

OMNIA.9

All you can imagine. And more.



Installation & User's Guide

Version 3.18.99 (MKII) Revised June, 2020
1490-00082-010 --- USER MANUAL: OMNIA-9



TelosAlliance.com

User Warnings and Cautions

The installation and service instructions in this manual are for use by qualified personnel only. To avoid electric shock, do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so. Refer all servicing to qualified personnel

This instrument has an autoranging line voltage input. Ensure the power voltage is within the specified range of 100-240VAC. The ~ symbol, if used, indicates an alternating current supply.



This symbol, wherever it appears, alerts you to the presence of uninsulated, dangerous voltage inside the enclosure – voltage which may be sufficient to constitute a risk of shock.



This symbol, wherever it appears, alerts you to important operating and maintenance instructions. Read the manual.

CAUTION: HAZARDOUS VOLTAGES

The instrument power supply incorporates an internal fuse. Hazardous voltages may still be present on some of the primary parts even when the fuse has blown. If fuse replacement is required, replace fuse only with same type and value for continued protection against fire.

WARNING:

The product's power cord is the primary disconnect device. The socket outlet should be located near the device and easily accessible. The unit should not be located such that access to the power cord is impaired. If the unit is incorporated into an equipment rack, an easily accessible safety disconnect device should be included in the rack design.

To reduce the risk of electrical shock, do not expose this product to rain or moisture. This unit is for indoor use only.

This equipment requires the free flow of air for adequate cooling. Do not block the ventilation openings on the rear and sides of the unit. Failure to allow proper ventilation could damage the unit or create a fire hazard. Do not place the units on a carpet, bedding, or other materials that could interfere with any panel ventilation openings.

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

USA CLASS A COMPUTING DEVICE INFORMATION TO USER.

WARNING:

This equipment generates, uses, and can radiate radio-frequency energy. If it is not installed and used as directed by this manual, it may cause interference to radio communication. This equipment complies with the limits for a Class A computing device, as specified by FCC rules, part 15, subpart j, which are designed to provide reasonable protection against such interference when this type of equipment is operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference. If it does, the user will be required to eliminate the interference at the user's expense.

Note: objectionable interference to TV or radio reception can occur if other devices are connected to this device without the use of shielded interconnect cables. FCC rules require the use of shielded cables.

CANADA WARNING:

“This digital apparatus does not exceed the Class A limits for radio noise emissions set out in the radio interference regulations of the Canadian department of communications.”

“Le présent appareil numérique n’émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques (de Class A) prescrites dans le règlement sur le brouillage radioélectrique édicté par le ministère des communications du Canada.”

CE CONFORMANCE INFORMATION:

This device complies with the requirements of the EEC council directives:

- ◆ 93/68/EEC (CE MARKING)
- ◆ 73/23/EEC (SAFETY – LOW VOLTAGE DIRECTIVE)
- ◆ 89/336/EEC (ELECTROMAGNETIC COMPATIBILITY)

Conformity is declared to those standards: EN50081-1, EN50082-1.

Trademarks, Patents, and Licenses

Omnia is a trademark of TLS Corp. All other trademarks are the property of their respective holders.

All versions, claims of compatibility, trademarks, etc. of hardware and software products not made by The Telos Alliance which are mentioned in this manual or accompanying material are informational only. The Telos Alliance makes no endorsement of any particular product for any purpose, nor claims any responsibility for operation or accuracy. We reserve the right to make improvements or changes in the products described in this manual which may affect the product specifications, or to revise the manual without notice.

This document and its content are copyrighted by TLS Corporation and may not be copied, reproduced, or distributed in any form without expressed written permission.

Patent information can be found at www.TelosAlliance.com/legal

Updates

Telos Omnia.9 features and operations are determined largely by software. The Telos Alliance strives to provide the most stable and feature-rich software available. We encourage you to check for software updates from time to time by visiting our website or by contacting us directly.

Feedback

We welcome feedback on any aspect of our products or this manual. In the past, many good ideas from users have made their way into software revisions or new products. Please contact us with your comments or suggestions.

We support you...

By Phone/Fax

You may reach our Telos Support Team in emergencies by calling +1 216-622-0247. For billing questions or other non-emergency technical questions, call +1 216-241-7225 between 9:00 AM to 5:00 PM USA Eastern Time, Monday through Friday.

By Email.

Non-emergency technical support is available at Support@TelosAlliance.com.

By Web

The Telos Web site has a variety of information that may be useful for product selection and support. The URL is <https://www.telosalliance.com/Telos>.

SERVICE

You must contact Telos Alliance before returning any equipment for factory service. We will need your unit's serial number, located on the back of the unit. We will issue a return authorization number, which must be written on the exterior of your shipping container. Please do not include cables or accessories unless specifically requested by the Technical Support Engineer. Be sure to adequately insure your shipment for its replacement value. Packages without proper authorization may be refused. US customers, please contact Telos Alliance Technical Support at +1-216-622-0247. All other customers should contact local representative to make arrangements for service.

Warranty



For the latest Telos Alliance warranty, visit: [telosalliance.com/warranty](https://www.telosalliance.com/warranty)

Register your product

Register your product today to get the full benefits of our warranty, support, and product updates. [telosalliance.com/product-registration/](https://www.telosalliance.com/product-registration/)

The Telos Alliance

1241 Superior Ave. Cleveland, OH 44114 USA
+1 (216) 241-7225

For Telos Support:

24/7 telephone: +1 (216) 622-0247
Email: support@telosalliance.com
Web: <https://www.telosalliance.com/support-request>

Table of Contents

	User Warnings and Cautions	ii
	Trademarks, Patents, and Licenses	iii
	We support you.	iv
	Warranty.	iv
	A Letter from Frank Foti . . . . .	.xvi
<hr/>		
1	<i>The Story Continues</i>	1
	How it all came to be	1
	Processing for FM, AM, HD, Studio, and Streaming Audio	1
	Omnia.9 MKII defined	2
	The Omnia.9 Toolbox	2
	That's A Lot of Power.	3
<hr/>		
2	<i>Quick Start Guide</i>	4
	Quick Start	4
	Initial Startup	4
	Network Connectivity	4
	NfRemote Software	5
	Physical Installation and Initial Configuration	6
	Input Configuration	6
	Output Configuration	7
	Input Level Adjustment	8
	Preset Selection	8
	Troubleshooting FAQ	9
	Obtaining Service	11
<hr/>		
3	<i>General Processing Advice</i>	12
	Know Your Goals	12
	Tweaking and Fiddling.	12
	Choosing a Preset	12
	Making and Saving Changes	13

4	<i>Home Screen & User Interface</i>	14
	At the Top of Every Screen	14
	Understanding the User Interface and Display	16
	Navigation Modes	16
	Tree Navigation Mode	17
	Tabbed Navigation Mode	18
	The Three Basic Control Types	19
5	<i>Reading the Processing Meters</i>	20
6	<i>The Home Menu</i>	22
7	<i>Inputs 1/2/3 Source Audio Menu</i>	23
	Source Audio Menu	23
	Auto Balance Menu	24
	Internal Playback Menu	25
8	<i>Inputs 1/2/3 Undo Menu</i>	26
	What Exactly Is Undo?	26
	Undo Menu	28
	Load Preset, Save Preset, and Preset Protection Menus	28
	Undo Main Menu	29
	Undo Metering Menu	29
	De-clipper Menu	30
	Density Detector Band Weighting	30
	Dynamics Detector to Ratio Menu	31
	Peak Detector Menu	32
	Expander Levels Menu	33
	Expander Rates Menu	34
	Expander Ratios Menu	35
9	<i>FM Menu Processing for FM</i>	37
	You Have to Start Somewhere: The FM Menu.	37
	FM Processing Menu.	38
	About Preset	38
	Adjustment Levels.	39

	Load Preset Menu . . . . .	.40
	Save Preset Menu . . . . .	.41
	Preset Protection Menu . . . . .	.42
<hr/>		
10	<i>FM Menu Basic Mode</i>	43
	Input Conditioning Menu . . . . .	.43
	Enhance Menu . . . . .	.44
	Gain Riding Menu . . . . .	.45
	Multiband Menu . . . . .	.46
	Final Menu . . . . .	.47
	Bypass . . . . .	.48
	HD Crossfeed . . . . .	.49
<hr/>		
11	<i>FM Menu Intermediate Mode</i>	50
	Phase Processing Menu . . . . .	.51
	Downward Expanders Menu . . . . .	.52
	Input AGC Menu . . . . .	.53
	Wideband AGC 1 Menu . . . . .	.54
	Solar Plexus . . . . .	.55
	Parametric Equalizer Menu . . . . .	.55
	Stereo Enhancer . . . . .	.56
	Multiband Setup . . . . .	.57
	Multiband AGC . . . . .	.58
	MB AGC Main . . . . .	.58
	MB AGC Levels . . . . .	.59
	MB AGC Speed . . . . .	.60
	Multiband Compression . . . . .	.61
	MBC Main . . . . .	.61
	MBC Speed . . . . .	.62
	MB Thresholds . . . . .	.62
	Dry Voice Detection . . . . .	.63
	Wideband AGC 2 . . . . .	.64
	Wideband AGC 3 . . . . .	.65
	Band Mix . . . . .	.65
	Power Limiter . . . . .	.66

	Clipper	66
	HD Crossfeed	67
12	<i>FM Menu Expert Mode</i>	68
	Phase Processing	68
	Downward Expanders Menu	69
	Exp Levels	69
	Expander Speed	70
	Input AGC Menu	70
	Sidechain PEQ.	72
	Wideband AGC 1 Menu	73
	Sidechain PEQ.	74
	Solar Plexus	74
	Parametric Equalizer	75
	Stereo Enhancer	76
	Multiband Setup	77
	Multiband AGC	78
	MB AGC Main	78
	MB AGC Levels	79
	MB AGC Speed	80
	Ratio Override	81
	Multiband Compression	81
	MBC Main	81
	MBC Speed	82
	MBC Delay	82
	MB Thresholds	83
	Dry Voice Detection	84
	Dry Voice Speed	85
	Wideband AGC 2	87
	Main	87
	Sidechain PEQ.	88
	Wideband AGC 3	88
	Main	88
	Sidechain PEQ.	89
	Band Mix.	89

	Power Limiter	90
	Clipper	90
	Clipper Highs Menu	91
	Clipper Lows Menu	92
	Dual FM Configuration	93
<hr/>		
13	<i>FM Menu Display Settings</i>	94
	Display Settings Menu	94
	Displays: This is where you start.	95
	Undo Meters Menu	95
	Processing Meters Menu	96
	Input Meters Menu	97
	Loudness Meters, Modulation Meters, and Modulation Numeric Menus	97
	Oscilloscope Menu	98
	RTA Menu	101
	FFT Spectrum Analyzer Menu.	102
<hr/>		
14	<i>FM Menu ITU-R BS.412 Processing / MPX Power Limiting</i>	106
	MPX Power Graphs	108
	Power Graph Menu	108
<hr/>		
15	<i>FM Menu RDS</i>	109
	RDS Main Menu.	109
	Using Omnia.9's Built-In RDS Encoder.	110
	Using External RDS Encoders	111
	Using an RDS Encoder After Omnia.9	111
	UECP menu	112
	Flags Menu.	113
	Station ID Menu.	114
	Program Type Menu	115
	Alternative Frequencies Menus	115
	Field installing RDS	116

16	<i>FM Menu MPX Inputs</i>	117
	MPX Input 1 and MPX Input 2 Menus	118
	Pre-emph Input Menu	119
	Display Settings Menu	119
17	<i>FM Menu Meter Options</i>	120
	Meter Options Menu	121
	Loudness Matched A/B Menu	122
	Loudness Graph Menu	123
	Test Options Menu	124
	Display Settings Menu	125
18	<i>Studio Processing Menu</i>	126
	Processing Menu	127
19	<i>HD Processing Menu</i>	128
	Processing Menu	128
	HD Processing Final	129
	Meter Options Menu	129
	Loudness Meters Menu	130
	Test Input Menu	130
	Loudness Matched A/B Menu	131
	Comparison Output Menu	131
	Display Settings Menu	131
20	<i>Streaming Processing & Encoding Menu</i>	132
	Processing Menu	133
	Streams Menu	133
	Overview / Metadata Menu	134
	Encoder Menu	135
	Meter Options Menu	136
21	<i>AM Processing</i>	137
	Enabling the AM Processing Core	137
	AM Output Options	138
	AM Main Menu	139

	AM Night Menu	140
	AM Phase Menu	141
	TX Out Menu	141
	Insert Menu	142
	AM Processing Presets	144
<hr/>		
22	<i>Monitor Output Menu</i>	145
	Patch Points Menu	146
	FM Processing Patch Points	146
	AM Patch Points	147
	Studio Processing Patch Points	147
	HD-1, HD-2, and HD-3 Patch Points	148
	Streaming 1, Streaming 2, and Streaming 3 Patch Points	149
	Load Preset Menu	150
	Save Preset Menu	151
	Main 1 Menu	151
	X Over Menu	152
	Delay Phase Menu	153
	Channel Coupling Menu	153
	Protection Limiting Menu	154
	Loudness Menu	154
	Left EQ1, Left EQ2, Right EQ1, and Right EQ2 Menus	155
<hr/>		
23	<i>System Menu</i>	156
	System Status Menu	156
	I/O Options Menu	159
	Load Preset and Save Preset Menus	159
	Input 1/2/3 Menus	160
	Livewire Inputs Menu	161
	Livewire Outputs Menu	165
	Source Adjustment Menus	170
	Diversity Delay Menu	171
	Silence Detection Menu	171
	Main Outputs Menu	172
	FM Options Menu	173

μMPX (Omnia microMPX)	177
AM Options Menu	177
File Recorder Menu	178
Time/Date Menu	179
Time Zone Menu	180
NTP Menu	180
Set Clock Manually Menu.	180
Scheduling Menu	181
Info Menu	181
Event Menus (A-B, C-D, E-F, etc.)	182
GPIO Menu	183
GPI Enable	183
GPI Function A-D / E-H.	184
Livewire GPI Banks 1-4.	185
GPO Function A-B / and Livewire GPO 1 – 4	185
Task Scripts	186
System Configuration Menu	188
Sample Rate Menu	189
Processing Paths Menu.	189
Password Menu	190
Power Menu	190
IP Configuration Menu	191
Outbound Connection Menu	192
HTTP Access.	194
SNMP Menu	195
Software Update Menu	196
Backup Menu	197
Upgrades menu.	198
<hr/>	
24 <i>Getting the Sound You Want</i>	199
Quality v. Loudness	199
Achieving a High Quality Sound	200
Achieving Loudness	200
Spectral Consistency & Equalization.	200

25	<i>Factory Presets</i>	202
	FM Presets	203
	1981A/092 – by Jesse Graffam	203
	Barbeque Sound – by Rob Morsink	203
	Big Bottom– by Leif Claesson.	203
	Big Iron – by Jesse Graffam.	203
	Celeste – by LeeXS	203
	Classical/Jazz – by Leif Claesson	203
	Echoes - by Jim Kuzman	204
	Empire State of Processing – by Leif Claesson.	204
	Eruption 2.0 – by Leif Claesson and Johnny Lundholm.	204
	French Kiss – by Leif Claesson.	204
	Helix – by Jesse Graffam	204
	Imagine Hot Mid – by Rob Morsink	204
	Jill FM – by Jesse Graffam	204
	Motor City – by Jesse Graffam	204
	New York – by Jesse Graffam	205
	Northridge FM – by Jim Kuzman and Leif Claesson	205
	Northridge HD – by Jim Kuzman and Leif Claesson	205
	NYC Attack of the Camclones – by Jesse Graffam	205
	Orlando – by Jim Kuzman	205
	Passive Aggressor – by Jesse Graffam	205
	Plutonium FM – by Leif Claesson	205
	Plutonium HD – by Leif Claesson	206
	Point Blank – by LeeXS.	206
	Quintessence – by Sam Sergi	206
	Radium – by Leif Claesson	206
	Reference Settings – by Leif Claesson	206
	Rustonium – by Leif Claesson and Jesse Graffam	206
	Stacked Boxes – by Jim Kuzman	206
	Stacked Boxes Plus! – by Jim Kuzman	207
	The Blitz – by Jim Kuzman	207
	Tokyo – by Jesse Graffam.	207
	Trinity – by Leif Claesson	207

	Upsidasium – by Leif Claesson	207
	Uranium-238 – by Leif Claesson	207
	Zenith – by Jesse Graffam	207
<hr/>		
26	<i>NfRemote Client Software</i>	208
	Downloading, Installing, and Configuring the Client Software	208
	Some Important Ethernet/Wi-Fi Network Considerations	209
	Understanding the NfRemote Connection Window	209
	Initiating an Outbound Connection from Omnia.9	210
	Client-Only Controls	211
	Client Audio Output Menu	213
	Client Microphone Input Menu	216
	Client File Recorder	216
	Speaker Calibration	217
	Choosing a Calibrated Mic	217
	Setting Up the Mic.	217
	Setting Up the Client Software for Calibration	217
	Connect the Client PC and the Calibrated Mic.	217
	Set Up RTA and Oscilloscope Display Windows	218
	Feeding Pink Noise To the Speakers	218
	Final Adjustments to the RTA	218
	Using the Parametric EQ to Smooth Things Out	218
	Chasing Your Tail	219
	Saving Your Calibration Settings.	219
	Tweaking After Calibration	219
<hr/>		
27	<i>Frequently Asked Questions</i>	220
<hr/>		
28	<i>Signal Path Diagrams</i>	228
	Physical Inputs	229
	Input / Output Overview.	230

Input Section	231
MPX Input	232
MPX Output	233
MPX Patch Point	234
Pre-emphasis Patch Point	235
Undo	236
Input AGC/WB AGC1	237
WB AGC2 / AGC3 Post-Multiband	238
WB AGC2 / AGC3 Bass Wideband	239
WB AGC2 / AGC3 Bass Only	240
Multiband Processing	241
Speaker Controller	242
<hr/>	
29 <i>Specifications</i>	243
<hr/>	
30 <i>Warranty</i>	245

Creating the Most Exciting and Engaging Audio Experiences Imaginable

Congratulations on your new Telos Alliance product!

The gang here at Telos is committed to shaping the future of audio by delivering innovative, intuitive solutions that inspire our customers to create the most exciting and engaging audio experiences imaginable.

We're grateful that you have chosen audio tools from Telos® Systems, Omnia® Audio, Axia® Audio, Linear Acoustic®, 25-Seven Systems®, and Minnetonka Audio®. We're here to help you make your work truly shine. We hope that you enjoy your Telos Alliance product for many years to come and won't hesitate to let us know if we can help in any way.

The Telos Alliance

BLANK PAGE

1 The Story Continues

How it all came to be

As of the release of this software version, manual revision, and the significant platform upgrade that turns the Omnia.9 into the Omnia.9 MKII, this legendary processor has been on the air for more than seven years now on thousands of radio stations around the globe. But the story of how Omnia.9 actually began though goes back much further, to a time when its creator and designer Leif Claesson got tired of listening to classic rock music processed by “old style” audio processors.

There was a lot of good current music out but he just didn’t like the way CD mastering was falling victim to its own “loudness war” reminiscent of the one (still) being waged by many major market FM radio stations. The CDs themselves were over-processed, hyper-compressed, and clipped to death, and while some people with good ears and common sense finally started to pay attention to quality again, the sad fact is that the problem got significantly worse long before anyone took action. And so Leif found himself listening only to older recordings.

Growing tired of his relatively small playlist, he decided to do something about it, and the idea for “Undo” was born.

Processing for FM, AM, HD, Studio, and Streaming Audio

In the original Omnia.9 each processing core contained an Input AGC, a 6-band fully parametric equalizer, multiband noise reduction via downward expanders, a multiband stereo enhancer, a wideband AGC, a second (defeatable) wideband AGC, up to 7 bands of multiband AGC and peak limiting, and an adjustable bass clipper. As you discover the latest improvements in the latest chapter of the Omnia.9 story, you will find even more ways to tailor your station’s sound to exactly what you want, as well as find additional options for streaming, RDS, patch points, and more.

The FM and AM cores feature a final psychoacoustically-controlled distortion masking clipper that not only allows you to be louder on the dial (if that’s your goal) but far cleaner, too. It can also be equipped with built-in RDS injection in the composite to ensure perfect integration of RDS, pilot, and audio. The optional HD, and Streaming cores utilize a look-ahead final limiter for peak control. The Studio core uses look-ahead limiters and offers low latency by replacing the phase linear crossovers and equalizers found in other core types with analog style minimum phase filter networks.

There are no hidden or “back door” controls in Omnia.9. We’ve given you full access to all of its controls so as not to limit your ability to create exactly the sound you want on the air – and as you will soon discover – there is no shortage of controls.

Omnia.9 MKII defined

Omnia.9 has been evolving through software feature additions and refinements for years. We believe in continuous improvement, and protecting the investment users have made in their Omnia products. But we got to a point where in order to offer certain features, we needed to change some of the internal characteristics of the unit. Instead of just doing a “facelift” and calling the unit by some new name, we took a different course:

- ◆ We created the “MKII” platform to support major new features like Livewire+AES67, and to make it easy for you and our team to understand platform dependencies that may require hardware updates, vs. those that don’t.
- ◆ We made as many features as possible compatible with our existing user base, and our installation software able to understand the difference between platforms. This means a software-only upgrade gets you most of the new features in the latest software at no cost, and with no hardware changes.
- ◆ We created an upgrade path so users can work with us and our service centers to turn their “classic” Omnia.9’s into Omnia.9 MKII units on a planned, elective basis.

Throughout the rest of this manual, you may see “Omnia.9 MKII” as an added reference, since it denotes the current shipping product, or units that have undergone a platform upgrade. Please understand that this manual describes the current state of the software as of 3.18.98 and higher, and most features herein are available to the all Omnia.9 users, regardless of legacy or MKII platform.

The Omnia.9 Toolbox

Omnia.9 is unique in that it provides you with some built-in tools that we believe are essential to have when setting up your processing. In the past, tuning a processor was done purely by ear in most cases. And while processing is certainly a subjective process – it’s as much art as it is science – having the right tools in your toolbox can be very handy (not to mention revealing) when you want to find out why something sounds the way it does.

For that reason, we’ve chosen to include a built-in oscilloscope, an RTA, and an FFT spectrum analyzer that can monitor dozens of different points within each of Omnia.9’s processing cores. There’s even a pink noise generator and a powerful parametric equalizer so that you can calibrate your speakers, giving you an accurate monitoring point from which to adjust your processing. Learning to use these tools to your advantage is just as important as learning how to use Omnia.9’s controls, because with them, you can see what you are hearing and make informed and intelligent adjustments to your audio that were heretofore difficult if not impossible to make.

That's A Lot of Power...

If it sounds like there's a lot to Omnia.9, well, there is! The original Omnia.9 was unlike any other processor you'd ever used. Giving you full access to all of its controls was like giving you the keys to an exotic sports car. If you knew what you're doing, you were in for quite a ride! If you didn't, well, let's just say there were lots of ways to get yourself loose in the corners and end up in the weeds. And the latest software adds even more sophisticated tools for you. If you were already an Omnia.9 user, MKII will be familiar, but even more powerful. For all of its capabilities, the Omnia.9 is not difficult to set up and use. We've given you some great presets, created and tuned by people who know the unit best, that will either satisfy your on-air processing goals right out of the box or will get you close enough to your desired sound so that you can make some tweaks to suit your individual needs and tastes for your format in your market.

That said, we highly recommend that you set aside some time up front to understand the various design philosophies and controls that make the Omnia.9 so unique, versatile, and powerful. The time you spend now will pay off exponentially when your on-air sound becomes louder and cleaner than you ever thought possible.

Once you've learned your way around Omnia.9 and rid yourself of the hassle of trying to keep up with separate processing for your HD channels and audio encoding computers, you'll have plenty of time to take phone calls from the program directors and engineers of the other stations in town who have been spending their time trying to figure out why your FM radio station not only sounds bigger on the dial than theirs, but why your music sounds better than it does on the CD.

How long you want to keep them guessing is entirely up to you!

2 Quick Start Guide

Quick Start

We know that you're probably in a hurry to get your new Omnia.9 installed and on the air. If you have technical expertise and previous knowledge of audio processor fundamentals, this Quick-Start Setup Guide will get you up and running as quickly as possible.

Please note: because Omnia.9 can be configured in many different ways, (some requiring optional licenses) , not all features and capabilities referenced in this guide or in the full product manual may be available in your particular unit.

We suggest having an assistant on hand when racking up Omnia.9 to help balance the unit during installation, and strongly urge using all 4 rack screws since the chassis design requires all four points be mounted. Although Omnia.9 is fan cooled, leaving an empty rack space directly above and below the unit is advisable.

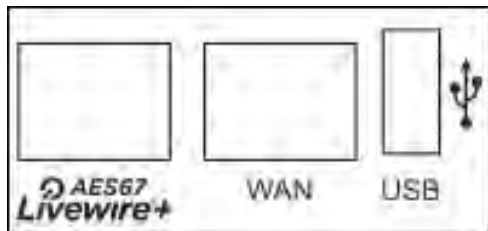
Initial Startup

All controls for the Omnia 9 are available via the front panel touch screen. While we consider it far easier to control the Omnia 9 from the NfRemote software as described below, initial control and setup can be done without the unit connected to a network. Upon power-up, enter the password default of "1234" to unlock the front panel.

Once unlocked, you can navigate through the entire menu structure. For quick network setup, navigate to the Home > System > System Configuration > IP Configuration menu. Note that DHCP is enabled by default. When configuring your network, please note that the Omnia 9 does not respond to Ping commands. From the WAN tab, you can enter specific network settings.

Network Connectivity

Two network ports are found on the rear panel of the unit, allowing separate, segregated networks for administrative capabilities (remote control, including NfRemote and SNMP) and Livewire audio over IP networks.



Flexible network configuration means that all network traffic can be run over a single port if required. For more information, refer to the full manual's networking section.

Note:

If your rear panel network ports are marked “Ethernet” and “Future” and your unit was shipped before April 2018, your system may need an MKII upgrade. Contact Telos Technical support or your dealer for details.)

NfRemote Software

NfRemote is a Windows-based client app that allows you to remotely connect to any Omnia.9 on your network. By default, you should use the port marked “WAN” for NfRemote access.

As mentioned, it is significantly easier to use the NfRemote software to control the Omnia 9, since a keyboard, mouse and large display will be more comfortable to work from (not to mention, portable). In fact, the front panel interface is the same remote GUI client as NfRemote, but running on a small touchscreen.

NfRemote software is available for download from the Omnia website: <https://www.telosalliance.com/Omnia> in the “software” section of the Omnia.9 page.

NfRemote may also be downloaded at any time directly from Omnia.9’s built-in http server once certain conditions are met:

- ◆ Omnia.9 must be connected to your network and must have an IP address assigned to it via the **System > System Configuration > IP Configuration** menu; DHCP is enabled by default.
- ◆ A password must be entered in the **System > System Configuration > Password** menu. The factory default is 1234.
- ◆ The IP address/mask of the computer used to access the http server must be “white listed” in the **System > System Configuration > HTTP Access** menu; the format is IP/mask (such as 192.168.1.1/255.255.255.0); wildcard characters are supported.

Once these conditions are met, you can access your Omnia.9 by entering “http://IP Address:7380” into the address window of any standard web browser (for example, <http://192.168.0.183:7380>). You will see a screen entitled “Welcome to Omnia.9 HTTP Server” with a current version number.

Under the “Downloadables” section, click on the “Download Remote Interface” link. This should be done each time you update the software in your Omnia.9 to ensure full compatibility between the unit’s internal software and the remote control application.

NfRemote will download to a “save to” destination folder depending upon your browser settings. To install, double-click the executable (.exe) file. Enter the IP address and password of your Omnia.9 in the respective fields and choose the appropriate connection type (such as mouse, VM, or touch) in the dropdown menu. Click on the “Connect” button. You may also save this connection to the bottom portion of the window for easy one-button recall by clicking on the “Add” button, especially handy if you are connecting to more than one Omnia device utilizing NfRemote.

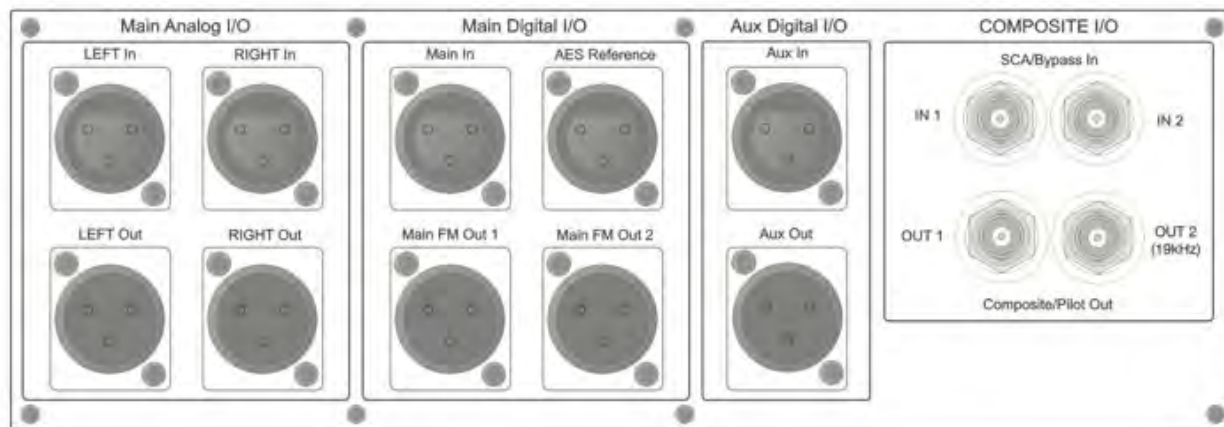
Physical Installation and Initial Configuration

Connect AC power to both of the internal power supplies. There is no power switch. When only one power supply is connected, the unit sees this as a failure in one of the supplies and an audible alarm will result. You can silence this alarm by pressing the small red button between the power supplies.

Redundant power supplies help protect you in the unlikely event that one fails. However, it is far more likely that the unit will lose power because of an interruption in the AC mains circuit feeding the unit. Best engineering practice recommends that each supply be fed from a different power source for maximum redundancy.

Input Configuration

Connect the audio inputs as appropriate for your installation. Omnia.9 accepts balanced professional line-level analog audio via its Left and Right Inputs in the Main Analog I/O section of the rear panel, AES/EBU digital audio on standard XLR connectors via its Main and AES Reference Inputs in the Main Digital I/O section of the rear panel, Aux Digital Input in the Aux Digital I/O section, and Livewire+ AES67 inputs / Outputs over IP. (AoIP is standard on new Omnia 9's as of April, 2018. Network setup is required). Legacy users seeking AoIP IO should contact their dealers or Telos Customer Support and ask for the MKII upgrade).



A Word about AES Reference and Sample Rates:

If you need to sync the Omnia.9 to an external reference, use the AES Reference Input to ensure that the externally generated AES clock will be used as the main clock for the Omnia.9.

Note:

Omnia.9's main sample rate MUST be set to match the rate of the external reference at either 44.1 or 48kHz. These settings are found in the System Configuration portion of the System menu. For HD Radio, a sample rate of 44.1kHz is required. For DAB radio, a sample rate of 48kHz is required.

Sample rate converters are present on both the Main Digital In and Aux Digital In connections, and accept any AES signal from 32 – 96kHz.

From the Omnia.9 Home screen, select System, then I/O Options, then Input 1, 2 or 3. Each of Omnia.9's three configurable internal inputs can be fed from any of the physical rear-panel inputs or with Livewire, by using the drop-down menus for each Input Source as appropriate for your installation.

In turn, each processing core is fed from one of the three internal input sources. The FM, HD-1, and Stream 1 cores are fed from Input 1. HD-2 and Stream 2 are fed from Input 2, while HD-3 and Stream 3 are fed from Input 3. The (low-delay) Studio core is fed from Input 1 by default but can be assigned its own separate input.

Output Configuration

Connect the audio outputs as appropriate for your installation. Omnia.9 supports balanced professional line-level analog audio outputs via its Left and Right Outputs in the Main Analog I/O section of the rear panel, two AES/EBU digital outputs on standard XLR connectors in the Main Digital I/O section, an additional AES/EBU digital output in the Aux Digital I/O section, two composite MPX outputs in the Composite I/O section and Livewire+ AES67. Omnia Direct (MPX over AES/EBU is also supported from Main FM Out 1 and/or 2.

Return to the I/O Options menu, then select Main Outputs. Drop-down menus are provided to assign the outputs and set the levels of the Analog Out XLR jacks and the three AES/EBU XLR outputs (Main FM Out 1, Main FM Out 2, Aux Out) .. Default output audio choices include FM Pre-final L/R, AM, HD-1, HD-2, HD-3, Headphone Out, Speaker Out and more.

A complete explanation of these controls can be found in the System Menu section of the full user manual.

Pre-emphasis options and the stereo generator (MPX) output level / stereo pilot level controls can be found in I/O Options / FM Options.

FM Diversity Delay, if needed, can be set from I/O Options / Diversity Delay.

Omnia.9 is set up by default to provide a pre-emphasized composite MPX signal from the Omnia.9's built-in stereo generator. If you must use an external stereo generator, some additional configuration is required:

Note:

Feeding the transmitter with L/R pre-emphasized output instead of the MPX output has several inherent performance disadvantages, including the loss of peaks beyond 91% (leaving room for the 19kHz pilot tone, as we will not know its phase) - a capability unique to the MPX clipper. RDS and Auto Pilot also become unavailable, though the L/R clipper does employ psychoacoustic distortion masking.

From the Home menu, go to System, then System Configuration, then Processing Paths. The default setting for the "FM:" dropdown is "MPX Only". In order to add the output choices needed for FM L/R audio, choose either "L/R Only" if you are you do not intend to use Omnia.9's built-in stereo generator at all or "MPX + L/R" if you plan to use the built-in stereo generator for your main output, but need an additional pre-emphasized L/R output to feed a secondary chain. Select "Apply Configuration" to put the changes into effect. A confirmation dialog will appear. Clicking "Yes" will cause the Omnia.9 to reinitialize, which will take your station off the air for a few seconds.

Finally, from the Home menu, go back to System, then I/O Options, then Main Outputs to select the Output Mode. Now "FM Pre-emph L/R" and "FM De-emph L/R" will be among the available choices. Output levels are also adjusted here and The AES Main FM Out 1 and/or 2 outputs can be set to output Omnia Direct™ (MPX over AES/EBU) if desired instead of the default "L/R Audio".

Note:

FM De-emphasized L/R is the least-recommended output option, especially for analog. Although is it theoretically possible to have excellent peak modulation control even with external pre-emphasis, in practice stereo generators vary widely in implementing pre-emphasis. Certain stereo generators use phase-linear pre-emphasis in DSP, which is incorrect and causes roughly 20% overshoot (2dB loudness loss) when used with any audio processor. We recommend connecting the output of your stereo generator to one of Omnia.9's composite inputs, watching the Left De-mod waveform on the oscilloscope, and comparing it to L/R Output - Left Pre-emph. If you see high frequency peak overshoots, the stereo generator may be poorly designed, and must either be replaced or have its pre-emphasis disabled, with Omnia.9's output set to FM Pre-emphasized.

Input Level Adjustment

From the Home menu, go to System, then I/O Options, then Source Adjustment. Use the Input Gain sliders to set the input levels. When driving the input with typical program material at normal operating levels, adjust the Input Gain while watching the Input meters in the Processing display window so that average levels keep the meters in the green. If the meters flash red, the input is being overdriven and levels to the Omnia.9 must be reduced. If necessary, it is also possible to invert the polarity of either or both channels with the Invert control. The Mode control allows several different channel configuration options. Return to the Home Menu, select FM, select Processing, then select Load Preset to choose one of the factory presets. “Rustonium” is the default preset and provides a well-balanced sound with competitive loudness, suitable for nearly any format. However, we suggest you audition all of the factory presets to get a feel for each of them.

Preset Selection

Note:

Omnia.9 contains a relay-bypass feature that allows unprocessed audio to pass directly through the unit to prevent complete loss of audio (dead air) any time the software is not active. This includes when the unit loses power, is in the start-up process, or must re-initialize its software after applying certain user-initiated configuration changes.

Normally this is not an issue. However, in certain situations - for example, if you have a CD player connected to the analog inputs and an amplifier or speakers connected to the analog outputs - this means the input and output will be directly connected *with no attenuation whatsoever*, resulting in fried speakers (or eardrums). It also means that if you are using your unit as an A-D converter or as a way to distribute different types of IO, bypass may break the connection.

When engaged, the bypass relays hard wire the following inputs to outputs:

Analog In > Analog Out

Main Digital In > Main FM Out 1

Aux Digital In > Aux Out

MPX In 1 > MPX Out 1

MPX In 2 > MPX Out 2

Obviously, there is no relay bypass for Livewire AoIP inputs and outputs.

Troubleshooting FAQ

Every now and again, there are surprises or something doesn't go quite as you expected the first time around (this IS radio, after all...) so we've assembled some frequently asked questions (and answers!) to the most common unexpected issues based upon conversations with many new users and the experience of our Omnia support team.

The unit is totally dead. What should I check first?

Let's start with catastrophically bad first and get it out of the way: The unit won't power up at all.

Double-check that the unit is receiving AC line power to BOTH AC power connectors and the wall outlets they are plugged into are live and working. (If there is power to only one supply, an alarm will sound, which can be temporarily silenced by pressing the small red button near the supplies.) Make sure all connections are secure at both ends of both cords.

If power checks out, look at the front panel screen - is there any light on the display at all? If not, or if the screen appears scrambled, it may indicate a power supply problem. If you wish to examine the power supplies, note that they are the switching type, and require a load in order to start up and operate properly. Voltage measured when the supplies are not connected to the Omnia.9's circuitry may not be correct if no load is present.

If your unit was just delivered and won't start, it's possible that some internal component or cable became unseated in shipping. While we take enormous precautions in terms of packaging and securing connectors, commercial carriers can be really tough on equipment (our support crew has some stories to tell!) If you see obvious damage on outside of the box, your unit may have had a really rough ride. Please contact technical support if you suspect your unit suffered a shipping related injury.

The unit boots up normally, but there is no audio output. What should I check?

First, verify that there is audio appearing on both the input, output, and processing meters. If the metering looks normal, check to see if there is audio in the front panel headphone jack. If audio is present in the headphones, make sure your output connections are good.

If there is no metering activity, go to Home>System>I/O Options>Input 1/2/3 and verify your input source is properly set. You should also verify there is audio present on the cable(s) feeding audio into Omnia.9.

I have the unit in a quiet studio, is there a way to make it silent?

In a word, no. The kind of processing power in the Omnia.9 requires cooling fans.

Omnia.9 was designed to be installed in a typical rack room or transmitter site where noise is not an issue. Omnia.9 utilizes four internal fans to provide cooling to the unit: One on the main CPU, one on the front left side of the unit, and one in each power supply.

I have set the unit up on my network, but I cannot "ping" it. Why?

This is normal, and is a precaution that keeps the unit from responding to "bots". Network security for Omnia.9 is accomplished via a whitelist that is initially set up from the front panel.

Navigate to Home>System>System Config>HTTP Access and add the IP address/addressess of computers that need to access Omnia.9's HTTP server on Port 7380. Begin adding your IP addresses to the whitelist in the "IP 2" box, as "IP 1" is for use by the front panel touchscreen.

The HTTP server can be used to download the remote client software from the unit and for advanced scripting functions. Once downloaded, the remote client software itself does not require additional security access.

The diversity delay is turned off, but there is still about half a second of delay through the unit. Can it be reduced?

No. This delay is normal and integral to our advanced processing algorithms. In applications where analog FM and HD are broadcast, this should not be an issue as the analog audio must be delayed to match the digital audio.

For those who want to hear a processed headphone mix, a dedicated low-latency Studio processing core is provided for talent monitoring. This can be used if Omnia.9 is located at the studio, or if a suitable low-delay return path is available from the transmitter site.

Otherwise, we suggest using an older processor you may have available (or an Omnia VOLT HD-Pro) to drive talent headphones.

I want to use the AES/EBU digital output to feed my linear digital STL at the studio. How do I activate this function?

Navigate to Home>System>System Configuration>Processing Cores and set “FM” to “MPX+L/R”. It will ask you if you want to restart the unit. Ensuring that Omnia.9 is not actively on the air, follow through with the restart.

Once re-started, navigate to Home>System>I/O Options>Main Outputs and set the AES/EBU output you are using to “FM Pre-emph L/R”.

I found a preset I like, but I need more loudness.

Some of the factory presets are “custom built for speed” right out of the box, and are already extracting as much loudness as possible from Omnia.9 without crossing the line where tighter dynamics and more clipping would simply degrade the audio.

However, most presets have been created for a particular spectral mix or texture and have plenty of “room to grow” in terms of loudness without compromising overall quality. If you find you like one of these presets but just need more loudness, navigate to Home>FM>Processing>Clipper and advance the final clipper drive. Notice that it is possible to make 0.25dB adjustments, an indication that small adjustments go a long way. We suggest advancing clipper drive 0.25 to 0.50dB at a time as you try to achieve more loudness.

I found a preset I like, but I wish it were more open-sounding.

See above, but in reverse! The clipper drive, more than any other single control, will have the greatest impact on the tradeoff between a more dynamic and open sound and all-out loudness. Reduce the clipper drive in small increments; we recommend 0.25 to 0.50dB at a time so that your station doesn't become too quiet in your quest for openness.

Obtaining Service

Before contacting Omnia Customer Support, please have the serial number of the unit (located on a small barcode sticker on the rear panel in this format - "0292xxyyyy") and a description of the symptoms/problems ready for the technician.

All units being returned for service MUST have a Return Authorization Number (RA) assigned to them first.

Units shipped without an RA number will experience delays in service. Be sure to write the RA prominently on the box on or near the shipping label.

Whenever possible, return Omnia.9 in its original shipping carton with original packing materials. This will provide the best protection possible during shipping. Remember, damaged caused by improper packaging is not covered under warranty.

Our shipping address is:

Telos Alliance
1241 Superior Avenue East
Cleveland, Ohio 44114 USA
ATTN: (RA Number obtained from Omnia Customer Service)

Support via the Web

The Omnia website (www.TelosAlliance.com) has a wide variety of information that may be useful for product support, applications information, software updates, and user manuals.

Factory Support via Phone and E-mail

Customer support personnel in the Cleveland, Ohio, USA office are available by phone or e-mail Monday through Friday 9:00am to 5:00pm Eastern Time by calling +1.216.241.7225 or sending an e-mail to "support@TelosAlliance.com"

After Hours Support

After hours support is available 24/7 by telephone by calling +1.216.622.0247 or by sending an e-mail to "support@TelosAlliance.com"

If you are outside the United States and need support in a language other than English, please contact the Omnia dealer you purchased your unit from.

3 General Processing Advice

Know Your Goals

The first step to successful processing – and this applies to ANY processor, not just Omnia.9 - is defining your goals. Whatever those goals are, Omnia.9 is capable of getting you there.

You may wish to maintain as much quality as possible while increasing loudness somewhat over your existing processor. You might want to create very consistent source-to-source spectral balance and develop a “signature sound” for your station. You may find yourself in a situation where you need to stay competitively loud on the dial at the expense of the best possible sound. Or you may have the luxury of aiming for a more open, cleaner sound that will draw and keep listeners for longer periods of time without having to worry about all-out loudness.

In any case, it is best to start with a goal in mind and work toward it carefully and deliberately.

Tweaking and Fiddling

One big temptation when installing a new processor is fiddling with every available control, and there is no shortage of those in Omnia.9! There’s really no better way to find out what each control does, but experimentation and exploration are probably best done “on the bench” before you put your new acquisition on the air. That way, you’re free to tweak away without having to worry about jeopardizing your on-air sound or being unnecessarily timid about making adjustments because you don’t know what affect they will have.

Another suggestion for getting to know your way around Omnia.9 is to find a factory preset that you like and then go exploring in the various menus to see how that sound was achieved. For example, let’s say you find a preset with a smooth, open sound which matches your general processing goal. As you explore, you might find some controls set as you would expect to deliver that sound, but you may also find some unexpected settings that make more creative use of Omnia.9’s controls. There is much to be learned by studying.

Once you are comfortable with navigating through Omnia.9’s menus and have a good understanding of how its controls operate, you’re ready to take it for a test drive on the air.

Choosing a Preset

Regardless of whether you end up using a supplied preset “as-is” or make adjustments to customize your sound, you must start with one of the factory presets. We recommend you find one that most closely matches your goals and then make any modifications from there as needed.

Many processors use radio format names to try and define their preset’s sound but then go on to explain there’s no reason a rock station shouldn’t try out the “Country” preset – which is very true. As a rule, Omnia.9 takes a deliberately different approach and most of its presets don’t give you any hint as to who should use them (or how) in the hopes that you’ll “step out of your box” a bit and explore.

If your Country station sounds great on the air with settings that might mimic an “Urban” preset - with a slamming low end and a nice open mid-range – the last thing we want to do is make you second guess yourself because the preset name doesn’t match.

Making and Saving Changes

Human nature is fickle; the human ear adapts and tires quickly; and Omnia.9 is powerful! With those things in mind, here are some recommended “Do’s” and “Don’ts” when making and saving changes to presets:

- ◆ DO resist the temptation to constantly fiddle with every control right after you put Omnia.9 on the air.
- ◆ DON’T make hasty, radical changes.
- ◆ DON’T make adjustments to too many parameters at once – that makes it difficult to determine which of the adjustments is actually responsible for the changes (for better or worse) you’re hearing on the air.
- ◆ DO look to the Band Mix and Parametric EQ sections first to achieve the spectral balance (aka “signature sound”) that you’re looking for. These are powerful adjustments, and a little EQ can go a long way. This is generally “safer” than making adjustments to the target, attack, and release rate controls as it is sometimes difficult to know how the different compression stages interact with one another on all material.
- ◆ DO take breaks when adjusting your processing. Ears tire quickly, and if you stay at it too long, you’re almost sure to make changes influenced by fatigue.
- ◆ DON’T turn your monitor speakers up too loud when making adjustments. High listening levels cause ears to tire even more quickly and mask both gain riding artifacts and distortion. Most listeners play the radio in the background, and problems tend to be more audible at comfortable listening levels.
- ◆ DO make small adjustments, particularly to critical controls like Clipper and Limiter thresholds.
- ◆ DO take the time to calibrate a set of high-quality reference monitors (a process described in detail in this manual) so that any changes you make aren’t skewed by colorations of the speakers or room.
- ◆ DON’T rush the process. Use the “sleep-on-it” method when you’ve reached a point where you are mostly satisfied with the sound, and then re-evaluate it the next day. If it still sounds good, STOP. If it doesn’t, make a few adjustments and walk away for another day.
- ◆ DO use the “Save As” method of naming and saving your custom presets rather than over-writing them. This will allow you to return to any point in your adjustments if you get too far “off track” and keep you from having to remember (or guess) what changes you’ve made along the way.

Many Omnia.9 users have asked if they can make their own custom presets “from scratch.” All custom presets start life as a factory preset, but the most straightforward, neutral-sounding factory preset for FM is “Reference Settings,” (Home, FM, Processing, Reference Settings) and as such provides the closest thing to a “blank canvas” possible for building your own preset from the ground up.

For AM, use the “Everything Flat” preset as your starting point.

4 Home Screen & User Interface

At the Top of Every Screen

The Menu Bar at the top of the Home Screen shows the current processing core being viewed. There are between one and three dropdown menus on top of the front panel screen depending on chosen font size. (You can select font size on the front panel by clicking on the button labeled Menu) . However, when using the NfRemote there can be as many as six of these drop-down menus, depending upon how the computer screen is sized. Each drop-down menu has as choices: the location of the unit, CPU Load, Speaker Volume, and Headphone Volume Additionally, when using the NfRemote there are choices for Client Volume, and Client CPU Usage. A location name of the particular Omnia.9 can be user-customized (path: Home/System/System Configuration/SNMP) . If you wanted, each drop-down menu could have the same identical choice, a bit of a waste of resources, but if it makes you happy...

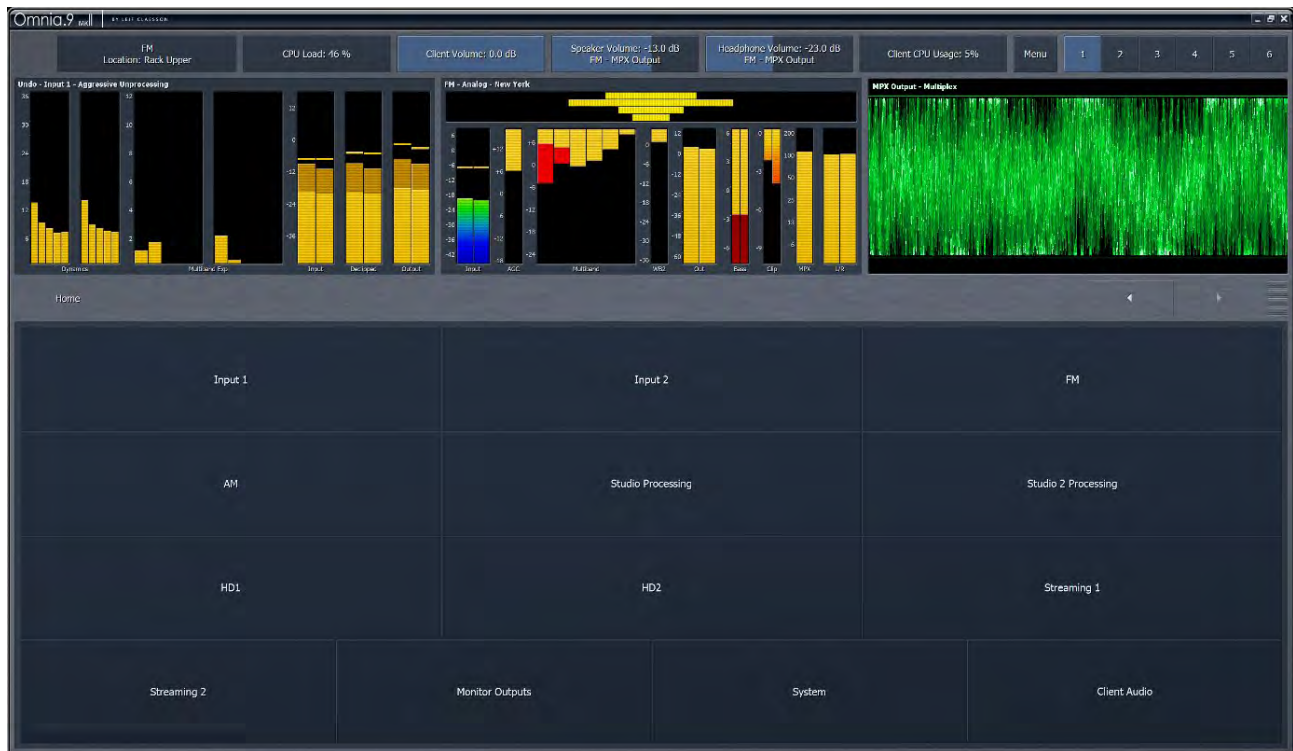
There is also, a Menu button, and 6 display preset buttons.

WARNING:

Operating additional HD or Streaming processing cores, encoding multiple streams, connecting multiple remotes, and using more display windows at one time places additional demands on the CPU, so as you employ more of these features, it's good practice to take note of the CPU usage. When CPU usage reaches 65%, the indicator turns yellow alerting you that you have reached a practical safe maximum. At 75%, the indicator turns red to provide a warning that reduced system performance, including interruptions to program audio, is possible.

Omnia.9's front panel touch screen simultaneously provides access to the user interface and displays a wealth of information about your processing and signal.

This is a typical screen you will see upon opening NfRemote, and then clicking the Home button. This is your starting point. The Omnia.9 powers up in the “default” tree starting mode. The meters will be showing whatever their settings were before the previous shutdown.



Here, this display is showing the Undo Meters (Aggressive Unprocessing preset) and the Oscilloscope (found in Display Settings under the Instrumentation group) is showing the MPX Output. Controls such as the Speaker and Headphone Volume levels can be adjusted via the Omnia.9's touchscreen by placing your finger on the touchscreen control and sliding your finger in the desired direction of adjustment (note that you can keep dragging for the entire width of the screen, outside the depicted control, as long as you don't let go), or by sliding the cursor (on NfRemote) on the control. Double-tapping on a sliding control will bring up an enlarged view for easier adjustment. Tapping on a button such as the Menu control opens up drop-down menus or navigates to a sub-menu.

- ◆ The **Speaker Volume** control adjusts the output level of whatever audio you have routed to the Speaker Output. Likewise, the **Headphone Volume** control adjusts the output level of the audio you have routed to the Headphone Output. Each control displays the patch point currently being monitored. Orange bars within the controls indicate that the limiters in the corresponding monitor output are active. Details of the Speaker Output and Headphone Output are described in the Monitor Outputs section of this manual.
- ◆ The **Menu** button on the unit front panel has the following options: Displays Only, Lock Front Panel (assuming you've set a password!), Tree Navigation, Tabbed Navigation, Small/Medium/Large fonts, and Re-initialize Display.
 - ◇ The **Menu** button in NfRemote has the following options: Displays Only, Tree Navigation, Tabbed Navigation, Lock Position, Maximize and Fullscreen (if not maximized or fullscreen) and Restore otherwise, Close Window.
 - ◇ Selecting Displays Only allows whichever displays you have selected to occupy the entire front panel while hiding the controls, useful when you want a more detailed view of the processing meters or an oscilloscope or FFT display. Tapping anywhere on the screen returns you to the normal view, which shows both displays and controls.

- ◆ The **Lock Front Panel** option allows you to lock the front panel if you have enabled password protection. When you lock the screen, all of the display windows will remain visible in the top portion of the display and the bottom portion will change to accept your password via the on-screen keyboard. Depending upon how you have re-sized the various portions of the screen,
 - ◇ Displays may appear smaller when the unit is locked to ensure sufficient space is reserved for the on-screen keyboard.
 - ◇ Tree Navigation versus Tabbed Navigation determines how many controls are visible at one time, with Tabbed Navigation displaying more menu choices, but at the cost of having a busier screen.
 - ◇ Lock Position is great on a big touch screen, so the window doesn't get nudged out of place accidentally.
 - ◇ The Re-init Display menu item (on the Omnia.9 front panel, not present on NfRemote) will reset the front panel display. In normal operation it is highly unlikely that you would ever need to do so unless otherwise instructed by our support team when diagnosing an issue related to the display.
 - ◇ The menu items of Small Fonts, Medium Fonts, and Large Fonts do what you'd expect. Select whatever you find most comfortable.
 - ◇ The Restore menu item restores the window to normal, movable size when maximized or full-screen.
- ◆ The **Display Preset** buttons, to the right of the Menu button, numbered 1 – 6, let you create and save six separate Home screens. For example, you may wish to devote one display preset to nothing but the Undo and Processing Meters to display these parameters in greater detail. Or, you could devote an entire display preset to the oscilloscope and monitor the program input, the output of Undo, the MPX before the clipper, and the final MPX output to see what the various stages within Omnia.9 are doing to the audio signal. These display preset buttons allow you to customize your display, so you can quickly go from one custom screen to another.

You can also zoom into any display and make it cover the entire screen, by first tapping on it to both highlight it and go to its display settings page, and then double-tapping it. Tap again to restore the normal layout.

Understanding the User Interface and Display

Omnia.9's User Interface (UI) is set up in "tiers".

The first tier always contains the highest level (most general) menu options in the form of buttons. When selected, these buttons take you to a second tier of menu options, which are also buttons, but of a more specific nature. The third tier is made up of Omnia.9's controls. Some pages have subpages, which form a fourth tier. (Example: System - I/O Options - FM Options has sub pages such as Main, MPX and Insert. This could be considered a fourth tier, and you choose which tier four page to view by clicking on a the page selection button to the left of the controls, down in the page area.

Navigation Modes

There are two navigation modes: **Tree** and **Tabbed**. The default mode is "Tree." Both modes give you access to the same number of controls; the terms refer only to the way those controls are displayed and laid out. This choice is made under the **Menu** button in the upper right portion of the screen

The **Tree** mode shows fewer controls at once and has a cleaner, less cluttered look, especially on the front panel display. However, it requires more steps to navigate through the menu system.

The **Tabbed** mode shows all tiers and available controls for selected menu sections at once. This provides more direct access to items located deeper in the menu structure but may be visually more intimidating to inexperienced users. It works especially well when connected via NfRemote control where you have more screen real estate to work with.

Tree Navigation Mode

By default, Omnia.9 powers up in the Tree navigation mode.

In this mode:

- ◆ The top portion of the screen is devoted to the display windows.
- ◆ The bottom portion of the screen shows the buttons or controls for the current tier.
- ◆ In between these two areas is a navigation bar that shows you exactly where you “are” within Omnia.9, along with navigation arrow buttons that let you go forward or backward to most places you have visited in the fourth tier.
- ◆ Selecting and holding down either of the arrow buttons will bring up a list of these places so you can re-visit them directly.
- ◆ Double-tapping on any of the controls brings up a magnified view that has two large sliders – one for a “coarse” adjustment and one for a “fine” adjustment. Some high resolution controls (such as Diversity Delay) have a third slider labeled “medium”. Once you have made your adjustments, tap “Done” to return to the previous display of all the controls for the tier you’re in.
- ◆ You can make individual portions of the window larger or smaller to devote more or less on-screen real estate to display windows or control windows by dragging up and down on the re-size bars.



A: Client Volume, **B:** Speaker Volume, **C:** Headphone Volume, **D:** Display Presets, **E:** Resize Bars, **F:** Navigation Arrows, **G:** Tier 1 Menu, **H:** Tier 2 Menu, **I:** Tier 3 Menu, **J:** Tier 3 Controls Area

Tabbed Navigation Mode

Clicking on the Menu button and selecting “Tabbed Mode” allows more direct control by displaying more information at once.

In this mode:

- ◆ The navigation bar and arrows are eliminated.
- ◆ The top portion of the screen is devoted to the display windows.
- ◆ The middle portion of the screen shows the first, second, and third tier buttons.
- ◆ The bottom portion of the screen shows where the third tier controls populate as selected.
- ◆ You can make individual portions of the window larger or smaller to devote more or less on-screen real estate to display windows or control windows by dragging up and down on the re-size bars.



A: Tier 1 Menu, **B:** Tier 2 Menu, **C:** Tier 3 Menu, **D:** Tier 3 Controls Area, **E:** Resize Bars

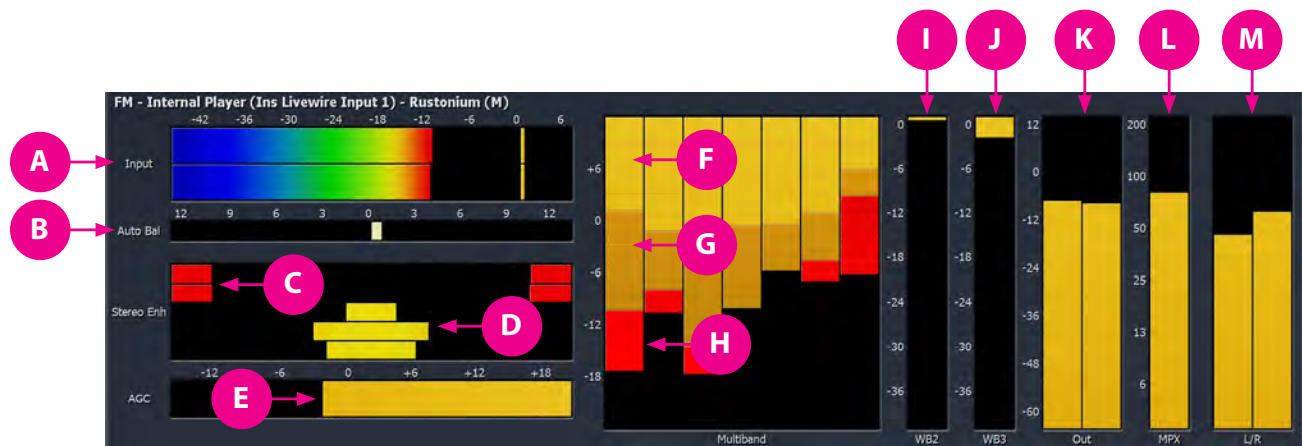
The Three Basic Control Types

There are three basic types of controls in Omnia.9:

- ◆ **On/Off buttons** - These controls toggle on and off, thereby enabling or disabling the associated function.
- ◆ **Drop-down menus** provide a drop-down list of options. Scrolling over each option highlights it, while a tap or left-click on a mouse selects it.
- ◆ **Sliding controls** - Selecting a slider control highlights it. Tapping and holding (or left-clicking and holding with a mouse) a slider allows you to drag it back and forth to adjust its parameter. Dragging the slider faster will accelerate the rate of change. As long as you haven't lifted your finger (or released the left mouse button) you can continue to drag the slider beyond the edge of the control all the way out to the very edge of the display. Because it is often difficult to make fine adjustments on a small screen, you can double-tap a slider to bring up a pop-up window with two large sliders, one for "coarse" adjustment and one for "fine." Some sliders with large control range (such as Diversity Delay) will present a third, "medium" slider.

5 Reading the Processing Meters

The Processing Meters Display provides a tremendous amount of information about what’s going on inside each of Omnia.9’s processing cores, but in a very efficient and easy-to-read manner.



A: Input Level, **B:** Auto Balance, **C:** Stereo Enhance Narrowing, **D:** Stereo Enhance Widening, **E:** Wideband AGC 1, **F:** Multiband AGC, **G:** Multiband Compressor, **H:** Multiband Limiter, **I:** Wideband AGC 2, **J:** Wideband AGC 3, **K:** Multiband Output, **L:** MPX Output, **M:** L/R Clipper

In the FM processing core, meters are provided for monitoring input levels, Input AGC, Auto Balance, Wideband AGC1, Multiband AGC and Limiters, Multiband Noise Reduction, Multiband Stereo Enhancement, Wideband AGC2 and AGC3 sections, post-multiband output, MPX output, and individual left and right outputs. Depending on the view selected, in the HD and Streaming cores, meters for the final look-ahead peak limiters and the final output of the processing core are added, while the MPX output and left and AGC output meters are eliminated.

- ◆ The ITU BS.1770 **Input** meters indicate the loudness of the unprocessed source audio coming into Omnia.9 with floating peak indicators above each bar.
- ◆ The **Auto Balance** meter (AB) indicates any corrective left-to-right channel balancing being performed.
- ◆ The **AGC** meter window shows the levels and action of the Input AGC and the Wideband AGC1 compressors. It also shows the level of the Wideband AGC2 section when it is enabled and positioned before the multiband section.
- ◆ Depending upon the settings of the various Input and Wideband AGC1/AGC2 controls, the scale to the left of the meter can display levels below threshold (positive numbers) as well as levels above threshold (negative numbers). When the meters dip down below “0” the compressors are above threshold and therefore in a state of gain reduction. When they rise above “0” they are below threshold and in a state of gain increase. The combination of Input AGC, AGC1, and AGC2 gain is added together to determine the total amount of AGC gain in place.
- ◆ The **Input** AGC levels are indicated by a bright yellow bar. The Wideband AGC1 levels are shown as a dark orange bar extending below the Input AGC meter. Wideband AGC2 levels (if this compressor is situated before the multiband section) are shown as a second, darker orange bar below the AGC1 meter.

- ◆ The **Multiband** meter window shows the levels and action of the AGC, Compressors, limiter, and noise reduction sections for each band (ranging from 2 to 7 depending upon the preset employed). As is the case with the AGC metering section, the scale will change based upon the settings of various multiband controls.
- ◆ The AGC level in each band is indicated by a bright yellow bar. The multiband compressor for each band, when enabled, is represented by an orange bar extending down from the bottom of the yellow AGC bar. The multiband limiter for each band is represented by a bright red bar that flashes beneath the AGC level. The multiband noise reduction for each band is shown by a dark red bar that appears to drop down from the very top of the meter. Gating - the condition in which release is significantly slowed down - is indicated by a dark red ribbon at the bottom of the multiband AGC meters. Freezing - the condition in which release stops completely - is indicated by the same red ribbon, but slightly brighter. Dry voice detection is indicated by a green ribbon in the same location.
- ◆ If the **Wideband AGC2** compressor is enabled and placed after the multiband section, or it is used in one of its Bass modes, its meter will be displayed separately to the right of the multiband display. The **Wideband AGC3** meter will appear after the multiband section as well if it has been enabled.
- ◆ The **Multiband Output** meters show the levels after the multiband processing section, but before the Bass Clipper and Final Clipper.
- ◆ The **L/R** meters show the output of the L/R clipper, which is useful only if you are using the Analog or Digital FM L/R outputs.
- ◆ The **Multiband Stereo Enhancer** meters will be displayed if the current preset employs this feature.

Yellow bars extending from the middle outward toward the left and right of the display indicate a widening of the stereo image.

Red bars extending from the left and right edges toward the middle indicate a narrowing of the stereo image.

6 The Home Menu

Omnia.9's Home Menu is the highest level menu available in the user interface. From here, you can configure and route Input source audio, access the Undo menus and controls, access the controls of the various processing cores, configure the Monitor Outputs, and access system settings.

If you ever lose your way in the menu system, going back to the Home Menu will get you quickly back on familiar ground.

The Home menu and its navigation bar are only available when the interface is set to "Tree Navigation" rather than "Tabbed Navigation". This setting is available from the "Menu" button at the top of the screen. See Pages 17-18 for more information about the Tree and Tabbed navigation modes.

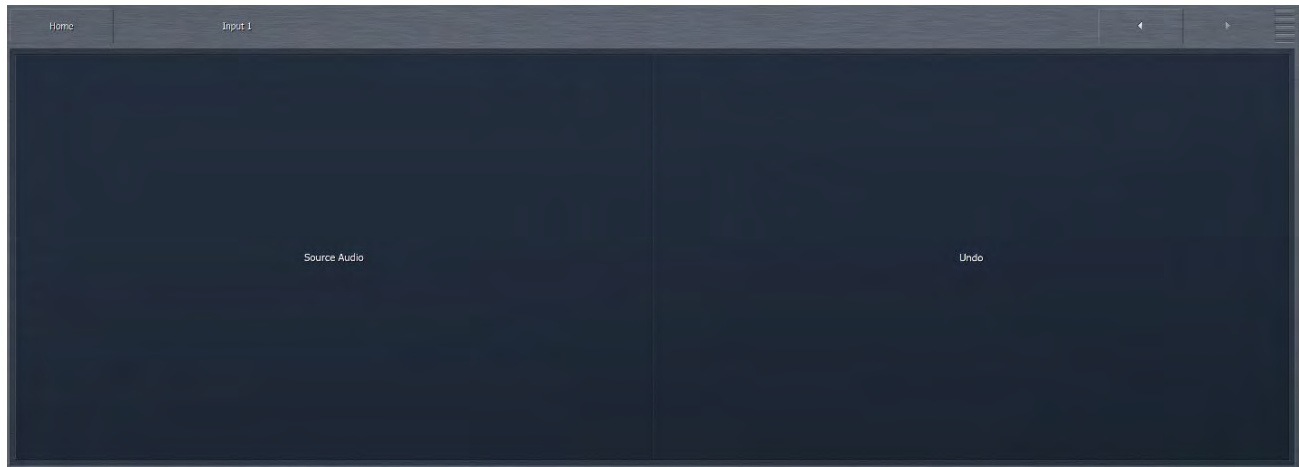


A: Home

7

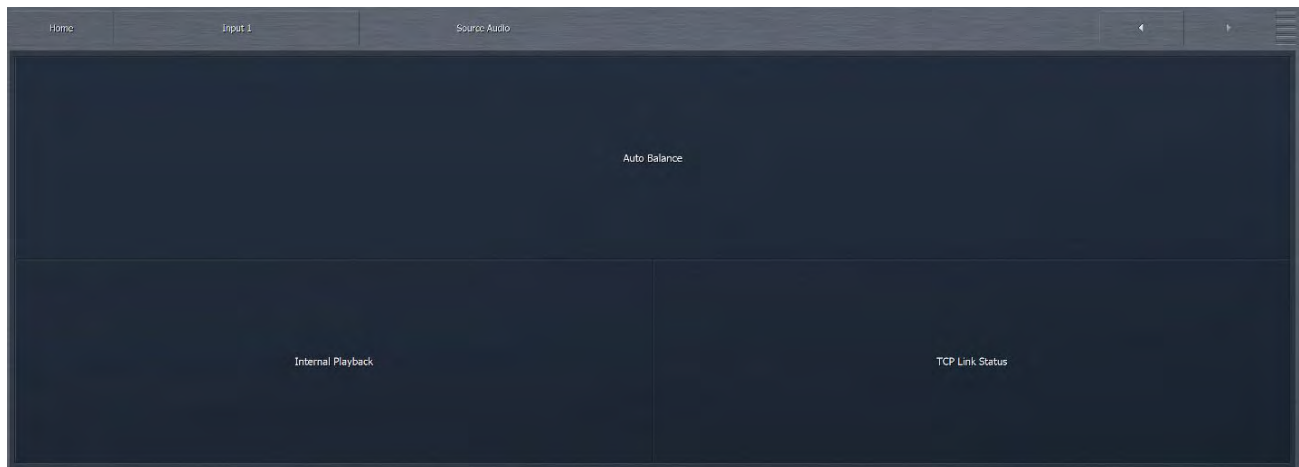
Inputs 1/2/3 Source Audio Menu

Input 1 feeds the FM, HD-1 and Streaming 1 path. On units so equipped (with proper licensing), Input 2 feeds the HD-2/Streaming 2 path while Input 3 feeds the HD-3/Streaming 3 path. The menus and controls are identical for each.



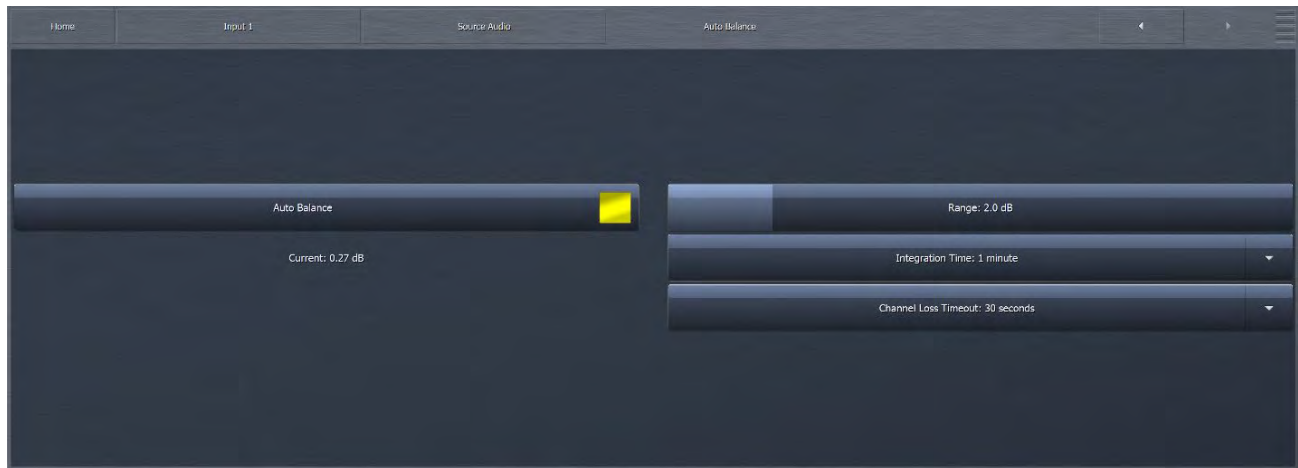
Source Audio Menu

The Source Audio Menu provides access to the Auto Balance and Internal Playback sub-menus. In the NfRemote software, TCP Link Status is also available here and in various other menus. It is used to check the quality of the NfRemote connection.



Auto Balance Menu

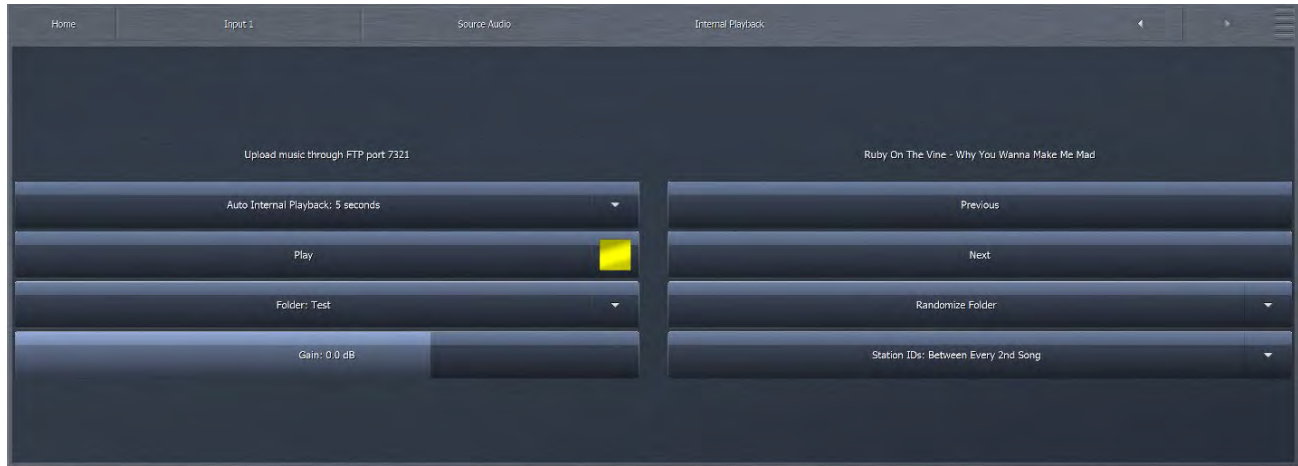
When **Auto Balance** is enabled, Omnia.9 will automatically balance the left and right channels of the incoming audio, compensating for any level discrepancies that may be present in an audio stage preceding the processor (such as the output of a console or an STL). To monitor input audio before Auto Balance, be sure to monitor at the Program Input patch point. To monitor audio immediately after Auto Balance, choose the Pre-Declipper patch point.



- ◆ Selecting the **Enable** button toggles Auto Balance on and off.
- ◆ The **Range** slider sets the maximum total amount of gain that can be increased or decreased in each channel. For example, with the Range control set at 6.0dB, the gain in each channel can be boosted by up to 3dB and attenuated by up to 3dB. Each channel contains an ITU BS-1770 loudness monitor which measures and compares the frequency-shaped RMS level in each channel.
- ◆ The **Integration Time** control determines how quickly Auto Balance corrects any discrepancies between the left and right channel. Shorter integration times correct channel-to-channel imbalances more quickly and provide more consistent levels between the left and right channels. Reducing the integration time too much may cause an undesirable or unnatural effect as the channels re-balance, and therefore the default setting of 10 seconds is recommended for most situations.
- ◆ The **Channel Loss Timeout** option automatically fades to mono if one input channel is missing. The length of time Omnia.9 waits before fading to mono can be set to 3, 10, 30, or 60 seconds. 10 seconds is the default. This feature can be disabled altogether by selecting "Off".

Internal Playback Menu

- ◆ Omnia.9 provides the ability to play audio files you provide from within the unit itself for each input.



- ◆ Selecting the **Internal Playback** button will start audio playback from Omnia.9’s internal library of songs or other content.

WARNING:

This will interrupt the program audio being fed to the selected input!

The internal player is not an automation system, but it can randomize music and guarantees not to repeat a song within twenty songs (provided you have more than 20 songs in the folder). Beyond its value as a temporary backup source, the internal player is also handy if you are doing work in the studio and need to temporarily interrupt the normal audio input path. Or, provided Omnia.9 is located at the transmitter site, it can also play out music if you need to work on the STL.

The internal player will not crossfade, but will automatically cut any silence at the beginning and end of each track and thus provide tight back-to-back playback. Station IDs may be optionally inserted between songs.

- ◆ Music is uploaded to the internal SSD drive by connecting to Omnia.9’s built-in FTP server on port 7321 (passive ports 7322-7331). The default user name is either anonymous or “Omnia”. There is no password, as access is controlled by the HTTP Access White List (found in the System > System Configuration > HTTP Access menu).

The internal drive can hold roughly 15GB of music in MP2, MP3, FLAC, or WAV (PCM only) formats. The FTP server will refuse any file that is not a supported type.

Note that although the internal player overrides the program input, you can still hear and see the physical input through any of the Monitor Outputs (including Client Audio on a remote connection) by selecting one of the Physical Input patch points.

Each root folder will be directly available in the Folder drop-down menu and will automatically receive a “Station IDs” folder where you can place station IDs or jingles. The Gain control sets the output level of the internal audio player.

The Previous and Next buttons allow you to play the next or last song, respectively.

The Mode Selector dropdown menu has several options for file playback. “Randomize Folder”, as mentioned above, will select and play songs at random guaranteeing not to repeat a song within twenty songs (provided you have more than 20 songs in the folder. It will play continuously. “File” simply plays one cut until it is over and then stops. “Folder” plays the entire contents of the folder and stops. “Repeat File” and “Repeat Folder” allow you to repeat either a single cut or an individual folder respectively.

8 Inputs 1/2/3 Undo Menu

What Exactly Is Undo?

In order to understand how to best use Undo, it is helpful to understand exactly what it is and how it works.

Undo is actually two separate processes - a de-clipper and a multiband expander – which work together to “undo” the poorly mastered, hyper-compressed and clipped audio found on so many modern CD’s.

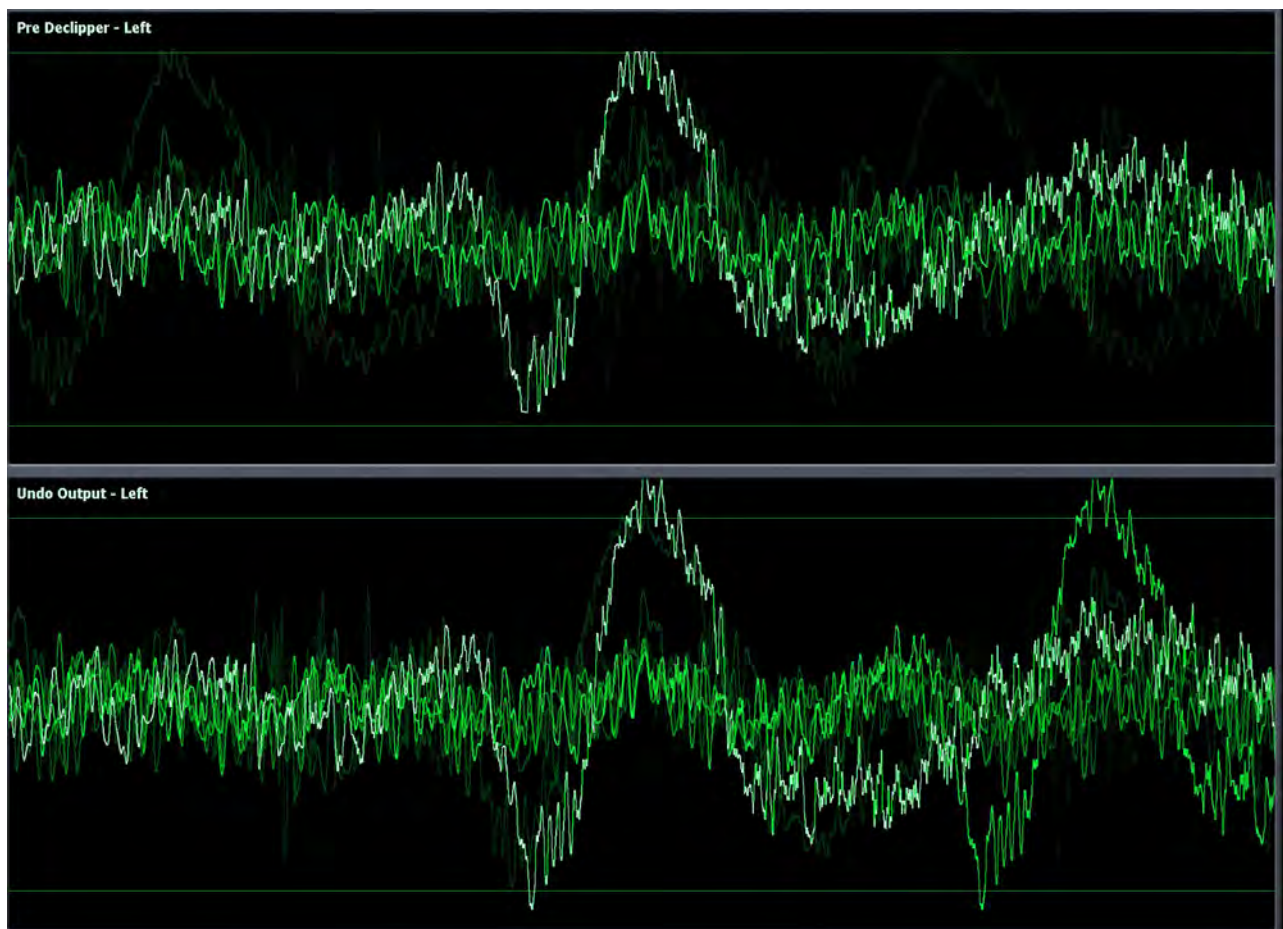
Note:

The de-clipper works most effectively when using Omnia.9’s digital inputs. Regardless of whether you use an analog, digital or Livewire input, the incoming audio must not be equalized or pre-processed in any way. This means NO leveler, neither wideband nor multiband. If the possibility of clipping the STL at the studio is a concern, simply turn down the input level to the STL and use Omnia.9’s Input Gain control to compensate. Omnia.9 will also happily boost low input levels automatically.

Take a look at the two waveforms below, captured using Omnia.9’s built-in oscilloscope. The top window shows the damaged source audio. The second window shows the same audio after it has passed through the de-clipper and the Undo stages. Notice how the peaks that were clipped during mastering have been restored by the de-clipper and Undo.

Note:

The oscilloscope gain was kept at the same level for comparison purposes, but Omnia.9 has sufficient internal headroom, and the illustrations that follow do not suggest that the audio is being clipped again by any portion of “Undo”.

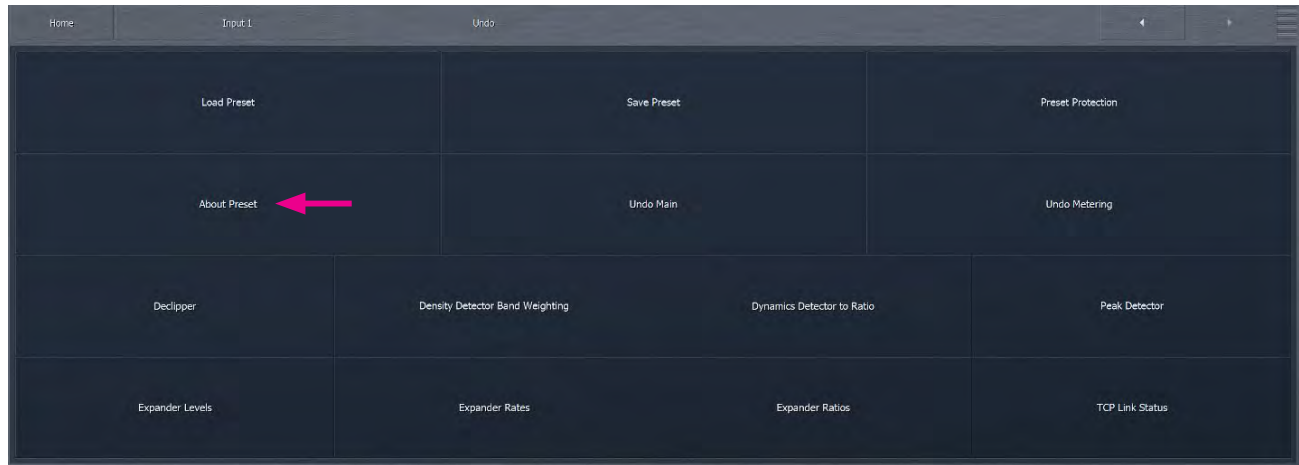


The second stage of Undo is a multi-band expander that is designed to restore dynamic range to audio that has been excessively compressed. Each of the five bands of the expander has a corresponding psychoacoustic dynamics detector and a peak detector that examine the peak levels of the incoming audio, and based upon that information plus the settings of the various controls, tells the expander how much dynamic range to restore to the audio.

Undo Menu

Each of the three internal audio input paths has a dedicated Undo section.

From the main Undo menu, you can load and save Undo presets, protect presets, enable and disable the de-clipper or multiband expander, choose which functions are displayed in the Undo meter window, adjust the amount of de-clipping, adjust the dynamics detector's ratio, weighting, and peak settings, and set the expander's levels, rates, and ratios.



A word of caution about Undo! In keeping with the “spirit” of Omnia.9, we have not blocked access to any of its controls, including those found in the Undo section. And while we would be the last ones to discourage you from making the most of everything Omnia.9 has to offer, we feel that outside of adjusting the level of de-clipping, most users will get the most out of this powerful tool by using one of the provided factory Undo presets. For the more curious and brave, read on!

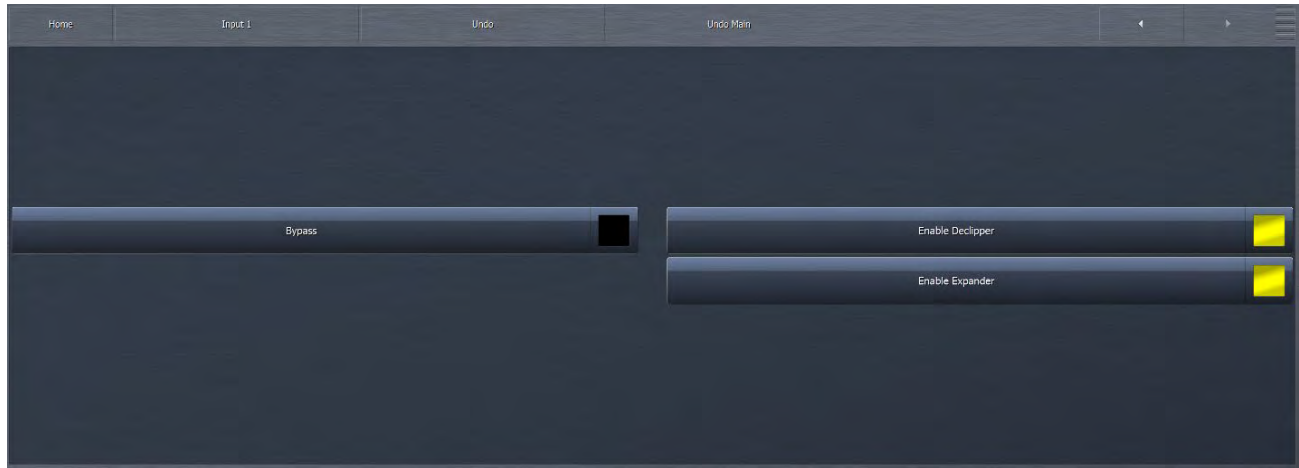
Load Preset, Save Preset, and Preset Protection Menus

The Load Preset menus allows you view the Undo preset currently on the air, toggle back and forth between the current and backup presets, load a new preset, compare the settings of two presets, and delete user presets. The Save Preset menu allows you to edit the name of or save over a user preset. About Preset let's you maintain and display notes about a preset The Preset Protection Menu allows you to password protect a preset so that it cannot be modified or copied for use in another Omnia.9.

A complete explanation of how to use the Load Preset, Save Preset, and Preset Protection functions is found in the section of this manual devoted to FM processing. Keep in mind, however, that while the process for loading and saving presets is identical, *these are two completely independent operations within Omnia.9 with completely different sets of presets.*

Undo Main Menu

The **Undo Main** menu contains the controls to enable and disable Undo.



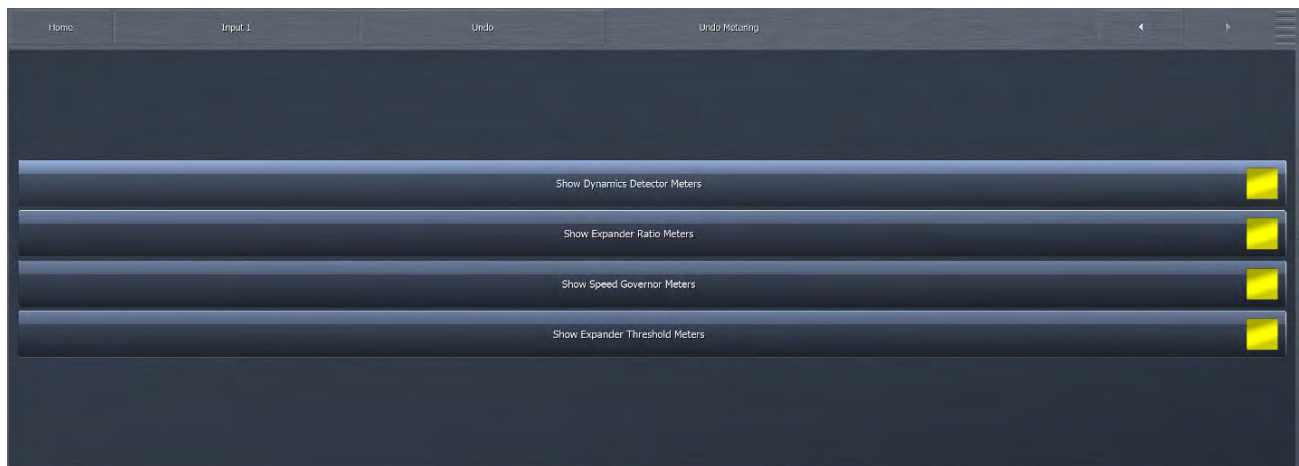
When selected, the **Bypass** control turns off both the de-clipper and the expander portions of Undo.

The **Enable De-clipper** and **Enable Expanders** buttons turn the de-clipper and expander portions of Undo on and off independently, respectively.

Undo Metering Menu

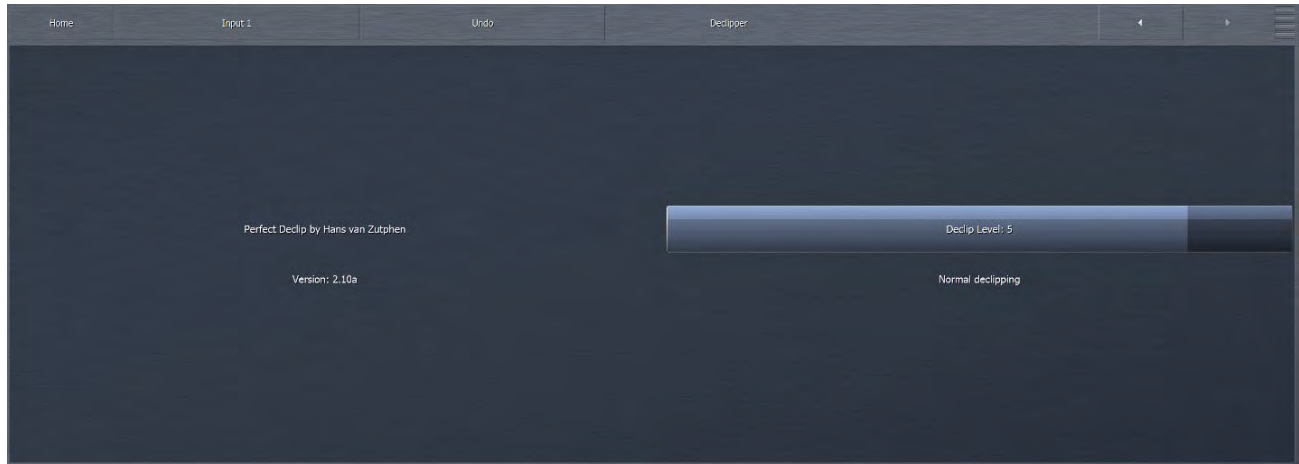
The **Undo Metering** menu determines which of Undo’s four metering functions are displayed in the Undo Meters window. A more comprehensive explanation of how to read and understand the Undo meters is provided later in this section when the various Undo controls are explained.

When enabled, the **Show Dynamics Detector Meters**, **Show Expander Ratio Meters**, **Show Speed Governor Meters**, and **Show Expander Threshold Meters** allow the associated meters for each respective section to be displayed in the Undo Meters window.



