WheatNet-IP

AUDIO OVER IP NETWORK

TECHNICAL MANUAL

Wheatstone Corporation

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Wheatstone Corporation
April 2009

Wheatstone WheatNet-IP Audio Over IP Network - 3rd Edition Revised

Attention!

Federal Communications Commission (FCC) Compliance Notice:
Radio Frequency Notice

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

> ⚠ **This is a Class A product. In a domestic environment, this product may cause radio interference, in which case, the user may be required to take appropriate measures.**

This equipment must be installed and wired properly in order to assure compliance with FCC regulations.

Caution! *Any modifications not expressly approved in writing by Wheatstone could void the user's authority to operate this equipment.*

Attention!

WheatNet-IP Blade 3s
Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. This equipment must be installed and operated in a dry location free from dripping or splashing liquids. No objects filled with liquid (such as beverage containers and the like) shall be placed on or near the unit.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into an apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
14. DISCONNECTING DEVICE FROM MAINS – Main power cord plug is the disconnecting device. The power plug of an installed unit must remain readily accessible/operable at all times.

WARNING!

⚠ *To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.*

c **UL** us
LISTED
(PRODUCT IDENTITY)
8D48

Attention!

WheatNet-IP Blade 3s

Consignes De Sécurité Importantes

1. Lire ces instructions.
2. Conserver ces instructions.
3. Observer tous les avertissements.
4. Suivre toutes les instructions.
5. Ce matériel doit être installé et utilisé dans un endroit sec à l'abri d'éclaboussures de liquides ou de gouttes. Aucun objet rempli de liquides tel que breuvages ou autres, ne doit être placé sur le dessus ou à côté de cet appareil.
6. Nettoyer uniquement avec un linge sec.
7. Ne pas bloquer les ouvertures de ventilation. Installer d'après les instructions du manufacturier.
8. Ne pas installer près de sources de chaleur tels que des radiateurs, registres de chaleur, poêles ou autres appareils (incluant les amplificateurs) pouvant de la chaleur.
9. Ne pas contourner le dispositif de sécurité de la fiche polarisée ou de mise à la terre. Une fiche polarisée a deux lames dont une plus large que l'autre. Une fiche de terre a deux lames et une troisième broche de mise à la terre. La lame large ou la troisième broche est fournie pour votre sécurité. Si la fiche fournie ne rentre pas dans votre prise, consultez un électricien pour le remplacement de la prise obsolète.
10. Protéger le cordon d'alimentation en évitant qu'il ne soit piétiné ou écrasé notamment au niveau des fiches et le point de sortie de l'appareil.
11. N'utiliser que les fixations et accessoires spécifiés par le fabricant.
12. Débrancher cet appareil pendant les orages ou lorsqu'il n'est pas utilisé pendant de longues périodes de temps.
13. Confier toute réparation à un personnel qualifié. Une réparation est nécessaire lorsque l'appareil a été endommagé de quelque façon que ce, soit tel que : le cordon d'alimentation ou la fiche est endommagée, du liquide a été renversé ou des objets sont tombés dans l'appareil ou celuici a été exposé à la pluie ou à l'humidité ou ne fonctionne pas normalement ou s'il est tombé.
14. DÉBRANCHEMENT DE L'APPAREIL DU SECTEUR – Le cordon d'alimentation principal est le dispositif de déconnexion. Le cordon d'alimentation d'une unité installée doit rester facilement accessible / utilisable à tout moment.

ATTENTION!
Pour réduire le risque d'incendie ou de choc électrique, ne pas exposer cet appareil à la pluie ou à l'humidité.

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(PRODUCT IDENTITY)
8D48

Wheatstone Corporation

WheatNet-IP Quick Start Setup Guide

Before Getting Started

The purpose of this document is to aid in the quick setup of your new Wheatstone WheatNet-IP product. The WheatNet-IP product comes with a setup wizard that will walk you through the setup process. This wizard is designed to help you get the system up and running quickly with little effort. If you have any issues during the setup process please contact Wheatstone Technical Support for further assistance at (252) 638-7000.

The guide assumes that connectivity will take place by one of the following methods.

Isolated Network

It is recommended that connectivity of the WheatNet-IP be made through an isolated Gigabit Ethernet switch.

House Network

Careful planning should be done if the WheatNet-IP system will integrate into your house network. A separate VLAN or other isolation method must be deployed to contain the multicast traffic. This guide assumes the network is equipped with a Gigabit network switch or router capable of handling this type of configuration. Consult your IT department for more information.

Snake Mode

This connection method assumes there will be two BLADEs connected back to back via a crossover cable to provide a point-to-point audio link. See "Snake" in Chapter 2 of this manual.

Network Setup

BLADE ID

Once power is applied the BLADE Quick Setup wizard will start automatically, assuming this is a first-time startup, and the front panel display should read as follows.
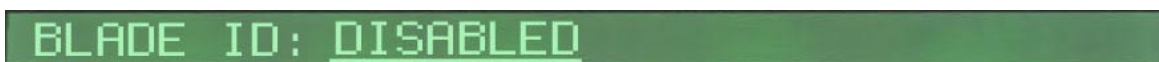
Rotate the encoder knob to the desired BLADE ID and press the TAKE button.

Consideration should be given to the ID selection as no two BLADEs in the system may have the same ID. The ID should be chosen based on system topology and should reflect how the system will ultimately be configured.

Wheatstone recommends assigning ID "1" to the first BLADE you power up on the network, ID "2" to the second, etc. The numbers have no real significance, only that they must be unique.

IP Address

Based on the BLADE ID selected the wizard will recommend an IP address. The default IP address will be in the 192.168.87.XXX scheme. Press the TAKE button if this address is correct for your network scheme and the wizard will automatically advance to "Signal Setup" section.

Consult the manual or Wheatstone Support if you cannot accept this IP Address.

Sample Rate

The WheatNet-IP system operates at 44.1kHz or 48kHz sample rates. Here you will select the default sample rate at which the system will operate. It is a good idea to pick a sample rate that your entire facility will adopt and stick with it. If 3rd party gear is operating at a different sample rate the WheatNet-IP system is capable of receiving inputs from 32kHz up to 96kHz and will up or down convert accordingly to the WheatNet-IP sample rate.

Signal Setup

Now that the Network Setup is complete the wizard will assist with creating audio signals if desired. The WheatNet-IP unit is equipped with signal templates to aid in quick setup. These templates are standard signal setups that may be a good starting point, depending on the application. The WheatNet-IP 88a, 88d, and 88ad have three template layouts. Choose from Custom, Stereo I/O, and Mono I/O templates. The 88m has two available templates, Mono_Mic and Stereo_Mic. The WheatNet-IP 88cb has three template layouts. Choose from Custom, Console_Stereo_In, and Console_Mono_In templates.

To select a template rotate the encoder knob to the desired template and press Take.

Custom Template

This template creates no signals. Instead the user will create the signals using the Navigator GUI.

Stereo I/O Template

This template creates eight Stereo Inputs and eight Stereo Outputs. Signal names are assigned based on the BLADE ID and will have a "BLxx_yy" naming convention, where "xx" is the BLADE ID and "yy" is source (or destination) 01 through 08.

Mono I/O Template

This template creates 16 Mono Inputs and 16 Mono Outputs. Signal names are assigned based on the BLADE ID and will have a "BLxx_yy" naming convention, where "xx" is the BLADE ID and "yy" is source (or destination) 01 through 16.

Stereo Mic I/O Template

This template creates eight Mono Microphone inputs and four Stereo outputs. Signal names are assigned based on the BLADE ID and will have a "BLxx_yy" naming convention, where "xx" is the BLADE ID and "yy" is source 01 through 08 or destination 01 through 04.

Mono Mic I/O Template

This template creates eight Mono Microphone inputs and eight Mono outputs. Signal names are assigned based on the BLADE ID and will have a "BLxx_yy" naming convention, where "xx" is the BLADE ID and "yy" is source or destination 01 through 08.

Console I/O Template

This template creates and maps all connections needed to run your E-1 control surface. This includes the four Program busses, along with the Headphone, Cue, and Studio outputs. All surface output mixes are automatically routed to the Console Blade's rear panel connectors to help speed up the installation process.

Connection Status

After completing the setup process the BLADE will attempt to join the network. During this process a "Connecting..." message will appear on the display.

Once the BLADE has successfully joined the network the front panel will display:

To access the Main Menu rotate the encoder and select the desired option by pressing "Take."

Things To Look For In The Wizard

If an online BLADE is detected with the same ID the wizard will display the following

"IP ALREADY IN USE! VERIFY SETUP"

This message will be displayed until the user acknowledges by pressing the TAKE button. The wizard will then start over. Simply change the BLADE ID to a unique ID and advance through the options.

If replacing a failed BLADE on the network and you wish to assume the identity of the failed BLADE, select the ID previously used. This will place the new BLADE on the network in a default configuration. Once online you may restore the previous configuration from a backup copy using the WheatNet-IP Navigator GUI or the BLADE Web Interface. For more information on backing up and restoring BLADE configuration please refer to the WheatNet-IP Navigator GUI section of the manual.

Surface Setup

If you have an Mix Engine Blade, it can be used with a Wheatstone E-Series surface to provide mixing capability. In order to be used in a BLADE system, the surface must first be properly configured.

Network Settings

When the E-Series surface is powered up the first time it will display a dialog box stating that no network file was found (*See Figure 1*).
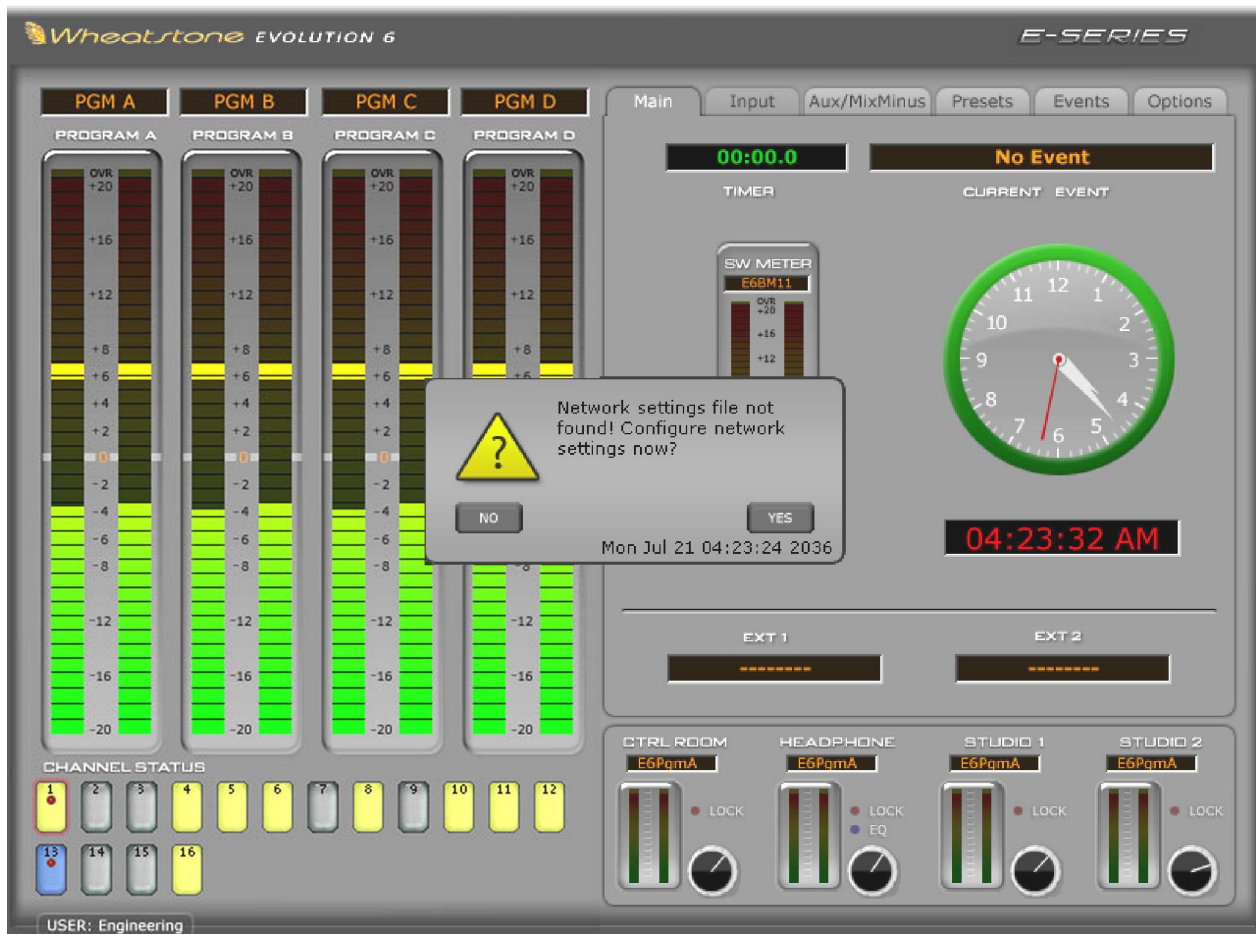

Figure 1

To configure the network settings for the E-Series surface select "YES" from the dialog box. The surface will now display the Options Tab (*See Figure 2*). Here you will set the BLADE ID and IP address of the Engine to which the surface will connect, along with the Surface IP Address, Subnet Mask, and Gateway. If Automatic mode is selected, enter the BLADE ID of the Mix Engine Blade to be associated with the surface and remaining settings are configured for you. You can manually enter this information by turning off Automatic mode and using the numbered keypad on the screen. Pressing NEXT will advance to the next field. When done simply press APPLY to finalize these settings and the surface will request a reboot (*See Figure 3*).
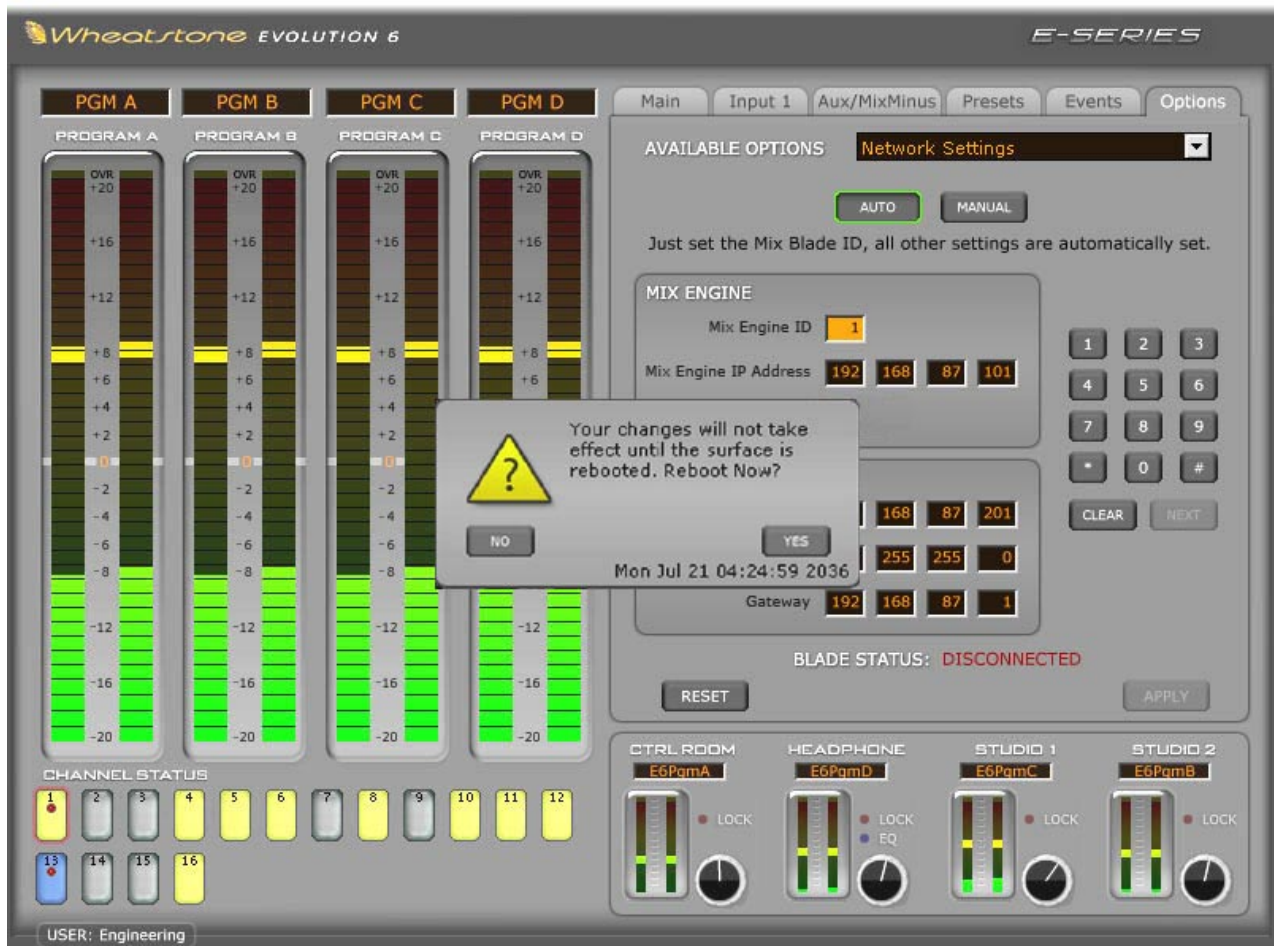
Figure 2

A	Configuration Mode	This is where you select the Configuration mode desired. The choices are Automatic or Manual.
B	Mix Engine ID	This is where the ID of the Mix Engine Blade that will be associated with the surface is assigned. One Mix Engine Blade supports a single surface.
C	Blade Status	This is the Blade connection status. If properly configured and connected to an Engine, status will be "CONNECTED." If improperly configured the status will read "DISCONNECTED."

For convenience, Wheatstone uses the following convention for IP Addressing in the WheatNet-IP system:

1. The IP Address of a BLADE is equal to the BLADE ID plus 100; i.e. BLADE 3 = 192.168.87.103

2. The IP Address of an E-6 control surface is equal to the Engine BLADE ID plus 200; i.e. Engine BLADE = 5, Surface IP Address = 192.168.87.205

Figure 3

Select YES from the dialog box and the surface will reboot. Once the surface has been rebooted navigate to the Options Tab and select Network Settings from the drop down menu. If all information was entered properly the BLADE STATUS will display "CON-NECTED" (*See Figure 4*). The E-Series surface has been successfully configured.

Figure 4

Wheatstone WheatNet-IP System

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General Information

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General Information

Introduction

Congratulations on acquiring the Wheatstone WheatNet-IP system. This exciting new technology allows you to build a networked audio system of I/O devices, control surfaces, computers, and controllers, all without using a dedicated audio router. How do we do this? By using a LAN (Local Area Network) itself to connect the various devices together and distribute audio and logic data where needed.

Each WheatNet-IP device (we call them "BLADEs") functions primarily as an audio access point, where analog or digital audio signals are connected to this network. Within the WheatNet-IP unit, the audio channels are converted to packets of data that can travel over an Ethernet LAN. The Ethernet switches that compose the core of the LAN directly control the distribution of packets and perform the "switching" function of a traditional audio router. Once the audio packets have been forwarded to the desired destination end point (typically a PC or another WheatNet-IP device), they are reassembled into an audio signal and made available.

By converting audio into data packets, the traditional audio wiring infrastructure of multipair cables, trunk lines, patch bays, and punchblocks is no longer needed. In fact all the distribution cables you need may already be in place – in the form of your LAN and its CAT-5e cables. You'll only need to wire your source and destination devices to "BLADEs" to complete your system. Best of all, the dozens of audio cables and hundreds of logic connections you used to need to connect up each audio console have been replaced with a single CAT-5e cable to the control surface. What could be easier?

A word about latency – a finite and not insignificant delay from when audio or logic starts at the input of the system and when it appears at the output. Packet based audio networks have a reputation of having significant latency issues due to the performance of the earliest implementations, some of which had tens and even hundreds of milliseconds of latency. Each component of the system contributes to latency. On the input side, the A/D convertors (or Sample Rate Convertors for digital inputs) take a little time to do their work. Multiple samples of audio data must be accumulated and formed into packets before they are placed on the network. Ethernet switches take time to analyze the packets before they are sent on to their destinations, where they are disassembled and formed into audio streams which finally can be converted by D/A converters before the audio starts to play. All of this eats up a little bit of time at each step along the way. The WheatNet-IP system has been designed from the outset to use Gigabit networks, among other things, to minimize latency. Total latency from a BLADE's input through an Ethernet switch to a different BLADE's output

is roughly 1/2 millisecond, which is well below the 5-10 millisecond human threshold of detection. Unfortunately, due to the none-real time nature of the Windows operating system and the fact that Windows requires buffers for audio streams, latency to/from a Windows PC remains on the order of 100 milliseconds.

Rack Mounting

The WheatNet-IP is designed to fit into an industry standard 19" equipment rack, and requires one rack unit (1.75 inches) of vertical space. Every BLADE model has a depth of 13-1/4" behind the rack rails (including chassis connectors), with the exception of the MADI BLADE with a 13-3/4" depth and LIO-48 BLADE with a 9-1/2" depth. An additional five inches of space is required for wiring cables to pass through. The chassis of all BLADE models has a width of 17-3/8". Space needed in front of rack rails is 3/4"for all BLADE models. The WheatNet-IP does not have top or bottom cover vent holes. Latent heat is vented out of the enclosure by natural convection through slots in the top of the rear panel. Cooler air is drawn into the unit through vertical slots positioned lower in the side panels. There is no fan inside the WheatNet-IP because its power consumption is low enough to not require one.

The WheatNet-IP may be mounted between other devices in the equipment rack and in accordance with good engineering practice should not be mounted directly above devices that generate significant amounts of heat. If such a location is unavoidable then it is advisable to utilize an extra 1RU blank rack panel between the WheatNet-IP and devices immediately above and/or below it. WheatNet-IP 88a analog BLADEs in particular run hotter and should be installed with spaces in between to avoid detrimental heat build up.

WARNING! **Under no circumstances should the WheatNet-IP unit be opened! The unit contains high voltage circuits that are hazardous and potentially harmful. The unit has no user-serviceable parts inside! If you have a problem the unit must be returned to Wheatstone Corporation for repair.**

Installation Tips

- Place any surge protection circuits as close as possible to the WheatNet-IP or other device being protected.
- Establish a low impedance common ground in your facility and try to route all grounds to that point.
- Choose the best power conditioning / UPS units that you can afford and suitable for your equipment – focus on the features and options you need. The better UPS products can prevent thousands of dollars in equipment damage — some even come with an external equipment damage warranty.
- *Unbalanced* audio connections to the WheatNet-IP should be made with shielded two conductor cable such as Belden 8451 or 9451 as if connecting a balanced source. At the unbalanced source's output connect the + Output to the HI input wire and connect the source GND wire to the LO wire. Connect the shield at the WheatNet-IP end only.
- For digital audio connections always use a good quality digital audio cable with a characteristic impedance of 110 ohms.

The AES/EBU specification, with its broad impedance tolerance, allows for cables with impedances from 88 ohms to 132 ohms – 110 ohms is ideal. Twisted pair cable should be shielded, and in the case of multi-pair cable, each pair should be individually shielded. Foil shielding is recommended for permanent installations and foil shield plus overall braid should be used in applications where frequent flexing of the cable will occur. One cable pair is capable of carrying two channels of digital audio.

Generic "audio" cable such as Belden 8451 *may* be used for interconnecting AES3 digital audio devices but **only** for distances of less than about 25 feet. The actual cable length that will work satisfactorily in an installation is primarily determined by the error correction and jitter tolerance of the AES3 receiver device and the cable used.

The impedance of most 'analog' cables ranges from 40 ohms to 70 ohms and represents a large impedance mismatch from the nominal 110 ohms required in the AES3 standard. Such mismatch will result in signal reflections, causing bit errors at the AES3 receiver. The higher capacitance of generic analog cables also slows down the rise time of the digital data signals, impairing the ability of the AES3 receiver to accurately detect digital signal transitions. This may result in increased jitter.

Energizing

Assuming the WheatNet-IP is correctly rackmounted, you may now energize it. There is no power switch. The AC line input voltage is permitted to be between 90 and 260VAC, 50 or 60Hz. Power consumption is under 100VA.

Aggressive AC input filtering is utilized at the AC input of the WheatNet-IP; however, it is always advisable to use external surge protection and/or an uninterruptible power supply (UPS), especially where AC power quality is questionable, such as at a remote transmitter site.

Power conditioning, surge suppression, and even power backup devices are wise investments when using sensitive modern electronic devices that use an internal computer.

Use of a UPS (uninterruptible power supply) is a good idea and will protect the WheatNet-IP from short duration power interruptions which may cause it to reboot. During boot up, audio is interrupted for approximately 40 seconds.

A Word About Nomenclature

Throughout this manual references are made to "BLADEs," "sources," "destinations," and other terms whose meanings may not be instantly understood by everyone. Let's take a moment to clarify some terms.

1. BLADE. In the WheatNet-IP system a "BLADE" is taken to mean an individual member of a WheatNet-IP system; any device that has a unique BLADE ID. It commonly refers to an individual input/output rackmount unit, but a more complete definition would include any network connected PC running a WheatNet-IP driver as well, including Automation servers and even the Program Director's PC if they are running the WheatNet-IP driver to listen to audio streams. Conversely, any PC that is running the WheatNet-IP Navigator GUI program or using a browser for interfacing to the built in web servers on BLADEs is not a BLADE itself. Only those devices that can transmit and/or receive WheatNet-IP audio streams are "BLADEs."

2. Source. A source is any audio signal in the WheatNet-IP system that is uniquely generated. Any WheatNet-IP signal that is created by accepting and packetizing an input is a source, as is any signal generated within the system. Source signals may be audio, logic, or both. A logic source might be a logic port triggered by an external switch. We generally avoid using the term "input" to describe WheatNet-IP signals because the term can be misleading. One would easily understand that an external

audio input jack could be an "input" or "source," but less obvious is the fact that an audio mix bus output is also a WheatNet-IP source because it is generating a unique signal (the mix) and making it available to stream throughout the system. Likewise, PCs streaming audio from a file via the WheatNet-IP driver can clearly be seen as a "source."

3. **Destination**. A destination is the opposite of a source. It is a signal that can accept any WheatNet-IP stream. A destination can take the received WheatNet-IP stream and convert it to a physical analog or digital output, or, in the case of a PC, a virtual output that subsequent PC application programs can convert to an audio output at the PC's speakers, or lay down as an audio track on the hard disc. Destinations can be audio, logic, or both. A logic destination might be a logic port wired to a lamp or relay. We avoid using the term "output" for WheatNet-IP signals. While it is clear that a WheatNet-IP destination wired to an output jack is an "output," control surface fader channels would not normally be considered "outputs" but they *are* "destinations" in the WheatNet-IP system, because you can route a WheatNet-IP audio stream to them.

4. **LIO**. Shorthand for **L**ogic **I**nput or **O**utput. In the WheatNet-IP system, an LIO signal is a signal that either generates or receives logic state information created either physically via a logic port or virtually via some state change within a mixing control surface. In the WheatNet-IP system logic information can be routed and cross connected just as audio can be.

5. **GUI**. Shorthand for **G**raphical **U**ser **I**nterface. A method of providing for user interaction with the system using a special computer program that displays information in the form of images and text on the computer screen and accepts user input via typing and mouse clicking within the computer program. The WheatNet-IP Navigator is a computer program that provides a GUI.

6. **Web Server.** A special computer program running on WheatNet-IP devices. Its intention is to provide for user interaction with the system by means of common place computer programs called "Web Browsers" that the user is likely to have on their PC and be familiar with because of their use accessing web pages over the World Wide Web via the Internet. The web server and Navigator GUI provide similar functions but in opposite ways: the Navigator GUI provides user access via the special program that must first be installed and then run on a particular PC, while the web server is a special program installed on every BLADE to provide user access via commonplace programs from any PC. Why do we provide both? Each has it advantages. A Browser is a general purpose program designed for viewing many different web pages and, as such, is best suited for general viewing functions such as seeing status, version, or logging information, while the Navigator GUI is a special program written specifically to control the nuances of a WheatNet-IP system. A browser is easier to use because you don't have to install any special programs, so any network connected PC should be capable of accessing the system, but the WheatNet-IP Navigator GUI is more powerful because it was designed from the ground up to control a WheatNet-IP system. Since each method of user access has some advantages, we have provided for both methods in the WheatNet-IP system.

WheatNet-IP System Description

Let's take a look at the parts of the WheatNet-IP system in more detail.
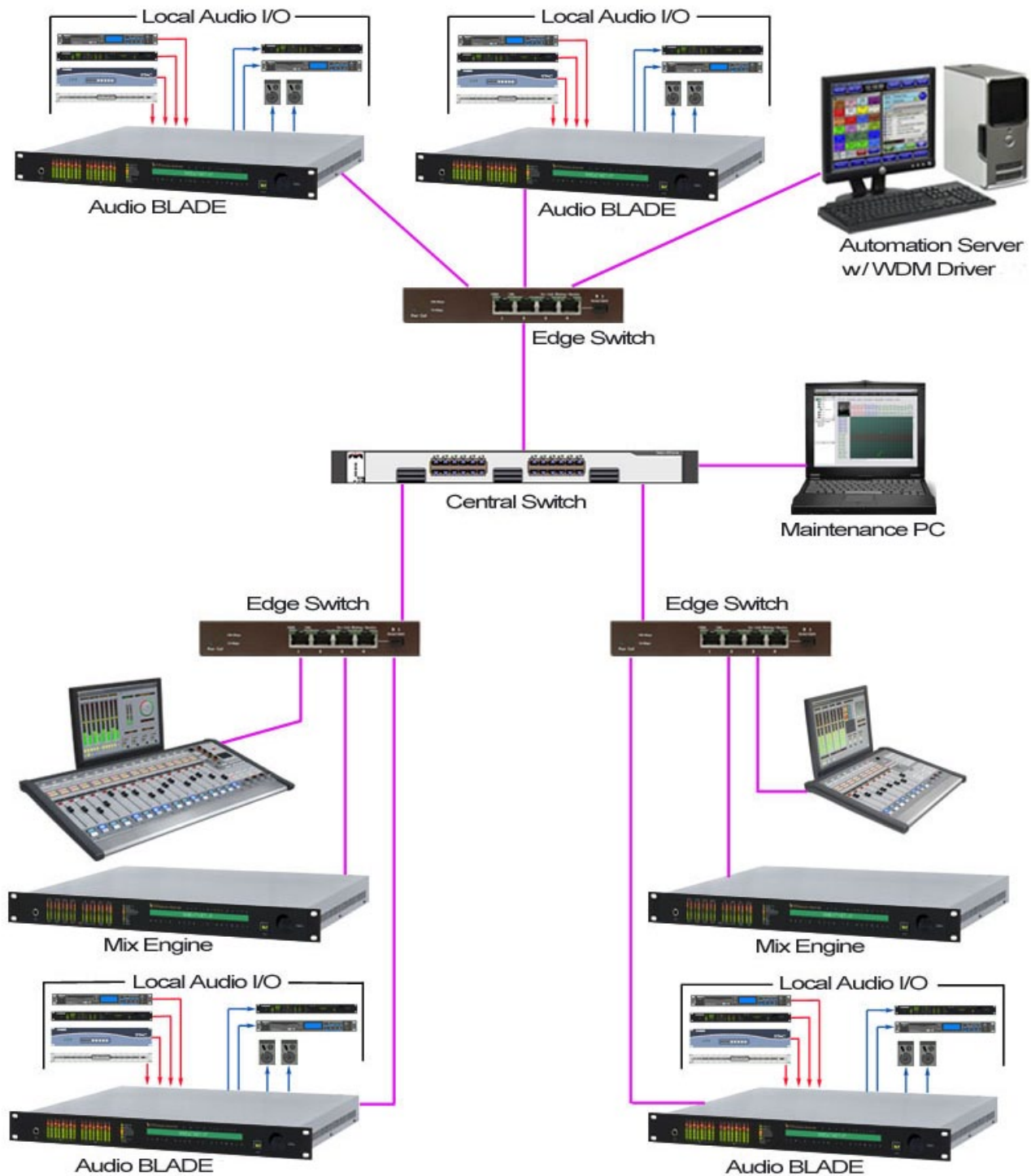
First there are the "BLADEs" themselves of which there are five flavors.

Model 88a - Analog BLADE

WheatNet-IP 88a is an access point for analog audio.

It has two DB-25 and eight RJ-45 connectors (the DB and RJ connections are in parallel so you can choose your preferred connector type) for 16 audio inputs. These can be set up as eight stereo, 16 mono, or any combination up to a maximum of 16 discrete channels.

It also has two DB-25 and eight RJ-45 connectors (again, use your preferred connector) for 16 audio outputs. These can also be set up as eight stereo, 16 mono, or any combination up to a maximum of 16 discrete channels.

It has two more RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram at the page 1-35 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model 88d - Digital BLADE

WheatNet-IP 88d is an access point for digital audio.

It has two DB-25 and eight RJ-45 connectors (the DB and RJ connections are in parallel so you can choose your preferred connector type) for eight AES audio inputs. These can be set up as eight stereo, 16 mono, or any combination up to a maximum of 16 discrete channels. Please note that because AES audio signals represent two audio channels on one connection, some of the input connections on the WheatNet-IP 88d are unused.

It also has two DB-25 and eight RJ-45 connectors (again, use your preferred connector) for eight AES audio outputs. These can be set up as eight stereo, 16 mono, or

any combination up to a maximum of 16 discrete channels. Please note that because AES audio signals represent two audio channels on one connection, some of the output connections on the WheatNet-IP 88d are unused.

It has two more RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram at the page 1-36 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model 88ad - Analog/Digital BLADE

WheatNet-IP 88ad is a hybrid access point for analog and digital audio.

It has two DB-25 and eight RJ-45 connectors (the DB and RJ connections are in parallel so you can choose your preferred connector type) for audio inputs. These can be set up as eight stereo, 16 mono, or any combination up to a maximum of 16 discrete channels. The first DB-25 and the first four RJ-45 jacks are set up as analog inputs. The second DB-25 and the last four RJ-45 jacks are set up as AES digital inputs.

It also has two DB-25 and eight RJ-45 connectors (again, use your preferred connector) for audio outputs. These can be set up as eight stereo, 16 mono, or any combination up to a maximum of 16 discrete channels. The first DB-25 and first four RJ-45 jacks are set up as analog outputs. The second DB-25 and the last four RJ-45 jacks are set up as AES digital outputs.

It has two more RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram at the page 1-37 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model 88m - Microphone BLADE

WheatNet-IP 88m is an access point for eight microphones.

This box has eight female XLR connectors for microphone inputs. Phantom power can be applied independently to each of the individual inputs.

It also has one DB-25 and eight RJ-45 connectors (the DB and RJ connections are in parallel so you can choose your preferred connector type) for audio outputs. Only the first four RJ-45 ports are used. These can be set up as four stereo, eight mono, or any combination up to a maximum of eight discrete channels. These are setup as analog outputs.

Two RJ-45 connectors provide 12 logic ports, which can be individually designated during set up as inputs or outputs. Use these ports to wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram on page 1-38 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model 88cb, 88cbe - Console BLADE

The WheatNet-IP 88cb and 88cbe Console BLADE models provide comprehensive access points for typical control room audio I/O.

Both Console BLADEs integrate a powerful mix engine with analog and digital I/O to give you a single rack-space console solution. Pairing the 88cbe with the E-1 control surface, or pairing the 88cb with IP-12 control surface, results in a super-compact, ultra powerful-mix station that ties perfectly into your WheatNet-IP network or functions as a stand-alone console.

Two female XLR connectors are microphone preamplifier inputs. Recessed rear panel phantom power switches and gain trims can be independently configured, and one RJ-45 connector connects the preamp outputs to any one of the Analog Input RJ-45's.

⚠

When using the microphone preamplifiers, a jumper must be connected from the MIC OUTS to the desired analog input port (1-4).

Eight RJ-45 connectors are for audio inputs. The first four RJ-45 jacks are set up as analog inputs which can be setup as four stereo, eight mono, or any combination stereo and mono. The last four RJ-45 jacks are set up as AES digital inputs.

Both Console BLADEs have eight RJ-45 connectors for audio outputs. The first four RJ-45 jacks are set up as analog stereo outputs, and the last four RJ-45 jacks are set up as AES digital outputs. The "Console" template, by default has a signal map that automatically cross connects the surfaces Program, Headphone, Cue, and Studio sources to the designated outputs. The Digital outputs follow the Analog outputs and cannot be independently connected to different audio sources.

An RJ-45 or four 1/4" jacks are provided for headphone and cue outputs.

Four XLR male connectors are provided for control room and studio outputs.

Console BLADEs have two more RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram on page 1-39 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model e - Mix Engine DSP

WheatNet-IP e is a special device that contains the mix engine and signal processing needed for a control surface. One WheatNet-IP e is needed for each control surface.

As you can see, it has no connections for audio inputs or outputs.

It has two RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram at the page 1-40 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

As for the control surfaces, there are a variety of models (E-1, E-4, E-5, E-6) and sizes (from as few as 4 to as many as 28 faders) to choose from. These look like traditional audio consoles and perform similar kinds of functions and more. Consult the specific control surface manual for detailed information.

Model Aura8ip - Vorsis Embedded BLADE

The WheatNet-IP Aura8ip Audio Processing BLADE brings two of Wheatstone's core technologies together (Vorsis Audio Processing and the WheatNet-IP Intelligent Network) to provide a convenient and cost effective way to bring access to audio processing wherever you need it on your WheatNet-IP network.
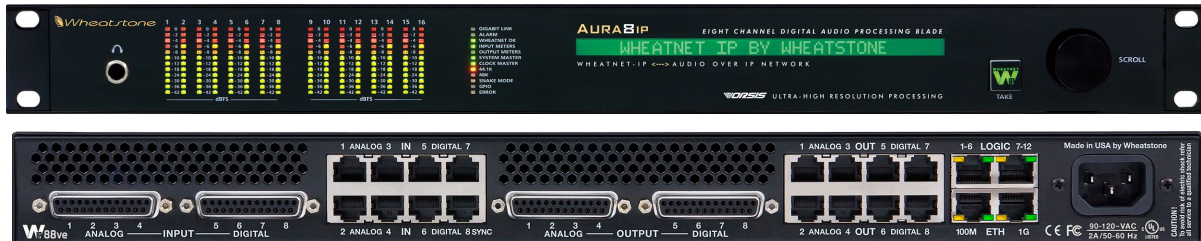
The Aura8ip BLADE occupies a single rack space, but packs an impressive complement of eight fully independent Vorsis Embedded multi-band stereo audio processors. Refer to the *Aura8ip Vorsis Embedded Processing Blade* technical manual for audio processor description and configuration.

This BLADE has two DB-25 and eight RJ-45 connectors (the DB and RJ connections are in parallel so you can choose your preferred connector type) for audio inputs. The first DB-25 and the first four RJ-45 jacks are set up as analog inputs. The second DB-25 and the last four RJ-45 jacks are set up as AES digital inputs.

The BLADE also has two DB-25 and eight RJ-45 connectors (again, use your preferred connector) for audio outputs. The first DB-25 and first four RJ-45 jacks are set up as analog outputs. The second DB-25 and the last four RJ-45 jacks are set up as AES digital outputs.

The BLADE has two more RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram on page 1-41 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Signal Configuration

The Aura8ip BLADE can be operated as a stand alone unit, or can be operated as part of a larger WheatNet-IP network.

If the Stand alone option is selected when the BLADE is configured, the rear panel inputs and outputs are automatically configured to provide the required connections to the eight channels of audio processing. Line 1 Input feeds signal to the first channel of audio processing, Line 2 Input feeds signal to the second channel, and so on. Likewise, Line 1 Output provides the output connection for the first channel of processing, Line 2 Output for the second channel, and so on. In this mode, all inputs and outputs are configured as stereo signals. Thus, in Stand alone mode, the Aura8ip BLADE functions as eight independent channels of stereo audio processing, four with analog inputs and outputs, and the other four with digital inputs and outputs.

If the Mono, Stereo, or Custom template is selected when the BLADE is configured, the eight channels of audio processing are divorced from the unit's input and output connections, and these inputs and outputs can then be routed to other BLADEs in the system. In this Networked mode the inputs of the eight audio processing channels become destinations in the system, to which any available sources in the system can be routed. Likewise, the outputs of the eight audio processing channels become sources in the system, and may be routed to any available destinations.

Also in this Networked mode, signals wired to the BLADE's input connections become sources in the system and can be freely routed to any available destinations, which can include the processing channel inputs if desired. Meanwhile, the BLADE's output connections become destinations to which any available system sources can be routed, including the processing channel outputs, if so desired.

In the Networked mode the BLADE's inputs and outputs can be configured as mono, stereo, or any combination of mono and stereo required. Whether in Networked or Stand alone mode the audio processing channels are always stereo in and out.

Model MADI - Multichannel Audio Digital Interface BLADE

The MADI BLADE is an access point on the WheatNet-IP Intelligent Network, converting a 64-channel MADI input to data streams on the network, and converting data streams to 64-channel MADI outputs.

The MADI BLADE bridges the gap between any MADI-capable audio gear or network and the WheatNet-IP Intelligent Network. With the MADI BLADE, users can add-on to their existing infrastructure to access audio via MADI with affordable and proven WheatNet-IP equipment.

The MADI BLADE makes it possible for WheatNet-TDM Bridge users to use WheatNet-IP control surfaces and BLADEs with their existing networks to access up to 64 channels of audio. The added functionality and low cost of WheatNet-IP make this an exceptionally attractive offering. But its functionality is not limited to Wheatstone systems. WheatNet-IP can now put to use audio from ANY system that utilizes MADI.

The MADI BLADE supports either copper or fiber connectivity.

A pair of 75 ohm BNC connectors are provided on the rear panel and are labeled INPUT and OUTPUT. All connections should be made with a high quality 75 ohm coaxial cable terminated to male BNC connectors. By installing digital video grade coax, cable runs of 200M or more can be realized.

The MADI BLADE supports an optional fiber connection to the Bridge Router. The MADI BLADE uses an SFP module interface with integral LC connectors. See page 1-32 for more information on the Optical Fiber Interface.

A rear panel BNC ACTIVE or FIBER ACTIVE LED will illuminate when a MADI input signal is present.

This BLADE has two RJ-45 connectors to provide 12 logic ports, which can be individually designated during set up as inputs or outputs. These ports are where you wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram on page 1-42 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model M4IP - Microphone Processing BLADE

The M4IP Preamp BLADE is the newest member of Wheatstone's WheatNet-IP Intelligent Network family. Two devices in one package, it's a complete WheatNet-IP BLADE with four microphone inputs, four high quality microphone processors, and both digital and analog outputs.

The Wheatstone M4IP hosts four discrete, very high quality microphone processors. The Vorsis Embedded™ processing features of the M4IP, the processing capabilities of the M4IP and how to control it with the included Windows-based GUI application are described in the *M4IP Microphone Processing BLADE* technical manual.

This unit has four XLR female connectors for microphone-level inputs.

It also has one DB-25 and eight RJ-45 connectors (the DB and analog 1-4 RJ connections are in parallel so you can choose your preferred connector type) for audio outputs.

Two RJ-45 connectors provide 12 logic ports, which can be individually designated during set up as inputs or outputs. Use these ports to wire the various external switches, indicators, and control functions you need in your facility.

There are two RJ-45 jacks for Ethernet. One is for 1 Gigabit Ethernet – connect this one to your network. The 100 Megabit Ethernet port is not used – do not connect anything to this port.

Consult the wiring diagram on page 1-43 for detailed information.

The unit has a standard IEC power connector. The BLADEs have an internal power supply that will accept 100-240 volts 50/60 hertz AC power.

Model LIO-48 - Multiple Port Logic I/O BLADE

Wheatstone's new LIO-48 is a high-density logic BLADE for the WheatNet-IP Intelligent Network that can handle all those new conditional logic functions needed for today's busy studios. The LIO-48 provides 48 universal logic I/O ports, each individually configurable, for turning devices on or off by time or event, for automatically adjusting the audio processing settings when a certain mic turns on, and for any other logic control you need in your studio operation.

The front panel of the LIO-48 has a logic I/O meter array that lets you drill down to see the information for each of the 48 ports. The front panel also sports a display which can show various status messages relating to the BLADE's performance and configuration. A SCROLL knob, a TAKE button, and four status indicator LEDs complete the front panel. Refer to the *LIO-48 Multiple port Logic I/O Blade* technical manual for front panel configuration and software setup.

The rear panel has eight RJ-45 connectors that have the connections for all 48 ports (each RJ-45 has connections for six ports). Two DB-25 female connectors duplicate the logic port connections. A DB-9 female connector provides access to +5VDC from the BLADE. Two additional RJ-45 connectors are stacked at the right side of the rear panel. The top one of there is reserved for future use, while the bottom one provides a 1 Gigabit connection to the WheatNet-IP network. At the far right of the rear panel is a standard IFC power connector. The LIO-48 has an internal power supply that will accept 100-240 Volts 50/60 Hertz AC power.

Consult the wiring diagram on page 1-44 for detailed information.

Network Switches

The next component of the WheatNet-IP system is your network switch(es). These are standard Ethernet devices that form the core of your LAN. You may already have a suitable one in place in your facility. There are literally hundreds of different models available in the market place which vary widely in size and capability, costing anywhere from $30 to $30,000 and up. Obviously the $30,000 switch has more features and capability than the $30 switch. The important thing to remember is that most Gigabit switches will work with WheatNet-IP – up to a point. As the size of your system increases, it's easy to exceed the capability of inexpensive switches. Large systems need high capacity managed switches to avoid the bane of Ethernet audio systems, network overload. Simply put, if the WheatNet-IP devices are streaming packets faster than the Ethernet switch can distribute them, packets get dropped and the audio starts to break up. This is why your Ethernet switches must be sized appropriately, and your network traffic managed and controlled so that the sizing assumptions you made remain valid. Because 24 bit 48K sample rate audio streams represent a much larger packet rate than Ethernet networks were originally assumed to contain, they can represent the vast majority

of data in the network. Consequently just about any switch or link can get overloaded if you are streaming lots of channels and don't attempt to manage your network and switch configuration. Conversely, because we use Gigabit ports for the WheatNet-IP to minimize link overload issues, a smaller system will run just fine on an inexpensive unmanaged switch, *as long as it is a Gigabit switch*. It's all in the numbers. Consult the chapter on Ethernet considerations for more information about switches, or call us at Wheatstone Corporation for help with switch recommendations.

CAT-5e Wiring

The next component of your WheatNet-IP system is the CAT-5e wiring itself. Each "BLADE" requires a single 1 Gigabit network connection, which is typically a CAT-5e cable. Due to the nature of Ethernet and CAT-5e cabling, these connections must be at least 1 meter but less than 100 meters in length. If you must connect devices together that are more than 100 meters apart, use an interim Ethernet "edge" switch, or else use optical fiber and copper/fiber convertors to extend the range of the Ethernet LAN connections.

AoIP Driver

The next component of your system is the WheatNet-IP AoIP driver. This is software that will allow any Windows 2000 or XP device to send and receive audio packets as a member of the WheatNet-IP system. Typically, this driver would be installed on your Automation PCs to allow them to play back audio into the WheatNet-IP system without using a sound card. You can install the driver on any PC that you wish to get audio to/from. On a modern PC, the driver will allow up to eight different audio streams playing back simultaneously while accepting eight different audio input streams. That's a lot of audio, representing over half of the total bandwidth available on the standard 100 Mbit Ethernet NIC card installed in most PCs. Please note that any PC can use the WheatNet-IP AoIP driver; it doesn't need to be an Automation server. If you want to stream your station's Program output to the PD's office PC, you can. Likewise, many modern audio devices such as codecs are really PCs at heart. If they are running Windows and can work with standard WDM drivers, they can most likely be directly connected to the WheatNet-IP system.

Software Tools

The next components of your WheatNet-IPs system are the software tools used to administer it. While the WheatNet-IP system is completely functional (unlike some competitors) without running any software on a PC, you will find the Navigator GUI program very handy for administrating normal system functions like setting access passwords, controlling signal visibilities, naming sources and destinations, etc. Each WheatNet-IP device also runs a web server, thus allowing convenient access from any web browser for basic set up and control. These tools are described later in this manual.

Audio Devices

Lastly are your audio devices themselves. Your loudspeakers and headphone amps, your microphones, CD players, and Sat receivers, your processors and codecs. These are the devices you've created your audio network for. Wire them up to the appropriate "BLADE" and they have instant access to all of the audio in your system. Connecting any source to any destination is just a simple "click" away.

I/O Connections

All audio input and output, control, Ethernet, and power supply connections are made via DB-25, RJ-45, XLR, BNC connectors, and 1/4" jacks mounted on the WheatNet-IP rear panel. The pinout drawings on pages 1-35 through 1-44 summarize all wiring connections.

Model 88a

INPUTS

The WheatNet-IP 88a is fed from analog line level inputs via two DB-25 or eight RJ-45 connectors.

The line level analog audio inputs are +4dBu balanced. The analog line inputs exhibit a bridging impedance and can handle signals up to +20dBu.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ Line 1 Lt In
Pin 25 – SH ⎦

Pin 10 – HI
Pin 23 – LO ⎤ Line 1 Rt In
Pin 11 – SH ⎦

Pin 21 – HI
Pin 9 – LO ⎤ Line 2 Lt In
Pin 22 - SH ⎦

Pin 7 – HI
Pin 20 – LO ⎤ Line 2 Rt In
Pin 8 – SH ⎦

Pin 18 – HI
Pin 6 – LO ⎤ Line 3 Lt In
Pin 19 – SH ⎦

Pin 4 – HI
Pin 17 – LO ⎤ Line 3 Rt In
Pin 5 – SH ⎦

Pin 15 – HI
Pin 3 – LO ⎤ Line 4 Lt In
Pin 16 – SH ⎦

Pin 1 – HI
Pin 14 – LO ⎤ Line 4 Rt In
Pin 2 – SH ⎦

Analog 5-8 DB-25

Pin 24 – HI
Pin 12 – LO   Line 5 Lt In
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   Line 5 Rt In
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   Line 6 Lt In
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   Line 6 Rt In
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   Line 7 Lt In
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   Line 7 Rt In
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   Line 8 Lt In
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   Line 8 RT In
Pin 2 – SH

Analog 1-8 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   Line 1 Lt In

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   Line 1 Rt In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   Line 2 Lt In

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   Line 2 Rt In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   Line 3 Lt In

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   Line 3 Rt In

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   Line 4 Lt In

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   Line 4 Rt In

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO   Line 5 Lt In

RJ-45#5 Pin 3 – HI
RJ-45#5 Pin 6 – LO   Line 5 Rt In

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO   Line 6 Lt In

RJ-45#6 Pin 3 – HI
RJ-45#6 Pin 6 – LO   Line 6 Rt In

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO   ] Line 7 Lt In
RJ-45#7 Pin 3 – HI
RJ-45#7 Pin 6 – LO   ] Line 7 Rt In

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO   ] Line 8 Lt In
RJ-45#8 Pin 3 – HI
RJ-45#8 Pin 6 – LO   ] Line 8 Rt In

OUTPUTS

The line level analog output signal is +4dBu, balanced.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   ] Line 1 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   ] Line 1 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   ] Line 2 Lt Out
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   ] Line 2 Rt Out
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   ] Line 3 Lt Out
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   ] Line 3 Rt Out
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   ] Line 4 Lt Out
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   ] Line 4 Rt Out
Pin 2 – SH

Analog 5-8 DB-25

Pin 24 – HI
Pin 12 – LO   ] Line 5 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   ] Line 5 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   ] Line 6 Lt Out
Pin 22 - SH

Pin   7 – HI
Pin 20 – LO   ] Line 6 Rt Out
Pin   8 – SH

Pin 18 – HI
Pin   6 – LO   ] Line 7 Lt Out
Pin 19 – SH

Pin   4 – HI
Pin 17 – LO   ] Line 7 Rt Out
Pin   5 – SH

Pin 15 – HI
Pin   3 – LO   ] Line 8 Lt Out
Pin 16 – SH

Pin   1 – HI
Pin 14 – LO   ] Line 8 Rt Out
Pin   2 – SH

Analog 1-8 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   ] Line 1 Lt Out

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   ] Line 1 Rt Out

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   ] Line 2 Lt Out

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   ] Line 2 Rt Out

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   ] Line 3 Lt Out

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   ] Line 3 Rt Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   ] Line 4 Lt Out

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   ] Line 4 Rt Out

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO   ] Line 5 Lt Out

RJ-45#5 Pin 3 – HI
RJ-45#5 Pin 6 – LO   ] Line 5 Rt Out

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO   ] Line 6 Lt Out

RJ-45#6 Pin 3 – HI
RJ-45#6 Pin 6 – LO   ] Line 6 Rt Out

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO   ] Line 7 Lt Out

RJ-45#7 Pin 3 – HI
RJ-45#7 Pin 6 – LO   ] Line 7 Rt Out

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO   ] Line 8 Lt Out

RJ-45#8 Pin 3 – HI
RJ-45#8 Pin 6 – LO   ] Line 8 Rt Out

Model 88d

INPUTS

The WheatNet-IP 88d is fed from digital inputs via two DB-25 or eight RJ-45 connectors.

The WheatNet-IP 88d will accommodate digital inputs having a wide range of sample rates. These inputs will be sample rate converted to the system's chosen sample rate of 44.1kHz or 48kHz, which is set via the WheatNet-IP Navigator GUI. The GUI also allows you to select input 8 of the digital BLADE, or of any BLADE that has a digital input as input 8, to be a primary external reference, and a digital input 8 from a different BLADE to be a secondary external reference. Please note that the sample rate of a digital input 8 should be the same, either 44.1kHz or 48kHz, as the system's chosen sample rate.

AES sources are by design stereo; if the BLADE is not set to be stereo the appropriate Left or Right signal within the AES stream will be applied to the signal path.

Digital 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   AES 1 In
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO   AES 2 In
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO   AES 3 In
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO   AES 4 In
Pin 16 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO   AES 5 In
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO   AES 6 In
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO   AES 7 In
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO   AES 8 In
Pin 16 – SH

Digital 1-8 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO ⎤ AES 1 In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO ⎤ AES 2 In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO ⎤ AES 3 In

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO ⎤ AES 4 In

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO ⎤ AES 5 In

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO ⎤ AES 6 In

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO ⎤ AES 7 In

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO ⎤ AES 8 In

OUTPUTS

Digital 1-4 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ AES 1 Out
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO ⎤ AES 2 Out
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO ⎤ AES 3 Out
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO ⎤ AES 4 Out
Pin 16 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ AES 5 Out
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO ⎤ AES 6 Out
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO ⎤ AES 7 Out
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO ⎤ AES 8 Out
Pin 16 – SH

Digital 1-8 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO ⎤ AES 1 Out

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO ⎤ AES 2 Out

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO ⎤ AES 3 Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO ⎤ AES 4 Out

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO ⎤ AES 5 Out

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO ⎤ AES 6 Out

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO ⎤ AES 7 Out

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO ⎤ AES 8 Out

Model 88ad

INPUTS

The WheatNet-IP 88ad is fed from a combination of analog and digital inputs via two DB-25 or eight RJ-45 connectors.

The digital inputs of the WheatNet-IP 88ad (inputs 5-8) will accommodate digital inputs having a wide range of sample rates. These inputs will be sample rate converted to the system's chosen sample rate of 44.1kHz or 48kHz, which is set via the WheatNet-IP Navigator GUI. The GUI also allows you to select input 8 of the digital BLADE, or of any BLADE that has a digital input as input 8, to be a primary external reference, and a digital input 8 from a different BLADE to be a secondary external reference. Please note that the sample rate of a digital input 8 should be the same, either 44.1kHz or 48kHz, as the system's chosen sample rate.

AES sources are by design stereo; if the BLADE is not set to be stereo the appropriate Left or Right signal within the AES stream will be applied to the signal path.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ Line 1 Lt In
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO ⎤ Line 1 Rt In
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO] Line 2 Lt In
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO] Line 2 Rt In
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO] Line 3 Lt In
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO] Line 3 Rt In
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO] Line 4 Lt In
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO] Line 4 Rt In
Pin 2 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO] AES 5 In
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO] AES 6 In
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO] AES 7 In
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO] AES 8 In
Pin 16 – SH

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI] Line 1 Lt In
RJ-45#1 Pin 2 – LO

RJ-45#1 Pin 3 – HI] Line 1 Rt In
RJ-45#1 Pin 6 – LO

RJ-45#2 Pin 1 – HI] Line 2 Lt In
RJ-45#2 Pin 2 – LO

RJ-45#2 Pin 3 – HI] Line 2 Rt In
RJ-45#2 Pin 6 – LO

RJ-45#3 Pin 1 – HI] Line 3 Lt In
RJ-45#3 Pin 2 – LO

RJ-45#3 Pin 3 – HI] Line 3 Rt In
RJ-45#3 Pin 6 – LO

RJ-45#4 Pin 1 – HI] Line 4 Lt In
RJ-45#4 Pin 2 – LO

RJ-45#4 Pin 3 – HI] Line 4 Rt In
RJ-45#4 Pin 6 – LO

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO ⎤ AES 5 In

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO ⎤ AES 6 In

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO ⎤ AES 7 In

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO ⎤ AES 8 In

OUTPUTS

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ Line 1 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO ⎤ Line 1 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO ⎤ Line 2 Lt Out
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO ⎤ Line 2 Rt Out
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO ⎤ Line 3 Lt Out
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO ⎤ Line 3 Rt Out
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO ⎤ Line 4 Lt Out
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO ⎤ Line 4 Rt Out
Pin 2 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO ⎤ AES 5 Out
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO ⎤ AES 6 Out
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO ⎤ AES 7 Out
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO ⎤ AES 8 Out
Pin 16 – SH

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI ⎤ Line 1 Lt Out
RJ-45#1 Pin 2 – LO ⎦
RJ-45#1 Pin 3 – HI ⎤ Line 1 Rt Out
RJ-45#1 Pin 6 – LO ⎦

RJ-45#2 Pin 1 – HI ⎤ Line 2 Lt Out
RJ-45#2 Pin 2 – LO ⎦
RJ-45#2 Pin 3 – HI ⎤ Line 2 Rt Out
RJ-45#2 Pin 6 – LO ⎦

RJ-45#3 Pin 1 – HI ⎤ Line 3 Lt Out
RJ-45#3 Pin 2 – LO ⎦
RJ-45#3 Pin 3 – HI ⎤ Line 3 Rt Out
RJ-45#3 Pin 6 – LO ⎦

RJ-45#4 Pin 1 – HI ⎤ Line 4 Lt Out
RJ-45#4 Pin 2 – LO ⎦
RJ-45#4 Pin 3 – HI ⎤ Line 4 Rt Out
RJ-45#4 Pin 6 – LO ⎦

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI ⎤ AES 5 Out
RJ-45#5 Pin 2 – LO ⎦

RJ-45#6 Pin 1 – HI ⎤ AES 6 Out
RJ-45#6 Pin 2 – LO ⎦

RJ-45#7 Pin 1 – HI ⎤ AES 7 Out
RJ-45#7 Pin 2 – LO ⎦

RJ-45#8 Pin 1 – HI ⎤ AES 8 Out
RJ-45#8 Pin 2 – LO ⎦

Model 88m

INPUTS

The WheatNet-IP 88m analog mono mic level input (-50dBu nominal) is fed from the female XLR connector to the internal microphone preamplifier. The mic preamp has digitally controlled gain, up to a maximum of 70 dB, and displays remarkably high performance and accuracy. Phantom power is available.

Analog 1-8 XLR

XLR#1 Pin 1 – SH ⎤
XLR#1 Pin 2 – HI ⎥ Mic 1 In
XLR#1 Pin 3 – LO ⎦

XLR#2 Pin 1 – SH ⎤
XLR#2 Pin 2 – HI ⎥ Mic 2 In
XLR#2 Pin 3 – LO ⎦

XLR#3 Pin 1 – SH ⎤
XLR#3 Pin 2 – HI ⎥ Mic 3 In
XLR#3 Pin 3 – LO ⎦

XLR#4 Pin 1 – SH
XLR#4 Pin 2 – HI   Mic 4 In
XLR#4 Pin 3 – LO

XLR#5 Pin 1 – SH
XLR#5 Pin 2 – HI   Mic 5 In
XLR#5 Pin 3 – LO

XLR#6 Pin 1 – SH
XLR#6 Pin 2 – HI   Mic 6 In
XLR#6 Pin 3 – LO

XLR#7 Pin 1 – SH
XLR#7 Pin 2 – HI   Mic 7 In
XLR#7 Pin 3 – LO

XLR#8 Pin 1 – SH
XLR#8 Pin 2 – HI   Mic 8 In
XLR#8 Pin 3 – LO

OUTPUTS

The output signals are available as analog line level (+4dBu, balanced) or mono mic level (-50dBu) on the DB-25 connector, or on the four RJ-45 (#1 through #4) connectors.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   Line 1 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   Line 1 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   Line 2 Lt Out
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   Line 2 Rt Out
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   Line 3 Lt Out
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   Line 3 Rt Out
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   Line 4 Lt Out
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   Line 4 Rt Out
Pin 2 – SH

Analog 1-8 RJ-45

RJ-45#1 Pin 1 – HI   Line 1 Lt Out
RJ-45#1 Pin 2 – LO

RJ-45#1 Pin 3 – HI   Line 1 Rt Out
RJ-45#1 Pin 6 – LO

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO ⎤ Line 2 Lt Out
RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO ⎤ Line 2 Rt Out
RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO ⎤ Line 3 Lt Out
RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO ⎤ Line 3 Rt Out
RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO ⎤ Line 4 Lt Out
RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO ⎤ Line 4 Rt Out

Model 88cb, 88cbe

INPUTS

The WheatNet-IP 88cb and 88cbe console BLADEs can be fed from three different types of inputs: microphone, analog line level, and AES-3 digital.

When processing mic level (-50dBu nominal) inputs, the input to the internal microphone preamplifiers is fed from one of the two female XLR connectors. When using the internal microphone preamplifiers, a jumper must be connected from the MIC OUTS RJ-45 to a selected Analog input (1-4). The mic preamp has digitally controlled gain, up to a maximum of 70dB, and displays remarkably high performance and accuracy. Phantom power is available via recessed rear panel switches.

Four RJ-45 connectors can be used for analog line level inputs. The line level analog audio inputs are +4dBu balanced. The analog line inputs exhibit a bridging impedance and can handle signals up to +20dBu.

To handle digital line level sources there are also four RJ-45 connectors.

The digital inputs of the WheatNet-IP 88cb and 88cbe (inputs 5-8) will accommodate digital inputs having a wide range of sample rates. These inputs will be sample rate converted to the system's chosen sample rate of 44.1kHz or 48kHz, which is set via the WheatNet-IP Navigator GUI. The GUI also allows you to select input 8 of the digital BLADE, or of any BLADE that has a digital input as input 8, to be a primary external reference, and a digital input 8 from a different BLADE to be a secondary external reference. Please note that the sample rate of a digital input 8 should be the same, either 44.1kHz or 48kHz, as the system's chosen sample rate.

AES sources are by design stereo; if the BLADE is not set to be stereo the appropriate Left or Right signal within the AES stream will be applied to the signal path.

MIC IN XLR

XLR#1 Pin 1 – SH
XLR#1 Pin 2 – HI ⎤ Mic 1 In
XLR#1 Pin 3 – LO

XLR#2 Pin 1 – SH
XLR#2 Pin 2 – HI   Mic 2 In
XLR#2 Pin 3 – LO

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   Line 1 Lt In
RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   Line 1 Rt In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   Line 2 Lt In
RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   Line 2 Rt In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   Line 3 Lt In
RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   Line 3 Rt In

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   Line 4 Lt In
RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   Line 4 Rt In

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO   AES 5 In

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO   AES 6 In

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO   AES 7 In

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO   AES 8 In

OUTPUTS

The WheatNet-IP 88cb and 88cbe provide four stereo analog outputs on RJ-45 conec-tors, four digital AES formatted outputs on RJ-45 connectors, cue and headphone outputs on RJ-45 connector and on 1/4" jacks, and control room and studio monitor outputs on XLR male connectors.

MIC OUTS RJ-45

RJ-45 Pin 1 – HI
RJ-45 Pin 2 – LO   Mic 1 Out
RJ-45 Pin 3 – HI
RJ-45 Pin 6 – LO   Mic 2 Out

CUE/HDPN OUT RJ-45

RJ-45 Pin 1 – HI
RJ-45 Pin 2 – LO   HDPN Lt Out
RJ-45 Pin 3 – HI
RJ-45 Pin 6 – LO   HDPN Rt Out

⚠️

When using the microphone preamplifiers, a jumper must be connected from the MIC OUTS to the desired analog input port (1-4).

RJ-45 Pin 4 – HI
RJ-45 Pin 5 – LO ⎦ Cue Lt Out
RJ-45 Pin 7 – HI
RJ-45 Pin 8 – LO ⎦ Cue Rt Out

STUDIO OUT XLR

XLR#1 Pin 1 – SH
XLR#1 Pin 2 – HI ⎦ Studio Lt Out
XLR#1 Pin 3 – LO
XLR#2 Pin 1 – SH
XLR#2 Pin 2 – HI ⎦ Studio Rt Out
XLR#2 Pin 3 – LO

CR OUT XLR

XLR#1 Pin 1 – SH
XLR#1 Pin 2 – HI ⎦ CR Lt Out
XLR#1 Pin 3 – LO
XLR#2 Pin 1 – SH
XLR#2 Pin 2 – HI ⎦ CR Rt Out
XLR#2 Pin 3 – LO

PGM OUT ANALOG RJ-45

RJ-45 A Pin 1 – HI
RJ-45 A Pin 2 – LO ⎦ PGM A Lt Out
RJ-45 A Pin 3 – HI
RJ-45 A Pin 6 – LO ⎦ PGM A Rt Out
RJ-45 B Pin 1 – HI
RJ-45 B Pin 2 – LO ⎦ PGM B Lt Out
RJ-45 B Pin 3 – HI
RJ-45 B Pin 6 – LO ⎦ PGM B Rt Out
RJ-45 C Pin 1 – HI
RJ-45 C Pin 2 – LO ⎦ PGM C Lt Out
RJ-45 C Pin 3 – HI
RJ-45 C Pin 6 – LO ⎦ PGM C Rt Out
RJ-45 D Pin 1 – HI
RJ-45 D Pin 2 – LO ⎦ PGM D Lt Out
RJ-45 D Pin 3 – HI
RJ-45 D Pin 6 – LO ⎦ PGM D Rt Out

PGM OUT DIGITAL RJ-45

RJ-45 A Pin 1 – HI
RJ-45 A Pin 2 – LO ⎦ PGM AES A Out
RJ-45 B Pin 1 – HI
RJ-45 B Pin 2 – LO ⎦ PGM AES B Out
RJ-45 C Pin 1 – HI
RJ-45 C Pin 2 – LO ⎦ PGM AES C Out
RJ-45 D Pin 1 – HI
RJ-45 D Pin 2 – LO ⎦ PGM AES D Out

Model Aura8ip
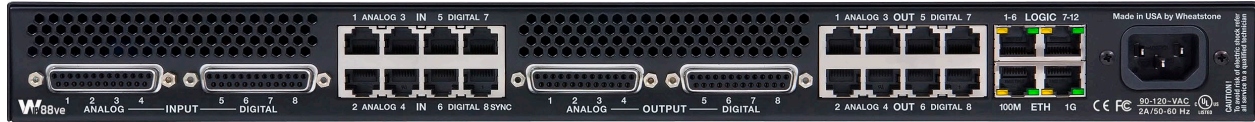
INPUTS

The WheatNet-IP Aura8ip is fed from a combination of analog and digital inputs via two DB-25 or eight RJ-45 connectors.

The WheatNet-IP Aura8ip will accommodate digital inputs having a wide range of sample rates. These inputs will be sample rate converted to the system's chosen sample rate of 44.1kHz or 48kHz, which is set via the WheatNet-IP Navigator GUI. The GUI also allows you to select input 8 of the digital BLADE, or of any BLADE that has a digital input as input 8, to be a primary external reference, and a digital input 8 from a different BLADE to be a secondary external reference. Please note that the sample rate of a digital input 8 should be the same, either 44.1kHz or 48kHz, as the system's chosen sample rate. If you are using the Aura8ip in a stand-alone application, one involving no other BLADEs, and if the outputs from Aura8ip must be synchronized to downstream digital equipment, you must use input 8 for your external reference, even if you are not using all 8 inputs.

AES sources are by design stereo; if the BLADE is not set to be stereo the appropriate Left or Right signal within the AES stream will be applied to the signal path.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   Line 1 Lt In
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   Line 1 Rt In
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   Line 2 Lt In
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   Line 2 Rt In
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   Line 3 Lt In
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   Line 3 Rt In
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   Line 4 Lt In
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   Line 4 Rt In
Pin 2 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO   AES 5 In
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO   AES 6 In
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO   AES 7 In
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO   AES 8 In
Pin 16 – SH

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   Line 1 Lt In

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   Line 1 Rt In

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   Line 2 Lt In

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   Line 2 Rt In

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   Line 3 Lt In

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   Line 3 Rt In

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   Line 4 Lt In

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   Line 4 Rt In

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO   AES 5 In

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO   AES 6 In

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO   AES 7 In

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO   AES 8 In

OUTPUTS

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   Line 1 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   Line 1 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   Line 2 Lt Out
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   Line 2 Rt Out
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   Line 3 Lt Out
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   Line 3 Rt Out
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   Line 4 Lt Out
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   Line 4 Rt Out
Pin 2 – SH

Digital 5-8 DB-25

Pin 24 – HI
Pin 12 – LO   AES 5 Out
Pin 25 – SH

Pin 21 – HI
Pin 9 – LO   AES 6 Out
Pin 22 - SH

Pin 18 – HI
Pin 6 – LO   AES 7 Out
Pin 19 – SH

Pin 15 – HI
Pin 3 – LO   AES 8 Out
Pin 16 – SH

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   Line 1 Lt Out

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   Line 1 Rt Out

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   Line 2 Lt Out

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   Line 2 Rt Out

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   Line 3 Lt Out

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   Line 3 Rt Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   Line 4 Lt Out

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   Line 4 Rt Out

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO ⎤ AES 5 Out

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO ⎤ AES 6 Out

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO ⎤ AES 7 Out

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO ⎤ AES 8 Out

Model MADI

Digital Audio Connections

A pair of 75 ohm BNC connectors are provided on the rear panel for input and output connections. All connections should be made with a high quality 75 ohm coaxial cable terminated to male BNC connectors. By installing digital video grade coax, cable runs of 200M or more can be realized.

BNC IN Pin 1 – HI
BNC IN Pin 2 – SH ⎤ AES In

BNC OUT Pin 1 – HI
BNC OUT Pin 2 – SH ⎤ AES Out

Optical Fiber Interface

The MADI BLADE supports an optional fiber connection to the Bridge Router. The MADI BLADE uses an SFP module interface with integral LC connectors.

Note that the QOT-2001 rear panel on the Bridge router uses SC connectors, so to connect to a Bridge MADI card a patch cable fitted with LC connectors on one end and SC connectors on the other end is required.

Optical Transceiver

Optical Transceivers convert physical signals from electrical to optical (and vice-versa) in a network and couple the optical signals into (and out of) optical fiber. Small form factor pluggable (SFP) transceivers, used in the MADI BLADE, are designed to be hot-swappable in industry standard cages and connectors (for easy field repair), and offer high speed and physical compactness.
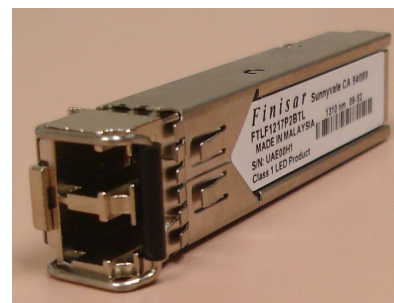
Optical Transceiver

Connector Type

The high-density *LC Duplex* connector has a tabbed locking mechanism similar to what you would find on a phone jack. This enables secure connectivity and easy removal.

The *SC* (subscription channel) *Duplex* connector is a low insertion loss connector using a push/pull locking mechanism.

Optical Fiber Cable

The SC-LC optical fiber cable required in this application is a multimode duplex fiber optic patch cable with a core/cladding size *62.5/125 micron* suitable for low-to-moderate-speed data links (≤100Mbps). The following Fiber Instrument Sales, Inc. part number X2YLM3FISC may be used to reference the physical characteristics of the required cable assembly. The full-duplex nature of the audio network interface requires one fiber for transmit, and one for receive; hence dual zip cables are recommended.

Optical Fiber Cable

Optical fiber cables are manufactured with a variety of jacket materials, which directly affect cable cost, including Thermoplastic Elastomer (TPE), Kynar® and Teflon® FEP. Physical properties of the jacket material determine a cable's resistance to abrasions, flame retardancy, etc. *Check local codes to be sure the cable you plan on using is compliant in your application.*
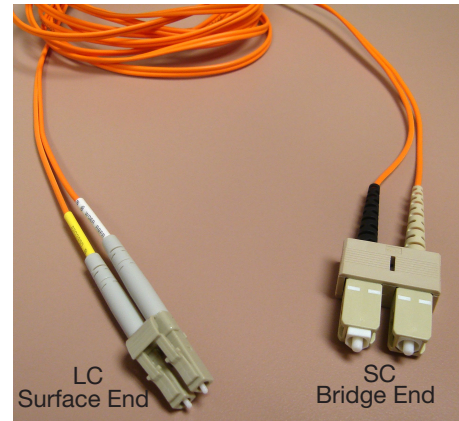
Model M4IP
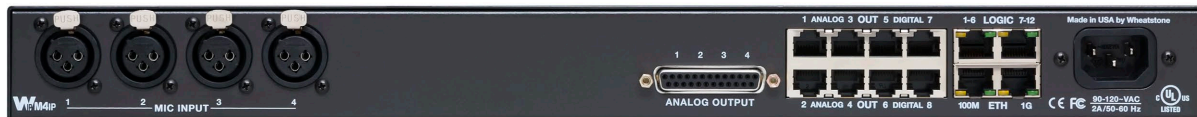
INPUTS

The M4IP analog mono mic level input (-50dBu nominal) is fed from the female XLR connector to the internal microphone preamplifier. The mic preamp has digitally controlled gain, up to a maximum of 70 dB, and displays remarkably high performance and accuracy. Phantom power is available.

Analog 1-4 XLR

```
        XLR#1 Pin 1 – SH ⎤
        XLR#1 Pin 2 – HI  ⎬  Mic 1 In
        XLR#1 Pin 3 – LO ⎦

        XLR#2 Pin 1 – SH ⎤
        XLR#2 Pin 2 – HI  ⎬  Mic 2 In
        XLR#2 Pin 3 – LO ⎦

        XLR#3 Pin 1 – SH ⎤
        XLR#3 Pin 2 – HI  ⎬  Mic 3 In
        XLR#3 Pin 3 – LO ⎦

        XLR#4 Pin 1 – SH ⎤
        XLR#4 Pin 2 – HI  ⎬  Mic 4 In
        XLR#4 Pin 3 – LO ⎦
```

OUTPUTS

The output signals are available as analog line level (+4dBu, balanced) on the DB-25 connector, or on the four RJ-45 (#1 through #4) connectors, and as four digital AES formatted outputs on the RJ-45 (#5 through #8) connectors.

Analog 1-4 DB-25

Pin 24 – HI
Pin 12 – LO   Line 1 Lt Out
Pin 25 – SH

Pin 10 – HI
Pin 23 – LO   Line 1 Rt Out
Pin 11 – SH

Pin 21 – HI
Pin 9 – LO   Line 2 Lt Out
Pin 22 - SH

Pin 7 – HI
Pin 20 – LO   Line 2 Rt Out
Pin 8 – SH

Pin 18 – HI
Pin 6 – LO   Line 3 Lt Out
Pin 19 – SH

Pin 4 – HI
Pin 17 – LO   Line 3 Rt Out
Pin 5 – SH

Pin 15 – HI
Pin 3 – LO   Line 4 Lt Out
Pin 16 – SH

Pin 1 – HI
Pin 14 – LO   Line 4 Rt Out
Pin 2 – SH

Analog 1-4 RJ-45

RJ-45#1 Pin 1 – HI
RJ-45#1 Pin 2 – LO   Line 1 Lt Out

RJ-45#1 Pin 3 – HI
RJ-45#1 Pin 6 – LO   Line 1 Rt Out

RJ-45#2 Pin 1 – HI
RJ-45#2 Pin 2 – LO   Line 2 Lt Out

RJ-45#2 Pin 3 – HI
RJ-45#2 Pin 6 – LO   Line 2 Rt Out

RJ-45#3 Pin 1 – HI
RJ-45#3 Pin 2 – LO   Line 3 Lt Out

RJ-45#3 Pin 3 – HI
RJ-45#3 Pin 6 – LO   Line 3 Rt Out

RJ-45#4 Pin 1 – HI
RJ-45#4 Pin 2 – LO   Line 4 Lt Out

RJ-45#4 Pin 3 – HI
RJ-45#4 Pin 6 – LO   Line 4 Rt Out

Digital 5-8 RJ-45

RJ-45#5 Pin 1 – HI
RJ-45#5 Pin 2 – LO ⟩ AES 5 Out

RJ-45#6 Pin 1 – HI
RJ-45#6 Pin 2 – LO ⟩ AES 6 Out

RJ-45#7 Pin 1 – HI
RJ-45#7 Pin 2 – LO ⟩ AES 7 Out

RJ-45#8 Pin 1 – HI
RJ-45#8 Pin 2 – LO ⟩ AES 8 Out

Logic Ports - All Models (except LIO-48)

All models, with exception of the LIO-48, have two LOGIC I/O RJ-45 connectors that provide 12 Universal logic ports.

LOGIC I/O 1 - 6 RJ-45

RJ-45 Pin 1 – Digital Ground
RJ-45 Pin 2 – Logic 1 In/Out
RJ-45 Pin 3 – Logic 2 In/Out
RJ-45 Pin 4 – Logic 3 In/Out
RJ-45 Pin 5 – Logic 4 In/Out
RJ-45 Pin 6 – Logic 5 In/Out
RJ-45 Pin 7 – Logic 6 In/Out
RJ-45 Pin 8 – +5V Digital

LOGIC I/O 7 - 12 RJ-45

RJ-45 Pin 1 – Digital Ground
RJ-45 Pin 2 – Logic 7 In/Out
RJ-45 Pin 3 – Logic 8 In/Out
RJ-45 Pin 4 – Logic 9 In/Out
RJ-45 Pin 5 – Logic 10 In/Out
RJ-45 Pin 6 – Logic 11 In/Out
RJ-45 Pin 7 – Logic 12 In/Out
RJ-45 Pin 8 – +5V Digital

LIO-48 Logic Ports

The rear panel has eight RJ-45 connectors that have the connections for all 48 ports (each RJ-45 has connections for six ports). Two DB-25 female connectors duplicate the logic port connections. A DB-9 female connector provides access to +5VDC from the BLADE.

LOGIC I/O "A" RJ-45

RJ-45 Pin 1 – Digital Ground
RJ-45 Pin 2 – Logic 1 In/Out
RJ-45 Pin 3 – Logic 2 In/Out

RJ-45 Pin 4 – Logic 3 In/Out
RJ-45 Pin 5 – Logic 4 In/Out
RJ-45 Pin 6 – Logic 5 In/Out
RJ-45 Pin 7 – Logic 6 In/Out
RJ-45 Pin 8 – +5V Digital

All "LOGIC RJ PORTS" connectors wired in same manner as the "A" connector shown above.

LOGIC I/O "1 - 24" DB-25

Pin 1 – Logic 1 In/Out
Pin 2 – Logic 2 In/Out
Pin 3 – Logic 3 In/Out
Pin 4 – Logic 4 In/Out
Pin 5 – Logic 5 In/Out
Pin 6 – Logic 6 In/Out
Pin 7 – Logic 7 In/Out
Pin 8 – Logic 8 In/Out

Pin 9 – Logic 9 In/Out
Pin 10 – Logic 10 In/Out
Pin 11 – Logic 11 In/Out
Pin 12 – Logic 12 In/Out
Pin 13 – Logic 13 In/Out
Pin 14 – Logic 14 In/Out
Pin 15 – Logic 15 In/Out
Pin 16 – Logic 16 In/Out
Pin 17 – Logic 17 In/Out
Pin 18 – Logic 18 In/Out
Pin 19 – Logic 19 In/Out
Pin 20 – Logic 20 In/Out
Pin 21 – Logic 21 In/Out
Pin 22 – Logic 22 In/Out
Pin 23 – Logic 23 In/Out
Pin 24 – Logic 24 In/Out
Pin 25 – Digital Ground

The "25-48" DB-25 connector wired in same manner as the "A" connector shown above.

+5VDC LOGIC DB-9

Pin 1 – +5V Logic 1
Pin 2 – +5V Logic 2
Pin 3 – +5V Logic 3

Pin 4 – +5V Logic 4
Pin 5 – +5V Logic 5
Pin 6 – +5V Logic 6

Pin 7 – +5V Logic 7
Pin 8 – +5V Logic 8
Pin 9 – Digital Ground

Simplified Blade Logic I/O

Input Logic

EXTERNAL
CLOSURE

INPUT
PIN

X

BLADE LIO PORT

LOGIC
INPUT

1
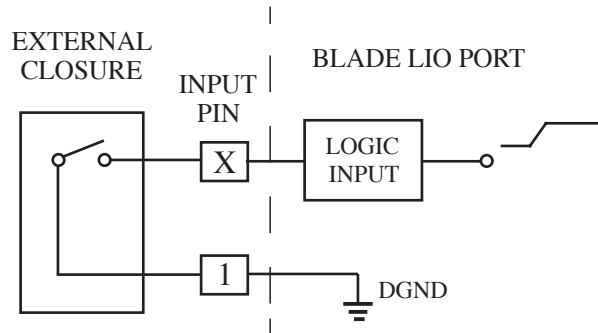
DGND

Input Port Specs
- Internally current limited
- No pull up required

Logic Inputs are activated when the input pin is pulled to DGND.

Output Logic

Logic Ouput ports are pulled to DGND when activated.

