

# Omnia.11 Version 3.0.1 Update

**This update is for Omnia.11's currently running version 1.5, 1.6 or 3.0 ONLY!**

**If your unit is running ANY EARLIER VERSION and you have not installed the version 1.5(85) compact flash card, please go to the URL below and order the free v1.5 update first:**

<http://www.telosalliance.com/support/Omnia11-v15-Software>

Please also see the changelog starting on Page 4 of this booklet which covers all of the new features included in this version 3.0 update and the **Introduction to G-Force** manual addendum. The full User Manual will also be updated and available online soon by clicking on the "Manual" link to the right of the Omnia.11 product page here:

<http://www.telosalliance.com/Omnia/Omnia11>

If you have questions or find that you require assistance with this upgrade, you may call Customer Support at 216.242.0225 during normal business hours or email us at [support@omniaaudio.com](mailto:support@omniaaudio.com). Please have the serial number of your unit handy if you need to contact us. The serial number can be found on a small barcode sticker on the rear panel that looks like this: 0279xyyyy, 0314xyyyy or 0382xyyyy.

## **\*IMPORTANT NOTES:**

- This software update requires that version 1.5 or later is installed in both software banks before updating. It checks that the proper software is installed in the running bank, but it is not possible to check the alternate bank. If the 1.5 update card was used (as it should have been), it will always have the proper software in both banks. If it was not, please see above and follow the link to order one.
- Once version 3.0 or higher is installed, you will not be able to go back to previous 1.x versions. Please contact Omnia Support for help if this is needed.
- This update requires the use of the built-in webpage remote control interface. Be sure that your Omnia.11 is properly configured for and connected to your network (or computer) per Appendix C in the user manual before updating.
- Your network parameters and Livewire Input settings will be carried over and activated automatically after the update. In some cases, Livewire Output settings may not re-populate so be sure to jot your Livewire output channel numbers down.
- Any existing custom user processing and I/O configuration presets will also be carried over but not loaded automatically. That said, please be sure to save your user presets to a computer before you update!
- Due to re-calibration of the composite MPX output level controls in v1.6, the MPX output levels may be slightly higher than in versions 1.5 or earlier for the same control setting, even after loading a previously saved I/O Config. So be sure to check your modulation level on the device following the Omnia after the update if you are updating from v1.5.
- Due to improvements in the clipping system, existing presets from older versions (1.5 and earlier) may be louder in version 1.6 and higher. If this is not desired, we recommend reducing the clipper drive by approximately 1dB.

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## Software Update Procedure

Below is the step-by-step procedure for uploading the new firmware to your Omnia.11. Note that this will involve removing the unit from the air for several minutes so be sure to have a backup processor ready or perform the update at a time when the station can be down. Note that steps 1 through 10 can be performed while the unit is still on the air.

1. From the Setup menu, verify that the currently running version as shown in the System icon button is 1.5(85), 1.6(115) or 3.0(78). If it is, proceed to Step 2.

If the currently running version is 1.4 or below, you must order the free version 1.5 update compact flash card first. See <http://www.telosalliance.com/support/Omnia11-v15-Software> to do so.

2. If you are using the Livewire outputs, make a note of your output channel numbers in the Setup menu/Livewire icon button as these may be lost after the upgrade.
3. Download the version 3.0.1 update file (.oup) from the Omnia.11 product page: <http://www.telosalliance.com/Omnia/Omnia11> by clicking on the "Software" link to the right of the Omnia.11 product page and choosing "Omnia.11 v3.0.1 Software Upgrade".
4. Connect to the Omnia.11 via Ethernet using a web browser and login. (Default password is "omnia")
5. Navigate to the Configuration menu and in the "Software Bank Selection and Update" section, click on the word "Update" inside the gray button. (it will become underlined when the mouse is properly positioned over it)
6. Read the confirmation text and click the "Continue" button to confirm that you want to continue the update process. Note that on-air audio will not be interrupted during this upload phase of the update.
7. Click the "Browse" button and find the v3.0.1 update file (.oup) that you downloaded from the Omnia website. Highlight it, click "Open" and it should appear in the "Update file:" box. Click the "Update" button to begin.

\*\*\*\*\***IMPORTANT:** Do not disturb or remove power from the Omnia until the update is complete. Any power interruption will result in a corrupted upload and the Omnia may have to be sent in for repair.

8. Click on the link: "**Click here to monitor the progress of the update.**" You will need to manually move the scroll bar on the right-hand edge of the update monitor box down periodically (you can also use the mouse wheel) to see all of the text. When you see the following message at the bottom, the upload of the file is complete:

```
Update successful.  
[stderr test]
```

If you do not see this, contact Omnia Support for assistance.

9. Click the "Select New Software (Configuration Page)." link at the bottom of the page. (Or the "Configuration" button at the top). In the "Software Bank Selection and Update:" section, you should now see Version 3.0.1 loaded into the currently inactive software bank. At this point, your Omnia.11 is still running the previous version as you can see next to "Running Software:"
10. To select and activate the new version, click the radio button for the bank where the new version is located and then click the "Apply" button. (Be sure not to click the "Update" button again instead!) You will now see this message: "**Software bank (0 or 1) selected. The newly selected software will be active after reboot. To use the new meters and remote control applet, your web browser's Java(TM) cache must be flushed. Typically, this requires shutting down the browser and restarting it.**"
11. At this point the Omnia.11 must be rebooted. You can use the reboot function on the web page, and then shut down the browser, or use the "Reboot" button on the front panel Setup screen/System block. **Note that this will take you off the air for several minutes!** So be sure you have a backup processor online or are prepared to be off for the next few minutes. Note also that the unit may reboot on its own more than once.

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12. After the Omnia logo screen appears, you will see text messages on the screen as the unit boots and is configured to run the new software for the first time. Please note that the time required to boot **this time only** will be much longer than a normal boot up. After about a minute or so you should see the message “Updating I/O Board...This will take a few minutes.” The screen will remain like this for about the next couple of minutes. This is normal and the update is not stuck! After it is finished with the I/O board update, you should see the message “Done with Update...Rebooting”. The unit will now reboot (perhaps twice) and the normal touch screen interface will finally appear.
13. Touch the Input or Output icon button and then the “I/O Config” tab. Now touch the padlock icon to unlock the I/O config preset list and then select your desired I/O Config preset from the list. If you do not have one, select “default”.
14. Touch any of the processing icon buttons and then the “Preset” tab. Now touch the padlock icon to unlock the preset list and then select your desired processing preset from the list.
15. If you were using the Livewire outputs you may need to go into the Setup menu to re-enter your output channel numbers and re-enable the Livewire outputs. Please note that for proper sync, the LiveWire inputs should not be used unless at least one of the LiveWire outputs is enabled.

The update procedure is completed. You may now return the Omnia.11 to normal service.

NOTE: If you are using the composite MPX outputs and are updating from v1.5, check your modulation since the MPX output levels may be higher for a given setting after the update.

The next section contains the changelog and manual addendum so be sure to read-on for information about the new features and bug fixes in this update!

# Omnia.11 Version 3.0.1 Changelog

(Applicable to Software v3.0.1, July 2016)

**Also see the Introduction to G-Force manual addendum later in this document for more details on using the new (optional) G-Force plugin features.**

Release 3.0.1 is the first 3.x release available to all customers as a field update file. Previously, some new units were shipped with version 3.0. In this 3.0.1 release, a number of bugs were addressed, and the processing controls and presets received some tweaks based on in-field experience.

## Additions and Enhancements

### G-Force Plugin Only:

- New G-Force presets added: CGSmooth series, ModernRock, Azimuth\_Rock, EventHorizon\_CHR, VinylSmooth\_Brite, Cosmic\_Natural\_NSE (see Note 7 below) and GlideSlope2.
- G-Force presets modified since v3.0: AC\_Punch, Azimuth, VinylSmooth, GForce. "GlideSlope" renamed as GlideSlope1.
- Dynamic Bass Enhancement and Solar Plexus controls moved to "Bass EFX" tab
- New (advanced) clipper option: **Clipper Silk**
- New Bass Clipper Options added: **Bass Clipper Drive**, **Bass Clip Tight** and **Bass Punch**
- GUI help text added to many controls.
- RDS Configuration added to web interface, allowing remote adjustment. (See Note 6 below.)

### Notes and Known Issues:

1. If Processing restart is underway, and the front panel is "woken-up" prematurely (before the restart wakes it up) by touching it, the FP may become stuck and display strange graphics. The workaround is to perform the restart again, and not touch the front panel until it completes.
2. We recommend disconnection of all remote control sessions before performing a style change or processing restart. The restart will complete correctly if a remote is left connected, but it will take longer before a new remote session can be initiated, and the front panel will have some "false starts" when coming up, which will require the touchscreen to be tapped several times.
3. Some browsers may display the update status with black text on a gray background, making it difficult to read. This is browser dependent.
4. When connecting with the stand alone remote for the traditional (Orange) style, a warning is given stating that the remote version is incorrect and to download the correct version. This warning can be safely ignored, and the remote will work correctly with 3.0.1 (11).
5. After entering RDS information on the front panel, the "RDS" block on the "Setup" screen will not immediately update. The workaround is to go to the "ADJ" screen and then return to the "Setup" screen.
6. Updating the RDS data from the web page interface will cause the new data to be saved, but will not update the on-air transmission. Only pressing apply on the front panel will update the on-air data.
7. The new G-Force "Cosmic\_Natural\_NSE" preset has an issue where the limiter thresholds are set too high for the Omnia.11's clipper. If you are interested in this preset, please download Cosmic\_Natural\_NSE2 from our website.

## **Omnia.11 Version 3.0 Changelog**

(Applicable to Software v3.0r78, JUNE 2016 – shipped in new units only)

Also see the **Introduction to G-Force** manual addendum in the next section for more details on using the new (optional) G-Force plugin features.

Software version 3.0 is a significant and important update that, when running the optional new G-Force plugin, completely overhauls the dynamics processing engine of the Omnia.11 and adds some new features that you have been asking about since the Omnia.11's debut in 2010!

It is very much like getting a completely new and improved audio processor without the need or expense of a new box. Think of this as like getting a new, more powerful engine upgrade in your car!

### **Additions and Enhancements**

#### **Both Original Mode (orange) and G-Force Mode (blue):**

- Mode switching between the original (orange) mode and the optional G-Force (blue) mode can be done from the Configuration page in the remote control web interface. For your convenience you may evaluate the G-Force engine plugin by switching to it in the webpage remote interface.
- ENHANCED: Voltair-aware insert (patch) point now optimized for use with watermark encoders and the Voltair. This is based on C. Gould's research on the effects of audio processing on watermarking technologies. The net effect is more consistent watermark performance over a broader range of material when compared to simple wideband processing in front of the watermark encoder (and definitely better than no processing at all in front of the watermark encoder).
- Safety limiter added to patch point output.
- Patch point output level control added
- Patch point input and output meters added. These are available in the Input → Detail meter panel.
- Patch point calibration tone added.
- Patch output level control added. This is intended to be used only if necessary to increase headroom in the patch point output.
- Patch point send can now be output on analog or AES/EBU outputs as well as LiveWire.
- NEW: For the HD processing chain, a parametric EQ including lo and hi shelf equalizers replaces the limiter mixer section. This is for compatibility with the new patch point location.
- Option added to select whether the HD processing is fed with the signal that goes through the patch point or not.
- ENHANCED: For Solar Plexus, added "Upper Subharmonic" control to change the tonal balance of the enhancement. Setting this to "off" will give an effect similar to the previous "Thunder Bass" enhancement.
- NEW: (static) RDS generator added.

#### **G-Force plugin (blue) mode Only:**

- NEW: Five Band dynamic equalizer -> Assists in source to source consistency without the use of more compression. Uses unique "ratio based" control method to maintain source to source equalization without "smashing" the audio more. Can be adjusted to operate as a cut – only mode, boost-only mode, or any combination in between.

- ENHANCED: Next Generation wideband AGC whose control characteristics model how we perceive the actual levels & loudness of the program mix. This takes into account the new production techniques being used to record and master today's music. For example, it is designed to handle and pass the EDM-style bass found in today's popular music where bass response has to be managed in an entirely different way.
- NEW and ENHANCED: Next Generation "Chameleon AI" dynamics control. This version of the Omnia.11 features full smart control of all of the multiband processing stages. This AI system constantly monitors the characteristics of the audio in terms of density, long term and short term loudness, and intelligently controls the gain state to insure minimal artifacts, and to maintain consistent "base loudness levels". For the first time, these advanced chameleon dynamics work throughout the infrastructure of the entire processing chain, not just a segment. This represents a major structural reworking resulting in a complete makeover of the omnia.11's capabilities. It is like getting a whole new processor!
- NEW: Suite of tools in the multiband AGC processing including multiband windowing, user adjustable thresholds, and intelligent gating modes.
- ENHANCED: Chameleon dynamics control has also been extended to the multiband limiter system. The limiters have the ability to greatly (and actively) reduce induced intermodulation distortion under fast & heavy limiting conditions. The new limiters have also allowed for the removal of the clipper Auto Sense control in the "FM" menu.
- ENHANCED: More powerful Quick Setup menu. With 7 simple controls, you can totally alter & tailor any preset to your tastes. NEW: "Bass" control allows you to easily and effortlessly dial in the amount of bass you want without having to tweak other "expert level" parameters. Quick setup also works in conjunction with expert level controls giving even more power and flexibility. This makes quick adjustments much easier and more intuitive without the necessity of entering the full adjustment menu.
- NEW: Optional Perfect De-Clipper module by Hans Van Zutphen.

### **Bug Fixes:**

- Reduced the range of the Solar Plexus level control and increased its resolution.

### **Here's what was new in version v1.6:**

(For those updating from v1.5)

- CHANGE: Selecting a processing block on the GUI will now always bring up the Preset tab. Pressing it again will bring up the controls specific to that block. This is for compatibility with operation of protected presets.
- NEW: Solar Plexus bass enhancement. (Wide Band → ENH → Advanced tab) This is a sub-harmonic bass enhancement that, unlike earlier attempts, preserves the dynamics of the original bass. Warning! A little goes a long way so use sparingly. Too much will overdrive the low-band limiters and can muddy the sound.
- NEW: Bass enhancer "Mode B". (Wide Band → ENH → Basic tab) This gives a fuller, more "rounded", warmer bass tone. (It is useful for Jazz, Country and AC formats)
- NEW: Pilot Embedder buries the 19kHz stereo pilot tone within the program audio rather than adding it on top, creating 1dB additional loudness. If you aren't using the Omnia.11's built in MPX stereo generator now, you may want to give it a try!
- NEW: Additional processing presets: "CGSmooth\_V2" is a much louder version of CGSmooth that is optimized for that greater loudness and the new bass features. It can also be used at reduced loudness by simply reducing the main "FM" clipper drive.