De-clipper Menu

The De-clipper menu contains a single control to set the level of de-clipping in seven stages (0-6). Lower settings offer more conservative de-clipping action, while higher settings offer more de-clipping.



A setting of Level 5 the “normal” setting and recommended for most modern material which have been mastered with high levels of compression and clipping. If your station primarily plays source material that has been cleanly mastered, you may find lower settings are sufficient.

The most effective way to monitor exactly what the de-clipper is doing is to view the pre-de-clipper and post-de-clipper waveforms side-by-side using Omnia.9’s built-in oscilloscopes. Details of how to configure the display windows and set up the oscilloscopes are provided in the **Display Settings** section of the manual.

Density Detector Band Weighting

Each band of Undo’s expander has a corresponding density detector. The **Density Detector Band Weighting** controls allow you to determine how much control each detector provides its own band as well as any other expander band.



To put this concept into traditional processing terms, it is similar to “band coupling” in a multiband compressor, where all bands may operate completely independently of one another or may influence one another by way of coupling to varying degrees.

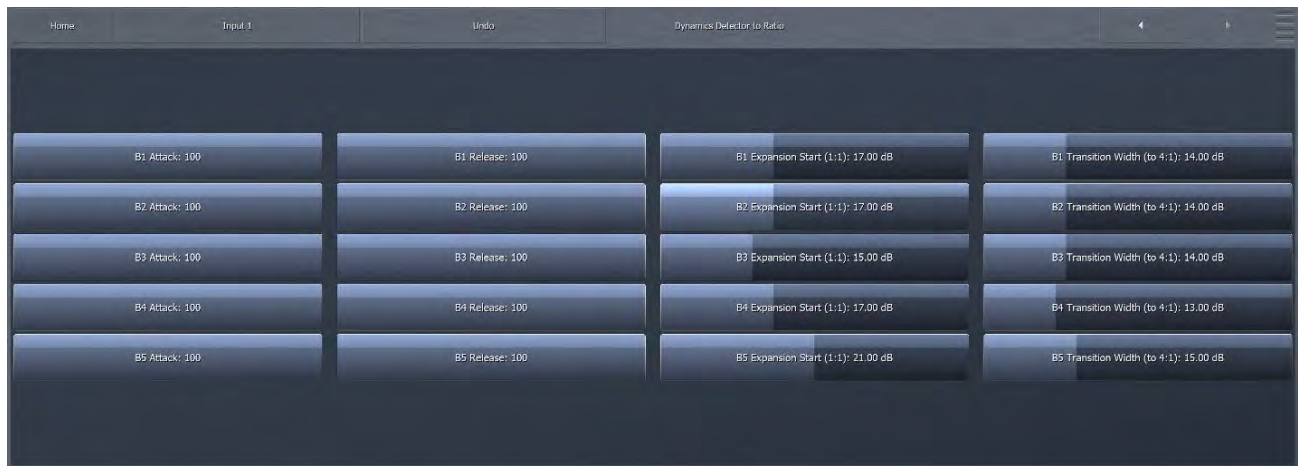
The degree to which each dynamics detector band influences and controls each expander band is determined by a 5 x 5 slider matrix. Each column represents a dynamics detector band, while each row represents an expander band.

The default (and recommended) settings are set up so that each expander band controlled almost entirely by its corresponding dynamics detector band, but with some control provided by surrounding dynamics detector bands. Higher values mean a particular dynamics detector band has more influence over a particular expander band, and vice versa.

Please note that in order to provide a means by which to allow one dynamics detector band to provide 100% of the control over a single expander band, every control must be designed to go all the way to 100. When one control is set to 100 and other controls in that band are set to a value higher than 0, thereby causing a sum greater than 100, Undo interprets that information and adjusts the settings of each band to maintain the desired proportion of influence you have set for each band relative to 100.

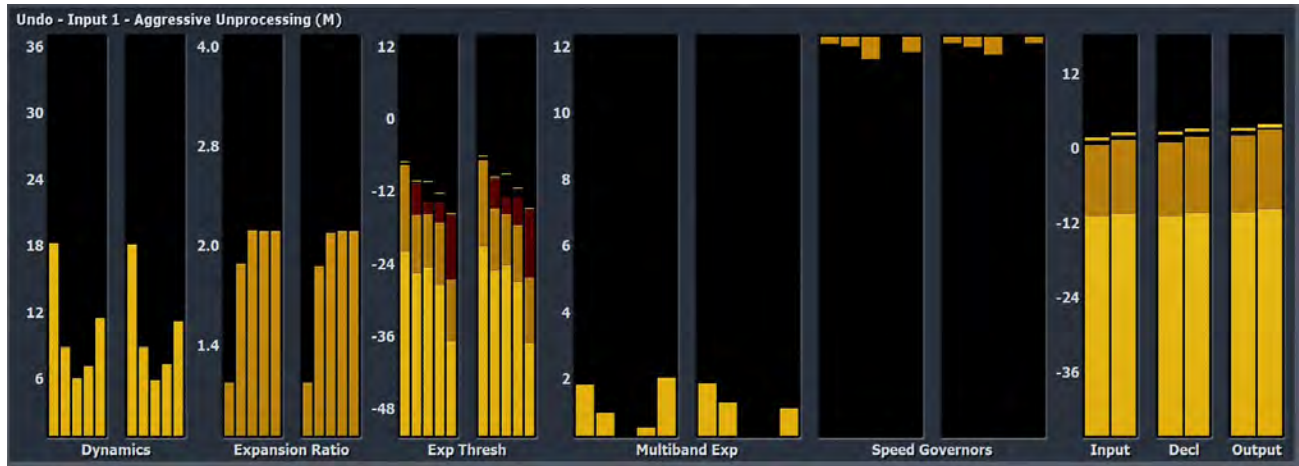
Dynamics Detector to Ratio Menu

The **Dynamics Detector to Ratio** menu allows you to set time constants of the expansion ratio adjustment as well as the Expansion Start levels and Transition Width levels for each of the 5 bands of Undo's multiband expander.



- ◆ The **Attack** and **Release** controls for each band determines how quickly the expansion ratio will track along with the dynamic detector settings. The default (and recommended) setting is 100, which means the expansion ratio will track instantaneously with no additional delay.
- ◆ When the dynamics detector falls below a certain level, expansion will begin, starting at a minimum ratio of 1:1 and increasing to a maximum ratio of 4:1. The point at which that expansion begins to occur is set by the **Expansion Start** control in each band.
- ◆ The relative point at which the expansion reaches its full 4:1 ratio is determined by the setting of the **Transition Width** control in each band.

The detected amount of dynamics in each band is indicated by the **Dynamics** meters. Taller bars indicate more inherent dynamics in the music, while shorter bars indicate less dynamics and are generally the inverse of the **Expansion Ratio** meters. The result of settings in the Dynamics Detector to Ratio menu can be observed on the **Expansion Ratio** meters in the Undo Meter Window.



A: Dynamics Meters, **B:** Expansion Ratio Meter

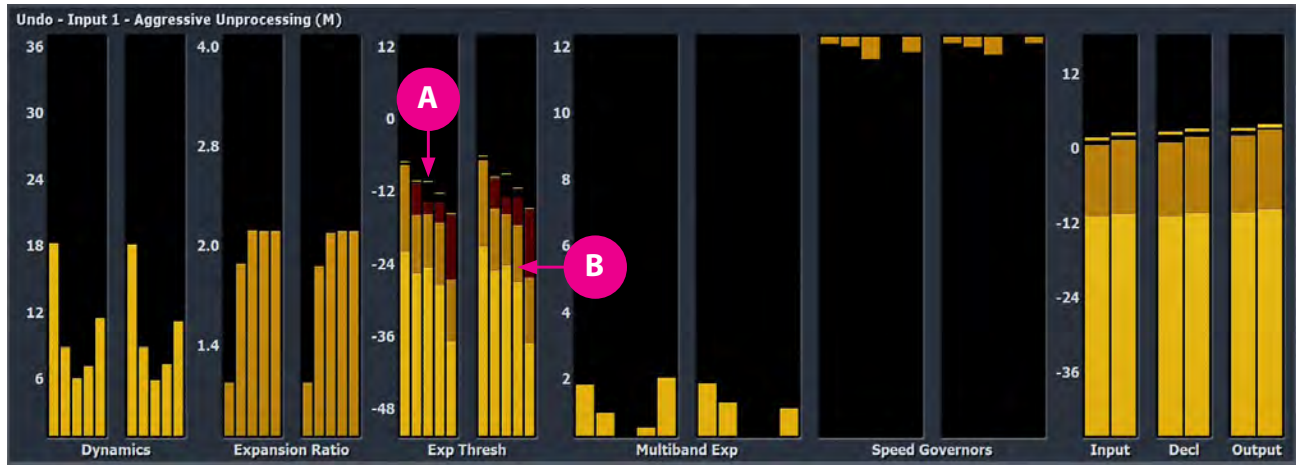
Peak Detector Menu

Undo measures audio peaks as a means by which to set the expander thresholds based upon the incoming program audio. The **Peak Detector** Menu controls the attack and release speed of each band of Undo’s Peak Detectors.



- ◆ The **Attack** speed controls determine how quickly Undo reacts to incoming audio peaks. Faster settings will make Undo more reactive to smaller incoming peaks by raising the threshold. Slower settings will effectively lower the threshold.
- ◆ The **Release** speed controls determine how quickly Undo allows the peak values to fall back toward the actual audio levels. Faster times will cause the peak levels to fall more quickly.

The effect of the Peak Detector settings is represented by the peak “blips” at the top of the dark orange peak level bars within the Expander Threshold meters in the Undo Meter window. Average levels are indicated by the bright orange bars.



A: Peak Blips and Peak Level Meters, **B:** Expansion Thresholds

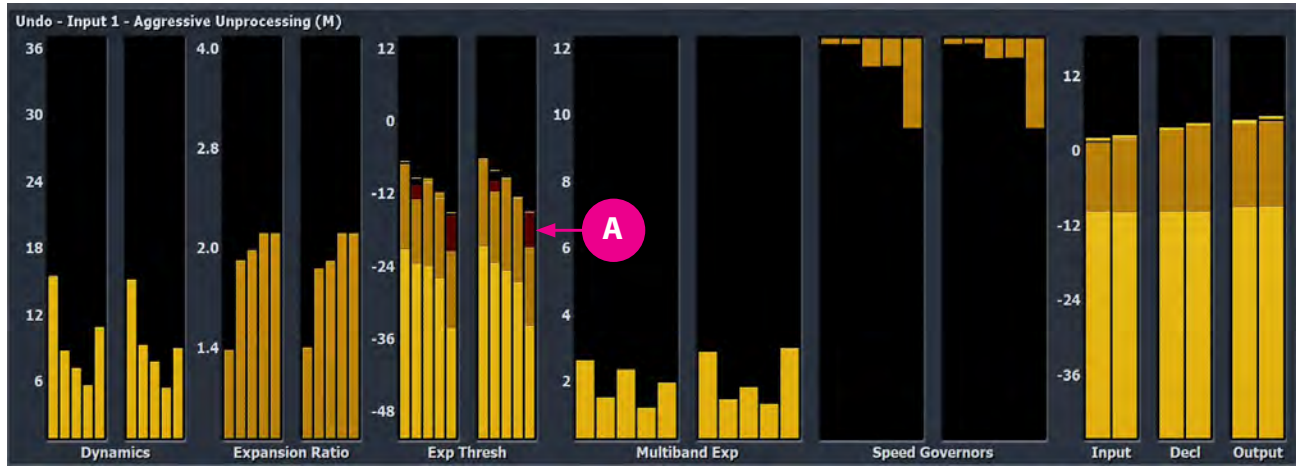
Expander Levels Menu

The Expander Levels menu gives you access to the Relative Threshold, Band<Wideband Distance Limit, and Maximum Gain controls of each band of Undo’s expanders.



- ◆ The **Relative Threshold** control for each band determines how far below the currently detected peak the expander threshold sits. Lower thresholds (moving the slider to the right) result in a greater peak-to-threshold distance and therefore provide more expansion. Higher thresholds (moving the slider to the left) narrow the peak-to-threshold distance and provide less expansion.
- ◆ In addition to an adjustable per-band peak detector with adjustable attack and release speeds (whose function is described above in the Peak Detector menu section), each channel also has a wideband peak detector with fixed attack and release speeds. The **Band<WB Distance Limit** controls determine the greatest distance by which an individual band’s peak detector can fall relative to the wideband level and keeps any one band from being expanded if there are insufficient levels to begin with. For example, if the current wideband peak is -6dB and this control is set to -10dB, the peak detector for that individual band will not fall below -16dB.
- ◆ The **Maximum Gain** control sets the absolute maximum amount of gain that can be applied to the audio in each expander band regardless of program material or any other control settings.

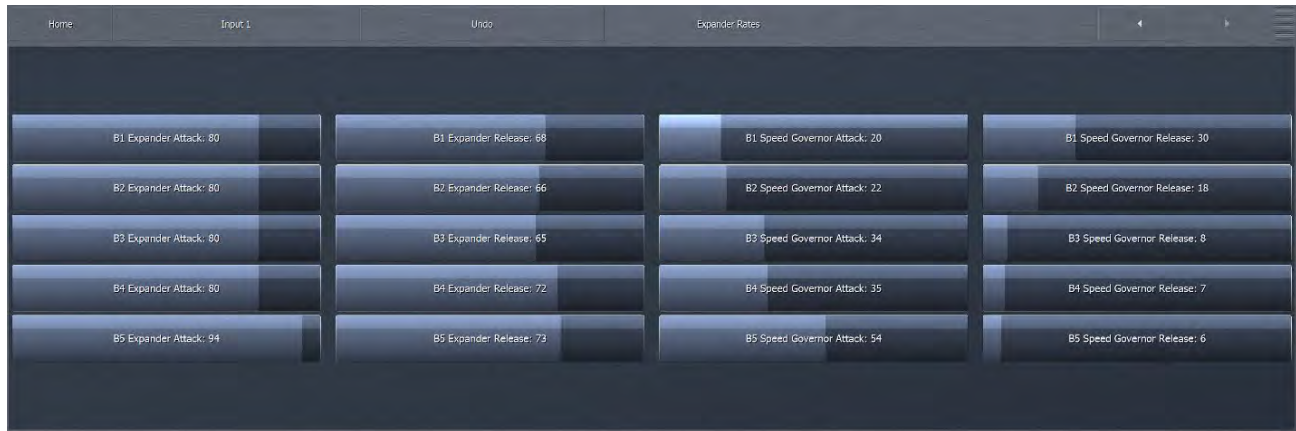
The Distance Limit is represented by the dark red bars in the Expander Thresholds meter in the Undo Meter window.



A: Distance Limit Meters

Expander Rates Menu

The Expander Rates menu provides controls for the attack and release speeds of the expanders for each band as well as attack and release speed controls for each band’s speed governors.



- ◆ The **Expander Attack** speed control determines how quickly each band’s expander will rise when the audio is in need of expansion. Faster settings will expand the audio more quickly. Using the built-in oscilloscope to view the Undo Control Signal patch point is very helpful for adjusting attack and release speeds as they show the gain that will be applied to the audio in each band. A detailed explanation of how to monitor various patch points within Omnia.9 is provided in the Display Settings menu of this manual.
- ◆ The **Expander Release** speed control adjusts how quickly the expander levels will fall once the expansion is no longer called for. Faster settings will allow the levels to fall more quickly.

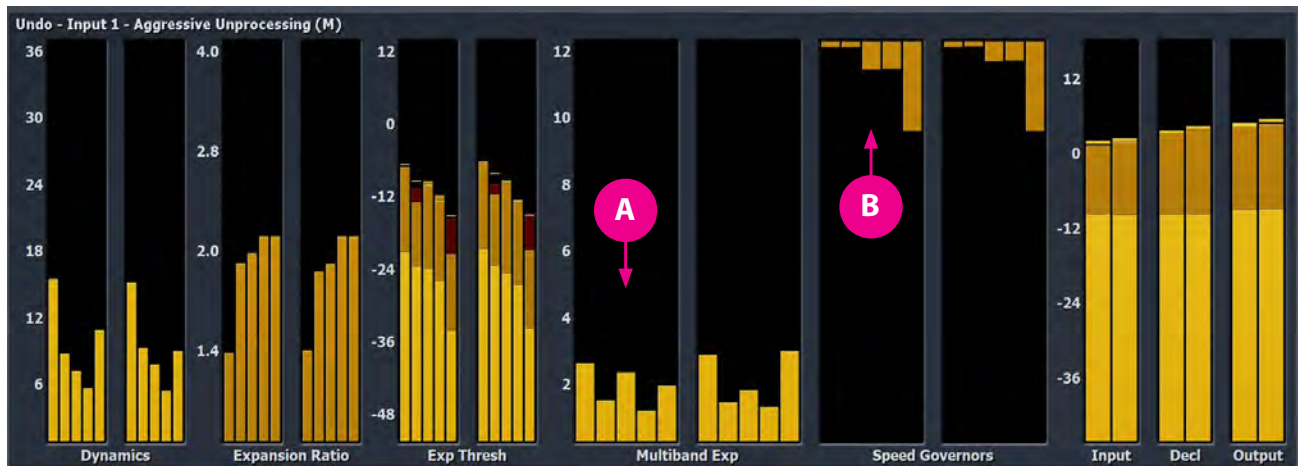
Undo also utilizes a second set of parallel expanders which look at the same input and automatically scale the attack and release characteristics of the main expanders. These Speed Governors detect when the main expanders have been operating at full speed for an extended period of time and will slow down the main expanders.

- ◆ The **Governor Attack** speed determines how long the speed governors wait before scaling back the speed of expanders. Faster attack speeds will cause the speed governors to slow down the expanders more quickly.
- ◆ The **Governor Release** speed setting determines how quickly the speed governors give up their influence on the main expanders.

The effect of the expander attack and release speeds are indicated by the **Multiband Expander** meters in the Undo Meter window. The levels of the speed governors are indicated in the **Speed Governors** window.

Expander Ratios Menu

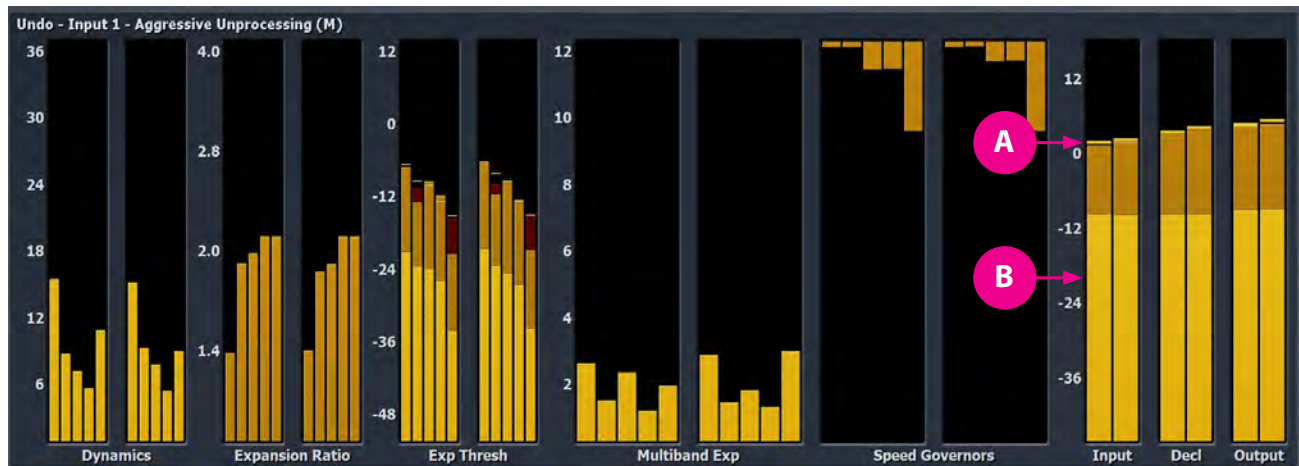
Each Undo expander band can operate in a range of ratios between 1:1 and 4:1. The **Minimum Ratio** and **Maximum Ratio** determine the absolute minimum and maximum ratios, respectively, for each band.



A: Multiband Expander Meters, **B:** Speed Governor Meters



There are three additional meters in the Undo metering window for audio levels at the input to Undo, after the de-clipper but before the multiband expanders, and at the output of Undo following the de-clipper and expanders. In each case, the bright orange bar indicates average levels, the darker orange bars indicate peak levels, and the floating orange blips serve as peak hold indicators.



A: Peak Blips and Peak Level, **B:** Average Level Meters

9 FM Menu Processing for FM

You Have to Start Somewhere: The FM Menu

The main FM Menu contains four sub-menus: Processing, MPX Input, RDS, and Meter Options.



While Omnia.9 offers completely separate processing cores for FM, AM, up to three HD channels, three streams (depending upon configuration), and a low latency studio core, the majority of the controls are the same for each. There will be some differences, of course, for settings that are peculiar to a particular medium. (For instance, HD and Streaming outputs use look-ahead limiters instead of a clipper for final peak control).

By familiarizing yourself with the FM section – which is the primary and perhaps most familiar section of any processor - you can get to know the menu interfaces and the function of the various controls.

Fair warning: There is no shortage of controls in Omnia.9! It was deliberately designed to provide a very comprehensive set of tools and give you complete freedom to create exactly the sound you want and feel is best suited to your station in your market. The latest software version offers Basic and Intermediate modes in addition to the Expert mode (which shows all available controls). Using one of these new modes should help make learning and making adjustments less intimidating.

Read on for a complete rundown and explanation of the various menus found in the FM processing core.

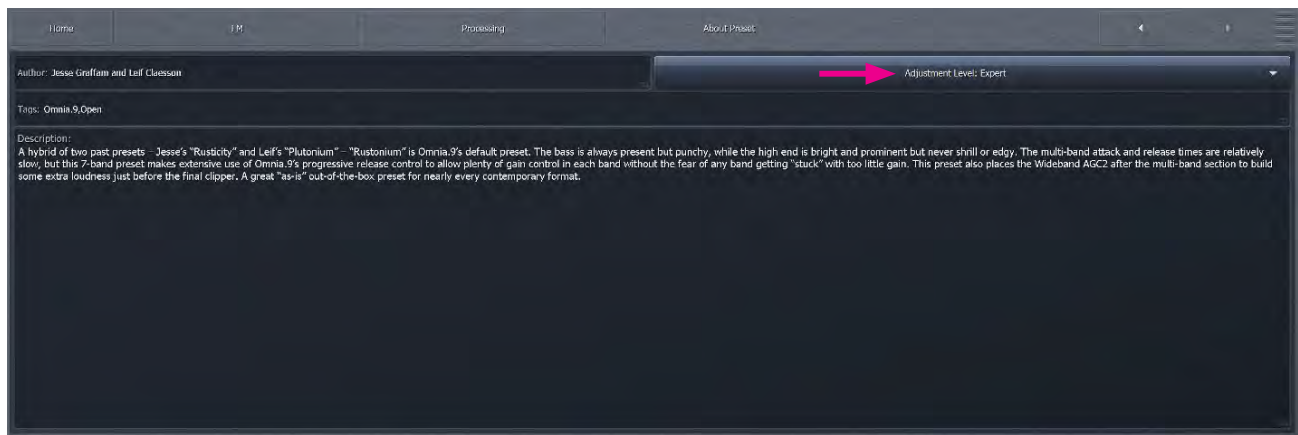
FM Processing Menu

The FM Processing menu (Expert mode controls shown here) provides access to all sections of the main FM processing core. From this menu, you can load and save presets, enable and configure Preset Protection, and adjust phase-related processing such as the Phase Scrambler, Phase Rotator, and Bass-EFX circuit. This is also where you can adjust audio parameters including the Downward Expanders, Input AGC, Wideband AGCs, Parametric Equalizer, Multiband Stereo Enhancer, Multiband AGC and Limiters, Band Mix, Dry Voice Detector, and Clipper.



About Preset

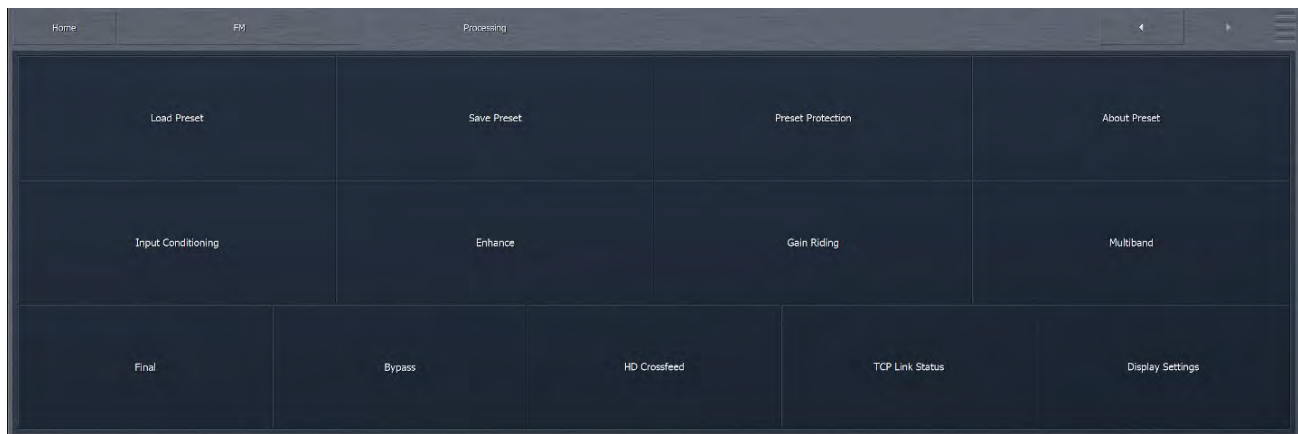
The About Preset option, while not the very first button within the Processing Path, nevertheless should be the first button you visit. There is a drop down menu labeled “Adjustment Level.” This allows an operator to choose between “Basic”, “Intermediate”, and “Expert”.



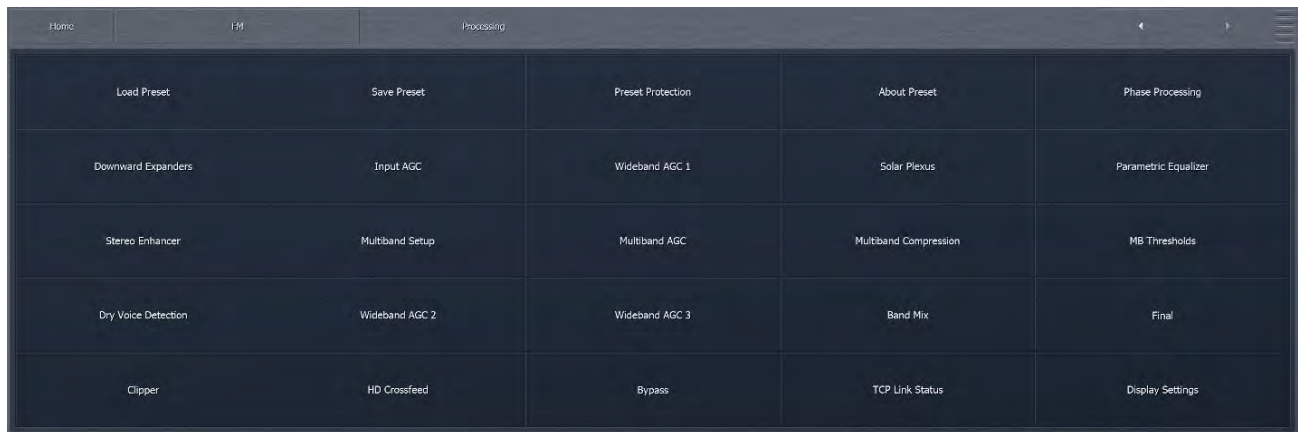
Adjustment Levels

The choice of the “Adjustment Level” will determine how much *finesse* is made available to the operator. There are the “Basic”, “Intermediate”, and “Expert” levels of control. Shown here are the “Basic” screens and “Expert” screens. You may wish to do your initial setup using the basic controls to “get you in the ball park”. Then you can choose the intermediate or expert sets of adjustments to fine tune your Onmia.9. Whatever works best for you.

BASIC



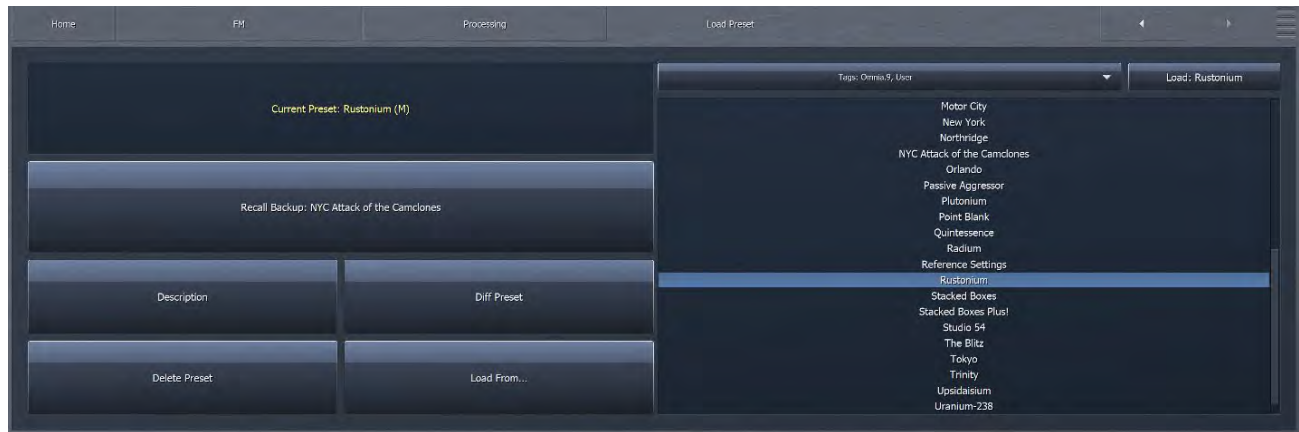
EXPERT



Those additional buttons under “Processing” will be explained shortly. The “About Preset” button has the function of recording the originator of a processing preset, and providing a textual description and name of a preset. By default, each factory preset loads in the Basic mode.

Load Preset Menu

The Load Preset menu is shared among the “Adjustment Levels” within the “About Preset” tab. This allows you to view the preset currently on the air, toggle back and forth between the current and backup presets, load a new preset, compare the settings of two presets, and delete user presets.



Highlighting a preset from the list places it in the Load button. Selecting the Load button puts that preset on the air and moves it up to the Current Preset position. The preset that was previously on the air will become the Backup Preset. You may also place a preset on the air from the list directly by double tapping it.

After changing any parameter of a preset, an (M) appears next to the Current Preset name and the text turns yellow to indicate the preset has been modified but not yet saved. The Backup Preset also becomes the former (and unmodified) Current Preset. This allows you to toggle back and forth to hear the difference between the original and modified presets on-air by simply clicking the backup button to swap the current and backup slots.

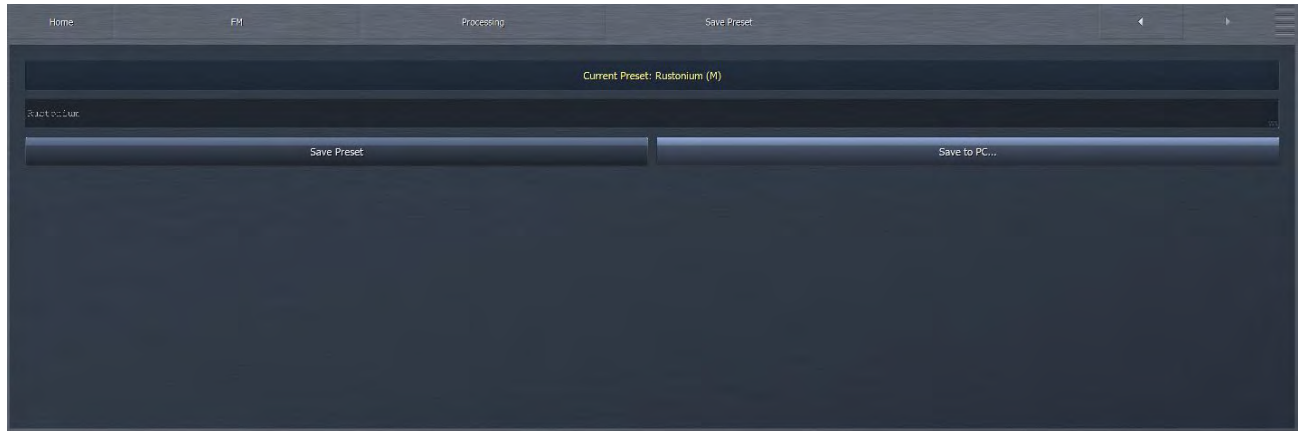
Changes to each parameter you adjusted to create the modified preset are also displayed in yellow on the specific control button in each section of the processing core, providing an instant visual comparison between the modified preset and the original preset upon which it is based.

You can also compare the differences between the Current Preset and the Backup Preset by selecting the Diff Preset button. Any control settings in the Current Preset that are different from those in the Backup Preset will be displayed in yellow in their respective sections. In addition, the backup value of each control is indicated by a small arrow on the bottom of the control itself.

Selecting the Delete Preset button allows you to permanently delete user-created presets. Factory presets cannot be deleted.

Save Preset Menu

The Save Preset menu is another common tab among the “Adjustment Levels.” It allows you to edit the name of or save over a user preset.



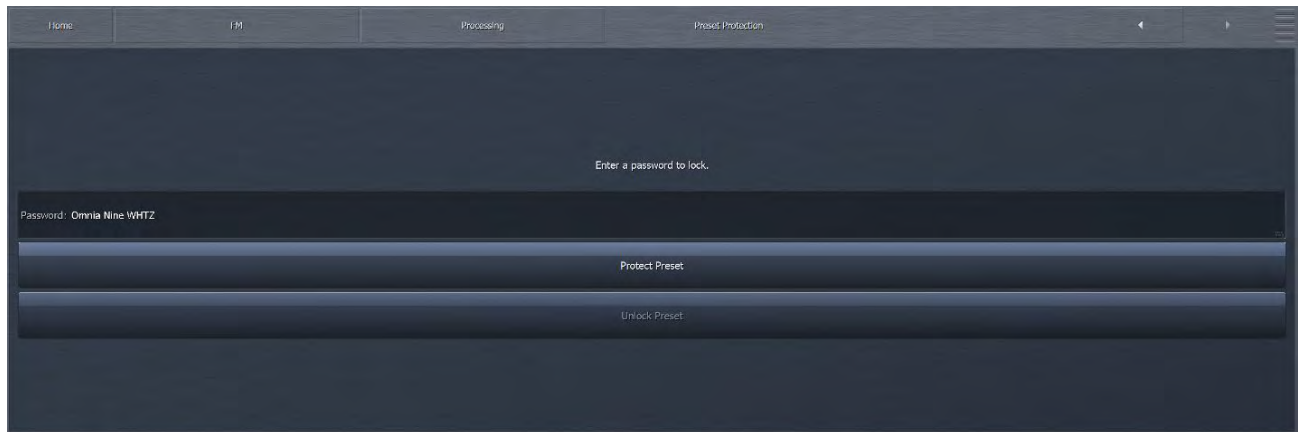
- ◆ You can rename your current preset from the front panel, regardless of whether or not it has been modified, by selecting the **Edit Preset Name** button to bring up the on-screen keyboard. Type in the new name, select “OK”, and select **Save Preset**. The new preset will now appear in the list.
- ◆ If your **Current Preset** has been modified, you also have the option to write over the existing preset without renaming it by selecting **Save Preset**.
- ◆ **Save to PC**. This will save a copy of the preset to your PC. This is highly recommended in order to have a backup of your work “just in case”. It is also convenient for sharing presets between Omnia.9’s.

That said, we strongly recommend that after you have made some adjustments and are ready to save those changes to a Custom Preset you give it a unique name instead of saving directly over your current version. That way, should there come a time when you want to revert to a previous incarnation of a preset, you can do so. Please note: if you continually save over the same preset throughout your adjustment process instead of giving it a unique name, you will not be able to get back to your starting point..

Keep in mind that you cannot give a Custom Preset the same name as an existing Factory Preset.

Preset Protection Menu

The Preset Protection Menu is also common to all processing types. It allows you to password protect a preset so that it cannot be modified or copied for use in another Omnia.9. In addition, the settings for this preset will be hidden from view as long as the preset is locked.



To password protect a preset, enter a password, click on “OK,” and then on “Protect Preset.” A warning dialogue box will appear. If your intention really is to protect the preset, select “Yes.” The final step is saving the new, protected preset with a unique name in the Save Preset menu. Protected presets appear in green in the Load Preset menu. Remember not to accidentally leave an unencrypted version of your preset in the Backup Preset slot!

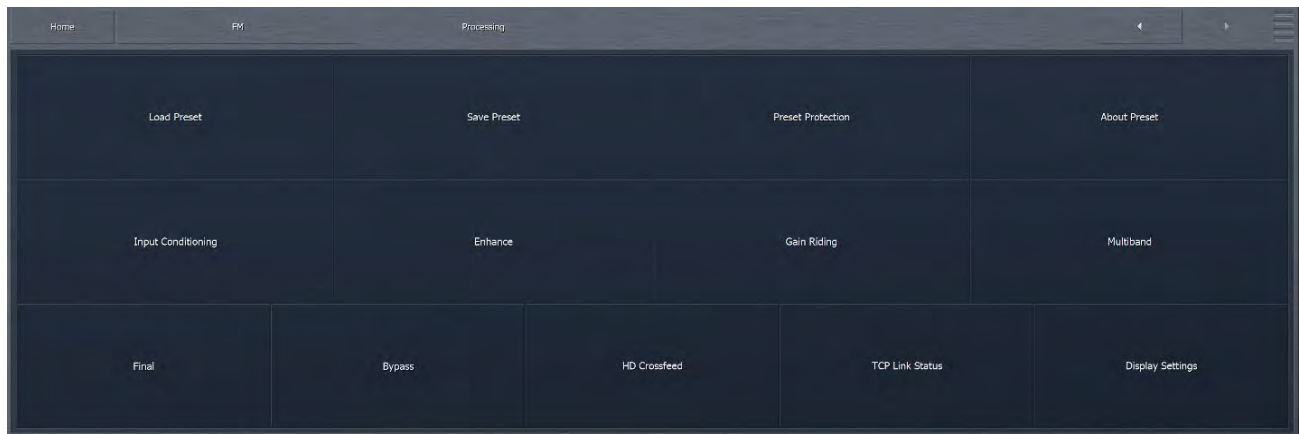
To un-protect a preset, return to the Preset Protection menu, enter your password, click on “OK,” and then on “Unlock Preset.”

Please note: *If you lock a preset and forget the password, customer support cannot reset the the password for you. Make sure to write your preset down somewhere. For best practice, save a local copy using the NfRemote software.*

NfRemote also auto-saves a local copy any time you press Save, in separate folders for each day, for each unit you’re connected to. You’ll find them in `c:\Users\user\AppData\Local\NfRemote\local_copies\`. This is useful to know, as it may contain an earlier unprotected version of a preset.

10 FM Menu Basic Mode

Basic mode is ideal for anyone who does not care to dig deeply into the hundreds of controls exposed in the Expert mode, but it is also useful even for processing experts who just want the convenience of quickly tweaking a preset without having to manually make multiple adjustments.



Input Conditioning Menu

The Input Conditioning menu is one of the five tabs available under the “Basic” Adjustment Level that are used to tailor the audio of your station. It contains the controls for enabling the phase scrambler, enabling and adjusting the phase rotation, and enabling and adjusting noise reduction. These controls will be available within the “Intermediate” and “Expert” levels, albeit with more detail. The Input Conditioning is the first stage of processing.



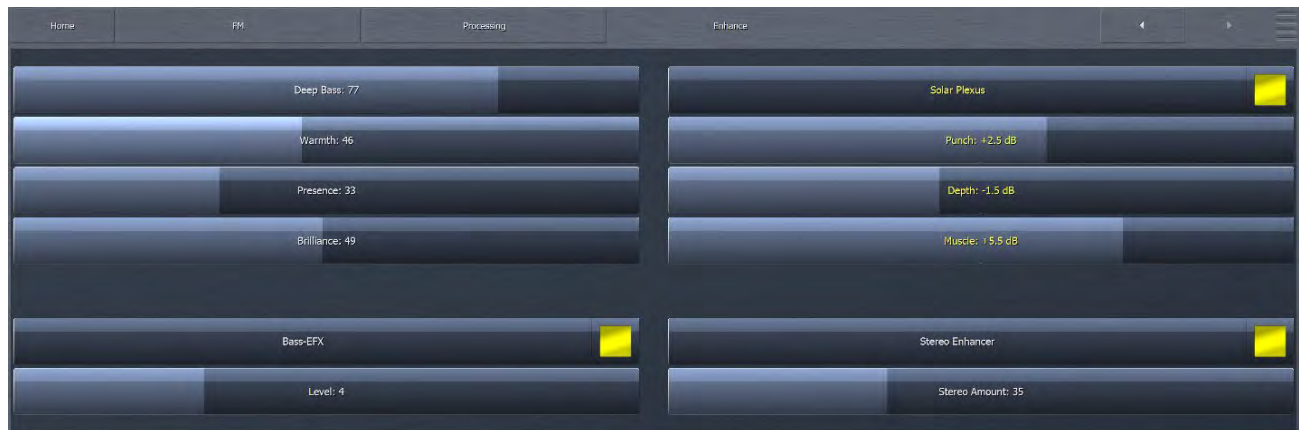
- ◆ Omnia.9 features downward expanders in its multiband AGC stage to help control noise in the content itself (for example, tape hiss present on an old recording) or environmental noise (such as HVAC noise in the studio). The maximum amount of downward expansion is determined by the **Noise Reduction Amount** control. The setting of the **Noise Reduction Threshold** control determines the point at which the expanders begin to react.
- ◆ The **Phase Scrambler** button enables or disables the phase scrambler. Certain sharp sounds with high harmonic content (such as trumpets or some synthesized sounds) are low in energy but contain high peaks. Since peaks must be limited to prevent over-deviation of the FM carrier, and if the majority of those peaks are removed by clipping, the sound may become dull and distorted.

The **Phase Scrambler**, without employing limiting or clipping of its own, slightly offsets the various harmonics present in the audio to drastically lower the peak level, thereby allowing much more of the audio to pass through the final clipper. The result is a dramatically improved high end and less distortion.

- ◆ The **Phase Rotator** button enables or disables the phase rotator. Phase rotation is recommended primarily for stations airing talk programming who are also trying to achieve high levels of loudness as it can adversely affect transient “punch” desirable on music formats.

Enhance Menu

The **Enhance Menu** under the Basic Adjustment level is a combination of controls that are separated under the higher levels of Adjustment. The **Enhance** menu contains controls that affect the spectral balance of processed audio as well as enhancements to the stereo image.

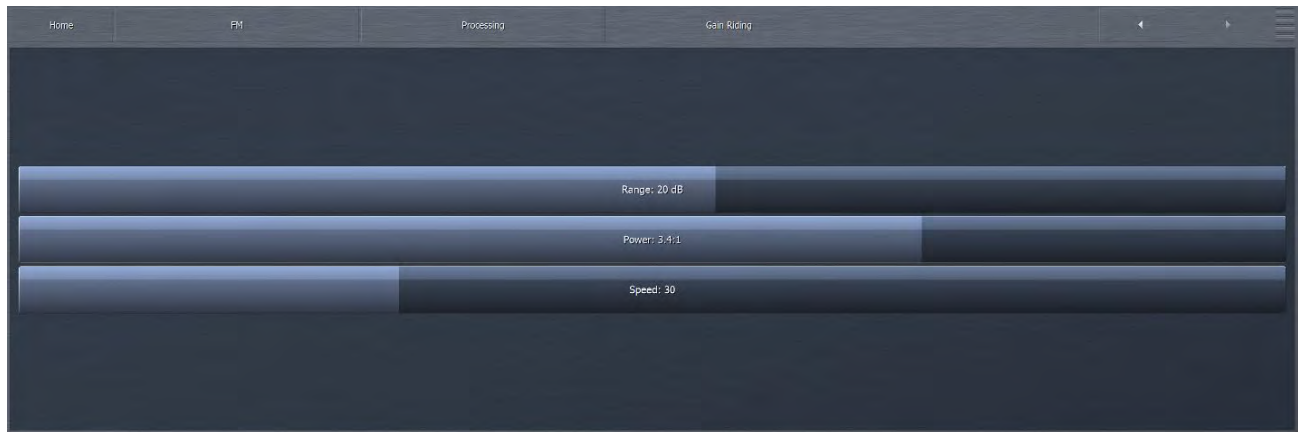


- ◆ In presets with 4 to 7 bands, the **Deep Bass** control simultaneously adjusts the lowest band of the parametric equalizer, the target level of Band 1 in the multiband AGC, and the setting of Band 1 in the Band Mix Output control. In presets with only 2 or 3 bands, only the parametric EQ is adjusted. Advancing the control increases the amount of deep bass.
- ◆ The **Warmth** control works in the same manner as Deep Bass but operates on the mid-bass and low-mid range of frequencies by adjusting the parametric equalizer. Additionally, in presets with 4 to 7 bands, it adjusts the target setting of Band 2 in the multiband AGC and output level of Band 2 in the Band Mix Output.
- ◆ The **Presence** control adjusts high-mid frequencies. Like the other Enhance controls, it adjusts the parametric equalizer. In presets with 5 to 7 bands, it also adjusts the multiband AGC target setting of Band 5 and the output of Band 5 in the Band Mix Output.
- ◆ The **Brilliance** control adjusts high frequencies with the parametric equalizer. In 4 and 5 band presets, it also adjusts the target setting of the highest band of the multiband AGC along with the output level of the highest band in the Band Mix Output.

- ◆ The **Solar Plexus** control switch activates a sub-harmonic bass enhancement effect. This replaces the original “Bass Thunder”, providing greater flexibility over the older enhancer. Unlike other attempts at this that use simple frequency dividers that provide phony sounding “one note” bass, the sub-harmonic enhancement here is locked to the original bass musically, in both frequency and level. When activated there are 3 adjustments to control the effect that can be set to reduce as well as boost the **Punch**, **Depth** and **Muscle** features of the effect as desired. When adjusting **Solar Plexus**, be sure to use speakers or headphones with good low bass response to avoid “overdoing it” with too much energy in the lowest octaves.
- ◆ The **Bass-EFX** control allows you to enable or disable the Bass-EFX feature and, when enabled, adjust the level of Bass-EFX processing. which helps retain the punch of low-frequency transients such as those found in a kick drum by spreading the bass energy out in time, thus allowing more of the energy of a bass kick to pass through the clippers. Bass-EFX does not itself add energy.
- ◆ The **Stereo Enhancer** control allows you to enable or disable the stereo enhancer feature. When enabled, the **Stereo Amount** control determines the ratio of L+R to L-R. Higher settings provide more stereo enhancement. Adjust this control carefully to avoid turning the stereo image “inside out” by allowing L-R to overpower L+R which ruins mono compatibility and increases multipath distortion.

Gain Riding Menu

Multiple individual settings of Omnia.9’s various wideband AGC sections are simultaneously controlled by the settings in the **Gain Riding** menu.

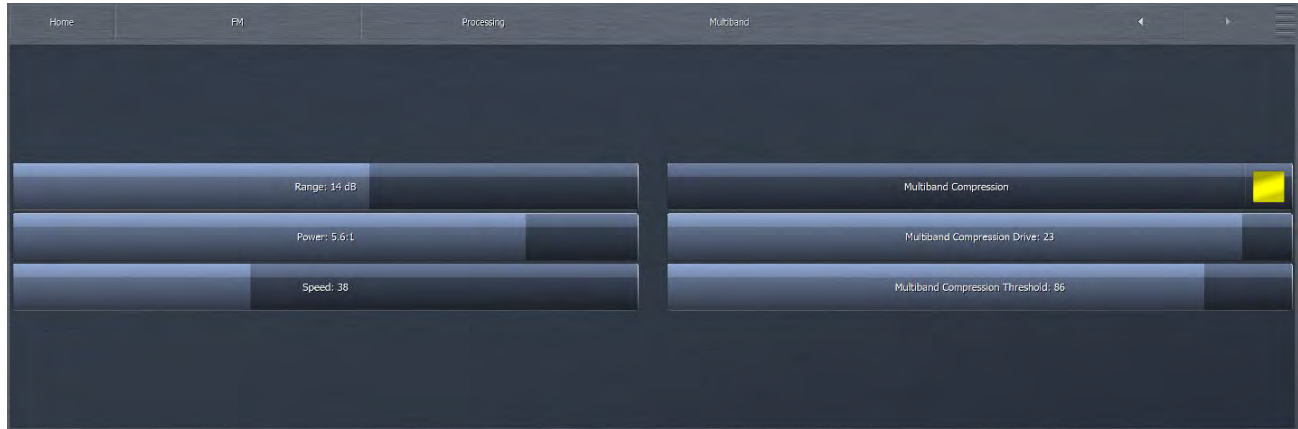


- ◆ The setting of the **Gain Riding Range** control affects the Input AGC only and determines the amount of available gain. Setting this control too high may provide too much room for low level audio to be raised up while not providing enough room to adequately attenuate higher input levels. Conversely, setting it too low may not provide enough gain to increase low incoming levels.

It is worth noting that traditional processors only act upon audio above a particular threshold. They are driven into various amounts of gain reduction, but once the audio falls below the threshold, they “run out of room” or “top out” and are incapable of increasing the audio any further. This necessitates some sort of make-up gain control later in the audio chain. The AGC’s in Omnia.9 operate both above AND below threshold (as you can see by observing the scale on the Input AGC meter) thereby controlling the dynamics over a much wider range without the need for makeup gain.

- ◆ The **Gain Riding Power** control simultaneously adjusts the ratio of the Input AGC and Wideband AGC 1 sections. Advancing the control tightens the ratio and provides more consistency, while sliding the control to the left loosens the ratio and yields a more open sound.
- ◆ **Gain Riding Speed** simultaneously adjusts the attack and release rates of the Input AGC and Wideband AGC 1 sections. Higher settings translate to faster attack and release rates. Since the actual attack and release speeds are program dependent, the numeric value on the control simply represents the relative position of the slider (0 = control completely to the left = slowest, 100 = control completely to the right = fastest).

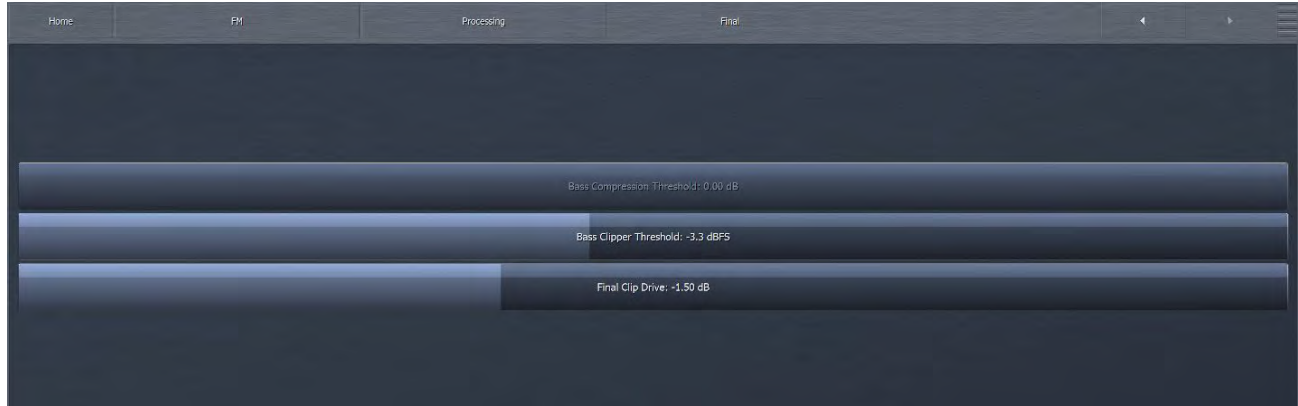
Multiband Menu



The controls of the **Multiband** menu work in a similar fashion to their counterparts in the **Gain Riding** menu but (as the sharper students in the class may have already surmised) work on Omnia.9's multiband AGC section.

- ◆ The **Multiband AGC Range** control sets the total amount of available multiband gain. Setting this control too high may provide too much room for low level audio to be raised up. Setting it too low may not provide enough gain to increase low incoming levels. It may also cause individual bands to run out of gain before others which in turn can cause inconsistencies in the overall spectral balance.
- ◆ The **Multiband AGC Power** control adjusts the ratio of the multiband AGC's. Advancing the control tightens the ratio and provides more consistency, while sliding the control to the left loosens the ratio and yields a more open sound.
- ◆ **Multiband AGC Speed** simultaneously adjusts the attack and release rates of all bands of the multiband AGC's. Higher settings translate to faster attack and release rates, though actual attack and release speeds are program dependent.
- ◆ The optional **Multiband Compression** switch enables a multiband compression section integrated into the multiband AGC and multiband limiters. These operate faster than the multiband AGC's, adding "bite" that some find desirable. When enabled, the **Multiband Compression Drive** control adjusts the amount of compression. Higher settings provide more compression. Be careful about using too much compression as the sound can become flat and fatiguing. Lower settings provide a more open compression sound. On the Multiband meters, the compression can be seen as an additional bargraph, below the AGC bargraphs that are a darker shade of yellow/orange.
- ◆ The **Multiband Compression Threshold** control sets the point where compression starts for a given Drive setting, relative to the multiband AGC's. Higher settings allow the compression component to be a greater percentage of the overall processing.

Final Menu



The Final Menu provides control of the final clip drive, bass compression threshold, and, bass clipper threshold. If BS-412 Power Limiting is enabled (for countries that require it), Power Limiter Drive and Peak Limiter Drive controls will also be displayed.

- ◆ The **Final Clip Drive** control sets the drive of the final clipper. Decreasing the drive (moving the slider to the left) reduces the amount of clipping. Conversely, increasing the drive (moving the slider to the right) will result in more clipping. Less clipping will result in a more open, less-processed, cleaner sound, but at the expense of overall loudness. More clipping can result in a louder on-air sound – but only up to a point. Even if total dial domination and loudness are your processing goals, there comes a point when the final wave-form is completely full, and increasing the amount of clipping will no longer yield additional loudness – only more distortion. We strongly recommend using Omnia.9’s oscilloscope as well as your ears to monitor the MPX Output signal while adjusting the final clip drive. This control ranges from -6.0 to +6.0 in one-quarter dB increments, which should give you the (correct) impression that small changes make a big difference in the sound. Keep in mind that a setting of +0.00 means the control is at the middle of its range, but does not necessarily mean that no clipping is taking place.
- ◆ The **Bass Clipper Threshold** control sets the threshold of the Bass Clipper. Raising the threshold (moving the slider to the left) reduces the amount of clipping performed by the Bass Clipper, but place a greater burden on the Final Clipper. Conversely, lowering the threshold (moving the slider to the right) will yield more bass clipping, which takes some of the load off the Final Clipper, but may result in low frequency distortion if set too low.
- ◆ The **Bass Compression Threshold** control will only be active on presets that have Wideband AGC 2 set to “Bass Only”. When active, lower settings provide more bass compression activity.

Bypass



The bypass processing control is mostly self explanatory. It bypasses the entire main processing section, but it does NOT bypass either Undo, the final clipper or the stereo generator. Peak control is absolute even with bypass enabled. You can adjust the bypass gain to compensate for the differences in levels between processed and unprocessed audio. Be careful with your monitor levels when making this adjustment because unprocessed audio may either be much lower in level than processed audio, or it may be somewhat higher, depending on your initial settings.

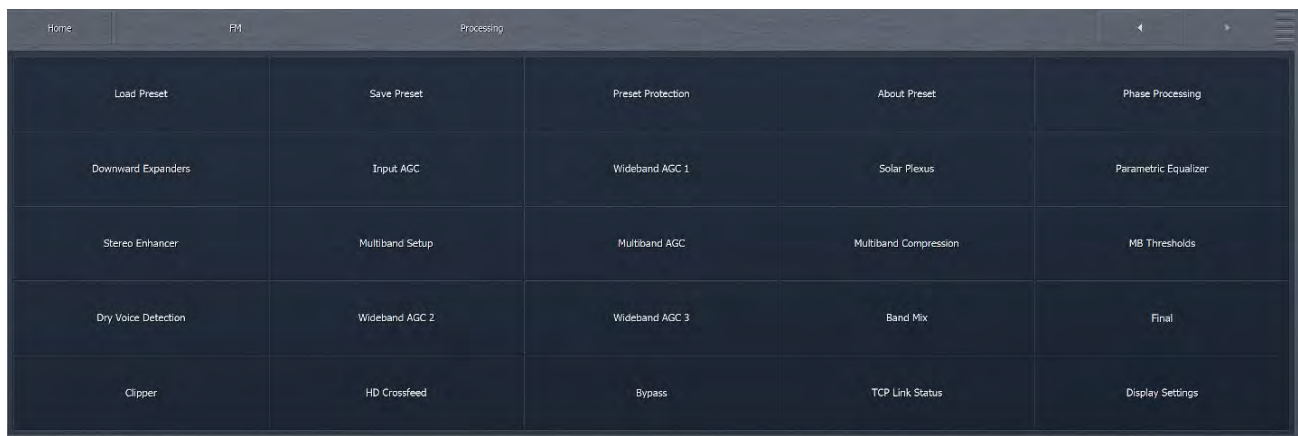
HD Crossfeed



The HD-Crossfeed menu provides you access to drive and filter controls relating to the shared processing paths in Omnia.9. Crossfeed architecture allows FM and HD or AM and HD paths to share a common processing path, up to the point where those paths must diverge. For example, if FM and HD paths share early stage processes such as input conditioning, WB AGC, Undo, and insert points (for watermarking, etc.) they benefit in terms of blending and resource use. But since the FM path must go to a clipper stage while HD goes to a final limiter, paths must split at latter stages in the chain. HD Crossfeed is the last point before that split.

- ◆ The **HD Limiter Meters** control enables / disables the HD Limiter Meter in the FM processing meter section.
- ◆ The **HD Limiter Drive** control allows you to increase or decrease the drive to the look-ahead limiter used for the crossfeed, so that you can achieve the cleanest possible sound through low bit-rate coded channels (having some transients will help the codec!), as well as balance transitions that may occur in the transmission path downstream (such as HD/FM blend).
- ◆ The **HD Treble** control allows you to reduce high frequency content in the crossfeed. This may be necessary since the FM pre-emphasis clipper stage will inevitably reduce high frequency content on the FM path, which is often compensated for by increasing brightness in the processing preset for the FM path. Since crossfeed means that this same preset is used for HD which does not have the corresponding high frequency limitation, reducing treble will go a long way towards preventing the fully digital HD path being perceived as overly bright or harsh.

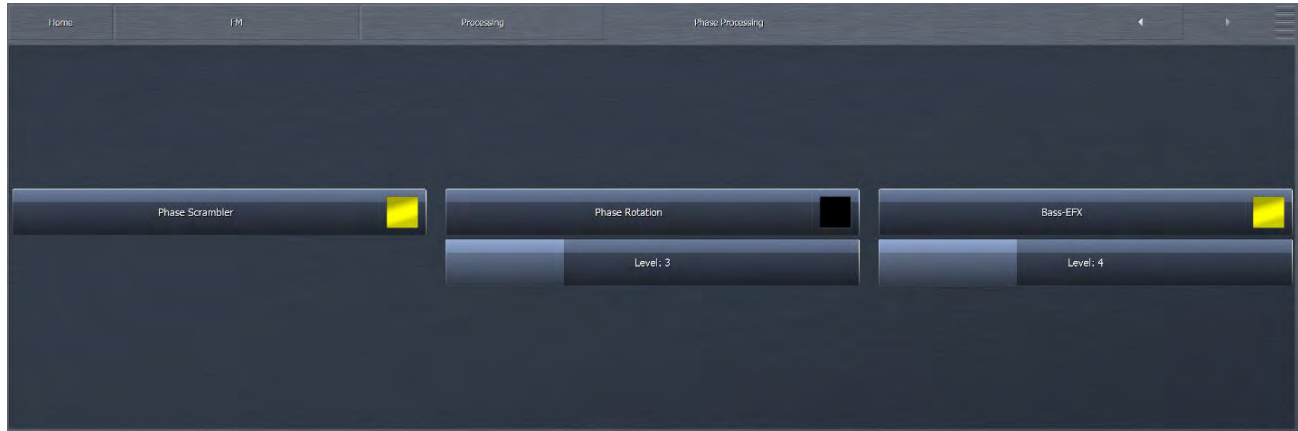
11 FM Menu Intermediate Mode



Switching to **Intermediate** mode makes a significantly larger number of controls available and is much more akin to **Expert** mode than **Basic**. For instance, the three simple controls for multiband adjustments in **Basic** mode are replaced by entire menus that allow complete control over parameters like attack rate, release rate, targets, and thresholds for each band of the multiband AGC's and multiband limiters. While the number of selections (as above) is the same as **Expert** mode, there are fewer sub-menus at this level.

- ◆ **Intermediate** mode is best suited for anyone who knows the art of processing well, understands how these controls work and interact with one another, and wants to fine tune their sound with tools that are not available in **Basic** mode.

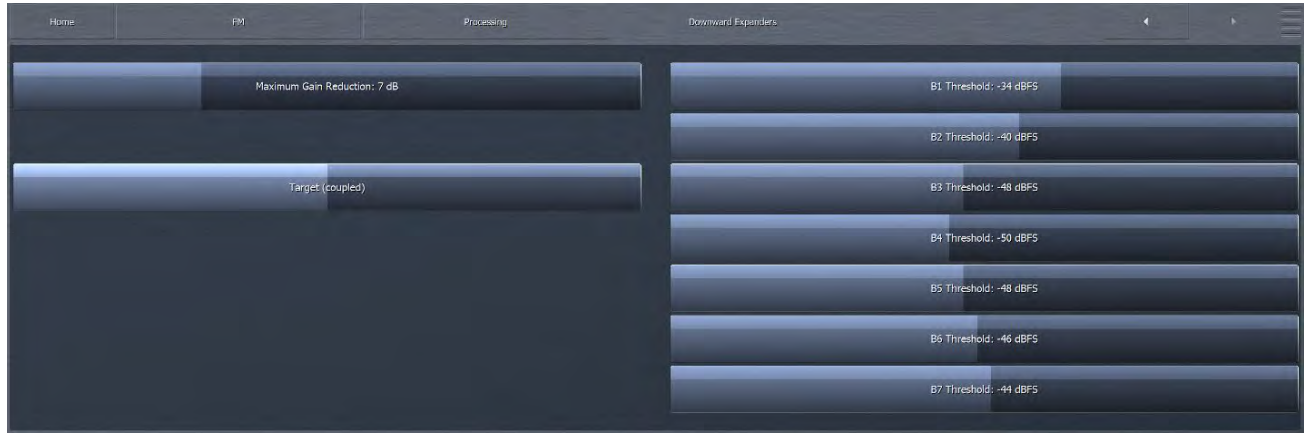
Phase Processing Menu



The Phase Processing menu contains the controls for enabling the phase scrambler, enabling and adjusting the phase rotator, and enabling and adjusting the Bass-EFX feature.

- ◆ The **Phase Scrambler** button enables or disables the phase scrambler. Certain sharp sounds with high harmonic content (such as trumpets or some synthesized sounds) are low in energy but contain high peaks. Since peaks must be limited to prevent over-deviation of the FM carrier, and the majority of those peaks will be removed by clipping, the sound may become dull and distorted. The Phase Scrambler, without employing limiting or clipping of its own, slightly offsets the various harmonics present in the audio to drastically lower the peak level, thereby allowing much more of the audio to pass through the final clipper. The result is a dramatically improved high end and less distortion.
- ◆ The **Phase Rotator** button enables or disables the phase rotator. Phase rotation is recommended primarily for stations airing talk programming who are also trying to achieve high levels of loudness as it can adversely affect transient “punch” desirable on music formats. The Level Slider adjusts the amount of phase rotation. Carefully monitor the MPX Output signal on the oscilloscope while listening to dry voice and advance the slider just enough to achieve symmetrical peaks. The default setting is 3.
- ◆ The **Bass-EFX** menu allows you to enable or disable the Bass-EFX feature and, when enabled, adjust the level of Bass-EFX processing. When used in conjunction with heavier overall levels of processing, Bass-EFX helps retain the punch of low-frequency transients such as those found in a kick drum by spreading the bass energy out in time, thus allowing more of the energy of a bass kick to pass through the clippers. Bass-EFX does not itself add energy.

Downward Expanders Menu

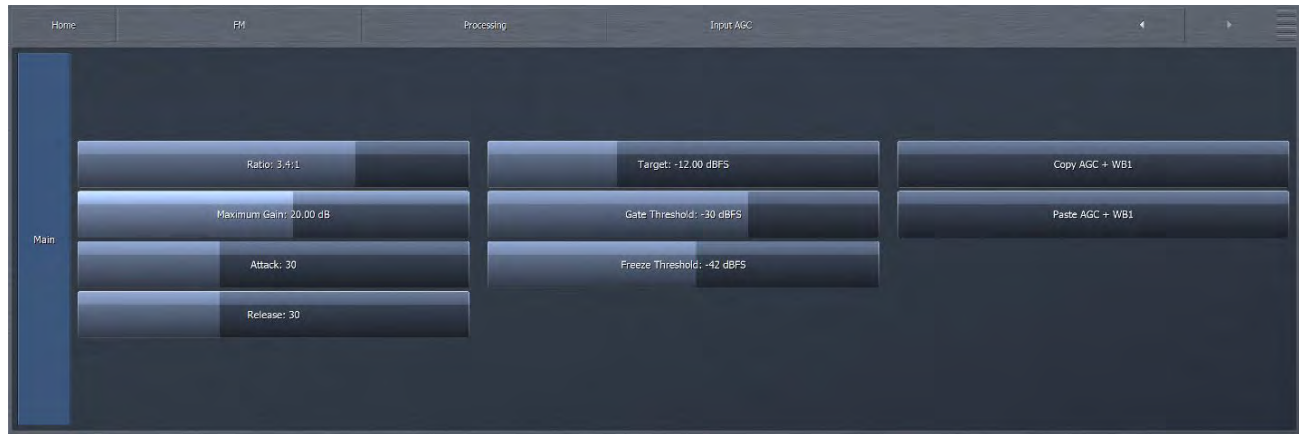


The **Downward Expanders** menu allows you to control the maximum noise reduction (downward expansion) for all bands in the Downward Expanders section as well as the threshold, attack and release speeds for each individual band. The total number of bands available in the Downward Expanders section is determined by the number of bands of processing used in the Current Preset.

The Downward Expanders operate in a manner similar to a traditional “noise gate,” and are useful for reducing unwanted background noise from less-than-perfect program material or from a noisy studio environment. The ratio of these expanders is 2:1.

- ◆ The **Maximum Gain Reduction** control determines the greatest amount of noise reduction for all available bands.
- ◆ The **Threshold** control for each band sets the point at which downward expansion begins. The range of this control is from -90 to 0dB. The **Threshold (Coupled)** control allows all bands to be adjusted simultaneously by an identical amount.

Input AGC Menu



The **Input AGC Menu** is used to set the ratio, maximum gain, attack rate, release rate, target level, gate threshold and freeze threshold of the input Automatic Gain Control.

The Input AGC is the first gain control stage in Omnia.9 following Undo, and is designed to be used as a slower-acting leveler ahead of the Wideband AGC1 (if active) and multiband sections that follow it.

It is worth noting that traditional processors only act upon audio above a particular threshold. They are driven into various amounts of gain reduction, but once the audio falls below the threshold, they “run out of room” or “top out,” and are incapable of increasing the audio any further. They require some sort of make-up gain control later in the audio chain. The compressors in Omnia.9 operate above AND below threshold, controlling the dynamics over a much wider range and do not require makeup gain.

- ◆ The **Ratio** control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 (effectively bypassed) to Infinity:1.
- ◆ The **Maximum Gain** control works in conjunction with the Ratio control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The **Attack** control determines the speed with which the Input AGC acts to reduce audio above threshold. Lower settings represent slower attack speeds and allow more audio to pass unprocessed by the Input AGC into subsequent processing stages. Higher settings result in faster attack speeds and allow less unprocessed audio to enter subsequent sections. Because all of Omnia.9’s processing stages are to some extent program-dependent, putting actual measures of time on these controls would be pointless, and so the numbers on the various Attack and Release controls throughout are simply relative numbers.
- ◆ The **Release** control determines the speed with which the Input AGC increases audio below threshold. Lower settings provide slower release speeds, while higher settings result in faster release speeds.
- ◆ The **Target** control sets the target output level of the Input AGC. A lower setting results in a lower output level, while higher settings provide a higher output level. This is similar to a traditional “threshold” control when the levels are below the target.

- ◆ The **Gate Threshold** and **Freeze Threshold** controls work together to determine the points at which the release rate of the Input AGC slows by a factor of 3 (gate threshold) or freezes altogether (freeze threshold). The range of these controls is -90dB to 0dB. Lower settings means the audio must drop to a lower level before the release speed slows or freezes. Higher settings means the audio doesn't have to drop as much in level before the input AGC gain slows down or stops. Using higher settings when employing faster Input AGC release speeds can keep the audio from being increased too quickly or too much during quieter passages or pauses. If the display is sized and configured in such a way that the Input AGC meter is shown vertically, a Gate condition will be indicated by a dim, dark red bar at the bottom of the meter. A Freeze condition will be indicated by a brighter dark red bar.

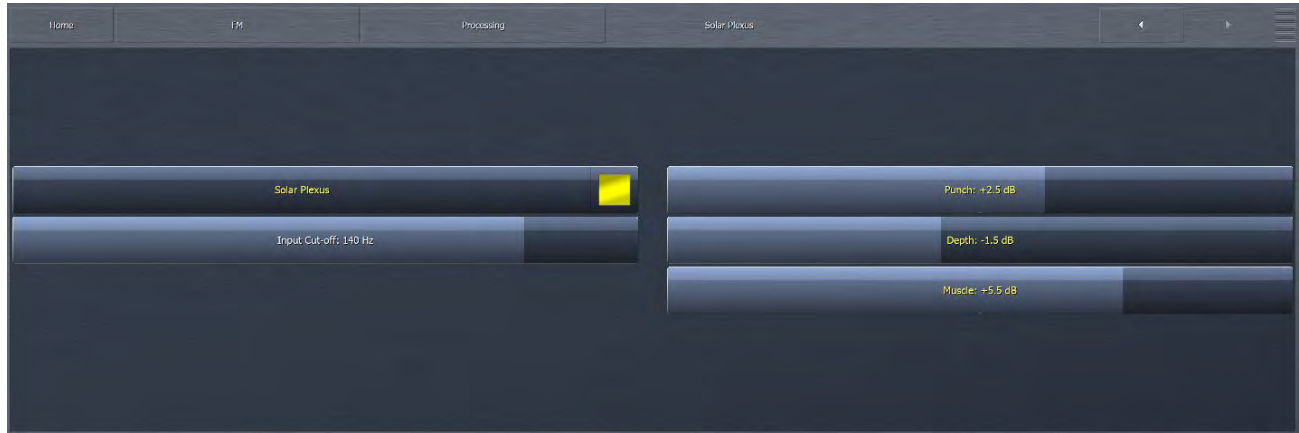
Wideband AGC 1 Menu



The **Wideband AGC1** menu provides access to enable and bypass controls, maximum gain, maximum gain reduction, ratio, attack, release, progressive release, target level, gate threshold, freeze threshold and sidechain delay.

- ◆ The **Wideband AGC1 Enable** button enables this section, which follows the Input AGC section and provides additional wideband compression as determined by its various controls. Disabling the Wideband AGC1 also makes this patch point unavailable in an oscilloscope or RTA display window.
- ◆ The **Bypass** button removes the Wideband AGC1 compressor from the audio path, but its patch point remains an available option for viewing on the oscilloscope or RTA via the Display Settings menu.
- ◆ The **Sidechain Delay** feature is useful for both adding punch and managing the amount of low frequency power (while increasing bass punch). This is an especially useful “trick” for maintaining apparent loudness when operating under MPX Power regulations.
- ◆ The **Maximum Gain**, **Ratio**, **Attack rate**, **Release rate**, **Target**, **Gate Threshold**, and **Freeze Threshold** controls work in the same manner as their counterparts in the other sections of the Omnia.9. However, the **Maximum Gain** control in the Wideband AGC1 section has a range of 24db.
- ◆ The **Maximum Gain Reduction** control sets the maximum amount of gain reduction possible in the Wideband AGC1 compressor, and is adjustable from 0 to 24dB in one-quarter dB increments.
- ◆ The **Progressive Release** control determines the degree to which the Wideband AGC1 compressor releases its gain at a faster rate as the audio is driven further toward or into gain reduction. At a setting of 0, the control has no effect and the Release speed control fully determines the rate of release. Increasing the setting progressively makes the release speed of the audio faster as gain decreases.

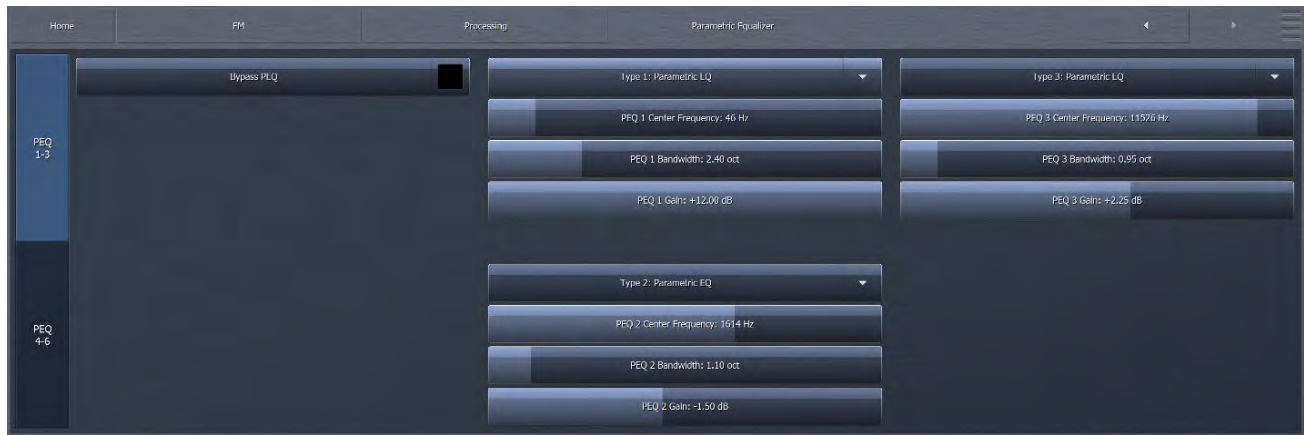
Solar Plexus



The **Solar Plexus** control switch activates a sub-harmonic bass enhancement effect. Unlike other attempts at this that use simple frequency dividers that provide phony sounding “one note” bass, the sub-harmonic enhancement here is locked to the original bass musically, in both frequency and level.

- ◆ When activated there are 3 adjustments to control the effect that can be set to reduce as well as boost the **Punch**, **Depth** and **Muscle** features of the effect as desired. When adjusting **Solar Plexus**, be sure to use speakers or headphones with good low bass response to avoid “overdoing it” with too much energy in the lowest octaves.

Parametric Equalizer Menu



The **Parametric Equalizer** menu allows you to set up the 6-band phase-linear parametric equalizer, which is located just ahead of the multiband section of the processing core. In addition, an assortment of pre-configured filters is available, including a Low Pass Filter, a High Pass Filter, a Band Pass Filter, a Notch Filter, a Low Shelf EQ, and a High Shelf EQ. PEQ 1-3 and PEQ 4-6 buttons on the left of the screen let you toggle between 2 sets of 3 bands to reduce screen clutter.

- ◆ The **Bypass** button removes the equalizer from the audio path.
- ◆ The **Type** drop down menu determines what type of EQ or filter is employed, including high, low, band-pass, notch filters, or high and low shelf.
- ◆ The **Frequency** slider is used to set the center frequency for each band. The range of this control is 20 to 22,050Hz.

- ◆ The **Width** slider determines how much audio above and below the center frequency will also be affected by any boosts or cuts in gain. The range of this control is 0.0 to 10.0 octaves in one-tenth octave increments. Lower values provide a narrower (sharper) boost or cut, while higher values provide a wider (gentler) boost or cut.
- ◆ The **Gain** slider determines how much the audio selected with a combination of the Frequency and Width sliders is boosted or cut. Each band can be boosted or cut by 12dB in one-quarter dB increments for a total range of 24db per band.

Although changes made in the parametric equalizer section are offset somewhat by the action of the multiband compressors that follow, this does not occur to the degree you might expect based upon your experience with other processors. The parametric equalizer in Omnia.9 is a very versatile and powerful tool for creating your on-air sound. A visual representation of the effects of the PEQ using the built-in real time analyzer can be seen in the RTA portion of the Display Settings section of this manual.

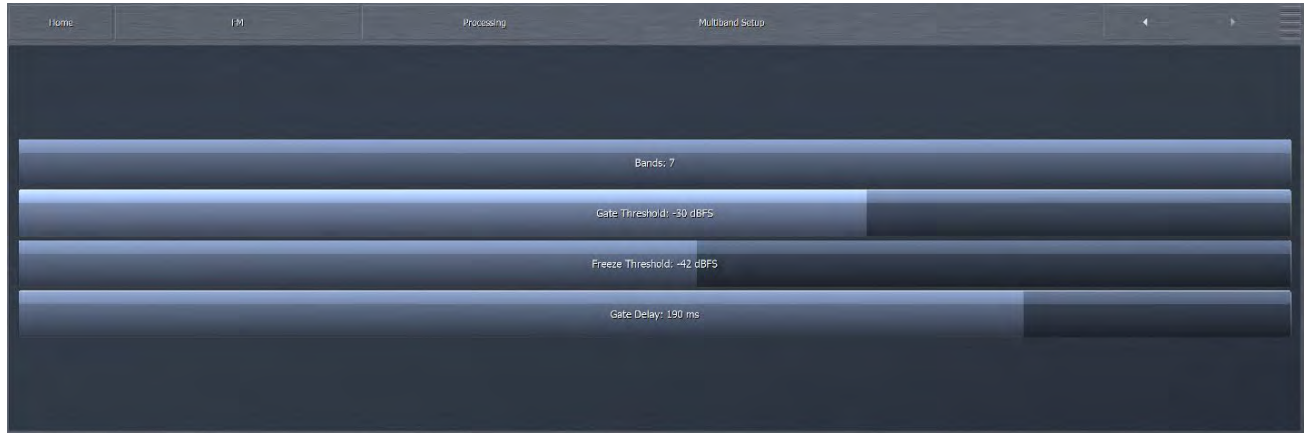
Stereo Enhancer



Omnia.9 offers a unique multi-band Stereo Enhancer, whose total number of bands is determined by the number of bands of processing used in the Current Preset. Regardless, it never works on bass, because listener perception of bass is not directional. This is why Band 1 is never represented and Band 2 may be grayed out. This approach significantly reduces the chance that quieter, hard-panned stereo sounds in a recording with a strong centered mono sound will be shifted out of phase and offers much greater control over the stereo enhancement available in various portions of the spectrum.

- ◆ The **Stereo Enhancer** menu gives you access to the Target, Maximum Gain, Maximum Gain and Maximum Gain Reduction.
- ◆ The **Enable** control turns the Stereo Enhancer on or off.
- ◆ The **Target Width** control determines the ratio of L+R to L-R. Higher settings provide more stereo enhancement. Adjust this control carefully to avoid turning the stereo image “inside out” by allowing L-R to overpower L+R which ruins mono compatibility and increases multipath distortion.
- ◆ The **Maximum Gain** control determines how much the Stereo Enhancer can increase L/R separation in an effort to achieve the Target Width in program material that has a narrow stereo image. The range is between 0 and 18dB.
- ◆ The **Maximum Gain Reduction** control determines how much the Stereo Enhancer can reduce L/R separation in an effort to achieve the Target Width in program material that already has a wide stereo image. The range is between 0 and 18dB.
- ◆ The **Target Width (coupled)**, **Maximum Gain (coupled)**, **Maximum Gain Reduction (coupled)**, controls allow you to adjust all the bands simultaneously by an equal amount in their corresponding sections.

Multiband Setup



The **Multiband Setup** menu provides control over the number of processing bands employed as well as, gate threshold, freeze threshold, and gate delay controls. Also found here are the enable buttons for gain reduction override and controls for the gain reduction ratio.

- ◆ The **Band** slider determines the number of bands in the multiband processing section and ranges from 2 to 7.
- ◆ The **Gate Threshold**, and **Freeze Threshold** controls work in the same manner as their counterparts in other sections of the Omnia.9.
- ◆ The **Gate Delay** control determines how long the Gate Threshold and Freeze Threshold controls wait before they begin working. The range of this control is between 0 and 255ms. Setting the control to “0” means that as soon as audio falls below the threshold as determined by the settings of the Gate and Freeze controls, it immediately slows or stops, respectively. Higher settings mean it will take longer for the release of the audio to slow or stop. A Gate condition will be indicated by a dim, dark red bar at the bottom of the multiband meters. A Freeze condition will be indicated by a brighter dark red bar.

Note:

Setting the Gate Delay much lower than the default setting of 79ms will cause the gate to take effect during the brief pauses in dry speech, resulting in a much lower volume level from an announcer mic, for instance, as compared to music. Used creatively, this is actually a very useful tool for controlling announcer/music level balance.

It is worth mentioning again here the importance of a concept unique to Omnia.9. Most (if not all) other processors “top out at 0” – that is, they constantly operate in a state of gain reduction, and once the audio falls below threshold, they can no longer increase it any further. To make up for the fact that they are capable only of reducing gain, they rely upon a “makeup gain” control somewhere downstream in the audio chain to get the levels back up. Omnia.9 is not only capable of gain reduction – that is, driving audio levels above threshold as other processors do – but is also capable of increasing gain below threshold.

Multiband AGC

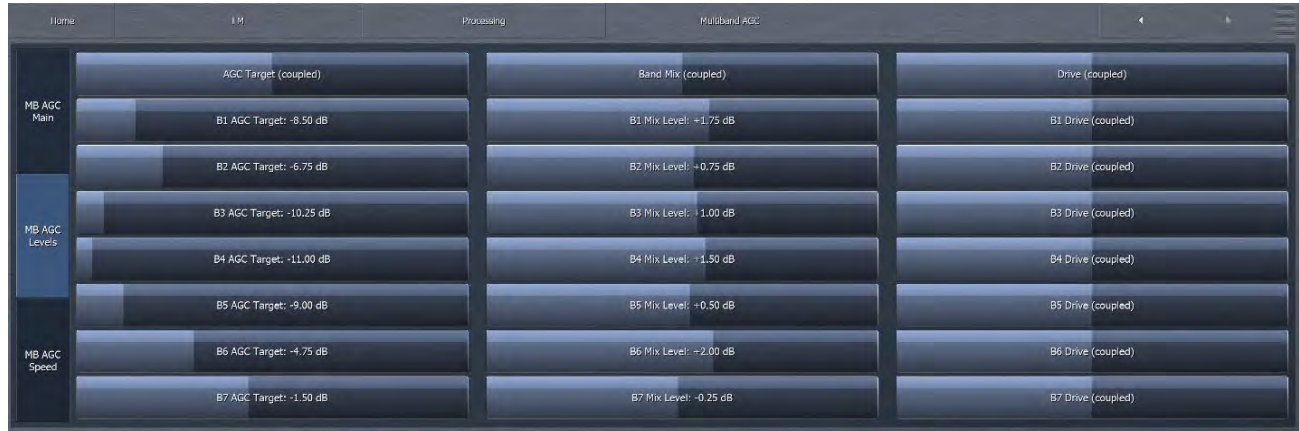
There are 3 sections to the Multiband AGC control page: Main, Level and Speed. The buttons on the left of the screen allow you to navigate between pages.



MB AGC Main

- ◆ The **Maximum Gain** control works in conjunction with the Ratio control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The **Ratio** control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 to Infinity:1.
- ◆ The **Progressive Release** control determines the degree to which the Multiband compressor releases its gain at a faster rate when the audio is driven further toward or into gain reduction. At a setting of 0, the control has no effect and the Release speed control fully determines the rate of release both below and above threshold. Increasing the setting progressively makes the release speed of the audio faster as gain decreases.

MB AGC Levels



The AGC Target controls set the target gain reduction / output level of the MB AGC bands individually or overall with the “coupled” control. A lower setting results in more gain reduction thus a corresponding lower output level while higher settings provide less gain reduction and a higher output level. This is similar to a traditional “threshold” control when the levels are below the target.

The Band Mix column within the Multiband AGC/MB AGC Levels allows you to adjust the final output of each band after all Wideband and Multiband processing has been applied. This is the same Band Mix that is a separate tab under the Processing path. It is provided here as a convenience. It can be used very effectively to tailor the overall spectral balance of your sound, but keep in mind that this is the final point of adjustment before the audio reaches the Final Clipper (FM core) or Final Limiter (HD and Streaming Cores). In other words, levels increased in the Band Mix section can only be controlled by final clipping or final limiting, which may result in unexpected or unwanted density on some material, so care is required when making adjustments here.

The Drive controls adjust the amount of drive (input level) to the AGC bands individually or overall with the “coupled” control. Drive differs from Target in that higher settings of Drive actually raise the input level to the AGC band or section, increasing gain reduction but not changing the output level. Depending on other AGC parameters, the output may change due to other factors, but the output level set point does not change.

MB AGC Speed



The Multiband Attack/Release section lets you control the Attack Speed and Release Speed of each band in the multiband AGC section.

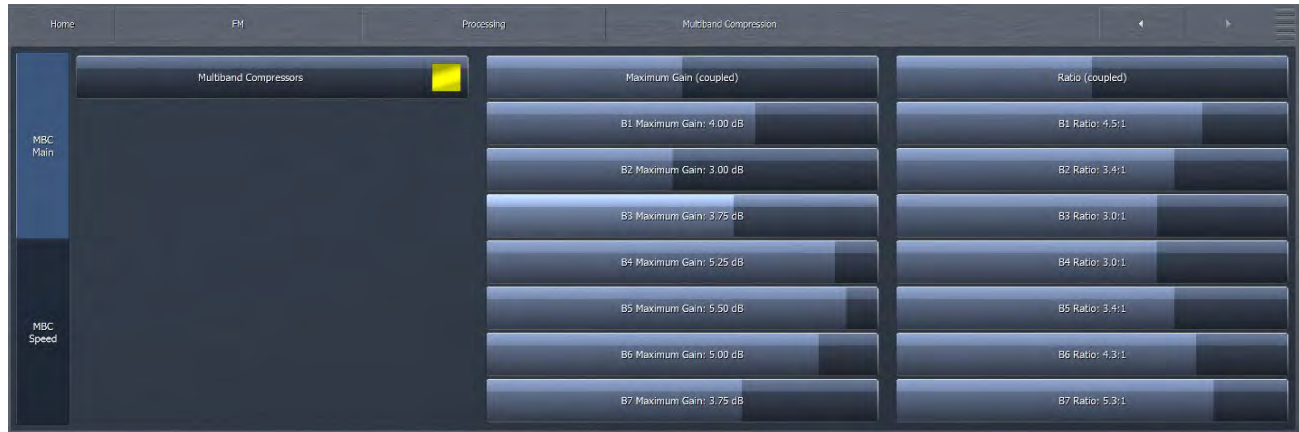
- ◆ The Attack speed and Release speed controls work in the same manner as their counterparts in the other sections of the Omnia.9. However, the behavior of the multiband AGC compressors is also program-dependent.
- ◆ The Attack (coupled) control allows you to adjust the attack speed of all of the bands simultaneously by an equal amount.
- ◆ The Release (coupled) control allows you to adjust the release speed of all the bands simultaneously by an equal amount.
- ◆ The Speed (coupled) control allows you to adjust both the Attack speed and Release speed of all the bands simultaneously by an equal amount.
- ◆ The Peak Sense (Coupled) control simultaneously adjusts the attack and release rates but in opposition to one another. Sliding the control to the right increases the attack rate and slows the release rate, making it more peak sensitive. Sliding the control to the left decreases the attack rate and speeds up the release rate, making it less peak sensitive.

The attack and release speeds of the multiband limiters are program-dependent and not adjustable.

Multiband Compression

There are 2 sections to the Multiband Compression control page: Main and Speed. The buttons on the left of the screen allow you to navigate between pages.

MBC Main



- ◆ The **Multiband Compressors** switch enables or disables the multiband compression section. When disabled all of the controls will be grayed-out.
- ◆ The **Maximum Gain** control works in conjunction with the **Ratio** control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The **Ratio** control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 to Infinity:1.
- ◆ Each band can be adjusted separately, or all bands may be adjusted simultaneously via the **Coupled** control.

MBC Speed



These controls allow you to adjust the attack and release times of the multiband compressor bands, either individually or for all bands simultaneously using the “coupled” controls.

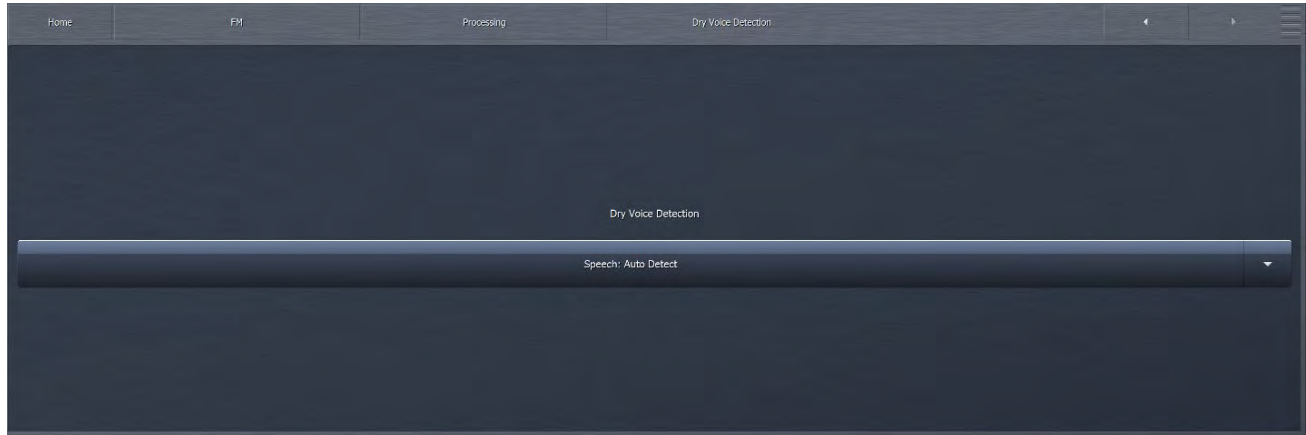
MB Thresholds



The Multiband Thresholds menu allows you to set the target for each of the Multiband AGC bands, target for the compression for each of the Multiband AGC bands, as well as the threshold for each band of the Multiband Limiters. The total number of bands available in the Multiband Thresholds section is determined by the number of bands of processing used in the Current Preset.

- ◆ The **AGC Target** controls set the target output level of each band of the Multiband AGC. A lower setting provides a lower output level, while a higher setting provides a higher output level. These controls have a range between +12 and -12dB in one-tenth dB increments.
- ◆ The **Comp Target** controls set the target compression level for each band of the Multiband AGC. A lower setting provides less compression, while a higher setting provides additional compression. These controls have a range between +18 and -3dB in one-quarter dB increments.
- ◆ The **Limiter Threshold** controls determine at which point the Multiband Limiter acts upon the incoming audio for its particular band relative to its corresponding AGC Target. For example, a setting of +6dB means that any peaks of less 6dB above the AGC Target level will not be processed by the limiter. These controls have a range between +18 and 0dB in one-tenth dB increments.

Dry Voice Detection



The **Dry Voice Detection** Menu contains the controls to enable the dry voice detector circuit and adjust the dynamics section of Omnia.9 when this feature is engaged.

Dry voice is one of the most difficult waveforms to process cleanly, as the human voice is complex in nature and is typically asymmetrical in form. Stations that choose to process aggressively in an effort to maximize loudness may find that bare vocals come through with unacceptably high levels of audible distortion.

