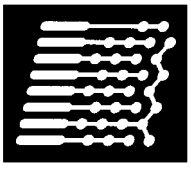
AUDIOARTS ENGINEERING
DIGITAL AUDIO NETWORK SYSTEM

TECHNICAL MANUAL

AUDIOARTS ENGINEERING
December 2005



Audioarts Engineering Digital Audio Network System Technical Manual

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Audioarts Engineering Digital Audio Network System Technical Manual

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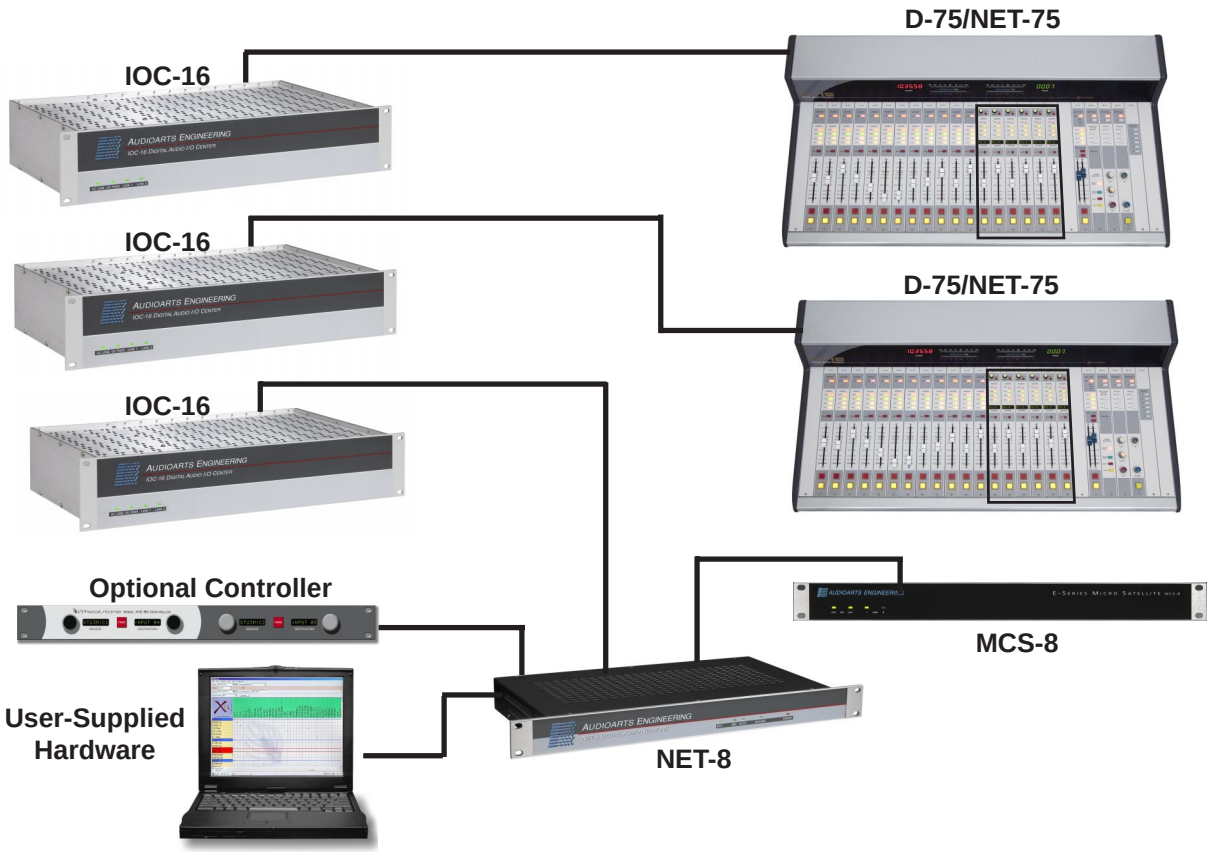


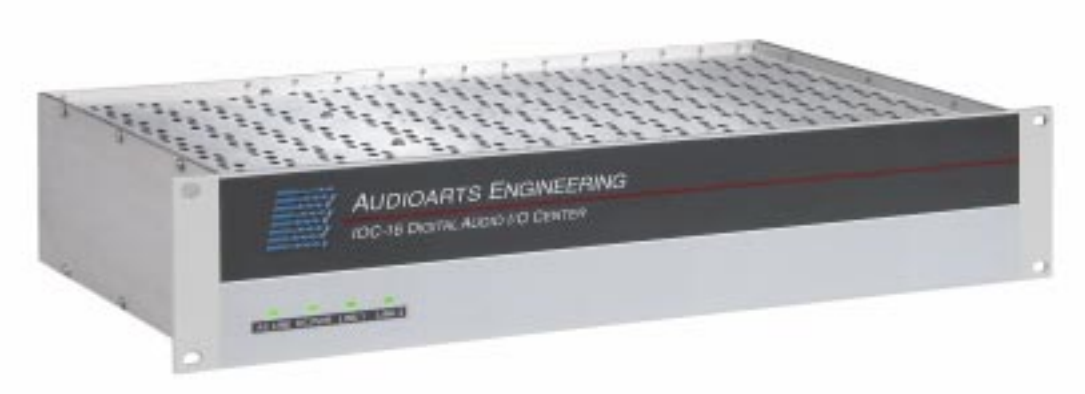
General Information

Introduction

The Audioarts Engineering Digital Audio Network System is an audio routing and control system comprised of a number of components that are interconnected via CAT5 links. System components include the Audioarts NET-8 central switch, IOC-16 and IOC-4 Audioarts Network I/O Center cages, one or more D-75 digital consoles with a NET-75 network panel, and various versions of XY Controllers.

Start your system with a simple AES router with analog and/or digital inputs and outputs. From there you can add logic I/O cards and scheduling software to interface to your automation system. You can create a custom system that includes up to eight IOC-16 cages and to up to eight digital D-75 (NET-75) consoles linked to the NET-8 network central switch. Cages can be separated by distances up to 100m (328') with many studios connected to your central rack room, providing shared resources, yet still permitting independently functioning satellite studios, each with its own combination of analog and digital input and output cards and connector modules specifically selected to suit a large variety of gear. We also provide a full complement of Ethernet protocol remote router control panels, as well as a complete family of plug-in modules that interface the routing system to existing Audioarts digital and analog stand-alone consoles. Three different flows of the custom system that includes multiple Audioarts Network I/O Centers, D-75 digital consoles with the NET-75 network panel or XY controller module, rackmount controllers, and Ethernet switch are shown on pages 1-17 through 1-19.

IOC-16 Audioarts Network I/O Center



The IOC-16 is a rackmount unit occupying two 19” wide rack spaces (total height 3.5”) with 16” depth.

The IOC-16 accepts up to 16 discrete stereo analog or AES-3/SPDIF digital audio sources, and switches them to any of 16 stereo analog or digital outputs. Integral, high quality SRC’s on the digital inputs resolve sample rates up to 96kHz. The IOC-16 may be fitted with up to 4 input cards, 4 output cards, and 2 logic cards. The IOC-4 ia a short loaded version with 2 input and 2 output cards. Hardware is described is in the next chapter.

