

Omnia VOLT®

The 4-in-1 Processing Powerhouse with Audio Processing for FM, AM, SG, HD/DAB/DRM, or Studio Applications.



OVERVIEW

Omnia VOLT offers “best in class” processing performance from the people who brought you the multiple-award-winning Omnia.11, the acclaimed Omnia.9, the power-packed Omnia 7, and the 13,000+ Omnia ONEs currently in service. With thousands of units on the air, VOLT gives you more sonic performance and processing power in one rack unit than others give you in three. Now with new Version 2.0, the best just got better!

Here’s how:

With VOLT, we rewrote the rules for broadcast DSP, fine-tuning our algorithms and creating the world’s best-sounding, most powerful and versatile 1RU audio processor. The QuickTweak system helps users get just the sound they want quickly. You can get VOLT on the air and sounding great in minutes, select presets that we’ve designed for today’s stations and programming, and create a unique sonic personality with just a few nudges.

Omnia VOLT | Leave the Competition in the Dust.

VOLT may be the most value-packed audio processor on the market, thanks to its DSP|Core firmware module system. This system means you can repurpose your VOLT to serve different needs by simply updating firmware. The capability to turn your FM VOLT into an AM unit or an HD/DAB or SG box comes built into every VOLT, and the fact that each DSP|Core firmware package is FREE is like getting four processors in one package. Modules include VOLT FM, VOLT AM, VOLT HD PRO, and VOLT SG. Each Core has a feature set that has been fine-tuned for its application, optimizing system DSP to the unique demands of different use cases.

VOLT FM - Killer Omnia FM sound featuring 6 AGC sections (5 multiband + wide-band), 5-band, time-aligned limiters, Dynamics Engine architecture, the latest low distortion clipper design by Frank Foti, and a high-quality composite stereo generator. Dozens of modern presets give you an awesome sound straight out of the box. Run studio side to feed your STL, or generate FM composite at the transmitter.

VOLT AM - Is specially designed for the challenges of AM radio. Versatile pre- and post-limiting equalization plus superior narrow and wide-band presets created for today's AM stations give you the cleanest and most powerful signal on the band. Asymmetrical Modulation and Tilt, applied after the clipper, help you get better performance even from older transmitters!

VOLT HD PRO - Is purpose-built for HD Radio, DRM, DAB, web streams, and other compressed media, as well as syndicated program and studio productions. Selectable bandwidths and crossover points, plus our exclusive Sensus algorithms, help reduce lossy compression artifacts even at low bitrates. Put it in your syndicated program production chain before the uplink: every episode will be clear, clean, and have a consistency listeners can recognize. Super-low latency for processed headphone monitoring applications. Use VOLT HD PRO as a general-purpose processor for, gain control, limiting, and program distribution.

VOLT SG (Stereo Generator) - For use in cases where you want to split your system between the main processor—usually at the station—and a dedicated MPX stereo generator with advanced composite features at the transmitter. VOLT SG can be paired with a VOLT FM, one of our other Omnia processors, or with any other processor from another manufacturer. VOLT SG uniquely features the same “One Louder” embedded pilot as the Omnia 11.

FEATURES

VOLT FM

- A new generation Frank Foti-designed Clipper for stronger on-air sound.
- Flexible Pre-Emphasis Switching. This makes it easy to fit VOLT into any existing FM airchain.
- Dual Variable Composite Outputs to feed a main and backup transmitter.
- Variable Pilot Level and Phase let you fine-tune the signal for transmission.
- Adjustable SCA input for additional services, including RDS and specialty networks.
- 19 kHz sync output to synchronize external generators.
- Bass Pre-Clipper - Fully adjustable with Tightness and Girth controls. You'll have strong, listener-pleasing bass without worrying about intermodulation distortion.
- Adjustable BS-412 Threshold and Processing for full compliance with ITU standards.
- BS-412 and Low Latency settings that can be turned on as needed.
- Automatic Mono "Dry Voice" Sensing - Ideal for FM Analog Stereo stations using extreme processing: it keeps an extra hand on the clipper, to stop distortion when the L+R channel gets boosted by mono signals.
- Low Latency FM mode - lets you fine-tune the tradeoffs between processor latency and ultra-high quality.
- Stereo Enhancement for FM Analog, without Adding Multipath - You'll get a wider, more exciting signal that jumps out of the radio.
- Optional expansion module to support Kantar watermarking
- MIB2 compliant SNMP support