EXTERNAL
DEVICE

OUTPUT
PIN

BLADE LIO PORT

LOGIC OUTPUT

START

X

CONTROL

DGND

GND

1

OR

OPTO ISOLATED
EXTERNAL DEVICE

LOGIC OUTPUT

V+

8

+5VDC

START

X

DGND
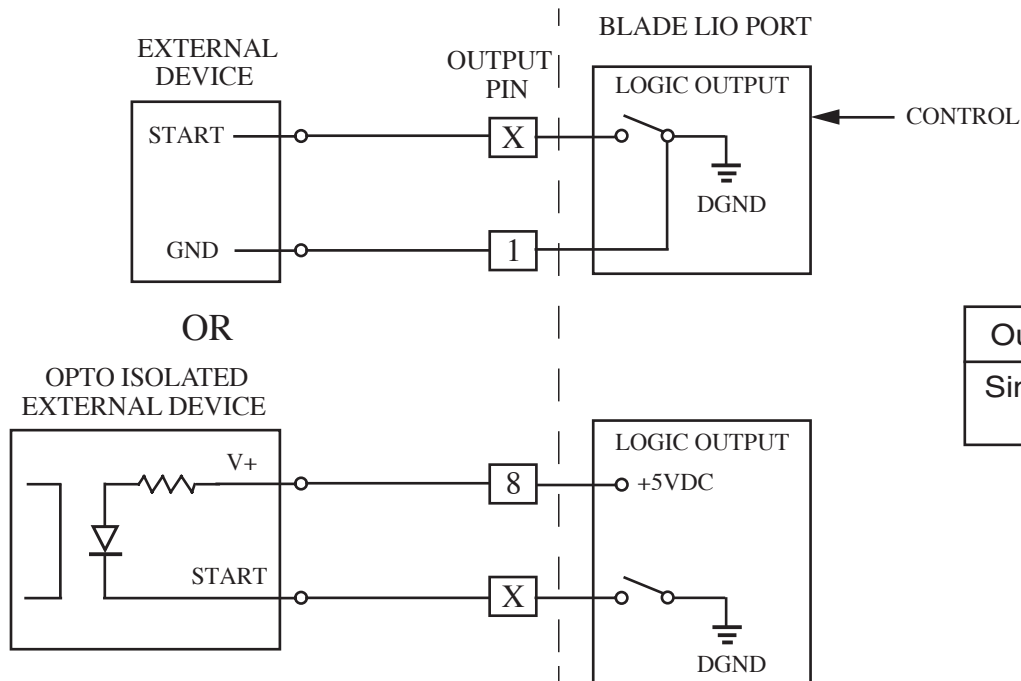
Output Port Specs

Sink: • 50mA nom
       • 100mA max

LIO 1

RJ-45

CT7

TOP

	COLOR CODES		
	T568A	T568B	
C1	WHT/GRN	WHT/ORG	GND
C2	GRN	ORG	LIO_RJ_1
C3	WHT/ORG	WHT/GRN	LIO_RJ_2
C4	BLU	BLU	LIO_RJ_3
C5	WHT/BLU	WHT/BLU	LIO_RJ_4
C6	ORG	GRN	LIO_RJ_5
C7	WHT/BRN	WHT/BRN	LIO_RJ_6
C8	BRN	BRN	LIO1 +5V

ANALOG INPUTS 1- 4 DB-25

LINE 1 LT IN SH — (25)(13) — AUDIO GROUND
LINE 1 LT IN HI — (24)(12) — LINE 1 LT IN LO
LINE 1 RT IN LO — (23)(11) — LINE 1 RT IN SH
LINE 2 LT IN SH — (22)(10) — LINE 1 RT IN HI
LINE 2 LT IN HI — (21)(9) — LINE 2 LT IN LO
LINE 2 RT IN LO — (20)(8) — LINE 2 RT IN SH
LINE 3 LT IN SH — (19)(7) — LINE 2 RT IN HI
LINE 3 LT IN HI — (18)(6) — LINE 3 LT IN LO
LINE 3 RT IN LO — (17)(5) — LINE 3 RT IN SH
LINE 4 LT IN SH — (16)(4) — LINE 3 RT IN HI
LINE 4 LT IN HI — (15)(3) — LINE 4 LT IN LO
LINE 4 RT IN LO — (14)(2) — LINE 4 RT IN SH
(1) — LINE 4 RT IN HI

ANALOG INPUTS 5 - 8 DB-25

LINE 5 LT IN SH — (25)(13) — AUDIO GROUND
LINE 5 LT IN HI — (24)(12) — LINE 5 LT IN LO
LINE 5 RT IN LO — (23)(11) — LINE 5 RT IN SH
LINE 6 LT IN SH — (22)(10) — LINE 5 RT IN HI
LINE 6 LT IN HI — (21)(9) — LINE 6 LT IN LO
LINE 6 RT IN LO — (20)(8) — LINE 6 RT IN SH
LINE 7 LT IN SH — (19)(7) — LINE 6 RT IN HI
LINE 7 LT IN HI — (18)(6) — LINE 7 LT IN LO
LINE 7 RT IN LO — (17)(5) — LINE 7 RT IN SH
LINE 8 LT IN SH — (16)(4) — LINE 7 RT IN HI
LINE 8 LT IN HI — (15)(3) — LINE 8 LT IN LO
LINE 8 RT IN LO — (14)(2) — LINE 8 RT IN SH
(1) — LINE 8 RT IN HI

ANALOG INPUTS

RJ-45 #1
1 — LINE 1 LT IN HI
2 — LINE 1 LT IN LO
3 — LINE 1 RT IN HI
4
5
6 — LINE 1 RT IN LO
7
8

RJ-45 #5
1 — LINE 5 LT IN HI
2 — LINE 5 LT IN LO
3 — LINE 5 RT IN HI
4
5
6 — LINE 5 RT IN LO
7
8

RJ-45 #2
1 — LINE 2 LT IN HI
2 — LINE 2 LT IN LO
3 — LINE 2 RT IN HI
4
5
6 — LINE 2 RT IN LO
7
8

RJ-45 #6
1 — LINE 6 LT IN HI
2 — LINE 6 LT IN LO
3 — LINE 6 RT IN HI
4
5
6 — LINE 6 RT IN LO
7
8

RJ-45 #3
1 — LINE 3 LT IN HI
2 — LINE 3 LT IN LO
3 — LINE 3 RT IN HI
4
5
6 — LINE 3 RT IN LO
7
8

RJ-45 #7
1 — LINE 7 LT IN HI
2 — LINE 7 LT IN LO
3 — LINE 7 RT IN HI
4
5
6 — LINE 7 RT IN LO
7
8

RJ-45 #4
1 — LINE 4 LT IN HI
2 — LINE 4 LT IN LO
3 — LINE 4 RT IN HI
4
5
6 — LINE 4 RT IN LO
7
8

RJ-45 #8
1 — LINE 8 LT IN HI
2 — LINE 8 LT IN LO
3 — LINE 8 RT IN HI
4
5
6 — LINE 8 RT IN LO
7
8

ANALOG OUTPUTS 1- 4 DB-25

LINE 1 LT OUT SH — (25)(13) — AUDIO GROUND
LINE 1 LT OUT HI — (24)(12) — LINE 1 LT OUT LO
LINE 1 RT OUT LO — (23)(11) — LINE 1 RT OUT SH
LINE 2 LT OUT SH — (22)(10) — LINE 1 RT OUT HI
LINE 2 LT OUT HI — (21)(9) — LINE 2 LT OUT LO
LINE 2 RT OUT LO — (20)(8) — LINE 2 RT OUT SH
LINE 3 LT OUT SH — (19)(7) — LINE 2 RT OUT HI
LINE 3 LT OUT HI — (18)(6) — LINE 3 LT OUT LO
LINE 3 RT OUT LO — (17)(5) — LINE 3 RT OUT SH
LINE 4 LT OUT SH — (16)(4) — LINE 3 RT OUT HI
LINE 4 LT OUT HI — (15)(3) — LINE 4 LT OUT LO
LINE 4 RT OUT LO — (14)(2) — LINE 4 RT OUT SH
(1) — LINE 4 RT OUT HI

ANALOG OUTPUTS 5 - 8 DB-25

LINE 5 LT OUT SH — (25)(13) — AUDIO GROUND
LINE 5 LT OUT HI — (24)(12) — LINE 5 LT OUT LO
LINE 5 RT OUT LO — (23)(11) — LINE 5 RT OUT SH
LINE 6 LT OUT SH — (22)(10) — LINE 5 RT OUT HI
LINE 6 LT OUT HI — (21)(9) — LINE 6 LT OUT LO
LINE 6 RT OUT LO — (20)(8) — LINE 6 RT OUT SH
LINE 7 LT OUT SH — (19)(7) — LINE 6 RT OUT HI
LINE 7 LT OUT HI — (18)(6) — LINE 7 LT OUT LO
LINE 7 RT OUT LO — (17)(5) — LINE 7 RT OUT SH
LINE 8 LT OUT SH — (16)(4) — LINE 7 RT OUT HI
LINE 8 LT OUT HI — (15)(3) — LINE 8 LT OUT LO
LINE 8 RT OUT LO — (14)(2) — LINE 8 RT OUT SH
(1) — LINE 8 RT OUT HI

ANALOG OUTPUTS

RJ-45 #1
1 — LINE 1 LT OUT HI
2 — LINE 1 LT OUT LO
3 — LINE 1 RT OUT HI
4
5
6
7
8 — LINE 1 RT OUT LO

RJ-45 #5
1 — LINE 5 LT OUT HI
2 — LINE 5 LT OUT LO
3 — LINE 5 RT OUT HI
4
5
6
7
8 — LINE 5 RT OUT LO

RJ-45 #2
1 — LINE 2 LT OUT HI
2 — LINE 2 LT OUT LO
3 — LINE 2 RT OUT HI
4
5
6 — LINE 2 RT OUT LO
7
8

RJ-45 #6
1 — LINE 6 LT OUT HI
2 — LINE 6 LT OUT LO
3 — LINE 6 RT OUT HI
4
5
6 — LINE 6 RT OUT LO
7
8

RJ-45 #3
1 — LINE 3 LT OUT HI
2 — LINE 3 LT OUT LO
3 — LINE 3 RT OUT HI
4
5
6 — LINE 3 RT OUT LO
7
8

RJ-45 #7
1 — LINE 7 LT OUT HI
2 — LINE 7 LT OUT LO
3 — LINE 7 RT OUT HI
4
5
6 — LINE 7 RT OUT LO
7
8

RJ-45 #4
1 — LINE 4 LT OUT HI
2 — LINE 4 LT OUT LO
3 — LINE 4 RT OUT HI
4
5
6 — LINE 4 RT OUT LO
7
8

RJ-45 #8
1 — LINE 8 LT OUT HI
2 — LINE 8 LT OUT LO
3 — LINE 8 RT OUT HI
4
5
6 — LINE 8 RT OUT LO
7
8

100M RJ-45 / ETHERNET / 1G RJ-45

100M RJ-45
1 — TX +
2 — TX -
3 — RX +
4 — N/C
5 — N/C
6 — RX -
7 — N/C
8 — N/C

1G RJ-45
1 — TRD0 +
2 — TRD0 -
3 — TRD1 +
4 — TRD2 +
5 — TRD2 -
6 — TRD1 -
7 — TRD3 +
8 — TRD3 -

NOT USED

LOGIC I/O

1 - 6 RJ-45
1 — DIGITAL GROUND
2 — LOGIC 1 IN/OUT
3 — LOGIC 2 IN/OUT
4 — LOGIC 3 IN/OUT
5 — LOGIC 4 IN/OUT
6 — LOGIC 5 IN/OUT
7 — LOGIC 6 IN/OUT
8 — +5V DIGITAL

7 - 12 RJ-45
1 — DIGITAL GROUND
2 — LOGIC 7 IN/OUT
3 — LOGIC 8 IN/OUT
4 — LOGIC 9 IN/OUT
5 — LOGIC 10 IN/OUT
6 — LOGIC 11 IN/OUT
7 — LOGIC 12 IN/OUT
8 — +5V DIGITAL

Panel labels: W88a · ANALOG INPUT · ANALOG OUTPUT · LOGIC I/O 1 - 6 7 - 12 · Made in USA by Wheatstone · 100M / 1G ETHERNET · 90 - 120 ~VAC 2A / 50 - 60 Hz · CAUTION! To avoid the risk of electric shock refer all service to a qualified technician

NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

Made in USA by Wheatstone

LOGIC I/O
1 - 6   7 - 12

1   3   5   7

1   3   5   7

CAUTION!
To avoid the risk of electric shock refer all service to a qualified technician

Wiip 88d
1   2   3   4   5   6   7   8
DIGITAL INPUT

2   4   6   8 SYNC

1   2   3   4   5   6   7   8
DIGITAL OUTPUT

2   4   6   8

100M   1G
ETHERNET

FC

90 - 120 ~VAC
2A / 50 - 60 Hz

DIGITAL INPUTS
1- 4 DB-25

AES 1 IN SH   25 13   AUDIO GROUND
AES 1 IN HI   24 12   AES 1 IN LO
N/C   23 11   N/C
AES 2 IN SH   22 10   N/C
AES 2 IN HI   21   9   AES 2 IN LO
N/C   20   8   N/C
AES 3 IN SH   19   7   N/C
AES 3 IN H   18   6   AES 3 IN LO
N/C   17   5   N/C
AES 4 IN SH   16   4   N/C
AES 4 IN HI   15   3   AES 4 IN LO
N/C   14   2   N/C
                      1   N/C

DIGITAL INPUTS
5 - 8 DB-25

AES 5 IN SH   25 13   AUDIO GROUND
AES 5 IN HI   24 12   AES 5 IN LO
N/C   23 11   N/C
AES 6 IN SH   22 10   N/C
AES 6 IN H   21   9   AES 6 IN LO
N/C   20   8   N/C
AES 7 IN SH   19   7   N/C
AES 7 IN HI   18   6   AES 7 IN LO
N/C   17   5   N/C
AES 8 IN SH   16   4   N/C
AES 8 IN HI   15   3   AES 8 IN LO
N/C   14   2   N/C
                      1   N/C

DIGITAL INPUTS

RJ-45 #1   AES 1 IN HI / AES 1 IN LO
RJ-45 #5   AES 5 IN HI / AES 5 IN LO
RJ-45 #2   AES 2 IN HI / AES 2 IN LO
RJ-45 #6   AES 6 IN HI / AES 6 IN LO
RJ-45 #3   AES 3 IN HI / AES 3 IN LO
RJ-45 #7   AES 7 IN HI / AES 7 IN LO
RJ-45 #4   AES 4 IN HI / AES 4 IN LO
RJ-45 #8   AES 8 IN HI / AES 8 IN LO

DIGITAL OUTPUTS
1- 4 DB-25

AES 1 OUT SH   25 13   AUDIO GROUND
AES 1 OUT HI   24 12   AES 1 OUT LO
N/C   23 11   N/C
AES 2 OUT SH   22 10   N/C
AES 2 OUT HI   21   9   AES 2 OUT LO
N/C   20   8   N/C
AES 3 OUT SH   19   7   N/C
AES 3 OUT HI   18   6   AES 3 OUT LO
N/C   17   5   N/C
AES 4 OUT SH   16   4   N/C
AES 4 OUT HI   15   3   AES 4 OUT LO
N/C   14   2   N/C
                      1   N/C

DIGITAL OUTPUTS
5 - 8 DB-25

AES 5 OUT SH   25 13   AUDIO GROUND
AES 5 OUT HI   24 12   AES 5 OUT LO
N/C   23 11   N/C
AES 6 OUT SH   22 10   N/C
AES 6 OUT HI   21   9   AES 6 OUT LO
N/C   20   8   N/C
AES 7 OUT SH   19   7   N/C
AES 7 OUT HI   18   6   AES 7 OUT LO
N/C   17   5   N/C
AES 8 OUT SH   16   4   N/C
AES 8 OUT HI   15   3   AES 8 OUT LO
N/C   14   2   N/C
                      1   N/C

DIGITAL OUTPUTS

RJ-45 #1   AES 1 OUT HI / AES 1 OUT LO
RJ-45 #5   AES 5 OUT HI / AES 5 OUT LO
RJ-45 #2   AES 2 OUT HI / AES 2 OUT LO
RJ-45 #6   AES 6 OUT HI / AES 6 OUT LO
RJ-45 #3   AES 3 OUT HI / AES 3 OUT LO
RJ-45 #7   AES 7 OUT HI / AES 7 OUT LO
RJ-45 #4   AES 4 OUT HI / AES 4 OUT LO
RJ-45 #8   AES 8 OUT HI / AES 8 OUT LO

100M RJ-45   ETHERNET   1G RJ-45

1   TX +   1   TRD0 +
2   TX -   2   TRD0 -
3   RX +   3   TRD1 +
4   N/C   4   TRD2 +
5   N/C   5   TRD2 -
6   RX -   6   TRD1 -
7   N/C   7   TRD3 +
8   N/C   8   TRD3 -

NOT USED

1 - 6 RJ-45   LOGIC I/O   7 - 12 RJ-45

1   DIGITAL GROUND   1   DIGITAL GROUND
2   LOGIC 1 IN/OUT   2   LOGIC 7 IN/OUT
3   LOGIC 2 IN/OUT   3   LOGIC 8 IN/OUT
4   LOGIC 3 IN/OUT   4   LOGIC 9 IN/OUT
5   LOGIC 4 IN/OUT   5   LOGIC 10 IN/OUT
6   LOGIC 5 IN/OUT   6   LOGIC 11 IN/OUT
7   LOGIC 6 IN/OUT   7   LOGIC 12 IN/OUT
8   +5V DIGITAL   8   +5V DIGITAL
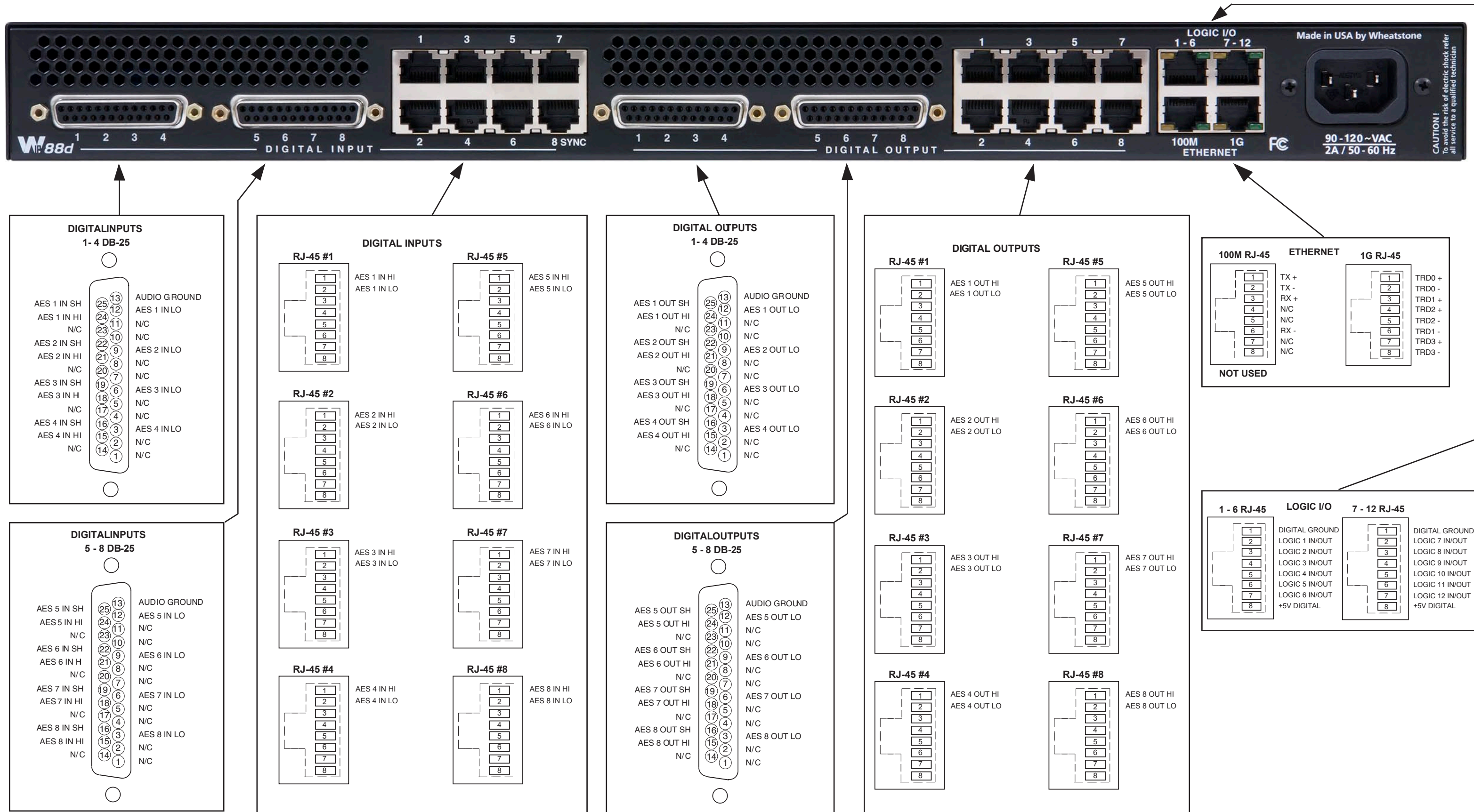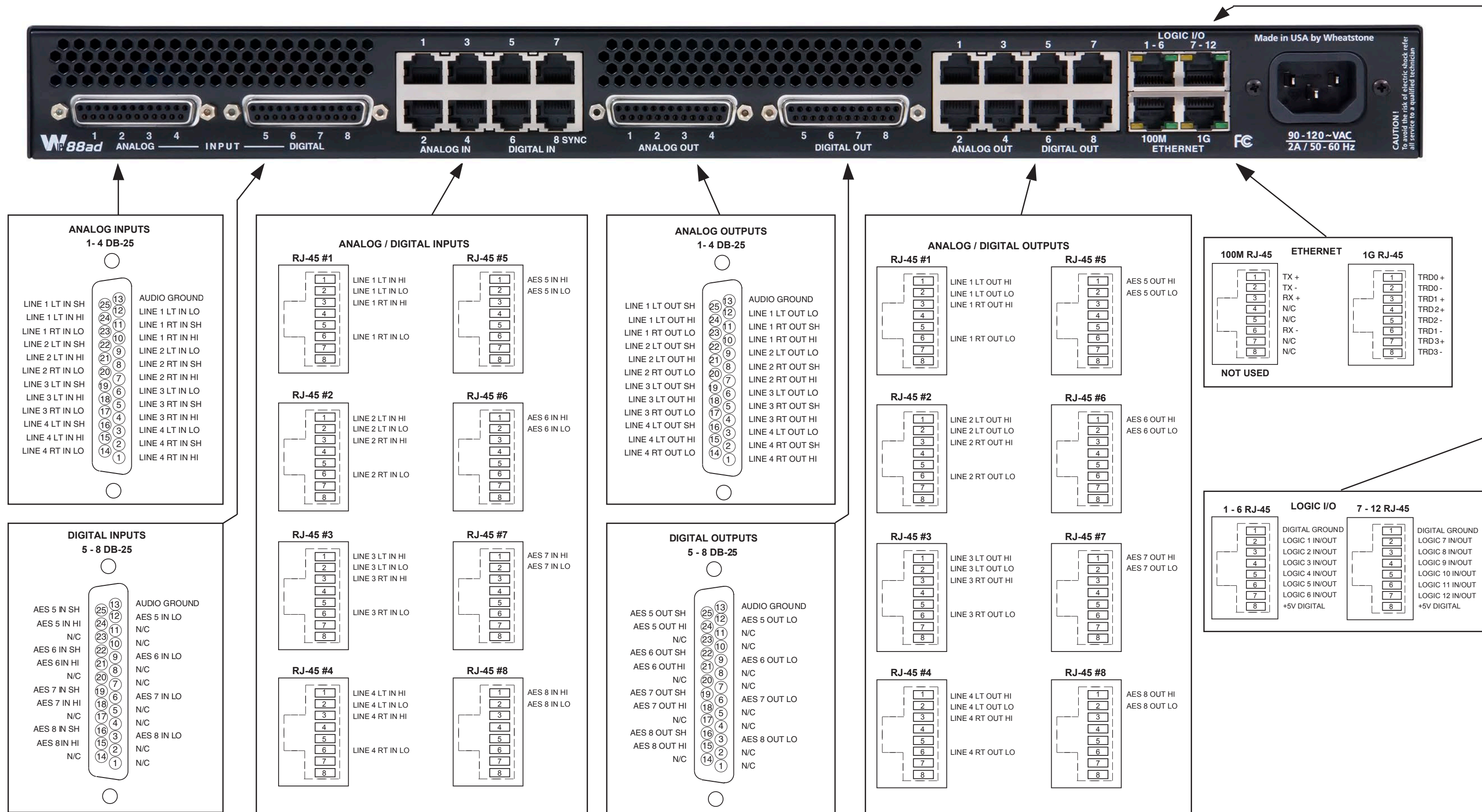
NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

ANALOG INPUTS
1- 4 DB-25

LINE 1 LT IN SH — 25 13 — AUDIO GROUND
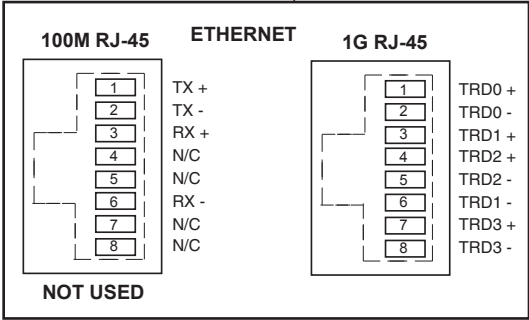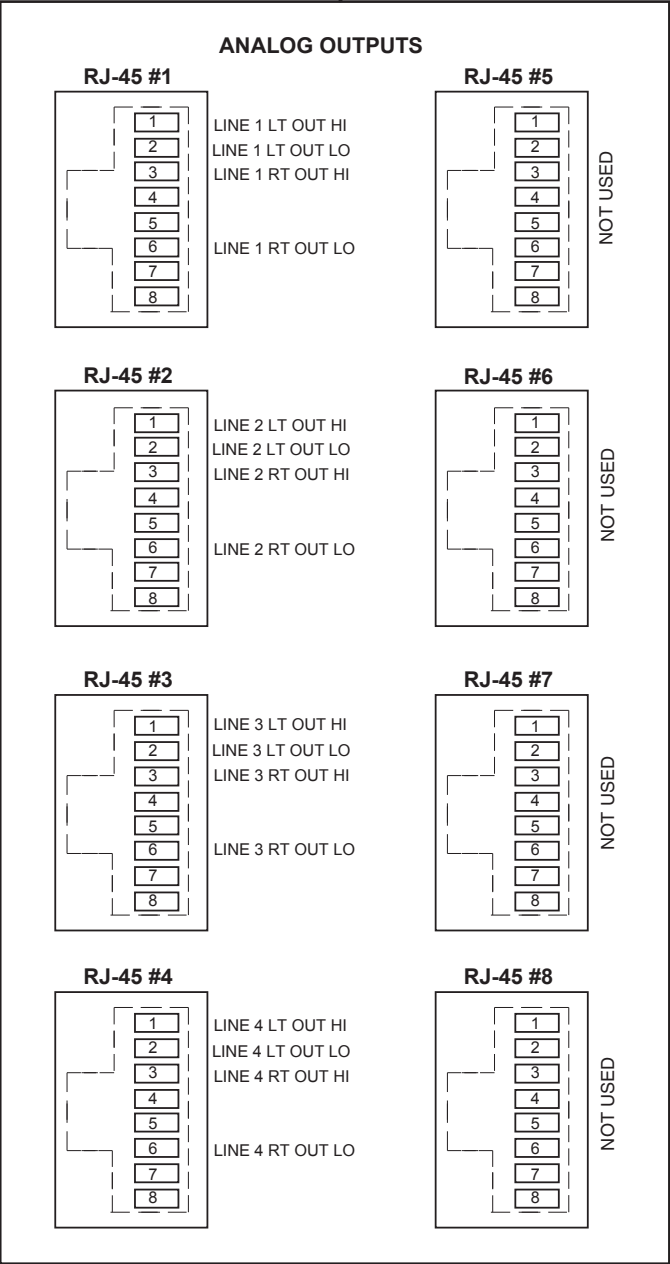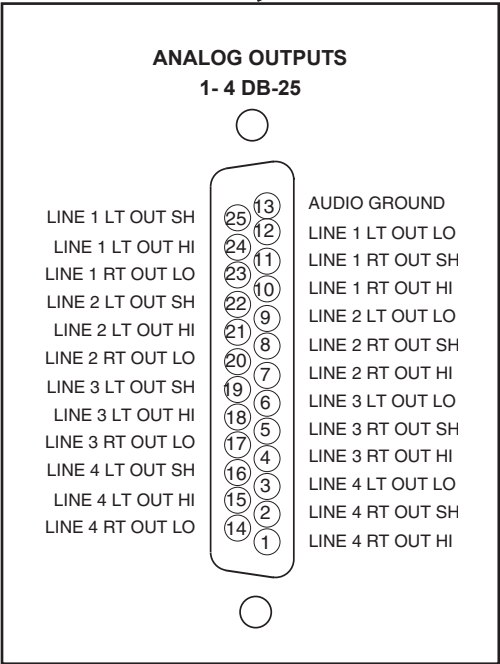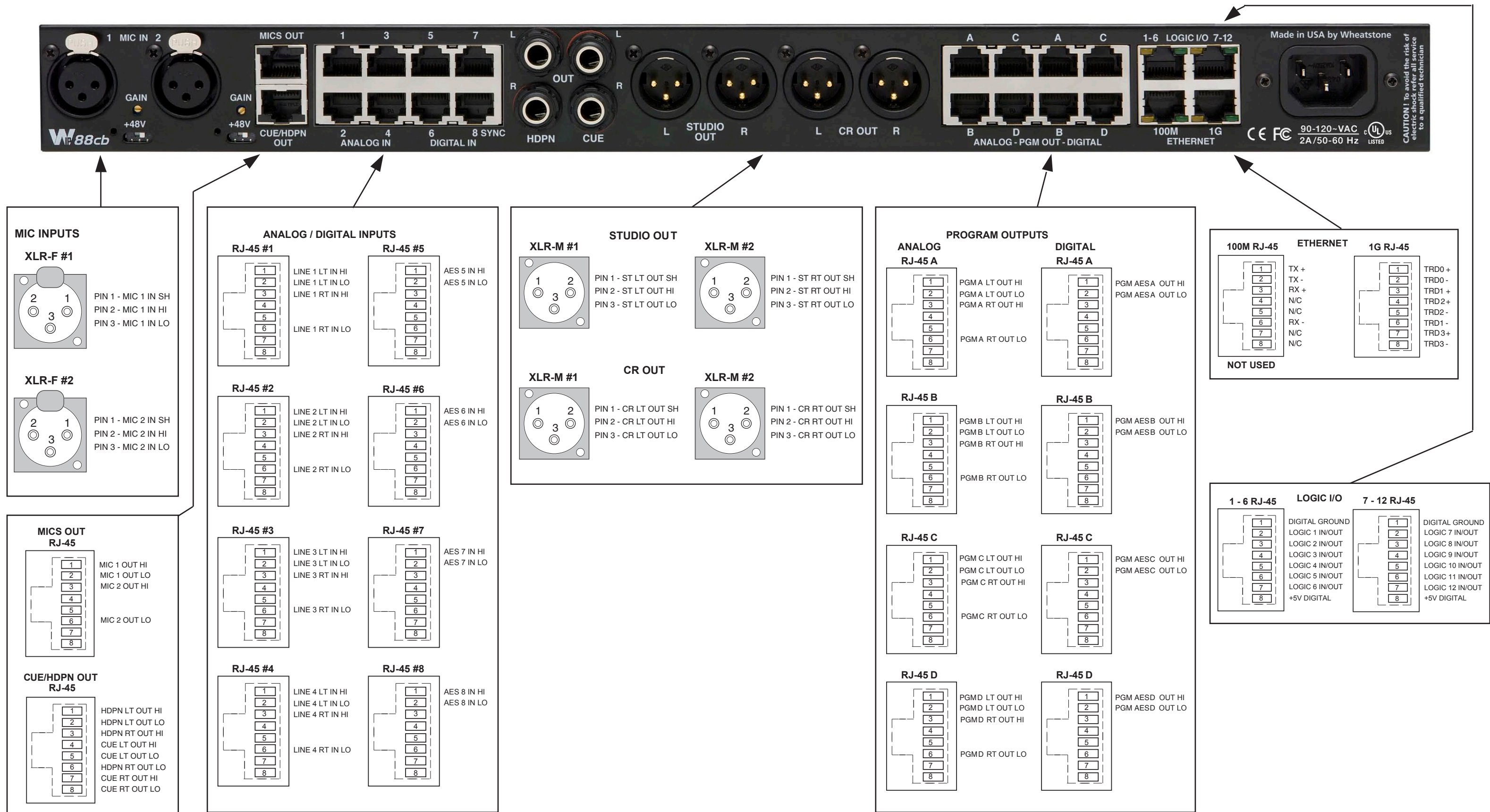LINE 1 LT IN HI — 24 12 — LINE 1 LT IN LO
LINE 1 RT IN LO — 23 11 — LINE 1 RT IN SH
LINE 2 LT IN SH — 22 10 — LINE 1 RT IN HI
LINE 2 LT IN HI — 21 9 — LINE 2 LT IN LO
LINE 2 RT IN LO — 20 8 — LINE 2 RT IN SH
LINE 3 LT IN SH — 19 7 — LINE 2 RT IN HI
LINE 3 LT IN HI — 18 6 — LINE 3 LT IN LO
LINE 3 RT IN HI — 17 5 — LINE 3 RT IN HI
LINE 4 LT IN SH — 16 4 — LINE 3 RT IN HI
LINE 4 LT IN HI — 15 2 — LINE 4 RT IN SH
LINE 4 RT IN LO — 14 1 — LINE 4 RT IN HI

DIGITAL INPUTS
5 - 8 DB-25

AES 5 IN SH — 25 13 — AUDIO GROUND
AES 5 IN HI — 24 12 — AES 5 IN LO
N/C — 23 11 — N/C
AES 6 IN SH — 22 10 — N/C
AES 6 IN HI — 21 9 — AES 6 IN LO
N/C — 20 8 — N/C
AES 7 IN SH — 19 7 — N/C
AES 7 IN HI — 18 6 — AES 7 IN LO
N/C — 17 5 — N/C
AES 8 IN SH — 16 4 — N/C
AES 8 IN HI — 15 3 — AES 8 IN LO
N/C — 14 2 — N/C
N/C — 1 — N/C

ANALOG / DIGITAL INPUTS

RJ-45 #1
1 LINE 1 LT IN HI
2 LINE 1 LT IN LO
3 LINE 1 RT IN HI
4
5 LINE 1 RT IN LO
6
7
8

RJ-45 #2
1 LINE 2 LT IN HI
2 LINE 2 LT IN LO
3 LINE 2 RT IN HI
4
5
6 LINE 2 RT IN LO
7
8

RJ-45 #3
1 LINE 3 LT IN HI
2 LINE 3 LT IN LO
3 LINE 3 RT IN HI
4
5
6 LINE 3 RT IN LO
7
8

RJ-45 #4
1 LINE 4 LT IN HI
2 LINE 4 LT IN LO
3 LINE 4 RT IN HI
4
5
6 LINE 4 RT IN LO
7
8

RJ-45 #5
1 AES 5 IN HI
2 AES 5 IN LO
3
4
5
6
7
8

RJ-45 #6
1 AES 6 IN HI
2 AES 6 IN LO
3
4
5
6
7
8

RJ-45 #7
1 AES 7 IN HI
2 AES 7 IN LO
3
4
5
6
7
8

RJ-45 #8
1 AES 8 IN HI
2 AES 8 IN LO
3
4
5
6
7
8

ANALOG OUTPUTS
1- 4 DB-25

LINE 1 LT OUT SH — 25 13 — AUDIO GROUND
LINE 1 LT OUT HI — 24 12 — LINE 1 LT OUT LO
LINE 1 RT OUT LO — 23 11 — LINE 1 RT OUT SH
LINE 2 LT OUT SH — 22 10 — LINE 1 RT OUT HI
LINE 2 LT OUT HI — 21 9 — LINE 2 LT OUT LO
LINE 2 RT OUT LO — 20 8 — LINE 2 RT OUT SH
LINE 3 LT OUT SH — 19 7 — LINE 2 RT OUT HI
LINE 3 LT OUT HI — 18 6 — LINE 3 LT OUT LO
LINE 3 RT OUT HI — 17 5 — LINE 3 RT OUT SH
LINE 4 LT OUT SH — 16 4 — LINE 3 RT OUT HI
LINE 4 LT OUT HI — 15 3 — LINE 4 RT OUT SH
LINE 4 RT OUT LO — 14 1 — LINE 4 RT OUT HI

DIGITAL OUTPUTS
5 - 8 DB-25

AES 5 OUT SH — 25 13 — AUDIO GROUND
AES 5 OUT HI — 24 12 — AES 5 OUT LO
N/C — 23 11 — N/C
AES 6 OUT SH — 22 10 — N/C
AES 6 OUT HI — 21 9 — AES 6 OUT LO
N/C — 20 8 — N/C
AES 7 OUT SH — 19 7 — N/C
AES 7 OUT HI — 18 6 — AES 7 OUT LO
N/C — 17 5 — N/C
AES 8 OUT SH — 16 3 — N/C
AES 8 OUT HI — 15 2 — AES 8 OUT LO
N/C — 14 1 — N/C

ANALOG / DIGITAL OUTPUTS

RJ-45 #1
1 LINE 1 LT OUT HI
2 LINE 1 LT OUT LO
3 LINE 1 RT OUT HI
4
5
6 LINE 1 RT OUT LO
7
8

RJ-45 #2
1 LINE 2 LT OUT HI
2 LINE 2 LT OUT LO
3 LINE 2 RT OUT HI
4
5
6 LINE 2 RT OUT LO
7
8

RJ-45 #3
1 LINE 3 LT OUT HI
2 LINE 3 LT OUT LO
3 LINE 3 RT OUT HI
4
5
6 LINE 3 RT OUT LO
7
8

RJ-45 #4
1 LINE 4 LT OUT HI
2 LINE 4 LT OUT LO
3 LINE 4 RT OUT HI
4
5
6 LINE 4 RT OUT LO
7
8

RJ-45 #5
1 AES 5 OUT HI
2 AES 5 OUT LO
3
4
5
6
7
8

RJ-45 #6
1 AES 6 OUT HI
2 AES 6 OUT LO
3
4
5
6
7
8

RJ-45 #7
1 AES 7 OUT HI
2 AES 7 OUT LO
3
4
5
6
7
8

RJ-45 #8
1 AES 8 OUT HI
2 AES 8 OUT LO
3
4
5
6
7
8

100M RJ-45   ETHERNET   1G RJ-45

1 TX +
2 TX -
3 RX +
4 N/C
5 N/C
6 RX -
7 N/C
8 N/C

NOT USED

1 TRD0 +
2 TRD0 -
3 TRD1 +
4 TRD2+
5 TRD2 -
6 TRD1 -
7 TRD3+
8 TRD3 -

1 - 6 RJ-45   LOGIC I/O   7 - 12 RJ-45

1 DIGITAL GROUND
2 LOGIC 1 IN/OUT
3 LOGIC 2 IN/OUT
4 LOGIC 3 IN/OUT
5 LOGIC 4 IN/OUT
6 LOGIC 5 IN/OUT
7 LOGIC 6 IN/OUT
8 +5V DIGITAL

1 DIGITAL GROUND
2 LOGIC 7 IN/OUT
3 LOGIC 8 IN/OUT
4 LOGIC 9 IN/OUT
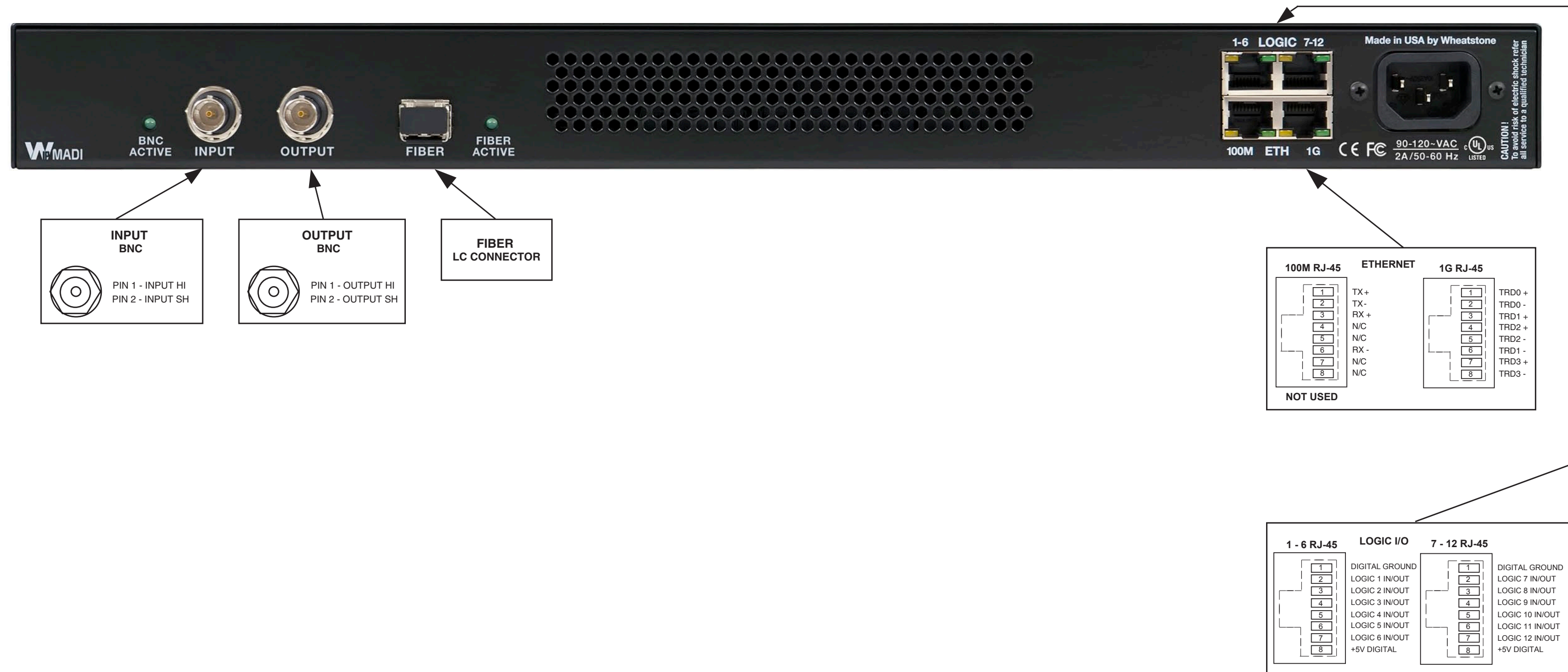5 LOGIC 10 IN/OUT
6 LOGIC 11 IN/OUT
7 LOGIC 12 IN/OUT
8 +5V DIGITAL

NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

MIC INPUT — 1 2 3 4 5 6 7 8

PUSH (×8)

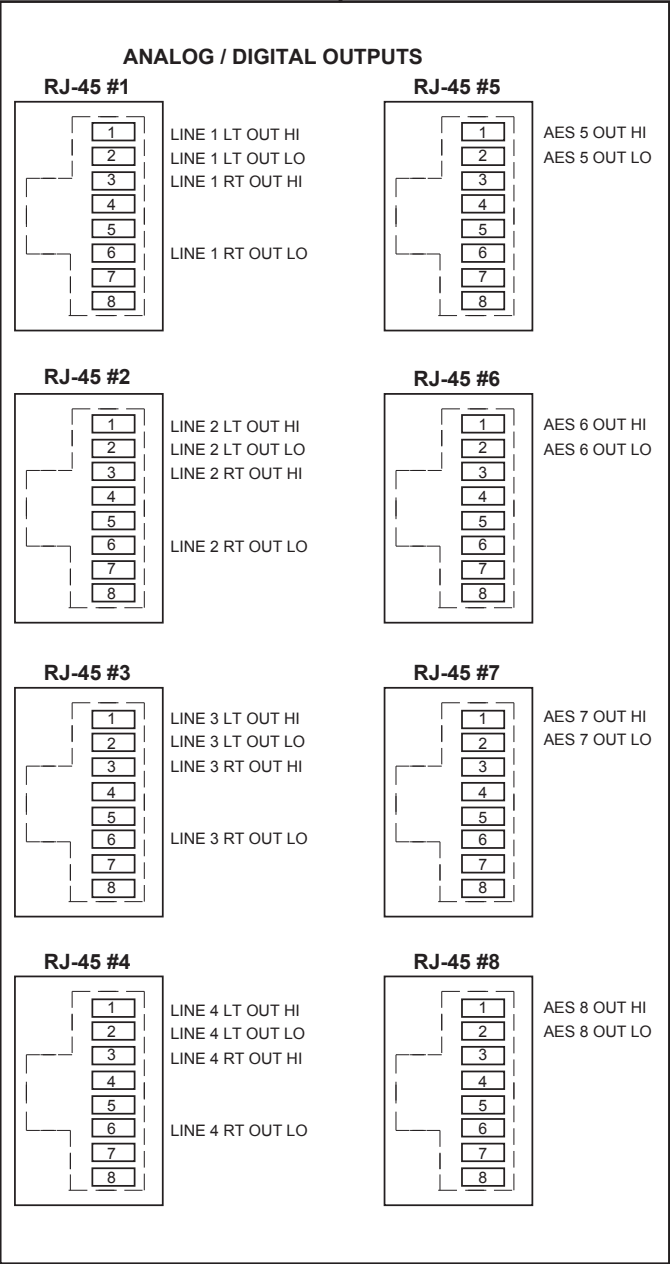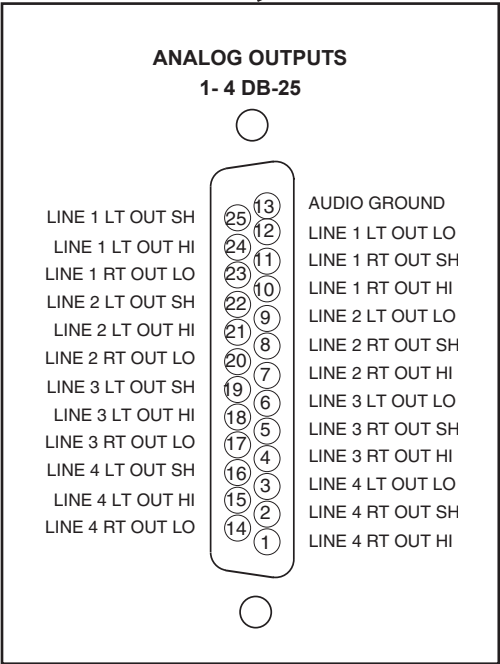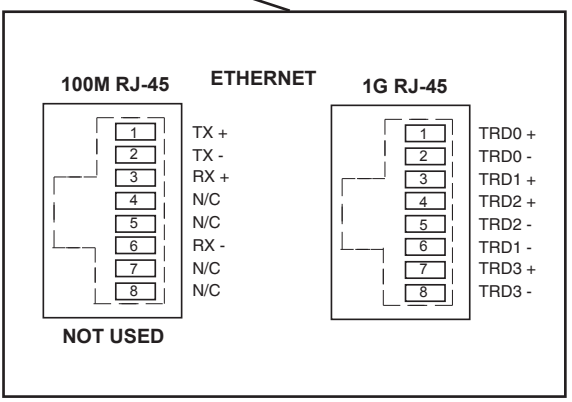1 3 5 7 — ANALOG OUTPUT — 1 2 3 4 / 5 6 7 8

LOGIC I/O 1 - 6 / 7 - 12

Made in USA by Wheatstone

90 - 120 ~VAC 2A / 50 - 60 Hz

CAUTION! To avoid the risk of electric shock refer all service to a qualified technician

W 88m

2 4 6 8

100B 1G ETHERNET

FC

MIC INPUTS

XLR-F #1
PIN 1 - MIC 1 IN SH
PIN 2 - MIC 1 IN HI
PIN 3 - MIC 1 IN LO

XLR-F #5
PIN 1 - MIC 5 IN SH
PIN 2 - MIC 5 IN HI
PIN 3 - MIC 5 IN LO

XLR-F #2
PIN 1 - MIC 2 IN SH
PIN 2 - MIC 2 IN HI
PIN 3 - MIC 2 IN LO

XLR-F #6
PIN 1 - MIC 6 IN SH
PIN 2 - MIC 6 IN HI
PIN 3 - MIC 6 IN LO

XLR-F #3
PIN 1 - MIC 3 IN SH
PIN 2 - MIC 3 IN HI
PIN 3 - MIC 3 IN LO

XLR-F #7
PIN 1 - MIC 7 IN SH
PIN 2 - MIC 7 IN HI
PIN 3 - MIC 7 IN LO

XLR-F #4
PIN 1 - MIC 4 IN SH
PIN 2 - MIC 4 IN HI
PIN 3 - MIC 4 IN LO

XLR-F #8
PIN 1 - MIC 8 IN SH
PIN 2 - MIC 8 IN HI
PIN 3 - MIC 8 IN LO

ANALOG OUTPUTS
1- 4 DB-25

LINE 1 LT OUT SH — 25 / 13 — AUDIO GROUND
LINE 1 LT OUT HI — 24 / 12 — LINE 1 LT OUT LO
LINE 1 RT OUT LO — 23 / 11 — LINE 1 RT OUT SH
LINE 2 LT OUT SH — 22 / 10 — LINE 1 RT OUT HI
LINE 2 LT OUT HI — 21 / 9 — LINE 2 LT OUT LO
LINE 2 RT OUT LO — 20 / 8 — LINE 2 RT OUT SH
LINE 3 LT OUT SH — 19 / 7 — LINE 2 RT OUT HI
LINE 3 LT OUT HI — 18 / 6 — LINE 3 LT OUT LO
LINE 3 RT OUT LO — 17 / 5 — LINE 3 RT OUT SH
LINE 4 LT OUT SH — 16 / 4 — LINE 3 RT OUT HI
LINE 4 LT OUT HI — 15 / 3 — LINE 4 LT OUT LO
LINE 4 RT OUT LO — 14 / 2 — LINE 4 RT OUT SH
1 — LINE 4 RT OUT HI

ANALOG OUTPUTS

RJ-45 #1
1 LINE 1 LT OUT HI
2 LINE 1 LT OUT LO
3 LINE 1 RT OUT HI
4
5
6 LINE 1 RT OUT LO
7
8

RJ-45 #5
1
2
3
4
5
6
7
8
NOT USED

RJ-45 #2
1 LINE 2 LT OUT HI
2 LINE 2 LT OUT LO
3 LINE 2 RT OUT HI
4
5
6 LINE 2 RT OUT LO
7
8

RJ-45 #6
1
2
3
4
5
6
7
8
NOT USED

RJ-45 #3
1 LINE 3 LT OUT HI
2 LINE 3 LT OUT LO
3 LINE 3 RT OUT HI
4
5
6 LINE 3 RT OUT LO
7
8

RJ-45 #7
1
2
3
4
5
6
7
8
NOT USED

RJ-45 #4
1 LINE 4 LT OUT HI
2 LINE 4 LT OUT LO
3 LINE 4 RT OUT HI
4
5
6 LINE 4 RT OUT LO
7
8

RJ-45 #8
1
2
3
4
5
6
7
8
NOT USED

100M RJ-45 **ETHERNET** **1G RJ-45**
1 TX + 1 TRD0 +
2 TX - 2 TRD0 -
3 RX + 3 TRD1 +
4 N/C 4 TRD2 +
5 N/C 5 TRD2 -
6 RX - 6 TRD1 -
7 N/C 7 TRD3 +
8 N/C 8 TRD3 -

NOT USED

1 - 6 RJ-45 **LOGIC I/O** **7 - 12 RJ-45**
1 DIGITAL GROUND 1 DIGITAL GROUND
2 LOGIC 1 IN/OUT 2 LOGIC 7 IN/OUT
3 LOGIC 2 IN/OUT 3 LOGIC 8 IN/OUT
4 LOGIC 3 IN/OUT 4 LOGIC 9 IN/OUT
5 LOGIC 4 IN/OUT 5 LOGIC 10 IN/OUT
6 LOGIC 5 IN/OUT 6 LOGIC 11 IN/OUT
7 LOGIC 6 IN/OUT 7 LOGIC 12 IN/OUT
8 +5V DIGITAL 8 +5V DIGITAL

NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

MIC INPUTS

XLR-F #1

PIN 1 - MIC 1 IN SH
PIN 2 - MIC 1 IN HI
PIN 3 - MIC 1 IN LO

XLR-F #2

PIN 1 - MIC 2 IN SH
PIN 2 - MIC 2 IN HI
PIN 3 - MIC 2 IN LO

MICS OUT
RJ-45

1 MIC 1 OUT HI
2 MIC 1 OUT LO
3 MIC 2 OUT HI
4
5 MIC 2 OUT LO
6
7
8

CUE/HDPN OUT
RJ-45

1 HDPN LT OUT HI
2 HDPN LT OUT LO
3 HDPN RT OUT HI
4 CUE LT OUT HI
5 CUE LT OUT LO
6 HDPN RT OUT LO
7 CUE RT OUT HI
8 CUE RT OUT LO

ANALOG / DIGITAL INPUTS

RJ-45 #1
1 LINE 1 LT IN HI
2 LINE 1 LT IN LO
3 LINE 1 RT IN HI
4
5
6 LINE 1 RT IN LO
7
8

RJ-45 #5
1 AES 5 IN HI
2 AES 5 IN LO
3
4
5
6
7
8

RJ-45 #2
1 LINE 2 LT IN HI
2 LINE 2 LT IN LO
3 LINE 2 RT IN HI
4
5
6 LINE 2 RT IN LO
7
8

RJ-45 #6
1 AES 6 IN HI
2 AES 6 IN LO
3
4
5
6
7
8

RJ-45 #3
1 LINE 3 LT IN HI
2 LINE 3 LT IN LO
3 LINE 3 RT IN HI
4
5
6 LINE 3 RT IN LO
7
8

RJ-45 #7
1 AES 7 IN HI
2 AES 7 IN LO
3
4
5
6
7
8

RJ-45 #4
1 LINE 4 LT IN HI
2 LINE 4 LT IN LO
3 LINE 4 RT IN HI
4
5
6 LINE 4 RT IN LO
7
8

RJ-45 #8
1 AES 8 IN HI
2 AES 8 IN LO
3
4
5
6
7
8

STUDIO OUT

XLR-M #1
PIN 1 - ST LT OUT SH
PIN 2 - ST LT OUT HI
PIN 3 - ST LT OUT LO

XLR-M #2
PIN 1 - ST RT OUT SH
PIN 2 - ST RT OUT HI
PIN 3 - ST RT OUT LO

CR OUT

XLR-M #1
PIN 1 - CR LT OUT SH
PIN 2 - CR LT OUT HI
PIN 3 - CR LT OUT LO

XLR-M #2
PIN 1 - CR RT OUT SH
PIN 2 - CR RT OUT HI
PIN 3 - CR RT OUT LO

PROGRAM OUTPUTS

ANALOG

RJ-45 A
1 PGM A LT OUT HI
2 PGM A LT OUT LO
3 PGM A RT OUT HI
4
5
6 PGM A RT OUT LO
7
8

RJ-45 B
1 PGM B LT OUT HI
2 PGM B LT OUT LO
3 PGM B RT OUT HI
4
5
6 PGM B RT OUT LO
7
8

RJ-45 C
1 PGM C LT OUT HI
2 PGM C LT OUT LO
3 PGM C RT OUT HI
4
5
6 PGMC RT OUT LO
7
8

RJ-45 D
1 PGMD LT OUT HI
2 PGMD LT OUT LO
3 PGMD RT OUT HI
4
5
6 PGMD RT OUT LO
7
8

DIGITAL

RJ-45 A
1 PGM AESA OUT HI
2 PGM AESA OUT LO
3
4
5
6
7
8

RJ-45 B
1 PGM AESB OUT HI
2 PGM AESB OUT LO
3
4
5
6
7
8

RJ-45 C
1 PGM AESC OUT HI
2 PGM AESC OUT LO
3
4
5
6
7
8

RJ-45 D
1 PGM AESD OUT HI
2 PGM AESD OUT LO
3
4
5
6
7
8

100M RJ-45   **ETHERNET**   **1G RJ-45**
1 TX +   1 TRD0 +
2 TX -   2 TRD0 -
3 RX +   3 TRD1 +
4 N/C   4 TRD2+
5 N/C   5 TRD2 -
6 RX -   6 TRD1 -
7 N/C   7 TRD3+
8 N/C   8 TRD3 -

NOT USED

1 - 6 RJ-45   **LOGIC I/O**   **7 - 12 RJ-45**
1 DIGITAL GROUND   1 DIGITAL GROUND
2 LOGIC 1 IN/OUT   2 LOGIC 7 IN/OUT
3 LOGIC 2 IN/OUT   3 LOGIC 8 IN/OUT
4 LOGIC 3 IN/OUT   4 LOGIC 9 IN/OUT
5 LOGIC 4 IN/OUT   5 LOGIC 10 IN/OUT
6 LOGIC 5 IN/OUT   6 LOGIC 11 IN/OUT
7 LOGIC 6 IN/OUT   7 LOGIC 12 IN/OUT
8 +5V DIGITAL   8 +5V DIGITAL

NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

Console BLADE 88*cb*, 88*cbe* - Input/Output Pinouts

Top panel labels:
1 MIC IN 2   GAIN +48V GAIN +48V
MICS OUT   1 3 5 7   ANALOG IN   DIGITAL IN   2 4 6 8 SYNC
L OUT R   L R
CUE/HDPN OUT
HDPN   CUE
STUDIO OUT L R   CR OUT L R
A C A C   1-6 LOGIC I/O 7-12
B D B D
ANALOG - PGM OUT - DIGITAL
100M 1G ETHERNET
Made in USA by Wheatstone
CAUTION ! To avoid the risk of electric shock refer all service to a qualified technician
90-120~VAC 2A/50-60 Hz
W88cb

LOGIC I/O
1 - 6   7 - 12

Made in USA by Wheatstone

100M   1G
ETHERNET

FC

90 - 120 ~VAC
2A / 50 - 60 Hz

CAUTION!
To avoid the risk of electric shock refer
all service to a qualified technician

W 88e

100M RJ-45	ETHERNET	1G RJ-45	
1	TX +	1	TRD0 +
2	TX -	2	TRD0 -
3	RX +	3	TRD1 +
4	N/C	4	TRD2 +
5	N/C	5	TRD2 -
6	RX -	6	TRD1 -
7	N/C	7	TRD3 +
8	N/C	8	TRD3 -

NOT USED

---

1 - 6 RJ-45	LOGIC I/O	7 - 12 RJ-45	
1	DIGITAL GROUND	1	DIGITAL GROUND
2	LOGIC 1 IN/OUT	2	LOGIC 7 IN/OUT
3	LOGIC 2 IN/OUT	3	LOGIC 8 IN/OUT
4	LOGIC 3 IN/OUT	4	LOGIC 9 IN/OUT
5	LOGIC 4 IN/OUT	5	LOGIC 10 IN/OUT
6	LOGIC 5 IN/OUT	6	LOGIC 11 IN/OUT
7	LOGIC 6 IN/OUT	7	LOGIC 12 IN/OUT
8	+5V DIGITAL	8	+5V DIGITAL

1 ANALOG 3 IN 5 DIGITAL 7

1 ANALOG 3 OUT 5 DIGITAL 7

1-6 LOGIC 7-12

Made in USA by Wheatstone

CAUTION! To avoid risk of electric shock refer all service to a qualified technician

Aura8ip 1 2 3 4 ANALOG — INPUT 5 6 7 DIGITAL 8

2 ANALOG 4 IN 6 DIGITAL 8 SYNC

1 2 3 4 ANALOG — OUTPUT 5 6 7 DIGITAL 8

2 ANALOG 4 OUT 6 DIGITAL 8

100M ETH 1G

90 - 120 ~VAC 2A / 50 - 60 Hz

FC

ANALOG INPUTS 1- 4 DB-25

LINE 1 LT IN SH	25 / 13	AUDIO GROUND
LINE 1 LT IN HI	24 / 12	LINE 1 LT IN LO
LINE 1 RT IN LO	23 / 11	LINE 1 RT IN SH
LINE 2 LT IN SH	22 / 10	LINE 1 RT IN HI
LINE 2 LT IN HI	21 / 9	LINE 2 LT IN LO
LINE 2 RT IN LO	20 / 8	LINE 2 RT IN SH
LINE 3 LT IN SH	19 / 7	LINE 2 RT IN HI
LINE 3 LT IN HI	18 / 6	LINE 3 LT IN LO
LINE 3 RT IN HI	17 / 5	LINE 3 RT IN SH
LINE 4 LT IN SH	16 / 4	LINE 3 RT IN HI
LINE 4 LT IN HI	15 / 2	LINE 4 RT IN SH
LINE 4 RT IN HI	14 / 1	LINE 4 RT IN HI

DIGITAL INPUTS 5 - 8 DB-25

AES 5 IN SH	25 / 13	AUDIO GROUND
AES 5 IN HI	24 / 12	AES 5 IN LO
N/C	23 / 11	N/C
AES 6 IN SH	22 / 10	N/C
AES 6 IN HI	21 / 9	AES 6 IN LO
N/C	20 / 8	N/C
AES 7 IN SH	19 / 7	N/C
AES 7 IN HI	18 / 6	AES 7 IN LO
N/C	17 / 5	N/C
AES 8 IN SH	16 / 4	N/C
AES 8 IN HI	15 / 3	AES 8 IN LO
N/C	14 / 2	N/C
	1	N/C

ANALOG / DIGITAL INPUTS

RJ-45 #1
1 LINE 1 LT IN HI
2 LINE 1 LT IN LO
3 LINE 1 RT IN HI
4
5
6 LINE 1 RT IN LO
7
8

RJ-45 #5
1 AES 5 IN HI
2 AES 5 IN LO
3
4
5
6
7
8

RJ-45 #2
1 LINE 2 LT IN HI
2 LINE 2 LT IN LO
3 LINE 2 RT IN HI
4
5
6 LINE 2 RT IN LO
7
8

RJ-45 #6
1 AES 6 IN HI
2 AES 6 IN LO
3
4
5
6
7
8

RJ-45 #3
1 LINE 3 LT IN HI
2 LINE 3 LT IN LO
3 LINE 3 RT IN HI
4
5
6 LINE 3 RT IN LO
7
8

RJ-45 #7
1 AES 7 IN HI
2 AES 7 IN LO
3
4
5
6
7
8

RJ-45 #4
1 LINE 4 LT IN HI
2 LINE 4 LT IN LO
3 LINE 4 RT IN HI
4
5
6 LINE 4 RT IN LO
7
8

RJ-45 #8
1 AES 8 IN HI
2 AES 8 IN LO
3
4
5
6
7
8

ANALOG OUTPUTS 1- 4 DB-25

LINE 1 LT OUT SH	25 / 13	AUDIO GROUND
LINE 1 LT OUT HI	24 / 12	LINE 1 LT OUT LO
LINE 1 RT OUT LO	23 / 11	LINE 1 RT OUT SH
LINE 2 LT OUT SH	22 / 10	LINE 1 RT OUT HI
LINE 2 LT OUT HI	21 / 9	LINE 2 LT OUT LO
LINE 2 RT OUT LO	20 / 8	LINE 2 RT OUT SH
LINE 3 LT OUT SH	19 / 7	LINE 2 RT OUT HI
LINE 3 LT OUT HI	18 / 6	LINE 3 LT OUT LO
LINE 3 RT OUT HI	17 / 5	LINE 3 RT OUT SH
LINE 4 LT OUT SH	16 / 4	LINE 3 RT OUT HI
LINE 4 LT OUT HI	15 / 3	LINE 4 LT OUT LO
LINE 4 RT OUT LO	14 / 2	LINE 4 RT OUT SH
	1	LINE 4 RT OUT HI

DIGITAL OUTPUTS 5 - 8 DB-25

AES 5 OUT SH	25 / 13	AUDIO GROUND
AES 5 OUT HI	24 / 12	AES 5 OUT LO
N/C	23 / 11	N/C
AES 6 OUT SH	22 / 10	N/C
AES 6 OUT HI	21 / 9	AES 6 OUT LO
N/C	20 / 8	N/C
AES 7 OUT SH	19 / 7	N/C
AES 7 OUT HI	18 / 6	AES 7 OUT LO
N/C	17 / 5	N/C
AES 8 OUT SH	16 / 4	N/C
AES 8 OUT HI	15 / 3	AES 8 OUT LO
N/C	14 / 2	N/C
	1	N/C

ANALOG / DIGITAL OUTPUTS

RJ-45 #1
1 LINE 1 LT OUT HI
2 LINE 1 LT OUT LO
3 LINE 1 RT OUT HI
4
5
6 LINE 1 RT OUT LO
7
8

RJ-45 #5
1 AES 5 OUT HI
2 AES 5 OUT LO
3
4
5
6
7
8

RJ-45 #2
1 LINE 2 LT OUT HI
2 LINE 2 LT OUT LO
3 LINE 2 RT OUT HI
4
5
6 LINE 2 RT OUT LO
7
8

RJ-45 #6
1 AES 6 OUT HI
2 AES 6 OUT LO
3
4
5
6
7
8

RJ-45 #3
1 LINE 3 LT OUT HI
2 LINE 3 LT OUT LO
3 LINE 3 RT OUT HI
4
5
6 LINE 3 RT OUT LO
7
8

RJ-45 #7
1 AES 7 OUT HI
2 AES 7 OUT LO
3
4
5
6
7
8

RJ-45 #4
1 LINE 4 LT OUT HI
2 LINE 4 LT OUT LO
3 LINE 4 RT OUT HI
4
5
6 LINE 4 RT OUT LO
7
8

RJ-45 #8
1 AES 8 OUT HI
2 AES 8 OUT LO
3
4
5
6
7
8

ETHERNET

100M RJ-45
1 TX +
2 TX -
3 RX +
4 N/C
5 N/C
6 RX -
7 N/C
8 N/C

NOT USED

1G RJ-45
1 TRD0 +
2 TRD0 -
3 TRD1 +
4 TRD2+
5 TRD2 -
6 TRD1 -
7 TRD3+
8 TRD3 -

LOGIC I/O

1 - 6 RJ-45
1 DIGITAL GROUND
2 LOGIC 1 IN/OUT
3 LOGIC 2 IN/OUT
4 LOGIC 3 IN/OUT
5 LOGIC 4 IN/OUT
6 LOGIC 5 IN/OUT
7 LOGIC 6 IN/OUT
8 +5V DIGITAL

7 - 12 RJ-45
1 DIGITAL GROUND
2 LOGIC 7 IN/OUT
3 LOGIC 8 IN/OUT
4 LOGIC 9 IN/OUT
5 LOGIC 10 IN/OUT
6 LOGIC 11 IN/OUT
7 LOGIC 12 IN/OUT
8 +5V DIGITAL

NOTE: DB-25 audio connections and RJ-45 audio connections are paralleled. Either may be used.

BNC ACTIVE   **INPUT**   **OUTPUT**   **FIBER**   **FIBER ACTIVE**

W MADI

1-6 LOGIC 7-12

Made in USA by Wheatstone

100M ETH 1G

CE FC

90-120~VAC
2A/50-60 Hz

CAUTION !
To avoid risk of electric shock refer
all service to a qualified technician

INPUT
BNC

PIN 1 - INPUT HI
PIN 2 - INPUT SH

OUTPUT
BNC

PIN 1 - OUTPUT HI
PIN 2 - OUTPUT SH

FIBER
LC CONNECTOR

100M RJ-45   **ETHERNET**   **1G RJ-45**

1	TX +
2	TX -
3	RX +
4	N/C
5	N/C
6	RX -
7	N/C
8	N/C

1	TRD0 +
2	TRD0 -
3	TRD1 +
4	TRD2 +
5	TRD2 -
6	TRD1 -
7	TRD3 +
8	TRD3 -

NOT USED

1 - 6 RJ-45   **LOGIC I/O**   **7 - 12 RJ-45**

1	DIGITAL GROUND
2	LOGIC 1 IN/OUT
3	LOGIC 2 IN/OUT
4	LOGIC 3 IN/OUT
5	LOGIC 4 IN/OUT
6	LOGIC 5 IN/OUT
7	LOGIC 6 IN/OUT
8	+5V DIGITAL

1	DIGITAL GROUND
2	LOGIC 7 IN/OUT
3	LOGIC 8 IN/OUT
4	LOGIC 9 IN/OUT
5	LOGIC 10 IN/OUT
6	LOGIC 11 IN/OUT
7	LOGIC 12 IN/OUT
8	+5V DIGITAL

Multichannel Audio Digital BLADE - Input/Output Pinouts

MIC INPUT — 1 2 3 4

1 ANALOG 3 **OUT** 5 DIGITAL 7
2 ANALOG 4 **OUT** 6 DIGITAL 8

1-6 **LOGIC** 7-12

100M **ETH** 1G

90-120~VAC
2A/50-60 Hz

ANALOG OUTPUT — 1 2 3 4

MIC INPUTS

XLR-F #1
PIN 1 - MIC 1 IN SH
PIN 2 - MIC 1 IN HI
PIN 3 - MIC 1 IN LO

XLR-F #2
PIN 1 - MIC 2 IN SH
PIN 2 - MIC 2 IN HI
PIN 3 - MIC 2 IN LO

XLR-F #3
PIN 1 - MIC 3 IN SH
PIN 2 - MIC 3 IN HI
PIN 3 - MIC 3 IN LO

XLR-F #4
PIN 1 - MIC 4 IN SH
PIN 2 - MIC 4 IN HI
PIN 3 - MIC 4 IN LO

ANALOG OUTPUTS
1- 4 DB-25

Pin	Signal	Pin	Signal
25	LINE 1 LT OUT SH	13	AUDIO GROUND
24	LINE 1 LT OUT HI	12	LINE 1 LT OUT LO
23	LINE 1 RT OUT LO	11	LINE 1 RT OUT SH
22	LINE 2 LT OUT SH	10	LINE 1 RT OUT HI
21	LINE 2 LT OUT HI	9	LINE 2 LT OUT LO
20	LINE 2 RT OUT LO	8	LINE 2 RT OUT SH
19	LINE 3 LT OUT SH	7	LINE 2 RT OUT HI
18	LINE 3 LT OUT HI	6	LINE 3 LT OUT LO
17	LINE 3 RT OUT LO	5	LINE 3 RT OUT SH
16	LINE 4 LT OUT SH	4	LINE 3 RT OUT HI
15	LINE 4 LT OUT HI	3	LINE 4 LT OUT LO
14	LINE 4 RT OUT LO	2	LINE 4 RT OUT SH
		1	LINE 4 RT OUT HI

ANALOG / DIGITAL OUTPUTS

RJ-45 #1
1 — LINE 1 LT OUT HI
2 — LINE 1 LT OUT LO
3 — LINE 1 RT OUT HI
6 — LINE 1 RT OUT LO

RJ-45 #5
1 — AES 5 OUT HI
2 — AES 5 OUT LO

RJ-45 #2
1 — LINE 2 LT OUT HI
2 — LINE 2 LT OUT LO
3 — LINE 2 RT OUT HI
6 — LINE 2 RT OUT LO

RJ-45 #6
1 — AES 6 OUT HI
2 — AES 6 OUT LO

RJ-45 #3
1 — LINE 3 LT OUT HI
2 — LINE 3 LT OUT LO
3 — LINE 3 RT OUT HI
6 — LINE 3 RT OUT LO

RJ-45 #7
1 — AES 7 OUT HI
2 — AES 7 OUT LO

RJ-45 #4
1 — LINE 4 LT OUT HI
2 — LINE 4 LT OUT LO
3 — LINE 4 RT OUT HI
6 — LINE 4 RT OUT LO

RJ-45 #8
1 — AES 8 OUT HI
2 — AES 8 OUT LO

ETHERNET

100M RJ-45
1 — TX +
2 — TX -
3 — RX +
4 — N/C
5 — N/C
6 — RX -
7 — N/C
8 — N/C
NOT USED

1G RJ-45
1 — TRD0 +
2 — TRD0 -
3 — TRD1 +
4 — TRD2 +
5 — TRD2 -
6 — TRD1 -
7 — TRD3 +
8 — TRD3 -

LOGIC I/O

1 - 6 RJ-45
1 — DIGITAL GROUND
2 — LOGIC 1 IN/OUT
3 — LOGIC 2 IN/OUT
4 — LOGIC 3 IN/OUT
5 — LOGIC 4 IN/OUT
6 — LOGIC 5 IN/OUT
7 — LOGIC 6 IN/OUT
8 — +5V DIGITAL

7 - 12 RJ-45
1 — DIGITAL GROUND
2 — LOGIC 7 IN/OUT
3 — LOGIC 8 IN/OUT
4 — LOGIC 9 IN/OUT
5 — LOGIC 10 IN/OUT
6 — LOGIC 11 IN/OUT
7 — LOGIC 12 IN/OUT
8 — +5V DIGITAL

NOTE: DB-25 analog output connections and RJ-45 analog output connections are paralleled. Either may be used.

Wheatstone *Model LIO-48 Logic Blade*

Made in USA by Wheatstone

A B C D   E F G H   1 – 24   25 – 48   +5 VDC   ETHERNET   FC   90 - 240 VAC / 50 - 60 Hz

LOGIC RJ PORTS — **LOGIC I/O PORTS**

LOGIC RJ PORTS

A RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 1 IN/OUT
3	LOGIC 2 IN/OUT
4	LOGIC 3 IN/OUT
5	LOGIC 4 IN/OUT
6	LOGIC 5 IN/OUT
7	LOGIC 6 IN/OUT
8	+5V DIGITAL

E RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 25 IN/OUT
3	LOGIC 26 IN/OUT
4	LOGIC 27 IN/OUT
5	LOGIC 28 IN/OUT
6	LOGIC 29 IN/OUT
7	LOGIC 30 IN/OUT
8	+5V DIGITAL

B RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 7 IN/OUT
3	LOGIC 8 IN/OUT
4	LOGIC 9 IN/OUT
5	LOGIC 10 IN/OUT
6	LOGIC 11 IN/OUT
7	LOGIC 12 IN/OUT
8	+5V DIGITAL

F RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 31 IN/OUT
3	LOGIC 32 IN/OUT
4	LOGIC 33 IN/OUT
5	LOGIC 34 IN/OUT
6	LOGIC 35 IN/OUT
7	LOGIC 36 IN/OUT
8	+5V DIGITAL

C RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 13 IN/OUT
3	LOGIC 14 IN/OUT
4	LOGIC 15 IN/OUT
5	LOGIC 16 IN/OUT
6	LOGIC 17 IN/OUT
7	LOGIC 18 IN/OUT
8	+5V DIGITAL

G RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 37 IN/OUT
3	LOGIC 38 IN/OUT
4	LOGIC 39 IN/OUT
5	LOGIC 40 IN/OUT
6	LOGIC 41 IN/OUT
7	LOGIC 42 IN/OUT
8	+5V DIGITAL

D RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 19 IN/OUT
3	LOGIC 20 IN/OUT
4	LOGIC 21 IN/OUT
5	LOGIC 22 IN/OUT
6	LOGIC 23 IN/OUT
7	LOGIC 24 IN/OUT
8	+5V DIGITAL

H RJ-45
Pin	
1	AUDIO GROUND
2	LOGIC 43 IN/OUT
3	LOGIC 44 IN/OUT
4	LOGIC 45 IN/OUT
5	LOGIC 46 IN/OUT
6	LOGIC 47 IN/OUT
7	LOGIC 48 IN/OUT
8	+5V DIGITAL

LOGIC I/O PORTS

1 - 24 DB-25
Pin		Pin	
25	DIGITAL GROUND	13	LOGIC 13 IN/OUT
24	LOGIC 24 IN/OUT	12	LOGIC 12 IN/OUT
23	LOGIC 23 IN/OUT	11	LOGIC 11 IN/OUT
22	LOGIC 22 IN/OUT	10	LOGIC 10 IN/OUT
21	LOGIC 21 IN/OUT	9	LOGIC 9 IN/OUT
20	LOGIC 20 IN/OUT	8	LOGIC 8 IN/OUT
19	LOGIC 19 IN/OUT	7	LOGIC 7 IN/OUT
18	LOGIC 18 IN/OUT	6	LOGIC 6 IN/OUT
17	LOGIC 17 IN/OUT	5	LOGIC 5 IN/OUT
16	LOGIC 16 IN/OUT	4	LOGIC 4 IN/OUT
15	LOGIC 15 IN/OUT	3	LOGIC 3 IN/OUT
		2	LOGIC 2 IN/OUT
14	LOGIC 14 IN/OUT	1	LOGIC 1 IN/OUT

25 - 48 DB-25
Pin		Pin	
25	DIGITAL GROUND	13	LOGIC 37 IN/OUT
24	LOGIC 48 IN/OUT	12	LOGIC 36 IN/OUT
23	LOGIC 47 IN/OUT	11	LOGIC 35 IN/OUT
22	LOGIC 46 IN/OUT	10	LOGIC 34 IN/OUT
21	LOGIC 45 IN/OUT	9	LOGIC 33 IN/OUT
20	LOGIC 44 IN/OUT	8	LOGIC 32 IN/OUT
19	LOGIC 43 IN/OUT	7	LOGIC 31 IN/OUT
18	LOGIC 42 IN/OUT	6	LOGIC 30 IN/OUT
17	LOGIC 41 IN/OUT	5	LOGIC 29 IN/OUT
16	LOGIC 40 IN/OUT	4	LOGIC 28 IN/OUT
15	LOGIC 39 IN/OUT	3	LOGIC 27 IN/OUT
		2	LOGIC 26 IN/OUT
14	LOGIC 38 IN/OUT	1	LOGIC 25 IN/OUT

+5VDC DB-9
Pin		Pin	
9	DIGITAL GROUND	5	+5V LOGIC 5
8	+5V LOGIC 8	4	+5V LOGIC 4
7	+5V LOGIC 7	3	+5V LOGIC 3
		2	+5V LOGIC 2
6	+5V LOGIC 6	1	+5V LOGIC 1

ETHERNET

100M RJ-45
Pin	
1	TX +
2	TX -
3	RX +
4	N/C
5	N/C
6	RX -
7	N/C
8	N/C

NOT USED

1G RJ-45
Pin	
1	TRD0 +
2	TRD0 -
3	TRD1 +
4	TRD2 +
5	TRD2 -
6	TRD1 -
7	TRD3 +
8	TRD3 -

NOTE: DB-25 logic connections and RJ-45 logic connections are paralleled. Either may be used.

LIO-48 Multiple Port Logic I/O BLADE - Input/Output Pinouts

WheatNet-IP
System Operational Modes

Chapter Contents

WheatNet-IP
System Operational Modes

Stand Alone
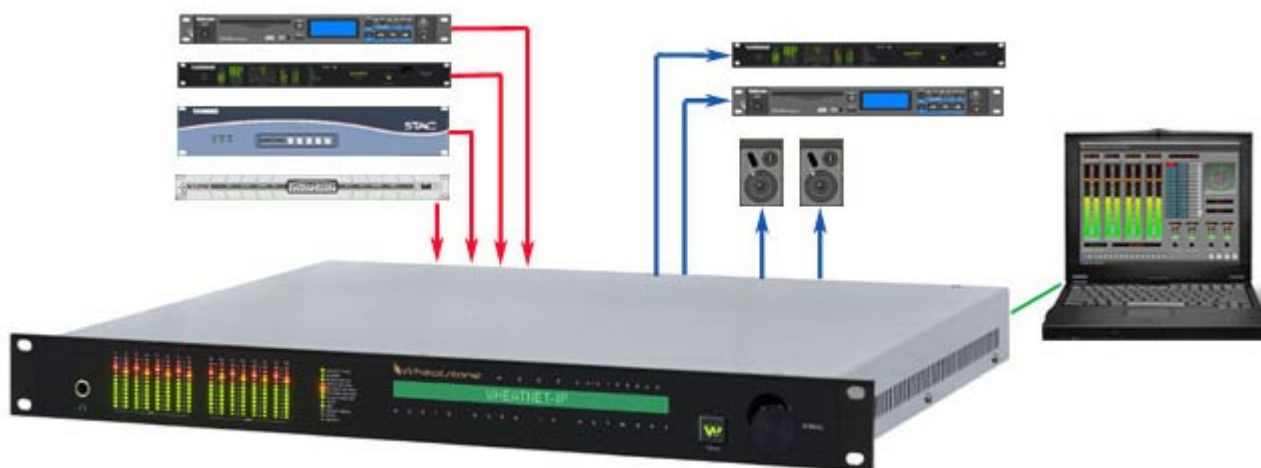
While no one would think of a single rack space device as a networked audio system, a single "BLADE" is actually a very handy device. It is essentially a stand alone router with audio and logic, that can be controlled remotely or from the front panel. Use an 88m for eight microphone inputs and eight mono (four stereo) outputs, an 88a for up to 16 mono analog inputs and outputs, an 88d for eight stereo digital inputs and outputs, or use an 88ad for a combination of both analog and digital inputs and outputs, plus A/D and D/A conversion too. While using an 88cb and Evolution 1 control surface you have a stand alone studio with analog and digital inputs and outputs to give you maximum flexibility. This stand alone system can be added to a network as your needs change and expansion is required. As a stand alone router no network connection or Ethernet switch is required. If you choose to connect the BLADE to a network, you can do things like set levels remotely, meter and monitor all inputs and outputs, mix channels, use silence detection, and make routing changes based on time of day. Quite a lot of features packed into one rack space.
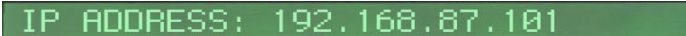
To use a "BLADE" in stand alone mode is easy. Just connect your audio and logic inputs and outputs and turn it on. As shipped from the factory, all "BLADEs" start up initially in "System Wizard" mode. That's where you tell the BLADE what you want it to do by means of the front panel encoder and switch. When the device first powers up it will show the System Wizard start up message on its front panel, and then display "BLADE ID: DISABLED"

```
BLADE ID: DISABLED
        └─── 1
```

Simply scroll the front panel knob one click for the display to change to "BLADE ID: 1" and press the front panel switch. The display will change to show the default IP address; make a note of this address in case you want to use web browser access in the future, and press the front panel switch again to accept it.

```
IP ADDRESS: 192.168.87.101
```

Finally the display will show "I/O TEMPLATE: MONO_IO." There are three signal templates for WheatNet-IP 88a, 88ad, and 88d that the BLADE will use for automatically defining the signals related to the input and output jacks. By turning the knob you can choose "MONO_IO" to define all 16 inputs and outputs as mono signals, "STEREO_IO" to define all inputs and outputs as eight stereo pairs, or "CUSTOM," in which case no signals are automatically defined. Choose "CUSTOM" only if you need a combination of mono and stereo signals within the BLADE. You'll have to do more work and define the signals yourself.

```
I/O TEMPLATE
        ├─── MONO_IO
        ├─── CUSTOM
        └─── STEREO_IO
```

For WheatNet-IP 88m there are two signal templates available. Choose from "MONO_MIC" which creates eight microphone inputs and eight mono outputs, or "STEREO_MIC" which creates eight microphone inputs and four stereo outputs.

```
I/O TEMPLATE
        ├─── STEREO_MIC
        └─── MONO_MIC
```

For Wheatstone-IP 88cb there are three templates available. Choose the "Console_Stereo_In" template to create all of the needed signals for your E-1 control surface. When using this template the input signals are created as stereo sources. This template maps all of the Program, Headphone, Cue, and Monitors signals.

Choose the "Console_Mono_In" template to create all of the needed signals for your E-1 control surface. When using this template the input signals are created as Mono sources. This template maps all of the Program, Headphone, Cue, and Monitors signals.

Choose the "Custom" template to create your own layout.

```
I/O TEMPLATE
    Custom
    Console_Stereo_In
    Console_Mono_In
```

Scroll the knob to the template you want to use and press the front panel switch and you're done. The BLADE will complete its configuration process and display the message "WHEATNET-IP" when it's finished.

```
WHEATNET-IP
```

You now have a functioning stand alone audio router. Note: if you chose the "CUSTOM" signal template (because you wanted to use both stereo and mono signals) you will have to use the Navigator GUI to create sources and destinations and define which ones are to be mono or stereo before you can actually make any cross connections.

⚠️

"CUSTOM" configuration only applies to Sources, the Destinations are fixed.

You can use the front panel controls to make crosspoint connections. First turn the encoder knob through the menu selections until "OUTPUTS..." is shown. Press the switch and the display will show the first audio destination, corresponding to the first output jack. If you have not yet given this destination a special 8 character name via a web browser or the Navigator GUI, then the default name "BL01D01: NO SRC" will be shown in the display. This cryptic shorthand means "BLADE 01, destination 01 has no source connected to it," obviously then there will be no audio output at destination 1.

```
OUTPUT...
    BL23D01: NO SRC
```

Pressing the front panel switch will change the source section of the display to show underlines flashing under the source name, indicating that the source can now be changed. Scroll the knob until the desired source is shown and press the switch. The crosspoint connection will be made and the display will change to indicate the destination/source connection. Turning the knob again will change the display to the next destination, where the process can be repeated. In this manner, connections for all of the destinations can be made. Note, you can connect any source to any destination. You can connect the same source to multiple destinations. If you wish to break a connection to a particular destination, simple select that destination via the encoder, and scroll through the sources until you see "NO SRC" and select it.

In addition to the normal destinations (eight to 16, depending on configuration) each BLADE has a special destination corresponding to the front panel headphone jack. Like any other destination, you can choose the source connected to it, allowing you to monitor any source on a pair of headphones plugged in to the BLADE. To control the volume of this headphone output, scroll through the front panel menus until you see "HEADPHONE..." and select it. The encoder knob now functions as

a volume control for the headphone jack. The display will show "HDPN LEVEL: XX ————" where "XX" is a number from 1 to 10 indicating relative loudness. The number of dashes next to these digits also increase to give a "gas gauge" style indication of loudness. To change the loudness of the headphone output, momentarily press and release the knob; the level indicators will start flashing and you can turn the encoder to increase or decrease the level. To choose which audio channel you are monitoring at the headphone jack, scroll the knob until you see the "HDPN SOURCE: xxxxxxxx" display (xxxxxxxx represents the name of the previously selected source for the headphone destination), and press the switch. The encoder will now let you scroll through the available sources; press the switch when you find the one you want. Of course, if desired, the Navigator GUI can also be used to choose a source for the headphone destination, just as it can for any other one.

```
HEADPHONE...

    HDPN LEVEL: 7-------

    HDPN SOURCE: NO SRC

    << TOP OF MENU
```
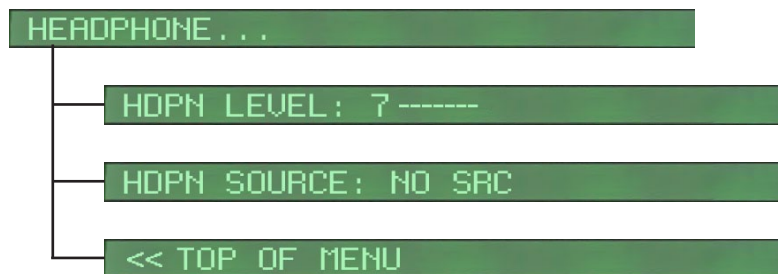
You can use the front panel encoder to set the front panel meter mode for the BLADE. There are 16 LED bargraph meters on the front panel. These can show either the input signal levels for each source, or the output signal levels for each destination. To choose, scroll through the front panel menus until you find "METERS..." and select it with the switch. The front panel display will change to show the current mode, either "INPUTS" or OUTPUTS." Scroll the knob to select your preference and select it with the switch. Note there are front panel mode LEDs that indicate whether the meters are showing input levels or output levels. Also, these meters show audio levels after any gain trimming has been applied, so if for some reason you have the gain for a particular channel cranked down, you may not see any meter indication even though audio is there.

```
METERS...

    SELECTED METERS: INPUTS

    SELECTED METERS: OUTPUTS

    << TOP OF MENU
```
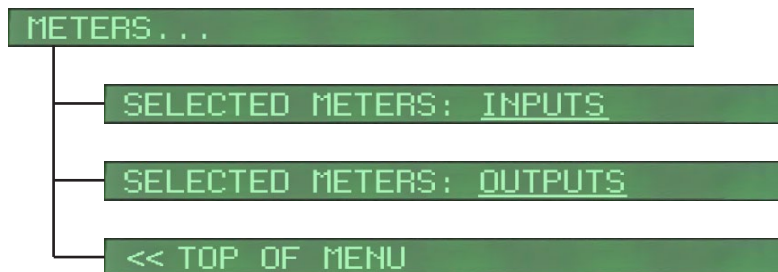
Connecting to this stand alone BLADE with the Navigator GUI or web browser will allow you to create user defined names for each of the source and destination signals, trim their audio levels, meter the audio, define logic, set silence detect parameters, and a host of other functions. See the WheatNet-IP Navigator GUI chapter of this manual for details.