The other new presets have an "\_splx" extension and are the same as their namesake except that they have the Solar Plexus bass enhancer turned on.

- NEW: "Day event" scheduling support (accessible on the "GPIO / Events" web page).
- NEW: Support for setting time from an NTP server. (accessible from Setup → Network on the front panel).
- ENHANCED: Added "BYPASS MODE" watermark indication on front panel when unit is in bypass mode.

- ENHANCED: Livewire Sync indicator on front panel screen and remote. (in Setup → Livewire)
- ENHANCED: Added "Primary Audio Failure" watermark indication on front panel when the failover logic has switched to the secondary input.
- ENHANCED: Better reporting of error conditions, particularly those occurring during startup. These will now display in the "Fault:" indication in the top line of the front panel.
- ENHANCED: Added GPI disable setting to "GPIO / Events" web page.
- ENHANCED: Bootup time decreased.
- NEW: Added gain-reduction meter for BS-412 processing.
- NEW: Reverse remote connection. Because the remote is entirely web-based, this works by allowing the Omnia 11 to connect to a remote relay server. The user can then point a web browser at the relay server to get the remote connection.
- NEW: FM test tone can be sent to the stereo generator as L+R, L-only, R-only, or L-R (Output → Advanced).

### **Bug Fixes:**

- FIXED: Problem where booting up an O11 or enabling its LiveWire outputs on a LiveWire network could cause a brief network-wide audio dropout.
- FIXED: A variety of issues that could, under certain conditions, cause the front panel and web server to become inaccessible after the O11 had been running for an extended period.
- FIXED: Issue that would occasionally cause the O11 to boot up not passing audio, requiring a reboot to correct.
- FIXED: Bugs that could cause problems obtaining the unit's HWID. Symptoms of this are problems with the activation checks, resulting in failure of DSP processes, or problems communicating with the I/O board.
- FIXED: GPI bug where the IN 1 HI preset, if present, was always selected at boot time.
- FIXED: Leading zeros in the network configuration values will no longer cause problems (these are now just stripped off). Previously, they could lead to an infinite crash and reboot cycle.
- FIXED: Bug where LiveWire outputs would come up partially disabled after reboot.

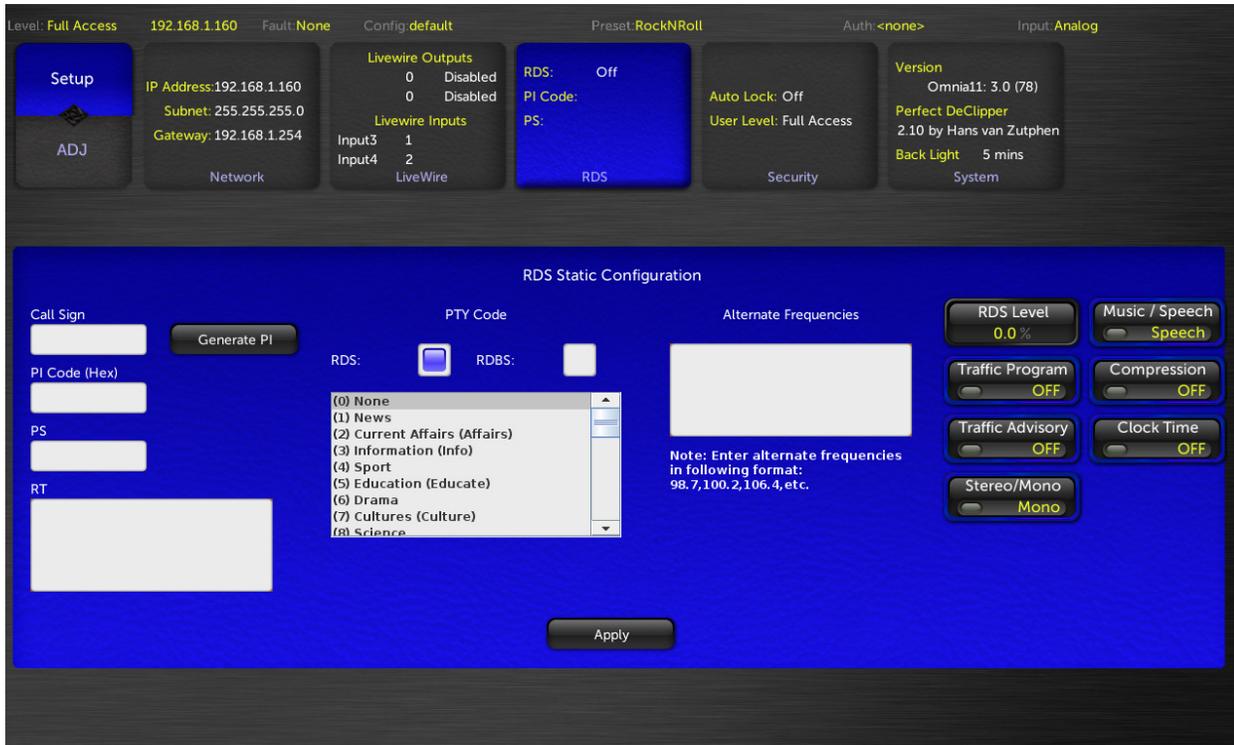
### **Security:**

- NEW: Additional preset security modes. Any protected preset can now have view/modify (and, separately, unprotect) permissions allowed or denied as part of the preset authorization. If denied, the permission can be gained by an individual user (i.e. front panel or one remote connection) by entering the original passphrase used to create the preset authorization. Note that encrypted presets created with release 1.6 cannot be read with previous releases, in order to prevent those without view/modify permission from being viewed on an older release. Older presets can be read by 1.6, and will be automatically converted to the new format.
- Any potential "Shellshock" vulnerability removed by removing bash shell.
- Verified that the O11 is not vulnerable to GHOST (CVE-2015-0235) vulnerability. Here is our statement regarding this:  
 The Omnia 11 uses glibc 2.7 and is potentially vulnerable. However, the only open network ports are for our custom remote control server, the boa webserver and sshd. Our remote control server does not use gethostbyname\*(), and is thus not vulnerable. boa only uses gethostbyname\*() on values supplied in its configuration file, and only after syntax checks. Modifying this file requires pre-existing root access to the unit, thus boa is not vulnerable. OpenSSH sshd uses getaddrinfo() instead of gethostbyname() (except in some really obscure configurations, not including ours), and is not considered vulnerable.  
 See <http://seclists.org/oss-sec/2015/q1/283> and the answer (not the comments to the question) at <http://security.stackexchange.com/questions/80217/ghost-which-services-are-vulnerable-ssh-web-server>. Thus, Omnia 11 is not vulnerable to GHOST.

# New Setup Features

## RDS Setup

RDS is available in both Original Mode (orange) and G-Force Mode (blue). G-Force mode shown:



Omnia.11 v3.0 adds static built-in RDS to its onboard stereo generator. By “static” we mean that dynamic metadata is not supported. You’ll need to enter your PS and RT messages in this front panel screen (only) and these messages will be transmitted continuously.

Your PI code (in Hex) can be automatically generated from your call letters entered into the “Call Sign” box.

Manually enter your desired static PS text (maximum 8 characters) in the “PS” box.

Manually enter your desired static RT text in the “RT” box.

Touch “RDS” for the European RDS standard or “RDBS” for the USA standard.

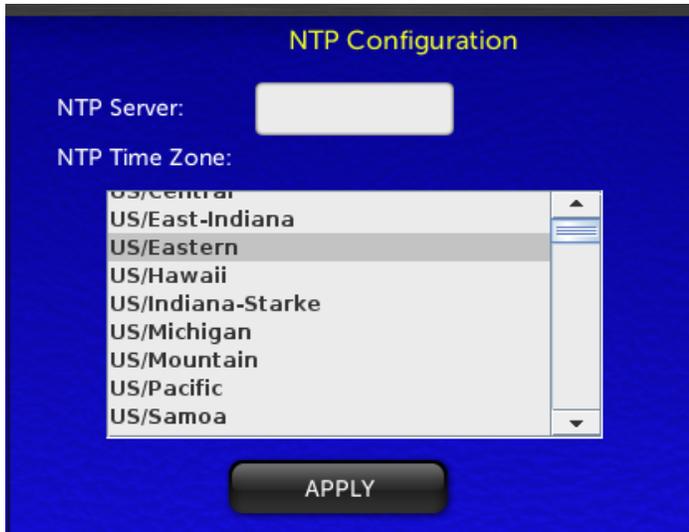
Enter your alternate frequency list (if any) in the following format: 98.7,100.2,106.4, etc.

To turn the internal RDS generator on, advance the “RDS Level” control above 0.0% (which is OFF). Typically RDS injection level should be 4.0%.

The rest of the switches on the right-hand portion of the screen set the features being transmitted on your station as seen on RDS capable radios. Turn on only the options featured on your station.

**\*\*\*Note that Updating the RDS data from the web page interface will cause the new data to be saved, but will not update the on-air transmission. Only pressing “Apply” on the front panel will update the on-air data.**

## NTP Configuration

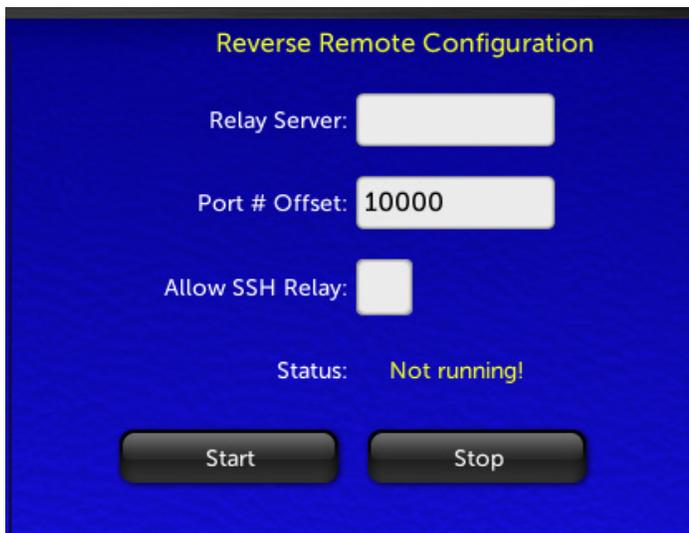


The Omnia.11 real-time clock used for the new “Day Events” feature can be set via NTP only (configured in the Network setup menu) and cannot be set manually.

\*\*\*Note that network setup can only be done from the front panel of the unit.

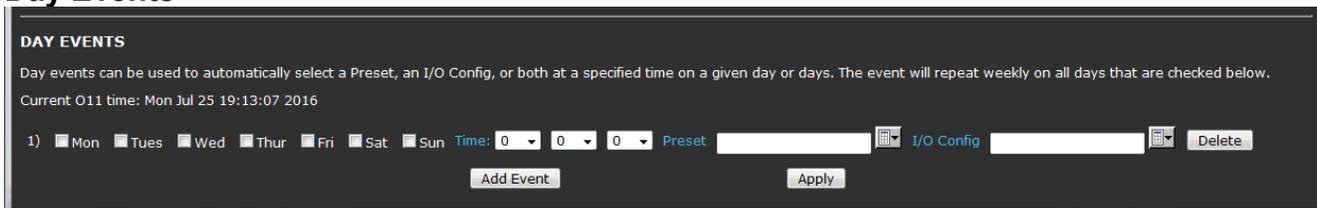
Enter the numeric IP address of the desired NTP server in the NTP Server box and choose your time zone from the NTP Time Zone dropdown list. Then touch “APPLY”.

## Reverse Remote Configuration



Allows you to point the Omnia at a server and make an outbound SSH remote control and diagnostic connection. This can be used to tunnel through a firewall and allow support access. Contact Omnia Support for more information.

## Day Events



Day events (found at the bottom of the GPIO / Events page in the remote webpage interface) can be used to automatically select a Preset, I/O Config, or both at a specified time on a given day or days. The event will repeat weekly on all days that are checked.

To add another day event, click the “Add Event” button. Once your day events are as you like them, click “Apply” to activate them.

Individual day events can be deleted by clicking the “Delete” button to the right of each day event line.

## INTRODUCTION to G-Force

Hello, and thanks for your interest in Omnia.11 G-Force!

The Omnia.11 G-Force option is the result of several years of intense Research and Development by Frank Foti and Cornelius Gould with the help of Team Omnia including Mark Manolio, Rob Dye and Frank Foti's boss, his pet cat, Silvio Dante - who provided the funding for the project.

Seriously though, The Omnia Team is proud to bring this technical achievement to our flagship audio processor! G-Force ships as the standard processing engine on all new Omnia.11 units and is available as an optional plugin on all existing Omnia.11 units running v3.0 software or higher. G-Force brings groundbreaking improvements to the art of processing! A demo mode is included in v3.0 so you can try G-Force without having to purchase a license.

A little background on G-Force is in order.

The overall goal of G-Force was to spread the intelligent processing engines to every stage of dynamics processing, including bass clipper management. It has always been Cornelius' goal to provide intelligence to dynamics processing so that complicated time constant operations could be performed and manipulated with just a small number of parameters for the end user.

Version 1.x of the Omnia.11 was the first step in this direction. Omnia.11 G-Force features dramatic improvements in this area, and the intelligence encompasses all aspects of dynamics processing -- up to and including the program adaptive bass clipper.

Since all of the dynamics processing sections feature internal intelligence, we are able to use the computer in the Omnia.11 to coordinate the local intelligence in each stage. This is done in such a way that their actions can be more faithful to the source content while simultaneously providing unparalleled source-to-source consistency.

One tremendous benefit that this computer management of the intelligent stages brings to the show is the new "Quick Setup" tab. Early testers of G-Force found that the Quick Setup section provided the controls they needed to get their station "dialed into the zone" within 20 minutes or so! This is a great improvement over the days of hunting through the large array of controls available to find that perfect combination of settings that brings your station to life.

During focus group discussions, potential end users liked to refer to the new quick start tab as the "PD Page", where programmers with very little knowledge of audio processing are able to dial in the overall sound of the radio station with just 9 controls.

Of course, the advanced settings are all still there; just think of them as tools to "put the icing on the cake."

The new intelligent limiter sections of G-Force are extremely powerful compared to Omnia.11 version 1.x. You can make adjustments that were absolutely unthinkable in 1.x due to intelligent limiter sidechains as well as advanced intermod mitigation algorithms that allow the limiters to operate quickly and positively. They are able to control program peaks effectively and transparently for superior clipper protection. This means music with more punch, loudness, and clarity than before while providing the best on-air announcer vocal performance yet!

The limiter sections are so effective that the "Auto Sense" function, which was a key feature in version 1.x, is not needed (or desired) in Omnia.11 G-Force.