VOLT AM

- Extra equalization to control or enhance highs in two critical places, both before and after the multiband limiter.
- Wide and Narrow bandwidth options and presets to let you get the best combination of coverage and quality for your station's format.
- Crossover system is re-tuned for various narrow-band options so that all five bands of processing are used within the bandwidth constraints for maximum performance at all bandwidth settings.
- Adjustable Tilt to compensate for low-frequency 'droop' in older plate-modulated transmitters.
- Asymmetrical modulation for maximum AM power.
- Flexible Pre-Emphasis Switching on audio inputs and outputs. This makes it easy to fit VOLT into any existing AM airchain.

VOLT HD PRO

- Sensus® Processing for Digital Program Streams - Omnia's exclusive Sensus algorithms predict how HD, DRM, DAB, or streaming data reduction will affect your sound. They precondition your signal, making digital compression sound better—even at low bitrates, actually reducing the distortion added by psychoacoustic compression schemes.
- Switchable bandwidths with eight choices between 4 kHz – 24 kHz. They reconfigure VOLT's multiband processing frequencies as well as limit high frequencies, to give you the cleanest signal for your distribution medium.
- Crossover system is re-tuned for various narrow-band options so that all five bands of processing are used within the bandwidth constraints for maximum performance at all bandwidth settings.
- Look-ahead wideband limiter in addition to five fully adjustable band limiters guard against quick transients that can add distortion.

VOLT SG

- SSBSC support lets you select Single Sideband suppressed carrier for more multipath immunity, less noise, and more robust HD radio.
- "One Louder" technology embeds the stereo pilot directly into the composite signal. This frees up power, giving you a full decibel more loudness—effectively, 10% additional modulation—without exceeding legal limits.
- Flexible Composite Limiter can be calibrated to control overshoots from nonlinearities in your STL.
- Pilot Phase adjustment of $\pm 32^\circ$, compared to the 38 kHz suppressed carrier, to compensate for timing errors elsewhere in your system.
- Advanced single sideband suppressed carrier processing [SSBSC] - for reduced multipath and more robust HD transmission.

FM, AM, and HD-Pro VOLT processors commonly feature:

- **Optimized Dynamics Engine and time-aligned crossover system** designed by our best Omnia engineers.
- **Six Separate AGC Sections** - Tunable midband crossover, one wideband, plus five separate time-aligned narrow band sections, each with separate controls for every important parameter give your station the loudness and consistent sound you want!
- **Five Separate Time-Aligned Limiter Sections** - each with separate Drive, Hold, Threshold, and Attack/ Decay controls. They give you protection against over-modulation while maintaining a loud signature sound.
- **QuickTweak™ Adjustment System** - lets you fine-tune your sound like a processing genius. Get exactly the processing you want in minutes, while you're on the air, right from the front panel or a connected computer or tablet.