All audio input and output, logic, audio network, and ethernet connections are made via DB-25 PCB-mounted connectors located on the rear of chassis. The factory supplied hand crimping tool is used for all DB-25 connections to and from the router (see instruction on page 1-15). Cage-to-cage network connections can be made by UTP CAT5 crossover cables terminated with RJ-45 connectors.

Assuming the IOC-16 is correctly rackmounted, you may now energize it by connecting the factory supplied power cord to the rackmount unit and then plugging it into the AC mains.

Front panel LED indicators “AC LINE” and “DC PWR” should light up to indicate the presence of their respective voltages.

The “LINK1” and “LINK2” LED’s indicate a good connection to the NET-8 and a D-75’s NET-75 panel if connected.

Note: To de-energize the IOC-16, unplug its AC cord from the AC mains.

MCS-8 - Micro Satellite Digital Network Router

The MCS-8 is a rackmount unit occupying one 19” wide rack space (total height 1 3/4”) with 16” depth.

The MCS-8 accepts up to 8 discrete stereo analog or AES-3/SPDIF digital audio sources, and 8 stereo analog or digital outputs. Integral, high quality SRCs on the digital inputs resolve sample rates up to 96kHz. The MCS-8 may be fitted with up to 2 input cards, and 2 output cards. It uses the same input/output card family as the IOC-16 and is pre-configured at the factory. Hardware is described in the next chapter.

All audio input and output connections are made via DB-25 PCB-mounted connectors located on the rear of chassis. The factory supplied hand crimping tool is used for all DB-25 connections to and from the router (see instruction on page 1-15).

There are also two RJ-45 connectors for audio network (“AT LINK” RJ-45—see pages 1-5 and 1-7 for pinouts) and GPO logic (LOGIC RJ-45) connections.

“LOGIC” Connector

Pin 1 – GROUND
Pin 2 – LOGIC PORT 1
Pin 3 – LOGIC PORT 2
Pin 4 – LOGIC PORT 3
Pin 5 – LOGIC PORT 4
Pin 6 – LOGIC PORT 5
Pin 7 – LOGIC PORT 6
Pin 8 – +5V

Cage-to-cage network connections can be made by UTP CAT5 crossover cables terminated with RJ-45 connectors (see page 1-6 for pinouts).

Assuming the MCS-8 is correctly rackmounted, you may now energize it by connecting the factory supplied power cord to the rackmount unit and then plugging it into the AC mains.

Front panel LED indicators AC PWR and DC PWR should light up to indicate the presence of their respective voltages.

The LINK1 LED indicates a good connection to the NET-8. Use of the LINK2 LED is reserved.

Note: To de-energize the MCS-8, unplug its AC cord from the AC mains.

Internal Programming Options

All internal programming options are made via PCB mounted switches.

Switch Settings

SW1 - AT Reset

Momentarily pressing the switch resets the AT board LAN chip, while pressing and holding the switch also resets the FPGA.

The recessed SW1 is accessible from the rear and is located next to the "AT LINK" / "LOGIC" RJ-45 connectors.

SW2 - DSP Reset

Momentarily pressing the switch resets the DSP board LAN chip, while pressing and holding the switch also resets the FPGA.

If loaded the recessed SW2 is accessible from the rear and is located next to the "MIXER LINK" RJ-45 connector.

Dipswitch SW3-SW5 - Logic Common Plus / Common Ground
Dipswitch SW7, SW8, SW10 - Logic IN /OUT

The SW3-SW5 switches are used in setting up logic in conjunction with SW7, SW8, and SW10.

For Input Logic the corresponding switches should be set for Logic In and Common Plus.

For Output Logic Active Low the corresponding switches should be set for Logic Out and Common GND.

For Output Logic Active High (+5V) the corresponding switches should be set for Logic Out and Common Plus.

For corresponding switches follow the 1 - 12 markings on the board.

Dipswitch SW6

Pos. 1 - Sample Rate Select - 48kHz when ON, 44.1kHz when OFF.

Pos. 2 - Remote Rack -

ON - this is a remote rack, therefore it is connected to another rack and is designated as Rack 5 of the Tier in which the connected rack is located.

OFF - this is not a remote rack and will be configured as Rack 1.

Pos. 3 - Disables Remote Rack -

ON - a remote rack is not connected.

OFF - a remote rack is connected.

Pos. 4 - This switch is used in configuration and should be in the ON position.

SW9 and SW11 - Not Used

NET-8 Audioarts Audio Network

Audioarts NET-8 is the high speed central network switch that connects up to eight studios from the technical operations center. NET-8 is capable of simultaneously switching 64 bi-directional audio channels to 8 ports — that's 1024 traffic channels.

This unit occupies one 19" wide rack unit (height 1-3/4"), and is 13" deep.

Front panel LED indicators display system status, sample rate, and external clock functions. No external PC is required for continuous operation.

The eight rear mounted RJ-45 audio network ports easily integrate multiple studio systems. Installation is simple: run one UTP CAT5 crossover cable to the NET-8 from each of your studios or locally mounted I/O centers.

CAT5 Wiring Tip

Another wiring option is to run a UPT CAT5 straight connection from the rack room to a small RJ-45 patch point block in each studio. The final connection to each I/O Center rack or NET-75 panel can then be made using an off the shelf crossover patch cable.

Assuming the NET-8 is correctly rackmounted, you may now energize it by connecting the factory supplied power cord to the rackmount unit and then plugging it into the AC mains.

Note: To de-energize the NET-8, unplug its AC cord from the AC mains.

I/O Connections

All audio network, master clock, and Ethernet connections are made via RJ-45 connectors mounted on the rear panel. The pinout drawings on page 1-7 summarize all wiring connections.

Audio Network

AT cards installed in Audioarts Network I/O center racks are connected to NET-8 via CAT5 ***crossover*** cables. For typical CAT5 cable pinouts, see page 1-6.

"1"-"8" Connector

Pin 1 – TX +
Pin 2 – TX -
Pin 3 – RX +
Pin 6 – RX -

AES Clock Sync

The NET-8 Network system's sample rate is normally derived from its own internal crystal oscillator. The AES Clock sync connector provides a means for synchronizing the Network system to an external AES-11 master clock signal in the rare case that plant wide synchronization is required. The fact that all digital inputs are fitted with high quality sample rate converters obviates the need for external sync in most cases.

"CLK" Connector

To sync your NET-8 to an external AES Black clock source use the AES Sync IN port available on the "CLK" RJ-45 connector:

Pin 1 – AES SYNC OUT HI
Pin 2 – AES SYNC OUT LO
Pin 3 – AES SYNC IN HI
Pin 6 – AES SYNC IN LO

AES Clock is a standard AES-3 output without audio.

Valid sample rates are 44.1kHz and 48kHz. EXT sync must match the internal crystal setting. When sync is detected the front panel EXT LED will light. Use only a high grade Digital Audio Reference Signal (DARS) per the AES-11 specification.

