

OMNIA.7

CAPTIVATING CLARITY FOR FM BROADCASTS.
SIMULTANEOUS STREAMING PROCESSING/ENCODING.
PREMIUM PERFORMANCE, PRICED RIGHT.



OVERVIEW

Up to now, there have been two choices when it comes to audio processing: all the features and advanced audio-shaping tools (with a five-figure price tag), or gear that fit your budget — but made you compromise on performance and capabilities.

No more compromises: meet Omnia.7, the premium, feature-rich FM audio processor that's surprisingly affordable. But low price doesn't mean low performance: Omnia.7 delivers the powerful, clear and precise Omnia signature sound that's the first choice of top stations worldwide.

Omnia.7 comes with a host of standard features:

- ▶ "Undo", exclusive Omnia technology that removes distortion and mathematically re-creates the peaks sliced from today's poorly mastered contemporary music. Undo restores life, brilliance and dynamic range to any type of music.
- ▶ Exclusive Psychoacoustic Controlled Distortion Masking Clipper analyzes and masks distortion perceptible to the human ear, leaving only clean, clear audio.
- ▶ A complete toolbox of sophisticated Omnia sound-shaping technology gives you the power to analyze and refine your signature sound using a variety of sonic tools ranging from Real-Time Analyzers to Oscilloscopes, FFT's and more.

Optional HD, RDS, and simultaneous Internet streaming / encoding options are also available, putting Omnia.7 head-and-shoulders above any other comparably priced audio processor in features, performance and value.

FEATURES

- The Omnia exclusive 'Undo' technology.
- Psychoacoustically Controlled Distortion Masking FM clipper.
- Two-band final look-ahead limiter for HD Radio and Streaming.
- Full Omnia Toolbox, with a digital oscilloscope, an FFT spectrum analyzer, and real time analyzer (RTA).
- Remote Client software allows full remote control of the processor and all metering tools from any Windows-based PC or tablet on the local network — including touch-screen devices.
- Wet Voice Detector detects speech even on top of music for clearest possible voice quality.
- Built-in Speaker Calibration tool.
- Multiband downward expansion (source noise reduction).
- 3-stage wideband AGC with adjustable sidechain equalization.
- Program-dependent two-to-five-band multiband AGCs and limiters.
- 4.3 inch/10.9 cm front panel screen.
- Full remote control with audio monitoring.
- HTTP push support for automation such as dynamic RDS and streaming song titles, with preset recall.
- Dual independent power supplies.
- Composite pass-through (relay bypass) for your backup processor.

OPTIONAL FEATURES

- Simultaneous streaming processing/encoding.
- Simultaneous processing for HD Radio / DAB.
- RDS encoding.

IN DEPTH

"Undo"

An FM processor, by its very nature, compresses dynamic range and employs some form of clipping to deliver a "signature sound" and a competitively loud signal. Clean, well-recorded audio has always been able to withstand greater degrees of processing; this was true decades ago and it's more relevant than ever today. Unfortunately, recordings made in the past two decades have declined in terms of quality, as mastering engineers wage their very own "loudness wars". (Rip a track from the modern CD of your choice and look at the waveform in your favorite editor if you need proof!)

The result is source material that is hyper-compressed from the studio, with only a dB or two of dynamic range at most. As if that weren't bad enough, the music is run through unsophisticated, brute-force clippers to make them louder still. Before it even gets touched by the compressors, limiters, and clippers in the processor itself, it has been damaged.

By repairing the damaged audio before processing, "Undo" gives Omnia.7 cleaner and more dynamic audio to work with. The first step of Undo is the de-clipper, which examines and mathematically re-creates audio peaks that were flattened during mastering. The second step, a multi-band expander, increases dynamic range. The result: clean, dynamic, enjoyable sound. In fact, audio processed by Omnia.7 for FM often sounds far better than the original CD!

Psychoacoustically Controlled Distortion-Masking Clipper

Clipping is typically the final stage of an FM processing chain, usually done in the final L/R audio, with additional clipping optionally available in the composite signal. The final clipper is also where the classic (and oft dreaded) "loud versus clean" tradeoff is made. When more clipping is used to gain loudness on the dial, clipper distortion becomes more and more pronounced. The clipped peaks fall back into the audio and manifest themselves as audible distortion.

How to solve this problem? You could back down the clipper drive to clean up the sound — but you lose loudness. You could dial up the compressors and limiters that precede the clipper — but that results in busy, dense sound that leads to listener fatigue.

Omnia.7 eliminates clipper distortion with a sophisticated, proprietary psychoacoustic-controlled algorithm in the composite signal. This masks the distortion, effectively eliminating it from the listener's perception. This process is so effective that it imparts an additional 3dB of high-frequency headroom, and is capable of 140% L/R modulation within 100% total modulation.

To put it plainly: Omnia.7 sounds significantly cleaner than other processors at a given loudness level — and substantially louder at any given level of quality. It comes closer to eliminating the “loud / clean” compromise than any other processor on the market today.

Omnia Toolbox

While audio processing is largely a “hearing” process, there is still much to be learned by *seeing* what your adjustments are doing to your sound as well. Some stations still have an oscilloscope on the test bench or a spectrum analyzer at the transmitter, but it's not always convenient (or possible) to hook up a processor to them while it's on the air.