We feel confident that you will enjoy the sound quality of G-Force. In addition, we hope you will also appreciate its forgiving, effortless and positive reaction to user adjustments that will make getting your on-air signature sound fun again.

Now, get out there, and make some great audio!

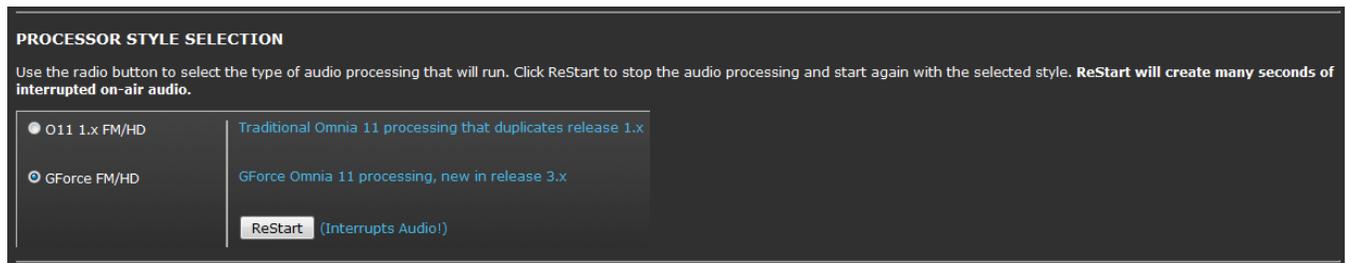
## OPERATION

Ensure that the 11 is running in the blue G-Force mode. If not, navigate to the “PROCESSOR STYLE SELECTION” section in the Configuration page of the remote control webpage interface.

Version 3.0 comes with a demo mode so you can evaluate G-Force without purchasing a license. In demo mode, audio is interrupted every with 1 second of silence every four hours, and the front panel will indicate “DEMO MODE” in bold letters.

To switch to G-Force mode, select the G-Force radio button and then click “ReStart”. **Note: The unit will reboot causing audio interruption.**

You can switch back to “traditional” (orange) mode at any time by selecting the O11 1.x (that is: v3.0 running the 1.x algorithm) radio button followed by “ReStart”. **Note: The unit will reboot causing audio interruption.**



### Omnia.11 G-Force Preset Selection

Our suggested method for using G-Force for the first time is to listen to all of the presets while offline. Pick the ones that sound closest to what you want on-air. Then put the Omnia.11 G-Force on-air, listen to those candidate presets on your “trusted” radios, and decide on one to start with.

Once you’ve picked the winning preset on air, chances are that programmers will want to make some tweaks. The first step to the tuning process starts on the Quick Setup tab. Do start here first, as Quick Setup operates on a global level that touches many internal parameters not accessible by any of the other controls in the user interface.



Quick Setup Tab

Tips for using the Quick Start controls to adjust a preset to match your desired sound:

- A. If preset is louder than desired but otherwise has the sound you desire, you have two choices: Preserve the texture of the preset and reduce loudness by lowering the “clipper drive” to taste, or create a more open texture for the given loudness of the preset by lowering the limiter drive which will reduce the “overall density”.
- B. Overall bass levels of a preset can be set using the “Bass” control. This will adjust many parameters simultaneously (including important but hidden ones) that govern the bass content of a given preset.
- C. The brightness characteristics of a preset are determined by the three brightness controls. These controls are somewhat interactive with each other and adjust many “under the hood” parameters that determine the high frequency personality of a preset.
- D. The stereo sound stage can be manipulated using the Stereo Enhance control. Our stereo enhancer has also been updated, and to our ears, it captures the sound of the “Space EFX” plugin of the original Omnia classic. The effect is pleasing and the new stereo enhancer shuts itself off completely during mono content. The density control adjusts the speed of enhancement. This is helpful to sculpt the type of stereo sound field you will have when the effect is used.

With these nine “Quick Setup” controls, most users should be able to “dial in” many presets to suit their markets using this small collection of controls alone. More advanced users will find these controls to be very powerful as well as they interact with the existing controls in the advanced menus of the Omnia.11 V3. We encourage you to revisit the quick setup controls to “feel their effect” after making changes to more advanced settings elsewhere in the menu system.

When finished making adjustments, be sure to save your modified preset with a new name (you can’t overwrite the factory presets) using “Save Current As” in the Preset tab.

### Quick Setup Control Descriptions

- **Clipper Drive:** Adjusts the “brute force” loudness level of the Omnia.11. Higher levels of clipper drive equal greater loudness, with the potential side-effect of greater overall distortion. Use carefully to avoid unnecessary listener fatigue.
- **Limiter Drive:** Adjusts the overall drive level of the multiband limiter system. The effect of limiter drive in G-Force is VERY different from earlier Omnia.11 versions. The effect of greater amounts of limiter drive is that of more on-air density, and not necessarily that of greater loudness. Extremely high levels of limiter drive creates a “wall of sound” type of effect, but be careful. Such levels of drive can cause listener fatigue (and tune-out after a relatively short period of time).
- **Bass:** The Omnia.11 had many places in the system to tweak bass. Specifically the types of bass, the texture of bass, etc. This control simply turns the overall bass level up or down...because sometimes that’s simply all you really want to do. The bass control tunes many “hidden” parameters within the algorithm with this control.
- **Bass Thump:** Adjusts many different (hidden) parameters under the hood including the action of the dynamic bass clipper. At higher levels, the “kick” or “thump” action of bass material is emphasized.
- **Presence:** This control tunes many hidden parameters to bring out the “presence” or higher mids (brightness) in program content.
- **Treble:** This control tunes many hidden parameters to bring out the highs in program content. The effect starts around the 5K range and up.

- **Sparkle:** The Sparkle control brings out the “air” or “sparkle” region of the audio spectrum. Use just enough to add a touch of professionalism to your on-air sound. Too much, however, can be a bit irritating. This control shares a number of parameters with the “treble” control, so the two are somewhat interactive.
- **Stereo Enh:** Adjusts the stereo image enhancer. Higher values widen the stereo sound field. Careful adjustment of this parameter and the “St. Enh. Density” control can provide a unique stereo soundstage for your station.
- **St. Enh Density:** Adjusts how fast the stereo enhancer algorithm functions. Lower values equate to a slower speed, and can be useful for emphasizing stereo ambient effects (such as reverb. Higher values (faster speeds) are useful for enhancing specific elements within the stereo soundfield (such as instruments, vocals, etc.). When using slower values, it is advisable to use lower enhancement levels (“Stereo Enh” control).

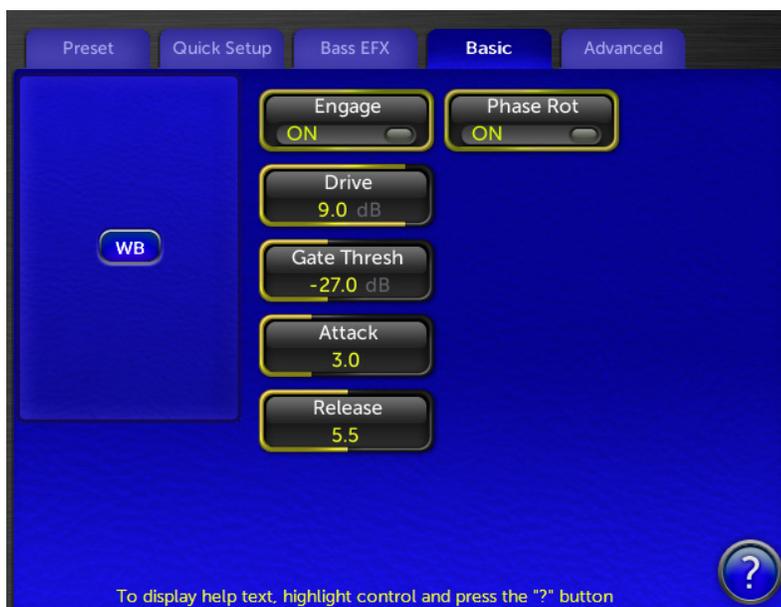
### Intelligent Wideband AGC

The wideband AGC in the “version 1.x” of the Omnia.11 was widely acclaimed by many as “the best darn wideband AGC ever”. With G-Force, we took things to a new level.

The new wideband AGC algorithm not only looks at the audio using multiple frequency bands, it also uses psychoacoustic analysis to add more power to the intelligently controlled side-chain. Gain reduction is not just derived by level, but is also based on several psychoacoustic properties. The intent is to provide smooth yet responsive gain control over a wide range of program levels, and to do it in a way that is least obtrusive to the ear and to provide intelligent data for downstream control stages.

The new wideband AGC can be adjusted to ride through material that alternates between full instrumentation to moments of single instrument (or solo voice) and back without obvious disruption of the sound stage, all while still maintaining precise level control.

The Basic Tab controls on the new Wideband AGC operate exactly like the ones in 1.x.



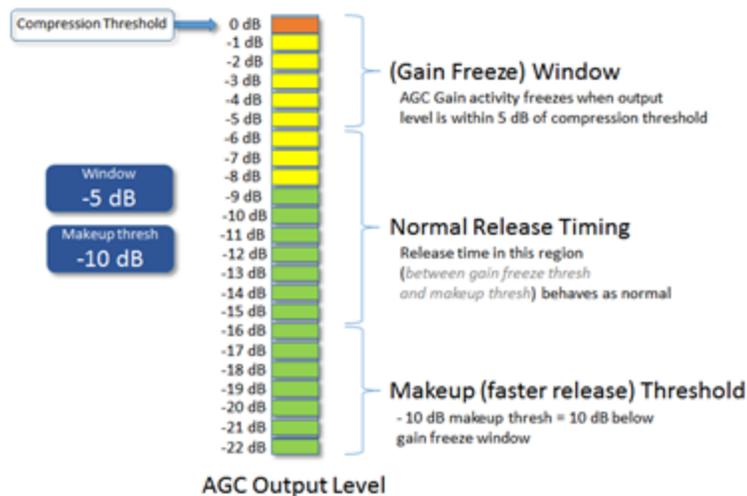
However, there are major advancements in the operation of the “Window” and “Make Up” functions found in the “Advanced” tab (shown on the next page).

## Advanced Tab Wideband AGC Control Descriptions



- **Window:** The wideband AGC system of the Omnia.11 (as part of the overall algorithm improvements) now features an improved windowing algorithm. Audio that falls within the “do nothing” window (as defined by the user) will cause the AGC to freeze, neither compressing or releasing. This is useful when high RMS rich material (already processed loudly) is fed to the Omnia.11 as the AGC system will not add more “density” to already dense material as long as their waveforms fall within the window. This is all thanks to improved RMS and density detection schemes that are better able to differentiate between program peaks and long term average levels. You will notice much improved “stability” in the gain riding operation of the AGC system but responsiveness when the need arises.
- **Makeup Threshold:** The Makeup Threshold control itself isn’t new, but its operation has changed a bit. It interacts with the Window control and can be thought of as a “soft window”. Audio that remains above the makeup threshold value will use the release time as defined by the user. Audio that falls below the makeup threshold value will have a faster release time, allowing low level material to be brought up faster without using a blanket faster release time which could cause listening fatigue. When the audio level is brought up to the Makeup threshold, the normal (user) release time will once again be applied.

The value expressed in the Makeup Gain controls (in dB) is the audio level below the level expressed in the window control where makeup action occurs. The combination of the Window make Up Threshold controls constitutes a “dual staged windowing” system for the AGCs.



- **RTP Level:** RTP stands for Return to Platform. What RTP does is return the gain of the AGC to the selected amount of gain reduction or “platform level” in the absence of audio. This control adjusts the “resting” or “platform” gain reduction level the AGC will return to when audio pauses or stops (while gated).

The primary purpose of RTP is to prevent the AGC gate from increasing the gain unnecessarily or holding the gain too low during pauses in audio, which could result in an increase in noise level or unexpected sudden increase in level when the audio returns.

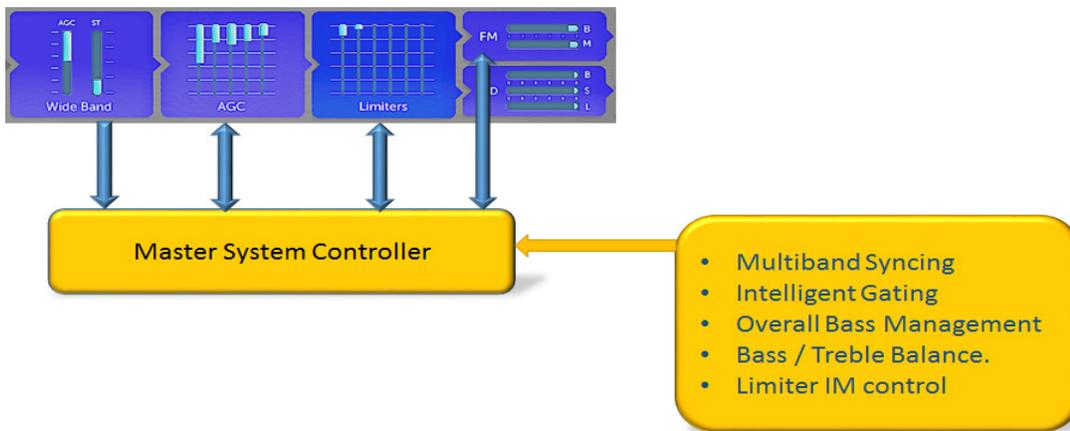
- **RTP Speed:** controls how fast the adjustment to the platform level (set with the RTP Level control above) takes place – i.e., how long it takes the AGC to move to the target RTP gain reduction level. Range is from “0” (off) to 11 (fast).

Note: For maximum gain-riding range, we suggest a Wide Band RTP Speed setting of “0.0” for most popular music formats which effectively disables RTP. Use higher settings if you have consistent board operators and don’t mind that quieter program sections remain quieter.

- **Pause Threshold:** activates and changes the characteristics of the dual platform “smart” moment-to-moment gate function. A setting of 0.0 turns off the smart gating, reverting it to conventional gate behavior. Settings other than 0.0 activate the smart gating function and higher settings allow the smart gating to be more aggressive.

Note: Middle-range settings can completely eliminate any perceived “pumping” effect during shorter quiet sections without compromising overall longer-tem gain-riding ability.

- **Filter Freq:** (High-pass Filter Frequency): This drop-down control adjusts the cutoff frequency of the built-in high-pass (lo-cut) filter. Available settings are “Out” (not recommended), “20 Hz”, “30 Hz” and “40 Hz”. A setting of at least “20 Hz” is suggested for most formats to keep sub-sonic signals from affecting the processing performance.
- **Ratio:** This variable control adjusts the overall compression ratio of the Wideband AGC. As of version 3.0r78, the values expressed on this control are relative. Lower values equal lower ratio values. .1 is roughly 10:1. A value of .02 is about 2:1.