Snake
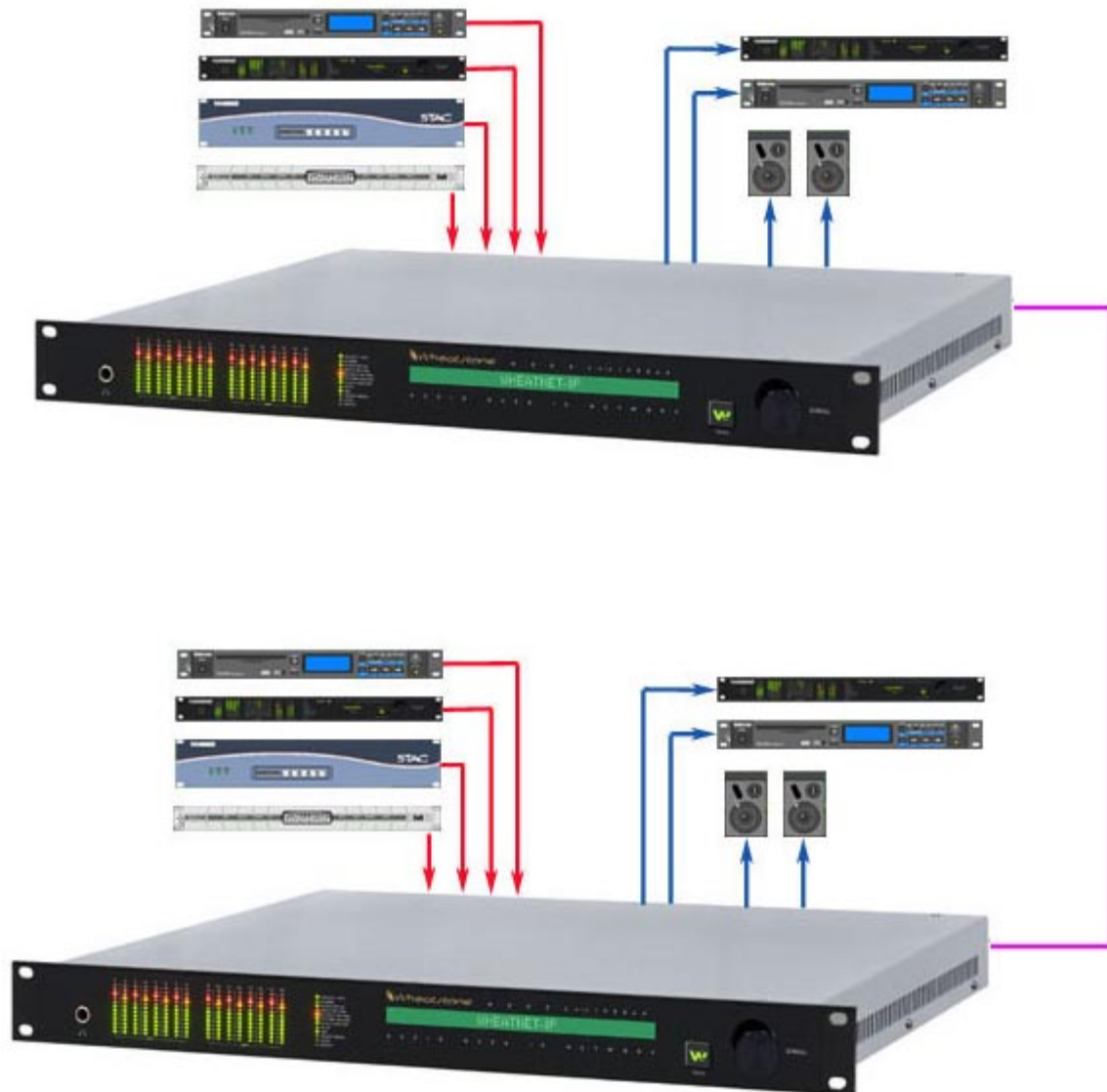
Snake mode (from the term "audio snake," which refers to a multipair audio cable meant to connect a number of audio channels simultaneously) is a way to use two BLADEs to transport up to 16 audio channels from one location to another via a single CAT-5e cable. Connect the Gigabit Ethernet port of the first BLADE directly to the Gigabit Ethernet port of the second BLADE. No Ethernet switch is required. Power up both BLADEs, and at the "BLADE ID: DISABLED" start up screen, scroll the encoder knob through the various IDs and select "SNAKE A" for the first BLADE. Hint: if you scroll the knob backwards (counterclockwise) you will get to the "SNAKE A" selection much quicker. Repeat the process on the second BLADE and select "SNAKE B" for the second. An indicator LED on the front panel will light up to signify the BLADE is in snake mode.

```
BLADE ID: DISABLED
```

```
    SNAKE A
```

```
    SNAKE B
```
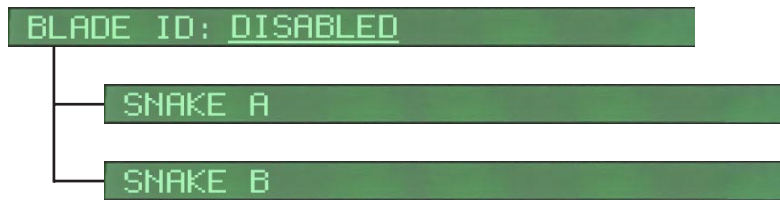
Once the BLADEs complete their boot up process and their display shows "WHEATNET-IP", the sources from BLADE one are automatically connected to the destinations from BLADE two and vice versa. In other words, source 1 from BLADE 1 is connected to destination 1 in BLADE 2, source 2 from BLADE 1 is connected to destination 2 in BLADE 2, etc. Likewise, source 1 from BLADE 2 is connected to destination 1 in BLADE 1 and so forth for a total of 32 channels of audio (16 one direction and 16 more the reverse direction) over a single CAT-5e cable, which, by the way, is much less expensive and easier to manage than an old 32 channel audio snake would be. Plus the transport mechanism is digital, which is less susceptible to noise pick up.

Network
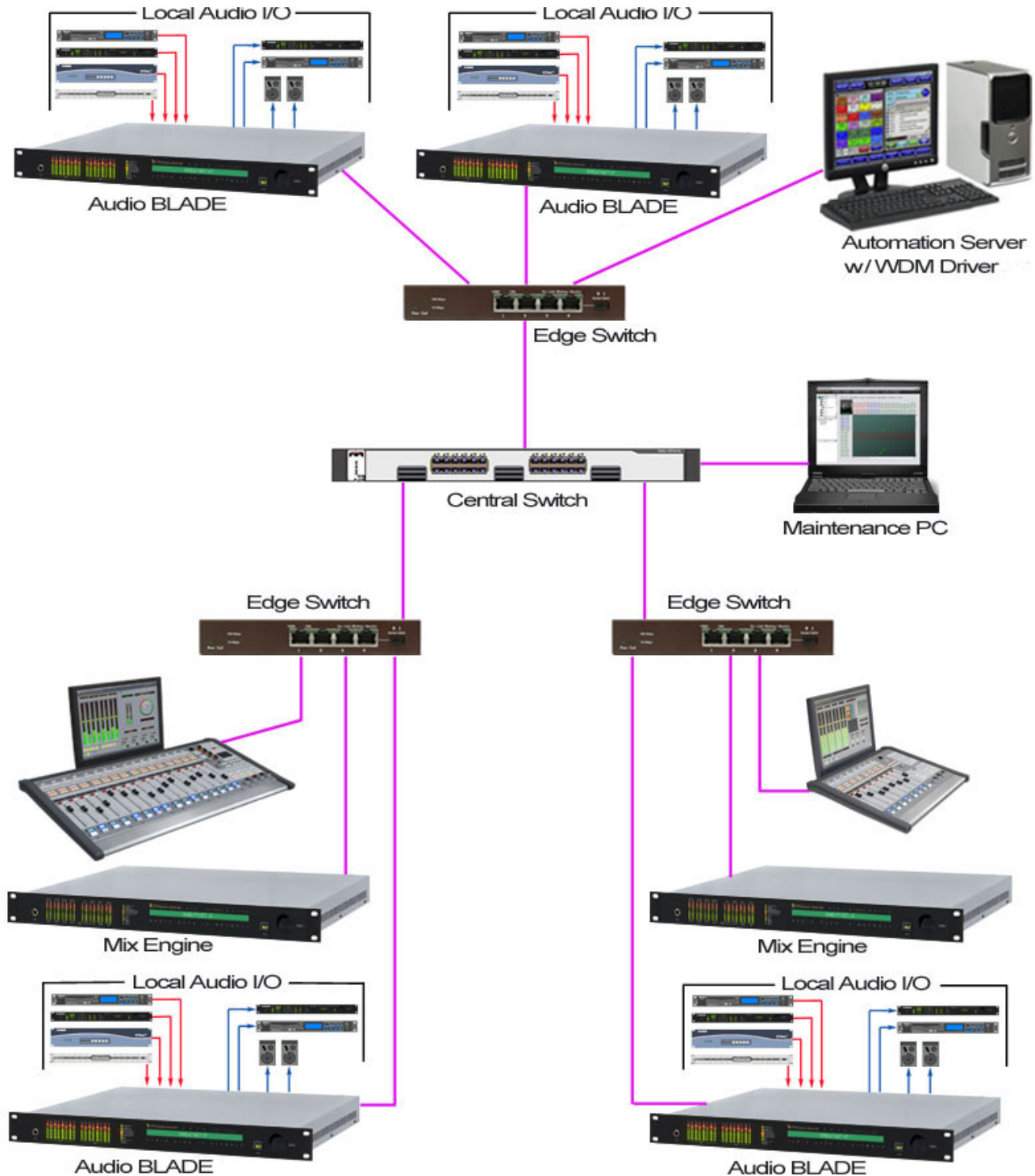
Network mode is used to create complete audio networks of multiple BLADEs, control surfaces, and other devices. In this mode every BLADE is a member of the network and is identified with its name and ID. The BLADE ID is crucial to proper system operation; each member of the network must have a unique ID number. This number is a simple decimal number (from ID=1 to ID=99) that is chosen by the user when the BLADE is first started up.

The ID number has no special significance, only that it needs be unique. You can choose any number in any order. For simplicity, and to avoid unintentional duplicates, Wheatstone recommends that you give the first BLADE started up ID=1, the second, ID=2, and so forth. If you prefer you can create your own numbering scheme such as the BLADEs in studio 1 are ID=10, ID=11, ID=12, etc., while the BLADEs in studio 2 are ID=20, ID=21, ID=22, etc. As an aside, each BLADE can also be given an 8 character name and location to help identify it in the system.

```
BLADE...
    ├── NAME: BLA023
    │       └── NAME: BLA023
    └── ID: 23
```
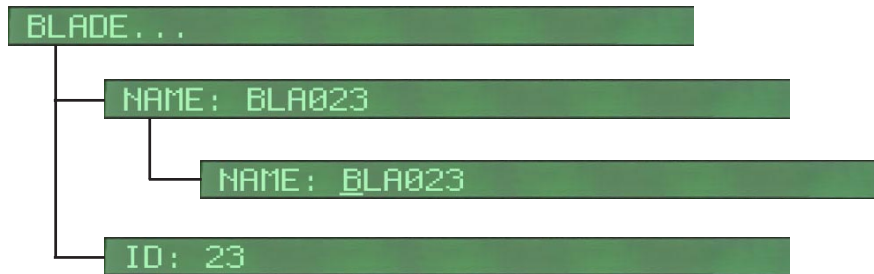
In network mode each BLADE is a member of the network, so of course there must be a network in the first place. This is the Ethernet LAN (Local Area Network) created with the Ethernet switch(es) and CAT-5e cable infrastructure. Creating and managing a LAN is beyond the scope of this manual, but a few things must be taken into account. First, the WheatNet-IP system uses fixed IP addresses for each BLADE, therefore your LAN must have the required IP addresses available. Second, the WheatNet-IP system comes configured with a default IP address scheme to make it easy to configure; the default addresses are 192.168.87.100 through 192.168.87.199, corresponding to BLADE ID=1 to BLADE ID=99. Third, to make sure that audio can be streamed throughout the network without disruption, the bandwidth and traffic patterns on the network must be carefully controlled. For these reasons, Wheatstone strongly recommends that the WheatNet-IP system and its various components be isolated (either physically or virtually) on its own LAN using the default IP addressing scheme. If this is done, a good sized WheatNet-IP system can be brought up and streaming audio in less than an hour.

To use network mode, first locate and mount each BLADE where you intend to use it. Connect the Gigabit Ethernet port on each BLADE to an available Gigabit Ethernet port in your LAN with a CAT-5e cable. The best practice is to locate your largest Ethernet switch in a central area such as your TOC or Rack Room. If your system is fairly small, only a few studios, then a single 1 Gigabit Ethernet switch in your rack room might be enough. In that case a CAT-5e cable from each BLADE to this central switch is all you need. Just remember that every device in the system, each BLADE, control surface, and PC, must have its own Ethernet port available, so a single central Ethernet switch can get filled up in a hurry. It's more common to use small 1 Gigabit Ethernet switches located in each studio as edge switches. In this case, all of the devices in one studio are connected to its edge switch, and then all of the edge switches are in turn connected to a central 1 Gigabit Ethernet switch.

In either case, each BLADE must be connected to the network. Power up the first BLADE, and it will boot up into the System Wizard start up mode showing "BLADE ID: DISABLED" flashing on the front panel display.

```
WHEATNET-IP SET UP WIZARD

BLADE ID: DISABLED

          1

          2

          100

          SNAKE A

          SNAKE B
```

Scroll the encoder to "1" and press the front panel switch; the front panel display will show the default IP address of "192.168.87.101". Once again, press the switch to accept the IP address.

```
IP ADDRESS: 192.168.87.101
```

The display will show "I/O TEMPLATE: MONO_IO." There are three signal templates for WheatNet-IP 88a, 88ad, and 88d that the BLADE will use for automatically defining the signals related to the input and output jacks. By turning the knob you can choose "MONO_IO" to define all 16 inputs and outputs as mono signals, "STEREO_IO" to define all inputs and outputs as eight stereo pairs, or "CUSTOM," in which case no signals are automatically defined. Choose "CUSTOM" only if you need a combination of mono and stereo signals within the BLADE. You'll have to do more work and define the signals yourself.

```
I/O TEMPLATE

          MONO_IO

          CUSTOM

          STEREO_IO
```

For WheatNet-IP 88m there are two signal templates available. Choose from "MONO_MIC" which creates eight microphone inputs and eight mono outputs, or "STEREO_MIC" which creates eight microphone inputs and four stereo outputs.

```
I/O TEMPLATE

          STEREO_MIC

          MONO_MIC
```

For Wheatstone-IP 88cb there are three templates available. Choose the "Console_Stereo_In" template to create all of the needed signals for your E-1 control surface. When using this template the input signals are created as stereo sources. This template maps all of the Program, Headphone, Cue, and Monitors signals.

Choose the "Console_Mono_In" template to create all of the needed signals for your E-1 control surface. When using this template the input signals are created as Mono sources. This template maps all of the Program, Headphone, Cue, and Monitors signals.

Choose the "Custom" template to create your own layout.

```
I/O TEMPLATE

        Custom

        Console_Stereo_In

        Console_Mono_In
```

⚠

"CUSTOM" configuration only applies to Sources, the Destinations are fixed.

Scroll to your desired choice and press the switch to select it.

The BLADE display will show "CONNECTING..." while it completes its configuration process. That' all there is to it, you can move on to the next one.

```
CONNECTING...
```

Once it has configured itself, the display will show the "WHEATNET-IP" message.

```
WHEATNET-IP
```

By the time you've finished the last BLADE, you will have created a complete working audio network system, with all signals defined with their default names.

In network mode, the front panels on each of the BLADEs function much as they do in stand alone mode. You can choose input or output meters, you can make/break connections, you can use the headphone jack to monitor, etc. And of course, this mode is where the value of the Navigator GUI is most apparent, letting you view and control the entire system. We will go into more detail about network mode in the next section.

A special note about control surfaces and mix engines. In the WheatNet-IP system, as in Wheatstone's other networked audio systems, each "input" to a control surface (fader 1, fader 2, etc.) is defined as a system destination. That way, sources can be crosspoint connected to these inputs just like any other destination. Conversely, every mix "output" from a control surface (PGM A, PGM B, Cue, etc.) is defined as a system source, again so any other system destinations, such as your processors, codecs, and amplifiers can be crosspoint connected to these mixes. This makes it very easy to connect any source device into a mixer and to pick up the mix at any destination anywhere on the network; no Distribution Amplifiers or break out boxes are needed. You can even use one control surface as a submixer, say for several microphones in a talk studio, and then pick up the mix on a fader on a different control surface.

When you first run the System Wizard on an engine BLADE, a few things happen differently. Because there are no physical audio outputs on an engine BLADE, there is no signal template to choose. The Wizard will add the engine BLADE into the system

without creating any audio signals. So where do the mixer signals come from? When you associate the engine BLADE to a particular control surface (this is done on the network info screen on the control surface; see the control surface manual), the engine BLADE automatically queries the surface for the number of fader channels, mixes, etc. that it is configured with and creates the matching source and destination signals in the engine BLADE. It adds default signal names for all of these signals, identifying them with the control surface; of course, just like any other signal, you can rename them as you please.

WheatNet-IP Front Panel Menu Diagram

Meters
- Selected Meters
  - Inputs
  - Outputs
- Top Menu

Status
- Uptime
- Date/Time
- Temperature
- Annc Pkts
- Annc Errors
- LIO Pkts
- LIO Errors
- GUI
- Route Master
- Clock Master
- Top Menu

HeadPhone
- HDPN Level
- HDPN Source
- Top Menu

Logic
- IN/OUT
- Out Test
- Top Menu

Output
- Output 1
- Output 2
- Output 3
- Output 4
- Output 5
- Output 6
- Output 7
- Output 8
- Top Menu

Main Menu

BLADE
- Name
- ID
- System ID
- Type
- Date/Time
  - Date/Time Mode
    - Manual
    - NTP
  - Date
  - Time
  - Top Menu
- Primary External Ref
- Secondary External Ref
- Version
  - Software
  - Hardware
  - Top Menu
- Network
  - IP Address
  - Subnet Mask
  - Gateway Address
  - MAC Address
  - Change Network Settings
    - IP Address
    - Subnet
    - Gateway
    - Reboot To Apply Changes
- Reboot
  - No
  - Yes
- Factory Reset
  - Yes
    - Enter Password
  - No
- Top Menu

Password
- Change Password
- Top Menu

WheatNet-IP Networks and What They Do

Let's look at a WheatNet-IP network in more detail. What exactly is an "WheatNet-IP network?" Simply put, it is a collection of WheatNet-IP devices and driver equipped PCs connected together via an Ethernet LAN. In a WheatNet-IP network, each device is represented as a "BLADE" with a unique BLADE ID. Each WheatNet-IP rackmount unit is a BLADE, each control surface rackmount engine is a BLADE, and even each driver equipped PC is a BLADE. The Navigator GUI gives a Windows Explorer style device tree system view showing all of the devices currently connected in the system.

You'll notice in the example at the right that there are eight WheatNet-IP rackmount units connected in this system, with IDs 1 - 8. You'll notice 3 and 7 control surface engines, with the control surface at IPs 192.168.87.203 and 192.168.87.207 associated with them. Finally, you'll notice PCs with IDs 95 and 96 connected as well; these are typically your Automation PCs, but in the WheatNet-IP system each is represented as a PC style BLADE.

This system tree view given by the Navigator GUI is a very handy tool for monitoring your system. It sure beats scrolling through a long list of names from the front panel of a BLADE. It will always show your system connection status. This is a very important point and indicates a big feature of the WheatNet-IP system. Every WheatNet-IP network system is dynamic. Devices can be added to it or removed from it at will, in real time, just like computers in your LAN. As you add a WheatNet-IP device to the network (by plugging it in and assigning it a BLADE ID) it's associated signals are also automatically added and made available to the system. They will show up in the front panel displays of other BLADEs, and insert themselves into the crosspoint grid of the Navigator GUI. No complicated configuration or IP management is required; the BLADEs take care of it all for you.
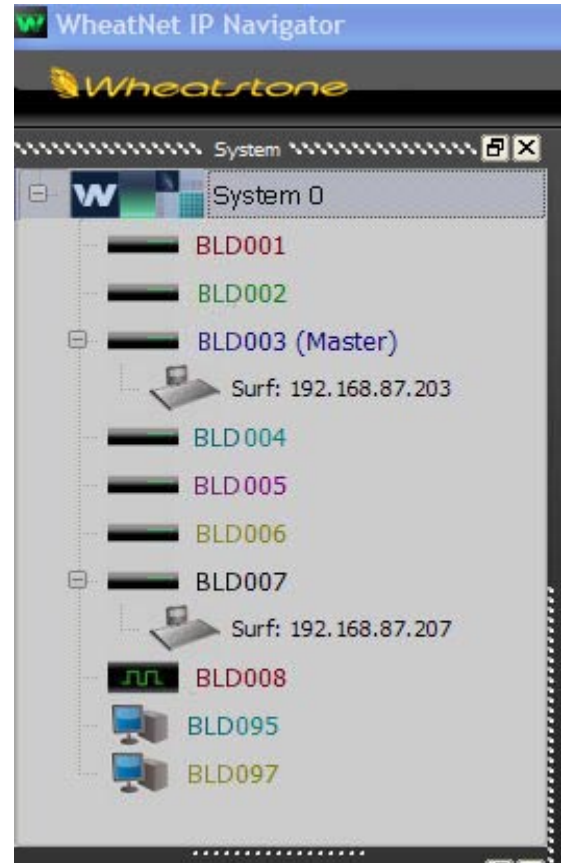
Should you need to remove a device (say because you want to borrow it to use elsewhere), no problem. Just unplug it from the network and it and its signals will automatically "disappear." Later on, if you want to add it back in, again no problem. Just plug it back in and use the same BLADE ID it previously had when it was in the system. It will reappear in the network with all of its old signal names, logic connections, silence detect settings, etc. The distributed intelligence of the WheatNet-IP system "knew" it was missing and reserved all of the information for when it came back. You don't have to reconfigure anything.

So what does this WheatNet-IP network actually do? Actually, quite a lot of things. First and foremost, it transports audio from one device to another, or others. It matters not whether the devices are analog or digital, rackmount BLADEs or PCs or control surfaces. Once an audio signal is present in the system, it can be

made to appear anywhere else with the scroll of a knob or the click of a mouse. That's all there is to it; go to the destination you want the audio to appear at and click on the source channel you want to appear there and you're done.

There are some purpose-built extensions to this arrangement. Perhaps you would like a particular destination, say an air chain, to be protected from unauthorized connection changes. You can "lock" a connection and password protect it so it can't be changed. Control surfaces automatically issue a temporary connection "lock" whenever they are On-Air, so someone doesn't disconnect a source while it is playing out a program channel.
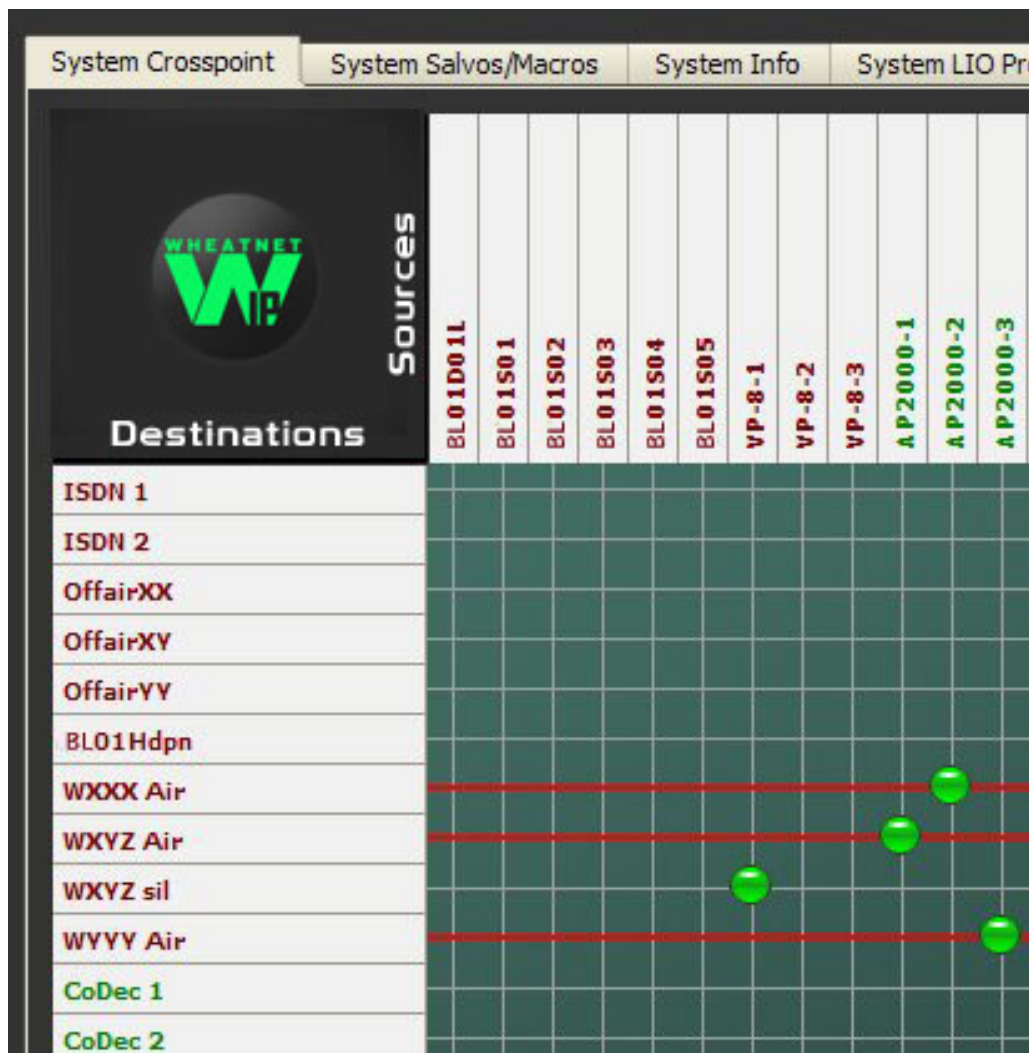
Maybe you want to restrict connection choices in some places. After all, a large system can have hundreds and hundreds of sources available. Why force your Air talent to scroll through hundreds and hundreds of names looking for the few choices he actually needs to have? You can create a "visibility" list so he sees only what you want him to. Each of the hundreds of destinations can have its own visibility settings.
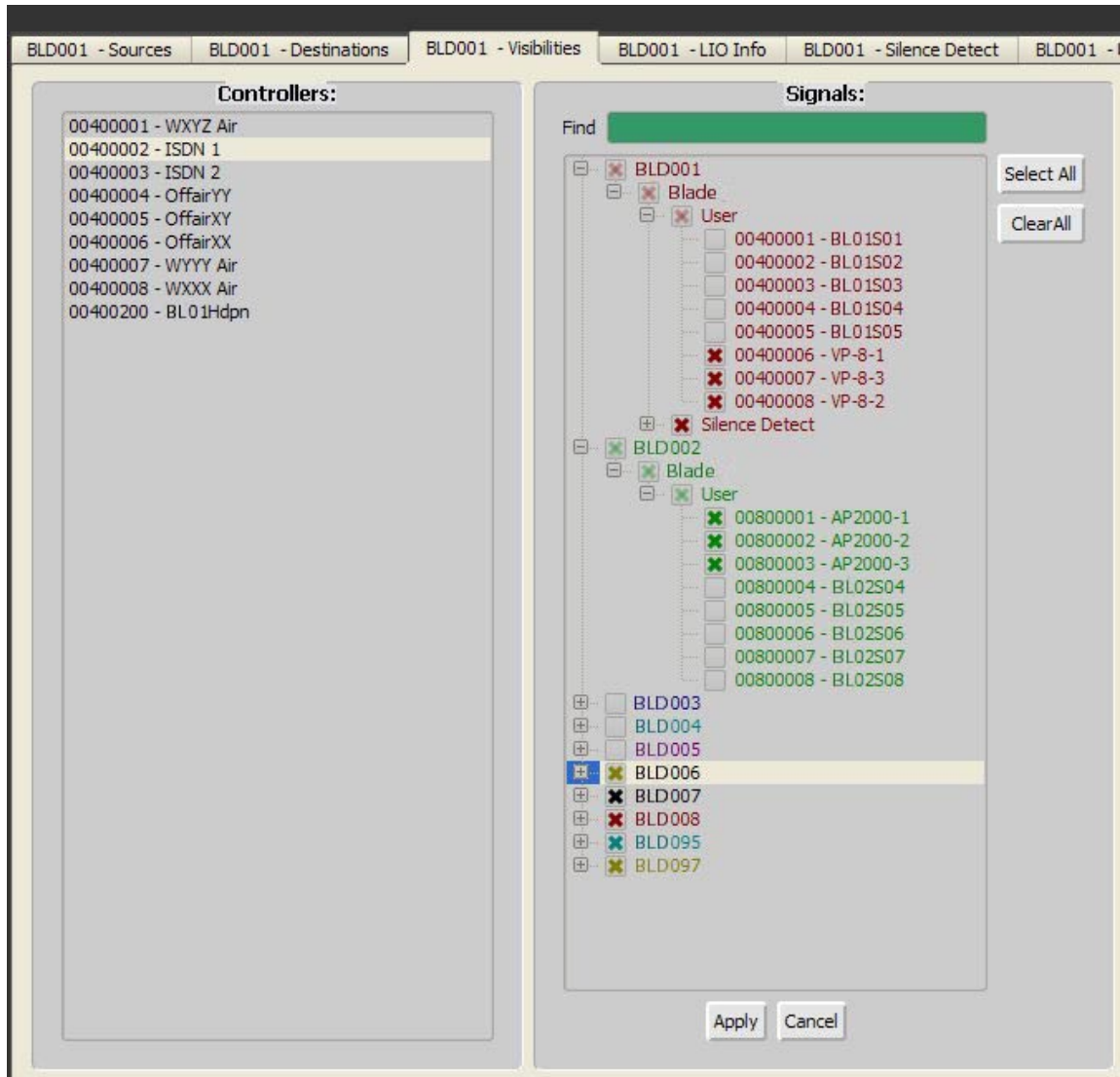
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Audio connections can also be combined into groups. We call these salvos. A salvo can be an assortment of up to 120 connections. Once defined, all of these multiple connection changes can be initiated with a single mouse click. These salvos can also be programmed to fire from logic connections or control surface buttons, making it easy to manage large changes. They can even be programmed to fire based on time of day from the Event Scheduler software.
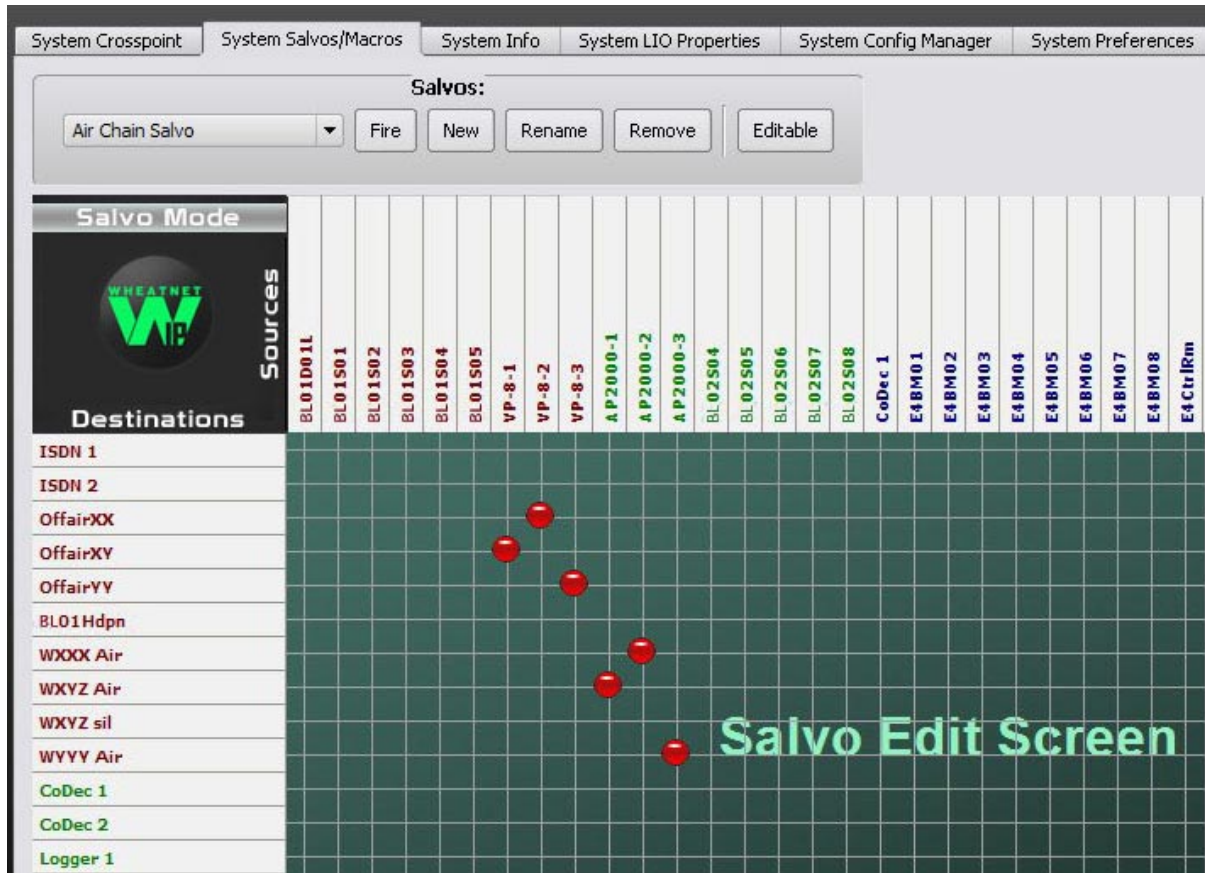
Audio connections can be mixed, or combined together. That's obviously what a control surface is for. You assign various sources to the fader channels (in the WheatNet-IP system, console fader channels appear as destinations just like physical outputs do) and combine them into different buses and/or outputs, which can then be sent on to other destinations (again, in the WheatNet-IP system, all of the mix buses and console outputs appear as sources, just like physical inputs do). This is a huge advantage in system design, because you don't need to buy physical inputs or outputs for your consoles, nor do you need to buy distribution amps to get the same signal to multiple places. You need only one connection for each physical input or output device (say a microphone or speaker) and the WheatNet-IP network takes care of the rest.

But control surfaces aren't the only ways you can combine signals in the WheatNet-IP system. After all, a control surface can be a fairly expensive proposition if all you need to do is mix a few channels together. So each rackmount BLADE includes two built Utility Mixers. Each mixer can select up to eight WheatNet-IP network sources, and provides two stereo buses which become available throughout the WheatNet-IP network. Each mixer channel has a separate fader for each bus output in the same mixer. The mixers are configured with the Navigator GUI, with the mixer inputs showing up in the crosspoint grid as destinations and the mixer bus outputs showing up as sources. And, for simple summing, such as combining the left and right channels of a stereo source into a mono destination, the WheatNet-IP system does that too.
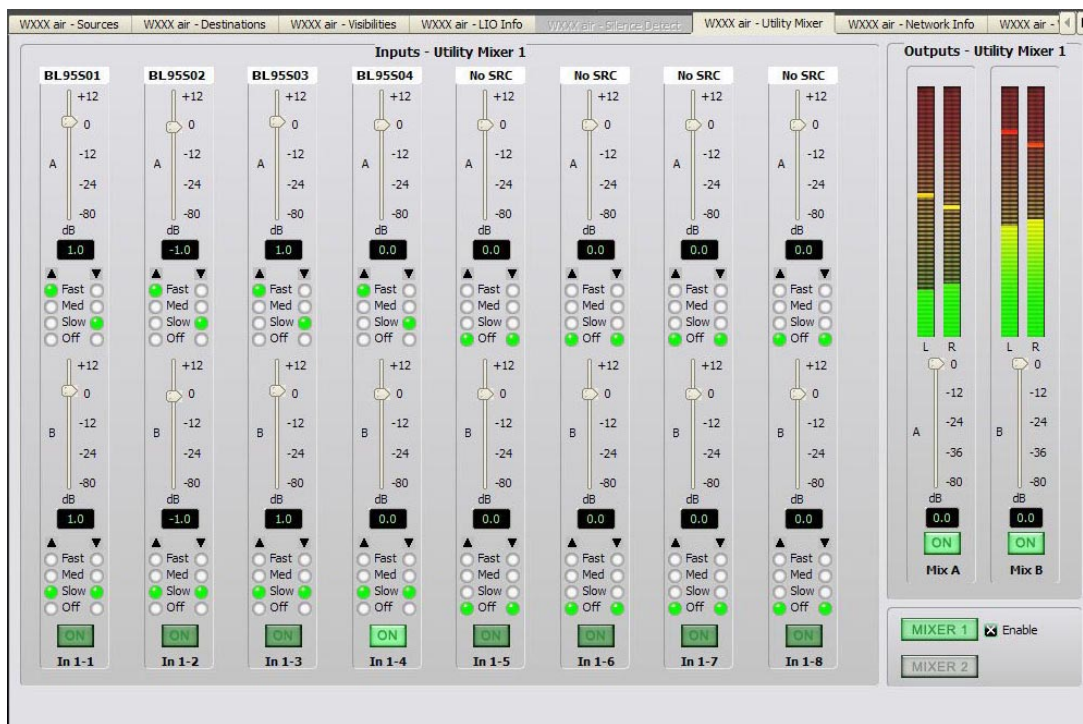
What about when an audio connection goes bad? You'll be pleased to know that each physical output destination in each and every BLADE has the ability to automatically detect silence and, if need be, switch to an alternate source defined by you should the silence endure for longer than a specified period. Furthermore, it can be programmed to automatically switch back when the audio is restored. You can use this extensive capability to map out multiple levels of automatic failover to enhance your system's reliability. If a program output from a control room goes away, you can switch to an alternate. If a mix-minus feed to a remote drops out, you can feed him a back up. If your entire network goes down, you can have the BLADE that feeds your air chain switch to a backup playback machine and start it playing. Because every output on every BLADE has this capability, you can layer as many levels of failover as you care to.
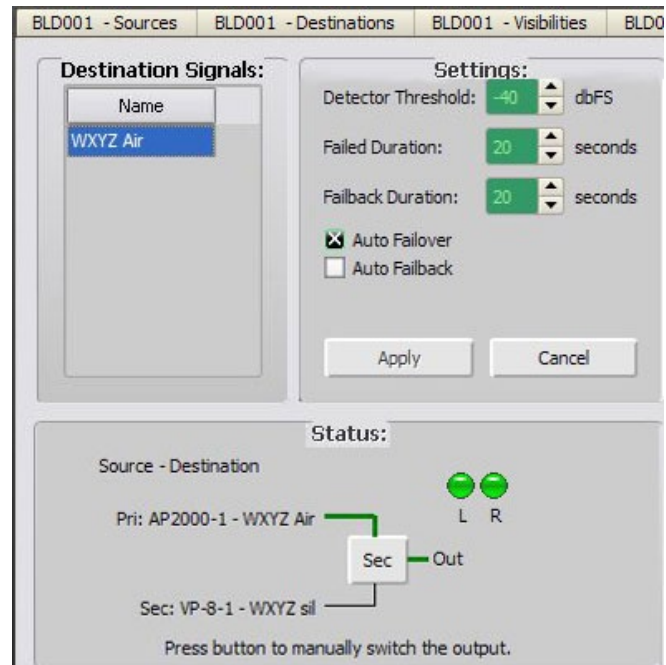
Consult the Navigator GUI section of this manual for specific details on audio signals, connections, salvos, mixing, and more.

There's more that the WheatNet-IP network can do besides transport audio. It can also transport logic changes. No modern broadcast facility can operate without logic control. This is what lights a warning light when a studio goes On-Air, mutes a speaker when a microphone turns on, starts a playback machine when a console button is pushed, or starts a recording when a relay is closed. The WheatNet-IP network transports logic change information between every BLADE, control surface, and PC that is attached to the system, via the same CAT-5e LAN connection and Ethernet switch used for audio. You don't need to add anything. Each physical BLADE has 12 general purpose logic connections that can be individually mapped as inputs or outputs. Each control surface has a number of automatically defined logic functions (Start, Stop, On, etc.) for each fader, as well as a number of programmable buttons and indicators, plus an assortment of mutes, tallies, and other functions. Between the jacks on the BLADEs for physical connections, plus all of the virtual ones on the control surfaces, just about any logic function you need can be accomplished. On top of that, Wheatstone can provide dedicated switch panels for host and talent locations, some of which contain their own scripting language for creating complex conditional logic configurations.

WheatNet-IP Rear

E-6 Surface

GP-4 Panel
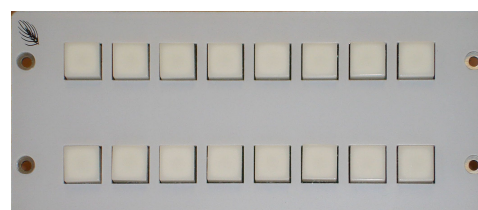
GP-16 Panel

Logic functions in the WheatNet-IP system come in a number of different types. First there is the simple but direct self contained functions that are typically found in consoles and control surfaces. "If this mic channel is on then mute the control room output" and "if this channel is turned on then start the timer" are examples of direct logic. In the WheatNet-IP system, these functions and many more similar ones are programmed in the VDIP screens of the control surfaces.

A second type of logic in the WheatNet-IP system is audio associated logic. A "START" or "STOP" command for a playback device or an "ON" or "OFF" command for a microphone channel is an example of audio associated logic. What we mean by audio associated is that the particular logic function is "associated with," or "belongs to" the audio signal being programmed. For instance, playback deck 1 of your Automation PC has a START command reserved only for deck 1, and playback deck 2 has a similar START command reserved for deck 2. If you make audio connections between these playback decks and faders 1 and 2 of a control surface, how can you use the buttons on the surface to activate the playback? In the WheatNet-IP system, audio channels can have these common logic functions "associated" with the audio such that any other device (such as a control surface for instance) that has matching logic functions associated with it will allow the logic functions to work as long as there is a crosspoint connection (which is of course necessary for the audio to flow) between them. Audio associated logic is very powerful, because the "associations" take care of most of your common logic functions without lots of physical wired connections or undue programming. In the WheatNet-IP system, as many as 12 logic functions can be attached to each audio signal.

A third type of logic in the WheatNet-IP system is discrete logic. In this case you have some input device somewhere that needs to control some output device somewhere else. A profanity delay DUMP button is a good example. This is where the 12 physical logic connections on each BLADE
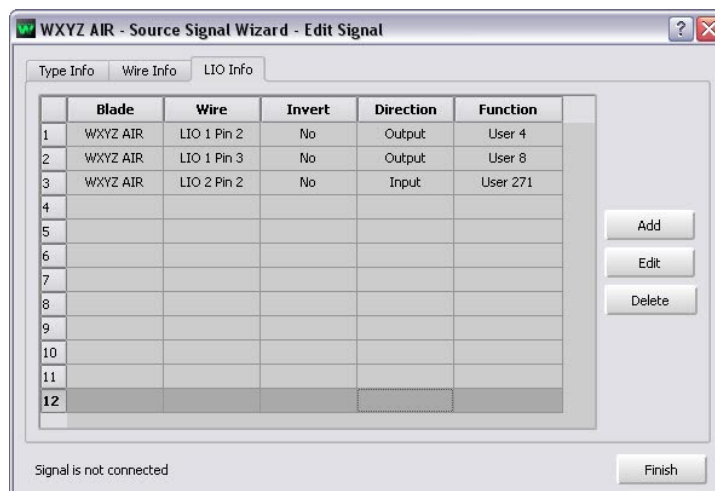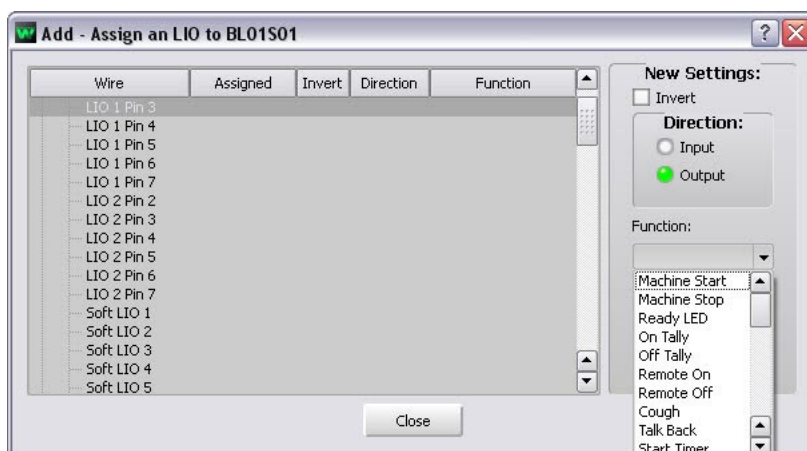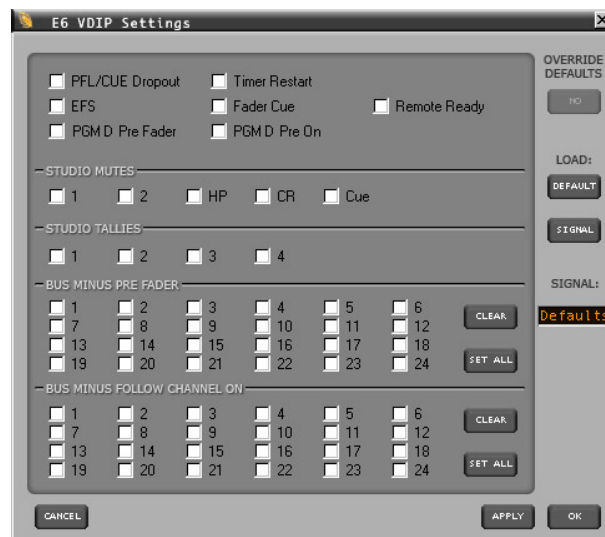
come in especially handy. In the WheatNet-IP system, you can create a special class of signal called "LIO only." These signals appear in the crosspoint matrix as logic "sources," i.e. switches, and logic "destinations," i.e. relays or indicators. When a logic source is cross connected to a logic destination, via the Navigator GUI for instance, then the logic state of the source will affect the logic state of the destination; the switch will fire the relay. No actual logic wiring between the switch and the relay is required, it all happens (with sub millisecond latency, by the way) over the LAN.

A fourth type of logic function in the WheatNet-IP system is called "action logic." This is where you want some kind of system action to be controlled by a logic state. An example of this might be switches that are programmed to fire a salvo, or make a connection, or recall a control surface preset. Action logic is easily programmed with the Navigator GUI and is described in detail along with the other logic types in the GUI section of this manual.

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
LIO 1 Pin 2		☉	Switch 1	Dump	<none>	<none>
LIO 1 Pin 3		☉	<none>	<none>	<none>	<none>
LIO 1 Pin 4		☉	<none>	<none>	<none>	<none>
LIO 1 Pin 5		☉	<none>	<none>	<none>	<none>
LIO 1 Pin 6		☉	<none>	<none>	<none>	<none>
LIO 1 Pin 7		☉	<none>	<none>	<none>	<none>
LIO 2 Pin 2		☉	<none>	<none>	Air Chain Salvo	<none>
LIO 2 Pin 3		☉	<none>	<none>	<none>	DST 00400002 - ISDN 1 => SRC 00400006 - VP-8-1
LIO 2 Pin 4		☉	<none>	<none>	<none>	<none>
LIO 2 Pin 5		☉	<none>	<none>	<none>	<none>
LIO 2 Pin 6		☉	<none>	<none>	<none>	<none>
LIO 2 Pin 7		☉	<none>	<none>	<none>	<none>

Tabs: BLD002 - Sources | BLD002 - Destinations | BLD002 - Visibilities | BLD002 - LIO Info | BLD002 - Silence Detect | BLD002 - Utility Mixer | BLD002 - Network

One of the most challenging parts of any logic system is getting it all right, making sure the senses, polarities, timing, and connections are all correct. In the WheatNet-IP system we provide a number of useful tools to help. First of all, logic pin outs, functions, and polarities can all be changed with a click of a mouse. You can also specify what you want a logic connection to do when it's disconnected (go to a specific state or retain its last setting), and then change your mind about it later. Each logic input or output is fully independent and not linked into a scheme or template that uses them up needlessly. The physical logic connections on each BLADE are fully programmable; they can be all inputs, all outputs, or any combination. Changing them is simple via the Navigator GUI. The GUI provides on-screen indication of logic state changes so you can see that your buttons are actually triggering the right ports. The BLADEs themselves have a logic test display mode that will show the state changes on every logic input or output. They also have a front panel indicator (GPIO) that goes off when any logic state is changed, so you can see that your logic programming is getting through
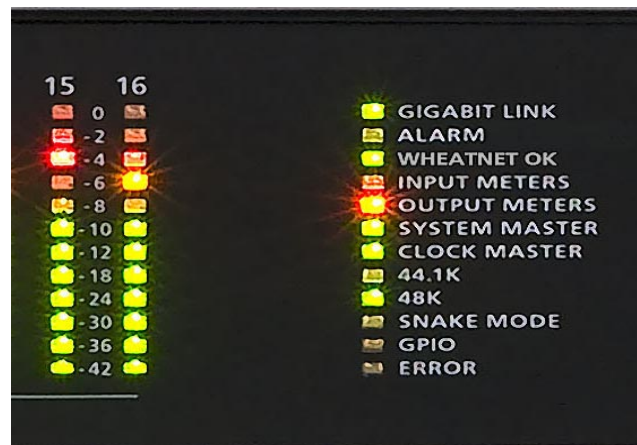
to the correct BLADE. Best of all, the WheatNet-IP logic functionality is a completely integrated part of the WheatNet-IP system itself and does not require the Navigator GUI or any other PC to be running to make it work. The GUI is needed only for programming.

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
LIO 1 Pin 2			<none>	<none>	Air Chain Salvo	<none>
LIO 1 Pin 3			<none>	<none>	<none>	DST ISDN 1 => SRC E4MM1
LIO 1 Pin 4			<none>	<none>	<none>	<none>
LIO 1 Pin 5			<none>	<none>	<none>	<none>
LIO 1 Pin 6			<none>	<none>	<none>	<none>
LIO 1 Pin 7			<none>	<none>	<none>	<none>
LIO 2 Pin 2			<none>	<none>	<none>	<none>
LIO 2 Pin 3			<none>	<none>	<none>	<none>
LIO 2 Pin 4			<none>	<none>	<none>	<none>
LIO 2 Pin 5			<none>	<none>	<none>	<none>
LIO 2 Pin 6			<none>	<none>	<none>	<none>
LIO 2 Pin 7			<none>	<none>	<none>	<none>

There is one last feature of a WheatNet-IP audio system that should be mentioned. Because WheatNet-IP is based on standard network models, the system has SNMP capability. Simple Network Management Protocol is a standard built into some networked devices to allow for a third party remote program to query them and retrieve important information regarding the status and operation of the networked devices. Depending on its complexity and set up, this remote program can acquire statistics, issue alarms, and even send email reports of the systems functionality. Consult the "Ethernet Networks and Switches" chapter of this manual for more information regarding the SNMP capability of WheatNet-IP systems.

The above descriptions of the functionality of the WheatNet-IP system are a brief overview of what it can do. For more details about these functions and others, please read the Navigator GUI section of this manual.

Ethernet Networks and Switches

Chapter Contents

Ethernet Networks and Switches

Overview

The underlying network plays a major role in the successful deployment of your WheatNet-IP system. In the IP audio world, the Ethernet network is the analog of the punch block wall in a traditional broadcast plant. As such, careful consideration should be given to network topology when planning the installation. Because the size and type of network you design and deploy directly depends on the amount of WheatNet-IP and surface hardware you are installing, it is wise to build a network that has reasonable overhead and room to grow as formats and audio distribution needs change over time.

Gigabit Ethernet Technology

The WheatNet-IP system uses 1000BASE-T gigabit Ethernet technology exclusively to transport audio and control packets between BLADEs. Because the WheatNet-IP system uses gigabit connectivity, the possibility of link overload is drastically reduced when compared to competing 100BASE-TX systems. Each Gigabit connection is capable of handling literally hundreds of audio streams, along with associated GPIO, system configuration, and network monitoring capabilities. Advantageously, the cost of gigabit technology is rapidly decreasing due to economy of scale benefits gained by cross application use of the technology.

Choosing Ethernet Switches

There are literally hundreds of choices of Ethernet switches on the market today. Chances are you have a compatible switch in your facility already. However it is recommended that the WheatNet-IP network be isolated from any existing network using separate switches or a unique VLAN on existing switches.

The primary design concern you face is whether to use managed or unmanaged switches, and the amount of Ethernet audio hardware you deploy ultimately drives this decision. Further reasons for selecting one over the other are described in detail after the basic feature considerations listed below.

Switch Feature Considerations

- **10/100/1000 Ports** - When looking at switches, make sure all the ports support full-duplex 1000BASE-T connections. Some switch models are touted as Gigabit, but really only have one or two 1000BASE-T ports.
- **Hubs** - Packets entering a hub or repeater are broadcast out of every other port on the device. Gigabit hubs must be avoided because they are a single collision domain and can slow your GbE audio network to a crawl. If you find a really good deal on a Gigabit "switch" be sure it is not really a hub.
- **Throughput** - Is an important specification when deciding on a Gigabit switch. Throughput is the amount of cumulative data traffic a switch is capable of transceiving. Ideally an eight port 1000BASE-T switch should incorporate an 8Gbps non-blocking switch fabric. Low throughput switches typically use input buffering techniques susceptible to Head-Of-Line blocking which can

adversely affect the real time performance of medium to large IP audio networks.

- **Rack Mounting** - Rack mounting is a useful option for most broadcast systems.
- **Chassis Based** - Large enterprise systems may benefit from installing or expanding existing chassis based managed switch solutions.

Unmanaged vs. Managed Switches

An unmanaged Ethernet switch is a low cost WYSIWYG device and has no configuration software interface. Most unmanaged switches do not support IGMP snooping and will therefore act as repeaters to IP audio multicast packets, effectively flooding all ports with audio packet traffic. Unmanaged switches are relatively inexpensive, though, so in very small systems this may be a perfectly acceptable cost vs. performance compromise.

Managed switches, on the other hand, allow users to configure the switch hardware with a software interface of some kind, such as Telnet, Web, Terminal, etc. Primary configuration features applicable to your Ethernet audio network are the ability to configure VLAN's, IGMP management, built in diagnostics, and routing. We highly recommend the deployment of managed switches throughout the network.

Managed switches fall in to several market niches. Low end managed switches, or "Smart Switches," offer some configuration, but may not provide the level of configurability required in a medium to large Ethernet audio network. For example, these switches may forward IGMP host messages and multicast traffic but can not act as the IGMP router. In medium to large applications at least one switch capable of being the IGMP Querier is required. Mid-priced managed switches are better suited to the task and will provide more configuration flexibility.

In larger systems it makes sense to employ a "core and edge" model. This type of system balances the switching horsepower (cost) according to the throughput requirements at different physical segments of the network. Lighter bandwidth "edge" segments can use lower cost switches, while central rack room "core" segments utilize higher performance devices.

Rules of Thumb

The WheatNet-IP system will work with a minimum number of devices on an unmanaged switch. If the system is to include more than six BLADEs, two Control Surfaces, and two PC drivers it is recommended that an IGMP compliant, managed switch be used.

In large systems, careful attention must be paid to the placement of core and edge switches.

- Each I/O (88a, 88d, 88ad) BLADE requires 36.9Mb/s for eight Stereo connections.
- Each I/O (88a, 88d, 88ad) BLADE Requires 73.7Mb/s for 16 Mono connections.

- Each Engine (e) requires 147.5Mb/s for 32 unique stereo connection streams.
- Each E-6 surface requires a 100Mb/s Ethernet connection.
- Each Surface requires an Engine (e) connected to the same GbE switch.
- Each PC driver requires 19.6Mb/s for eight Stereo outputs.
- An aggregate of eight BLADEs (64 streams) requires roughly 295Mb/s of bandwidth when each BLADE have eight stereo connections.

The Multicast channels used by the WheatNet-IP System are as follows:
- one per audio source
- one for system announce messages
- one for metering data
- one for Logic messages

What's on the Wire?

The WheatNet-IP system uses the standard 1000BASE-T gigabit Ethernet hardware infrastructure to distribute audio, logic, and control over copper UTP CAT-5e or CAT-6 cable. Because the WheatNet-IP system uses a standard, non-proprietary Ethernet network for connecting devices, the digital audio network supports the universal suite of Ethernet protocols, including TCP/IP, HTTP, FTP, Telnet, SNMP, RTP, IGMP, etc.

The WheatNet-IP system software utilizes RFC standards initially developed for VoIP applications to synchronize and distribute packetized audio between BLADEs (nodes), control surface processing, and PC's. Specifically, the Internet Group Management Protocol (IGMP) is used to manage the distribution of multicast audio packets, which are integral to WheatNet-IP design.

Designing the WheatNet-IP Network

Where to Start

Before you buy any network equipment, it may be beneficial to sketch out or formally draw a block diagram of your system. A few typical system block diagrams are included later in this chapter for your reference. Note the number of Ethernet ports required, wire length estimates, potential Ethernet switch locations as well as the number of BLADEs, PC drivers, and control surfaces. Remember this exercise is intended to give you a general idea on what physical topology might work best in your facility so it is probably best not to get bogged down in the details. This information will also help guide you in network hardware purchasing decisions.

Many small Ethernet audio network applications may be assembled without much preparation or difficulty while medium to large systems will require careful planning to eliminate potential bottlenecks. When designing your Ethernet audio network it is useful to consider the following parameters:

- **Scope** - Does the network design meet current interconnectivity requirements?
- **Physical Infrastructure** - Topology, switch placement, CAT-5e/CAT-6 cabling.
- **Throughput** - Is there enough switching throughput?
- **Headroom** - Is there room for growth built into the network?
- **Applications** - Will this be an audio only or shared use network?
- **Serviceability** - What is the maintenance plan?
- **Monitoring** - What network monitoring software tools are required?
- **Remote Access** - Is there a secure path to remotely monitor or troubleshoot the network?

Cabling

The wiring requirements for the WheatNet-IP system follow the specifications for 1000BASE-T set forth in IEEE 802.3ab. That specification calls for UTP CAT-5e or CAT-6 cabling, jacks, and patch cables to be used throughout the network. When wiring with CAT-6 cable, use CAT-6 rated RJ-45 connectors that are designed to accommodate the thicker wire insulation. Note that unlike common 1000BASE-T/100BASE-TX Ethernet networks, the 1000BASE-T gigabit networks use all four twisted pairs inside the cable. This specification requirement makes the system less tolerant of problems stemming from sub-standard wiring installation. Because Auto-negotiation is part of the 1000BASE-T specification either straight or crossover cabling may be used. We recommend that all cables be wired identically simply to avoid potential confusion.

One often overlooked but critical step in the installation of Ethernet networks is Certification. Poor installation methods can easily degrade your CAT-6 cabling into CAT-3 performance. It is recommended that all Ethernet audio network cable runs and patch cords be certified onsite to confirm that wiring patterns, bandwidth, and cable length all meet specifications. This relatively easy but important step gives you peace of mind and can save hours of troubleshooting time chasing connectivity and bandwidth problems.

GbE Network Cabling Guidelines

- 1000BASE-T Standard - All four twisted pairs are used.
- Use UTP CAT-5e or CAT-6 cable exclusively.
- Use the correct connectors for the cable type.
- Certify all end to end runs and patch cables.
- 100M (328ft) port to port distance limit.
- Auto-MDI/MDI-X supported on GbE switches.
- CAT-6 crossover wiring pattern differs from CAT-5.
- Switches may be linked with fiber using GBIC modules.

1000BASE-T vs. 1000BASE-TX

Note that these very similarly named standards specify different wiring methods. The prevailing Gigabit Ethernet 1000BASE-T standard uses all four pairs of wire, while the outdated 1000BASE-TX standard uses only two pairs. To add to the confusion some products marketed as 1000BASE-TX may actually be 1000BASE-T designs.

Wireless Connectivity

Wireless routers of the 802.11ab/g/n variety are currently not up to the task of reliably distributing multicast audio at the data rates required by the system. A wireless access point could be added to the network for administration, monitoring, or remote access purposes.

Configuring the Network

The WheatNet-IP system is very friendly when it comes to network configuration. By default, BLADEs will configure their IP Address and Multicast parameters automatically based on the BLADE ID number. This auto-configuration method is similar to the Dynamic Host Configuration Protocol (DHCP) used on many Ethernet networks to configure PC wired and wireless NIC's on power up. A provision for user override of this functionality is provided for customers wishing to manually configure their network.

Configuring your WheatNet-IP network breaks down into four categories:
- Managed Switch configuration
- BLADE configuration
- Surface configuration
- PC Configuration

Managed Switch Configuration

At first glance, the number of configuration options for a managed switch can be overwhelming. Luckily, there are only a few parameters that need to be configured on the managed switch to set it up for WheatNet-IP multicast traffic.

Default LAN Parameters

- IP Address Settings - set the IP address of the core switch or WheatNet-IP VLAN to 192.168.87.1.

- Stacking switches - give each subsequent switch an IP address on the same subnet.

- VLAN's - modern managed switches allow the user to segment any number of ports into a VLAN or Virtual Local Area Network. This collection of ports is identified by a static base IP address and Subnet mask and, more importantly, constitutes a discrete Broadcast Domain. Segmenting a network into discrete Broadcast Domains allows you to control which ports send and receive the Multicast audio packets. VLAN's may be segmented across multiple managed switches connected to the core switch. Most switches that are capable of VLANs come out of the box with a default VLAN configured. You must assign an IP address to the default VLAN. For Sample Configuration Refer to the *"Configuring a Cisco 2960"* section in the Appendix 3.

- IGMP - IGMP will need to be enabled on the switches or VLAN's designated for the WheatNet-IP system. Settings may vary among switch manufacturers. When configuring Standard and Advanced IP services always refer to the switch documentation for setup specifics. For Sample Configuration Refer to the *"Configuring a Cisco 2960"* section in the Appendix 3.

- Spanning -Tree Portfast - It is recommended that Portfast be enabled only on switch ports connecting to a single BLADE. This allows the BLADE to join the network immediately on power up, bypassing the listen and learn states.

Note: If you enable Portfast on a port connecting another network device such as a switch, you can create network loops. Use Caution when enabling Portfast.

BLADE Configuration

The Quick Start Guide provides details on quickly setting up a BLADE. Note that some of the parameters listed below will automatically be created based on the BLADE ID number you enter.

Important! Before you plug the BLADE into the Network, set a unique BLADE ID.

The following parameters must be configured on a BLADE.

- BLADE ID number - this device number must be selected and entered by the user on each BLADE in order to uniquely identify the BLADE in the system.

- IP addressing - all WheatNet-IP devices use dynamic IP addressing based on their BLADE ID number. Each device is given an IP address in the 192.168.87.xxx scheme, starting at .101 for the box with BLADE ID 1 and so on.

- You can override the automatic setup and have full control over IP addressing.

- Subnet Mask - the default 255.255.255.0 subnet mask will work in most systems. This allows for 254 devices on the audio network.

• Gateways - gateways may be employed for remote access and routing purposes.

• Ports - The system uses the following TCP/IP Ports - See Table Below:

PORT	PURPOSE
80	HTTP-Web Configuration Interface
23000	Telnet to Play Service
50000	GUI Connect
50100	Metronome Multicast Stream
51000	Web/XML Multicast Stream
52000	Announce Channel Multicast Stream
52001	Logged Channel Multicast Stream
52002	Meter Multicast Stream
55776	Automation Control Interface
60000	Surface Channel

Surface Configuration

Surface configuration is very easy using a mouse and VGA monitor connected directly to the control surface. When first powered up, a surface will ask you to configure its network parameters.

To configure the network settings for the E-Series surface select "YES" from the dialog box. The surface will now display the Options Tab's Network Settings screen, where you will set the Mix Engine ID and IP address of the Engine to which the surface will connect, along with the Surface IP Address (on the default 192.168.87.xxx scheme), Subnet Mask, and Gateway.
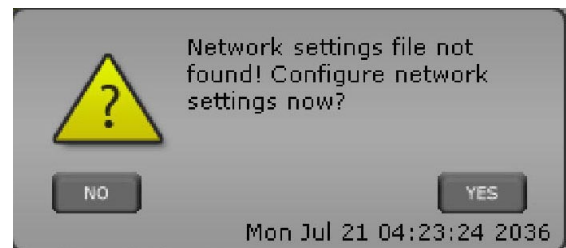
If Automatic mode is selected, enter the Mix Engine ID of the WheatNet-IP Mix Engine to be associated with the surface and remaining settings are configured for you. You can manually enter this information by pressing the Manual button and using the numbered keypad on the screen. Pressing NEXT will advance to the next field.

For convenience, Wheatstone uses the following convention for IP Addressing in the WheatNet-IP system:

1. The IP Address of a BLADE is equal to the BLADE ID plus 100; i.e., BLADE 3 = 192.168.87.103

2. The IP Address of an E-6 control surface is equal to the Engine BLADE ID plus 200; i.e., Engine BLADE = 5, Surface IP Address = 192.168.87.205

When done simply press APPLY to finalize these settings and the surface will request a reboot.

Select YES from the dialog box and the surface will reboot.
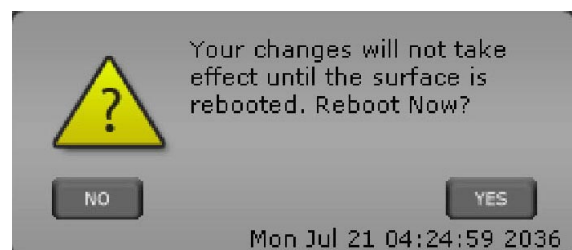
Once the surface has been rebooted navigate to the Options Tab and select Network Settings from the drop down menu. If all information was entered properly the BLADE STATUS will display "CONNECTED." The E-Series surface has been successfully configured.

PC Configuration

The WheatNet-IP PC Driver is a WDM driver that supports up to eight Stereo Output and eight Stereo Input streams. The driver eliminates the need for expensive sound cards. Each driver Output/Input is displayed in Windows as a unique sound device and can be controlled using the Windows mixer or any audio application that accesses sound cards.

Driver Installation - The driver may be installed on any Windows PC running Windows XP Service Pack 2 and higher. Please refer to the Appendix 6 of the manual for detailed installation and configuration information.

Network Interface Card (NIC)

It is recommended that a multi-home connection method be used on PCs that need to be connected to an office LAN while also connecting to the WheatNet-IP network. This will require a second NIC in the PC. There are many types of Network Interface Card on the market. While many of them may work for this application there may be some that do not perform well under such demanding conditions. Intel and Broadcom cards perform very well in this environment.

There are a few settings that can help improve the performance of many of the available cards:

- Disable Windows Power management on the Interface card.
- Set the Speed and Duplex to Auto negotiate (Default).
- Disable the Windows firewall.

Typical Small Network Block Diagram

E-6/24

E-6/24

e Model

e Model

Cisco 2960
Gigabit Ethernet
Switch

88a Model

88d Model

88ad Model

PC-1   PC-2
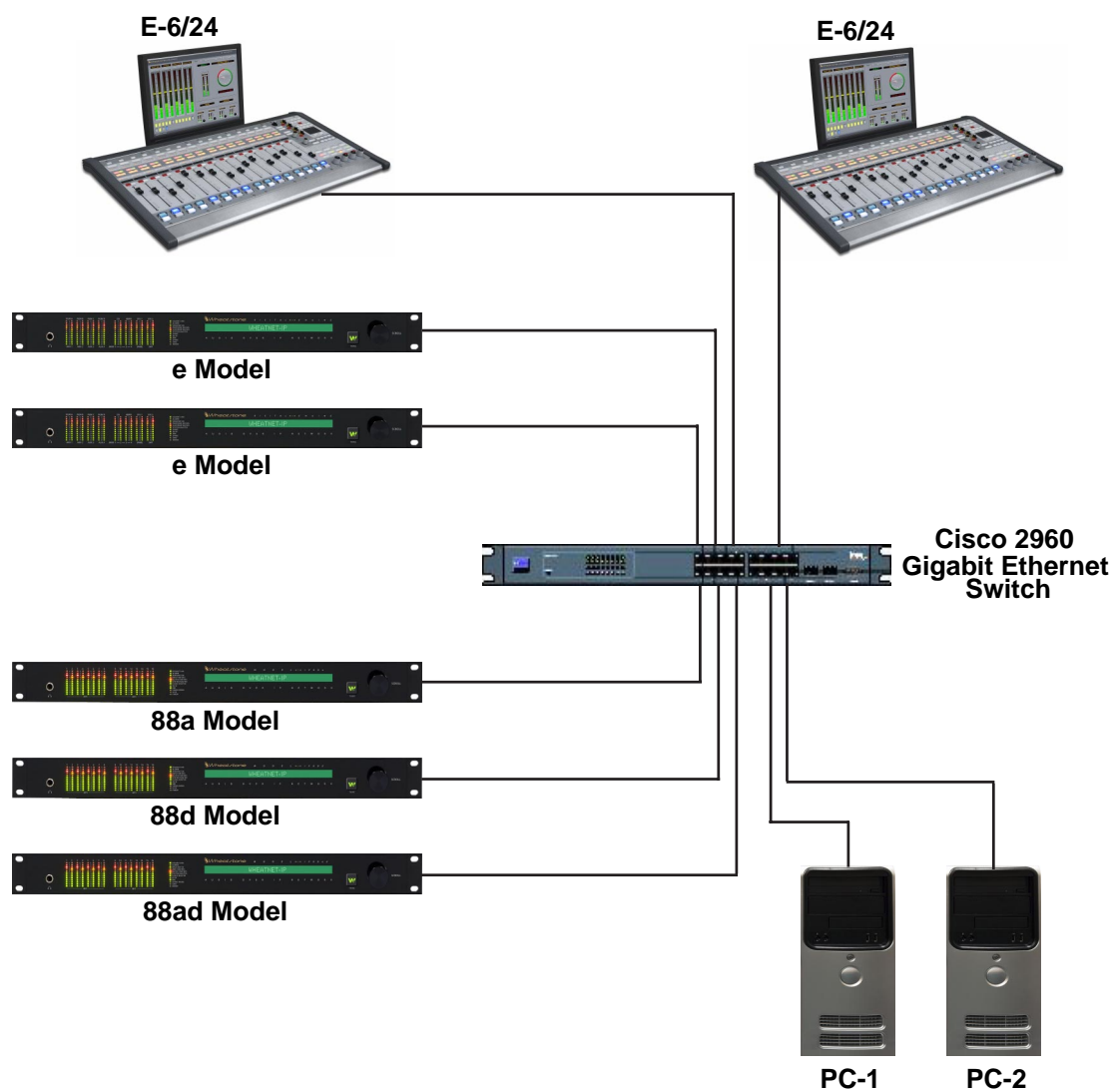
Typical Medium Network Block Diagram

E-6/24

88a Model

88a Model

E-6/24

**Cisco 3560
Edge Switch**

e Model

88a Model

**Cisco 3560
Edge Switch**

**Cisco 3750
Gigabit Ethernet
Switch**

e Model

88a Model

88d Model

**Cisco 3560
Edge Switch**

88ad Model

e Model

E-6/24

PC-1 **PC-2** **PC-3** **PC-4**
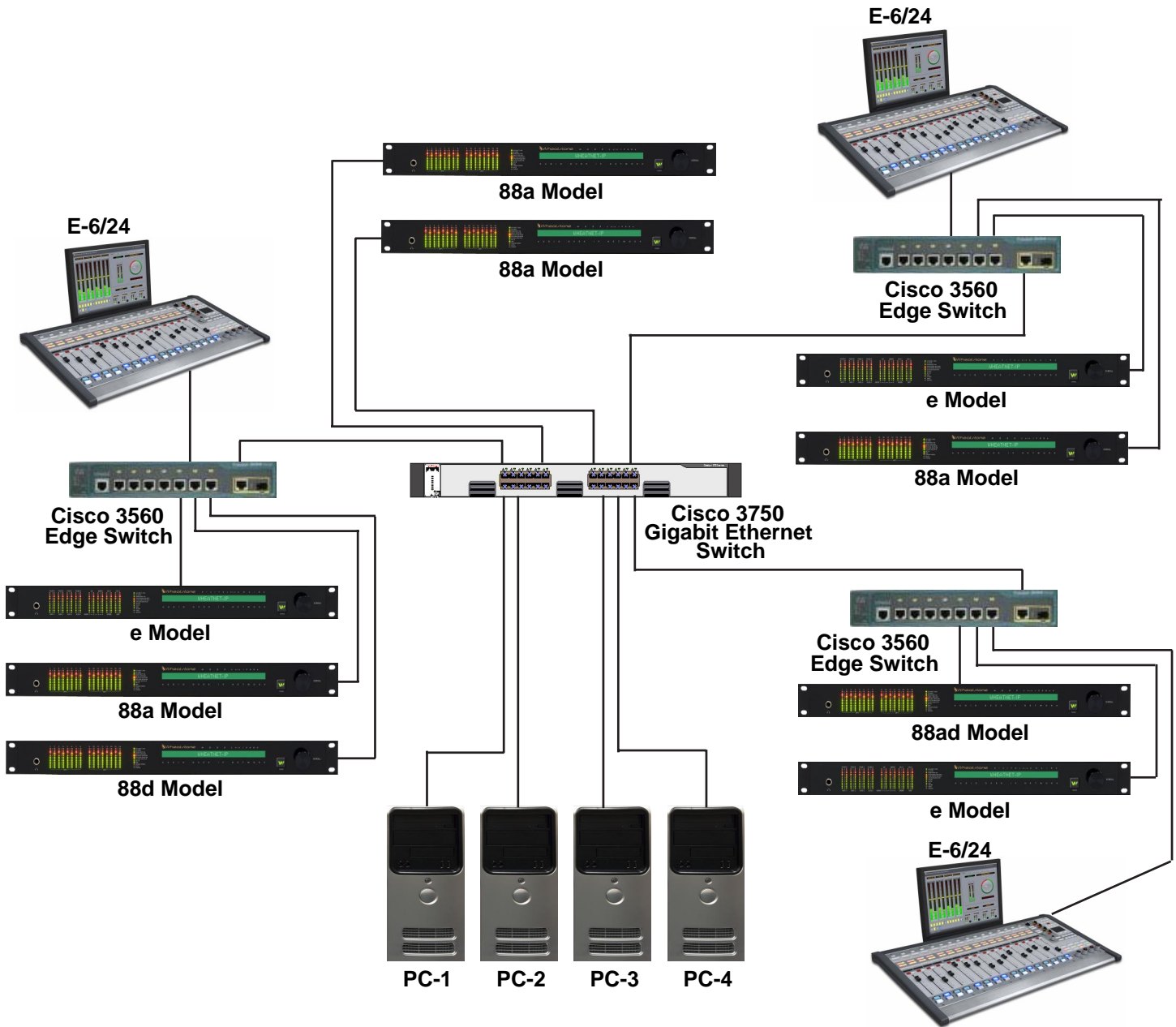
Typical Large Network Block Diagram

6 Mix Engines/Surf

AIR 1

Edge Switch

8 BLADEs

Automation Server

2 Mix Engines/Surf

Edge Switch

AIR 2

4 BLADEs

Core Switches

4 Mix Engines/Surf

PRODUCTION

Edge Switch

8 BLADEs

VPN

ISP

Remote PC

Rack Room BLADEs

3 Mix Engines/Surf

Edge Switch

NEWS

6 BLADEs
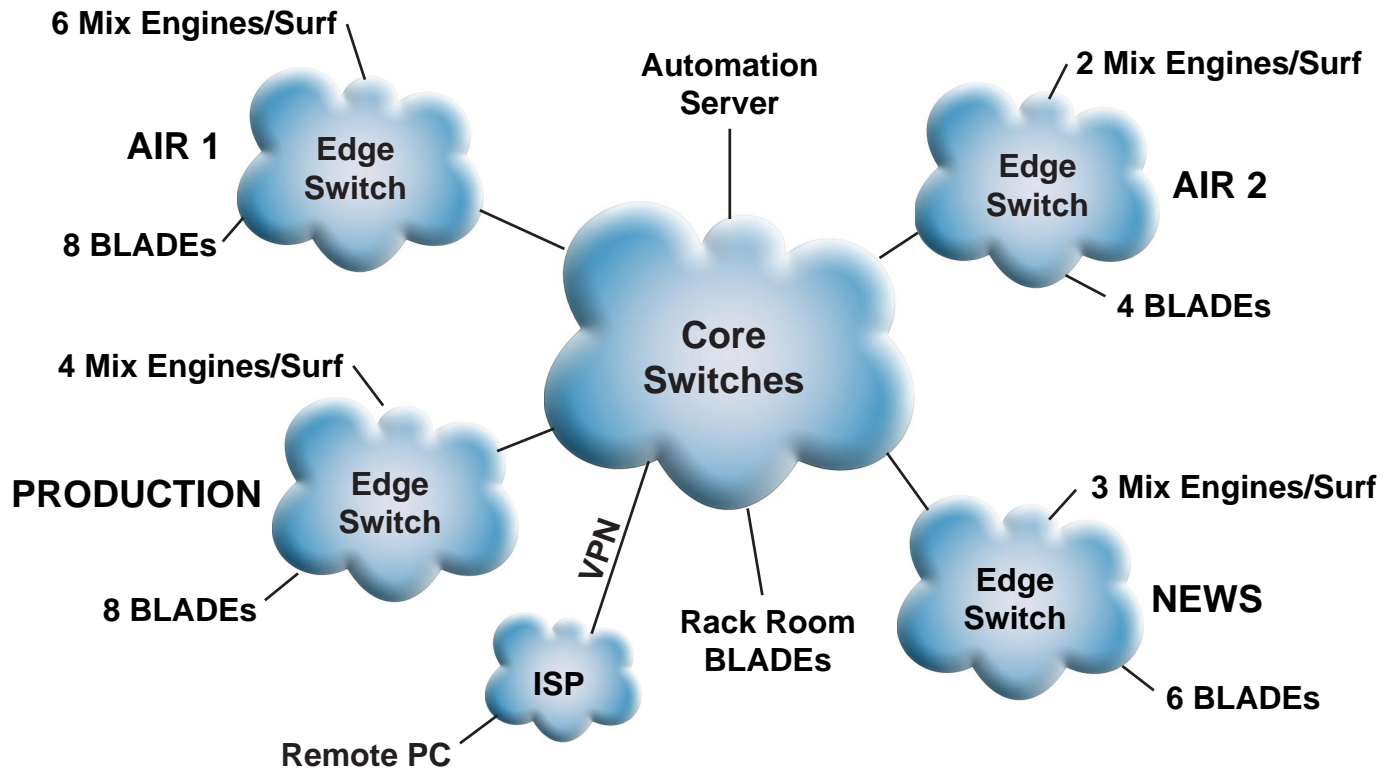
Network Troubleshooting

A variety of free software based tools can be effective in verifying, maintaining and troubleshooting network performance and configuration. Some rudimentary network testing may be done from the Command line in a DOS window using standard Internet Control Message Protocol (ICMP) commands built into Windows shell. A freeware or full blown network analysis program can be valuable when troubleshooting medium to large installations. Many managed switches include built in port traffic analysis using a web interface to the hardware.

Useful ICMP Commands

- **Ping** - Use this command to confirm that a device at a specific IP address is actually "talking" on the network. At the C:\> prompt in a command window type **ping xxx.xxx.xxx.xxx** where the x's are the IP address of the device.

- **TraceRoute** - Use this command to find the path a PC takes to get from point a to b. At the C:\> prompt in a command window type **tracert xxx.xxx.xxx.xxx** where the x's are the IP address of the destination you are tracing.

- **Ipconfig** - this is actually a console application in Windows that will display the network parameters configured for any network interface card installed on the PC.

Software Tools

- **WheatNet-IP GUI & Web Interface** - These Wheatstone applications access configuration, status messaging, and error logging of all connected WheatNet-IP hardware.

- **WireShark** - This freeware (GNU) Network Protocol analyzer offers a comprehensive look at network traffic down to the packet payload level.

- **Telnet** - Used to open a Debug portal on a BLADE or surface. Use the built in Windows Telnet client or any third party client.

- **FTP** - Used to transfer files to and from surfaces. We recommend using a third party FTP client like Mozilla's Filezilla.

- **SNMP** - Third party software can monitor the devices using SNMP. The MIBs created for the BLADE will allow users to monitor things like last boot time, Internal Temperature, Network Traffic, etc.

Simple Network Management Protocol (SNMP)

SNMP forms a part of the internet protocol suite defined by the Internet Engineering Task Force (IETF). Network management systems use SNMP to monitor network attached devices such as BLADEs for conditions that may require action by the end user.

SNMP uses a manager/agent model that presents the information to the end user. A software component called the agent runs on the network device and sends the management information to the managing system. The managing system is the application that the end user needs to organize the information. The manager and the agent use a Management Information Base (MIB) and a small command set to exchange information.

The WheatNet-IP system provides information such as Uptime, Transmit and Receive packets, CPU utilization, and others. This information can be useful in locating potential issues and correcting the issues before they have an impact on the performance of the system.

Hardware Status Indicators

Check that your hardware meets the following parameters

- Switch LED's - no link Led's: check wiring is CAT-5e or better, check switch port configuration is GbE compliant, patch cables, full duplex, certify wiring.

- NIC Issues- confirm NIC's are GigabitE, check IP config on PC.

- BLADE LED indicators- See Table Below.

STATUS LED	FUNCTION
Gigabit Link	Gigabit Link established with switch
Alarm	Alarm status
WheatNet OK	BLADE loaded and functioning
Input Meters	Front panel meter monitoring inputs
Output Meters	Front panel meter monitoring outputs
System Master	BLADE has been voted route master for the system
Clock Master	BLADE has been voted the master clock reference for the system
44.1K	44.1K Sample Rate selected
48K	48K Sample Rate selected
Snake Mode	BLADE connected in Snake mode another BLADE
GPIO	Flashes when there is GPIO activity
Error	Trouble with BLADE configuration

Error Logs

In the WheatNet-IP system there are several places you can view logs to aid in troubleshooting. The PC GUI and Web Interface provide system wide logging to help pinpoint where a problem may exist. The PC GUI also has an "Alarms" section that displays any message that may require user attention such as silence detection notification.