With Omnia.7, there's no extra test equipment to buy ('scopes and analyzers aren't cheap) and no cables to hook up. You also have the built-in capability to visually monitor the signal at the input, the output, and dozens of in-between points throughout the processing path so you can tell what's happening to your audio every step of the way.

Speaker Calibration

If you make decisions about your processing on uncalibrated monitors, your choices are colored by the audio characteristics of the speaker itself — not to mention those of your listening room.

The pink noise generator and RTA built into Omnia.7, used with an inexpensive calibrated microphone, makes it possible to calibrate any speaker system to deliver as flat a response as the speakers will allow. (Small speakers still won't reproduce low frequencies well; the laws of physics still apply!) With speaker and room influences removed from the equation, you are free to adjust your audio based only upon “the facts.”

“But,” you say, “listeners aren't hearing my station on calibrated speakers! They're listening in their cars, at their computer, and through cheap ear buds, so I should too.” It's true - that's exactly how your listeners hear your station, and why listening on a variety of radios, in many different environments, is a good idea. But adjusting your processing this way invariably results in frustration and lousy audio.

Here's why: You listen first in a compact car with typical factory stereo. You don't hear much bass, so you adjust your processing to deliver more low end. Then, you move to a luxury car with 10 speakers and a subwoofer, and the bass is muddy, boomy, and overwhelming. Why? Because you adjusted the processing to make up for its perceived deficiencies, when the real deficiency was in your speakers!

Having at least one pair of high quality, calibrated speakers as your reference will dramatically improve your on-air sound, save you valuable time — and help preserve your sanity, too!

Wet Voice Detector

The human voice can present a real challenge to FM processors. Even Omnia.7's psychoacoustically-controlled distortion-masking clipper, which dramatically minimizes the dreaded “clean / loud” tradeoff, can reveal some distortion on voices when overall loudness is the goal.

To ensure clean voice quality in these situations, the Wet Voice Detector listens for speech, then automatically and inaudibly adjusts the compressor and limiter sections, reducing the amount of overall clipping needed to maintain the same level of loudness.

Remote Client

Remote control is a must — especially when your processor is miles (and often mountains) away from the studio. Omnia.7 takes remote control to a new high, with a high-performance Web interface that eliminates interface lag. And, if you have multiple Omnia.7 processors, its single connection window enables you to manage multiple remotes simultaneously.

Provided your network has sufficient bandwidth, you can even stream audio from various patch points within the processing chain back to your computer, so you can hear the effect of your adjustments in the quiet of your office — not inside a noisy transmitter building.

SPECIFICATIONS

FREQUENCY RESPONSE

- +/-0.5dB 20Hz to 15kHz, 16.5kHz in extended mode.

SIGNAL TO NOISE RATIO

- Greater than -80dBu de-emphasized, 20Hz to 15kHz.

SYSTEM DISTORTION

- Less than 0.01% THD below pre-emphasis, inaudible above.

STEREO SEPARATION

- 65dB minimum, 20Hz to 15kHz, 70dB typical.

DIGITAL OUTPUT LEVEL

- Adjustable from -24.0dBFS to 0.0dBFS in 0.1dB increments.

STEREO BASEBAND OUTPUT

- Adjustable from -2dBu to +22dBu (0.1dB increments) into 600-Ohms, 20-Ohm output impedance.

A/D CONVERSION

- Crystal Semiconductor CS5361, 24 bit 128x over-sampled delta sigma converter with linear-phase anti-aliasing filter.
- Pre-ADC anti-alias filter, with high-pass filter at <10 Hz.

D/A CONVERSION

- Crystal Semiconductor CS4391, 24-bit, 128x oversampled.

ANALOG I/O

- Two balanced, EMI filtered XLR connectors.

STEREO GENERATOR CONNECTIONS

- Four 75-Ohm BNC female, two inputs (accepting RDS only), two outputs.

DIGITAL I/O

- AES/EBU In & Out via XLR connectors.
- Supports stereo digital audio and Omnia Direct™.
- Ethernet.
- Shared RJ45 supporting 100 and 1000 BASE-T Ethernet connections.
- Input accepts 32000 – 96000 Hz. Output is 44100 or 48000 depending on the rate selected in software.

AES Reference Input via BNC connector. Accepts 44100 or 48000 Hz only, and the correct rate must first be selected in the software.

POWER REQUIREMENTS

- 100-264 VAC, 47-63Hz autosensing, 100W maximum.

POWER CONNECTOR

- IEC male, detachable 3-wire power cords supplied.

POWER SUPPLY

- Internal dual redundant.

ENVIRONMENTAL

- Operating: 0 to 50 degrees C.
- Non-operating: -20 to 70 degrees C.

REGULATORY

- North America: Tested to comply with the limits for a class A digital device pursuant to Part 15 of the FCC rules (CFR). Designed for U.S. and Canadian listing with UL.
- Europe: Tested for CE and RoHS compliance.

PHYSICAL SPECIFICATIONS

- Unit weight: 11 pounds.
- Total shipping weight: 15 pounds.
- Dimensions: 2RU at 3.5" H x 19" W x 12.5" D.