Since the intelligent sidechain of the wideband AGC contains a treasure trove of information about the acoustic sound signature of material on your program buss, we can use this data to manipulate all of the stages after the wideband AGC making the multiband AGCs, limiters, and even portions of the clipping process “program aware”. It is also where the data used by the “Intelligent Gating” and “Mode Control” sections comes from. This means G-Force is capable of being extremely transparent sounding even during heavy dynamics processing.

This data is used by the system controller (the “compute” portion) of the Omnia.11 to synchronize the gating and dynamics functions of stages downstream from the wideband AGC, providing unparalleled clarity and punch to the multiband AGCs and Limiters.

In the past, it could be a struggle to adjust the multiband processing sections downstream of the initial AGC stage. Much of the time was spent managing the “mushiness” of the sound that typically happens as processing stages become further and further removed from the program input.

The system controller can help here since it is able to keep all downstream stages “source aware” so that as much program impact as possible can make its way to the listening audience. You decide how much you want to let through and are not hampered by the limitations of “stacking stages” of processing.

## New Multiband AGC

### AGC Basic Tab and Dynamic EQ Controls



- **Drive:** This controls the overall drive level into the multiband AGC system. Individual band drives can be adjusted by tapping the “XO” button to the left of the controls.

- **Gate Master:** The Gate Master adds or subtracts (depending on how it is adjusted) the gating threshold on all of the multiband AGC bands together. This control *offsets* the values of the individual multiband gate thresholds.

- **Attack Offset:** Attack Offset makes a relative change to the individual attack times within each of the multiband AGCs. Positive values speed up the attack times, negative values slow the attack times down.

- **Release Offset:** The Release Offset control makes a relative change to the individual release times within each of the multiband AGCs. Positive values speed up release times, negative values slow the release times down.
- **Intelligent Gating (Master Intel Gate):** As part of the full implementation of Cornelius' "G-Force Technology", there are a few new functions introduced into the Omnia.11's G-Force upgrade. Intelligent Gating is one of them.

Since the G-Force system operates on a global level encompassing ALL of the dynamics processing, it is aware of what is happening in all stages of the process. As a result, it is capable of altering the individual bands of the multiband AGC for processing that better "matches" the program source.

One of the critical aspects of this is coordination of the multiband AGCs so that their operation "blends" with the source material better. A critical function is the Intelligent Gating system.

The G-Force algorithm can alter the behavior of the multiband AGC's gating functions in a way that allows them to contribute significantly to building the RMS energy needed for consistent loudness while suppressing common side-effects often heard in other multiband AGC systems. As the program spectrum shifts around, the algorithm intelligently shifts the gating activity to keep the bulk of RMS build-up centered around the bands with the most audio energy.

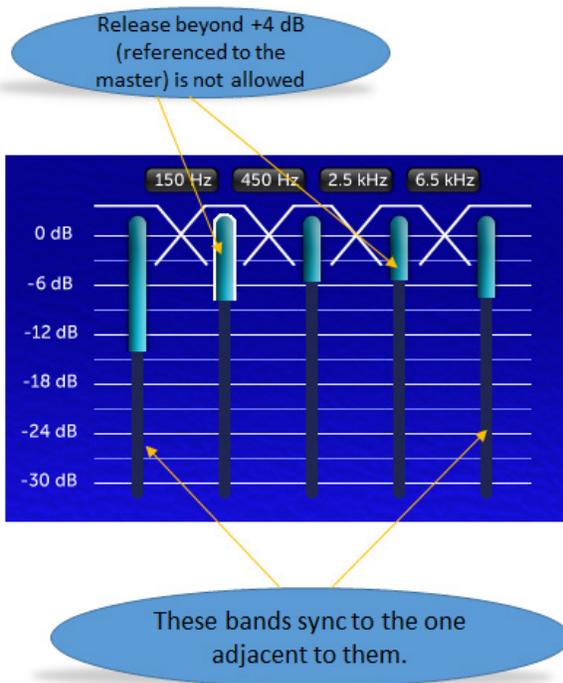
How much influence this system has over the normal gating functions is determined by the "Master Intel(igence) Gate" control. Higher values (towards 0dB) mean stronger control by G-Force.

The intelligent gating system allows the multiband AGC system to operate over the full range permitted by its local system of gates. As a result, higher levels of intelligent gating will not cause the multibands to "stick" at some high level during moments of dynamic level change. It is only concerned with keeping the bands with minimal energy from floating around "unchecked".

When adjusted (or "tweaked") along with the Sync control, a LOT of power can be unleashed!

- **Sync:** This controls the amount of adjacent band syncing in the 5-Band AGC, relative to the middle (MH or ML) band. A setting of "0.0 dB" provides maximum sync between the bands. At this setting, minimal spectral manipulation will take place. A setting of "-2.0 dB" will allow 2 dB more "independence" in the immediately adjacent band and 4 dB in the second-adjacent bands. Use lower settings (along with lower settings of the Gate Thresh controls) to get more spectral manipulation. Use higher settings to preserve the frequency balance of the original program material. Also, please note that on presets where the AGCs are operating faster, a lower Sync setting will generally be needed.

- **Sync Master:** The Sync Master control in the Basic tab of the AGC menu allows you to select whether AGC Band 2 (the ML band) or Band 3 (the MH band) will be the master band the other bands reference to when using the Sync feature. In the example below, a Sync value of -4.0dB has been applied:



Select “ML Master” when you want the overall brightness to match closer to the source.

Select “MH Master” if you want things to be brighter overall.

If the Sync control in the Basic tab of the AGC menu is turned down, this control will have less effect. (And virtually no effect at all if Sync is set to -12)

- **Engage Control:** If you would like to bypass the 5-Band AGC section, switch off the Engage switch.
- **Process Mode Switch Control:** This switch determines which bands have the G-Force influence of the AGC control side-chains. When switched on, the side-chains are manipulated by the system controller (Omnia.11’s computer) in a way that produces more “open” and “dynamic” sounding audio. As a result, audio within the bands chosen for control “move forward” in the mix, and sound more “musical”.

There are similar controls within the multiband limiter system as well.

The process mode switch control has three options.

- 0: There is no G-Force altering of the multiband AGC side-chains.
- 1: G-Force control is applied to the LO, and ML bands of the AGC
- 2: G-Force control is applied to ALL bands of the multiband AGC system.

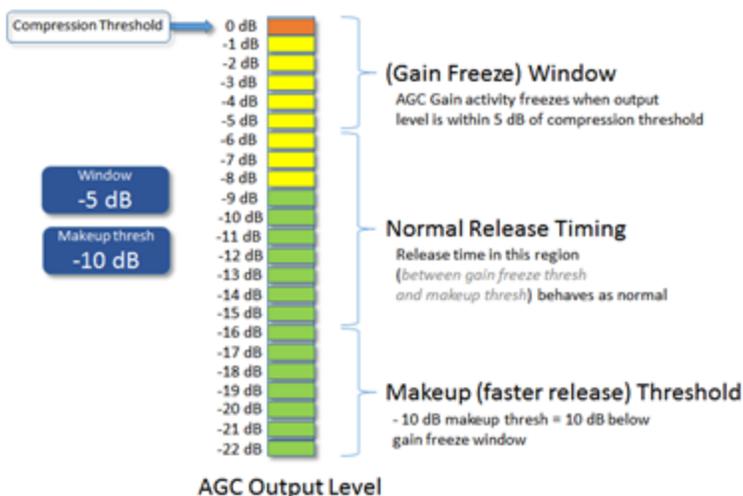


## Advanced Tab Controls



HI Band AGC Advanced Tab Controls

Each of the multiband AGC sections has a few new controls added. All of the multiband AGC bands feature “Window” and “Threshold” controls. The three highest bands also have their own “Intel Gate” controls.



- The Window Control:** The wideband AGC system of the Omnia.11 has always featured a wideband “do nothing” window. We have now extended this functionality to the multiband AGCs. The newly re-designed windowing algorithm makes it possible to finally implement this function to the multiband AGCs. For more information on the windowing function, refer to the Wideband AGC section.

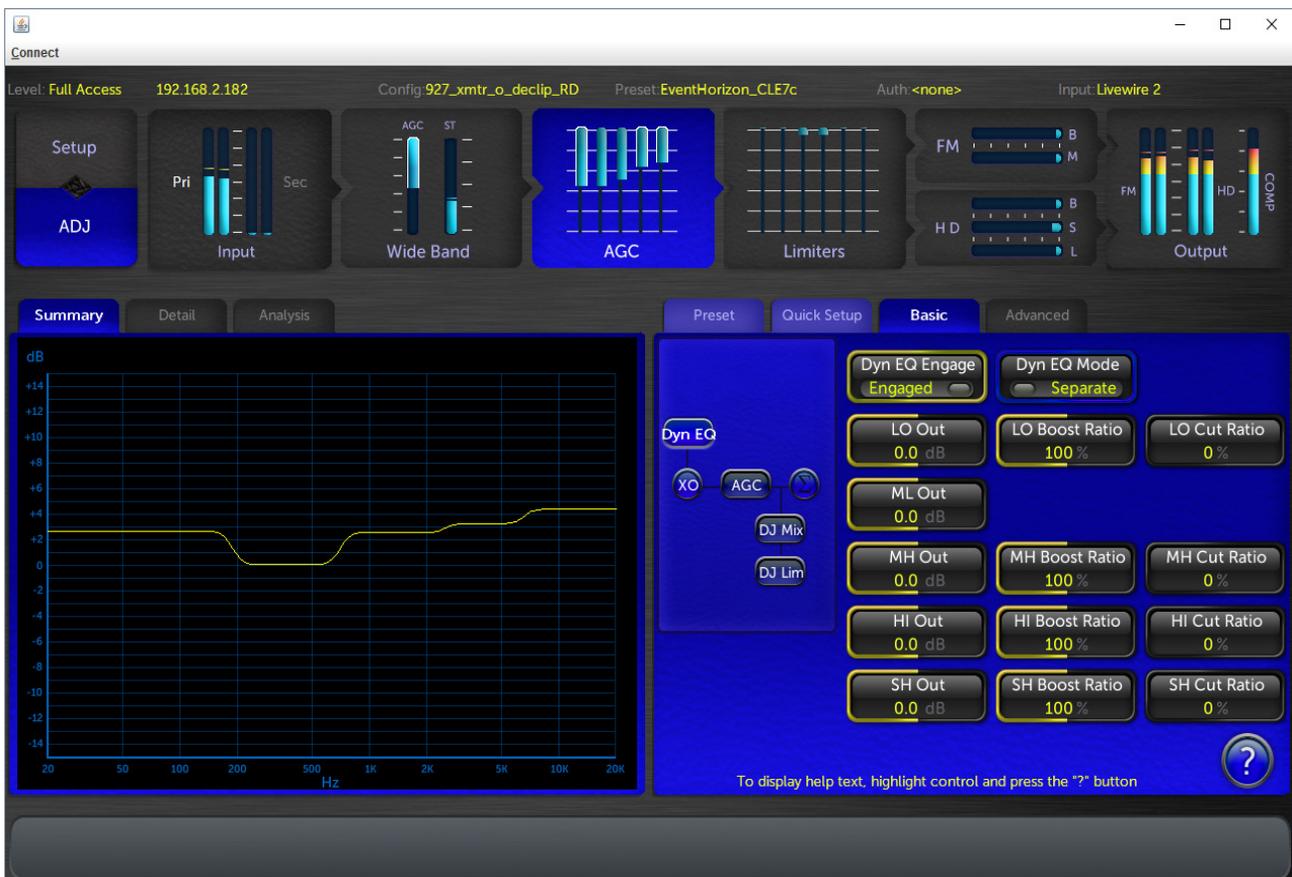
Audio that falls within the “do nothing” window (as defined by the user) will cause the AGC band to “sit there”, neither compressing nor releasing. This is useful when high RMS rich material (already processed loudly) is fed to the Omnia.11 as the AGC system will not add more “density” to already dense material – as long as the waveforms fall within this do nothing window.

- Makeup Threshold:** The makeup thresholds in the multiband AGCs operate the same as in the wideband AGC. The Makeup threshold interacts with the window (gain freeze window) control. The Makeup threshold control can be thought of as a “soft window”. Audio that remains above the makeup threshold value will use the release time that is defined by the user. Audio that falls below the makeup threshold value will have a faster release time – this allows low level material to be brought up faster without using a blanket faster release time, which could cause listening fatigue. When the audio level is brought up to the Makeup threshold, the normal (user) release time will once again be applied. The value expressed in the Makeup Gain controls (in dB) is the audio level below the level expressed in the window control where makeup action occurs. The combination of Window, and Make Up threshold constitutes a “Dual staged windowing” system for the AGCs.

- **Threshold Controls:** We've added Threshold controls to the multiband AGC system. This will allow expert users to custom tailor what "flat frequency response" means for their formats.
- **Intelligent Gate (Offset):** In addition to the master intelligent gating in the top level multiband AGC control set, we've provided means via the "Intel Gate" controls (in the advanced tab) to offset the value of the master intelligent gate control on the highest three bands of the multiband AGC. This ability comes in handy in controlling the "brightness" characteristics of the multiband AGC system. Lower "Intel Gate" numbers allow that band to "stand out" more in the mix.

## Dynamic EQ - An Overview

Adjustment of the dynamic EQ can be made by clicking on the "Dyn EQ" button on the multiband AGC Basic controls tab.



The Dynamic EQ is a revolutionary tool for audio processing. Its history can be traced back to the Telos Delta phone hybrid from the mid 90's, and later adopted into the Telos VX phone system. It was revolutionary for phone hybrids, and Frank Foti and Cornelius Gould recognized it to be a powerful concept to bring to audio processing.

**The dynamic EQ is NOT a multiband compressor, AGC, or other similar process. It is a process that ONLY operates as a program controlled equalizer. It does not care about level. If the audio is quiet, it will do its thing at that quiet level. If it is loud, it will do its thing at that level. As a result, it can provide spectral consistency from source to source *without* messing with the dynamic range of the program content!**

For Omnia.11 G-Force, the Dynamic EQ was transformed into a four band process, and placed ahead of the multiband AGC. It is able to manipulate the frequency balance of the LO, MH, HI, and SH bands. The ML band is used as the reference for the others, so the frequency balance there is static, but the static level can be changed by the end user for tailoring the frequency balance that is output to the multiband AGC section, if desired.

The operation of the dynamic EQ can be observed using the dynamic graph to the left of the controls. It will display in real time what actions the Dynamic EQ is performing on program content.