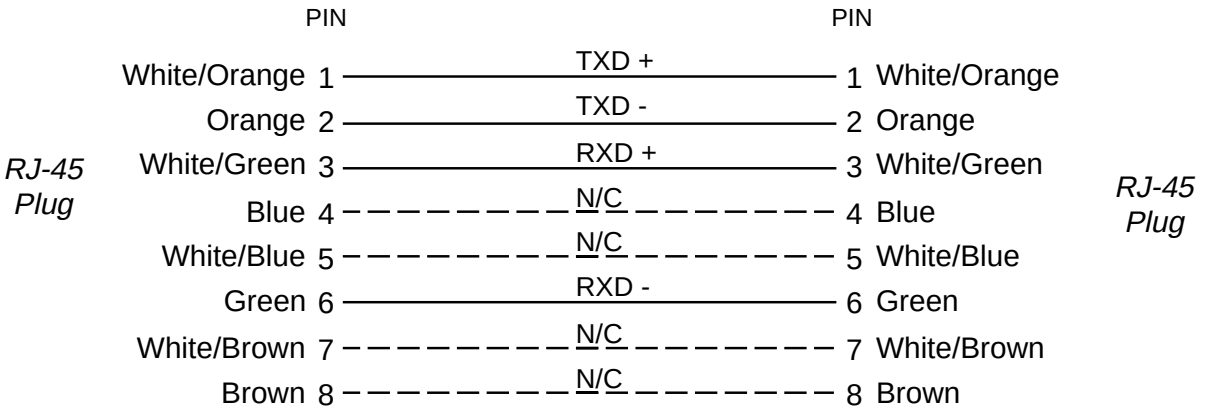
Ethernet Interface

Connect NET-8 to your Ethernet LAN with a straight (pin to pin) CAT5 cable. The LAN connection is for communicating with computers running Wheatstone software such as XPoint, PC-XYC, and Event Computer. If you are connecting directly between the computer and the NET-8 with no network in between, use a crossover cable. Typical straight and crossover CAT5 cable pinouts are shown below.

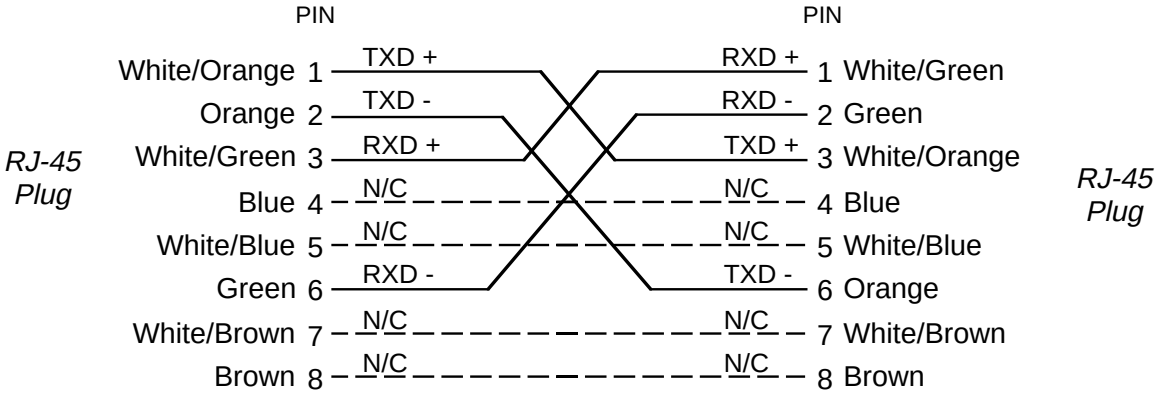
"ETH" Connector

Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 6 – RXD -

Typical Ethernet Cable



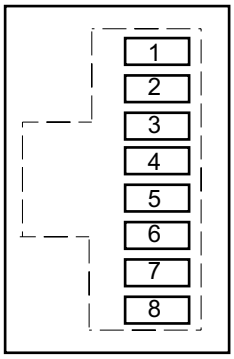
Typical Crossover Cable



RJ-45 Connections

Audio Network

"1"-"8" RJ-45

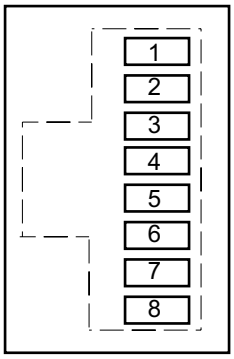


TX +
TX -
RX +

RX -

AES Clock SYNC

"CLK" RJ-45

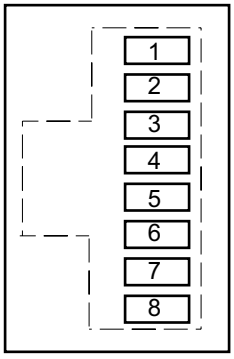


AES SYNC OUT HI
AES SYNC OUT LO
AES SYNC IN HI

AES SYNC IN LO

Ethernet - RJ-45

"ETH" RJ-45



TXD +
TXD -
RXD +

RXD -

Front Panel LEDs

On the right-lower part of the front panel there are five LEDs, that function as follows.

EXT

The “EXT” LED lights up when an external AES reference clock source is connected to the NET-8.

48K or 44.1K Sample Rate

Indicates the internally selected system sample rate, “48K” or “44.1K”.

Note that all NET-8 devices must operate at the same sample rate. Please consult the factory before changing sample rate.

On Line

The “ON LINE” LED lights when the NET-8 CPU has booted and is ready for use.

Error

In the unlikely event of a NET-8 CPU failure the “ERROR” LED will light up.

Internal Programming Options

All internal programming options are made via PCB mounted dipswitches and jumpers.

Switch Settings

SW1, SW2 - CPU Reset

These momentary pushbutton switches allow the CPU to be reset without powering down the system. Holding either button for two seconds will also cause the FPGA program to be reloaded, first breaking all audio crosspoints. Upon re-boot completion, the CPU will remake all system crosspoints.

The recessed SW1 is accessible from the rear and is located next to the ETHERNET port. SW2 is accessible on the main motherboard.

DIPSW3

Pos.1 (labeled DIPSWØ on the circuit board) - 48/44.1 Sample Rate - Off = 44.1K, On = 48K

Pos.2 - reserved - never ON

Pos.3 - reserved - never ON

Pos.4 - PRI/SEC select - OFF = Primary, ON = Redundant (not used)

Note!!
Sample Rate must match on all D-75/NET-75 and IOC devices.

Jumper Settings

J1 - CPU I/O PGRM

Momentary shorting will reload the CPU FPGA program.