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- **Variable Deep Bass, Phat Bass, and Warmth enhancers** - Get that meaty Omnia sound, fine-tuned the way you want.
- **Clipper Silk Adjustment** - (FM & AM) If your format is prone to treble distortion, you can add just enough Silk to clean up those high frequencies.
- **Variable High-Pass and Switchable Phase Rotator** - Special processing in VOLT's input makes sure that ultra-low frequencies, too low to be perceived as bass by listeners, don't rob you of on-air power.
- **Totally Flexible Input / Output** - Use analog, AES/EBU digital, or Livewire® AoIP inputs; analog, AES/EBU digital, Livewire, or composite outputs (FM & SG only). Adjust channel balance and correct polarity separately on each input. Save and recall input/output setups for different applications. All outputs are always active, regardless of input type.
- **Switchable Insert Points for Voltair®, Watermark Encoders, or Other Downstream Encoding** - Optimize your airchain and eliminate the need for external pre-processing! You can feed encoders with a pre-processed signal from VOLT's multiband AGC and limiters, so your encoder sees a stronger, more reliable signal. Then feed the encoder's output back into VOLT for post-encoding clipping that protects you against overmodulation.
- **Automatic "Failover" signal switching** - Designate a backup input to use if your main signal drops out or STL fails. Switch to this source automatically, with adjustable sensitivity, or trigger it as needed.
- **Graphic User Interface** - is easy to navigate, but gives you the deep level of control you need.
- **Built-in HTML-5 Server** - for full control from any modern browser, tablet, or smartphone... without special plug-ins.
- **Rugged 1RU Construction** - fits any control room, technical center, or transmitter shack, with easy-to-see LED meters.
- **Cool Running, Fanless Operation** - VOLT can even be used near live mics.
- **Flexible Pre-Emphasis Switching** - makes it easy to fit VOLT into any airchain.
- **Built-In Tone Generator** - provides for quick setup and calibration.
- **Multiple Selectable Bandwidths for Digital Data Streams** - More than simple low-pass filters, HD Pro also modifies the VOLT's crossover to get the best results for any bitrate.

IN DEPTH

Nail Your Signature Sound Faster with QuickTweak™

Whether you are a processing novice or expert, Omnia VOLT gives you the tools to create a superior signature sound. Choose from some of the best factory presets available, designed by Omnia's processing experts, and by our favorite "insider" guest programmers. For those who want to push beyond stock presets, Omnia's new QuickTweak system lets you fine-tune your sound quickly. For experts, drill down into deeper parameter adjustments. Get exactly the processing you want, while you're on the air, whether you're at the front panel, or sitting in your car controlling VOLT over the web.

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Nobody knows processing like Omnia. We've designed QuickTweak based on our decades of experience and market leadership, algorithmically linking complex and interactive parameters to create a core set of "meta" controls.

- QuickTweak is easy to understand: You can tune it by ear, and hear the results instantly.
- QuickTweak's six master controls allow millions of recallable variations, right from the front panel.
- You can use QuickTweak on the factory presets, or on your own custom presets.
- You can save your own settings after using QuickTweak to easily A/B compare preset modifications.
- Any preset can be adjusted with QuickTweak, or you can fine-tune using even deeper control layers. Presets can always be refined, then saved under a new title.
- Share presets by importing or exporting them with others in your company. Back-up preset files on common media.

Total Versatility with DSP|Core Firmware

VOLT's DSP|Core firmware modules rearrange and modify VOLT as your needs change. DSP|Cores aren't extra cost add-ons! Download the functionality you need for free, install the DSP|Core firmware package from a connected computer, and reboot. It's that simple.

- Use VOLT for FM Analog Stereo at the station, with high-quality baseband clipping to feed uncompressed STLs, or at the transmitter, with dual composite outputs.
- Use VOLT for AM Broadcast, with purpose-built presets for the challenges of AM radio. VOLT's Tunable Asymmetrical Modulation and Tilt controls help you get modern results, even from older transmitters!
- Use VOLT for Studio and Program Production or Syndication. It comes with the tools and presets you need for modern production styles.
- Use VOLT for HD/DAB/DRM/Web Streaming. Our exclusive Sensus algorithms reduce compression artifacts even at low bitrates.
- Use VOLT as a standalone FM Stereo Generator at the transmitter for direct connection to transmitters.
- Use VOLT for low-latency FM Stereo to comply with local regulations, using a high-efficiency clipper that's optimized for this kind of broadcast.