### Dynamic EQ Adjustment

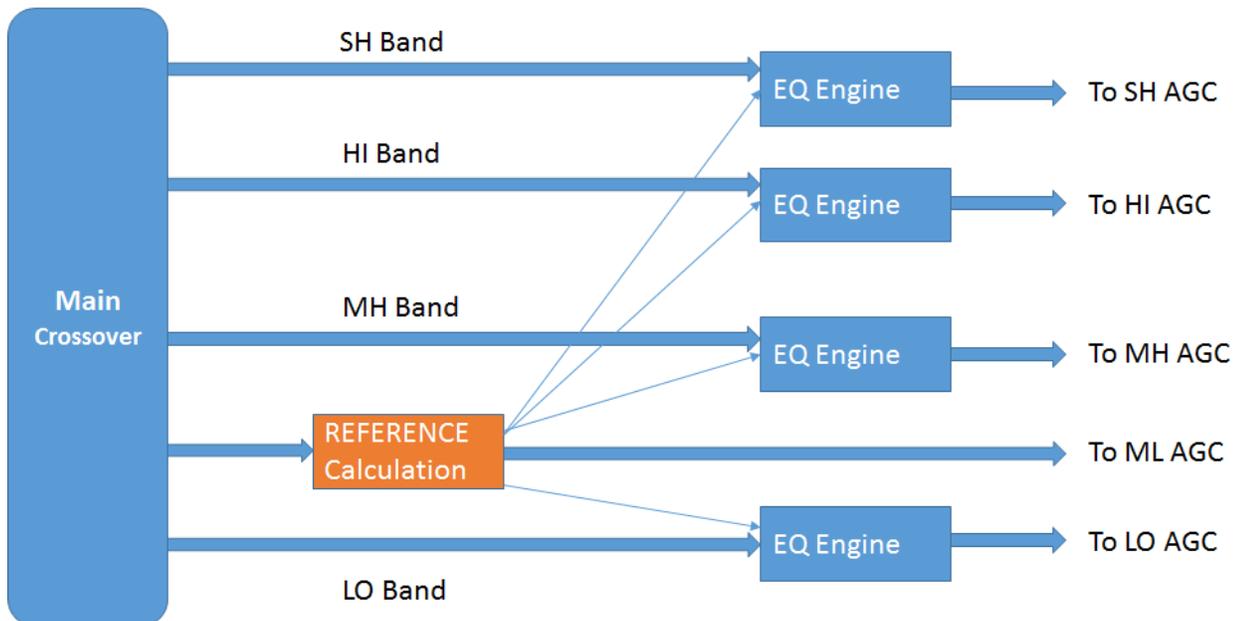
There are a number of controls available to the end user for customizing its operation to their respective formats.

- Dyn EQ Engage:** This switch can be used to bypass the Dynamic EQ stage in the Omna.11 processor. It can be useful to A/B with and without, particularly when you see an extreme equalization curve being developed. Doing this provides great insight into the power of the Dynamic EQ feature, and is a great diagnostic tool!
- Dyn EQ Mode:** There are two modes of operation for the Dynamic EQ: "Separate" and "Interactive".



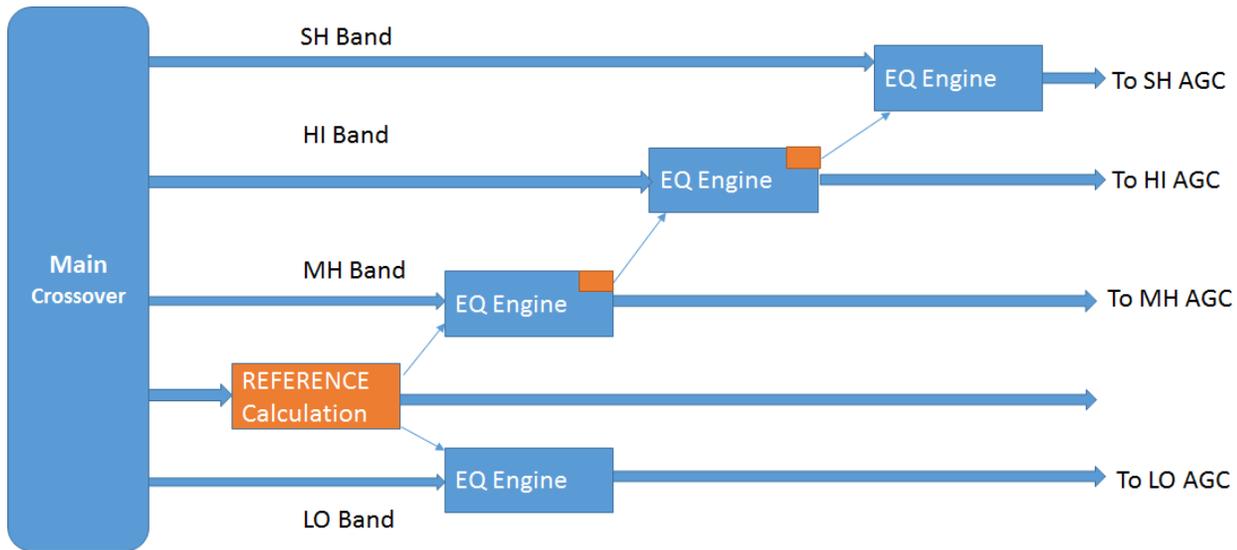
**Separate Mode:** In Separate mode, each individual EQ engine watches the master reference calculation algorithm, which monitors the "ML" crossover output.

#### Dyneq "SEPARATE" Mode



Separate Mode maintains a "warmer" tonal balance with "a bit of top end sparkle". In Separate mode, the Dynamic EQ graphic display shows the frequency response of the Dynamic EQ system as it feeds the multiband AGC.

**Interactive Mode:** In Interactive Mode, the top three bands of dynamic EQ operate in a chain, where the SH EQ engine watches the HI EQ engine for its reference, and the HI EQ engine watches the MH engine. The MH engine watches the reference engine.



Interactive Mode maintains a “brighter” tonal balance.

The Dynamic EQ display representation needs to be interpreted a bit differently in interactive mode. You may see a graph that shows 2 dB of boost in the MH EQ, none in the HI EQ, and, maybe 5 dB of boost in the SH EQ. While this looks like it would be strange, keep in mind that what you are seeing in this case (INTERACTIVE MODE ONLY) is a representation of the gain calculations relative to the adjacent reference band.

- **Boost Ratios:** The boost ratio controls are used to limit how “hard” the EQ engines operate. 100% settings allow the system to operate in a 1:1 ratio. In other words, a 3dB difference (or error) between an individual EQ Engine and its reference results in a 3 dB EQ correction. 50% settings result in a 1.5 dB correction for the same scenario.
- **Cut Ratios:** In the initial G-Force release, they are disabled. When enabled, they will allow the ability to reduce EQ gain when necessary.

## New Limiter Section



### Basic Tab Controls

In Omnia.11 Version V3 with G-Force, the G-Force Technology extends to the multiband limiter section as well! Users can choose how much of this effect is applied and where using the LF and HF mode switch controls, as well as the LF & HF density controls.

The main goal of the G-Force Technology in the limiter stages is to manage & create more consistency in the texturing created by the multiband limiters.

- **Drive control:** In Omnia.11 G-Force, the limiter drive control has an entirely new role in life. It not only adjusts the overall drive level to the limiters (as before) but now it serves a bigger purpose of “texturing” your station’s audio.

Due to the super tight control characteristics of the new limiter system, and its new high speed ultra-low IMD management algorithms, driving the limiters hard without loss of quality or clipper management is possible! Driving the limiters harder causes a smooth, forgiving, and carefree transition to a “thicker” or “denser” on-air sound.

Older version issues such as inconsistent live vocal quality are GREATLY reduced (if not eliminated) in G-Force. Driving the limiters lighter or harder does not change loudness levels on the dial. It only manages how “dense” your station’s audio sounds. For a more open / natural sound, watch the multiband limiter activity on high RMS content (like the choruses on heavily compressed / limited content like P!nk, or Kelly Clarkson songs - or metal songs in general), and adjust the multiband limiter Drive to just “tickle” the limiters to about maybe 1-2 dB or so (3-4 dB when the optional Perfect DeClipper is used). What you will see is that the limiters will run extremely lightly on high RMS material and work harder on dynamic content (such as older songs, and live voice), yet sound remarkably transparent and loud! Why “re-limit” program material that is already limited to within an inch of sanity and doesn’t need any additional density enhancement? This allows the limiters to work as real peak limiters, adding density only to material that needs it.

- **Attack Offset:** Similar to the scheme in older Omnia.11 software, the Attack Offset control makes a global change to all of the attack times in the multiband limiter system. A bigger number equates to a faster attack time. The individual attack and release times are scaled up or down according to the Attack Offset control setting. A value of “-5” places the multiband limiter attack time under computer control (or automatic attack), where the system actively (dynamically) modulates attack times for the best “punch” vs. “clipper peak control”. When in “automatic attack” mode, the individual attack controls in each of the limiter sections become controls to “modify the shape” of the automatic attack times.

Since the limiters’ attack times intelligently engage whenever extreme conditions exist, using a value of -5 places the system solely under the control of the computer. Higher Attack Offset values creates an “override”, allowing attack times to be more under user control, and less under the control of the computer -- unless a condition occurs to cause the user value to be insufficient to protect the final clipper, in which case, the computer will (temporarily) override user attack settings.

- **Release Offset:** The release offset control does the opposite of the Attack Offset control mentioned above. A higher value creates a faster release time across all limiters. A value of “5” places the exact release time of the individual limiters under control of the computer (automatic control).

When in automatic mode, the release times are actively modulated to release as fast as possible without causing objectionable intermod distortion, and minimizing listener fatigue. Settings lower than “5” gently transitions to a slower, program controlled, release slope. Lower values are useful for programming meant for long term critical listening.

- **LF & HF Limiter Density controls:** Use these controls to set the desired amount of “density texturing” of the limiter sections. Higher number values equal more density (or “thickness”) created in the high or low frequency bands. For greater TSL (Time Spent Listening), lower values in the HF Lim Density control create less long term listening fatigue. We recommend a value of around “2”.

Higher values of HF Lim Density can be useful where limiter activity in general is extremely light, or if users want to emulate the HF characteristics of older analog audio processing gear...which can be useful for some “retro” formats.

There is more freedom in the lower frequency bands (LF Lim Density control). Lower value numbers here create more “openness” in the low frequency and low-mid bands (SL, LO, and ML bands). Higher level settings give more “sustain” to these frequencies, and can add a level of “excitement” to some material.

The density controls operate by modifying parameters in the computer controlled attack & release algorithms.

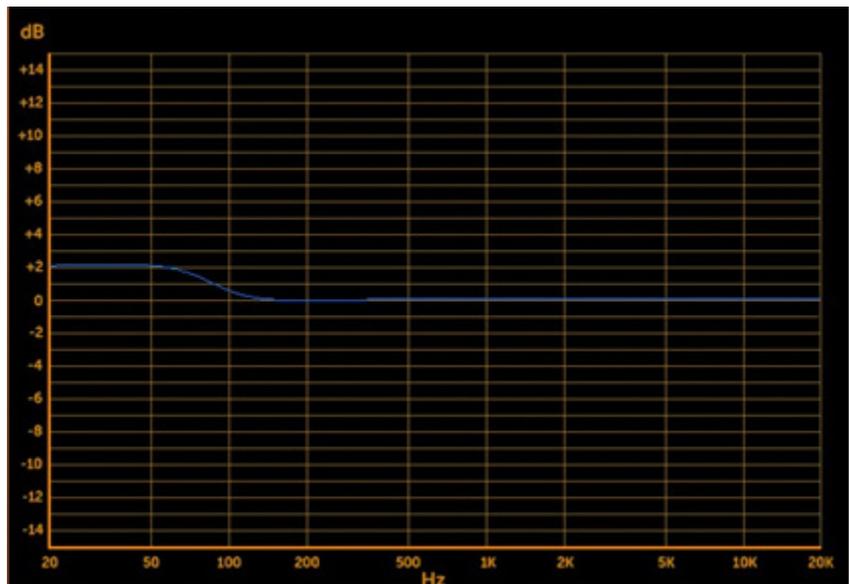
- **Limiter Mode switches:** These switches determine which bands have dynamics sidechain manipulation by the system controller (Omnia.11’s computer). When switched on, the sidechains are manipulated in a way that produces more “open” and “dynamic” sounding audio vs. the traditional “flat” sound produced by multiband limiters. As a result, audio within the bands chosen for intelligent control “move forward” in the mix, and sound more “musical”.
- **LF Limiter modes:** The LF limiter mode switch features three modes:  
Mode 0 is “off”.  
Mode 1 turns the SL and LO bands on. This produces more dynamic audio in the bass frequencies only.  
Mode 2 turns the control mode “on” for not only the SL and LO bands, but the ML band as well.
- **HF Limiter modes:** There are two modes that determine the dynamic control status for the MH, HI, and SH bands:  
 Mode “0” is off.  
 Mode “1” is on.

## Improved Equalization System

The limiter section of the Omnia.11 now features an extensive equalization system.



In addition to the previous three parametric bands of equalization, users now have a fully adjustable low and high shelf filters. This comes in VERY handy when there is a desire to reproduce the classic "low end" sound of earlier Omnia processors. For example, you can set the low shelf to lowpass at 80 Hz with a Q of "0.9", and a few dB's of boost for smooth pleasing "oomph" to the bass texture of program material.



## Bass EFX Tab



### **Solar Plexus**

Solar Plexus is in G-Force as well! We've added a new control called "**Subharmonic Balance**".

When Subharmonic Bal is set to "Off" the Solar Plexus effect is very close to the subtle "thunder" as heard in the original "thunder bass" control in earlier Omnia.11 version 1.4. When Subharmonic Balance is turned "up" the Solar Plexus effect is more obvious, and encompasses a broader range of bass frequencies.

Similarly to Deep Bass range (see below), be careful not to apply too much of the Solar Plexus effect as it can exaggerate low frequency room noise or mic "plosives". Higher settings can also cause some audible distortion when heavy bass is present. Be sure to monitor on speakers or headphones that can reproduce the lowest frequencies in order to hear the full effect of what Solar Plexus is doing.

### **Deep Bass Boost & Warm Bass Boost**

These controls can be used to apply a "static boost" for both the Deep bass and Warm Bass enhancers. Boosting the levels here will cause an immediate and audible increase to their respective frequency bands.

The Phat Bass control adds subtle low mid / upper bass detail to program content, and helps to define the sound of bass not only in small speakers, but larger ones as well. The effect is program controlled, so do not fear the use of large amounts of "phat bass" boost.

### **Deep Bass & Warm Bass Range**

If these "range" controls are set to "0", there is no dynamic program controlled action of the bass enhancers. The static boost controls on the basic menu act as shelving (deep) and bandpass (warm) equalizers of sorts. As the range controls are increased, the Omnia.11 dynamically applies more enhancement in these frequency areas whenever they are deficient in the program source. The higher the settings, the more aggressively Omnia.11 will try to bring out these frequency tones. If there are already sufficient amounts of energy in these bands, the Omnia.11 will apply less enhancement to these bands. The Omnia.11 will not apply any additional enhancement to these frequency bands on material that has really strong bass content. It will only add where energy is deficient.