PC GUI Log
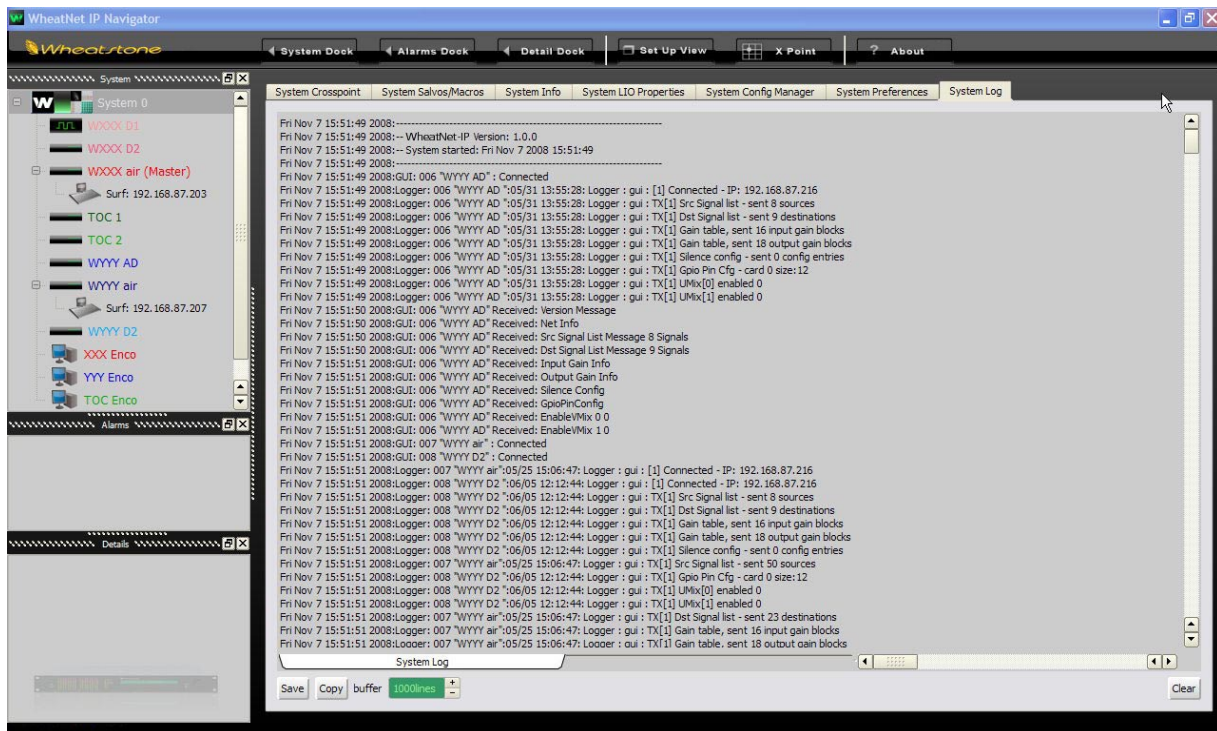
Web Interface Log
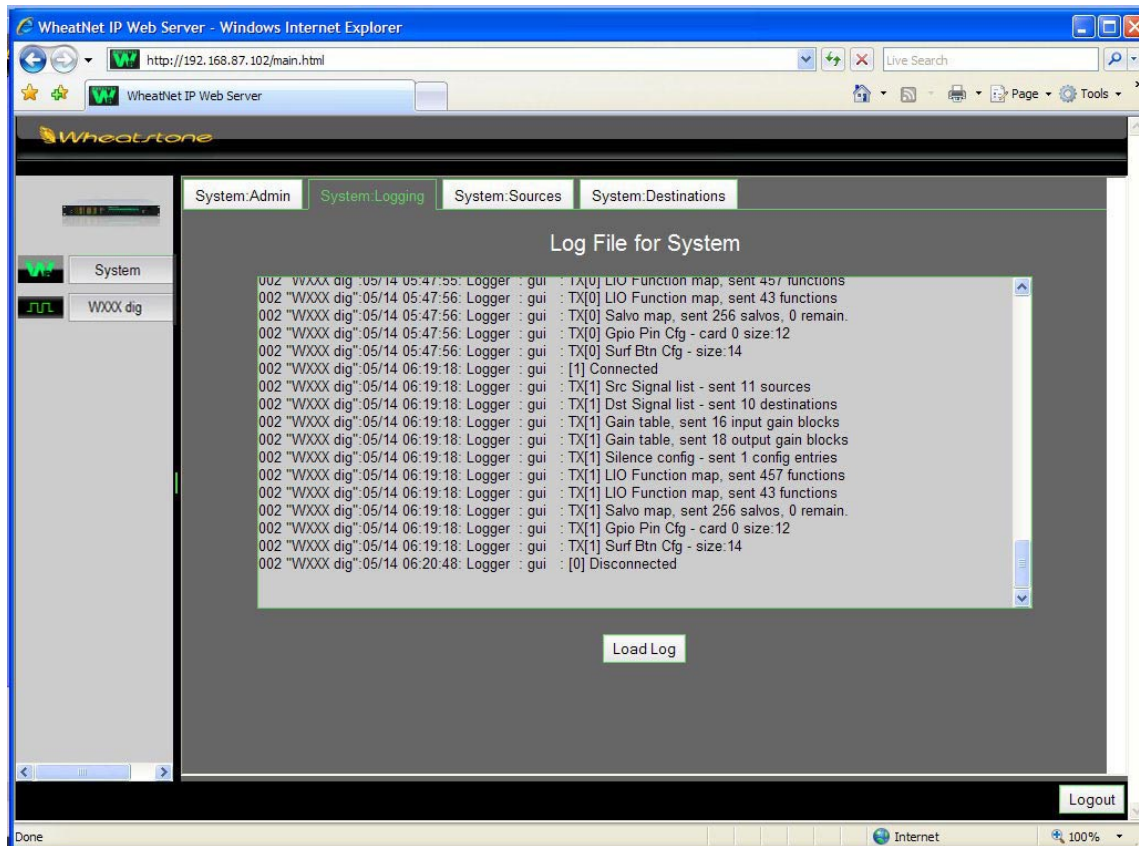
Alarms
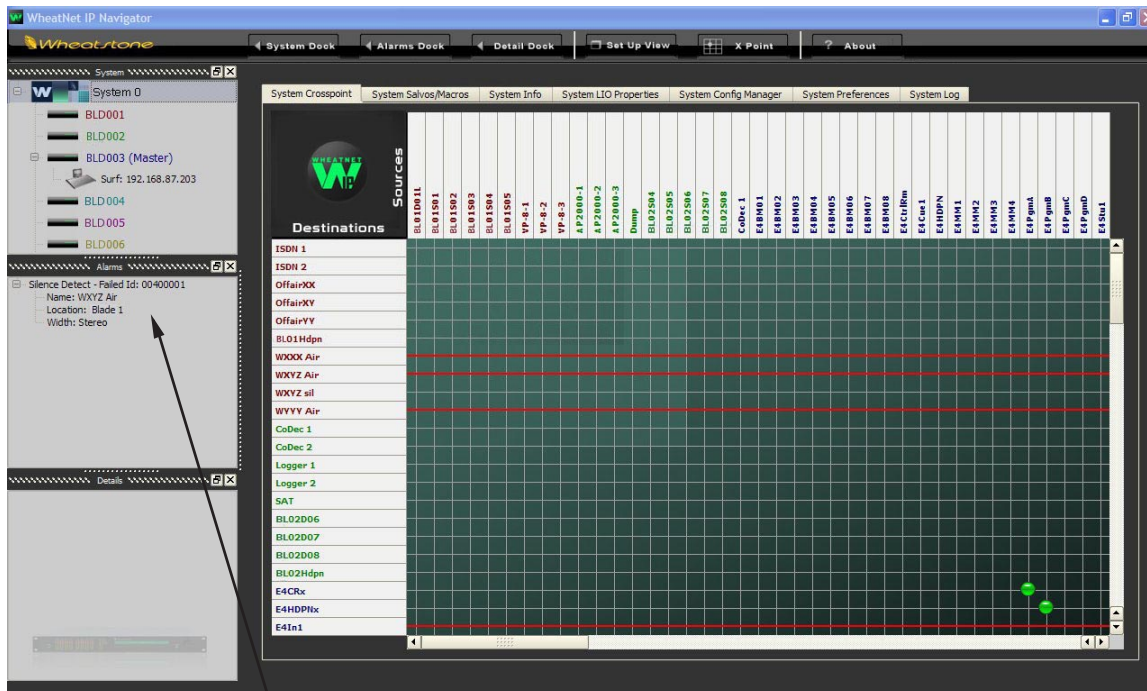
Silence Detected on Output

WheatNet-IP Navigator GUI

Chapter Contents

WheatNet-IP Navigator GUI

Description

The Navigator GUI is an optional software program designed to administer and manipulate WheatNet-IP networked audio systems. The use of this program is strictly optional, however we strongly recommend it because it makes many system functions much easier. Anyone who has tried to spell out a name via jog wheel and switch on a video game will appreciate how much easier it is to simply type it — especially if there are hundreds of names.

To use the Navigator GUI, it must first be installed on a PC running Windows XP. This program uses substantial computing power, especially in a large system, so we recommend using a computer with at least a 1.8GHz P4 processor and 1G memory. Insert the program CD into the drive on the PC and run the installer program. Accept all of the suggested defaults unless you have experience with this program and have specific requirements. After the installer has completed its process, it will leave a shortcut to the Navigator GUI on your desktop. Double-click on the shortcut to launch the program. Before launching the program, you must make sure that the IP address of the PC is compatible with the WheatNet-IP system. It must have a fixed IP address on the .87 subnet.

The first thing the program does after launching is to query the network the PC is connected to for any WheatNet-IP system present. This is an important thing to understand. Because WheatNet-IP networks, by their nature, are dynamic, the Navigator GUI can't know ahead of time what the network will be; it must inquire every time it is launched. This process takes anywhere from a few seconds for a small system up to a minute or so for a larger one. You can actually watch this process take place as the GUI discovers BLADEs and adds them to its list.

At the end of the discovery process you will see one of two things. First if the GUI could not find any BLADEs, it means that there is no WheatNet-IP system on its network. Usually this means that your PC is not actually plugged in to the network, or that your PC is running on a different subnet than the WheatNet-IP system. Remember, the default IP settings for BLADEs are all on the .87 subnet; this means your PC must have a fixed IP address of 192.168.87.xxx where xxx is any number not used by a BLADE or other member of the network. Wheatstone recommends 192.168.87.20 for the Navigator GUI PC. Go to the TCP/IP properties under the Network Properties section on the Windows Control Panel and verify/change the settings.

Secondly, if the PC has been addressed properly, in the left hand pane of the main GUI window, you will see a list of all the BLADEs the GUI was able to discover. In the center of the main window will be a password log-on window. Initially the GUI has no password assigned, so just click OK for now. Later on you can assign a password to prevent unauthorized modifications.

Using the Navigator GUI
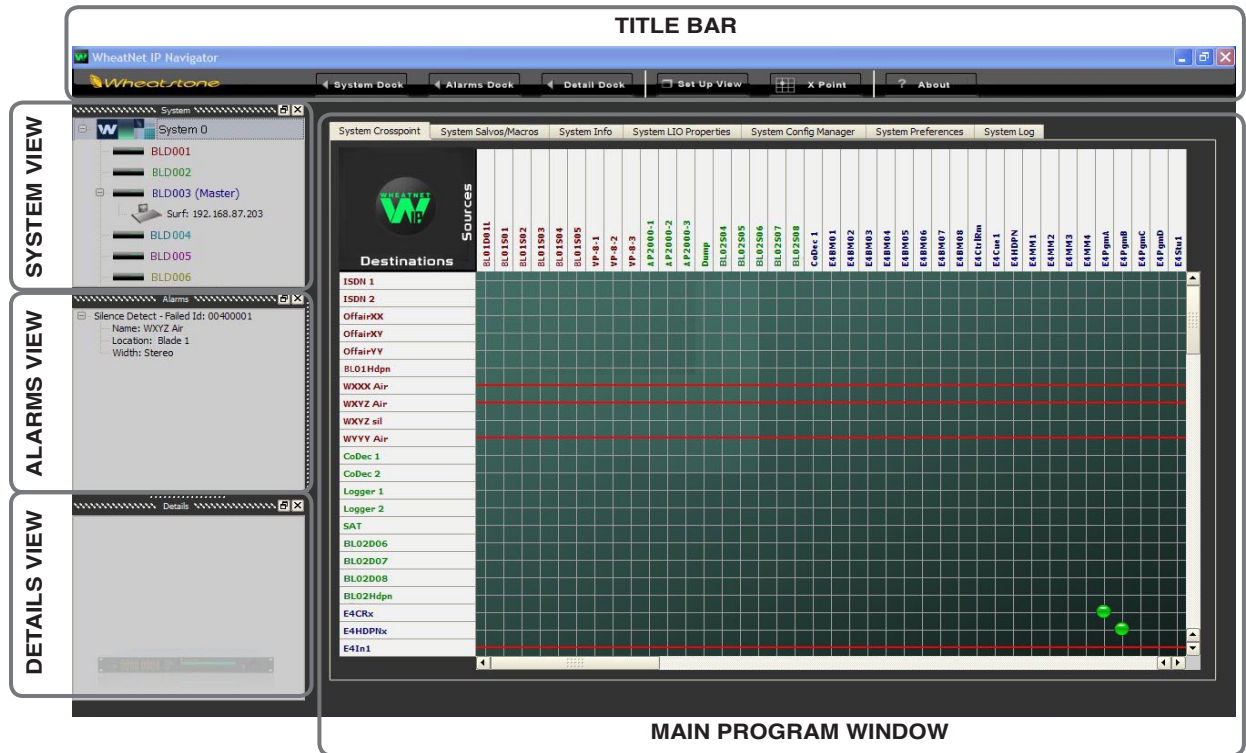
The main window of the GUI is divided into several parts. Along the left hand edge are three smaller panes, one above the other. These three panes show the system view, the alarms view, and the details view. Their functions will be described shortly, but for now, just note that they are there, and that you can move and resize them as you would with many Windows programs.

To the right of the three stacked panes is the main program window. Note that it has a number of tabs along its top, which when clicked on, will switch the main window to a number of different views. Another point to note is that the main window's views are also dependant on which part of the system you are looking at. To familiarize your self with the action of the various views, first click on the WheatNet-IP System 0 icon in the System pane. The main window will show information about the overall system, depending on which of the tabs in the main window have been selected.

Before we get into the tabs, take a moment to experiment with the system pane. If you've connected properly (remember, because WheatNet-IP networks are dynamic, each BLADE must be powered up and plugged into the LAN to be visible in the system pane) all of the BLADEs in your system will show in the system pane.

Each BLADE is shown with an icon and BLADE ID number. If it is the System Master, the designation "(Master)" will be shown beside the icon. If it is the
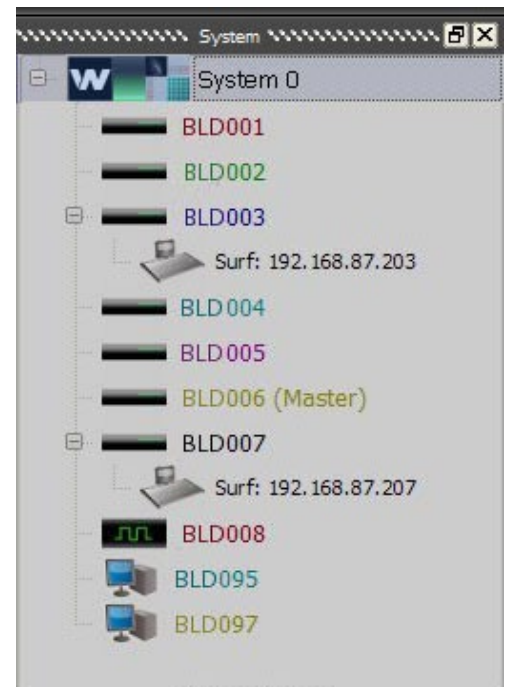
Clock Master, a BLADE wave image will be overlaid on the icon (more on System Master and Clock Master later). If the BLADE is a mix engine BLADE, then the icon will show a control surface icon attached to it, with the IP address of the corresponding control surface. If the BLADE is a streaming PC BLADE, say one of your Automation Playback machines, the icon will change to represent a PC. Note that for a PC to become a part of a WheatNet-IP system and work with WheatNet-IP audio streams it must first have the WheatNet-IP PC driver software installed on it. Information about this is provided in the appendix of this manual.

If there are too many BLADEs in your system to all show at once in the system pane, you can use a scroll bar on the right side of the pane to move through the list of BLADEs.

Now take a moment and temporarily unplug the network connection from one of your BLADEs. You'll notice in the system pane window of the GUI, the icon of that BLADE has been overdrawn with a yellow question mark. This is to let you know that a BLADE was a member of your system but has become unavailable. If you ever see this during normal system operation, look for an unplugged network cable, or check to see if the power has been removed from a BLADE or a network switch. A short time after you plug the network cable back into the switch, the yellow question mark will disappear, indicating that the BLADE is available again.

To illustrate the dynamic nature of the WheatNet-IP system, quit the GUI by clicking in the close box at the upper right corner of the GUI window (not the system pane window, please). Unplug one of the BLADEs and relaunch the Navigator GUI. Once the discovery process has been completed, if you check the system pane, the BLADE you unplugged will be missing from the list, as will all of its sources and destinations. Plug the BLADE back in, and after a short while, the BLADE and its sources and destinations will automatically get added back in. You have a dynamic network.
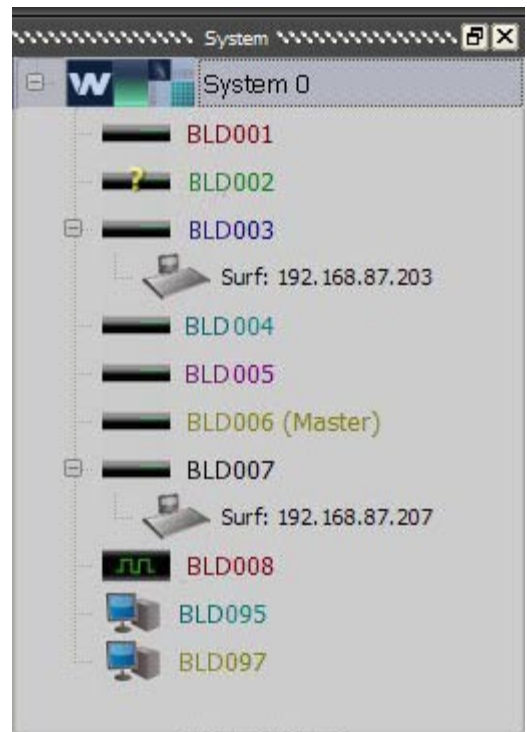
Now let's get back to the tabs.

System Crosspoint   The first tab is labeled "System Crosspoint." It shows a grid with system sources (their eight character names) running horizontally along the top, and the system destinations (again their eight character names) running vertically along the left side. The signal names are shown in different colors, matching the color of their BLADE icon in the system pane. Any connections between sources and destinations are shown by a dot at the grid intersection of the source and destination. To make a connection, click on an intersection. An audio connection will be made and a dot will form at the intersection. To break a connection, click on the dot and it will disappear, as will the audio connection. If your system is larger than a couple of BLADEs, then the crosspoint grid will have scroll bars along the bottom and right sides, allowing you to scroll the grid view to see every part of your system window. There's much more you can do here but for now just understand the basics.

System Salvos/Macros   The second tab is labeled "System Salvos/Macros." If you click on this tab, you will again see a crosspoint grid except that the words "Salvo Edit Screen" are shown in the background and some buttons have appeared above the grid. This is the screen used to create, edit, and execute Salvos (ganged simultaneous connections). More on this later.

System Info   The third tab is labeled "System Info." This is the screen where system clock rate, date and time, and passwords are set.

System LIO Properties   The fourth tab is labeled "System LIO Properties." This screen is where you can define the states of various logic functions.

System Config Manager

The fifth tab is labeled "System Config Manager." This screen is for archiving and restoring system information.

| System Crosspoint | System Salvos/Macros | System Info | System LIO Properties | System Config Manager | System Preferen |

Configuration Folder:

Program Files/Wheatstone/WheatnetIPGui/bin/cfg   [...]

[Default]

Backup System Configuration:
All system settings and all blades will be backed up.

[Backup...]

Restore System Configuration:

Select the system settings and blades to be restored.

Restore:

☒ Salvos
☒ LIO Properties
☒ Clock Settings
☒ Date and Tiime Settings
☒ Blades
   ✖ BLD001
   ✖ BLD002
   ✖ BLD003
   ✖ BLD004
   ✖ BLD005
   ✖ BLD006

Please select a folder to restore from:

Name
⊞ 📁 cfg_2008-10-14_18-27-51_SQ
⊞ 📁 cfg_2009-01-15_16-39-54_SYS

[Restore]

System Preferences

The sixth tab is labeled "System Preferences." This screen is used to control the viewing and colors of various parts of the main System Crosspoint Window. You can specify colors for the dots and highlights, BLADEs and signal names, salvo indicators, etc.

| System Crosspoint | System Salvos/Macros | System Info | System LIO Properties | System Config Manager | Syste |

Default View: No View

Default Grid Labels: Name

Default Sort Order:

Sources: Blade Id - Name

Destinations: Blade Id - Pin

☒ Use Style Sheet
☒ Use 24 Hour Time

Blade Colors

🟩 BLD002
🟦 BLD003
🟦 BLD004
🟥 BLD001
🟥 BLD008
🟪 BLD005
🟦 BLD095
🟨 BLD097

Other Colors

[🟪 Grid Hilite]   [🟪 Salvo Hilite]

[🟢 Grid Connection Icon]   [🔵 Salvo Connection Icon]

Grid Logo Default   Salvo Logo Default

Grid Background Default   Salvo Background Default

[Default Grid]   [Default Salvo]

System Log   The last tab is labeled "System Log." This screen shows the logging of various system messages. More on this later.
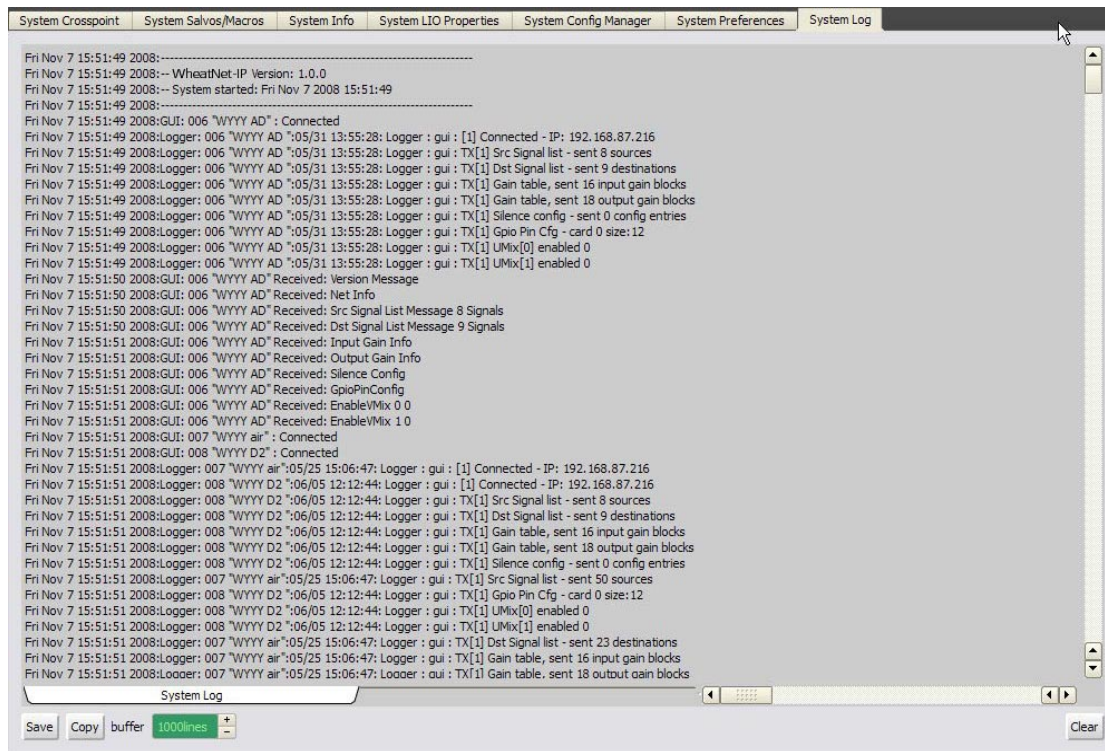
Experiment with clicking on the various tabs until you become familiar with what they contain. Now comes the good part. Over on the system pane, click on a BLADE icon. The main window changes from a system view to a BLADE view, and there are nine new tabs showing information about the particular BLADE you clicked on. The tabs are "Sources," "Destinations," "Visibilities," "LIO Info," "Silence Detect," "Virtual Mixer," "Network

Info," "Version Manager," and "Config Manager." They provide lots of functions and information about the particular BLADE. Again, more on this later.

Of course, if you now click on a different BLADE in the system pane, the main window will show you nine more tabs representing the BLADE you just clicked on.

In this manner you can look at/work on each individual BLADE in the system. Now go back and click on the system icon in the system pane and select the System Crosspoint tab. Click on one of the destination signal names along the left side of the grid and notice the information that appears in the "Details" pane. Essentially everything you would like to know about that signal appears in the Details pane: what its name and ID are, what BLADE it's in, what mode it is, which jacks it uses, what source is crosspoint connected to it, and more. Each time you click on a source or destination name, its information is reflected in this Details pane.

Finally note the Alarms pane normally located just below the system pane. The Alarms pane is a text area that shows a message whenever an alarm function, such as Silence Detection on a particular output, happens.

The System pane, Alarms pane, and Details pane are all scrollable and resizeable in typical Windows fashion. You can also drag and relocate them on the screen, or dock them back to their default locations using the dock buttons along the top of the screen.

In addition to the System, Alarms, and Detail dock buttons, the top of the screen contains buttons for Set Up View, XPoint, and About WheatNet-IP. These buttons activate navigation shortcuts that will take you to some commonly used areas of the Navigator GUI program.

In the WheatNet-IP system, the mechanism for showing a subset of all of the system audio signals is called filtering. You can specify certain search criteria or functions, and the software will restrict the crosspoint grid to show only those signals that fit the criteria. In a large system with hundreds or even thousands of signals, filtering is a way to reduce the amount of scrolling you need to do while navigating on the crosspoint grid. Some common filters might be "show only the signals in BLADEs 2 and 14," or "show me only my mono signals," or "show me only logic signals." As you might expect, you can combine the criteria to create a complex search that significantly reduces the number of signals that meet it.

Open the "Set Up Crosspoint Views" window by clicking on the "Set Up View" button at the top of the screen.
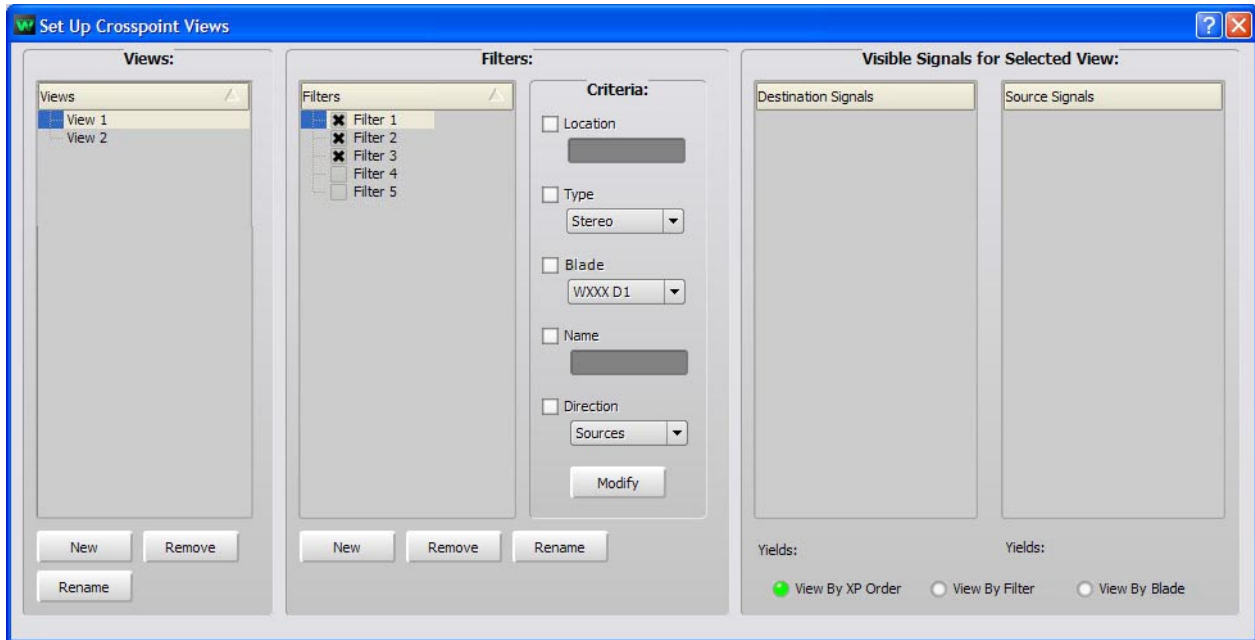
In the window you will notice a list of the currently defined filters, along with some buttons used to create, rename, or delete them. If the list appears empty, then no filters have yet been defined. Click on the "New" button and a new filter having a default name is added to the list. Click the Rename button to open a dialog box that allows you to rename the filter. Type a name that will help you recognize the filter later such as "BLADE 1" or "Morning Show," click "OK," and the window will change to show you the criteria you can specify for your filter. As you click on various check boxes to specify criteria, notice how the source and destination signal lists change to reflect the filter's effect once you've also created a view (see below). Obviously, if you make your filter too exclusive, the signal count will dwindle to zero and the filter will therefore be useless. After all, what good is a filter that removes all of the signals from view, leaving nothing but a blank screen? Don't hesitate to experiment with defining a few filters and seeing how they work. You can always delete them later.

Once you have created a filter, you need to assign it to a view before you can use it. A "View" is simply a collection of one or more filters, and is useful for combining filters for a more complex set of criteria.

Initially, as in filters, no views will show in the list until you have created them. Click on "New" to create a view; you can use the "Rename" button to give it a special name.

Once you have defined one or more views, click on the view name to highlight it. Then, in the Filters list, click on the check boxes to enable the desired filter function(s). Enabling the view by right clicking on the WheatNet-IP logo on the
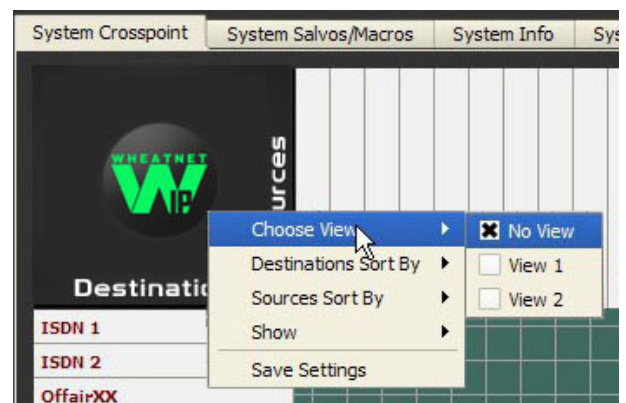
crosspoint grid will give you a new crosspoint grid view with the signals reduced to only those that meet the criteria.

One final note about filters: If you are having trouble locating a signal on the crosspoint grid, make sure you haven't inadvertently enabled a view that excludes it. Right click on the WheatNet-IP logo and Choose View / No View to be sure.

Clicking on this button opens a crosspoint grid window on a floating palette. This can be a very handy function when you are working on a part of the system GUI and need a quick look at the grid to check on some signal or connection information. You could close down whatever window you are working on and go to the "System Crosspoint" tab, but that might mean leaving your work unfinished. Instead, try clicking on the "XPoint" button and opening this floating grid window. You can position it where you like on the screen and use it for reference as you continue your work.

Predictably, this button opens a window displaying the version information for the WheatNet-IP Navigator GUI program.

Now you have learned the basics of navigating around the WheatNet-IP Navigator GUI. It makes no difference if your WheatNet-IP system has two BLADEs in it or a hundred, they are all treated the same way.

An Important Point About WheatNet-IP Systems - The System Master

Because the WheatNet-IP system is dynamic, there needs to be some mechanism to arbitrate and maintain the specifics of the system configuration from moment to moment. "Somebody has to be in charge!" In the WheatNet-IP system, we don't rely on a PC for this role; the entire system is fully functional without any PCs. Since all BLADEs are electrically identical (except for their specific audio I/O ports) the system has been architected with a distributed intelligence. Each and every BLADE has enough on-board intelligence to control the whole system by itself. During initial set up, one of the BLADEs in the system is automatically selected to be System Master. It is this System Master BLADE that gathers all of the information from the BLADEs, control surfaces, and PCs that belong to the system. The Master BLADE then redistributes all of this information back to every BLADE. The Master BLADE and all of the others keep this information in flash memory so it is not lost when the power is turned off. What this means is that every BLADE is fully capable of running the entire system at any moment. In fact, if the Master BLADE is lost for any reason, a new BLADE will be elected as Master and seamlessly take up running the system. The beauty of this architecture is the depth of backup and redundancy automatically provided. Essentially there are as many backup hosts in the system as you have BLADEs; you can never lose your system because a host controller went down. The need for archiving is also greatly reduced, because there is a system copy residing in every BLADE. It's like having a RAID array of hosts. If you look carefully at the list of BLADEs in the System Pane, you will see one of them designated as the current System Master. There is also a front panel LED indicator that lights to show that the BLADE is functioning as the System Master.
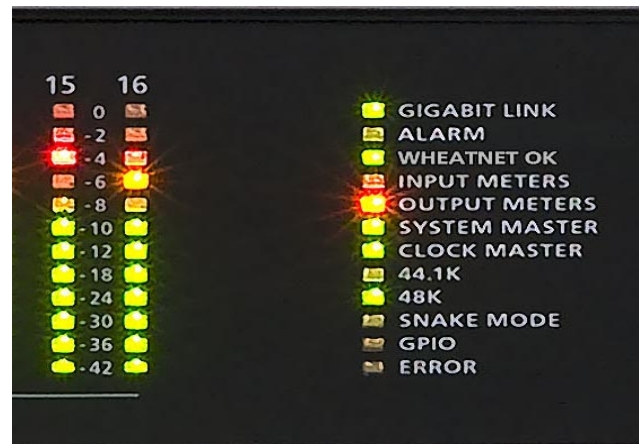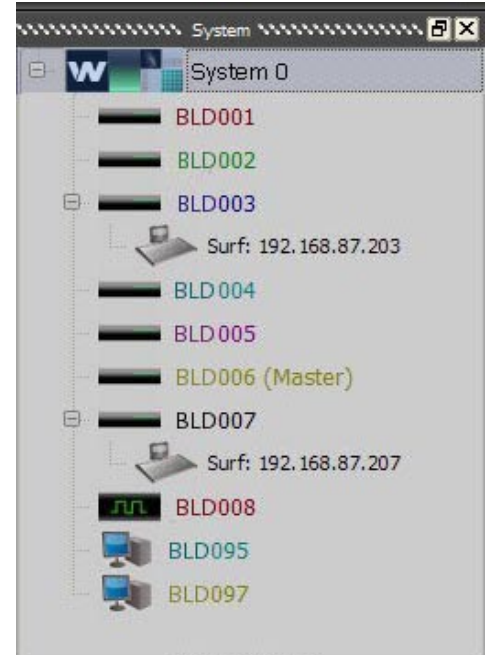
Similarly, the system will also have a Clock Master, responsible for synchronizing timing throughout the system. If a Clock Master has been designated via the System Info tab (see later in this chapter) by assigning a Primary External Reference, then that BLADE will be indicated in the System Pane by the "BLADE wave" icon - see BLD008 in the example shown. If, however, no such assignment is made, the system will self-designate a Clock Master and flag it as such in the System Pane. Once again, a front panel LED lights on the designated BLADE.

Note that in a single BLADE system the one BLADE will serve as both the System Master and the Clock Master.

Navigator GUI System Windows in Detail

System Crosspoint Tab
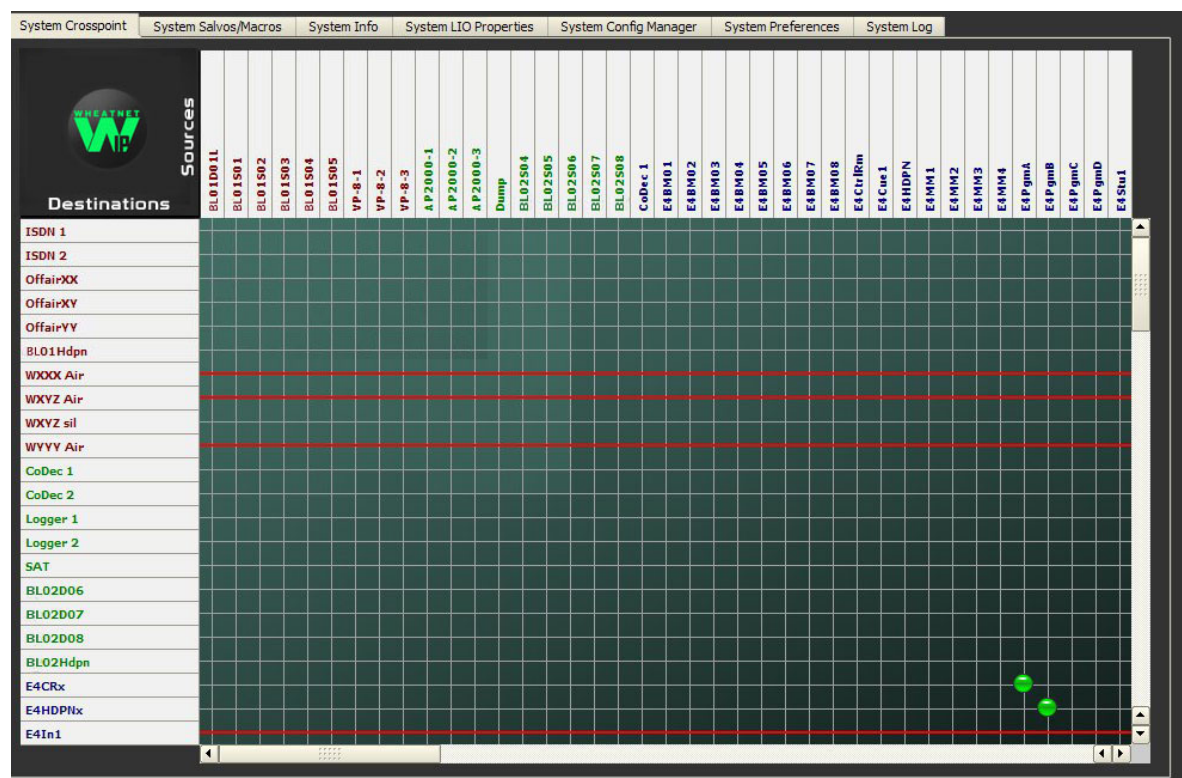
This window is the main crosspoint window for the GUI. It is used to make/break/view crosspoint connections. In a LAN based audio network, just what is a crosspoint connection? After all, there is no audio router or patch bay to make audio connections. Simply put, a crosspoint connection represents a message that a particular destination (i.e. network address) wants to subscribe to the multicast packets representing a particular audio stream. The Ethernet switch obliges by forwarding those packets along to the subscribing device. In the Navigator GUI, this is shown as a dot at the grid intersection of the source (multicast stream) and destination (subscribing device).

In the most basic view, the System Crosspoint window shows all of the system sources across the top and all of the system destinations vertically on the left. The default view has these signals shown first in numerical order of the BLADEs, and alphabetically by signal name within the BLADE. Furthermore, each BLADE has a color, and the BLADE's signals are shown printed in matching color. This is meant to help identify which signals go with which BLADE.

SYSTEM CROSSPOINT DETAILS MENU

There are refinements to the basic view that come in very handy. If you right click on the WheatNet-IP logo of the system crosspoint window, a popup window with four sub-menus will appear.

Choose View

Various filters can be defined to restrict the crosspoint view of the system. This is useful when you have a large system with hundreds of signals and want to work on a small section of it. The filter manager tool of the GUI (see the SetUp View button discussion) allows you to define filters based on BLADE ID, signal type (mono, stereo, logic only), location, sources, or destinations, and assemble them into Views. The Choose View menu allows you to specify any of the views you have defined, and the crosspoint grid will immediately shrink, removing those signals not part of your selected view.

Hint: if you know you have a signal in your system but it is not appearing in the crosspoint grid, right click on the WheatNet-IP logo and select Choose View / No View. Chances are your signal will now appear in the grid - your filter setting was excluding it.

Destinations Sort By

This menu allows you to change the order in the crosspoint grid for the destination signals. The choices are:

BLADE Id - Name - This is the default. The destinations show in order of BLADE ID, then alphabetically by name.

BLADE Id - Pin - The destinations show in order of BLADE ID first, then connector number.

BLADE Id - Location - The destinations show in order of BLADE ID, then alphabetically by location name.

Name - BLADE ID - The destinations show alphabetically by name first, then by BLADE ID. Useful for when you use a name like "CD 1" over and over.

Name - Location - The destinations show alphabetically by name first, then by location name.

Location - BLADE ID - The destinations show alphabetically by location name, then by BLADE ID.

Signal ID - The destinations show in order of their system assigned signal ID.

Sources Sort By

This menu allows you to change the order in the crosspoint grid for the source signals. The choices are:

BLADE Id - Name - This is the default. The sources show in order of BLADE ID, then alphabetically by name.

BLADE Id - Pin - The sources show in order of BLADE ID first, then connector number.

BLADE Id - Location - The sources show in order of BLADE ID, then alphabetically by location name.

Name - BLADE ID - The sources show alphabetically by name first, then by BLADE ID. Useful for when you use a name like "CD 1" over and over.

Name - Location - The sources show alphabetically by name first, then by location name.

Location - BLADE ID - The sources show alphabetically by location name, then by BLADE ID.

Signal ID - The sources show in order of their system assigned signal ID.

Show

This menu allows you to change the information showing in the grid labels for each signal. The choices are:

Name - This is the default. Only the eight character name is shown on the grid label.

Name - Location - Both the eight character name and eight character destination are shown on the grid label.

Signal Id - Name - Both the system assigned signal ID and the eight character name are shown on the grid label.

DESTINATION DETAILS MENU

You have already learned how to make and break crosspoint connections from the grid. Here are some more things you can do. By right clicking directly over the name of a destination, you can bring up the destination details menu.

This menu allows you to access some very common functions:

Choose View

This is same function as mentioned previously. Various filters can be defined to restrict the crosspoint view of the system. This is useful when you have a large system with hundreds of signals and want to work on a small section of it. The filter manager tool of the GUI allows you to define filters based on BLADE ID, signal type (mono, stereo, logic only), location, sources, or destinations and assemble them into Views. The Choose View menu allows you to specify any of the views you have defined, and the crosspoint grid will immediately shrink, removing those signals not part of your selected view.

Hint: if you know you have a signal in your system but it is not appearing in the crosspoint grid, right click on the WheatNet-IP logo and select Choose View / No View. Chances are your signal will now appear in the grid - your filter setting was excluding it.

Destinations Sort By

This menu allows you to change the order in the crosspoint grid for the destination signals. The choices are:

BLADE Id - Name - This is the default. The destinations show in order of BLADE ID, then alphabetically by name.

BLADE Id - Pin - The destinations show in order of BLADE ID first, then connector number.

BLADE Id - Location - The destinations show in order of BLADE ID, then alphabetically by location name.

Name - BLADE ID - The destinations show alphabetically by name first, then by BLADE ID. Useful for when you use a name like "CD 1" over and over.

Name - Location - The destinations show alphabetically by name first, then by location name.

Location - BLADE ID - The destinations show alphabetically by location name, then by BLADE ID.

Signal ID - The destinations show in order of their system assigned signal ID.

Show

This menu allows you to change the information showing in the grid labels for each signal. The choices are:

Name - This is the default. Only the eight character name is shown on the grid label.

Name - Location - Both the eight character name and eight character location are shown on the grid label.

Signal Id - Name - Both the system assigned signal ID and the eight character name are shown on the grid label.

Rename Signal

Choosing this function will open up a "Rename Signal" window. You will use this function a lot to replace the system auto-generated signal names with names that have more meaning for you. Here you can type a new name, up to eight characters long, for the signal. As soon as you click on the "OK" button, the new name will be broadcast throughout the system and get updated everywhere.

Modify Signal

Choosing this function will open the "Destination Signal Wizard" window. You will also use this function frequently, at least in the beginning. This wizard is used to attach logic, map the audio to the connectors, set up silence sensing, and define the signal type (mono, stereo, etc.). During initial configuration of the BLADE, the System Wizard will assign default values for these items; Type Info = Mono or Stereo, dependant on which signal template you chose, Wire Info = in order, i.e. signal 1 will be mapped to connector position 1, signal 2 will be mapped to connector position 2, etc., Silence Detect, if enabled via the checkbox, = -40 dBFS threshold and 20 seconds duration, and LIO Info = none. You can navigate between these functions by clicking on the tabs at the top of the window.

Type Info: The choices are 5.1 Surround, Stereo, Mono, or LIO only (LIO stands for Logic Input or Output). The first three choices are for various kinds of audio, while the fourth, LIO only, is for discrete logic signals as described in the logic section. You can also use this window to change the signal name, if desired. Finally, there is a check box that will enable the Silence Detect function for this destination signal.

Wire Info: The actual physical connection of the audio destination signal. For an all mono BLADE, the first output connection on a BLADE is called "Wire 1" and the last output connection is called "Wire 16." If the BLADE is all stereo, the first output connection is called "Wire 1 LT" and the last output connection is called "Wire 8 RT." These
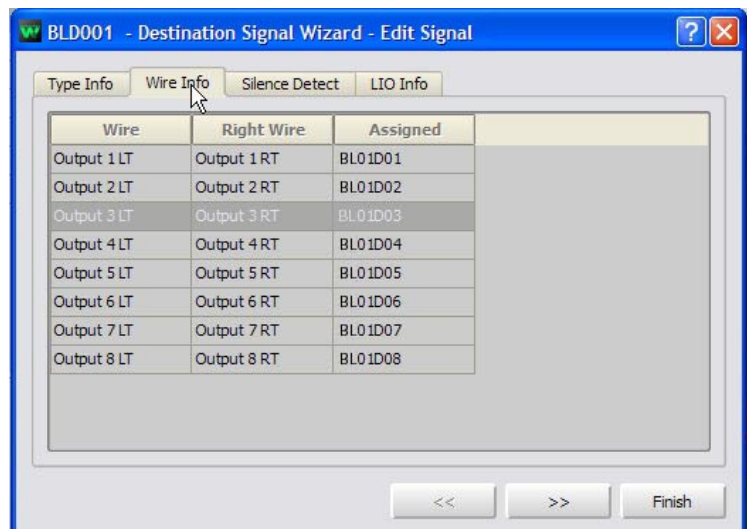
wire numbers correspond to the connection numbers on the wiring diagrams, and also the rear panel silk screening on the BLADE chassis, and define the connector you need to plug into to get the signal. The system defaults to the first signal on the first connector, etc., but you can map them any way you like by selecting the wire in this screen. Note that if you try to map a destination to a connector that has already been used, the GUI will alert you to the error.

Silence Detect: This function, when engaged, continuously monitors the destination signal for audio content. If the signal falls below the specified threshold for longer than the specified duration, then various things can happen. First, a silence detect alarm will be issued and shown in the "Alarms" window of the GUI.
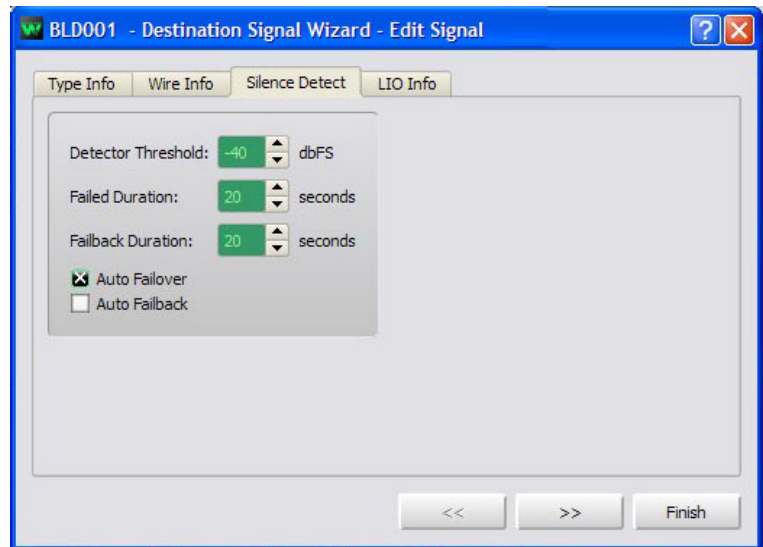
A logic signal can be triggered, and if "Auto Failover" has been selected, a secondary source you have previously defined will be switched to the destination. Finally, if "Auto Failback" has been selected, then the destination will be switched back to the original source if audio has been restored for at least as long as the specified duration. Use this window to define these parameters. Note that for silence detect to work, it must first be enabled in the "Type info" window by clicking the check box, and the secondary source must be defined using the GUI "Silence Detect" tab for the individual BLADE.

LIO Info: This window shows the parameters for audio associated logic for the signal. Up to 12 functions can be defined and attached to the audio signal. To activate an audio associated logic signal, click on the LIO Info tab of the signal Wizard screen. Select "Add" from the right side of the window. Now select the logic port you wish to configure by clicking on the appropriate wire. Select the direction (Input or Output) and assign a function (machine start, on tally, etc.) from the drop down selection. When you are done click Apply, then Finish. If you find that your logic works backwards, you can click on the "Invert" check box to reverse the sense of the logic. You cannot change the settings in a connected signal.

Lock Signal

Select this function to "lock" a source connection to this destination. Once locked, a connection cannot be broken without the proper password access to the Navigator GUI. A locked connection is shown on the crosspoint grid as a red line from the destination across the grid.
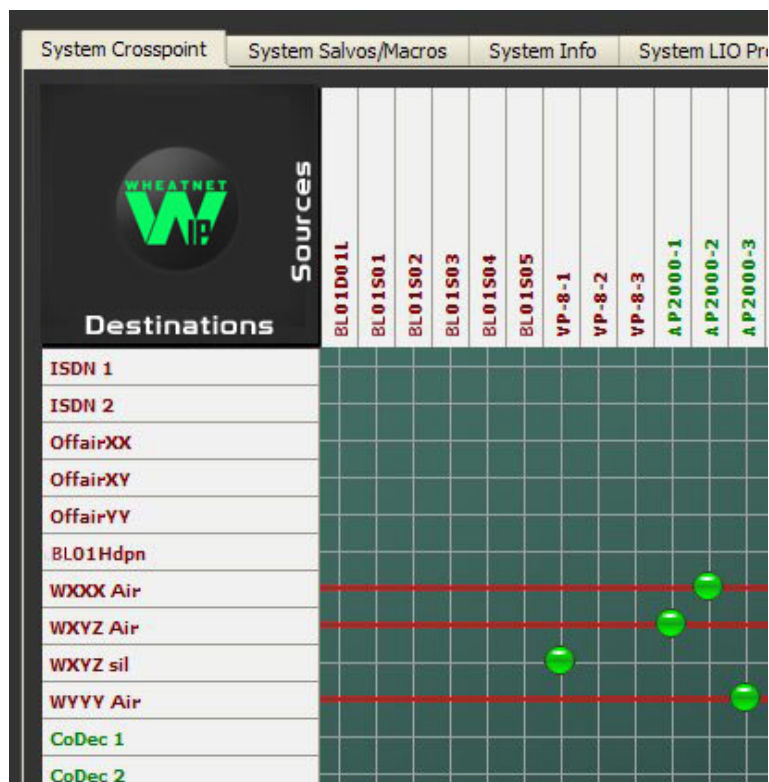
SOURCE DETAILS MENU

In a similar fashion, if you right click over any source name on the crosspoint grid, you will open the source details window.

This menu allows you to access some very common functions:

Choose View

This is same function as mentioned previously. Various filters can be defined to restrict the crosspoint view of the system. This is useful when you have a large system with hundreds of signals and want to work on a small section of it. The filter manager tool of the GUI allows you to define filters based on BLADE ID, signal

type (mono, stereo, logic only), location, sources, or destinations, and assemble them into Views. The Choose View menu allows you to specify any of the filters you have defined, and the crosspoint grid will immediately shrink, removing those signals not part of your selected view.

Hint: if you know you have a signal in your system but it is not appearing in the crosspoint grid, right click on the WheatNet-IP logo and select Choose View / No View. Chances are your signal will now appear in the grid - your filter setting was excluding it.

Sources Sort By

This menu allows you to change the order in the crosspoint grid for the source signals. The choices are:

BLADE Id - Name - This is the default. The sources show in order of BLADE ID, then alphabetically by name.

BLADE Id - Pin - The sources show in order of BLADE ID first, then connector number.

BLADE Id - Location - The sources show in order of BLADE ID, then alphabetically by location name.

Name - BLADE ID - The sources show alphabetically by name first, then by BLADE ID. Useful for when you use a name like "CD 1" over and over.

Name - Location - The sources show alphabetically by name first, then by location name.

Location - BLADE ID - The sources show alphabetically by location name, then by BLADE ID.

Signal ID - The sources show in order of their system assigned signal ID.

Show

This menu allows you to change the information showing in the grid labels for each signal. The choices are:

Name - This is the default. Only the eight character name is shown on the grid label.

Name - Location - Both the eight character name and eight character location are shown on the grid label.

Signal Id - Name - Both the system assigned signal ID and the eight character name are shown on the grid label.

Rename Signal

Choosing this function will open up a "Rename Signal" window. You will use this function a lot to replace the system auto-generated signal names with names that have more meaning for you. Here you can type a new name, up to eight characters long, for the signal. As soon as you click on the "OK" button, the new name will be broadcast throughout the system and get updated everywhere.

Modify Signal

Choosing this function will open the "Sources Signal Wizard" window. You will also use this function frequently, at least in the beginning. This wizard is used to attach logic, map the audio to the connectors, and define the signal type (mono, stereo, etc.). During initial configuration of the BLADE, the System Wizard will assign default values for these items: Type Info = Mono or Stereo, depending on which signal template you chose; wire info = in order, i.e. signal 1 will be mapped to connector position 1, signal 2 will be mapped to connector position 2, etc.; and LIO info = none. You can navigate between these functions by clicking on the tabs at the top of the window.

Type info: The choices are 5.1 Surround, Stereo, Mono, or LIO only (LIO stands for Logic Input or Output). The first three choices are for various kinds of audio, while the fourth, LIO only, is for discrete logic signals as described in the logic section. You can also use this window to change the signal name, if desired.

Wire info: The actual physical connection of the audio destination signal. For an all mono BLADE, the first input connection on a BLADE is called "Wire 1" and the last input connection is called "Wire 16." If the BLADE is all stereo, the first input connection is called "Wire 1 LT" and the last input connection is called "Wire 8 RT."
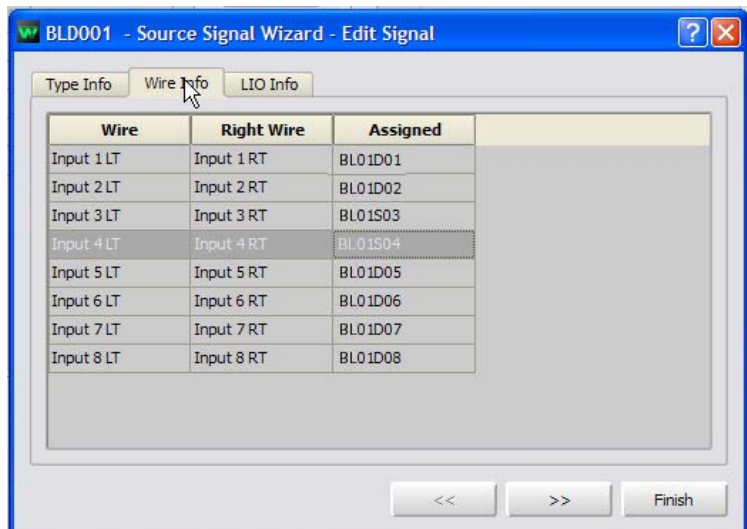
These wire numbers correspond to the connection numbers on the wiring diagrams, and also the rear panel silk screening on the BLADE chassis, and define the connector you need to plug into to get the signal. The system defaults to the first signal on the first connector, etc., but you can map them any way you like by selecting the wire in this screen. Note that if you try to map a source to a connector that has already been used, the GUI will alert you to the error.

LIO Info: This window shows the parameters for audio associated logic for the signal. Up to 12 functions can be defined and attached to the audio signal. To activate an audio associated logic signal, click on the LIO Info tab of the signal Wizard screen. Select "Add" from the right side of the window. Now select the logic port you wish to configure by clicking on the appropriate wire. Select the direction (Input or Output) and assign a function (machine start, on tally, etc.) from the drop down selection. When you are done click Apply, then Finish. If you find that your logic works backwards, you can click on the "Invert" check box to reverse the sense of the logic. You cannot change the settings on a connected signal.

System Salvos/Macros Tab

In the WheatNet-IP system, you can group up to 100 connection states into a "Salvo" and then trigger the one Salvo instead of the 100 individual connections. This capability is especially useful for systematic events involving multiple connection changes. Going from your late night automated set up into your Morning Drive Show is a good example. It may involve switching out automation from your air feed, bringing in a control surface, a bunch of mics, switching headphone feeds, connecting automation playback decks, etc. The good news is that this set up tends to be the same every day. Go ahead and group all of these connections into a Salvo, and instead of all the patching and cross connecting you would have had to do in the old analog days, you can simple click on a menu selection (or press a button if you map the Salvo to an LIO port) and make these wholesale changes quickly and reliably. It's one of the great benefits of having a networked system in the first place.

Here's how to do it. Click on the Salvos/Macros tab, and a new window opens. It shows a crosspoint grid with scroll bars, like you have seen before, but there are differences. A new button area labeled "Salvos" has appeared on screen between the system tabs and the crosspoint grid itself. Also, the grid background shows the legend "Salvo Edit Screen," and any dots on the grid representing connections will be in a new color. By the way, the trick you learned earlier about right-clicking on the WheatNet-IP logo on the crosspoint grid also works here. It will bring up some of the same menus that change how the signals are labeled and sorted on the grid (by name, ID, etc.). Any of the filters you've defined for restricting the crosspoint view will also be usable on the salvo grid.
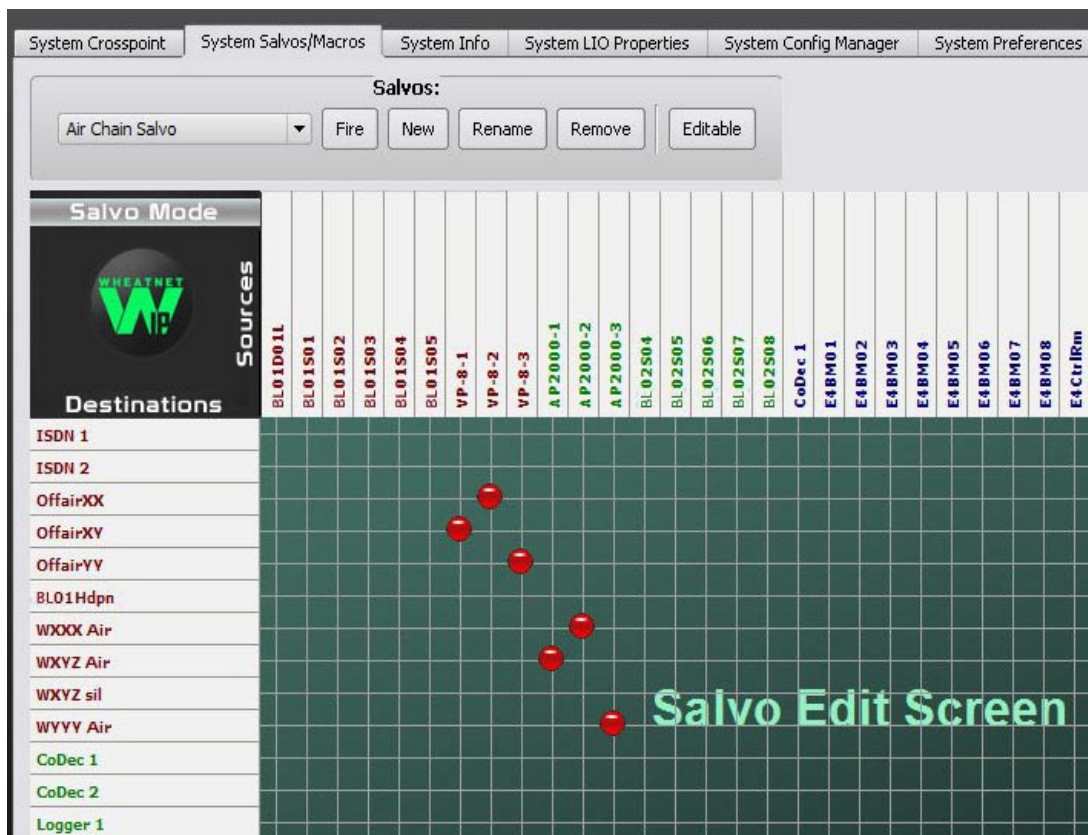
In the left part of the salvo button area is a selection window. Initially it will say "Salvo 1 (empty)." As you define Salvos, their names will appear in this selection window. Executing a Salvo is simply a matter of scrolling through the list in this selection window to highlight the desired Salvo, and then clicking on the "Fire" button. Don't be alarmed if you don't see any crosspoint changes on the grid; remember this is the Salvo Edit Screen. You can click on the System Crosspoint tab (or use the floating Crosspoint window) to verify that your connection changes actually happened.

Click back on the System Salvos/Macros tab if you aren't already there and click on the "New" button in the salvo button area. A blank grid will appear, and a new salvo name, "Salvo x" will be added to the salvo selection window where "x" is the next salvo number available. In the case of the first salvo created, the default name will be "Salvo 1" and so forth. Click on the button labeled "Editable" to highlight it. Click on any source - destination connections you want to include in your salvo and a dot will appear on the appropriate grid intersection. If you have any destinations you simply want to disconnect and not use, right click on the destination name and select "Disconnect Destination;" a solid line will be drawn across the grid at the destination, indicating that there are no sources connected to the destination. When you are finished, you can click on the button labeled "Rename" if you would like to overwrite the default salvo name with something more identifiable, say for instance "Morning Show." A good name for the salvo is very useful in other parts of the Navigator GUI, such as the LIO mapping area where you can assign salvos to buttons. You'll see a list of salvo names exactly as shown here in the salvo select window.
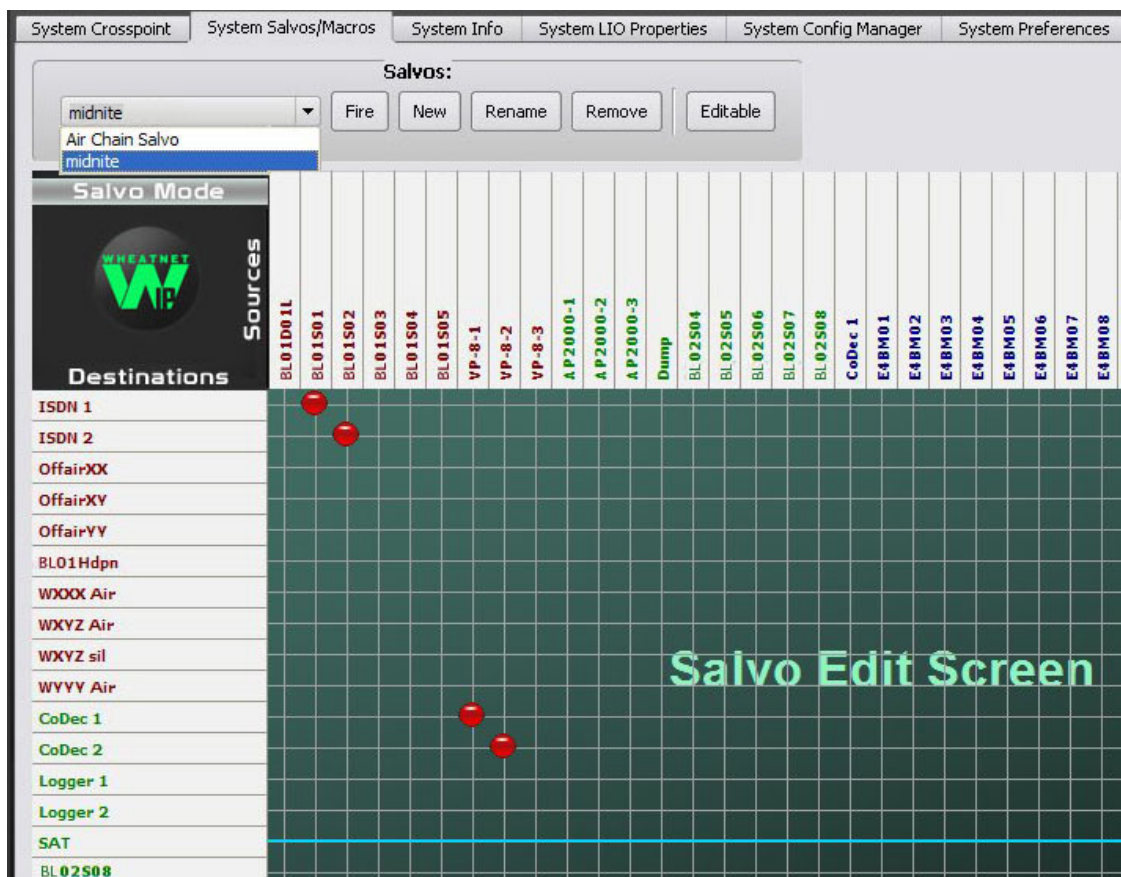
A few final hints about salvos. When you switch to the System Salvos/Macros tab, the screen will go to the view from the last time the salvo window was opened. Also, if you find you can't change connections on the grid, make sure you've clicked the "Editable" button first. We've chosen to make the salvo edit process take two steps so as to avoid inadvertent changes caused by accidental mouse clicks during casual viewing. Finally, salvos are executed very quickly; however, there is a sequence to them. Connections changes are made in the order they were created in the salvo, so if the order is important to you, keep this in mind while creating the salvo.

System Info Tab

Clicking on the System Info tab removes the crosspoint grid from the main part of the GUI screen and opens a new window. Within this window are four subwindows used for setting up important system functions.

Clock Master Info

In the WheatNet-IP system, in order to keep all of the audio channels in all of the connected BLADEs and PCs synchronized, one of the BLADEs is designated as "system clock master." This is something that is normally done automatically by the system at start up time, but this window allows you to deliberately specify the clock master. Why would

you want to do this? In the case where you are trying to synchronize the entire system to some external AES master clock. By feeding the external clock reference into AES input 8 of one of your digital BLADEs and selecting that BLADE in the "Primary External Reference" window, you will force the system to slave off of the timing reference on input 8 of the designated BLADE. We chose input 8 as the reference input

because the external clock reference chews up an audio channel, and input 8 seems less valuable than, say, input 1. Note that you can also specify another BLADE to be a "Secondary External Reference" for back up. In this case if you provide the same AES reference signal to the secondary clock master BLADE, the system will stay locked to the external reference should the primary clock master BLADE loose power or otherwise go down.

This window also has two buttons to set the system clock rate to be either 44.1K or 48K. While this selection is not so significant for AES digital input signals because all AES inputs in BLADEs are equipt with sample rate converters, it does set the sample rate of all of the system's AES digital outputs. Most modern digital devices can accept various sample rates, but there are still some out there (primarily Automation PCs) that require a specific sample rate.

Choose the settings you want in this window and click on the "Apply" button to execute them.

How does this all work? The system will synchronize to the BLADE that is the primary clock master. This will be indicated in the System Pane of the GUI by a BLADE wave signal overdrawn on the appropriate BLADE icon. There is also a front panel LED that will also be lit to show that the BLADE is the primary clock master. That BLADE will use whatever AES signal that is connected to input 8 as the clock reference; if there is nothing connected to input 8, or if the device connected to input 8 goes away, it will use its own internal reference. If the primary clock master BLADE itself should power off, become disconnected, or otherwise cease to function, the secondary clock master will take over so be sure to connect your external AES reference signal to input 8 of the secondary clock master too if you need to keep the system locked to the external reference.

Set Date and Time

This window is used to set up the date and time of day for the WheatNet-IP system. There are two modes the system can operate under, manual and NTP. The mode is chosen with the "Adjustment:" buttons.

In NTP mode, each BLADE and surface will subscribe to a network time server and maintain date/time synchronization with the network server.

In Manual mode, you have two choices. You can specify the date and time yourself by clicking a section in the window and clicking on the up/down arrows to advance or backtrack the section, or you can take a short cut and simply click on "use this PC's time." In that case the time settings on the GUI PC will be distributed to the BLADEs and control surfaces. It will take a little while after making your selection for everything to get updated.

The system date and time settings aren't visible in the system during normal operation but

you should still take the time to set this carefully. Each BLADE maintains a log which can be useful for checking and troubleshooting problems. This log has a date and time stamp on it that is derived from the system date/time. Also, each control surface has a time of day display that is controlled by the system date/time.

Choose the settings you want in this window and click on the "Apply" button to execute them.

Web Access

Each BLADE runs a web server while operational to allow easy access to settings from a browser on any PC on the network. The webserver provides three levels of access, "admin," "user," and "guest," each of which can have a different password. To set a password for one of these levels, scroll the list to select the desired level and then enter a password.

Once you have completed the settings you want in this window, click on the "Set Password" button to execute them. Users attempting to log into a BLADE via their browser will be prompted for a password which will restrict their access to the level you've specified. Default passwords are identical to the User ID; that is, the default password for user admin is admin, etc.
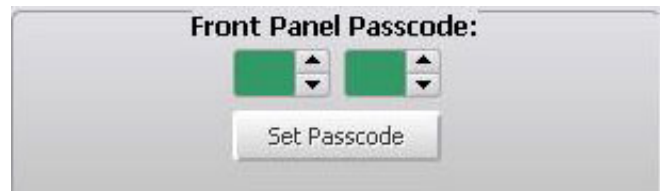
Front Panel Passcode

In a similar vein, you can restrict access to all front panel functions of the BLADEs with passwords, such as REBOOT, FACTORY RESET, IP ADDRESS, etc. These are the functions that can significantly alter the functionality of a BLADE, so their access can be controlled with passwords. The passwords are all numbers because users will use the front panel encoder to enter them. Use the up/down arrows or else type the numbers in directly to specify the password. Useable values are in the range 0 - 255.
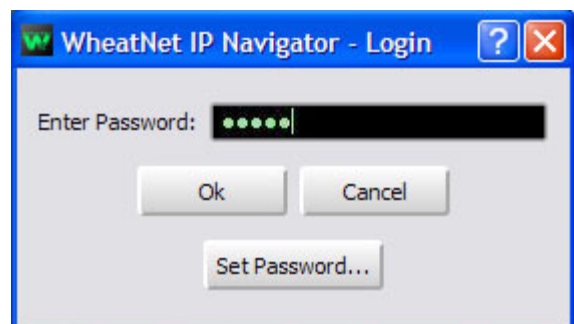
Once you have completed the settings you want in this window, click on the "Set Passcode" button to execute them. Users attempting to log into the sensitive areas of a BLADE via the front panel will be prompted for a password which will prevent their access unless entered correctly.

GUI Access Passcode Window

Here you can specify a passcode to be used to allow system access from the GUI. When it is first launched, the GUI opens a dialog box asking for a password. If the correct password is not entered, then system access is denied. The default is no password.

System 3rd Party Devices Tab

There are a number of products in the WheatNet-IP system that must be added to the *System 3rd Party Devices* tab in the Wheatstone WheatNet-IP Navigator program (aka the Navigator GUI) to utilize their complete set of features. Such devices include certain Control Surfaces, Audio Processors, and some other control devices and system components.

You will need to know the IP address of the device being added, so you will want to find that out before you start.

With the Navigator GUI and with **System 0** selected in the *System* pane you will see something like this:

Now, to the right of the *System* pane, select the *System 3rd Party Devices* tab.

Device	IP Address	Port	Host Blade	Id	Vendor	Product
JJ Meter	192.168.87.129	60021	AudioBL1	1	Wheatstone	MeterMonitor
TS22 A	192.168.87.220	60021	AudioBL1	3	Wheatstone	TS22
dw met	192.168.87.130	60021	AudioBL1	2	Wheatstone	MeterMonitor

Click the *Add* button to bring up the *Add 3rd Party Device* dialog:

Type in a convenient *Name* and insert the *IP Address* of the device being added. Leave the *TCP Port* at the default setting of **60021**. From the *Host Blade* drop down select the Blade that you want to associate the 3rd Party device with. Click *Ok*.

This completes the process of adding the device to the *System 3rd Party Devices* tab. The added device should show up in the *System* pane under the Blade you added it to. If it does not show up, or if it shows up but has a yellow question mark on it, then there is either a network issue that needs attention, or the device is not connected to the network at all, or one or more steps have been omitted or done incorrectly in the configuration process.

System LIO Properties Tab
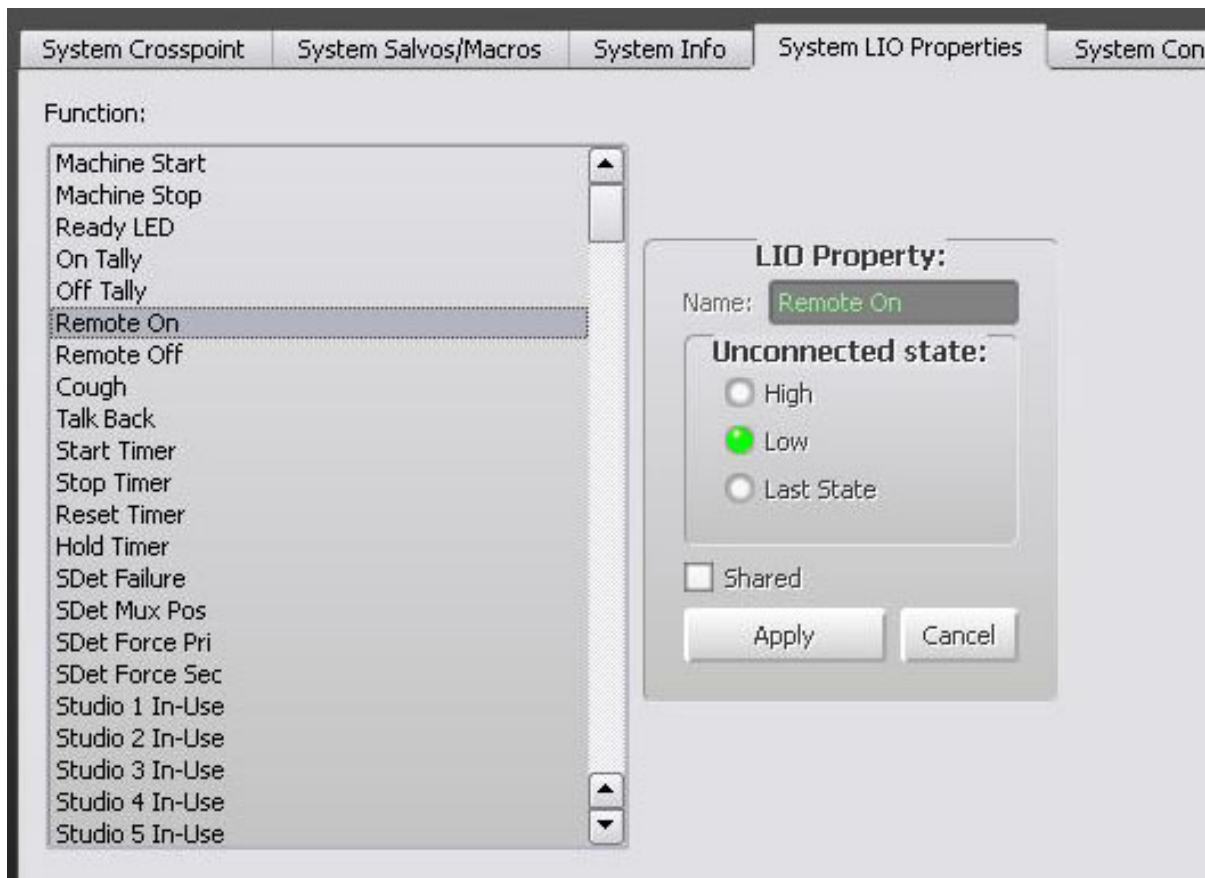
This screen is used to set certain logic output function properties. The logic system in WheatNet-IP works by using crosspoint connections between logic inputs and logic outputs to establish a logic path. If a logic source, for instance a switch, is crosspoint connected to a logic destination, say relay #1, and they both have been defined with the same function (start, remote on, user 23, etc), then the switch will trigger relay #1 as long as the crosspoint connection is maintained. If that connection is broken and, instead, a connection is made to a different logic destination, say relay #2, then the switch will trigger relay #2. The question then becomes "How should a logic output behave when it is disconnected from a logic input?" The Navigator GUI allows you to specify this behavior separately for each logic function (starting with function User 1). This capability can be very useful with some types of machines that also have front panel controls. These controls may not function if the remote control logic ports of the machine are held in the wrong state. The choices for the disconnected state of a logic output are:

High - When the output is disconnected from a logic input it will go high.

Low - When the logic output is disconnected from a logic input it will go low. This is the default.

Last State - When the logic output is disconnected from a logic input, it will stay in whatever state it was last in.

To change from the default, select the logic function desired from the scrolling list. Its disconnect state will appear in the "Unconnected state:" window. Click on the button to make your choice, then click on "Apply."

The LIO Property: section of the window also has a "Shared" check box. It is rather easier to explain the use of this check box by first explaining what we mean by the opposite term, "not shared." The factory defined logic functions all work in a "not shared" mode. This is best described using a specific example from a system that includes one or more surfaces.

Let's say that you have a CD player signal with an associated "Machine Start" logic output. This would typically be the case when you want the CD player to begin playing a cut when a surface fader's ON button is pressed. But what happens when that same CD player also gets assigned to a different fader, say on another surface in a different studio? We normally would not want an ON button press on this second fader to fire the Machine Start logic while the cut is playing, possibly on air, on the first surface, since it might restart the cut, or switch to a new cut. In fact, using the factory defined functions, like "Machine Start," we lock out control from additional faders when the first fader is turned on, rather than "share" the logic signal.

Having said that, checking the "Shared" check box for a user defined logic signal allows the signal to be shared among users of the signal. In the above example, with both faders on, either fader's ON button could fire a shared user defined function at any time.

System Config Manager Tab
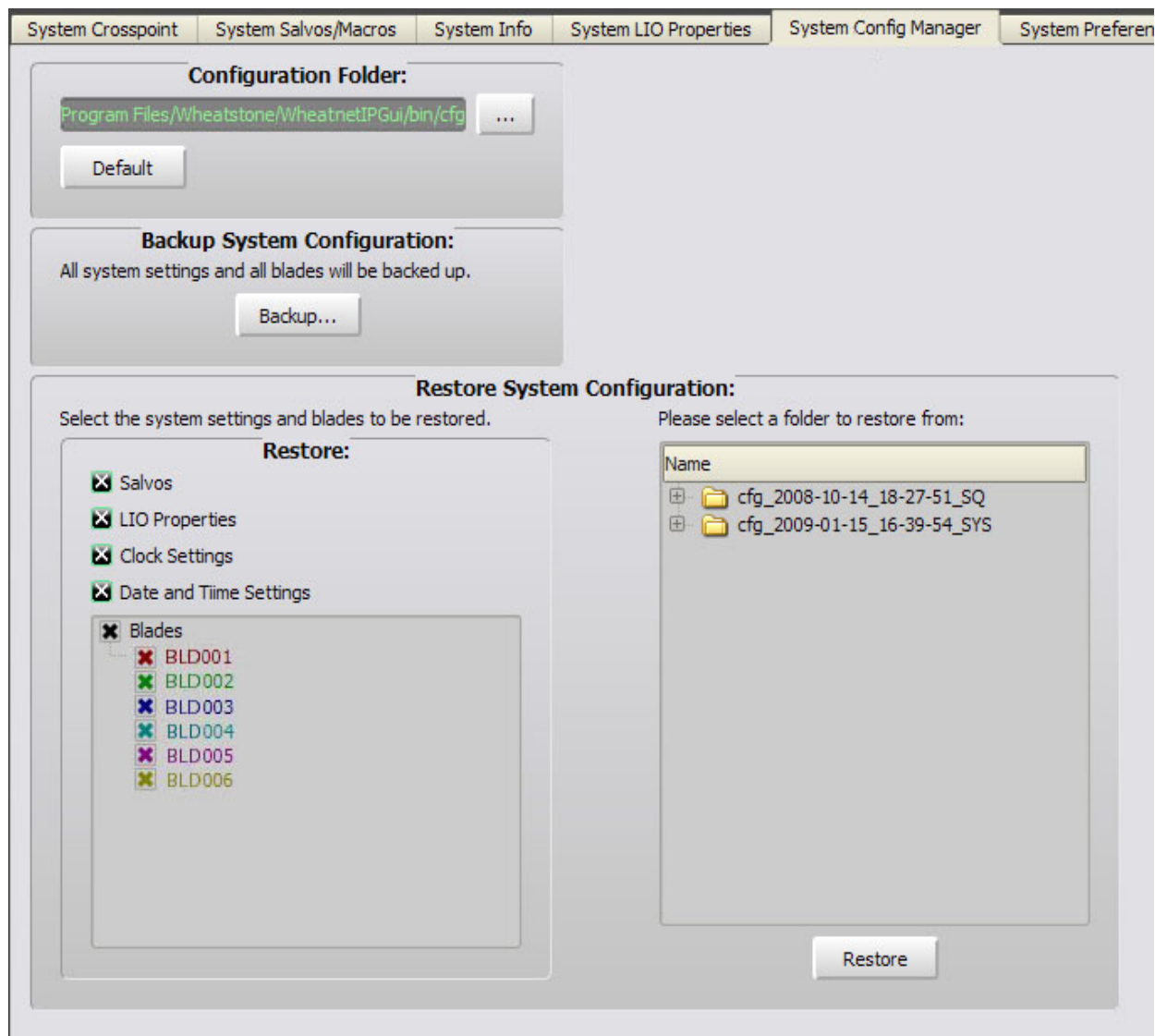
This screen allows you to specify a directory on the GUI PC to be used to Archive system information, to back up data to the directory, or restore data to the system from the directory. As in any digital system, it's a good idea to back up critical information regularly.

In the WheatNet-IP system, there are two classes of data for archiving, system data such as salvos, clock, date, and password information, LIO properties, and so forth, and BLADE data such as signals, names, silence detect parameters, logic port mapping, etc. The System Config Manager window has three sub windows:

Config Folder

In this window you choose the specific directory for the Archive. The default directory is shown in the box, or you can click on the "..." button to open another window to browse for a different directory. If you decide to change the default directory, browse for and highlight the new one in the box and then click the "Default" button.
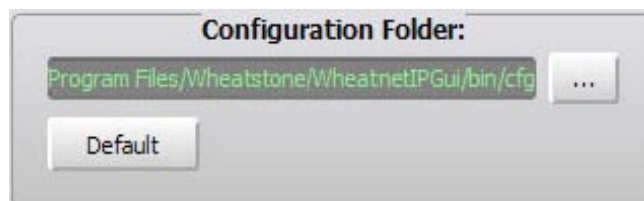
Backup System Configuration

This window is quite simple. Click on the "Backup..." button and the system information will be sent to a new, automatically named, directory created in the directory specified in the "Config Folder" window.
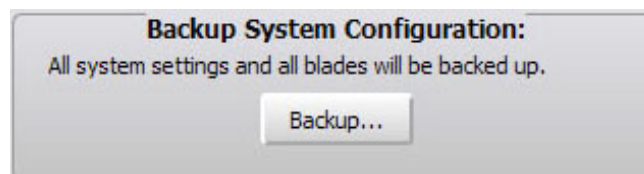
Restore System Configuration
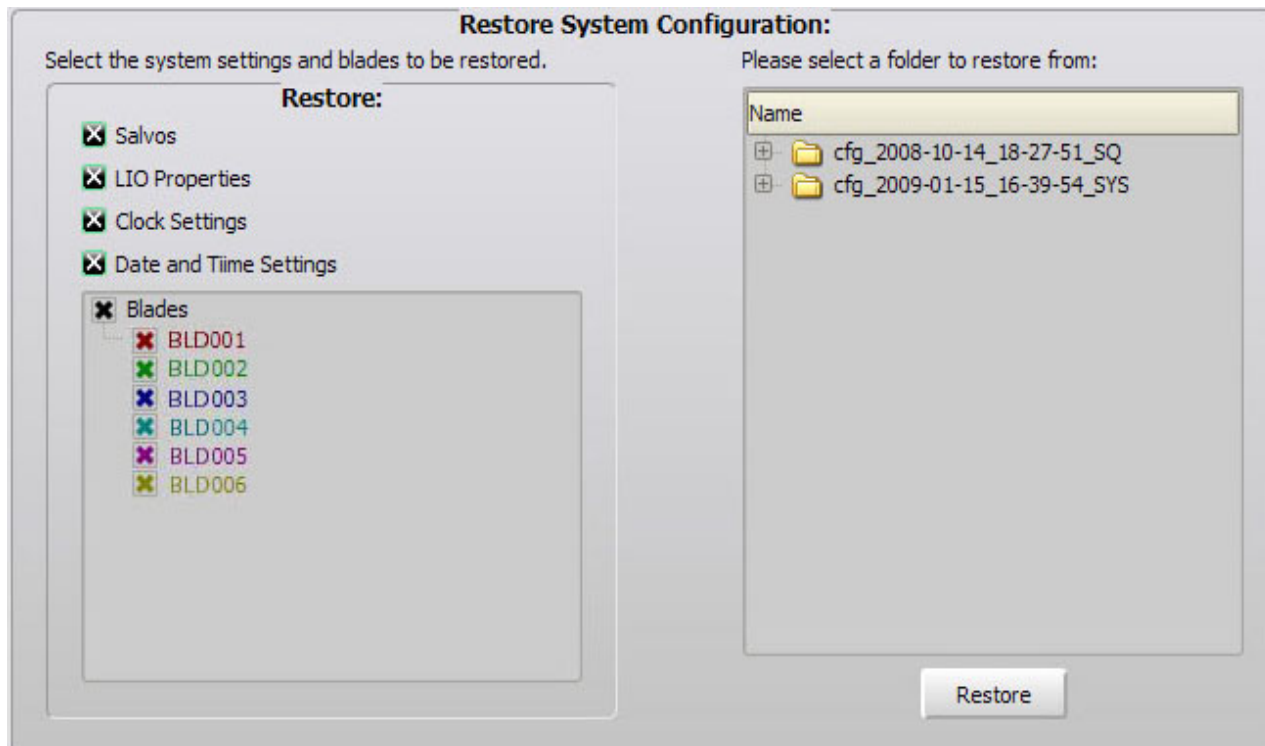
This window is used for restoring data from the Archive back to the WheatNet-IP system. In the right hand pane you select a directory to restore from. You are given four choices of data in the "Restore:" section, Salvos, LIO Properties, Clock Settings, and Date and Time Settings. Click on the check boxes to select any or all of these. In the BLADEs section you can click any or all BLADEs to be stored.

Once you have made your selection, click on the "Restore" button.