J2 - PBRST

Factory Use Only

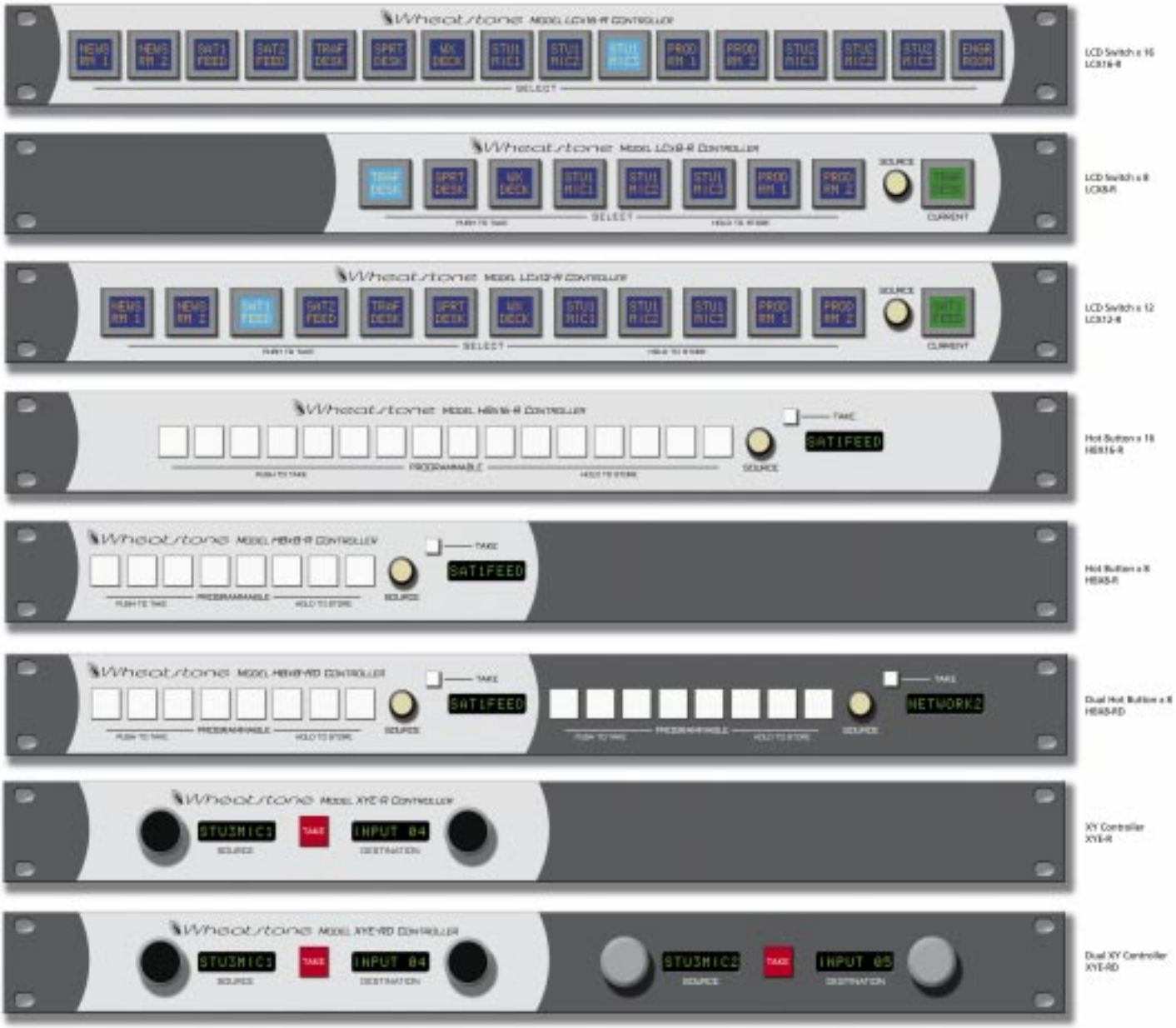
NET-75 Panel

The NET-75 Network Panel is designed to combine work surface technology with a standalone console. The Audioarts D-75 Digital Audio Console can be modified by adding the NET-75 panel to provide a fully integrated network system with the option of autonomous console operation when needed. An RJ-45 Audio Transport "AT LINK" connector on the right-hand top of the panel serves as the link between the NET-75 panel and the network system. Operation of the NET-75 panel is covered in the separate D-75 Technical Documentation.

Ethernet-Based Controllers

A family of Ethernet-based controllers provides an integrated way of switching Digital Audio Router sources to destinations connected to the console. Rackmount and modular versions of the Ethernet based controllers are available. Mount the Ethernet based controller modules into existing Audioarts's standalone analog or digital mixing consoles. Choose from eight or sixteen button source selectors, dual source select panels, or single and dual X-Y panels.

A/D SERIES MODULE Hot Button x 16 HBX16-8 | A/D SERIES MODULE Hot Button x 8 HBX8-8 | A/D SERIES MODULE Dual Hot Button x 8 HBX8-8D | A/D SERIES MODULE LCD Switch x 12 LCX12-8 | A/D SERIES MODULE LCD Switch x 8 LCX8-8 | A/D SERIES MODULE XY Controller XYE-8 | A/D SERIES MODULE Dual XY Controller XYE-8D | AUDIOARTS MODULE Hot Button x 8 HBX8-55/90



All X-Y crosspoint controllers have similar functions. First, select a DESTINATION (console fader, recorder, etc.) by turning the DESTINATION knob. By turning the SOURCE knob, the available inputs are displayed in the 8-character display window and the TAKE button lights. When the desired input source is scrolled into the display window, pressing the TAKE button will execute the take command on the downstroke. The TAKE button light goes off and the desired input source is selected. Note that if the TAKE button is not pressed in a timeout period of 6-8 seconds, the display will revert to its previous setting.

Some controllers have PROGRAMMABLE buttons to program input sources. To program the desired input source for a selected button, press the button and hold it for a few seconds. The display window will displayed <STORED>, and the desired input source will be stored for this button.

When the SOURCE knob is scrolled to a programmed input source, the associated button lights to indicate the correspondence between the source and button.

The Ethernet-Based Controllers connect to your LAN via standard UTP CAT5 “straight” cables terminated with RJ-45 connectors.

Audio Connections

All audio connections to the IOC-16 are made through multipin DB-25 connectors located on the rear of the chassis.

The factory supplied hand crimping tool is used for all DB-25 style wiring connections (see instruction on the page 1-15).

Digital Audio Connections

CABLE - All AES/EBU input and output digital audio connections are balanced and should be made using a high quality digital audio cable. Be sure to select a digital audio cable with an integral drain wire of the same wire gauge (AWG) as the twisted pair as this facilitates an easier and consistent termination process. Typical AES/EBU digital audio cable has a very low characteristic capacitance per ft (pF/ft), and a nominal impedance of 110Ω. High quality digital audio cable offers better signal transmission performance versus typical analog audio cable, especially over long cable runs. Check the cable manufacturer's data sheet to be sure the cable you plan to use will work in your application.

CONNECTORS - Typically, all AES/EBU connections are made with the supplied DB-25 male mating connectors. These crimp style connectors will accept wire gauge 22 - 28AWG.

Unbalanced Analog Connections

ANALOG INPUTS — Wire to the switcher input end with typical shielded, two conductor cable (like Belden 9451), just as if you were connecting a balanced source. At the unbalanced source machine's output, connect the + output to the HI input wire and connect the source machine GND wire to LO, connect the shield at the balanced end only .