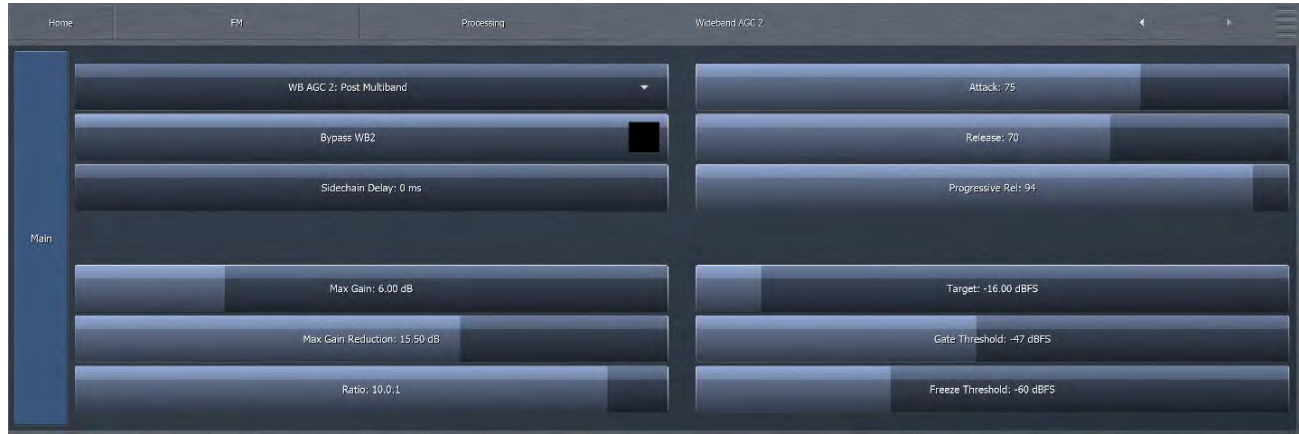
Omnia.9 overcomes this situation by automatically detecting (in the Auto Detect mode) when the input audio is dry voice and using a separate set of multiband targets, attack rates, and release rates. This allows the dynamics section to do more of the “heavy lifting” and reduces the amount of clipping necessary to maintain the same level of loudness.

- ◆ The **Dry Voice** dropdown menu can be set to “Off”, “Auto Detect”, or “Force”. “Off” completely disables this feature. “Auto” allows the processor to automatically detect the presence of dry voice. “Force” overrides the main multiband settings and uses the Dry Voice Detection settings at all times. It is useful to force detection of voice while testing with music, in order to facilitate adjusting the separate dry voice multiband controls so that even when the inevitable false voice detection occurs, the frequency balance will not shift unacceptably. It could also be useful to control this parameter by GPI or HTTP, tied to the DJ mic fader. The default setting depends upon the preset chosen; most presets have this featured set to “Off” by default, while the default setting for more aggressive, loudness-driven presets is “Auto Detect.”

The Omnia.9 processing algorithm is really optimized for music, and mostly insensitive to peaks, which is what can cause voices to come out too loud. This is opposite of most processors, which tend to be peak sensitive, requiring pre-processing the microphones with a dedicated mic processor for voices to come through loud and clear. Thus, many users have found that the best results are achieved by *completely bypassing the mic processing*, using the existing units only as pre-amplifiers, as the non peak-sensitive algorithms in the Omnia.9 will naturally perform the work of a mic processor, *without* needing dry voice detection.

Wideband AGC 2

The Omnia.9's Wideband AGC2 control allows you to insert one additional AGC processing stage into the chain as outlined in detail below.

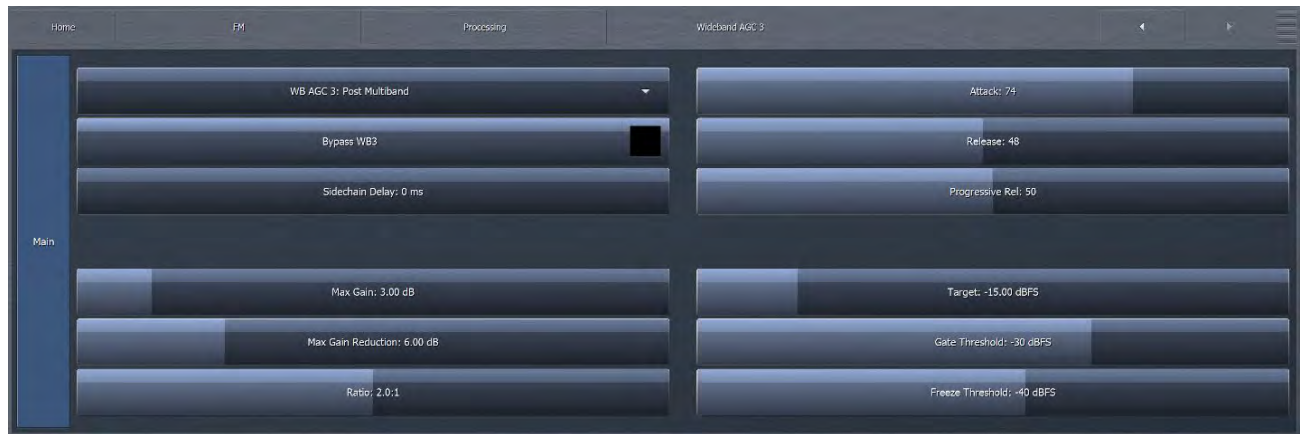


The Wideband AGC2 menu provides access to the Sidechain Delay, Maximum Gain, Maximum Gain Reduction, Ratio, Attack, Release, Progressive Release, Target, Gate Threshold, and Freeze Threshold.

- ◆ The **Bypass** button removes the Wideband AGC2 compressor from the audio path, but its patch point remains an available option for viewing on the oscilloscope or RTA via the Display Settings menu.
- ◆ The Sidechain Delay, Maximum Gain, Maximum Gain Reduction, Ratio, Attack speed, Release speed, Progressive Release, Target, Gate Threshold, and Freeze Threshold controls work in the same manner as their counterparts in the Wideband AGC1 section.
- ◆ The **Wideband AGC2** dropdown control enables or disables the Wideband AGC2 section and allows you to choose whether it is situated before or after the Multiband AGC section or used as a dedicated Bass Compressor.
- ◆ If you use the AGC2 as a **Bass Compressor**, it will be situated after the Multiband section but will affect only the lower bands, and allow you to push the bass a bit harder without over-driving the final clipper or using excessively fast attack and release speeds in the lower bands of the Multiband AGC.
- ◆ **Bass Only** (“BO”) employs a sidechain filter that allows only the audio from the lower bands to affect gain, so only the lower frequencies are compressed above threshold.

Wideband AGC 3

The Wideband AGC3 menu operates in the same manner as Wideband AGC2, with all of the same controls, but with one difference: It cannot be used as a wideband compressor before the multiband section, only after. It can, however, be used in the Bass Only or Bass Wideband mode just like Wideband AGC2.



Band Mix

The Band Mix Menu allows you to adjust the final output level of each band after all Wideband and Multiband processing has been applied. It can be used very effectively to tailor the overall spectral balance of your sound, but keep in mind that this is the final point of adjustment before the audio reaches the Final Clipper (FM and AM cores) or Final Limiter (HD and Streaming Cores). In other words, levels increased in the Band Mix section can only be controlled by final clipping or final limiting, which may result in unexpected or unwanted density or distortion on some material, so care is required when making adjustments here.



- ◆ Each Band Level control has a range of -12 to +12dB in one-quarter dB increments.
- ◆ The Band Mix (coupled) control allows you to adjust the output of all bands in the Band Mix section simultaneously and by an equal amount.

Power Limiter



Clipper



- ◆ The Final Clip Drive control sets the drive of the final clipper. Decreasing the drive (moving the slider to the left) reduces the amount of clipping. Conversely, increasing the drive (moving the slider to the right) will result in more clipping. Less clipping will result in a more open, less-processed, cleaner sound, but at the expense of overall loudness. More clipping can result in a louder on-air sound – but only up to a point. Even if total dial domination and loudness are your processing goals, there comes a point when the final wave-form is completely full, and increasing the amount of clipping will no longer yield additional loudness – only more distortion. We strongly recommend using Omnia.9’s oscilloscope as well as your ears to monitor the MPX Output signal while adjusting the final clip drive. This control ranges from -6.0 to +6.0 in one-quarter dB increments, which should give you the (correct) impression that small changes make a big difference in the sound. Keep in mind that a setting of +0.00 means the control is at the middle of its range, but does not necessarily mean that no clipping is taking place.
- ◆ The Bass Clipper Slope control determines the slope characteristics of the bass clipper.
- ◆ Slope 1 is filtered at a very low frequency so that the low bass stays “clean” even when clipped hard. However, some of the mid-bass will pass through the clipper, which may result in more of the final waveform being taken up by the bass. For lighter processing settings, Slope 1 offers the cleanest and punchiest bass sound.

- ◆ **Slope 2** has a higher cutoff frequency than Slope 1, offering more control over the mid-bass while creating a “dirtier” bass sound with more harmonics. On certain formats, or when listening on a smaller radio, this may be a desirable effect.
- ◆ **Slope 1+2** is simply Slope 1 followed by Slope 2. Most of the low bass will be controlled by Slope 1 and stay nice and clean, while the remaining bass will be taken care of by Slope 2 without affecting the low bass. If you are using heavier overall processing, this option will give you the cleanest sound.
- ◆ The **Bass Clipper Threshold** control sets the threshold of the Bass Clipper. Raising the threshold (moving the slider to the left) reduces the amount of clipping performed by the Bass Clipper, but place a greater burden on the Final Clipper. Conversely, lowering the threshold (moving the slider to the right) will yield more bass clipping, which takes some of the load off the Final Clipper, but may result in low frequency distortion if set too low.

HD Crossfeed



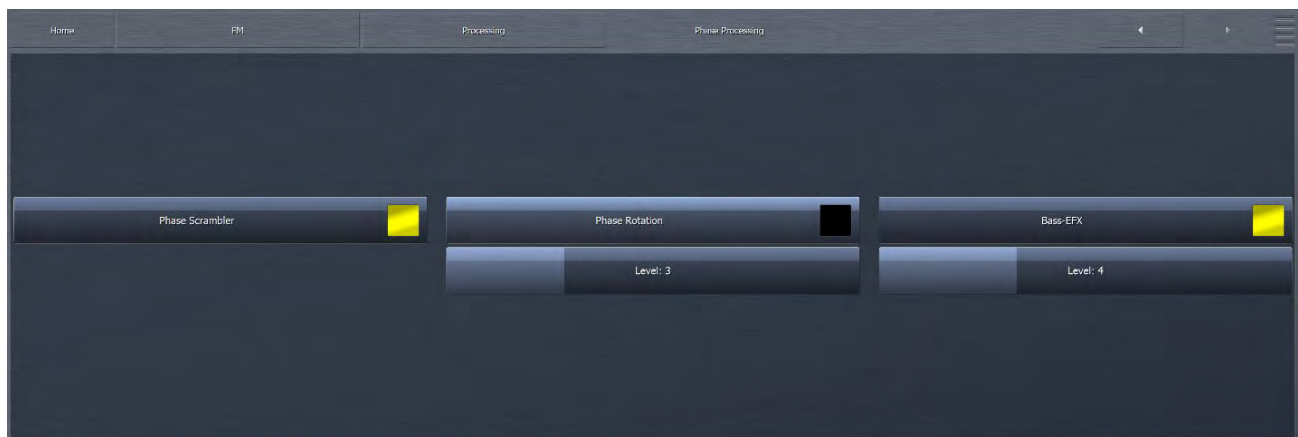
The HD-Crossfeed menu provides you access to drive and filter controls relating to the shared processing paths in Omnia.9. Crossfeed architecture allows FM and HD or AM and HD paths to share a common processing path, up to the point where those paths must diverge. For example, if FM and HD paths share early stage processes such as input conditioning, WB AGC, Undo, and insert points (for watermarking, etc.) they benefit in terms of blending and resource use. But since the FM path must go to a clipper stage while HD goes to a final limiter, paths must split at latter stages in the chain. HD Crossfeed is the last point before that split.

- ◆ The **HD Limiter Meters** control enables / disables the HD Limiter Meter in the FM processing meter section.
- ◆ The **HD Limiter Drive** control allows you to increase or decrease the drive to the look-ahead limiter used for the crossfeed, so that you can achieve the cleanest possible sound through low bit-rate coded channels (having some transients will help the codec!), as well as balance transitions that may occur in the transmission path downstream (such as HD/FM blend).
- ◆ The **HD Treble** control allows you to reduce high frequency content in the crossfeed. This may be necessary since the FM pre-emphasis clipper stage will inevitably reduce high frequency content on the FM path, which is often compensated for by increasing brightness in the processing preset for the FM path. Since crossfeed means that this same preset is used for HD which does not have the corresponding high frequency limitation, reducing treble will go a long way towards preventing the fully digital HD path being perceived as overly bright or harsh.

12 FM Menu Expert Mode

Expert mode makes visible every available control in Omnia.9, including some that are admittedly rarely used by anyone except Omnia factory preset authors. While there are some very powerful controls available in this mode, our experience with Omnia.9 over the past several years is that they are best left alone unless you are intimately familiar with the intricacies of these processes and have a very specific need to make changes to these settings.

Phase Processing



The Phase Processing menu is the same as it is under the Intermediate level. It is repeated here as a reminder.

The Phase Processing menu contains the controls for enabling the phase scrambler, enabling and adjusting the phase rotator, and enabling and adjusting the Bass-EPX control.

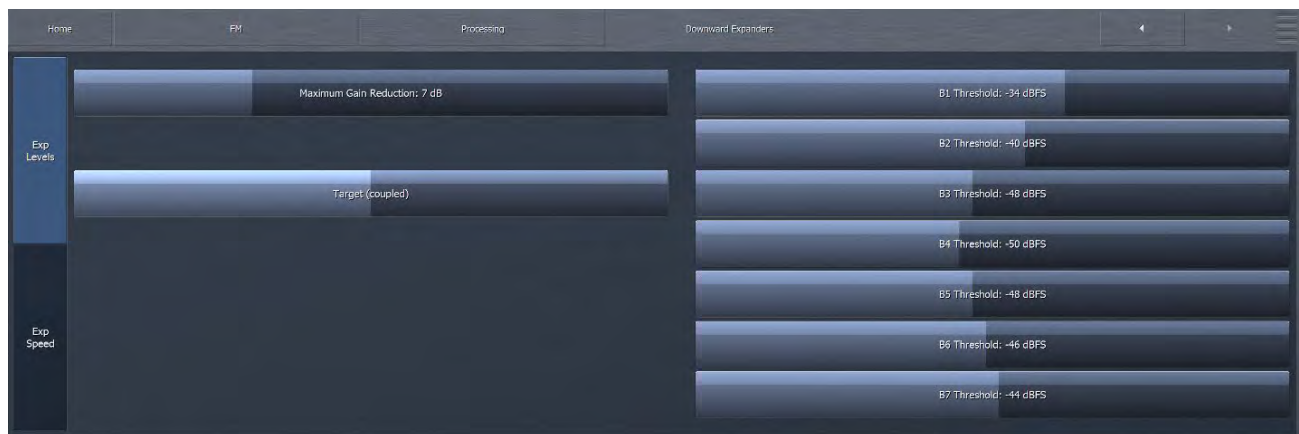
- ◆ The Phase Scrambler button enables or disables the phase scrambler. Certain sharp sounds with high harmonic content (such as trumpets or some synthesized sounds) are low in energy but contain high peaks. Since peaks must be limited to prevent over-deviation of the FM carrier, and the majority of those peaks will be removed by clipping, the sound may become dull and distorted. The Phase Scrambler, without employing limiting or clipping of its own, slightly offsets the various harmonics present in the audio to drastically lower the peak level, thereby allowing much more of the audio to pass through the final clipper. The result is a dramatically improved high end and less distortion.
- ◆ The Phase Rotator button enables or disables the phase rotator. Phase rotation is recommended primarily for stations airing talk programming who are also trying to achieve high levels of loudness as it can adversely affect transient “punch” desirable on music formats. The Level Slider adjusts the amount of phase rotation. Carefully monitor the MPX Output signal on the oscilloscope while listening to dry voice and advance the slider just enough to achieve symmetrical peaks. The default setting is 2.
- ◆ The Bass-EPX menu allows you to enable or disable the Bass-EPX feature and, when enabled, adjust the level of Bass-EPX processing. When used in conjunction with heavier overall levels of processing, Bass-EPX helps retain the punch of low-frequency transients such as those found in a kick drum by spreading the bass energy out in time, thus allowing more of the energy of a bass kick to pass through the clippers. Bass-EPX does not itself add energy.

Downward Expanders Menu

The information for the Downward Expanders is repeated here from the Intermediate level, however, the Expert Level also allows an operator to adjust Attack and Release times.

The Downward Expanders menu allows you to control the maximum gain reduction (downward expansion) for all bands in the Downward Expanders section as well as the threshold, attack and release speeds for each individual band. The total number of bands available in the Downward Expanders section is determined by the number of bands of processing used in the Current Preset. The Downward Expanders operate in a manner similar to a traditional “noise gate,” and is useful for reducing unwanted background noise from less-than-perfect program material or from a noisy studio environment. The ratio of these expanders is 2:1.

Exp Levels



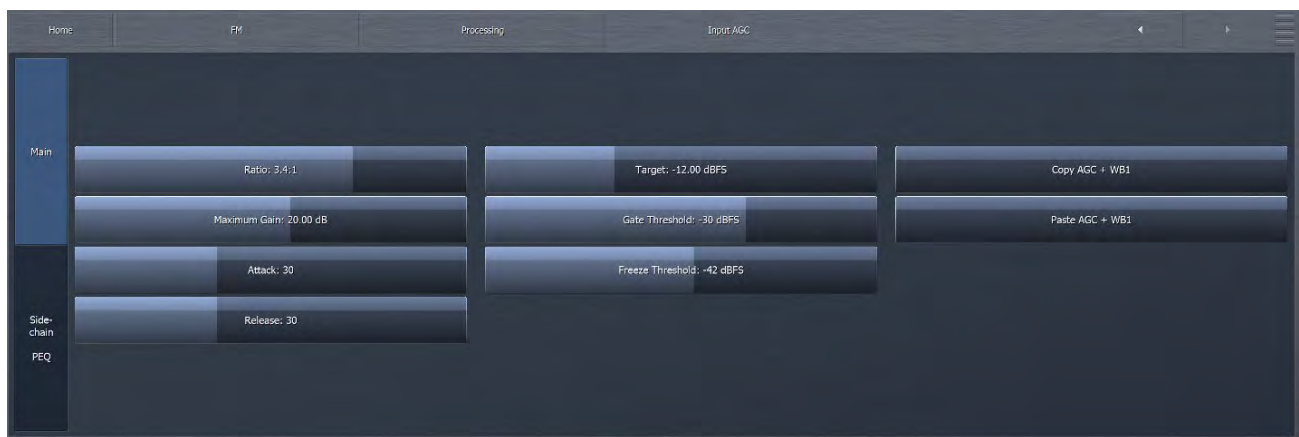
- ◆ The **Maximum Gain Reduction** control determines the greatest amount of gain reduction for all available bands.
- ◆ The **Threshold** control for each band sets the point at which downward expansion begins. The range of this control is from -90 to 0dB. The **Target (Coupled)** control allows all bands to be adjusted simultaneously by an identical amount.

Expander Speed



- ◆ The Attack control determines the speed with which the Downward Expanders act to reduce gain in each band when the program audio falls below the threshold. Lower settings provide slower attack speeds, while higher settings result in faster attack speeds.
- ◆ The Release control determines the speed with which the Downward Expanders act to return gain to each band when the program audio rises above threshold. Lower settings provide slower release speeds, while higher settings result in faster release speeds.
- ◆ The “coupled” controls adjust all bands simultaneously. **Speed (coupled)** adjusts both attack and release at the same time.

Input AGC Menu



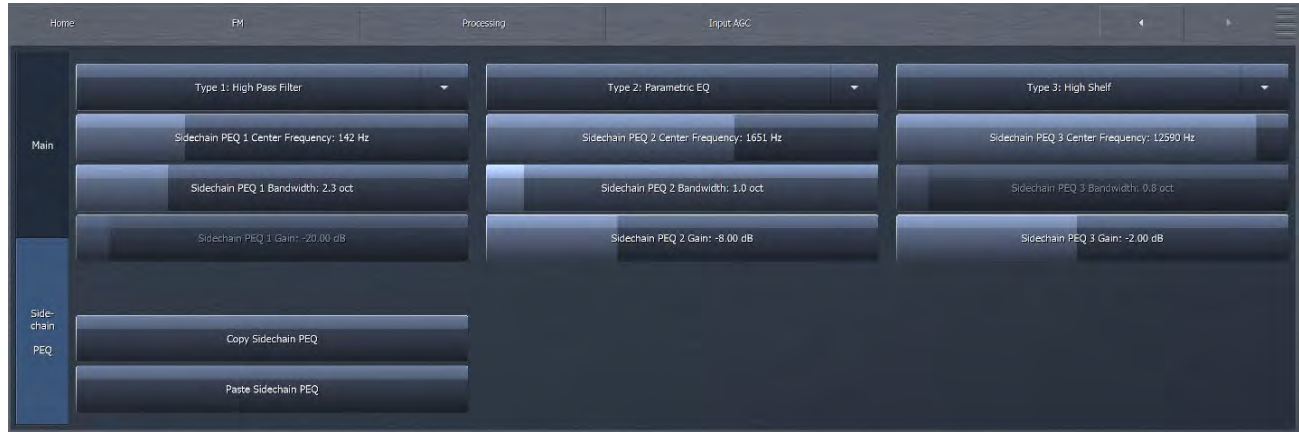
The Input AGC Menu is used to set the ratio, maximum gain, attack rate, release rate, target, gate threshold, freeze threshold, and sidechain equalizer controls.

The Input AGC is the first gain control stage in Omnia.9 following Undo, and is designed to be used as a slower-acting leveler ahead of the Wideband AGC1 and multiband compressor sections that follow it.

It is worth noting that traditional processors only act upon audio above a particular threshold. They are driven into various amounts of gain reduction, but once the audio falls below the threshold, they “run out of room” or “top out,” and are incapable of increasing the audio any further. They require some sort of make-up gain control later in the audio chain. The compressors in Omnia.9 operate above AND below threshold, controlling the dynamics over a much wider range and do not require makeup gain.

- ◆ The **Ratio** control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 to Infinity:1.
- ◆ The **Maximum Gain** control works in conjunction with the Ratio control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The **Attack** control determines the speed with which the Input AGC acts to reduce audio above threshold. Lower settings represent slower attack speeds and allow more audio to pass unprocessed by the Input AGC into subsequent processing stages. Higher settings result in faster attack speeds and allow less unprocessed audio to enter subsequent sections. Because all of Omnia.9's processing stages are to some extent program-dependent, putting actual measures of time on these controls would be pointless, and so the numbers on the various Attack and Release controls throughout are simply relative numbers.
- ◆ The **Release** control determines the speed with which the Input AGC increases audio below threshold. Lower settings provide slower release speeds, while higher settings result in faster release speeds.
- ◆ The **Target** control sets the target output level of the Input AGC. A lower setting results in a lower output level, while higher settings provide a higher output level. This is similar to a traditional "threshold" control when the levels are below the target.
- ◆ The **Gate Threshold** and **Freeze Threshold** controls work together to determine the points at which the release rate of the Input AGC slows by a factor of 3 (gate threshold) or freezes altogether (freeze threshold). The range of these controls is -90dB to 0dB. Lower settings means the audio must drop to a lower level before the release speed slows or freezes. Higher settings means the audio doesn't have to drop as much in level before the input AGC gain slows down or stops. Using higher settings when employing faster Input AGC release speeds can keep the audio from being increased too quickly or too much during quieter passages or pauses. If the display is sized and configured in such a way that the Input AGC meter is shown vertically, a Gate condition will be indicated by a dim, dark red bar at the bottom of the meter. A Freeze condition will be indicated by a brighter dark red bar.

Sidechain PEQ



- ◆ The Input AGC features a fully-adjustable, 3-band Sidechain Parametric Equalizer, which allows you to make it more or less sensitive to particular frequencies. When the controls are not set to cut or boost any frequency, the Input AGC reacts to the full audio spectrum. When set to cut or boost a particular range of frequencies, the Input AGC becomes less sensitive (cut) or more sensitive (boost).
- ◆ The Copy control places the settings into a “clipboard” so that they can be shared by using the Paste control.
- ◆ The Type drop down menu determines what type of EQ or filter is employed.
- ◆ The Frequency slider is used to set the center frequency for each band. The range of this control is 20 to 22,050Hz.
- ◆ The Width slider determines how much audio above and below the center frequency will also be affected by any boosts or cuts in gain. The range of this control is 0.0 to 10.0 octaves in one-tenth octave increments. Lower values provide a narrower (sharper) boost or cut, while higher values provide a wider (gentler) boost or cut.
- ◆ The Gain slider determines how much the audio selected with a combination of the Frequency and Width sliders is boosted or cut. Each band can be boosted or cut by 12dB in one-quarter dB increments for a total range of 24dB per band.

Note:

You can see a visual representation of the sidechain EQ curve in a display window using Omnia.9’s built-in RTA by navigating to FM> Processing> Display Settings and choosing the Sidechain> AGC Sidechain option. A full explanation of Display Settings is provided later in this chapter.

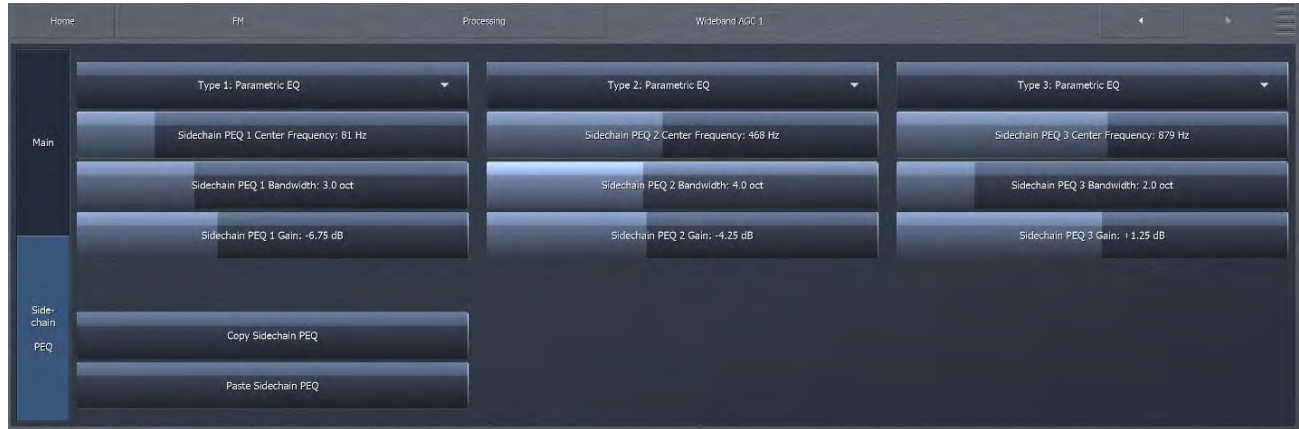
Wideband AGC 1 Menu



The Wideband AGC1 menu provides access to the sidechain delay, maximum gain, maximum gain reduction, ratio, attack, release, progressive release, target, gate threshold, freeze threshold, and three-band sidechain parametric equalizer controls.

- ◆ The **Wideband AGC1 Enable** button enables this section, which follows the Input AGC section and provides additional wideband compression as determined by its various controls. Disabling the Wideband AGC1 also makes this patch point unavailable in an oscilloscope or RTA display window.
- ◆ The **Bypass** button removes the Wideband AGC1 compressor from the audio path, but its patch point remains an available option for viewing on the oscilloscope or RTA via the Display Settings menu.
- ◆ The **Sidechain Delay** feature is useful for both adding punch and managing the amount of low frequency power (while increasing bass punch). This is an especially useful “trick” for maintaining apparent loudness when operating under MPX Power regulations.
- ◆ The **Maximum Gain**, **Ratio**, **Attack rate**, **Release rate**, **Target**, **Gate Threshold**, and **Freeze Threshold** controls work in the same manner as their counterparts in the other sections of the Omnia.9. However, the **Maximum Gain** control in the Wideband AGC1 section has a range of 24dB.
- ◆ The **Maximum Gain Reduction** control sets the maximum amount of gain reduction possible in the Wideband AGC1 compressor, and is adjustable from 0 to 24dB in one-quarter dB increments.
- ◆ The **Progressive Release** control determines the degree to which the Wideband AGC1 compressor releases its gain at a faster rate as the audio is driven further toward or into gain reduction. At a setting of 0, the control has no effect and the Release speed control fully determines the rate of release. Increasing the setting progressively makes the release speed of the audio faster as gain decreases.

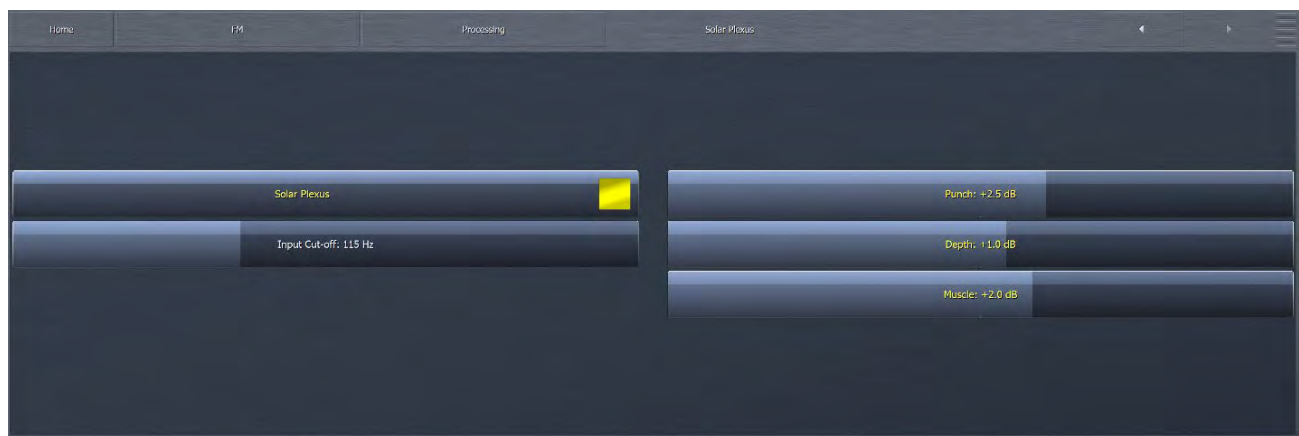
Sidechain PEQ



- ◆ The 3-band Sidechain Equalizer can be used to make the Wideband AGC1 more or less sensitive to the frequencies determined by the Frequency, Width, and Gain controls, which function exactly like their counterparts in the Input AGC section above. A PEQ preview patch point similar to the one described in the Input AGC section is also available here.
- ◆ The Copy control places the settings into a “clipboard” so that they can be shared by using the Paste control.

Solar Plexus

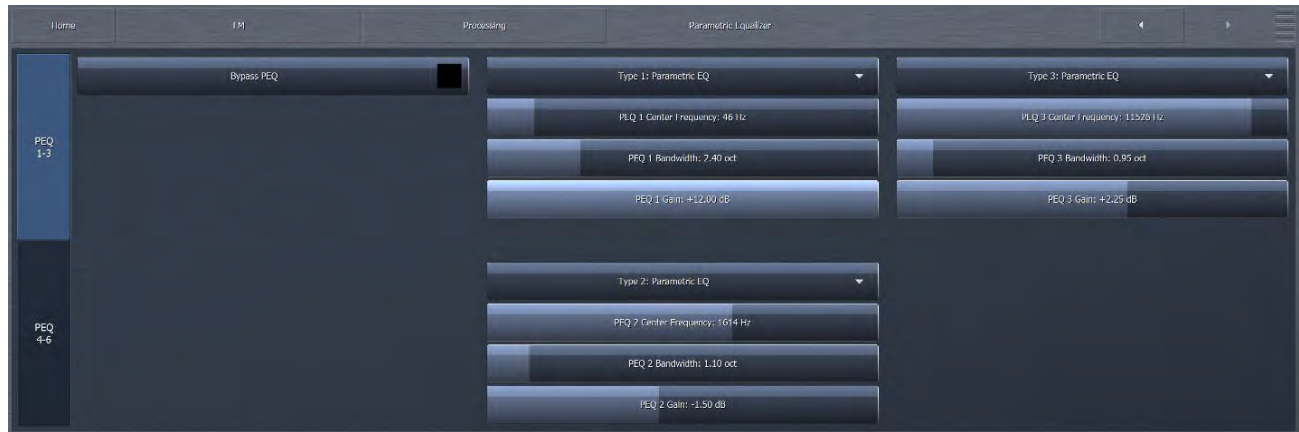
The **Solar Plexus** control switch activates a sub-harmonic bass enhancement effect. Unlike other attempts at this that use simple frequency dividers that provide phony sounding “one note” bass, the sub-harmonic enhancement here is locked to the original bass musically, in both frequency and level.



- ◆ When activated there are 3 adjustments to control the effect that can be set to reduce as well as boost the **Punch**, **Depth** and **Muscle** features of the effect as desired. When adjusting **Solar Plexus**, be sure to use speakers or headphones with good low bass response to avoid “overdoing it” with too much energy in the lowest octaves.

Parametric Equalizer

The Parametric Equalizer menu allows you to set up the 6-band phase-linear parametric equalizer, which is located just ahead of the multiband section of the processing core. In addition, an assortment of pre-configured filters is available, including a Low Pass Filter, a High Pass Filter, a Band Pass Filter, a Notch Filter, a Low Shelf EQ, and a High Shelf EQ.



- ◆ The **Bypass** button removes the equalizer from the audio path.
- ◆ The **Type** drop down menu determines what type of EQ or filter is employed.
- ◆ The **Frequency** slider is used to set the center frequency for each band. The range of this control is 20 to 22,050Hz.
- ◆ The **Width** slider determines how much audio above and below the center frequency will also be affected by any boosts or cuts in gain. The range of this control is 0.0 to 10.0 octaves in one-tenth octave increments. Lower values provide a narrower (sharper) boost or cut, while higher values provide a wider (gentler) boost or cut.
- ◆ The **Gain** slider determines how much the audio selected with a combination of the Frequency and Width sliders is boosted or cut. Each band can be boosted or cut by 12dB in one-quarter dB increments for a total range of 24db per band.

Although changes made in the parametric equalizer section are offset somewhat by the action of the multiband compressors that follow, this does not occur to the degree you might expect based upon your experience with other processors. The parametric equalizer in Omnia.9 is a very versatile and powerful tool for creating your on-air sound. A visual representation of the effects of the PEQ using the built-in real time analyzer can be seen in the RTA portion of the Display Settings section of this manual.

Stereo Enhancer

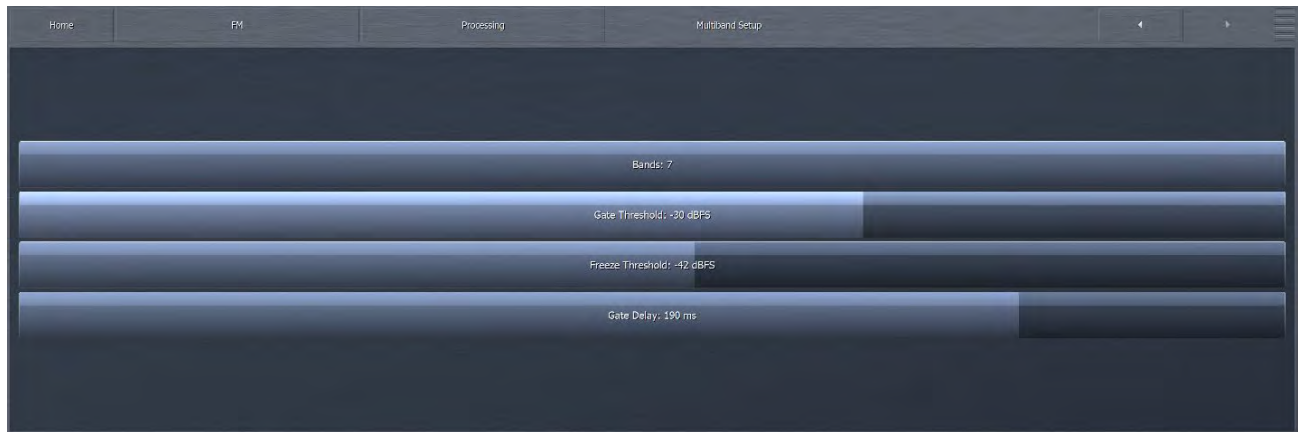
Omnia.9 offers a unique multi-band Stereo Enhancer, whose total number of bands is determined by the number of bands of processing used in the Current Preset. Regardless, it never works on bass, which is why Band 1 is never represented and Band 2 may be grayed out. This approach significantly reduces the chance that quieter, hard-panned stereo sounds in a recording with a strong centered mono sound will be shifted out of phase and offers much greater control over the stereo enhancement available in various portions of the spectrum. A second page allows you to toggle between Main and Spd (speed) controls. Speed settings adjust attack and release times for each band.



- ◆ The **Stereo Enhancer** menu gives you access to the Target, Maximum Gain, Maximum Gain Reduction, Attack speed, and Release speed of each of its bands.
- ◆ The **Enable** control turns the Stereo Enhancer on or off.
- ◆ The **Target Width** control determines the ratio of L+R to L-R. Higher settings provide more stereo enhancement. Adjust this control carefully to avoid turning the stereo image “inside out” by allowing L-R to overpower L+R which ruins mono compatibility and increases multipath distortion.
- ◆ The **Maximum Gain** control determines how much the Stereo Enhancer can increase L/R separation in an effort to achieve the Target Width in program material that has a narrow stereo image. The range is between 0 and 18dB.
- ◆ The **Maximum Attenuation** control determines how much the Stereo Enhancer can reduce L/R separation in an effort to achieve the Target Width in program material that already has a wide stereo image. The range is between 0 and 18dB.
- ◆ The **Attack** control determines the speed at which the stereo image is narrowed. The **Release** control determines the speed at which the stereo image is widened.
- ◆ The **Target Width (coupled)**, **Maximum Gain (coupled)**, **Maximum Attenuation (coupled)**, **Attack (coupled)** and **Release (coupled)** controls allow you to adjust all the bands simultaneously by an equal amount in their corresponding sections.

Multiband Setup

The Multiband Setup menu provides control over the number of processing bands employed as well as, gate threshold, freeze threshold, and gate delay controls. Also found here are the enable buttons for gain reduction override and controls for the gain reduction ratio.



- ◆ The **Band** slider determines the number of bands in the multiband processing section and ranges from 2 to 7.
- ◆ The **Gate Threshold**, and **Freeze Threshold** controls work in the same manner as their counterparts in other sections of the Omnia.9.
- ◆ The **Gate Delay** control determines how long the Gate Threshold and Freeze Threshold controls wait before they begin working. The range of this control is between 0 and 255ms. Setting the control to “0” means that as soon as audio falls below the threshold as determined by the settings of the Gate and Freeze controls, it immediately slows or stops, respectively. Higher settings mean it will take longer for the release of the audio to slow or stop. A Gate condition will be indicated by a dim, dark red bar at the bottom of the multiband meters. A Freeze condition will be indicated by a brighter dark red bar.

Note:

Setting the Gate Delay much lower than the default setting of 79ms will cause the gate to take effect during the brief pauses in dry speech, resulting in a much lower volume level from an announcer mic, for instance, as compared to music. Used creatively, this is actually a very useful tool for controlling announcer/music level balance.

It is worth mentioning again here the importance of a concept unique to Omnia.9. Most (if not all) other processors “top out at 0” – that is, they constantly operate in a state of gain reduction, and once the audio falls below threshold, they can no longer increase it any further. To make up for the fact that they are capable only of reducing gain, they rely upon a “makeup gain” control somewhere downstream in the audio chain to get the levels back up. Omnia.9 is not only capable of gain reduction – that is, driving audio levels above threshold as other processors do – but is also capable of increasing gain below threshold.

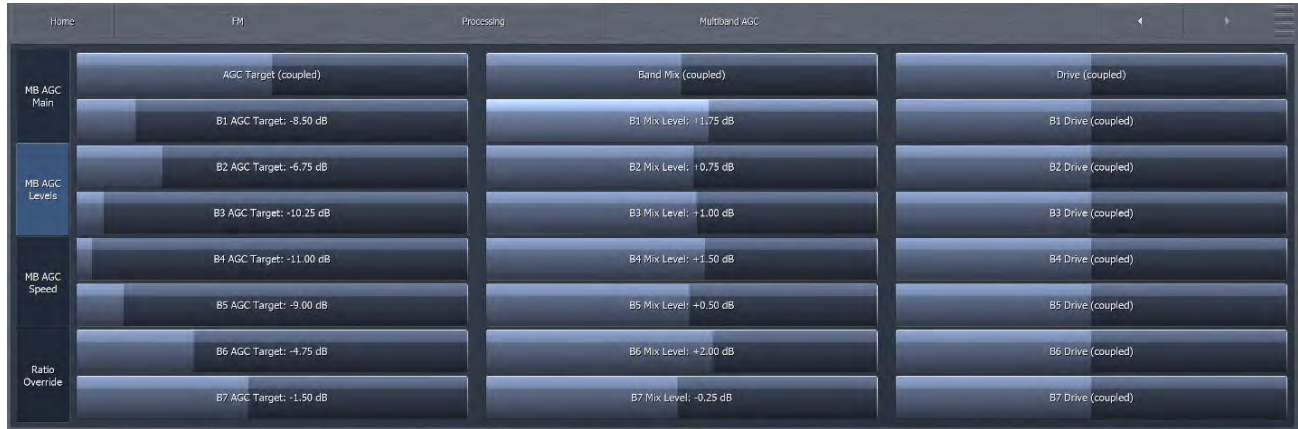
Multiband AGC

MB AGC Main



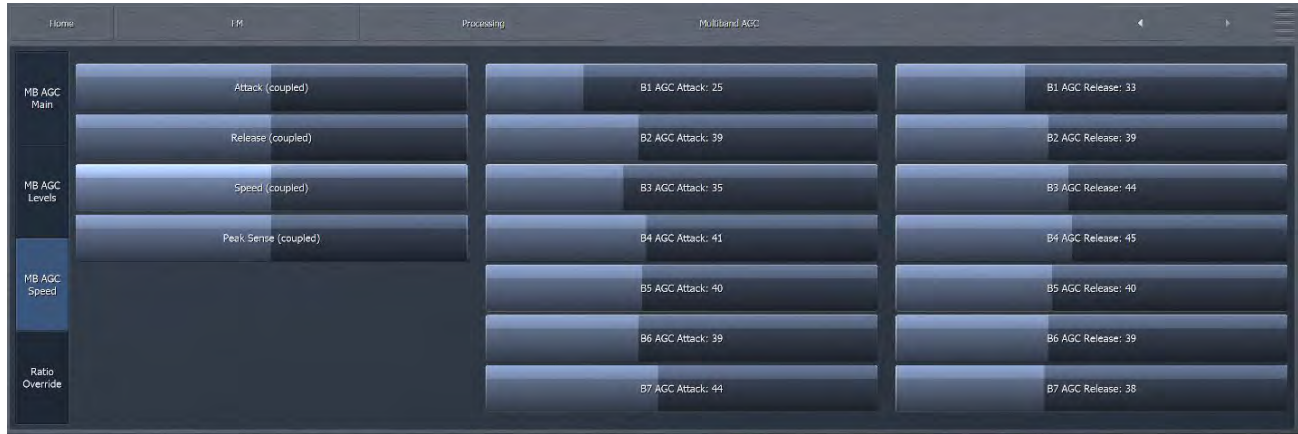
- ◆ The **Maximum Gain** control works in conjunction with the **Ratio** control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The **Ratio** control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 to Infinity:1.
- ◆ The **Progressive Release** control determines the degree to which the Multiband compressor releases its gain at a faster rate when the audio is driven further toward or into gain reduction. At a setting of 0, the control has no effect and the Release speed control fully determines the rate of release both below and above threshold. Increasing the setting progressively makes the release speed of the audio faster as gain decreases.

MB AGC Levels



- ◆ The AGC Target controls set the target gain reduction / output level of the MB AGC bands individually or overall with the “coupled” control. A lower setting results in more gain reduction thus a corresponding lower output level while higher settings provide less gain reduction and a higher output level. This is similar to a traditional “threshold” control when the levels are below the target.
- ◆ The Band Mix column within the Multiband AGC/MB AGC Levels allows you to adjust the final output of each band after all Wideband and Multiband processing has been applied. This is the same Band Mix that is a separate tab under the Processing path. It is provided here as a convenience. It can be used very effectively to tailor the overall spectral balance of your sound, but keep in mind that this is the final point of adjustment before the audio reaches the Final Clipper (FM core) or Final Limiter (HD and Streaming Cores). In other words, levels increased in the Band Mix section can only be controlled by final clipping or final limiting, which may result in unexpected or unwanted density on some material, so care is required when making adjustments here.
- ◆ The Drive controls adjust the amount of drive (input level) to the AGC bands individually or overall with the “coupled” control. Drive differs from Target in that higher settings of Drive actually raise the input level to the AGC band or section, increasing gain reduction but not changing the output level. Depending on other AGC parameters, the output may change due to other factors, but the output level set point does not change.

MB AGC Speed



The Multiband Attack/Release section lets you control the Attack Speed and Release Speed of each band in the multiband AGC section.

- ◆ The Attack speed and Release speed controls work in the same manner as their counterparts in the other sections of the Omnia.9. However, the behavior of the multiband AGC compressors is also program-dependent.
- ◆ The Attack (coupled) control allows you to adjust the attack speed of all of the bands simultaneously by an equal amount.
- ◆ The Release (coupled) control allows you to adjust the release speed of all the bands simultaneously by an equal amount.
- ◆ The Speed (coupled) control allows you to adjust both the Attack speed and Release speed of all the bands simultaneously by an equal amount.
- ◆ The Peak Sense (Coupled) control simultaneously adjusts the attack and release rates but in opposition to one another. Sliding the control to the right increases the attack rate and slows the release rate, making it more peak sensitive. Sliding the control to the left decreases the attack rate and speeds up the release rate, making it less peak sensitive.

The attack and release speeds of the multiband limiters are program-dependent and not adjustable.

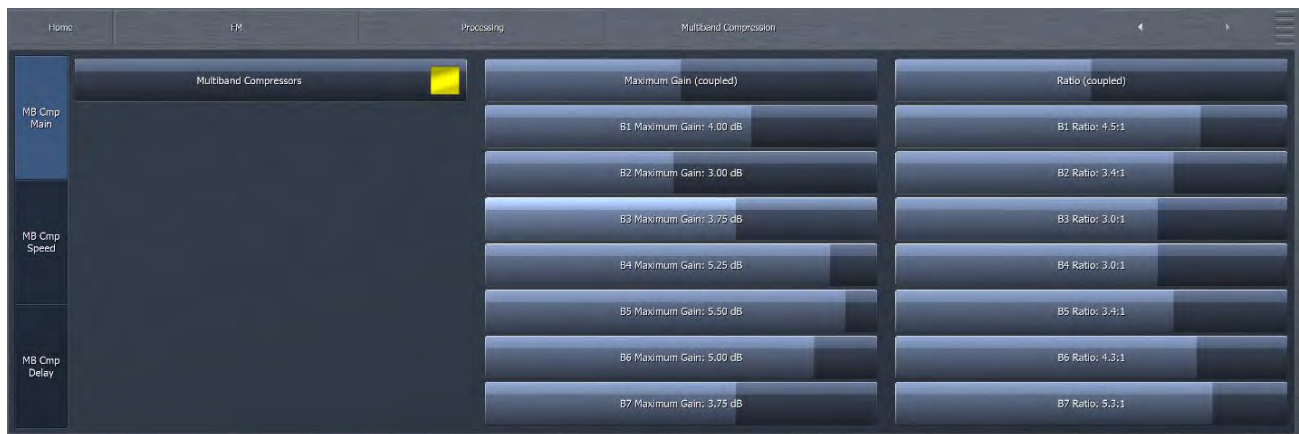
Ratio Override



- ◆ The Gain Reduction Ratio Override and Gain Reduction Ratio controls work together to let you set a different ratio for each band when audio in that band crosses above threshold – that is, when it is driven into gain reduction. The ratio for audio below threshold is always determined by the Ratio control for all bands. Specifically, the Gain Reduction Ratio Override control enables or disables the Gain Reduction Ratio controls, which are sliders that let you set the ratio of audio above threshold from 1:1 to Inf:1.

Multiband Compression

MBC Main



- ◆ The Maximum Gain control works in conjunction with the Ratio control to determine how much gain is available below threshold. If the Input AGC Ratio is set at Infinity:1 and the Input AGC Maximum Gain is set to 36dB, the Input AGC has 36dB of range below threshold. At a ratio of 2.0:1 and the same Maximum gain setting, the range is reduced by half to 18dB. The scale to the left of the Input AGC meter automatically adjusts as needed when changes are made to the Input AGC Maximum Gain or the Input AGC Ratio to accurately reflect how much range is available below threshold.
- ◆ The Ratio control determines how much the output audio will be increased or decreased in relationship to the input audio of the Input AGC section. For example, a ratio of 3:1 means for every 3dB of change in the level of the input audio, the output will be changed by 1dB. Lower (looser) settings provide less control of the dynamics in this section but provide a more open sound, while higher (tighter) settings provide more control at the expense of openness. The range of this control is 1.0:1 to Infinity:1.

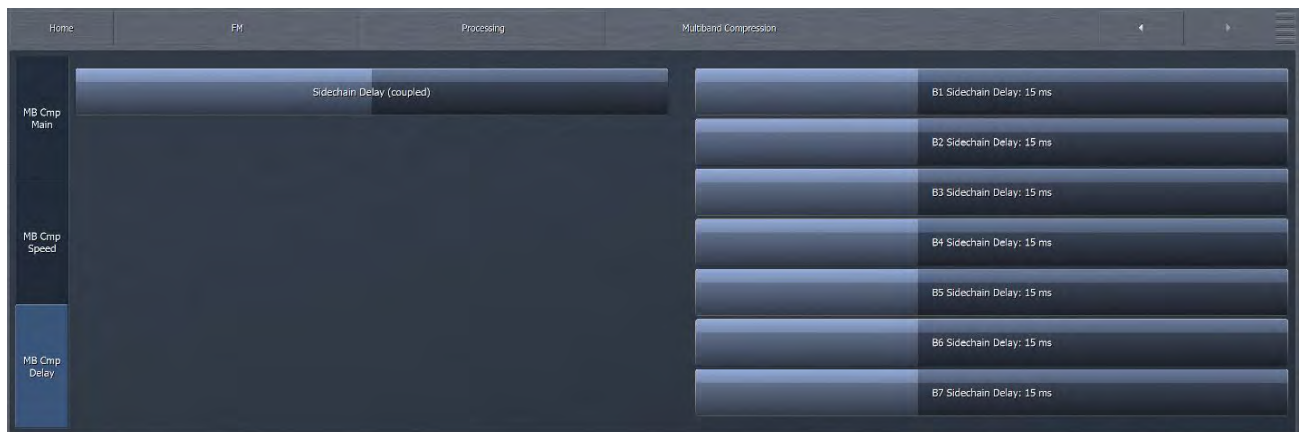
MBC Speed



- ◆ The Attack speed and Release speed controls work in the same manner as their counterparts in the other sections of the Omnia.9. However, the behavior of the multiband AGC compressors is also program-dependent.
- ◆ The Attack (coupled) control allows you to adjust the attack speed of all of the bands simultaneously by an equal amount.
- ◆ The Release (coupled) control allows you to adjust the release speed of all the bands simultaneously by an equal amount.
- ◆ The Speed (coupled) control allows you to adjust both the Attack speed and Release speed of all the bands simultaneously by an equal amount.
- ◆ The Peak Sense (Coupled) control simultaneously adjusts the attack and release rates but in opposition to one another. Sliding the control to the right increases the attack rate and slows the release rate, making it more peak sensitive. Sliding the control to the left decreases the attack rate and speeds up the release rate, making it less peak sensitive.

The attack and release speeds of the multiband limiters are program-dependent and not adjustable.

MBC Delay



The Sidechain Delay feature is useful for both adding punch and managing the amount of low frequency power (while increasing bass punch). This is an especially useful “trick” for maintaining apparent loudness when operating under MPX Power regulations. Delay value can be coupled, and set from 0 to 40ms.

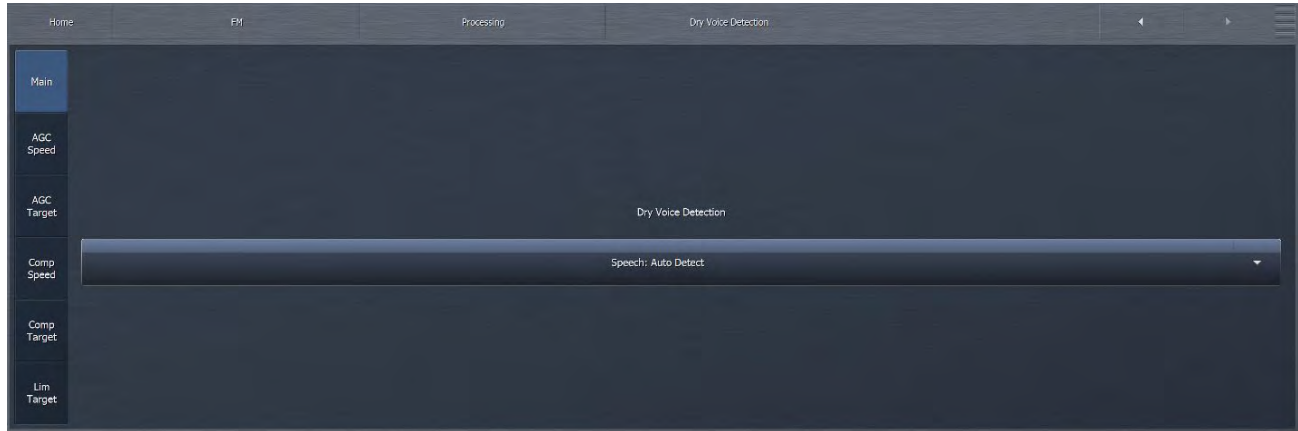
MB Thresholds



The **Multiband Thresholds** menu allows you to set the target for each of the Multiband AGC bands, target for the compression for each of the Multiband AGC bands, as well as the threshold for each band of the Multiband Limiters. The total number of bands available in the Multiband Thresholds section is determined by the number of bands of processing used in the Current Preset.

- ◆ The **AGC Target** controls set the target output level of each band of the Multiband AGC. A lower setting provides a lower output level, while a higher setting provides a higher output level. These controls have a range between +12 and -12dB in one-tenth dB increments.
- ◆ The **Comp Target** controls set the target compression level for each band of the Multiband AGC. A lower setting provides less compression, while a higher setting provides additional compression. These controls have a range between +18 and -3dB in one-quarter dB increments.
- ◆ The **Limiter Threshold** controls determine at which point the Multiband Limiter acts upon the incoming audio for its particular band relative to its corresponding AGC Target. For example, a setting of +6dB means that any peaks of less 6dB above the AGC Target level will not be processed by the limiter. These controls have a range between +18 and 0dB in one-tenth dB increments.

Dry Voice Detection



The **Dry Voice Detection** Menu contains the controls to enable the dry voice detector circuit and adjust the dynamics section of Omnia.9 when this feature is engaged.

Dry voice is one of the most difficult waveforms to process cleanly, as the human voice is complex in nature and is typically asymmetrical in form. Stations that choose to process aggressively in an effort to maximize loudness may find that bare vocals come through with unacceptably high levels of audible distortion.

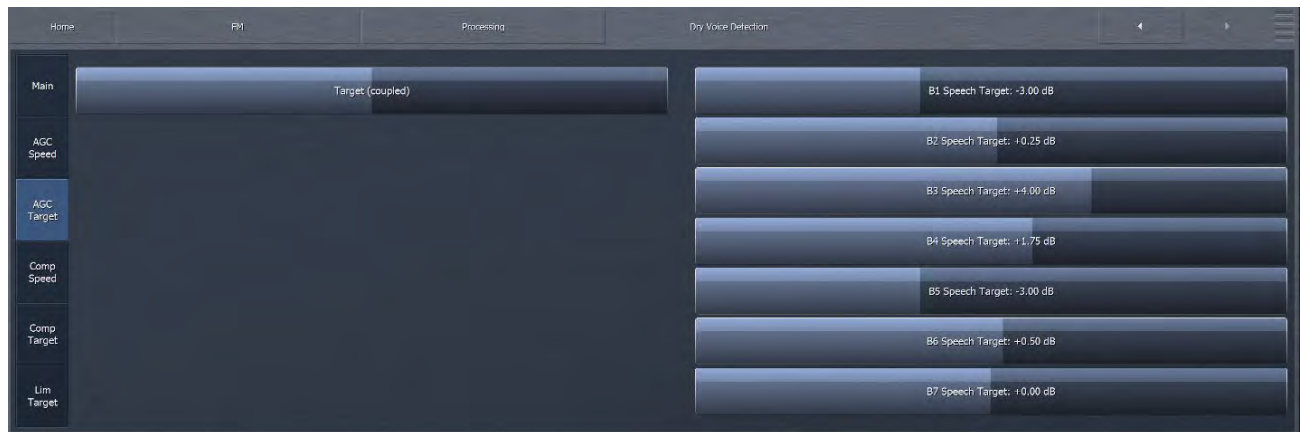
Omnia.9 overcomes this situation by automatically detecting (in the Auto Detect mode) when the input audio is dry voice and using a separate set of multiband targets, attack rates, and release rates. This allows the dynamics section to do more of the “heavy lifting” and reduces the amount of clipping necessary to maintain the same level of loudness.

The **Dry Voice** dropdown menu can be set to “Off”, “Auto Detect”, or “Force Off” completely turns off this feature. “Auto” allows the processor to automatically detect the presence of dry voice. “Force” overrides the main multiband settings and uses the Dry Voice Detection settings at all times. It is useful to force detection of voice while testing with music, in order to facilitate adjusting the separate dry voice multiband controls so that even when the inevitable false voice detection occurs, the frequency balance will not unacceptably. It could also be useful to control this parameter by GPI or HTTP, tied to the DJ mic fader. The default setting depends upon preset chosen; most presets have this featured set to “Off” by default, while the default setting for more aggressive, loudness-driven presets is “Auto Detect.”

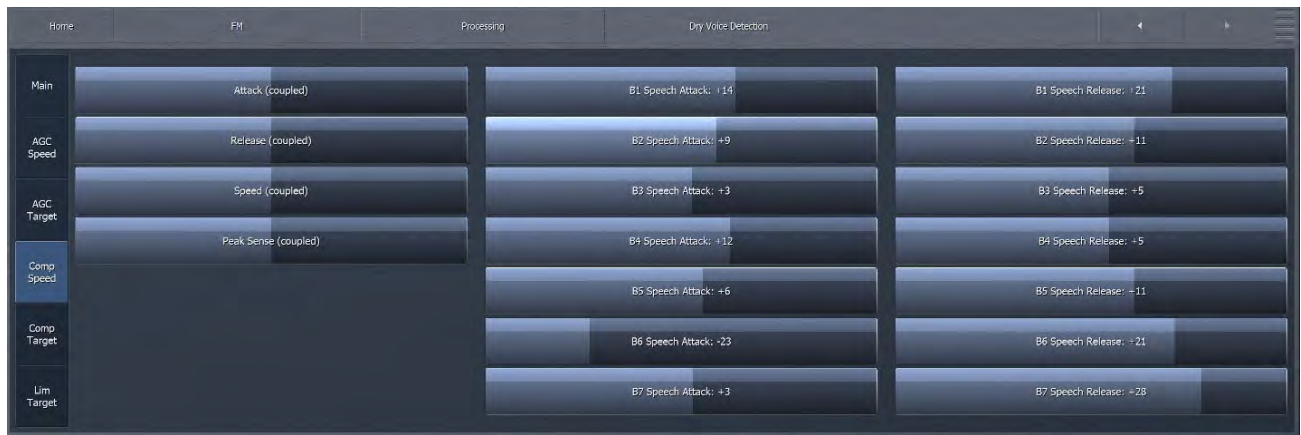
Dry Voice Speed



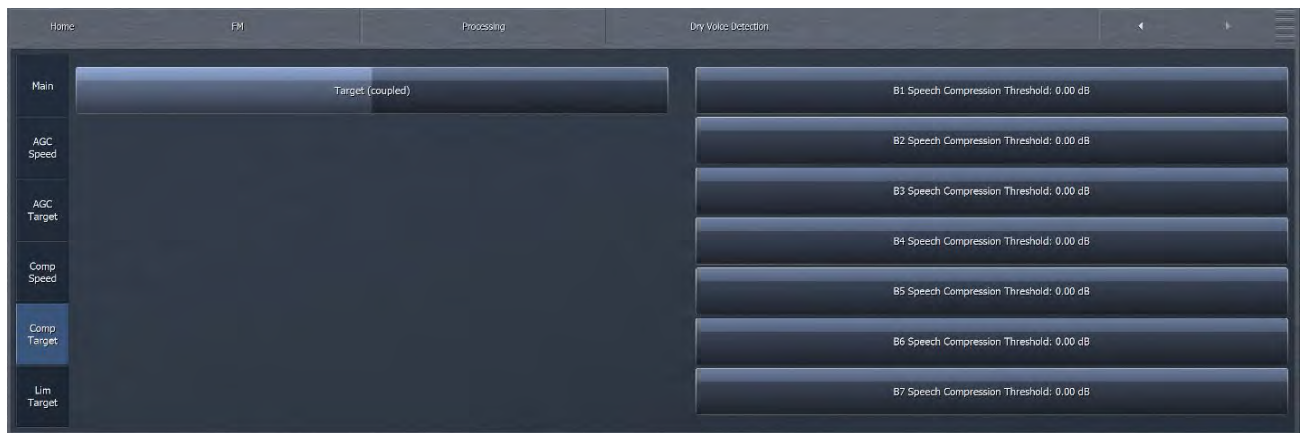
- ◆ The Attack, Release, Target, Limiter Threshold, Attack (Coupled), Release (Coupled), Speed (Coupled) and Target (Coupled) controls provide relative adjustments referenced to their counterparts in the Multiband section.
- ◆ The Peak Sense (Coupled) control simultaneously adjusts the attack and release rates but in opposition to one another. Sliding the control to the right increases the attack rate and slows the release rate, making it more peak sensitive. Sliding the control to the left decreases the attack rate and speeds up the release rate, making it less peak sensitive.



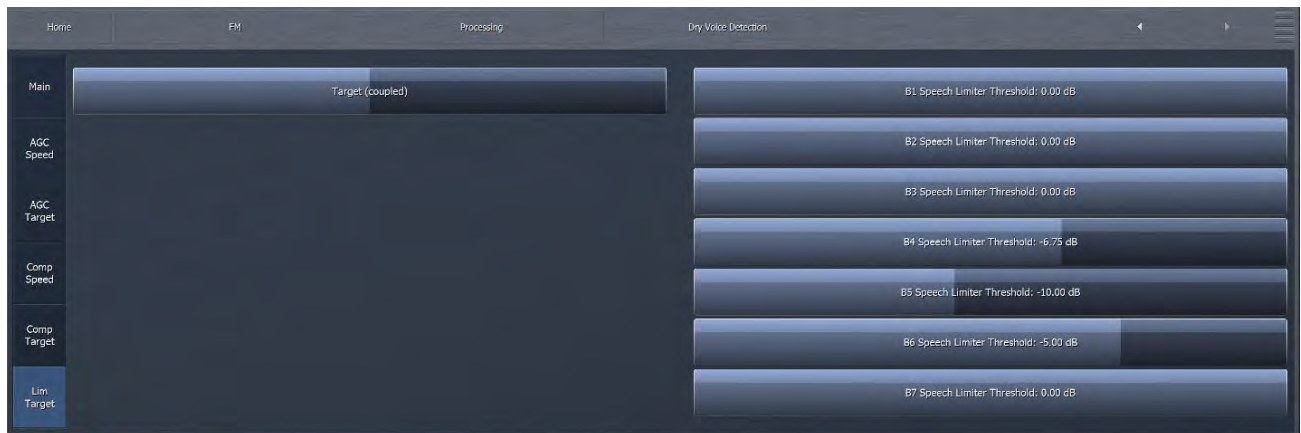
- ◆ The AGC Target for dry voice detection controls works the same way that it does for the MB AGC section, except that it functions only when dry voice detection is activated, and the values are relative to the corresponding multi-band target slider. It sets the target gain reduction / output level of the dry voice AGC bands individually or overall with the “coupled” control. A lower setting results in more gain reduction thus a corresponding lower output level while higher settings provide less gain reduction and a higher output level. This is similar to a traditional “threshold” control when the levels are below the target.



The Attack speed and Release speed controls work in the same manner as their counterparts in the other sections of the Omnia.9 , and the values are *relative* to the corresponding multiband attack/release speed slider.



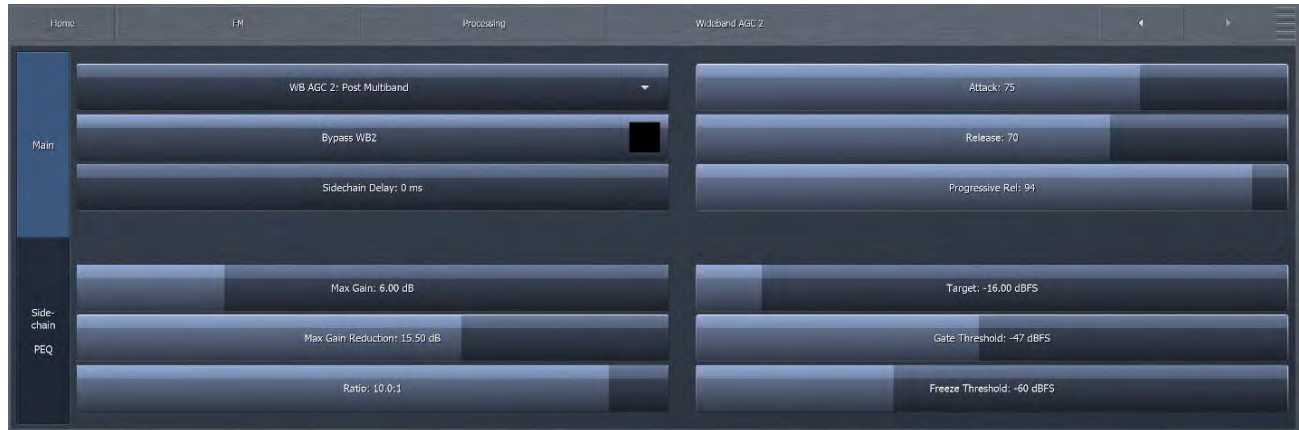
- ◆ The **Comp Target** controls set the target compression level for each band of the Dry Voice Detect AGC. A lower setting provides less compression, while a higher setting provides additional compression. These controls have a range between +18 and -3dB in one-quarter dB increments.



The **Lim Target** control sets the target output level of the Dry Voice AGC, again similar in operation to the other AGC sections of the Omnia.9. A lower setting results in a lower output level, while higher settings provide a higher output level.

Wideband AGC 2

Main

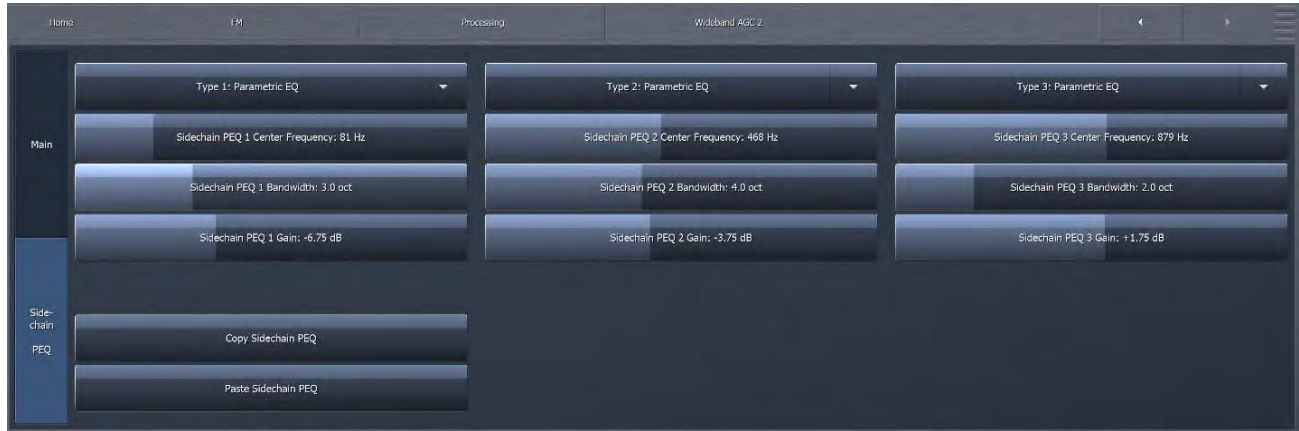


The Omnia.9's Wideband AGC2 control allows you to insert one additional AGC processing stage into the chain as outlined in detail below.

The **Wideband AGC2 Main** menu provides access to the Sidechain Delay, Maximum Gain, Maximum Gain Reduction, Ratio, Attack, Release, Progressive Release, Target, Gate Threshold and Freeze Threshold.

- ◆ The **Bypass** button removes the Wideband AGC2 compressor from the audio path, but its patch point remains an available option for viewing on the oscilloscope or RTA via the Display Settings menu.
- ◆ The Sidechain Delay, Maximum Gain, Maximum Gain Reduction, Ratio, Attack speed, Release speed, Progressive Release, Target, Gate Threshold, and Freeze Threshold controls work in the same manner as their counterparts in the Wideband AGC1 section.
- ◆ The **Wideband AGC2** dropdown control enables or disables the Wideband AGC2 section and allows you to choose whether it is situated before or after the Multiband AGC section or used as a dedicated Bass Compressor.
- ◆ If you use the AGC2 as a **Bass Compressor**, it will be situated after the Multiband section but will affect only the lower bands, and allow you to push the bass a bit harder without over-driving the final clipper or using excessively fast attack and release speeds in the lower bands of the Multiband AGC.
- ◆ **Bass Only** (“BO”) employs a sidechain filter that allows only the audio from the lower bands to affect gain, so only the lower frequencies are compressed above threshold.
- ◆ **Bass Wideband** (“BW”) also employs a sidechain filter, but one that contains the entire audio spectrum, so the bass becomes more compressed when the entire mix is above threshold. This mode is most useful when loudness is your primary processing goal, as it could allow full-scale bass audio in circumstances when there is no mid-range or treble audio present. However, there will be less bass present in situations when there are other frequencies present.

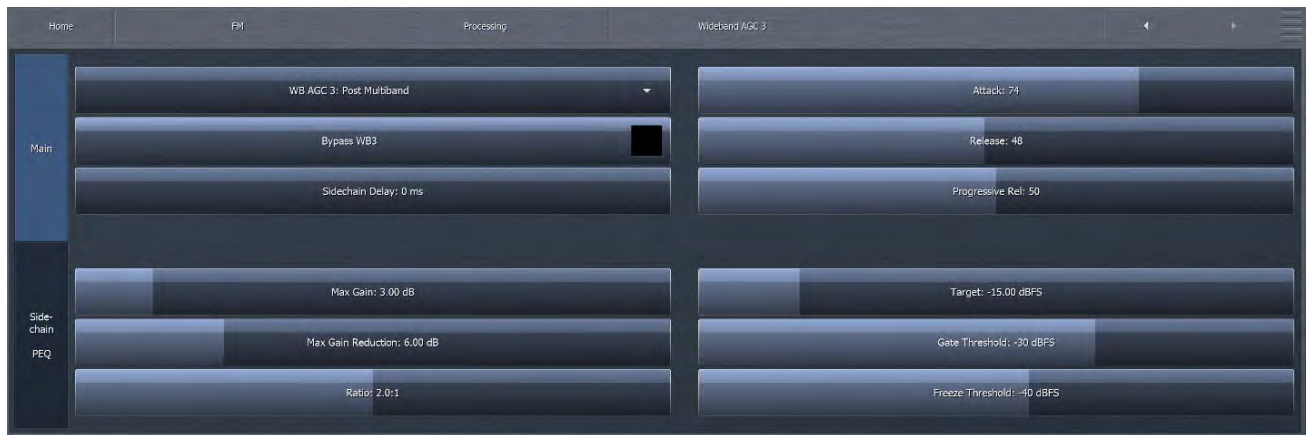
Sidechain PEQ



A fully-adjustable, 3-band Sidechain Parametric Equalizer is available, which allows you to make it more or less sensitive to particular frequencies. When the controls are not set to cut or boost any frequency, the Input AGC reacts to the full audio spectrum. When set to cut or boost a particular range of frequencies, the Input AGC becomes less sensitive (cut) or more sensitive (boost).

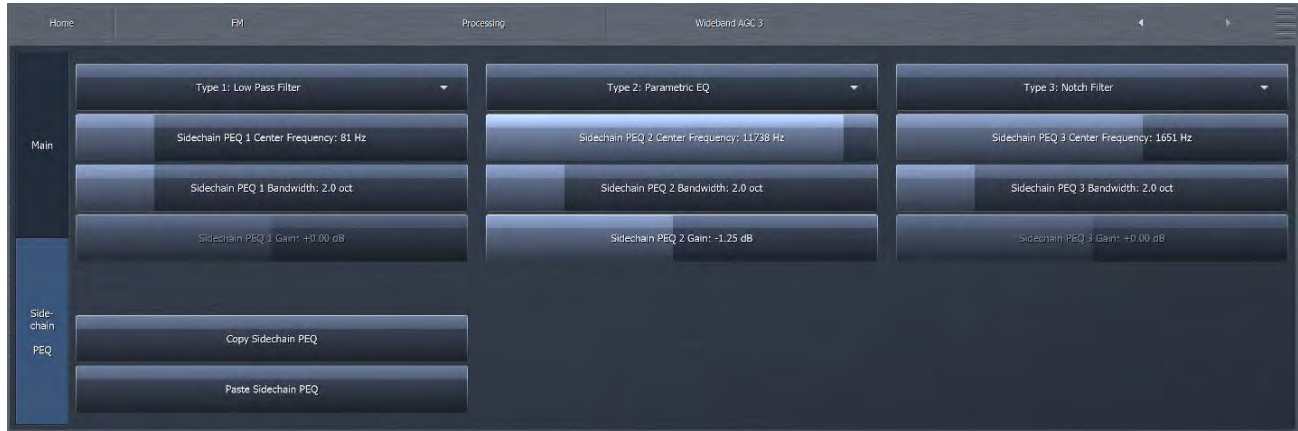
Wideband AGC 3

Main



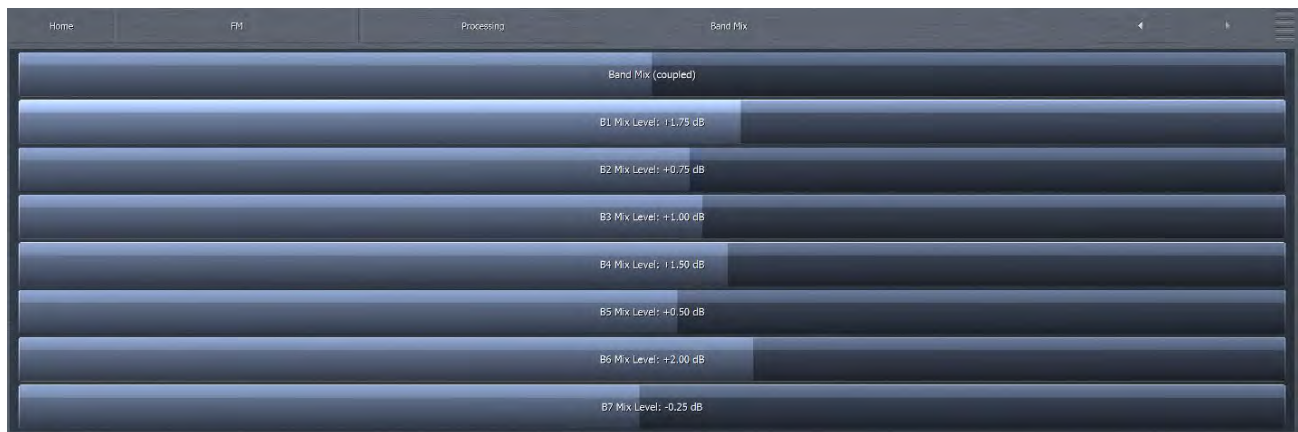
The Wideband AGC3 menu operates in the same manner as Wideband AGC2, with all of the same controls, but with one difference: It cannot be used as a wideband compressor before the multiband section, only after. It can, however, be used in the Bass Only or Bass Wideband mode just like Wideband AGC2.

Sidechain PEQ



Similar to the Wideband AGC 1 and 2, another fully-adjustable, 3-band Sidechain Parametric Equalizer is available here, which allows you to make it more or less sensitive to particular frequencies. When the controls are not set to cut or boost any frequency, the Input AGC reacts to the full audio spectrum. When set to cut or boost a particular range of frequencies, the Input AGC becomes less sensitive (cut) or more sensitive (boost).

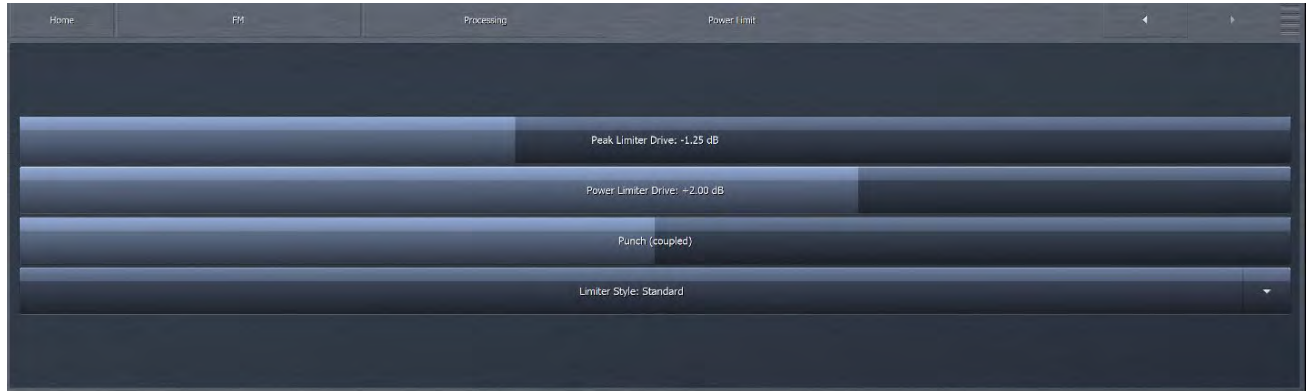
Band Mix



The Band Mix Menu allows you to adjust the final output of each band after all Wideband and Multiband processing has been applied. It can be used very effectively to tailor the overall spectral balance of your sound, but keep in mind that this is the final point of adjustment before the audio reaches the Final Clipper (FM and AM cores) or Final Limiter (HD and Streaming Cores). In other words, levels increased in the Band Mix section can only be controlled by final clipping or final limiting, which may result in unexpected or unwanted density on some material, so care is required when making adjustments here.

- ◆ Each Band Level control has a range of -12 to +12dB in one-quarter dB increments.
- ◆ The Band Mix (coupled) control allows you to adjust the output of all bands in the Band Mix section simultaneously and by an equal amount.

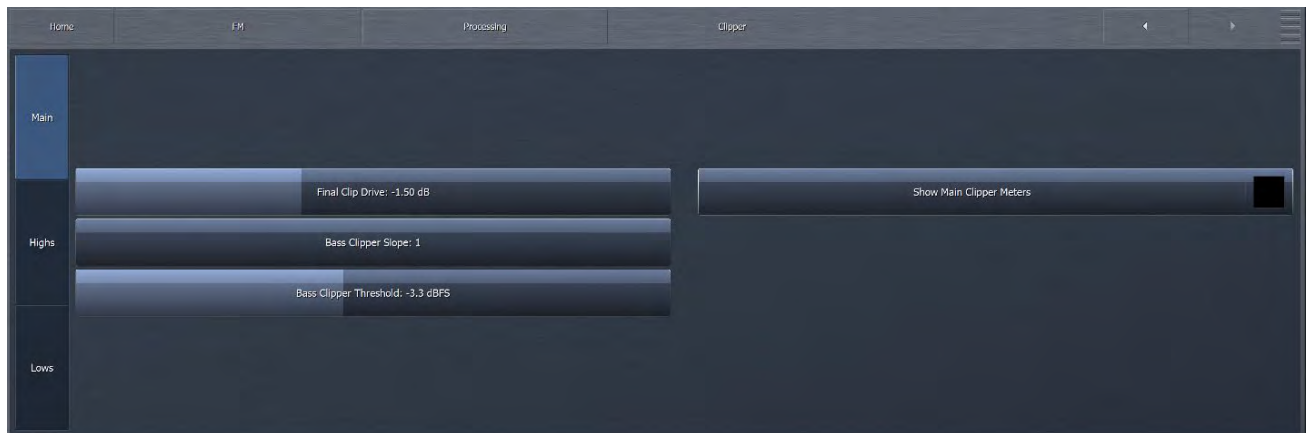
Power Limiter



The **Power Limiter** menu allows you to adjust settings for BS-412 operation. This screen will only appear if you have selected to run BS-412 power limiting (an ITU standard, mandated by some countries). To enable BS-412, go to Home/System/System Configuration/Processing Paths and enable **MPX Power Control**.

Clipper

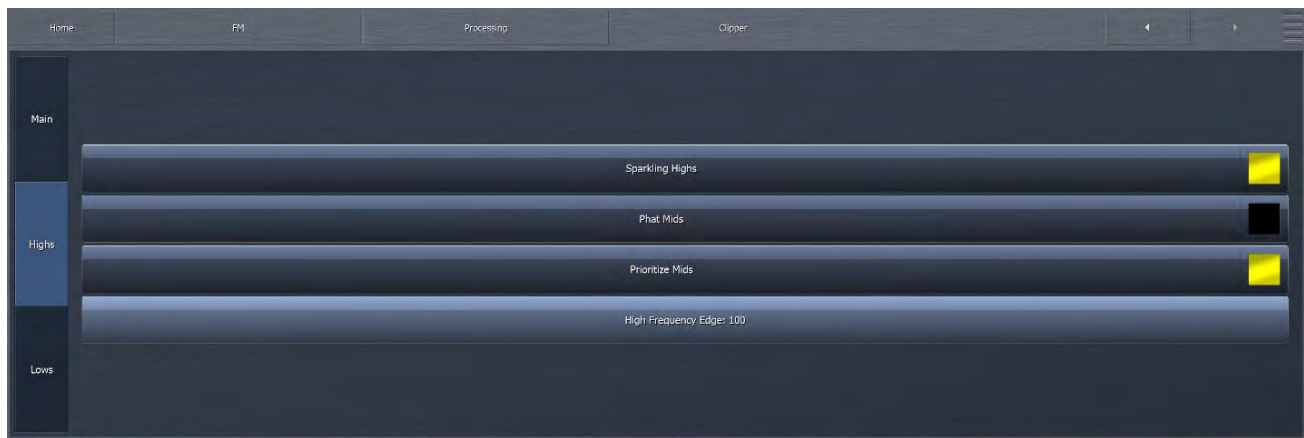
The **Clipper Menu** contains controls that allow the sound and texture of the clipper to be fine tuned. Please remember that the overall clipper drive is determined by the “Input Gain” control in the “Input Adjust” menu. There are 3 screens in the Expert mode. Use the buttons on the left to navigate between Main, Highs and Lows.



- ◆ The **Final Clip Drive** control sets the drive of the final clipper. Decreasing the drive (moving the slider to the left) reduces the amount of clipping. Conversely, increasing the drive (moving the slider to the right) will result in more clipping. Less clipping will result in a more open, less-processed, cleaner sound, but at the expense of overall loudness. More clipping can result in a louder on-air sound – but only up to a point. Even if total dial domination and loudness are your processing goals, there comes a point when the final wave-form is completely full, and increasing the amount of clipping will no longer yield additional loudness – only more distortion. We strongly recommend using Omnia.9’s oscilloscope as well as your ears to monitor the MPX Output signal while adjusting the final clip drive. This control ranges from -6.0 to +6.0 in one-quarter dB increments, which should give you the (correct) impression that small changes make a big difference in the sound. Keep in mind that a setting of +0.00 means the control is at the middle of its range, but does not necessarily mean that no clipping is taking place.
- ◆ The **Bass Clipper Slope** control determines the slope characteristics of the bass clipper.

- ◆ **Slope 1** is filtered at a very low frequency so that the low bass stays “clean” even when clipped hard. However, some of the mid-bass will pass through the clipper, which may result in more of the final waveform being taken up by the bass. For lighter processing settings, Slope 1 offers the cleanest and punchiest bass sound.
- ◆ The **Bass Clipper Threshold** control sets the threshold of the Bass Clipper. Raising the threshold (moving the slider to the left) reduces the amount of clipping performed by the Bass Clipper, but place a greater burden on the Final Clipper. Conversely, lowering the threshold (moving the slider to the right) will yield more bass clipping, which takes some of the load off the Final Clipper, but may result in low frequency distortion if set too low.

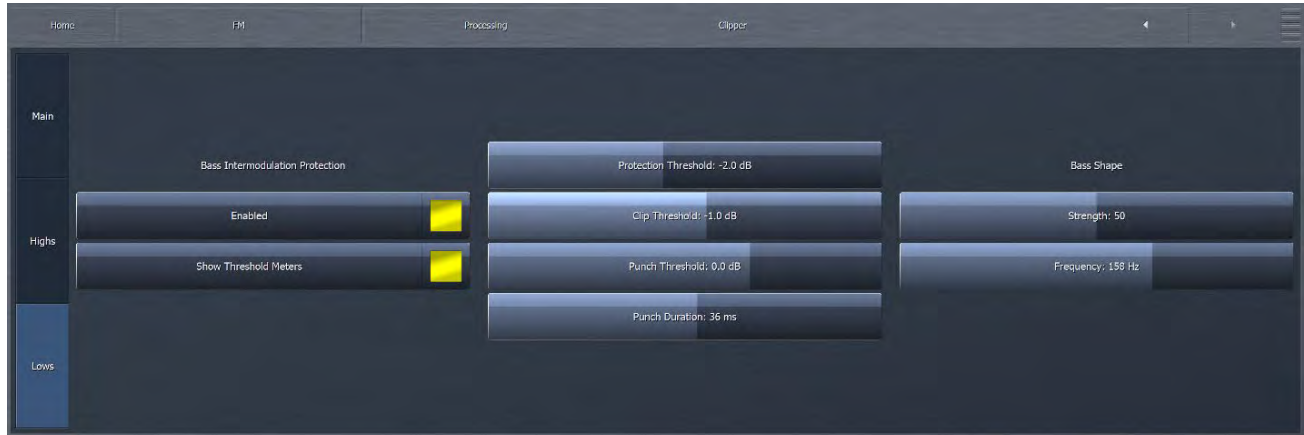
Clipper Highs Menu



These controls affect the sound and texture of middle and higher frequencies.

- ◆ Enabling the **Sparkling Highs** control preserves the openness and enhances the texture of very high frequencies, especially when the incoming program material has a high degree of high frequency content.
- ◆ **Phat Mids** warms up and enhances mid-range frequencies, particularly male and lower female voices. Please note that “Sparkling Highs” must be enabled for “Phat Mids” to be selectable; if “Phat Mids” is enabled and “Sparkling Highs” is turned off, the “Phat Mids” indicator will remain yellow and switch back on when “Sparkling Highs” is re-enabled, but will be grayed out and removed from the audio path until such time.
- ◆ The **Prioritize Mids** control emphasizes Mids over Highs when energy levels between the two are equivalent.
- ◆ The **High Frequency Edge** control sets tradeoff between highs that are always clean and free from distortion and a consistent high frequency output at the expense of distortion. A setting of “0” will yield the cleanest highs but with less overall brightness. A setting of “100” will result in a uniformly bright sound but at the risk of more audible distortion, and sounds more like the original Omnia.9 clipper when pushed for loudness.

Clipper Lows Menu



These controls affect the texture and feel of the bass clipper and are sub-divided into two groups:

Bass Intermodulation Protection and Bass Shape.

- ◆ The controls in the **Bass Intermodulation Protection** section are primarily responsible for distortion management, particularly intermod distortion, and for the behavior of the bass clipper. Unless you specifically want the presence of intermodulation distortion (where strong low frequency material can attenuate or audibly distort higher frequencies) we strongly recommend the “Intermod Distortion Protection” control be left enabled.
- ◆ The **Clip Threshold** control is the point at which bass clipping will occur under normal circumstances and is analogous to a traditional “bass clipper threshold” control. When bass at the level set by the “Clip Threshold” control would cause audible IM distortion, it will instead be clipped at the point determined by the “Protection Threshold” control. Note that if both the “Clip Threshold” and “Protection Threshold” controls are set to the same value, the bass clipper will operate in the traditional manner with a fixed threshold in all cases.
- ◆ The **Punch Threshold** control allows the initial edge of the bass waveform to be clipped at a different threshold for extra bass punch; the amount of time this threshold is active is determined by the “Punch Duration” slider.
- ◆ The controls in the **Bass Shape** menu help set the “texture” of the bass.
- ◆ Unlike most bass clippers, the one in Omnia.9 can (but does not have to) create a square wave when processing strong low frequency content. Setting the “Bass Shape Strength” control at 0 will always prevent square waving the bass resulting in a very smooth low end texture, but one that does not offer the “slam” of a traditional Omnia clipper even on the initial peak of a bass transient waveform. Advancing the control toward 100 will produce more square waves, increasing the bass “punch” and overall loudness, but at the possible expense of more distortion in the low end.
- ◆ The **Bass Shape Frequency** control sets the frequency of the highest harmonic produced by the bass clipper. Higher settings will produce more and higher harmonics and create a more complex and frequency-rich bass sound.

Dual FM Configuration

As if all of this capability was not impressive enough, with the optional “Dual FM” system configuration, the Omnia.9 can provide independent processing for two unique FM stations.

When configured in this manner, the first FM processor (FM1) can provide processing for MPX (composite) only, L/R only, or MPX+L/R together.

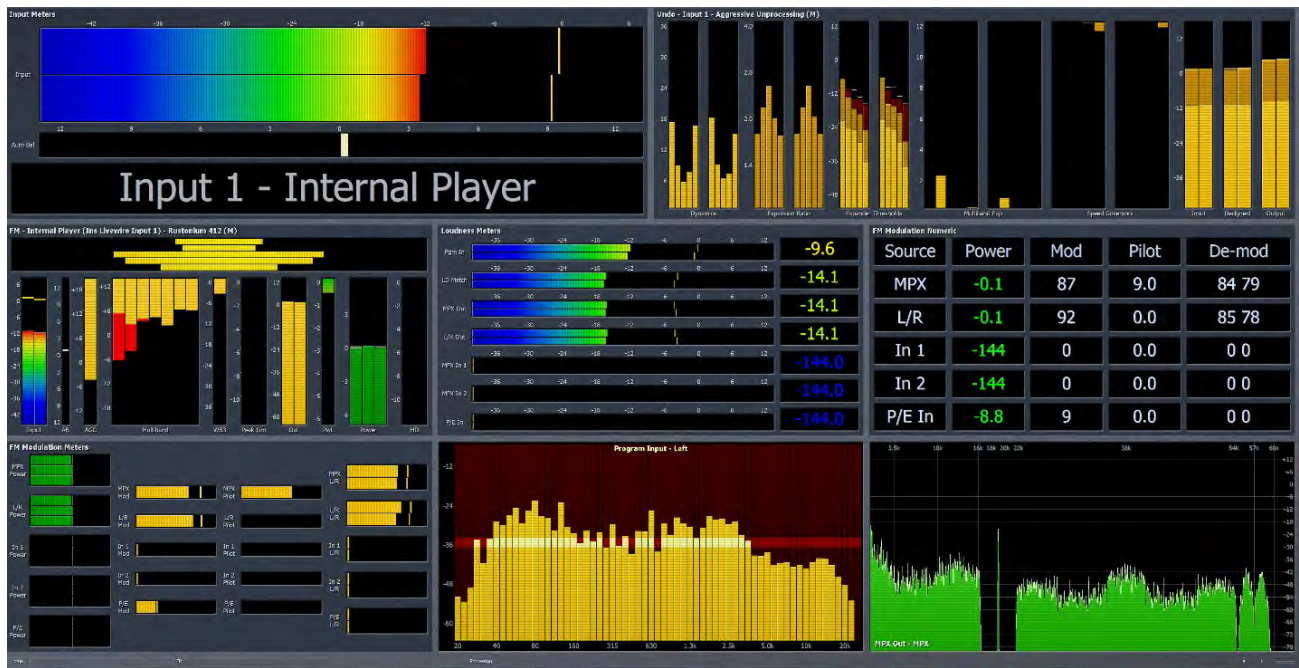
The second FM processor (FM2) can provide processing for MPX or L/R, but not for both together.