System Preferences Tab
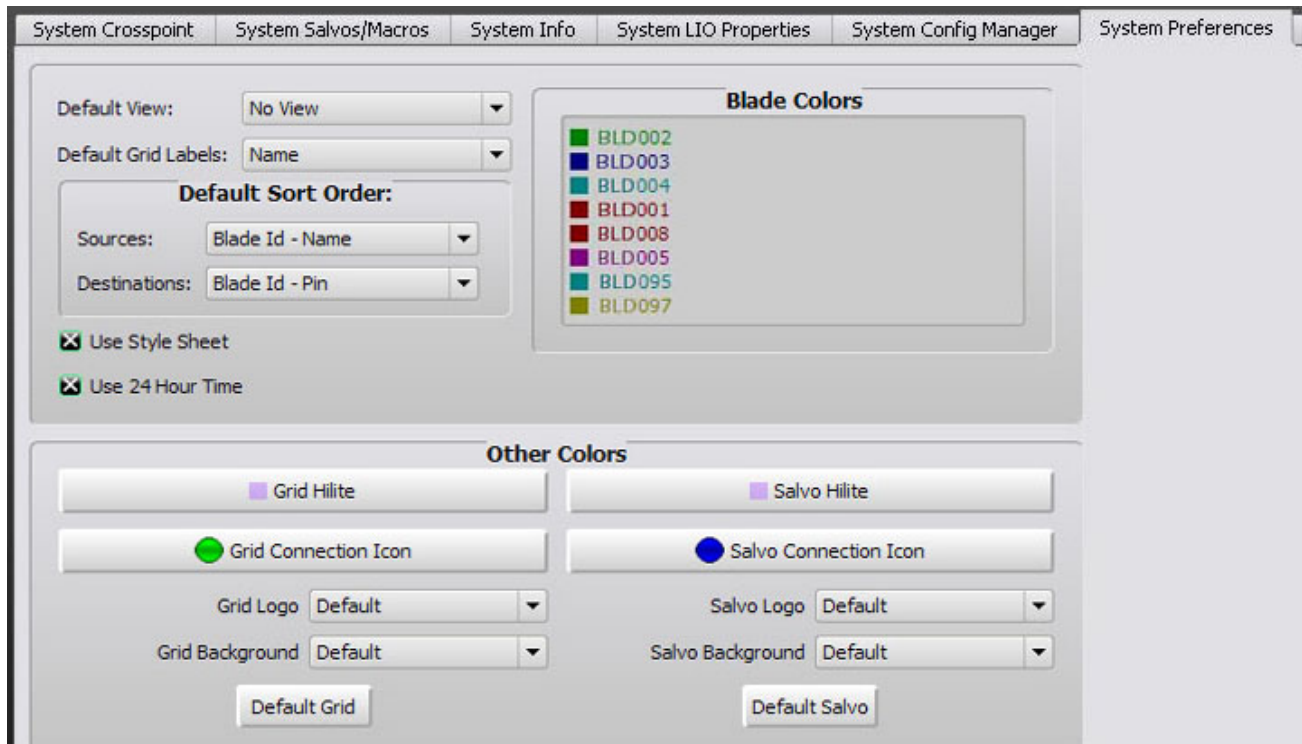
This window is used to change the look and feel of the Navigator GUI. Within it are several sections that control a number of default settings of the program. Click on the System Preferences tab to open this window and you'll note the selections:

Default View

Clicking in this box opens a drop down window listing all of your defined views. Chose one of them to be the default and this view will automatically be applied every time you open the GUI, showing the subset of the system as specified by the view. This function can be useful if you regularly run the system in a partial state. Some examples might be if you have a TV - Radio combined system and don't want your radio staff distracted by the TV half and vice versa. Or perhaps you are in a total rebuild situation with some studios active and on-air while others are still under construction; a situation all too common these days. Be cautious about applying a default view as you can easily overlook the parts of the system masked by the view. The normal default view setting is "No View."

Default Grid Labels

Clicking in this box will open a drop down window with choices to set the information displayed as the crosspoint grid labels. The three choices are:

Name - The signals are identified on the crosspoint grid by their eight character user defined name.
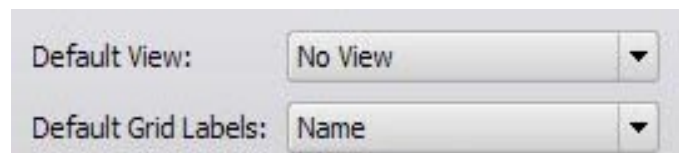
Name - Location - The signals are identified on the crosspoint grid by both their eight character name and the eight character user defined location. Including the location information helps keep track of the signals, especially if you have chosen to use the same name for different signals.

Signal ID - Name - The signals are identified on the crosspoint grid by both their signal ID and their eight character name. This mode is especially useful during set up as each signal is clearly identified by its ID. These are set by the system and absolutely unique. This setting is automatically selected when the GUI is installed.

Default Sort Order

This next section of the screen allows you to specify a default sort order for the way sources and destinations are displayed. The choices are:

BLADE Id - Name - This is the default. The signals show in order of BLADE ID then alphabetically by name.

BLADE Id - Pin - The signals show in order of BLADE ID first, then connector number.

BLADE Id - Location - The signals show in order of BLADE ID, then alphabetically by location name.

Name - BLADE ID - The signals show alphabetically by name first, then by BLADE ID. Useful for when you use a name like "CD 1" over and over.

Name - Location - The signals show alphabetically by name first, then by location name.

Location - BLADE ID - The signals show alphabetically by location name, then by BLADE ID.

Signal ID - The signals show in order of their system assigned signal ID.
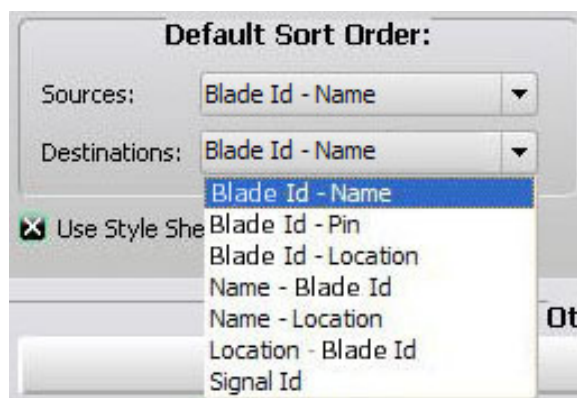
Colors

The remaining sections of the System Preferences window have to do with customizing the visual presentation of the crosspoint grid. Begin by making sure that the "Use Style Sheet" check box has been checked. This tells the software to use richer, more colorful graphics for the grid at the penalty of slightly slower performance. If this
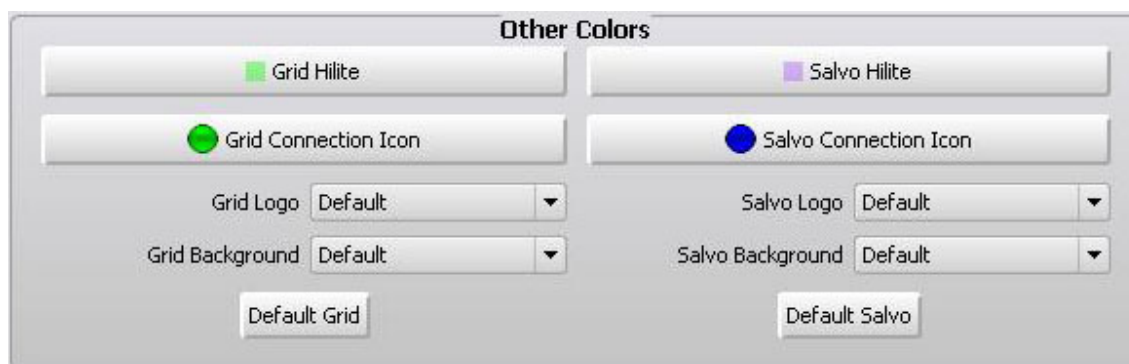
check box had not been checked, you will have to restart the Navigator GUI software after you change it. Most of the color functions are disabled when the "Use Style Sheet" box is unchecked. If you find that your GUI doesn't display colored windows as have been shown in this manual, chances are the "Use Style Sheet" box is unchecked.

Clicking on any of the feature boxes opens up a Select Color window, giving you the opportunity to customize the feature color as you see fit. You have millions of colors to choose from.

By manipulating the colors of the crosspoint grid you can radically change the look of the GUI, from a bright, bold, hard to miss look
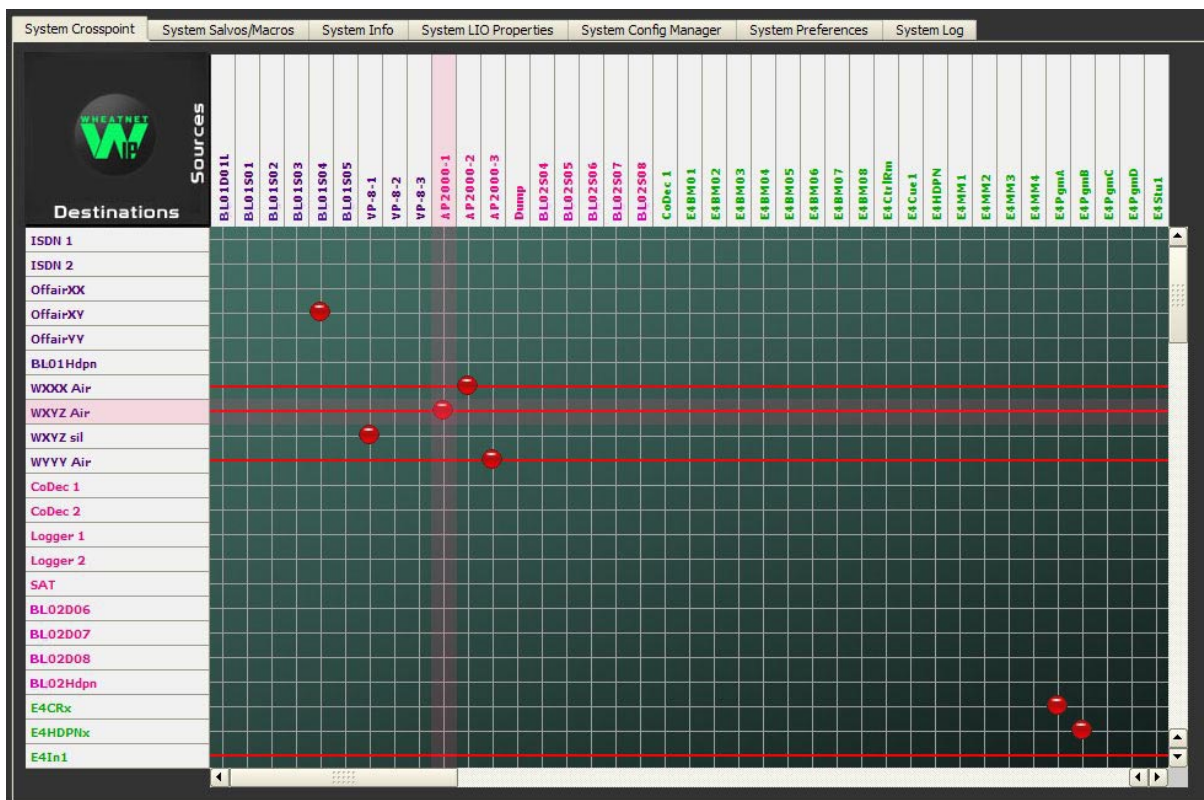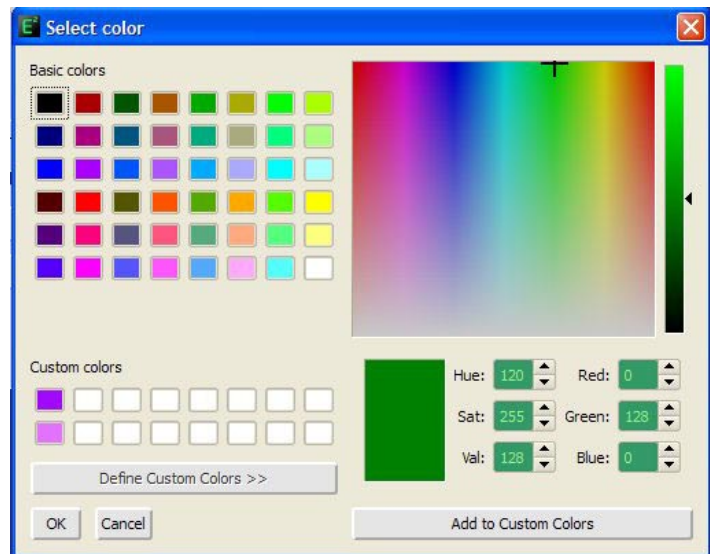
to a soft, subtle, easy on the eyes look.
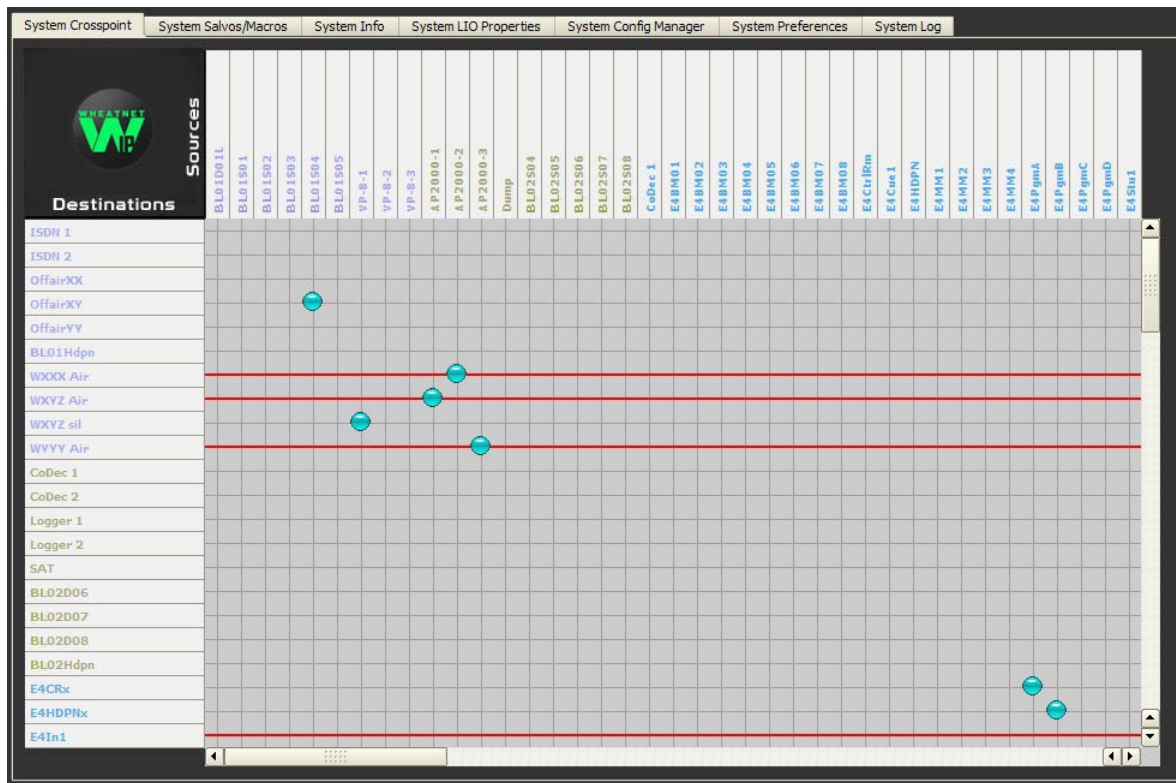
There are lots of possibilities, its all up to you.
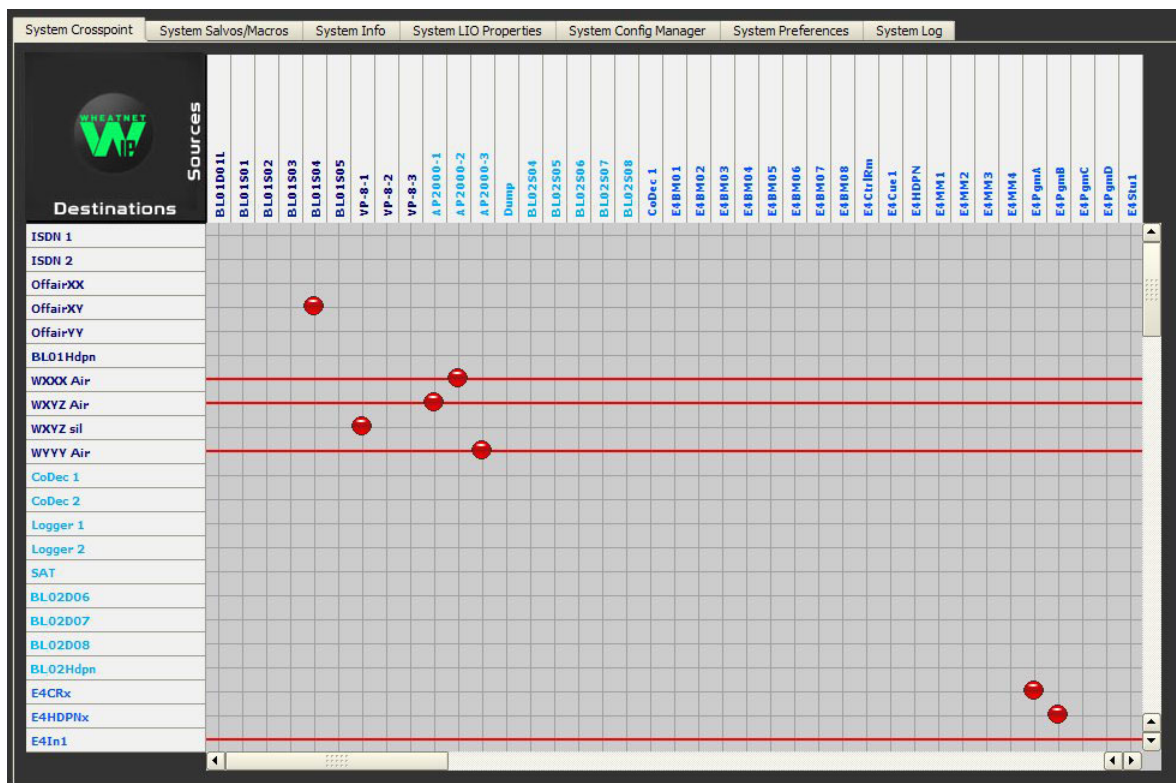
A Final Word About Colors

The Navigator GUI has been designed to simplify the organization of large complex systems. To that end, the system will automatically assign a different color for each BLADE and its associated signals. That is to say, as soon as a BLADE is brought into the system, it is given a color and the BLADE's name will be listed in the System Pane printed in this color. Additionally, the BLADE's source and destination names will appear in the crosspoint grid in this same color. This color coding makes it easy to quickly identify visually which signals go with which BLADE.

Now comes the good part. Because the System Preferences window allows you to customize these colors, you can set up your own color schemes for identifying the signals. Because a WheatNet-IP system can be brought up so quickly, you might have a little extra time for organizing the GUI with colors. Here are some suggestions:

> Make each station's part of your complex a different color as in WXXX air, production, and talk studios are all red, WYYY's are all blue, WZZZ's are all green, and the common signals in your rack room are all teal. You can further enhance the presentation by making the different studios in the station different shades of the same color, with the Air studio brightest.

> You can key your color scheme to physical location, such as all the BLADEs on the first floor are one color, all the BLADEs on the second floor a second color, and all the BLADEs in the rack room a third color. Again you can use degrees of these colors to further distinguish them.

> Another possibility is to use colors to designate functions, say, all analog BLADEs are blue, all digital BLADEs are red, all analog/digital BLADEs are purple, and all engine BLADEs are green.

System Log Tab
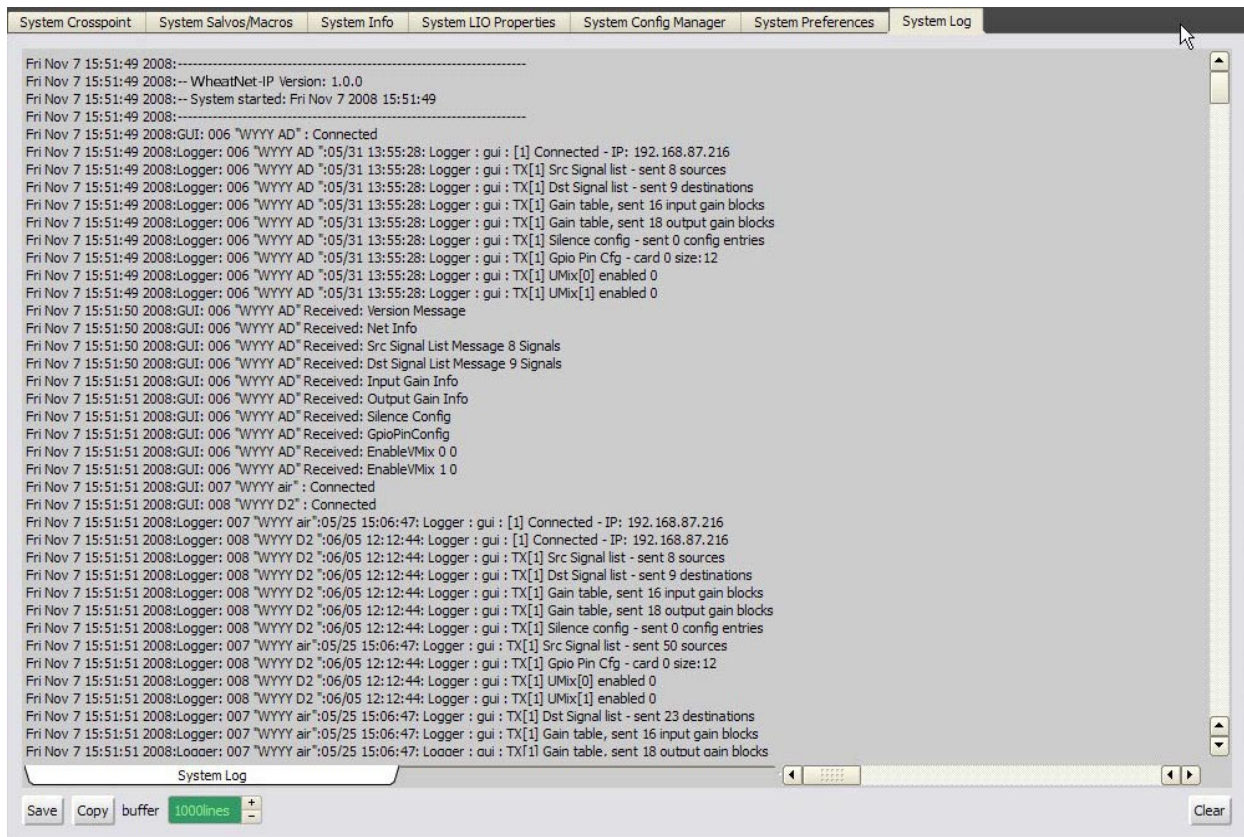
In a large complex system, it is always a good idea to have some method of viewing the sequence of recent system events. It can be very helpful for reviewing and troubleshooting, especially during system installation and set up when the system is unfamiliar and you're not sure if your LAN set up is correct, etc. The Navigator GUI provides a log window for viewing this information. This log is accumulated until the number of entries matches the setting in the "buffer" window, after which the earliest entries are discarded as new ones are received.

Because this log is continually being updated, it can be difficult to read. In that case, click on the "save" button and a "save log as text file" window will open, allowing you to give the log a name and save it to a directory. You can then review the saved copy without the hassle of lines scrolling out of view as you are trying to read them. For saving a partial section of the log, you can drag over the section to highlight it and then click on the "copy" button. The selected section of the log will be copied to the clipboard and can subsequently be pasted into a text editor, email, etc.

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Navigator GUI BLADE Windows in Detail

Earlier, when we were looking at the system pane, we noted that we could see an icon for each BLADE connected in the system. If we left click on one of these icons to select it, the GUI switches to the BLADEs info view and a whole new set of tabs appear in the main window. These tabs are for functions and settings not at the system level, but localized to the individual BLADEs. If you click on several different BLADE icons you will see the same set of tabs appearing over and over, but the detailed information within each tab changes from BLADE to BLADE. So the process becomes one of clicking on a BLADE icon, verifying or modifying the settings for that BLADE, clicking on the next BLADE icon, verifying its settings, and so forth until you've looked at every BLADE. Because there are more tabs than fit across the top of the window, horizontal scroll buttons appear at the right end of the row of tabs in the BLADE info view, allowing you to scroll and view all of the tabs.

BLADE Sources Tab
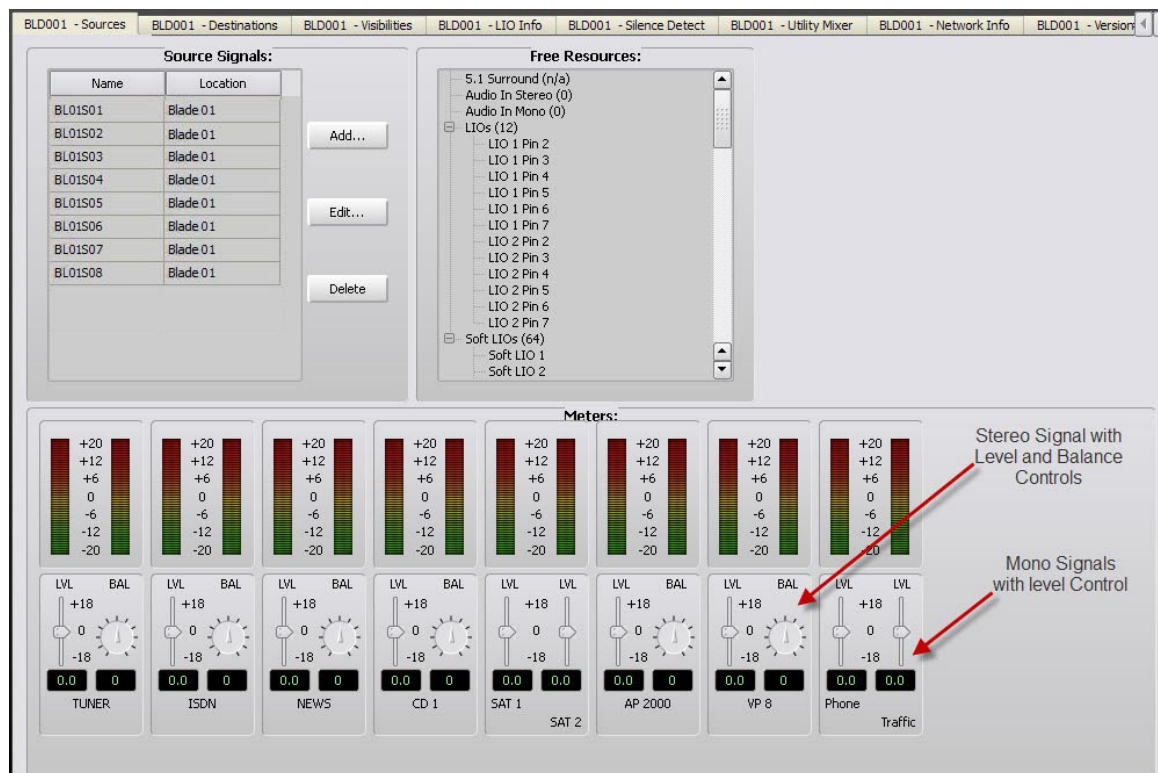
The first tab is the BLADE "Sources" tab. It is used for viewing and modifying settings for the local audio inputs in the BLADE. The Sources window has three main parts. Along the bottom of the window is an array of 16 bargraph meters and individual level and balance controls for each source (Mono sources do not have balance controls). These meters and controls are used to monitor the level and set gain on the 16 inputs (or eight stereo pairs, etc.) coming into the BLADE. In the upper left area of the main window is a section labeled "Source Signals:" and to the right is the "Free Resources:" section. The Source Signals: section is where the eight character input signal name and eight character input location names can be seen and modified from their defaults. The Free Resources: section is where the input signal characteristics (mono, stereo, logic, etc.) can be seen.

Source Signals

In this section you can see two columns; the first column, labeled "Name" is the source name and the second matching column, labeled "Location," is the source location. Depending on whether the BLADE has been designated as a stereo or mono BLADE at initial set up, there will be eight or 16 names in the columns. (If the BLADE was originally set up as a custom BLADE, there will actually be no source or location names showing until you first define the mono and stereo signals you want — more on that later). If the BLADE is an engine BLADE, there will be names for every available control surface input and monitor channel (depending on the size of the associated control surface this can be as many as 32 or more).

Assuming you are looking at BLADE 1 and you've chosen the stereo signal template, the Source Signals section will look as shown here:

The first signal in the list (representing input #1) is named "BL01S01" and its location is named "Blade01." These are the system default names and they can be simply decoded. The "BL01" part of the name is just shorthand for "Blade 1," and the "S01" is shorthand for "Source 1." Thus the auto generated system name means "the first input in Blade 1." Likewise, "BL01S02" means "the second input in Blade 1," and "BL23S07" means "the seventh input in Blade 23." It's not exactly Rocket Science and, in fact, you can just leave things as they are and go with the system default names if you like. But you can do better. If you double click on a signal name, the name becomes highlighted and you can retype it to be anything you like. "BL01S01" becomes "Guest 1," or "Zephyr," or "Rick," or "Enco 1" - you get the idea. As soon as you type a new name for the signal, it appears everywhere in the system under this new name. In other BLADEs, on the crosspoint grid, on control surface displays, everywhere.

Likewise, the "Location" column has default location names which are even more easily decoded; "Blade01" obviously means "Blade 1." You can leave these as they are because that pretty much tells you the location of the signal, but if you want, you can change the location to " WXYZ Air" or "rackroom" or whatever suits your fancy. Edit the Location just as you did the Name, by double clicking on it.

Free Resources

Resources to a BLADE mean audio and logic signals. This section of the "Sources" window shows the remaining available resources within the BLADE. The first three line entries in this section indicate the number of surround 5.1, stereo, and mono signals sources, respectively, that have not yet been allocated to the system, and are hence available for allocation. Remember, each BLADE has a maximum total of 16 mono audio channels plus 12 logic ports available. If you have used a standard mono or stereo signal template when you first initiated the BLADE, then all of the signals will have been allocated automatically by the Startup Wizard to

Source Signals:

Name	Location
BL01S01	Blade 01
BL01S02	Blade 01
BL01S03	Blade 01
BL01S04	Blade 01
BL01S05	Blade 01
BL01S06	Blade 01
BL01S07	Blade 01
BL01S08	Blade 01

Source Signals:

Name	Location
Guest 1	WXYZ Air
Zephyr	WXYZ Air
Rick	WXYZ Air
ENCO 1	
BL01S05	Blade 01
BL01S06	Blade 01
BL01S07	Blade 01
BL01S08	Blade 01

Free Resources:

```
  5.1 Surround (n/a)
  Audio In Stereo (0)
  Audio In Mono (0)
⊟ LIOs (12)
    LIO 1 Pin 2
    LIO 1 Pin 3
    LIO 1 Pin 4
    LIO 1 Pin 5
    LIO 1 Pin 6
    LIO 1 Pin 7
    LIO 2 Pin 2
    LIO 2 Pin 3
    LIO 2 Pin 4
    LIO 2 Pin 5
    LIO 2 Pin 6
    LIO 2 Pin 7
```

match the template, and the number available will show as zero. This is one of the special features of the WheatNet-IP system; it can take care of all of this signal allocating and defining automatically, saving you a lot of work.

If, however, you chose the Custom template, no signals will have been allocated, and all will show as available in the resources list. As you define a new signal, the resources available will decrease. Thus you can tell by looking at the resources list what additional signals you could define for this particular BLADE.

Defining a new signal is easy. Click the "Add" button and the "Source Signal Wizard - Add Signal" screen pops up. On the Type Info tab enter the Name, and optionally the Location. Select the Signal Type and accept the Packet Type as automatically selected. Next, switch to the Wire Info tab. Highlight the desired wire number (you must pick one that is not already assigned), then click "Finish." The new signal name will now appear throughout the system.

The same is true for the logic ports. The default configuration makes no automatic assignment of logic ports, so all 12 are initially available and show as LIOs. As you allocate logic ports for functions, the resources decrease correspondingly. The "available resources" list, then, allows you to see at a glance how many ports you've used.

OK, so how do you modify the logic resources? Click on a signal name or location in the Source Signals: area, then click on the "Edit" button. This opens a "Source Signal Wizard - Edit Signal" window where you can redefine the audio signal type or, in this case, add or change logic signals associated with the audio. Use of this form has already been covered in the Source Details Menu section of this chapter under the topic "Modify Signal." The "LIO Info" tab of this form is where you define the logic associated with the audio signal.

The "Delete" button completes the signal modification tools. Highlight a signal and choose "Delete" and an "Are you sure?" window opens. If you click on yes, then the selected signal is removed from the system, adding those resources back to the Free Resources: list.
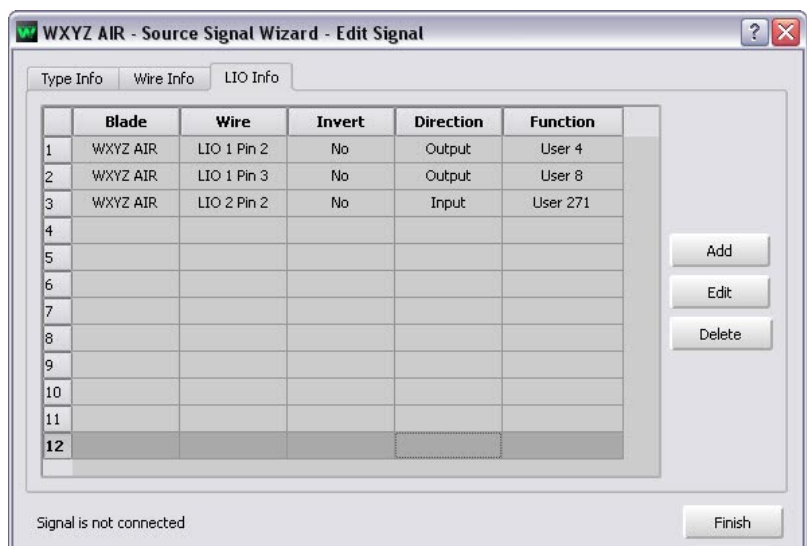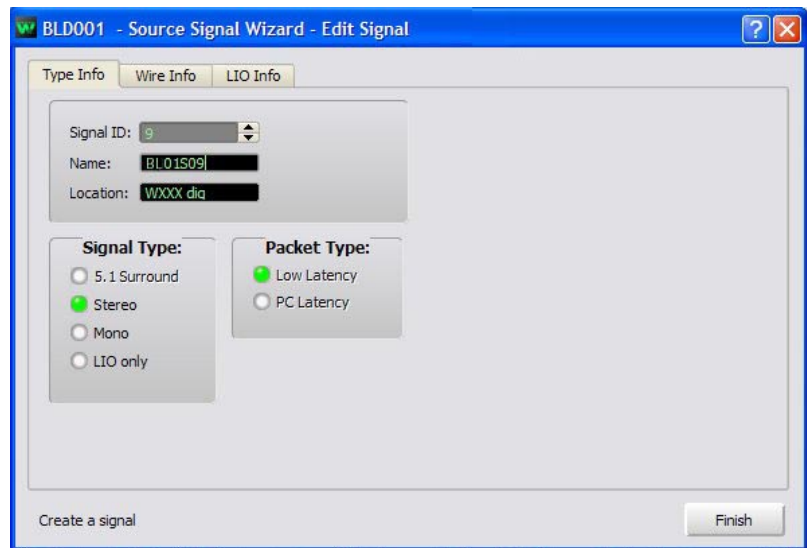
It all sounds more complicated than it is, but most folks will just use the automatic system defaults and not bother with any of this initially, at least until they need to define some logic signals. Don't be afraid to experiment with defining signals. You can always edit back any changes you make, and if you really get things out of whack, you can just rerun the System Startup Wizard for the BLADE and start over.
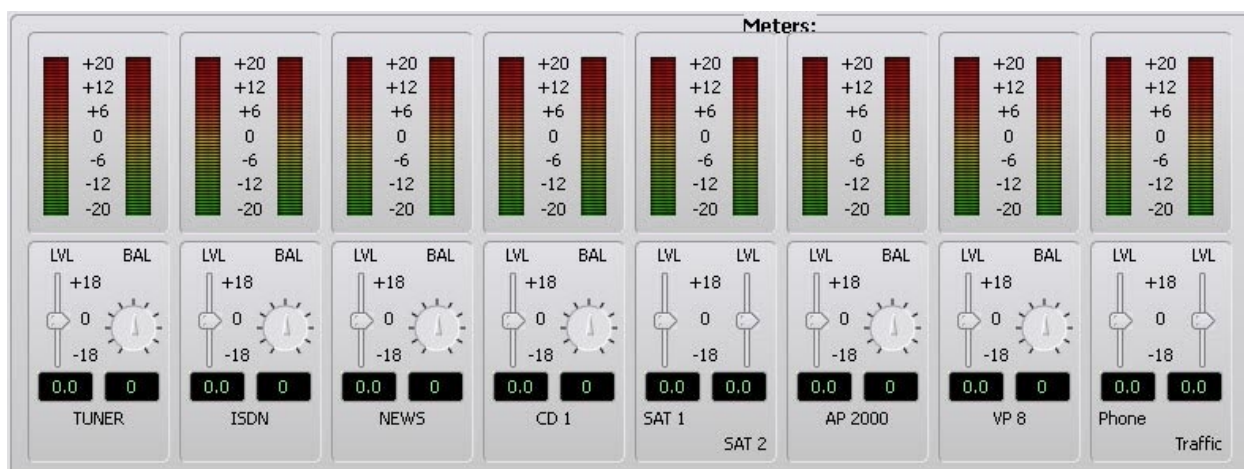
Meters

The bottom portion of the "Sources" tab window, as mentioned before, shows the input channel meters and gain settings. The 16 individual baragraph meters show audio levels for the individual channels color coded over a 40dB range, with the highest level being "+20" VU, corresponding to +24dBu, 0dBFS, and the onset of clipping. These meters show the actual input signal level as modified by the input gain setting. The bouncing bar at the top shows the peak audio level while the solid column shows the short term average audio level using VU time constants.

Below the baragraph meters are individual slider controls for adjusting each channel's gain or loss over a range of +/-18dB. The slider handle, or knob, moves to indicate a relative gain setting as you drag it with your mouse, and the text box below the slider updates with the specific gain value. If you prefer, you can drag your cursor over the number in the text box to highlight it and type in the gain value you want. The gain adjustment is made in real time and will reflect instantly on the bargraph meters. The system rounds off gain settings to the nearest 1/10th dB.

If the signal is defined as stereo a balance control will be displayed to the right of the level control. This control allows you to adjust the balance of the left and right stereo signal. The adjustments can be made by left clicking and holding the control while moving the cursor in a circular motion. If you prefer, the arrow keys can also be used to make this adjustment. Like the level control, you can highlight the number in the text box and set the balance level with "0" being center. The balance adjustments are also made in real time and will reflect instantly on the bargraph meters.

Please note that any gain modifications you make to a source signal will affect the level of that signal everywhere in the system it appears. If you are making a gain adjustment to compensate for one particular destination only, it might be better to make a destination gain adjustment (more on this in the next section) and leave the source gain alone for correct use in other parts of the system. Source gain adjustments are best used for input signals known to be too hot or too low, to bring them to the nominal system signal level of 0VU, +4dBu, -20dBFS.

BLADE Destinations Tab
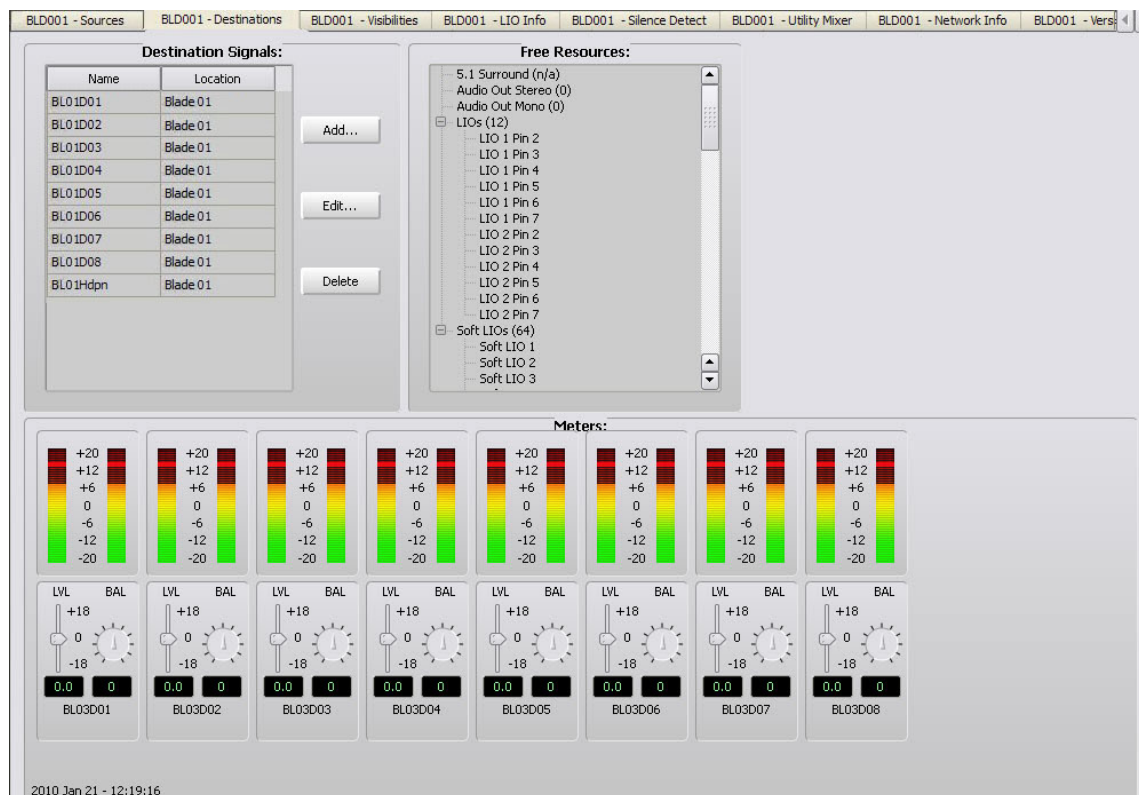
The second tab is the BLADE "Destinations" tab. It is used for viewing and modifying settings for the local audio outputs from the BLADE. The Destinations window has three main parts. Along the bottom of the window is an array of 16 bargraph meters and individual level and balance controls for each source (Mono sources do not have balance controls). These meters and controls are used to monitor the level and set gain on the 16 outputs (or eight stereo pairs, etc.) going out of the BLADE. In the upper left area of the main window is a section labeled "Destination Signals:" and to the right is the "Free Resources:" section. The Destination Signals: section is where the eight character output signal name and eight character output location names can be seen and modified from their defaults. The Free Resources: section is where the output signal characteristics (mono, stereo, logic, etc.) can be seen.

Destination Signals

In this section you can see two columns; the first column, labeled "Name" is the destination name and the second matching column, labeled "Location," is the destination location. Depending on whether the BLADE has been designated as a stereo or mono BLADE at initial set up, there will be eight or 16 names in the columns. (If the BLADE was originally set up as a custom BLADE, there will actually be no destination or location names showing until you first define the mono and stereo signals you want — more on that later).

Assuming you are looking at BLADE 1 and you've chosen the stereo signal template, the Destination Signals section will look as shown here:

The first signal in the list (representing output #1) is named "BL01D01" and its location is named "Blade01." These are the system default names and they can be simply decoded. The "BL01" part of the name is just shorthand for "Blade 1," and the "D01" is shorthand for "Destination 1." Thus the auto generated system name means "the first output in Blade 1." Likewise, "BL01D02" means "the second output in Blade 1," and "BL23D07" means "the seventh output in Blade 23." You can just leave things as they are and go with the system default names if you like. But you can do better. If you double click on a signal name, the name becomes highlighted and you can retype it to be anything you like. "BL01D01" becomes "Speaker," or "CoDec," or "Studio 1," or "Enco Rec" - you get the idea. As soon as you type a new name for the signal, it appears everywhere in the system under this new name. In other BLADEs, on the crosspoint grid, on control surface displays, everywhere.

Likewise, the "Location" column has default location names which are even more easily decoded; "Blade1" obviously means "Blade 1." You can leave these as they are because that pretty much tells you the location of the signal, but if you want, you can change the location to "WXYZ Air" or "Rackroom" or whatever suites your fancy. Edit the Location just as you did the Name, by double clicking on it.

Free Resources

Resources to a BLADE mean audio and logic signals. This section of the "Sources" window shows the remaining available resources within the BLADE. The first three line entries in this section indicate the number of surround 5.1, stereo, and mono signal destinations, respectively, that have not yet been allocated to the system, and are hence available for allocation. Remember, each BLADE has a maximum total of 16 mono audio channels plus 12 logic ports available. If you have used a standard mono or stereo signal template when you first initiated the BLADE, then all of the signals will have been allocated automatically by the Startup Wizard to match the template, and the number available will show as zero. This is one of the special features of the WheatNet-IP system; it can take care of all of this signal allocating and defining automatically, saving you a lot of work.

Destination Signals:

Name	Location
BL01D01	Blade 01
BL01D02	Blade 01
BL01D03	Blade 01
BL01D04	Blade 01
BL01D05	Blade 01
BL01D06	Blade 01
BL01D07	Blade 01
BL01D08	Blade 01
BL01Hdpn	Blade 01

Destination Signals:

Name	Location
Speaker	Rackroom
CoDec	Rackroom
Studio 1	Rackroom
ENCO Rec	Rackroom
BL01D05	Blade 01
BL01D06	Blade 01
BL01D07	Blade 01
BL01D08	Blade 01
BL01Hdpn	Blade 01

Free Resources:

- 5.1 Surround (n/a)
- Audio Out Stereo (0)
- Audio Out Mono (0)
- LIOs (12)
  - LIO 1 Pin 2
  - LIO 1 Pin 3
  - LIO 1 Pin 4
  - LIO 1 Pin 5
  - LIO 1 Pin 6
  - LIO 1 Pin 7
  - LIO 2 Pin 2
  - LIO 2 Pin 3
  - LIO 2 Pin 4
  - LIO 2 Pin 5
  - LIO 2 Pin 6
  - LIO 2 Pin 7

If, however, you chose the Custom template, no signals will have been allocated, and all will show as available in the resources list. As you define a new signal, the resources available will decrease. Thus you can tell by looking at the resources list what additional signals you could define for this particular BLADE.

Defining a new signal is easy. Click the "Add" button and the "Destination Signal Wizard - Add Signal" screen pops up. On the Type Info tab enter the Name, and optionally the Location. Select the Signal Type and accept the Packet Type as automatically selected. Next, switch to the Wire Info tab. Highlight the desired wire number (you must pick one that is not already assigned), then click "Finish." The new signal name will now appear throughout the system.

The same is true for the logic ports. The default configuration makes no automatic assignment of logic ports, so all 12 are initially available and show as LIOs. As you allocate logic ports for functions, the resources decrease correspondingly. The "available resources" list, then, allows you to see at a glance how many ports you've used.

OK, so how do you modify the logic resources? Click on a signal name or location in the Destination Signals: area, then click on the "Edit" button. This opens a "Destination Signal Wizard - Edit Signal" window where you can redefine the audio signal type or, in this case, add or change logic signals associated with the audio. Use of this form has already been covered in the Destination Details Menu section of this chapter under the topic "Modify Signal." The "LIO Info" tab of this form is where you define the logic associated with the audio signal.

The "Delete" button completes the signal modification tools. Highlight a signal and choose "Delete" and an "Are you sure?" window opens. If you click on yes, then the selected signal is removed from the system, adding those resources back to the Free Recources: list.

Most folks will just use the automatic system defaults and not bother with any of this initially, at least until they need to define some logic signals. Don't be afraid to experiment with defining signals. You can always edit back any changes you make, and if you really get things out of whack, you can just rerun the System Startup Wizard for the BLADE and start over.

Meters

The bottom portion of the "Destinations" tab window, as mentioned before, shows the output channel meters and gain settings. The 16 individual baragraph meters show audio levels for the individual channels color coded over a 40dB range, with the highest level being "+20" VU, corresponding to +24dBu, 0dBFS, and the onset of clipping. These meters show the actual output signal level as modified by the output gain setting.

Below the baragraph meters are shown individual slider controls for adjusting each channel's gain or loss over a range of +/-18dB. The slider handle, or knob, moves to indicate a relative gain setting as you drag it with your mouse, and the text box below the slider updates with the specific gain value. If you prefer, you can drag your cursor over the number in the text box to highlight it and type in the gain value you want. The gain adjustment is made in real time and will reflect instantly on the bargraph meters. The system rounds off gain settings to the nearest 1/10th dB.

If the signal is defined as stereo a balance control will be displayed to the right of the level control. This control allows you to adjust the balance of the left and right stereo signal. The adjustments can be made by left clicking and holding the control while moving the cursor in a circular motion. If you prefer, the arrow keys can also be used to make this adjustment. Like the level control, you can highlight the number in the text box and set the balance level with "0" being center. The balance adjustments are also made in real time and will reflect instantly on the bargraph meters.

Please note that any gain modifications you make to a destination signal will affect the level of that output for all sources feeding it. If you are making a gain adjustment to compensate for a systematic gain problem, it might be better to make a source gain adjustment, and leave the destination gain alone. Destination gain adjustments are best used for output signals known to be too low or too hot, such as those feeding headphones or amplified speakers with no gain control of their own, to bring them to the correct listening level.

BLADE Visibilities Tab
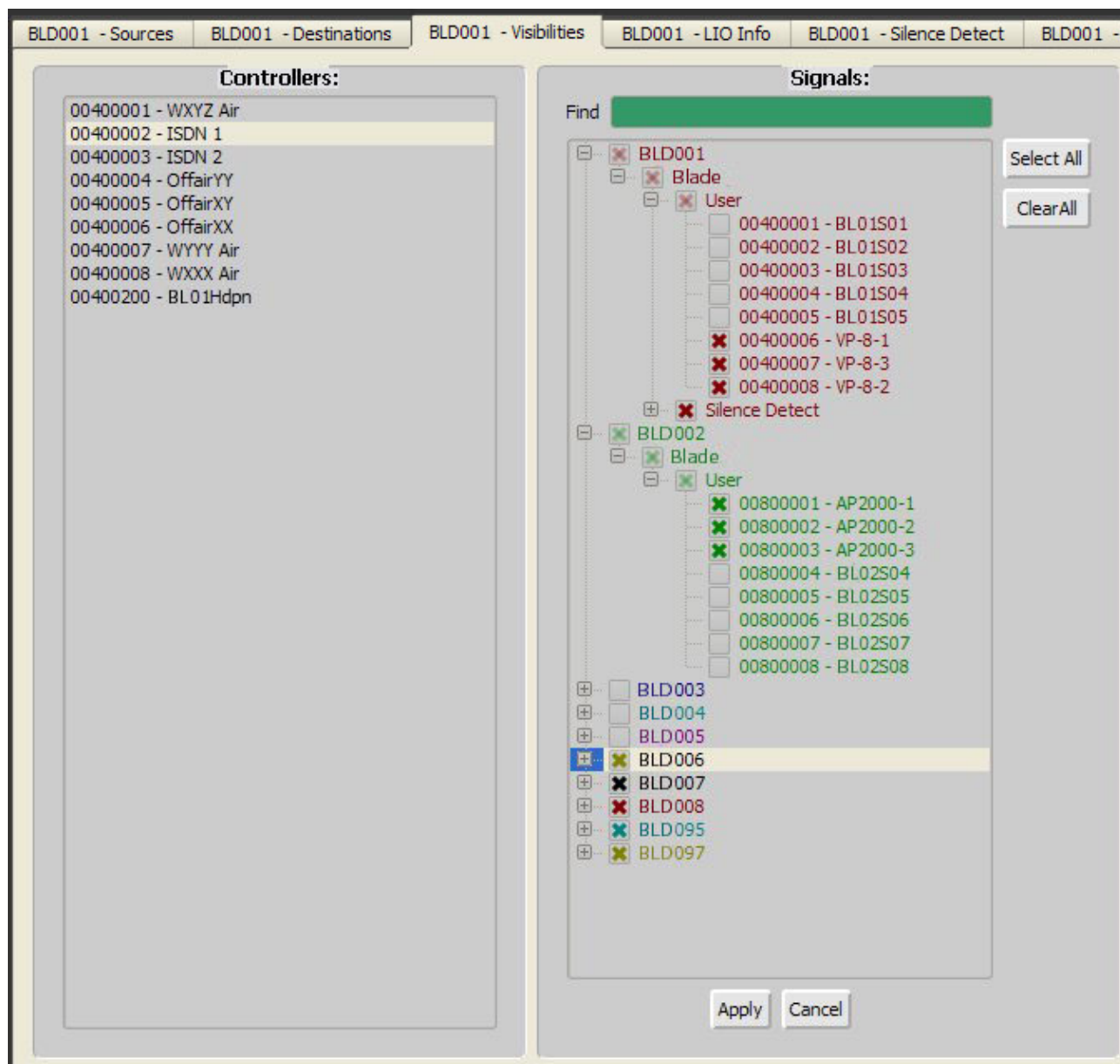
The third tab is the BLADE "Visibilities" tab. The settings available on this tab are used to limit or control the choices that can be made for connecting sources to the local audio destinations in the BLADE. The default settings of the WheatNet-IP system allow any source to be connected to any destination, but there are some good reasons to restrict this capability in specific places. A good sized system can have hundreds and hundreds of sources available. To locate and select any particular one from the front panel control on a BLADE might involve a lot of scrolling! If you can limit the number of choices available it becomes less confusing and much easier. In many cases it makes practical sense to restrict the source choices. For example, if one of the destination outputs from a BLADE is being used as a headphone feed to a guest location in a talk studio for WXYZ, why would that guest ever need to select the audition mix output of a production

studio in WZZZ? Another good reason for restrictions is that you might never want a connection such as the feed from your processor to your air chain to be inadvertently changed. In many cases you can greatly restrict the source choices available for a destination, sometimes even to as few as one. In the WheatNet-IP system, we use the "visibilities" property to control these choices, and it's very easy to do. Essentially, we allow you to edit the list of names that are "visible" to the user on a destination by destination basis, so that every audio output in the system can have a unique setting. Note that we are not actually restricting the connection possibilities; you can at any time choose any source you want using the Navigator GUI or by firing a salvo, etc. We are only restricting which choices are visible to a user sitting in front of the BLADE and scrolling the front panel knob.

Clicking on the Visibilities tab opens a new window showing two columns. The left hand column, labeled "Controllers:" shows a list of every local destination defined for the BLADE. The right hand column shows a hierarchal view (typical Windows Explorer tree style) of every source defined in the system.

To set visibility for a destination, first make sure the desired destination is actually a member of the BLADE you are currently viewing. You can check on the label for the visibility tab; it will read "BLDxxx - Visibility" where "xxx" is the BLADE ID number. If this is not the correct BLADE, then just click on the correct icon in the system pane window to get to the correct visibility tab.

Examine the list of destinations in the left hand window and left click on the desired destination to highlight it. The right hand window shows a list of all of the BLADEs in the system, with a check box beside the name of the BLADE.

If you know that none of the sources in a particular BLADE should be visible to the destination, click on the check box to uncheck it. In this manner, go through the list of BLADEs and uncheck any that should not be visible. Continue on and click on the expand box for any BLADE that you want visibility to some, but not all, of its signals. The list expands in tree fashion to show the individual signals within the BLADE, each with their own check boxes. Uncheck the signals that should not be visible, and repeat this process for any other BLADEs to set them.

When you have completed working on the list for the selected destination, you can click on another destination in the left hand window and set visibilities for it. After setting visibilities for all of the destination signals, click on the "Apply" button at the bottom of the window and your choices will be instantly forwarded to each BLADE in the system.

As you no doubt have noticed by now, this process can be somewhat time consuming. Fortunately, the WheatNet-IP GUI has some built in shortcuts that can be very useful. The "Select All" and Clear All" buttons in the upper left corner of the visibility window allow you to check or uncheck groups of signals at once, assuming that the common selections are suitable for each member of the group. You can accept these common selections, or then drill down through the menu and make individual tweaks without having to repeat the selections that were in common.

BLADE LIO Info Tab

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
LIO 1 Pin 2		○	Switch 1	Dump	<none>	<none>
LIO 1 Pin 3		○	<none>	<none>	<none>	<none>
LIO 1 Pin 4		○	<none>	<none>	<none>	<none>
LIO 1 Pin 5		○	<none>	<none>	<none>	<none>
LIO 1 Pin 6		○	<none>	<none>	<none>	<none>
LIO 1 Pin 7		○	<none>	<none>	<none>	<none>
LIO 2 Pin 2		○	<none>	<none>	Air Chain Salvo	<none>
LIO 2 Pin 3		○	<none>	<none>	<none>	DST 00400002 - ISDN 1 => SRC 00400006 - VP-8-1
LIO 2 Pin 4		○	<none>	<none>	<none>	<none>
LIO 2 Pin 5		○	<none>	<none>	<none>	<none>
LIO 2 Pin 6		○	<none>	<none>	<none>	<none>
LIO 2 Pin 7		○	<none>	<none>	<none>	<none>

The fourth tab is the BLADE "LIO Info" tab. This tab brings up a screen you can use to program and control the operation of the 12 physical Logic Input/Output ports on each BLADE. These ports are available on the two RJ-45 jacks on the rear of the BLADE. Each of these 12 ports can be individually defined as a logic input or a logic output, and can be mapped to a number of different functions.

The LIO info tab is arranged as a table, with logic ports listed along the left side, and attributes listed across the top. Each row, or line, therefore shows the logic settings for a particular logic port. Recall that each BLADE has twelve ports available; they are named LIO 1 pin 2 through LIO 1 pin 7, representing the six logic ports available on the first RJ-45 rear panel logic jack, and LIO 2 pin 2 through LIO 2 pin 7, representing the six logic ports available on the second RJ-45 rear panel logic jack. The logic port names not so subtly reflect the physical pin number of the logic jack, so it is easy to correlate the GUI functions with the corresponding physical connection. These pin numbers have been chosen so they mate up with some common Wheatstone auxiliary switch panels; when they are used for logic outputs, power is available on pins 1 & 8.

WheatNet-IP Rear

The logic functions that have been programmed will appear in this table, giving you an at-a-glance summary of the physical logic ports on the BLADE. In the row for a particular port you will see whether it has been programmed as an input or an output, the name of the logic function configured for the port (if one has programmed), the eight character name (the one that appears on the crosspoint grid) you've given to the logic signal, the salvo it has been programmed to fire, or the temporary XPoint connection it has been programmed to trigger. Note that the three possible uses of the logic port are mutually exclusive; a logic port can be programmed as a logic only signal for use in connecting to other logic signals on the grid, or it can be programmed to fire a salvo, or it can be programmed to trigger a connection. It can only do one of these things.

The LIO Info tab shows which programming options have been set for each of the 12 physical ports. If nothing has programmed, the info will be shown as "<none>."

An especially handy feature of this window is that each logic port has an associated indicator with it. These are the circles shown in the input or output columns next to the logic port name. When the logic port is triggered, these indicators will light up in color for as long as the port stays triggered. This makes it easy to trace out your wiring to the ports; if you wire up a switch as an input to the logic port, the associated indicator will turn color as long as you hold the switch button down. Conversely, if you've wired up a logic port as an output to drive a relay, lamp, or other device, the associated indicator will turn color as long as the logic output is activated by whatever you intend to drive this output with (presumably a console logic signal, another switch panel somewhere, or so forth).

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
LIO 1 Pin 2	●		Switch 1	Dump	<none>	<none>
LIO 1 Pin 3		☾	On Tally	D lite	<none>	<none>
LIO 1 Pin 4	☾		Remote Off	CoDec 1	<none>	<none>
LIO 1 Pin 5	☾		<none>	<none>	<none>	<none>
LIO 1 Pin 6	☾		<none>	<none>	<none>	<none>
LIO 1 Pin 7	☾		<none>	<none>	<none>	<none>
LIO 2 Pin 2	☾		User 80	AP2000-1	Air Chain Salvo	<none>
LIO 2 Pin 3	☾		Remote On	CoDec 1	<none>	DST 00400002 - BL02D02 => SRC 00400006 - BL02S06
LIO 2 Pin 4	☾		<none>	<none>	<none>	<none>
LIO 2 Pin 5	☾		<none>	<none>	<none>	<none>
LIO 2 Pin 6	☾		<none>	<none>	<none>	<none>
LIO 2 Pin 7	☾		<none>	<none>	<none>	<none>

Tabs shown: WXXX dig - Sources, WXXX dig - Destinations, WXXX dig - Visibilities, WXXX dig - LIO Info, WXXX dig - Silence Detect, WXXX dig - Utility Mixer, WXXX dig - Net

BLADE Silence Detect Tab

The fifth tab is the BLADE "Silence Detect" tab. One of the very powerful features of the WheatNet-IP system is that every single audio output channel can be programmed with a silence detection and automatic switch over function. This capability can go a long way to maintaining smoother, more reliable operation to your radio stations when an unexpected problem happens. Careful planning of alternate and back up audio paths for crucial connections can keep you on the air.

While the silence detect function is available for every destination signal in each BLADE, it is not automatically enabled. Many of the signals in a typical system do not need this function. To enable silence detect for a particular destination signal, you must click on the Destinations tab for the BLADE in which the signal is located, click on the desired signal to highlight it, and then click on the Edit... button to open the familiar "Destination Signal Wizard" window. You will notice the Silence Detect check box; if it has not been checked, silence detection will not be enabled for this audio channel.

Tabs: WXXX dig - Sources, WXXX dig - Destinations, WXXX dig - Visib

Destination Signals:

Name	Location
CoDec 1	Blade 02
CoDec 2	Blade 02
SAT	Blade 02
Logger 1	Blade 02
Logger 2	Blade 02
BL02D06	Blade 02
BL02D07	Blade 02
BL02D08	Blade 02
BL02Hdpn	Blade 02
SATB	Blade 02

Add...

Edit...

Delete

When you click on the silence detect check box and finish the signal wizard, several things happen.

First, the silence detect function is enabled. Second the silence detect alarm logic signal (default name is "XXXL" where XXX is the name of the destination signal you are working on) is automatically created as a Source Signal to generate messages in the "Alarms" pane of the GUI and to allow connection to a physical logic output port to activate an alarm device. Finally, a new audio destination signal is automatically added into the BLADE (and the system). This signal is created with a default name of "XXXB" (where XXX is the name of the signal you are working on) and represents the secondary audio path that can be used for automatic failover of your source connection upon detecting silence. Create a back up signal path by making a source connection from your back up source to this secondary "B" connection (it will show on the crosspoint grid).

Clicking on the silence detect tab for a BLADE opens up a three part window.
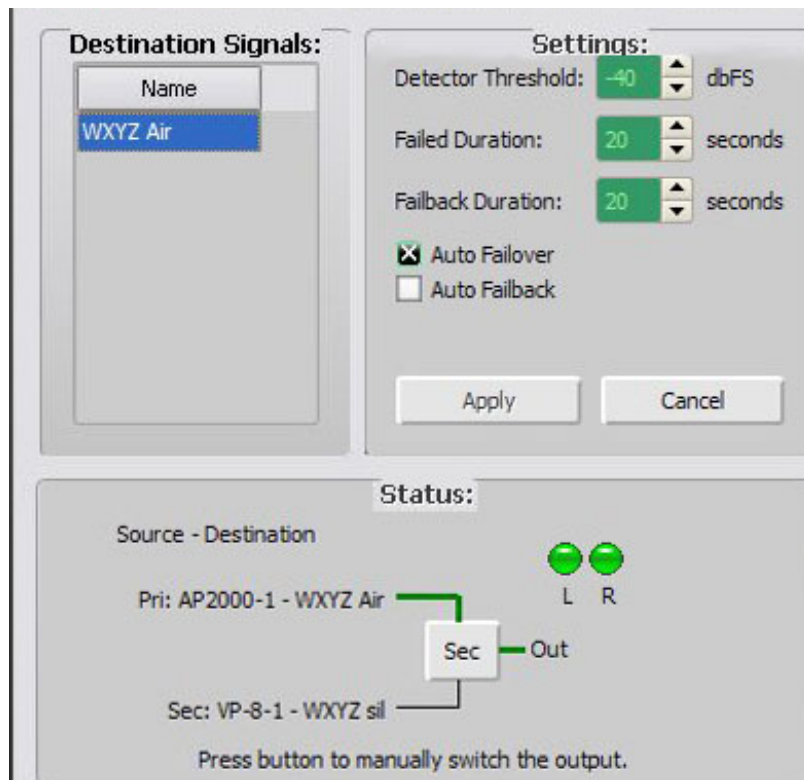
Destination Signals

The upper left hand window part is labeled "Destination Signals" and shows a list of any destinations that have been set up for silence detection. The upper right hand window part is labeled "Settings" and shows the particular level and duration parameters that have been chosen (or the standard default settings). The bottom window part, called "Status" shows details about the current state of the silence detect function.

To experiment with the silence detect function, click on one of the destinations in the "Destination Signals" list. The "Settings" and "Status" areas of the window will change to show the particulars for the selected destination signal. If there are no destinations shown in the list, that means silence detection has not been enabled yet for any of the signals in the BLADE. In the right hand "settings" area you can modify the default settings or leave them as the defaults.

Settings

You can review the effect of the settings in the "Status" area of the window. These settings are:

Detector Threshold - This is the signal level threshold for silence detection. Any time the audio signal at the destination falls below this threshold, the BLADE will start to keep track of how long the signal stays below this threshold level. This setting should be adjusted to match your station's format. Not to be obvious, but a Hot format most likely never expects to have a low signal level, while a classical format might frequently do so.

Failed Duration - This is the acceptable length of time for the signal to be below threshold. It is only applied when the "Auto Failover" check box has been set. Again, this setting is very dependant on your format. If your program material has few, if any, pauses, and your Talent voices are energetic, you can set the duration as low as several seconds. Conversely, if your programs have frequent quiet passages and your Talent voices are relaxed you may need to set the duration as high as the maximum duration of 45 seconds.

The Navigator GUI can be helpful in arriving at the optimum settings for threshold and duration. In the Status area of the Silence Detect window are two round indicators labeled "L" and "R." These are audio indicators that show the left and right channels of the destination. They will be shown in green when the audio level is above the threshold setting, and in red when it is below the threshold setting. If you leave the auto failover box unchecked, you can watch these indicators as you alter the threshold without danger of losing the audio connection due to a silence detect triggered failover. Monitor how frequently and for how long the audio is below threshold, add some extra time margin for insurance purposes, and that's your settings. Just remember, if your programming or Talent changes, these settings may need to be readjusted.

Failback Duration - This setting can be very useful. It is only applied when the "Auto Failback" check box has been set, and represents how long the BLADE will wait to restore the original source connection. It will monitor the original source for level, and, if it stays above the threshold for the specified time, will switch back to the original source. This is useful in situations where the primary connection is intermittent; by specifying a duration over which the primary connection must "prove itself good" you can avoiding a premature switch back before the connection is solid.

The other two controls in the "Settings" area of the silence Detect tab are the previously mentioned check boxes for "Auto Failover" and "Auto Failback." Check the "Auto Failover" box if you would like to have an automatic source connection change to your specified secondary source when silence detect is triggered. Check the "Auto Failback" box if you would like to have an automatic source connection changed to your primary source when the silence detect function is released.

Finally, you must click on the "Apply" button at the bottom of the window before any of your changes will take effect.
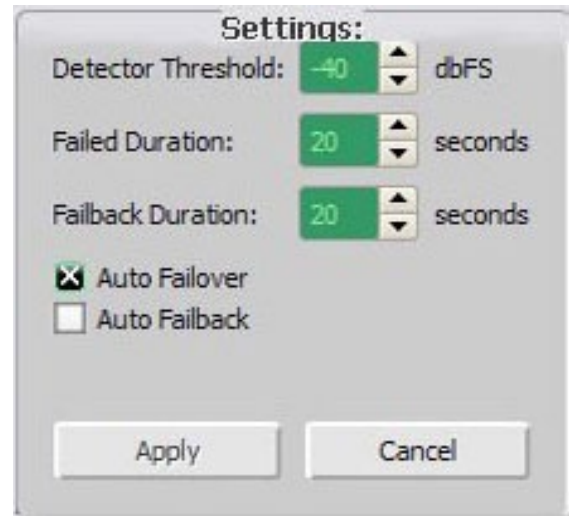
Status

The "Status" area of the silence detect tab shows at a glance information about the silence detect function for the destination signal. The primary and secondary connection paths are labeled and indicated, and the "L" and "R" audio level indicators will flicker in the presence of audio. Note that the currently active signal path shows in green and the inactive signal path shows in black. You can click on the button to force a connection change to the alternate signal path and a dialog window will open asking you to confirm the change. Warning; clicking "Yes" on the dialog box will instantly change the audio connection. This button is meant to be used for initial set up and testing and for manual failover in cases where automatic failover is not desired, or when the failover is needed for reasons other than the loss of audio signal.
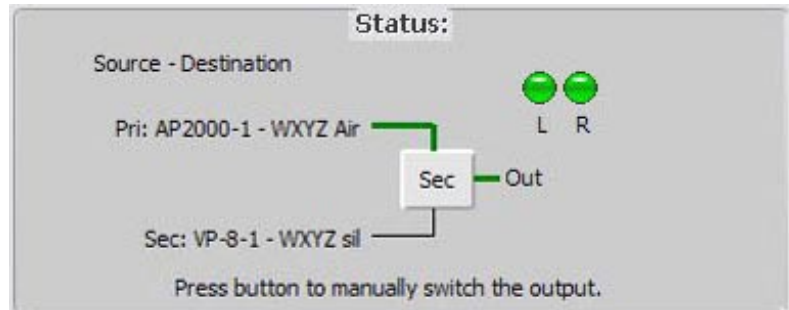
Logic

Enabling Silence Detection on a Destination automatically creates a new Logic Only source signal. This signal will appear in the crosspoint grid with a name of "XXXL" where XXX is the name of the destination using silence detection. This logic signal also has an ID# of XXXXX4XX where XXXXX_XX is the signal ID of the destination.

To use this logic signal to trigger a physical alarm, create a new Logic Only destination signal on the BLADE you will use for the physical alarm (light, buzzer, etc.) logic connection. Map the particular logic pin that you want to use and select the "SDet Failure" function from the drop down list.
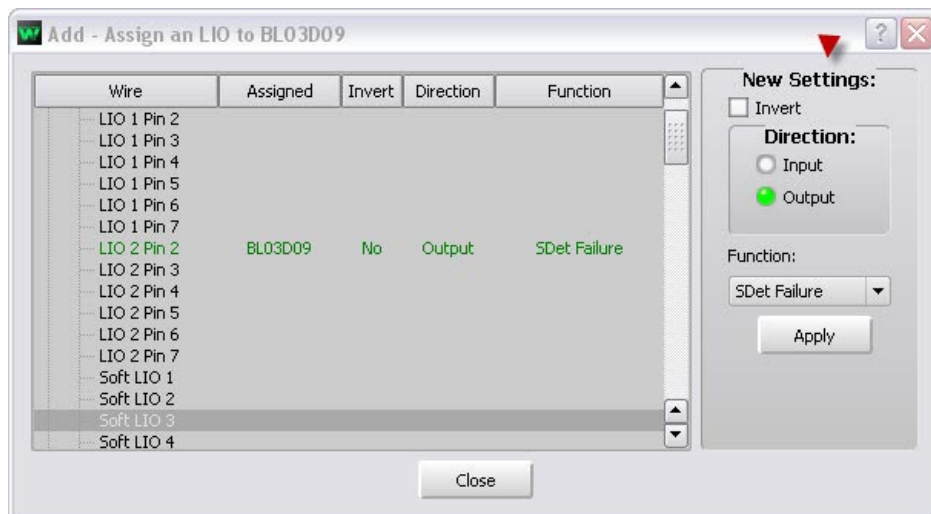
One you have defined the new Logic Only destination signal, make a new crosspoint connection between the auto generated silence alarm source logic signal and your new alarm destination signal. On detecting silence, the SDet Failure logic function will trigger your destination alarm signal for as long as the silence persists.

Utility Mixer Tab
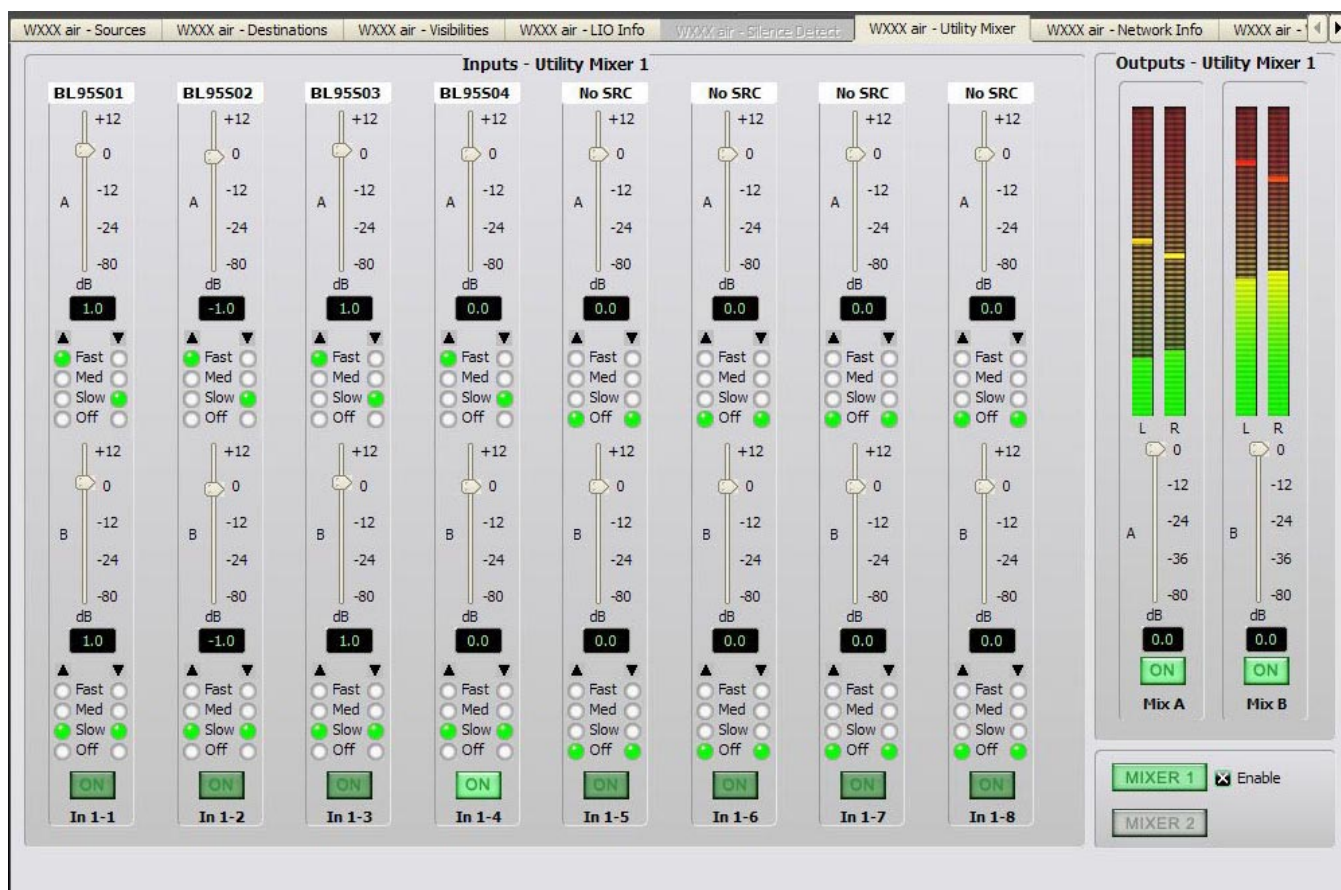
The next tab is "Utility Mixer." Each BLADE can optionally have a built in audio mixer capability (this tab will be grayed out if it is not available on the BLADE). Clicking on this tab will open the Utility Mixer window, which shows a graphic representation of an 8 x 2 mixer, complete with faders, meters, and ON switches. There are two different 8 x 2 mixers available on this tab. With each of these mixers, two separate mixes of up to eight audio sources can be created and manipulated. Furthermore, each one of these two 8 x 2 mixers has a separate Automation Control Interface, or ACI, providing for external control of the mixer by a third party program such as an Automation system. Lastly, every physical BLADE in the system can have these two mixers enabled on it simultaneously, so the number of mixes available to you is limited only by how many BLADEs you have.

Enabling the Utility Mixer will add (4) new sources in the BLADE, labeled BL04UMXA, BL04UMXB, BL04UMXYA, & BL04UMXYB, representing the A & B output channels for each mixer. Also added will be (16) new destinations, labeled BL04UMX1 - BL04UMX8, representing the eight fader input channels of the first mixer and BL04UMY1 - BL04UMY8 for the eight fader input channels of the second

mixer. These new sources and destinations will appear in the system crosspoint grid, allowing you to connect various system resources, mix them as required, and distribute these mixes to other system destinations.

To operate the Utility Mixer, first be sure it is enabled by clicking on the Enable check box. You can separately enable mixer number 1, number 2, or both. This will cause the BLADE to autogenerate the required new signals. Then assign the signal sources needed to fader channels by using the system crosspoint grid. To mix the audio signals, bring up the fader channels to a desired mix output bus by dragging with the your mouse and clicking on the channel "ON" button. Adjust the mix by dragging the individual and mix faders up or down. The radio buttons beside each fader provide for automatic "Fade up" or Fade down" with a variety of speeds. You can monitor the mix by watching the on screen meters, and/or by listening to the mix output on any speaker or headphone output destination. The front panel headphone jack on the BLADE is a good place to do this.

The Utility mixer is handy for a variety of functions. You can use it to premix some standard signals, provide for late night automated operation, set up mix minus feeds, create an intercom system, or even run a small remote.

Network Info Tab

The next tab is the "Network Info" tab. This tab is where the BLADE's network settings are displayed and can be modified. If you have used the System Wizard to automatically set up the BLADEs initially, all of the system configured network settings are shown here. Wheatstone recommends leaving these settings unchanged unless you have strong reasons to change the default addresses and are experienced in LAN set up, and have created an address plan for the system.

The upper part of the window shows the BLADE's hardware address information. Every networkable device is built with a unique physical hardware address (called the MAC address) that cannot be changed. This MAC address, along with the BLADE's type and ID information, are displayed for information purposes only in non-editable boxes.
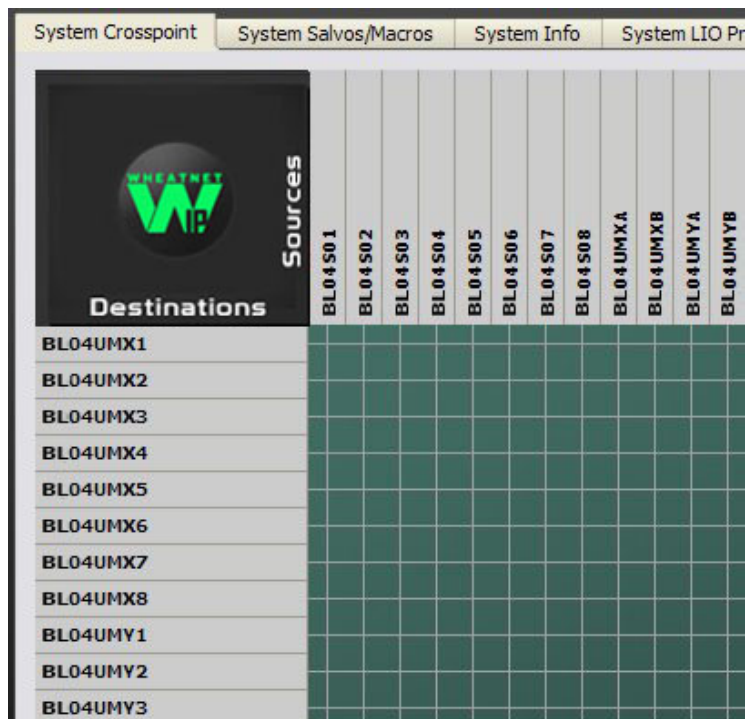
The lower part of the window shows the BLADE's software address information. This is the IP address information created by the System Wizard, and takes the form of the familiar IP address, Subnet, and Gateway. This address information is described in detail in the Networks chapter of this manual; it is sufficient to note that these boxes can be edited to change the BLADE's software address.

Note that modifying this address information improperly will cause the BLADE to cease operating on the WheatNet-IP network and potentially become invisible to the WheatNet-IP Navigator GUI. In other words, if you mess this up you may not be able to get back without rerunning the System Wizard from the front panel of the BLADE.

The one setting that you might consider changing is the BLADE name. This is the name that will identify the BLADE in the System Pane and elsewhere. The system default name for the BLADE is "BLADEXX" where "XX" is the BLADE ID number. You can leave the BLADE name as the default, or change it to any eight character name by dragging or double clicking on the name and typing a new one. Just remember that each BLADE needs a unique name to let you identify it in the system. Click on the "Apply" button in order to save any changes.

Version Manager Tab

The next tab is the "Version Manager" tab. Clicking on this tab opens an information window showing the current software and firmware versions running on the BLADE. As the WheatNet-IP system evolves over time, there will no doubt be future updates that increase or improve functionality of the BLADE. This tab is a convenient way to keep track of the current versions on the BLADE. It also can be used to update the BLADE with new versions.

The "Versions:" section in the upper part of the Versions Manager window shows the current versions running. Note that even after loading a newer version of software on the BLADE, this window will still show the older version until the BLADE is rebooted and the newer version is launched.

The "Release Folder:" section in the middle part of the window is used during software updating. Assuming you have downloaded a new version of software onto your GUI PC, click on the "..." button to the right of the window to browse to the directory on your PC that contains the version you wish to upload to the BLADE. If desired, click on the "Default" button to make this directory path the default.

The "Select a file to install on BLADE:" section in the lower part of the window will show a list of all the available files in the chosen directory. Older software versions from previous updates will appear in this list unless you have specifically deleted them in the past. Click on a file name to highlight it and then click on the install button. The file will be uploaded to the BLADE. Note that the BLADE must be rebooted in order for the new software file to actually run on the BLADE. Either power cycle the BLADE or chose "Reboot" from its front panel menu.

After uploading and rebooting, check in the "Versions:" window to make sure the desired software version is running.

Config Manager Tab

The last BLADEs tab is the "Config Manager" tab, which gives access to backup or restore the BLADE's specific configuration information. All of the BLADE's signal ID's, names, format, logic settings, silence detect settings, etc., can be saved to a directory on the GUI PC. Likewise, all of this information can be retrieved from the PC and re-stored to the BLADE.

The "Configuration Folder:" section of the window is used to specify the directory path on the GUI PC to be used for the backup and restore functions. The currently specified path will show in the text box in this section. To specify another folder, click on the browse button next to the text box. A standard Windows dialog box will open allowing you to specify the desired directory. If desired, you can assign this directory as the default location for configuration files by clicking on the "Default" button.

The "Backup BLADE Configuration" section of the window is even simpler. All it contains is a "Backup" button which, when clicked, will write all of the configuration information to the specified directory. First a subdirectory is created, and is named "cfg_YYYY-MM-DD_HH-MM-SS_BL" where YYYY-MM-DD is the current date and HH-MM-SS is the current time. This automatic naming convention makes it easy to keep track of your backup files. Click "Yes" on the ensuing dialog box to proceed (clicking "No" will cancel the
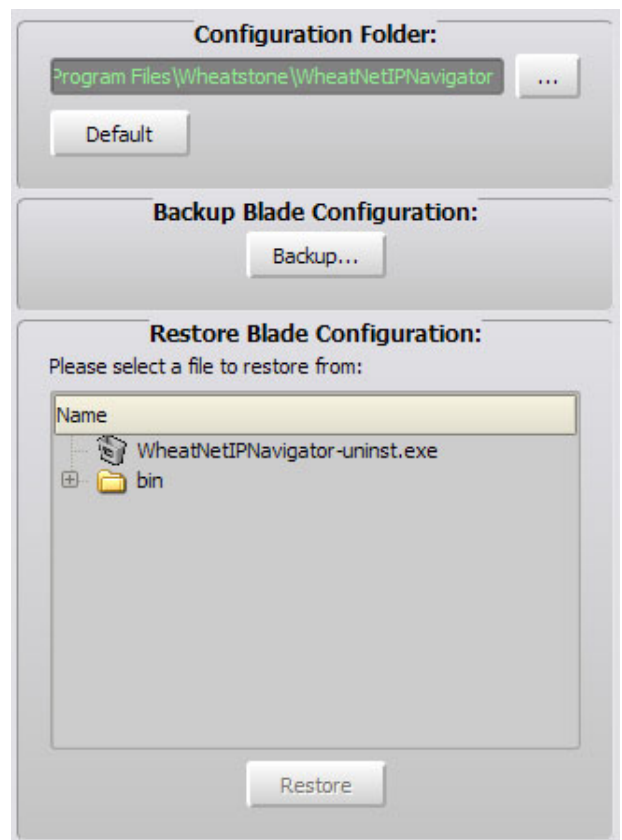
operation). A file will be created with a name of the form "full_BLADE_config_XXXX" where "XXXX" is the BLADE ID number.

The last section of this tab shows the "Restore BLADE Configuration" section. Here you can scroll through the list of available configuration directories and files, click on one to highlight it, and then click on the "Restore" button to send the information to the BLADE. A restore dialog box will open showing the selected file and asking you if you are sure. Clicking "Yes" will again show a progress bar as the information is uploaded to the BLADE.
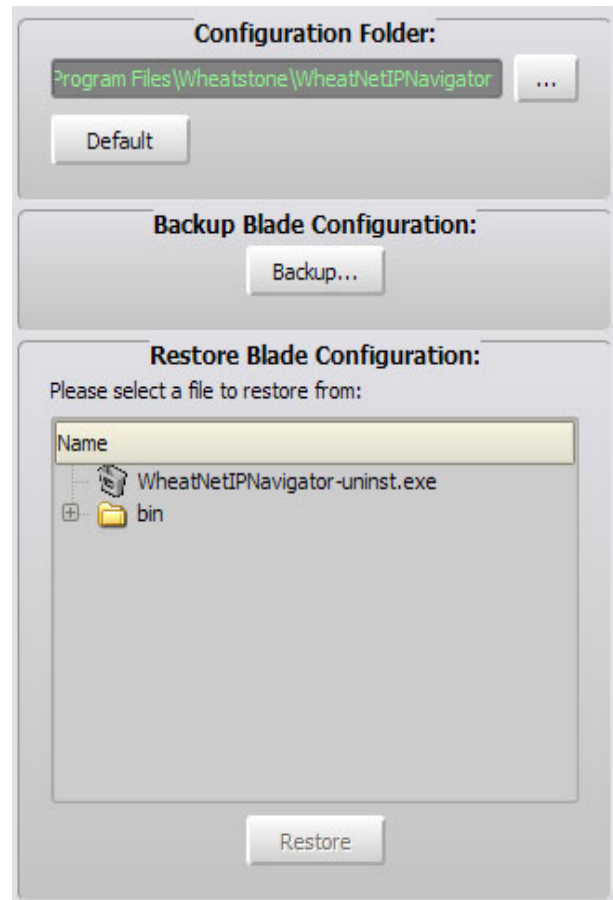
A Word About Backup and Restore

Because of the distributed intelligence of the WheatNet-IP system, the backup function is mainly intended for archival purposes. Since all of the system's information is concurrently saved in flash memory on multiple BLADEs, it is extremely unlikely that it all would be lost. So why then do we need to perform backups? It would take a catastrophic event, such as a direct lightning strike or massive flooding that simultaneously wipes out all of the BLADEs, in order for all of this information to be lost. Maintaining a regular schedule of backups is a good way to mitigate against this unlikely but still possible scenario.