Be careful with high amounts of deep bass range if you do not have high pass filtering on studio mics. High levels of deep bass range can enhance microphone "plosives". So, if you have a notorious "P-Popper" on staff, either employ 80 Hz high pass filtering on the studio mic processor, or use less deep bass range! Excessive warm bass range boost can cause some program material to sound "muddy". Listen carefully, and adjust the controls using small amounts over a long period of careful listening.

### Deep Bass Slope

When set to 12 dB per octave, the deep bass / warm bass characteristics are broader, and favors upper bass / low mid tones. This is a useful setting for stations playing primarily older material (such as Classic Rock or 70s & 80s formats).

### Bass Enh Engage

The G-Force release features the ability to turn off the active bass enhancement stages to allow for “before and after” comparisons.

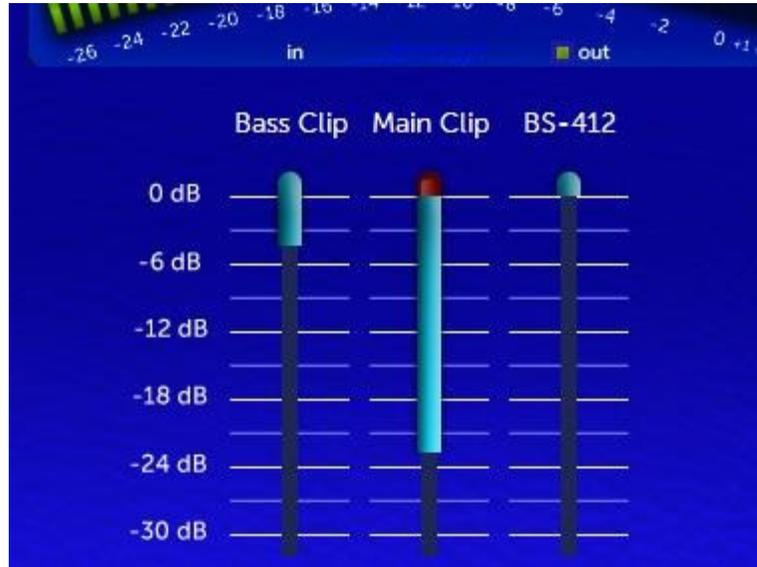
### New Clipper Features

The FM clipper section of the Omnia.11 V3 / G-Force update contains the same groundbreaking final limiter unveiled in version 1.6.

We’ve added a meter that quantifies the “perceived distortion” for a given clipper setting. This helps users to adjust for the “loudness vs. distortion” tradeoff.

The level of distortion will be displayed in red on top of the main clipping depth (Main Clip) meter (in blue).

Generally speaking, the FM clipper drive is properly adjusted when you are able to achieve the desired loudness with a minimum amount of distortion. Some adjusting of the “limiter drive” control may be necessary if the proper loudness level is not achieved without excessive distortion.



It is normal to see brief moments of high distortion readings that last fractions of a second. This is OK. You do not want long term distortion (red) levels beyond 1 or 2 dB or so. The exact reference here varies from market to market as the acceptable level of distortion is not the same across a broad range of radio markets.

### FM Clipper Advanced Features

Once you are in the FM Clipper section, choose the “advanced” tab below to switch to the advanced features.



### **Clipper Silk**

This function is similar to the “Clipper Silk” parameter available in older Omnias. Higher values feature a smoother sound to the clipper, lower values can provide more “clarity”, but could possibly be a bit less forgiving in terms of distortion. Care should be exercised when adjusting the dynamics and enhancement settings in earlier stages if lower values are used.

### **Bass Clip Drive**

Increasing bass clipper drive can create stronger “dominating” bass. It may be necessary to increase “Bass Clipper Tightness” at higher drive settings to prevent a “muddy sounding” low end.

### **Bass Clip Tight**

Higher settings create a “tighter” more defined bass sound. Lower settings create a “girthy” bass sound, but too much bass clipper drive with lower settings here could create a flabby overwhelming bass sound. Use care, and also adjust the “Bass Thump” in the quick setup tab if necessary.

### **Bass Punch**

This control shifts around the distortion products created by the bass clipper system. Higher settings allow more clarity of deep bass products, but might create some intermod distortion of higher frequencies. Lower settings produce less high frequency intermod distortion, with the trade-off being thinner sounding bass.

### **Perfect Declipper (optional)**

Omnia.11 G-Force was designed from the ground-up assuming the incorporation of Hans Van Zutphen’s “Perfect Declipper”, an ingenious real-time de-clipping algorithm.

What it does is to continuously monitor program source content as it arrives to the Omnia.11’s input. It watches for “clipped” waveforms (waveforms clipped by either lack of headroom, or deliberately in highly mastered music tracks). When it sees these clipped waveforms, it calculates the angular trajectories of the waveforms as they approach flat topping, it recalculates the peak that would have been there.

The Perfect Declipper does not stop there! It also monitors all of the harmonic waveforms, and their relationships to the fundamental frequencies that were present before flat-topping, and regenerates their activity around the main signals that were flat-topped!

This process greatly reduces (if not completely eliminates) distortion present in the mastering process. This is important for broadcast audio processing! It may seem silly at first glance to unclip material so it could be clipped later, but when you look closely, it makes a lot of sense!

Consider the fact that much of the sophisticated work that happens at the back-end level clipping system of today’s FM broadcast processors. The modern-day FM broadcast processor uses sophisticated clipping algorithms designed to hide much of the distortion you would normally hear for a given level of loudness (dial presence). Now consider that a lot of the same type of distortion is present in much of today’s modern mastering techniques - only not as sophisticated. There is NO distortion masking used at the record mastering level.

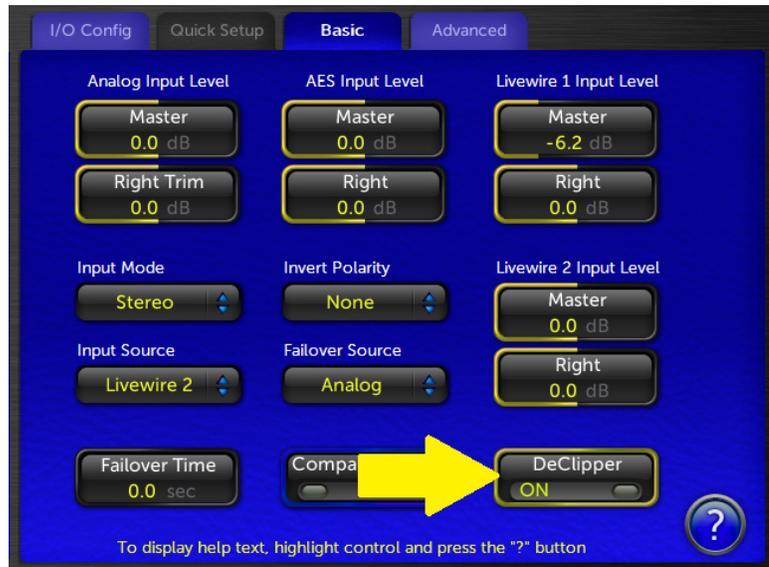
In this situation, much of the distortion the FM system is built to remove is already part of the program content. So the work of these advanced broadcast loudness clippers is compromised by the fact that the same type of distortion is in the source material! When run through broadcast processing, the distortion you don’t want to make on the air is already present in the source, thus making your station sound “bizzy”, or “fuzzy”.

Perfect Declipper adds clarity to your on-air sound by removing this distortion. Also, since much of the clipping in the mastering process removes just about all the peaks in percussion and other transient waveforms, modern source material sounds flat, uninteresting over the air. With Perfect Declipper, these transients are restored. Percussion (drums, kick drums) have impact again. Your music program audio will “breathe” on air, and have depth of field.

## Turning on Perfect DeClipper

The Perfect Declipper is located in the Basic tab of the Input menu and can be turned on (if licensed) by turning on the “DeClipper” switch.

The Perfect Declipper requires an activation license to function. If this option has not been purchased with G-Force, please contact your Omnia dealer to purchase a license.

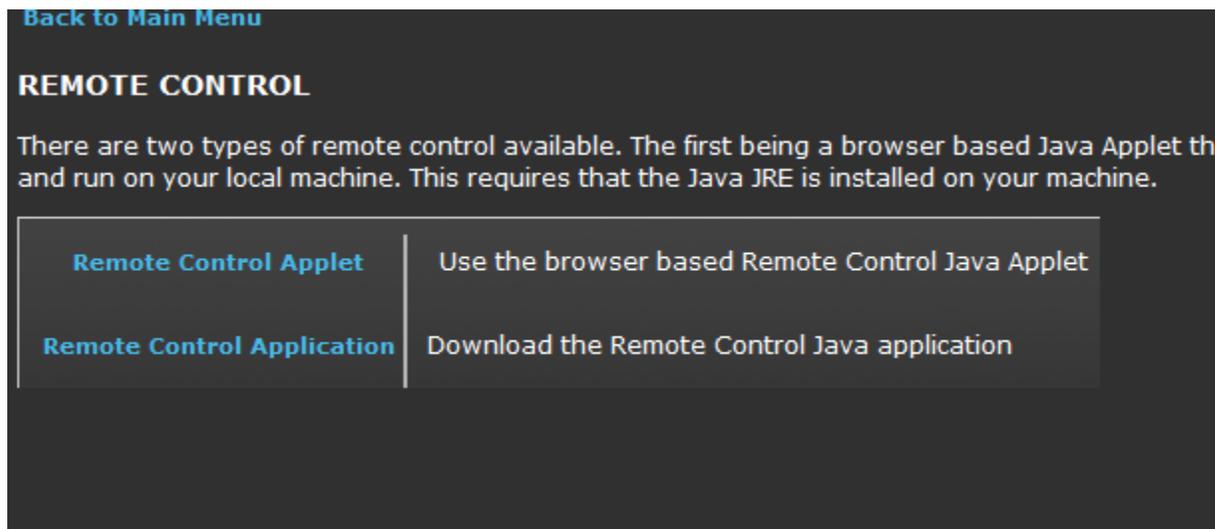


## New Remote Control Options

Omnia.11 G-Force now features two methods of remote management. The first is via the traditional Java Web browser based remote control. (Note that, to our knowledge as of this writing, only the Mozilla Firefox browser and some versions of Internet Explorer still have full Java capabilities).

The second is by a new downloadable Java stand-alone application. In recent years, it has become increasingly difficult to use the web browsers with Java due to security issues. Some browsers have eliminated Java support all together. This lead us to introduce a different, and more stable remote control approach.

The stand-alone download option is available by logging into the Omnia.11 with your browser, and going to the “remote” tab.

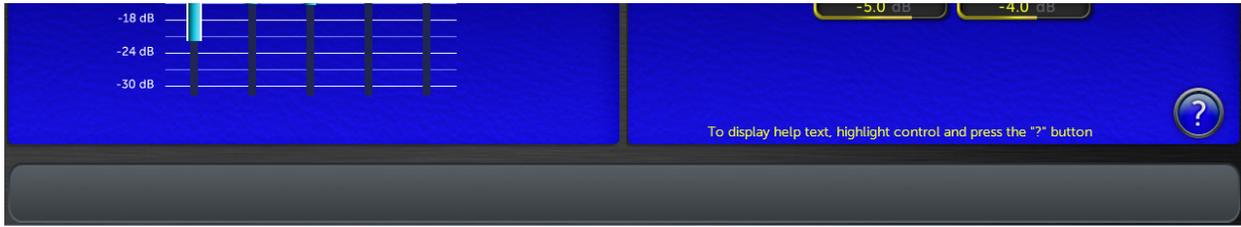


Clicking on “Remote Control Application” will prompt you to save the .jar file to your local computer. You will still need to have Java installed on your computer to run this app, but you will no longer need to have Java installed within your web browser. In fact, it may be desirable that you use the downloadable application only, and uninstall the remote application from your browser.

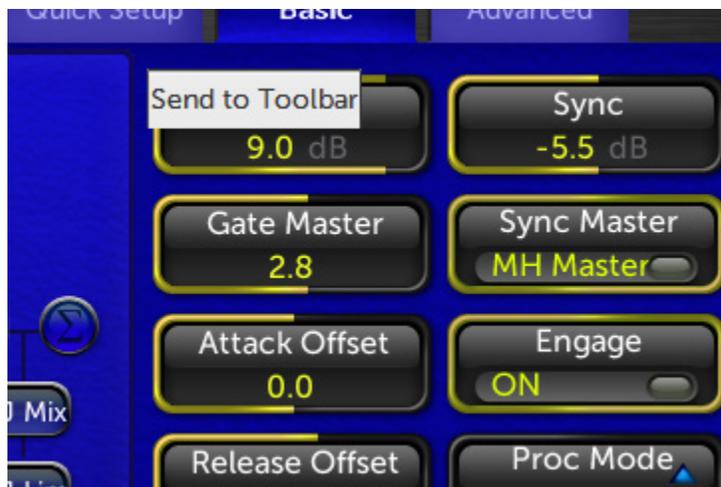
Upon each login, the stand-alone remote control application will check its internal version with the operating software of the Omnia.11. If a version conflict is detected, the application will alert you to the condition. It is advisable to log into the Omnia.11 after a software update to download the version compatible with the current Omnia.11 OS.

## New (remote control) feature...

At the bottom of the remote control window, you will see a horizontal rectangle box. This is the “holding pen” or Toolbar for controls you wish to have quick access to.



Controls can be pinned to the toolbar by right clicking the control. An option to “send to Toolbar” will appear. Clicking on this option will place the control to the toolbar.



Controls can be removed from the toolbar by right-clicking on the shortcut, and choosing “Remove”.

## G-Force Preset Descriptions

Below is the complete list of G-Force presets included in this release. Note that they don't all have descriptions as many are fairly self-explanatory and some are variations on an overall "theme". Some do not have format names at all. Some may recognize a few "rocketry" terms thrown in ☺ Note that the names and descriptions are not set in stone! You should listen to as many as possible with your program material (preferably offline at first) and pick one or two to start with.

**AC:** The **AC** group could be a good place to start for you if you are interested in a more "laid-back" sound.

**AC\_Punch / AC\_Punch\_Open / AC\_Soft / AC\_Soft\_Bass / AC\_Vocal\_Punch:** Open sounding presets useful for AC / Hot AC, or any other music format where higher TSL is desired. 3.0.1: add more dial presence and clarity.

**Analog\_AAA / Analog\_CHR / Analog\_CHR\_Brite / Analog\_Rock / Analog\_Smooth1 / Analog\_Smooth2:** The **Analog** group has a warm, analog-type processor sound with variations in loudness and brightness while staying true to that warm, analog sound.

