HLS, a distribution server and CDN push or pull.

Audio sweetening suite
DLFR, wideband noise reduction, SpatialMax™, vocal and bass enhancement and a 24-band graphic EQ.

ON AIR AND ONLINE

HD1 + diversity delay

- OUT2/HD1: HD Radio HD1 or DRM service A, on AES/EBU
- Its own trim, 0 to –90 dBFS, for the exporter's level
- Diversity delay up to 12 s, MAIN against HD1, ±2 samples
- Set in s, ms and µs, then trimmed by up to ±10 samples
- Without HD Radio: a second main AES output

FM composite + RDS

- 2 × composite / MPX outputs (BNC), ITU-R BS 412, individual level up to +12 dBu
- Either output composite or MPX; one can carry a 19 kHz pilot
- Built-in RDS encoder: PI, PS (static or dynamic), RadioText, AF
- Now-playing from automation, over TCP or UDP
- Pilot 6–12 %; pre-emphasis 50 or 75 µs

Nielsen™ watermarking

- CBET watermarking encoder, in the box
- Station SID and check digits, as issued by Nielsen
- Time-code insertion; radio mode set for your region
- Prior-watermark detection, with overwrite
- EAS handling; no external encoder in the chain

StreamMax™ simulcast

- **One stream** of the main programme, on a processing path of its own
- AAC, HE-AAC v1/v2 at 24–384 kbps; MP3 at 32–320 kbps
- Two-bitrate adaptive HLS, 3–10 s chunks
- CDN push incl. Amazon S3 (AWS SigV4); Icecast — yours or ATC's
- Built-in HTTP server; UDP unicast / multicast

Every input and output, *on one 1U panel.*

ANALOG
XLR in and out, balanced

AES/EBU
Input 32 / 44.1 / 48 kHz auto-sense · output 1 · OUT2/HD1

FM COMPOSITE
2 × BNC out, composite or MPX, with the built-in RDS

NETWORK
AOIP: AES67 in and out · CTRL/STREAM: SoundMaxManager™, SNMP, stream

OTHER
Front: display, keypad, headphones, USB 2.0 · GPIO (optional)

IN
Analog XLR, AES/EBU or AES67 — with automatic failsafe to a secondary input.

→

PROCESS
24 bands of Aideal Audio™ for the air chain, and a profile of its own for the stream.

→

ALIGN
Diversity delay holds MAIN against HD1 for a seamless analog–digital blend.

→

OUT
Composite with RDS, analog and AES, HD1, AES67 and the stream — all at once, Nielsen™ in the box.

SoundMaxManager™

One PC controls every SoundMax on the network — and the front panel does the essentials on the unit itself.

- Finds SoundMax units on the network automatically; SNMP compliant
- Profiles, Basic and Advanced tuning — export and import between units
- Streaming set-up, AES67 in and out, and the diversity delay
- RDS encoder, the automation feed, and the Nielsen™ settings
- Monitoring with VU meters; firmware and configuration over the network

Also available: Q24-6111HD — three digital services (MAIN/HD1, HD2, HD3), three streams and a touchscreen, in 2U.

Q24-1111HD Technical specifications

24 Band Audio Processing for Audio Quality Optimization

ANALOG AUDIO INPUT

Configuration	Left and Right / Stereo
Maximum Input Level / Impedance	+27 dBu / >10 kΩ
Nominal Input Level	Adjustable –10.0 to +13.0 dBu
A/D Converter Resolution	24-bit
EMI Suppressed	Yes
Connectors	Balanced XLR Female

ANALOG AUDIO OUTPUT

Configuration	Left and Right / Stereo, flat or pre-emphasised (50 µs or 75 µs)
Output Level	Adjustable –6.0 to +24 dBu
Frequency Response	±0.3 dB (20 Hz – 20 kHz)
SNR	≥ 90 dB (20 Hz – 20 kHz), unweighted
Crosstalk	≤ –90 dB (20 Hz – 20 kHz)
Distortion	THD+N ≤ 0.01% (20 Hz – 20 kHz)
D/A Converter Resolution	24-bit
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, 110 Ω