Because the Navigator GUI is so powerful, Wheatstone has provided in the WheatNet-IP system for up to four copies to be running at the same time. You can be running a copy in your TOC, running another copy down the hall, and even run a copy from your home if you have provided for external access into your system. This functionality can be handy for managing connection, silence detection, and logic functions. Be aware, however, that the backup and restore functions work in concert with the directories on a particular PC, so to avoid confusion it is best to restrict these activities to only one PC.

More on the System Pane

Popup menus are available when a BLADE's icon or name is right-clicked in the System Pane. Additionally, the view in the main window area changes as if the icon or name was left-clicked.

If the BLADE type is any of the hardware BLADEs, the popup menu allows you to choose any of the tabs in the main view, This is most handy when you want to change to a tab that's currently not visible and would require use of the tab scroll buttons to make that tab show before selecting it. With the right-click method you don't need to use the tab scroll buttons.

There are two additional entries in the popup menu for a hardware BLADE. At the top is a choice to "Go to Crosspoint," which changes the main view to the System Crosspoint tab. At the bottom of the menu is a choice to "Reboot BLADE." This should be used with caution, since the BLADE will be out of commission for the reboot time, and any audio in the BLADE will be lost to the system until reboot is done. The main reason for providing "Reboot BLADE" is to allow you to reboot a BLADE when updating its software without having to physically travel to where the BLADE is located.

If the BLADE is a PC type, the popup menu once again lists the tabs for that BLADE as choices, and also sports the "Go to Crosspoint" choice. There is, however, no "Reboot BLADE" choice.

You can also right-click on the System icon or name to bring up a similar menu. Since one of the choices is already the System Crosspoint tab, there is no need to have the "Go to Crosspoint" choice, so that item is omitted from the list. And the bottom choice is not "Reboot BLADE" but, instead, is "Reboot All BLADEs." Once again, this choice needs to be used with caution.

Appendices

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Appendix 1

Contents

WheatNet-IP Set Up Wizard

WHEATNET-IP SET UP WIZARD

BLADE ID: DISABLED

 1   scroll to change

 2   scroll to change

 100   scroll to change

 SNAKE A   scroll to change

 SNAKE B   scroll to change

IP ADDRESS: 192.168.87.101

For WheatNet-IP 88a, ad, d

I/O TEMPLATE

 MONO_IO   scroll to change

 CUSTOM   scroll to change

 STEREO_IO   scroll to change

OR

For WheatNet-IP 88m

I/O TEMPLATE

 STEREO_MIC   scroll to change

 MONO_MIC   scroll to change

OR

For WheatNet-IP 88cb

I/O TEMPLATE

 Custom   scroll to change

 Console_Stereo_In   scroll to change

 Console_Mono_In   scroll to change

CONNECTING...

                    WHEATNET-IP

WheatNet-IP Front Panel Menus

NOTE: Menus are circular

HEADPHONE...

> HDPN LEVEL: 7 -------   scroll to change

> HDPN SOURCE: NO SRC   scroll to change

> << TOP OF MENU

BLADE...

> NAME: BLA023

>> NAME: BLA023   scroll to change,
>   dobby to advance

> ID: 23

> SYSTEM ID: 0

> TYPE: 88ad

> DATE/TIME...

>> DATE/TIME MODE: MANUAL   scroll to change

>> DATE/TIME MODE: NTP   scroll to change

>> DATE: 2008 SEP 15   scroll to change,
>   dobby to advance

>> TIME: 11:23:12   scroll to change,
>   dobby to advance

>> << TOP OF MENU

> PRIMARY EXTERNAL REF: 23   scroll to change

> SECONDARY EXTERNAL REF: 2   scroll to change

> VERSION...

>> SOFTWARE: 1.1.0 AUG 25 2008

>> HARDWARE: EE010105 20080821.1505

>> << TOP OF MENU

BLADE (CONTINUED)

NETWORK...

 IP ADDRESS: 192.168.87.123

 SUBNET MASK: 255.255.255.0

 GATEWAY ADDRESS: 192.168.87.1

 MAC ADDRESS: 00:50:C2:23:C7:48

 CHANGE NETWORK SETTINGS...

  IP ADDRESS: <u>192</u>.168.87.123   scroll to change,
                                       dobby to advance

  SUBNET MASK

  GATEWAY

  REBOOT TO APPLY CHANGES

REBOOT...

 <u>NO</u>   scroll to change

 <u>YES</u>   scroll to change

FACTORY RESET...

 THIS WILL DELETE YOUR SETTINGS

 FACTORY RESET: <u>NO</u>   scroll to change

 FACTORY RESET: <u>YES</u>   scroll to change

  ENTER PASSWORD: <u>_0__0_</u>   scroll to change,
                                       dobby to advance

  REBOOTING...

<< TOP OF MENU

```
OUTPUT...

      BL23D01: NO SRC                    switch to select,
                                         scroll to change

      BL23D02: NO SRC                    switch to select,
                                         scroll to change

      BL23D08: NO SRC                    switch to select,
                                         scroll to change

      << TOP OF MENU


INPUT...

      MIC GAIN...                        switch to select,
                                         scroll to change

          BL05501: 50.0 dB                scroll to change

      PHANTOM POWER...                   switch to select,
                                         scroll to change

          BL05501 — 48V Phantom Power: OFF  scroll to change


STATUS...

      UPTIME: 0 days 00:10:36

      DATE/TIME: JUL 20 2008 11:10:23

      TEMPERATURE: 31.9 C

      ANNC PKTS: TX 3487 RX 3512

      ANNC ERRORS: TX 0 RX 0

      LIO PKTS: TX 0 RX 0

      LIO ERRORS: TX 0 RX 0

      GUI: NONE CONNECTED

      ROUTE MASTER: YES

      CLOCK MASTER: YES

      << TOP OF MENU
```

```
METERS...
        SELECTED METERS:  INPUTS         scroll to change

        SELECTED METERS:  OUTPUTS        scroll to change

        << TOP OF MENU

LOGIC...
        IN: 00000000000 OUT:-----------

        OUT TEST:-----------

        << TOP OF MENU

PASSWORD...
        CHANGE PASSWORD: _0__0_          scroll to change,
                                         dobby to advance
        << TOP OF MENU
```
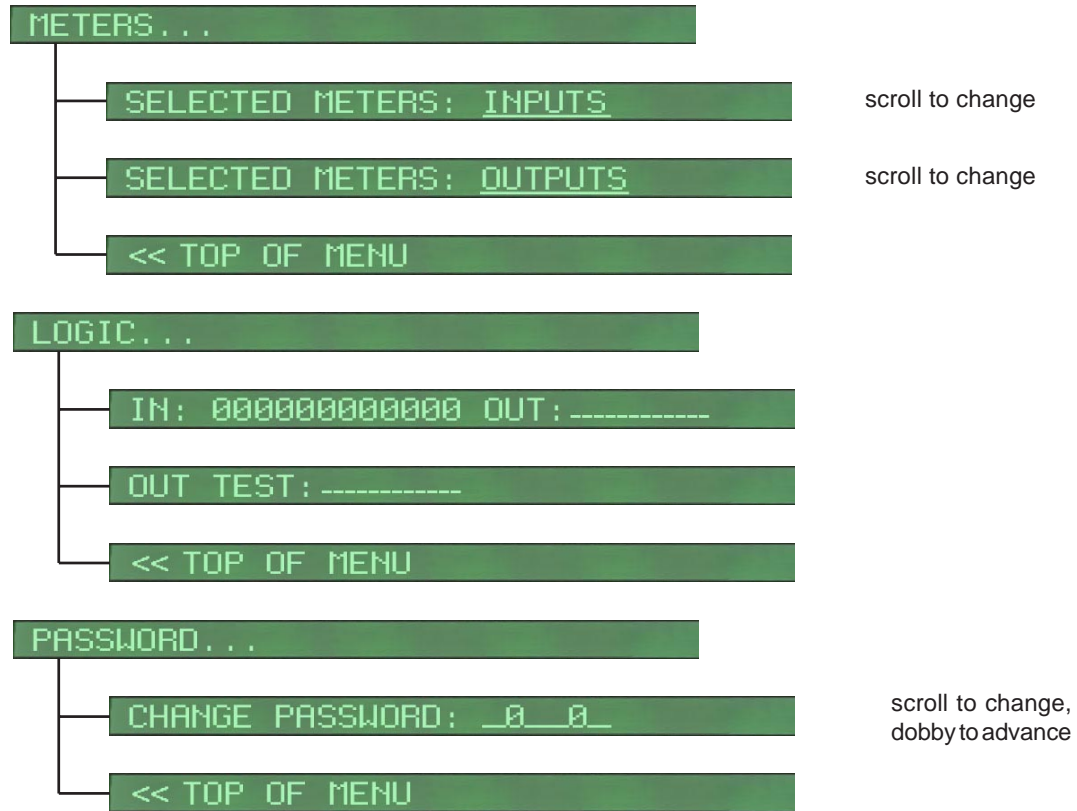
Appendix 2

Contents

Configuring Control Surfaces for Use in WheatNet-IP Systems

Wheatstone makes a number of different model control surfaces. Not all of these are compatible with the WheatNet-IP system. Currently supported are the Evolution series E-4, E-5, and E-6 control surfaces.

In order to use an Evolution control surface with the WheatNet-IP system it must be properly configured. There are two parts to this configuration. First, the control surface must be equipped with the correct version of WheatNet-IP specific software. If you have ordered your control surface as a part of a WheatNet-IP system, this will be taken care of automatically. If you are moving an Evolution control surface purchased previously, its software may need to be updated. The Evolution series control surfaces can be used with other Wheatstone products and may be equipped with software specific to other applications. Consult with Wheatstone Technical Support; they can assist you with any required software updates.

The second part of the configuration is to mate a specific control surface to its mixing engine BLADE within the WheatNet-IP system. This mate up process is actually done at the control surface itself. To complete this process successfully, the control surface and its intended WheatNet-IP engine must be powered up and connected to the same LAN.

First, be sure that you know the BLADE ID and IP address of the intended WheatNet-IP engine BLADE. This BLADE must be available and unassociated with any other control surface. You can confirm this information via the front panel controls on the engine BLADE, or from the WheatNet-IP Navigator GUI.

At the control surface click on the "Options" tab and then the "Network Settings" menu.

Enter the WheatNet-IP ID and IP address in the boxes provided, and verify that the IP address of the control surface is correct (it must be on the same subnet as the BLADEs). While you are at it, it is highly recommended that you use the IP address number convention for the control surface IP address. This convention makes it easier to understand and trouble shoot your system architecture. Simply take the ID number

of the engine BLADE and add 200 to it. Thus Engine BLADE ID=03 would have IP address 192.168.87.103 and the mating surface would have IP address 192.168.87.203.

Reboot the control surface. After the surface has booted up, the new settings should now be visible in the "Options"/"Network Settings" tab of the control surface VGA display.

Once the control surface has been associated with a WheatNet-IP engine, the BLADE will query the surface for its configuration information and then automatically generate the required source and destination signals. A control surface icon (showing its IP address) will be added to the WheatNet-IP Navigator GUI system view, attached to the mating engine BLADE.
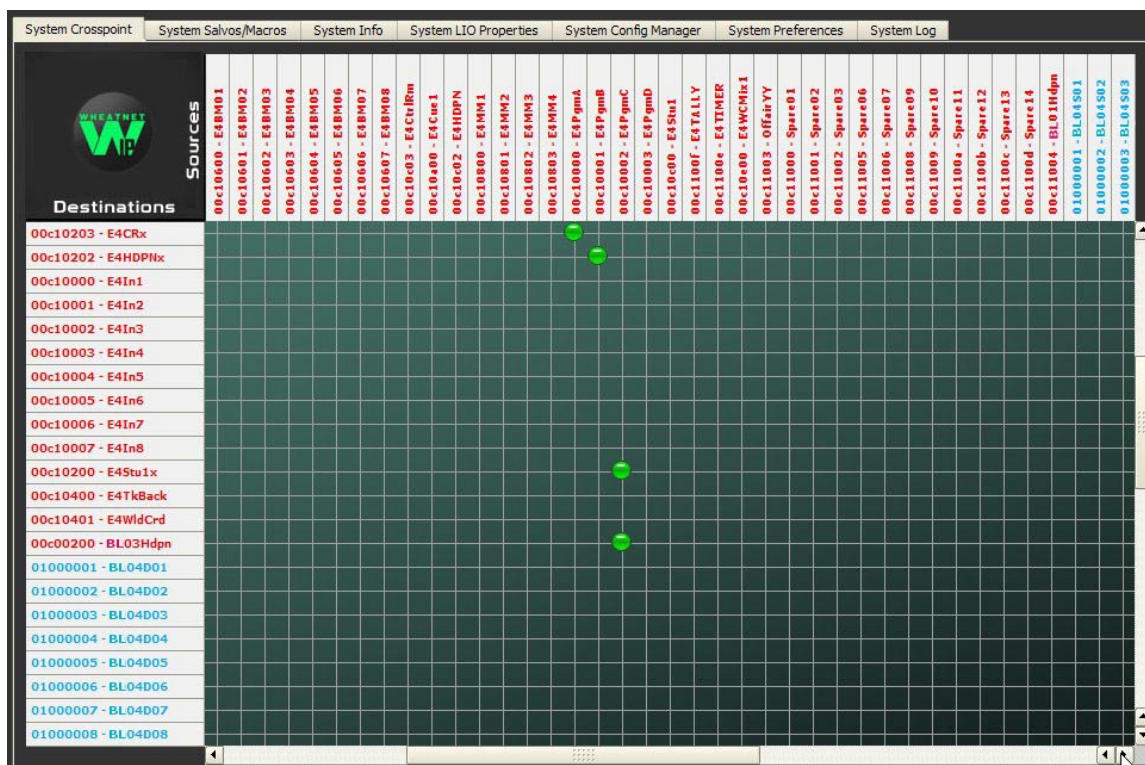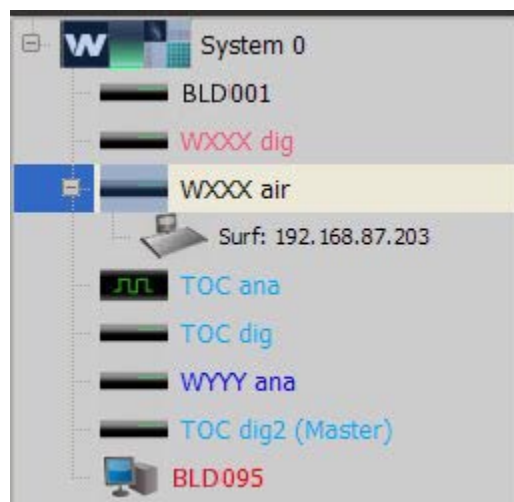
The specific signals created and their default names are a function of the model and size of the associated control surface. The following is a listing of a typical set of signals for a XX fader E-Series control surface. Of course, just as with any other signals, you can rename these however you choose; if you've done so, the names on your system may not exactly match the ones on the following list.

Sources
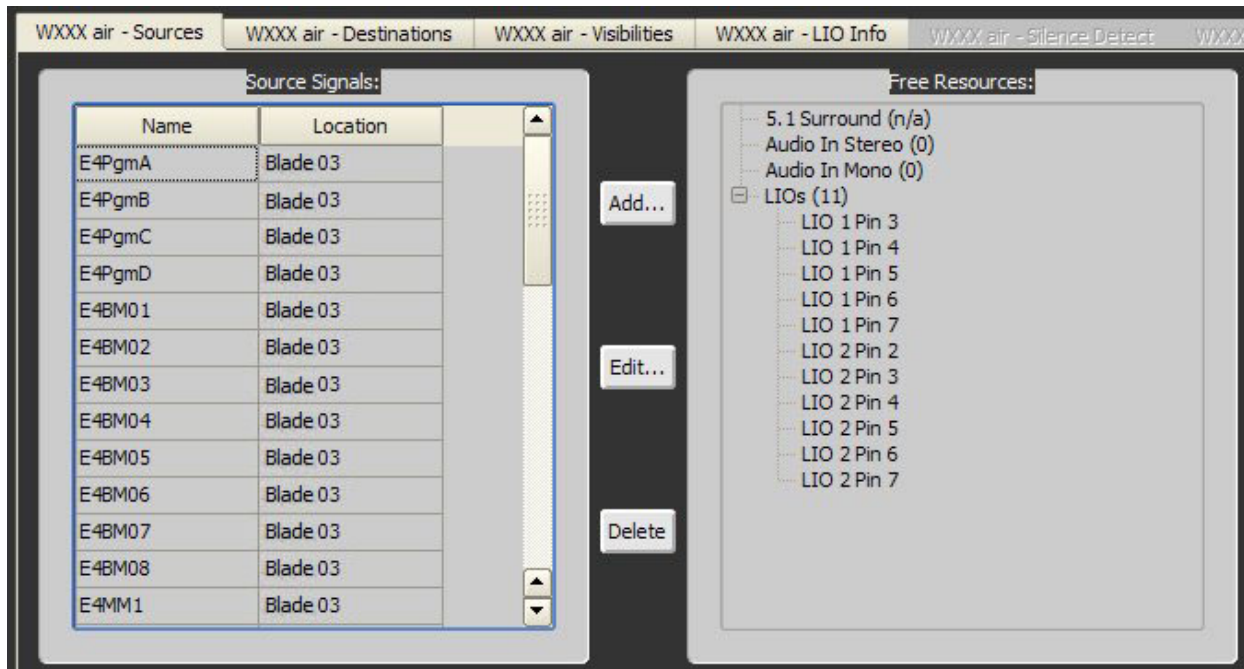
Spare01	Logic signal associated with programmable button #1
Spare02	Logic signal associated with programmable button #2
Spare03	Logic signal associated with programmable button #3
Spare04	Logic signal associated with programmable button #4
Spare05	Logic signal associated with programmable button #5
Spare06	Logic signal associated with programmable button #6
Spare07	Logic signal associated with programmable button #7
Spare08	Logic signal associated with programmable button #8
Spare09	Logic signal associated with programmable button #9
Spare10	Logic signal associated with programmable button #10
Spare11	Logic signal associated with programmable button #11
Spare12	Logic signal associated with programmable button #12
Spare13	Logic signal associated with programmable button #13
Spare14	Logic signal associated with programmable button #14
E6Aux1	Aux 1 audio mix
E6Aux2	Aux 2 audio mix
E6Aux3	Aux 3 audio mix
E6Aux4	Aux 4 audio mix
E6BM01	Bus minus 1 audio mix (for fader 1)
E6BM02	Bus minus 2 audio mix (for fader 2)

.....

E6BMxx	Bus minus 1 audio mix (for last fader)
E6CtrlRm	Control room monitor audio mix
E6Cue1	Cue monitor audio mix
E6HDPN	Headphone monitor audio mix
E6MM1	Mix Minus 1 audio mix
E6MM2	Mix Minus 2 audio mix
E6MM3	Mix Minus 3 audio mix
E6MM4	Mix Minus 4 audio mix
E6PgmA	Program A audio mix
E6PgmB	Program B audio mix
E6PgmC	Program C audio mix
E6PgmD	Program D audio mix
E6Stud1	Studio 1 monitor audio mix
E6Stud2	Studio 2 monitor audio mix
E6Tally	Mute/tally logic signals
E6Timer	Timer logic signals
E6WCMix1	Source for Control room/headphone/studio monitors

Destinations
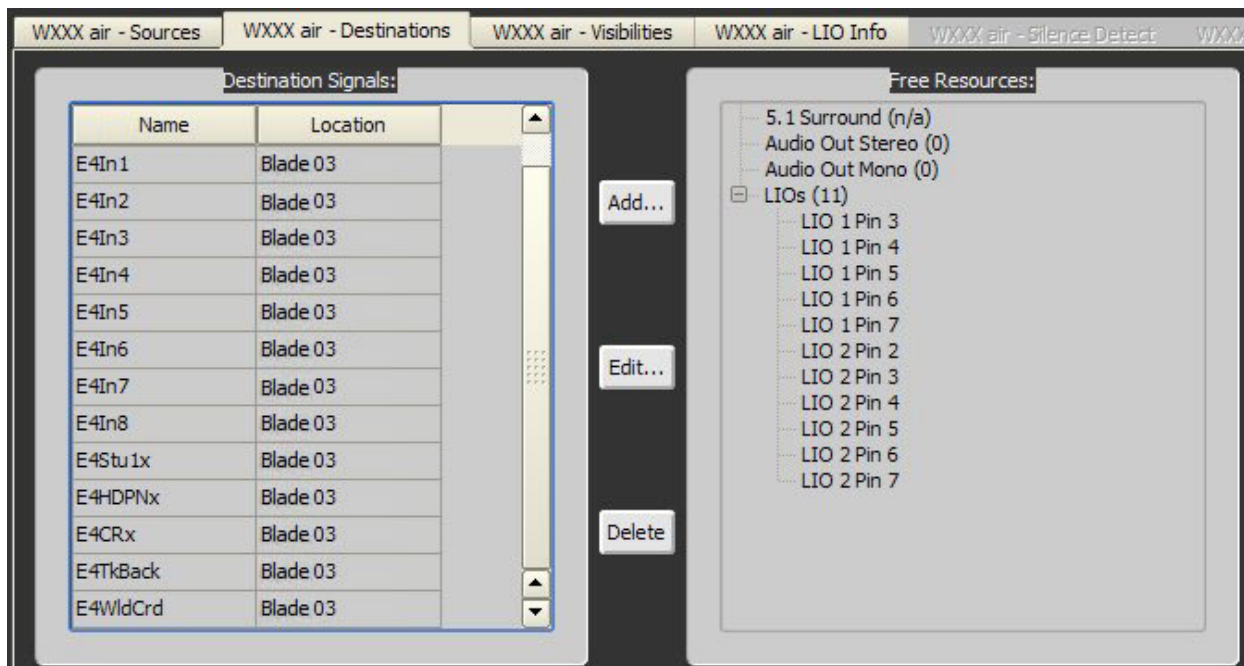
E6CRx	External input for Control room monitor
E6HDPNx	External input for Headphone monitor
E6In1	Input to first fader channel
E6In2	Input to second fader channel

.....

E6Inxx	Input to last fader channel
E6Stu1x	External input for Studio 1 monitor
E6Stu2x	External input for Studio 2 monitor
E6TkBack	Input for talkback channel
E6WldCrd	Input for switchable meters

Once these signals have been auto-generated, the control surface is now ready for use. You can make connections to the fader channels either with the Navigator GUI, or through the control surface front panel controls, and begin mixing. One thing you will notice is that, as soon as a fader channel is turned on, the system automatically locks the connection (as shown by the red line on the GUI screen) to prevent someone else from breaking your connection while you are on air.
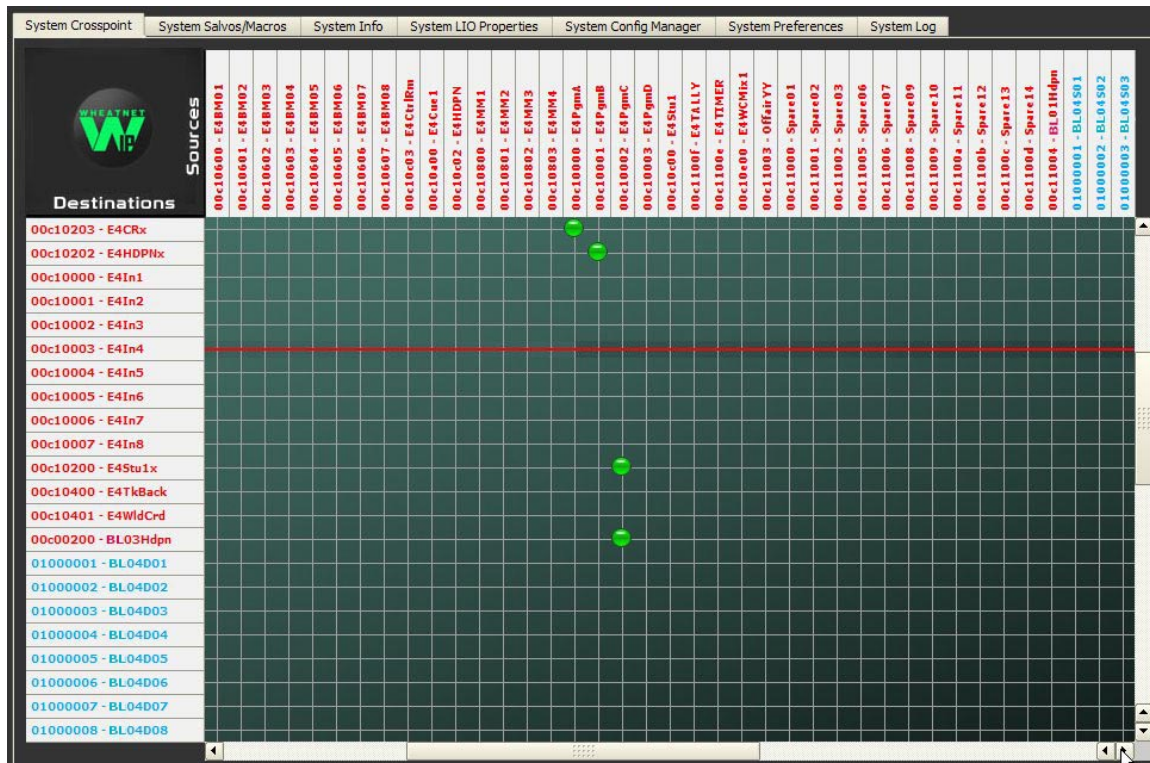
Remember, you must also make connections from the mixer signals to actual audio destinations before the mixes are routed through the WheatNet-IP system. Use the GUI to make these connections and lock them if necessary.

Lastly, you can continue setting up control surface options, for logic, mutes, signal visibility, and others. Consult the proper Evolution series manual for details.

Appendix 3

Contents

Cisco 2960G Configuration for WheatNet-IP

Overview

Let's take a look at what needs to be done to get your Cisco 2960G ready for the installation of your WheatNet-IP system. Properly configuring your switch allows you to take advantage of the "management" capabilities to control network traffic and allows the network to operate at its highest potential. This becomes necessary to prevent overloading the network as the system size increases.

In this setup process you will setup switch ports according to the type of device connecting to that port. You will be setting things like VLAN access, Trunking, Speed, etc. Each section below gives you the exact commands needed to get your Wheatnet-IP network up running.

Below is a chart that gives you some information about the command you will be using to complete the setup. This can be a quick reference for you as

Command	Purpose
Configure Terminal	Enter Global configuration mode on switch
Interface	Enter interface configuration mode
Switchport mode access	Configures the port as an access port
Switchport mode Trunk	Configures port for trunking to other switches
Switchport nonegotiate	Prevents DTP frames from being generated
Spanning-tree portfast	Enables portfast on the switch port
Show running-config	Show the current running configuration
Write memory	Writes the configuration to memory on the switch
IP igmp snooping querier	Enables IGMP querier
IP igmp snooping querier timer expiry	Set the length of time until the IGMP querier expires

This document will explain the initial configuration of the Cisco 2960G switch. To get started you will need the blue console cable that came with your switch. Go ahead and connect the console cable to the serial port on your pc and the RJ-45 to the console port on the switch. If your pc is not equipped with a serial port you will need a USB to Serial converter.

Next let's get your pc ready to communicate. You will need a terminal program such as HyperTerminal to finish this portion of the setup. HyperTerminal is an application you can use in order to connect your computer to other remote systems. These systems include other switches, routers, other computers, and Telnet sites.

HyperTerminal is located under the Start menu of your Windows 2000/XP PC. If you are using Windows Vista or Windows 7 you will need to install a similar terminal program to complete the setup.

To get started, open HyperTerminal and start a new connection. The terminal session should be setup using 9600Baud, 8 bit, no Parity, and no Flow control.

For those who are familiar with the Cisco IOS you may wish to jump ahead to the commands. For the rest, keep reading and we'll walk you through it step by step.

Along the way we'll even explain why we use the commands below so that you have some basic understanding of what you are doing. Hopefully you will walk away with some new found knowledge.

Privileged EXEC Mode

Now that we are connected to the switch let's login. When logging into a Cisco switch under the default configuration, you are in user EXEC mode (level 1). In EXEC mode, you have limited access to the status of the switch. However, you can't make any changes or view the running configuration file.

Because of these limitations, you need to type *enable* to get out of user EXEC mode. By default, typing *enable* takes you to "Privileged" EXEC mode (Level 15). In the Cisco IOS, this level is equivalent to having root privileges in UNIX or administrator privileges in Windows. In other words, you have full access to the switch.

Let's get started on the configuration of your switch. Type "*enable*" command at the prompt. When prompted, enter the password and press Enter again. If no password has been defined just press Enter.
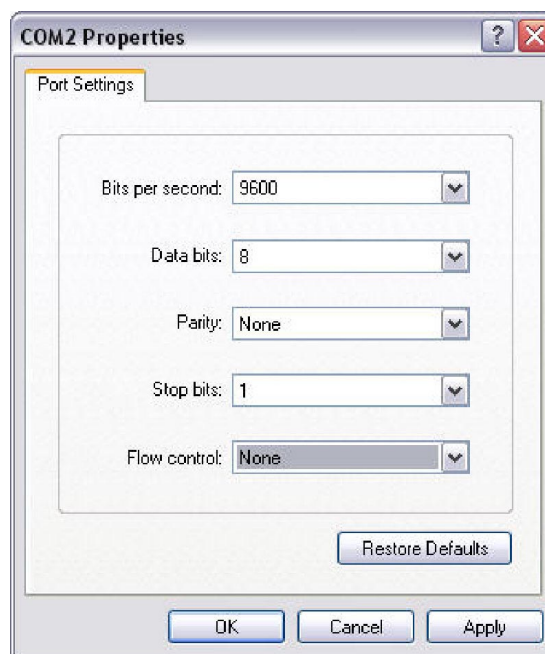
NOTE: The command prompt now ends with "#" indicating you are now at the Privileged EXEC mode (Level 15).

Global Configuration Mode

To enter the IP address and Subnet Mask for the VLAN or configure the switch ports you must first enter the configuration mode. To enter the global configuration mode on the 2960G type "**Config T**" and press enter. This places the switch in Global configuration mode and will allow configuration from the terminal window for the selected interface. You should now have the **switch (config)#** prompt.

Configuring the VLAN Interface

A VLAN is a switched logical network that is segmented based on the function or application. VLANs are virtual LANs but have the same attributes as the physical LAN. VLANs allow a user to create a virtual broadcast domain in which traffic can be isolated to keep it reaching unwanted destinations. Any switch port can belong to a VLAN, and unicast, broadcast, and multicast packets are forwarded only to those end stations assigned to that VLAN.

Now that you are in the Global configuration mode you need to select the interface that you would like to configure. We'll start with the default VLAN.

The switch will come with a default VLAN enabled. In the default configuration all ports on the switch have been assigned to VLAN1. The command below selects the default VLAN for configuration to segment network traffic on the switch. If you are adding an additional VLAN to existing hardware, substitute that VLAN number in place of 1.

Enter the following commands ("XXX" = the actual network IP address)

```
interface Vlan1
ip address 192.168.87.XXX 255.255.255.0
end
```

Let's look at what you just setup. By typing "interface Vlan1" you are entering the configuration for that VLAN. The "IP Address" Command simply sets the IP address of the VLAN1 interface for remote management purposes. The IP address must be unique on the network.

IGMP Snooping Querier Configuration

By default, IGMP is enabled globally on the switch. To setup IGMP Snooping Querier on the switch you must be in the Global configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands:

```
ip igmp snooping querier
ip igmp snooping querier max-response-time 25
ip igmp snooping querier timer expiry 205
end
```

By default IGMP Snooping is globally enabled on the switch. It is enabled on VLANs by default. Global IGMP snooping takes precedent over VLAN IGMP Snooping. If globally disabled you cannot enable IGMP Snooping on a per VLAN basis.

The commands above simply enable the querier on the switch and set a few values for maximum response time and the expiration duration for the querier.

Configuring Gigabit Ports Connecting to WheatNet-IP I/O Blades and PC Drivers

Configuring the ports on the Cisco 2960G is a key step in ensuring optimal performance of the Wheatnet-IP network. This section will guide you in the setup of each port used for Wheatnet-IP I/O Blades.

Switch ports operate in one of three modes, dynamic, trunk, or access mode.

Switch ports connecting to Wheatstone-IP devices must be in Access mode. Access mode places the port in static access mode and gives it access to the default VLAN. The switchport nonegotiate command disables the Dynamic Trunking Protocol and tells the port not to generate DTP frames.

To setup ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport mode access
switchport nonegotiate
speed 1000
spanning-tree portfast
end
```

Ports on the 2960G can be configured individually or in a "Range." If range is desired type **Interface range gig1/0/1 - 24** using the desire number of ports.

Configuring Gigabit Ports Connecting to Wheatnet IP Control Surfaces, GP Panels, and XY Controllers

Enter the following commands

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport mode access
switchport nonegotiate
speed 100
spanning-tree portfast
end
```

Ports on the 2960G can be configured individually or in a "Range." If range is desired type **Interface range gig0/1 - 24** using the desired number of ports.

Configuring Ports for Linking to Other Network Switches

Trunk mode is used when connecting another switch to the port.

To set a specified port to trunk mode when connecting to another network switch the port needs to be set for trunk mode. To setup Gigabit ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands.

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport mode trunk
switchport nonegotiate
end
```

Checking and Saving the Switch Configuration

When you are done, check the switch configuration by typing the following command from the command prompt.

`show running-config`

Once you are sure you have the correct configuration you need to save it. You can save the configuration by typing one of the following commands

`copy running-config startup-config`

or

`write memory`

Below is a diagram that shows you what a typical configuration might look like.

Sample Switch Configuration

Cisco 3750G and 3560G Configuration for WheatNet-IP

Overview

Let's take a look at what needs to be done to get your Cisco 3750G/3560G ready for the installation of your Wheatnet-IP system. Properly configuring your switch allows you to take advantage of the "management" capabilities to control network traffic and allows the network to operate at its highest potential. This becomes necessary to prevent overloading the network as the system size increases.

In this setup process you will setup switch ports according to the type of device connecting to that port. You will be setting things like VLAN access, Trunking, Speed, etc. Each section below gives you the exact commands needed to get your Wheatnet-IP network up running.

Below is a chart that gives you some information about the command you will be using to complete the setup. This can be a quick reference for you as

Command	Purpose
Configure Terminal	Enter Global configuration mode on switch
Interface	Enter interface configuration mode
Switchport mode access	Configures the port as an access port
Switchport mode Trunk	Configures port for trunking to other switches
Switchport nonegotiate	Prevents DTP frames from being generated
Spanning-tree portfast	Enables portfast on the switch port
Show running-config	Show the current running configuration
Write memory	Writes the configuration to memory on the switch
IP igmp snooping querier	Enables IGMP querier
IP igmp snooping querier timer expiry	Set the length of time until the IGMP querier expires

This document will explain the initial configuration of the Cisco 3750G/3560G switch. To get started you will need the blue console cable that came with your switch. Go ahead and connect the console cable to the serial port on your pc and the RJ-45 to the console port on the switch. If your pc is not equipped with a serial port you will need a USB to Serial converter.

Next let's get your pc ready to communicate. You will need a terminal program such as HyperTerminal to finish this portion of the setup. HyperTerminal is an application you can use in order to connect your computer to other remote systems. These systems include other switches, routers, other computers, and Telnet sites.

HyperTerminal is located under the Start menu of your Windows 2000/XP PC. If you are using Windows Vista or Windows 7 you will need to install a similar terminal program to complete the setup.

To get started, open HyperTerminal and start a new connection. The terminal session should be setup using 9600Baud, 8 bit, no Parity, and no Flow control.

For those who are familiar with the Cisco IOS you may wish to jump ahead to the commands. For the rest, keep reading and we'll walk you through it step by step.

Along the way we'll even explain why we use the commands below so that you have some basic understanding of what you are doing. Hopefully you will walk away with some new found knowledge.

Privileged EXEC Mode

Now that we are connected to the switch let's login. When logging into a Cisco switch under the default configuration, you are in user EXEC mode (level 1). In EXEC mode, you have limited access to the status of the switch. However, you can't make any changes or view the running configuration file.

Because of these limitations, you need to type *enable* to get out of user EXEC mode. By default, typing *enable* takes you to "Privileged" EXEC mode (Level 15). In the Cisco IOS, this level is equivalent to having root privileges in UNIX or administrator privileges in Windows. In other words, you have full access to the switch.

Let's get started on the configuration of your switch. Type "*enable*" command at the prompt. When prompted, enter the password and press Enter again. If no password has been defined just press Enter.

*NOTE:* The command prompt now ends with "#" indicating you are now at the Privileged EXEC mode (Level 15).

Global Configuration Mode

To enter the IP address and Subnet Mask for the VLAN or configure the switch ports you must first enter the configuration mode. To enter the global configuration mode on the 3750G/3560G type "**Config T**" and press enter. This places the switch in Global configuration mode and will allow configuration from the terminal window for the selected interface. You should now have the **switch (config)#** prompt.

Configuring the VLAN Interface

A VLAN is a switched logical network that is segmented based on the function or application. VLANs are virtual LANs but have the same attributes as the physical LAN. VLANs allow a user to create a virtual broadcast domain in which traffic can be isolated to keep it reaching unwanted destinations. Any switch port can belong to a VLAN, and unicast, broadcast, and multicast packets are forwarded only to those end stations assigned to that VLAN.

Now that you are in the Global configuration mode you need to select the interface that you would like to configure. We'll start with the default VLAN.

The switch will come with a default VLAN enabled. In the default configuration all ports on the switch have been assigned to VLAN1. The command below selects the default VLAN for configuration to segment network traffic on the switch. If you are adding an additional VLAN to existing hardware, substitute that VLAN number in place of 1.

Enter the following commands ("XXX" = the actual network IP address)

```
interface Vlan1
ip address 192.168.87.XXX 255.255.255.0
end
```

Let's look at what you just setup. By typing "interface Vlan1" you are entering the configuration for that VLAN. The "IP Address" Command simply sets the IP address of the VLAN1 interface for remote management purposes. The IP address must be unique on the network.

IGMP Snooping Querier Configuration

By default, IGMP is enabled globally on the switch. To setup IGMP Snooping Querier on the switch you must be in the Global configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands:

```
ip igmp snooping querier
ip igmp snooping querier max-response-time 25
ip igmp snooping querier timer expiry 205
end
```

By default IGMP Snooping is globally enabled on the switch. It is enabled on VLANs by default. Global IGMP snooping takes precedent over VLAN IGMP Snooping. If globally disabled you cannot enable IGMP Snooping on a per VLAN basis.

The commands above simply enable the querier on the switch and set a few values for maximum response time and the expiration duration for the querier.

Configuring Gigabit Ports Connecting to WheatNet-IP I/O Blades and PC Drivers

Configuring the ports on the Cisco 3750G and 3560G is a key step in ensuring optimal performance of the Wheatnet-IP network. This section will guide you in the setup of each port used for Wheatnet-IP I/O Blades.

Switch ports operate in one of three modes, dynamic, trunk, or access mode.

Switch ports connecting to Wheatstone-IP devices must be in Access mode. Access mode places the port in static access mode and gives it access to the default VLAN. The switchport nonegotiate command disables the Dynamic Trunking Protocol and tells the port not to generate DTP frames.

 To setup ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport mode access
switchport nonegotiate
speed 1000
spanning-tree portfast
end
```

Ports on the 3750G and 3560G can be configured individually or in a "Range." If range is desired type **Interface range gig1/0/1 - 24** using the desire number of ports.

Configuring Gigabit Ports Connecting to Wheatnet IP Control Surfaces, GP Panels, and XY Controllers

Enter the following commands

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport mode access
switchport nonegotiate
speed 100
spanning-tree portfast
end
```

Ports on the 3750G/3560G can be configured individually or in a "Range." If range is desired type **Interface range gig0/1 - 24** using the desired number of ports.

Configuring Ports for Linking to Other Network Switches

Trunk mode is used when connecting another switch to the port.

To set a specified port to trunk mode when connecting to another network switch the port needs to be set for trunk mode. To setup Gigabit ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands.

```
Interface gig 0/x (X=the Ethernet port being configured)
switchport trunk encapsulation dot1q
switchport mode trunk
switchport nonegotiate
end
```

Checking and Saving the Switch Configuration

When you are done, check the switch configuration by typing the following command from the command prompt.
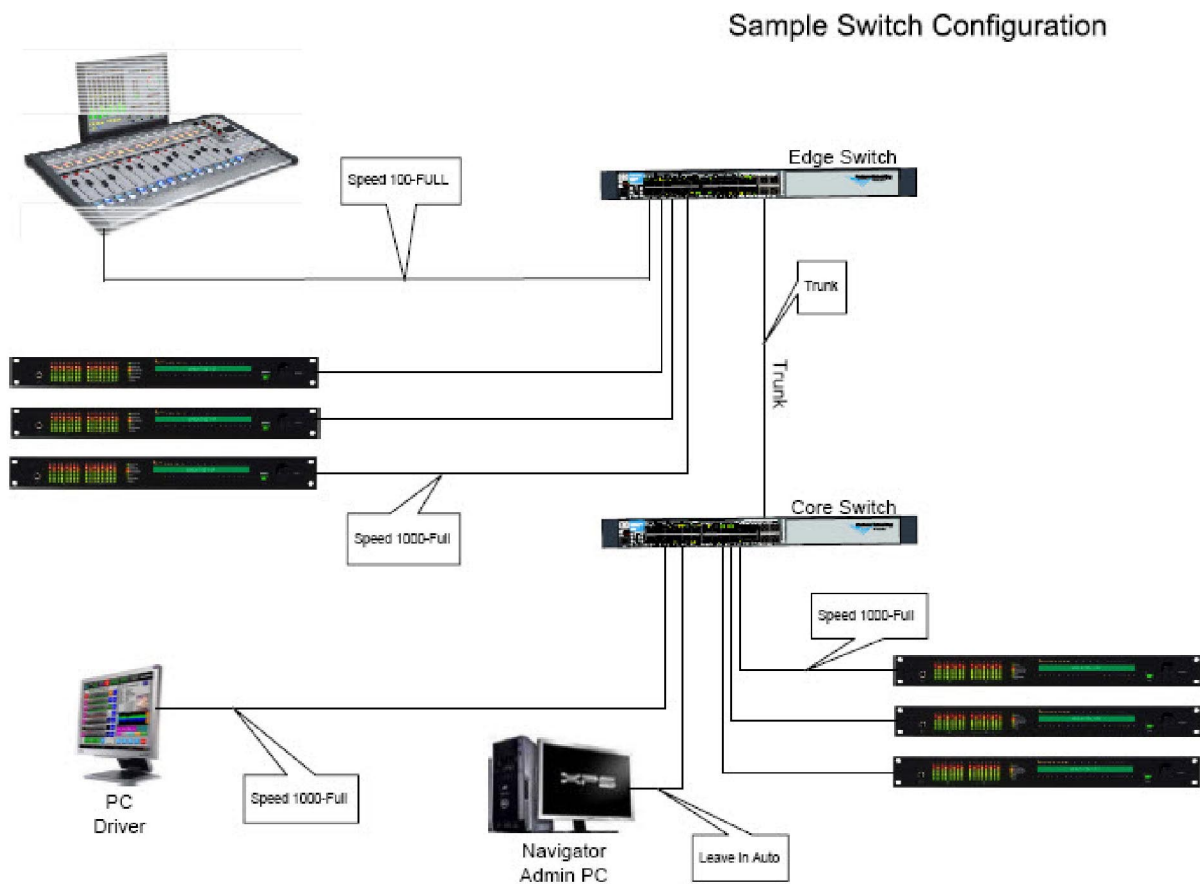
```
show running-config
```

Once you are sure you have the correct configuration you need to save it. You can save the configuration by typing one of the following commands

```
copy running-config startup-config
```

or

```
write memory
```

Below is a diagram that shows you what a typical configuration might look like.

Sample Switch Configuration
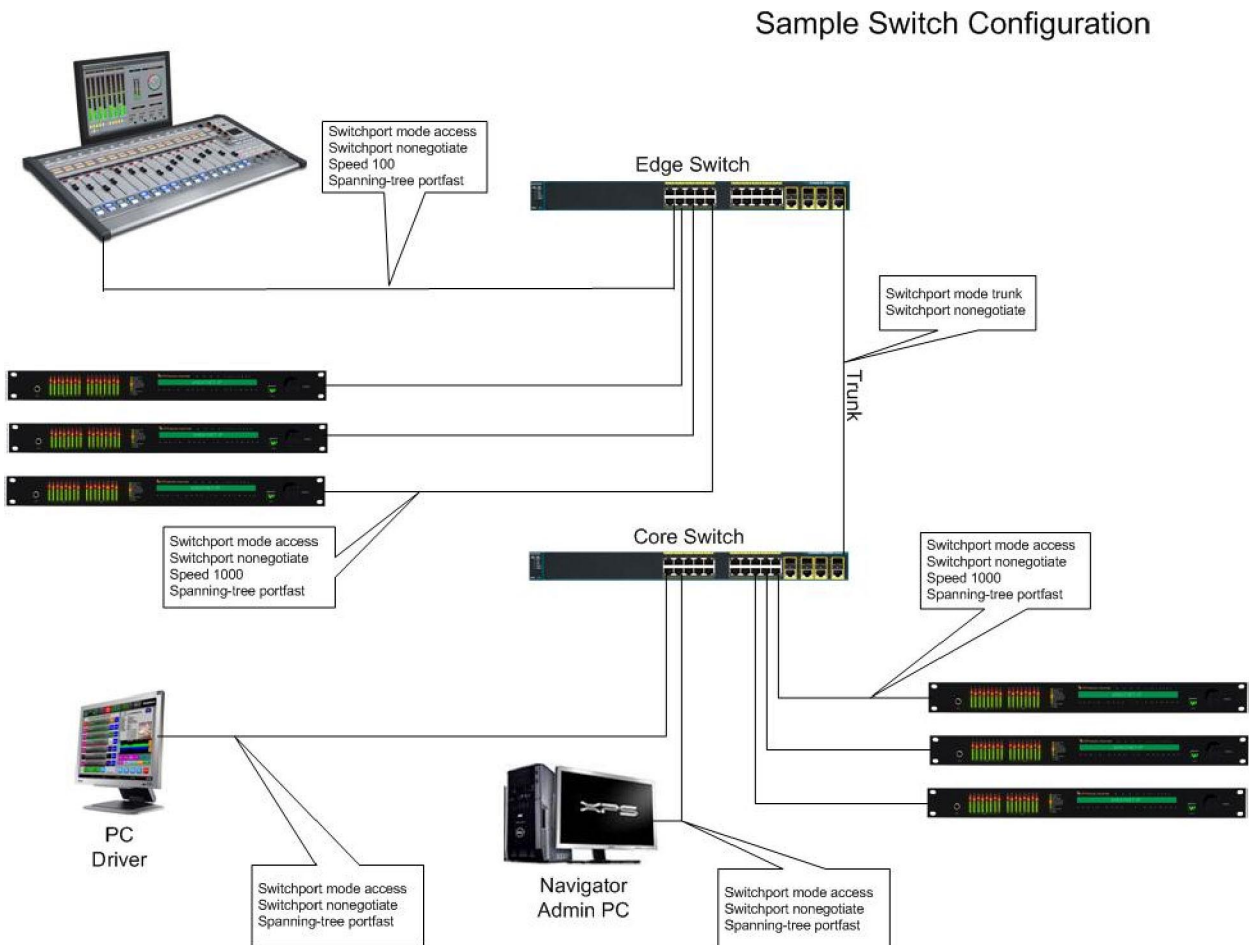
HP Procurve 2810 Configuration for WheatNet-IP

Overview

Let's take a look at what needs to be done to get your HP Procurve 2810 switch ready for the installation of your WheatNet-IP system. Properly configuring your switch allows you to take advantage of the "management" capabilities to control network traffic and allows the network to operate at its highest potential. This becomes necessary to prevent overloading the network as the system size increases.

In this setup process you will setup switch ports according to the type of device connecting to that port. You will be setting things like VLAN access, Trunking, Speed, etc. Each section below gives you the exact commands needed to get your WheatNet-IP network up running.

Below is a chart that gives you some information about the commands you will be using to complete the setup. This can be a quick reference for you as proceed through the configuration.

Command	Purpose
Configure Terminal	Enter Global configuration mode on switch
Interface	Enter interface configuration mode
Show running-config	Show the current running configuration
Write memory	Writes the configuration to memory on the switch
IP igmp querier	Enables IGMP querier

This document will explain the initial configuration of the HP Procurve 2810 switch. To get started you will need the HP provided console cable that came with your switch. Go ahead and connect the console cable to the serial port on your PC and the RJ-45 to the console port on the lower left corner on the front panel of the switch. If your PC is not equipped with a serial port you will need a USB to Serial converter.

Next let's get your PC ready to communicate. You will need a terminal program such as HyperTerminal to finish this portion of the setup. HyperTerminal is an application you can use in order to connect your computer to other remote systems. These systems include other switches, routers, other computers, and Telnet sites.

HyperTerminal is located under the Start menu of your Windows 2000/XP PC. If you are using Windows Vista or Windows 7 you will need to install a similar terminal program to complete the setup.

To get started, open HyperTerminal and start a new connection. The terminal session should be setup using 9600Baud, 8 bit, no Parity, and no Flow control.

For those who are familiar with the HP Procurve switches you may wish to jump ahead to the commands. For the rest, keep reading and we'll walk you through it step by step.

Along the way we'll even explain why we use the commands below so that you have some basic under-standing of what you are doing. Hopefully you will walk away with some newfound knowledge.

Privileged EXEC Mode

Now that we are connected to the switch let's login. When logging into an HP Procurve switch under the default configuration, there are two privilege level modes. These modes are Operator and Manager. Operator level will allow you to see configuration information without being able to modify any of the current settings. You also have limited access to the status of the switch. But again, you can't make any changes to the running configuration file.

Because of these limitations, you need to type *enable* to get out of Operator Privilege mode. By default, typing *enable* takes you to "Manager Privileges" mode. Under Manager Privilege there are three additional levels of access, Manager, Global Configuration, Context Configuration.

Let's get started on the configuration of your switch. Type "*enable*" at the prompt. When prompted, enter the password and press Enter again. If no password has been defined just press Enter.

NOTE: The command prompt now ends with "#" indicating you are now at the Manager level mode.

```
ProCurve#_
```

Global Configuration Level

To enter the IP address and Subnet Mask for the VLAN or configure the switch ports you must first enter the configuration level. To enter the global configuration level type "**Config T**" and press enter. This places the switch in Global configuration mode and will allow configuration from the terminal window for the selected interface. This level is equivalent to having root privileges in UNIX or administrator privileges in Windows. In other words, you have full access to the switch.

You should now have the **ProCurve(config)#** prompt.

Configuring the VLAN Interface

A VLAN is a switched logical network that is segmented based on the function or application. VLANs are virtual LANs but have the same attributes as the physical LAN. VLANs allow a user to create a virtual broadcast domain in which traffic can be isolated to keep it from reaching unwanted destinations. Any switch port can belong to a VLAN, and unicast, broadcast, and multicast packets are forwarded only to those end stations assigned to that VLAN.
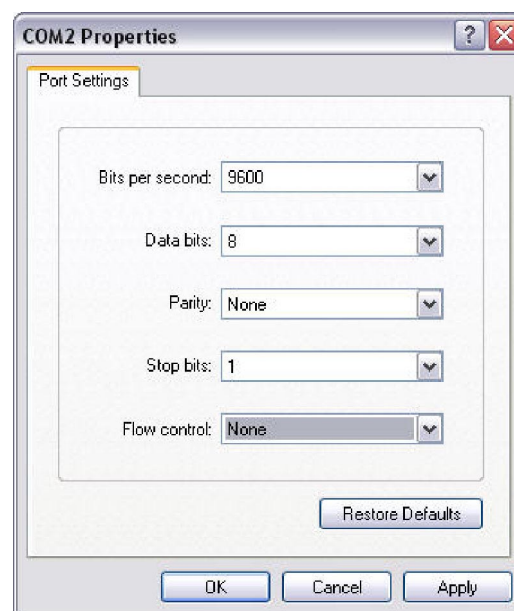
Now that you are in the Global configuration mode you need to select the interface that you would like to configure. We'll start with the default VLAN.

The switch will come with a default VLAN enabled. In the default configuration all ports on the switch have been assigned to VLAN1 (DEFAULT_VLAN). The command below selects the default VLAN for configuration to segment network traffic on the switch. If you are adding an additional VLAN to existing hardware, substitute that VLAN number in place of 1.

Enter the following commands ("XXX" = the actual network IP address)

```
Vlan1
ip address 192.168.87.XXX 255.255.255.0
end
```

Let's look at what you just setup. By typing "Vlan1" you are entering the configuration for that VLAN. The "IP Address" Command simply sets the IP address of the VLAN1 interface for remote management purposes. The IP address must be unique on the network.

IGMP Querier Configuration

By default, IGMP is disabled globally on the switch. To setup IGMP Multicast filtering on the switch you must be in the Global configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands:

```
ip igmp
ip igmp querier
end
```

The commands above simply enable IGMP on the default VLAN and the querier on the switch.

Configuring Gigabit Ports Connecting to WheatNet-IP I/O Blades and PC Drivers

Configuring the ports on the HP Procurve Series 2810 is a key step in ensuring optimal performance of the WheatNet-IP network. This section will guide you in the setup of each port used for WheatNet-IP I/O Blades.

To setup ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands

```
Interface X (X=the Ethernet port being configured)
speed 1000-FULL
end
```

Ports on the HP Procurve can be configured individually or in a "Range." If range is desired type **Interface 1 - 24** (for example), using the desire number of ports.

Configuring Gigabit Port Connecting to WheatNet-IP Navigator PC

The Navigator PC port can be left in the default mode. Speeds will vary depending on the type of network card installed in the PC. It is recommended that a Gigabit card be installed in the PC, however it is not mandatory.

Configuring Gigabit Ports Connecting to WheatNet-IP Control Surfaces, GP Panels, and XY Controllers

Enter the following commands

```
Interface X (X=the Ethernet port being configured)
speed 100-FULL
end
```

Once again, the ports on the HP Procurve can be configured individually or in a "Range." If range is desired type **Interface 1 - 24** (for example), using the desired number of ports.

Configuring Ports for Linking to Other Network Switches

Trunk mode is used when connecting another switch to the port.

To set a specified port to trunk mode when connecting to another network switch the port needs to be set for trunk mode. To setup Gigabit ports on the switch you must also be in the Global Configuration mode. To enter the configuration mode once again type "**Config T**" and press enter.

Enter the following commands.

```
Interface X (X=the Ethernet port being configured)
trunk
end
```

Checking and Saving the Switch Configuration

When you are done, check the switch configuration by typing the following command from the command prompt.

```
show running-config
```

Once you are sure you have the correct configuration you need to save it. You can save the configuration by typing one of the following commands