To configure your processing paths, go to Home/System/System Configuration/Processing paths.

Note that FM2 is an option and requires a license to be installed. You can check what licenses are installed on your unit by going to Home/System/System Configuration/Upgrades.

13 FM Menu Display Settings

Display Settings Menu



The Display Settings Menu allows you to customize what is displayed in up to 8 different windows on-screen at the same time. To set your display options for FM, go to Home/FM/Meter Options/Display settings. Settings for other processing cores follow the same tree navigation conventions.

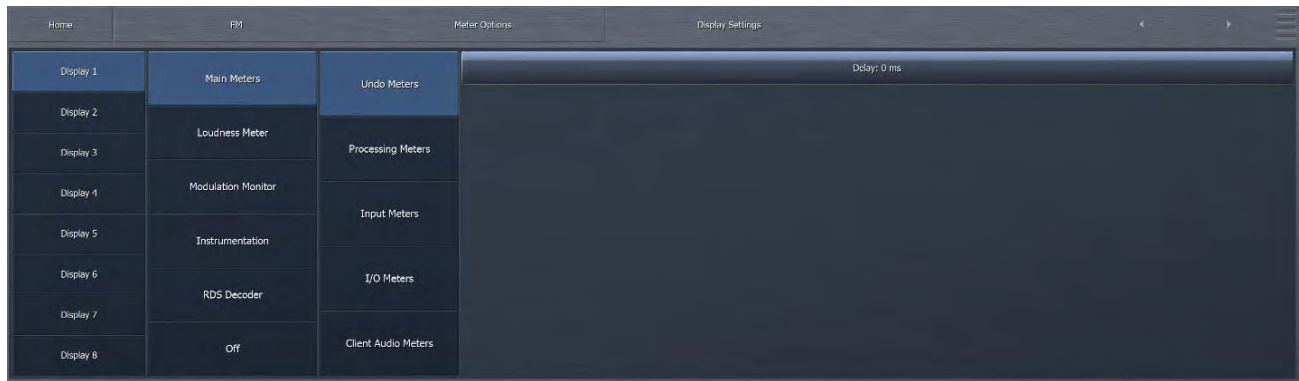
Each of the six Display buttons allows you to choose which processing parameters or visualizations from one of Omnia.9's valuable built-in diagnostic tools are viewable in each window. The ten main groups are Undo Meters, Processing Meters, Input Meters, Loudness Meters, Modulation Level (as bar graph meters), Modulation (as a numeric readout), Oscilloscope, RTA, and FFT Spectrum Analyzer.

You can also turn off any or all of Omnia.9's displays here – a handy feature for keeping your processing meters and settings from curious eyes!

Since Omnia.9 can display such a wide variety of information about your station's audio processing and signal, it allows you to create and save up to six Display Presets, which are always visible in the top right portion of the display. Any changes you make to the display settings are saved as you make them for that particular preset. Plus, you can choose from 1 to 8 simultaneous displays for the metering.

For example, you may wish to devote one preset to nothing but the Undo and Processing Meters to display these parameters in greater detail. Or, you could devote an entire preset to the oscilloscope and monitor the program input, the output of Undo, the MPX before the clipper, and the MPX output to see what the various stages within Omnia.9 are doing to the audio signal. The combinations are endless and yours to customize to suit your particular needs and preferences. Here is just an example of a “fully stuffed” NfRemote display of eight metering stages, expanded to fill the screen. This shows the flexibility of metering options available on the Omnia.9. Have fun configuring yours!

Displays: This is where you start



Undo Meters Menu

The Undo Meters button allows you to display the activity of the entire Undo section. Which specific Undo meters are displayed within this window is determined by settings in the Undo Metering portion of the main Undo menu, which is located in Omnia.9’s Input section. A full explanation of the Undo meters is given in the section dedicated to using Undo. Here is an example of a typical Undo meter indication:



You can see how to select that particular display, by selecting Display 1, Main Meters, and Undo Meters. Follow the next section to observe how to select other meter options to observe what is “going on” inside the Omnia.9.

Processing Meters Menu

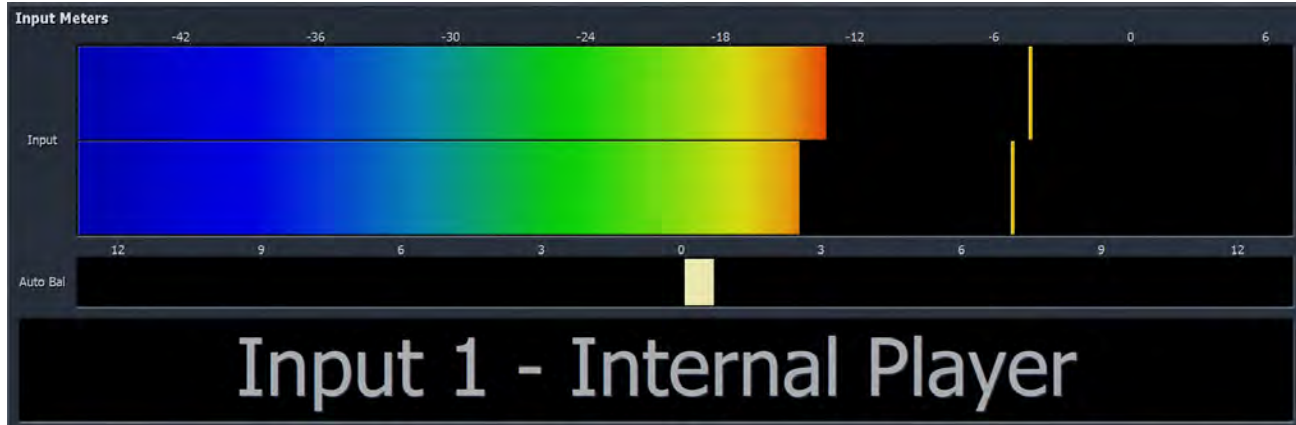
The Processing Meters menu allows you to display the levels and activity of Omnia.9’s various gain stages and processing sections. Here is an example of a typical processing meter indication:



As pointed out in the previous section, you can see here that Display 1 is selected, so only one parameter is being displayed at this time as well. On the next tier, the Main Meters option is selected, and on the third tier, the Processing Meters option is selected. As we proceed through the additional metering options, you will see how you can customize your displays exactly as you like them.

- ◆ The Delay control, which is also present in (and coupled to) the Processing Meters, Oscilloscope, RTA, and FFT Spectrum Analyzer menus, lets you synchronize Omnia.9’s meters with the audio to which you are listening. For example, if you are listening to a stream with a 10 second delay, it would be impossible to properly adjust the processing if that much time passed before you actually heard what you were seeing on the meters! By advancing the Delay control to 10,000ms, what your eyes see on the meters will coincide with what your ears are hearing. Keep in mind, however, that any changes you make to the processing will still take 10 seconds to be audible.

Input Meters Menu



The Input Meters menu allows you to monitor the audio levels entering Omnia.9 with ITU BS.1770 bargraph meters.

Loudness Meters, Modulation Meters, and Modulation Numeric Menus



In this display example, we have selected three meters to watch, Loudness, Modulation Meters, and Modulation Numeric.

The Loudness Meters menu provides separate loudness meters for Program Input, Loudness Match, MPX Output and if enabled, L/R Output and the output levels of external gear feeding Omnia.9's MPX1 and MPX 2 inputs.

The Modulation Meters menu displays the modulation levels of the MPX output of Omnia.9 as well as any processor or applicable tuner feeding the MPX1 or MPX2 inputs as a bar graph.

The Modulation Numeric menu indicates the modulation levels of the MPX output of Omnia.9 as well as any processor or applicable tuner feeding the MPX1 or MPX2 inputs as a numeric value relative to a 100% scale. The percentage of modulation occupied by the pilot and the L/R Demod level is also displayed.

Oscilloscope Menu



The Oscilloscope menu allows you to monitor a very wide variety of input and output points from various stages of Omnia.9's processing sections on the built-in oscilloscope. In the above example, the single Display 1 is selected, with the Instrumentation button engaged, as well as the Oscilloscope button.

The Delay control works the same here as it does previous and subsequent display sections.

- ◆ The **Oversampling** control enables or disables the oscilloscope's 4x oversampling function. Without oversampling, some peaks may pass through without being displayed, giving an inaccurate view of the signal. This is most critical when monitoring the MPX Output or the L/R Pre-emphasis Output. However, since oversampling consumes more CPU resources, it is turned off by default.
- ◆ The **Phosphor Persistence** control adjusts how long latent images remain on the screen. A setting of 0 provides no image delay at all and offers the greatest amount of visual detail for the current information on the scope. Higher settings allow images of signal that has already passed through the scope to remain on the screen for progressively longer periods of time. Setting this control all the way to the right keeps the image from fading at all, useful for catching peaks.
- ◆ The **Gain** control adjusts the Y scale of the oscilloscope and moves the grid relative to the signal.
- ◆ The **Lines** control adjusts the offset of the reference lines as measured in dB.
- ◆ The **Zoom** control allows you to choose between a 1x, 2x, and 4x view of the X scale, similar to setting the sweep time of a traditional oscilloscope.

The I/O (Input/Output) Menu allows you to view the audio signal at various points of the Program Input, MPX Output, L/R Output, MPX Input 1, MPX Input 2, and Client Mic Input paths.

- ◆ From the **Program Input** patch point, you can view the left or right input audio signal.
- ◆ From the **MPX Output** patch point, you can view the Multiplex, left de-modulated, right de-modulated, left de-emphasized, or right de-emphasized audio signal as well as the pilot tone (obtained through a brick wall phase-linear band pass filter from 18,950 – 19,050Hz) and the MPX signal minus SCA carriers (obtained through a brick wall phase-linear low pass filter at 54,000Hz).
- ◆ From the **L/R Output** patch points, you can view the original pre-emphasized left/right audio signal, the de-emphasized left/right audio signal, as well as the MPX signal, a stereo coded version of the pre-emphasized left/right audio signals.
- ◆ From the **MPX Input 1** and **2** patch points, you can view the Multiplex, left de-modulated, right de-modulated, left de-emphasized, or right de-emphasized audio signal as well as the pilot tone and MPX signal minus SCA carriers.
- ◆ The **Pre-emph Input** allows you to view the original pre-emphasized left/right audio signal, the de-emphasized left/right audio signal, as well as the MPX signal, a stereo coded version of the pre-emphasized left/right audio signals. The pre-emph input is similar to the MPX Inputs, but is specifically for use with the L/R Outputs from another processor. This input can receive audio from any of the three digital inputs, but since it is not DC coupled, it is not designed to be used with the analog input.
- ◆ From the **De-clipper** patch point, you can view the audio signal before or after de-clipping in either the left or right channels.
- ◆ The **Undo Pre** patch points allow you to view the audio signal from each of the 5 individual bands of the Undo section after the de-clipper but before Undo's multiband expansion in either the left or right channel.
- ◆ The **Undo Post** patch points allow you to view the audio signal from each individual band or the combined output of all bands of the Undo section after the de-clipper AND after Undo's multiband expansion in either the left or right channel.
- ◆ The **Undo Control Signal** patch points allows you to view the control signal from each of the individual bands in either the left or right channel.
- ◆ The **Miscellaneous** patch points allows you to view the audio signal from various other points in the signal path, including after input filtering, after the multiband section, after the bass clipper, after input loudness matching, as an MPX signal with noise injection, and at the program passthrough point.
- ◆ The **MPX Decoded** patch points contain the decoded left or right channel of the MPX output of the Omnia.9 as well as devices connected to the MPX1 and MPX2 inputs, the de-emphasized version of the L/R pre-emph output, and the de-emphasized version of the Pre-emph input when enabled. These patch points are most useful when using the NfRemote client over the internet, as their original un-decoded counterparts may be not be available remotely due to insufficient network bandwidth.
- ◆ The **Physical Inputs** menu contains patch points of the actual rear panel inputs, including the Main Digital, AES Reference, Aux Digital, and Analog inputs.
- ◆ The **Livewire Inputs** menu contains patch points with audio sourced from Livewire inputs 1-8 (Livewire+/AES67 AoIP requires the MKII platform. Contact Telos support or your dealer for more information)
- ◆ The **Sidechains (SC)** menu contains patch points with the left- and right-channel audio signals from both the sidechains and output sections of the Input AGC, Wideband AGC1, Wideband AGC2, and Wideband AGC3 compressors.
- ◆ From the **Multiband** menu, audio from any one of the bands in the multiband compressor can be accessed individually and listened to as a Solo. The number of available bands is determined by the number of bands employed in the current preset. Post Multiband (meaning pre-clipper, pre-insert) can also be accessed.
- ◆ The **Monitor Out** menu allows you to view the input (source) and output audio signals of the Speaker, Headphone, and Aux monitor points in either the left or right channel.

Below are some more examples of how to use the oscilloscope:

As a High Frequency Headroom Monitor:

- ◆ Display the Left or Right Demod signal from the MPX Output menu
- ◆ Set Oversampling to “On”
- ◆ Set Phosphor Persistence to 50
- ◆ Set Gain to -3
- ◆ Set Lines to -1
- ◆ Set Zoom to 4x

Below is a comparison of this signal to the L/R pre-emphasized output (the one you’d be using if you used an external stereo generator, whether fed with Analog or AES/EBU) so you can see just how much additional HF headroom Omnia.9’s own stereo generator provides!

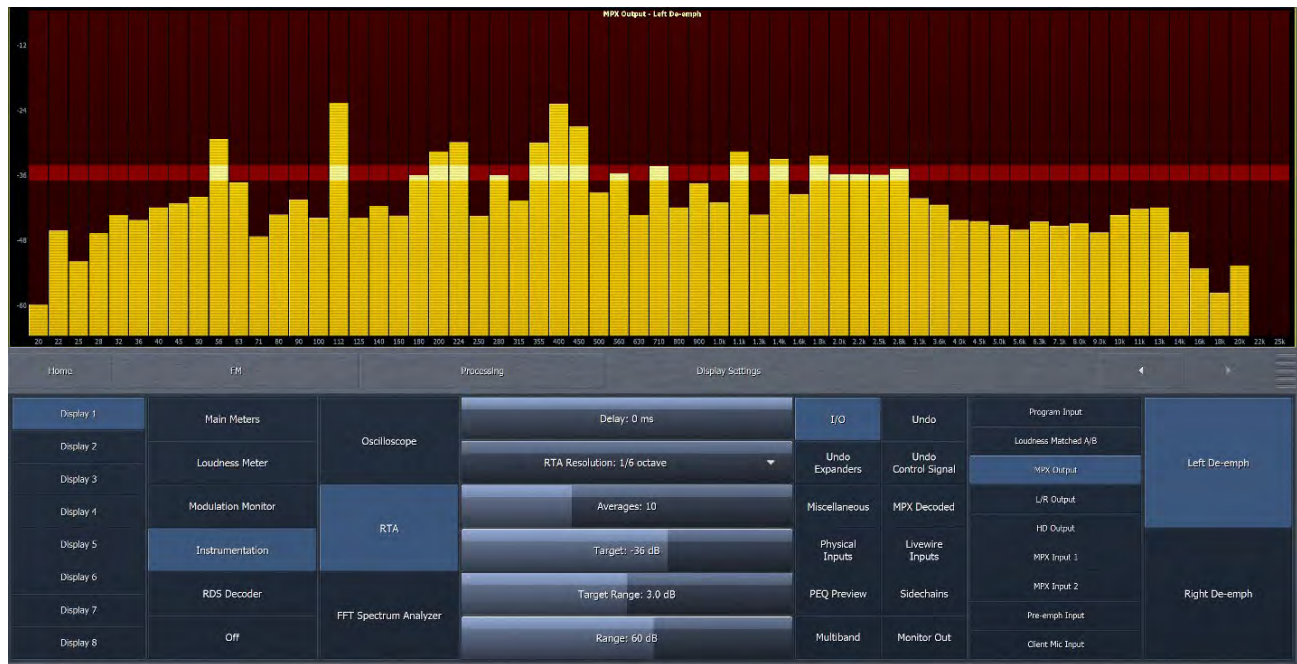
As a Pilot Protection Monitor:

- ◆ Display the MPX Output
- ◆ Set Oversampling to “Off”
- ◆ Set Phosphor Persistence to 40
- ◆ Set Gain to 0
- ◆ Set Lines to 0
- ◆ Set Zoom to 8x

Note that what you are seeing here is the actual pilot extracted from the entire MPX signal. Note the complete lack of pilot modulation despite basically *all* the clipping happening in the composite domain.

RTA Menu

The Real-Time Analyzer menu allows you to monitor many of the same sources as those mentioned in the Oscilloscope menu section. The horizontal scale along the bottom of the RTA screen shows frequencies from 20 to 20,000Hz. The vertical scale along the left side shows the amplitude of the audio in decibels.

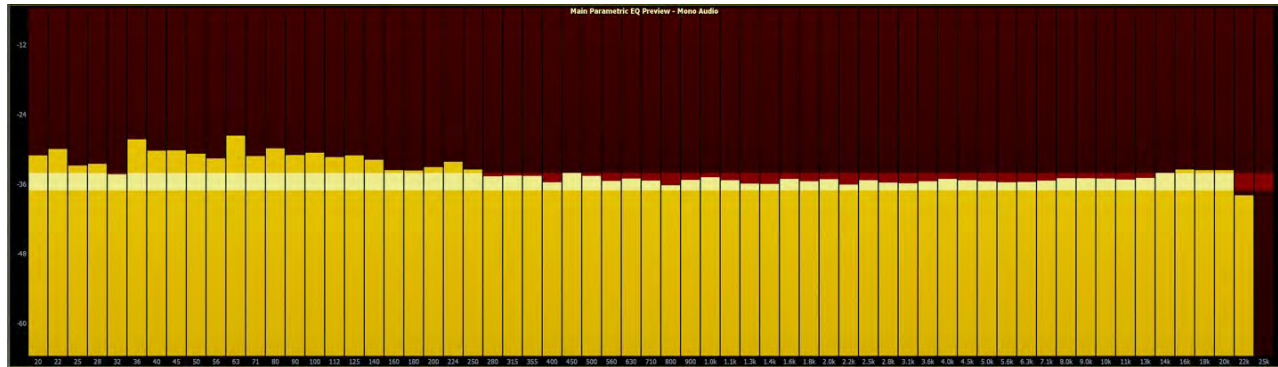


- ◆ The Delay control works the same here as it does previous and subsequent display sections.
- ◆ The RTA Resolution control lets you choose between a 1/3 and 1/6 octave display.
- ◆ The Averages control can be used to slow down or speed up the RTA’s display response. A lower average setting (faster meter response) might be more useful for peak monitoring; while a higher average setting (slower meter response) might be more useful for calibrating speakers. Higher averages are also useful for adjusting lower frequencies. The recommended setting for speaker calibration is 100. Regardless of how the Averages control is set, the RTA maintains a history “buffer” of 1,000 frames. Advancing the control to 1,000 will immediately display the average of the last 1,000 frames.
- ◆ The Target control moves the dark red target window and/or the amplitude scale up and down within the display, a useful tool for establishing a target when performing speaker calibration.
- ◆ The Range control allows you to view a broader or narrower range of audio, indicated by the range scale along the left side of the display.
- ◆ The Target Range adjusts the height of the target window within a 6dB range in half-decibel increments. Lower settings are better suited to more precise measurements. Moving the Target Range slider all the way to the left hides the target window.

Below is an example of how to use the RTA menu:

To see a visual representation of a parametric EQ (PEQ) setting:

- ◆ Display the MB DRC Solo menu and select PEQ Preview
- ◆ Set Resolution to 1/6 octave
- ◆ Set Averages to 100 to “freeze” the display



You will now be able to see the curve of the PEQ in the RTA display window. You can also view the curves of each band of the multiband compressor by selecting one of the Solo band buttons. Since the Solo bands relate to a dynamic section of the processing core, lowering the Averages slider will yield more of a “real time” view.

FFT Spectrum Analyzer Menu



The FFT menu allows you to monitor the same sources as those mentioned in the Oscilloscope menu section.

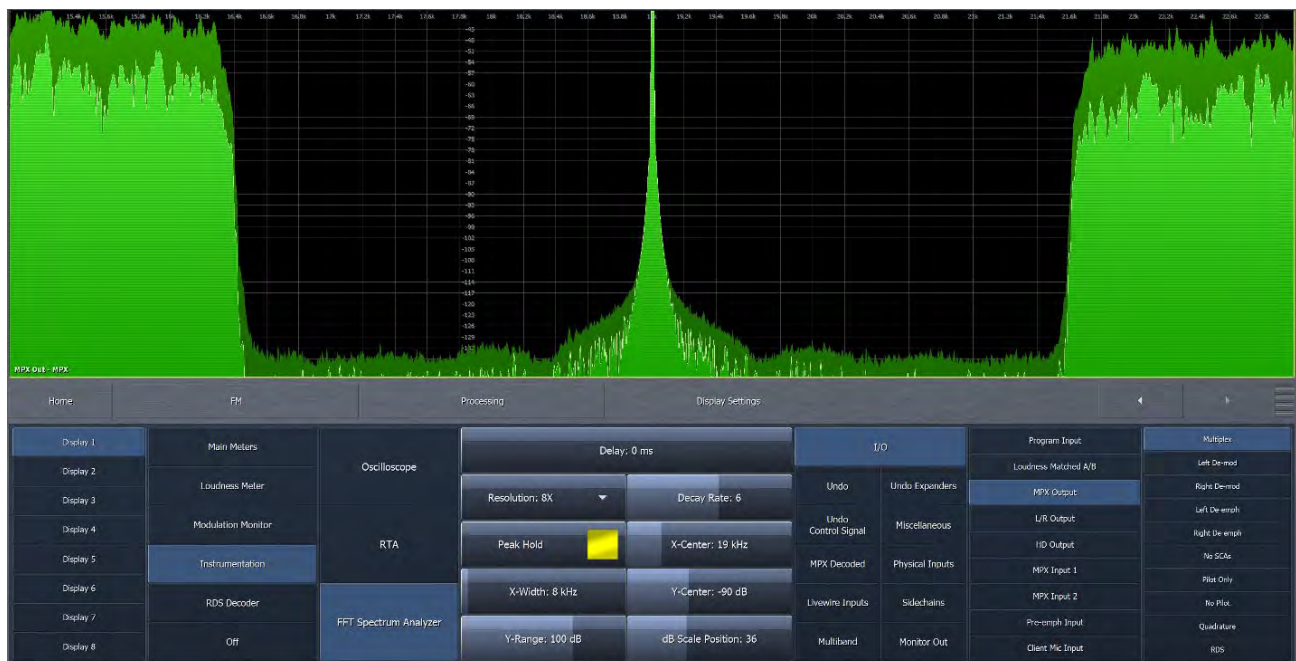
- ◆ The Delay control works the same here as it does previous and subsequent display sections.
- ◆ The Resolution control selects the number of frequency bands into which the audio is divided. 1x resolution gives you a refresh rate of approximately 48 frames per second and a frequency resolution sufficient for viewing the entire audio spectrum. 8x resolutions gives you a refresh rate of approximately 6 frames per second, but a much finer frequency resolution.

- ◆ The Decay Rate control adjusts how quickly the display will fall after a peak is displayed. Lower settings are the slowest, while the highest setting is instantaneous.
- ◆ The Peak Hold control enables or disables the ability to indicate and hold the highest peak achieved. Peak Hold is displayed in the dark green background layer.
- ◆ The X-Center control centers the display at the selected frequency.
- ◆ The X-Width control sets the displayed frequency range in kHz.
- ◆ The Y-Center control centers the display vertically around the selected level in dB.
- ◆ The Y-Range control sets the displayed level range in dB.
- ◆ The dB Scale Position control allows you to move the dB scale horizontally to a different place in the display. Advancing the control completely to the right places it in front of the graph at all times.

Below are some examples of how to use the FFT menu:

As a pilot protection monitor:

- ◆ Display the MPX Output
- ◆ Set Resolution to 8x
- ◆ Set Decay Rate to 6
- ◆ Set Peak Hold to “On”
- ◆ Set X-Center to 19kHz
- ◆ Set X-Width to 8kHz
- ◆ Set Y-Center to -90dB
- ◆ Set Y-Range to 100dB,
- ◆ Set dB Scale Position to 36



To display the RDS subcarrier frequency spectrum:

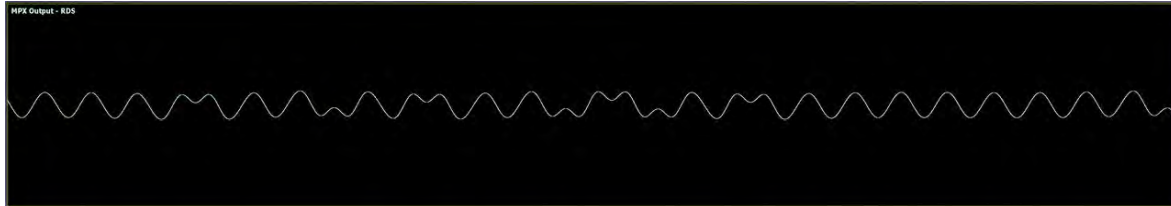
- ◆ Display the MPX Output
- ◆ Set the Resolution and Decay rate to any setting
- ◆ Set Peak Hold to “Off”
- ◆ Set X-Center to 57kHz
- ◆ Set X-Width 10kHz
- ◆ Set Y-Center to -80dB
- ◆ Set Y-Range to 100dB
- ◆ Set dB Scale Position to 100



To display the RDS biphasic signal, extracted from the MPX composite signal through a PLL as would be done in an RDS decoder

- ◆ Select the Oscilloscope
- ◆ Display the MPX Output - RDS subchannel
- ◆ Enable Oversampling
- ◆ Set Phosphor Persistence to 0
- ◆ Set Gain to +12.0dB
- ◆ Set Zoom to 4x

A phase flip (two peaks in the same direction) is a ONE. No phase change is a ZERO. The RDS bit-stream really is this simple, despite how complex it looks on the spectrum analyzer above.



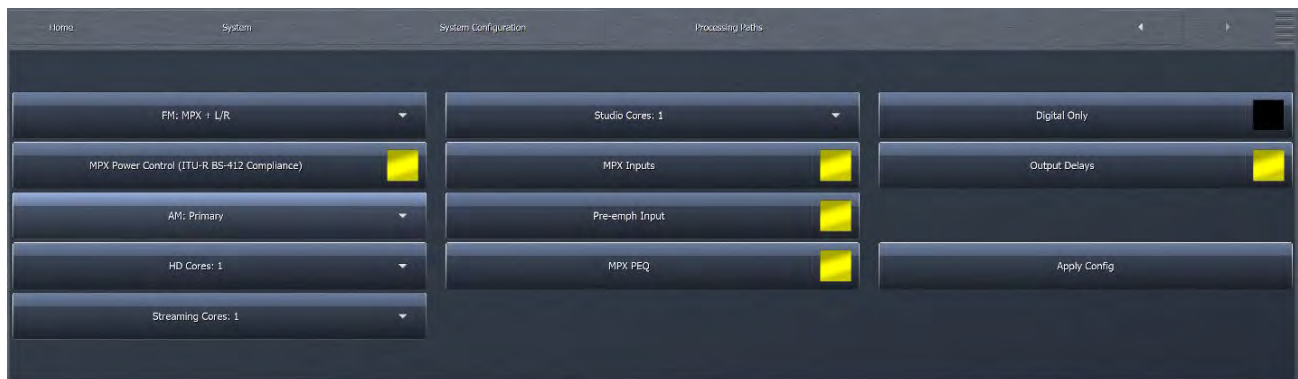
14 FM Menu ITU-R BS.412 Processing / MPX Power Limiting

ITU-R BS.412 requires that the average MPX power be limited to a particular standard and measured with a rolling 60-second integration time. However, since it is impossible to know what lies ahead in terms of content, loudness must be practically controlled within a much shorter period of time “just in case.”

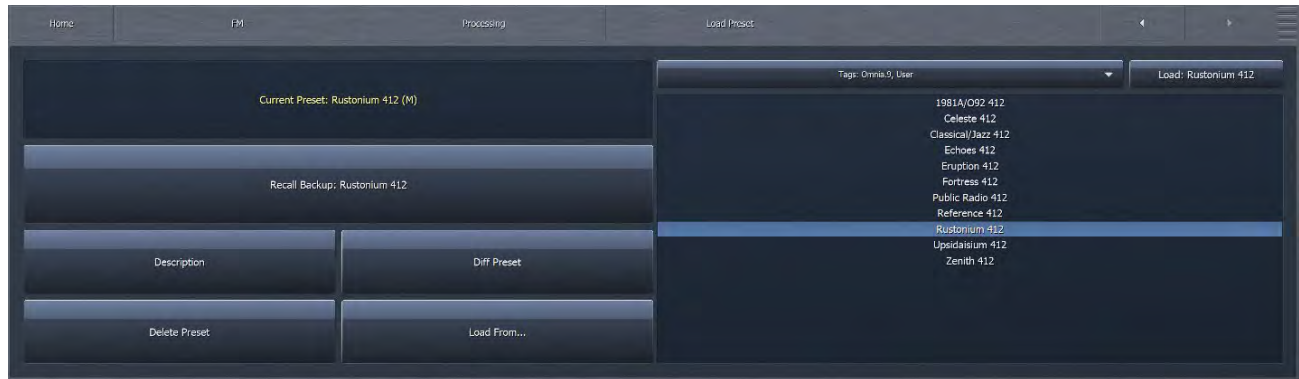
The factory “412” presets included with Omnia.9 are tuned in such a way that significantly less power limiting is needed to deliver a compliant output compared to other processors. In fact, it is not at all unusual to see no gain reduction on the Power Limiter meter at all during normal programming and only 2dB - 3dB with very bass-heavy material.

Speaking of bass, managing bass-heavy content presents a special challenge because of the amount of energy typically present in the lower frequencies. Most of Omnia.9’s “412” presets make use of the WB AGC2 or WB AGC3 compressors in “Bass Only” mode. This allows the initial portion of the bass waveform to be managed by the clipper while the remainder is processed by the compressor, resulting in much higher levels of bass than would otherwise be possible under the limitations imposed by the regulations.

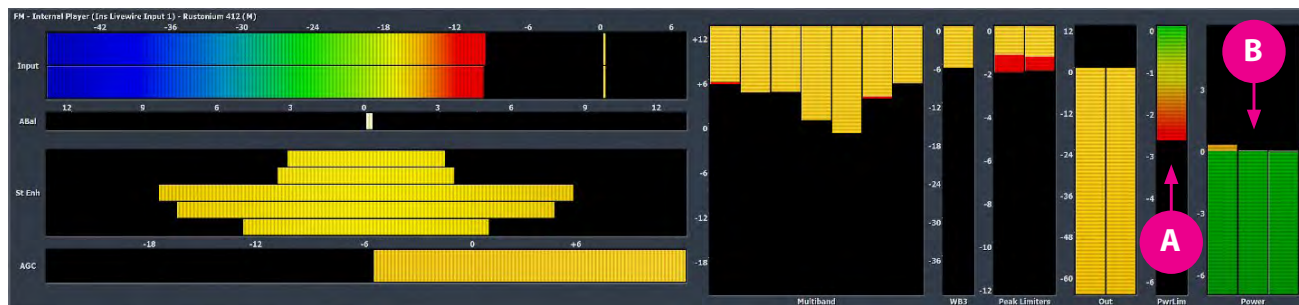
To prepare Omnia.9 to operate in compliance with ITU-R BS.412, MPX Power Control must first be enabled in the **System > System Config > Processing Paths** menu. Be sure to “Apply Config” after enabling this mode and remember that doing so will take the unit off-air temporarily.



You will notice in the FM> Processing> Load Preset Menu that the preset list has been updated to include only those specifically designed for BS.412 use. There is also an additional Power Limit menu option.



In addition, the Processing Meters display window now includes a meter for the Power Limiter and three meters showing output levels over 10 second, 30 second, and 60 second integration times.



A: Power Limiter Meter, **B:** Output Levels (10s, 30s, 60s Integration)

Controls for adjusting the Power Limiter are found in the FM> Processing> Power Limit menu.



- ◆ The **Peak Limiter Drive** control sets the amount of limiting performed by the final peak limiters and has a 12dB range and is adjustable in one-quarter dB increments. These limiters are the same type used in the HD and Streaming cores and are situated before pre-emphasis.
- ◆ The **Power Limiter Drive** control determines the amount of limiting performed by the MPX Power Limiter with a range of 12dB adjustable in one-quarter dB increments.
- ◆ Advancing the **Punch (coupled)** slider (moving it to the right) increases the Power Limiter Drive while simultaneously reducing the Peak Limiter Drive by a corresponding amount which results in a more open sound. Sliding the control to the left decreases the Power Limiter Drive and increases the Peak Limiter Drive by a corresponding amount which results in a more dense sound.

- ◆ The Limiter Style drop-down menu provides a choice between Standard and Aggressive settings. “Standard” is more gentle and less audible. “Aggressive” is more audible but allows you maintain levels that are closer to the designated power limit.

MPX Power Graphs

Graphs for MPX Power are also available.

Just like with loudness graphic, this feature is turned off by default and must be enabled in the FM > Meter Options > Meter Options menu.

Power Graph Menu

The power graph menu is accessible by navigating to the FM > Processing > Display Settings > Modulation Monitor > Power Graph menu.

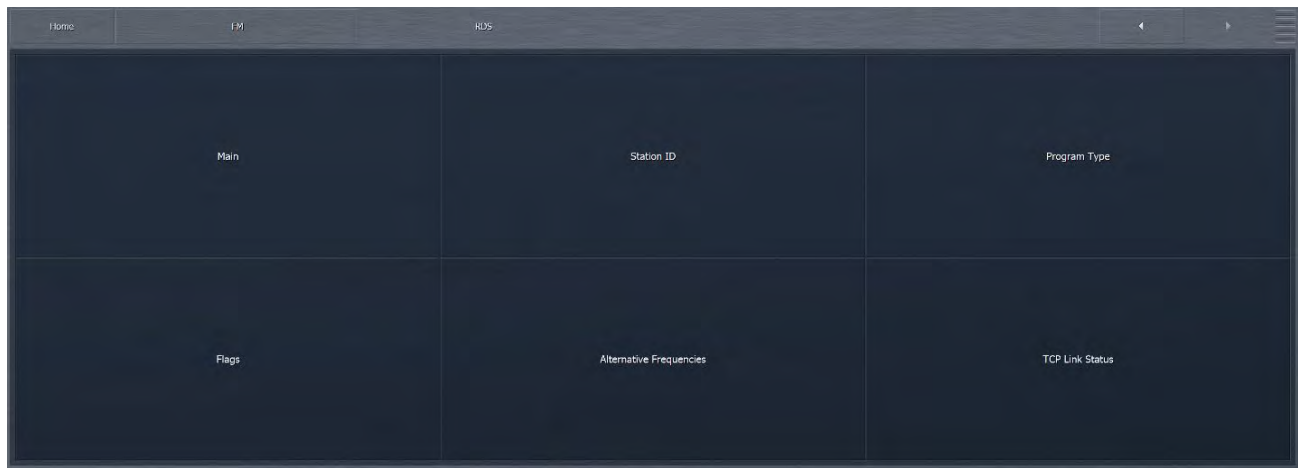
The graph is color coded according to the setting of the “Power Limit” control in the Meter Options menu. Any changes made to this setting are instantly displayed on the graph for current and historical readings as show in the images below.

In this example, you can see on the left side of the graph, the cold startup of the Omnia.9. In the middle of the graph is an example of varying depth of processing in the Power Limiter. On the right half of the display, you see a consistent “regulation” of the levels as controlled by the Power Limiter. Note that the “flow” of the screen, from right to left, is very slow, integrated over a period of about three hours.



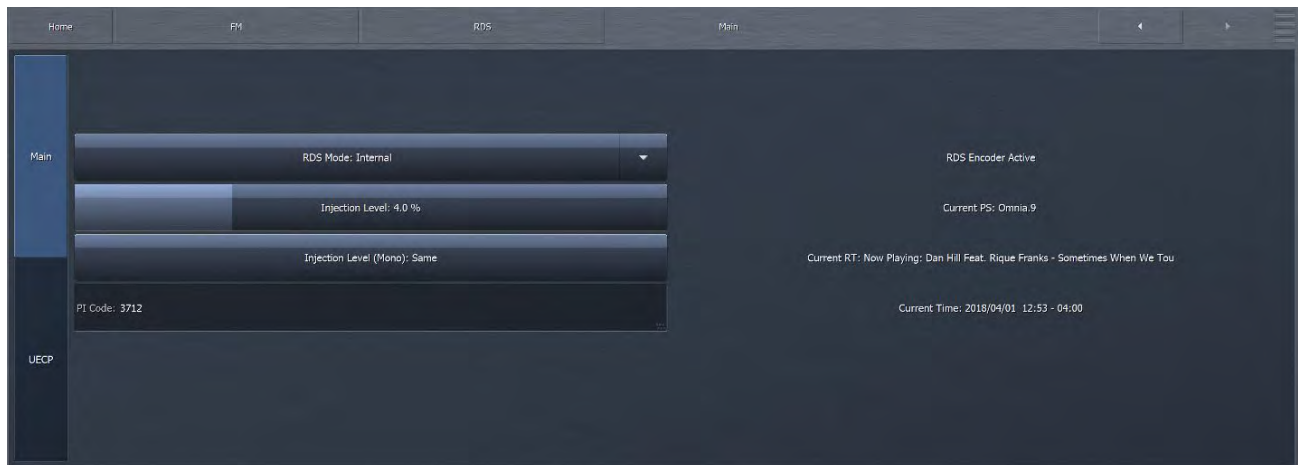
15 FM Menu RDS

When installed in the unit, the RDS control section of Omnia.9 contains the Main RDS menu, fields for Program Service (PS) and Radio Text (RT) information, program identification fields, selectable dynamic Program Type (PTY), selectable flags, and a section for selecting alternative frequencies.



RDS Main Menu

The Main menu controls allow you to enable RDS, choose the mode in which it operates, and set the injection level.



- ◆ The Injection Level slider sets the amount of RDS injection from 0 – 15%. The default setting is 4%. Please note that the RDS signal will be embedded by the Omnia.9’s final clipper, thus increasing RDS injection will not directly cost you

loudness as with other processors. However, excessive RDS injection will still aggravate multipath issue due to high amplitude at very high frequencies in the composite signal.

- ◆ The RDS Mode drop-down menu allows you to choose from several different RDS options.

When set to **Off**, RDS is turned off completely. If you want to insert RDS after the Omnia.9 in the chain, this is the mode to use.

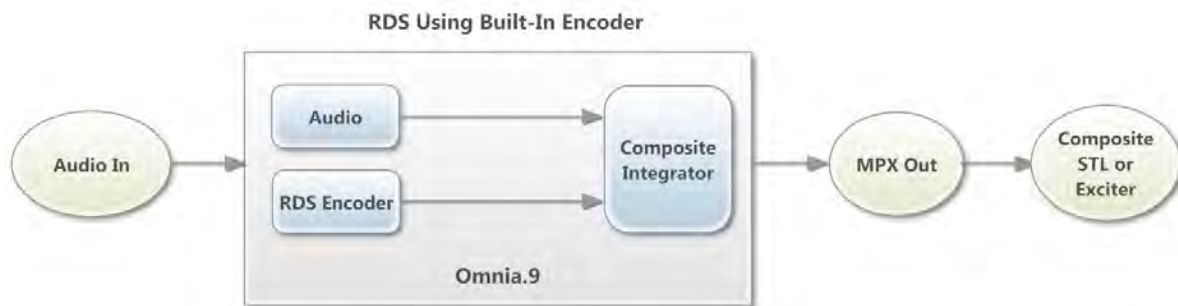
The **External Input 1** and **External Input 2** modes determine which of Omnia.9 MPX inputs are active for RDS input when using an external encoder. Omnia.9 has built in RDS confidence decoders, available in the display settings under RDS Decoder, which allow you to display the decoded RDS data from both external MPX inputs separately, regardless of whether they are selected here.

In the **Internal** mode, Omnia.9’s built-in RDS encoder is active.

- ◆ The **Program Identification** field must contain a 4-digit hexadecimal PI code, and must be unique to your station. If another station uses the same PI code, the preset buttons in car radios will get confused and sometimes tune in your competition instead of your station when the listener pushes the preset button! PI codes are usually assigned by the respective frequency/telecommunications authority in each country. In the United States and Canada (RBDS), PI codes are calculated from the call sign. There is a convenient calculator online: <http://www.w9wi.com/articles/rdsreverse.ht>

Using Omnia.9’s Built-In RDS Encoder

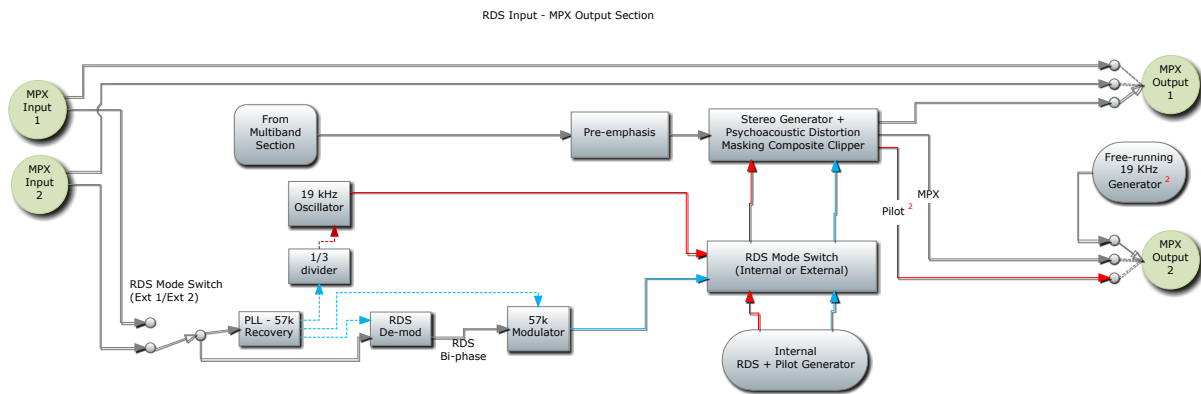
Using the built-in RDS encoder is the simplest and most straight-forward means of getting RDS data on the air since everything is handled within Omnia.9 itself:



Using External RDS Encoders

If you prefer to generate RDS data externally instead of utilizing Omnia.9's built-in encoder (or your situation dictates that you do) this is possible as well.

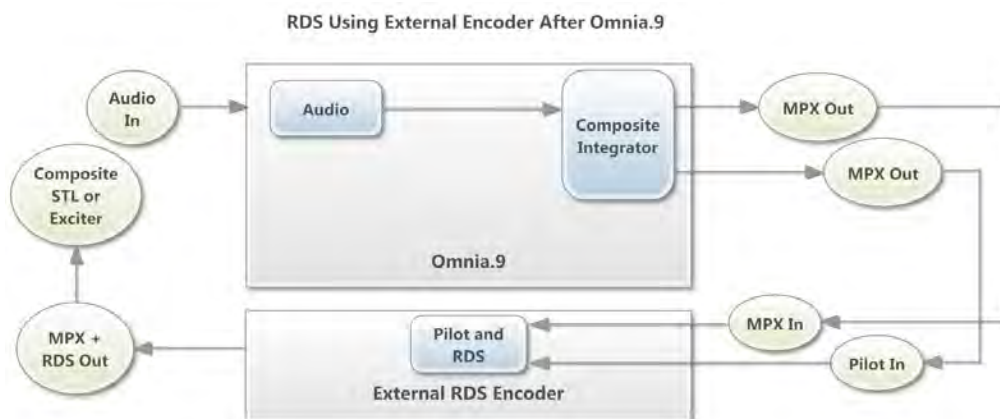
Unlike earlier versions of Omnia.9 software, our current 3.18.99 release does not need to see pilot on the MPX input when using an external encoder, instead the pilot is derived from the external 57 kHz signal internally. Thus, if you connect an RDS encoder to an Omnia.9 input, you no longer need to synchronize the encoder to anything; it's okay if it's free-running at 57 kHz. If your encoder requires a 19 kHz pilot reference to function, set the MPX 2 Output Mode drop-down (found in System - I/O Options - FM options - MPX) to "19 KHz Generator". If you have a Dual FM unit MPX 2 is already spoken for, and in this case you may use one of the analog outputs by selecting "19 KHz Generator" in System - I/O Options - Main Outputs - Analog Out: 19 KHz Generator in the drop-down. Please note you would need to supply an XLR to BNC adapter in order to physically connect Omnia.9ator in the drop-down.OutRDS encoder's reference input.



² Omnia.9 will recover sync from external RDS signals automatically. It is not necessary to feed an external pilot. If your RDS encoder requires a 19 KHz input, you may use the MPX2 Output Mode: 19k Generator option.

Using an RDS Encoder After Omnia.9

You can also use an RDS encoder after Omnia.9, but doing so means losing loudness since Omnia.9's composite clipper cannot process the fully encoded signal. In this case, Omnia.9's MPX1 Output will feed the encoder's MPX Input while the MPX 2 Output will feed the Pilot Input (Sync) of the external encoder. The output of the encoder will then feed the composite STL or exciter. In this scenario, the MPX 2 Output control should be set to the MPX Pilot mode.



UECP menu

At the time of manual publication the code for the section described here was still in progress. The description here applies to upcoming software that was in alpha test when 3.18.99 was released, and was not included in that version. Please check back with us to for updates on release status, or to obtain a beta software version.



RDS UECP/Remote control over TCP/IP

UECP (Universal Encoder Control Protocol) is a standardized protocol that is used to send information to RDS encoders. It is supported by many software and hardware RDS encoders, and by many automation systems. Originally, UECP was used over an RS232 connection, but many products are now supporting it via IP. Omnia.9 supports only the latter.

The UECP dropdown enables and disables UECP support and has the following options:

TCP / UDP / TCP (ASCII) / UDP (ASCII).

Select the one appropriate for your installation.

Many applications now support UECP directly, but for those that do not, an ASCII mode is supported for sending commands in plain text.

UECP input port is a text field where you can enter the port to listen for UECP commands on, in decimal.

UECP is connected (On/Off) (read only) Displays the current status of the UECP connection (On = connected, off = not connected)

Use internal settings on connection drop specifies whether Omnia.9 should fallback to the RDS settings specified in other pages in the RDS menu, should the UECP connection drop. It is a good idea to enable this and populate the RDS settings with “generic” information should the automation system fail to connect and provide data via UECP

The **Status** line will show the connection status (TCP) and number of messages received (UDP).

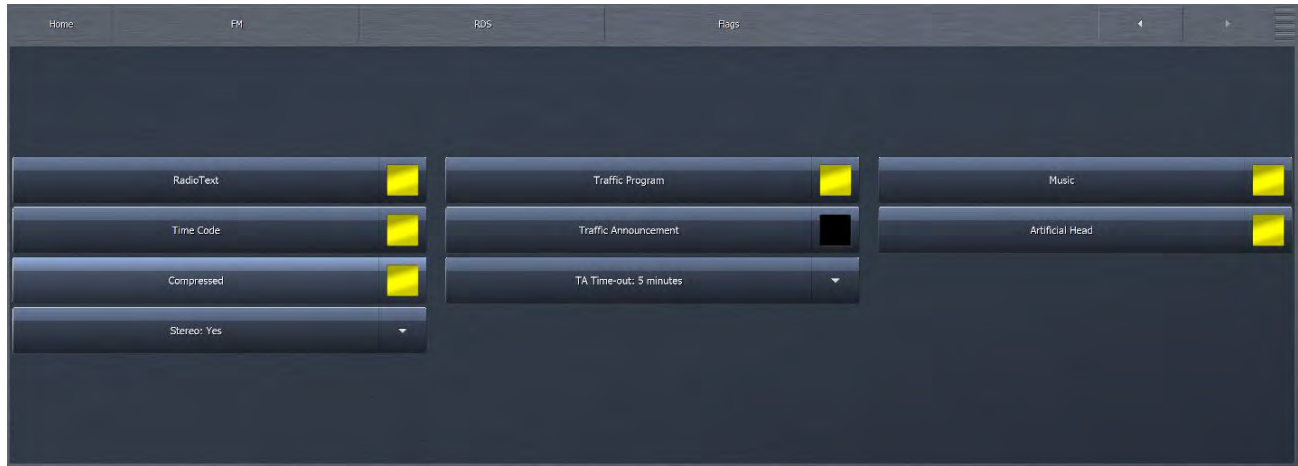
As UECP can send commands via multicasting to multiple RDS encoders, each message contains addressing information. The **Listen to specific address** option instructs Omnia.9 to only listen for UECP commands targeted to the specified address. The options are Site/Encoder Address, DSN, PSN.

Enter the information appropriate to your RDS network if this feature is utilized.

Flags Menu

The Flags Menu offers enable/disable controls for the Radio Text, Traffic Program, Time Code, Compressed, Stereo, Artificial Head, Traffic Announcement, and Music flags.

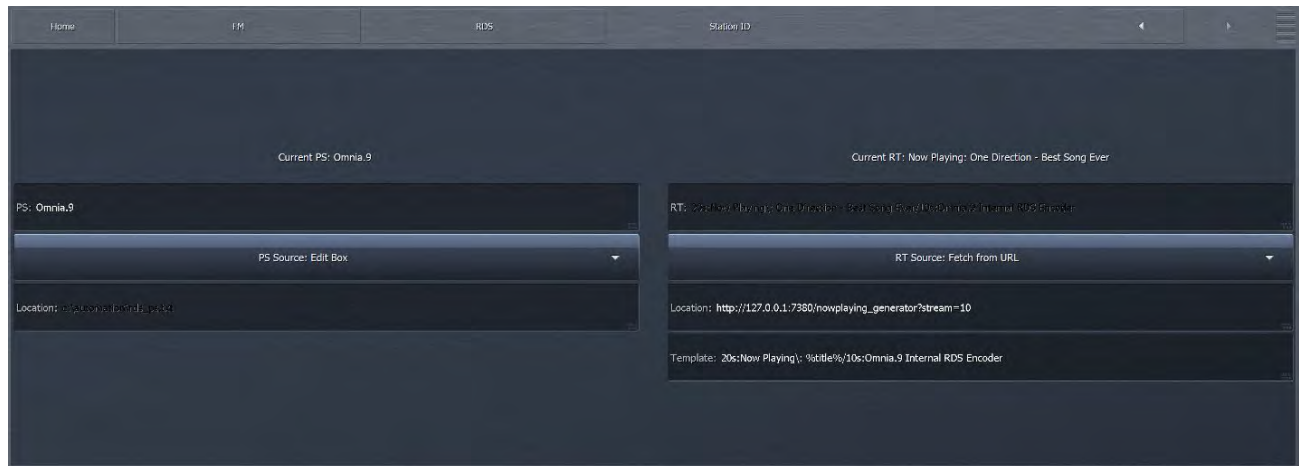
When enabled, the Radio Text (RT) flag allows whatever is programmed into the RT field to be transmitted.



- ◆ The **Traffic Program (TP)** flag, when enabled, allows listeners to find only stations that regularly broadcast traffic bulletins.
- ◆ When enabled, the **Time Code (CT)** flag allows time and date information within the RDS data to appear on the listener's receiver.
- ◆ The **Compressed** decoder information control, when enabled, indicates that the audio has been processed.
- ◆ The **Stereo** decoder information control, when enabled, identifies the station as broadcasting in stereo (as opposed to mono).
- ◆ When enabled, the **Artificial Head** decoder information control indicates the use of a binaural microphone.
- ◆ The **Traffic Announcement (TA)** flag, when enabled, can stop the playback of other media (a CD, for example) and tune in a broadcast station instead when a traffic bulletin is received. Turning the Traffic flag on and off could be automated through a request to Omnia.9's built-in http server.
- ◆ When enabled, the **Music** decoder information control identifies the station as one which broadcasts primarily music content (as opposed to speech) which in turns allows the receiver to choose between the volume levels for each type of content. Turning this flag on and off could also be automated through a request to the http server.

Station ID Menu

The Station ID Menu provides fields for entering Program Service (PS) and Radio Text (RT) information as well as the Program Information (PI) Code.



Typically, the PS field – an 8-character static display – contains the call letters of the station – for example, WOMN-FM. However, it is possible to program the PS field in such a way that it can provide a bit more information. Here are some ways to creatively use the PS field:

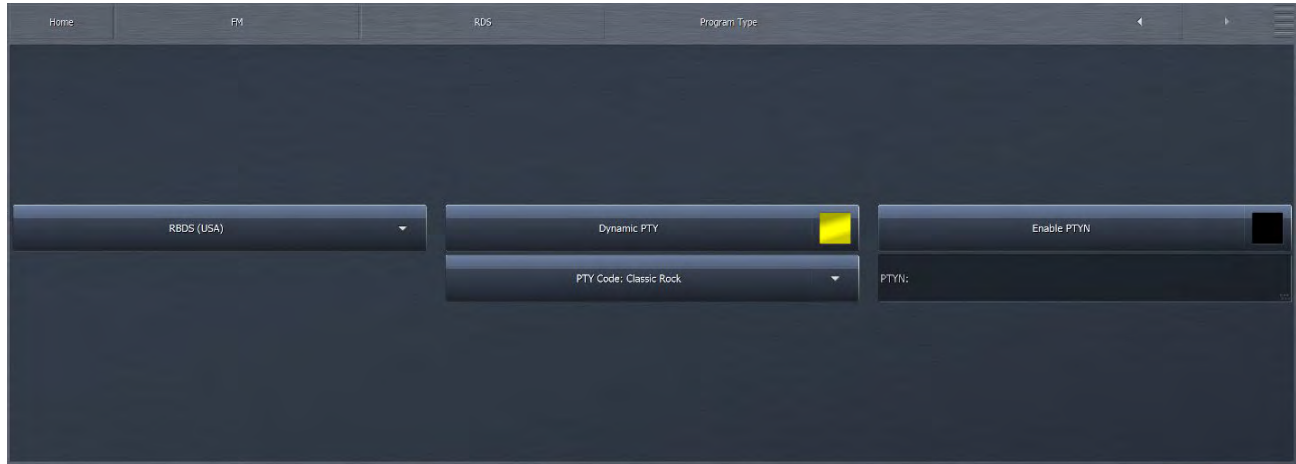
By splitting text with the “/” symbol, each text will alternate for 3 seconds. (WOMN-FM/88.5 FM/NOW WITH/OMNIA.9) or (WOMN-FM/TODAYS/HOTTEST/HITS)

To change the amount of time the text is displayed, put the desired time in front of the text in seconds (1.5s:WOMN-FM/3.0s:88.5 FM/1.5s:OMNIA.9) . In this example, “WOMN-FM” will be displayed for 1.5 seconds, “88.5 FM” will be displayed for 3 seconds, and “OMNIA.9” will appear for 1.5 seconds.

The RT source field provides a 64-character free-form message. It can be static to provide a station slogan, or dynamic and in sync with station programming to provide song titles and artist information. Dynamic updating is accomplished via the HTTP automation interface.

Program Type Menu

The Program Type Menu allows you to choose the RDS mode (USA or Europe), enable Dynamic Program Type, (PTY), and choose a PTY code.



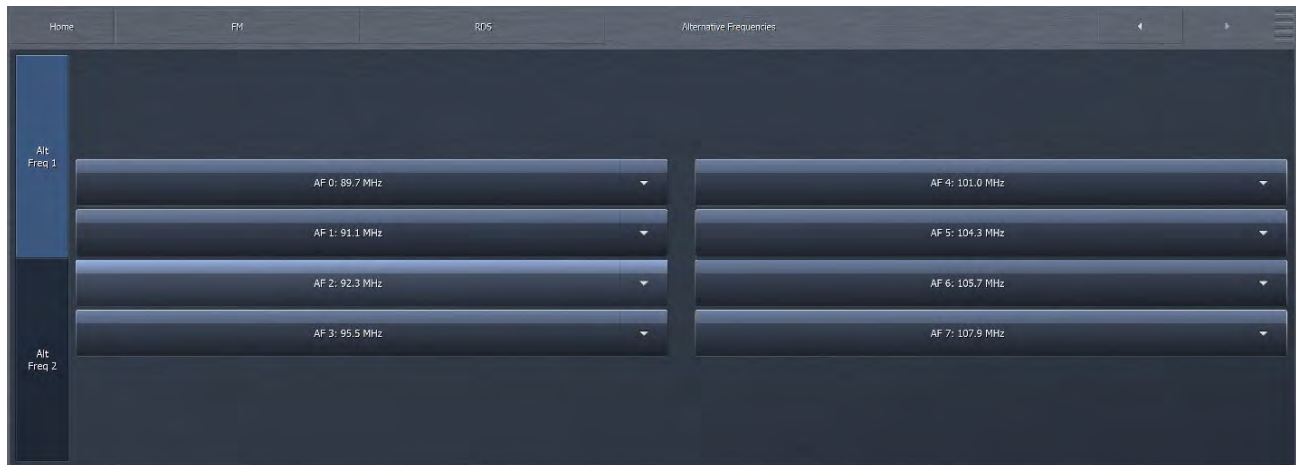
When enabled, Dynamic PTY indicates to listeners that the type of programming on your station may change periodically. This would be useful for a station that for example broadcasts music during the week, but airs sports programming on the weekends.

The PTY Code drop-down menu provides you with a choice of 31 Program Type categories when using a Static Program Type. These 31 program types are defined differently for RDS and RBDS so it is important that you set the RDS/RBDS switch correctly for your location. Most of the world is RDS, North America is RBDS.

The Enable PTYN Enables transmission of any custom program type - maximum 8 characters. For example LO-FI, ROKNROLL, SCHLAGER or VANSMAAK.

Alternative Frequencies Menu

If you broadcast the same programming on more than one frequency, you can take advantage of an RDS receiver's ability to search for and tune into up to 16 alternative frequencies when the signal of the current frequency weakens. The Alternative Frequencies 1 & 2 menus allow you to specify those frequencies.



Field installing RDS

To upgrade a unit already operating in the field with RDS, you must purchase a key to enter into the unit. The key is then entered into the unit along the path: Home -System-System Configuration-Upgrades.

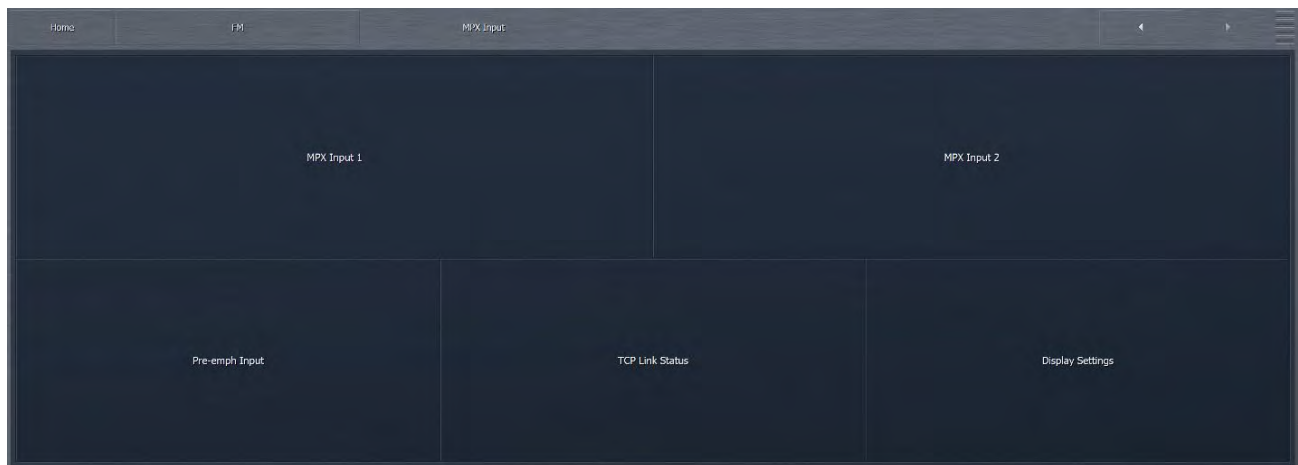
16 FM Menu MPX Inputs

Omnia.9 provides two rear-panel MPX (composite) inputs which can be used for a variety of purposes, including using an external RDS encoder as described in the previous section on RDS. If these MPX inputs are enabled (as described in the System Config Menu section of chapter 18 on the System Menu), they can also be used to put some of Omnia.9's built-in tools to good use.

For example, you may wish to connect a modulation monitor or a tuner with an MPX output to one of the inputs and take a closer look at other signals in your market on the oscilloscope or spectrum analyzer. You could feed the composite output of your existing processor into the Omnia.9 to check its performance. Or, you could verify the performance of an external stereo coder that you're planning to use with the Omnia.9's L/R Output path and compare it to the performance of Omnia.9's built-in stereo coder.

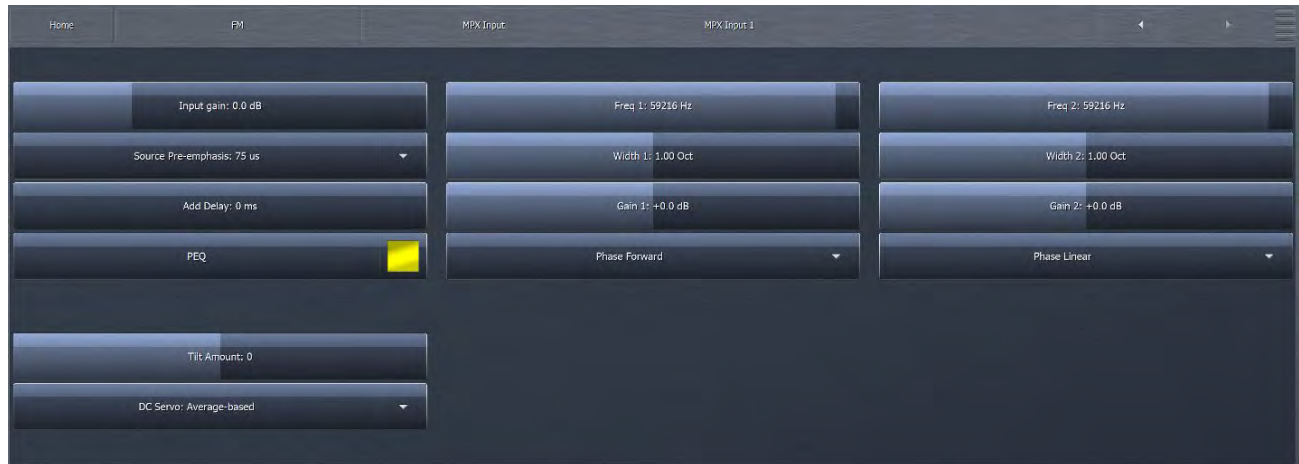
MPX Inputs 1 and 2 are available as patch points which can be viewed on any of Omnia.9's instrumentations as well as auditioned through the monitor outputs using the built-in phase linear reference quality stereo decoder.

The MPX Input Menu contains additional menus for MPX Input 1, MPX Input 2, Pre-emph Input, and Display Settings.



MPX Input 1 and MPX Input 2 Menus

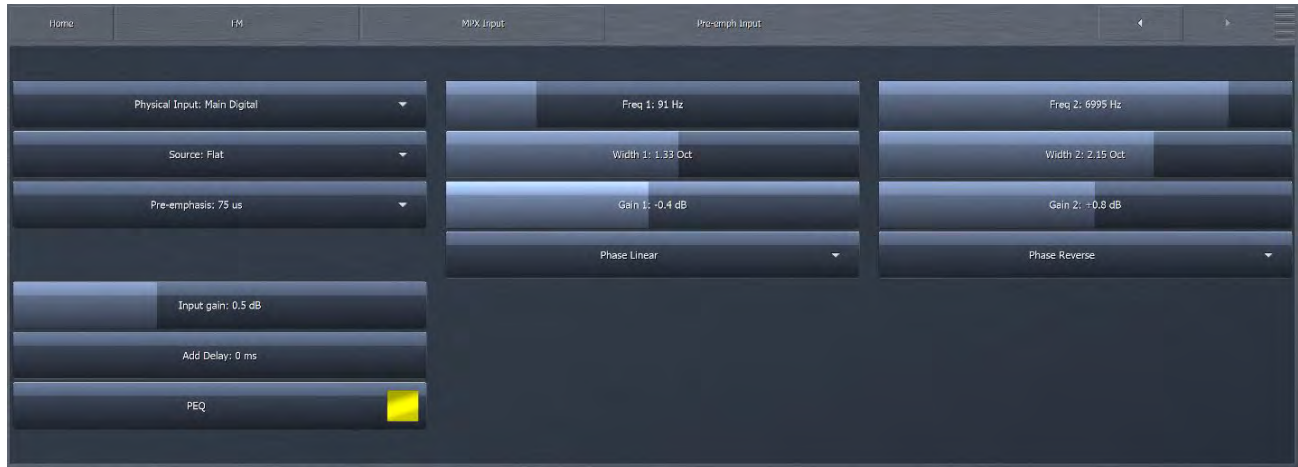
The MPX Input 1 and MPX Input 2 menus contain the controls to set the input gain, choose a pre-emphasis level, add delay, compensate for tilt, and add equalization.



- ◆ The **Input Gain** slider sets the input level of each of the two MPX Inputs in a range from -12dB to +18dB in one-tenth dB increments.
- ◆ The **Pre-emphasis** setting controls the de-emphasis circuit used when the MPX Input patch point needs to be de-emphasized, such as would be the case when it is selected as the source in a monitor input or if Left De-mod is selected when viewing the patch point in an oscilloscope display window. Typically, this should be set to match the pre-emphasis of the input signal, either 50 or 75us.
- ◆ The **Add Delay** control allows you to delay the audio coming in from the external MPX Input to match that of the Omnia.9.
- ◆ Since the outputs of most modulation monitors and tuners have some tilt present, controls to adjust compensate for **Tilt Amount** and **Tilt Coefficient** are provided. To get a good square wave reference, tune in a station with bass-heavy programming and heavy processing for visual flatness on the oscilloscope. You can also tune in your own station to verify STL and exciter performance.
- ◆ The **PEQ** button enables the 2-band parametric equalizer. When the PEQ is enabled, the sliders to adjust **center frequency**, **width**, and **gain** are available to make any necessary adjustments.
- ◆ The PEQ can be set to be phase linear, phase forward, or phase reverse via the **Phase** drop-down menu below the gain slider. The most likely mode will be phase forward to match an analog filter inaccuracy, but phase linear may be the preferred choice to counter a digital filter. If you have an exciter that you know to be perfectly accurate (such as a direct-digital-synthesis exciter) but a receiver that is not, you can use Omnia.9's MPX test tone generator in conjunction with the MPX Input PEQ to equalize the high frequency response of your receiver to achieve a more accurate result.

Pre-emph Input Menu

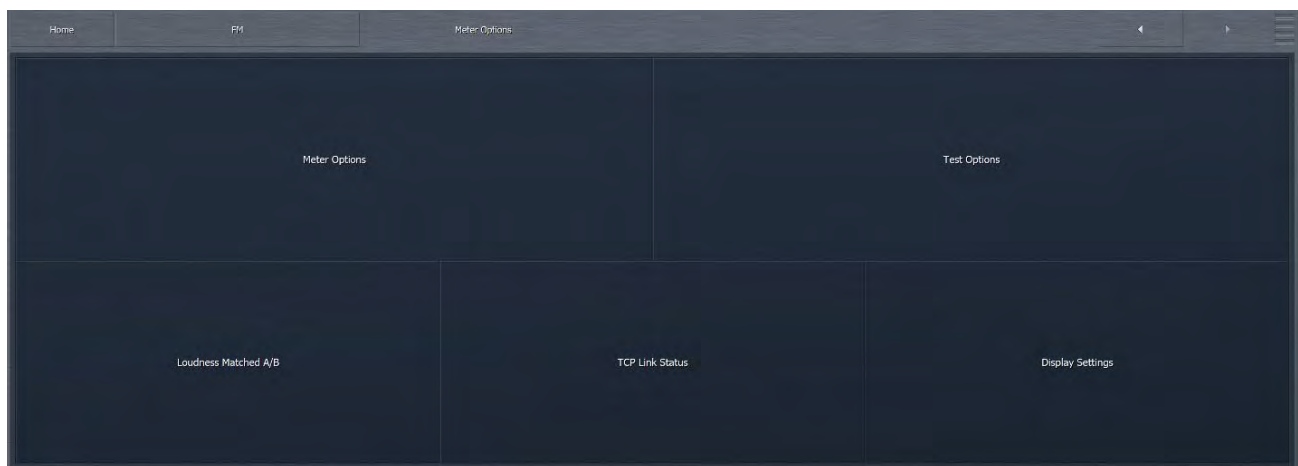
The Pre-emph Input menu contains the controls to choose and adjust the physical input, pre-emphasis, delay, and equalization settings. The Pre-emph Input is similar to the MPX Inputs, but is specifically for use with the L/R Outputs from another processor. This input can receive audio from any of the three digital inputs. The analog input is not suitable as it is not DC coupled.



- ◆ The **Physical Input** control determines which rear-panel input is routed to the pre-emph input patch point.
- ◆ The **Source** control selects whether the input source is flat or pre-emphasized.
- ◆ The **Pre-emphasis** control should be set to match the amount of pre-emphasis the incoming signal has (or used to have if it was de-emphasized prior to being fed into Omnia.9).
- ◆ The **Add Delay** control allows you to delay the audio coming in from the pre-emphasis input to match that of the Omnia.9.
- ◆ The **PEQ** button enables the 2-band parametric equalizer. When the PEQ is enabled, the sliders to adjust center frequency, width, and gain are available to make any necessary adjustments. The PEQ can be set to be phase linear, phase forward, or phase reverse via the drop-down menu below the gain slider.

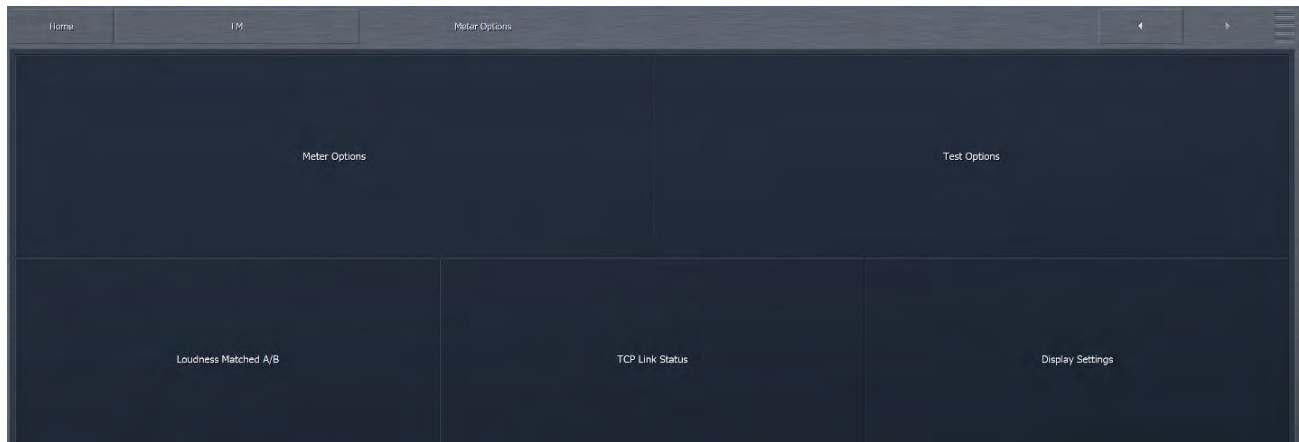
Display Settings Menu

The Display Settings menu is the same menu found in the Processing Menu of the Processing section, and is duplicated here for convenience.



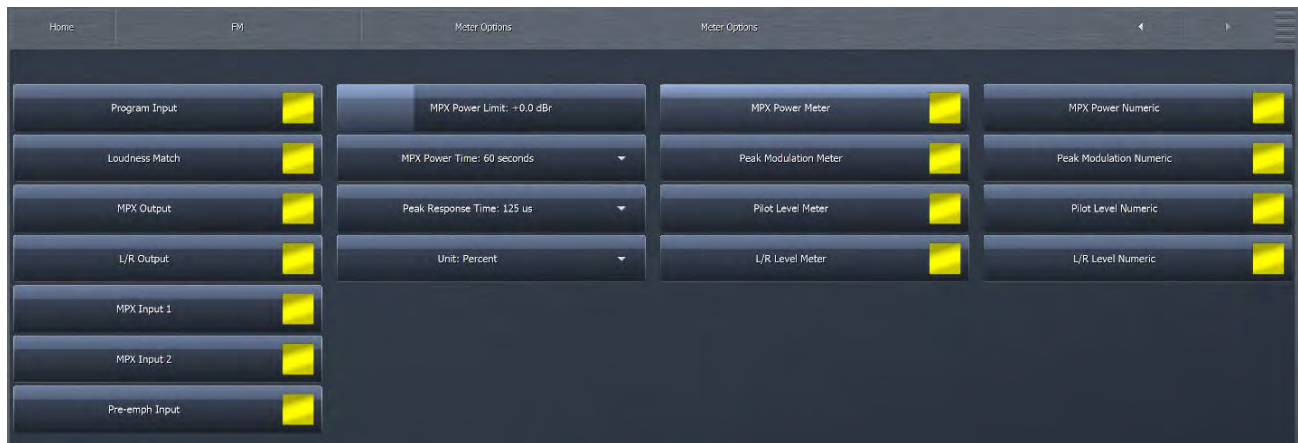
17 FM Menu Meter Options

The Meter Options Menu contains sub-menus for Meter Options, Test Options, Loudness Matched A/B, and Display Settings. NfRemote also includes TCP Link Status which shows parameters related to the connection quality.



Meter Options Menu

Which meters are displayed in the Loudness Meter, Modulation Meter, and Modulation Numeric display windows are determined by enabling or disabling available options in this menu.



Specifically:

- ◆ **Program Input** is available only in the in the Loudness Meter display.
- ◆ **MPX Output**, **MPX Input 1**, **MPX Input 2**, and **Pre-emph Input** are available in the Loudness Meter, Modulation Meter, and Modulation Numeric displays.
- ◆ The **MPX Power Meter**, **Peak Modulation Meter**, **Pilot Level Meter**, and **L/R Level Meter** can be added to the Modulation Meter display of any enabled MPX section, including MPX Output, MPX Input 1, and MPX Input 2.
- ◆ The **MPX Power Numeric**, **Peak Modulation Numeric**, **Pilot Level Numeric**, and **L/R Level Numeric** can be added to the Modulation Numeric display of any enabled MPX section.
- ◆ The **MPX Power Limit** control sets the center of the MPX Power meter as well as whether the numeric readout is green or red. This can be set differently from the MPX Power Limit control in the FM Processing section, and is available even when Omnia.9 is not operating in MPX Power Mode, to provide a power measurement reference.

You can select as many or as few meter options as you need.

Loudness Matched A/B Menu

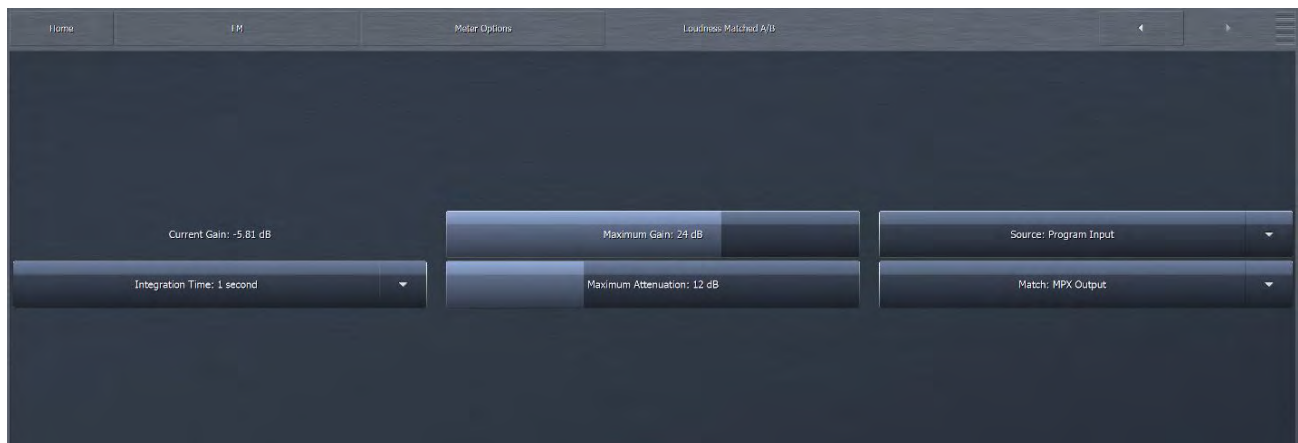
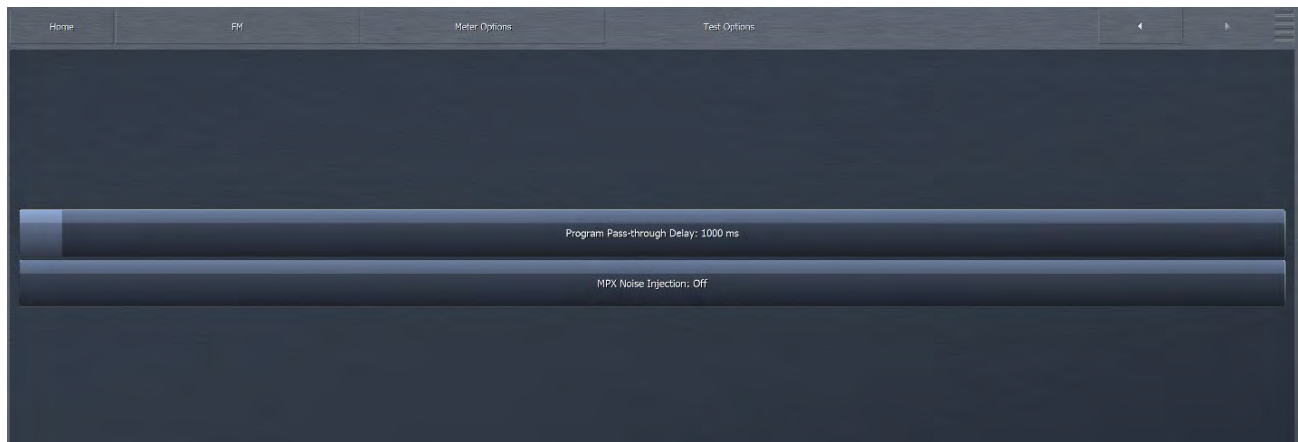
The ability to compare the sound of the input audio to the processed output audio is valuable when adjusting your processing. Because the human ear often misinterprets “louder” as “better” for the first few seconds after it hears a new sound, making sure the average levels of the input and output audio closely match eliminates that distraction so that your ear can concentrate on the other changes the processor is making to the texture, dynamics, and spectral balance of the audio.

It is possible to manually adjust these levels in the Monitor Output Menu as you switch back and forth between patch points, but because input levels vary so much within and between songs, this can get tricky (or just plain annoying), throws your ear for a momentary loop, and takes your mind off the careful study of the changes you’re making to your processing.

To make A/B comparisons easier, Omnia.9 can apply automatic leveling to several key input patch points and makes those available here in the Meter Options Menu (for display purposes) as well as in each of the Monitor Outputs menus.

Note:

This leveling function affects ONLY the audio available at the patch point. It has NO effect on the on-air processing.



- ◆ The **Integration Time** setting controls the integration time of the two ITU BS.1770 loudness meters that form the basis for the loudness comparison. The loudness is equalized by a ramping gain to account for the difference between the two loudness meters. The loudness is equalized by a ramping gain to account for the difference between the two loudness meters. The default time is 1 second; 3 seconds is optional. The 1 second integration time will cause the leveler to respond to differences in level more quickly, providing more consistent levels between A and B, while the 3 second time will allow more level variation and reduces the likelihood of audible pumping.

- ◆ The **Source** control allows you to choose the audio source for the Loudness Matching patch point. Available options are Program Input, MPX Input 1, MPX Input 2, Pre-emph Input and Post Multiband.
- ◆ The **Match** control allows you to choose which audio source to match the loudness of. Available options are MPX Output, L/R Output, MPX Input 1, MPX Input 2 and Pre-emph Input.

Loudness Graph Menu

The Loudness Graph menu can be accessed by navigating to the Display Settings menu of each particular processing core. In the case of FM, for example, by going to **FM > Processing > Display Settings > Loudness Meter > Short Term Graph** or **Momentary Graph**.

Depending upon the display sizing and how many display windows are enabled, the Short Term Graph will typically show loudness over a period of many minutes. The Momentary Graph will show loudness over a period of several seconds at a more detailed level.



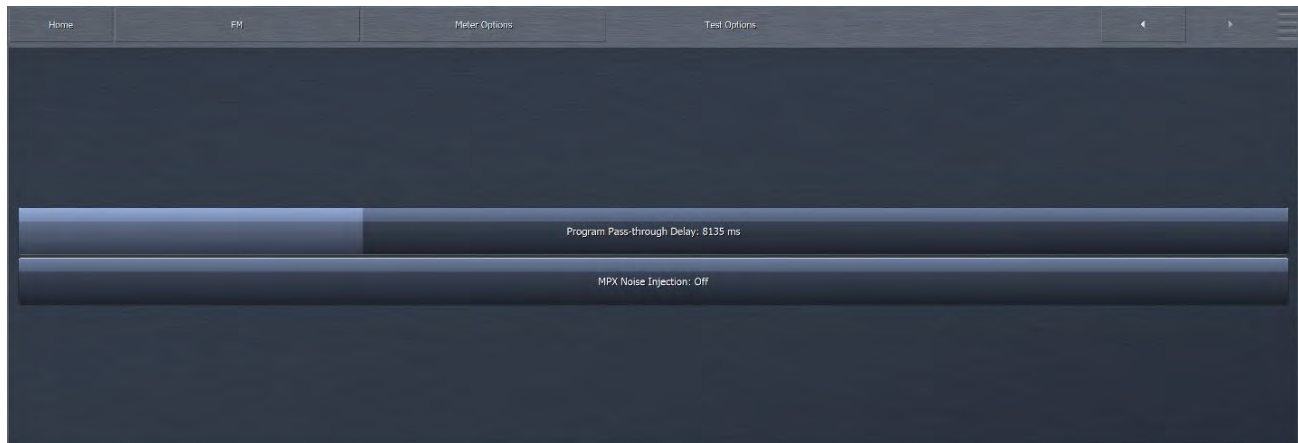
- ◆ The **Source** dropdown menu selects which source will feed the meter shown in a particular display. As mentioned earlier, the selection of possible sources is determined by selections in the **Meter Options** menu.
- ◆ By default, the graphs display data in **Relative** time, that is, since the graph was first enabled. Checking the **Absolute Time** control changes the display to the actual time as set in the **System > Time/Date** menu. Choosing **UTC** shows readings relative to Coordinated Universal Time (no local time offset). When connected to Omnia.9 via NfRemote (and not working with the front panel touchscreen) there is an additional selection, **Remote**, which is similar to Absolute Time but references the clock of the PC running the NfRemote software.
- ◆ The **X Range** control determines how long a period of time is shown in a particular display window. The most recent information will always be at the far right of the graph, but advancing this control will show more historical data at once though in less detail.

The exact length of visible time - that is, how much historical data can be displayed - will be dependent upon how much screen real estate is devoted to the graph. On smaller displays, or if multiple displays are enabled at once, each display will get less screen space and as a result, less past data will be visible.

- ◆ The **History** control determines allows you to “travel back in time” anywhere from the present to 24 hours in the past. With the slider set to 0%, the most recent information is displayed. Advancing the control looks further back in time.
- ◆ The **Y Zoom** control determines the visible range of loudness measurements on the LKFS/LUFS scale on the left side of the graph. At its default setting of 1.0 X, levels from approximately -30dB to +6dB are displayed. A wider range of levels can be seen by sliding this control to the left, while sliding the control to the right narrows the range.
- ◆ The **Y Center** control determines which LKFS/LUFS value on the left scale appears centered on the display. The default setting of 50% places the middle of the graph at -12dB.

Test Options Menu

The Test Options menu contains two controls that are useful only in a test situation, and have no effect at all on the on-air output. The Test Input patch point activates automatically and does not use processing power when inactive. Enabling the Always Active control in the Test Input menu forces this patch point to remain active at all times and allows for cleaner A/B switching.



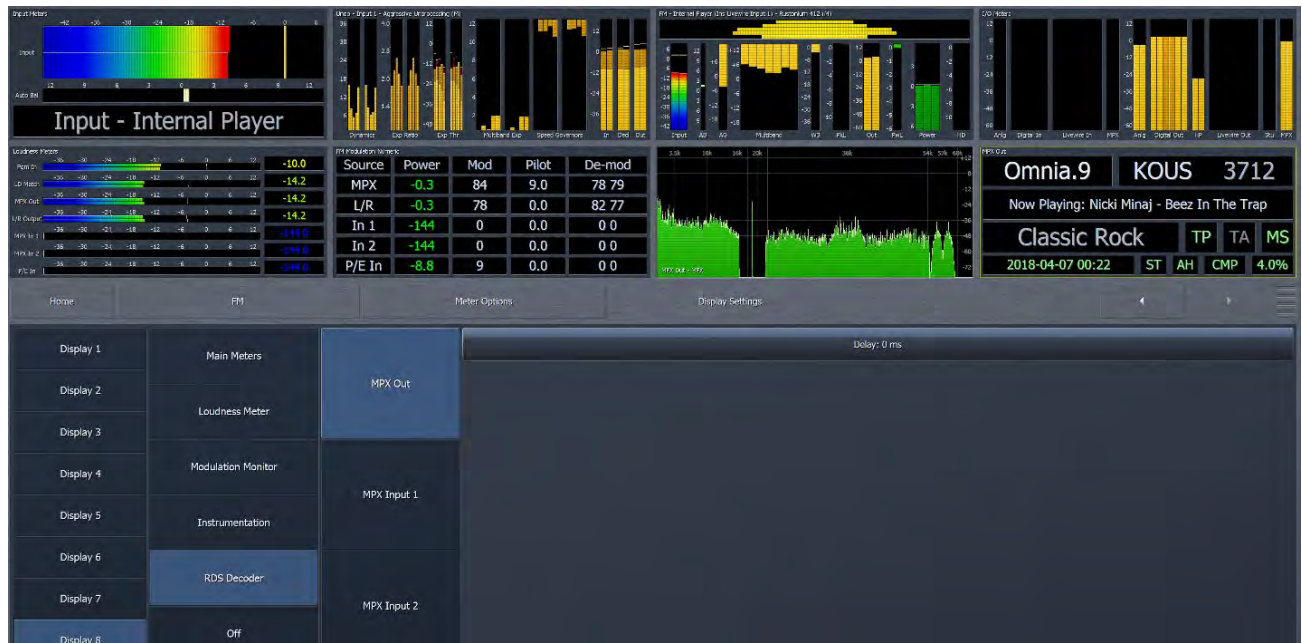
- ◆ **MPX Noise Injection** is useful when “racing” against your competition as received through a tuner with a composite output connected to one of Omnia.9’s MPX Inputs. There is no such thing as perfect radio reception, and some noise will always be present, so this control helps “level the playing field” a bit. To use this feature, set up two FFT spectrum analyzer displays, one looking at MPX Output with Noise, and the other looking at the MPX Input. Then, using the MPX Noise Injection control, you can visibly match the noise level of the received station so that you can A/B “MPX Input” with “MPX Output with Noise” using either a monitor output or the client audio output. This allows a much more carefully controlled and accurate comparison than simply changing presets on a tuner, especially since you can have two oscilloscopes side by side displaying both signals to make sure that both are modulating at the exact same peak level.
- ◆ The **Pass-Through Delay Time** control adjusts the delay time for the pass-through patch point, which contains the original, unprocessed audio but without compensation delay. It is normally in sync with the Input, not the Output.

Note:

If you feed the MPX signal from another processor into one of Omnia.9’s MPX inputs, the pass-through patch point can be used to feed the unprocessed program audio from Omnia.9 into the other processor. This is true even when Omnia.9 is using its internal playback and regardless of which physical input is selected. The output of the other processor can be monitored through Omnia.9’s Speaker or Headphone Monitor Output. The meters and controls of the other process will be in real time, without delay, as the compensation delay will be before the processor instead of after.

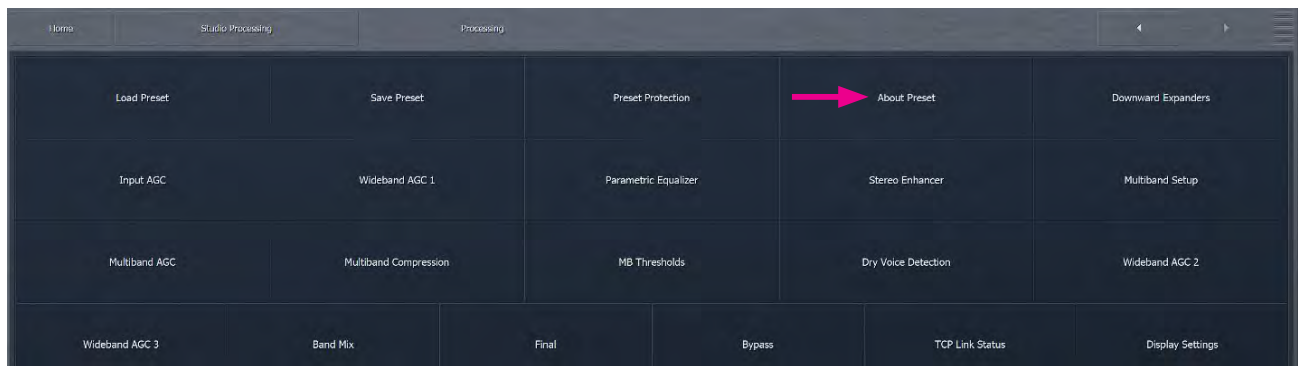
Display Settings Menu

The Display Settings menu is the same menu found in the Processing Menu of the Processing section. This is an example.



18 Studio Processing Menu

The Studio Processing Core is a low-latency processing core mainly designed for talent monitoring. Its menu allows you to choose the input source, load and save presets, and make changes to the Parametric Equalizer, Downward Expanders, Input AGC, Wideband AGC1, Multiband Stereo Enhancer, Multiband AGC and Limiters, Wideband AGC2, and Band Mix sections.



Processing Menu

The vast majority of the menus and controls in Omnia.9's Studio Processing core operate just as their counterparts in the FM Processing core do, and like the FM processing core, you should start with the **About Preset** tab, as this will make available the controls that determine how much finesse you will be able to access. A detailed explanation of each menu and control can be found and referenced in the FM Processing menu section of this manual. The **Band Mix** menu requires additional explanation because of its closeness to the end of the chain:



- ◆ The **Band Mix (coupled)** slider allows you to adjust the output levels of all bands simultaneously. Each band can also be individually adjusted with the **Band 1 - Band 7 Level** controls. Adjustments here should be made carefully (especially additional gain) as the only processing stage following this section is the Final Limiter.
- ◆ The Studio processing core does not use a final clipper for peak control. Instead, it uses a look-ahead limiter, which is adjustable by the **Final Limiter Drive** control and operates in a range between -6.00 and +6.00dB in one-quarter dB increments. Reducing limiter drive (sliding the control to the left) reduces the amount of limiting and gives you a more open sound, but at the expense of overall loudness. Conversely, increasing limiter drive (moving the slider to the right) will result in more limiting and a louder output, but at the expense of dynamics.
- ◆ Enabling the **Multiband Limiters** provides a peak limiter to ride atop each individual band, similar to the arrangement in the FM, HD, and Studio processing cores. Disabling the limiters reduces the already low latency times in the Studio processor core slightly.

