Omnia® XII

Telos Alliance®

Decades of experience and fresh ideas merge to create a processor that delivers an experience your listeners can hear and feel. Omnia XII is built from the soul up.



Omnia® XII™

FM/HD/DAB Broadcast Audio Processor





Built from the soul up

Overview

The culmination of decades of audio processing expertise and experience from Frank Foti and the Omnia team comes together in their best-sounding and most forward-thinking processor to date: Omnia XII.

A processor is more than hardware you rack up and plug in, or a collection of algorithms and parameters to adjust. It is a way to connect you with your listeners and create a visceral, emotional experience they can feel as well as hear.

Omnia XII's architecture allows us to put our best foot forward today while paving the way for new features, sonic improvements, and whatever tomorrow demands via software updates.

Omnia XII's Wideband AGC + 5-band multiband AGC and compressor + 6-band multiband limiter processing design, dynamic EQ, and unparalleled bass management features pair up with our most advanced clipper design yet, delivering a clear, warm, powerful sound that delivers effortless loudness, even at major-market levels.

As with all Telos Alliance products, Omnia XII is backed by our industry-renowned, world-class support.

Features

- Wideband AGC + 5-band multiband AGC and compressor + 6-band multiband limiter architecture
- Unparalleled bass management features
- Dynamic EQ
- Advanced FM clipper design for clean, punchy, and effortless, distortion-free loudness
- Browser-based HTML5 UI
- Quicktweak features to demystify complex processor tuning
- Processing for FM/HD-1 signals

Available HLS+ stream receiver



- Comprehensive dynamic RDS with UECP support
- ITU-R BS.1770 loudness and MPX power meters
- Built-in diagnostic tools, including a digital oscilloscope and an FM spectrum analyzer
- Insertion point supporting external ratings watermark encoder hardware
- SDK integration to support Nielsen, Fifty5Blue, and Ipsos watermark encoding
- 1 analog and 3 AES inputs and outputs
- MPX Composite I/O over both analog (BNC) and AES3 I/O
- Support for SSBSC (Single Sideband Suppressed Carrier)
- Livewire+ AES67 I/O
- Linear MPX over IP standard, with optional µMPX encoding
- 3 network interfaces for remote control and SMPTE 2022-7 workflows to provide flexible, seamless redundancy and stream protection
- Supports PTP and PPS time sync protocols with external GPS / PPS inputs
- Rest API communication supporting 3rd party integration
- Livewire Remote Protocol (LWRP) and hardware GPIO via DB-15 connector
- Relay bypass for primary AES and Composite I/O
- Integrated input mixer for source switching and failover
- Redundant dual internal power supplies
- Feature-rich built-in backup audio player
- Dual software banks for secure updating
- Optional streaming receiver input, supporting redundant HLS+, including metadata and up to 24 hours of backup playout capability as well as FLAC, AAC, MP3, Icecast/ Shoutcast streams.

Omnia XII's modular software architecture allows us to continually improve performance and introduce new features, ensuring the processor you buy today isn't yesterday's news tomorrow.



Modular software architecture allows continuous improvements and new features

In Depth

The content you create and broadcast - whether it's today's latest music and familiar feel-good hits from decades past, or late-breaking news, talk, and sports - is more than sonic wallpaper. It is an opportunity to connect one-on-one with your audience, and it requires an audio processor that delivers an experience they not only hear, but feel.

Omnia XII, the new flagship processor from Frank Foti and the Omnia team, is the culmination of decades of experience, ratings-proven success, and fresh ideas that challenge technical and sonic boundaries in a way that impacts your listeners on an emotional level. That's what we mean when we say that Omnia XII is "built from the soul up."

Built on a rack-space-friendly 2RU platform, Omnia XII has the look and feel of a traditional hardware processor, complete with analog, AES3, and composite I/O alongside Livewire+ AES67 and the redundant AoIP network capabilities required in a modern broadcast facility. But beyond the metal, Omnia XII has the design flexibility and ample horsepower to allow performance enhancements and new features, and quickly respond to emerging tech and evolving standards - all without the need for new hardware. The processor you choose now is just as performant and relevant in the future as it is today.

Sonically, Omnia XII's all-new processing algorithms employ an intelligent Wideband AGC + 5-band multiband AGC and compressor + 6-band multiband limiter design, dynamic EQ, and powerful bass management tools that provide everything you need to create your custom sound, from open and relaxed to punchy and loud. Frank Foti's "Clemenza" final clipper - his cleanest and most musical to date - delivers effortless loudness with no compromise to audio quality.

Omnia XII includes our intuitive QuickTweak system that adjusts multiple, interrelated controls simultaneously, demystifying complex processing for operators of any skill level. As always, processing experts can access the full suite of controls expected in a flagship offering.