**Azimuth:** A preset with good midrange power. Good starting point for many rock formats. 3.0.1: add more dial presence and clarity.

**Azimuth\_Rock:** Derivative of Azimuth tuned for classic rock formats.

**CGSmooth:** These presets can be used "as-is" if they fit your needs, or can be used as a starting template for your own customized version. Many adjustments have been made to take advantage of parameters that further improve limiter IMD suppression performance as well as bass options not available before version 3.01.

**CGSmoothOpenW / CGSmooth\_OpenW2 / CGSmooth\_Warm:** Warmer / broader bass tones are featured in this version of the "CG Smooth" preset. Features 12 dB / octave deep bass slope setting, and other associated bass processing settings. This preset is tuned for maximum loudness. For many markets, setting the overall clipper drive to -3 dB will be necessary.

**Chameleon\_Open1 / Chameleon\_Open2:** Nods to CG's analog processors that "started it all"!

**Classical1 / Classical2 / Classical3 / Classical4 / ClassicalPure1 / ClassicalPure2:** Excellent starting points for Classical or Jazz formats. Pick the one you like best to start with.

**CleanMuscle / CleanPower:** Bass oomph vs. extra loudness. Take your pick!

**Cosmic\_DEQ:** A good starting point to use if you don't like the "smile" curve and want a more natural presentation with good, solid but not overdone bass and nice midrange warmth. "DEQ" means that it uses the Dynamic EQ feature rather than relying on

**Cosmic\_DEQ\_NSE:** The same as above with the stereo EFX enhancer disabled. Unlike earlier processors, you may find (like I did) that G-Force lets the stereo image come through clearly without additional enhancement!

**Cosmic\_Natural\_NSE:** This is a variation on the above with even more natural mids! NOTE: This preset has an issue where the limiter thresholds may be set too high for the Omnia.11's clipper. If you are interested in this preset, please download Cosmic\_Natural\_NSE2 from our website.

**EastWind:** Named after a certain steam engine, EastWind is a preset that brings the sound signature of the "traditional" (orange) mode to G-Force.

**Elevation:** A cool sound without a target.

**EventHorizon:** A good starting point for pop music formats.

**EventHorizon\_CHR:** This is a more aggressive version of the "EventHorizon" preset. This was created with the input of several big market CHR / Hot AC programmers. It has a more refined, sculpted bass sound.

**GForce:** GForce preset is all about the bass! 3.0.1: add more dial presence and clarity. Utilizes advanced clipper options.

**GlideSlope1 / GlideSlope2 / GlideSlope\_Open:** One of the favorite presets from the G-Force beta test program. 1 is the original, 2 features controls that weren't available during beta testing and Open is a more open sounding variant.

**GoWithTheFlow:** Similar to Elevation...another "sound without a target" that could make a great starting point.

**HitCityRadio / Hot\_AC / HotMix / HotMix\_v2 / Mighty80s:** These are G-Force versions of the popular "orange" mode presets.

**ModernRock:** Derivative of the CG Smooth base presets, tweaked around the format indicated in the preset name.

**Nashville\_1 / Nashville\_2 / Nashville\_3 / Nashville\_Open / Nashville\_Smooth:** Great starting points for country music or contemporary Christian formats. Each variant has a different sound based on real field experience.

**OrbitalElements:** Another "sound without a target" that could make a great starting point.

**PhaseAngle / PhaseAngle\_Brite:** Another favorite from the beta testers.

**PowerMix / PowerMix2 / PowerRock:** These all have a special "bass power" to them useful for building presets where you want a solid bottom end.

**Proof:** For making measurements. Be careful not to select this by accident!

**ReferenceFlat / ReferenceFlat\_NOAGC:** Great starting points for building presets from scratch.

**RockNRoll:** The default preset made to have a similar sound signature to its namesake in the previous "orange" mode 11's.

**RockNRoll\_LoIMD:** Same as above but takes advantage of the new IM distortion reduction in G-Force.

**Smooth:** Generic "round" sounding preset.

**SubOrbital:** Another "sound without a target" that could make a great starting point.

**Talk\_Smooth1 / Talk\_Smooth2 / Talk\_Warm1 / Talk\_Warm2 / Talk\_Warm3 / cham\_talk:** Try one of these as a starting point for a primarily talk format.

**ThrustVector:** Another favorite of the beta testers that uses the clipper more for texture.

**UrbanAC / UrbanAC\_Bright / UrbanAC\_Open / UrbanAC\_Open2 / UrbanAC\_Soft:** Great starting points for Urban or Urban-leaning AC formats.

**Vinyl / VinylSmooth / VinylSmooth2 / VinylSmooth\_Brite:** A generic starting point for those looking for a natural sounding preset. Modified from Cosmic\_Natural\_NSE.

**WarmGrowl / WarmRound:** Can be useful as starting points for Urban formats.

## **“Voltair Aware” Insertion Point**

As of version 3.0, the insert point in the 11 has been moved to a more optimum point for use with watermark encoders and the Voltair. This is the result of extensive collaboration between the Omnia and Voltair R&D teams.

All inputs and outputs are now available for both Patch Send and Patch Return. Note however that there is only 1 AES/EBU input so if you wish to use AES/EBU for the patch point, your program audio will need to come in via the analog inputs or Livewire.

You can also use Livewire for the insertion point, freeing up both the analog and AES/EBU I/O. If you don't have an existing Livewire system, you can add an Axia X-Node and X-Switch to make this work. Please see the next section in this document **“Using the Omnia.11's Patch Point with the Voltair / Watermark Encoder Combo (Without an existing Livewire Network)”** for complete details.

### **Using the Insertion Point**

#### **Setting levels:**

Whatever output you choose for the insertion point, it is important that the output channel (send to watermark encoder) is set for -12 dB output. The chosen Omnia.11 input to return the audio from the output of the watermark encoder needs to be set for 0 dB. With these settings, the insertion point audio will pass in and out of the Omnia.11 at unity gain. This is important to avoid negatively changing the sound of your station when turning on the insertion point feature!

#### **Patch Return Source Switch:**

This is to set the desired input to the Omnia.11 for returning audio from the watermark encoder.

#### **Patch Send switch:**

This is to set the desired output FROM the Omnia.11 to feed the watermark encoder.

#### **Patch Mode switch:**

This control turns the watermark insertion feature on and off.

#### **Patch Tone Switch:**

Sometimes it may be desirable to check for unity gain through the insertion point system. This control turns on a setup tone that ONLY feeds the insertion loop for level verification. This tone is not sent on-air but while in use, there will be no watermark signals sent over the air!

#### **Patch Out Level:**

This control may be useful for presets whose outputs might exceed the headroom of the insertion point link. It modifies the headroom of the link without disturbing “unity gain”. This setting saves with the preset so that the proper insertion level is recalled when choosing the preset.

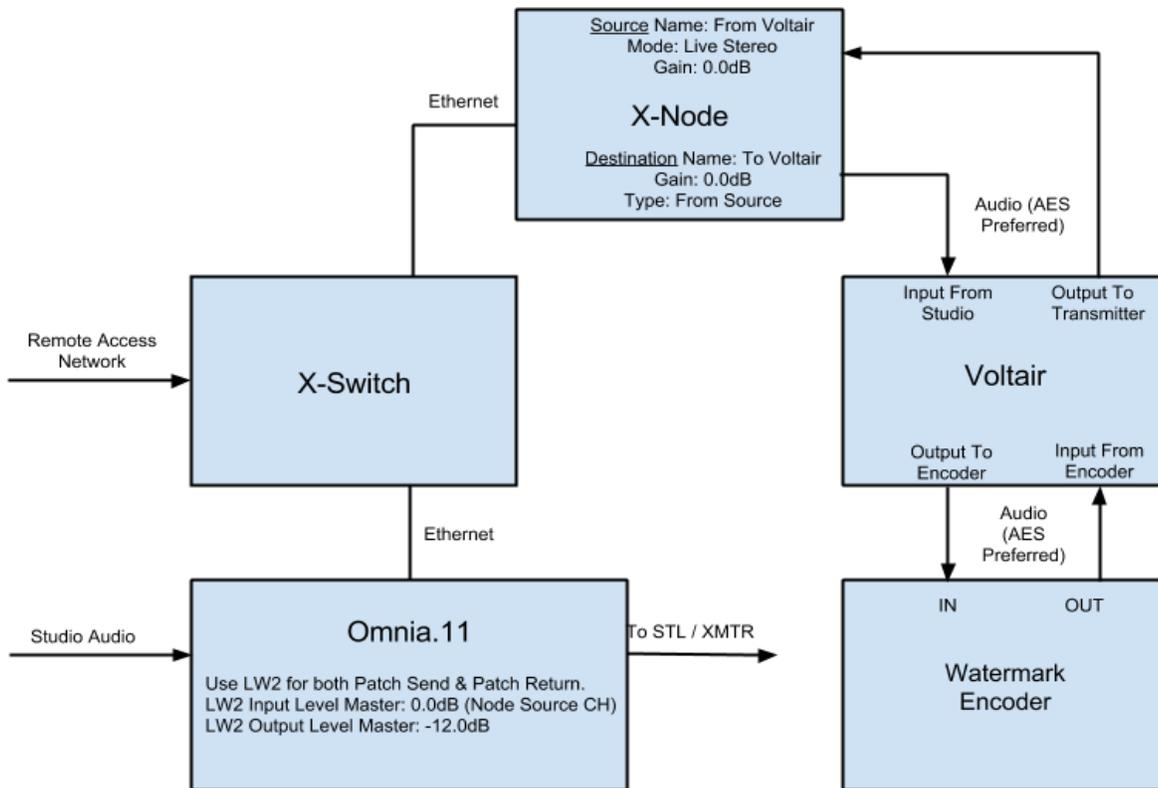
#### **Voltair Mode:**

This is a special mode that optimizes the audio through the link for use with a watermark encoder. When using the insertion point for watermark encoders, it is desirable to use this feature regardless of whether or not a Voltair is actually being used. Benefits are usually gained either way, though it is most effective when a Voltair is in use.

## Using the Omnia.11's Patch Point with the Voltair / Watermark Encoder Combo (Without an existing Livewire Network)

The block diagram below gives the overview of the devices used to create the Omnia.11 / Voltair / Watermark Encoder setup.

Read on for details and settings while referring to this overall block diagram of the device interconnection:



**Before proceeding, ensure that the Ethernet and Audio connections shown have been made and appropriate IP addresses have been set in all of the devices per their user manuals.**

## Axia x-Node Settings:

- NOTE: AES/EBU digital I/O will provide more consistency & repeatability from install to install as you do not have to deal with resistor value drift in analog audio gear. Levels are important!

Navigate to the Axia Node's webpage interface and select "Destinations" under "Advanced Options". You will be setting the Destination Channel/Address to the channel number you will set in the Omnia.11 for Livewire Output #2 (see the next page).

Please note that the channel numbers shown here are for example only. Channel numbers must be unique and cannot be duplicated on the network. Normally, it is best to use channel numbers that are based on the IP address of the unit. Please see the Appendix: "Axia Livewire Channel Numbering" for full details.

Set the Output Gain for this destination (that will be feeding the Voltair / Watermark Encoder combo) to "0 dB". It would also be convenient to name this destination "To Voltair". Click "Apply".

The screenshot shows the "Destinations" configuration page. On the left is a sidebar with "System options" (Home, Simple Setup, Unicast Link) and "Advanced options" (Sources, Destinations, Meters, Synchronization and QoS, System). The "Destinations" section is active. The main area has a table with columns: #, Name, Channel/Address, Type, and Gain [dB].

#	Name	Channel/Address	Type	Gain [dB]
1	To Voltair	17502 <LW Out 2@Omnia1	From source	0.0
2	dst2		From source	0.0
3	dst3		From source	0.0
4	dst4		From source	0.0

An "Apply" button is located at the bottom center of the table.

Changing to the "Sources" settings on the Axia Node, make sure that the input that is accepting the "Output to Transmitter" Voltair output is also set to "0.0 dB". Also ensure that the Mode is set to "Live Stereo".

It would also be convenient to name the source "From Voltair". Click "Apply".

Note the Channel number of this Source. Remember that the channel numbers shown here are for example only. Your actual channel numbers should be based on the IP address of the unit.

The screenshot shows the "Sources" configuration page. On the left is a sidebar with "System options" (Home, Simple Setup, Unicast Link) and "Advanced options" (Sources, Destinations, Meters, Synchronization and QoS, System). The "Sources" section is active. The main area has a table with columns: #, Source Name, Channel/Address, Stream Mode, and Input Gain [dB].

#	Source Name	Channel/Address	Stream Mode	Input Gain [dB]
1	From Voltair	12301	Live Stereo	0.0
		<a href="#">AES67: Download stream description (SDP), RTSP: rtsp://192.168.2.123/by-id/1</a>		
2	src2	12302	Standard Stereo	0.0
		<a href="#">AES67: Download stream description (SDP), RTSP: rtsp://192.168.2.123/by-id/2</a>		
3	src3	12303	Live Stereo	0.0
		<a href="#">AES67: Download stream description (SDP), RTSP: rtsp://192.168.2.123/by-id/3</a>		
4	src4	12304	Standard Stereo	0.0
		<a href="#">AES67: Download stream description (SDP), RTSP: rtsp://192.168.2.123/by-id/4</a>		

A link "Show source allocation status" is located below the table. An "Apply" button is at the bottom center.

## Omnia.11 Livewire Settings:

We recommend using the “Livewire2” input and output for the standard Insert Points.

Navigate to the Omnia.11’s Setup / LiveWire screen and set the Output #2 Channel to a convenient channel number not used anywhere else on the Livewire network. Normally, these channel numbers are based on the last octet of the unit’s IP address. In the below example, the last octet of this Omnia.11’s IP is “175” so the channel number assigned to Output #2 is 17502.

Click on the “Enable” button (it should turn green) and then click “Apply”.

Set or select this channel number in the Destinations options of the Node (see previous page).

Set the “Input #2” channel number to the Axia Node’s Source channel we setup on the previous page. In this example we used Channel 12301. Click “Apply”.