19 HD Processing Menu

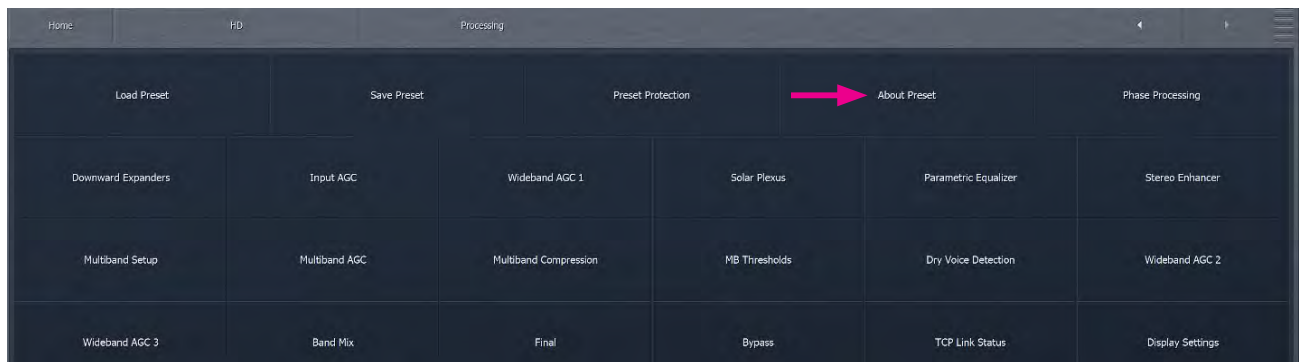
The HD-1, HD-2, and HD-3 menus of Omnia.9 provide access to all sections of the HD processing core (s) , depending upon configuration. From this menu, you can choose the input source, load and save presets, and make changes to the Parametric Equalizer, Downward Expanders, Input AGC, Wideband AGC1, Multiband Stereo Enhancer, Multiband AGC and Limiters, Wideband AGC2, Band Mix, Bass Clipper, and Final Limiter sections.

It also includes its own Meter Options menu.

The HD processing cores are suitable for use in both HD Radio (iBiquity/NRSC-5) and DAB (Eureka 147) applications depending upon the sample rate established in the System> System Config> Sample Rate menu.

Processing Menu

All processing parameters for the individual HD cores are found here. Their functions are similar to those in the FM processing core. Again, please select the **About Preset** tab to set up the level of control access.



Like the Studio Processing core, the HD processing cores do not use a final clipper for peak control. Instead, they use a look-ahead limiter, which is adjustable by the **Final Limiter Drive** control and operates in a range between -6.00 and +6.00dB in one-quarter dB increments. Reducing limiter drive (sliding the control to the left) reduces the amount of limiting and gives you a more open sound, but at the expense of overall loudness. Conversely, increasing limiter drive (moving the slider to the right) will result in more limiting and a louder output, but at the expense of punch.

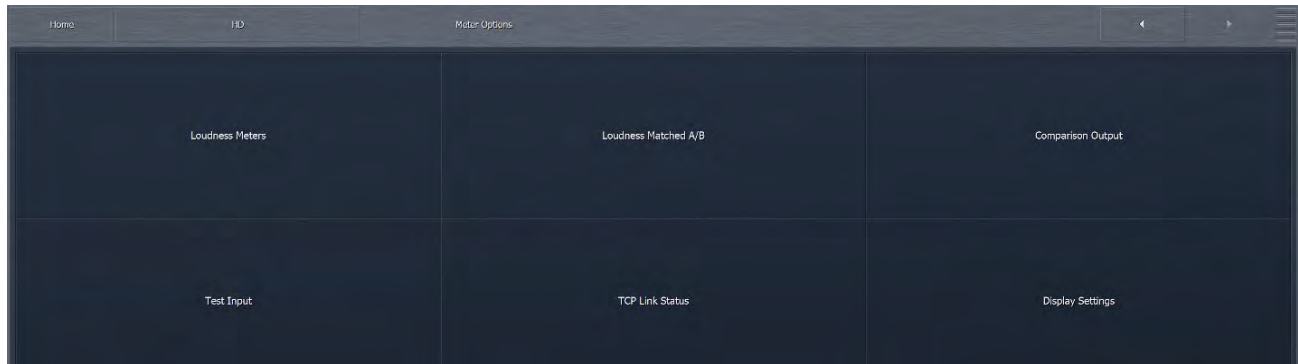
HD Processing Final



- ◆ The HD Processing Final adjustments are similar to those found in the FM final adjustments, except that for FM, you have the final clipper, but for HD you have the final look-ahead limiter.
- ◆ The Treble adjustment allows you to roll off the higher audio frequencies to match those heard on FM, since, due to FM’s pre emphasis processing, HD audio may sound overly bright in comparison. This helps to match HD vs FM when the receivers blend back to analog FM from HD. The reason for having this control in the HD section (despite the multitude of other ways to reduce high frequency content available) is to be able to easily modify an FM preset without having to make any other changes, which would then affect the FM section if the same preset were to be loaded for FM. By only adjusting the Treble control, the same preset can remain compatible with both HD and FM.

Meter Options Menu

Just as the FM section has a Meter Options menu, so does the HD section, including Loudness Meters, Loudness Matched A/B, Test Input, and Comparison Output sub-menus which make it possible to conduct A/B comparisons with another HD processor while matching gain and delay.



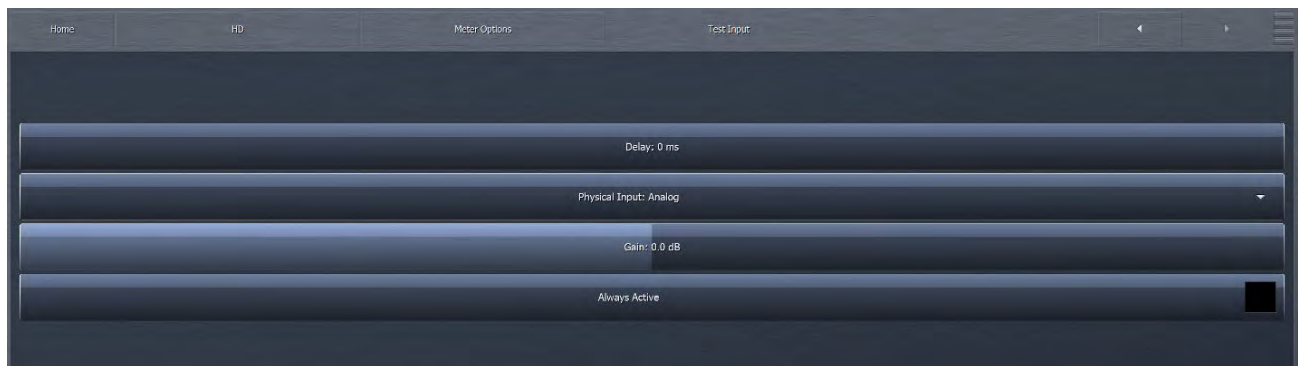
Loudness Meters Menu

The Loudness Meters Menu determines which meters are visible when the Loudness Meters are displayed. Choices include Program Input, Loudness Match, Program Output, and Test Input



Test Input Menu

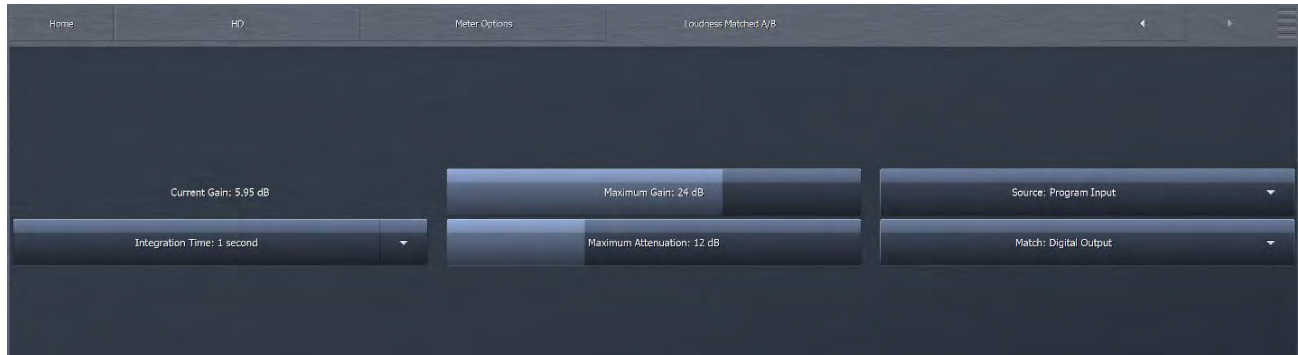
The source audio for the Test Input is selected here along with adjustments for gain and delay time and an option for meter activity.



- ◆ The **Delay** slider provides between 0 and 10,000 ms of delay to time-align audio coming in from the Test Input.
- ◆ The **Physical Input** drop down menu determines the source of the audio feeding the Test Input, including Analog, Main Digital, AES Reference, and Aux Digital.
- ◆ The **Gain** control provides adjustment for audio feeding the Test Input.
- ◆ Enabling the **Always Active** option keeps the meter running (continuous integration) even when the Program Input and Program Output sources are not actively being monitored at their corresponding patch points.

Loudness Matched A/B Menu

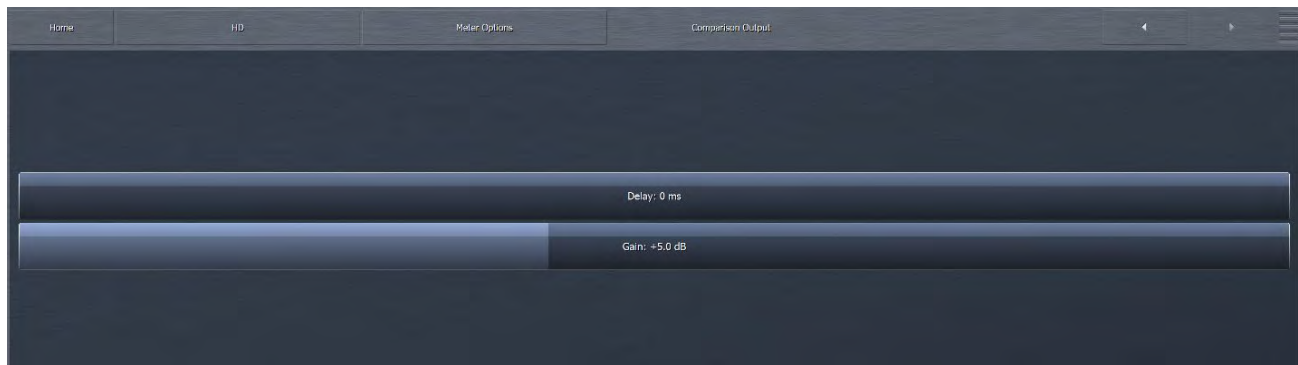
Loudness matching for HD works in the same manner as the corresponding section of the FM processing core previously described in detail though the **Source** and **Match** options are different.



- ◆ **Source** audio and **Match** audio can both come from either the Program Input to the HD core or from the Test Input as selected in the Test Input Menu.

Comparison Output Menu

- ◆ Like the Test Input menu, the **Comparison Output** menu has a **Delay** slider that provides between 0 and 10,000 ms of delay to time-align audio coming from another output. **Gain** control provides adjustment for audio from the Comparison Output.



Display Settings Menu

The Display Settings menu here is similar to the one found in the FM processing section but with patch points for the HD processing cores.

20 Streaming Processing & Encoding Menu

Streaming processing and encoding options in the Omnia.9 are as comprehensive as you will find. Depending on what options you have installed, you can have a total of 3 independent streams with up to 8 encoders (depending on configuration). The encoders can be independently set with different codec types, and can serve internal or external stream servers.

The audio for Stream 1 is shared with the FM and HD-1 sections of Omnia.9, while Streams 2 and 3 are shared with their corresponding HD-2 and HD-3. However, each stream section can be processed completely independently of its corresponding HD core, except in certain heavy configurations on Omnia.9 classic hardware such as Dual FM.

To enable stream processing, set choices from the Home > System > System Configuration > Processing Paths selection.

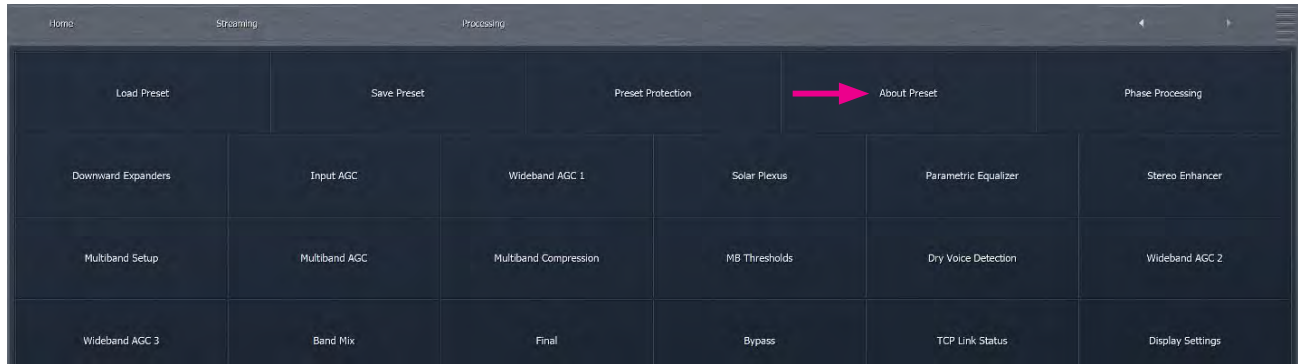
The Streaming menu for each of the Streaming 1, Streaming 2, and Streaming 3 sections contains sub-menus for processing and for configuring the various encoder and server options.



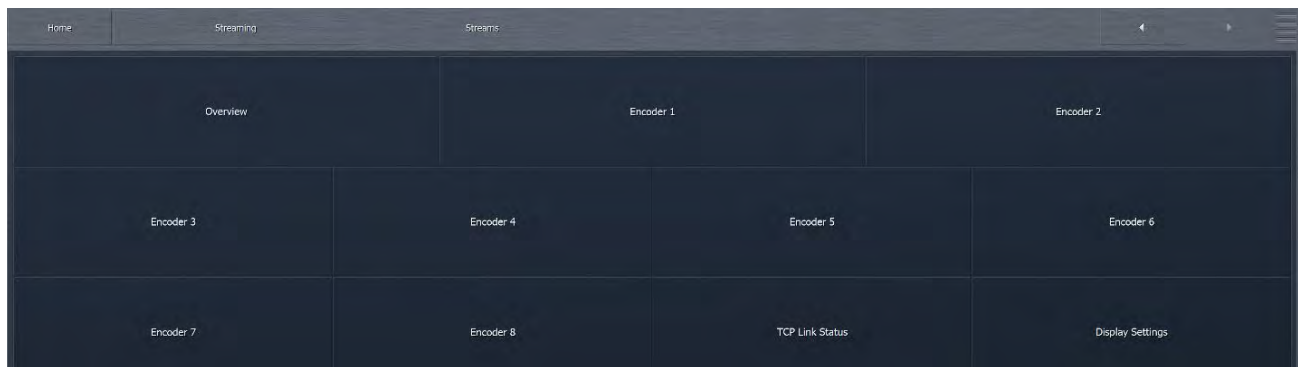
A detailed explanation of setting up and configuring streaming encoders and servers would require an entire document of its own, and is beyond the scope of the general Omnia.9 manual. We have assumed that users who stream possess at least a basic knowledge of how streaming audio works and an understanding of the differences between the various formats. We encourage you to work closely with your IT administrators to obtain the information specific to your operation.

Processing Menu

The menus and controls in each of Omnia.9’s Streaming cores operate just as their counterparts in the HD Processing cores do, which in turn are very similar to their counterparts in the FM processing section, each of which requires the operator to select the **About Preset** tab to set the Adjustment Level between Basic, Intermediate or Expert modes. A detailed explanation of each menu and control can be found and referenced in the FM Processing menu section of this manual. Controls unique to the HD and Streaming sections are described in detail in the HD Processing menu section.



Streams Menu



This menu contains the controls necessary to set up and configure each of the enabled encoders and is where details of the servers can be entered. Depending on the configuration of your Omnia.9, you may see 8, 6 or 4 encoders from the Streams menu (refer to the System> System Configuration> Streams menu).

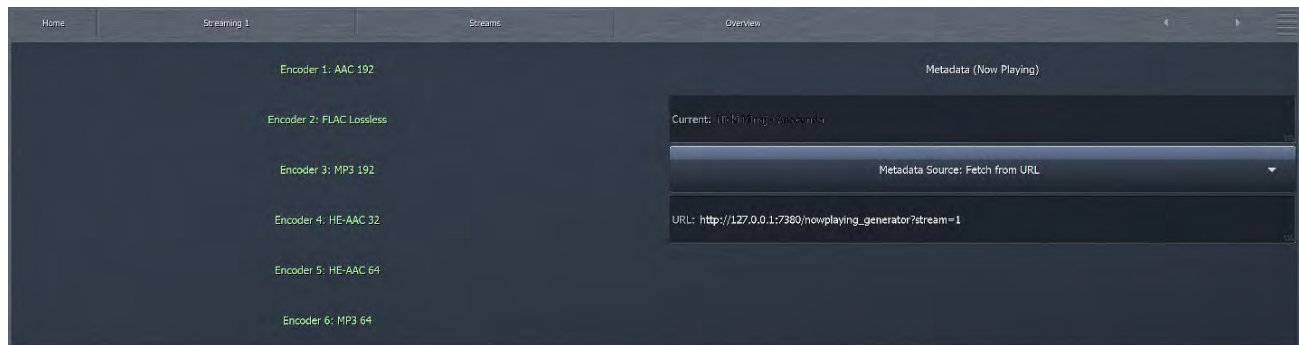
Overview / Metadata Menu

The Overview menu gives you the status of available encoders and metadata.

Omnia 9's built-in http server can be used to feed information such as the song title and artist information to each stream. The Default URL is an example, and feeds from a now playing generator written into the HTTP server, with a canned list of 40 of arguably the worst songs ever written in the history of mankind such as: Rebecca Black – Friday, Black Eyed Peas – My Humps and MIMS – This is why I'm hot.

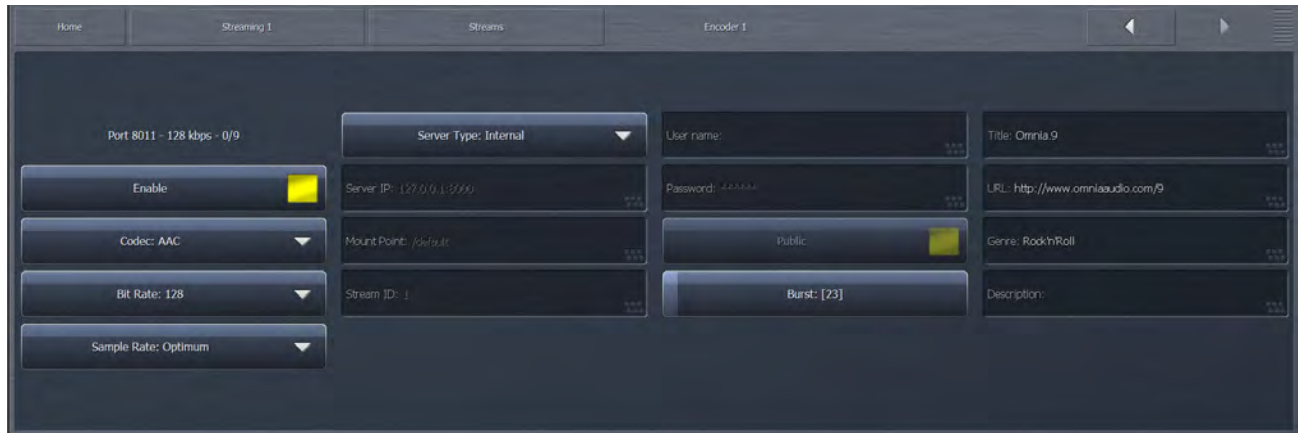
Now Playing info is handled on the Overview page under "Streams", and there are two ways to input it:

1. Set "Metadata Source" to "Edit Box", and then use the HTTP server to update the http://omnia9-ip:7380/parameter/stream1/strm_new/metadata_strm parameter every time the song name changes, in an automated fashion. This may be something you need your IT department to set up.
2. Set "Metadata Source" to "Fetch from URL", and the Omnia.9 will periodically fetch the song title from a server which must present it as plain text, no frills. The aforementioned canned song name generator in the Omnia.9's HTTP server can be used as an example of what format is required. The default URL is http://127.0.0.1:7380/nowplaying_generator?stream=1. Because it's accessible through the HTTP server, you can copy the URL in the Metadata page (and change the IP address from 127.0.0.1 to the actual LAN IP of the Omnia.9) and paste it into a web browser, to see what data format the unit is expecting – which is plain text with no frills. It's useful to have as a working example, which is why it is included in the software.



Encoder Menu

The Encoder menu allows you to enable and manage each encoder belonging to a particular stream. The number of encoders available depends on how many processing cores you have running (set in Home > System > System Configuration > Processing Paths). 8 encoders will be available if light configurations, while an Omnia.9 classic Dual FM unit will be limited to 4 in the heaviest configurations.



- ◆ The **Enable** control enables or disables the stream. When enabled, the encoder will continually try to connect to the specified server. If Enabled, the status will be displayed above the Enable control. While connected, it will display “Running” and the actual current bit rate of the encoded audio. If the server you are pointing to is not valid, you will see and “Error, can’t connect” message, and how many attempts have been made.
- ◆ If the **Server Type** is set to Internal, the port number, bit rate and number of active streams is displayed above the Enable control. The port number is different for each individual stream, and is revealed when you enable a stream set to server type Internal. It cannot be reassigned, but it will stay consistent. If you wish to use a different port, for external communication, configure your router to do a port address translation.

The **Codec** drop down menu allows you select which type of code to use. Available codecs are MP3, MP2, AAC, HE-AAC and FLAC.

- ◆ The **Bit Rate** menu allows you to choose encoding the available bit rates belonging to each codec. Your choice of bit rate settings will significantly influence the audio quality of your stream, and obviously, the lower the bit rate, the lower the quality of the audio for each given codec. Please take use factors into consideration when selecting a bit rate, such as the total amount of bandwidth available for the stream, the anticipated number of users, your maximum upload speed, and the download speed limits of your intended users.
- ◆ The **FLAC** codec has a different topology from other codes and is not set by bit rate, being a lossless codec. It deserves special mention since it uses bandwidth dynamically.
- ◆ **Lossless** is 16-bit lossless, and the bit rate is variable. The average bit rate is 1200 kbps or so, but it will vary with content, and will be very low on silence. This can cause buffer issues downstream, and is thus not appropriate for streaming to devices with a small internal buffer and low delay, but works fine for regular listening over the internet.
- ◆ **Reduced** will reduce the bit depth (before the FLAC encoder) when the noise floor of the audio content is uniformly high across the spectrum. It sounds exactly the same, but the average bit rate is 700 kbps or so. The bit rate will be very low on silence just like for the Lossless mode.
- ◆ **Lossless (Small Blocks)** will use a block size of 512 instead of the default 4096. This reduces compression efficiency a bit, but it improves metadata timing, which may be useful for customers who use metadata to trigger commercials.
- ◆ **Uncompressed FLAC** may sound like an oxymoron, but we did it! Because the bit rate remains constant at 1556 kbps (1430kbps for 44.1 KHz) regardless of program content, you can use much less buffering in the device receiving the stream without risking buffer-related dropouts, which is important in cases where delay matters – like feeding that Barix box connected to the lobby speakers, where one second of delay may be acceptable, but not 30.

- ◆ **No Metadata (Lossless, Reduced, Uncompressed)** – streamed FLAC is always encapsulated into an OGG stream, and OGG has no facility for updating the metadata on the fly – instead, the proper procedure is to terminate one OGG stream, and start another OGG stream with the new metadata, all in the same session. Some existing FLAC-capable decoders do not handle this satisfactorily – some will introduce an audio dropout, some will drop the connection, and some will just stop playing. If the decoder you need to use has this problem, you will need to feed it a stream without metadata (so that it will be one continuous OGG stream), and then this option is for you. Please note that FLAC is not related to the Vorbis codec except for them using the same bitstream format.
- ◆ The **Sample Rate** menu lets you override the sample rate used for the encoder. The default selection of “Optimum” lets the Omnia.9 select the sounding sample yielding the best audio quality for the encoder and bit rate combination you have selected, based on pre-determined rules.
- ◆ The **Server Type** drop down has selections for Shoutcast 1, Shoutcast 2 and Icecast 2, and should be set to match the server type you are streaming to.
- ◆ **Internal** means that the Omnia.9 is the server, and the client connects directly to the Omnia.9, to the port number that is shown when you enable it. This is for internal use only, and only 9 listeners are accepted per encoder. This is very useful to feed that Barix box in the lobby or as your backup, but access must remain limited; this is not for public use.
- ◆ The **Server IP** field should contain the IP address and port number of the server you are broadcasting to. When Internal Server is selected, the address will be the IP of the Omnia.9 on your network, with a port assigned by the Omnia.9.
- ◆ The **Mount Point** field (for Icecast 2 servers only) should contain the mount point on the server, in the following format: “/example1.mp3” following the server name. If you are using a streaming service provider utilizing Icecast 2, they will have assigned you a mount point.
- ◆ Conversely, the **Stream ID** (for Shoutcast 2 servers) is what Shoutcast 2 servers use to keep different streams apart. If you are using a streaming service provider utilizing Shoutcast 2, they will have assigned you a Stream ID.
- ◆ The **User Name** field contains the user (log-in) name for the server. In some cases this can be left blank.
- ◆ The **Password** field contains the password for the server.
- ◆ Enabling the **Public** control sets the “public listing allowed” flag in the stream, as determined by the server. This control is not available if you select “Internal” as server type.
- ◆ The **Burst on connect** slider control (available only for Internal servers) helps clients start playing streams more quickly on initial connection. Without burst-on-connect, a client set to 10 seconds of buffering would sit there and wait (buffering...) for 10 seconds before it starts playing. With burst-on-connect set to 10 seconds, the server will send the last 10 seconds of audio *as quickly as it can* to each listener that connects. The slider value range is Off to 300 seconds. This applies only to the Internal Server. For all other server types, Burst on connect is configured on the server itself.
- ◆ The **Title** field allows you to enter the stream title displayed to listeners and on public listings, such as shoutcast.com.
- ◆ The **URL** field is a metadata field whose information is sent to the server to be (potentially) displayed in the listings and player. The URL is typically the station’s official home page
- ◆ The **Genre** field is also a metadata field. The type or style of content found on the stream is typically entered here.
- ◆ The **Description Field** is part of some server’s protocols, and may or may not be used depending on server type (Icecast vs shoutcast). It allows you to enter extended text describing the stream.

Meter Options Menu

Just as the FM and HD sections have a Meter Options menu, so does the Streaming section, including Loudness Meters, Loudness Matched A/B, and Test Input sub-menus which make it possible to conduct A/B comparisons with another processor while matching gain and delay. Controls are explained in detail in HD section.

21 AM Processing

AM processing is a standard feature in all Omnia.9 configurations.

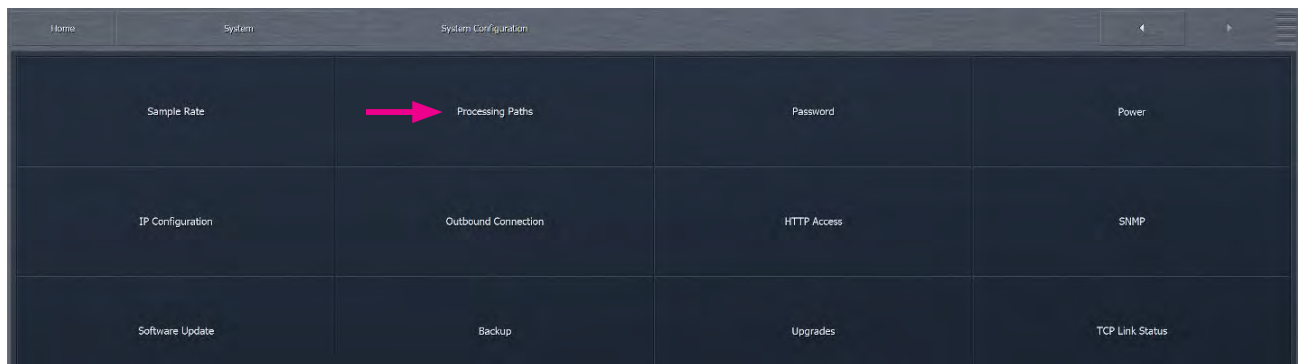
- ◆ FM-only units can now provide simultaneous processing for FM and AM using the same input audio source for both paths.
- ◆ Dual path units (9x2) will be able to process FM+FM, FM+AM, or FM/AM+FM using either the primary or secondary input audio source for the AM output.

Enabling the AM Processing Core

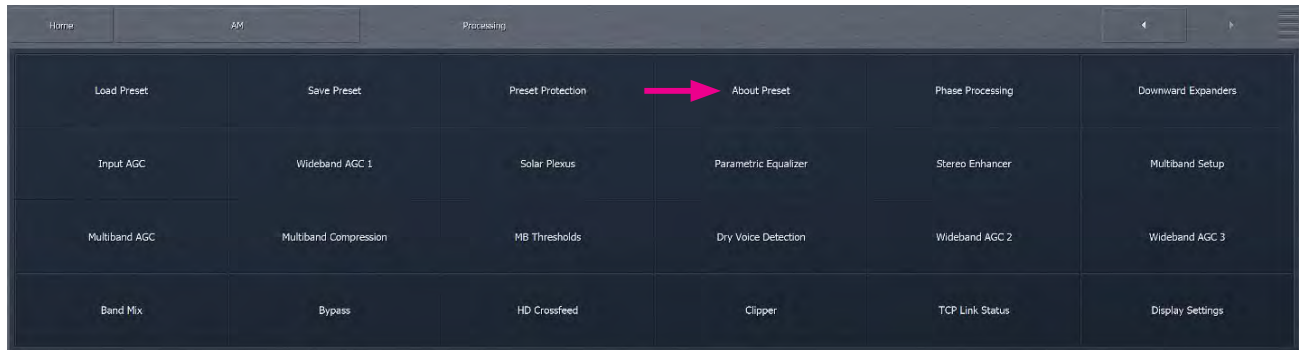
To enable AM processing, navigate to the System > System Configuration > Processing Paths menu. Then select Processing Paths. Then select AM Primary or Secondary.

Note:

AM Primary / Secondary lets you choose whether AM gets its audio from Input 1 or Input 2. It is the only core type that lets you choose, thus allowing a Dual FM box to be FM + AM with different programs. The 2xHD option alone will *not* let you assign AM as secondary, it requires the Dual FM option.



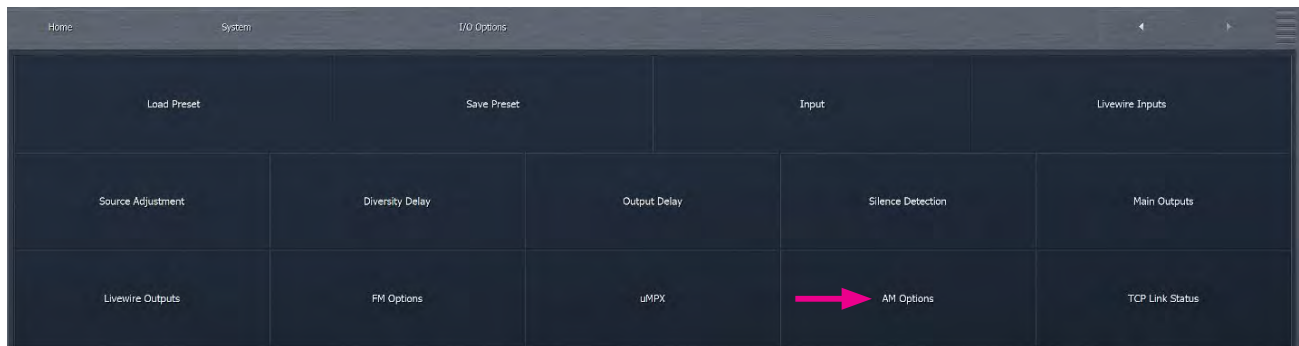
Once AM has been enabled and the configuration applied via the **Apply Config** button, an additional menu for AM processing will appear in the **Home** menu.



All of the processing controls and settings found in other processing cores (FM, HD, Studio, Streaming) are present here and function in exactly the same way, including the need to set the Adjustment Level under the **About Preset** tab.

AM Output Options

Navigating to the **System > I/O Options > AM Options** menu displays all of the AM-specific settings and is broken down into four sub-menus: **Main**, **Night**, **Phase**, and **TX Out**.

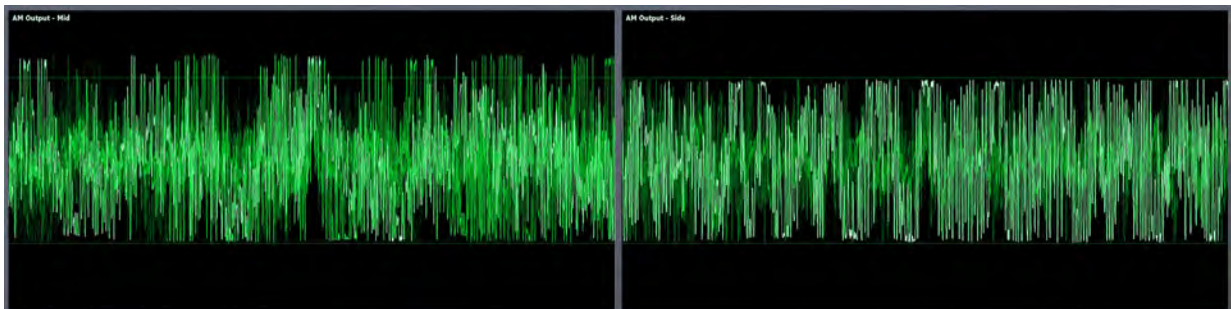


AM Main Menu

The Main Menu contains controls for pre-emphasis, high- and low-pass filters, positive peaks, inverting the input and output, and for the built-in test generator.



- ◆ The **Pre-emphasis** dropdown control allows you choose whether to apply the standard NRSC profile, or no pre-emphasis at all.
- ◆ The **High pass** dropdown control sets the frequency below which audio will be filtered while the **Low pass** control sets the frequency above which audio will be filtered.
- ◆ If the symmetry of the incoming program material normally has significant negative peaks, using the **Invert Input** control will invert the signal and help match the input audio to the processor. The **Invert Output** control works in much the same way but on the output side to help match the output of the processor with the transmitter.
- ◆ The **Stereo** slider enables matrix Mid/Side clipping compliant with C-QUAM Stereo.
- ◆ The **Positive Peaks** slider sets the maximum positive peak level. Due to the nature of AM modulation, it is possible to allow higher than 100% modulation for positive peaks, while negative peaks must be kept at or below 100% to prevent carrier loss. The L-R component of C-QUAM Stereo must be strictly limited to 100% at all times. Omnia.9 meets both requirements, as shown by the below screen shots of the built in oscilloscope showing the Mid and Side components separately.



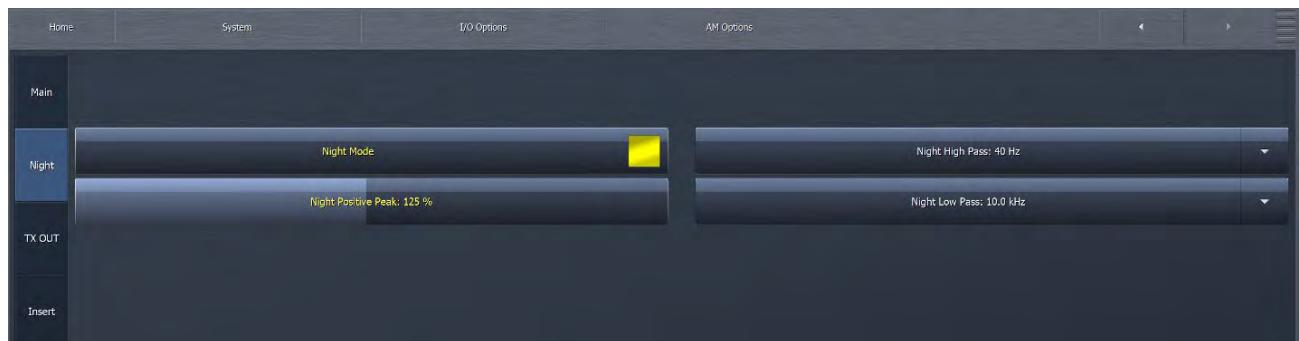
- ◆ The **100% Modulation** slider sets final output modulation reference level for the digital output. Provided that you have assigned "AM Digital Output" to a digital output in System – I/O Options – Main Outputs, a red warning message will appear at the top of the front panel or NfRemote screen if the output is being overdriven, indicating this control (or the Positive Peak control) should be turned down. Special care must be taken when using C-QUAM Stereo, as 100% refers to the AM L+R Sum mono modulation, while the actual output channel is L/R separate, meaning that extra head-room is required – as much as 7.0 dB for C-QUAM Stereo with an aggressive preset, a lot of stereo enhancement, and 125% positive peaks. It is recommended to select an aggressive preset (Flamethrower) while turning the stereo enhancement all the way up as you set it up, and after that select the more reasonable preset you actually plan to use.

- ◆ Just as with the FM section of Omnia.9, there is a test generator in the AM section that provides various tones that are useful for system analysis and setup. Turning on any of the tones in the **Test Generator** dropdown menu will interrupt normal program audio.
 - ◇ **Square**: A square wave with mild low-pass filtering which can be used to adjust and pre-compensate for transmitter tilt by connecting an external oscilloscope to the RF sample output of the transmitter.
 - ◇ **Sweep**: A linear sweep that includes frequencies in the range determined by the settings of the High Pass and Low Pass filters, and useful for adjusting transmitter EQ.
 - ◇ **400Hz**: The standard 400Hz reference tone.
 - ◇ **60Hz Sawtooth**: Useful for testing system linearity when connecting the output of the processor to the X input of an “X/Y” scope and connecting the RF sample output of the transmitter to the Y input.
 - ◇ **60Hz Sawtooth + Detent**: The same signal as the standard 60Hz Sawtooth but with a handy detent to make finding 50% easier on the scope. (Aren’t we thoughtful?)
- ◆ The **Test Level** slider adjusts the output of the test generator.
- ◆ Omnia.9 can accept the output of another processor, allowing it to be used as a delay-compensated, level-matched switcher between the two devices. When the **Air** dropdown control is set to “AM Proc Out”, Omnia.9 is on the air. Setting it to “Test Input” places the other processor on the air. determines whether the output of the processor or the test generator is fed to the transmitter. Information about the processor feeding the test input can be viewed on Omnia.9’s built-in oscilloscope and other analysis tools.

AM Night Menu

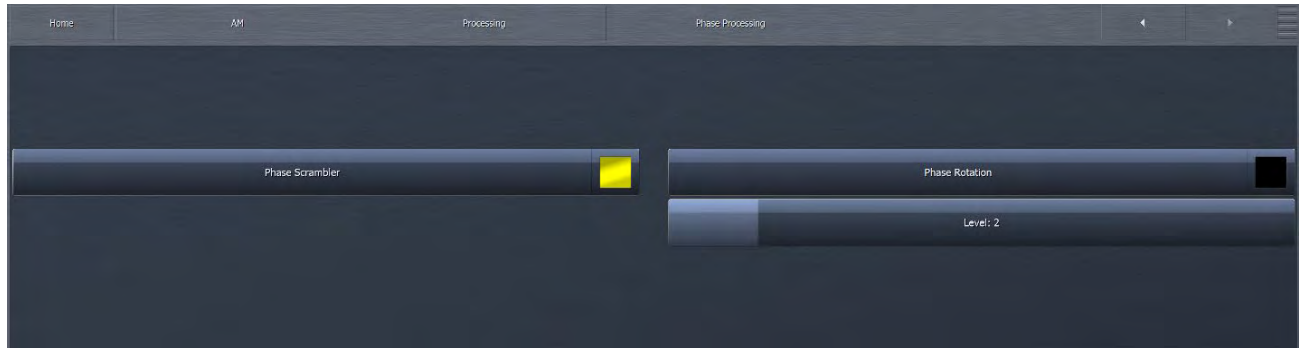
When enabled, the **Night** menu allows unique and independent settings for positive peaks as well as high pass and low pass frequencies.

Night mode can be turned on manually with the **Night Mode** control, by setting a time-based event in the **System > Scheduling** menu, or by setting a GPI function in the **System > GPI > GPI** menu.



AM Phase Menu

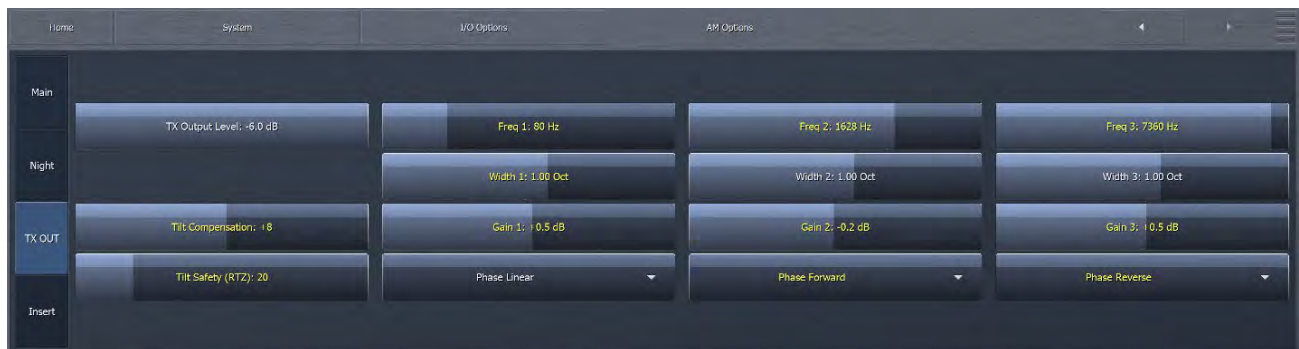
The Phase Menu contains the controls for the phase scrambler and phase rotator. These operate in the same manner as the corresponding controls in the FM section of Omnia.9, except here, they are enabled by default.



- ◆ Certain sounds with high harmonic content (such as trumpets and some synthesized sounds) are low in energy but contain high peaks. By slightly offsetting these harmonics, the **Phase Scrambler** drastically lowers the peak level, which in turn prevents them from having to be dealt with later in the processing chain by more aggressive means like limiting or clipping. This results in significantly less audible distortion.
- ◆ The **Phase Rotator** helps deliver more symmetrical peaks and is particularly effective for talk formats. We recommend monitoring the pre-emphasized or de-emphasized output on Omnia.9’s built-in oscilloscope and advance the slider just enough to achieve symmetrical peaks.

TX Out Menu

The TX Out menu contains controls used for feeding analog AM transmitters and includes adjustments for output level, tilt, and equalization. The resulting signal can be assigned to the Analog Outputs or any Livewire Output, by using the *AM TX Output* selection in System – I/O Options – Main Outputs. Please note that it cannot be assigned to any of the AES outputs.

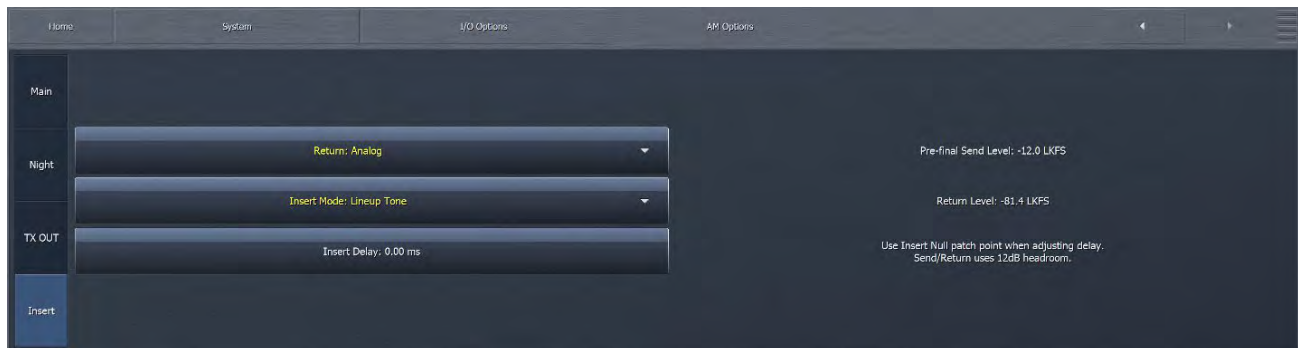


- ◆ The **TX Output Level** control is the analog equivalent to the 100% Mod control in the Main AM Options menu and sets final output modulation level for the analog outputs. Warning messages are provided here as well, provided the AM TX Output is assigned to an output.
- ◆ The **Tilt Compensation** control adjusts the amount of outward tilt when viewing a 60Hz square wave from the built-in tone generator on an external oscilloscope fed from the transmitter’s RF sample output. This control is set to “Off” by default. Typically, more positive (outward) tilt will be required which can be achieved by sliding the control to the right, though it is possible to achieve more negative (inward) tilt by moving the control to the left if needed.

- ◆ The **Tilt Safety (RTZ) control** is harder to explain, but we'll try. In order to compensate for tilt induced by any high-pass filter following the Omnia.9, for example a transformer which by definition cannot pass DC, one must apply the inverse what the high pass filter will do, meaning the lower the frequency, the higher the level boost. This presents a challenge, as for an infinitely low frequency, we'd need an infinitely high output level. Unfortunately an output stage with infinite headroom has yet to be invented, and as such, we must limit this boost by eventually pulling the signal back to zero. With this control you can adjust how quickly this happens. Higher values mean faster action, and less risk of overload – but also less accurate tilt correction. All-digital transmitters DC coupled transmitters do make life easier, don't they?
- ◆ The three-band **Parametric Equalizer** is provided to offset any characteristics or irregularities of the analog transmitter or any transformers in line after the Omnia.9.
 - ◇ The **Frequency** slider is used to set the center frequency for each band. The range of this control is 20 to 22,050Hz.
 - ◇ The **Width** slider determines how much audio above and below the center frequency will also be affected by any boosts or cuts in gain. The range of this control is 0.0 to 10.0 octaves in one-tenth octave increments. Lower values provide a narrower (sharper) boost or cut, while higher values provide a wider (gentler) boost or cut.
 - ◇ The **Gain** slider determines how much the audio selected with a combination of the Frequency and Width sliders is boosted or cut. Each band can be boosted or cut by 12dB in one-quarter dB increments for a total range of 24db per band.
- ◆ The **Phase Linear** drop down menu sets the phase characteristics of each associated equalizer. The Phase Forward setting matches the behavior of an analog filter and is most applicable when pre-compensating for anything downstream caused by a transformer or the transmitter itself, though both Phase Reverse and Phase Linear options are also provided.

Insert Menu

The Insert menu allows you to enable inserting an external processing device (such as a watermark encoder) into your signal.



Please follow this procedure to properly set up the Insert feature:

Select System – I/O Options – Main Outputs – [*this is the output you want to feed the external unit with, for example Analog Out*] = FM Pre-final L/R (or AM Pre-final)

System – I/O Options – AM Options – Insert

Return: [*The input the external unit will be feeding, for example Analog In*]

Insert Mode: Line-up tone. Set the external unit to BYPASS, then adjust the gain of the unit for the same Pre-final Send Level and Return Level. Both readouts are right on that page.

You can also adjust I/O Options – Main Outputs – [Analog Out or other] Level

Or

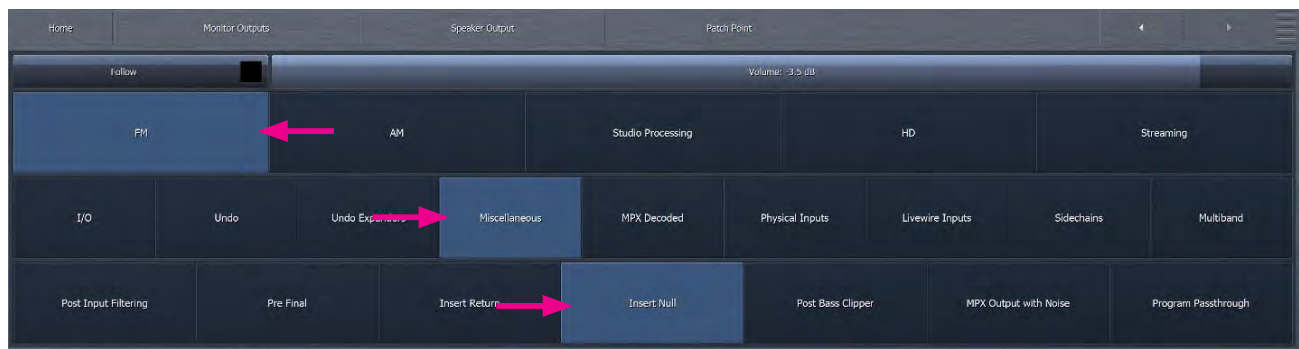
I/O Options – Source Adjustment – [Analog or other] Input Gain.

If you need to, run a second copy of NfRemote connected to the same unit so that you can see the Insert page while adjusting the gains in other sections.

Insert Mode: Blips (NULL).

Now, plug in a pair of headphones (or enable Client Audio) and select the **FM – Misc – Insert Null** patch point, so that you hear the lineup tone.

- ◆ To monitor the proper patch point, navigate to **Monitor Outputs > Speaker Output (or Headphone Output) > Patch Point > FM > Miscellaneous > Insert Null**. This can also be accomplished via the Client Audio feature of NfRemote.



This patch point takes the audio routed through the “Pre-final L/R” output, adds the amount of compensation delay as set by the Insert Delay control, subtracts it from whatever is routed through the currently selected Input Source, and outputs the (hopefully!) nulled result.

Listen to the cacophony of staggered blips.

Adjust Insert Delay until they audibly converge, so that you only hear about 3 blips per second.

Insert Mode: Noise (NULL). Adjust Insert Delay to fine-tune (it’ll sound like a jet plane, and get tinnier and tinnier as you get close) and null out the noise – only a tiny hiss should remain, plus whatever the in-line unit is adding to the signal, such as watermark tones.

Please note that **you have still been ON-AIR through all of this** – none of it has affected the on-air output!

Once the noise is satisfactory nulled, and only a tiny hiss remains:

Insert Mode: On

A very short repeat (the length of the Insert Delay) occurs on air, and then you’re back – with the audio now passing through the watermark encoder on the way to the clipper. All meters remain in sync, as the insert point delay (and the external unit’s delay) is compensated for.

The Insert Null patch point will still contain only what remains after the NULL, so once you enable the watermark encoder you should hear the codes more clearly than you ever wish for. Be careful, once you’ve heard what they sound like, you may not be able to un-hear them!

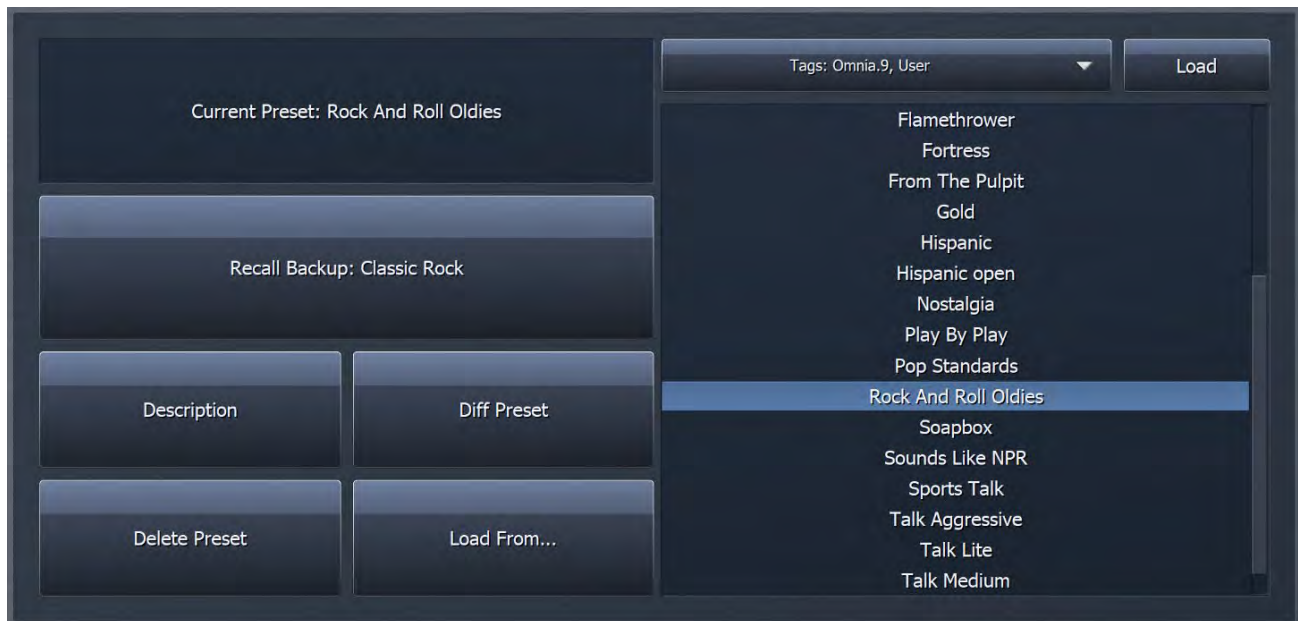
Once you’ve switched your monitoring path back to the output, it should hopefully sound like before.

Whenever the Insert Mode is active, you will see an additional label at the top of the Processing Meters display indicating so. An additional set of Insert meters (which should be in perfect sync with the Out meters when the null is properly set) provides additional visual verification that the Insert Mode is active.

Please note that a **broken insert chain will take you off the air!** If you see audio on the Out meters but silence on the Insert, MPX, or L/R meters, you have an off-air situation.

AM Processing Presets

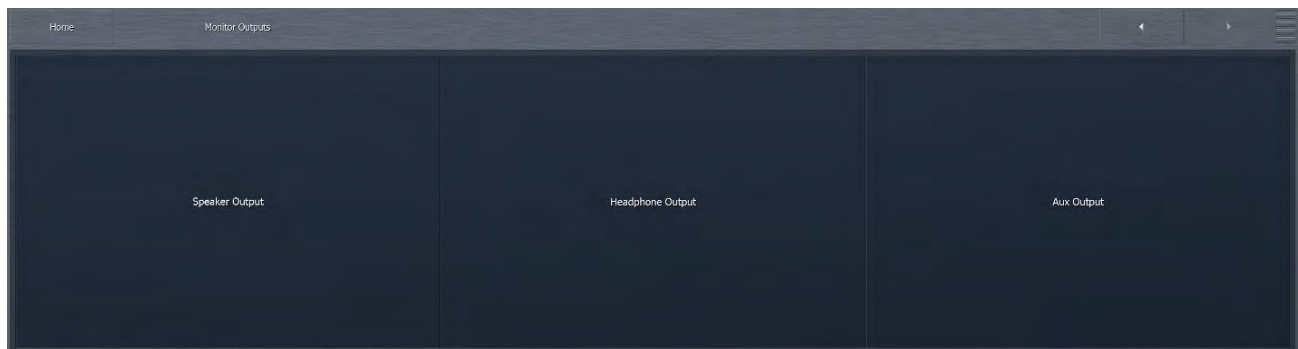
Twenty Nine factory presets specifically tuned for AM radio are provided and can be selected in the AM > Processing > Load Preset menu. Special thanks go to Ted Alexander for lending his deep understanding of AM transmission and processing knowledge in developing our AM preset offerings.



- ◆ **Eruption** employs 7 bands of multiband AGC and limiting and is suitable for general use, especially music. It employs a tight ratio on the Input AGC to consistently drive the multiband section which itself employs a fairly light ratio but faster release times to keep the output and spectral balance consistent. It also makes use of Wideband AGC 2 in Bass Only mode for enhanced low end.
- ◆ **Fine Arts** is similar to the Classical/Jazz preset found in Omnia.9's FM, HD, Streaming, and Studio processing cores. As a three-band preset, it provides gentle spectral re-equalization and delivers an output that is more faithful to the sound of the input than other presets.
- ◆ **Fire and Brimstone** is a loud 6-band preset with more mid-range presence than Eruption. It is suitable for most music formats or for talk stations that are looking for more loudness.
- ◆ **Flamethrower** is very similar to Fire and Brimstone and matches its loudness but with less mid-bass and less highs. It is the default preset.
- ◆ **Fortress** is a loud and warm-sounding 7-band preset with fast Input AGC attack and release rates. It adds the Wideband AGC 1 compressor on top of the Input AGC to build more wideband density and uses a much faster Progressive Release rate in the multiband section. It also pushes the bass clipper harder for a punchier low end.
- ◆ **Gold** is a warm, open, smooth-sounding preset that works well with music from different decades. It uses relatively slow multiband attack and release rates to provide gentle automatic spectral re-equalization.
- ◆ **Soapbox** is tuned especially for talk radio formats. It uses a loose multiband ratio to help preserve the natural dynamics of speech and builds loudness in the final clipper. It also has a boost in the upper frequencies to make speech more intelligible and uses higher gate and freeze thresholds to ensure pauses between speech don't cause unwanted noise rush-up.
- ◆ **Touchdown** is ideal for sports programming. Like Soapbox, it uses higher gate and freeze thresholds to keep things like crowd noise from building up during pauses, but it drives the multiband AGC section more aggressively and employs much faster multiband attack and release times. It is also less bright than Soapbox and pushes the mid-frequencies more toward the front of the mix.

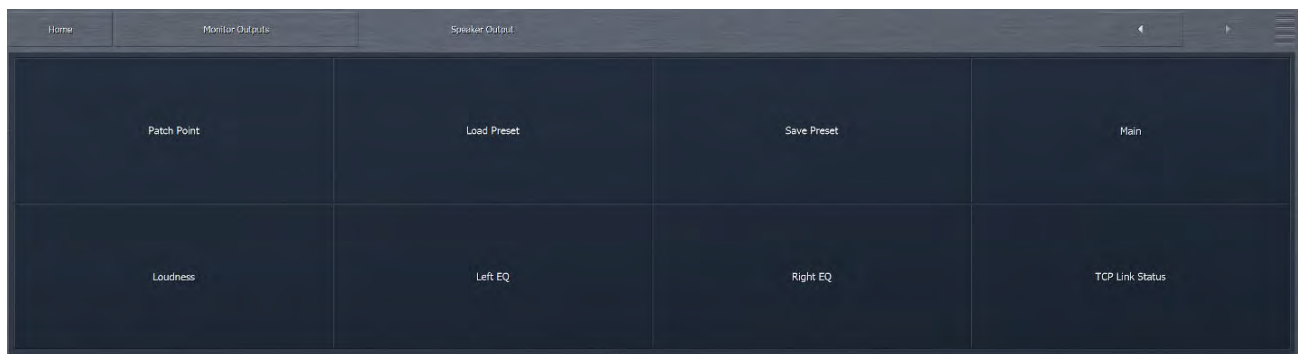
22 Monitor Output Menu

The Monitor Outputs menu of Omnia.9 allows you to independently configure the Speaker Output, Headphone Output, and Auxiliary Output. The menus and controls for each of these sections are identical.



From this menu, you can choose which of Omnia.9's processing cores you wish to monitor, and from within each core, which specific patch point you want to listen to. At the top level (and depending on configuration) you can monitor FM, AM, Studio, HD 1, 2, 3 and Streaming 1, 2 or 3 cores. This level of monitoring control can literally let you “tap into” and listen to any point in any processing chain.

In addition, you can Load and Save presets, adjust overall volume levels and individual left and right channel levels, access the built-in pink noise generators, independently delay the output of the left and right channels, solo the left and right channels, invert the phase of each channel, couple and un-couple the left and right channels for delay and EQ, set the frequency of the high pass filter, set the Bass Clip and Limiter thresholds, and access the loudness and parametric equalizer sections.



Keep in mind that although some of the features, terms, and tools in the Monitor Output sections are similar or identical to their counterparts in Omnia.9's various processing cores, such as the term “preset,” they have no impact on the air. Monitor Outputs only control what you hear through the Speaker, Headphone, or Aux outputs.

Patch Points Menu

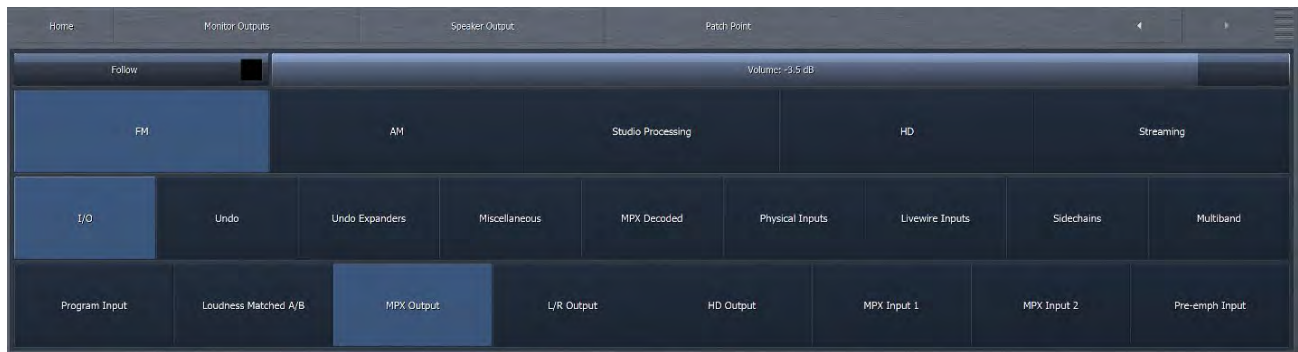
The Patch Point menu lets you choose which of Omnia.9's processing cores you wish to monitor in the Speaker, Headphone, and Aux outputs, and more specifically, which point within that core you want to hear. The patch point currently being monitored appears in the corresponding volume control at the top of the screen.

In a typical radio station scenario, the Speaker Output might be used to feed the control room monitors and the Headphone Output might be used to feed talent headphones. Each situation and application will be different, and the choice of how to utilize the monitor outputs is up to you.

One important feature to understand well is the Follow control, which is set to "Off" by default. When Follow is enabled in a particular user interface on a particular Monitor Output, the patch point (source audio) of that Monitor Output will conveniently "follow" along with you as you navigate to different processing cores in that user interface. Keep in mind that anyone else listening to that same Monitor Output will also be affected. The On/Off status of Follow is independently associated with each remote connection (or the front panel).

FM Processing Patch Points

You can feed each of the three Monitor Outputs audio from various points within the FM processing core.



- ◆ The **I/O** menu lets you listen to Program Input, Loudness Matched A/B, MPX Output, and L/R Output of the FM processing core. Additionally, both MPX Input 1 and 2 can be monitored. Note that only those processing cores that have been enabled will be available. The cores are enabled via Home, System, System Configuration, Processing Paths.
- ◆ The **Undo** menu lets you listen to the audio Pre-Declipper, and Post-Declipper, and after the audio has left Undo
- ◆ The **Undo Expanders** lets you listen to the audio of each individual Undo band before it enters the De-clipper and multiband expander (Pre), and after it leaves the De-clipper and multiband expander (Post). The available number of bands is determined by the current processing preset
- ◆ The **Miscellaneous** menu lets you listen to the audio after Input Filtering, after Multiband processing, after the Bass Clipper, after the Loudness Matched input, as an MPX signal with noise, or at the Program Pass-through patch point.
- ◆ The **MPX Decoded** menu allows you to listen to decoded (pre-emphasized/de-emphasized) audio from the MPX Output, MPX Input 1, or MPX Input 2.
- ◆ The **Physical Inputs** menu allows you to monitor any of the rear panel input points, including Main Digital, AES Reference, Aux Digital, and Analog
- ◆ The **Livewire Inputs** menu allows you to monitor any of the 8 Livewire inputs. Note: This requires MKII platform update to be installed. If you don't see any Livewire options, consult your dealer about purchasing an MKII upgrade.
- ◆ The **Sidechains** menu allows you to monitor the audio passing through the Input AGC, Wideband AGC 1, Wideband AGC 2, and Wideband AGC 3 sidechains, as well as the actual output audio from each of those stages.
- ◆ The **Multiband** menu allows you to individually monitor the audio in each band of the multiband AGC.

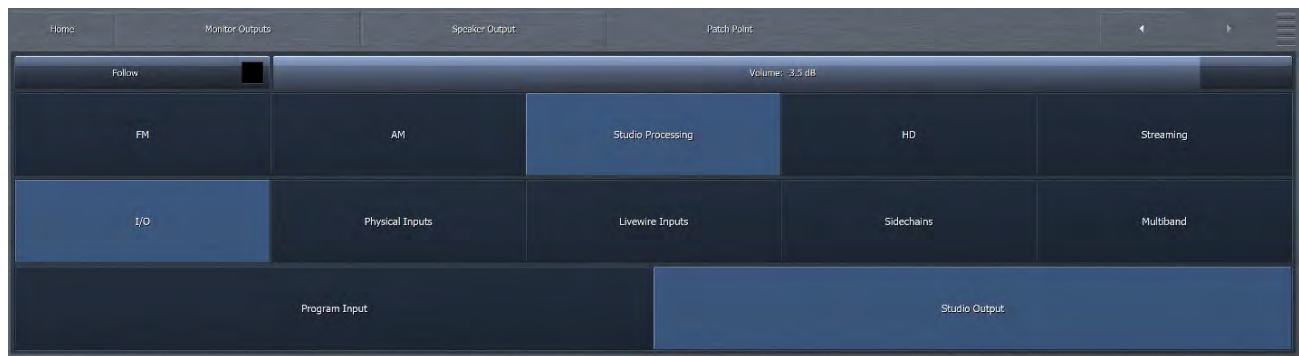
AM Patch Points

You can feed each of the three Monitor Outputs audio from various points within the AM Processing core.

- ◆ The I/O menu lets you listen to Program Input, HD Output, AM Output or Test Input.
- ◆ The Undo menu lets you listen to the audio Pre-Declipper, and Post-Declipper, and after the audio has left Undo
- ◆ The Undo Expanders lets you listen to the audio of each individual Undo band before it enters the De-clipper and multiband expander (Pre), and after it leaves the De-clipper and multiband expander (Post). The available number of bands is determined by the current processing preset.
- ◆ The Miscellaneous menu lets you listen to the audio Pre-Final stage, at the Insert Return, and at the Insert Null.
- ◆ The Physical Inputs menu allows you to monitor any of the rear panel input points, including Main Digital, AES Reference, Aux Digital, and Analog
- ◆ The Livewire Inputs menu allows you to monitor any of the 8 Livewire inputs (requires MKII platform update)
- ◆ The Sidechains menu allows you to monitor the audio passing through the Input AGC, Wideband AGC 1, Wideband AGC 2, and Wideband AGC 3 sidechains, as well as the actual output audio from each of those stages.
- ◆ The Multiband menu allows you to individually monitor the audio in each band of the multiband AGC.

Studio Processing Patch Points

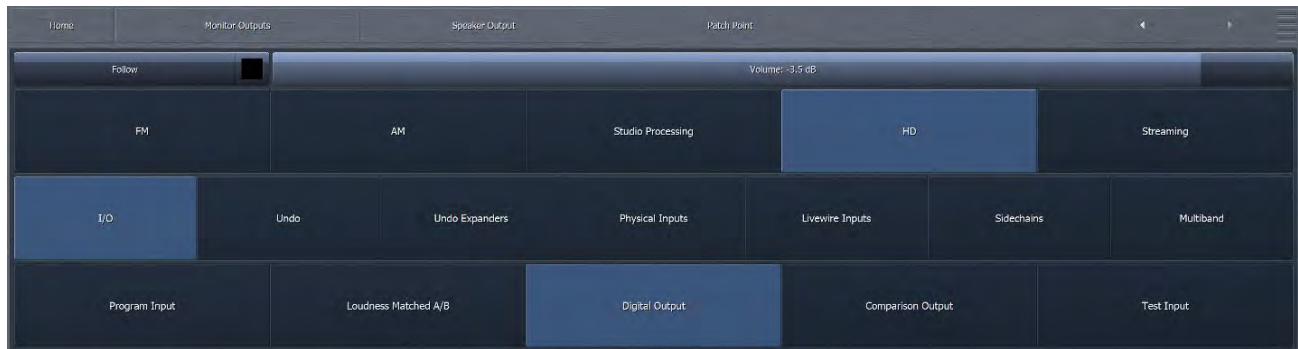
You can feed each of the three Monitor Outputs audio from various points within the Studio Processing core.



- ◆ The I/O menu allows you to listen to the Program Input or Studio Output.
- ◆ The Physical Inputs menu allows you to monitor any of the rear panel input points, including Main Digital, AES Reference, Aux Digital, and Analog.
- ◆ The Livewire Inputs menu allows you to monitor any of the 8 Livewire inputs (requires MKII platform update)
- ◆ The Sidechains menu allows you to monitor the audio passing through the Input AGC, Wideband AGC 1, Wideband AGC 2, and Wideband AGC 3 sidechains, as well as the actual output audio from each of those stages.
- ◆ The Multiband menu allows you to individually monitor the audio in each band of the multiband AGC.

HD-1, HD-2, and HD-3 Patch Points

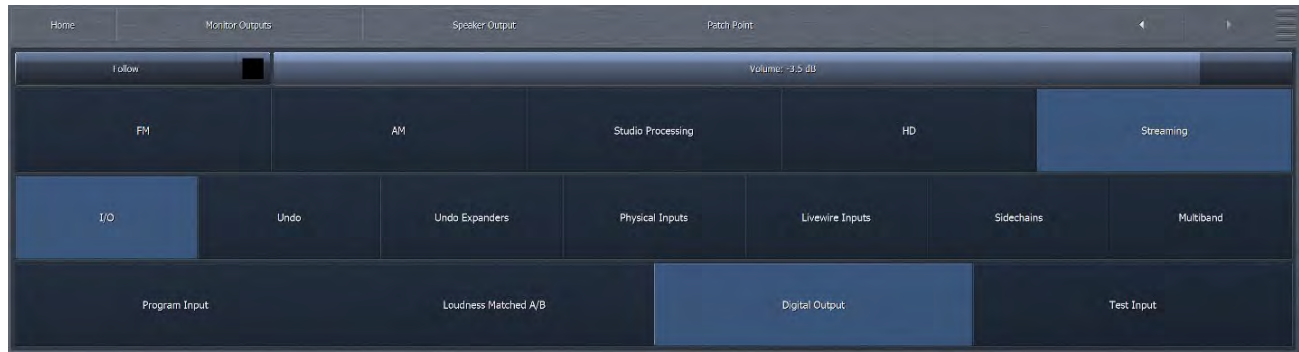
You can feed each of the three Monitor Outputs audio from various points within any of the HD processing cores.



- ◆ The **I/O** menu allows you to listen to either the Program Input, the Loudness Matched A/B patch point, the Digital Output, the Comparison Output and the Test Input of each HD processing core.
- ◆ The **Undo** menu lets you listen to the audio Pre-Declipper, and Post-Declipper, and after the audio has left Undo.
- ◆ The **Undo Expanders** lets you listen to the audio of each individual Undo band before it enters the De-clipper and multiband expander, and after it leaves the De-clipper and multiband expander. The available number of bands is determined by the current processing preset processing core.
- ◆ The **Physical Inputs** menu allows you to monitor any of the rear panel input points, including Main Digital, AES Reference, Aux Digital, and Analog.
- ◆ The **Livewire Inputs** menu allows you to monitor any of the 8 Livewire inputs (requires MKII platform update).
- ◆ The **Sidechains** menu allows you to monitor the audio passing through the Input AGC, Wideband AGC 1, Wideband AGC 2, and Wideband AGC 3 sidechains, as well as the actual output audio from each of those stages.
- ◆ The **Multiband** menu allows you to individually monitor the audio in each band of the multiband AGC.

Streaming 1, Streaming 2, and Streaming 3 Patch Points

You can feed each of the three Monitor Outputs audio from various points within each of the Streaming processing cores.



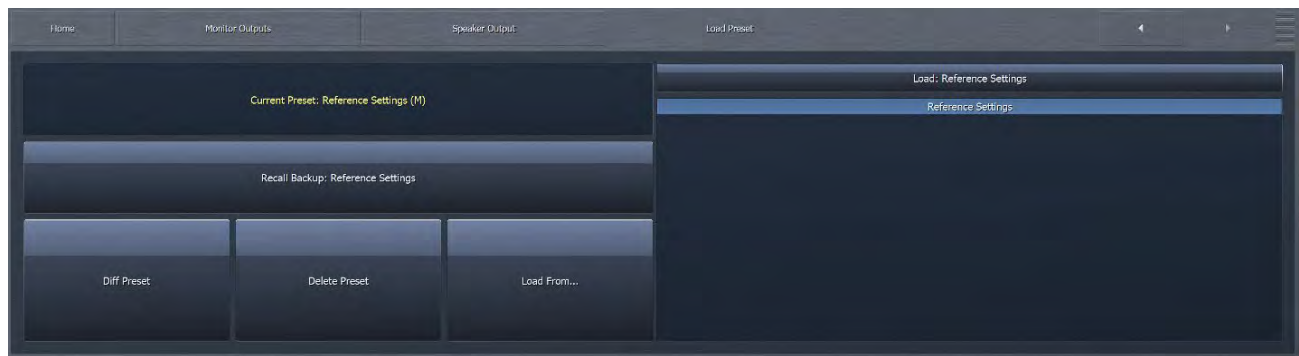
- ◆ The **I/O** menu allows you to listen to either the Program Input, the Loudness Matched A/B patch point, the Digital Output, and the Test Input of each HD processing core.
- ◆ The **Undo** menu lets you listen to the audio Pre-Declipper, and Post-Declipper, and after the audio has left Undo.
- ◆ The **Undo Expanders** lets you listen to the audio of each individual Undo band before it enters the De-clipper and multiband expander (Pre), and after it leaves the De-clipper and multiband expander (Post). The available number of bands is determined by the current processing preset processing core.
- ◆ The **Physical Inputs** menu allows you to monitor any of the rear panel input points, including Main Digital, AES Reference, Aux Digital, and Analog.
- ◆ The **Livewire Inputs** menu allows you to monitor any of the 8 Livewire inputs (requires MKII platform update).
- ◆ The **Sidechains** menu allows you to monitor the audio passing through the Input AGC, Wideband AGC 1, Wideband AGC 2, and Wideband AGC 3 sidechains, as well as the actual output audio from each of those stages.
- ◆ The **Multiband** menu allows you to individually monitor the audio in each band of the multiband AGC.

Load Preset Menu

Because Omnia.9 provides all of the tools – minus a calibrated microphone – to perform speaker/room calibrations for each of the Monitor Outputs, it also provides a way for you to store those calibrated settings in the form of presets.

It is important to remember that this menu refers to presets you create and save yourself for speaker calibrations within each of the three Monitor Outputs. *These are not the same as your processing presets!* However, the menus work in the same way.

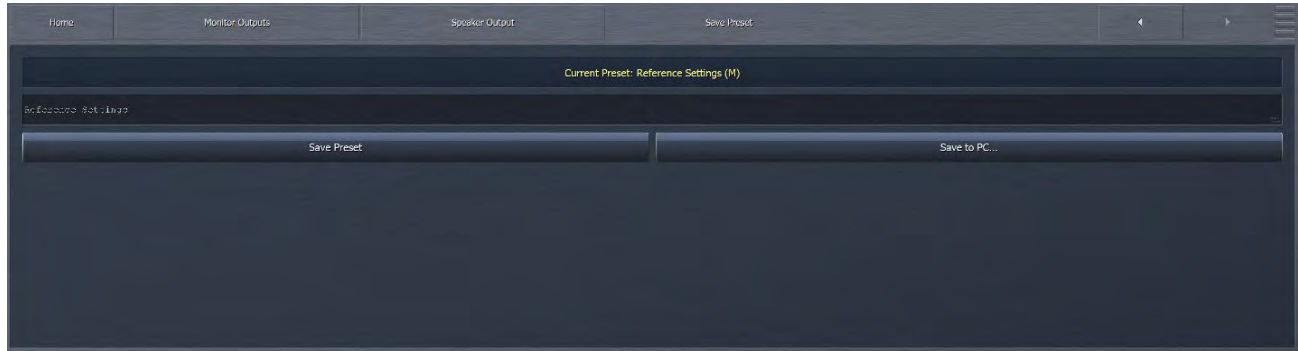
The Load Preset menu allows you view the preset you are currently feeding to the particular Monitor Output, toggle back and forth between the current and backup presets, load a new preset, compare the settings of two presets, and delete user presets.



- ◆ Highlighting a preset from the list places it in the Load button. Selecting the Load button puts that immediately loads the preset and moves it up to the **Current Preset** position. The preset that was previously audible will become the **Backup Preset**. You may also load a preset directly from the list by double tapping it.
- ◆ After changing any parameter of a preset, an (M) appears next to the Current Preset name and the text turns yellow to indicate the preset has been modified but not yet saved.
- ◆ The Backup Preset also becomes the former (and unmodified) Current Preset. This allows you to toggle back and forth to hear the difference between the original and modified presets.
- ◆ Changes to each parameter you adjusted to create the modified preset are also displayed in yellow on the specific control button in each section of the processing core, providing an instant visual comparison between the modified preset and the original preset upon which it is based.
- ◆ You can also compare the differences between the Current Preset and the Backup Preset, providing neither have been modified, by selecting the **Diff Preset** button. Any control settings in the Current Preset that are different from those in the Backup Preset will be displayed in yellow in their respective sections.
- ◆ Selecting the **Delete Preset** button allows you to permanently delete a preset from the list.

Save Preset Menu

The Save Preset menu allows you to edit the name of or save over an existing preset.



- ◆ You can rename your current preset, regardless of whether or not it has been modified, by selecting the **Edit Preset Name** button to bring up the on-screen keyboard. Type in the new name, select “OK”, and select **Save Preset**. The new preset will now appear in the list.
- ◆ If your Current Preset has been modified, you also have the option to write over the existing preset without renaming it by selecting **Save Preset**.

Main 1 Menu

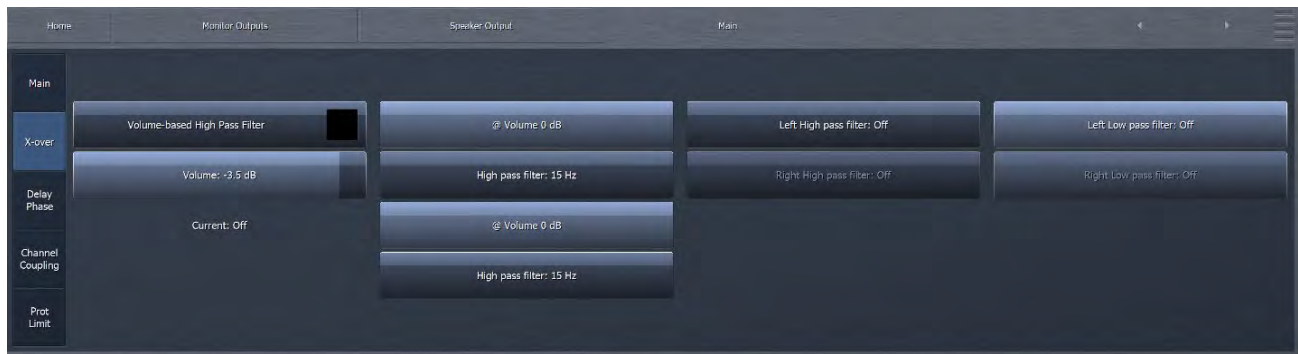
The Main 1 menu contains the controls to set the output level of each Monitor Output, enable or disable any adjustable parameters of each output, adjust the master gain level, adjust the left and right levels individually, solo an individual channel, and set a high pass filter frequency for both the left and right channels.



- ◆ The **Volume** slider is a duplicate of the control found on the top of the Home screen and controls the output level to the speaker or headphone output.
- ◆ The **Bypass** control enables or disables the parametric EQ, loudness contours, and high pass filters.
- ◆ The **Lock** control allows you to “lock down” all of the settings, including the patch points and the shortcut settings (such as volume controls) at the top of the user interface. When locked, the controls will appear grayed out. This is especially useful when the “Follow” control is enabled, as it prevents the selected patch point from being accidentally changed by someone connected via a remote client.
- ◆ Imagine the surprise - not to mention confusion - this would cause the talent if, say, the Speaker Output, which normally feeds the studio monitors with the low latency Studio output, got switched over to the HD-2 signal! And while we’re on the subject, let us go on record as stating we do not endorse the idea of deliberately confusing the talent in this manner. We’re just saying it could accidentally happen... Officially, we strongly recommend locking down any monitor output set in active use.

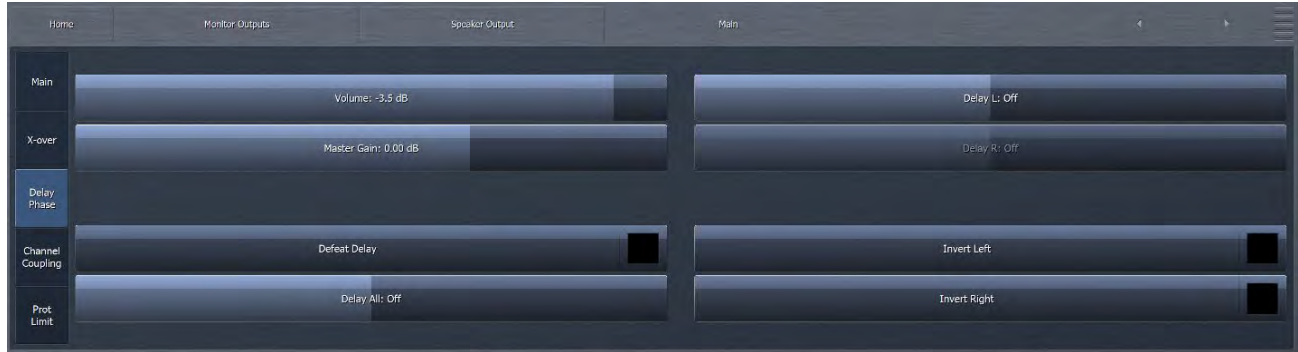
- ◆ The Monitor Output sections each contain Protection Limiters, a useful feature when performing speaker calibrations, which are often performed at higher than normal volume levels and can involve radical amounts of parametric equalization in the pursuit of a flat frequency response. When the limiters are active, orange bars in the corresponding volume controls will appear indicating that the master gain should be reduced. The **Master Gain** control adjusts the output level of each Monitor Output section relative to the Protection Limiter. You may also find that in the course of calibration you have made significant cuts to achieve a flat output, and need to use this control to raise the output level so that the calibrated and un-calibrated outputs match volume-wise when you compare them by using the Bypass control.
- ◆ The **Left Level** and **Right Level** controls allow you to adjust the output gain of each channel individually and act as a sort of “balance” control in situations where the left and right speakers are not equally spaced from the monitor point.
- ◆ The **Solo Left** and **Solo Right** controls allow you to monitor only the left or only the right channel.
- ◆ The **Pink Noise Left** and **Pink Noise Right** controls turn the pink noise generator in each channel on or off.

X Over Menu



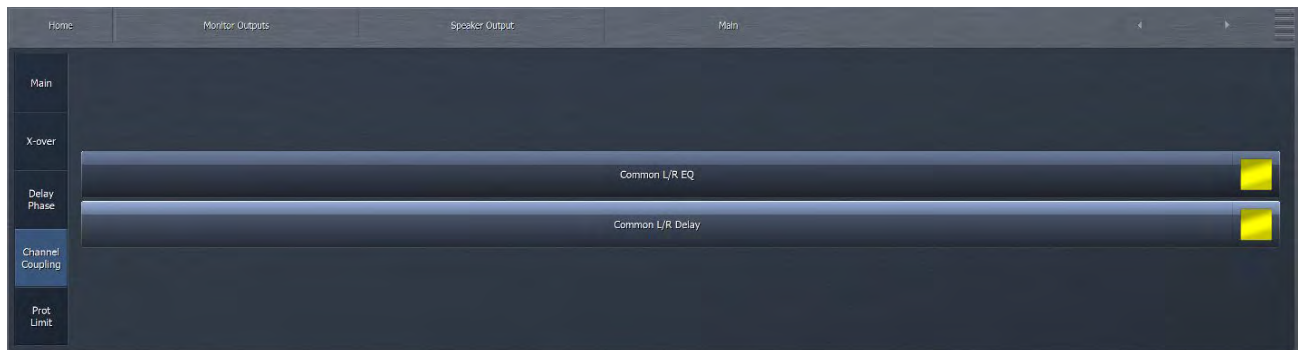
- ◆ The **Left High Pass Filter** and **Right High Pass Filter** controls allow you to set the high pass filter cutoff point to avoid over-driving small speakers. When calibrating smaller bass-shy speakers, there will come a point where you can no longer compensate for such a deficiency by EQ-ing, and it is more practical to simply not try and pass those frequencies at all. That point will be clear on the RTA and is explained in more detail in the Speaker Calibration section. These controls together with the **Left and Right Low Pass Filter** controls can also be used to simulate what your station will sound like on a clock radio, as a type of litmus test to ensure that your processing is appropriate for all devices.

Delay Phase Menu



- ◆ The **Volume** and **Master Gain** controls are duplicates of those found in the Main menu, but are found here as well for convenience.
- ◆ The **Delay All** control allows you to delay the audio output of the Speaker and Headphone outputs.
- ◆ The **Delay Left** and **Delay Right** controls provide a means by which to delay one channel independently of the other.
- ◆ The **Invert Left** and **Invert Right** controls let you swap the polarity of each channel. The ability to do so in one channel or the other can be useful if you discover that one of the speakers has been wired out of phase and it is not practical or convenient to physically switch the positive and negative wires. Being able to do so to both channels simultaneously can come in handy if you are in a situation where both channels have gotten out of phase at some point in the studio wiring.

Channel Coupling Menu



- ◆ When enabled, the **Common L/R EQ** control “couples” the left and right channels together in the parametric equalizer so that any changes made to the left channel will also be made in the right, eliminating the need to make the same adjustments twice. Disabling this control allows you to EQ the left and right channels differently. This can be useful if, for instance, one speaker is placed in the corner of a room while the other is not, resulting in a different bass response at the monitoring point.
- ◆ The **Common L/R Delay** ensures that any delay to the left and right speaker outputs is identical in time. If an operator wants to have a different delay time for left versus right speaker output, then disable this option, i.e. turn the yellow button off. Then go to the previous submenu, **Delay Phase**, where you can now apply different delay times separately to left and right.

Protection Limiting Menu



The Bass Limiter Threshold controls for the Left and Right channels set the threshold of the bass limiters. The (Coupled) control lets you move both Left and Right together, or you can use individual L / R controls to balance the two channels. *Keep in mind that these controls affect only the monitor output audio and have no effect on any of the on-air processing cores, but they are very useful when pushing higher volumes and more bass through very small speakers.*

The Limiter Threshold controls for the Left and Right channels set the threshold of the Protection Limiters in each Monitor Output section and operate in the same manner as their counterpart in the HD (and other non-FM) Processing cores. As with the Bass Clip Threshold controls, *only the monitor output audio is affected.*

Loudness Menu

The Loudness menu allows you to automatically change the equalization of each monitor output depending upon the volume level. This is similar to the traditional “Loudness” adjustment found on many car audio systems as well as on some home systems and TV sets. It only affects the speaker outputs and does not affect the on-air audio of the Omnia 9.



Speaker calibration, which is covered in greater detail later in this manual, is normally done at relatively high volume levels in order to provide adequate gain into the mic to overcome room noise. Normal listening levels may be substantially lower. While the EQ curve of the output of the speakers technically remains the same, the way our ears perceive different frequencies at lower sound levels will cause the audio to sound different. Specifically, lower and higher frequencies will sound softer than mid-range frequencies.

Do not be alarmed if you find you need to add several decibels of low-frequency boost (at a very low frequency and a width of 3.0 octaves or so) in order for the bass to sound balanced at lower volumes. The same is true for higher frequencies, but normally a dB or two is sufficient (perhaps at a very high frequency with a width of 2.0 octaves or so).

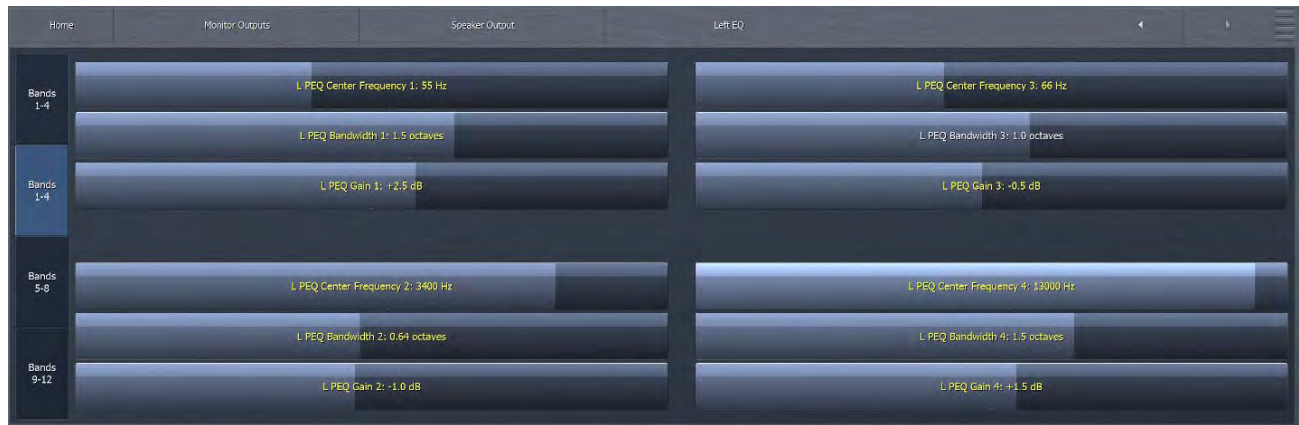
- ◆ The Frequency, Width, and Gain sliders operate in the same manner as their counterparts in other sections of the Omnia.9 in which a parametric equalizer is offered.

- ◆ The **Band Min** slider sets the point at which any equalization established by the Frequency, Width, and Gain sliders are begins to take place.
- ◆ The **Band Max** slider sets the point at which the maximum amount of equalization is reached.

If the Gain slider is set to 0dB and the Band Min and Band Max sliders are set to the same value, the equalizers in the Loudness 1 and Loudness 2 menus can be used as additional “static” EQ bands if, for whatever reason, more bands beyond those offered in the Main 1 and Main 2 setting are needed.

Left EQ1, Left EQ2, Right EQ1, and Right EQ2 Menus

The Left EQ1, Left EQ2, Right EQ1, and Right EQ2 menus each provide six bands of fully parametric equalization for each Monitor Output.

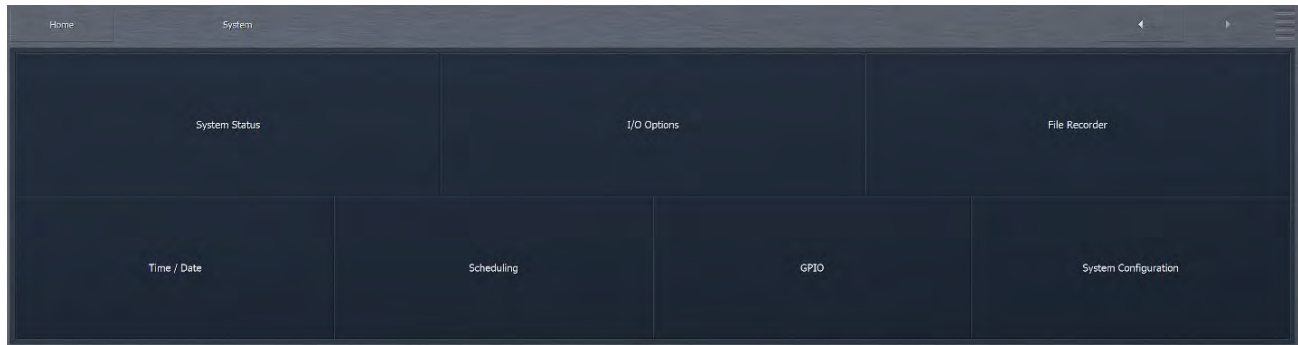


- ◆ The **Frequency**, **Width**, and **Gain** sliders operate in the same manner as their counterparts in other sections of the Omnia.9 in which a parametric equalizer is offered.
- ◆ The **Copy** control places the settings from either the Left EQ1 or Right EQ1 section onto a “clipboard” so that they can be shared in the opposite channel EQ by using the **Paste** control. This is especially handy if your left and right speakers require nearly - but not quite - identical equalization.