Note: Unbalanced analog sources typically have -10dBv (316mV RMS) signal levels and will not match the IOC-16 nominal operating level of +4dBu (1.23V RMS). We highly recommended that you first externally balance any unbalanced sources you plan on connecting to the IOC-16. Many third party "match boxes" are commercially available for this.

ANALOG OUTPUTS — Use an electronically balanced output circuit which behaves exactly like the secondary of a high-quality transformer, with no center tap—this output is both balanced and floating. For unbalanced operation, either the HI *or* LO side of the analog output must be strapped to ground of the unbalanced input, with the output taken from the other side. (Normally you would strap LO to ground, and use HI to feed your unbalanced equipment input.) Leave the SH floating at the balanced end.

Unbalanced Digital Connections (SPDIF)

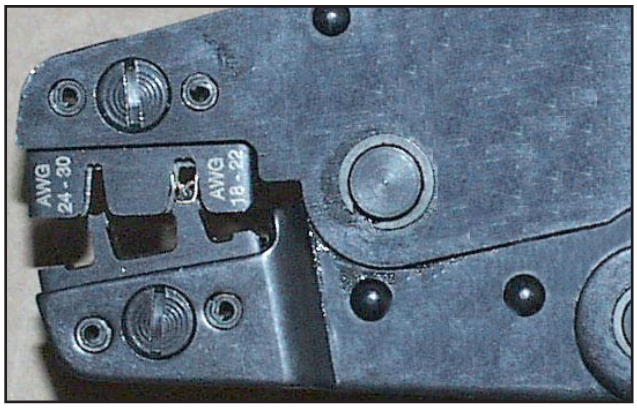
SPDIF INPUTS - The SPDIF (Sony/Phillips Digital Interface) or "consumer" digital audio interface is a two wire unbalanced signal typically on a single RCA style connector. We highly recommend using a "balun" or format converter when interfacing "consumer" grade source devices to the IOC-16.

In cases where a consumer grade device must be interfaced and the appropriate matching device is not available, try wiring the SPDIF center conductor (HOT) to the HI input pin and SPDIF shell (ground) to the LO input. Connect SH at the IOC-16 end only. Keep cable lengths to a minimum.

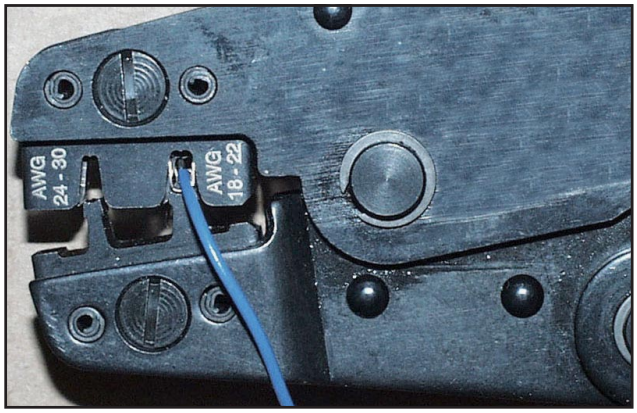
SPDIF OUTPUTS - The IOC-16 digital outputs are fixed, professional, AES-3 formatted outputs. SPDIF consumer format is not supported. Use of an external format converter may be required to connect the digital outputs to consumer gear.

HAND CRIMP TOOL WIRING INSTRUCTIONS

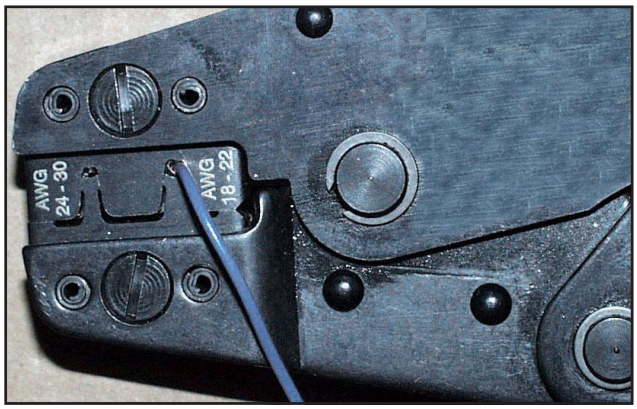
The supplied hand crimping tool (W/S#850067) is used for all I/O wiring connections to and from the console. It is to be used with the supplied pin (figure 1) intended for 22"-28" gauge wire.



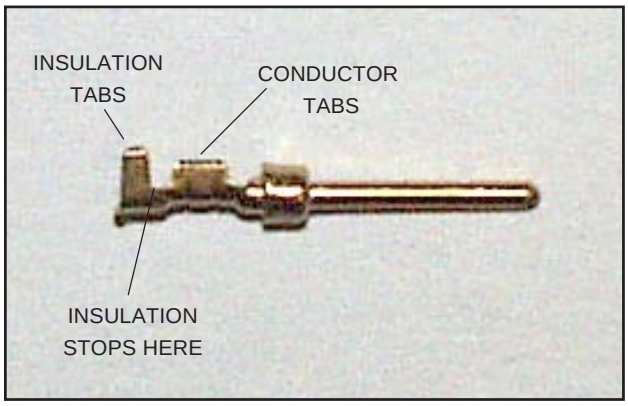
(2) The terminal conductor tabs (pointing UP) are placed in anvil 18-22; the terminal's insulation tabs extend in front towards the camera.



(3) The stripped wire is placed into the terminal and crimped. Note the wire's insulation must stop just short of the conductor tabs (detail)



(4) Final step: jaws fully closed; the insulation tabs have been crimped.



(1) Pin crimp terminal

1) Strip wire approximately 3/16" (insert in proper wire stripper, rotate one half turn, and pull insulation off wire).

2) Leaving wire aside for the moment, with crimping tool fully open (engraved side toward you) bring a terminal into position from the unmarked side of the tool. Place the conductor tabs (inner set as shown in figure 1) on the "18-22" or "24-30" (depending on the wire) anvil (slightly curved surface) so that the circular portion of the tabs rests in the curved surface of the anvil and the two tabs face up into the walls of the female jaw. The insulation tabs will be flush with the top of the tool (figure 2).

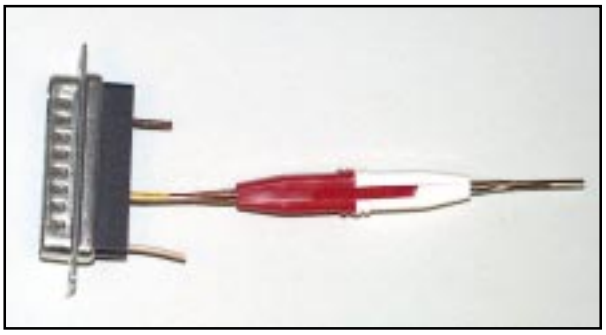
3) Close tool very slightly, only to the point of holding the terminal in position (figure 2).

4) Insert wire into terminal until wire insulation is stopped by conductor tabs (figure 3). CRIMP by squeezing handles until jaws are fully closed (figure 4).