Back to Main Menu

Level: Full Access    192.168.2.175    Config: MM1    Preset: MMSmooth\_2A    Auth: <none>    Input: Livewire 1

**Setup**    Network    Livewire Outputs    Security    System

ADJ    IP Address: 192.168.2.175    LW Out 1: 17501 Enabled  
LW Out 2: 17502 Enabled    Auto Lock: Off    Version: Omnia11: 1.6 (115)  
User Level: Full Access

Livewire Inputs    Input3: 601    Input4: 16201

LW Sync

Input to Omnia 11		Output from Omnia 11	
Input #	Channel	Channel	Enable
Input #1	601	Output #1: 17501	<input checked="" type="checkbox"/>
Input #2	12301	Output #2: 17502	<input checked="" type="checkbox"/>

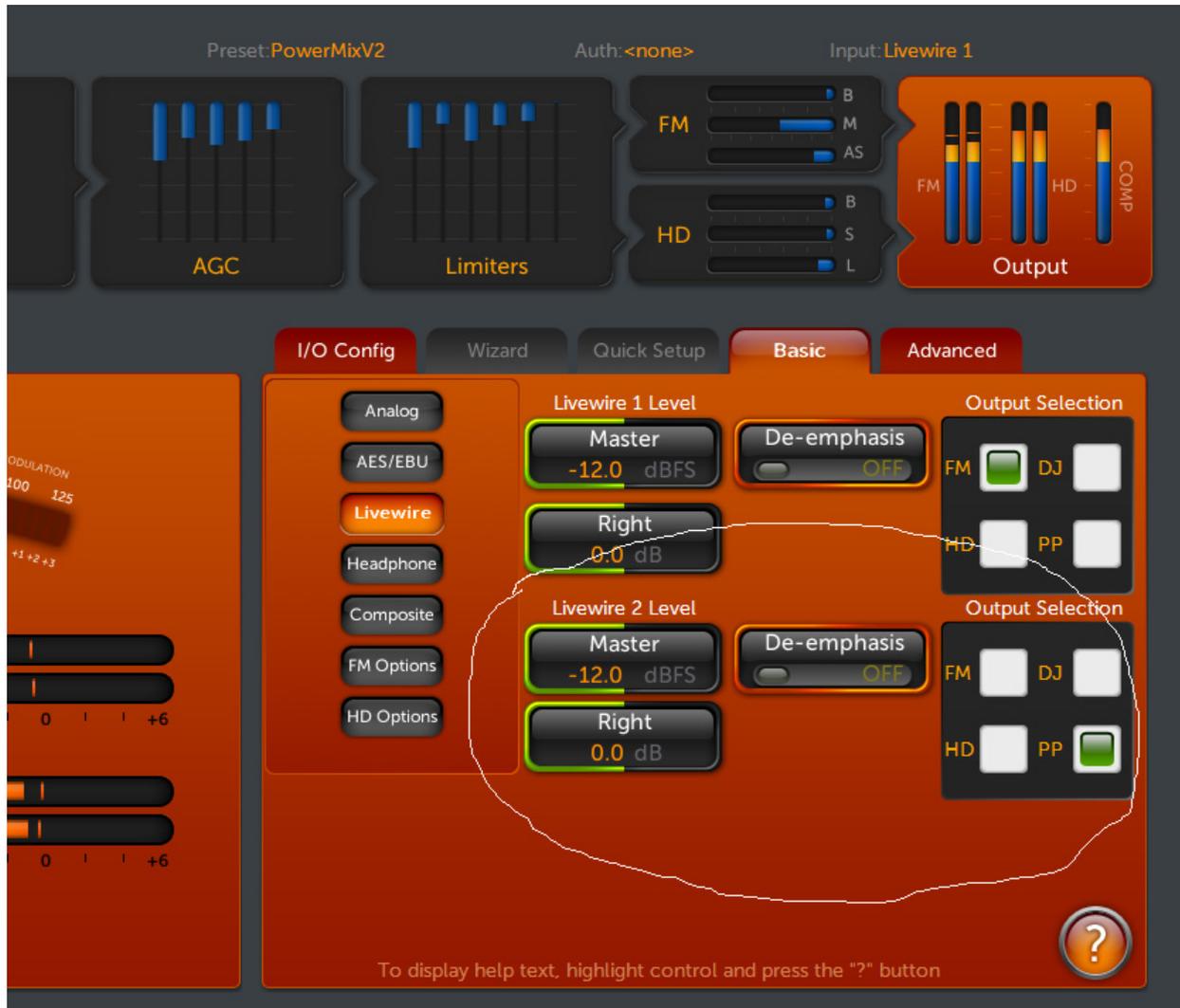
Mode: From Source    Mode: From Source    Mode: From Source

APPLY    APPLY

## Omnia.11 Output Menu Settings:

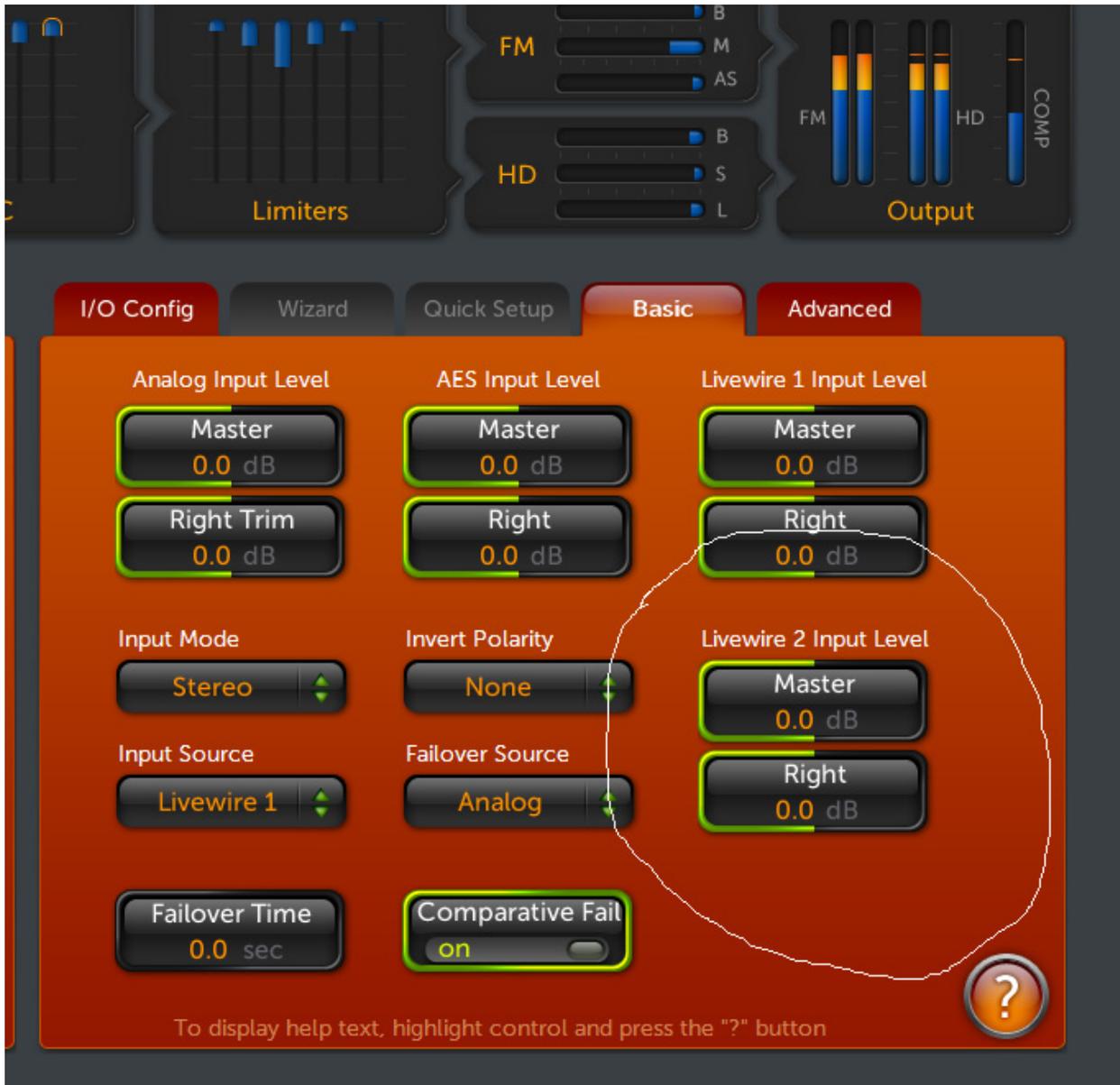
Next, navigate to the "Output" menu / Basic tab / Livewire screen on the Omnia.11.

Set the Livewire 2 "Output Selection" to "PP" and set the "Livewire 2 Level" Master to -12.0 dBFS.



## Omnia.11 Input Menu Settings:

Navigate to the "Input" menu / Basic tab on the Omnia.11 and make sure that the "Livewire2 Input Level" is set for "0.0dB".



## Omnia.11 Insert (Patch Point) Menu Settings:

Navigate to the “Input” menu / “Advanced” tab in the control pane of the the Omnia.11.



Set both “Patch Return Source” and “Patch Send” to “Livewire2”. This sets the second Livewire input of the Omnia.11 as the return path for the watermark encoder / Voltair combo, and sets the second Livewire output as the send path for the watermark encoder / Voltair combo.

Before placing the Omnia.11 into service, verify that the setup works as expected.

In the metering pane containing the “Dorrough Loudness Monitor”, click on the “Detail” tab to see the advanced metering for the insert patch point.

Next is to verify proper gain within the patch point environment. There are a number of tools available to you for this purpose.

To start with a basic overall test, in the control pane, turn on the “Patch Tone” switch. This sends a test tone to the patch outputs at the standard -12 dBfs operating level. When activated, the “Patch Return”, “Patch Return Zoom”, and “Patch Send” should all read -12 dB. If there are any discrepancies in meter readings, double check that the Omnia.11’s patch outputs are set to their proper settings, and that the LiveWire nodes are set to a gain of “0dB” on all inputs and outputs.

If analog nodes are being used, be sure to set the output termination to “600 ohms” for proper levels.

Note: When the Patch Tone is activated, the Voltair and any items within the patch system is removed from service, so the tone test can be performed at any time without fear of placing the tone on air.

\*\*\* **Remember to turn the Patch Tone off after testing**, as the patched devices (watermark encoders, etc.) are not online (not on-air) while the tone calibration test is in effect! \*\*\*

## **The “Patch Out Level” control**

Some highly customized presets can have mix levels that produce levels significantly higher than the -12 dB standard reference. The “Patch Out Level” control is used to compensate for these presets, allowing for proper levels within the insert point system. The intention of the control is to maintain headroom on the Livewire or AES link to prevent digital overload of the external digital links on audio peaks.

When adjusting the Patch Out Level, the Omnia.11 will automatically compensate for the level difference on the patch return, maintaining the proper clipper drive that was originally part of the user preset.

## **Appendix: Axia Livewire Channel Numbering**

### *A fast guide to IP address and Channel Number planning*

By Milos Nemcik, Axia Technical Support  
December 9<sup>th</sup>, 2010

### **Introduction**

An Axia node is an I/O device that provides an audio gateway into to the IP world of audio routing. Whether it’s an Analog node, AES/EBU node, Microphone node or a PowerStation console engine, incoming audio is converted to 48Khz - 24bit audio data which is then delivered to a multicast group. A unique Multicast address is created for each stream based on the Livewire Channel Number that is entered into the Sources page of a node or PowerStation. This document will explain how Multicast addresses are generated and how to calculate them, how to design a logical plan for device IP addresses, and a corresponding plan for Channel Numbers.

### **How Livewire Numbering Works**

A Livewire network utilizes Multicast IP addresses for incoming audio streams (called Sources), in the range between 239.192.0.1 and 239.192.127.255. Each time the last octet of the multicast IP address is filled, the address numbers “roll over”, incrementing the 3<sup>rd</sup> octet group by one, and starting to fill the 4<sup>th</sup> group again, starting with “0”.

This sounds harder to comprehend than it really is. Here’s an example: if the Channel Number “1” is entered for a Livewire audio stream, the multicast address will equal 239.192.0.1 (this is the address that the 48KHz-24bit stream goes occupies in the Livewire network).

- If the number 100 is entered, the multicast address will equal 239.192.0.100
- If the number 256 is entered, the multicast address will equal 239.192.1.0
- If the number 1101 is entered, the multicast address will equal 239.192.4.77
- And so on.

Typically, you do not need to concern yourself with these Multicast address numbers. All you need to know is the number that is entered into the Channel field. As long as each channel field is given a unique number, you will not have duplicate multicast streams.

So the question that arises is: how does one best maintain the system to insure that no device will create a duplication of Multicast data?

## Planning logical IP Addresses

In the days of analog facilities, a well-built plant would have each cable numbered. The number of cables was astronomical. Recommended best practice of the time was to create a “wire book.” This book contained a list of each wire, its number, and what was connected to each end of the wire. The amount of information could be very extensive, depending on how complicated the wire job was. The same practice could be applied to documenting the Axia Livewire domain, and the end result would be, again, a massive book that one would need to refer to any time they wished to make a change or find something. I personally believe this is a poor practice; better options are available when working with Livewire.

Each device connected to the network requires an IP address. Depending on the Class of network, the amount of available network devices can vary. For simplicity, I will discuss a class-C network. A plain-vanilla Class-C provides 254 unique addresses; usually plenty. If we imagine a facility with 6 physical studios, we can divide the available quantity of unique addresses into 6 or more groups. There is also plenty of room to divide them into logical, easy to remember groups.

For example,

- Studio 1 is given IP addresses X.Y.Z.110 - X.Y.Z.119
- Studio 2 is given IP addresses X.Y.Z.120 - 129
- Studio 3 is given ip addresses X.Y.Z.130 - 139

You can see that the last octet of the IP address will define its location. 110-119 = Studio 1 and 160-169 = Studio 6. This equates to 10 devices per studio. You can see that providing a unique IP address to every device in your network is fairly easy when following this method.

## Planning logical Channel Numbers

Next, we need to address Livewire Channel numbers. Remember, each Livewire audio source needs to be given a unique “identifier” (Livewire Channel Number). Livewire Channel Numbers can be anything from the number 1 to the number 32767. So how should one organize this? With the methods of “wire books” or by use of a logical numbering method? I’ve shown how one might design an easy IP address numbering plan — so why can’t we play off that same design for channel numbering?

Example:

STUDIO 1

- St1\_Analog-Node = X.Y.Z.111
- Input.1 = 11101
- Input.2 = 11102
- Input.3 = 11103
- ...
- Input.8 = 11108

As you can see, the first three numbers of the Channel have a relation to the last octet of the IP address of the device. If we consider the possibility that we would never introduce two devices with the same IP address, we could conclude that no Livewire Channel numbers would be the same.

- Device A (X.Y.Z.121) Ch#12101-12108
- Device B (X.Y.Z.122) Ch#12201-12208

## **Conclusion**

Random numbering of Sources provides almost no protection against duplicate Multicast data streams.

Creating a flat, sequential numbering plan leads to the need of a “wire book” and the perpetual need to reference to that book to determine which numbers have been used and which haven’t.

Creating a logical number plan, which references Channels to previously established device IP Address numbers can virtually eliminate the possibility of duplicate numbers, and also leads to a better-organized system that can easily be maintained.