Specific instructions for how to use these controls to calibrate your speakers are offered later in this manual.

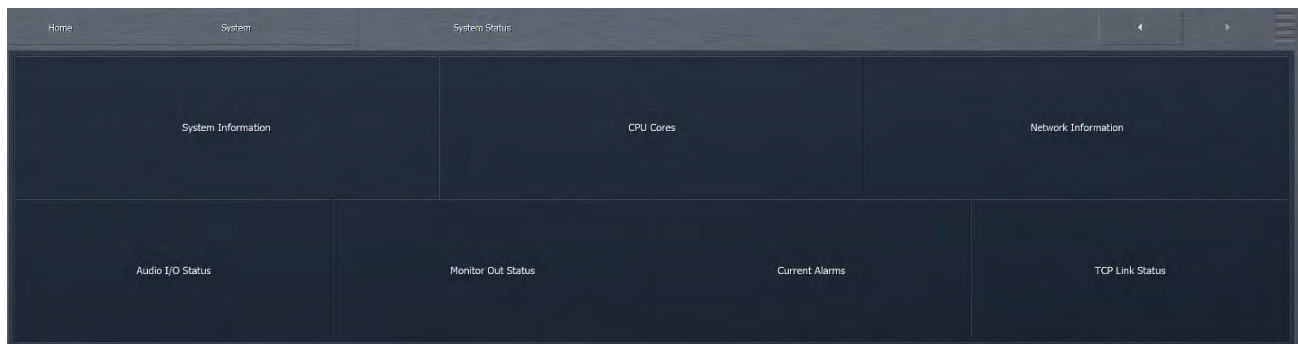
23 System Menu

The System Menu contains sub-menus that provide status information about the Omnia.9 itself, audio I/O, and remote connections. It is also where high level “global” settings such as the time and date, input, output, preset scheduling, and GPI configuration are set. It also contains the menus that determine which processing cores and streaming encoders are enabled, where HTTP access and IP information is entered, and where settings for the file recorder are made.



System Status Menu

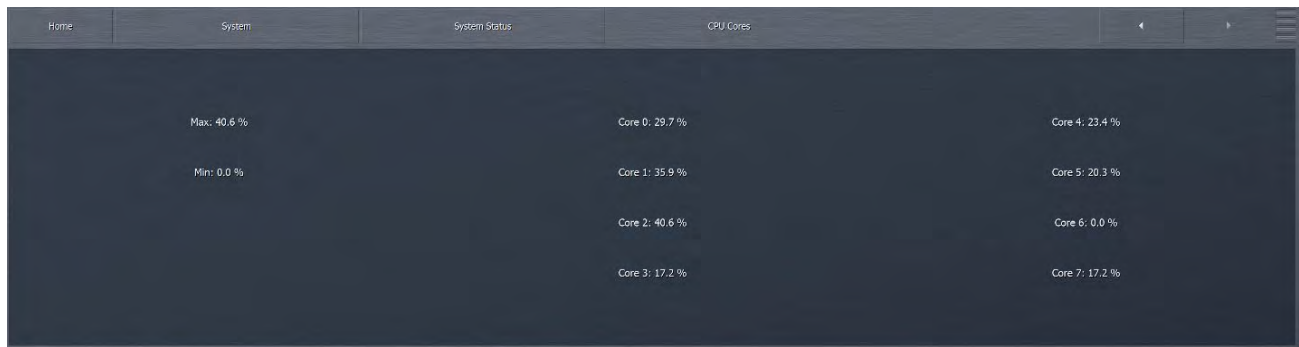
The System Status menu is divided into seven sections – System Information, CPU Cores, Network Information, Audio I/O Status, Monitor Out Status, Current Alarms, and TCP Link Status. These screens are useful for getting status information of various sub-systems within the unit, as well as for diagnostic and troubleshooting use.



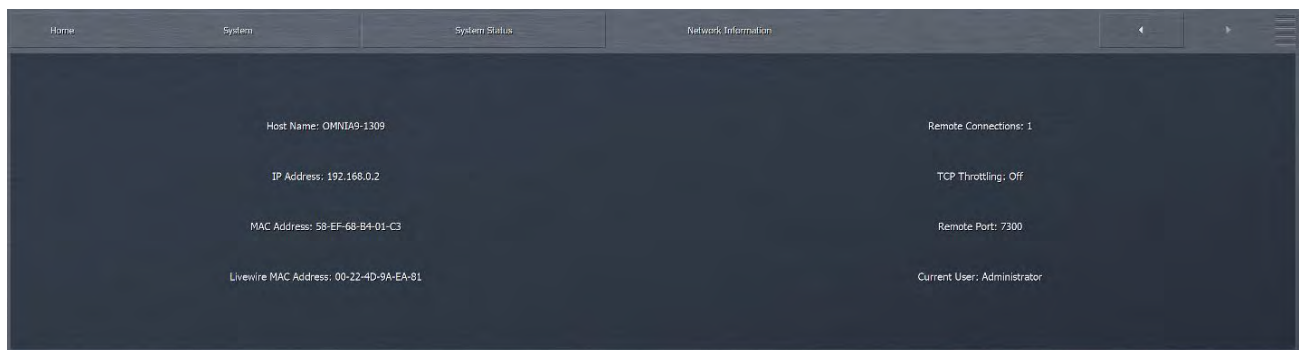
The **System Information** portion shows information about Omnia.9’s operation, including CPU load, available RAM, power supply health, up time, and various software, firmware, and hardware versions.



The **CPU Cores** shows a real time utilization status of all 4 cores (mk I) or 8 cores (MKII) . This display has diagnostic value for systems running multiple processing options



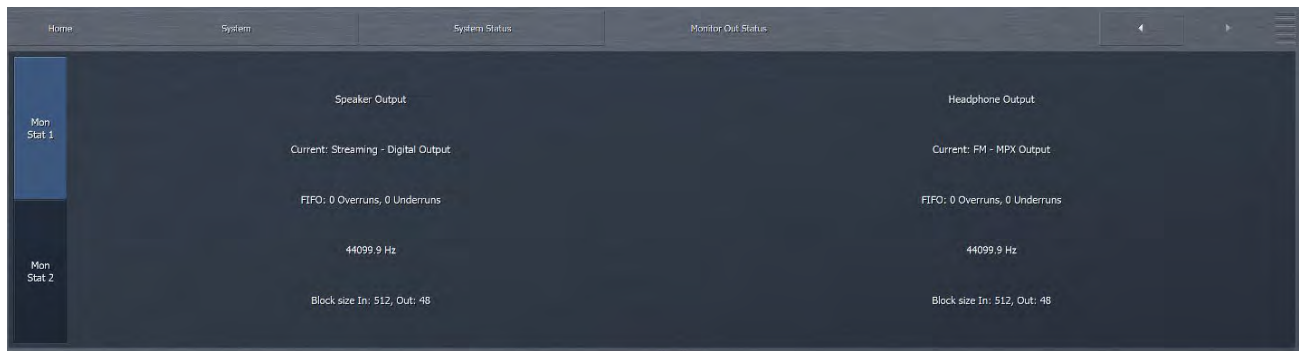
The **Network Information** section provides information including the host name, IP address, and MAC addresses of the Omnia.9 system, and Livewire/ AoIP network adapters. It also indicates how many users are remotely connected, indicates TCP throttling, the remote port number (for NfRemote) , and the security level of the current user.



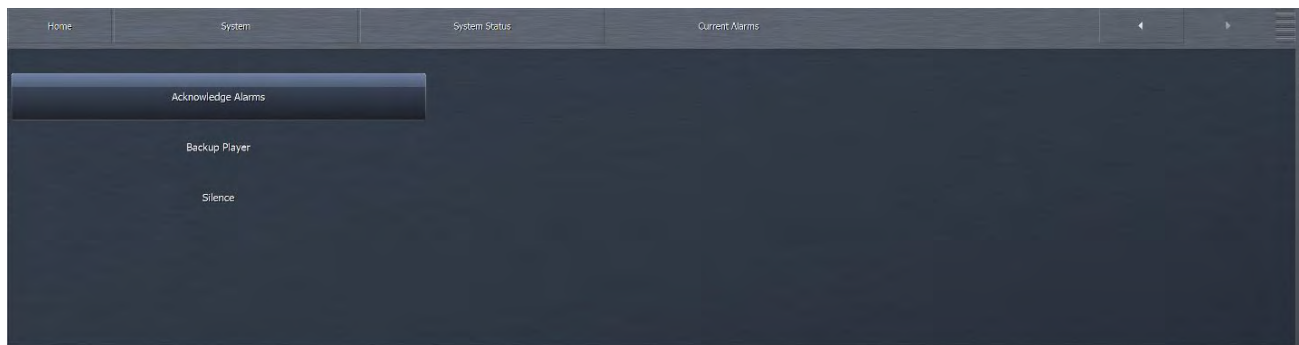
The **Audio I/O Status** section shows the current system sample rate as well as detailed information about audio input and output configurations. This information can help with system diagnostics and troubleshooting.



The **Monitor Out Status** shows the speaker and the headphone output conditions (Mon Stat 1) and for Aux Output (Mon Stat 2). You can toggle between the two displays using the buttons on the right of the screen.



The **Current Alarms** menu shows any alarms that have occurred since previous alarm events were last cleared. Alarms include status of the internal **Backup Player**, **Silence Detect**, and **Power Supply** status of the dual power supplies.

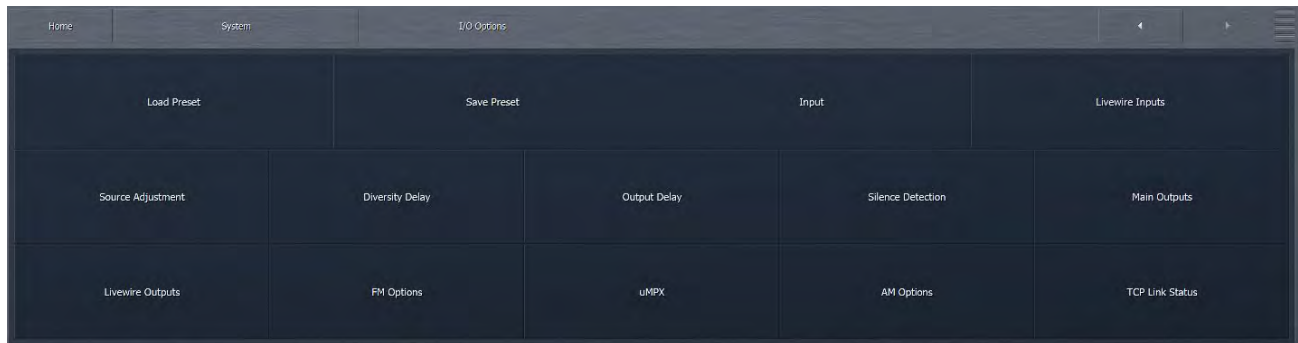


The **TCP Link Status** provides details of the current TCP connection.



I/O Options Menu

The **I/O Options** menu has various sub-menus, including Load Preset, Save Preset, Input (or multiple input sources depending upon configuration), Source Adjustment, Diversity Delay, Silence Detection, Main Outputs, Livewire Outputs, FM Options, μ MPX options, AM Options, and TCP Link Status.



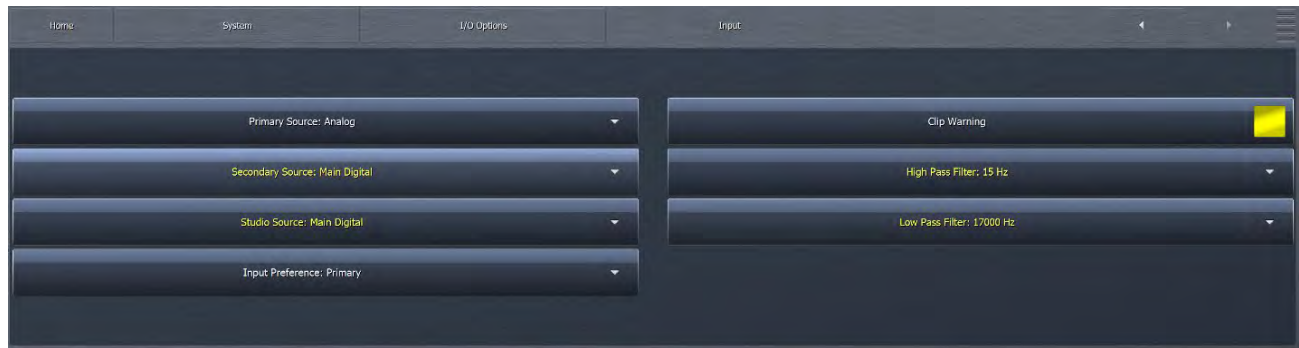
Load Preset and Save Preset Menus

All I/O settings in the Input, Source Adjustment, Diversity Delay, Silence Detection, Main Outputs, and FM Options can be saved to an I/O preset file. This makes it very easy to return to a known good configuration if you make a change to one of these settings and need a quick way to “get back home” or if you want to clone settings to transfer to another Omnia.9.

These are I/O setting presets and are not related to the processing presets.

Input 1/2/3 Menus

The Input Options menus are where you choose which physical rear panel input (Analog, Main Digital, AES Reference, Aux Digital, and Livewire) feeds each of Omnia.9's audio input paths.



- ◆ The **Primary Source** drop-down menu determines the audio source of each input. You can select between Analog, Main Digital, Aux Digital, AES Reference or Livewire inputs (if displayed: requires MKII platform)
- ◆ If you select a **Secondary Source** in the dropdown, the Omnia.9 will automatically use this alternate source if it has audio while the primary source is silence.
- ◆ The **Input Preference** control determines whether or not Omnia.9 keeps the current, secondary audio source on the air after audio returns to the primary input source or switches back to the primary source.
- ◆ The **Studio Source** drop-down menu allows the low-latency studio processing core to be fed independently, a useful feature for stations that utilize a profanity delay in their air chain and need a pre-delay feed for talent monitoring.
- ◆ When enabled, the **Clip Warning** control will cause the Input meters to flash red when the audio hits full scale. In a normal studio environment, Clip Warning should be turned on to keep the operator from overloading Omnia.9's input. However, if you are in a test environment and feeding a CD player directly into one of the digital inputs, you may wish to turn this control off as clipping present on the CD itself may trigger the Clip Warning.
- ◆ The **High Pass Filter** drop-down menu allows you to completely disable the filter or set its frequency to your choice of 15, 30, 45, 60, 70, 80, 90, or 100Hz. The 60, 70, 80, 90, and 100Hz filters are extremely sharp, completely eliminate hum and rumble, and are useful for an all-talk format or a station that still plays live vinyl. The default setting is 30Hz. It is worth noting that the HPF is phase linear.
- ◆ The **Low Pass Filter** drop-down menu allows you to completely disable the filter or set its frequency to 17,000, 17,500, 18,000, 18,500, 19,000, 19,500 or 20,000 Hz.

Livewire Inputs Menu

The Livewire Inputs overview menu shows an overview of all eight Livewire Audio inputs, as well as both Livewire MPX inputs. The channel numbers (or multicast addresses for AES67 streams) are shown, along with the source name, as well as color coded status indication. This menu will only be visible for units that have had the MKII platform upgrade.

Selecting an individual input sub menu shows statistics, a Channel List sub menu, buffer adjustments, and channel selection controls for that particular input.



Overview of the Livewire inputs. These are Livewire streams that are being received by the O9. The status of each is shown. LW1 shows name of CTY Mix coming from (the @ sign) the device named Node-114-0 with Livewire channel (11401). Note that LW2 shows no data which means it is configured in the O9 to receive channel 6001 but there is no “data” being received by the O9. This is NOT silence but rather the absence of any network data for that channel.

Omnia.9 (with MKII platform upgrade) accepts any Livewire or Livewire+/AES67 channel from your Axia network. There are eight regular (stereo audio) Livewire Input slots. Each Livewire input slot can take a unique Livewire channel from the network, and each Livewire input slot can in turn be assigned to any of the aforementioned Input 1/2/3 sections exactly the same way as a physical Analog or Digital input.

Furthermore, each input can act as a five-channel selector. This can be used to make quick selections of common Livewire channels that would be desired to feed the Omnia.9 MKII. These route changes may also be automated via task scripts (GPI), or through using Axia Pathfinder using LWRP.

An example would be if a main and backup processor located at the main studio site were triggered into fail-over. Backup feeds could both be on their own Livewire or Livewire+/AES67 channels and seamlessly picked to feed the Omnia 9, via Input 1. If a secondary backup studio location, also with a main and backup processor existed – the same thing could be setup on Input 2 for a dual redundant scheme.

A running display of real time data is shown on this screen as well to help with troubleshooting network path problems. A Fifo buffer can be adjusted to mitigate audio issues if jitter values are too high over the network.

With Livewire+/AES67 MPX baseband may also be sent and received over the network and fed directly into either of the two Omnia 9 MKII’s MPX inputs. These options are accessible by opening MPX Input 1 and MPX Input 2 screens and assigned a valid MPX over Livewire+/AES67 source. Please note, that when a Livewire channel is assigned to MPX Input 1 or MPX Input 2 this will override the physical composite input.

To assign a Livewire channel to a preset in the bank, First click on the Channel List button and scroll through the selections of advertised Livewire channels. Select the desired channel and press Take. Alternatively, if you know the channel number ahead of time you can key that in and simply press the Take button. Then press the Assign button, the box will glow yellow. Then simply click on any of the Livewire preset buttons below to set it to that button.

“Destination Name” field is used in conjunction with Axia Pathfinder routing software. An Axia Pathfinder server can directly manipulate the Livewire input of the Omnia.9 MKII. This name will appear in the Destination column of an Axia Pathfinder audio router. If the field is omitted the name will be shown as either Input 1, Input 2, Input 3, MPX Input 1 and MPX Input 2.



Same as previous image but shows proper reception of LW2 input.



This shows the configuration of input LW1 as well as stats for that channel. Most of the stats are self-explanatory.

The Livewire implementation in Omnia.9 MKII different from other AXIA products, as the implementation is entirely written in software. It is not possible to lock the internal processing of the network clock, the processing engine always runs either on internal clock or synced to the AES Reference Input.

Thus, any time we send or receive audio over Livewire, adaptive sample rate conversion is necessary. The conversion ratio is normally 1:1 but can vary a bit, and if the Omnia.9 is running at 44.1 kHz, the ratio will be 0.92:1 for inputs and 1.09:1 for outputs, since the network is always 48 kHz.

So, we use a FIFO buffer (First In, First Out) and ever so slightly alter the conversion ratio (+/- 0.1% for standard audio, much less for MPX I/O) . More buffer helps prevent against dropouts due to momentary network delays.

Network status is indicated with four statistics (Discarded, Lost, Late and Resyncs) .

Discarded counts packets that arrived too late to be useful.

Lost is a packet that did not arrive when we needed it.

Late is a packet that was late but that we were still able to use.

Resyncs indicates that the time code on the majority of the packets we received do not match our expectation, and that we had to resynchronize rather than try to adapt.

If you see **Lost** packets alone, packets are getting lost between the Livewire audio source and the Omnia.9. This is usually can by faulty network cables or switches.

If you see **Lost** and **Discarded** both tick up in tandem, packets are arriving out of order. In this case, you can increase the **Packet Buffers** slider until you instead see **Late** ticking up while **Discarded** and **Lost** hold steady. This works around the problem and will yield glitch-free audio, at the expense of more delay.

The Sample Rate Converter and the FIFO buffer are one unit, and statistics include **Overruns**, **Underruns**, **Margin In** and **Margin Out**.

Margin In is how many samples of free space we had in the buffer after we just wrote the last input frame. This number can go negative, because the buffer is internally much bigger than it needs to be for a given **Fifo Buffer** setting. Why throw away good audio if we have it, right? So, it has to go quite a lot below zero before we'd throw away an incoming block of audio and count it as an **Overflow**.

Margin Out is how many samples of audio remained in the buffer after we pulled the last output frame. This number *cannot* go below zero – if it did, that means there were not enough samples available in the buffer when we needed them, and we must instead use silence. We count this as an **Underrun**. If this happens frequently, you will want to increase the **Fifo Buffer** setting.

Packet buffers is different from the FIFO buffer. Packet buffers instructs the Omnia.9 to hold back N livewire packets before stuff their contents in the FIFO buffer, which guards against packets arriving out of order. As mentioned earlier, if **Lost** and **Discarded** increment in tandem, a packet arrived out of order. It wasn't there when we needed it, so we substituted it with silence and counted it as lost. It later arrived, but we didn't need it anymore so we discarded it. If that happens, increase **Packet Buffers** until they start showing up as "Late" instead. That means "Late, but got here in time."

Of course, while we're waiting for a single late packet, we can't let its younger counterparts (which have already arrived) into the **Fifo Buffer** because FIFO means First In First Out, meaning they will come out in the same order they went in. Thus, if fed into the fifo in the wrong order, they would also come out the wrong order. And so we must wait, while the fifo potentially runs out of buffer and has an underrun (and an audio drop-out). This is why the **Packet Buffers** and **Fifo Buffer** controls are separate in Omnia.9 MKII.

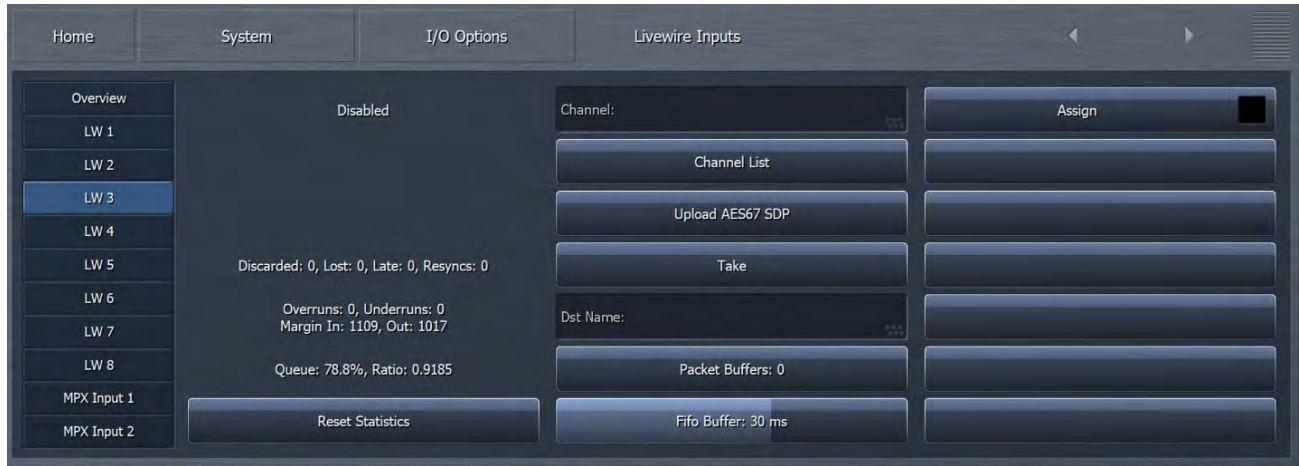


This shows the same LW1 configuration but also shows the channel list.



This shows the LW1 input channel list but with the search term “Program” applied. Note that the search is “live” and searches for the string you typed in all displayed columns. It will start to filter the list as you type. The Audition Switch is the on in the screen shot above, glowing RED. When enabled, navigating in the list immediately takes, making in easy to quickly audition multiple sources.

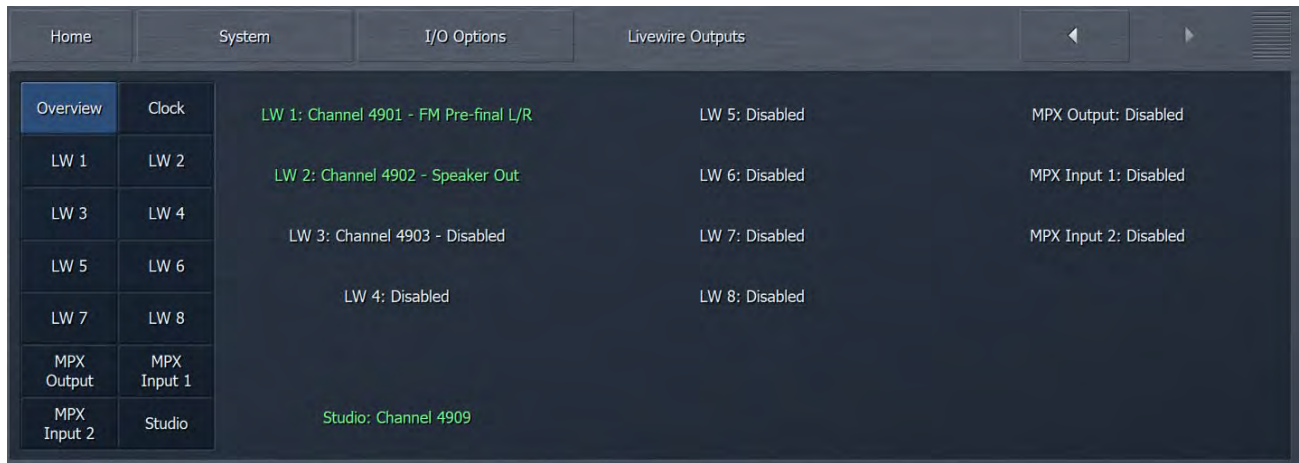
Once you press OK to close the channel list, the channel number you selected will be entered into the Channel edit box, at which point you can press Take to actually take the channel, if this hasn't already been done by the Audition switch being enabled.



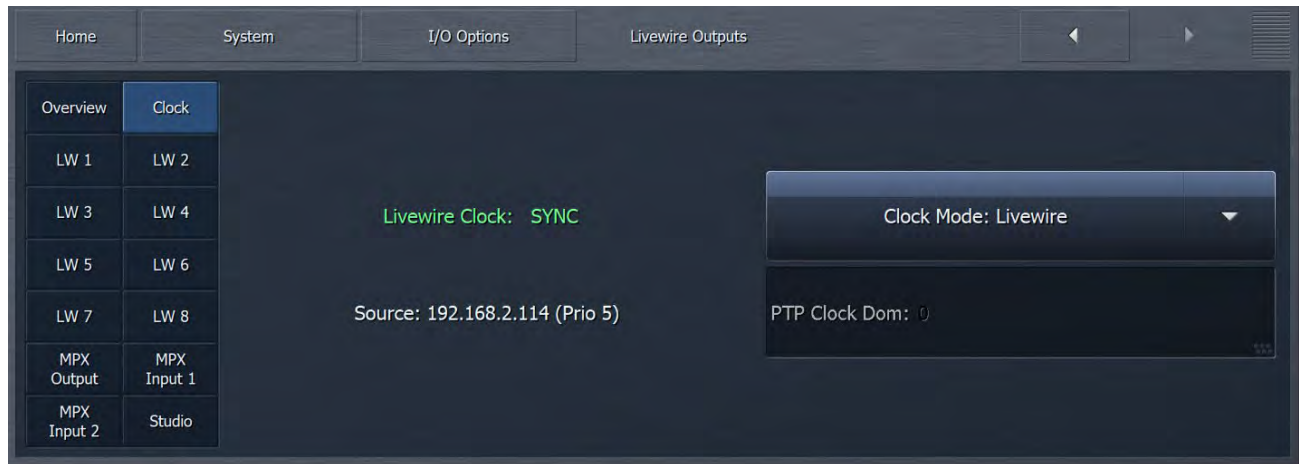
This shows what an unconfigured LW input looks like.

Livewire Outputs Menu

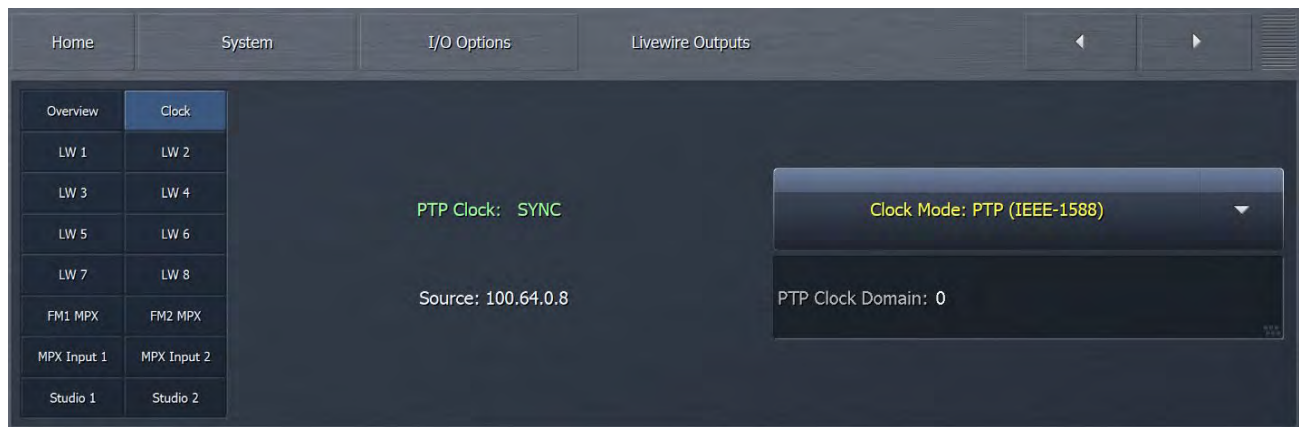
The Livewire Outputs overview menu shows an overview of all main Livewire Audio outputs, as well as a Livewire MPX output, Livewire MPX pass-throughs of both MPX inputs, and the Studio output. Dual FM units will also have FM2 MPX and Studio 2. The channel numbers (or multicast addresses for AES67 streams) are shown, along with the assigned audio source inside the Omnia.9, as well as color coded status indication. This menu will only be visible for units that have had the MKII platform upgrade. Selecting an output slot sub menu shows statistics and controls for that output.



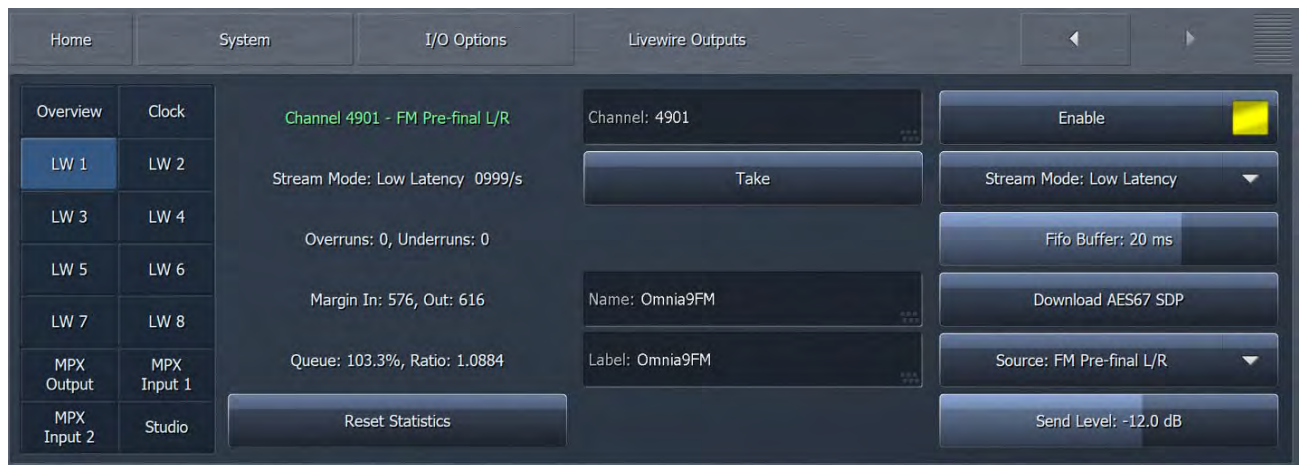
This is the overview screen for the Livewire Outputs (referred to as Sources in the Livewire vernacular). It shows we are producing 3 Livewire sources back to the livewire network. Ch 4901 which is shown as FM Pre-final L/R. Ch 4902 is the Speaker output from the O9 and Ch 4909 is the output of the Studio core.



This shows the settings for the clock source for the Omnia 9. In this case we are using Livewire clock (not PTP), it is SYNC'd (as shown in green) and the IP address of the source clock along with its priority are shown.



For other AES67 only environments, the PTP clock source can be chosen in the **Clock Mode** dropdown. Once PTP is selected the PTP domain can be chosen.



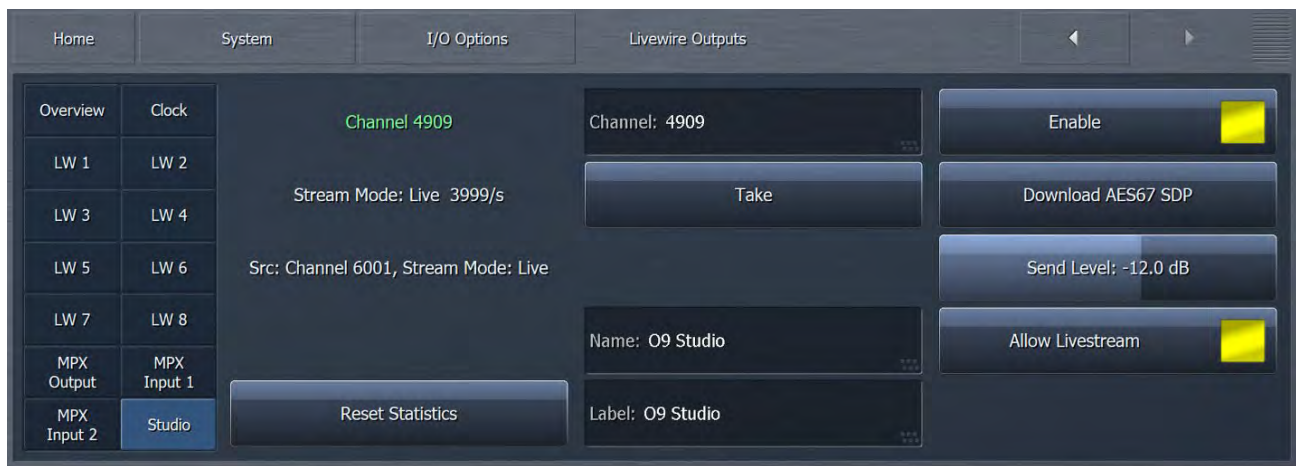
This shows a properly configured Livewire output. The Channel number, Name, and Label are user definable.

The **Stream Mode** selection lets you select the stream format. **Standard** uses 5 ms (240 samples) Livewire packets, which minimizes overhead. **Low Latency** is used for AES67 compatibility, with each packet being 1 ms (48 samples). Please note that the LW labeled output slots are *not* intended for low latency monitoring even if you select **Low Latency** mode. For Low Latency monitoring, you must use the **Studio** output slot, described later.

The **Source** selection lets you select which Omnia.9 audio source to assign to the LW output slot you are configuring. This list is identical to what you'd find when assigning a physical AES or Analog output, except it contains selections from *both* the aforementioned signal types, as we cannot know from this end whether you will be using an analog or digital node at the other end.



The **Studio** output slot for low latency use works a bit differently from the normal LW output slots.



Due to the software-only Livewire implementation in Omnia.9 MKII, low latency operation has some restrictions. The source *must* be a Livewire or AES67 stream, and the stream mode must be Low Latency (1ms, 1000 packets/sec) or Live (0.25ms, 4000 packets/sec), and this source must be selected as the **Studio Source** on the **Input 1** page. If the source is a Standard Livewire stream (5ms, 200 packets/sec), or a physical Omnia.9 output, the Studio LW output will not produce any output.

Furthermore, the outgoing packets are not buffered and re-clocked – there just isn't time for that. Instead, we process as the input packets comes in, and send the output stream with the same format as soon as the audio for that packet has been processed. This means that the output will have significantly more jitter than a "proper" livestream, and this can cause problems for Livewire gear trying to receive it.

If there are audible glitches, the workaround is to disable the **Allow Livestream** button, which will cause Omnia.9 MKII to send 1ms AES67 Low Latency packets in response. This solves one problem, but creates another: While AXIA gear uses just 0.75ms (three quarters of a millisecond) buffer when receiving a livestream, the default receive buffer for all other types of streams (standard streams, AES67 low latency streams) is 100 milliseconds. This will of course add far too much delay for the feed to be useful, so we must reduce the buffer size in the receiving unit down to **3 milliseconds**. Not all AXIA gear will not let you do this per channel (understandable since they all pre-date Omnia.9 MKII), but the xNode will, through LWRP.

Example

telnet to port 93 of your xNode

```
LOGIN <password>
```

```
DST 1 BUFF:3
```

This sets the playback latency (receive buffer) on destination 1 to 3 milliseconds. The setting is persistent.

This should result in a total Microphone to Headphone delay of about 10 milliseconds, which is well within acceptability for most talent.

Some General Notes

MPX Outputs, and MPX Inputs may be turned around and transmitted as Livewire channels, but note that they would need to be received by some other MPX receiver, for example another Omnia 9, or a Livewire MPX compliant transmitter, of which none yet exist at the time of this writing. It's a chicken-and-egg problem – one of them has to come first, and in this case we were.

You will note the existence of the Download AES67 SDP buttons (on the outputs) and Upload AES67 SDP (on the inputs). SDP stands for session description protocol and gives you a “portable” file that can be used for configuration. For example, you might have an AES67 audio stream to receive in to your Omnia.9. The AES67 compliant unit generating that source stream will have a way to download an SDP file, which you can then upload to your Omnia.9, and it would describe that stream to the O9 in sufficient detail that it could receive the stream.

An SDP file is a carefully formatted plain text file and looks for example like this for a normal audio stream:

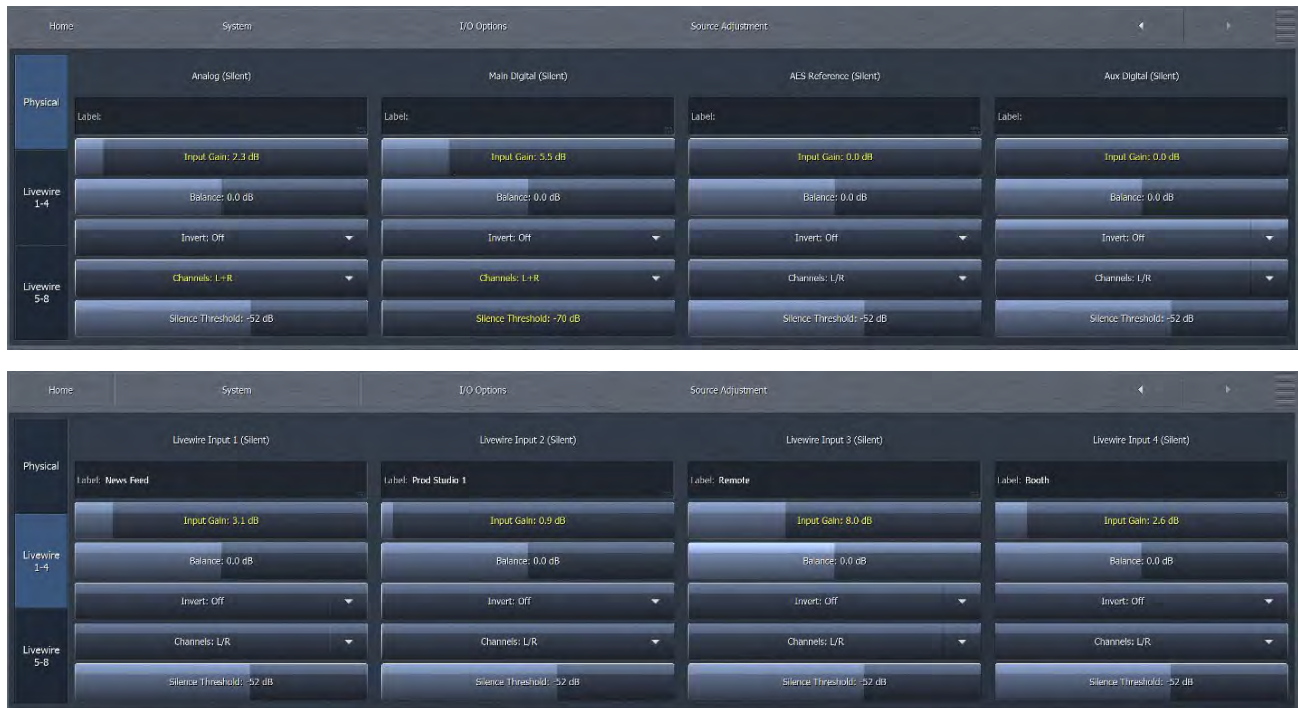
```
v=0
o=- 0 1 IN IP4 192.168.2.49
s=Omnia9FM @ OMNIA9-1759
i=FM Pre-final L/R
c=IN IP4 239.192.19.37/127
t=0 0
a=type:multicast
m=audio 5004 RTP/AVP 96
a=rtpmap:96 L24/48000/2
a=ptime:1
a=mediaclk:direct=0
a=sync-time:0
```

An SDP file for an MPX stream may look like this:

```
v=0
o=- 8 1 IN IP4 100.64.0.91
s=Omnia.9 @ 09-upper
i=FM1 MPX
c=IN IP4 239.200.35.141/127
t=0 0
a=type:multicast
m=audio 5004 RTP/AVP 112
a=rtpmap:112 L16/192000/1
a=fmtp:112 fm_stereo_mpx; emphasis=75
a=ptime:3.750
a=ts-refclk:ptp=IEEE1588-2008:58-50-AB-FF-FE-80-0A-74:0
a=mediaclk:direct=0
a=sync-time:0
```

Source Adjustment Menus

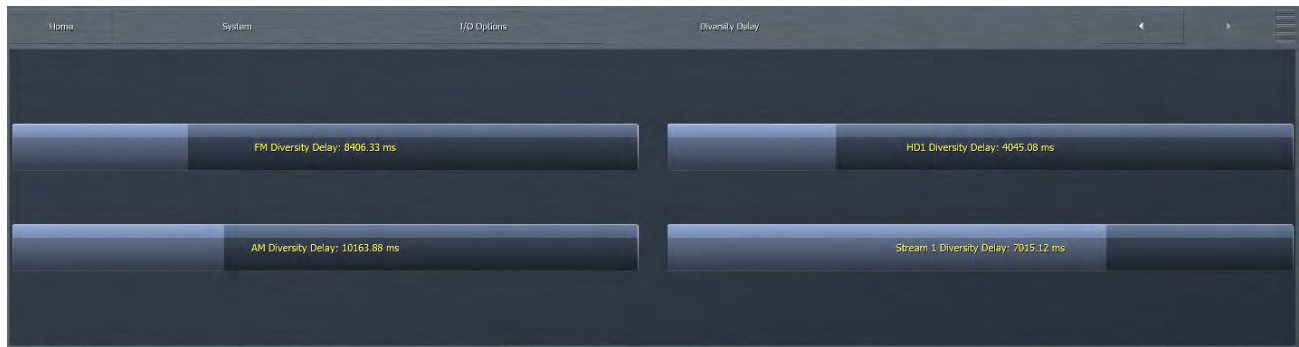
The **Source Adjustment** menus contain the controls to set the input gain, invert the polarity of the input audio, and set the input mode independently for the Analog, Main Digital, AES Reference, and Aux Digital physical inputs, as well as setting the adjustments for the Livewire inputs (visible only on MKII platform).



- ◆ The **Input Gain** control allows you to adjust a variable gain stage after the clip detector and can be used to boost levels to meet Omnia.9's reference input level as indicated by a green color on the input meters, with an adjustment range of 18dB.
- ◆ The **Balance** allows you to change the amount of left and right audio
- ◆ The **Invert** control allows you to swap the polarity of only the left channel input, only the right channel input, or both the left and right channels simultaneously.
- ◆ The **Channels** control offers five combinations to determine how the input audio is fed into Omnia.9 in terms of left and right channels.
- ◆ **L/R** sends left channel input audio to the left channel and right channel input audio to the right channel (default setting).
- ◆ **R/L** sends left channel input audio to the right channel and right channel input audio to the left channel.
- ◆ **L+R** sends both right- and left-channel input audio to both the left and right channels.
- ◆ **L** sends only left-channel input audio to both the left and right channels.
- ◆ **R** sends only right-channel input audio to both the left and right channels.
- ◆ The **Silence Threshold** establishes the point at which low program audio, or lack of audio, is considered to be silence.

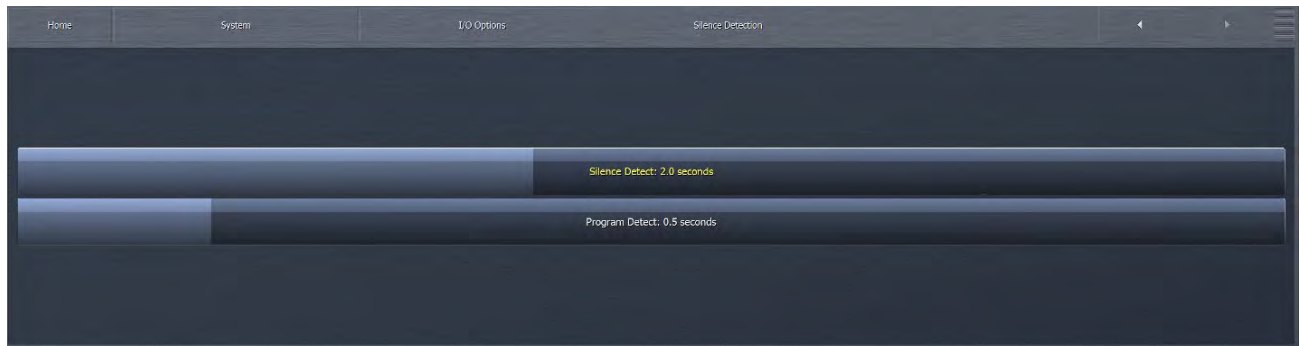
Diversity Delay Menu

Diversity delay is available for each of the processing cores configured in your unit. The amount of delay introduced to the FM or AM analog signal in order to match the corresponding HD-1 audio is set with in this menu with the FM Diversity Delay slider. The available range will depend on the configuration of your Omnia.9 as well as the hardware version. Setting this control properly (and monitoring your FM, HD-1, AM, and Stream-1 signals regularly) will ensure as smooth a transition as possible between the analog and digital signals for listeners with HD receivers. Each of the four sources are adjustable independently. Double clicking on each main slider opens three additional adjustment level setting sliders, for coarse, medium, and fine tune.



Silence Detection Menu

As previously indicated, Omnia.9 can switch over to a user-determined secondary input source when audio from the primary source is interrupted.



- ◆ The **Silence Detect** control determines how long Omnia.9 will wait before switching over to the secondary input source. It also determines how long the unit will wait before switching back to the Primary source upon loss of the secondary source if the Input Preference control in the Input > I/O Options menu is set to Current.
- ◆ If the Input Preference control in the Input > I/O Options menu is set to Primary, the **Program Detect** control adjusts how long the unit will wait once it has determined that audio has been restored to the primary input. If the Input Preference control is set to Current, this control has no effect.

The threshold audio level where signal is considered silence is fully adjustable. Because this feature is available independently for each input source, the control is located in the **System > I/O Options > Source Adjustment** menu. There are separate adjustments for each physical input, and for each Livewire input.

Main Outputs Menu

The **Main Outputs Menu** determines which audio source is present on each of the rear-panel connections including Main FM Out 1, Main FM Out 2, Aux Out, and Analog Out. Output level adjustment controls are provided for each. This menu also controls the source audio for the AES Main FM Out 1 and Out 2 outputs and enables the use of the AES Main FM Out 1 and Out 2 as *Omnia Direct* sources, the system jointly created by Nautel and Omnia which digitally transfers the composite baseband signal from the processor directly to the exciter over AES.



- ◆ The Main FM Out 1, Main FM Out 2, Aux Out, and Analog Out drop-down controls offer a choice of FM pre-emphasized or FM de-emphasized audio, audio from the HD-1, HD-2, and HD-3 processing cores (depending upon configuration) and audio from the Headphone, Speaker, and Aux monitor outputs, as well as several other useful selections.

Note:

The FM Pre-final L/R output allows audio just before pre-emphasis and clipping to be routed to any of the rear panel outputs (Main FM Out 1, Main FM Out 2, Aux Out, or Analog Out). Audio from this output point has been level-adjusted for 12dB of headroom and is ideal for feeding an external stereo generator with a full FM clipper back-end, such as the Omnia.9sg.

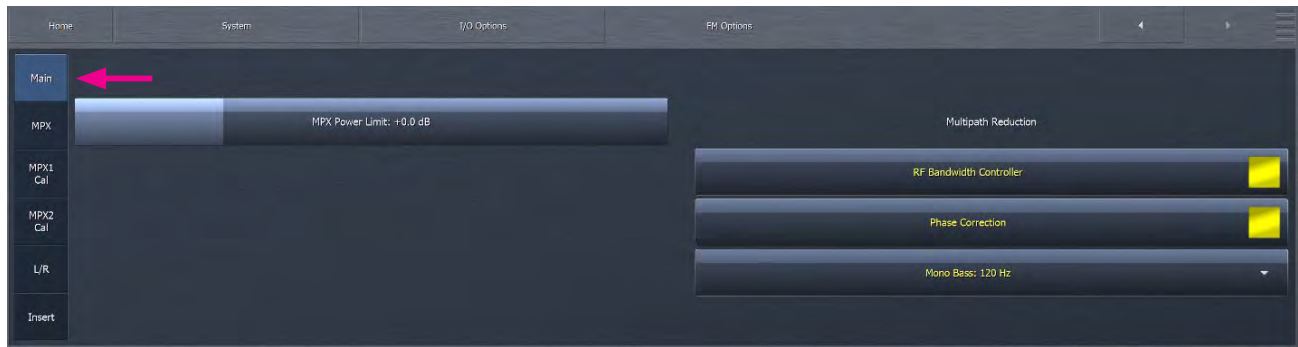
This is also the proper output signal to use to feed a Nielsen encoder and subsequently route the encoded audio back into Omnia.9 just ahead of the final clipper.

Once “Pre-final L/R” has been selected to feed a selected rear panel output, the **Input Source, Insert Mode, and Insert Delay** controls in the **System > I/O Options > FM Options** menu can be used to properly route audio into and back from the Arbitron encoder and compensate for the latency introduced by doing so.

- ◆ The corresponding Level sliders adjust the output levels.
- ◆ The AES FM Out 1 and Out 2 drop-down controls set the source audio for the Omnia Direct outputs and include L/R audio, MPX 1, MPX 2, or both MPX 1 and 2.

FM Options Menu

The FM Options Menu contains controls related to the composite and L/R output sections. Included here are adjustments and settings for the MPX Power Limit, Pilot Level, Auto Pilot, MPX and L/R Output Bandwidth, MPX and L/R Output Levels, Stereo Mode, RF Bandwidth Controller, L/R Codec Safety settings, and the built-in MPX Test Generator.



- ◆ Enabling the RF Bandwidth Control can tightly control the RF bandwidth to reduce multipath problems. The Strength slider determines the amount of control applied.

Because multipath issues are so specific to particular locations, the only practical way to determine the best setting for your station is by trial-and-error while driving to locations that are known to be problematic. With a Wi-Fi hotspot and a laptop or tablet running Omnia 9's remote software, it is entirely possible to make these adjustments on the fly and in real time.

Note:

The significance of this feature warrants a detailed explanation. Because certain sounds such as stereo-mic'ed piano (the first few notes of "My Immortal" by Evanescence serves as a good example) can cause excessive stereo reception problems.

Looking at the MPX spectrum of this song in particular, you will notice two very tall high frequency peaks: One at 37890 Hz and another at 38110 Hz. The original audio had a piano note at 110 Hz, recorded with stereo microphones, and has very little phase correlation between the left and right channels. Thus, due to the FM stereo system, which amplitude modulates the Left-Right difference signal by 38000 Hz, these two high frequency peaks result.

You may also notice that they are several dB's stronger than the pilot tone, but at twice the frequency. When this signal gets frequency modulated (as your exciter will do), these very tall high frequency peaks will cause very wide sidebands in your RF carrier, potentially causing multipath reception problems, which would be especially audible here due to the sparse audio content.

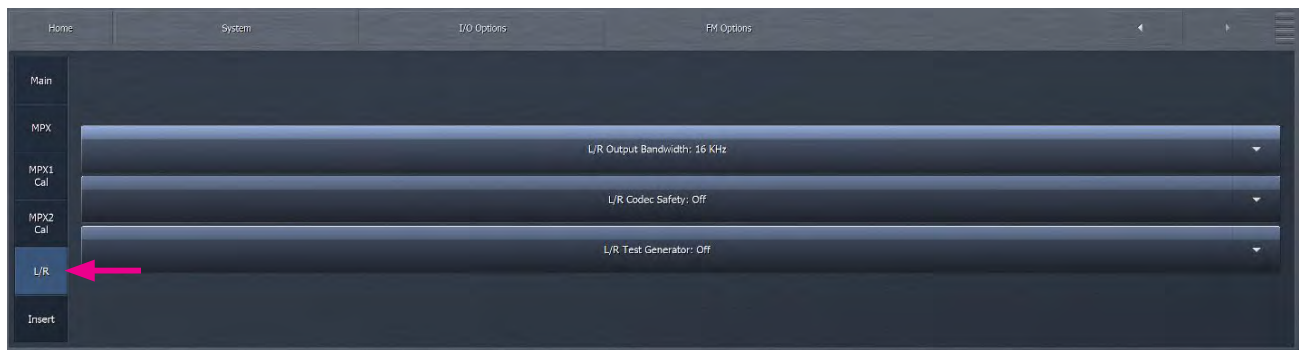
The careful observer may recognize that although SSB (Single Sideband) normally reduces RF bandwidth, it will not help in this case. In SSB we lose the 38110 Hz peak, but we still have the 37890 Hz peak, and with SSB it's 6dB stronger than before.

One solution would be to statically reduce the L-R signal as some processors do. However, this narrows the entire stereo image no matter what the audio content and is the equivalent of shooting a fly with a cannon.

Instead, Omnia.9's RF Bandwidth Controller (which is actually a limiter with thousands of bands) allows it to attenuate only the frequencies that cause problems without affecting the rest of the stereo image. This means tight control over your RF bandwidth without audible loss of stereo separation!



- ◆ The MPX Power Limit slider is used to set the MPX power as appropriate for particular countries when MPX Power is enabled.
- ◆ The Pilot Level control allows you to set the level of pilot injection over a range of 0 to 20% in one-tenth dB increments.
- ◆ Auto Pilot is a feature that automatically turns off the pilot when mono audio is detected which can help reduce multipath distortion and eliminate stereo noise when it is most noticeable, such as on dry voice.



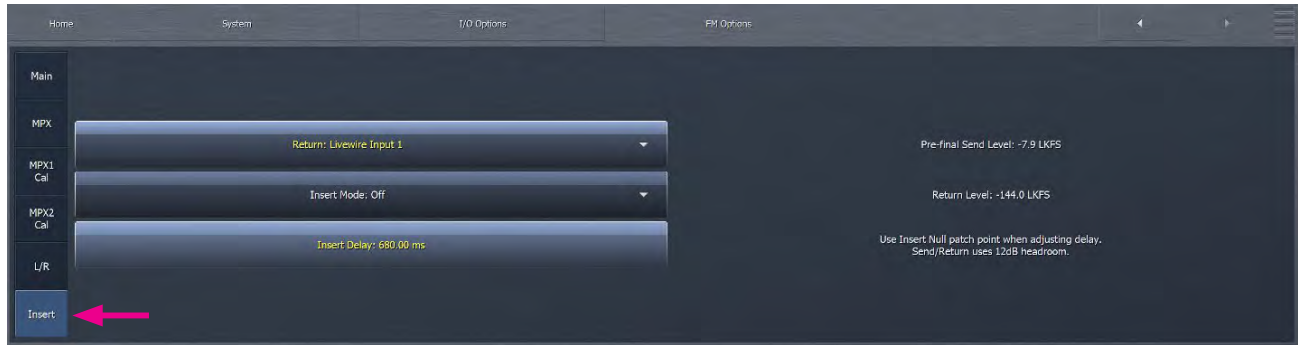
- ◆ The L/R Output Bandwidth drop-down allows you to select the audio bandwidth for the L/R outputs. Although the FM stereo standard dictates 15 KHz, in practice, with tight filters present in properly designed FM processors such as the Omnia.9, you can safely use 16.0 or even 16.4 kHz.

Note:

If you are using a 32kHz STL, you will need to set the L/R Output Bandwidth to 15 or 15.5 to prevent over-modulation.

If you are using your Omnia.9 to master music (some do – that psychoacoustic distortion masking clipper is the most effective weapon available in the loudness war), you'll like the 20 kHz and above settings that are also provided.

- ◆ The L/R Codec Safety drop-down control can be used to limit high-frequency headroom of the L/R output, a benefit when using a compressed digital STL and lower bit rates as it may help prevent bit rate reduction-induced peak overshoots. Settings are Off, Light, Medium and Heavy. You can see the exact effect it has by looking at the oscilloscope set to L/R Output with oversampling enabled.



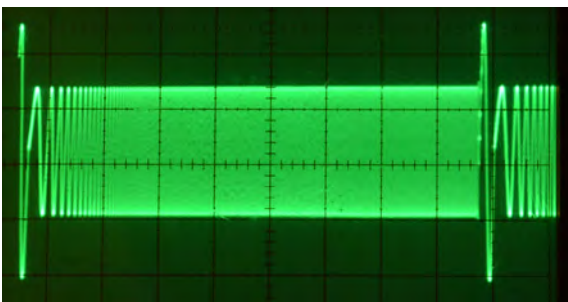
- ◆ The Insert sub menu in the System > I/O Options > FM Options menu allows you to insert an external effect unit such as a ratings encoder into the Omnia.9 processing chain at the ideal place right before the final clipper.

Please see the AM Processing section for a full description of this menu.

MPX Test Tone Generator: Control Details and Suggested Applications

The MPX and L/R Test Tone Generator controls allows you choose from several key test tones which can be very useful for testing and proofing transmission path components.

- ◆ Square is a 60Hz square wave useful for visualizing tilt.
- ◆ Quick Sweep is a very fast 1,000 – 60,000Hz sweep with a click before each sweep, designed to offer a visual reference as to the high frequency performance of your STL or exciter. If you were to connect an oscilloscope to a calibrated tuner with MPX output (such as the Belar Wizard, for example) this is the shape you would see if your STL or exciter had a flat high frequency response:



Any deviation from a flat high frequency response means a loss of loudness and/or stereo separation.

- ◆ Sweep (MPX) is a slow linear frequency sweep between 30 and 60,000 Hz.
- ◆ Log Sweep (MPX) is a logarithmic equivalent.
- ◆ 400Hz is a full amplitude sine wave to allow you to set an exact 75kHz deviation with a mod monitor.
- ◆ 0.5 – 5.0 and 0.5 – 30.0 are subsonic sweeps that allow you to see the extreme low frequency response of your air chain.
- ◆ 30Hz is a 30Hz sine wave. Certain exciters will go into protection mode if fed a full modulation sine wave this low in frequency, so please be careful!

- ◆ **30 Hz Phase Invert** produces a 30 Hz sine wave which abruptly changes phase twice per second. This test tone allows you to verify DC coupling of Omnia.9's composite output (with an external oscilloscope), as well as your exciter and your modulation monitor. Many exciters and even more modulation monitors have inaccurate low frequency response, which will cause severe over-modulation (or erroneously display severe over-modulation) if the low frequencies abruptly change, such as is customary in music that contains kick drums (which most songs do!).
- ◆ **Bessel Null 31,187.6Hz** allows you to set exact +/- 75kHz modulation with a direct off-air spectrum analyzer.

Omnia.9 provides extremely tight modulation control. Your modulation monitor's meter should essentially stand still at +/- 75kHz. (The composite meter in Omnia.9 will stand still at 75kHz no matter what any external equipment is doing). If it does not, **lack of DC coupling** is a likely culprit. To test for this, follow these steps:

- ◆ Connect an Oscilloscope (making sure it is DC coupled, not AC coupled) to Omnia.9's composite output.
- ◆ Select 400 Hz. Adjust the oscilloscope input level to accurately reach a particular set of lines.
- ◆ Select 30 Hz. Verify that the peaks reach the same lines at the exact same spot.
- ◆ Select 30 Hz Phase Invert. Verify that the peaks reach the same lines and never overshoot. For a "control sample", set your oscilloscope to AC coupling, and watch the waveform bounce.

We have now verified that Omnia.9's composite output is exactly accurate. You may also try the other test tones as well as program audio.

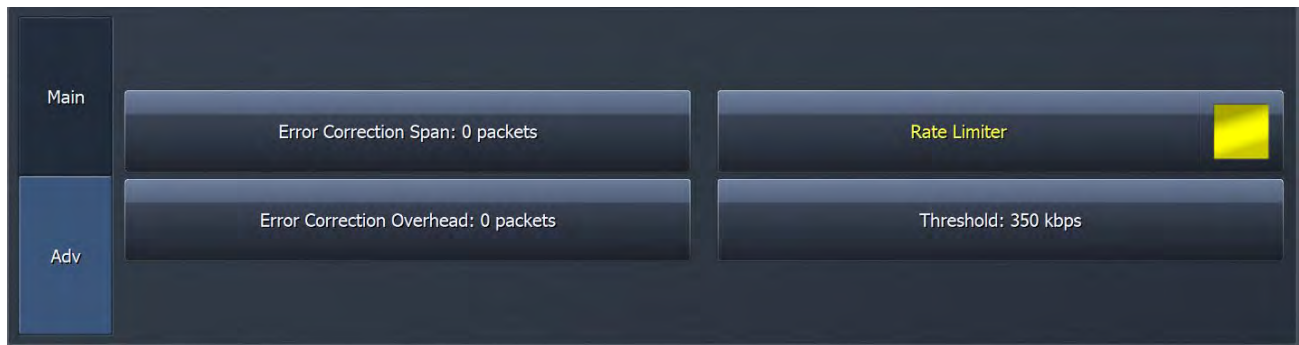
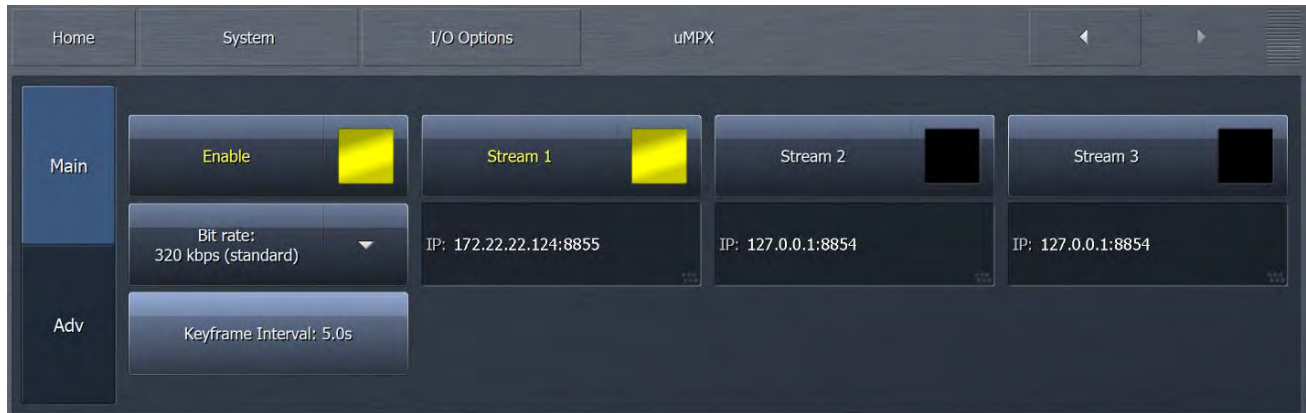
Here is another test, this time checking for overshoots:

- ◆ Connect Omnia.9's composite output to your exciter and look at your modulation monitor.
- ◆ Select 400 Hz and adjust for exactly 100% modulation.
- ◆ Then select 30 Hz and verify that you are reaching the same modulation level.
- ◆ Finally, select 30 Hz Phase Invert.

You will likely see some overshoot, but if you see more than a percent or two, then either your exciter (or STL) is causing the overshoots OR your modulation monitor is displaying overshoots that are not there. In extensive field testing, this problem has proven to be much more common than we ever thought! Please note that this problem affects every processor, but it has just never been as easy to pinpoint as it is now due to the presence of Omnia.9's built in signal generator.

μMPX (Omnia microMPX)

Omnia Micro MPX is an optional codec that can send a compressed composite MPX signal (including RDS information) over IP connections as small as 320kbps.



Omnia.9 is the first hardware processor to offer an encoder option for this revolutionary new codec. At the time of this writing, a μMPX decoder is available on our website as a software application, with Omnia hardware decoders coming soon.

μMPX retains all the advantages of the industry leading stereo generator in the Omnia.9, including RDS and auto-pilot, while maintaining competitive loudness and stellar audio quality.

As it grows in acceptance, μMPX will provide new cost effective STL solutions to feed lean, routable IP based composite signals point to point, or to an entire radio network.

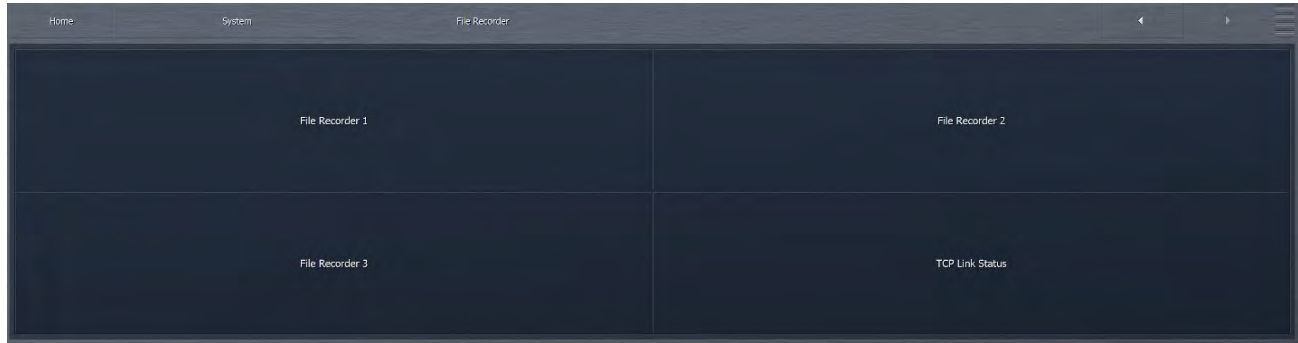
AM Options Menu

In the AM Main Options menu, you can engage or turn off the NRSC pre-emphasis, set high and low pass filters, invert input and/or output, set positive peaks, select output from processor or test generator, and set 100% modulation output level reference.

Please see the AM Processing section for a full description of this menu.

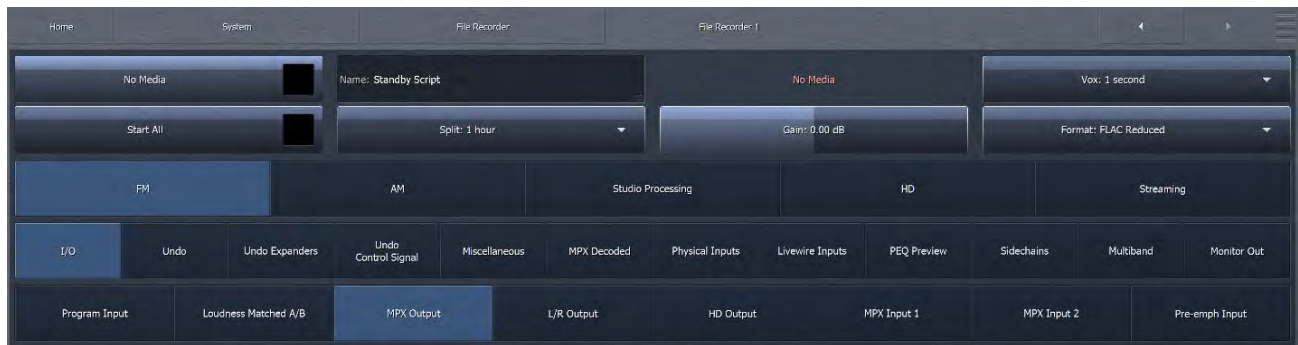
File Recorder Menu

Omnia.9 features three built-in file recorders that allow you to capture audio from various points within the processing chain onto a USB flash drive or internal hard drive.



Before you begin, select the “Name” input field and assign a name to your new file. Then choose which processing core (FM, HD-1, HD-2, HD-3, Stream 1, Stream 2, or Stream 3) you would like to record.

Next, pick a patch point from within the processing chain. Finally, enable “Rec” to start recording.



- ◆ The **Vox** control, when enabled, pauses recording when no audio is present and has a selectable timeout setting.
- ◆ The **Gain** slider controls the input level into the recorder. If you record a patch point with levels above 0 dBFS (for example Post Undo), you will need to attenuate it here by turning the level down, to avoid clipping during recording. Recording an MPX patch point has -3dB built-in attenuation, so no further attenuation is necessary to yield a -3dB peak MPX file, suitable for use in a modulation monitoring software program such as MpxTool. If you select Wave 32-bit, no attenuation is necessary.
- ◆ The **Format** drop-down lets you choose the resulting file format.

FLAC Lossless will yield a 16-bit FLAC file.

FLAC Reduced adjusts the recording resolution to match the actual noise floor of the audio, allowing you to record a full hour of off-air MPX audio in a file size of only 500mb. The resulting FLAC file can still be read by any program that supports FLAC.

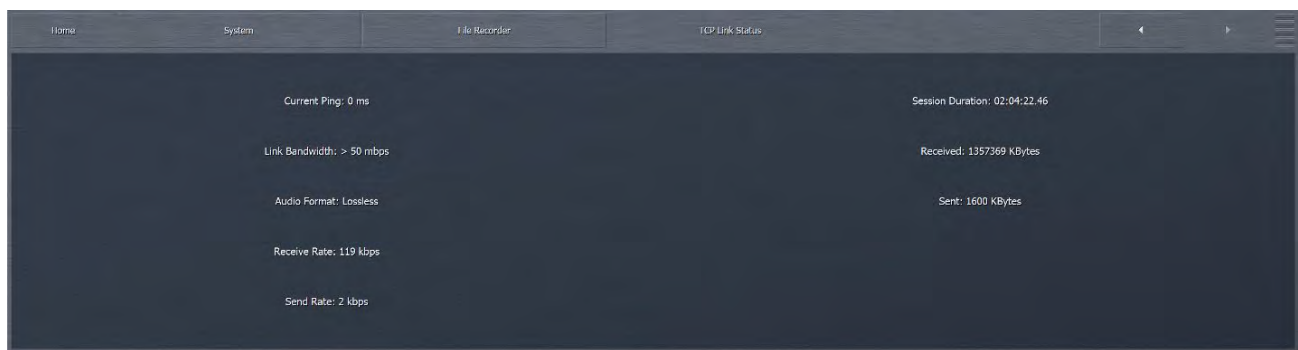
Wave 32-bit will field a 32-bit IEEE floating point WAV file, and this is the ideal format for recording a patch point with high levels, as 32-bit Wave files have headroom above 0dBFS just like Omnia.9 does internally.

Wave 24-bit and 16-bit yield 24- and 16-bit wave files, respectively.

MP3 High will yield a 320kbps MP3 file.

If you are recording directly from the Omnia.9 unit or on a remote computer with a high speed connection to Omnia.9, the Source window will show “PCM,” indicating the recording will be uncompressed PCM source data. If you have a slower remote connection, the window will show “Vorbis” indicating that you will be recording the decoded output of a lossy codec. In either case, the recorder always produces a file with the selected format, so be careful not to record to MP3 when the source is Lossy, as that would result in significant cascade bit rate reduction artifacts.

You also have the option to use Omnia.9’s Time-Based File Splitting feature, which allows you to record files of a specified length (15 minutes, 30 minutes, 1 hour, 2 hours, 3 hours, or 4 hours, as well as options for On The Quarter/Half Hour/Hour, to split based on the time of day) . As it is sample-accurate (except MP3) , you can splice the files together after recording if you like. Although FLAC and MP3 files have no file size limit (other than the amount of space on your external drive) , WAV files cannot be larger than 4 gigabytes, so we recommend leaving file splitting enabled.



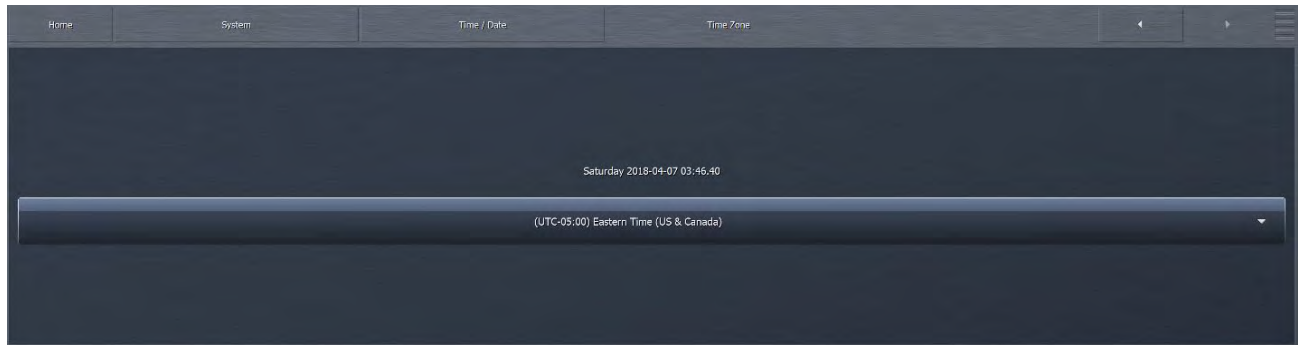
Time/Date Menu

The Time/Date menu has four sub-menus for setting Omnia.9’s internal clock: Time Zone, NTP, Set Clock Manually, and TCP Link Status.



Time Zone Menu

The Time Zone menu allows you to choose the proper time zone for your particular geographical area. Daylight Savings Time is automatically applied in applicable time zones.



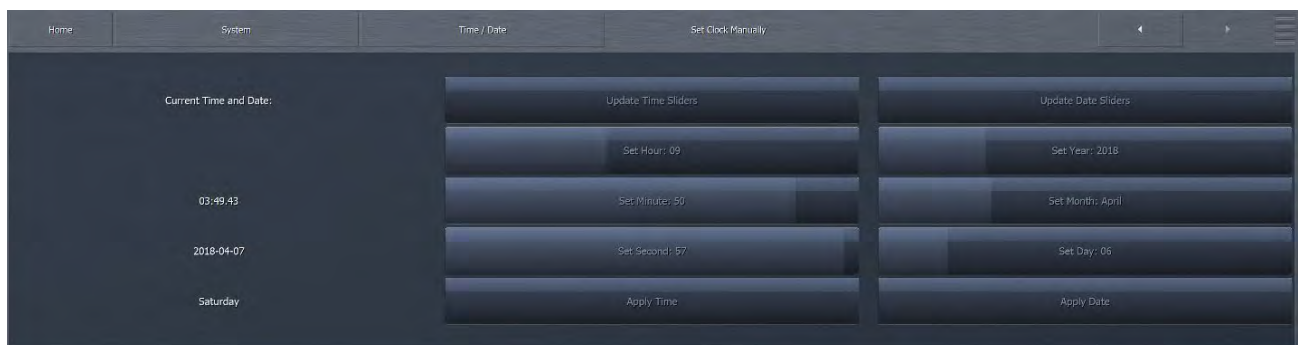
NTP Menu

The NTP menu contains the addresses for five Network Time Protocol servers. When enabled, NTP Synchronization will use one of these servers to keep the Omnia.9's clock synchronized.



Set Clock Manually Menu

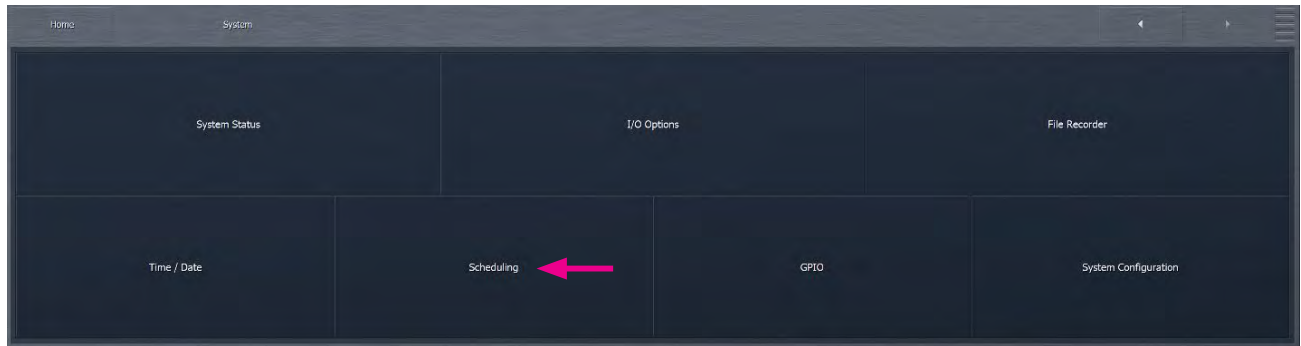
The Set Clock Manually menu contains the controls for manually setting the time and date.



- ◆ Selecting the Update Time or Update Date sliders will refresh the time displayed on the sliders. Use the Set Hour, Set Minute, Set Second, Set Year, Set Month, and Set Day sliders to reflect the current time and date, then select Apply Time or Apply Date to put the new values you have set into effect.

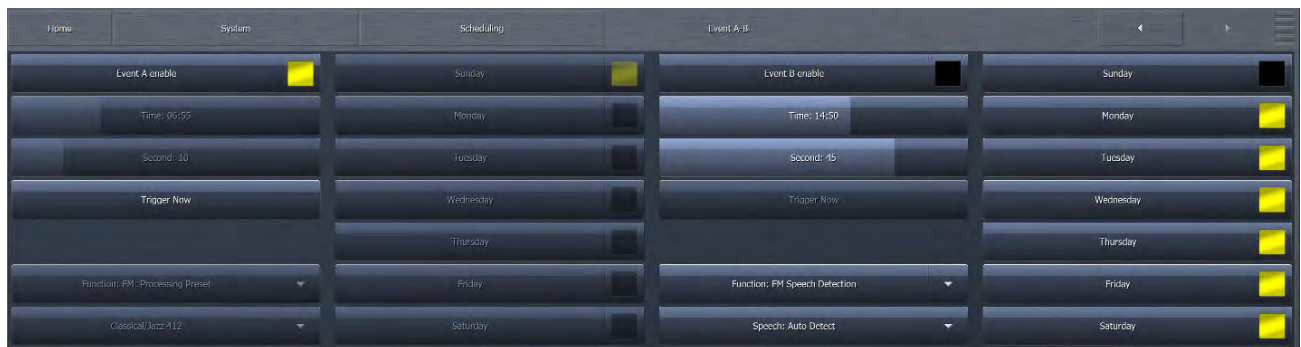
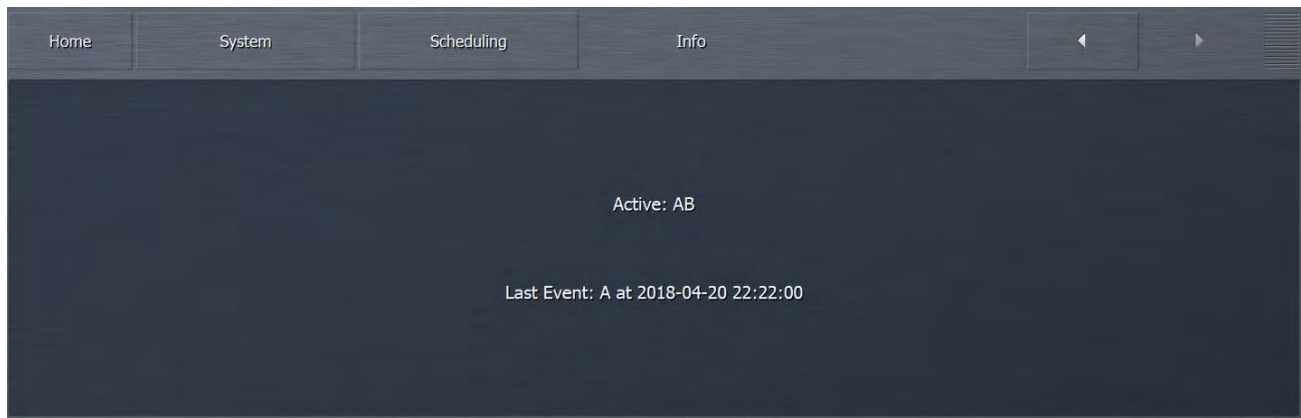
Scheduling Menu

The Scheduling menu allows you to program up to twenty-six (26) day- and time-driven events, including switching Undo Presets for each input, changing processing presets for the FM, Studio, and each HD and Streaming processing cores, and controlling the dry voice detector for each core.



Info Menu

The Info Menu displays events that are currently active and/or the most recent past event, if any.



Event Menus (A-B, C-D, E-F, etc.)

Each Event Menu window simultaneously displays controls for two separate events. An event may be scheduled on one, several, or all days of the week by enabling the Day of Week control for a particular day (s).



- ◆ The time at which the event occurs is determined by the **Time** (hours and minutes) and **Second** (seconds) sliders.
- ◆ The **Function** control selects the general event category, while the pull-down menu beneath the Function control is context-sensitive and provides a list of choices appropriate for the general event category. For instance, if the Function control is set to “FM Processing Preset,” a list of processing presets will be displayed.
- ◆ Once these parameters are set, the **Event Enable** control – not surprisingly – enables that event to occur at the specified date and time.

Note:

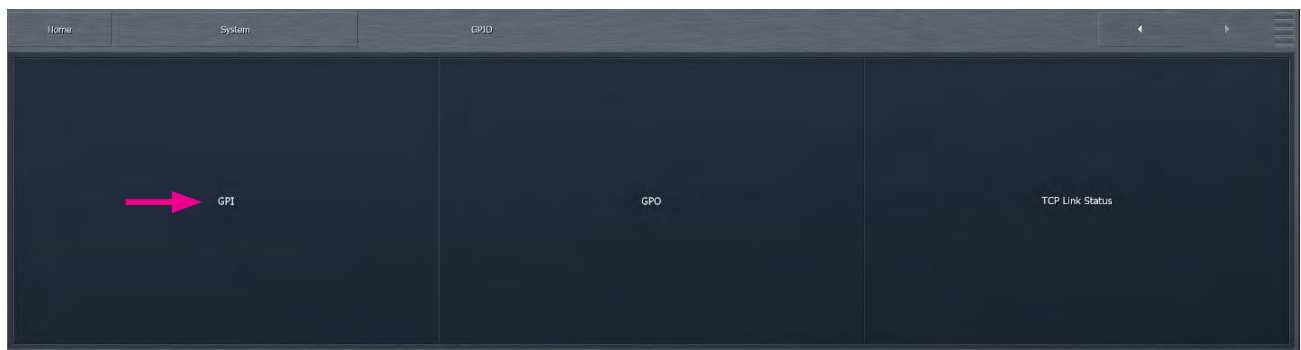
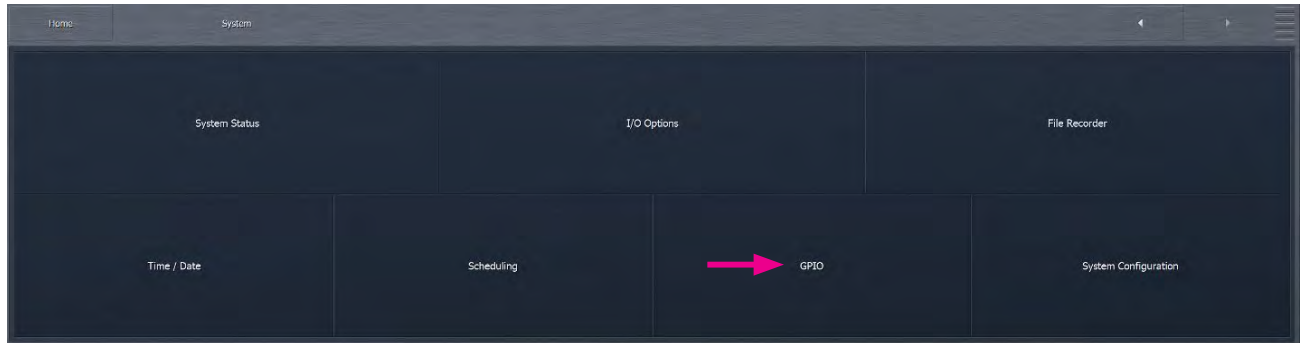
Be sure to set the day, time, and function parameters prior to enabling an event.

- ◆ Clicking or tapping the **Trigger Now** button executes the event immediately.

The current event remains active and on the air until the next scheduled event occurs. If only one event is scheduled, those parameters will remain active indefinitely or until another event is added to the schedule.

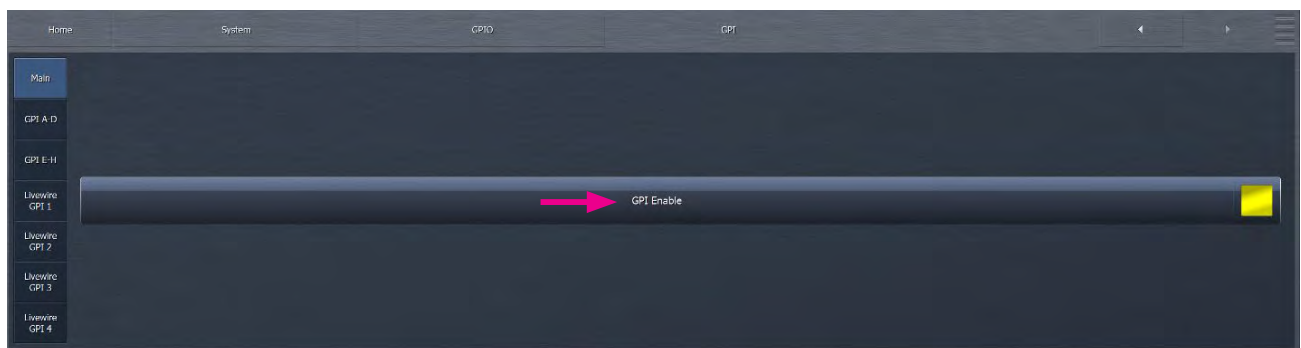
GPIO Menu

The GPIO menu contains controls to enable or disable GPIO functionality. Go to Home > System > GPIO, and select GPI.. When the GPI is enabled, by selecting GPI A-D or E-H, you can click on the top item in the menu stack to Disable, Task, Undo Preset (per processing core), Processing Preset (per processing core) Dry Voice Detection (per processing core), AM Night Mode and just about anything else you'd like to control externally. You can then select a LO or HI function enable, set up a latch set invert on or off. You can select from analog or Livewire.

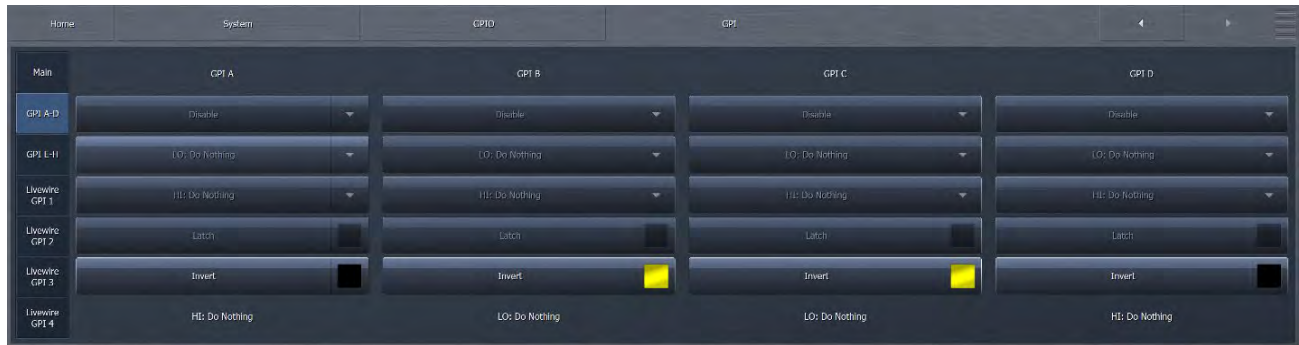


GPI Enable

The GPI Enable control is used to turn GPI on or off. Please note that GPI must be disabled in order to edit and configure the individual GPI functions.



Here is where you set GPI functions for main GPI or Livewire GPI.



GPI Function A-D / E-H

- ◆ The **Function** control in each GPI channel - A through H - determines which available parameter is affected when the input signal is received.
- ◆ The **Lo** and **Hi** controls work together to determine the specific action that occurs to the parameter selected by the Function control.
- ◆ **Livewire GPI** functions are set by selecting a **LW GPI** tab and selecting the desired function responses.

Pins 2 through 9 are GPI inputs 1-8. Pins 13, 23, and 25 are ground.

If a system is using relay logic, a contact closure from GPI to ground is “engaged” and an open contact is “not engaged”.

If supplied by a 5V GPO, 0V is GPI “engaged” and 5V is GPI “not engaged”. A 3.3V signal will also work.

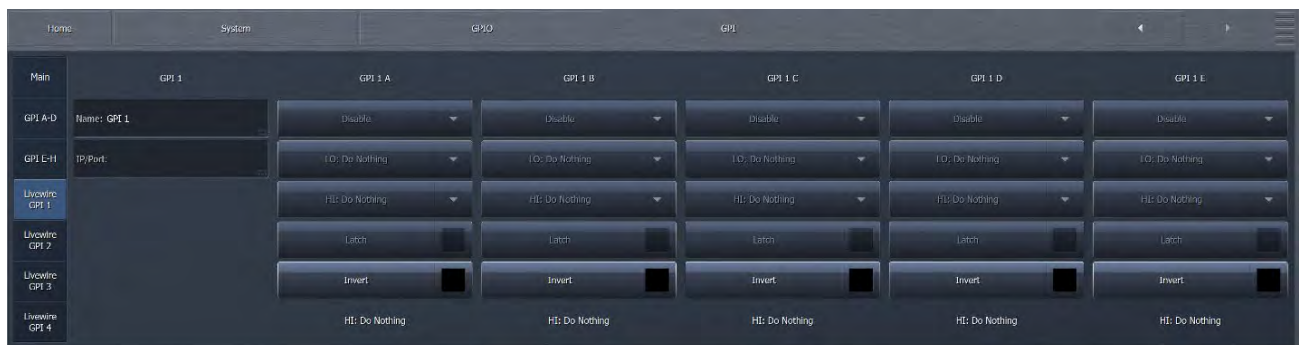
For continuous behavior, use one GPI for the action as follows:

- ◆ **LO** - Setting 1
- ◆ **HI** - Setting 2

For momentary behavior, use two GPI’s for the action as follows:

- ◆ **GPI 1 LO** - Setting 1
- ◆ **GPI 1 HI** - No change
- ◆ **GPI 2 LO** - Setting 2
- ◆ **GPI 2 HI** - No change

Always remember to re-enable GPI after making any changes!