5) If there is an insertion error or if a circuit change is needed, you'll need to use an extractor tool to remove terminals (see next page).

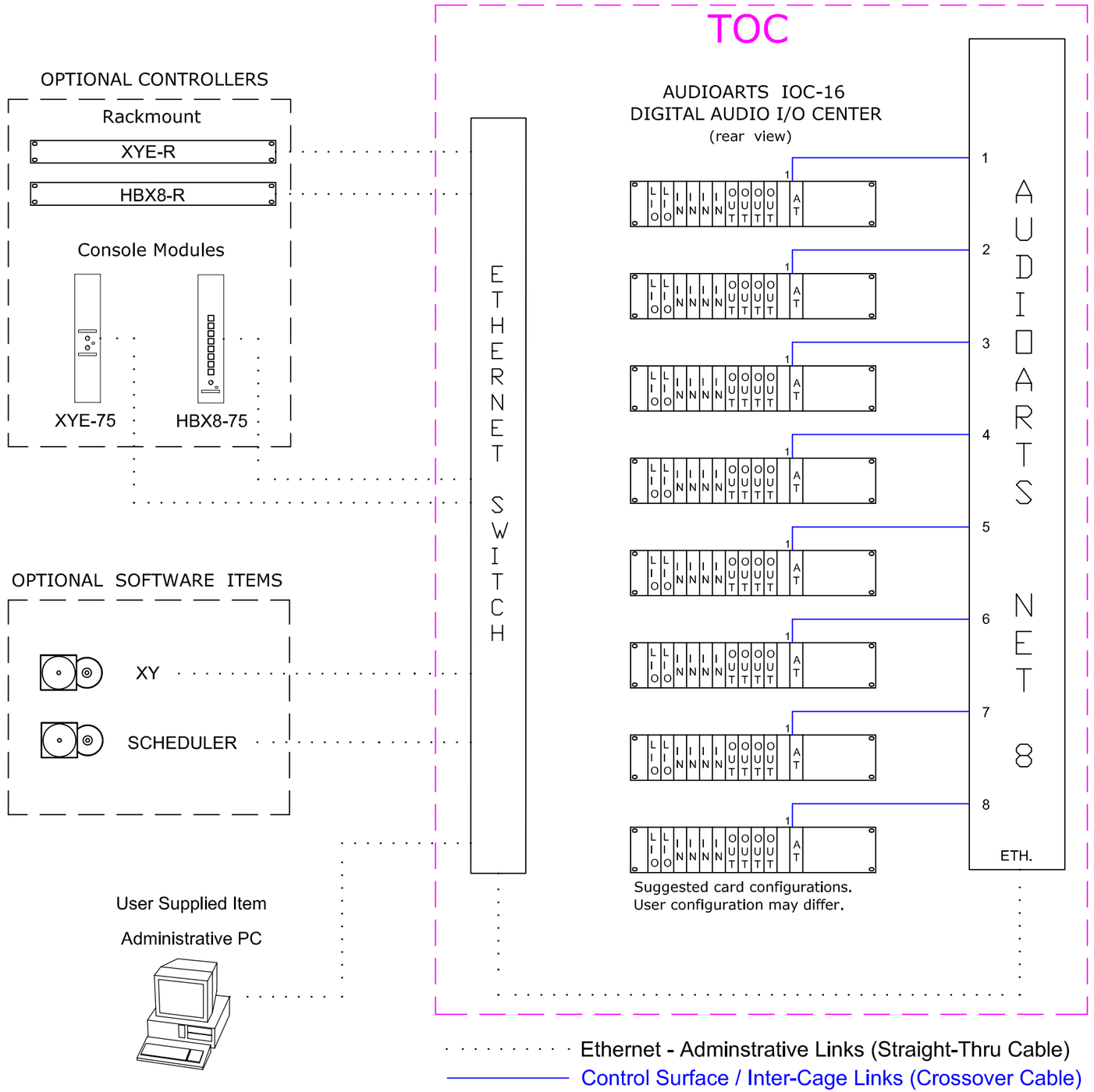
Note that metallized plastic hoods for each connector are also supplied with the router.

EXTRACTOR PIN INSTRUCTIONS

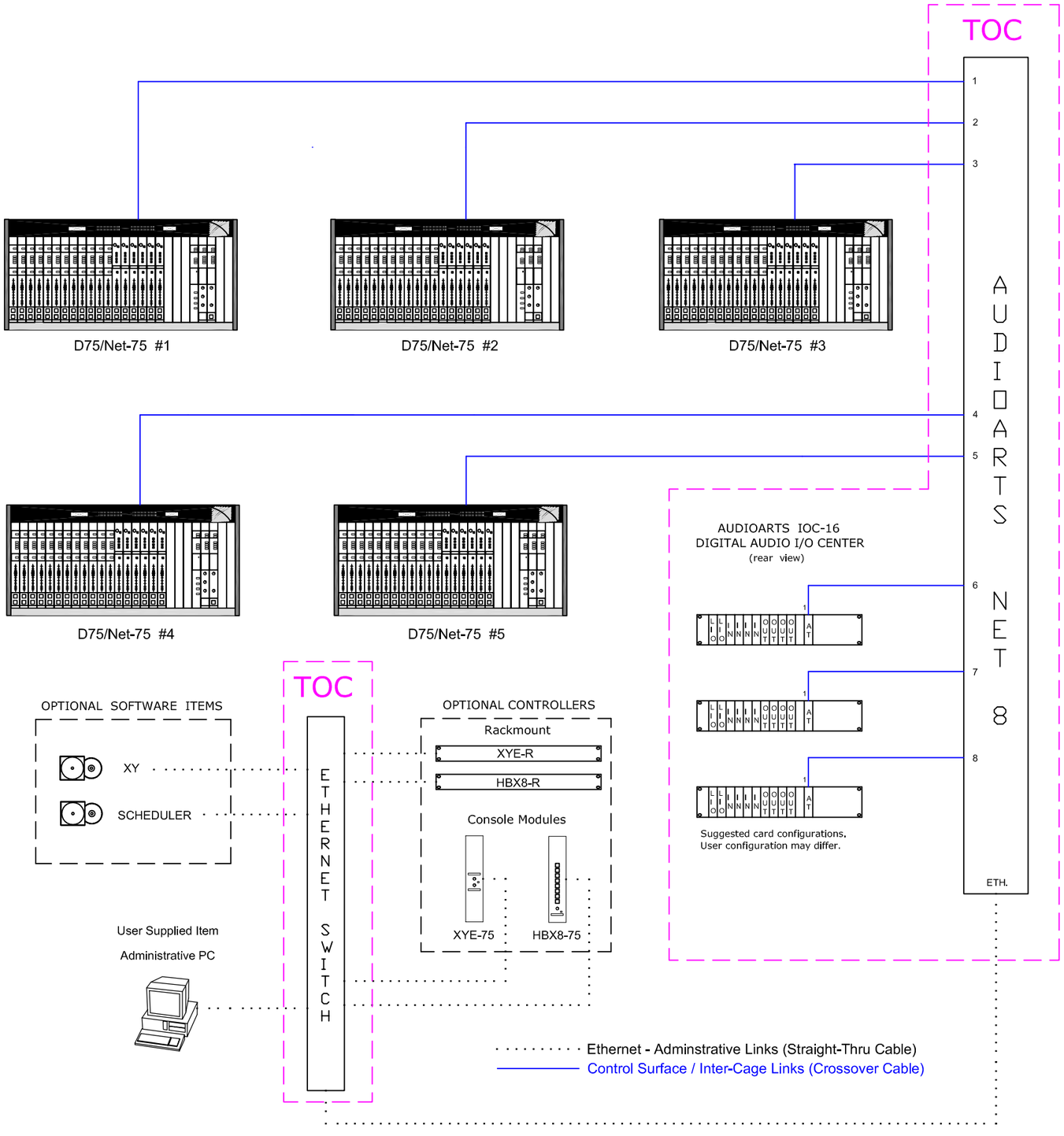


(5) Place extractor tip over pin terminal to be removed.