I/O designed for today's workflows



ITU-R BS.1770 loudness and MPX power meters combine with built-in diagnostic tools, including a digital oscilloscope and FM spectrum analyzer, to display critical parameters and aid in setup and tuning.

A standard Omnia XII configuration includes processing for one FM/HD-1 signal. A comprehensive RDS encoder with UECP is included and supports metadata input from common playout systems. An advanced RDS option is roadmapped, supporting AF Method B, EON, LPS, eRT, RDS2, and other extended RDS features.

A dedicated insertion point allows external watermark hardware encoders to be introduced at precisely the right point in the signal path for maximum effectiveness. SDK software integrations of Nielsen, Fifty5Blue, and Ipsos watermarking are optionally available.

An optional built-in redundant stream receiver supports HLS+ streaming technology with input stream redundancy and up to 24 hours of backup playback capability, as well as metadata to RDS routing.

Audio I/O includes analog, AES3, analog composite, digital composite (Omnia Direct), standard linear MPX over IP, and optional µMPX encoding, along with native Livewire+ AES67 for AoIP. Three independent network interfaces provide HTML5 browser-based remote control and SMPTE 2022-7 support for flexible, seamless redundancy and stream protection, including PTP and PPS time sync protocols.

Relay bypass is provided on AES 1, AES 2, and Composite 1 I/O for failsafe and easy switch-over to backup airchains. Dual independent internal power supplies, a feature-rich built-in backup audio player, and dual software banks for secure updating offer peace of mind for unforeseen events.

Livewire Remote Protocol (LWRP) and opto-isolated hardware GPIO on a rear-panel DB-15 connector combine with Rest API communication to provide remote triggering and control of events and parameters.



Available Nielsen, Fifty5Blue, and Ipsos watermark encoding

Specifications

Analog Audio Line Input

- Left/Right Stereo. Electronically balanced, mirrored on XLR or RJ45 connectors
- Input impedance 48k ohms resistive.
- Maximum Input Level (0dbFS): +24 dBu.
- Nominal Input Level: +4dBu, which nets a -18dBFS input meter reading on a steady-state signal
- Dynamic Range: 110dB ref 0dBFS
- Frequency Response +- .25db 20-20kHz
- THD+Noise <.005% @ 1kHZ unweighted, -6dBFS

A/D Conversion

- 24-bit 128 times oversampled delta-sigma converter with linear-phase anti-aliasing filter. Pre-ADC anti-alias filter, with high-pass filter at <10 Hz.

Analog Audio Line Output

- Left/Right Stereo; Electronically balanced on RJ45 connector.
- Output Impedance < 50 ohms.
- Minimum load Impedance: 600 ohms.
- Output Level adjustable from -2 dBu to +24dBu peak in 0.1dB steps.
- Frequency Response +- .25db 20-20kHz
- THD+Noise <.005% @ 1kHZ unweighted, -6dBFS

D/A Conversion

- 24 bit 128x oversampled. dynamic range 95dB ref 0dBFS, no spurious tones > 10dB below noise floor

Frequency Response

- Complies with the standard 50 or 75 microsecond pre-emphasis curve within ± 0.5 dB, 30 Hz to 15 kHz; the analog left/right output and AES/EBU Digital outputs can be configured for flat or pre-emphasized output

HTML5 browser-based remote control



System Latency

- 36-50ms dependent on processing and clipper selection through the “FM” channel, as measured from the analog inputs through the composite MPX output.

Digital Audio Input

- AES 1 & 2: Relay Bypass equipped, EMI-suppressed XLR-F, mirrored with RJ45 connectors
- AES 3: RJ45 connector
- Standard 110 ohm source impedance
- Status bits follow AES-3 Standard.
- 24-bit resolution, software selection of stereo, mono from left, mono from right, or mono from sum.
- Automatically accepts and locks to valid 44.1 / 48 kHz AES-3 signals

Digital Audio Output

- AES 1 & 2: Relay Bypass equipped, EMI-suppressed XLR-M, mirrored with RJ45 connectors
- AES 3: RJ45 connector
- Standard 110 ohm source impedance
- Status bits follow AES-3 Standard.
- AES Cable Length: 100 meters using CAT6 or Belden 1800B
- 24-bit resolution, software selection of stereo, mono from left, mono from right, or mono from sum.
- Output Sample Rates: 192kHz, 48 kHz, and 44.1 kHz (supports Omnia Direct MPX over AES on all ports
- Digital Output Level: AES-3 standard for peak-to-peak 2-7v at 48kHz and 192kHz into a 110 Ohm load. -22.0 to 0.0 dBFS software adjustable
- AES Cable Length: 100 meters using CAT6 or Belden 1800B
- >120 dB S/THD+N