```
copy running-config startup-config
```

or

```
write memory
```

Below is a diagram that shows you what a typical configuration might look like.

Sample Switch Configuration

Appendix 4

Contents

WheatNet-IP Logic Functions and Examples

As described in this manual, the WheatNet-IP system provides for certain logic (i.e. non audio) related functions and controls. The messaging structure for these functions is entirely contained within the WheatNet-IP hardware itself, and distributed over the same LAN connection as is the audio. No PCs are required, other than to use the WheatNet-IP Navigator GUI application to make the configurations and programming needed.

There are many different logic functions and controls available in the WheatNet-IP system; these can be sorted into four different categories. This appendix will provide specific examples in these categories to demonstrate the category as well as provide step by step instructions on how to program the function with the Navigator GUI software.

Category 1: Direct Logic

This type of logic function acts directly on and controls the operation of certain control surface features. Direct logic operation is independent of any BLADEs and/or physical logic ports. Direct logic functions are available on the Evolution series of control surfaces (E-4, E-5, E-6), and are further classed as to control surface functions and programmable buttons.

VDip Function

Direct logic control surface functions are programmed on the control surface itself under the Main>Options>VDIP window. These VDIP (Virtual Dip Switch) functions affect how the control surface works, and can be set to act either globally, for all input sources, or differently depending on the source.
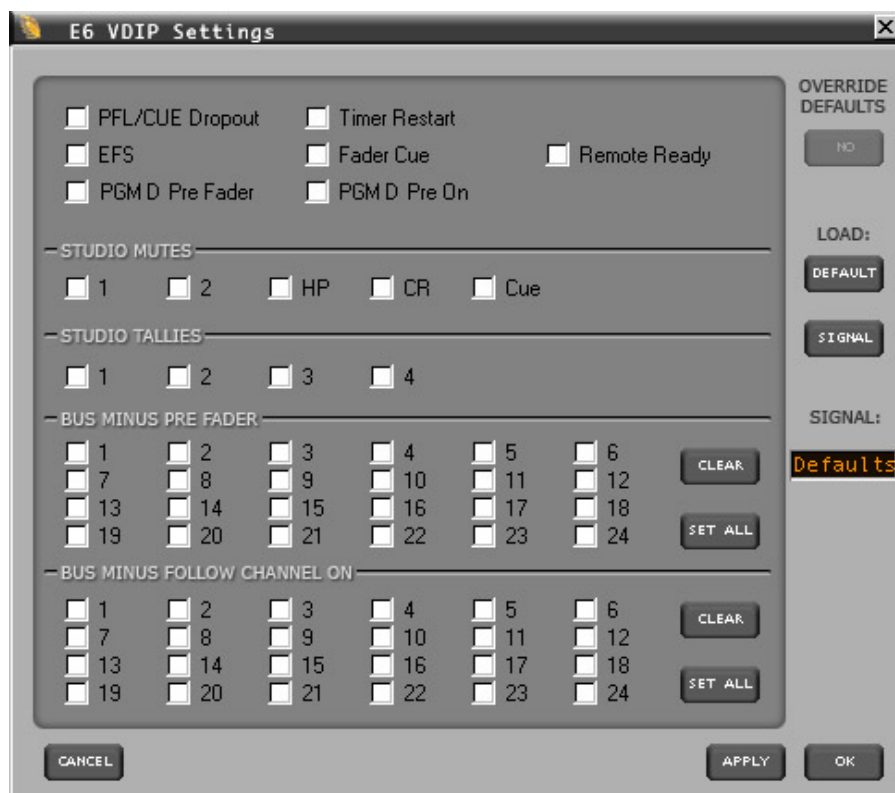
The following functions are available:

PFL/Cue Drop Out: Any fader channel that has been placed in Cue will automatically be removed from Cue when the channel is turned ON.

EFS: Moving a fader up from full off will automatically trigger a START logic command.

Program D Pre Fader: Sets the PGM D bus to be pre fader.

Program D Pre ON: Sets the PGM D bus to be ON independent of the ON/OFF switch.

Timer Restart: Forces a return to 0 and start counting on the Timer display when a fader channel is turned ON.

Fader Cue: Pulling a fader all the way down automatically puts the channel into Cue.

Remote Ready: Forces the fader channel OFF indicator to be driven by an external READY logic signal.

Studio 1 Mute: Mutes the studio 1 output when the fader channel is turned ON.

Studio 2 Mute: Mutes the studio 2 output when the fader channel is turned ON.

HP Mute: Mutes the headphone output when the fader channel is turned ON.

CR Mute: Mutes the control room output when the fader channel is turned ON.

Cue Mute: Mutes the cue output when the fader channel is turned ON.

Studio 1 Tally: Activates a tally 1 signal when the fader channel is turned ON.

Studio 2 Tally: Activates a tally 2 signal when the fader channel is turned ON.

Studio 3 Tally: Activates a tally 3 signal when the fader channel is turned ON.

Studio 4 Tally: Activates a tally 4 signal when the fader channel is turned ON.

Bus Minus Pre Fader: Sets the particular bus minus output signal to be pre fader.

Bus Minus Pre On: Sets the particular bus minus output signal to be pre ON.

As a programming example, let's use the CR Mute function. This function is commonly used to mute the control room speaker outputs while the talent microphones are turned on to avoid feedback from occurring if the amplified microphone signal is passed out the speakers and then picked back up by the microphone. The intention is that whenever a microphone channel that happens to be located close to the control room speakers is turned ON, the speakers are automatically turned OFF to prevent the feedback. Once the microphone channel is turned OFF the control room speakers are automatically turned back ON.

To enable this function, first identify the microphone source(s) that is(are) located near the control room speakers. These are the source signals that could cause feedback. In this situation you would normally want this logic action (mute the speakers) to happen only with these particular source signals.

Open the VDIP form on the control surface by using the Options menu on the Main tab of the control surface VGA display. This menu can be password protected so you must have access privileges before you can modify these settings.

Once the VDIP form is open, click on the SIGNAL button to change the VDIP mode from the default global to per source, and then scroll through the INPUT SIGNAL LIST until you highlight and double click the name of the audio source (the mic signal) you wish to activate the muting. The source name should appear in the SIGNAL window. Click on the CR Mute check box and hit the APPLY button. The control surface has now been programmed to automatically mute the control room output signal whenever any fader channel that has the mic signal routed to it is turned ON. A caveat: this feature does not actually mute the speakers, but only mutes the control room output signal. If, as is normal, you have connected the speakers to an amplifier whose input is connected to the control room output signal, this feature will work as expected; however, if for some reason the speakers are connected to some other output signal, they will not be muted.

Repeat the process for any other mic signals that could cause feedback with the control room speakers.

In similar fashion you can activate any of the other VDIP functions as you see fit. Some of these, such as the mutes and tallys, may need to be set on a per signal basis, while others, such as Timer Restart or PFL/Cue Drop Out, are better suited to the default Global (i.e. for any signal) setting.

Programmable Buttons

The evolution series control surfaces can be equipped with a number of switches whose operational functions can be programmed by the user. These are located in two different areas of the control surface panels. Possibilities include a pair of switches located above each fader on the input panels, and a number of switches located on the main monitor panel. Note that different models of these panels may have some or all of these switches removed.

The programmable buttons on the fader panels are meant for enabling higher level audio functions such as EQ or Dynamics on an as-needed basis. The functions available are:

Take a Source: Automatically select a specific source signal for the fader channel.

Take a Preset: Select a previously saved set of processing functions (a Preset) and apply them to the fader channel.

Toggle EQ In/Out: Change the current in/out mode of the EQ settings on the channel.

Toggle Low Pass Filter: Change the current in/out mode of the low pass filter.

Toggle High Pass Filter: Change the current in/out mode of the high pass filter.

Toggle Compressor: Change the current in/out mode of the compressor.

Toggle Expander: Change the current in/out mode of the expander.

Toggle Left Phase: Change the input polarity setting for the left audio channel.

Toggle Right Phase: Change the input polarity setting for the right audio channel.

Change Mode: Step through the input channel signal modes: stereo, mono, left only, right only.

Clear Button Programming: Remove any previously set up button programming.

As an example, lets program the left programmable button on fader #1 of an E-6 control surface to be an EQ IN/OUT switch. Again, these functions are password protected so you must have access privileges to program them. Also, not all surfaces will have all functions available so the list of functions may be less than is shown here.

First press the SET button for fader #1 on the input panel. The E-6 VGA screen will switch to settings for fader #1. If not already visible, click on the INPUT tab. In the PROGRAMMABLE section of the window, left click on the appropriate display window (top window for left button, bottom window for right button); a drop down list of functions will appear. Select the TOGGLE EQ IN/OUT function.
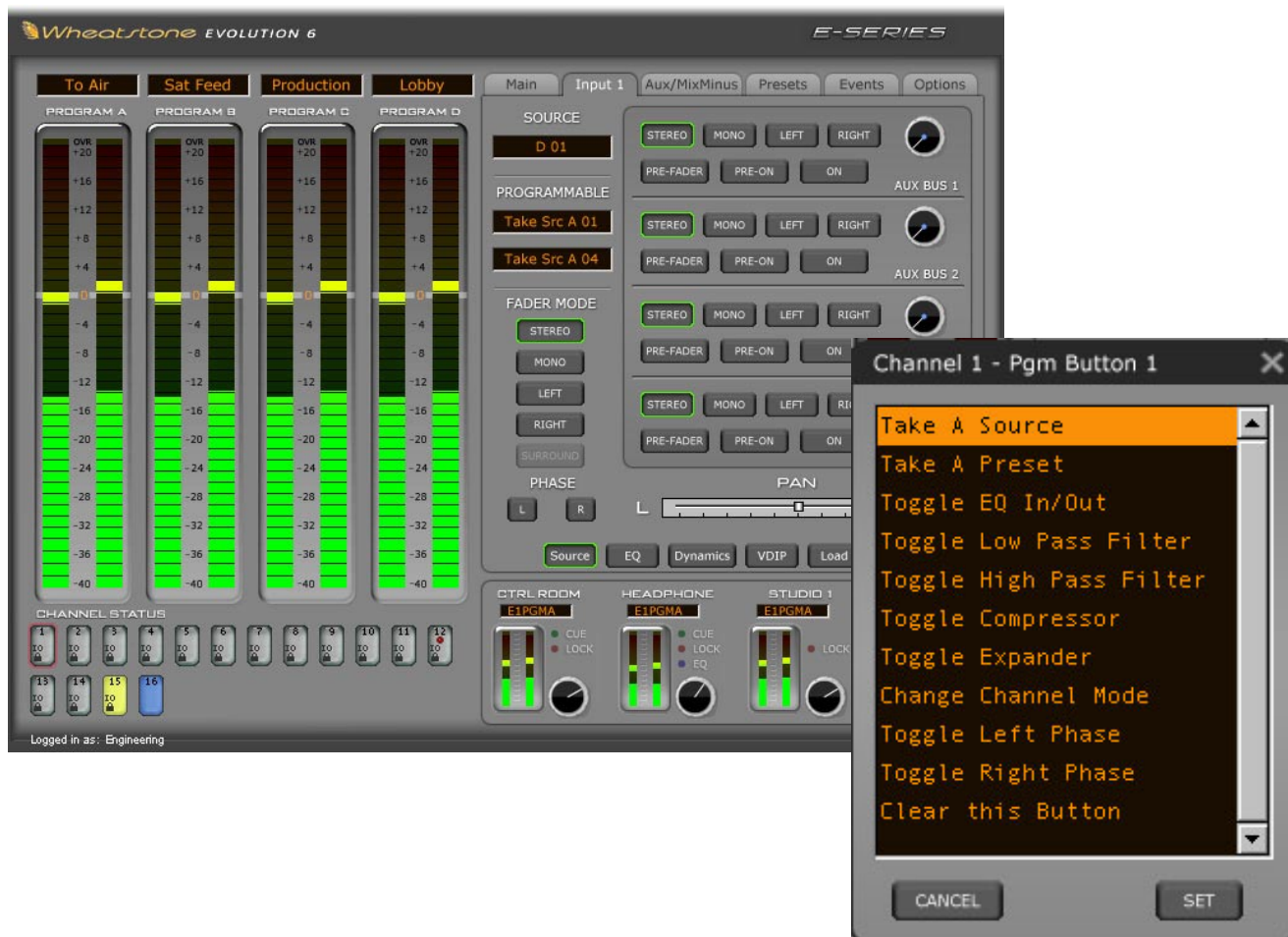
The left hand button on fader channel #1 will now function as an EQ In/Out switch. In a like manner, other functions and other input channel buttons can be programmed.

To remove any programming from a button, choose CLEAR BUTTON PRO-GRAMMING as the function, the button will now do nothing.

The programmable buttons on the main monitor panel have different functions tied to more general control surface functions rather than input specific functions. Selecting the Options>Programmable Buttons menu item on the main screen of the control surface VGA display (this is password protected so you must have access privileges) opens a drop down window listing the monitor panel programmable buttons (up to 14 max, the number will vary with the control surface model). For each button there is a drop down window displaying its current operating mode. The default mode is MOMENTARY/SURFACE LED.
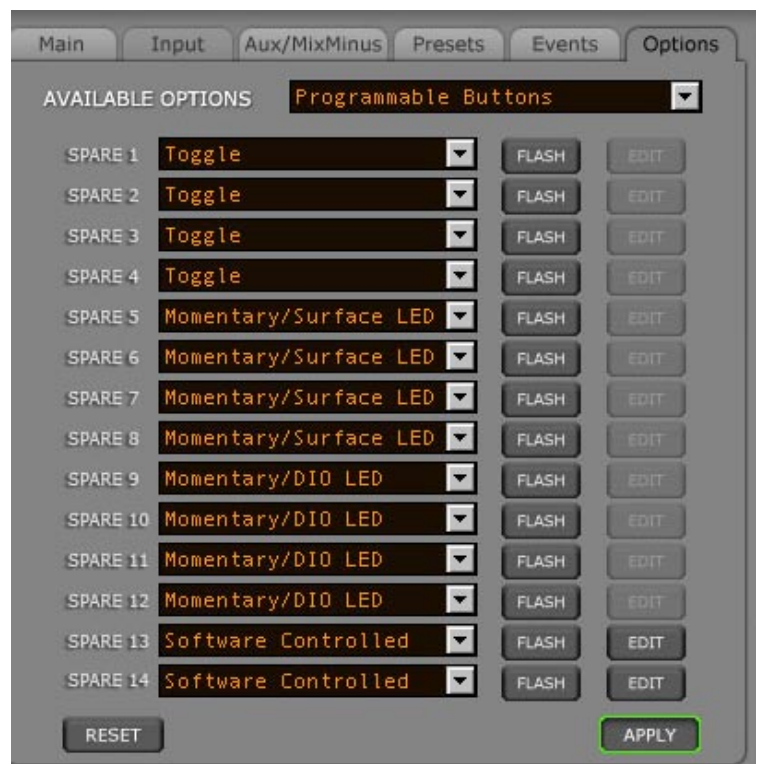
The available programmed mode functions are:

Momentary/Surface LED: Causes the button function to be momentary and the button LED indicator to be activated directly by the button's position.

Tally LED: The button LED indicator becomes an available logic output to be controlled externally.

Toggle: The button functions as an alternate action; push ON, push OFF switch.

Momentary/LIO LED: Causes the button function to be momentary and the button LED indicator controlled externally.

Automation LIO: Causes the button to work with, and the LED indicator to be controlled by, an external 3rd party device such as automation.

Software Controlled: Enables a list of functions to choose for the button to activate.

>**Load an Event:** Loads a previously saved event (a show or set of control surface settings).

>**PFL Clear:** Deactivates any PFL or Cue functions.

>**Show Main window:** Switches the VGA display to the main window.

>**Show Input Source screen:** Switches the VGA display to the input source select view.

>**Show EQ screen:** Switches the VGA display to the EQ settings view (some surfaces may not be equipped with this function).

>**Show Dynamics screen:** Switches the VGA display to the Dynamics settings view (some surfaces may not be equipped with this function).

Let's choose a couple of examples for the monitor panel programmable buttons. First let's enable button #1 to switch the control surface settings to your morning show. Before you can do this, you must of course have saved a set up for your morning show in the first place. If you haven't already done this consult your control surface operator's manual for details, but in brief you must set up the surface exactly as you want it to be. This includes source selection, channel assignments, EQ/Dynamics settings, etc.; in short, just how you want the control surface to be running during the show. Save these settings as an event with the name "Morning" or "Zoo" or whatever else you want to call it.

From the control surface VGA display screen main page choose Options>Programmable buttons. For button #1 choose SOFTWARE CONTROLLED from the drop down list, and the EDIT button will illuminate. Click on the EDIT button to open the functions list and double click on LOAD AN EVENT. This opens the Events list; select "Morning" or whatever the name of your desired event is and then click APPLY. Button #1 will now recall the "Morning" event set up whenever it is pressed.

For the second example let's make button #2 perform a talkback function to a remote location, say destination #5 in BLADE 2. We will make this work by making a temporary crosspoint connection of our talkback signal (typically the talent mic), which in our example is source #3 in BLADE 1, to
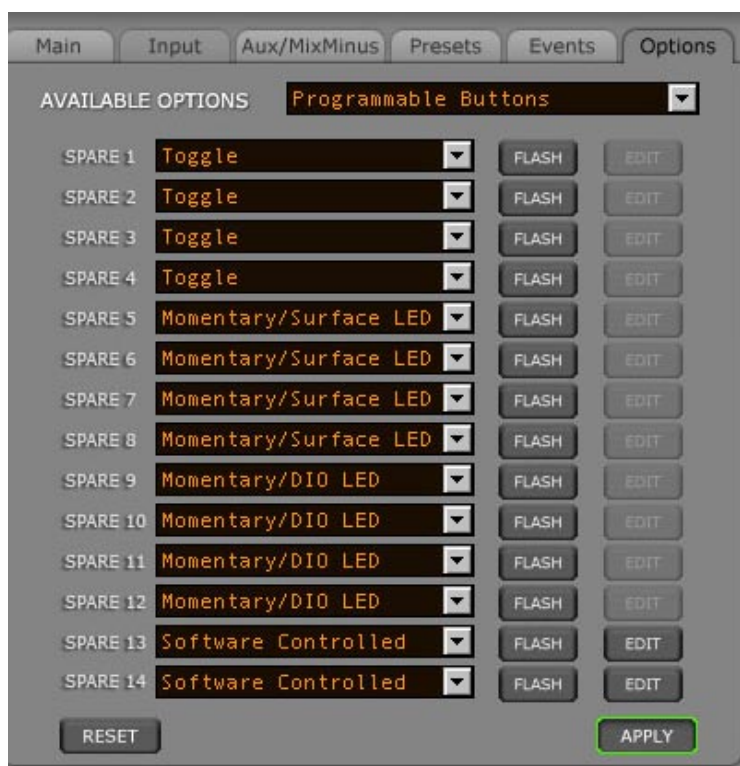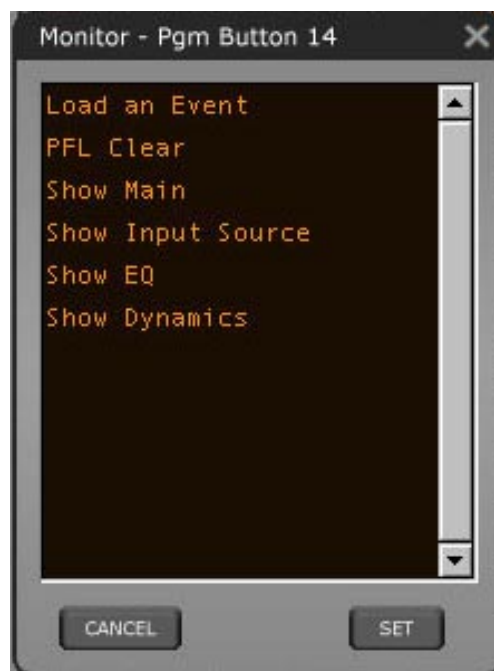
destination #5 in BLADE 2. A temporary connection in the WheatNet-IP system is where a destination's normal audio source connection is temporarily removed (normally for as long as a button is held down) and a secondary connection is substituted. Once the button is released, the secondary connection is removed and the original one is restored.

From the control surface VGA display screen main page choose Options>Programmable buttons. For button #2 choose MOMENTARY/SURF LED which is the default. This tells the control surface that you want programmable button #2 to act as a momentary switch (it stays engaged for only as long as the button is held down) and the switch indicator LED is to be illuminated directly by the surface for as long as the button is held down.

We've told the surface how we want the button to act; we must now tell it what we want it to do. If not already running, we must connect and start the Navigator GUI software, because this is where we'll program the crosspoint connections.

In the System Pane view, click on the engine BLADE for our control surface to display the BLADE tabs and click on LIO info tab. The LIO properties window will open, showing a listing of all the available logic signals for the control surface. Select "Spare Btn2" from the list to choose our button and double click on the MOMEN-TARY CONNECTION box; the LIO CONFIGURATION window will open. Click on the MOMENTARY CONNECTION check box to enable it.

In the DESTINATIONS window, double click to bring up the destinations list and scroll to BL02D05 or whatever you've named it.

In the SOURCES window, double click to bring up the sources list and scroll to select BL01S03 or whatever you've named the 3rd source in BLADE 1, which is your talkback signal. Finally, click OK and the momentary connection information will be displayed on the "Spare Btn2" line.

That's all there is to it; whenever you press programmable button #2 on the monitor panel of the control surface, destination #5 in BLADE 2 will receive audio from source #3 in BLADE 1 (the talent mic signal) until the button is released.

In a like manner all of the programmable buttons on the control surfaces can be programmed for any of the available functions. As a final note, once you have completed your programming, please be aware that Wheatstone can provide custom laser etched buttons with whatever labels you specify - a very handy way to dress up your control surfaces. Contact Wheatstone Sales or Customer Support if you wish to order custom buttons.

Category 2: Audio Associated Logic

There are many logic functions that are associated with or tied to specific audio signals. You may have a START or a STOP logic function that associates with a specific CD player or Automation machine, or ON and OFF logic functions that associate with a control surface fader channel. In the good old days you would have to wire a multi-conductor control cable from the logic ports on the machine to the logic ports on your console. Once you were done, those logic connections would only work for that one machine and one fader channel; if you patched your audio to a different channel, the logic wouldn't work right anymore. For this reason (and to make it easier to set it all up in the first place), general practice was to wire all of these connections up to punch blocks so connections could be changed via punch downs rather than rewiring complicated multi-pin connectors.

It's much easier with the WheatNet-IP system. First of all, many devices (including Wheatstone control surfaces) now support logic control directly over Ethernet connections, so separate logic wiring isn't needed. For that equipment that still requires physical logic connections, WheatNet-IP devices provide 12 available logic connections on every BLADE, and the system provides for audio associated logic. That means the only physical wiring you'll need for these devices is a direct connection from the device logic connector to the RJ-45 jacks on a BLADE.

Here's how it works. Each audio signal within the WheatNet-IP system - that's every source and every destination including control surfaces - can have up to 12 different logic functions (from a list of 500 different types) associated with it. Whenever an audio crosspoint connection is made between a source and a destination, the system looks for matching logic functions (for example START and STOP). For every matching function, a virtual logic connection is established such that the logic input will control the logic output. If the audio connection is changed, the system looks for matching functions in the new connection. In this manner the logic functions are associated with or attached to the audio devices, and hence follow with whatever audio connections are made.

This makes it easy to enable complex logic functionality without a lot of physical wiring, and minimizes the need for punch blocks or other cross connect and fan out wiring devices.

For an example, let's set up our system so that a control surface ON button will start a Denon DNC620 CD player. This machine has a D-sub 25 logic connector, with a START function located on pin #9 and Command Common located on pin #23. A momentary connection between pins 9 and 23 will cause the machine to begin playback. Let's assume that the CD player is located in our Air studio, which has an E-6 control surface and e engine BLADE #4, and 88a analog BLADE #5. We'll say that the CD's stereo audio output is connected to stereo input 7 on BLADE #5 and we have given this source signal the obvious name "CD." Let's further assume that we have already used the first logic port connection on this BLADE for our ON-AIR warning light, so we want to use the second logic port connection, pin #3, to START the DNC620. Your system will likely have different BLADE and port numbers than these in the example; just substitute your ID #s as necessary.

First we need to wire the logic ports, connecting pin #3 and #1 of the first logic connector on BLADE #5 to pins #9 and #23 respectively on the DB-25 connector of the DNC620 machine. That's all the physical wiring we will need to do for this function.

In the WheatNet-IP Navigator GUI, we need to locate the audio signal that represents the CD audio; that is BL05S07 which we have subsequently named "CD." On the crosspoint grid we can search until we see the source signals for BLADE #5, and then locate "CD."
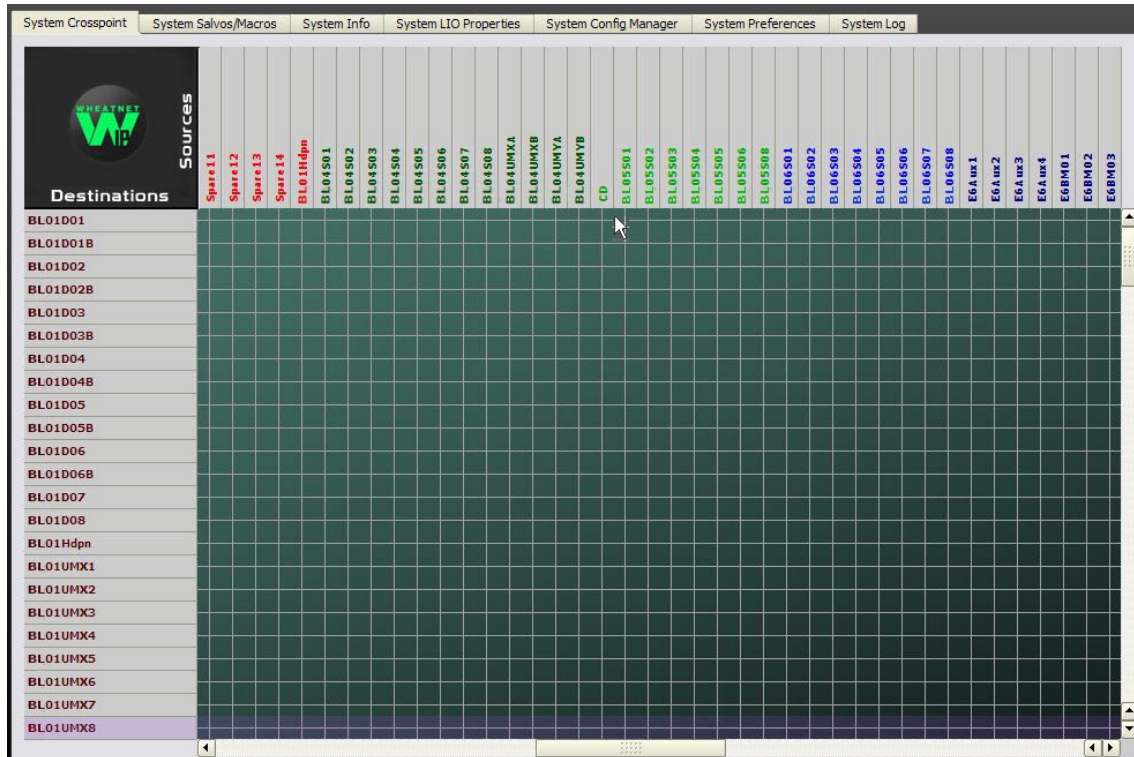
Right click on the source signal name "CD" which opens the signal edit window and choose "Modify Signal..." from the popup. Click on the LIO Info tab of the Source Signal Wizard to open the LIO info view. Click on the "ADD" button to open the "ASSIGN an LIO" window. Click and select pin 3. In the Direction: box choose Output as we want to create a logic output to fire the Denon machine. Finally, in the Function: window scroll down and select Machine Start. This is the all-important function that the system will attempt to match up to create our virtual logic connection. It doesn't matter what the function name actually is, it's only necessary for there to be a match on the destination side. It
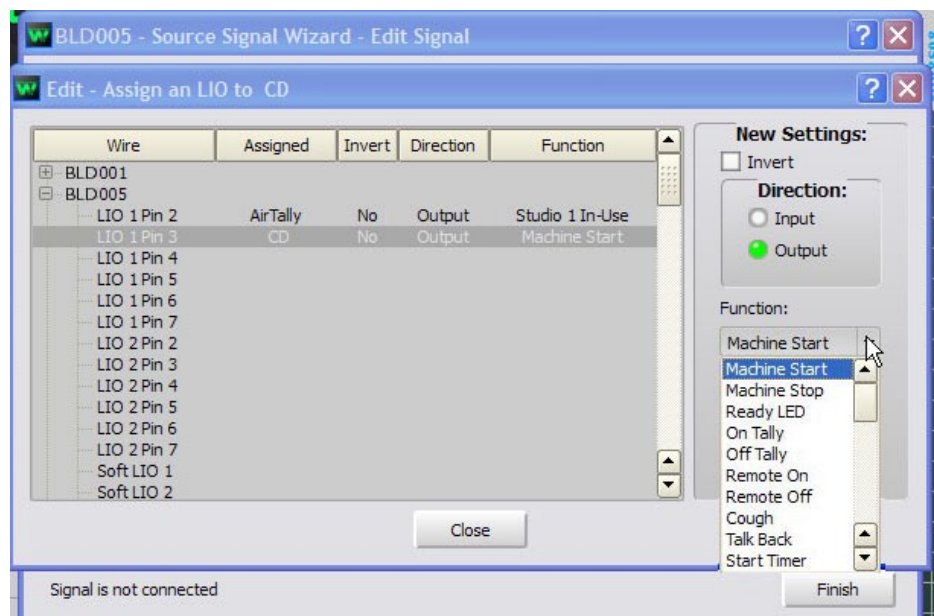
makes sense to use the function Machine Start, however, one, because it's a clear, easily understood name, and two, more importantly, the control surface automatically has a Machine Start function mapped on each fader. Click Apply and your LIO tab should look like this.
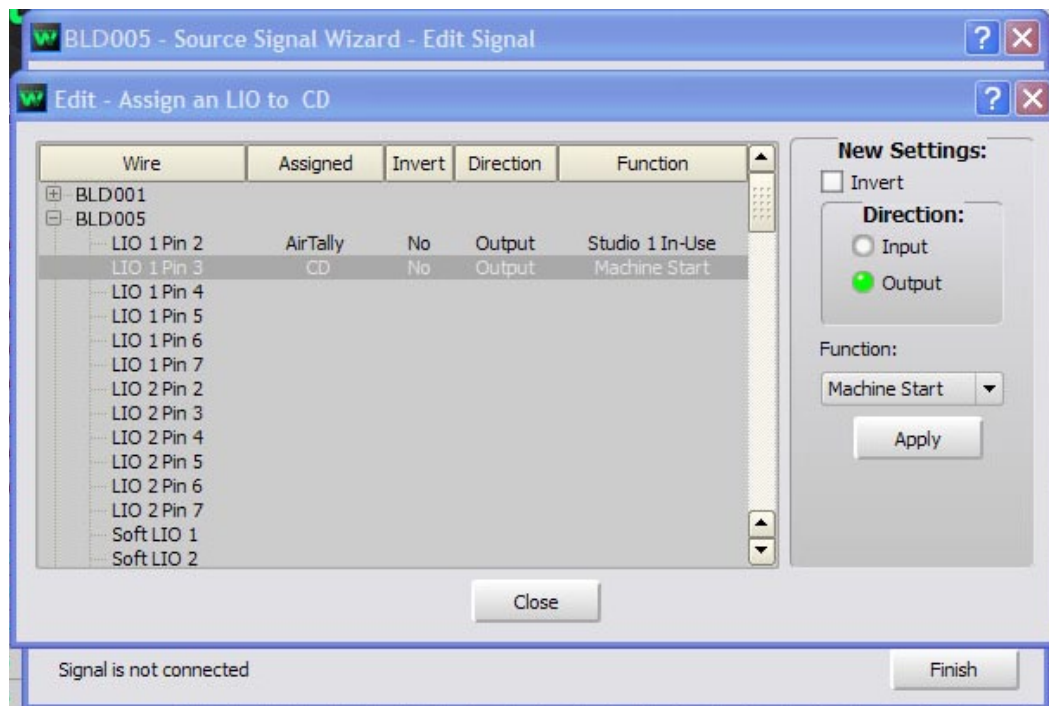
Click Close to close the Edit window. Then click Finish to exit the Source Signal Wizard. In this fashion, you can map up to 12 different logic functions with each audio signal. Notice also, that you could have mapped this function to a physical logic port in a different BLADE by using the signal tree on the left side of the window. This feature is very useful when you need more than the 12 physical logic ports in the BLADE; just map the logic signals onto another BLADE and wire your logic connections to it. For audio associated logic, the audio signal and the physical logic port can be in different BLADEs.

A further note about logic functions: Just because we have used the Machine Start function here doesn't mean it's all used up and can't be used elsewhere; the complete set of over 500 functions are available for every signal, so you can use Machine Start over and over again. In fact that's what makes audio associated logic so powerful - any signal that has the Machine Start function defined will automatically create the virtual logic connection anytime it is cross connected to any destination signal (say a fader channel) that also has the Machine Start function defined. Just as you need only the one physical wire to connect to the machine logic connector, you need only the one Machine Start function definition to allow any channel of any surface anywhere in the system to exercise Machine Start logic control of the Denon.

To continue with the example: we've wired up the logic connection to the machine and mapped and defined the Machine Start logic function. Let's move over to our control surface and pick a fader channel, say fader #3. Check the source name display above the fader indicating which audio source is currently connected to the destination FADER 3 of the control surface. Make sure it is not the Denon machine. Pushing the channel ON button will turn the fader channel on, but will do nothing as far as the Denon machine is concerned.

In the WheatNet-IP Navigator GUI, locate the destination signal for fader 3 of the control surface and right click on it and choose modify signal to get to the LIO info tab for this signal. You will notice that there is already defined the logic function Machine Start, among others. For future reference, you might want to make note of all of the functions used. By the way, this information is also visible in the Details Pane. Close the window and go back to the crosspoint grid.

Make an audio connection between the source signal "CD" (the Denon audio signal) and the destination FADER 3 on your control surface. You can use the crosspoint grid, or use the source selector knob on the control surface; it doesn't matter as long as you make the connection.

Now turn on fader channel #3 and the CD player will start playing! Manually STOP the CD player by pressing its front panel switch. Break the audio connection between the CD player and fader 3 and make a new audio connection between "CD" and fader #5 and turn that channel on. The CD player STARTs playing audio again, this time over fader #5. This is the power of associated logic; a single physical connection can provide transparent system-wide logic functionality.

You'll notice that turning the fader channel OFF did not stop the Denon machine; that's why you had to do it manually. This is because we have only defined the Machine Start function. We will leave the definition of the STOP function as an exercise. Remember, each audio signal can have up to 12 associated logic functions, so there's plenty of room for STARTs and STOPs and ON TALLYs, etc.

Many of the logic functions needed in a typical radio environment are associated with audio signals. You'll find the associated logic functionality of the WheatNet-IP system very useful in these situations.

Logic Function definitions: A large number of function names are defined in the WheatNet-IP system. The functions available at the time of this writing are shown in groups 1 through 7 below, along with descriptions of where and how they are used.

1. These functions are used with audio associated logic. The audio source they are associated with is expected to connect to a surface fader (example: *E6In01*), which will have a matching pre-programmed function.

Machine Start – logic output used to start a machine, such as a CD player, when a surface fader is turned on – by default the **Machine Start** function is a latched signal, but can be made to provide a pulse by selecting the *Machine Start Pulsed* VDip option for the associated audio signal in the control surface VDip settings (see the manual for the control surface type you are using)

Machine Stop – logic output used to stop a machine, such as a CD player, when a surface fader is turned off

Ready LED – logic input used to control the lighting of the OFF button on the fader to advise the operator of a condition such as a CD player being cued up and ready to play – the machine usually provides an alternating on and off signal so that the OFF button flashes on and off

On Tally – logic output used to provide a tally of the fader's ON button to a remote location

Off Tally – logic output used to provide a tally of the fader's OFF button to a remote location

Remote On – logic input used to turn the fader on from a remote location

Remote Off – logic input used to turn the fader off from a remote location

Cough – logic input used to unassign the fader from its output bus while a switch at a remote location is pressed, allowing talent at a microphone the chance to cough (or make some other sound) without it being heard on air

Talk Back – logic input used to assign the fader to the surface cue audio while a switch at a remote location is pressed, so talent at a microphone can talk directly to the board operator

2. These functions are programmed on logic-only destinations to control the timer on a surface. The logic-only destination must be routed to the surface source signal (example: *E6TIMER* on an E-6) that has the timer logic pre-programmed on it.

Start Timer – logic input to start a surface timer from a remote location

Stop Timer – logic input to stop a surface timer from a remote location

Reset Timer – logic input to reset (set to zero) a surface timer from a remote location

Hold Timer – logic input to hold a surface timer at its current setting from a remote location

3. These functions are programmed on logic-only destinations to interface with the Silence Detect functions. The logic-only destination must be routed to the logic signal that is automatically created when an output is enabled for Silence Detect. See the section on Silence Detect starting on page 4-52 of this manual for more details.

SDet Failure – logic output to indicate when an output set for Silence Detect is in a failed state; that is, when the primary source fails to provide audio to that output

SDet Mux Pos – logic output to indicate when an output set for Silence Detect is using its backup audio source

SDet Force Pri – logic input to force an output with Silence Detect enabled to its primary source

SDet Force Sec – logic input to force an output with Silence Detect enabled to its backup source

4. These functions are currently undefined.

Take Preset n (where n = any integer between 1 and 10 inclusive)

5. These functions are programmed on logic-only destinations to indicate when certain sources on the surface have their fader on. The logic-only destination must be routed to the surface source signal (example: *E6TALLY* on an E-6) that has the tally logic pre-programmed on it. Sources that will trigger the surface tallies are set in the surface VDip settings (see the manual for the control surface type you are using).

Studio n In-Use (where n = any integer between 1 and 12 inclusive) – logic output – the numbers 1, 2, 3, and 4 correspond to tallies 1, 2, 3, and 4, respectively – use of the remaining values for n is currently undefined

6. These functions are programmed on logic-only destinations to use with program-mable (spare) buttons on a surface. The logic-only destination must be routed to the surface source signal that has the logic for the desired spare button pre-programmed on it. On an E-6, for example, there are 14 such sources, named (by default) *Spare1*, *Spare2*, and so on, through *Spare14*. Other surfaces may have fewer buttons, and thus fewer sources.

Switch *n* (where *n* = any integer between 1 and 14 inclusive) – logic output to read a spare button. No matter which spare button is used, the function must be **Switch 1**; use of the remaining values for *n* is currently undefined.

Switch LED *n* (where *n* = any integer between 1 and 14 inclusive) – logic input to light the LED in a spare button. No matter which spare button is being lit, the function must be **Switch LED 1**; use of the remaining values for n is currently undefined.

7. These functions are by design undefined, to be used in any manner desired. They may be associated with audio signals or programmed on logic-only signals as needed, and may be used with input or output logic as required. Keep in mind the master rules of system logic: (1) a logic input must connect to a logic output; and (2) a common function name must be used at both ends of a logic connection.

User *n* (where *n* = any integer between 1 and 500 inclusive)

Category 3: Discrete Logic

A third class of logic functions available in WheatNet-IP systems is discrete logic. These are logic functions that work on their own, with no specific association to any audio signals. Typical of these is a situation where a button press in one area lights a light in another, or a satellite receiver detects a tone and closes a relay that is to be used to start a record machine. The WheatNet-IP system can handle this type of logic function very easily. As in the associated logic case, you need only to wire the specific logic connections on your devices to the logic ports on any conveniently located BLADE. All of the control communications between BLADEs happens over the LAN connection.

As an example let's take the case of a profanity delay DUMP control. We'll assume we have a switch panel located by our talent microphone and we have an airTools-6000 Delay unit located in our rack room. BLADE #5, located in the studio, has available logic ports, as does BLADE #19 located in the rack room. We'll use LIO #3 in BLADE #5 and LIO #1 in BLADE #19. Your system will likely have different BLADE and logic port numbers than these in the example; just substitute your BLADE ID#s as necessary.

To activate the DUMP function the airTools Delay unit requires a momentary clo-sure on pins #7 and #13 of its DB-25 GPIO control connector. First, in the rack room, wire the Delay unit GPIO connector pins 7 and 13 to the first RJ-45 logic connector on BLADE #19, pin #1 and #2 respectively. In the studio you will need to wire the normally open contacts of the DUMP switch to the BLADE #5 pins #1 and #4.

In the WheatNet-IP GUI, you will need to define two new signals for the logic function. You will need a logic source signal, representing the button, and a logic destination signal, representing the DUMP connections on the airTools Delay unit. First click on BLADE #5 in the System Pane of the GUI to open the tab windows for BLADE #5. Click on the Sources tab to open the sources window, and click on the ADD button to open the Signal Definition Wizard. Click on LIO only as the signal type and give this new signal a convenient name such as "Dump Sw."
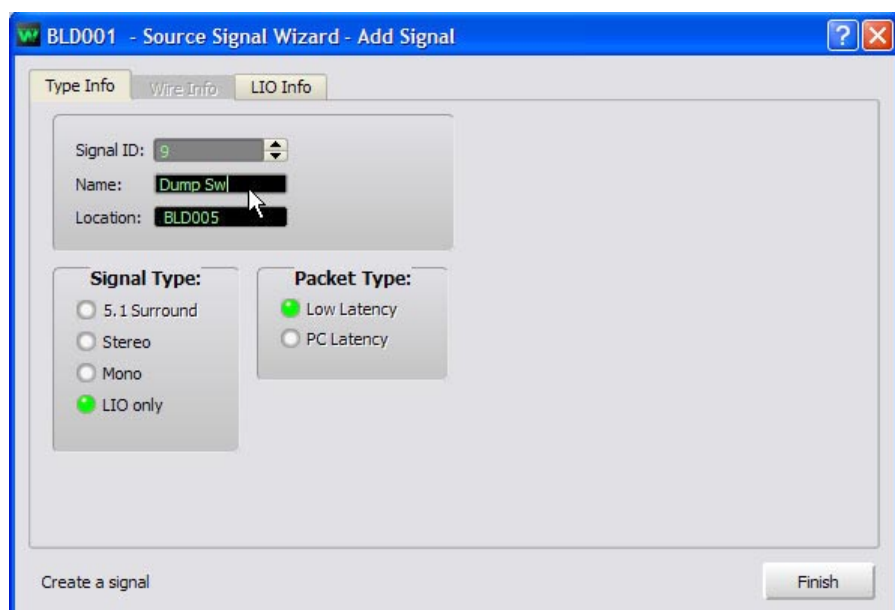
On the LIO Info tab of the Wizard, click on the ADD box. Click on the "LIO 1 pin 4," and then select Input in the Direction: box as the logic direction (the DUMP switch will be a logic Input). Finally open the logic function drop down menu and choose a logic function. As mentioned previously, the logic function chosen is unimportant, the requirement is that the device you wish to control must also use the same function. In this case choose "User 1" as the function; you can rename it as "DUMP" if you like. Click Apply, click Close, then click Finish, and the new logic source signal definition is complete.

Click on the System icon and Crosspoint tab to open the crosspoint grid; you should see your new "Dump Sw" signal source.
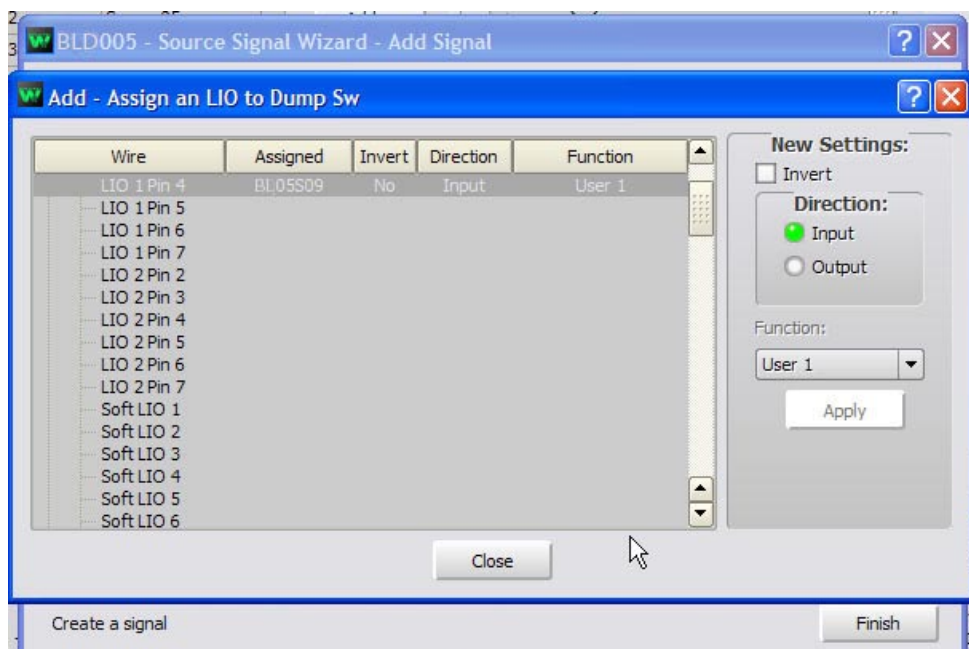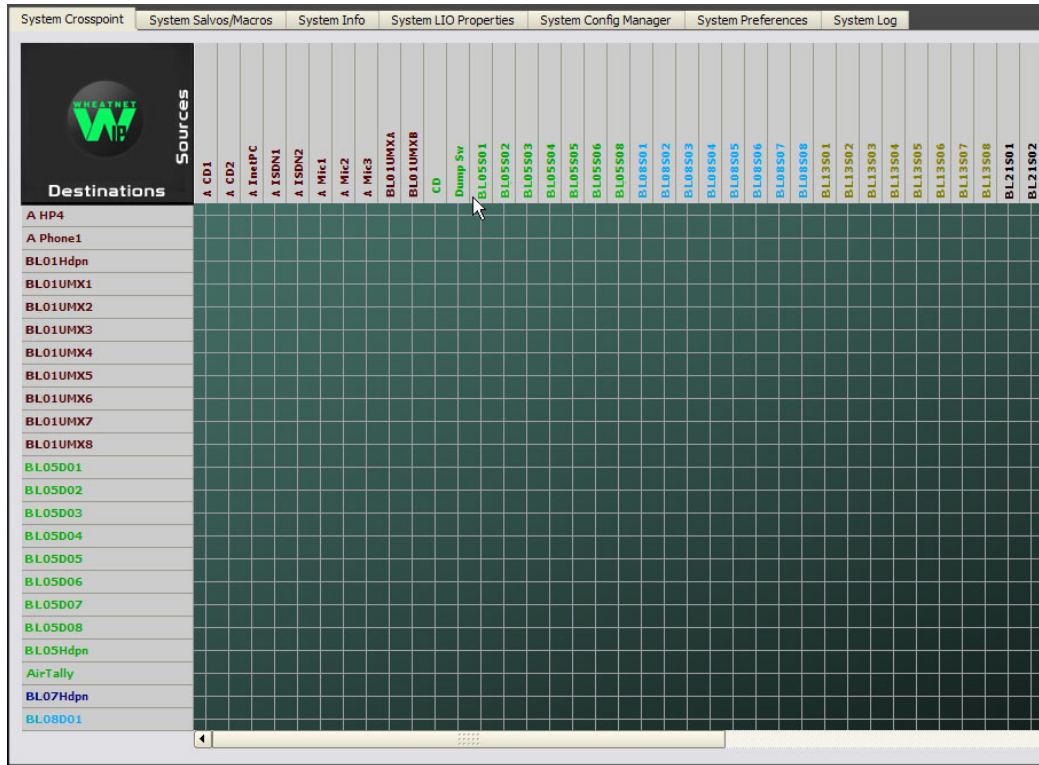
Similarly you need to define a new logic destination signal in BLADE #19. Click on the BLADE #19 icon in the System Pane and select the Destinations tab. As before, click on ADD, then select LIO only, to make the new signal, and name it something like "Dump Dev." On the LIO Info tab of the Signal Definition Wizard, click Add, select "LIO 1 Pin 2" to map the logic pin. In the Direction: box select Output for the direction, and finally select "User 1" as the logic function (this is where the logic function must match what you've previously defined for the DUMP switch; if these functions do not match, then the logic connection will not work).
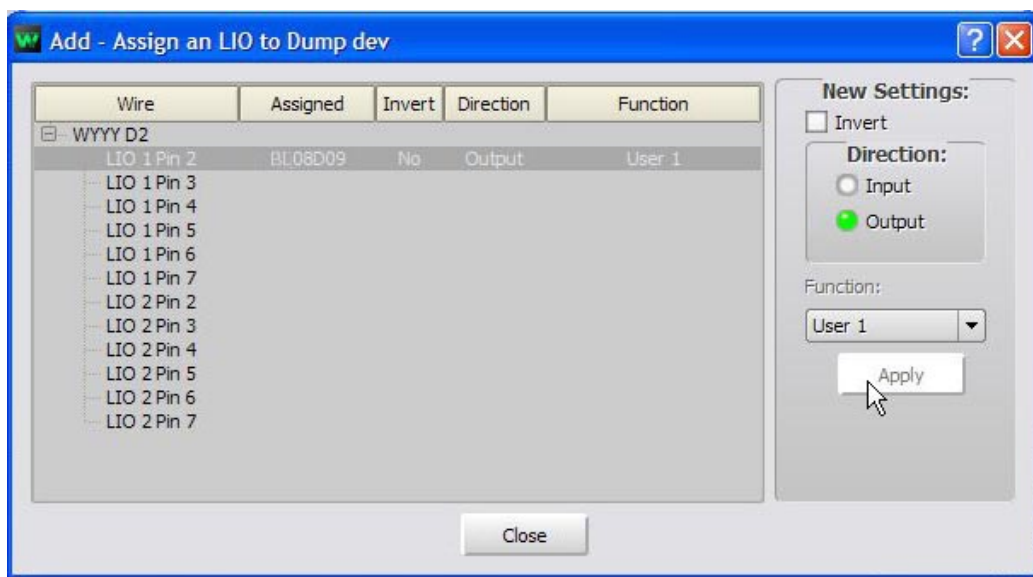
Click Apply, then Close, then Finish on the Wizard, and your new logic destination signal will appear in the crosspoint grid.

To activate and make this logic function operational, you must make a crosspoint connection on the grid between the source "Dump Sw" and the destination "Dump Dev." Once this has been done, pressing the DUMP switch will create a closure on the logic port of BLADE #19, triggering the DUMP function in the airTools Delay unit. Hint: you can use the WheatNet-IP Navigator GUI to trouble shoot this logic connection. Click on the BLADE #5 icon in the System Pane and click on the LIO Info tab. The window that opens will show the logic signals as they have been defined for the BLADE; you should see your "Dump Sw" shown on line 3. If you have wired and mapped this correctly, the circular indicator in the INPUT column for LIO #3 will change color every time you press the switch. This tells you that the logic input has been wired correctly and is working.

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
LIO 1 Pin 2		○	Studio 1 In-Use	CD	<none>	<none>
LIO 1 Pin 3		○	Machine Start	CD	<none>	<none>
LIO 1 Pin 4	●		User 1	Dump Sw	<none>	<none>
LIO 1 Pin 5	○		<none>	<none>	<none>	<none>
LIO 1 Pin 6	○		<none>	<none>	<none>	<none>
LIO 1 Pin 7	○		<none>	<none>	<none>	<none>
LIO 2 Pin 2	○		<none>	<none>	<none>	<none>
LIO 2 Pin 3	○		<none>	<none>	<none>	<none>
LIO 2 Pin 4	○		<none>	<none>	<none>	<none>
LIO 2 Pin 5	○		<none>	<none>	<none>	<none>
LIO 2 Pin 6	○		<none>	<none>	<none>	<none>
LIO 2 Pin 7	○		<none>	<none>	<none>	<none>

Tabs: TOC 2 - Sources | TOC 2 - Destinations | TOC 2 - Visibilities | TOC 2 - LIO Info | TOC 2 - Silence Detect | TOC 2 - Utility Mixer | TOC 2 - Network Info | TOC

Likewise, if you click on the BLADE #19 icon and LIO Info tab, you should see the "Dump Dev" logic signal shown on line 1. Again, if defined correctly and crosspoint connected to the "Dump Sw" signal, the circular logic status indicator will change color when you press the DUMP switch, showing activation of the logic signal at the output port on the BLADE.

All discrete logic functions are defined and configured the same way. Once you've made a few of them work to get comfortable with the process, it's easy. Just remember the fundamentals:

• Define the source and destination signals and map them to the logic ports you'll use.

• Choose a matching pair of logic functions.

• Make a crosspoint connection between the source and destination signals (note, if you want to, you can lock this connection just as you can audio signals).

Category 4: Action Logic

This fourth class of logic function in the WheatNet-IP system includes system events such as Salvos and Momentary Connections. Action logic is intended to force crosspoint connection changes. Perhaps you have an Air studio that undergoes a major change in signal connections when the morning show finishes. Instead of having the talent go through and change all the source and destination connections individually at each shift change, you could create a Salvo that makes all of the required changes at once. Furthermore, you can use a logic connection to a button to fire the Salvo itself, so all that your operator needs to know is to push the button at shift change. What could be easier?

For an example, let's assume you have created a Salvo to change out your studio configuration from Morning Drive to your 10 o'clock show, and you've cleverly called it "10AM." You are planning to use a switch panel in your studio to fire the Salvo, and you're going to wire the "10AM" switch on the switch panel to logic port #4 on BLADE #5.

Here's how to do it: First wire up the normally open terminals of the switch to pins #1 and #5 on the first RJ-45 logic port of BLADE #5. In the WheatNet-IP Navigator GUI, click on the icon for BLADE #5 in the System Pane, and then click on the LIO Info tab. On LIO #4 (the 4th line) double click on the Fire Salvo box to open the window and click on the "Fire Salvo" check box. In the drop down window, scroll and select the "10AM" Salvo and click on the OK button.

	Input	Output	Function	Signal	Fire Salvo	Momentary Connection
	TOC 2 - Sources	TOC 2 - Destinations	TOC 2 - Visibilities	**TOC 2 - LIO Info**	TOC 2 - Silence Detect	TOC 2 - Utility Mixer	TOC 2 - Network Info	TOC
LIO 1 Pin 2		◯	Studio 1 In-Use	CD	<none>	<none>
LIO 1 Pin 3		◯	Machine Start	CD	<none>	<none>
LIO 1 Pin 4	◯		User 1	Dump Sw	<none>	<none>
LIO 1 Pin 5	◯		<none>	<none>	10AM	<none>
LIO 1 Pin 6	◯		<none>	<none>	<none>	<none>
LIO 1 Pin 7	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 2	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 3	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 4	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 5	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 6	◯		<none>	<none>	<none>	<none>
LIO 2 Pin 7	◯		<none>	<none>	<none>	<none>

To test this out, switch to the crosspoint grid view of the GUI and watch the cross-points switch on the grid as you press the switch (be sure to do this at a safe time as you will actually be switching audio and can mess up a show On - Air).

You can also use action logic to make a crosspoint change (hint: use a Salvo of one signal) that switches the source for a destination, or to make a temporary crosspoint change that substitutes a source to a destination for as long as the button is held down. The latter is particularly useful in Talkback/Intercom types of situations.

Appendix 5

Contents

External Controllers

The WheatNet-IP audio networking system has been designed to work with a growing family of external hardware and software controllers. These controllers allow for a wide range of control functions, from making a single crosspoint to complex condition control scripts. There are hardware based controllers such as the Wheatstone HBX8 hot-button controller, the Wheatstone XYC xy controller, and the GP-8P and GP-16P programmable controllers. There are software controllers such as PC-XY and the Event Scheduler, and control applications by various Automation System providers ranging for Enco and OMT to Crestron and AMX.

All of these controllers integrate with WheatNet-IP by means of an Ethernet connection to the system; no physical GPI/GPO or serial cable wiring is required.

Wheatstone provides a separate software utility called the WheatNet-IP XYC control GUI for setting up and configuring the hardware controllers provided by Wheatstone. This password protected application allows you to set up the controller, map it to the desired control destination(s), set up its operating modes, and organize the signal visibility for the controller.

This image shows a typical set up screen from the control GUI.
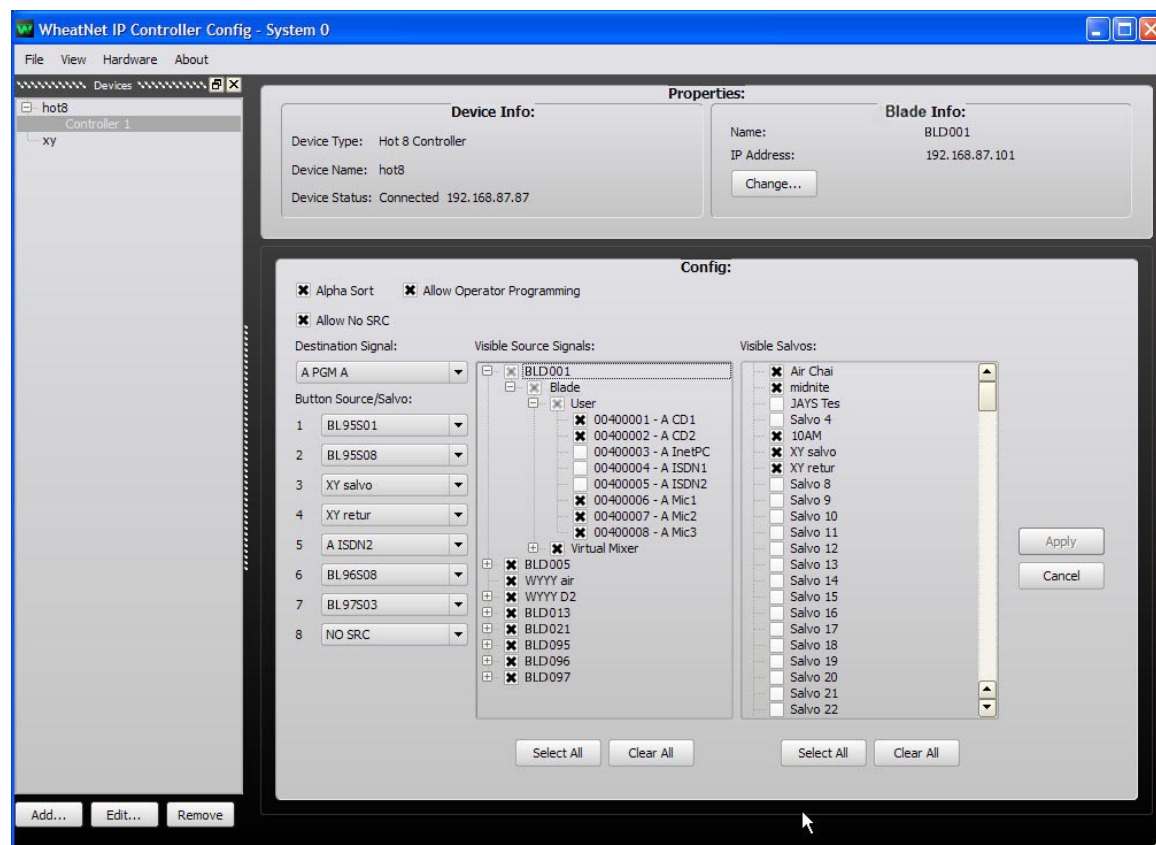
The WheatNet-IP XYC control GUI is provided with the purchase of any of the Wheatstone hardware controllers. Consult the manual included with the application for specific information about your controllers.

For software based controllers please refer to the documentation provided with the software package, or contact techsupport@wheatstone.com for more information.

Appendix 6

Contents

WheatNet-IP WDM Driver Installation

This technical document is intended to give you general information about installing the WheatNet-IP WDM Driver. This driver is network based using TCP/IP. It is recommended that a second Network Card be installed in the PC. The first card will connect to the Audio storage network for file sharing. The second card will connect to the WheatNet-IP network.

Hardware Requirements:

Standard PC (Intel or AMD x 86 based computer) with the following:
• 100 base T network interface configured to run in full duplex mode.
• USB Security Dongle (see page A-40) required for driver operation - but DO NOT install it until after the driver has been installed.

Software Requirements:

The WheatNet-IP driver has been designed to run under the Windows™ operating system. The following are minimum requirements:
• Windows 2000 with Service Pack 4.
OR
• Windows XP with Service Pack 2.

Installation

To install the driver, locate the setup files on the CD received with the WheatNet-IP system. Run the Setup_x.x.x.exe application (x represents the version number of the current release). Make sure any previously installed version of the WheatNet-IP driver or Audsnd (Winamp plugin) software has been removed.

1. Read the license and release notes before proceeding! Then click "I Agree".
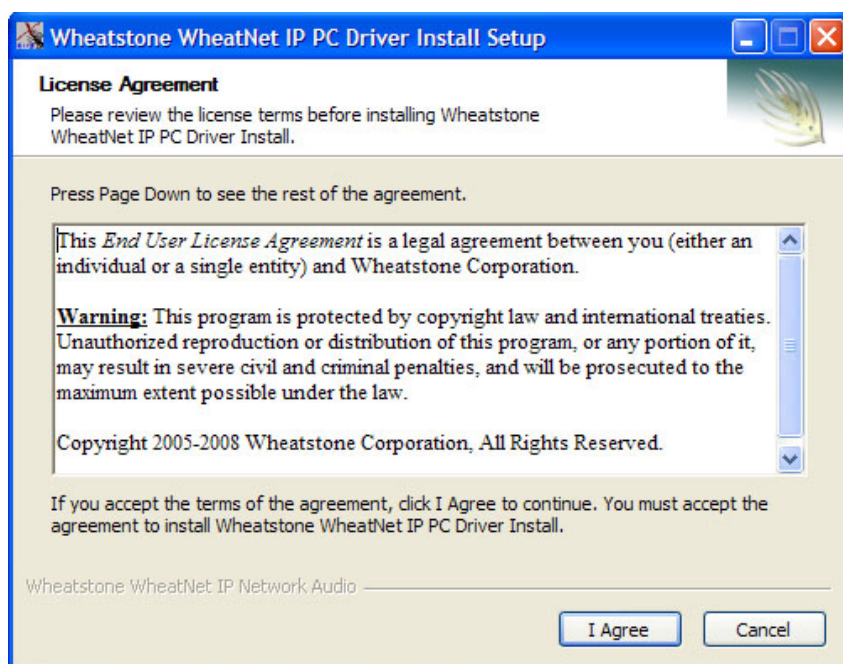
2. Select the components you want to install (default selection is recommended) and click "Next." You will want to make sure that no audio applications are running at this time.
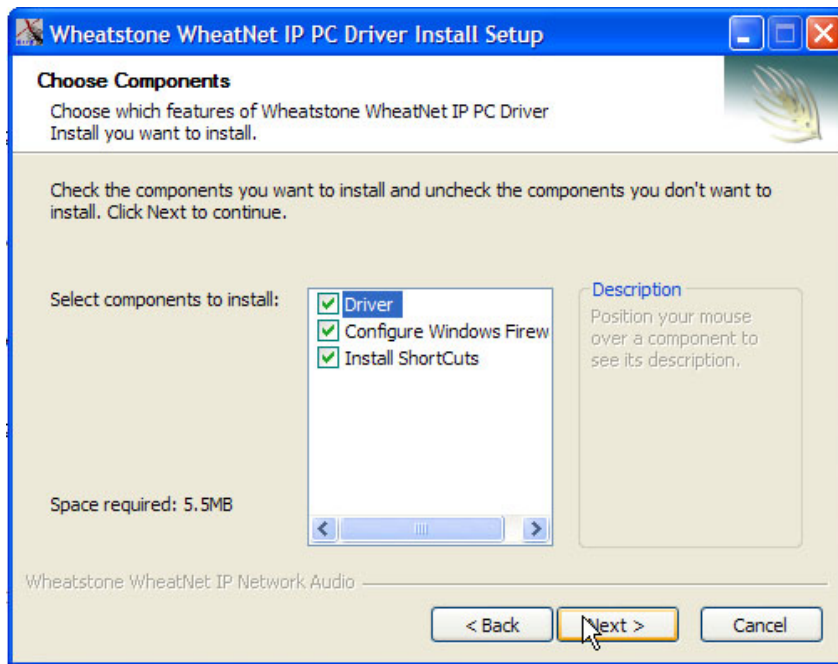
3. Choose the folder in which to install the WheatNet-IP PC Driver files. Using the default destination folder is recommended. If required, select a new destination folder by using the browse button. Navigate to the desired location and press "OK." Once your destination folder has been selected, click "Install" to proceed. During this process you will see several DOS windows appear. This is normal as firewall and port settings are being configured by the installer.
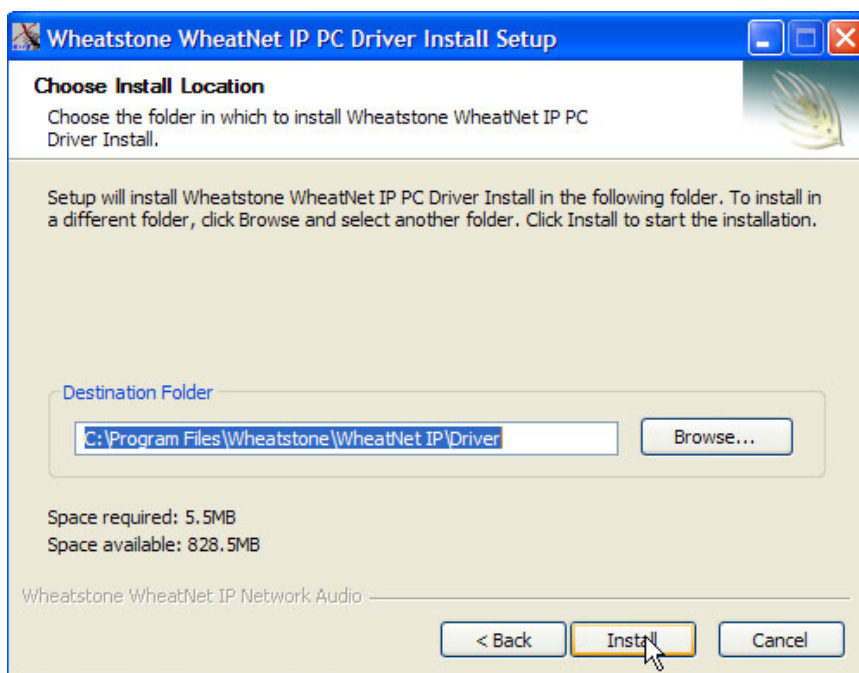
4. During the file copy process you will see a Hardware Installation message. Click the option to "Continue Anyway" to proceed with the install.

5. After the driver installs, you should see a successful install message. Click "OK," then click "Close."
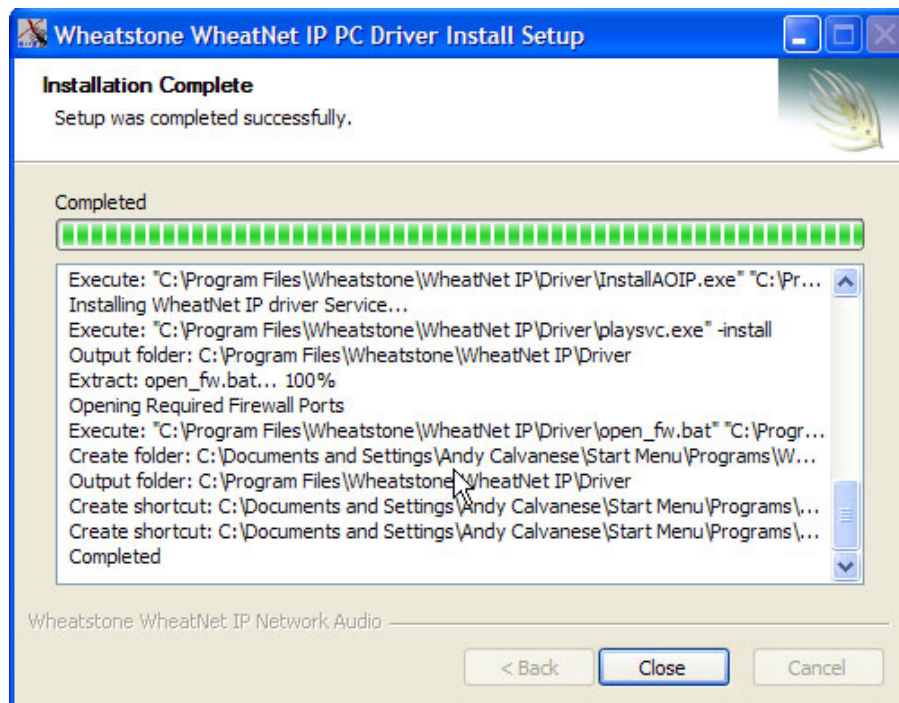
6. You will see an error box appear indicating that the AOIP License dongle is not present. Click "OK," then insert the AOIP License dongle now. The dongle was shipped with your driver installation kit. One dongle is required per computer. Each dongle has been programmed, as indicated on the order sheet that accompanies the shipment, to enable a number of BLADE channels (from 1 to 8, with 8 being typical). The dongle can be plugged into any USB port on the computer, and its presence is required for the WheatNet-IP driver to work. As indicated earlier, do NOT install the dongle until after the driver has been installed. If you inadvertently installed the driver while the dongle was installed, you may need to uninstall the driver and then re-install it with the dongle disconnected.

Once the dongle is connected to the machine you will see the License found dialog box. Click "OK" to accept.
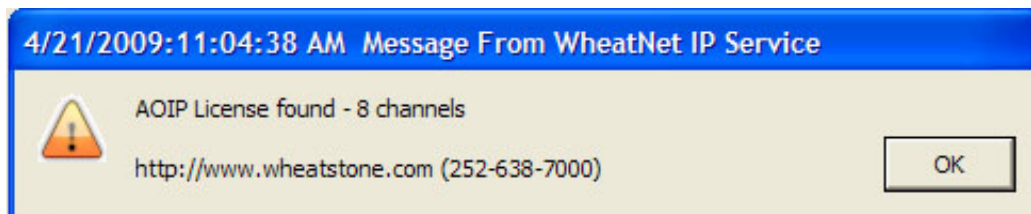
7. Now it is time to configure the driver settings. You will be prompted to run the configuration program. Select "Yes" to configure the system.
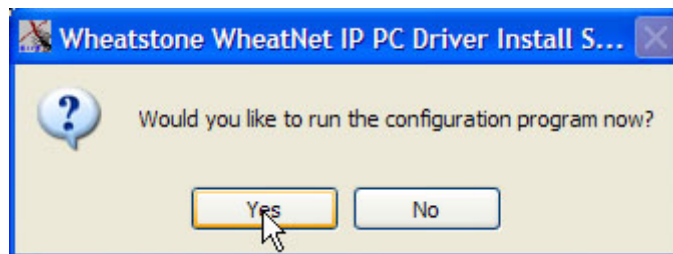
Configuration

The WheatNet-IP Driver Control application will allow you to setup the required parameters for the driver. Here you will configure the unique ID of the PC driver, along with choosing the Network interface card and number of channels available. There are three versions of the driver. Depending on the version you purchased it will have one, four, or eight stereo channels available.
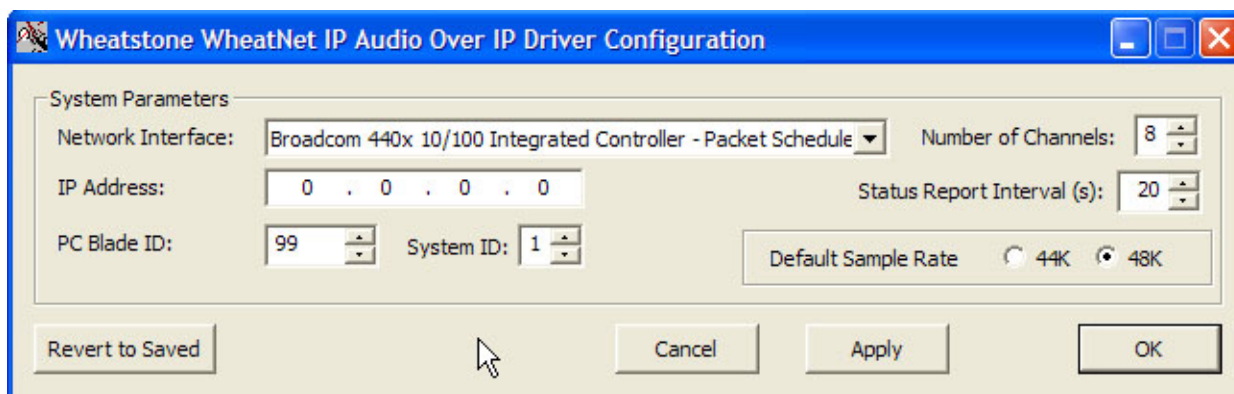
Each control is described below:

System Parameters

- **Network Interface** – This control is used to select a specific network interface card to use to connect to the WheatNet-IP network. If you only have one network connection, then leave "Default Adaptor" selected. The IP Address of the selected interface card is displayed in the **IP Address** field below the selection box.
- **System ID** – This control is used to form logical groups of equipment on a single WheatNet-IP network. It is primarily used for engineering testing and should be left at "1".
- **Status Report Interval(s)** – This controls how often the driver sends status back to the Master BLADE. The default value is 20 seconds.
- **Number of Channels** – This control is used to select the number of (full duplex) stereo channels supported by this driver. There are three versions of the driver. Depending on the version you purchased it will have one, four, or eight stereo channels available. Select only the number of channels you plan on using on this computer.
- **PC BLADE ID** – This is used to set the device number within the WheatNet-IP system that this particular PC will be known as. Each device (BLADE) within the system must have a unique ID number.
- **Default Sample Rate** – Select 44K or 48K as desired.

Other Controls

- **Revert to Saved** – This button causes the application to reread configuration values from the registry, discarding any changes you have made.
- **Cancel** – Closes the application without updating the parameters.
- **Apply** – Applies the changes made to the driver parameters.
- **OK** – Applies the parameter changes and exits the application.

Note that both the Apply and OK controls will need to re-start the driver for the changes to take effect. The application will attempt to restart the driver for you. If the system is unable to restart the driver, you will be prompted to reboot the computer. You may choose to reboot the computer even if the driver restarts. Once the PC is rebooted you should see it in the list of BLADEs in the Navigation GUI.

The configuration application and PC WheatNet-IP utility (if installed) are available under the start menu. All of the WheatNet-IP driver related programs are grouped under **Start>All Programs>Wheatstone>WheatNet IP.**
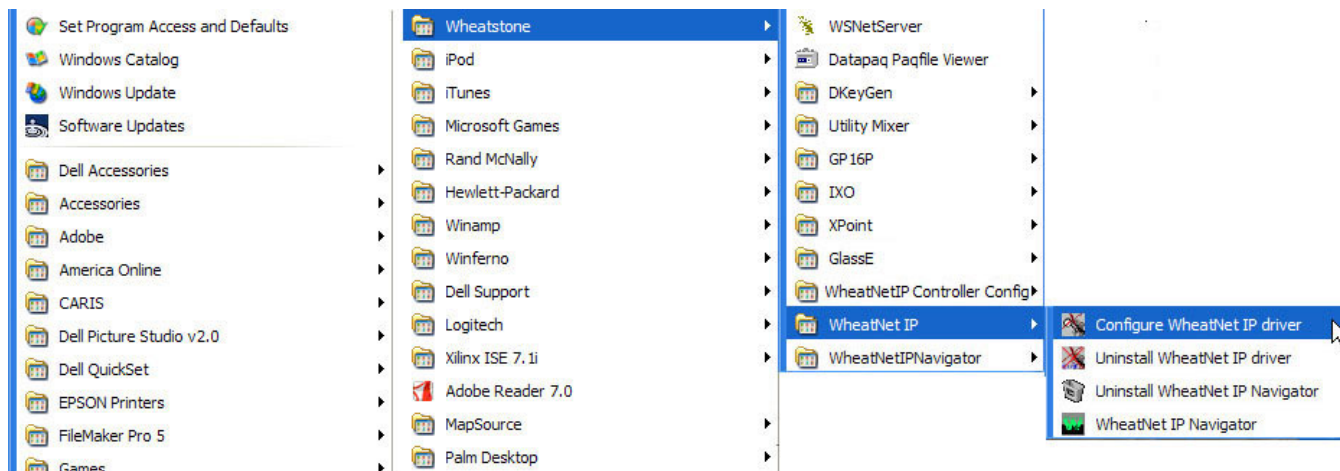
Uninstalling the Drivers

To uninstall the WheatNet-IP driver you can run unistaller application from **Start>All Programs>Wheatstone>WheatNet IP>Uninstall WheatNet-IP driver**
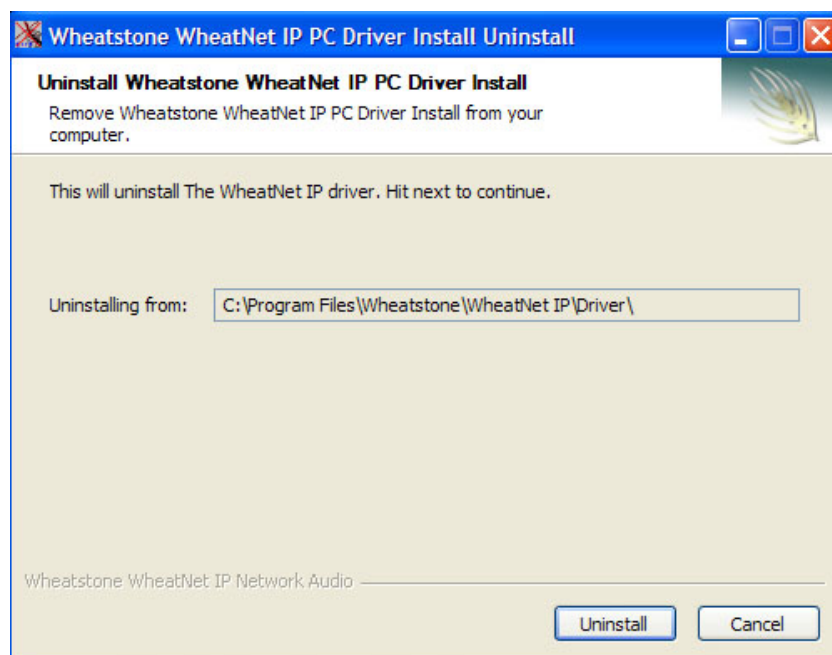
and click "Uninstall" button.

You will see a message box indicating that driver removal succeed. Click "OK." You will next see a dongle removal message:

Wheatstone WheatNet IP PC Driver Install Uninstall

Would you like to remove the KeyLok USB drivers (for the dongle)?

[Yes]   [No]
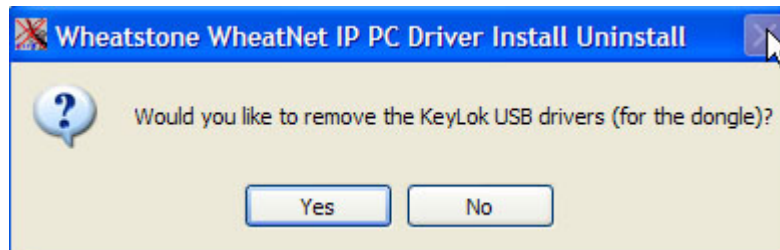
After the driver uninstalled, you should see a successful uninstall message. Click "Close."

Wheatstone WheatNet IP PC Driver Install Uninstall

Uninstallation Complete
Uninstall was completed successfully.

Completed

Deleting WheatNet IP driver installer app
Delete file: C:\Program Files\Wheatstone\WheatNet IP\Driver\InstallAOIP.exe
Deleting WheatNet IP driver inf file
Delete file: C:\Program Files\Wheatstone\WheatNet IP\Driver\jpaud.inf
Deleting windows lib installer vcredist_x86.exe
Delete file: C:\Program Files\Wheatstone\WheatNet IP\Driver\vcredist_x86.exe
Delete file: C:\Program Files\Wheatstone\WheatNet IP\Driver\jpaud-uninst.exe
Delete file: C:\Documents and Settings\Andy Calvanese\Start Menu\Programs\Whea...
Delete file: C:\Documents and Settings\Andy Calvanese\Start Menu\Programs\Whea...
Delete file: C:\Program Files\Wheatstone\WheatNet IP\Driver\open_fw.bat
Remove folder: C:\Program Files\Wheatstone\WheatNet IP\Driver\
Completed

Wheatstone WheatNet IP Network Audio

[< Back]   [Close]   [Cancel]

NOTE: **Make sure you uninstall the driver before installing it again. If you install it twice you will get multiple devices showing up, none of which will work!**

Appendix 7

Contents

IP-MTR64 Meters GUI

Adding Devices To The 3rd Party Tab

In order to utilize all the features of the IP-MTR64 Meters GUI the device must be added to the *System 3rd Party Devices* tab in the Wheatstone WheatNet-IP Navigator program (aka the Navigator GUI). This sheet shows you the basics of that procedure.

You will need to know the IP address of the device being added, so you will want to find that out before you start.

Launch the Navigator GUI and make sure that **System 0** is selected in the *System* pane. You will see something like this:
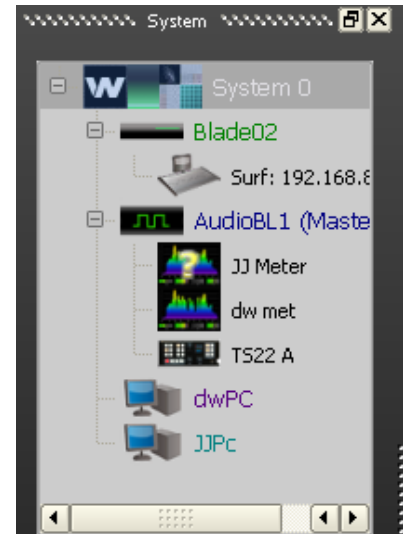
Now, to the right of the *System* pane, select the *System 3rd Party Devices* tab.

Click the *Add* button to bring up the *Add 3rd Party Device* dialog:

Type in a convenient *Name* and insert the *IP Address* of the device being added. Leave the *TCP Port* at the default setting of **60021**. From the *Host Blade* drop down select the Blade that you want to associate the 3rd Party device with. Click *Ok*.

This completes the process of adding the device to the *System 3rd Party Devices* tab. The added device should show up in the *System* pane under the Blade you added it to. If it does not show up, or if it shows up but has a yellow question mark on it, then there is either a network issue that needs attention, or the device is not connected to the network at all, or one or more steps have been omitted or done incorrectly in the configuration process.

Introduction To IP-MTR64 METERS GUI

Get a quick read of any audio source, destination or stream in your WheatNet-IP Intelligent Network. Our new IP-MTR64 Meters GUI app displays a "wall of meters" on your computer screen for ongoing monitoring of audio peak levels and average levels at selected points throughout the entire network. Included is a separate FFT meter for spectral readings plus visual alerts should a channel go dark.

IP-MTR64 METERS GUI Overview

In today's connected world of AoIP, it's nice to know what's going on with your audio. Not just the audio at local sources and destinations, either, but all audio at every point in your network. You could haul out all that expensive test gear for a look, but who has time for that? It's much easier to drop in an app like our new IP-MTR64 Meters GUI for the WheatNet-IP network, which gives you ongoing metering of audio levels, signal density, FFT readings – the works.

Fully customizable, the IP-MTR64 Meters GUI lets you display an almost limitless array of metering and analysis on the monitor of any computer connected to the WheatNet-IP Intelligent Network. Plus, meters have silence detection, so you can see at a glance if an audio stream has gone down, and where.

Each meter – or cell – in your IP "wall of meters" can be set up as a horizontal, vertical or eyebrow bargraph meter. You can set up two or 20 or 60 or more cells in one "wall." You determine where and what to meter: console inputs, mic outputs, the satellite receiver, studios, web streams, you name it. In addition, a separate analysis window allows you to view one audio stream in a variety of informative ways, including FFT, 3-D plot, oscilloscope, energy vs. frequency, spectral dynamic range, and more.

Meters are arranged in a grid layout with the number of individual cells and the size and location of analysis windows you want. Style of metering can be curved, horizontal or vertical bargraph (you determine the number of bars) for mono or stereo, and for reading peak levels, average levels and peak over average levels. Set up one or two bright VU or PPM meters for instant loudness verification of on-air studios from across the room, for example, and add five or 10 or 30 side meters for checking levels of players and mics feeding those studios. Size, background color and text labeling for each cell is fully customizable by you. One meter at a time can be zoomed to a full-screen view for detailed observation. Multiple layouts, complete with source selection, metering choices, colors, labels, and analysis settings, can be saved and recalled for use in various situations.

IP-MTR64 METERS GUI Features

- Multiple bargraph meters in one computer display for checking levels of any source, destination or audio path in a WheatNet-IP network
- Separate analysis window for detailed signal evaluation using FFT, 3-D plot, oscilloscope, energy vs. frequency, spectral dynamic range, and other tools
- Real-time metering of audio peak levels, average levels and peak over average levels; stereo or mono
- Two to more than 60 meter cells in a single display screen

- Style of metering can be curved "eyebrow," horizontal or vertical bargraph (you determine the number of bars)
- Silence detection/failover at a glance for alerting you if an audio stream has failed
- Customizable as an overall grid layout of meters with color options and font selections for metering in a way that makes sense to you.

Installation

The IP-MTR64 Meters GUI software is distributed as a Windows executable installer file, *WnetIP_MeterGui_x_x_x.exe*, where the x_x_x part gives the version number. Double-click this file's icon to begin the installation.

Requirements

For small system the IP-MTR64 Meters GUI software does not have a heavy requirements list. It will install on any modern computer with a Windows 2000 through Windows 7 operating system.

In systems larger than 15 Blades the computer should have at least a dual core processor and a minimum 4 GB of RAM.

Performing The Install

Double-click the installer file's icon to begin the installation and see the following screen:

Click *I Agree* to accept the End User License Agreement.
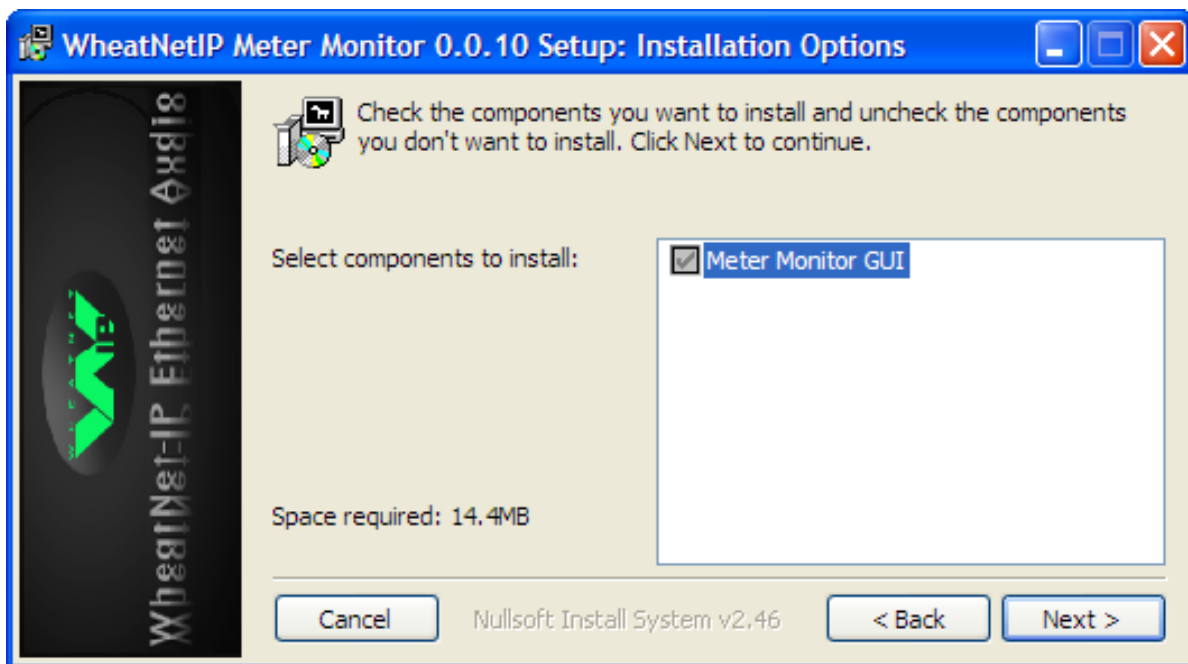
Click *Next*.
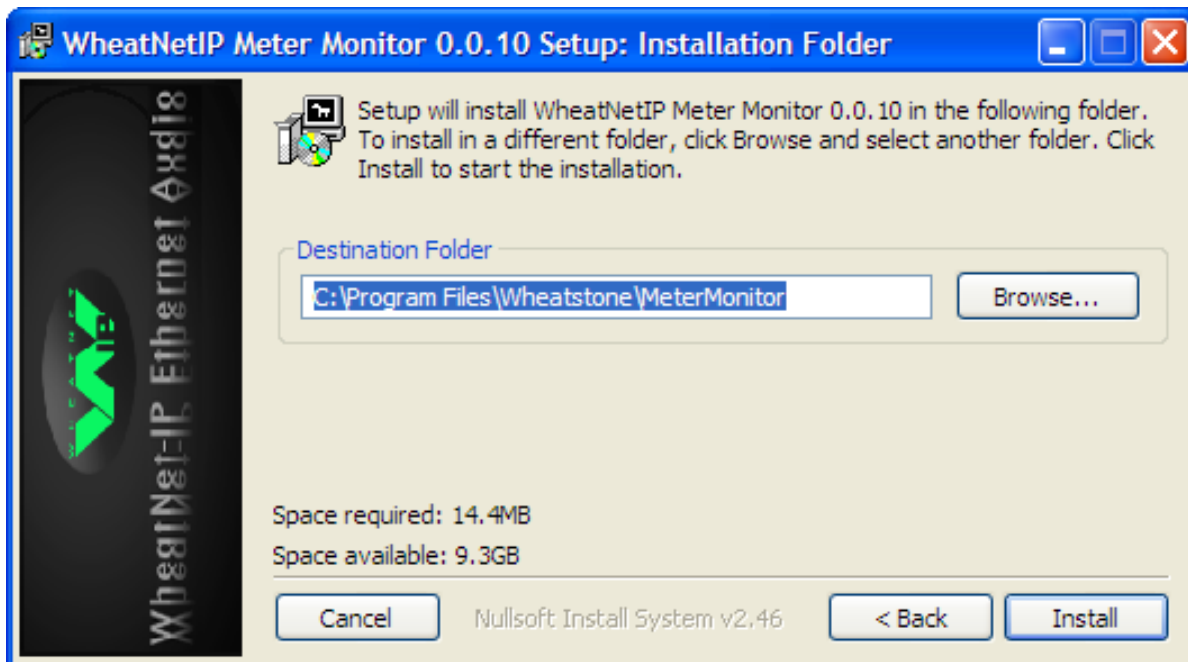
Click *Install*.
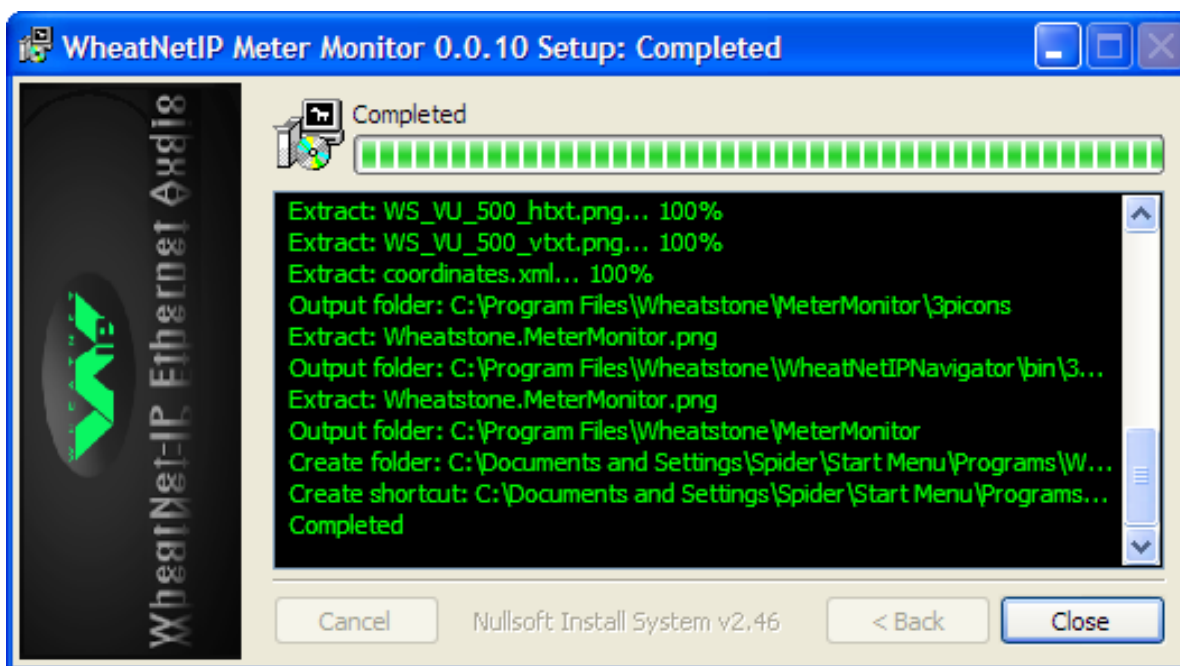
Click *Close* to complete the installation. An icon will appear on your desktop that you can use to start the IP-MTR64 Meters GUI program.

The program is installed by default to

C:\Program Files\Wheatstone\MeterMonitor\WheatNetIpMeterGui.exe

or in Windows 7 to

C:\Program Files (x86)\Wheatstone\MeterMonitor\WheatNetIpMeterGui.exe

and can be launched from the Start menu, where it will appear in the Wheatstone group.

Program Operation – Getting Started

First time operation of any software is a learning experience. You will want to be on a computer that's connected to a WheatNet-IP system when starting the program the first time. Note that the computer must have an IP address on the same subnet as the WheatNet-IP system hardware.

License Key

The first time you start up the program you will be asked for a license key.
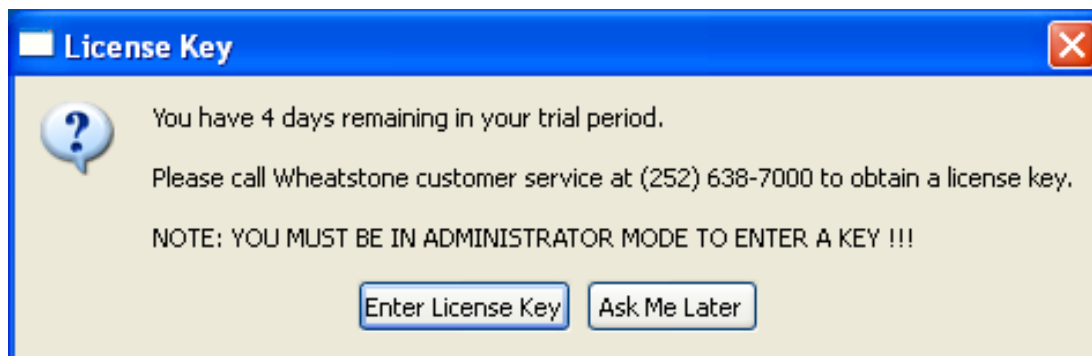
If you wish to run the software beyond the seven day trial period you will need to purchase a site license for the program from your Wheatstone Corporation sales representative.

To continue without entering a license key click *Ask Me Later*. Each time you restart the program without having entered a valid license key you will again be prompted to enter one. In our example screen shot above there are four days remaining in the trial period. After the seven day trial period is over the nag screen will no longer give you the option of continuing unless you enter a valid license key.

If you have a license key to enter, click *Enter License Key* to bring up the screen on the right:

Enter the license key that you obtain from Wheatstone Technical Support and click *OK*. The following screen appears when a valid license key has been entered:
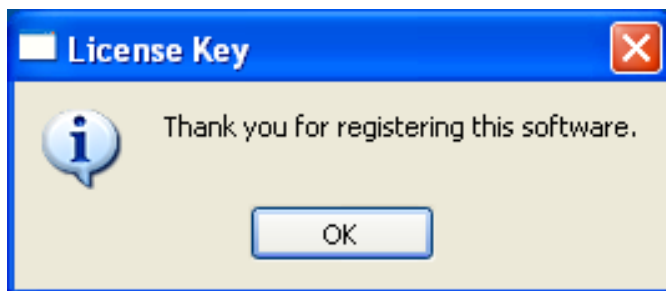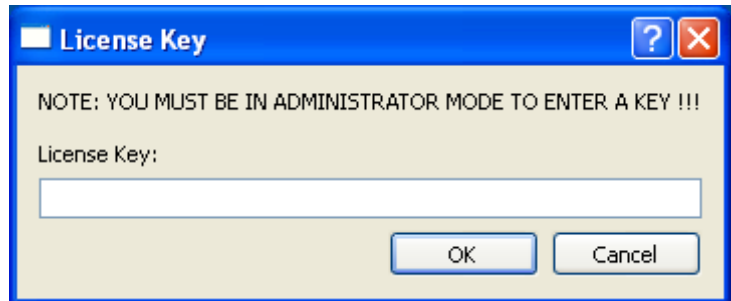
Click *OK* and the program will open in full screen mode.

First Time Operation

The first time you start up the program you will need to do some basic setup. The program opens in full screen mode. For convenience the following screen shots are made with the screen resized. Here's the opening screen:

Network Setup

Select Setup>Network... from the menu to bring up the *Network Setup* dialog:
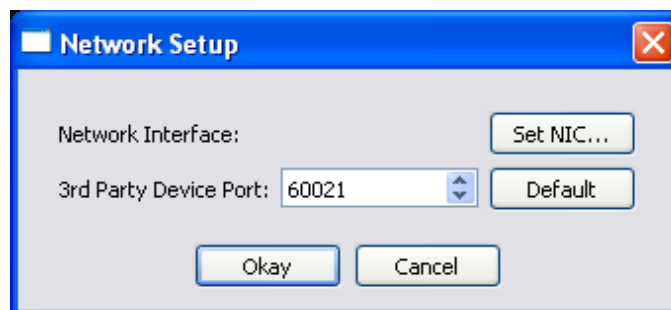
Click the *Set NIC...* button and select the NIC that interfaces to the WheatNet-IP system from the drop down list:
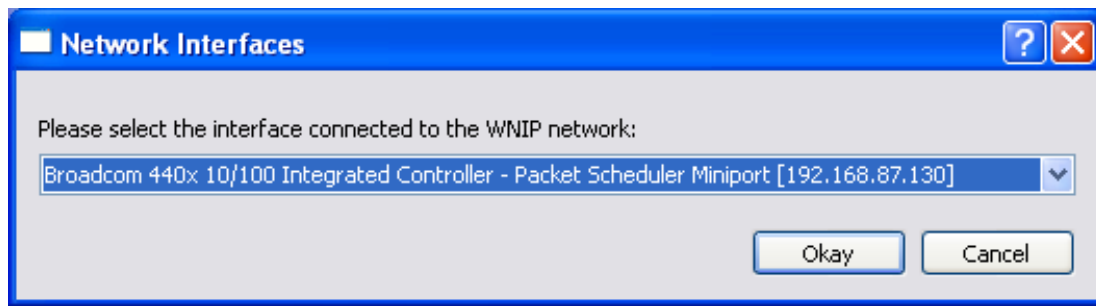
Click *Okay*. Leave the *3rd Party Device Port:* setting at the default. Click *Okay*. You will see a notice that you will need to restart the program for the changes to take effect.

Click *OK*, then close the program and restart it.
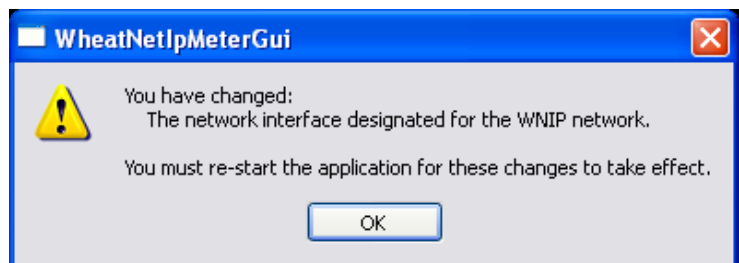
Note that the computer must have an IP address on the same subnet as the WheatNet-IP system hardware.

"Discovering" The System Components

The IP-MTR64 Meters GUI will need to gather some information from the system. From the menu, select *WheatNet-IP System>System Scan...* to start the process.

In the *Host Blade IP Address:* field, enter the IP address of one of the Blades in the system and click the *Start Scan* button. The data display area will start to fill with data from the system. When the scan is complete the data display area's last entry will be "Ok", and the *Cancel* button will change to become a *Finish* button.
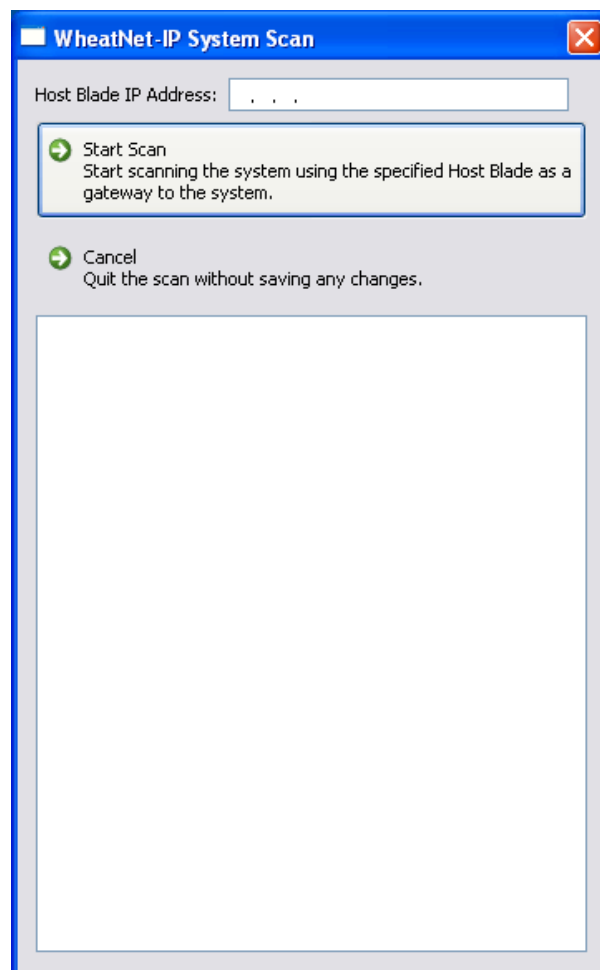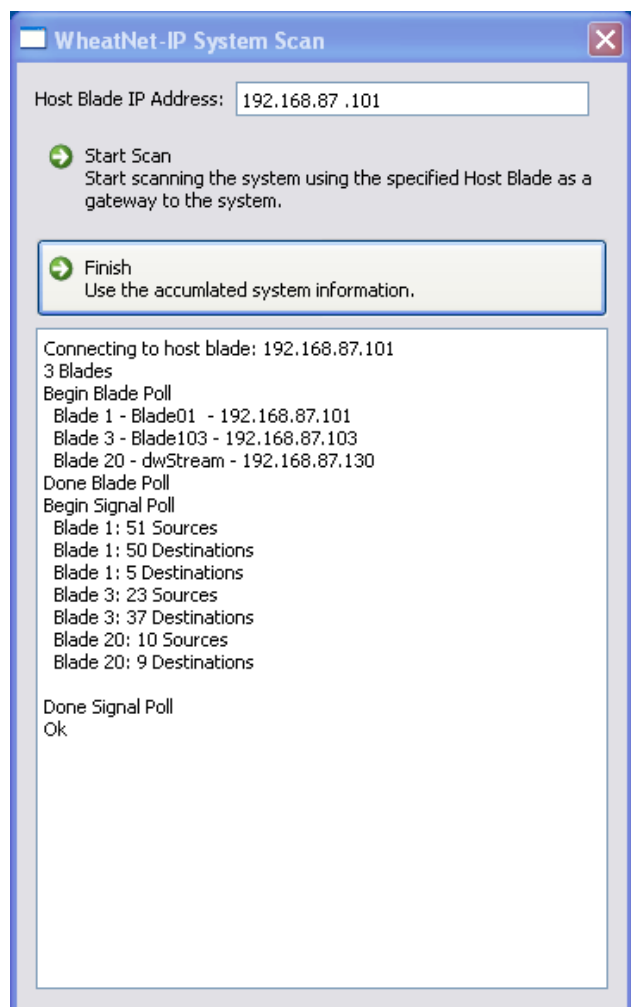
> **If you make any changes to the system you will need to redo the scan and re-save the scan results to keep the Meters GUI program up to date.**

Click *Finish*. You'll be asked if you want to save the system information to disk. Doing so will insure that the program uses the data the next time it is started. ***However, if you make any changes to the system you will need to redo the scan and re-save the scan results to keep the Meters GUI program up to date.***
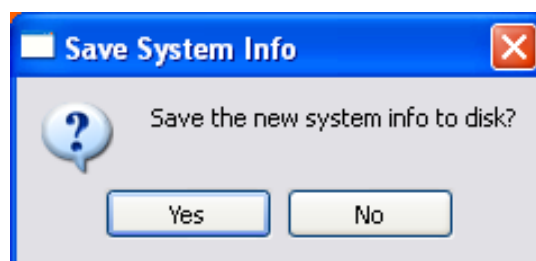
If you click *Yes* a typical Windows file save dialog will appear. Select the desired location and give the file a name, then click *Save*.

Any time you want to see the current system information the program is operating with, select *WheatNet-IP System>View Info...* - the *WheatNet-IP System Information* screen will appear:
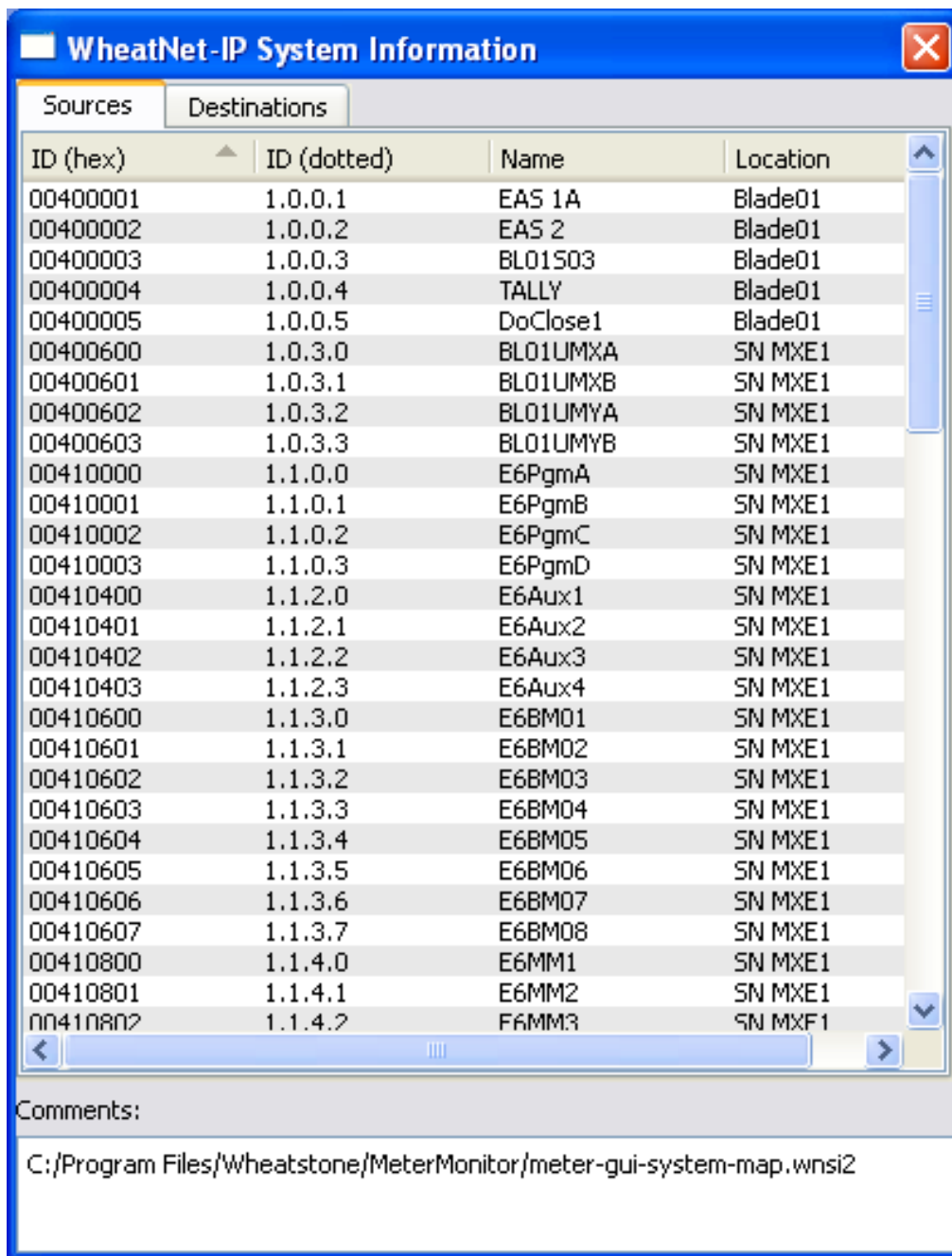
When done viewing this screen click the red 'X' icon in the upper right corner to close the window.

Setting Up Meters

Until you start working with the meters you see a default layout with no working meters. So let's get a meter playing.

Configuring A Meter Cell

Right-click in the first meter cell and select *Configure...* from the popup menu.
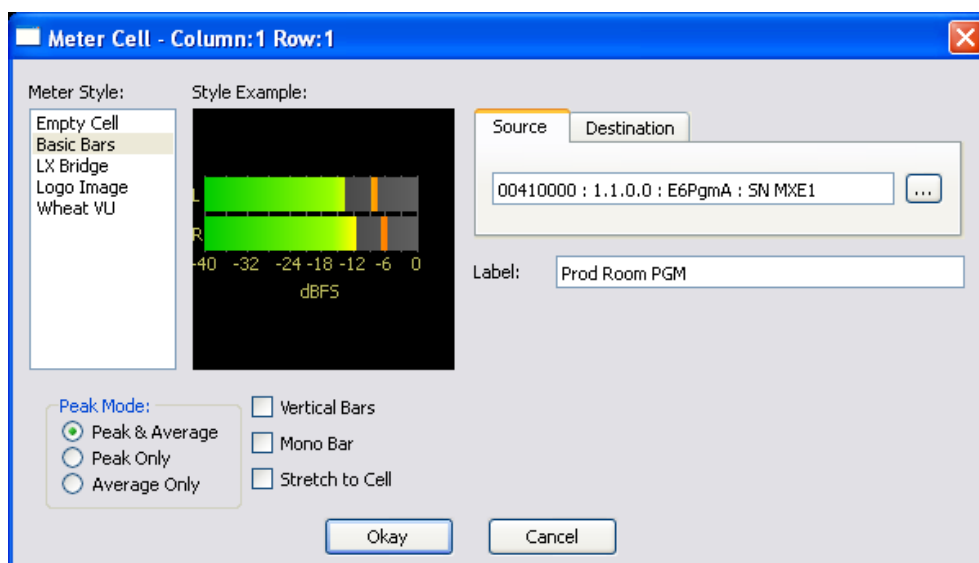
Change *Meter Style:* to **Basic Bars**. Now pick a signal from your system that you want to display. First choose either the *Source* or *Destination* tab, depending on which signal type you want to display, then click the set button (labeled with three dots) and double-click the desired signal name in the list that appears. Give the meter a descriptive *Label:* and keep the other settings at their defaults. Click *Okay*.

You should see the meter running in the first meter cell, and it will show any audio present on that signal.

If you right-click on the same meter cell and select *Zoom In...* from the popup you will see that individual meter cell in a full screen display. Right-click in the full screen display and select *Close* in the popup to go back to the normal view.

Note that you can also configure a meter cell to show a graphic, such as a station logo, or even a picture of you, or your boss, or even a pet.

Go ahead and configure a few more cells. Here's the standard layout on a typical system with a few meters configured:
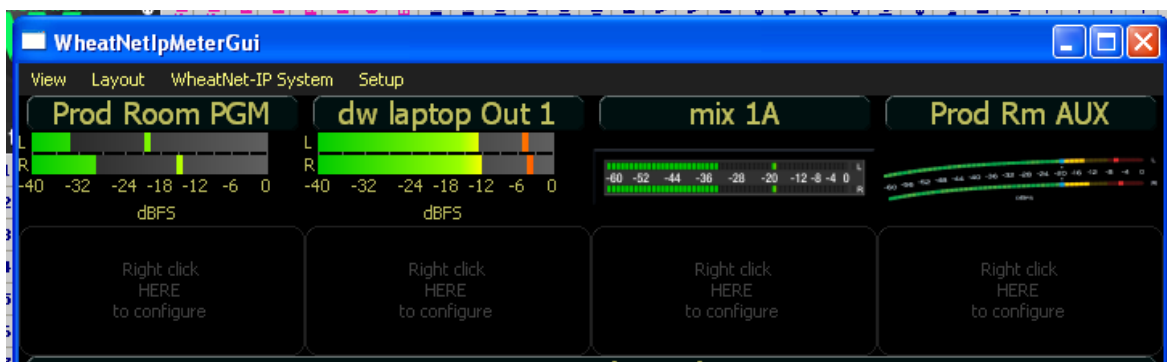
Configuring The Analysis Window

Before you can use the analysis window you need to do some configuring in WheatNet-IP Navigator. The meter application must be added to the 3rd Party Devices in Navigator to enable the analysis window.

In Navigator, select the *System 3rd Party Devices* tab and click the *Add...* button to bring up the *Add 3rd Party Device* window.

Give the device, which in this case is actually the IP-MTR64 Meters GUI program, a convenient *Name*. Enter the *IP Address* of the **computer on which the meter application is running**. Accept the default *TCP Port* and click the down arrow to the right of the *Host Blade* button to select the desired Blade.

Click *Ok*.

You should now see an icon for the meter application in the Navigator System Dock and its characteristics should show up on the *System 3rd Party Devices* tab.
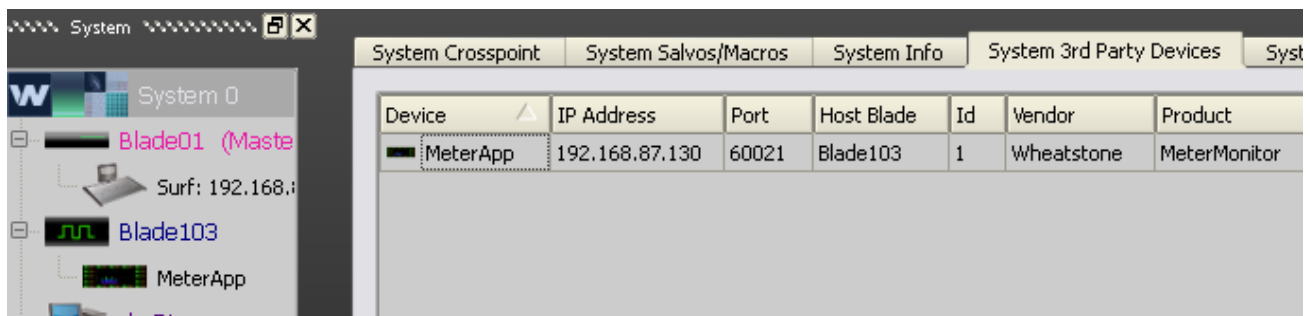
Using The Analysis Window

The first step in using the analysis window is to select the audio you want to view. For reasons that will be mentioned below, this must be a source signal. You will not be able to select a destination directly for analysis.