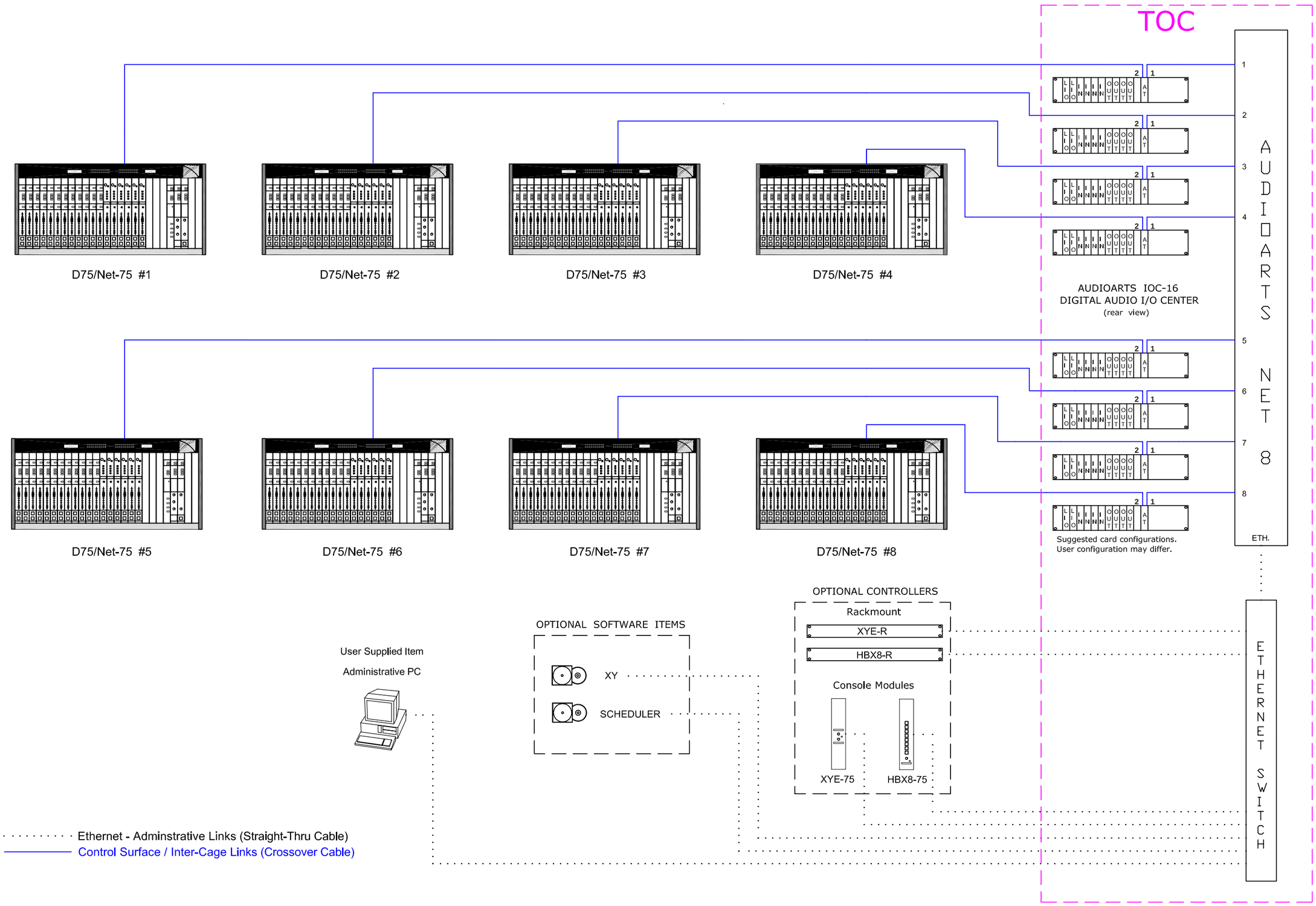
If you accidentally insert a crimp terminal pin into the wrong socket, you'll need to use the supplied pin extractor tool (W/ S#850069) to remove terminal pin, and correct your mistake without having to sacrifice a connector. Place extractor tip (red side) over terminal pin to be removed (figure 5), and press it downwards motion until tip rests upon Housing. Then pull out the terminal pin from Housing. It should never be necessary to discard a connector due to a wiring error.



Audioarts Engineering Digital Audio Network System Flow Diagram - Example 1



Audioarts Engineering Digital Audio Network System Flow Diagram - Example 2



Audioarts Engineering Digital Audio Network System Flow Diagram - Example 3

Hardware

Chapter Contents

Hardware

Overview

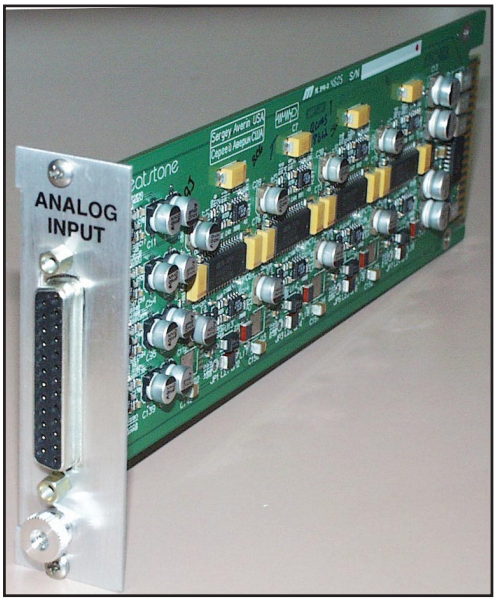
IOC-16 Network I/O Center

The IOC-16 may be configured in a variety of I/O card complements using various combinations of analog and digital audio input and output daughter cards. All audio input, output, and logic connections are made via multipin DB-25 connectors located on the cage rear and mounted on the daughter cards. The daughter cards plug into the IOC-16's backplane connectors.

MCS-8 Microsatellite

The MCS-8 unit may be fitted with up to 2 input card, and 2 output cards. It uses the same input/output card family as the IOC-16 and is pre-configured at the factory.