Built-in oscilloscope and FM spectrum analyzer

External Sync Input

- Output sample rate can be synchronized to the signal present on the AES/EBU input, or to an AES3 signal applied to the Ext. Sync input connector.
- PPS and GPS inputs support pulse per second (10MHz) signals for high-precision synchronization

MPX Composite

Analog MPX/SCA Inputs

- Analog MPX/SCA input converted to digital, which can be mixed into the composite output to add the sub-carriers or switched to select an alternative composite source
- Connectors: Relay Bypass equipped on MPX 1, BNC with EMI suppression
- Input Level: 10v P-P
- Input impedance: Hi Z
- Frequency response (after sw correction): +/-0.01dB, phase +/-2 degrees 40 Hz - 53 kHz
- S/N: >85dB ref: 10Vp-p 20Hz - 200kHz measurement bandwidth.
- Distortion: < 0.01% THD 20 Hz - 53kHz

Analog MPX Outputs

- Rear Connector: Relay Bypass equipped on MPX 1, BNC with EMI suppression
- Output impedance: 5Ω
- Output Level: 10v P-P (internal jumper for a low level of 4V as safety)
- Maximum cable 100’ / 30M RG-58U.
- Frequency response (after sw correction): +/-0.01dB, phase +/-2 degrees, 40 Hz - 53 kHz, >-1dB at 2Hz, >-10dB at 76kHz
- S/N: >85dB ref: 10Vp-p 20Hz - 200kHz measurement bandwidth.
- Distortion: < 0.01% THD 20Hz - 53kHz
- 19 kHz Reference output available on either MPX output 1 or 2

Redundant dual internal power supplies



MPX Performance

Pilot

- Stability: 19 kHz, ± 0.5 Hz.
- S/N: -85 dB typical, 75 µSec de-emphasized across 15 kHz, at 100% modulation
- Distortion: < 0.02% THD 20 Hz – 15 kHz, 75 µSec de-emphasized @ 100%.
- Adjustable from 4.0% to 12.0% in 0.1% steps and OFF.

Stereo Separation: > 55 dB, 40 Hz – 15 kHz.

- Linear Crosstalk: > -80 dB, main-to-sub or sub-to-main channel @ 100%.
- Non-linear Crosstalk: > -80 dB, main to sub or sub to main @ 100%.
- 38 kHz Suppression: > 70 dB @ 100%.
- 76 kHz Suppression: > 80 dB @ 100%.
- Pilot Protection: > -60 dB relative to 9% pilot injection, ± 1 kHz.
- 57 kHz (RDS/RBDS) Protection: > -50 dB.

Remote Control:

- HTML5 browser-based GUI

GPI Interface

- Fully configurable Livewire GPIO
- DB-15 with EMI Suppression, Opto Isolated using 5 in / 5 out xNode wiring standard
- Includes +5v, 100mA power with internal self-resetting thermal circuit breaker. EMI-suppressed DB-15 female connector

Power

- Dual Internal. Overvoltage and short circuit protection.
- Voltage: 100-250 VAC, 47-63 Hz, Typical: 65W RMS, Max: 90W RMS
- 2 x EMI-suppressed IEC male connectors
- Maximum power consumption 76 watts



Support for SMPTE 2022-7 workflows provides stream redundancy

Ethernet & AoIP

Hardware

- 3 Rear Panel GigE ports supporting IEEE 1588, with status indicators associated with jacks
- EMI-suppressed RJ-45 connector with shielded jacks to chassis
- Fully independent NICs (able to be separate subnets, IP & MAC addresses).

AoIP Standards Support

Livewire

- Input: Livestream, 1mSec, and Standard Streams, stereo only
- Output: 1mSec and Standard Streams, stereo only

AES67

- Input/output: 1 mSec, stereo only
- MoIP (MPX over IP) support
- SMPTE ST2110-30 Level A

Regulatory

- **United States:** Complies with FCC Part 15 Subpart B: 2023
- **Canada:** Complies with standard ICES-003 Issue 7
- **Europe:** Complies with European Union Directives 2014/30/EU, 2014/35/EU and 2011/65/EU+(EU) 2015/863.
- **UK:** Complies with the following standards, BS EN 55032 : 2015, BS EN 55035:2017, BS EN 62368-1:2022 and BS EN 63000:2018.
- **Australia/New Zealand:** Complies with standards AS/NZS CISPR 32:2015+AMD1:2020 and AS/NZS 62368.1:2022

Dimensions and Weight

- 2U form factor
- width-depth-height: 19” x 16.9” x 3.4” (482 x 428 x 86mm)
- 13.5 lbs (6.12 kg)

Environmental

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

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