Right-click in the analysis window and select *Take Source…* from the popup. Find the desired source and double-click it in the list to present that source to the analysis window. The analysis window will now show the source's audio in the presentation format selected, which is *O-Scope* by default.

Right-click again in the analysis window to change the presentation format. Select the desired format from the popup. Go ahead and experiment with the available formats to determine which one you want to use for the task at hand.

Once you have selected the desired presentation format, right-click one more time in the analysis window and select *Configure…* from the popup. You will be presented with a number of choices to alter the analysis view. The configuration choices will be different for each display format.

As mentioned above, you can only select sources to analyze. This is because the audio being analyzed is streamed to the computer from the host Blade via the meter analysis destination signal that was created when the application was set up as a 3rd party device. By default, this destination is named **Anlys A** and appears as a destination on the host Blade that was selected for the meter application.

Changing The Meter Layout

So far we've been working with the default meter layout. Select *Layout>Configure…* to bring up the *Meter Cell Layout* dialog to edit this layout. The *Simple* tab shows a gallery of layout starting points.
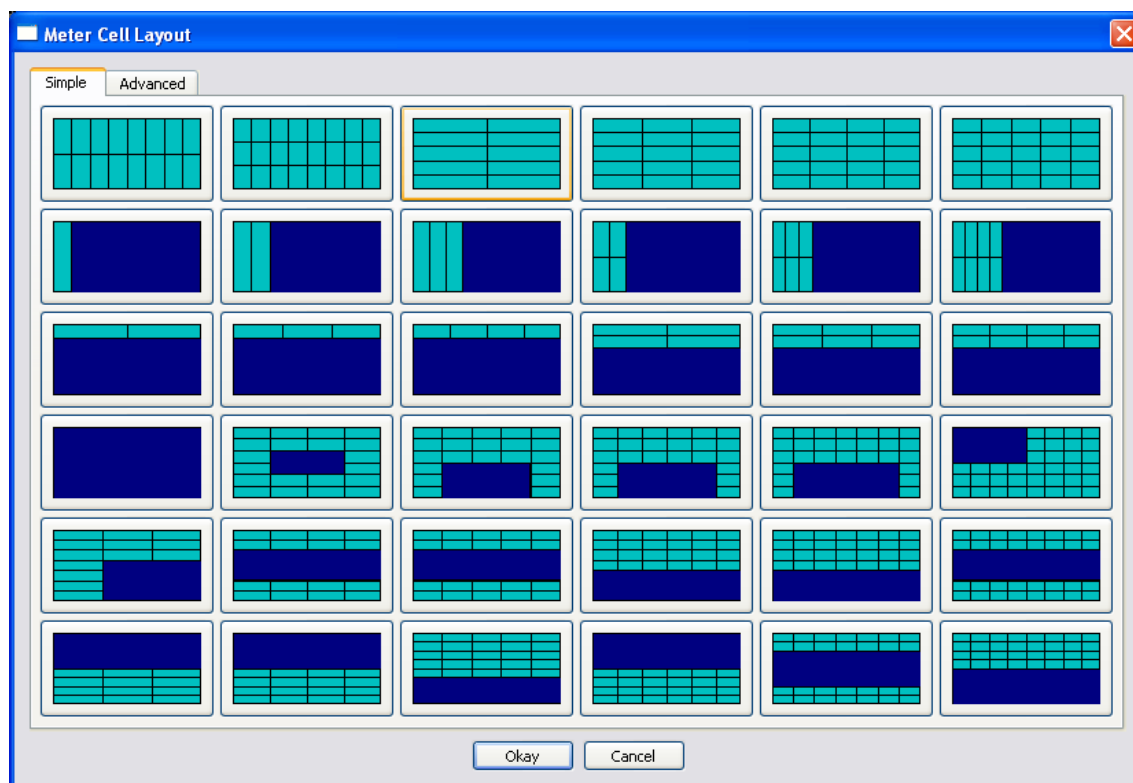
If you don't find a layout here that suits your needs, switch to the *Advanced* tab.
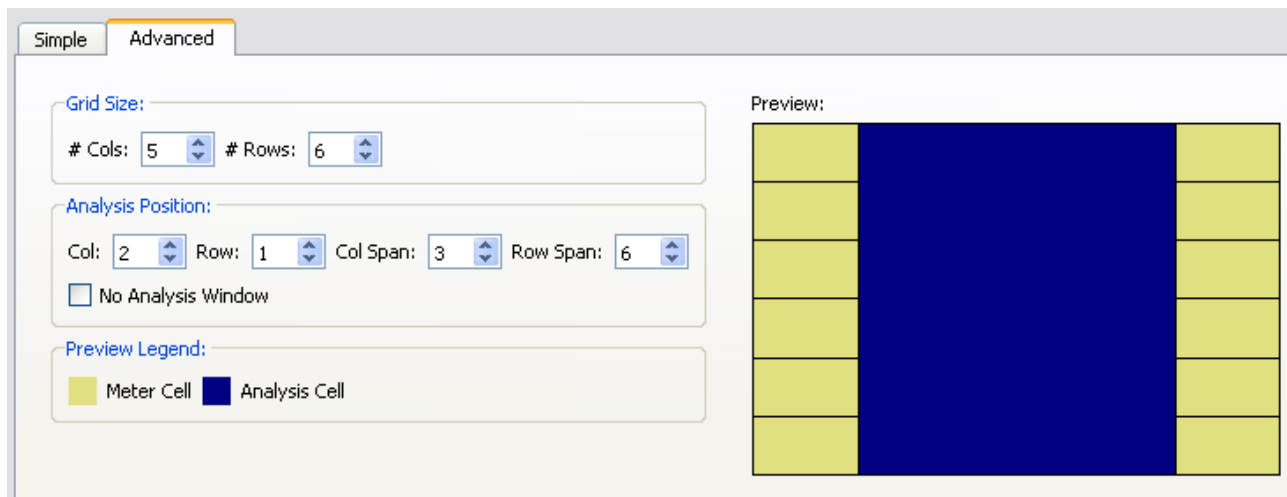
There you'll find a way to set up almost any layout you could want. Begin by selecting the number of *Cols:* (1 through 16) and *Rows:* (1 through 16). Then set up the analysis window by selecting the starting *Col:*, the *Col Span:* (width), the starting *Row:*, and the *Row Span:* (height).

Check the *No Analysis Window* box if you don't want an analysis window.

You can also invoke the layout dialog by selecting *Layout>New*. This is the starting point to use when creating a new layout, whereas *Layout>Configure…* is primarily used to edit an existing layout.

You can save layout changes by selecting *Layout>Save* or *Layout>Save As…* from the menu. Note that the Save option saves your changes to an existing file (setup.wnmtr by default), but the Save As option brings up a typical save dialog and allows you to create a new file, or save to an existing file, so you can have a library of layouts for different applications. To load a previously saved layout, select *Layout>Open…* and select the desired file.

Configuring Silence Detect Alarms

The IP-MTR64 Meters GUI can give you a visual cue when a destination with silence detection enabled does not have audio on it. It is assumed here that you have at least one destination in your system configured for silence detect. Look in the "WheatNet-IP Navigator GUI" chapter of this manual for details on how to configure silence detect.

Configure a meter cell to display a destination that is configured for silence detect. As long as there is audio on that destination within the silence detection parameters set up for the signal, it will display like any other meter cell of the same type.
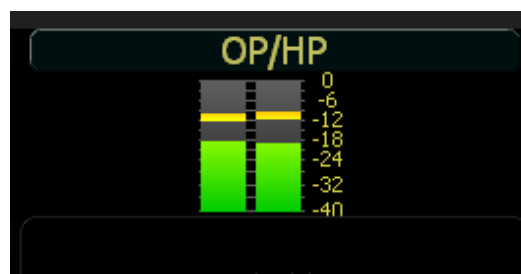
But if the audio on that destination goes away long enough to trigger the WheatNet-IP silence detect, and if there is no failover audio present, the display will change to indicate an alarm condition. The orange label indicates the alarm, and the meter shows no audio.
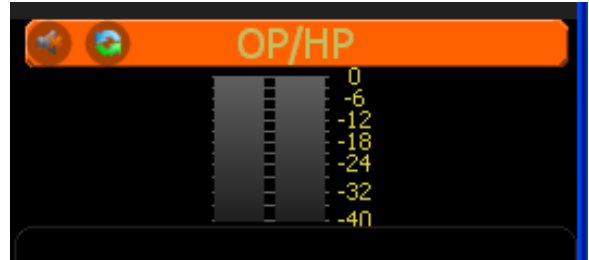
Alternatively, if the audio on that destination has gone away but there **is** failover audio present, the display will be different; the orange label will still be there, but the meter will show the presence of the failover audio.
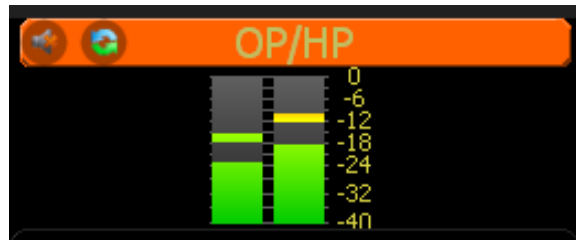
The alarm color, like several other layout colors, can be changed by selecting *Setup>Preferences...* from the menu.

Double-click on the alarm label and a log will pop up showing you what silence detect activity has transpired since the log was last cleared.

This log window can also be invoked by right-clicking in the meter cell and selecting *Alarm Logs...* from the popup menu.

Click *Okay* to close the log window. Clicking *Clear Logs* removes all entries from the window.

Logs:

04/29/13 18:18:09.312 Switched to primary destination.
04/29/13 18:18:09.312 Audio resumed.
04/29/13 18:17:36.250 Switched to secondary destination.
04/29/13 18:17:36.250 Silence detected!

Okay   Clear Logs
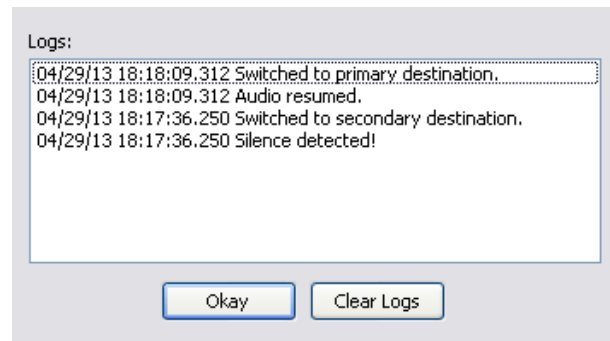
Security Settings

The IP-MTR64 Meters GUI can be password protected to keep unauthorized people from making changes. By default the password is empty.

Setting The Password

To set a password select *Network>Password...* from the menu.

Enter the *Old Password:* (or leave that field blank if there is no password currently set), then enter the new password in both the *New Password:* and *Verify New:* fields. Click *Okay*.

Operating With Security

When a password has been set and you start the program, you'll be prompted for a password:

Enter the password and click *Okay* to use the program. If the correct password is not entered the program cannot be started. There is also a level of security applied to certain functions of the program.
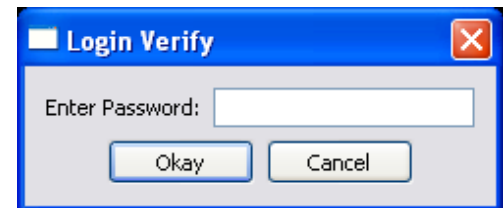
Making The Security Settings

Select *Setup>Preferences...* and switch to the *Security* tab.

Here you will see a number of tasks that can be *Un-Locked*, set to work *With Password*, or *Hidden*. Use these settings to prevent unauthorized operators from performing certain tasks.

You can also select or deselect check boxes for *Double Click to Zoom* and *Zoom Full Screen*.

Click *Okay* when done.
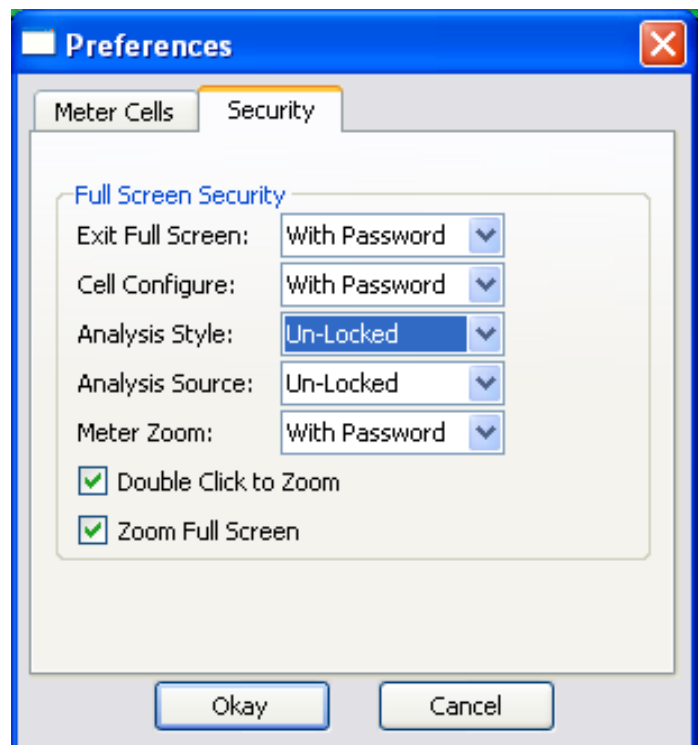
Menus

Operation of the IP-MTR64 Meters GUI is done through the use of menus, both drop down from the main menu bar, and popups that are activated by right-clicking at specified areas of the GUI. In this section we describe the various menu items, both those that have been described throughout the manual and those that haven't yet been mentioned.

View

The *View* menu contains a few items that are necessary for basic program configuration and operation. The available items are:

Full Screen – switches the program to a full screen view that eliminates both the status bar and the title bar from the display and in fact also hides the Windows task bar. While in full screen mode you can right-click in the area of any meter cell and select *Exit Full Screen* from the popup to revert to a normal view. You can also use the F11 key to toggle in and out of full screen mode.

About… – brings up a typical About dialog box to show you the program version.

Exit – use to close the application.

Layout

The *Layout* menu contains items that are used to adjust the layout of meter cells and the analysis window. The available items are:

New – use to create a new meter layout.

Open… – use to open a previously saved layout file.

Save – use to save the current meter layout to the last opened layout file.

Save As… – use to save the current meter layout to a new file.

Configure… – use to edit the current meter layout.

WheatNet-IP System

The *WheatNet-IP System* menu contains items used to acquire needed information from the WheatNet-IP system. The available items are:

Open… – use to open a previously saved system information file containing a list of sources and destinations that the program used when system resources were discovered via a system scan. This is handy when you are going to be setting up a meter layout on a computer that is not currently connected to the system.

Save As – use to save the current source and destination system information to a file for reference at a later time.

System Scan… – begins the process of discovering the available source and destination signals in the WheatNet-IP system.

View Info… – shows the list of source and destination signals known to the program.

Setup

The *Setup* menu contains items used to configure program options. The available items are:

Network… – use to set the network interface and the 3rd Party Devices port.

Preferences... – use to set program color and labeling schemes, and to set the tasks protected by password.

Password... – use to set a password that must be used to start the program and perform certain program functions.

Additional Popup Menus

Some popup menus are available by right-clicking within certain areas of the program window.

Right-click in a meter cell to bring up this popup:

Alarm Logs... – use to view silence detect activity on a meter cell that is monitoring a destination configured for silence detection.

Zoom In... – zooms that meter to a full-screen view for detailed observation.

Configure... – brings up the dialog for configuring that cell.

Right-click in the analysis cell to bring up this popup:

FFT – selects the FFT display type for the analysis window. This is a Fast Fourier Transform, or spectral analysis, of the selected audio signal.

O-Scope – selects the O-Scope display type for the analysis window. This is a time domain display of the audio waveform's amplitude (vertical) vs. time (horizontal).

E vs F – selects the E vs F display type for the analysis window. This displays the relative loudness using a 31-band 1/3 octave analysis.

3-D Plot – selects the 3-D Plot display type for the analysis window. This is a three-dimensional plot of the audio. The left scale is audio level in dB, the bottom scale is audio frequency in Hz, and the diagonal lower-left-to-upper-right flow of the display represents time.

SDR – selects the SDR display type for the analysis window. The Spectral Dynamic Range meter is a Wheatstone exclusive. Using a 31-band, 1/3 octave analysis the dynamic range of audio within each of the 31 bands is measured. The peak audio level is represented by the highest position of each meter bar, while the amount of dynamic range in each band is shown by the overall height of each bar. Very dense audio will be displayed with much shorter bars than very dynamic audio.

Configure... – brings up the dialog to configure the current analysis window display. Each analyzer type has its own set of parameters that can be configured.

Take Source... – brings up the dialog to select the source for the analysis display.

Summary

We have briefly discussed the IP-MTR64 Meters GUI program. We have described its function, how to install it, and how to use it. Like any software program, the best way to become acquainted with it is to use it, go through the menus, do some clicking here and there, and along the way decide how you can make the best use of its features for your particular application.

Appendix 8

Contents

WheatNet-IP Scheduler

Introduction To WheatNet-IP Scheduler

The WheatNet-IP Scheduler program is designed to fire Events in a WheatNet-IP system at pre-arranged times.

In order to integrate the software into a WheatNet-IP system, you will need to run it on a computer having a unique IP address on the same subnet as the WheatNet-IP system (typically 192.168.87.xxx). You will also need to know the IP address of at least one Blade in the system, since the software will need to directly address a Blade.

What are events? Simply put, they are actions that will occur within a WheatNet-IP system. The software supports Connect, Disconnect, Salvo, and ACI (Automation Control Interface) events. Events are configured within the software, and are also **fired** by the software. Events act on system **signals** (Connect and Disconnect events) and **salvos** (Salvo events). ACI events direct automation-specific **commands** to various devices in the WheatNet-IP system. Events may be saved to a file, and the saved event files may be loaded into the program. This allows you to create a schedule on one computer, then load and run the schedule on a different computer.

Since a scheduler by its very nature performs tasks at specific times, it is important to note that the WheatNet-IP Scheduler depends on the clock on the PC that the program is running on to know precisely when to fire an event. Thus the PC clock needs to be set to the correct time and date to match its location. Otherwise, events will not fire as expected.

Events And Signals

As stated above, the software utilizes various event types, signals, salvo definitions, and commands to compose the events necessary to effect the desired actions within the system at the appropriate times. These items will be discussed briefly here.

As previously stated, an event is an occurrence within the system that can be caused to take place at a specified time according to a schedule. Four types of events are supported in the software.

Connect Event

A **Connect** event is one that causes a particular source (input) in the system to feed a particular destination (output) in the system at the scheduled time. Both sources and destinations can be specified by signal Name and Location (which are assigned by the system administrator via the WheatNet-IP Navigator program) or signal ID (which is automatically assigned within the WheatNet-IP system based on the rules the system imposes to define signals).

It should be noted here that only one source can be connected to a given destination at a time. For this reason, an event that causes a source to be connected to a destination which already has a different source connected will cause the original source to be disconnected prior to making the new connection.

Also worthy of note is that connections in the system may be locked, and that the Scheduler software will not override signal locks.

Disconnect Event

The next type of event is a **Disconnect** event. In this case no source need be specified, only a destination. If a source is currently connected to the specified destination, the disconnect event will break that connection. However, once again, the Scheduler software will not override signal locks.

Salvo Event

The third type of event is the **Salvo** event. Salvos are configured within the WheatNet-IP Navigator program, and consist of sets of connections and/or disconnections that will happen rapidly in sequence when the salvo is fired. Salvos are identified both by Name and ID when constructing a salvo event.

ACI Event

The fourth type of event is the **ACI** event. This type of event is used to send ACI commands to various pieces of equipment within the WheatNet-IP system. The program currently supports sending ACI commands to Blades, Surfaces, and Processors. It is beyond the scope of this manual to list all of the ACI commands available for your use. Examples will be shown, but otherwise please contact Wheatstone Technical Support at 252-638-7000, or email us at techsupport@wheatstone.com, to discuss your specific requirements.

Installation

The following instructions guide you through the software installation process.

Begin Installation

The software is delivered as an installation file named **wheatnetipsched_install_x.x.x.exe**, where **x.x.x** is replaced with numbers indicating the version being installed. Double-click the installer file icon to start the process.

Accept The License

The first screen that you see in the installer displays the EULA (End User License Agreement). You must accept the license to install the program.

Click the *I Accept* radio button and click *Install* to continue.

Finish The Installation

You will see a progress screen that will look something like this when the installation is complete:
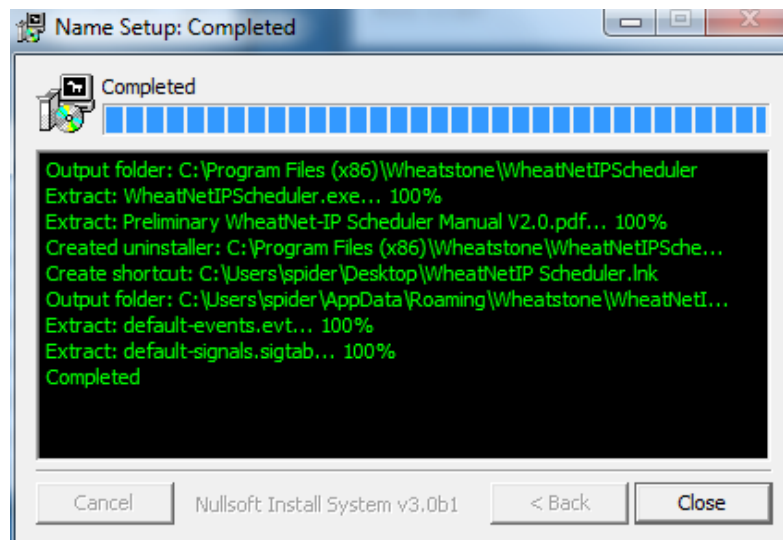
Click *Close* to finish the installation.

The installer will also add a shortcut to your Desktop for a convenient way to start the WheatNet-IP Scheduler after installation.
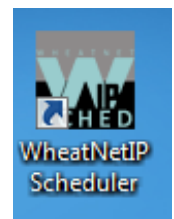
Uninstalling The Program

Should it become necessary or desirable to uninstall the WheatNet-IP Scheduler, navigate to the program's working directory, which will be in the folder **Wheatstone\WheatNetIPScheduler** under **C:\Program Files (x86)** (Windows 7) or **C:\Program Files** (Windows XP). Find the **uninstaller.exe** program and double-click its icon to remove the Scheduler. Or you can use the Windows Add or Remove Programs Control Panel.

First Time Operation

First time operation of any software is a learning experience. With the WheatNet-IP Scheduler program, the steps involved in first time operation will differ depending on whether or not you are actually connected on the same network as a WheatNet-IP system.

If You Are Not Connected To A System

This section will deal with what happens when you start the program and it is not connected to a WheatNet-IP System.

Default Signal Warning

Whenever the program starts it will check to see if it can find a saved signal set. The program installer provides a sample signal set in the directory the program searches by default, and whenever you save a signal set the path to that file is remembered, so you may never see this warning.
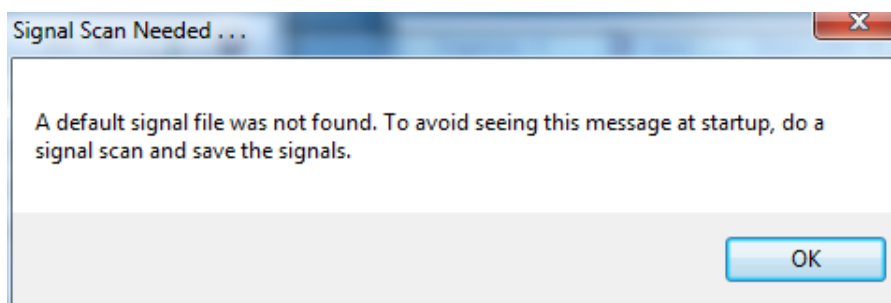
If you do see this warning, it simply means that your program will not be aware of any system signals needed to create events. Later on we will see what steps you can take to rectify this situation, but for the present, if you see this warning, just click *OK*.

License Warning

The first time you start up the program you will be asked for a License Key. This will also happen every time you open the program during the software's seven day trial period if you haven't yet entered a license key. Here is what the warning looks like on the second day of the trial period:

If you wish to run the software beyond the seven day Trial Period you will need to purchase a site license for the program from your Wheatstone Corporation sales representative.

To continue without entering a License Key click *Later*. Each time you restart the program without having entered a valid License Key you will again be prompted to enter one. After the seven day Trial Period is over the nag screen will no longer give you the option of continuing unless you enter a valid License Key.

License Key Entry

If you have a License Key to enter, click *Enter License Key...* to bring up the following screen:
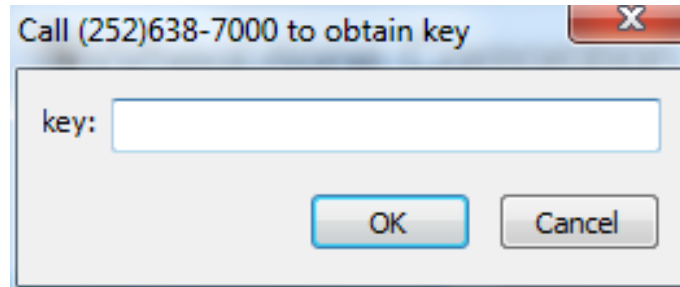
Enter the License Key that you obtain from Wheatstone Technical Support. You can either type the license key in, or right-click in the *key:* field and select *Paste* from the popup menu. Once the key is entered, click *OK*. The following screen appears when a valid License Key has been entered:
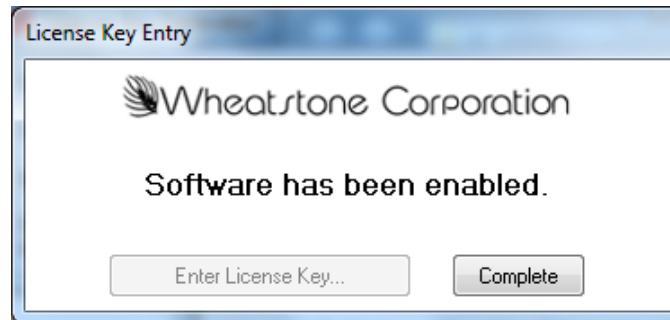
Click *Complete* to continue.

Main Screen

Once you have either entered a key, or indicated you will enter a key later if you are still in the trial period, the following main screen will appear:
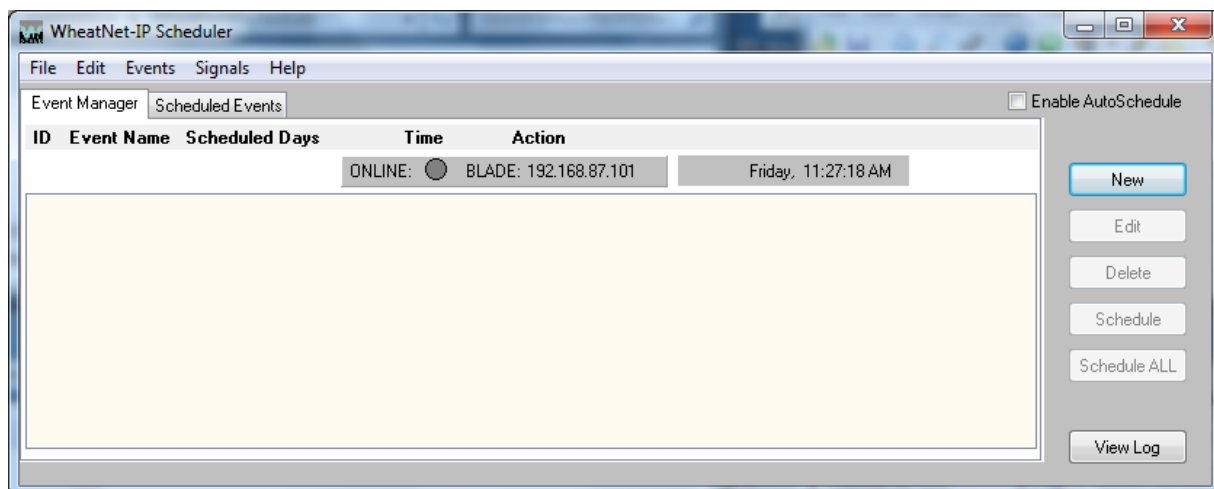
Proceed to section "Day To Day Operation", page A-71.

If You *Are* Connected To A System

This section will deal with what happens when you start the program and it *is* connected to a WheatNet-IP System.

The first few steps will be the same as when not connected to a system. You may encounter the default signal warning, and the first time you run the program you will certainly encounter the license warning, unless you had an older copy of the program already installed and licensed.

If you are connected to a system which contains a Blade with ID of 1 and the default IP address of 192.168.87.101, your main screen will look like the one shown earlier, with the exception that the ONLINE: indicator will be green rather than gray.

For the benefit of those who may have a system without a Blade of ID 1, or have their system set up on a different network subnet, the next step will be to change the IP address that the program looks for its host Blade at.

Set IP Address

There are two different ways to change the Blade that the program will connect to.

From the menu, select *File>Set IP Address...* to bring up the following form:
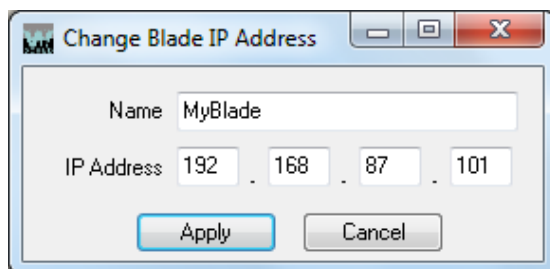
Note that the form indicates the current setting. Change the address information to that of the Blade you will use to host the Scheduler:
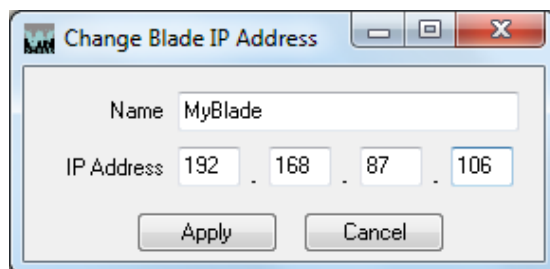
For convenience you can type a name in the *Name* field. The name is not actually used.

Once the IP address is entered, click *Apply*. You will be prompted to restart the WheatNet-IP Scheduler Program before your new IP address will take effect.
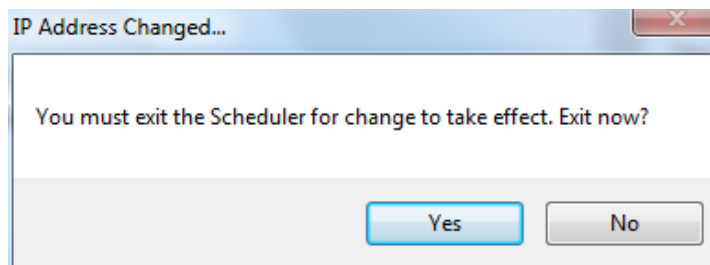
You can click *Yes* to exit immediately, or click *No* if you are not ready to exit. Until you do exit and restart it, the program will still be attempting to communicate with the previously specified Blade.

The other way to change the IP address is to click on the word *BLADE* next to the *ONLINE* indicator.

Time	Action
ONLINE: ⬤	BLADE: 192.168.87.101

This will bring up the change dialog, and the rest of the procedure is the same as when started from the menu.

Once you are connected to the host Blade the main screen *ONLINE* indicator will be green.
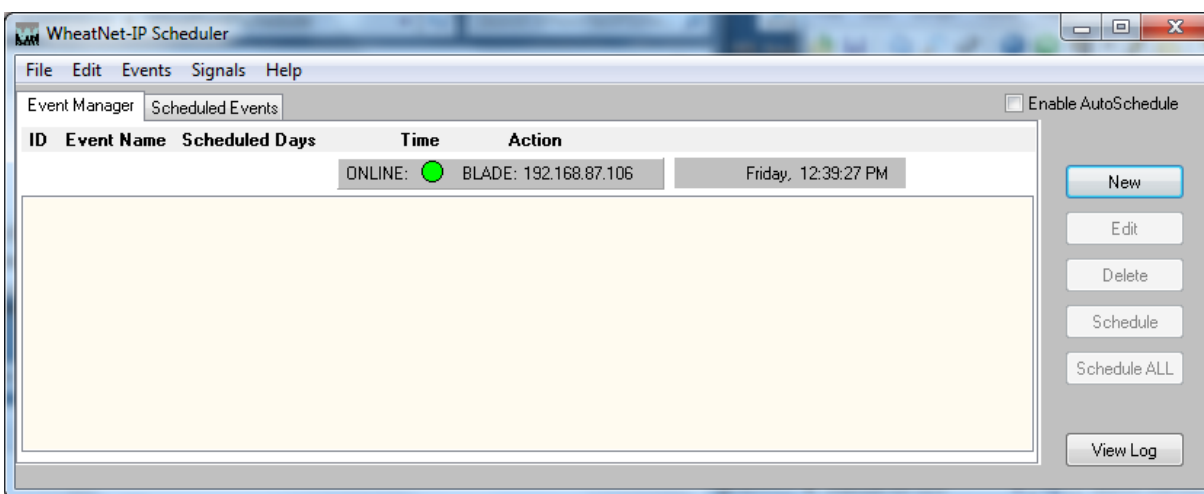
Day To Day Operation

As you become more familiar with the program operation you will begin discovering the tasks you want to perform with the software. This section of the manual details the various tasks, what they are for, and how to perform them. For the sake of discussion, tasks are organized by category: System, Signals, Events, Schedule Management, and Logs.

System

The following tasks relate to the interaction between the Wheatnet-IP Scheduler and the WheatNet-IP system.

Set IP Address

In order to perform any useful function, the program ultimately needs to interface with a WheatNet-IP Blade. Unless you will only be interfacing with a Blade at the default Blade 1 IP address of 192.168.87.101, you will need to know how to specify the Blade that the program communicates with. This procedure has already been discussed above in section "Set IP Address" under "If You Are Connected To A System", page A-70.

Please note that in a system with multiple Blades, it generally doesn't matter which Blade you connect to when running a schedule.

Define Devices

If you plan on using any ACI command events you will need to define the device or devices you want to control. From the menu, select *File>Define Devices* to bring up the following form:

This is quite a busy form, so let's take it on in sections.

The *Current Settings* area indicates any ACI devices that have already been set up. Until you have set up one or more devices this area will indicate that all eight devices are of type *blade*, and all of the IP Address entries will show **. . .** to indicate that they have not been defined.

The *New Settings* area on the right also shows any settings that have already been made, and allows you to easily add devices or edit existing devices.

The normal procedure for adding a device is to first use the Radio Buttons to specify if the device type is *Blade* (default), *Surface*, or *Processor*. Next, enter the IP Address of the device in the spaces provided. ***It is important to correctly match the device type and the IP Address since different device types use different ports for their ACI communications.***

Editing is just as simple; change the device type, if needed, and enter the new IP Address.

If you want to undefine a device, simply click the *Delete # X* button that corresponds to the device you no longer need.

You can commit your changes at any time by clicking *Apply*; the form will remain open. If you have made some changes but want to cancel your changes, you can click *Cancel* to revert any uncommitted changes back to what they were. *Cancel* will **not** affect changes that have been committed.

When you are done defining devices click the *Close* button to commit your changes and close the form. You will be prompted to restart the program before the new device data will actually be used. Click *Yes* or *No* as desired.
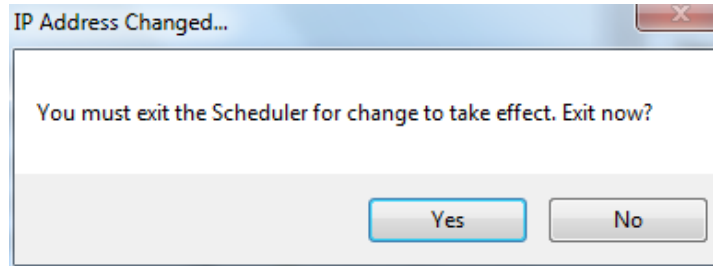
Signals

Signals are an integral part of Connect and Disconnect events. Although you can schedule one of these events without specifying signals, the event will do nothing when fired.

Signals are operated upon within the WheatNet-IP system according to their Signal ID, and you can, in fact, specify signals by referring to the ID. However, the signal IDs are somewhat cryptic, and signals can be given names that we humans will find much more meaningful.

Further, it makes sense from a human standpoint to have items with similar functions named with similar names. For an example relative to the project at hand, we may find it convenient to have a signal named "Fred" feeding an input on a Blade located in Studio 1, and a signal of the same name feeding a Blade in Studio 2, because Fred sometimes works from one studio and sometimes from the other. And so we allow the name to be extended by appending a Location to the name. In this example we would have Fred – Studio 1 and Fred – Studio 2. In this way we can easily distinguish the two signals even when they share a common name.

Signal names and locations are generally configured with the WheatNet-IP Navigator GUI. We just use the same names here, getting them from the fetched signal set.

Although earlier versions of the Scheduler always attempted to fetch signals from the attached system at program start, that has changed with version 2.0. Now, when the program starts, it first looks for a signal file residing on the computer hard drive. If at some time since installing the program you have saved a signal set, the program will attempt to load the last saved signal file. Prior to the first time you save a signal set the program will attempt to load a default sample set that was installed for you along with the program.

If Scheduler cannot find a signal file at startup it will display a warning, as described above in section "Default Signal Warning", page A-68. This will not be the case, however, if the AutoSchedule feature has been enabled (see below section "The AutoSchedule Feature", page A-83)

It is also possible at any time while the Scheduler is running to request signals from the connected system. This is covered in the next section.

Request Signals From Connected Blade

To request signals from the connected Blade while at the main screen, select *File>Request Config* from the menu. Or, if you are on the *Event Properties* screen (see below "Create Events" section, page A-76) you can click the *Request Config* button. Either method will start the signal fetch process described below.

The fetch process shows the following sequence of screens when connected to a Blade:
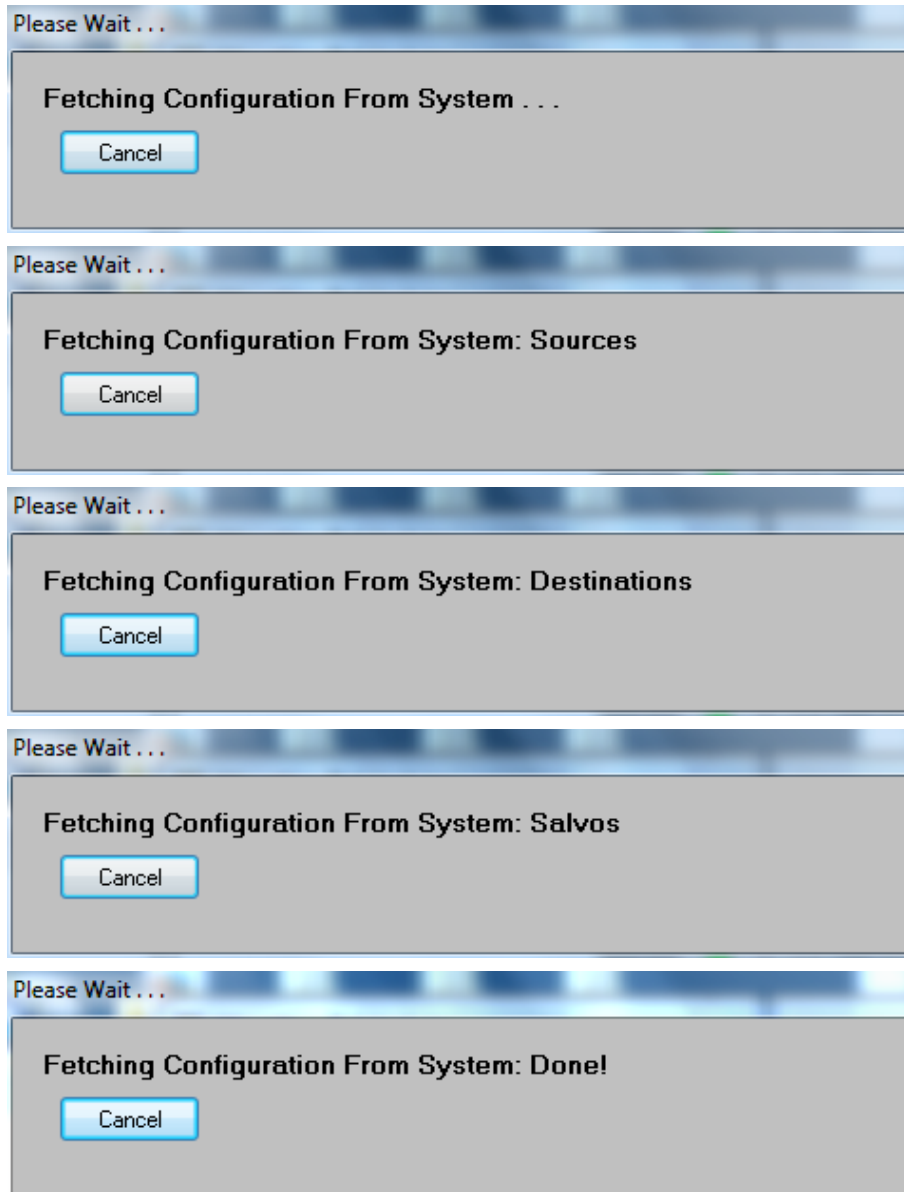

You may stop the fetch process at any time by clicking *Cancel*.

When the process completes, a window appears that advises you of some of the actions you can perform with the Scheduler. Close it by clicking *OK*. If you expect to be fetching signals on a regular basis (something you might want to do if you are slowly building up your system, or if you are making changes to signal names) but don't want to see this screen every time, check the *Do not show this message again* box before clicking *OK*.
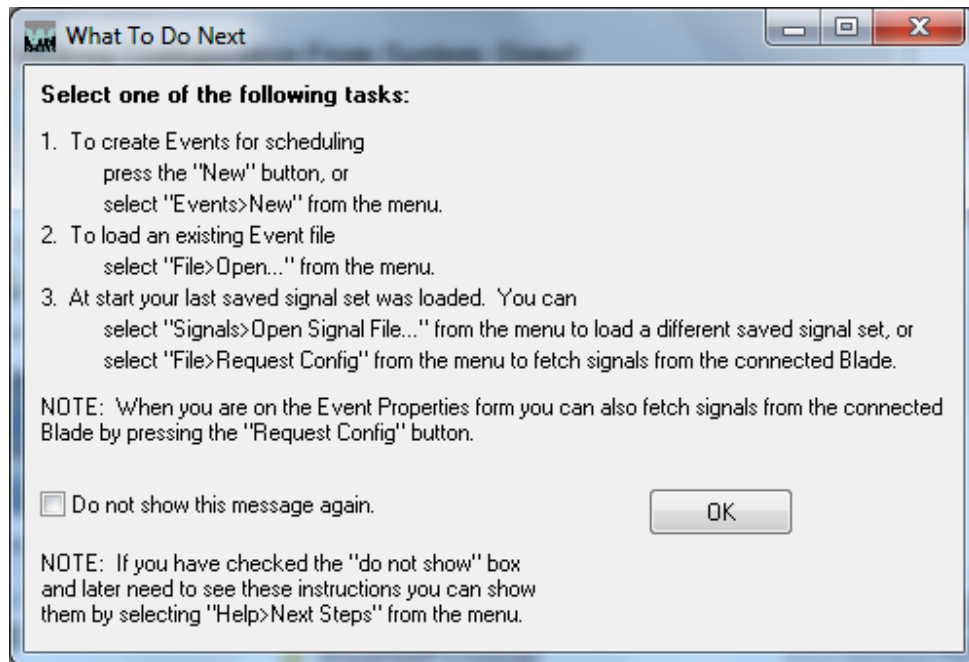
Should you be unable to fetch signals because the program can't connect to the system, you'll be presented with the above screen. After dismissing that one you'll be presented with following screen:
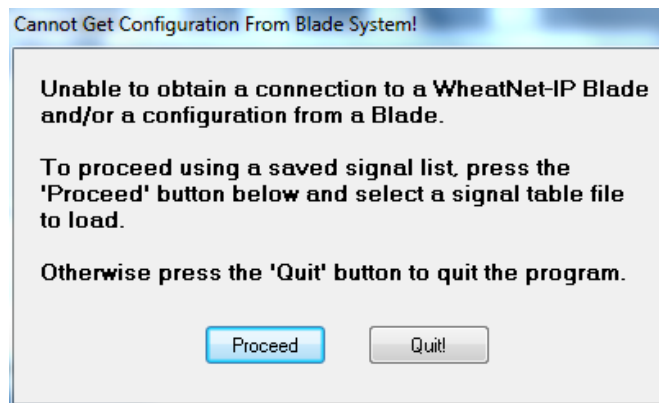
Clicking *Quit!* will exit from the Scheduler. Clicking *Proceed* will open a standard Windows file open dialog via which you can load a previously saved signal set file.

Load Signals From File

If you have previously saved a signal set, or if you want to view the sample signal set that is provided for you during product installation, select *Signals>Open Signal File...* from the main menu. This will open a Windows file open dialog, which will point to the default location for event and signal files the first time the program is run, or the location loaded from or saved to the last time the program was run. Navigate to the desired location, select the file, and click *OK*.

Save Signals To File

If you have successfully fetched signals from a system and want to have a copy of the signal set available so you can create and edit events without needing to be connected to a Blade, you will want to save your set of found signals. Select *Signals>Save Signal File...* from the menu to open a standard Windows file save dialog. Navigate to the desired folder if necessary, choose a memorable name for the file, and click *OK*.

Events

The unit building block used by the schedule as it operates is termed an Event. As previously discussed, there are four types of events: the Connect Event, the Disconnect Event, the Salvo Event, and the ACI Event. Events are created and edited from the *Event Properties* form, as discussed below in the section "Create Events". Sets of events can also be saved in a file for future scheduling.

Load Events From File

If you have previously saved an event set, you can load that set by selecting *File>Open...* from the main screen. A standard Windows file open dialog allows you to select a file to open. Once the file has been loaded you can begin working with it.

Save Events To File

You may find it desirable to save a set of events you have created. Select *File>Save...* from the main menu. This opens a standard Windows file save dialog.

Create Events

If you are starting from scratch to create events, select *Events>New* from the main menu. This opens the *Event Properties* screen, which looks like this:

Let's take a closer look at the various parts of this form, starting with the right side of the form. At the top we see an *ID* box that we can use to scroll through the events. This is followed by a *Name* field, where the event is given a name. To the right of that is an *Event Type* drop down box, where the type of event will be selected. Note that, in the picture, the *Event Type* is blank, and the tabbed area below displays a tab titled *Undefined*. The tabbed area title and contents will change depending on the type of event selected. When the *Event Properties* form is first viewed by clicking the *New* button on the main screen, or selecting *Events>New* from the menu, this is how the form will look. We will take a closer look at the various event type tabs later.

Worthy of note is the text displayed on the *Undefined* tab. This defines what is required before an event being created is accepted by the software. If you try to proceed from the currently viewed event to another by clicking *Apply* or *OK*, you will not be able to proceed unless certain information is furnished. The event must have an *Event Type* specified, must have at least one *Day* box checked, and must have a *Name* assigned.

Note that you can get away with not assigning signals to a Connect or Disconnect Event; however, such events will do nothing when fired.

The left side of the dialog, at the top, gives you the tools for specifying when an event will fire. The *Start Time* specifies the first time on a checked *Day* that the event will fire. Enter the time in 12 hour mode, and specify *AM* or *PM*.

The *Repeat Interval* determines how often an event will fire on a checked *Day*. The *Repeat Interval* is specified in hours and minutes. As an example, if the *Repeat Interval* is specified to be 4 hours and 30 minutes, and the *Start Time* is 2:15:00 PM, the event can be expected to fire on a checked day at 2:15, 6:45, and 11:15 (all these are PM times).

There are separate check boxes for each day of the week, *Sunday* through *Saturday*. Events will not be fired on days that are not checked. For convenience, the *Check All Days* and *Uncheck All Days* buttons are provided, with rather obvious consequences. The I*nvert Selection* button checks all unchecked *Day* boxes and unchecks all checked *Day* boxes.

The *1-Time-Only* check box is a little less obvious. When this box is checked, once an event fires it is deleted from the Scheduled Events list. However, if the box is not checked, the fired event is added at the bottom of the schedule, one week later in time than when it just fired.

Below the schedule settings are two buttons used to enter the event in the *Event Manager* list. *OK* enters the current event in the list and closes the *Event Properties* dialog, while *Apply* adds the current event to the list but leaves the *Event Properties* dialog in place. A third button, *Cancel*, er – ah – cancels the event, and it is not added to the list.

Advancing the previously described *ID* spin box without first clicking *Apply* on the current event results in a prompt that asks you to decide if you want to apply changes before viewing the next event.
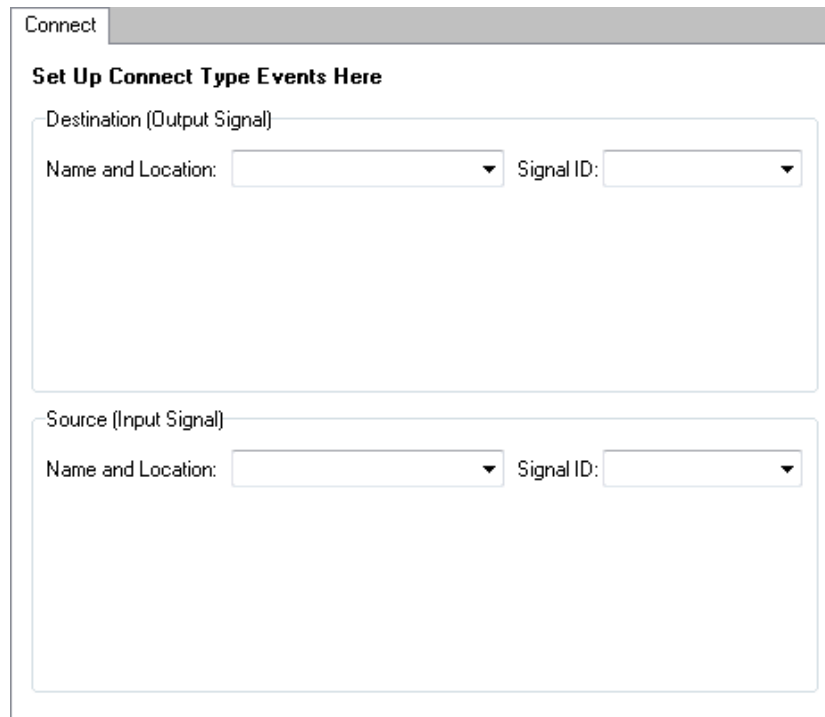
The previously discussed *Request Config* button on the left side of the dialog at the bottom is used to fetch signals from a connected Blade.

View Events

The *Event Properties* dialog shows you the properties of the event currently being viewed. As mentioned above, the tabbed area will change depending on the *Event Type*. Let's look at this a little more closely.

If *Connect* is selected as the *Event Type*, the tabbed area looks like this:

Notice that a Connect Event is used to connect a given source signal to a given destination signal. The signals are specified on this tab. You can select a signal by its *Signal ID* if you know it, but you do not need to know the *Signal ID* to specify it. The signal can also be selected by *Name and Location*. If you are not sure of the *Name and Location* associated with the signal you want to use, and do not know the *Signal ID* either, you can still have the event added to the *Event Manager* list. However, the event will do nothing when fired unless valid signals are specified.

Note that when you scroll to an already defined Connect Event the programmed signals will be shown.

If *Disconnect* is selected as the *Event Type* the tabbed area looks like this instead:

A Disconnect Event is used to disconnect the current source signal (which does not need to be specified) from a given destination signal. The destination is specified on this tab. Once again you can select a signal either by its *Signal ID* or by its *Name and Location*.

Note that when you scroll to an already defined Disconnect Event the programmed signal will be shown.

If *Salvo* is selected as the *Event Type* the tabbed area changes once again:

A Salvo Event is used to select a particular salvo to fire (please read the section of the WheatNet-IP manual that deals with the Navigator software to find out more about salvos). You can select the desired salvo either by its *Signal Number* or by its *Name*.

Note that when you scroll to an already defined Salvo Event the programmed salvo information will be shown.

Selecting ACI as the Event Type results in this in the tabbed area:

Use the *Device* spin dial to select the desired device for this **ACI** event. As you cycle through the defined devices the device *Type* and *IP Address* fields will reflect the properties

of the device. In this instance we have selected device 1, which is a control surface located at 192.168.87.202. The *OnLine* indicator will be green if the program is able to connect to the selected device, or red if not.

Once the device is selected you must compose a command string appropriate to the device. In our example we want fader 1 on the surface to turn on when the command is issued. The basic format for a fader on/off command to a surface is this: `<INPUT:x|ON:y>` where x indicates the fader number and y indicates the desired fader state, with 1 indicating on and 0 indicating off. This command is entered in the *Compose String* field. Note that letters are automatically converted to upper case when entered, so there is no need to use Shift or Caps Lock.

Once you have composed the desired command string you may want to test it. Press the *Test* button and the string in the *Compose String* field will be sent to the selected device.

When you are sure the command string is doing what you want, press *Enter*. This copies the command string from the *Compose String* field to the *Event ACI Command String* field.

If you have composed a command string you think you may need again press the *Save String* button. The program can remember up to 50 command strings this way.

Note that when you scroll to an already defined ACI Event the programmed device information will be shown, and command string will appear in the *Event ACI Command String* field.

As previously mentioned, it is beyond the scope of this manual to list all of the ACI commands available for your use. Please contact Wheatstone Technical Support at 252-638-7000, or email us at techsupport@wheatstone.com, to discuss your specific requirements.

Edit Events

If you have an existing event that you want to modify, you once again need to be on the *Event Properties* dialog. If you are already on this form you can use the *ID* spin dial to scroll to the event you want to change. Or if you are at the main window and viewing the *Event Manager* tab you can highlight the event and click *Edit* or select *Events>Edit* from the menu. The process of editing an event is to change the *Event Properties* from the current settings to the desired settings. The pertinent information has already been discussed.
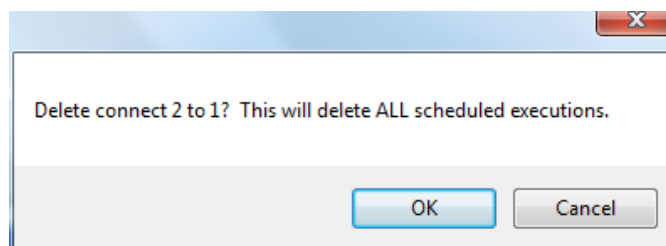
Schedule Events

With a few events in the Event Manager list, your main screen, *Event Manager* tab, could look like this:
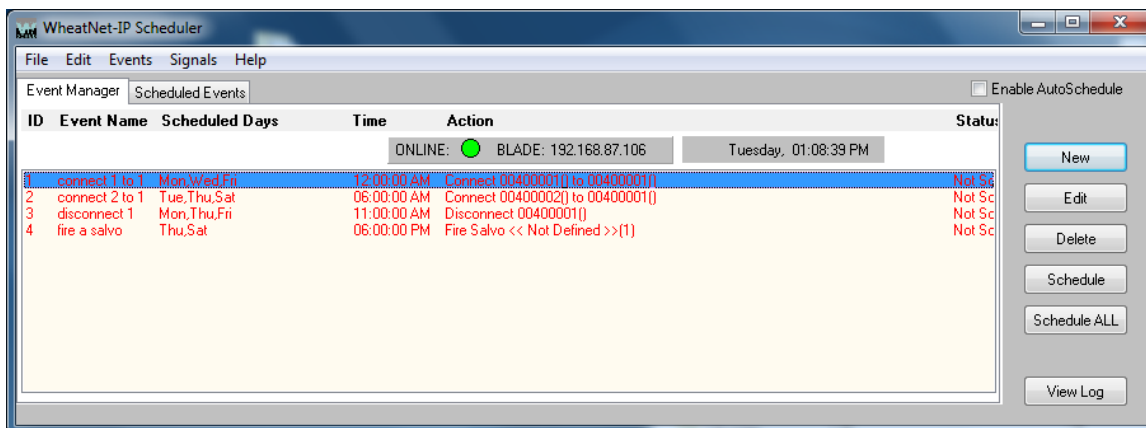
With a single event highlighted, as shown, you can click *Schedule*, or select *Events>Schedule*, to schedule only that event. You could also highlight, using either the Shift key or the Ctrl key, a small number of events, say two or three, and use *Schedule* to schedule only those events. Or you can use the *Schedule All* button or select *Events>Schedule All* to add all events in the list to the schedule – in this case you only need to highlight one event.

Delete Events

From the *Event Manager* list, you can highlight an event and click the *Delete* button or select *Events>Delete* from the menu to delete that event. This will delete the event from the *Event Manager* list and also delete any as yet unfired instances of the event from the schedule. If the event (or events) has not yet been scheduled, the delete process will happen automatically. But when removing scheduled events you will be asked to verify your intent:

Click *OK* to proceed, or *Cancel* if you've changed your mind.

Schedule Management

Once you have created some events and added them to the schedule, you can view the schedule list from the main form by selecting the *Scheduled Events* tab:
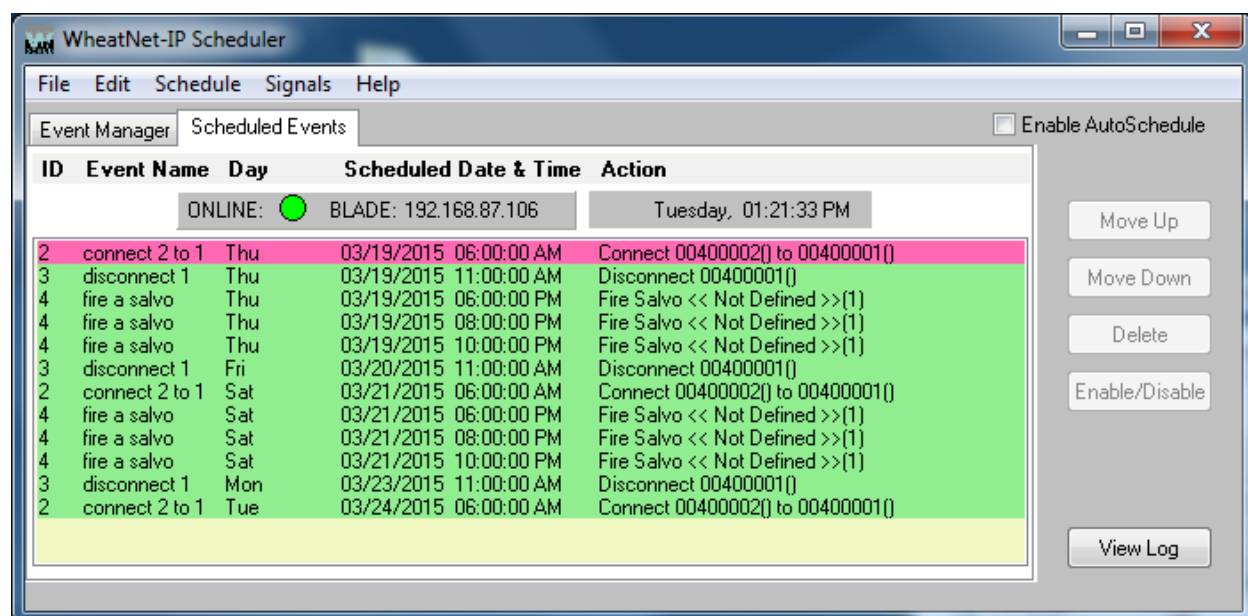
As the event at the top of the list fires, it is removed from the list. If the event is not specified to fire one time only, the same event will then appear at the bottom of the schedule list, for a time one week in the future from the time the event just fired.

The event at the top of the list is the next one due to fire. It is highlighted with a light red background, whereas the other events in the list are normally highlighted with a light green background.

If you click on an event in the list to select it for an action, such as to move, delete, or disable it, the event text changes from black to white. Multiple events can be selected using the Shift or Ctrl keys, as in normal Windows operation.

If an event is disabled it will show in the list as red text on a white background. An example of this is shown later.

Moving Items

Events in the schedule must fire in sequence. This means that two events scheduled to fire at the same time will still fire one after another, in the sequence they are listed on the *Scheduled Events* tab. If you have two (or more) such events and need to fire them in a specific sequence, you can adjust their relative positions in the list. If you highlight one of two (or more) events scheduled for the same time, one (or possibly both) of the *Move* buttons (*Move Up* and *Move Down*) will become active. Clicking *Move Up* moves the position of the event one place higher up the screen, whereas *Move Down* does the opposite. The buttons will be disabled (grayed out) if the event highlighted is scheduled for a different time than the one in the direction that the button would move it if enabled.

Deleting Items

Just as you can delete events from the *Event Manager* tab, you can also delete events from the *Scheduled Events* tab. But the choices are a little more complicated. Highlight an event on the *Scheduled Events* tab, click *Delete* (or select *Schedule>Del From Schedule* from the menu) and the following dialog pops up:
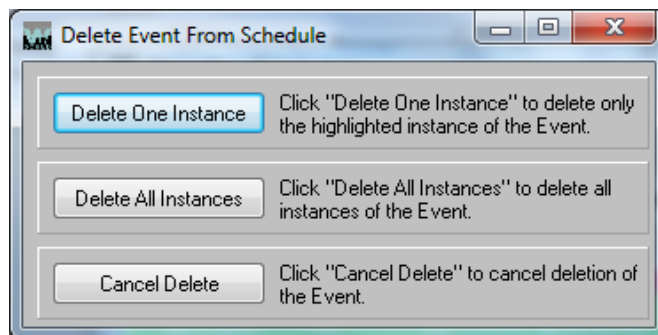

The choices are clearly explained on the dialog box. Click the appropriate button.

Enabling And Disabling Items

You can disable all instances of an event from the *Scheduled Events* tab. This will prevent the event from firing but will not delete it from the schedule. The event can later be enabled. Select an event and click the *Enable/Disable* button or select *Schedule>Enable/Disable* from the menu. A dialog box asks you if you want to disable all instances of the event:

Click *Yes* to disable all instances of the event, or *No* to cancel the delete.
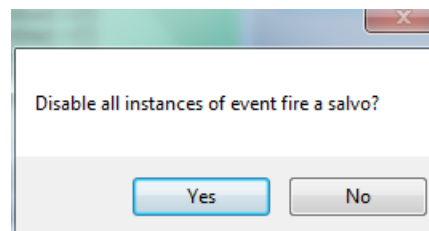
You can select multiple events from the list using the normal Windows techniques with the Shift and Ctrl keys. You will be prompted individually for each event you have selected.

Here is a section of the *Scheduled Events* tab showing a few disabled events:

3	disconnect 1	Thu	03/19/2015 11:00:00 AM	Disconnect 00400001()
4	fire a salvo	Thu	03/19/2015 06:00:00 PM	Fire Salvo << Not Defined >>(1)
4	fire a salvo	Thu	03/19/2015 08:00:00 PM	Fire Salvo << Not Defined >>(1)
4	fire a salvo	Thu	03/19/2015 10:00:00 PM	Fire Salvo << Not Defined >>(1)
1	connect 1 to 1	Fri	03/20/2015 12:00:00 AM	Connect 00400001() to 00400001()
3	disconnect 1	Fri	03/20/2015 11:00:00 AM	Disconnect 00400001()
2	connect 2 to 1	Sat	03/21/2015 06:00:00 AM	Connect 00400002() to 00400001()
4	fire a salvo	Sat	03/21/2015 06:00:00 PM	Fire Salvo << Not Defined >>(1)
4	fire a salvo	Sat	03/21/2015 08:00:00 PM	Fire Salvo << Not Defined >>(1)
4	fire a salvo	Sat	03/21/2015 10:00:00 PM	Fire Salvo << Not Defined >>(1)
1	connect 1 to 1	Mon	03/23/2015 12:00:00 AM	Connect 00400001() to 00400001()
3	disconnect 1	Mon	03/23/2015 11:00:00 AM	Disconnect 00400001()
2	connect 2 to 1	Tue	03/24/2015 06:00:00 AM	Connect 00400002() to 00400001()

To re-enable an event (or events) the process is similar. The prompt dialog asks if you want to enable all instances of the event.

The AutoSchedule Feature

The Scheduler can be set up to load and run your schedule automatically at program start. The check box for enabling and disabling the **AutoSchedule** feature is located near the upper right corner of the Scheduler main window, and appears no matter which tab, *Event Manager* or *Scheduled Events*, is being displayed.

When **AutoSchedule** has not been enabled the check box looks like this:
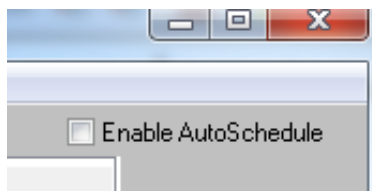
When **AutoSchedule** is enabled the check box looks like this:
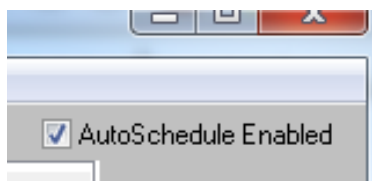
When **AutoSchedule** is enabled and the Scheduler started, it will attempt to load the last saved signal set. Whether this operation succeeds or not it will also attempt to load the last saved event file. If it succeeds at finding the event file it will schedule all events in the file and begin firing scheduled events at the required times.

The Scheduler, when *not* in **AutoSchedule** mode, will pop up a message indicating failure to find a signal set if it can't find default set, which will then require an operator to click *OK* on the message box to continue. But in **AutoSchedule** mode, if the signals cannot be found, no message about that appears. This is to keep the lack of a found signal set from preventing the running of the schedule automatically.

When the Scheduler is in **AutoSchedule** mode, it will stop and present a message requiring user action if it cannot find a schedule to run.

The main purpose of providing the **AutoSchedule** feature is so that a computer running a schedule on the Scheduler program can recover from a power outage without requiring user intervention to get the schedule running. In order for this to succeed you will need to be running the Scheduler as a user on the computer who is automatically enabled at computer startup without the need to have the user log in. Otherwise the program will not be able to start without some user input.

Exiting With A Schedule Running

Obviously, the software can only fire events from the schedule when the software is running. If a schedule is running and you close the program the following prompt will appear:
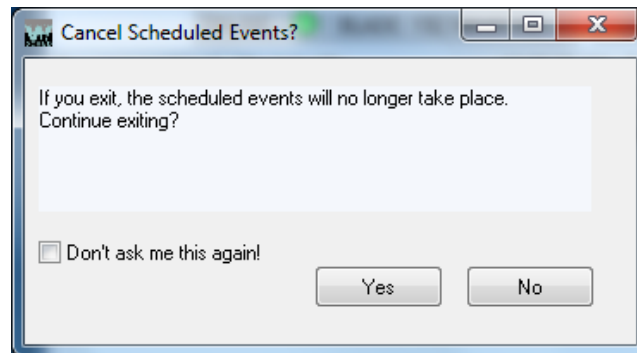
Clicking *Yes* will close the program, with the result that any as yet unfired events in the schedule will not be fired. Clicking *No* will dismiss the prompt and the program (and schedule) will continue to run. If you are tired of seeing this screen at program exit, check the *Don't ask me this again!* check box. The software will then no longer warn you at program close.

More On Exiting

Upon exiting the program you will see the following prompt:
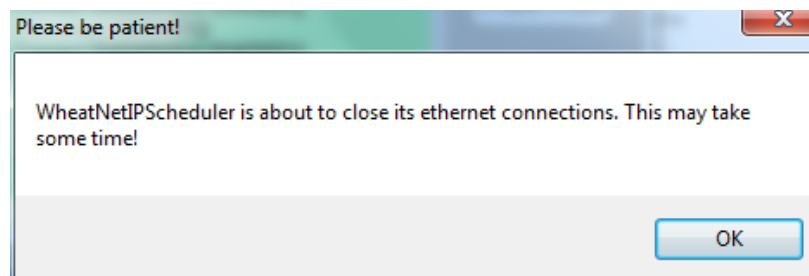
The program may continue running for a short time after all its windows disappear as it shuts down device connections.

Logs

The WheatNet-IP Scheduler program automatically keeps logs to indicate various types of activity. The files are named `EventLog_weekX.log`, where the `X` can be a number from 1 to 4. Upon program exit, log data from the current session is appended to the end of the currently active log file. Older logs are overwritten, so you need to look at the Date/Time stamp of the log files to determine which one is most current. Log files live in the same default location as the signal and event files previously discussed, typically `C:\Documents and Settings\<username>\Application Data\ Wheatstone\` in Windows XP or `C:\Users\<username>\AppData\Roaming\ Wheatstone\` in Windows 7.

Should you need to contact Wheatstone Technical Support regarding an issue with the software you may be asked to provide the logs.

Viewing Logs

The current log may be viewed by selecting *View Log* from either the *Events* or the *Schedule* menu item, or by clicking the *View Log* button on the main window. A typical log when viewed shortly after the program starts might look like this:
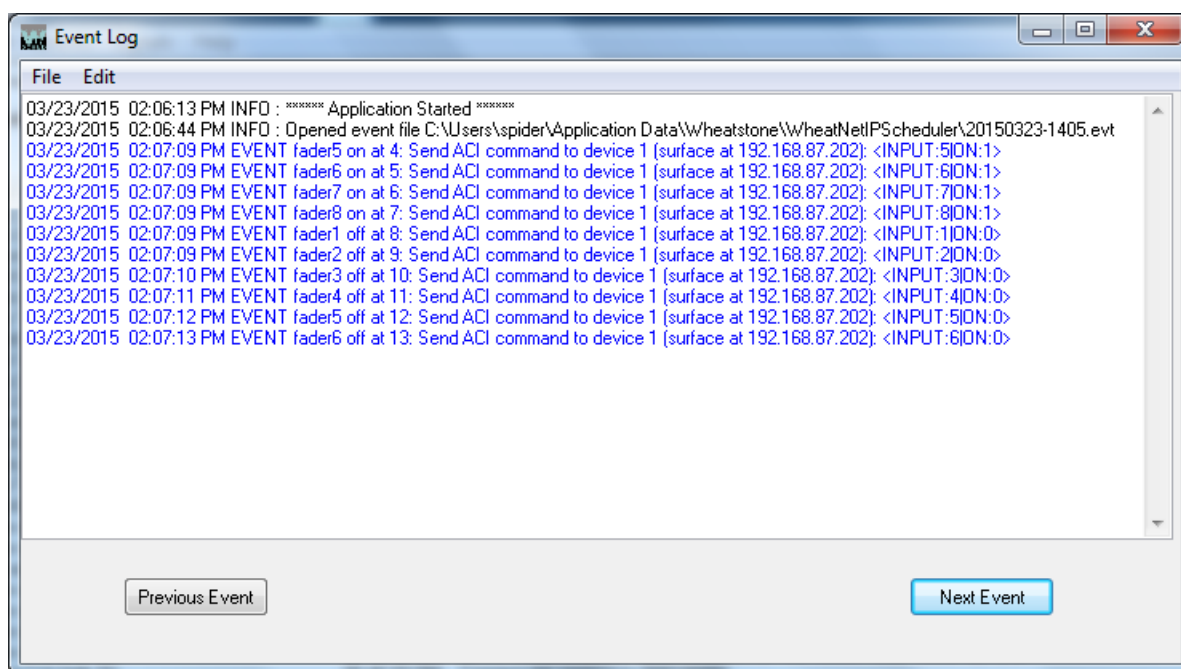
Also added to the log file are indications of events that have fired, requests for fetching signals, opening and saving event and signal files, and other useful information.

If any events have fired, they will be listed in the log. Any such listing contains the text "EVENT". This keyword is used when clicking the *Previous Event* and *Next Event* buttons to find all such listings in the log.

Since the log files are plain text files, they can also be viewed in any simple text editor.

Menus

The WheatNet-IP Scheduler software is operated using buttons and menus. This section serves to bring together the descriptions of the various menu items that have been described throughout the manual. Some items in the main menu depend on which tab is being viewed and what items on that tab are highlighted. The small menu on the log form is described at the very end of this section.

File

The *File* menu contains a few items that are necessary for basic program configuration and operation. The available items are:

Open... This item allows you to open a previously saved set of events for editing and/or scheduling.

Save... This item allows you to save the current set of events for later use.

Set IP Address... This item allows you to specify the Blade that you expect to connect to for obtaining signals and as the avenue by which your fired Connect, Disconnect, and Salvo events will control the system. You will need to restart the program after changing this setting.

Define Devices This item allows you to specify the device or devices that you expect to connect to for firing ACI events. You will need to restart the program after changing any device settings.

Request Config This item allows you to fetch the signals known to the Blade to which you are connected. The program's existing signal set is deleted first, so you may want to save a signal set before fetching a new one.

Print... When selected while viewing the *Event Manager* tab, this item allows you to print the contents of the event list. When selected while viewing the *Scheduled Events* tab, this item allows you to print a snapshot of the current schedule list. Events that have already fired will not appear on the printout.

Exit This item allows you to close the Scheduler software.

Edit

The *Edit* menu contains a couple of items that can be useful in creating new events that are similar to existing events. This menu is only usable on the *Event Manager* tab. The available items are:

Copy This item will copy the *Start Time* and *Repeat Interval* of the currently highlighted event to the clipboard, with a *Name* like "Copy of This Event", assuming the *Name* of the event copied is "This Event".

Paste This item will paste the contents of the clipboard into the next available line on the event list.

Events

The *Events* menu is only visible when viewing the *Event Manager* tab. It contains items useful in managing the creation and editing of events. The available items are:

New This item calls up the *Event Properties* dialog with the first available undefined event showing.

Edit   This item calls up the *Event Properties* dialog with the currently selected event showing. If multiple events are highlighted, the last one selected is the one that will be showing.

Delete   This item begins the delete process for the event(s) highlighted. When an event is deleted from the *Event Manager* tab it is removed from the event list, and all scheduled instances are removed from the schedule list.

Schedule   This item adds the highlighted event(s) to the schedule, at all scheduled times indicated by the Event Properties.

Schedule All   Regardless of event(s) highlighted, this item adds **all** events to the schedule at all scheduled times indicated by the *Event Properties*.

View Log   This item calls up the *Event Log* window.

Schedule

The *Schedule* menu is only visible when viewing the *Scheduled Events* tab. It contains items useful in managing the scheduling of events. The available items are:

Move Up   If the currently highlighted event is scheduled at the same time as the event immediately above it in the schedule list, this item moves the highlighted event up so it will fire first.

Move Down   Similarly, if the currently highlighted event is scheduled at the same time as the event immediately above it in the schedule list, this item moves the highlighted event down so it will fire second.

Del From Schedule   This item begins the delete process for the event(s) highlighted. When an event is deleted from the *Scheduled Events* tab it is **not** removed from the event list. You can also specify whether all scheduled instances are removed from the schedule list, or only the highlighted instance.

Enable/Disable   This item toggles the "firing state" of the highlighted event(s) in the schedule, at all scheduled times indicated by the *Event Properties*.

View Log   This item calls up the *Event Log* window.

Signals

The *Signals* menu contains a couple of items that can be useful in managing signal lists. The available items are:

Open Signal File...   This item opens a previously saved signal set file. This is useful if you want to do offline editing of events without being connected to a Blade since it allows you to use the same signal set the software will be working with when connected to the target system.

Save Signal File...   This item allows you to save the signal set in current use to a file. The file can be loaded to do offline editing. You can also print the file (after opening it in a standard text editor) for printed documentation of your system's signals.

Help

The *Help* menu contains a couple of useful items:

Next Steps   This item displays a message box with some quick hints on using the software.

About   This item reveals the Version number of the software.

Event Log Menu

The *Event Log* window has a small menu to help perform some useful tasks.

Event Log Menu – File

The *File* menu on the *Event Log* window contains a few items that are helpful in working with logs. The available items are:

Save as...   This item allows you to save the current contents of the *Event Log* window to a file without removing the text from the window.

Purge to File... This item allows you to clear the *Event Log* window. The current contents of the window are appended to the end of the currently active `EventLog_weekX.log` file. A brief line is added to the now clear *Event Log* window indicating the date and time the window was purged and what file the data was appended to.

Print...   This item allows you to print the contents of the Event Log window.

Exit   This item closes the *Event Log* window. It does not close the Scheduler software.

Event Log Menu – Edit

The *Edit* menu on the *Event Log* window contains one additional item useful in working with logs:

Copy   This item copies any highlighted text in the *Event Log* window to the Windows clipboardπ. The text can then be pasted into another application, such as a text editor from the clipboard. This is useful when you want to copy some data from the *Event Log* window, but don't want the entire contents.

Appendix 9

Contents

WheatNet-IP PC-XY Software Configuration Guide

Overview

PC-XY is an easy to use PC application that facilitates audio and logic cross point control of a WheatNet-IP audio network. The software connects to any host Blade in the system via the PC's Ethernet connection and provides customizable routing of audio or logic.

Source and *Destination* windows display user defined signal lists that give the broadcast engineer tight control over access to system resources. Eight fully programmable "hot" buttons can act as source selectors for rack room or desktop speakers, control room to air chain selectors, recorder source selectors – the possibilities are endless.

Installing The Software

WheatNet-IP PC-XY is a Windows platform program and runs on XP, Vista, or System 7. Installing the software is easy. Simply run the executable installation application and follow the installation prompts.

Once installation is completed you will be asked for a License Key. You can choose to run the software free for 14 days or contact customer support at 252-638-7000 or techsupport@wheatstone.com to get your license key emailed to you.

License keys are good for installing the product on multiple machines for up to seven days. The program will continue to run on the machine it is installed on, it is just the installation license key that expires.

Multiple PC-XY's

You can run multiple instances of PC-XY on one PC, each with unique buttons and visibilities. Each instance will share the same password.

• Copy the "*bin*" folder, from your current install folder: C:\ProgramFiles\Wheat-stone\WheatNetIpPCXYGui\bin

• Put "*bin*" inside a new folder in the Wheatstone folder.

• Create a shortcut to the new PC-XY.exe file location.

Network Considerations

The PC-XY program communicates to the WheatNet-IP system over an Ethernet network. The PC hardware requirements are "bare bones minimal". The PC's network card can be Fast Ethernet (10/100BTX) or Gigabit (1000BT). The PC must have an IP address on the WheatNet-IP system's subnet or have been routed there by your IT administrator.

Logging In

When PC-XY is first started you must log in to set a password and make various configuration changes. Right click on the PC-XY front panel to open the *Login* form. Click *Ok* to log in for the first time.
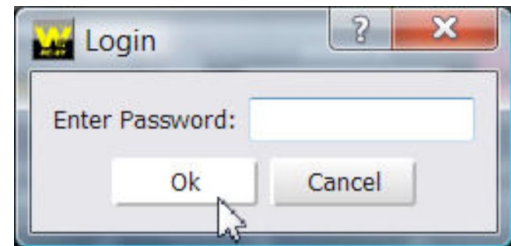
The default PASSWORD is **blank** when you install the program. Just click *Ok* to Login for the first time.

Menus

You may access the menu tree at any time by right clicking anywhere on the PC-XY controller. If you are not logged in you will be prompted to *Login*. Most menu choices are self explanatory. The following is a brief description of the key choices.

Sort Signals…

By Id – Sorts all signals in linear Blade ID order.

By Name – Sorts alphabetically - system wide.

Visibilites… – Create custom Source/Destination lists.

Change Password… – Modify password here.

Set IP Address… – Select a Blade that PC XY will use as an access point to the system's signal map.

Logout… – When you logout users can freely use PC-XY controls but can not program any changes.

Setting Blade IP Address

This step lets PC-XY use a Blade in your system as an access point so it can gather *Source* and *Destination* names and also make cross points. Start by selecting *Set IP Address…* from the right click menu.
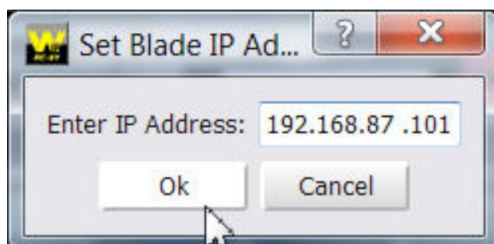
In order to communicate with the WheatNet-IP system you must tell PC-XY which Blade in the system you'd like it to talk to. You may select the IP address of any Blade in the system. Click *Ok* when done.

Once PC-XY establishes a connection with the specified Blade, you will see that the *LINKED* "LED" will turn bright green. *Source* and *Destination* signal names will also be available in the drop down lists.

Note that the *Visibility* controls, explained later, determine exactly which *Source* and *Destination* signal names are available to this particular installation of PC-XY.

Using Source / Destination Windows

These windows allow access to any number of sources and destinations.

- Use the *SOURCE* drop down list to select the audio input you would like to route.
- Select a *DESTINATION* from its drop down list.
- Press "*TAKE*" to complete the route.
- Customize lists with *Visibility* settings.

Logging Out

When you have completed the setup of PC-XY you can *Log Out*. When you log out, PC-XY continues to function however users can not edit any of the settings without the *Log In* password.

Visibilities

The *Set Visibilities* form allows the engineer to configure PC-XY so the end user "sees" a limited set of *Source*, *Destination*, and *Salvo* signals. This is where you limit what shows up in the drop down *Source* and *Destination* lists on PC-XY's front panel. This function is useful when you wish to give non-technical users *Source* select control of a very limited number of sources and usually control of only a single destination – like a set of PC speakers or the input to a recording device.
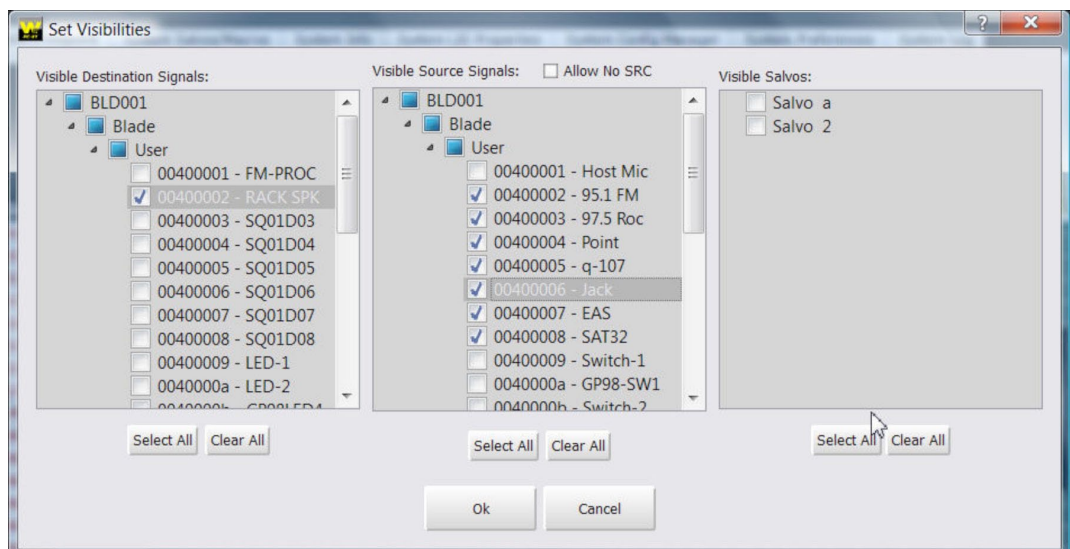
Simply select the signals you want *this* installation of PC-XY to "see" and click *Ok* when finished. PC-XY will boot with these settings. Setting a *Login* password will prevent unauthorized changes to the visibility lists.

Hot Button Programming

The eight *Hot Buttons* located along the bottom of the PC-XY front panel may be programmed to make dedicated cross points or fire salvos. Text typed in the *Legend* field will appear on the button. You may type approximately 10 characters before they are truncated.
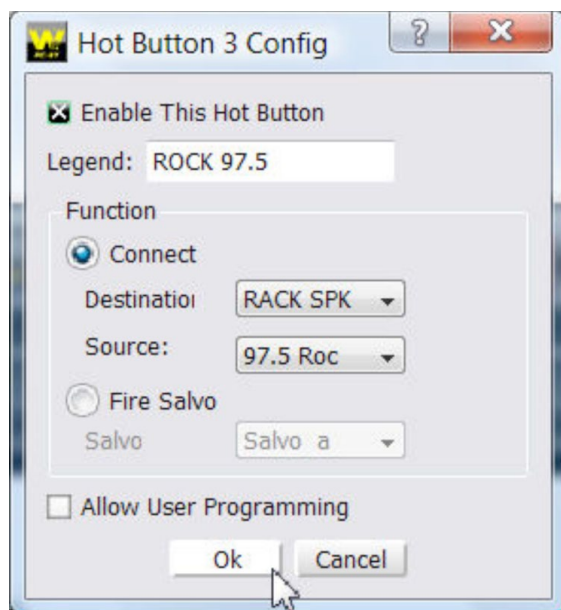
Right click on the button you want to program to open the button's configuration form.

Enable… – Check this to activate the button for all users. Un-check *Enable* to disable the button but retain settings.

Legend: – Enter text to display on button face.

Connect – Select the cross point that will be "patched" when the button is pressed.

Fire Salvo – Choose a Salvo to be executed when the button is pressed. Salvos are simply a list of multiple cross points that are simultaneously triggered. Salvos must be pre-configured in WheatNet-IP Navigator software.

Allow User Programming – Check this if you want to let users edit Hot Button settings without logging in.