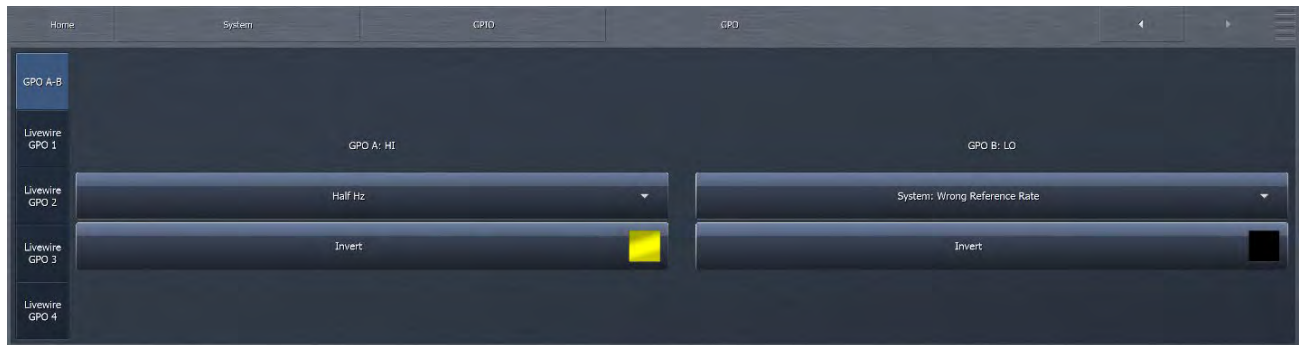
Livewire GPI Banks 1-4

Four banks of five Livewire GPIs are available on the Omnia.9 MKII platform for a total of 20 IP-based closure inputs. These GPIs operate in the same way as other Telos Alliance products having hardware GPIO pins. After enabling a GPI (labeled A-E in each bank) the dropdown lists for LO and HI will be populated with available values. GPI actions are momentary, but you can set them to Latch or Invert by selecting the control of the same name.

GPO Function A-B / and Livewire GPO 1 – 4

Similar to setting the GPI functions, the GPO functions are set through the GPO and Livewire GPO menus. There are two physical GPOs (A&B) on Pins 24 and 12 respectively. Livewire capability expands this to 20 IP based GPO's: four banks of 5 GPO closures.

Drop down menus allow you to select events or states to trigger outputs.



Task Scripts

The new task scripting function allows you to assign just about any Omnia.9 function to GPIO Functions or for dayparting. This feature is not directly accessible from NfRemote or the front panel, access is through the HTTP server only. However, when you've created your task scripts, you will see them in the GPI and Scheduling sections in both NfRemote and on the front panel.

Make sure you've added your workstation's IP to the HTTP access whitelist (Home / System / System Configuration / HTTP Access). Then connect to the Omnia.9's HTTP interface.

<http://your-omnia9-ip:7380/>

You should see this page:

Welcome to Omnia.9 mkII HTTP server - version 3.18.99 x64 [[Refresh](#)]

Host: OMNIA9-99901

- ◆ [List Parameters](#)
- ◆ [Preset Manager](#)
- ◆ [Launch Remote Interface \(Windows Application\)](#)
- ◆ [Log Files](#)
- ◆ [Task Scripts](#)
- ◆ [Internal Playback Log - Input 1](#)
- ◆ [Internal Playback Log - Input 2](#)

Downloadables

Download Remote Interface (Windows Application): <http://your-omnia9-ip:7380/NfRemote.exe>

Right-click on "List Parameters" and open the link in a new browser tab or window.

Leave the parameter list alone for now.

Click on "Task Scripts".

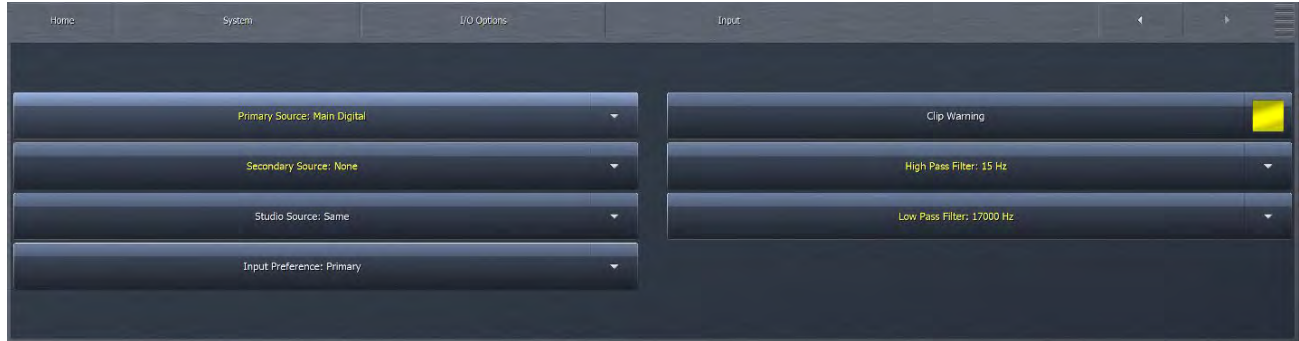
Click on Create to create new task.

You'll see several example lines. They're there to show you what it's supposed to look like, but you should delete them.

Now we need to find out the path to the parameter you actually DO want to change.

Just go to the parameter you want to change in NfRemote, right click on it, and select "Copy Path".

For example, navigate to Home / System / I/O Options / Input and right-click on Primary Source and select “Copy Path”:



Go back to the web browser with the New Task page, and paste.

You should get something like this:

```
/sys/i-o/source1_input1=1
```

That’s actually all it takes to write a script to set the Primary Source parameter to what it currently is (Main Digital in this case).

If you want to set it to something else, there are two ways. The easiest is to change the setting (for example to Analog), and then Copy Path again.

You would then get:

```
/sys/i-o/source1_input1=0
```

...but of course by changing the parameter, you’ve also now changed your actual on-air settings.

The other way is to go to the List Parameters tab (the one you opened before), and find the correct parameter.

In this case, the easiest way would be to:

In the parameter list, search (CTRL-F in your web browser), search for “source1_input1”. This identifier is visible in the tool tip, and it’s also of course in the path we copied before.

Click on the parameter. It will show you ALL the available options, and what the values are!

In this case:

```
/sys/i-o/source1_input1=="0" (Backup: "1")
```

Primary Source: Analog (Backup: Dig)

Value 0 (Analog) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=0

Value 1 (Main Digital) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=1

Value 2 (AES Reference) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=2

Value 3 (Aux Digital) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=3

Value 4 (Livewire Input 1) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=4

Value 5 (Livewire Input 2) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=5

Value 6 (Livewire Input 3) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=6

Value 7 (Livewire Input 4) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=7

Value 8 (Livewire Input 5) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=8

Value 9 (Livewire Input 6) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=9

Value 10 (Livewire Input 7) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=10

Value 11 (Livewire Input 8) : http://omnia9-99901:7380/parameter/sys/i-o/source1_input1=11

Instance: System
 Core: I/O Options
 Category: Input 1

Get Value Link: http://omnia9-99901:7380/parameter/sys/i-o/source1_input1%3f

Reload: http://omnia9-99901:7380/parameter/sys/i-o/source1_input1

List Parameters: <http://omnia9-99901:7380/listparams>

You can then simply change the number at the end of the line in the script, to make it set the value you want.

You can then Test the script to make sure it can find all the parameters.

You can Execute the script, to make sure it does what you want.

Finally, give it a name (other than New Task), and Save it. A good name might be “Use Backup Feed”.

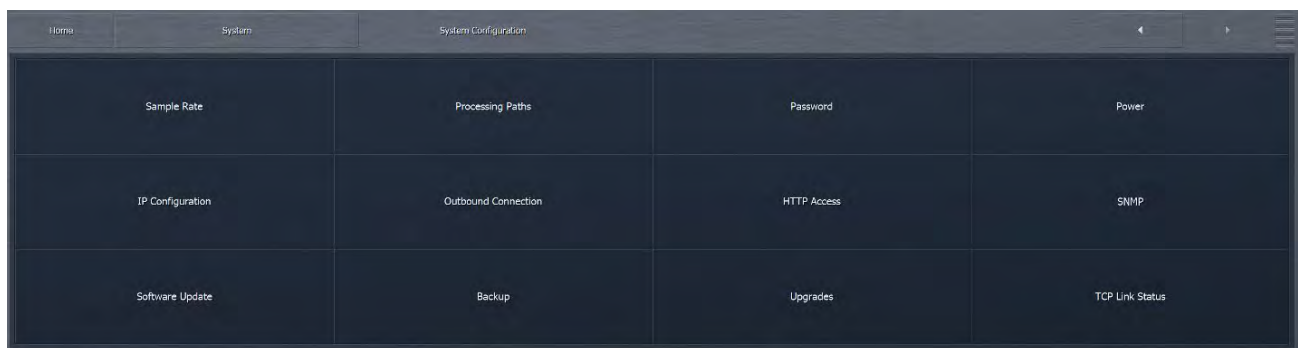
As soon as you’ve saved it, look in NfRemote again in Home / System / GPI. When “Function:” is set to “Task” in any of the GPI Function sections, the script you saved should be instantly available in the “LO:” and “HI” dropdowns!

This may seem complicated to just change inputs, but I would argue that it’s really not – what it is, is Universal.

Because, this is not limited to the changing of inputs – you can make a task change any one or any number of the thousands of parameters in the Omnia.9, in response to either GPI or Dayparting.

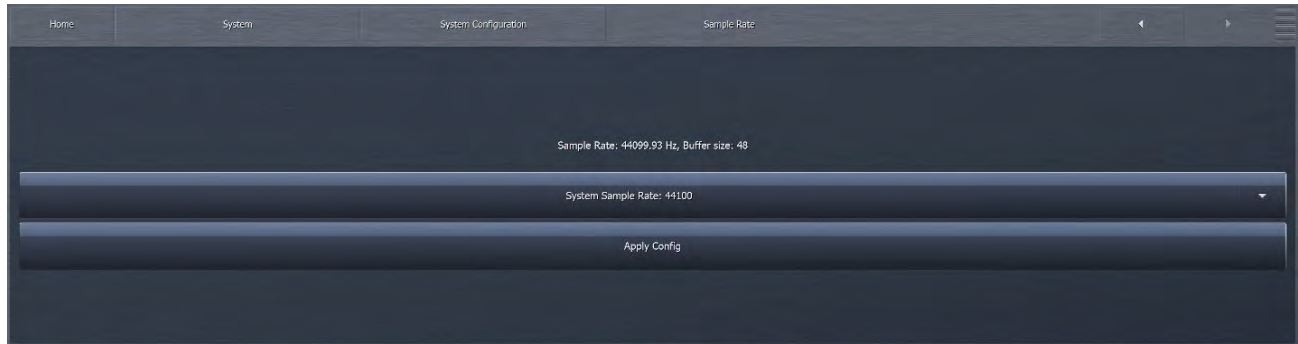
System Configuration Menu

The System Configuration menu contains the controls to select an internal sample rate, determine how many processing cores are available, how many streaming encoders of each variety are available, set a system password, power cycle or shut down the unit, set a display timeout, establish an IP “white list” for remote HTTP access, assign an IP address to the unit, and set up SNMP. You can also check the software and GUI versions, save your custom configurations to a USB drive, update to the latest software versions, and, if you purchased an Omnia.9 without the additional HD and streaming capabilities, unlock additional HD, streaming cores and unlock other options via software key .



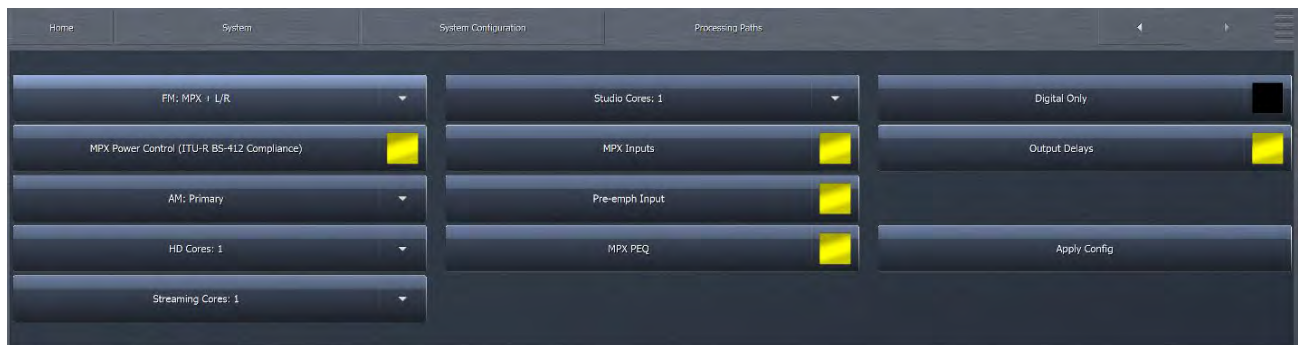
Sample Rate Menu

The **Sample Rate** menu lets you choose the internal sample rate at which Omnia.9 will run, either 44.1kHz or 48kHz. The default rate is 44.1kHz. Be sure to select **Apply Config** to put the changes into effect, keeping in mind that doing so will cause an interruption to program audio as Omnia.9 restarts. HD radio requires a sample rate of 44.1 kHz, whereas DAB radio requires a sample rate of 48.0 kHz.



Processing Paths Menu

The **Processing Paths** menu allows you to choose the type and number of FM, AM, HD, Studio, and streaming processing cores available, enable MPX Power Control for ITU-R BS-412 Compliance, and enable the studio processing core, the composite inputs, an additional auxiliary monitor output.



- ◆ The FM pull-down menu allows you to enable a processing core for the FM MPX (composite) output, L/R output, or both.
- ◆ The MPX Power Control control allows Omnia.9 to operate in compliance with ITU-R BS-412 regulations.
- ◆ The AM pull-down menu allows you to enable a processing core for AM.
- ◆ The HD Cores menu lets you choose how many HD processing cores are available.
- ◆ The Streaming Cores menu allows you to choose how many streaming processing cores are available.
- ◆ The Studio Core menu enables or disables the dedicated studio core, an independent low-latency path especially suited for talent monitoring.
- ◆ The Aux Monitor Output is a third speaker controller, similar to the Speaker and Headphone Outputs, which can be used to route audio to another studio or area of the station. Because it is fully routable and can provide audio from many different patch points within Omnia.9, you can also use it to feed audio to another processor.
- ◆ The Pre-emph Input control is similar to the MPX inputs, but is useful when the L/R output (either flat or pre-emphasized) of another audio processor is fed into Omnia.9.

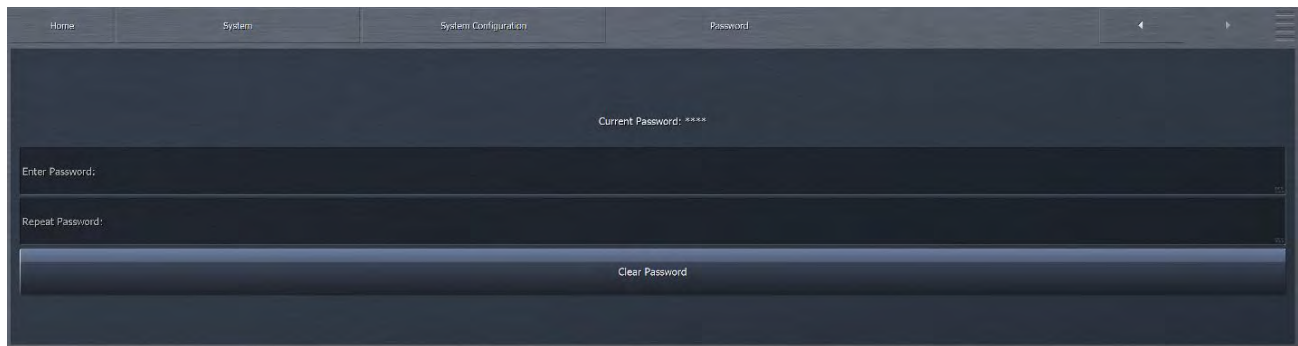
Note:

This input can receive audio from any of Omnia.9's three digital inputs only, or Livewire, but not the analog input, as the analog input is not DC coupled.

Password Menu

The password you set here controls access to the Omnia.9 as well as through NfRemote.

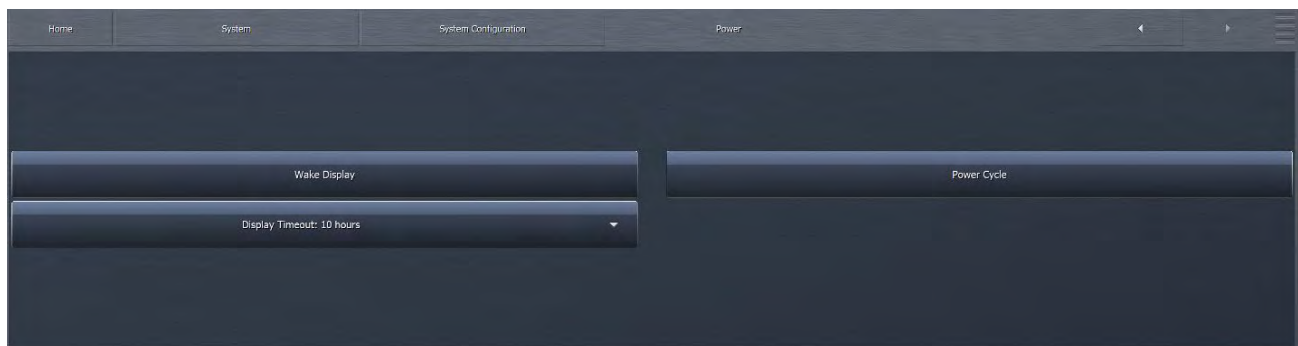
If you do not set a password, the front panel cannot be locked, and you *cannot* connect through NfRemote.



- ◆ Selecting the **Enter Password** field brings up the on-screen keyboard for entering a system password, which must be entered again in the **Repeat Password** field for verification, and click **Set Password**.
- ◆ To lock the front panel touchscreen, select the **Menu** button on the Home Screen and choose **Lock Front Panel**. To clear the passwords, leave both the **Enter Password** and **Repeat Password** fields empty and select **Clear Password**.
- ◆ To unlock the unit, enter your password and select **Unlock**. If you forget your password, Omnia support can help you unlock your unit.

Power Menu

The **Power** menu provides a means by which to restart or shut down your Omnia.9 and adjust the front panel display timeout. The **Power** displays differ between what you see on the physical unit, vs what you see via remote. This is the screen you see on the Omnia.9 front panel:



- ◆ The **Power Cycle** option safely shuts down the unit and restarts it – akin to a computer “reboot.”
- ◆ The **Safe Shutdown** option properly and completely shuts down the unit. This function is available only on the front panel, not through the remote software, as accidentally pressing it could result in an unplanned visit to the transmitter site!
- ◆ The **Display Timeout** menu determines how long the front panel display remains on after it was last used. It can be set to stay on for 10 minutes, 1 hour, 10 hours, or 24 hours. The default setting is 24 hours.

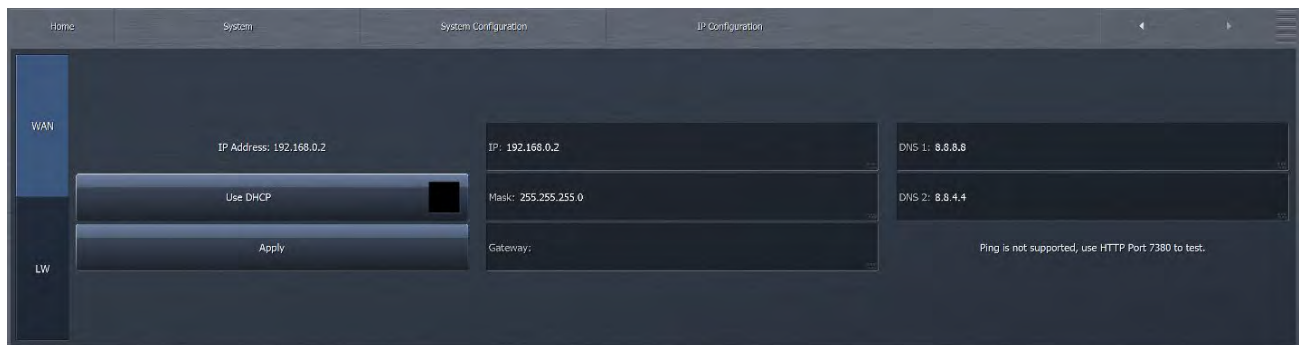
Note:

If you have one of the earliest units, (serial number 0025 and earlier), once the screen is asleep, it cannot be woken by touch, due to a hardware issue. In this case, you can wake the screen from NfRemote by pressing the Wake Display button in order to access the front panel.

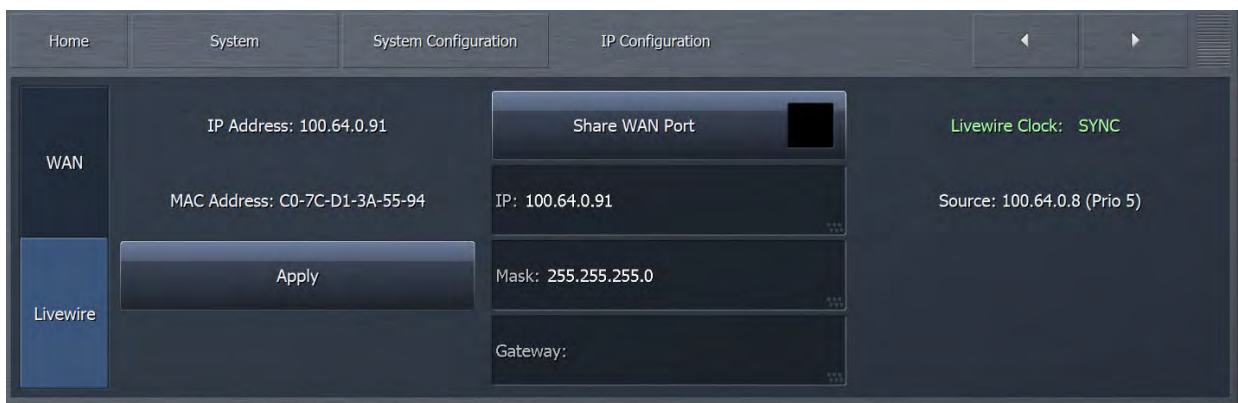
- ◆ The Wake Display menu allows you to reset the internal LCD display on the physical unit, in case it becomes unresponsive.

IP Configuration Menu

The IP Configuration menu allows you to assign IP addresses for WAN and Livewire / AoIP network adapters, enter subnet mask and gateway information for your network (s) , and enter DNS addresses.



- ◆ The Use DHCP button allows your local router to assign an IP address to the unit.
- ◆ Selecting Apply puts any changes you have made to these parameters into effect after a few seconds.

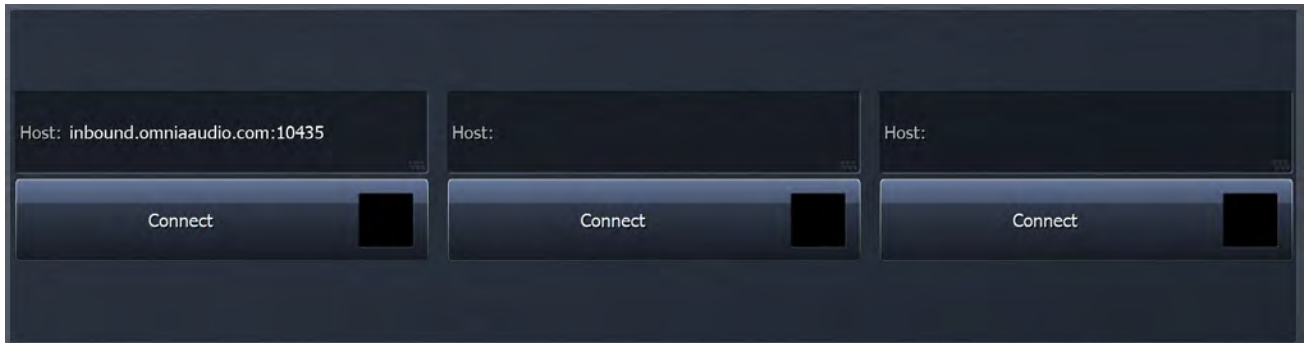


- ◆ The Livewire IP configuration menu has similar controls to the WAN menu, and also provides Livewire Clock status and a Share Wan Port control.
- ◆ When enabled, Share Wan Port allows all network traffic to travel over a single network connector (marked WAN on the rear panel) . This control is useful for facilities that don't have segregated Data and Livewire/AoIP networks.

Outbound Connection Menu

The **Outbound Connection** menu controls a very useful feature to go through firewalls you have no control over, by making the Omnia.9 initiate the NfRemote connection, rather than listening for an incoming connection that the firewall will not let through anyway. By putting NfRemote in listening mode (Inbound connection) on your local machine where you *do* control the firewall and port forwarding, and leaving Outbound Connection enabled with a dynamic DNS host name, you will always have a way in.

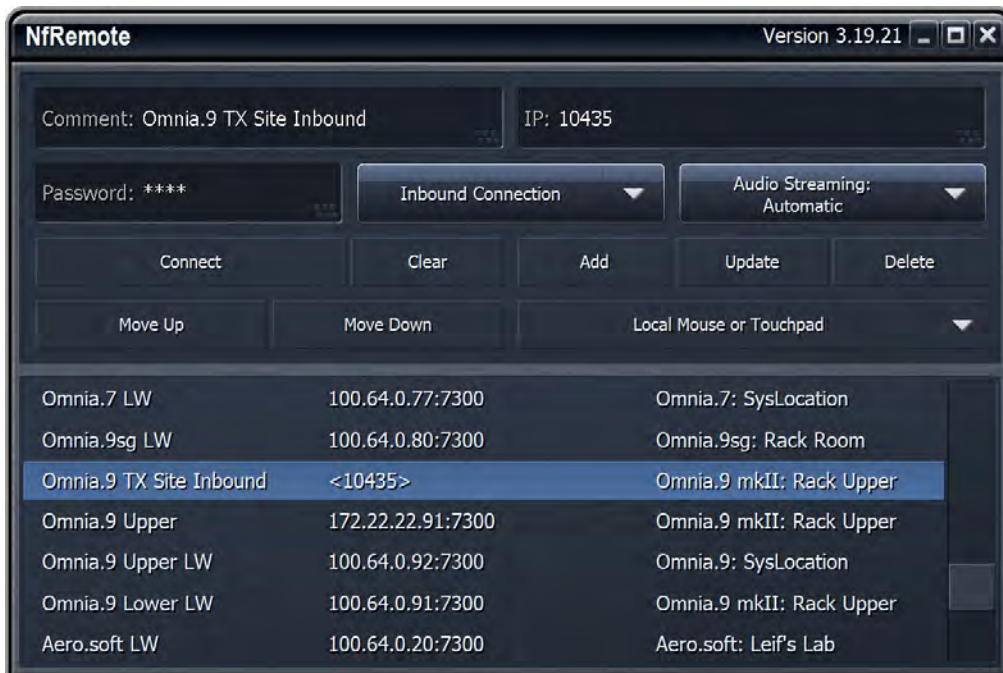
Enter the host name and port you want the Omnia.9 to attempt its NfRemote TCP/IP connection to.



Enable the **Connect** toggle switch, and Omnia.9 will attempt to connect indefinitely.

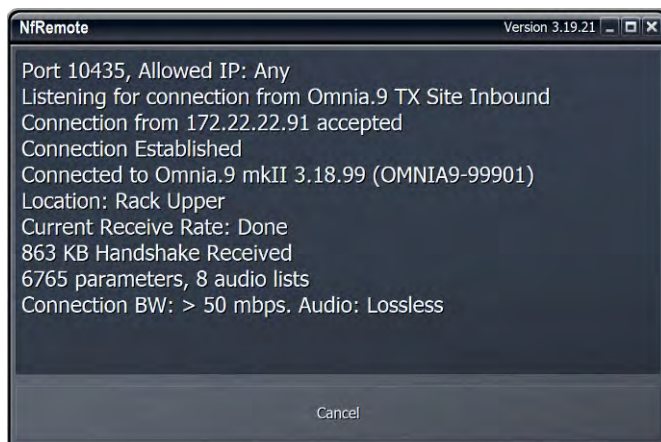
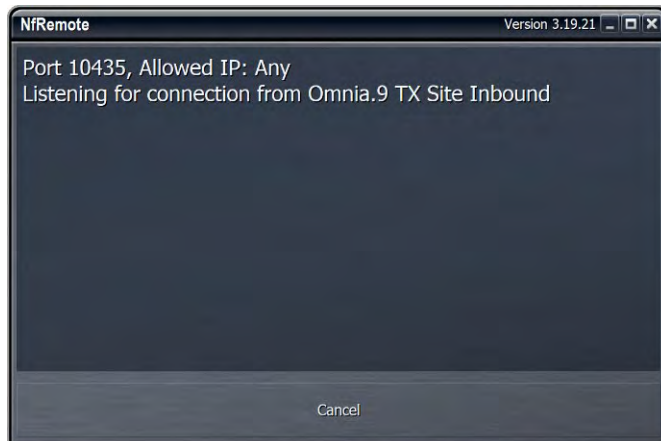
On your client machine, set NfRemote to accept an Inbound Connection. In the IP field, type the port number, for example 10435. You can also enter an IP address, wildcards or a full subnet mask in addition to the port number, which will instruct NfRemote which IP addresses to accept a connection from – useful if you have multiple Omnia.9’s on different public IP addresses connecting outbound to the same IP and port. These are all valid examples:

10435	Port 10435, accept any IP
164.33.25.7:10435	Port 10435, accept only IP 164.33.25.7
164.33.25.*:10435	Port 10435, accept 164.33.25.xxx only
164.33.25.0/255.255.255.248:10435	Port 10435, accept 164.33.25.1-164.33.25.6 only



Note:

You must also enter the correct password to be able to establish a connection, just as with an outgoing connection. When you press Connect, NfRemote will enter listening mode.



When NfRemote receives the connection request from the Omnia.9 MKII, the connection handshake will proceed normally, and the familiar user interface will open.

After you disconnect, Omnia.9 will keep reconnecting forever – rapidly at first, but gradually slowing down, until it idles at a rate of *one* connection every four minutes. This means bandwidth use over time will be negligible, but when you need to get back in, you will have to wait no more than four minutes, and once there's been a successful connection, Omnia.9 will again reconnect rapidly for a while.

HTTP Access

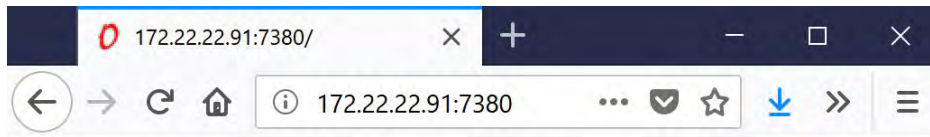
The HTTP Access menu allows you to control access to the HTTP server (port 7380) used for automation. This is the only security method for the HTTP server, there is no password. If you're connecting from a whitelisted IP, everything is wide open. **This whitelist does not affect NfRemote connections, which are access-controlled by password *only*.**



There are eight slots. The default value in the first slot of 127.0.0.1/255.255.255.255 is a complicated way of saying “localhost”, which always has access even if you erase it from the slot, so it is only there as an example. Each slot accepts either a single IP address, an IP with wildcards, or an IP with subnet mask.

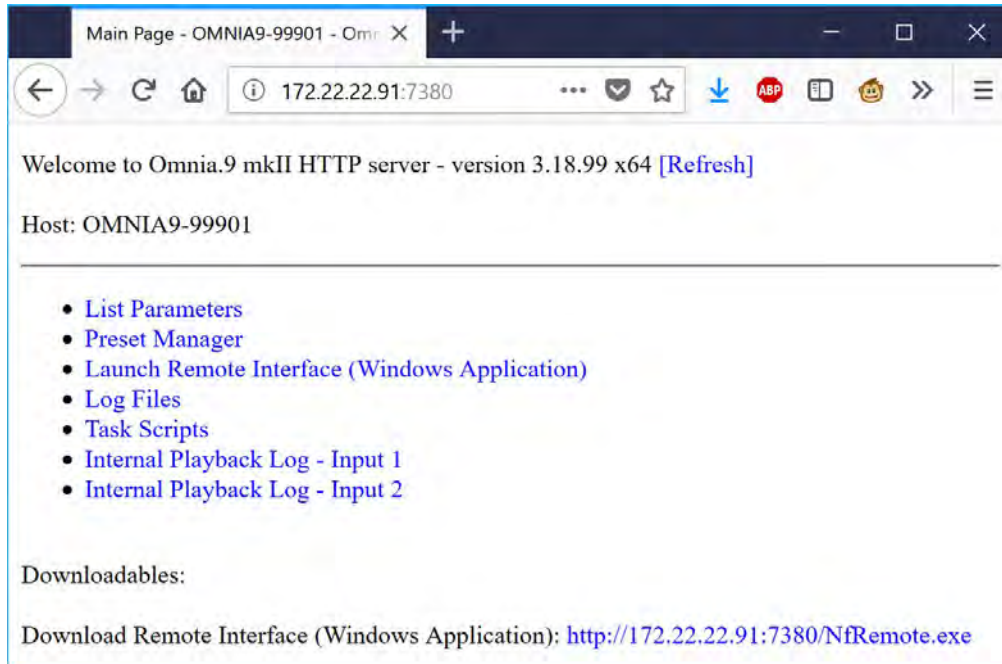
192.168.5.7	Accept only IP 192.168.5.7
192.168.5.*	Accept IPs 192.168.5.1 through 192.168.5.254
10.0.0.0/255.255.0.0	Accept IPs 10.0.0.1 through 10.0.255.254

If you attempt a connection from an IP not on the whitelist, Omnia.9 will respond as follows:



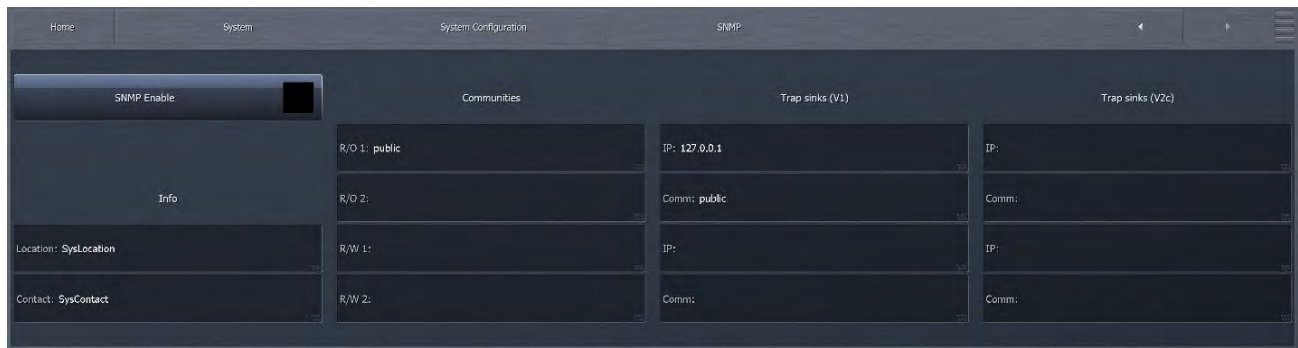
Unauthorized access from 172.22.22.41. For access, add your IP or subnet in System - System Configuration - HTTP Access.

If you *are* on the whitelist, the request will succeed.



SNMP Menu

The SNMP menu allows you to set the Simple Network Management Protocol parameters via NfRemote. It also lets you set the Location string of the Omnia.9 which will automatically be displayed in NfRemote and on the front panel.



The SNMP menu provides the means to enter the information necessary to facilitate communication between Omnia.9 and your SNMP manager. It supports SNMP versions V1 and V2c.

- ◆ The **SNMP Enable** control enables and disables SNMP. Note that SNMP must be disabled in order to make changes to this section.
- ◆ The **Communities** and **Trap Sink** fields accept the community names and IP addresses or names of the trap receiver.
- ◆ The **Contact** field accepts the e-mail address of the designated contact.
- ◆ Information entered in the **Location** field appears on the front panel display and on remote connections and makes it possible to quickly identify which particular unit you are viewing. This is especially convenient if you are monitoring more than one Omnia.9 simultaneously.

The Omnia.9 MIB file is available via the built-in HTTP server on the SNMP Test Page which can be accessed from any white-listed computer on your network.

Enter the IP address of Omnia.9 followed by the port number and /SNMP as follows, substituting your IP address: <http://your-omnia9-ip:7380/SNMP>

A Test Mode is also provided to help setup and verify proper SNMP configuration and communication.

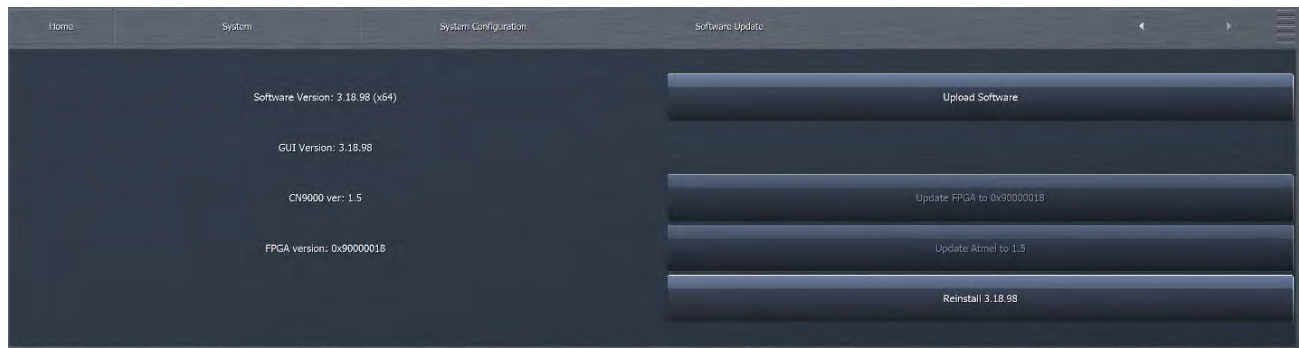
Note:

Please bear in mind that when test mode is enabled, no auto-generated SNMP traps will be sent and any GETs will return the test value, not the actual value.

SNMP in Omnia.9 is strictly status only. There is to support for using SNMP to affect operation of the Omnia.9. There are however an abundance of available status parameters and traps.

Software Update Menu

The Software Update menu (Home / System / System Config / Software Update) displays the current version of the Omnia.9 processing software and the GUI software.



The update .pak file downloaded from the Omnia website must be used as-is and can be copied to the root of an external USB drive to update the unit locally or can be used by the NfRemote software to update the unit remotely. This menu will look different from the front panel and through NfRemote.

To start the update process, put your backup processor on the air and then navigate to Home / System / System Config / Software Update.

If using NfRemote, click the **Upload Software** button. A select file dialog box will open, where you'll need to locate the downloaded update PAK file on your computer and then click **Open** which will upload it to the unit.

Upload status will be displayed on the Upload Software button. When the upload has successfully finished, the status line below should say "3.xx.xx updater ready". Click the **Update Software to 3.xx.xx** button to start the update process, which will take you of the air anywhere from a few seconds to a few minutes depending on the age of your current Omnia.9 software version.

If using the front panel, place the new PAK directly in the root directory of a USB drive (making sure there are no other Omnia.9 PAK files there) and plug it into the rear of the unit. The **Update from USB** button should become available after a few seconds. Tap it and follow the on-screen instructions. The update will take you of the air anywhere from a few seconds to a few minutes depending on the age of your current Omnia.9 software version.

Note:

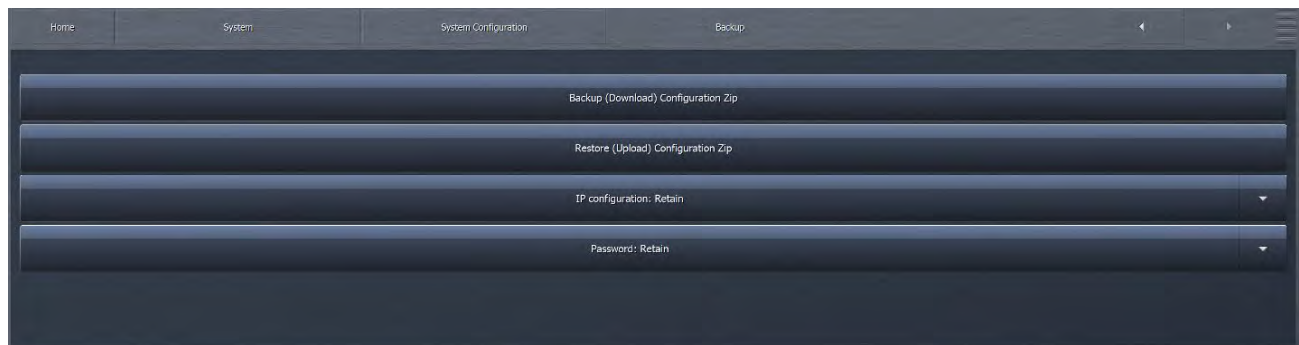
Please note that updating the software WILL take the Omnia.9 off the air! Be sure to switch to your backup processor before beginning the update!

Backup Menu

The Backup Menu appears as an additional System Config item *only when you are connected to Omnia.9 via the NfRemote software, not when viewing the front panel display*, and allows the entire configuration of the unit to be saved to your PC in a single .zip file. It also allows a previously saved configuration to be uploaded to the Omnia.9.

This configuration “profile” includes factory and user-created processing, Undo, I/O presets and all other configuration information. It also includes logs, crash dumps, and a full human readable configuration dump that shows the value of every single Omnia.9 parameter inside an automatically generated HTML file, so that you can explore the contents of a backup file on your computer without actually applying it.

Should you wish to “clone” your Omnia.9 you can do so simply by uploading the file to the second unit instead of configuring each parameter individually, rather like the concept of creating an “image” in computer terms. This is also handy if you (or someone else) accidentally changes something and isn’t sure of the original settings, as uploading a known good configuration can immediately get things back to normal similar to using a “restore point” in PC terms.



- ◆ The Backup (Download) Configuration button saves the current configuration to your computer. Selecting it opens up a Windows Explorer window allowing you to name and choose the location of the saved file.
- ◆ The Restore (Upload) Configuration button uploads a previously saved configuration to Omnia.9. Selecting it opens up a Windows Explorer window allowing you to navigate to the file on your computer and select it. A confirmation message will appear asking you to verify the upload.

Note:

This will temporarily take Omnia.9 off the air and disconnect the remote connection while the configuration file uploads and the unit reinitializes.

The backup configuration file contains IP-related information and the password belonging to the unit that created the file.

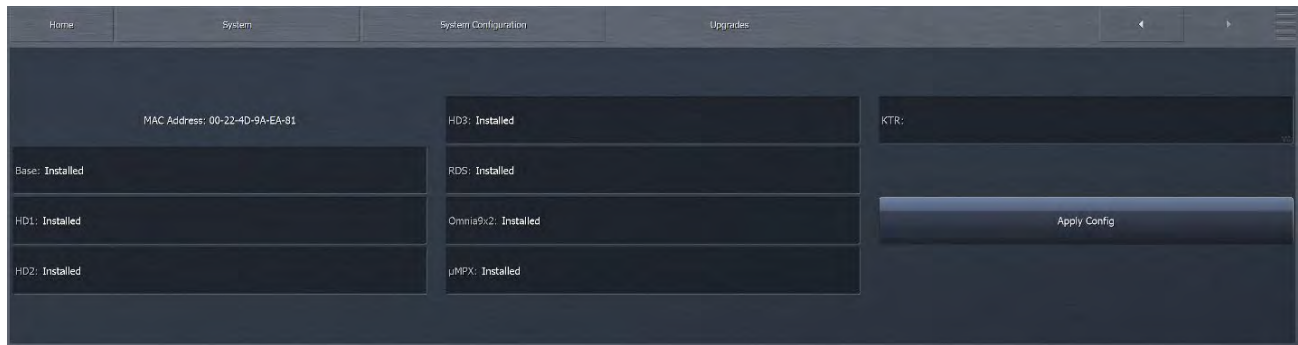
- ◇ The IP configuration and Password drop-down menus determine what to do with the IP configuration and the Password stored in the backup when restoring an backup. The default is to Retain the current configuration in the Omnia.9, thus ignoring what’s in the backup, as it would be easy to lock yourself out or cause an IP address conflict on your network if they were set to Override by default.
- ◇ Selecting “Override” will take the IP configuration and the Password stored in the backup file and apply them as part of the restoration process.

- ◇ Generally speaking, if you are working with a single Omnia.9 and need to bring it back to a known good configuration, choose “Override.” If you are copying a custom configuration to another Omnia.9 and want to avoid potential IP conflicts (like duplicate IP addresses) or uploading an unknown password, choose “Retain”.

Upgrades menu

The Upgrades menu displays options installed on your unit. You can add options and upgrade your Omnia.9 at any time, in many cases without needing to purchase new hardware. Please call Omnia support for more information. The KTR option, supporting Kantar audio watermarking, requires upgrade to the MKII platform.

When you’re received the license codes for your purchased new options, paste the license codes in the correct slots on this page and press “Apply Config” to validate and install them. If your string is valid, status will return as “Installed”. If the number remains in the box after restart, the entered license code was not accepted as valid.



24 Getting the Sound You Want

Quality v. Loudness

Omnia.9 is capable of providing sound quality superior to any other processor available today, and is equally capable of being louder than the competition, too.

If loudness is your primary goal, you will find that you can match the level of your current processor while getting a much cleaner on-air sound. If high-quality audio is your goal, you will be able easily achieve that goal and get the extra benefit of increased dial presence.

Omnia.9, more than any other processor, minimizes the impact of the classic “quality v. loudness” trade-off by employing processes like “Undo” and an advanced psycho-acoustic distortion-masking clipper, but bear in mind that NO processor can eliminate that compromise completely.

The trade-off between quality and loudness is still determined primarily by the settings of the Limiters and Clippers. Both processes can add to dial loudness, but each does so in a different way, with different-sounding results (and, if used to excess, different sounding artifacts).

The added short-term density provided by peak limiting can still make audio sound dull or overly-dense and create intermodulation distortion, and a little still goes a long way. The amount of limiting action is somewhat dictated by the program material itself. Audio that is already dense and has a high average level – even after being processed by Undo – will still cause less peak limiting than material that is more open with lower average levels and higher peak levels.

For example, almost any poorly mastered current CD that’s already been squashed down and has only a few dB’s of dynamic range already is not going to get the limiters moving – but a well-mastered Steely Dan song will!

Excessive clipping, on the other hand, creates harmonic distortion and can make things sound “edgy” or “torn.” It is imperative to remember that even when all-out loudness is your goal, *there will come a point when driving the clippers harder will not create additional loudness but will create more distortion*, and there is no benefit to going beyond that point.

Achieving a High Quality Sound

When all-out loudness is not your primary processing goal, and you are willing to give up just a bit of dial dominance in the name of quality, here are some suggestions to help you achieve that goal:

- ◆ Reduce the Clipper Drive (FM core) or Final Limiter Drive (HD and Streaming cores) in 0.25dB steps until you reach the point where the quality no longer dramatically improves, but you're losing too much loudness - then go back up a notch. It's surprising how much a small change can open up your sound without giving up much in the way of loudness.
- ◆ Reduce the level of the Band Mix section, especially if you have increased the output of one or two particular bands to achieve a particular sound.
- ◆ Raise the threshold of the Multiband Limiters to keep the audio from hitting the limiters as hard or as often. (You may need to lower the Band Mix level to keep from driving the final clipper too hard when making this adjustment).
- ◆ Lower the targets of the Multiband AGC compressors
- ◆ Use slower attack and release speeds in the Input AGC, Wideband AGC, and Multiband AGC sections.
- ◆ Use "looser" ratios in the Input AGC, Wideband AGC, and Multiband AGC sections.

Achieving Loudness

If loudness is an important processing goal, and you are willing to accept more processing artifacts and give up some quality, here are some suggestions:

- ◆ Use "tighter" ratios in the Input AGC, Wideband AGC, and Multiband AGC sections.
- ◆ Use faster attack and release speeds in the Input AGC, Wideband AGC, and Multiband AGC sections.
- ◆ Raise the target of the Multiband AGC compressors.
- ◆ Lower the threshold of the Multiband Limiters. (You may need to raise the Band Mix to compensate for the additional gain reduction this produces in the limiters).
- ◆ Increase the overall Band Mix level.
- ◆ Raise the Clipper Drive (FM core) or Final Limiter Drive (HD and Streaming cores) in 0.25dB steps until advancing the control no longer yields additional loudness, only more distortion, and then back off a notch.

Spectral Consistency & Equalization

Stations often want to create their own "signature sound" on the air with a spectrally consistent output without regard to the frequency balance of the original source material.

There are basically three ways to alter the spectral balance of your sound with Omnia.9, and each provides a different end result: The Parametric Equalizer, the Multiband AGC Targets, and the Band Mix control. Adjustments to each section can produce somewhat similar or very different outcomes depending upon a variety of factors.

The Parametric EQ is a very versatile and powerful means by which to shape your sound. You can set up a shelving EQ to create low bass "slam," set up a broad, gentle cut to the high-mids to smooth out horns or female vocalists, or add some "air" or "sparkle" to your sound by adding a bit of a boost to the very top of the spectrum.

Because the Parametric EQ is located fairly early in the processing chain and ahead of the Multiband AGC and Limiters, these processing sections are likely to make some attempt to compensate for large changes in the spectrum. However, because the crossover slopes of the multiband processors are relatively broad, the Parametric EQ can have more impact than you might expect.

Finally, remember that EQ is a *static* process. That is, it increases or reduces gain to a particular part of the spectrum irrespective of program content. In other words, if you apply 8dB of bass boost it is applied to *all* incoming audio whether it is bass shy or bass heavy.

- ◆ Adjusting the **Multiband AGC Targets** can have a very significant effect on the spectral balance of your sound as well but there are important factors to consider when adjusting these controls. For example:
- ◆ Raising the target of a particular band can make the audio within that band louder (providing increased gain) but this can also slow down the release rate if Progressive Release is employed, as Progressive Release is driven by the current amount of gain in that band.

The opposite is true when lowering a target. Doing so can make a particular band softer (providing decreased gain) but can result in an accelerated release rate when Progressive Release is used.

- ◆ Since raising the target increases gain, doing so means that audio in a particular band may not be increased sufficiently if the source material is lacking in that part of the spectrum. For example, if the source material lacks brightness and the target of the top bands is raised too much, there may not be enough “room” in those bands to sufficiently increase their output.

The result may be spectral inconsistencies from source-to-source. If creating a consistent spectral signature is important, this may be problematic. If, on the other hand, your goals lean more toward preserving the spectral balance of the original material, this could be advantageous.

- ◆ Making adjustments to the **Band Mix** will also influence the spectral balance, but since this is the final point in the processing chain before the Final Clipper (FM core) or Final Limiter (HD and Streaming cores), any peaks that result from adjustments made here will be dealt with only by these more aggressive processing stages. While it is not always a bad idea to increase the output level of a particular band, depending upon the sound you are trying to create, you may have better results by decreasing the output of the rest of the bands by that amount instead. Or, you may instead wish to make the adjustments to suit your tastes and then reduce the overall Band Mix level.

The Multiband AGC Target and Band Mix controls can be used together to help fine tune your sound.

For example, let's say you are using a 6-band preset and you want to create a more dense-sounding mid-range. By lowering the targets of bands 3 and 4, you will drive those bands further toward a state of gain reduction (and increase their release rate when Progressive Release is utilized) but this can also cause them to become softer in the mix if Progressive Release is not used or the source material does not have significant content in those bands. You can compensate for this loss by increasing the gain of those bands in the Band Mix.

Or, let's say you want an open and dynamic low end, and have raised the targets of Bands 1 and 2 to achieve less compression but now find that the bass seems too prominent in the mix. You can decrease the gain of these bands in the Band Mix section to restore a more balanced sound.

25 Factory Presets

Omnia.9 contains a good assortment of factory presets created by a handful of folks who are deeply passionate about audio processing and have extensive experience with the product. “FM” presets lists are common to FM, HD, and Streaming processing paths since bandwidth structures are similar. This section and preset descriptions apply to FM, HD and Streaming processing. AM presets are in their own category given the unique challenges of AM broadcasting. Please consult Chapter 21 “AM Processing” for descriptions of AM presets.

Creating a preset takes countless hours of critical listening to a wide variety of music, including hand-picked “problem songs” that contain passages that are known to be difficult for a particular section of any processor to handle. Each preset has been created with a particular sonic goal in mind. Some are relatively simple in structure, while others exploit Omnia.9’s unique processing functions and utilize a few “tricks” to achieve a particular sound.

We have deliberately avoided naming presets by format or genre (with the occasional exception) so you’ll find no “Urban,” “Open Country,” “Rock,” or “Smooth Jazz” badges here. With conventional naming, many presets that would work quite nicely on your station will be overlooked simply because no one would ever think of trying something called “Hot Country” if they were running a Light AC format that needed some extra punch.

Instead, we encourage you to audition each preset, preferably “on the bench” and not on the air at first, to get a feel for each. Listen for a spectral balance that appeals to you first, and then for texture, without much consideration for loudness. Most of the presets (minus the ones specifically created for maximum loudness) have plenty of “room to grow” in terms of loudness, so if you find something you like but it doesn’t seem quite loud enough, don’t summarily dismiss it; instead, try it out and use the suggestions in the “Getting the Sound You Want” chapter of this manual to up the loudness.

Finally, we are often asked how best to create a custom preset “from scratch”. Since all custom presets are initially based upon a factory preset, we recommend building off of “Reference Settings” since it is the most neutral-sounding factory preset and one upon which many of the factory presets themselves were built.

FM Presets

1981A/092 – by Jesse Graffam

Designed to capture the spirit of one of the most famous analog processing setups of the 1980's, "1981A/092" is a 7-band preset that uses tight ratios over threshold in the lowest band for strong consistent bass regardless of source material with looser ratios in the mid-bands to keep vocals and drums open. It also takes advantage of the WB AGC2 in the "Bass Only" mode to deliver an especially solid low end and uses the parametric EQ to "pre-load" the highs which then receive a good dose of fast compression and limiting to deliver a familiar-sounding top end. An excellent, easy-to-listen-to preset for 70's and 80's formats.

Barbeque Sound – by Rob Morsink

If you like a lot of "sizzle" with your music, "Barbeque Sound" brings it on and sends the highs out front to be noticed. The multi-band AGC's use an Infinite:1 ratio under threshold and looser ratios over threshold, providing higher density in lower-level audio and more openness in louder sounds. Fast multi-band release times offer up density and spectral consistency while the WB AGC-2 operating in the "Bass Only" mode gives low-end transients like kick-drums some extra punch.

Big Bottom– by Leif Claesson

As the name implies, a thundering and broad low-end is the hallmark of this 6-band preset. The strong bass is created by a combination of the parametric EQ, the WB AGC-2 in "Bass Only" mode, and a final boost in the Band Mix. Vocals are pushed a bit farther back in the mix in favor of the strong low end, and Infinite:1 ratios in all bands of the multi-band AGC at all times creates a dense and consistent output, conjuring up the general sound of another un-named but ubiquitous processor known for its bass texture and consistency. If there's bass to bring forward in the music, "Big Bottom" will find it.

Big Iron – by Jesse Graffam

"Big Iron" is a 4-band preset dedicated to the glory days of radio and emulates the characteristics of such notable compressors as the ART VLA and the Dorrough DAP 310. It provides a warm, open, vocal sound and won't attempt to aggressively re-equalize the original spectral balance of the source material. It makes use of Omnia.9's multi-stage AGC sections prior to the multi-band compressors as well as the Gain Reduction Override feature in the multi-band section. It's competitively loud on the dial, but still punchy.

Celeste – by LeeXS

A fast-acting WB AGC and Infinite:1 ratios over threshold in the multi-band AGC's give "Celeste" a consistent sound on a wide variety of source materials. It's strong, warm, and round bass texture and smooth midrange make it a good choice for smooth R&B or light AC stations who value long-term listening and an easy sound over all-out loudness.

Classical/Jazz – by Leif Claesson

"Classical/Jazz" is a 3-band preset designed to provide gentle wideband and multi-band dynamics control without interfering with the original spectral balance of the music. It is not designed for loudness, as it utilizes a modest amount of slow multi-band gain riding and minimal final clipping. It has a much wider gain range than corresponding presets in most other processors, yielding excellent consistency and listenability at lower volumes (such as an office setting) or in noisy environments (in cars). This preset works equally well with classical and jazz programming.

Echoes - by Jim Kuzman

This preset was created with openness and dynamics in mind but despite its mission remains competitively loud on average. Very slow multiband attack and release rates, high multiband AGC target settings, and higher-than-normal Gate and Freeze thresholds prevent soft passages from increasing too much and allow short-term dynamics to pass through with plenty of punch. This makes it a good choice for stations who play World or New Age music or for any format where long-term listening is a priority.

Empire State of Processing – by Leif Claesson

Built to answer the question “How loud can a 3-band preset be?”, “Empire State of Processing” relies more on the final clipper to deliver competitive loudness while employing slow attack and release rates and low ratios in the multi-band section for a more open feel. Vocals are warm and full, balanced by a crisp high end.

Eruption 2.0 – by Leif Claesson and Johnny Lundholm

Deep, always-present bass compliments of fast attack and release rates in the lowest band and a touch of intentional wideband “breathing” make the dynamic and punchy preset a great choice for techno, electronic, or highly-produced urban music. “Eruption 2.0” leans heavily on the final clipper to deliver plenty of loudness on-air.

French Kiss – by Leif Claesson

A 6-band preset reminiscent of the type of processing favored in France a decade or two ago, “French Kiss” offers up lots of clean, distortion-free bass and uses the WB AGC2 compressor to intentionally and noticeably pump the audio when the bass kicks in. While less suited for typical commercial formats, it pairs very well with electronic dance music.

Helix – by Jesse Graffam

“Helix” is a 7-band preset that sports a smiley-face EQ curve to deliver a solid low end and sparkling highs, but still provides a nice open mid-range sound. This preset uses the maximum amount of multi-band range, an Infinite:1 multi-band ratio, and a fair amount of high-frequency limiting to deeply re-equalize and re-balance virtually any input.

Imagine Hot Mid – by Rob Morsink

This bright and loud 3-band preset puts an emphasis on mids and highs and employs a fast release time in the WB AGC-1 compressor to keep levels consistent going into the multi-band AGC section which uses light ratios over threshold. A great preset for making vocals shimmer and for bringing out all the details in the upper frequencies.

Jill FM – by Jesse Graffam

A 7-band preset inspired by the eclectic programming of the “Jack” formats, “Jill FM” provides excellent vocal and lyrical clarity and a super-smooth mid-range. This preset uses a tight ratio on the AGC but loose multi-band ratios and heavier multi-band limiting. Carefully designed not to over-process the bass or high end, this is a great choice for stations with a high female demographic or with long-term listening as a goal who still need to maintain a competitive degree of loudness.

Motor City – by Jesse Graffam

A 7-band preset that unapologetically delivers an in-your-face rock sound, “Motor City” gets a little edgy in the mid-range but is never harsh. This preset makes use of Omnia.9’s Wideband AGC2 after the multi-band section, and while it uses a gentle multi-band ratio below threshold, it makes extensive use of tighter ratios in all bands via the Gain Reduction Override feature.

New York – by Jesse Graffam

One of Omnia.9's loudest factory presets, "New York" uses 6-bands of fast multi-band release times, lots of multi-band limiting, low multi-band AGC thresholds, and a generous amount of clipping to burn a hole in the dial with a very dense, compressed sound. A very generous bass boost from the parametric EQ creates a loud, harmonic-rich bass but never forces its way into the mids or highs. If your market demands maximum loudness, this is a good starting preset that can be backed down in several ways as needed to trade off a bit of that loudness for a cleaner sound.

Northridge FM – by Jim Kuzman and Leif Claesson

"Northridge FM" is a 7-band preset that makes use of the Wideband AGC2 compressor in "Bass Only" mode to deliver lots of bass punch. Loudness is built relying more upon the dynamics section of Omnia.9 rather than the final clipper, specifically through the use of the Wideband AGC1 compressor and the multiband limiters. It is also one of the brightest and "coolest" factory presets in terms of spectral balance and can be made louder if needed by increasing the final clipper drive.

Northridge HD – by Jim Kuzman and Leif Claesson

With the exception of "Plutonium", all other factory presets have their "HD only" parameters (such as the final limiter and output mix controls) tuned in such a way that choosing the same preset for FM and HD allows for a very close on-air sonic match when receivers switch between the analog and digital signal. With "Northridge", however, using the FM version of the preset will result in an on-air sound that was too heavy on the highs for HD. Therefore, we recommend stations using "Northridge FM" on the analog side use "Northridge HD" for the HD path.

NYC Attack of the Camclones – by Jesse Graffam

Slightly louder than "New York," "Attack of the Camclones" provides a huge, tight, dense bass texture, uses fast attack and release times to build density, and has dip in the lower mids to keep male vocals from becoming muddy. It also foregoes any stereo enhancement. A great choice for CHR stations who want high cume and an ear-catching, prominent sound just about guaranteed to win a major-market loudness war!

Orlando – by Jim Kuzman

Smooth and laid back but far from shrinking away on the dial, this 7-band preset provides gentle re-equalization from the multi-band AGC while still maintaining some of the character of the original audio. "Orlando" is competitively loud when fed more contemporary music, but very suitable for jazz and classical stations that desire better spectral balance and dial presence than presets designed specifically for those types of music. There's plenty of room to build loudness as needed with the final clipper without losing the overall feel of this preset.

Passive Aggressor – by Jesse Graffam

A 5-band preset with a split personality, "Passive Aggressor" is relaxed and dynamic in feel, yet it provides a great degree of spectral control and overall loudness by utilizing Omnia.9's "Gain Reduction Override" settings. Looser ratios below threshold and very tight ratios above in the low and high bands coupled with very slow multi-band attack and release times make this preset a great easy-to-listen-to choice for stations that place an emphasis on TSL.

Plutonium FM – by Leif Claesson

"Plutonium FM," the loudest factory preset and the most aggressive of the "atomic" presets, was initially designed to satisfy the specific needs of a large European broadcast group who not only wanted large quantities of bass, but plenty of bass punch and minimal distortion as well. When processing for all-out loudness, there's little (or no) room left for bass. Heavy bass clipping makes some room, but at the expense of punch. "Plutonium FM" solves this dilemma by employing the WB AGC2 compressor in the "Bass Only" mode and incorporating the Transient Enhance feature. If your needs call for lots of bass and dial domination, "Plutonium FM" delivers.

Plutonium HD – by Leif Claesson

With the exception of “Northridge”, all other factory presets have their “HD only” parameters (such as the final limiter and output mix controls) tuned in such a way that choosing the same preset for FM and HD allows for a very close on-air sonic match when receivers switch between the analog and digital signal. Because of the way in which “Plutonium FM” utilizes a higher-than-normal degree of composite processing, the result was an on-air sound that was too heavy on the highs for HD. Therefore, we recommend stations using “Plutonium FM” on the analog side use “Plutonium HD” for the HD path.

Point Blank – by LeeXS

Slightly more dense and loud than “Jill FM,” “Point Blank” is a 7-band preset that leans more on the multi-band limiters than the final clipper to build loudness. Bright but always clean and well-balanced, this preset delivers good source-to-source consistency without sounding overly compressed or processed. An excellent choice for a light AC station that wants long-term listening but doesn’t want to disappear from the dial or a CHR station that doesn’t mind trading a bit of loudness for dynamics.

Quintessence – by Sam Sergi

This 5-band preset features full, consistent bass and a sparkling high end. Mids are pushed further back in the mix and loudness is made a priority over openness and punch. Fast multi-band AGC settings ensure spectral consistency regardless of the balance of the source material, making it a good choice for formats where the music spans multiple decades.

Radium – by Leif Claesson

Derived from “Uranium-238”, this member of the “atomic” family of presets dials back the clipper drive and loosens up the multiband ratios a bit. The result is a slight loss of loudness but a considerably more open and dynamic sound. That said, this is still not a quiet preset. If you find yourself in a “loud” market and feel like you need to keep up, “Radium” is a great place to start and will likely be as loud on the dial as the competition but with a significantly more dynamic sound.

Reference Settings – by Leif Claesson

“Reference Settings” is the most neutral-sounding factory preset, but that does not diminish its suitability for a wide variety of formats. It has been used with only slight modifications on active rock stations in very “loud” markets with great success. If you have your eyes set on creating your very own custom preset for your station, this is the preset with which we recommend you begin your masterpiece as it is straightforward and doesn’t include any little tuning “tricks” to create a particular effect.

Rustonium – by Leif Claesson and Jesse Graffam

A hybrid of two past presets – Jesse’s “Rusticity” and Leif’s “Plutonium” – “Rustonium” is Omnia.9’s default preset. The bass is always present but punchy, while the high end is bright and prominent but never shrill or edgy. The multi-band attack and release times are relatively slow, but this 7-band preset makes extensive use of Omnia.9’s progressive release control to allow plenty of gain control in each band without the fear of any band getting “stuck” with too little gain. This preset also places the Wideband AGC2 after the multi-band section to build some extra loudness just before the final clipper. A great “as-is” out-of-the-box preset for nearly every contemporary format.

Stacked Boxes – by Jim Kuzman

Remember back when the dial-dominating air chain was made up of a rack full of analog gear? Say, one box for compression and leveling, another pair of boxes with lots of LED’s providing 4-band compression, and a program/peak limiter (maybe from the same folks as the compressor/leveler) – all driving a final limiter/clipper with edge meters and a key-locked front panel? We do too. “Stacked Boxes” pays homage to the not-so-distant past of analog processing.

Stacked Boxes Plus! – by Jim Kuzman

Offspring of “Stacked Boxes,” the “Plus!” version uses six bands of multiband compression and limiting instead of four, providing a similar overall feel as the original but with more refined mids and better source-to-source spectral control.

The Blitz – by Jim Kuzman

Living proof that loudness and high-quality audio are no longer mutually exclusive qualities, this 6-band preset hands over tight, solid bass, intelligible mid-range, an airy high end, and a wide stereo image. Designed to provide the maximum degree of loudness but never at the expense of audio quality, “The Blitz” is a great choice for classic and active rock formats with plenty of room for an extra dB or two on the clipper drive for those who need more loudness. (Thanks, Bill!)

Tokyo – by Jesse Graffam

Born of “Passive Aggressor” and created in homage to the “classic” sound of previous Omnia processors, the 7-band “Tokyo” delivers detailed transients and percussion without sacrificing average loudness. The mid-range is full and round with increased vocal intelligibility, a sound that translates well to smaller speakers and earbuds as well as higher-quality systems. A tightly-controlled low end ensures the bass always shows up for the party.

Trinity – by Leif Claesson

Inspired by the sound of the classic Omnia.3 FM Turbo, this 3-band preset is dynamic and punchy with an open mid-range and a more classic “Omnia” sound. “Trinity” doesn’t use any parametric EQ or stereo enhancement, runs with a very light ratio in the multi-band section, and presents itself very transparently on the air, making it suitable for nearly any format.

Upsidasium – by Leif Claesson

The smoothest and most open of the “atomic” presets, “Upsidasium” is still relatively loud but thanks to very loose multiband ratios, is also extremely open-sounding. Drums and other transient sounds cut through the mix, vocals are dynamic, and the upper high end delivers that “lighter than air” sound (here’s looking at you, Denny!). If your situation permits giving up the last dB of loudness in favor of a sound that’s easy to listen to long-term but you don’t want to sound underpowered on the dial, “Upsidasium” offers the perfect compromise.

Uranium-238 – by Leif Claesson

The second loudest of the “atomic” presets, “Uranium-238” is slightly less radioactive version of “Plutonium FM”. It has a similar sound to its parent preset, but does not utilize the Wideband 3 compressor after the multiband section and employs less final clipping. A good choice if market-dominating loudness is still your goal but “Plutonium” feels too over-the-top.

Zenith – by Jesse Graffam

How much processing can you get away with before things start to sound processed? The 7-band “Zenith” was created to answer that question. Always open and natural sounding in exchange for overall spectral and loudness consistency, this preset lets the music be what it was intended to be – with just a little push in the right direction.

26 NfRemote Client Software

The Omnia.9 remote interface software, NfRemote, is a separate “client” software application that can be downloaded and installed on nearly any desktop, laptop, or tablet PC of reasonably modern vintage running on Windows XP, Vista, 7, 8 or 10. High DPI displays are supported up to 192 DPI (200% font size).

With just a few differences, which will be discussed in this chapter, this client software looks and operates exactly like the front panel controls of the Omnia.9 itself (including touchscreen support on PC’s providing that feature) to provide a familiar and feature-rich means of controlling your Omnia.9 remotely. If you can do it on the front panel, you can do it via remote - a feature you’ll appreciate if your Omnia.9 is located in a noisy rack room, at the transmitter site, or even thousands of miles away at a distant station you oversee.

Perhaps one of the most valuable capabilities of the client software is speaker calibration. Since your Omnia.9 already contains a built-in pink noise generator and an RTA, adding your own calibrated microphone to the setup will allow you to perform a calibration of any speaker system – including your studio, control room, rack room, production facility, or any remote monitor point.

You may wonder why we consider this to be such an important exercise when listeners aren’t going to be hearing your station on calibrated monitors. Great question! Yes, listening to your station’s processing on speakers of different qualities in a wide variety of listening environments is important to get a “real world” feel of how things sound – but we feel strongly that having at least one set of calibrated “reference” monitors is absolutely critical to making educated decisions as you adjust your processing.

If you make adjustments based upon what you hear on un-calibrated speakers (from within the Program Director’s car, for example...) every decision you make will be influenced by the inaccuracies of those speakers in that room. Details of how to perform such a calibration are found later in this chapter.

Downloading, Installing, and Configuring the Client Software

Before the client software can be downloaded, your Omnia.9 must be connected to your network and must have an IP address assigned to it, a process outlined earlier in this manual. It must also have a password enabled and be HTTP “whitelisted” at least until you connect with the remote.

Connect to your Omnia.9 by entering `http://<IP Address>:7380` into the address window of any standard web browser (for example, <http://192.168.0.183.7380>). You will see a screen entitled “Welcome to Omnia.9 HTTP Server” with a current version number.

Under the “Downloadables” section, click on the link following “Download Remote Interface.” This should be done each time you update the software in your Omnia.9 to ensure full compatibility between the unit’s software and the remote software.

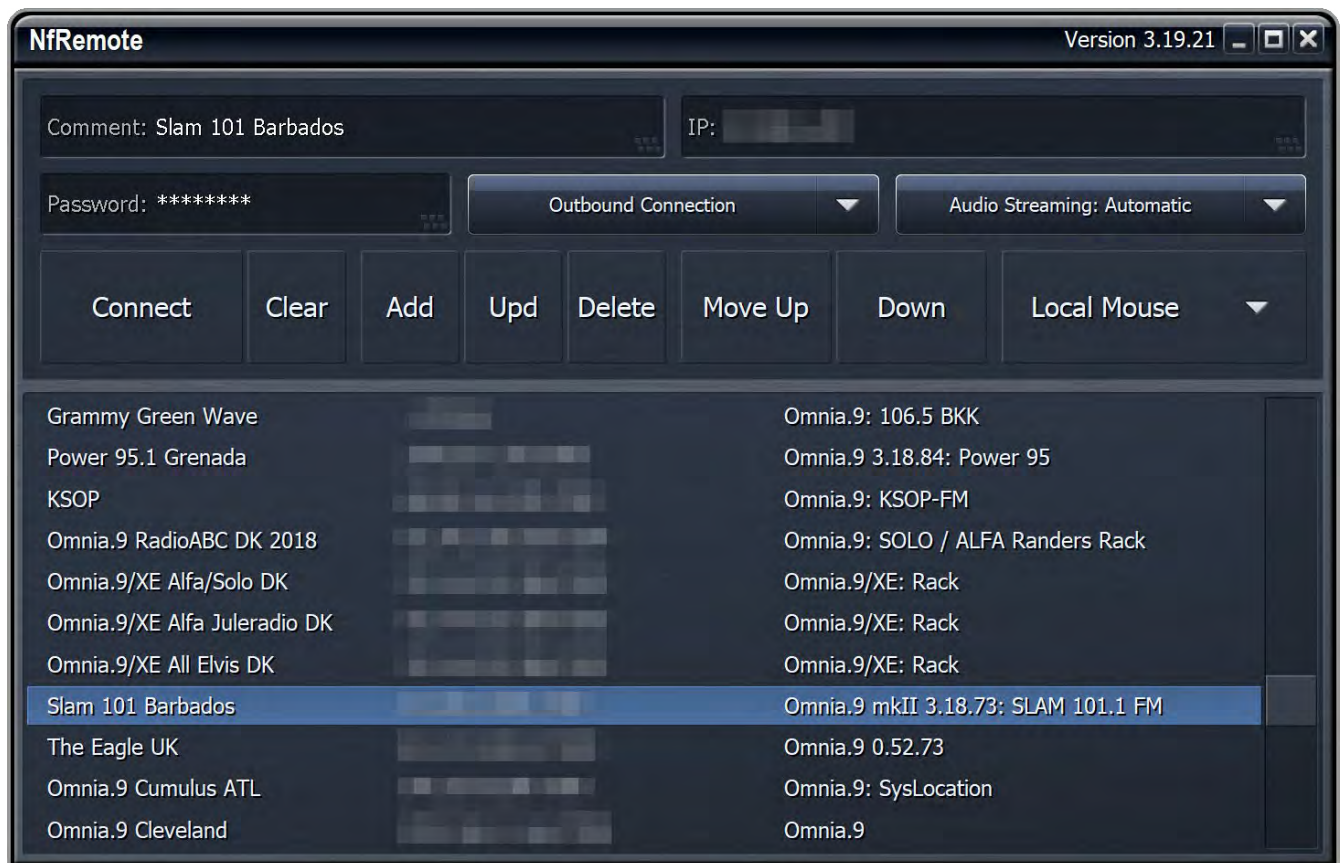
The latest version of NfRemote is also available under the “Software” heading to the right-hand side of the Omnia.9 product page of the Omnia website: <https://www.telosalliance.com/Omnia/Omnia9>

Some Important Ethernet/Wi-Fi Network Considerations

While the client software itself is not a terribly resource-intensive application, it does place some demands upon your local network. The client allows you to make “live” adjustments to the Omnia.9, observe its meters (as well as other displays such as the oscilloscope) in real time, and on networks with sufficient bandwidth play audio from the Omnia.9 to your remote control PC. The more information the client asks for, the more critical it is to have a robust Ethernet or Wi-Fi connection to the between it and Omnia.9.

Understanding the NfRemote Connection Window

It is possible to connect to any number of Omnia.9’s individually or concurrently using NfRemote.



- ◆ The **Comment** field allows you to enter a “friendly” name for each device to which you plan to connect.
- ◆ The **IP Address** field should contain the IP address of the Omnia.9 host computer.
- ◆ The **Password** field should contain the same password established in the Omnia.9.
- ◆ The **Connection Type** dropdown menu determines whether the connection is **Outbound** (NfRemote initiates connection to Omnia.9) or **Inbound** (Omnia.9 listens for an incoming connection request from an instance of NfRemote). Note that the IP addresses of inbound connections are enclosed by chevrons.
- ◆ It is possible to stream audio from the Omnia.9 to a remote PC using NfRemote. The **Audio Streaming** dropdown menu enables this feature and determines the type of data compression used to deliver the audio as well as the oscilloscope, RTA, and FFT display information.
- ◆ **Automatic** chooses the best audio format based upon connection speed.

- ◆ **Off** completely disables audio streaming and the client-side oscilloscope, RTA, and FFT displays.
- ◆ **Force Lossy** enables lossy streaming even on connections that are on the border of being too slow and forces lossy streaming even on fast connections.
- ◆ **Force Lossless** enables lossless streaming even on connections that are too slow. This choice is best reserved for local networks with sufficient bandwidth to support it.
- ◆ Clicking on the **Connect** button will initiate a connection to Omnia.9 whose IP address is currently displayed.
- ◆ The **Clear** button removes all information from the Comment, IP Address, and Password fields.
- ◆ The **Add** button collects the current Comment, IP Address, and Password information and carries it to the bottom of the window where it is saved for easy recall later.
- ◆ The **Update** button refreshes the list of saved connections.
- ◆ Clicking on the **Delete** button will remove the selected connection from the list.
- ◆ The **Move Up** and **Move Down** buttons will move the selected connection up or down respectively in the list so that you can sort them in any order.
- ◆ The **User Interface Pointing Device** dropdown menu offers several choices for optimizing NfRemote depending upon the type of device you are using.
- ◆ **Local Mouse or Touchpad** should be selected if you are running NfRemote on a local PC or laptop.
- ◆ **Virtual Machine or Remote Desktop** is the correct choice if you are connecting to the computer running NfRemote from another computer. This includes software like Parallels, VMware, Team Viewer, GoToMyPC, Remote Desktop Connection, or a VNC client. Wacom Digitizer users should also select this option.
- ◆ **Local Mouse (Touch Simulation)** allows you to use the finger-friendly layout of the Touch Screen option but with a mouse. It can also be used instead of the Virtual Machine or Remote Desktop option.
- ◆ **Touch Screen** provides a finger-friendly layout optimized for touch screen devices like tablets or all-in-one PC's with a touch interface.
- ◆ **Touch Screen Presentation** operates just like Touch Screen but with a large cursor, making it ideal for situations when you are using a projector for demonstration or instructing a group on how to use NfRemote.

Initiating an Outbound Connection from Omnia.9

Normally, an instance of NfRemote running on a remote computer initiates the connection to an Omnia.9 (“inbound” connection). However, there are some situations where it is more appropriate for Omnia.9 to initiate the connection to an instance of NfRemote on a remote computer (“outbound” connection).

One example of how this can be used is for technical support. By creating an outbound connection, you are connecting to the support engineer’s NfRemote computer which in turn allows them to control your Omnia.9.

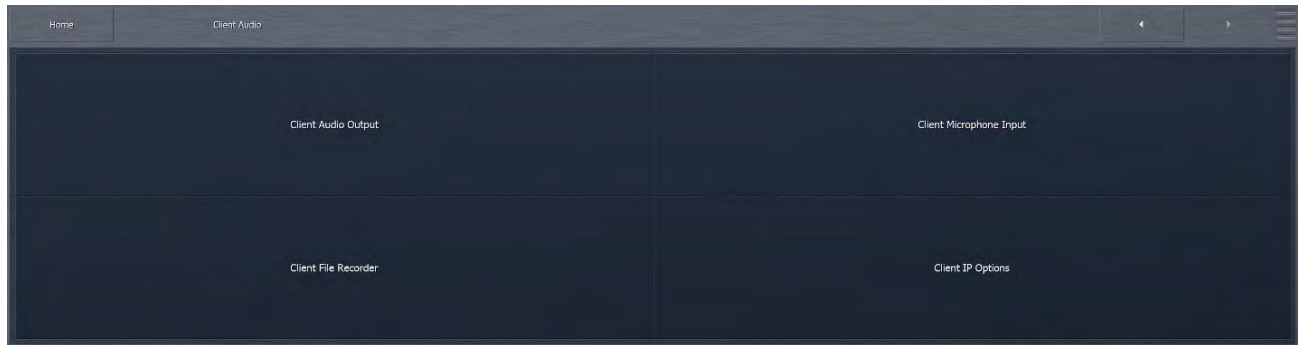
In such a situation, the support engineer would provide an IP address (or host name) and a port number separated by a colon (123.45.67.89:7373 for example). Because IP addresses are commonly dynamically allocated, using a host name is the preferred convention.

For more information about how to use Outbound Connection, please see the Outbound Connection page in the System section of this manual.

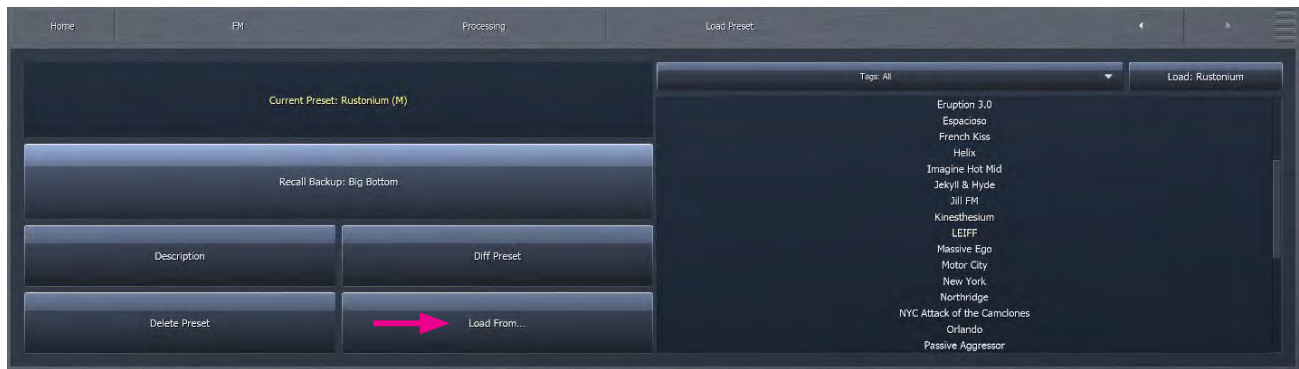
Client-Only Controls

As mentioned earlier, the remote interface looks nearly identical to Omnia.9's front panel display. If you have already familiarized yourself with its controls, you should feel right at home operating it remotely. Therefore, only those controls or features unique to the client software will be explained here.

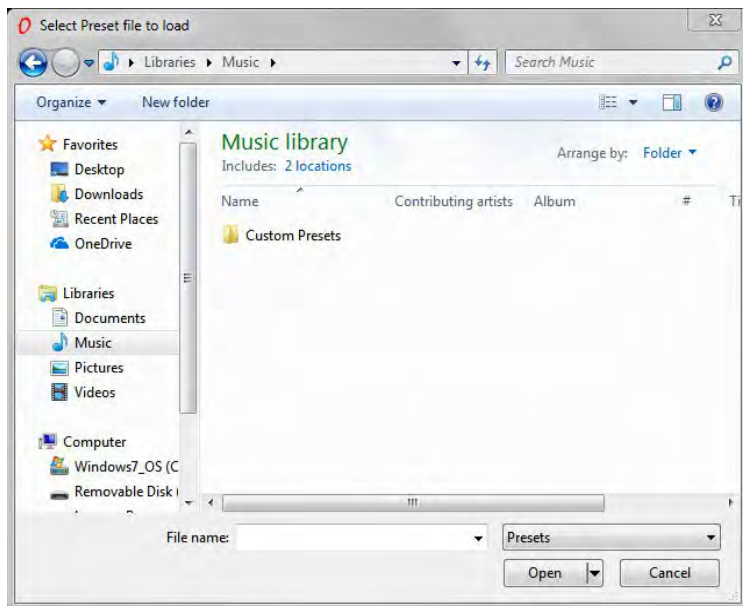
Joining the Input, FM, AM, Studio Processing, HD, Streaming, Monitor Output, and System Controls on the Home screen is an additional Client Audio menu, which contains additional menus for Client Audio Output, Client Microphone Input, and Client File Recorder. Each menu is discussed in more detail in this manual.



Additionally, the **Save Preset** and **Load Preset** menus for each of the processing cores in the client software have the additional capabilities of being able to save a preset to the location of your choice on the remote PC itself, or load a preset from the remote PC to your Omnia.9. This includes flash drives and external USB drives, which provides an excellent way to back up any custom presets, or easily duplicate those presets on another Omnia.9.



Load From... brings up this typical file page from your computer:

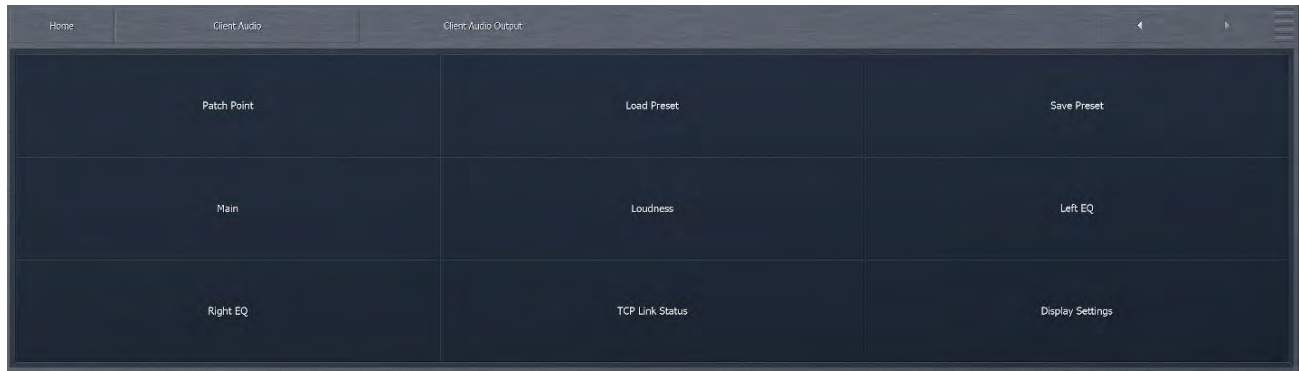


When using the Load Preset function, be aware that the preset will be loaded to the Current Preset position and will therefore *immediately go on the air*. Additionally, in order for the preset to appear in the list, you must save it using the Save Preset function.

If you need to upload a preset without putting it on air, you can do so through the HTTP server (port 7380) by clicking on Preset Manager and then selecting the appropriate type of preset. You'll find a Browse and an Upload button at the bottom of the page. There is also a Simple Upload Form which makes this process easy to automate for the average IT-savvy whippersnapper. Please see the HTTP Access section (in the System Section) of this manual.

Client Audio Output Menu

The Client Audio Output Menu contains additional controls similar to those in the Monitor Output menus of the Omnia.9 (with a few differences) and a TCP Link Status window to provide information about the remote connection.



Patch Point Menu

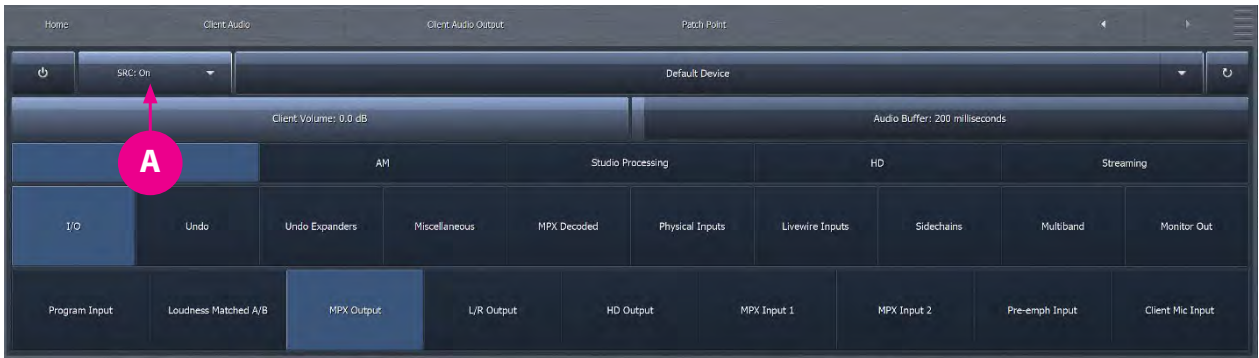
The Patch Point Menu provides additional controls for enabling Client Audio and SRC, choosing an Output Device, adjusting Client Volume, and setting the Audio Buffer. An additional patch point for monitoring the Client Mic Input is also available.



A: Audio Enable

When selected, the **Audio Enable** feature allows processed audio to from various patch points within the Omnia.9 to be streamed directly to the client PC. Keep in mind that audio streams require bandwidth, as does displaying patch points on the oscilloscope, FFT spectrum analyzer, or RTA. During handshaking, the remote control software measures the available network bandwidth. If you are on a local network, you will get PCM (NICAM) streaming. If you connect over the internet with sufficient bandwidth, you will get data-reduced streaming. If bandwidth is marginal, certain patch points such as MPX Input/Output (which requires at least 800kbps) or L/R Pre-emph Input/Output (which requires at least 400kbps) . will be grayed out. You can still monitor the patch points under “MPX Decoded”, which do the decoding and de-emphasis in the Omnia.9 itself and transport flat audio, which require only 200kbps.

- ◆ Enabling the SRC control lets the client software dynamically adjust the sample rate of the client playback. If you are experiencing interruptions or dropouts to the client audio stream, enabling SRC will result in a steadier connection, though at a slight cost to CPU usage. Regardless, the client software will automatically determine whether to stream client audio in a linear (uncompressed) PCM format or in a data-reduced format, which, while compressed, can still provide excellent audio quality.



A: SRC Control

- ◆ The client software recognizes any audio output devices (speakers, headphones, sound cards) installed on the remote



A: Output Device Drop Down Menu

- ◆ The **Client Volume** slider controls the volume of the selected output devices on the remote PC. This control is duplicated on the top menu of the client software where it is available at all times.



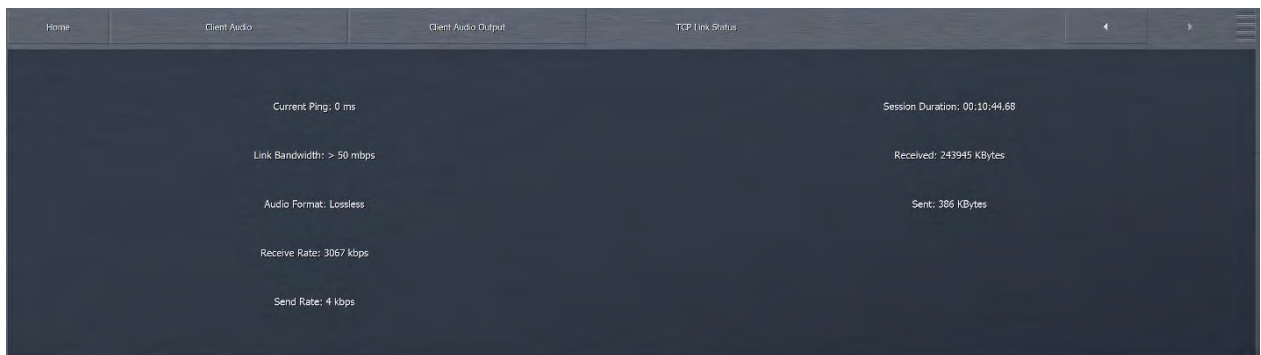
A: Client Volume

- ◆ Depending upon the bandwidth available on your local network, it may be necessary to buffer incoming audio to the client to avoid dropouts by adjusting the **Audio Buffer** control. The range of this control is between 0 and 10,000 milliseconds (10 seconds). The meters on the remote PC will automatically adjust so that they are always synchronized with the client audio as long as client audio is enabled. In addition, you can use the meter delay control in the display section to delay meters further to compensate for any delay occurring after the client PC (such as when using Bluetooth speakers).



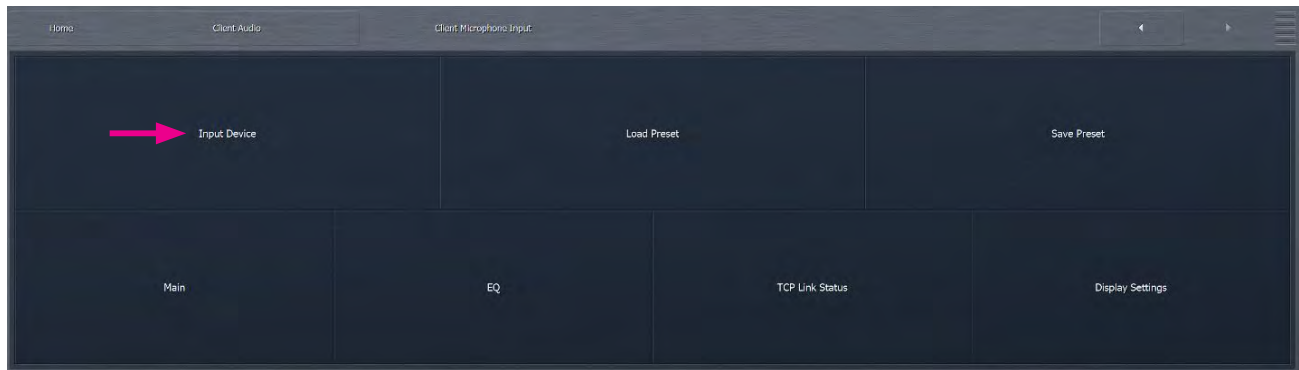
A: Audio Buffer

- ◆ The **TCP Link Status** window provides information about the connection status between Omnia.9 and the remote PC, including Current Ping time in milliseconds, Link Bandwidth in KB/sec, the Audio Format of the stream, and Send and Receive rates.