AUDIO OVER IP INPUT/OUTPUT

Configuration	Stereo in and out, AES67 standard
Format	L16 or L24, 44.1 or 48 kHz, stereo or mono
Packet Time (output)	0.125, 0.333, 1 or 4 ms
Clock	PTPv2 (IEEE 1588-2008)
Connector	Dedicated RJ-45 (AOIP), EMI-Suppressed

DUAL DIGITAL AUDIO OUTPUTS (AES/EBU)

Configuration	Two stereo outputs with individual software level control
Output 1	MAIN
Output 2	HD1 or DRM Service A — or a second MAIN output
Diversity Delay	Up to 12 s on MAIN w.r.t. HD1, accurate to ±2 samples
Output Levels	–20.0 to 0 dBFS; HD1 trim 0 to –90 dBFS
Sampling Rate	32, 44.1, 48 kHz (user selectable)
Frequency Response	±0.3 dB (5 Hz – 20 kHz)
Connectors	AES – XLR Male

AUTOMATIC FAILSAFE

Input Switching	Primary to secondary input on failure — analog, digital or audio over IP (user selectable)

COMPOSITE BASEBAND OUTPUT

Configuration	Two outputs, individual software level, ITU-R BS 412
Output Type	Composite or MPX; 19 kHz pilot on one output
Output Level	–12 to +12 dBu (+12 dBu max)
D/A Conversion	24 Bits
Signal to Noise Ratio	≥ 90 dB (20 Hz – 15 kHz)
THD	≤ 0.02% (20 Hz – 15 kHz)
Stereo Separation	≥ 60 dB (20 Hz – 15 kHz)
Cross Talk	≤ –90 dB, channel to channel
38 kHz Suppression	≥ 90 dB
Pilot	19 kHz ±1 Hz, level 6% to 12%
Pilot Protection	65 dB relative to 9% injection, ±500 Hz
57 kHz (RDS) Protection	> 60 dB relative to 4% injection, ±2 kHz
RDS Encoder	In box — PI, PS, RT, AF; data over TCP/UDP
Connectors	Two coaxial BNC, EMI-Suppressed

DIMENSIONS

Width / Height / Depth	19″ · 1U (1.75″) · 15.2″ (385 mm)

STREAMING AUDIO OUTPUT

Configuration	1 × Internet stream out for MAIN, on its own processing path
Encoding Formats	Enhanced AAC profiles: LC, HE-v1, HE-v2; MP3
Encapsulation Format	ADTS or MPEG2-TS for AAC; MP3 or MPEG2-TS for MP3
Bitrates	24–384 kbps for AAC; 32–320 kbps for MP3
HLS Generation	Up to 2 bitrates for adaptive HLS; chunking 3–10 s
Distributions	CDN primary/secondary push (incl. Amazon S3, AWS SigV4) · Icecast — your own or ATC Labs' servers · in-built HTTP server · UDP unicast/multicast
Player Compatibility	iOS / Android, VLC
Browser Compatibility	Edge, Chrome, Safari, Firefox

ETHERNET & REMOTE PC MANAGEMENT CONTROL

Configuration	Auto Presence Broadcast on Ethernet
Management	SoundMaxManager™ on any networked PC — monitoring, configuration & control; SNMP compliant
Connector	CTRL/STREAM RJ-45, EMI-Suppressed
Front Panel	Display, 5-way keypad, headphone jack, USB 2.0
GPIO (optional)	8 in / 2 out, opto-isolated, DB-25

POWER

Power Requirements	100–240 V AC, 50–60 Hz
Connector	IEC, EMI Suppressed, detachable 3-wire cord with earthing
Safety Standards	ETL listed to UL standards, CE

ENVIRONMENT

Weight	About 5.5 kg
Working Altitude	3000 m ASL
Operating Temperature	0° to 50° C
Relative Humidity	95%, non-condensing

Specifications are subject to change without notice, as the product is continually improved.

AFTER-SALES & SERVICE

Engineered with premium components for 24/7 continuous operation. ATC Labs provides 24×7 after-sales and service support from its own team, with software upgrades as part of that support.

ABOUT ATC LABS

Founded by former Bell Labs researchers, ATC Labs brings decades of signal-processing and acoustics expertise to broadcasting — its technology serves over 20 million listeners through FM, satellite and internet radio worldwide.

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