Front Panel



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Rear Panel



SPECIFICATIONS

Frequency Response

- User selection of flat, 50 μ s, or 75 μ s pre-emphasis curve within \pm 0.50 dB, 30 Hz to 15 kHz.

Signal-to-Noise Ratio

- Audio >95 dB analog, >120 dB digital I/O.

System Distortion

- Less than 0.01% THD, 20 Hz – 7.5 kHz (second harmonic distortion above 7.5 kHz is not audible in the FM system).

Latency

- 16ms nominal, \pm 0.5ms depending on IO selection. Low Latency FM version 10ms

Input / Output

- Composite: Output impedance 75 Ω , single-ended and floating over chassis ground. BNC connectors with EMI suppression. Maximum cable 100' / 30M RG-58U.
- Output level: Separately adjustable for each of two outputs, 0V - 10V in 0.05V steps.
- Pilot Level: Adjustable from 4.0% to 12.0% in 0.1% steps and OFF. Pilot Stability: 19 kHz, \pm 0.5 Hz. S/N: -85 dB typical, 75 μ S de-emphasized across 15 kHz, at 100% modulation Distortion: < 0.02% THD 20 Hz – 15 kHz, 75 μ S de-emphasized @ 100%.
- Stereo Separation: > 65 dB, 30 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: > -65 dB relative to 9% pilot injection, \pm 1 kHz. 57 kHz (RDS/RBDS) Protection: > -50 dB.

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Analog

- Left and Right Stereo on EMI-suppressed XLR-3, balanced with “pin 2 hot.”
- Input: Electronic balanced, impedance 10k Ω , nominal +4 dBu, max +22 dBu.
- Output: Impedance 20 Ω for >600 Ω load, +4 dBu nominal, +22 dBu peak. Converters: 24 bit, 128x oversampled with linear-phase anti-aliasing filter.
- 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.
- Delta sigma converter with linear-phase and anti-aliasing filter.

Digital

- Stereo per AES/EBU standard, 24-bit resolution. Input locks to any rate 32 kHz – 108 kHz. Output locks to input, internal 48 kHz, or separate external AES/EBU “digital black” reference 32 kHz – 96 kHz.

Audio over IP

- LiveWire Audio and control over IP, on the same RJ-45 used for Ethernet control.

Remote Control

- GPI: EMI suppressed DB-9 at logic levels, +5 V and ground supplied. Ethernet: 10/100BaseTX.
- Ethernet on EMI-suppressed RJ-45. TCP/IP control via HTML-5 internal web server, password protected. Manual addressing and port selection.

SNMP

- MIB 2 compliant SNMP support for remote monitoring and control

Electrical/Physical

- Power: 100 - 250 VAC, 47-63 Hz. < 40 VA. Typical draw 12W RMS, maximum 15W RMS. Internal supply with overVOLTage and short circuit protection. Meets EN55022, EN55011 Level B Conducted Emissions. EN61000-4-2, -3, -4, -5, -6 level 3 immunity compliant. Full international safety approval. CE marked. EMI suppressed IEC male connector. Detachable 3-wire power cords supplied for US and European use. Temperature: 32° to 122° F / 0° to 50° C for all operating VOLTage ranges.
- Humidity: 0-95% RH, non-condensing.

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- Dimensions: 19" wide x 1.75" high x 16" deep (48.26cm x 13.335 cm x 40.64 cm) including connectors. Unit requires one EIA rack space for mounting.
- Shipping Weight: 12 lbs. / 5.5 kg

Regulatory

- North America: FCC and CE tested and compliant, power supply is UL approved.
- Europe: Complies with the European Union Directive 2002/95/EC on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS), as amended by Commission Decisions 2005/618/EC, 2005/717/ EC, 2005/747/EC (RoHS Directive), and WEEE.