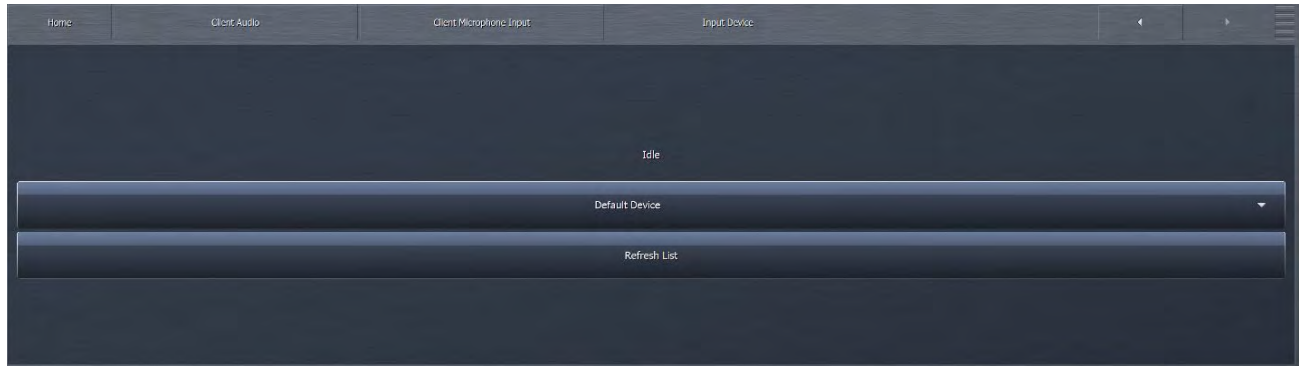
Client Microphone Input Menu

The Client Microphone Input Menu allows you to pick which microphone you’d like to use, a parametric equalizer to create custom EQ curves for individual mics, and the ability to save and recall custom mic presets. There is also a duplicate button to the TCP Link Status window and the Display Settings menu for convenience.



Input Device Menu

The Input Device Menu provides a list of available microphones, including built-in mics and any outboard microphones you may have plugged into the PC running the remote interface software. If you plug in an outboard mic while this window is open, you may need to tap the “Refresh List” button in order for the software to recognize the addition.



Load Preset Menu

This menu operates in a manner similar to the Load Preset menu in the various processing cores of the Omnia.9. However, the client software offers an additional Load From button that allows you to call up a preset file from the remote PC, including from a flash drive or external USB drive.

Save Preset Menu

Just like the Load Preset menu, this operates like its counterparts in other sections of Omnia.9. The Save To button allows you to save your presets to a location on the remote PC, including a flash drive or external USB drive.

Client File Recorder

Just as it is possible to record audio from various patch points within the processing chain on the actual Omnia.9 itself, you can also record audio streamed to the client PC. The recorders in the client software work in exactly the same way.

Speaker Calibration

As mentioned earlier, taking the time to calibrate at least one set of speakers to act as your reference monitors is time well spent. In order to perform a speaker calibration, you need four tools:

- ◆ A calibrated microphone to capture the audio.
- ◆ A pink noise generator to provide audio for measurement (pink noise having an equal amount of “noise power” in each octave).
- ◆ A real-time audio analyzer (RTA) to visually display what the microphone is hearing.
- ◆ Some means by which to correct for speaker and/or room inaccuracies (such as a parametric equalizer).

Omnia.9 provides three out of the four tools – the pink noise generator, the RTA, and the EQ. All you need to add is the calibrated mic.

Choosing a Calibrated Mic

It is important to understand that you *must* use a *calibrated* microphone designed for sound measurement purposes to perform a proper calibration. Studio or recording mics – even the high-end, high-dollar ones – are of no value when calibrating a system.

You can spend thousands of dollars on a scientific-grade, high-precision calibrated microphone, but the good news is – you don’t have to. Even the least expensive models will provide good quality results and are worthy of consideration.

While we are not in the business of selling microphones, nor do we have any interest in promoting any brand or model over another, we can tell you that Behringer ECM8000 and DBX RTA-M work quite well and can be purchased at local music stores and from various on-line vendors for around \$100. If you prefer to connect your mic via USB or Firewire, several manufacturers (M-Audio, E-Mu, and Blue come to mind) offer XLR to USB and XLR to Firewire converters starting at under \$50).

Setting Up the Mic

Place the microphone as close as possible to the position you will occupy when monitoring so that it hears what you will hear. In cases where you are calibrating two of the same speakers, and both are placed in similar locations in the room, you can calibrate both the left and right channels simultaneously. If you find yourself in a situation where the speakers will be affected differently by their individual placement in the room – one is suspending from the ceiling in a corner and the other is sitting on a shelf, for example – or one is significantly closer to your monitoring position than the other – we recommend performing an individual calibration for each speaker.

Setting Up the Client Software for Calibration

For the example below, let’s assume that you are calibrating your studio monitors, which are being fed audio from the Speaker Output portion of Omnia.9’s Monitor Outputs. We will also assume that you are in a situation where you can use the same calibration settings for both speakers. By default, the parametric EQ section is set up in the “common” mode, which means changes made to the left channel will be mirrored in the right channel.

Connect the Client PC and the Calibrated Mic

The first step to calibration is making sure you have a remote connection to your Omnia.9 per the instructions at the beginning of this manual.

Once connected, plug your calibrated mic into the remote PC, install any necessary software or drivers, and establish that it is working properly in Windows.

Set Up RTA and Oscilloscope Display Windows

After microphone installation and setup are complete, you will need to make sure you have the RTA and the oscilloscope set up in a Display Window.

If an RTA is not already visible, select any of the current display windows (Processing Meters, Undo Meters, etc.) to bring up a Display Settings menu. Set up one of the windows to monitor the Client Mic input (for example, Display 3, RTA, I/O, Client Mic Input).

1/3 octave resolution will provide more of a “big picture” overview, while the 1/6 octave will identify more specific peaks and valleys. We suggest an Average setting of 40 and a Target Range of 2.0dB. You will need to adjust the Target and Range controls for your individual situation once you have pink noise running through the speakers at a reasonable volume.

We also recommend setting up an Oscilloscope menu in the same manner so that you can watch for any clipping that may occur should you need to make any significant boost to a particular part of the audio spectrum during calibration. If you see (or hear) any clipping during the process, turn down the **Master Gain** control in the Main 1 menu.

Feeding Pink Noise To the Speakers

From the Home menu, select **Client Audio**, **Client Microphone Input**, then **Input Device** from the Home menu of the Omnia.9 client software on the remote PC. Your calibrated mic should be available in the device menu. You may need to refresh the list to make it visible.

Return to the Home menu, select **Monitor Outputs**, then **Speaker Output**, then **Main 1**. Turn down the Speaker Volume to a fairly low level, then enable Pink Noise for the left channel. Turn up the Speaker Volume enough to bring the level of pink noise well above the noise floor of the room, and to a level that approximates the volume at which you would normally listen to program material when adjusting your processing. As you adjust the overall volume, you should see the RTA display respond. Orange bars in the Speaker Volume control will indicate when the Speaker Output limiter is active and the Master Gain level should be reduced accordingly.

Final Adjustments to the RTA

Once you have established an overall pink noise level, adjust the **Range** control so that you can see the entire spectrum easily on the display, normally in the vicinity of 70 – 80dB.

Adjust the **Target** control so that the band with the lowest level (not counting very low or very high frequencies that are clearly beyond the ability of the speaker to reproduce) is situated at the top of the bright red target window. This will allow you to reduce, rather than boost, most of the frequencies with the parametric EQ.

When reading the RTA, it is important to know what peaks and dips are actual representations of “problem areas” with the speaker/room combination and which are microphone placement anomalies. If you move the microphone just slightly and the problem area magically corrects itself, you’re seeing such a placement-skewed reading. A little experimentation will quickly reveal this. Once you have finalized the mic placement, it’s time to begin correcting things with the PEQ.

Using the Parametric EQ to Smooth Things Out

Methods of equalizing speakers in their rooms vary, but generally speaking, using the fewest number of bands of EQ to achieve the desired result is preferred. Cutting (reducing) frequencies is usually preferred to boosting (increasing) them, although sometimes boosting a certain range is not easily avoided. Remember that there are a total of 12 available bands of EQ available to you – 6 in the EQ1 menu and 6 more in the EQ2 menu.

We assume that if you've gotten this far, you have a general idea of how the controls of a parametric equalizer work, but as a quick review:

- ◆ The **Gain** control determines how much the specified frequency range is amplified or attenuated, expressed in decibels.
- ◆ The **Bandwidth** control determines how wide or narrow a range of frequencies will be affected, measured in octaves.
- ◆ The **Center Frequency** control determines what frequency will lie in the middle of the adjustment curve, expressed in Hz.

You will be able to identify where your speakers start to roll off in terms of frequency response (especially on the low end) pretty quickly. You can't overcome pure physics with an equalizer, and small speakers will never reproduce bass with the same authority as larger ones, so there's no point in trying to give a 15dB boost at 30Hz to small monitors in the hopes that you'll get the equivalent of a free subwoofer. (What's frequently more effective with bass-shy speakers is taming the often over-boosted mid-bass that manufacturers dial in in the hopes that you think you have more low end than you do).

As you study the RTA, we recommend identifying and correcting any glaring peaks or valleys over a relatively narrow ranges of frequencies first to take care of any "hot spots." Then, work your way out to making broader changes to the overall curve.

Chasing Your Tail

Speaker calibration can be a frustrating process, especially if this is your first go-around with it. Sometimes it's like squeezing a balloon: When you squish one end, the other end puffs out. So it goes with calibration. Make a boost to one frequency, and the surrounding frequencies go up, too.

Experimenting with the center frequency and bandwidth controls will help, as will a good dose of patience and allotting enough time to do it up right. Your efforts will be rewarded when you play music through your calibrated setup for the first time and wonder if someone swapped out your tired old monitors with something new and much more expensive!

Saving Your Calibration Settings

You can save your calibration settings in the form of a preset by going to the **Save Preset** menu and typing in a friendly name for your file, preferably one that uniquely identifies the speakers and location ("JBL 4312 FM Air").

Tweaking After Calibration

You may notice that while your speakers sound significantly better than they did before you calibrated them, and they are technically much more accurate, they sound a little thin in the low end and a little dull in the highs because of the way the human ear perceives sound at the far ends of our hearing range.

We suggest that instead of making changes to the EQ sections, you use Omnia.9's **Loudness 1** and **Loudness 2** menus to make subjective adjustments. These menus each give you three additional bands of fully parametric equalization.

If desired, they also allow you to adjust at what point on the Speaker Volume control the changes take affect (since our ears are less sensitive to certain frequencies at lower volume levels).

- ◆ The **Minimum** slider on each EQ band sets the point on the volume control where the EQ has no effect on the sound.
- ◆ The **Maximum** slider sets the point on the volume control where the EQ in that band is in full effect (boosted or cut to whatever gain level you have set).

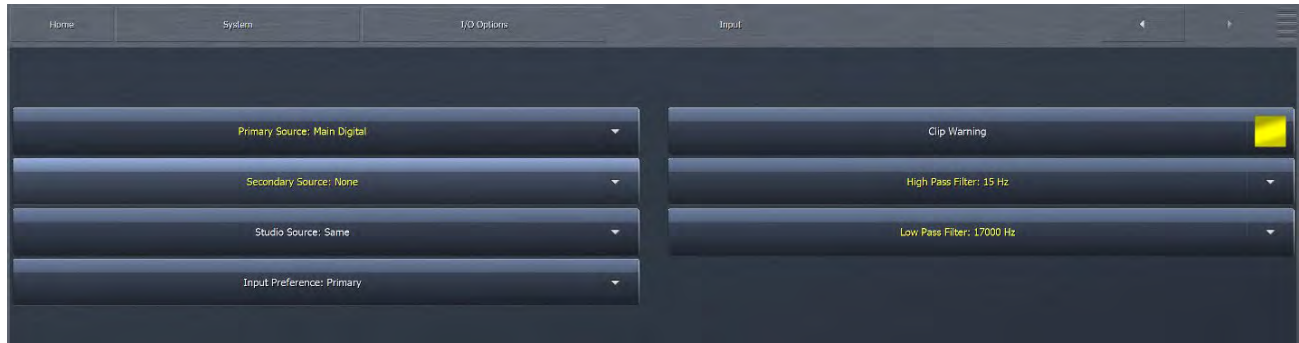
For example, if the **Minimum** slider is set to -20dB, the **Maximum** is set to -10dB, and the **Gain** is set to minus 5.0dB, equalization will begin to take effect when the volume control is set to -20dB and will be attenuated by 5dB by the time the control is set to -10dB.

If the minimum and maximum values are the same, the loudness controls function as a normal parametric equalizer independent of the volume setting.

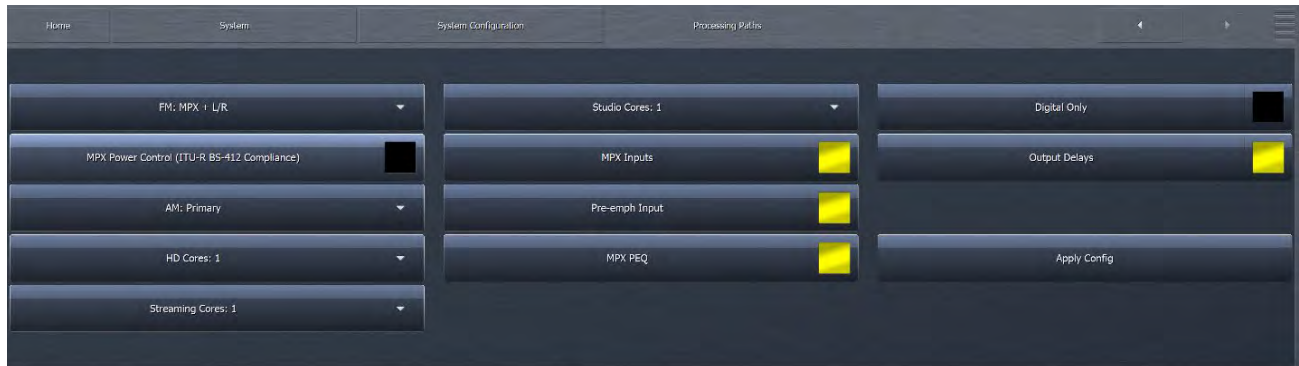
27 Frequently Asked Questions

How do the physical rear panel inputs relate to the various processing cores?

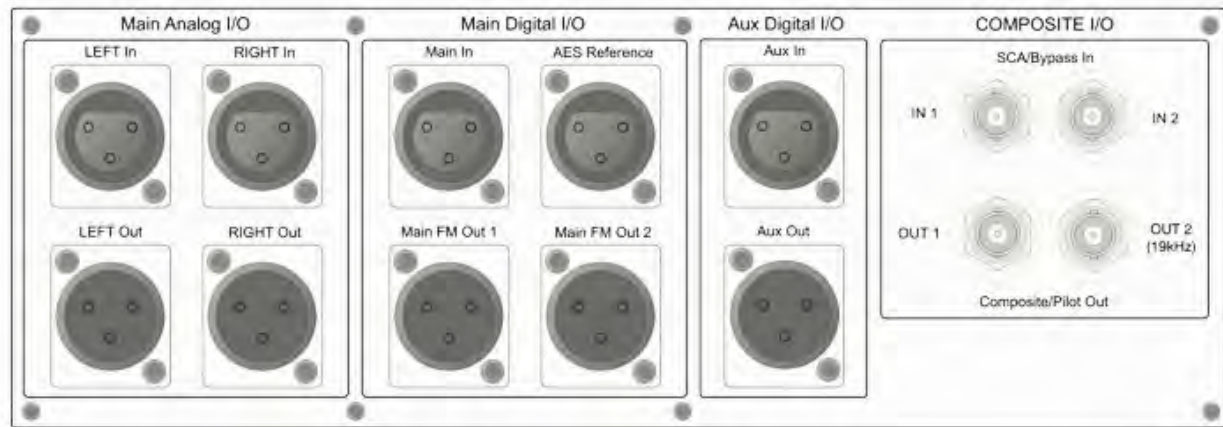
A fully-optional Omnia.9 can take in three independent audio sources via its physical rear panel inputs. Each physical input is then assigned to an internal signal path within Omnia.9 in the System > I/O Options > Input 1/2/3 menus.



Keep in mind that individual processing cores must be enabled, disabled, and configured in the System > System Configuration > Processing Paths menu, and only options that have been purchased and installed in your particular Omnia.9 will be available.



Though the rear panel digital inputs are labeled “Main In,” “AES Reference,” and “Aux In” in an effort to represent a typical installation scenario, they are in fact all identical and interchangeable, with the exception of the AES Reference Input which really is the reference, although it also accepts audio.

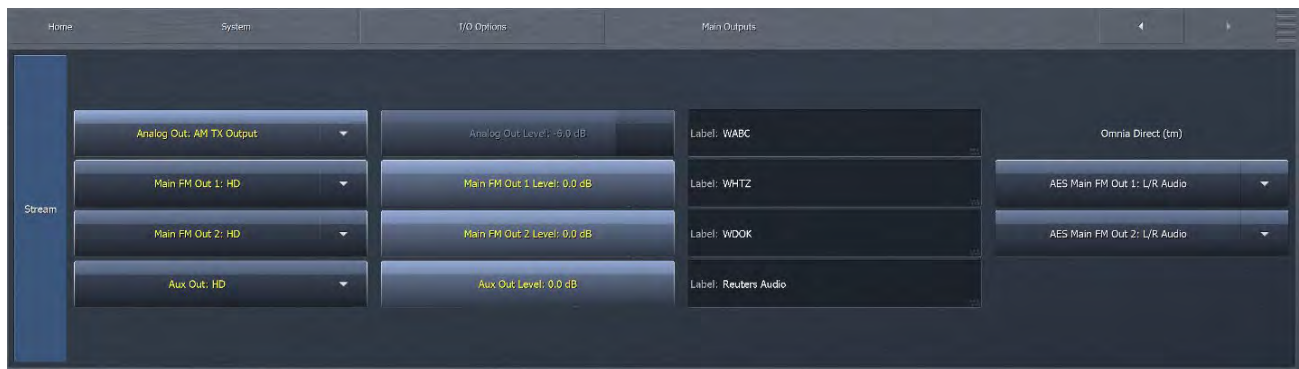


One important thing to understand is how each audio source is “shared” within the unit. Again, using a fully-featured unit for illustration, audio destined for the FM processor is also shared by the HD-1, Streaming 1, and Studio cores. Audio destined for HD-2 is shared by the Streaming 2 core, while audio for the HD-3 feed is shared by the Streaming 3 core.

Which rear panel output should I use?

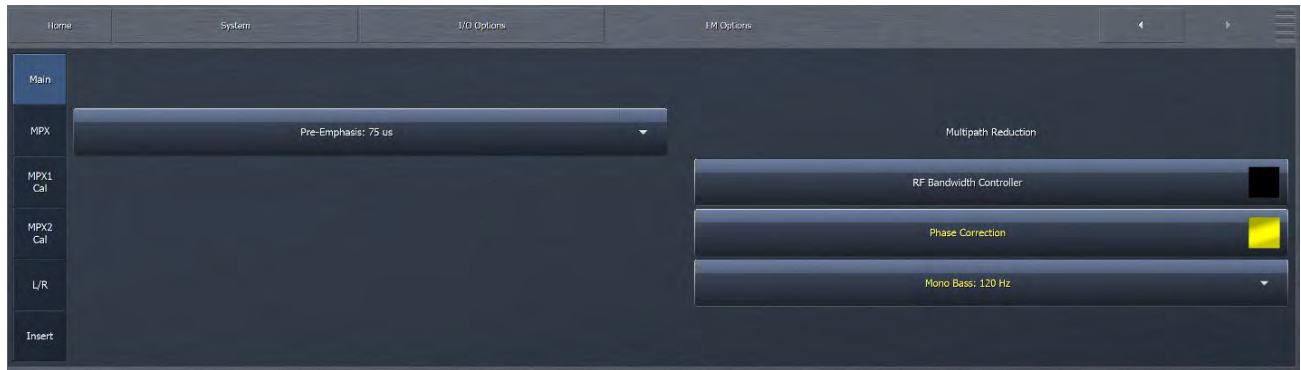
The choice of which rear panel outputs to use will depend upon the configuration of your particular plant.

In an all-digital plant where Omnia.9 is located at the studio and feeding AES audio to an STL with AES inputs, output audio should come from the AM, Main FM Out 1, Main FM Out 2, and Aux Out outputs. The source of the processed audio for each of these outputs is determined in the **System > I/O Options > Main Outputs** menu.



For example, the Main FM Out 1 might be set to “FM Pre-emph L/R” in order to output pre-emphasized audio for the main FM channel which will be de-emphasized later in the chain. Main FM Out 2 might be set to “HD-1” to route audio destined for the HD-1 path. Aux Out may be set to “HD-2” for audio being sent to the HD-2 path. Or Aux Out could be set to feed an AM transmitter.

If Omnia.9 is located at the transmitter, one of the two rear panel composite outputs can be used to feed the main FM audio directly to the exciter. This is also true if Omnia.9 is located at the studio feeding a composite STL. In these cases, adjustments to the output are made in the System > I/O Options > FM Options menu.

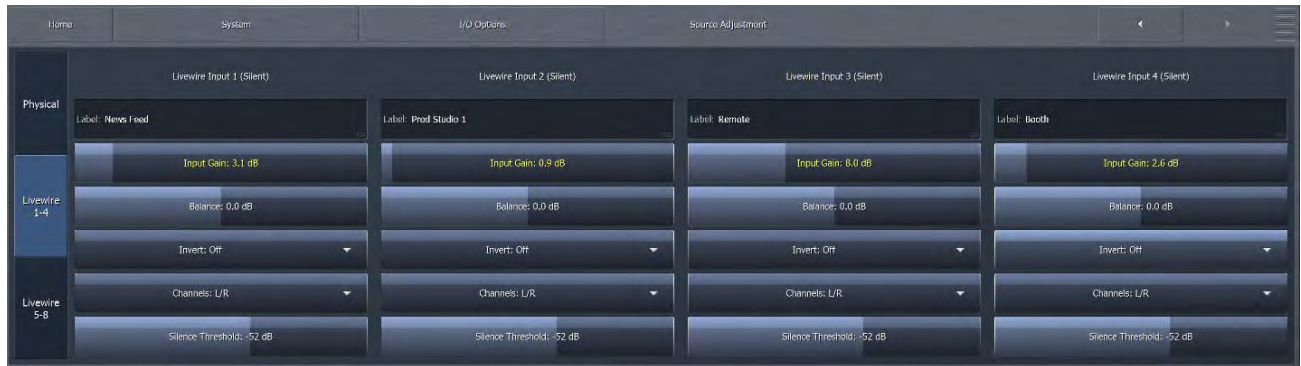


How do I set input levels?

Input levels are set in the System > I/O Options > Source Adjustment menu. There are separate adjustment options for Analog, Main Digital, AES Reference, Aux Digital (Silent), and eight Livewire inputs. The AES Reference (Silent) should contain AES clock information only, with no audio.

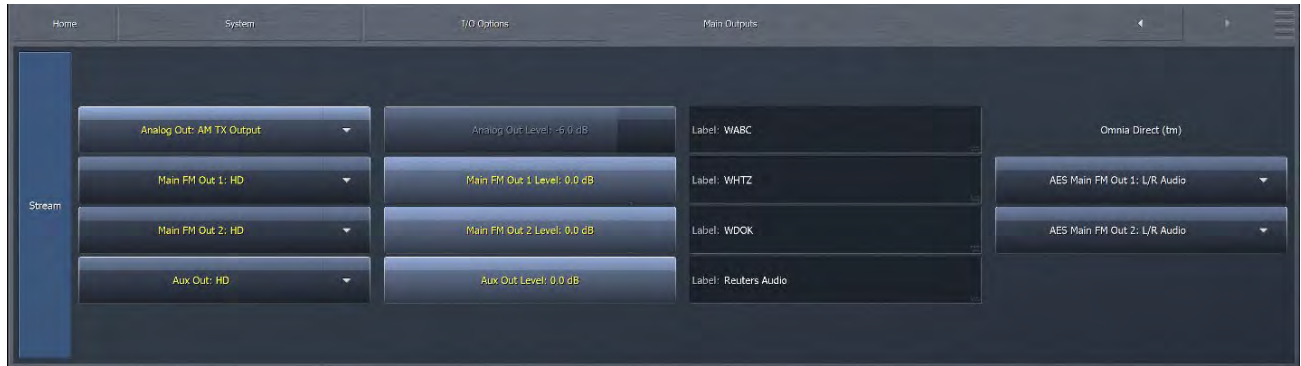


Here is the Livewire Source Adjustment input menu.

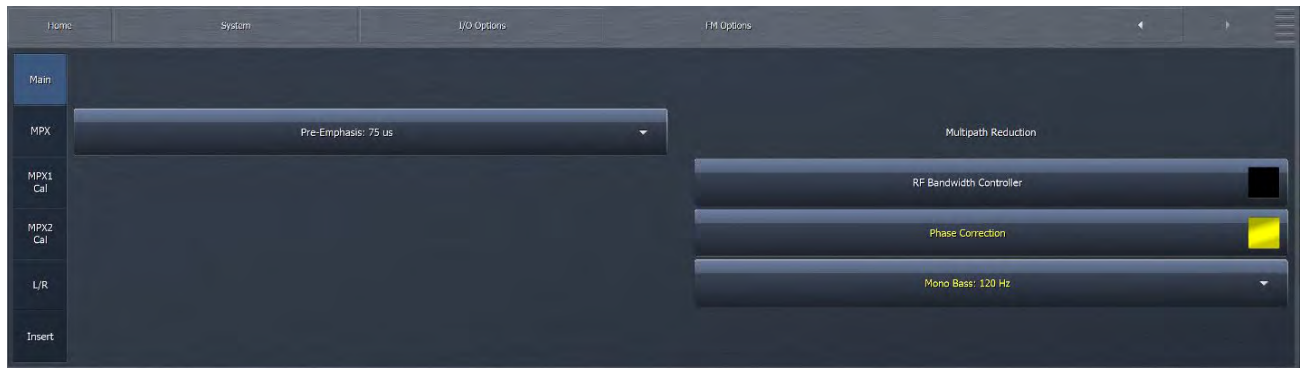


How do I set output levels?

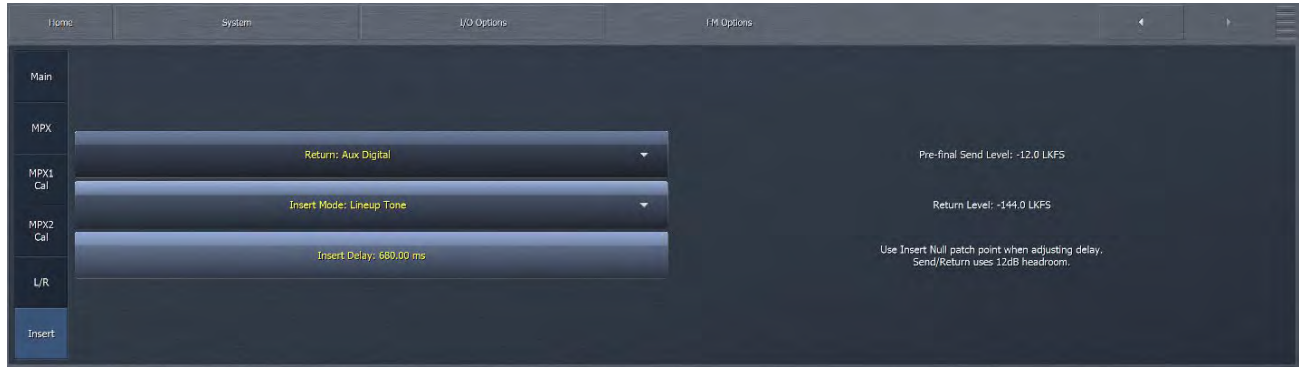
If you are using Omnia.9's digital outputs, levels are set in the **System > I/O Options > Main Outputs** menu.



If you are using the composite outputs, levels are set in the **System > I/O Options > FM Options** menu. There are options to select Main, MPX, and Insert output levels. The MPX menu is where you set pilot level, Demod clip threshold, allow Quadrature amount, SSB or DSB subchannel, Auto Pilot on or off, Stereo sense threshold, and Maximize Mono Headroom option. Here is also where you set MPX output levels, modes, and the MPX test generator.



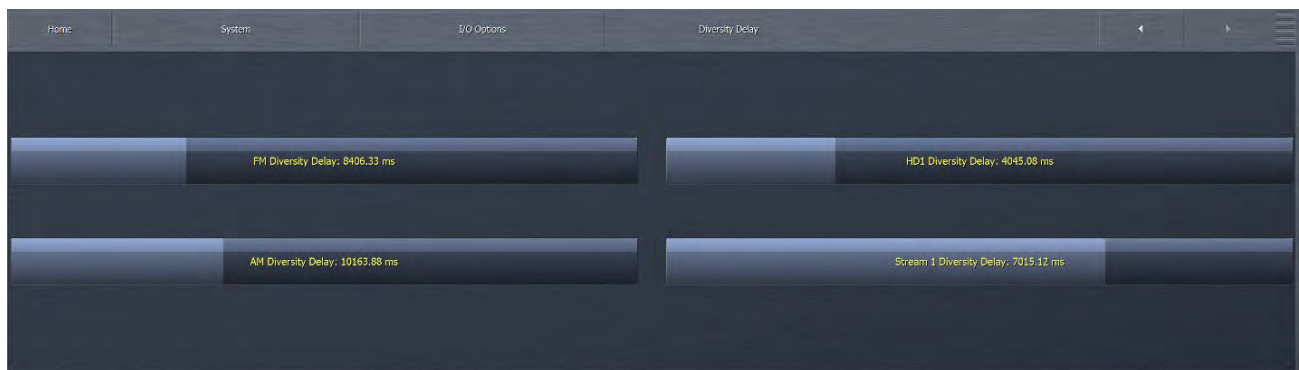
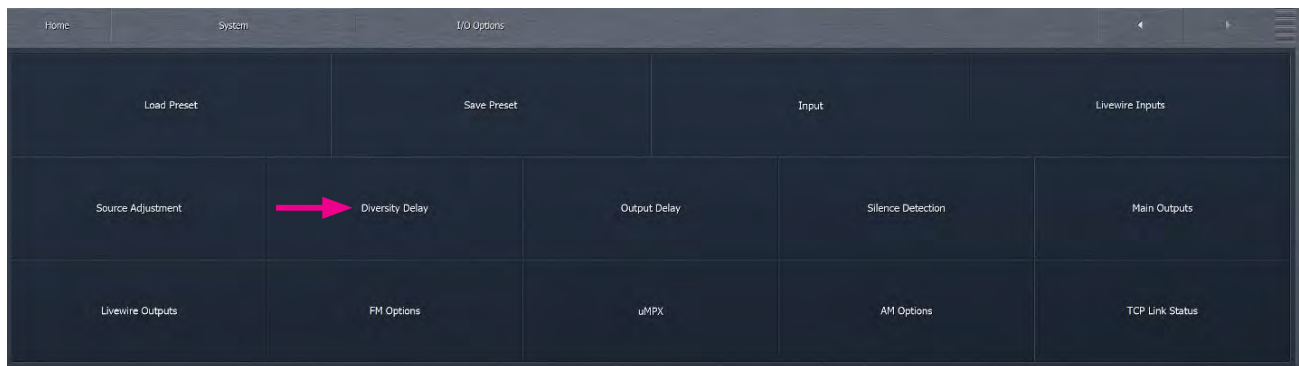
Here is where you set the Return source among None, Analog, Main Digital, Aux Digital and Livewire. You can set the Insert Mode to Off, On, Lineup Tone, Blips, or Noise (see the manual chapter for further details). And you can set the insert delay from 0 to 680 milliseconds.



Where is the diversity delay?

Omnia.9 provides a “diversity delay” so that AM or FM audio can be delayed and time-aligned to corresponding HD-1 audio, ensuring listeners with HD radios will experience a smooth transition when their receivers switch back and forth between the analog and digital signals.

This control is found in the System > I/O Options > Diversity Delay menu. Double-clicking on the slider will bring up three independent sliders for Coarse, Medium and Fine adjustment.



I'm having difficulty getting my Omnia.9 on my local network. I can't "ping" it either.

As a security measure, Omnia.9 is not "ping-able" on the network so the inability to get traditional ping response is not necessarily a sign of a problem.

There are two basic conditions that must be met before a remote connection to Omnia.9 is possible:

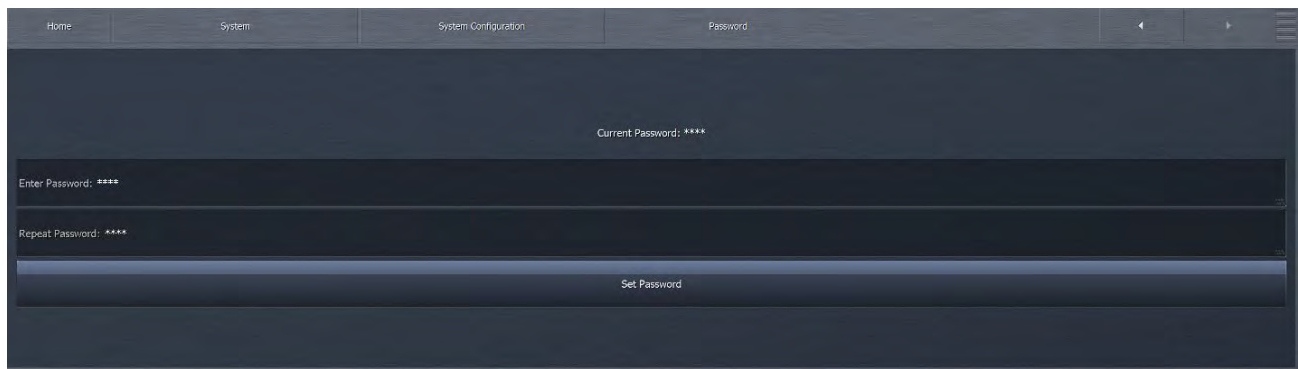
Omnia.9 must have a password set up via the front panel.

Omnia.9 must be connected to your local network and have a working IP address initially assigned to it via DHCP (a static address can be established later).

Note:

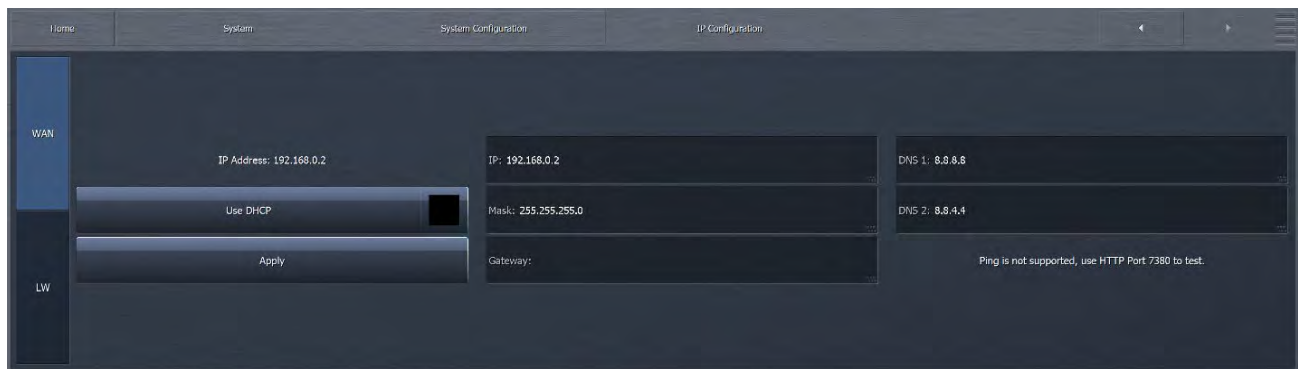
It is not necessary to "white list" a computer in order to access Omnia.9 remotely. Any computer running the NfRemote software can access Omnia.9 providing the user knows the unit's password. White listing IS required to access the built-in HTTP server, however.

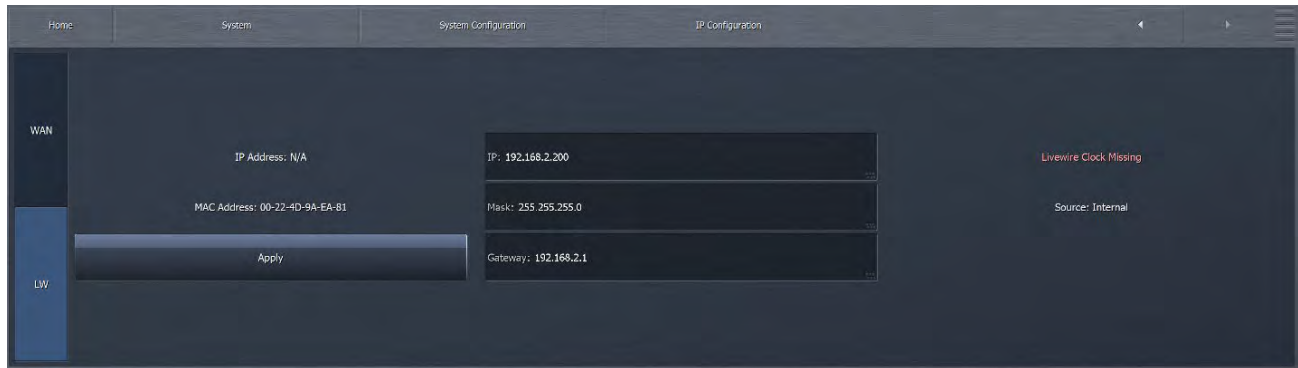
To set up a password, navigate to the **System > System Config > Password** menu from the *front panel*. Enter your password in the "Enter Password" and "Repeat Password" fields and click on the "Set Password" button. There is no factory default password, but 1 2 3 4 is commonly used in the lab.



To set up an IP address, navigate to the **System > System Configuration > IP Configuration** menu from the front panel. Click on "Use DHCP" to enable Omnia.9 to receive an IP address from your DHCP server. If, after a period of 30-60 seconds, the internal loopback address is still displayed, Omnia.9 is not communicating with the DHCP servers and there are network issues outside of the unit to explore.

The WAN and Livewire tabs allow you to set the IP Config for those two modes.





While it is beyond the scope of this manual to provide specific IP troubleshooting advise, we can suggest the following basic steps:

Try using a different Ethernet cable to rule out that a bad cable is at fault.

Plug Omnia.9 into a different port on your router or switch to rule out a bad port.

Plug Omnia.9 into a different router or switch altogether to eliminate a bad piece of hardware.

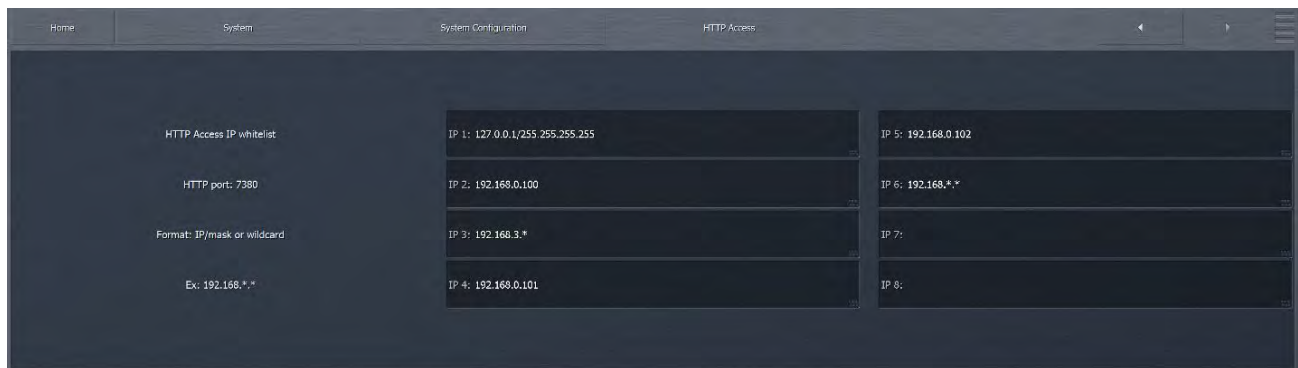
Plug another device (such as a laptop computer) into the same port and see if it will communicate with the DHCP server.

Using a computer that is already known to work on the network, use an Ethernet cable to connect Omnia.9 directly to that computer. In most cases, the computer will act as an ad-hoc DHCP server and attempt to assign Omnia.9 an IP address.

Where do I get a copy of the remote software?

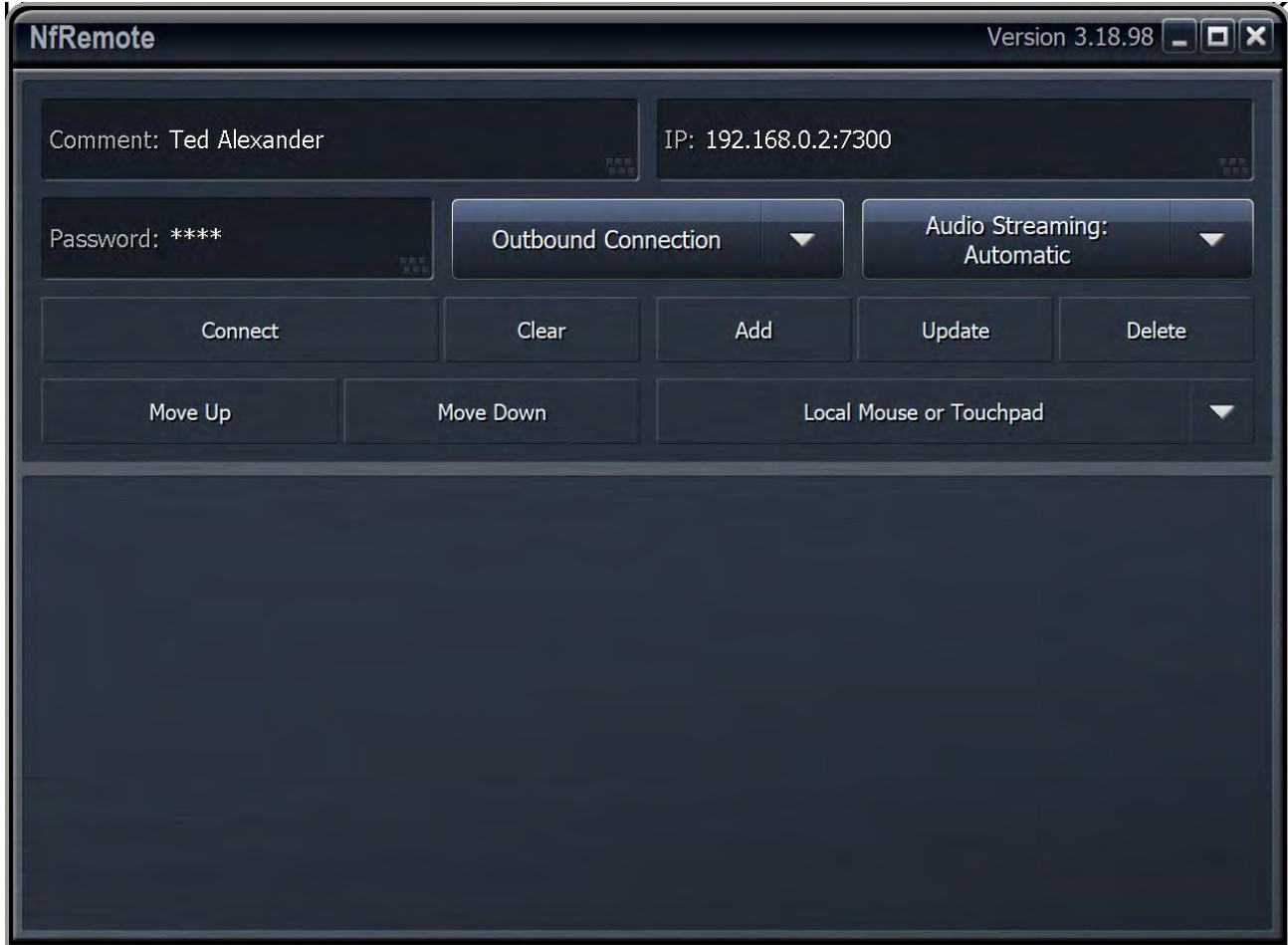
The remote software client (NfRemote) is always available from within Omnia.9 itself and can be retrieved using the built-in HTTP server. Any time you update your Omnia.9 software it is a good idea to update your NfRemote software as well to ensure compatibility.

The computer used to access the HTTP server must be on Omnia.9’s “white list” and Omnia.9 must be set up properly on your local network. To place a computer on the white list, navigate to System > System Configuration > HTTP Access and enter the IP address and subnet mask in the format shown below.



Using a web browser of your choice (and the actual IP address of your Omnia.9 to replace the sample address here), enter “http://192.168.1.1:7380”. This will bring up the HTTP server home page which contains a link to the NfRemote software. Download, locate and install the software. Once installed, assign a “friendly” name of your choice in the “Comment” field, enter the IP address and password, and click “Connect”.

Example:



28 Signal Path Diagrams

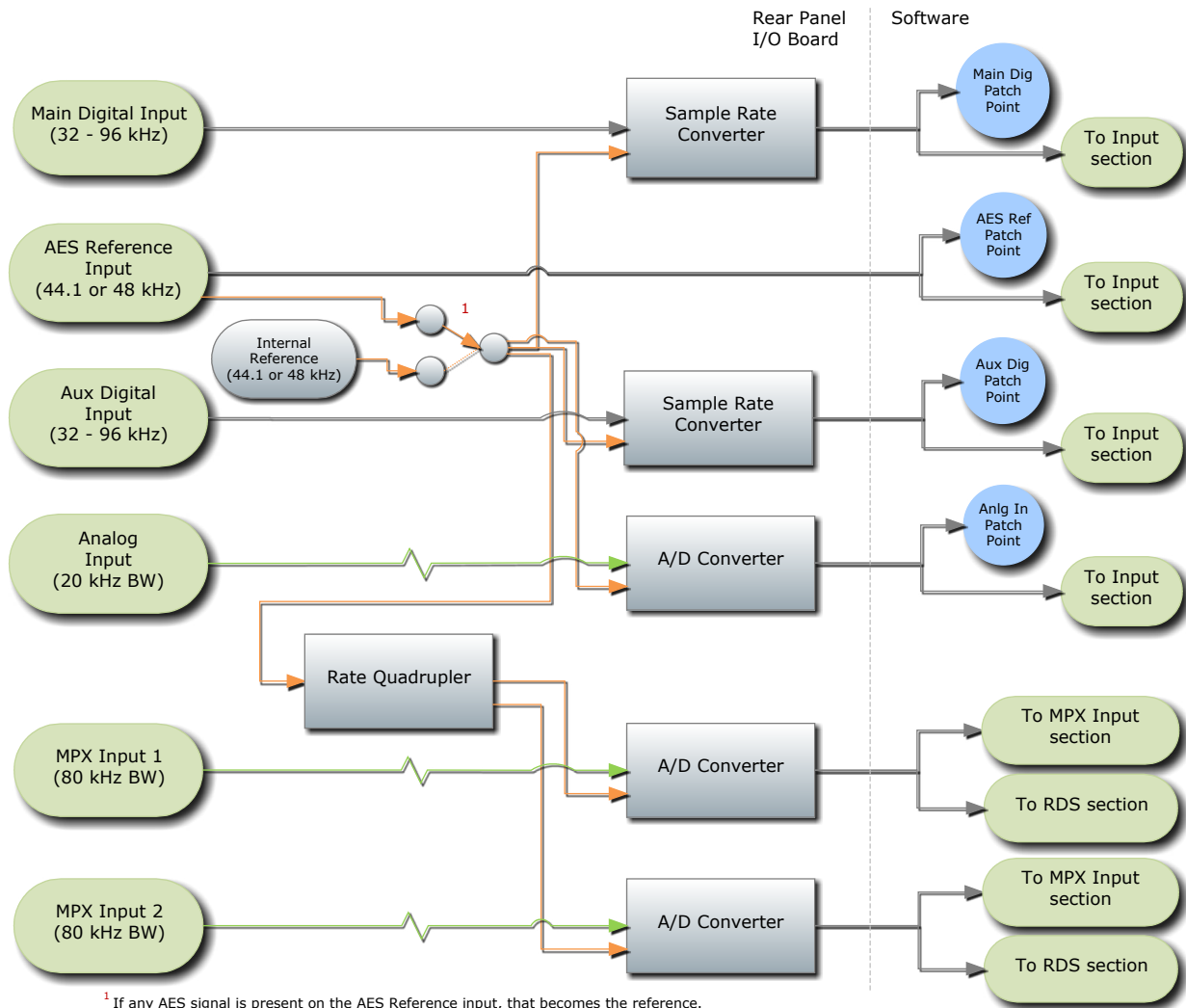
Many users of the Omnia.9 will be content with plugging it in, making the necessary I/O connections, picking a preset, then sitting back to enjoy the amazing aural delights and effortless dial dominance it provides.

Some will want to make changes to achieve a truly custom sound.

Still others will want to explore every nook and cranny of the menu system to discover every available control (there are nearly 4,500 points of adjustment when all features and cores are active – best to pull up a comfy chair and get a pot of coffee going).

And then there are those who will want to know more about how stuff gets done (you know who you are). It is for that crowd that we have provided the following flowcharts showing various signal paths within Omnia.9.

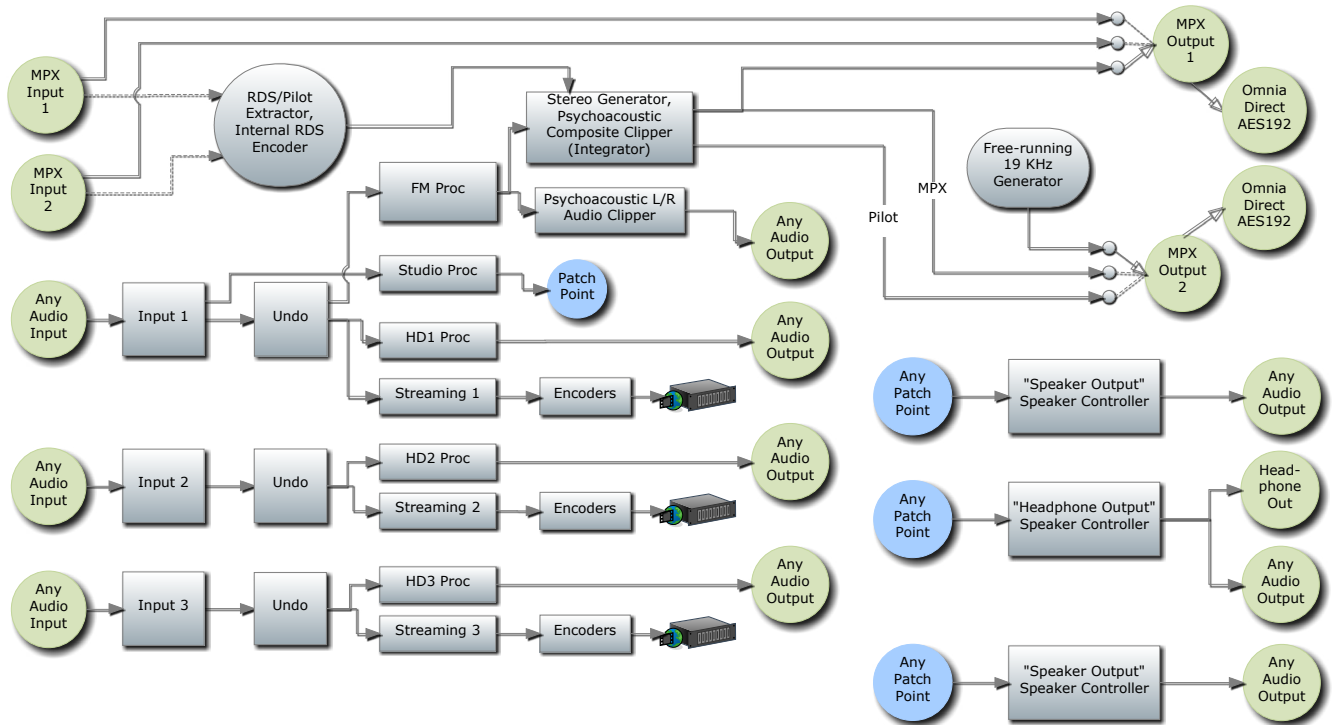
Physical Inputs



¹ If any AES signal is present on the AES Reference input, that becomes the reference. The rate of the signal **must match the system sample rate** (selected on the front panel). If it doesn't, **all I/O will mute**, including analog and MPX I/O, as the entire system is driven from the same (incorrect) clock source.

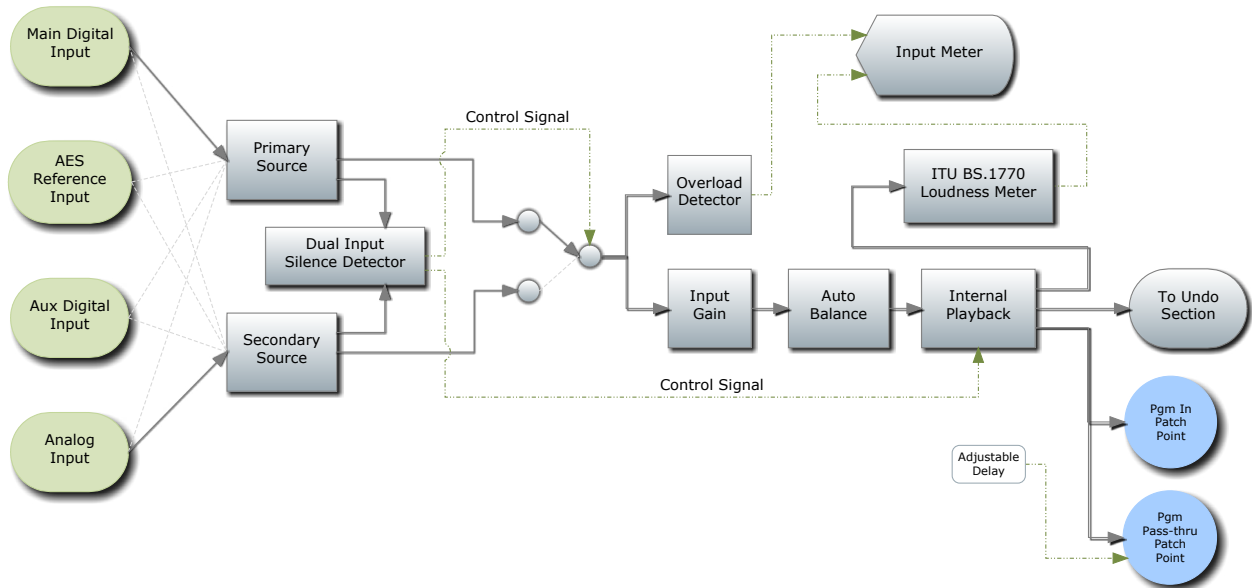
Input / Output Overview

Omnia.9 I/O Overview

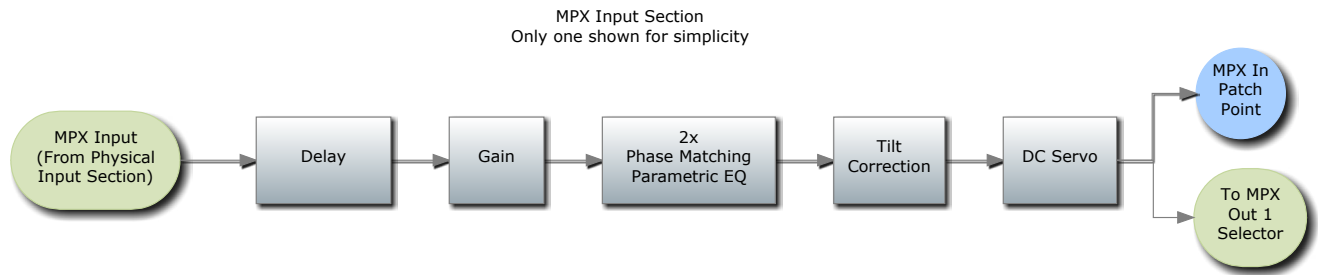


Input Section

Only one input section shown for simplicity.

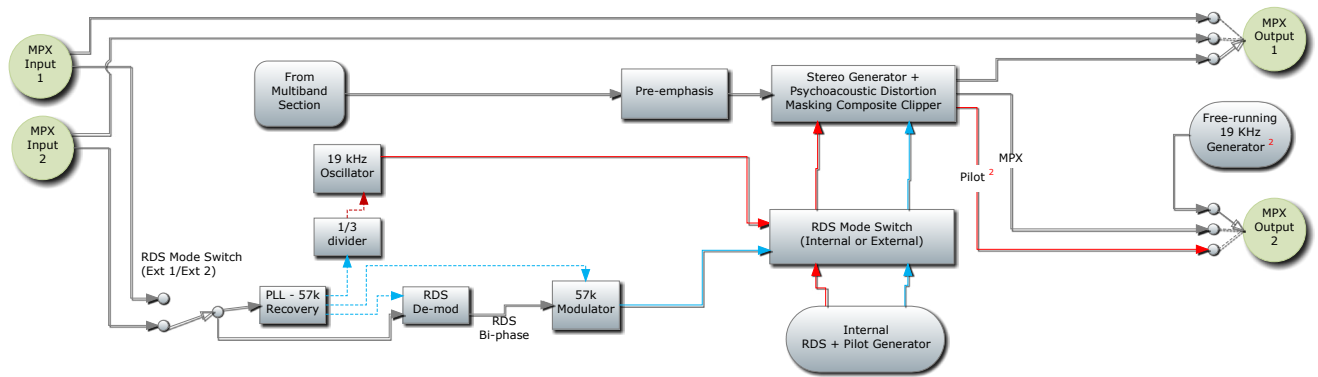


MPX Input



MPX Output

RDS Input - MPX Output Section

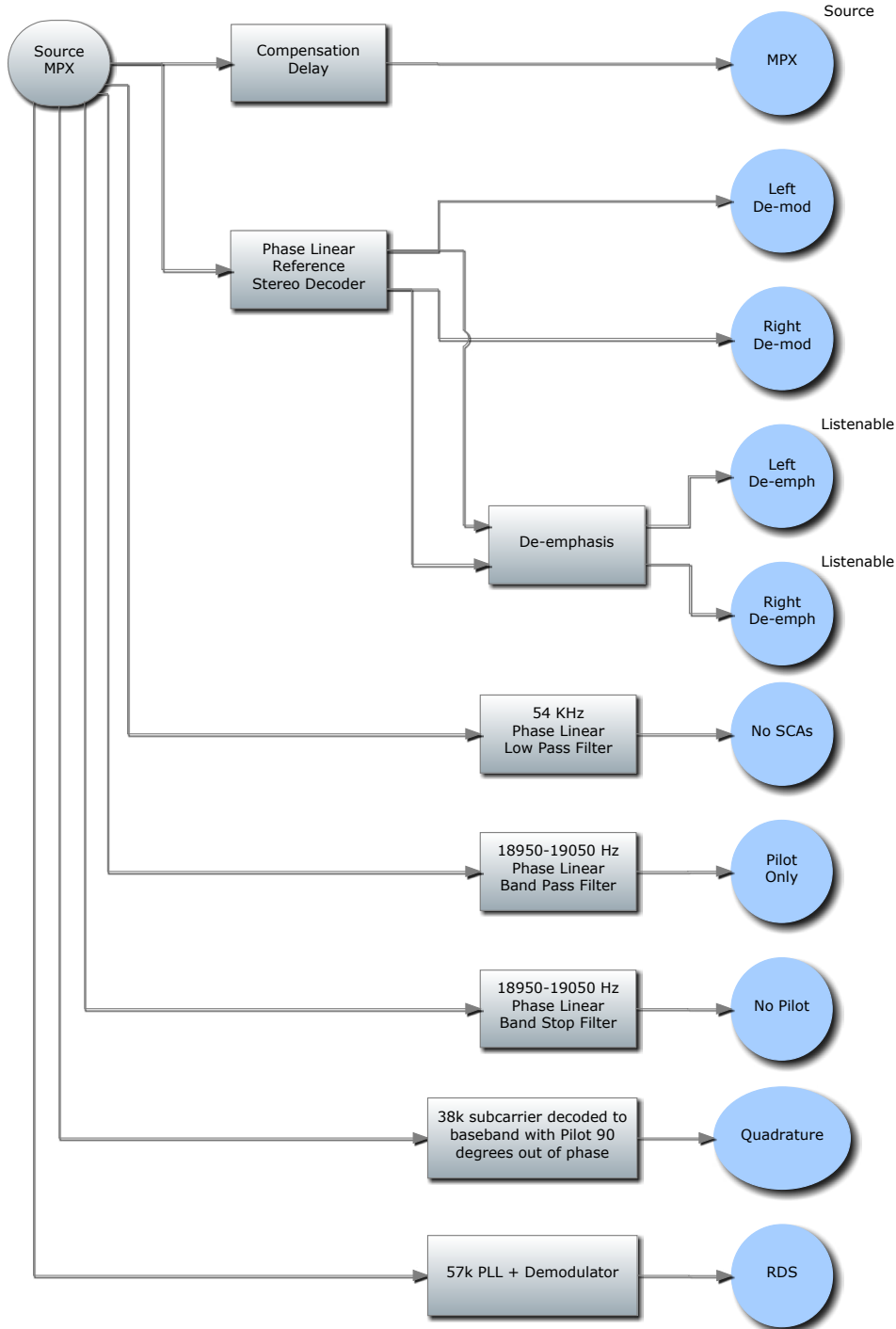


² Omnia.9 will recover sync from external RDS signals automatically. It is not necessary to feed an external pilot. If your RDS encoder requires a 19 KHz input, you may use the MPX2 Output Mode: 19k Generator option.

MPX Patch Point

MPX Patch Point
Used for both MPX Inputs and the MPX Output.

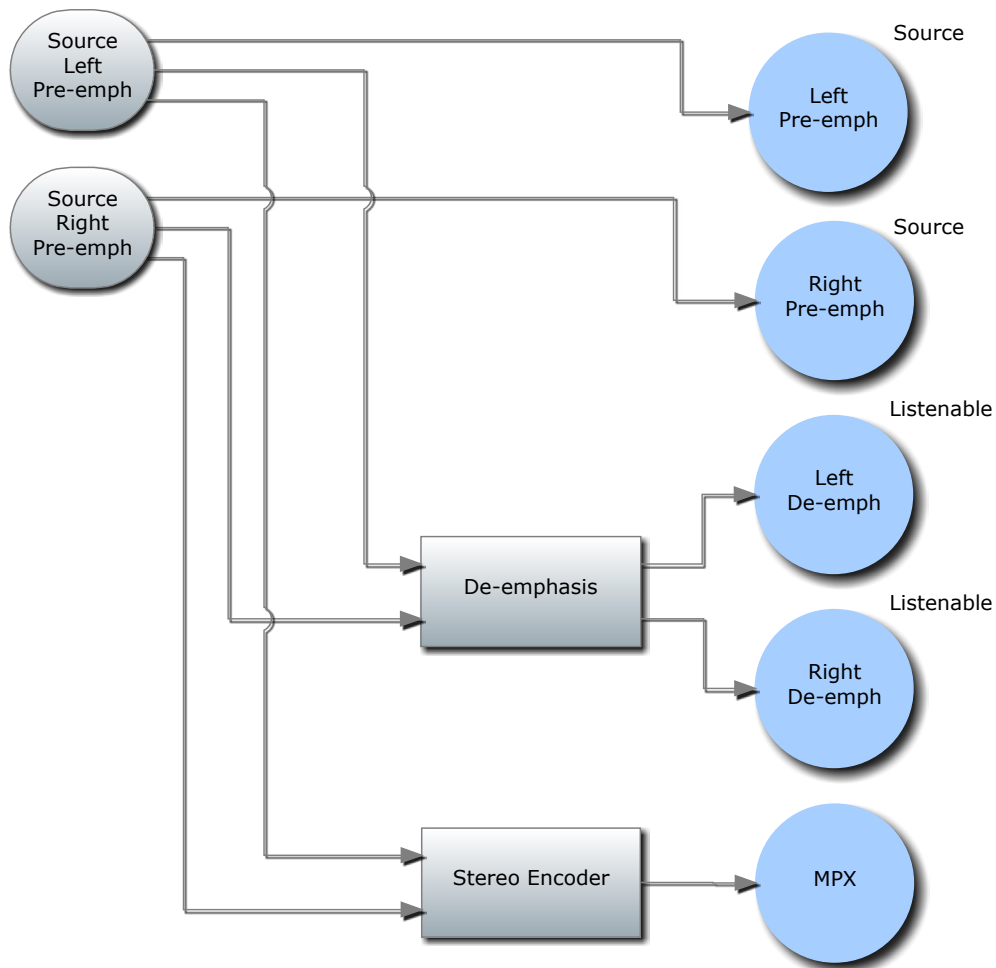
FFT Spectrum and Oscilloscope can view any channel.
RTA and Monitor Out can use only listenable channels.
File Recorder records only source channels.



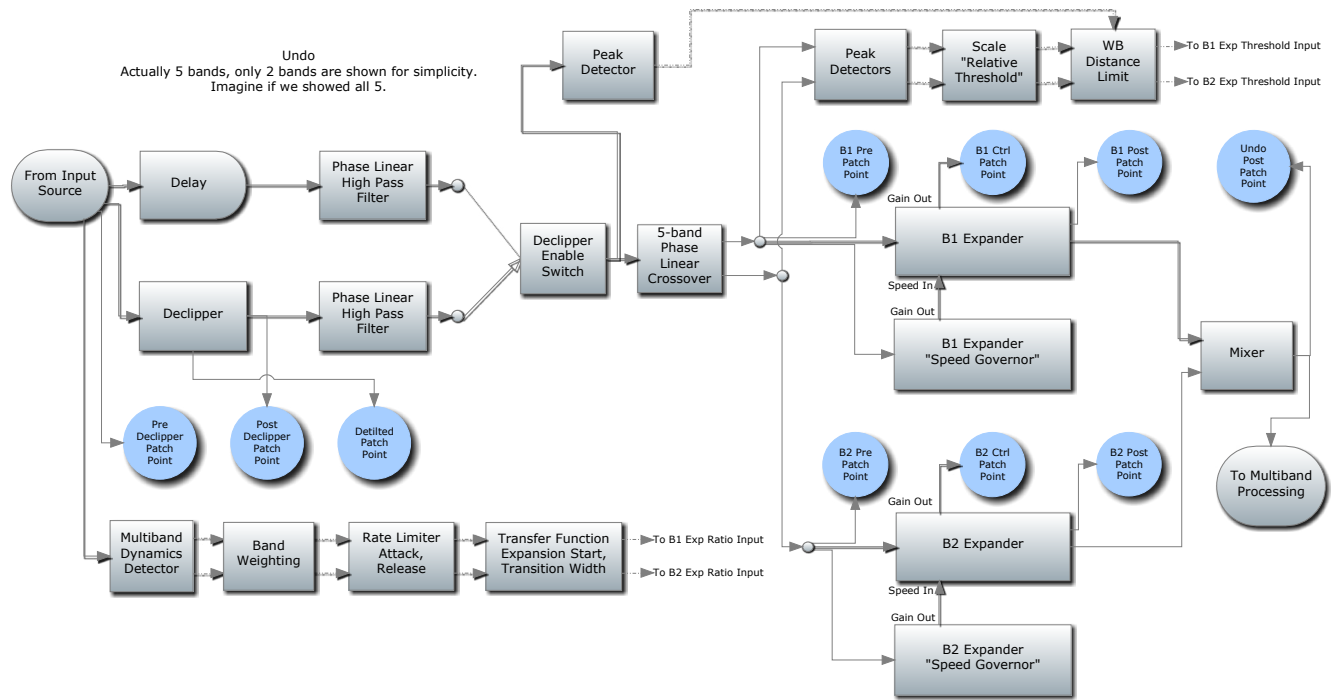
Pre-emphasis Patch Point

Pre-emph Patch Point
Used by the L/R Clipper (If using an external stereo coder -- **not** recommended)
Also used for the Pre-emph Test Input.

FFT Spectrum and Oscilloscope can view any channel.
RTA and Monitor Out can use only listenable channels.
File Recorder records only source channels.

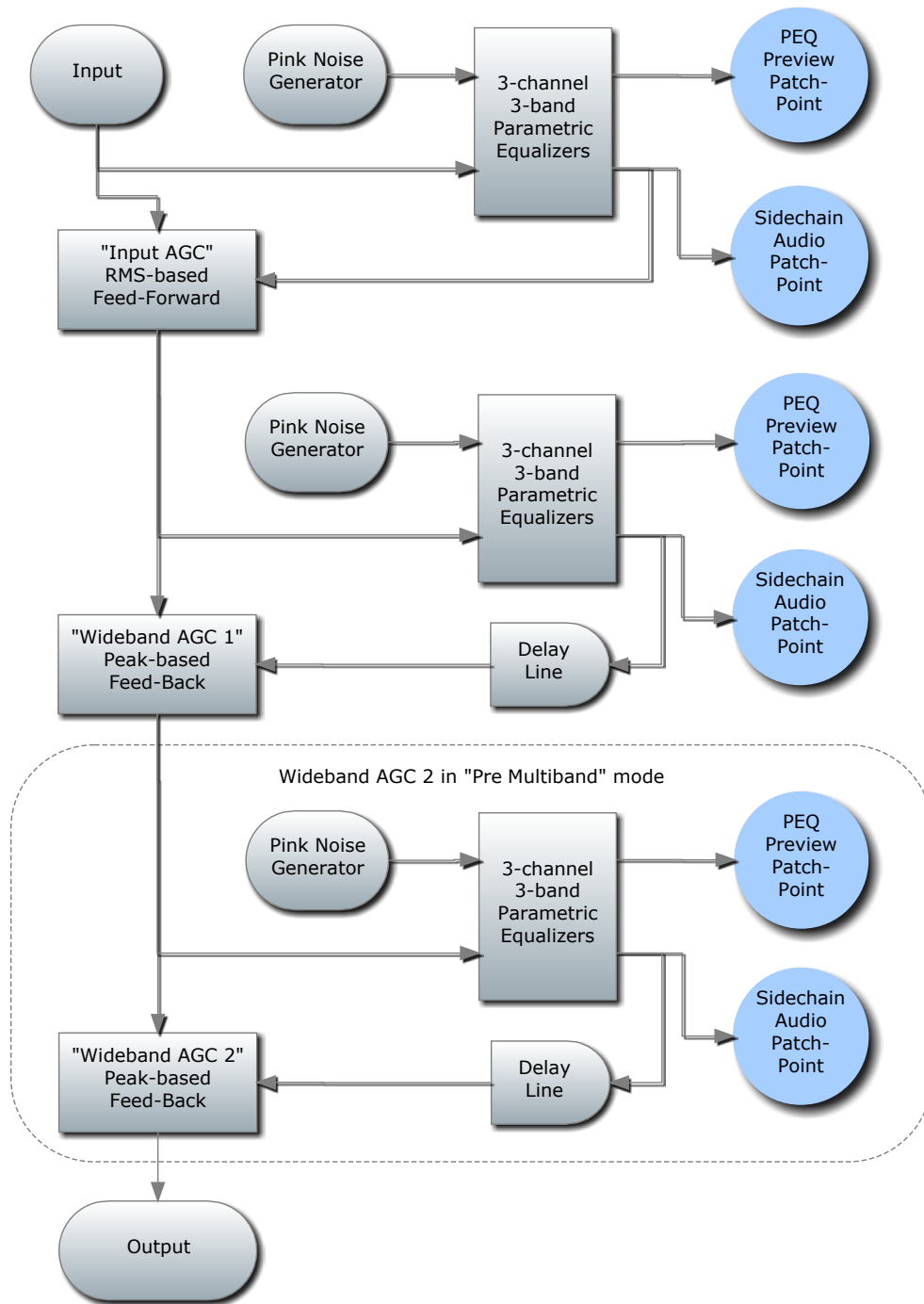


Undo



Input AGC/WB AGC1

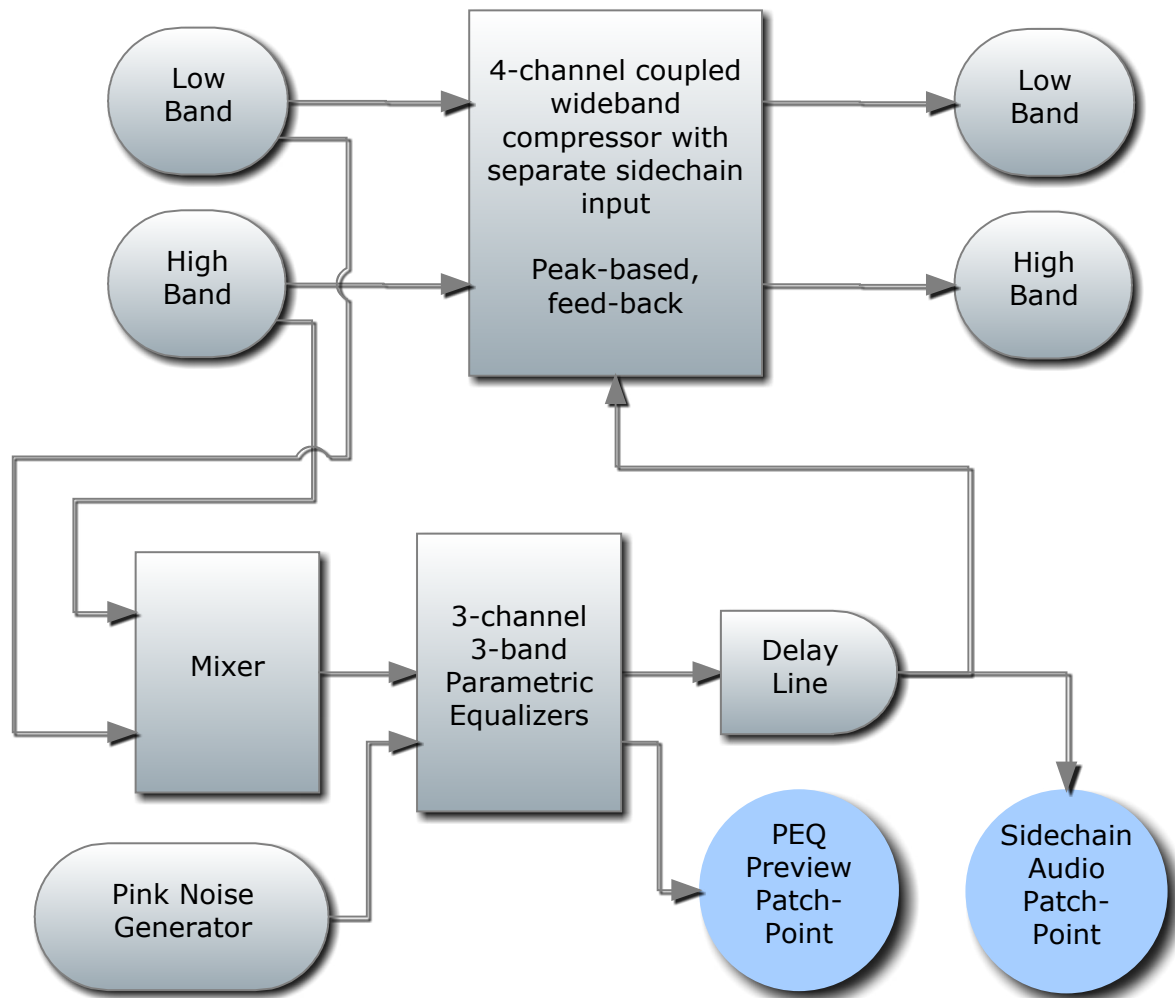
Input AGC and Wideband AGC 1



WB AGC2 / AGC3 Post-Multiband

Wideband AGC 2/3, Post Multiband Mode

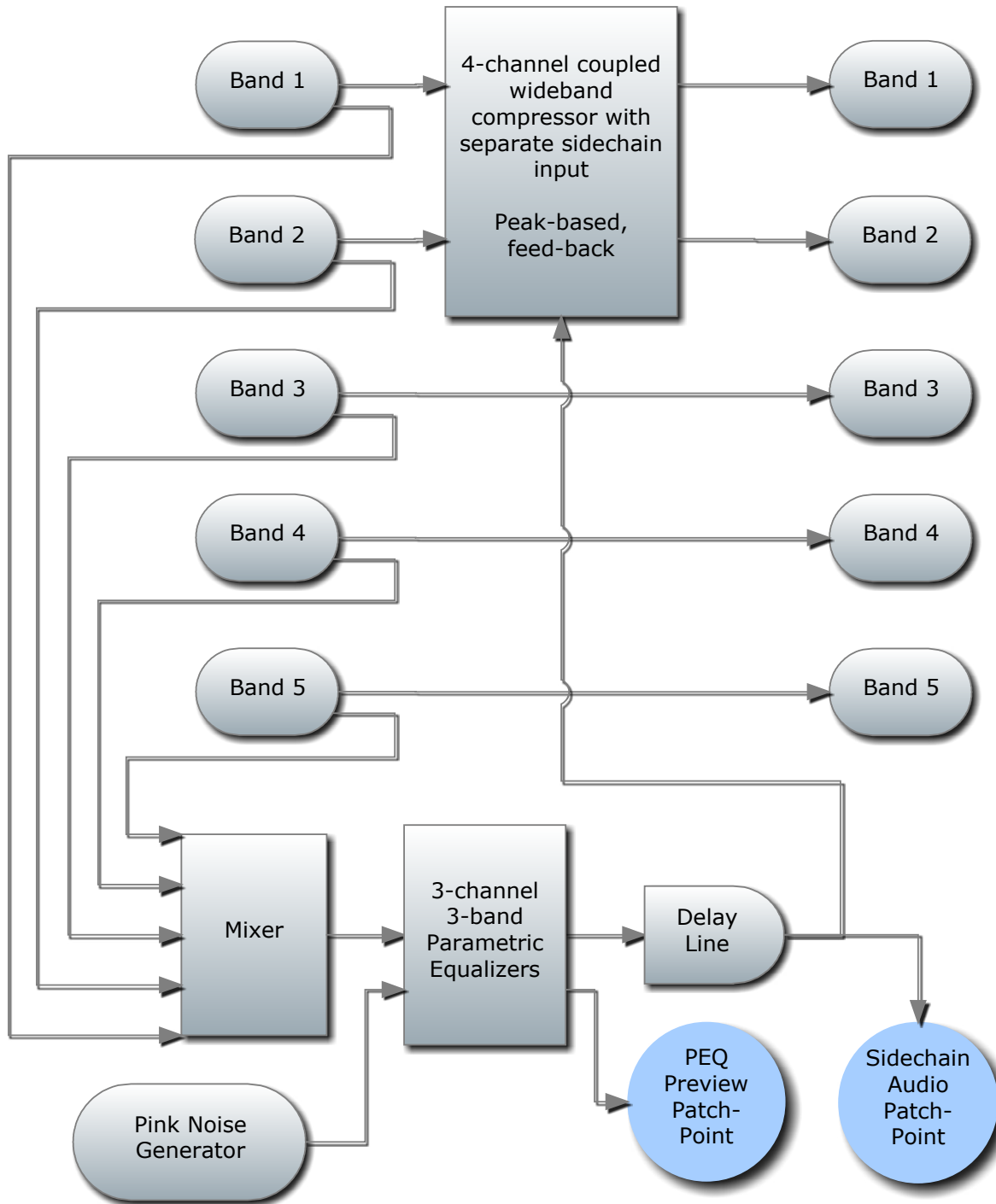
(Multiband is mixed down to two bands before this stage)



WB AGC2 / AGC3 Bass Wideband

Wideband AGC 2/3, Bass-Wideband Mode

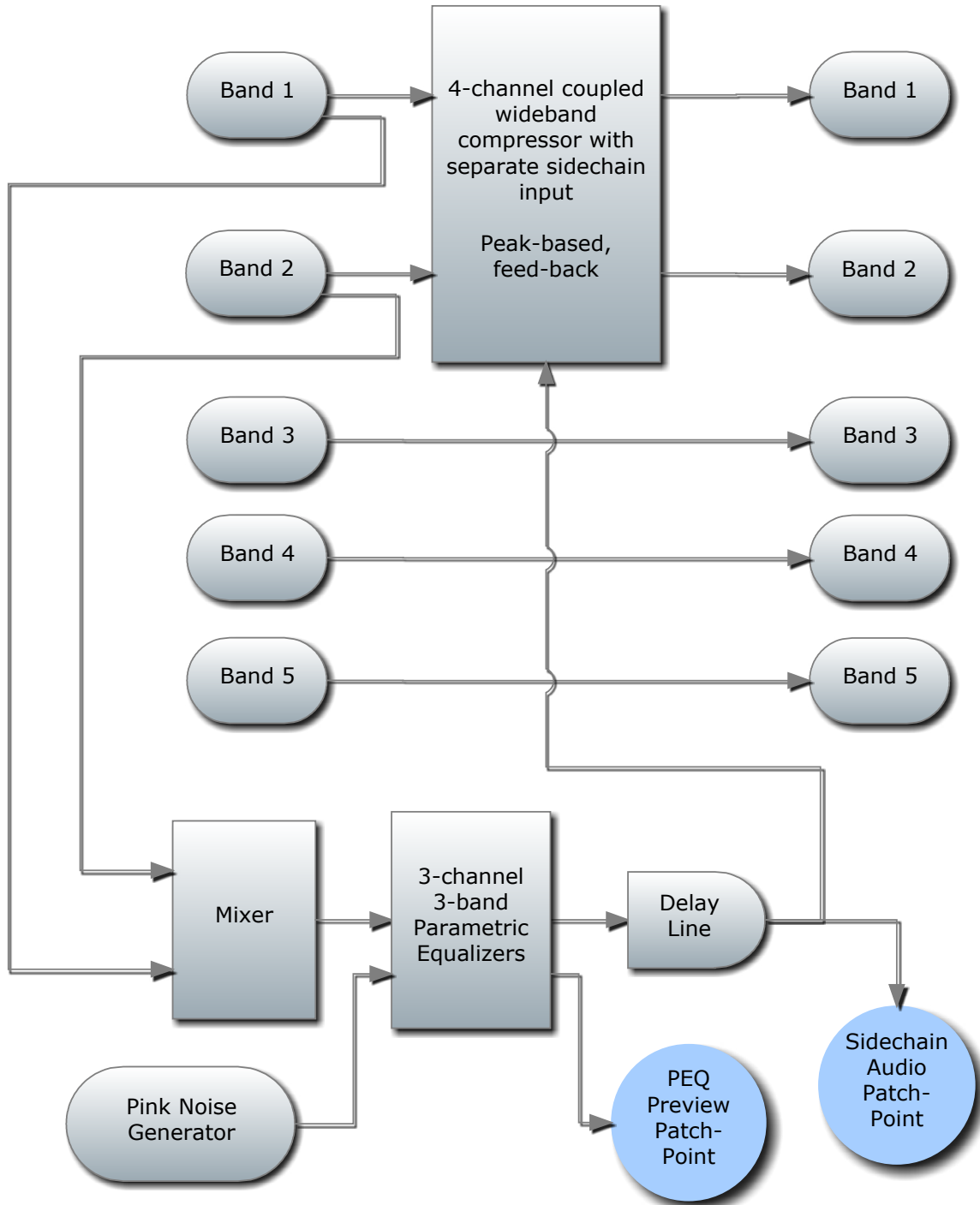
(Shown with 5 bands. In 2 and 3-band mode, only Band 1 goes through the compressor.)



WB AGC2 / AGC3 Bass Only

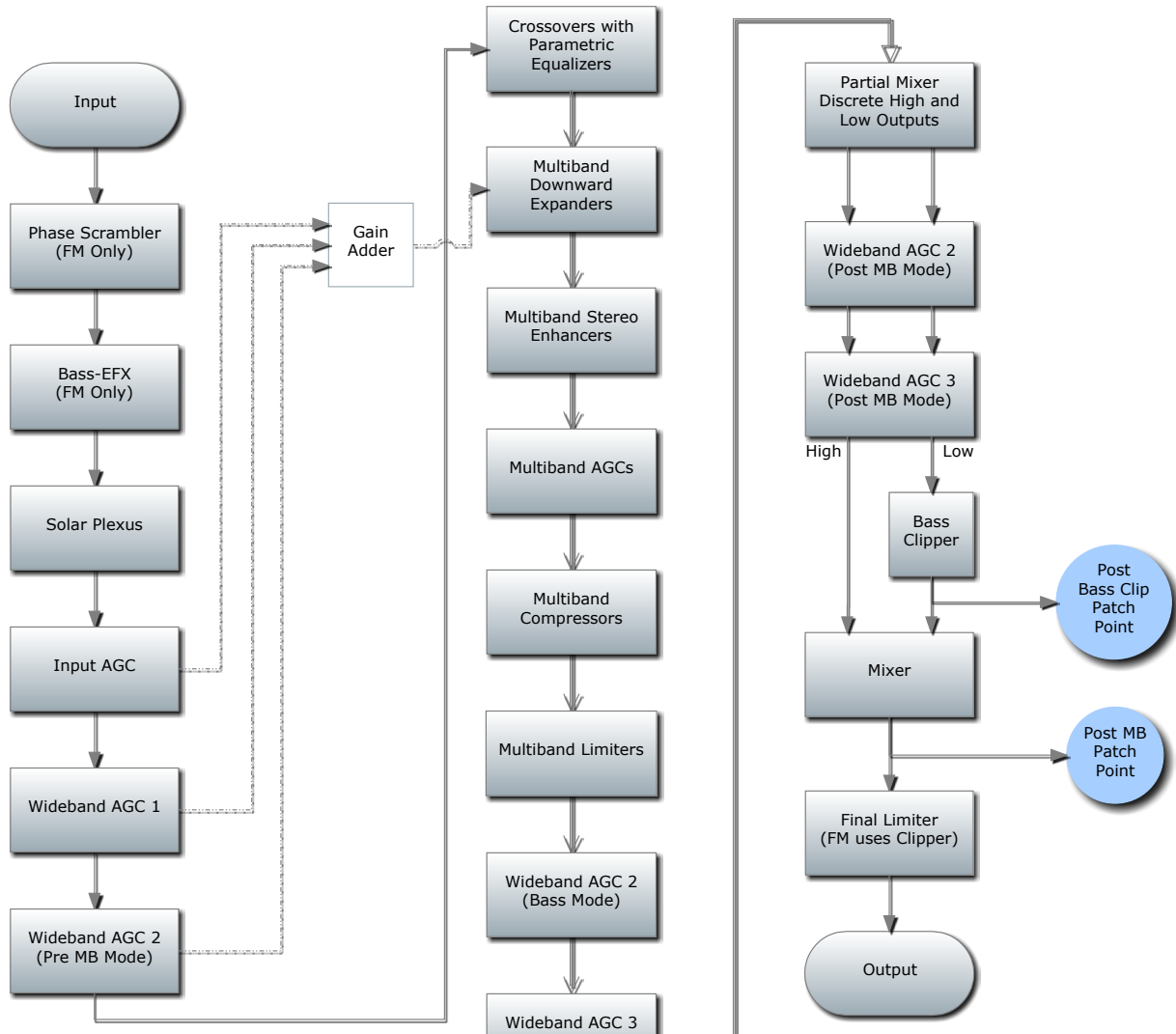
Wideband AGC 2/3, Bass-Only Mode

(Shown with 5 bands. In 2 and 3-band mode, only Band 1 goes through the compressor.)

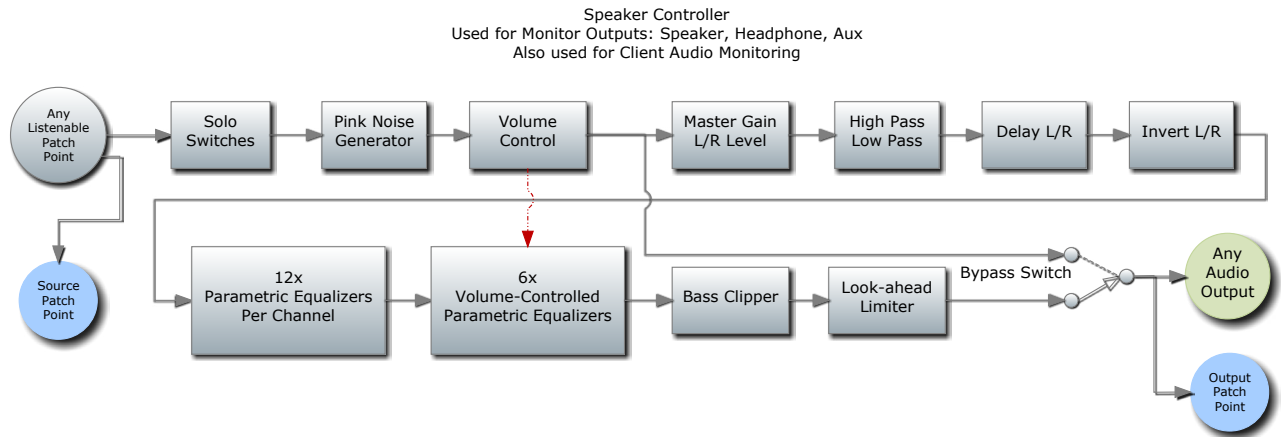


Multiband Processing

Omnia.9 multiband processing.
Double-lines signify multiple bands (2-7 bands).



Speaker Controller



29 Specifications

Preliminary specifications at the time this manual was compiled are provided here:

Frequency Response (FM)

- ◆ +/- 0.5dB 20Hz to 15kHz; 16.4kHz in extended mode.

Signal-to-Noise Ratio

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

System Distortion

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

Stereo Separation

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

Average Temperature in Thailand in December

- ◆ 77 F (25 C)

Digital Output Level

- ◆ Adjustable from -24dBFS to 0.0dBFS in 0.1 dB increments.

Stereo Baseband Output

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

A/D Conversion

- ◆ Crystal Semiconductor C55361, 24-bit 128x over-sampled.
- ◆ Delta sigma converter with linear-phase and anti-aliasing filter.
- ◆ Pre-ADC anti-alias filter with high-pass filter at <10Hz
- ◆ MPX Inputs have high pass filter <0.1Hz

D/A Conversion

- ◆ Crystal Semiconductor CS4391, 24-bit, 128x over-sampled.
- ◆ External sync input
- ◆ Per AES11 Digital Audio Reference Signal (DARS), reference for digital output sample rate.
- ◆ MPX Outputs are DC coupled

Distance from Earth to Moon

- ◆ 238,900 miles

External Sync Range

- ◆ 44.1kHz or 48kHz.

Inputs/Outputs

- ◆ Balanced, EMI-filtered, L/R analog input and output connectors.
- ◆ AES Reference Input, Main Digital Input, Aux Digital Input, Main FM Output 1, Main FM Output 2, and Aux Output on XLR connectors, including recognition of external sync signal on AES Reference Input. Main and Auxiliary digital inputs accept sample rates between 32kHz – 96kHz and have sample rate converters.
- ◆ Shared Ethernet/Livewire RJ-45 port supporting 100 and 1000 BASE-T Ethernet.

Power Requirements

- ◆ 100-264 VAC, 47-63Hz, auto-sensing.
- ◆ Power Connector
- ◆ IEC male; detachable 3-wire power cords supplied.

Power Supply

- ◆ Dual internal redundant hot-swappable supplies.

Environmental

- ◆ Operating temperature range: 0 to 50 degrees C (32 – 122 degrees F)
- ◆ Non-operating temperature range: -20 to 70 degrees C (Minus 4 – 158 degrees F)
- ◆ In North America, designed to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules (CFR) . Designed for U.S. and Canadian listing with UL.
- ◆ In Europe, designed to comply with the requirements of Low Voltage Directive 73/23/EEC and EMC Directive 89/336/EEC.
- ◆ Designed for RoHS and WEEE compliance.

Percentage of People Who Read Product Manuals Cover to Cover

- ◆ 0.00003%

30 Telos Alliance Warranty

Telos Alliance Limited Warranty



For the latest Telos Alliance warranty, visit: telosalliance.com/warranty.

THIS PAGE INTENTIONALLY LEFT BLANK