Configuration Guidelines



While the IOC-16 router is pre-configured at Wheatstone's factory, future expansion of a system may require some re-configuration of existing hardware to accommodate new resources.

Slots are numbered from 1 to 10 while facing the rear of the cage. Universal GPI/GPO logic cards occupy slots 1 and 2, audio input cards must be mounted in slots 3 through 6, and audio output cards must be mounted in slots 7 through 10. There are 12 ports on each logic card. Each logic card port may be configured as an input or output via an internal dipswitch selection. Analog and digital input and output cards each handle four stereo inputs/outputs. The IOC-16 can support up to four input cards and four output cards, and digital and analog can be freely mixed. However, the card complement can not exceed 16 inputs or 16 outputs.

Audio I/O Expansion

The IOC-16 supports a maximum of 16 stereo input channels and 16 stereo output channels.

• Power down by removing AC cord.

• Removing the rear panel with input/output card or blank rear panel - Remove the 2 - #4-40 x 3/16" Phillips head screws and pull the panel out carefully using the thumb nut.

• Installing an audio card - Care must be taken when plugging in the expansion card's 36 pin ribbon connector. Be sure to match the connector sockets to the motherboard header pins. Failure to do so will damage the expansion card, ribbon cable, and/or motherboard.

• Configuring the software - The IOC-16 software has been pre-configured to automatically recognize a newly installed audio I/O card. You may run the XPoint application to edit the pre-configured I/O names to match your new sources or destinations. Please see the "XPoint Software Setup Guide" for details.

Digital Input Card (DI-NC4)

Overview

The DI-NC4 digital audio input cards for the IOC-16 accept up to 4 AES-3 formatted stereo sources (i.e. 8 mono *channels*). An *Audio Configuration* form in the supplied XPoint software allows the user to set attributes for the input channels including signal name, location, and Stereo/Mono. These signal attributes are pre-configured at the factory for stereo operation.

Note: While it is possible to split the 4 stereo AES inputs into 8 mono channels, there are still only 4 physical wires, each containing the 2-channel AES formatted data.

A dedicated sample rate converter for each input re-clocks the incoming audio data and phase locks it to the system's master sample rate clock. Source sample rates up to 96 kHz are supported.

AES Input Interface

The balanced digital audio inputs on the DI-NC4 card are transformer coupled. AES receivers strip off the received sample rate clock and audio data for further processing by sample rate converters. The balanced interface operates at a nominal peak-to-peak input voltage of 5V with an input impedance of 110Ω and conforms to the AES-3 1992 electrical specification. Note that Channel Status data is not forwarded.

While unbalanced SPDIF formatted input signals may be connected to the HI and LO inputs of an AES input channel (leave the shield floating), it is recommended that a BALUN or other external matching device be inserted to convert the SPDIF impedance to 110Ω and signal level to at least 1V p-p.

Hook-Ups

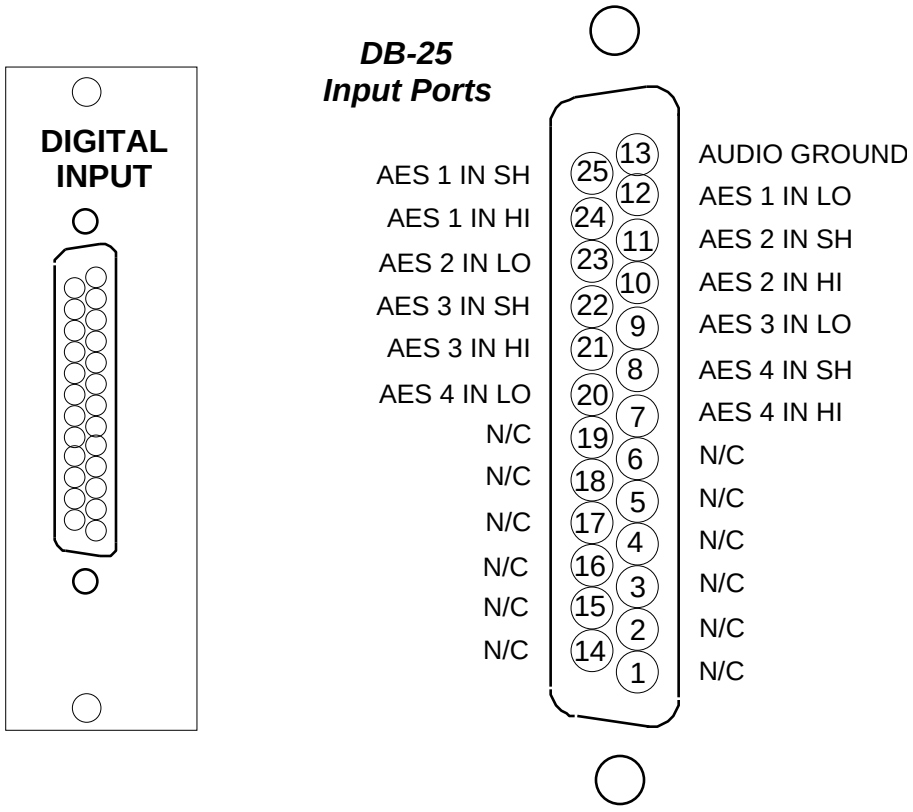
All user wiring to the DI-NC4 card takes place at the female DB-25 I/O connector on the cage rear.

DB-25—Digital Audio Connections

These include four input sources. Pinout drawing on page 2-8 shows all wiring connections at a glance.

Pin 24 – HI Pin 12 – LO Pin 25 – SH	AES 1 In
Pin 10 – HI Pin 23 – LO Pin 11 – SH	AES 2 In
Pin 21 – HI Pin 9 – LO Pin 22 – SH	AES 3 In
Pin 7 – HI Pin 20 – LO Pin 8 – SH	AES 4 In

DI-NC4 Panel
Digital Input Connections



Analog Input Card (AI-NC4)

Overview

The Analog input card accepts up to 4 stereo analog audio sources (i.e. 8 mono *channels*). An *Audio Configuration* form in the supplied XPoint software allows the user to set attributes for the input channel hardware, including signal name, location, and Stereo/Mono. The 8 input *channels* may be configured as mono *signals* (one channel) or stereo *signals* (two channels) in any combination.

The balanced, line level analog input signals are buffered and converted to the digital domain by 24bit A-D converters operating at the system's master sample rate. Embedded logic routes each channel of audio data into an available time slot of the input card's TDM bus. One TDM bus is allocated for each input card.

Analog Input Interface

The balanced analog input stages are direct coupled, unity gain circuits and operate at a nominal input level of +4dBu. The input impedance is 20kΩ. A +4dBu input signal will result in a -20dBFS digital output level at any of the selected AES outputs. The maximum analog input signal level is +24 dBu providing 20 dB of headroom above the nominal input level.

Reference Notes:

0dBu = .7746 V RMS, +4dBu = 1.23V RMS

dBFS = dB Full Scale Digital

-20dBFS = +4dBu

Internal Programming Options

There are no internal programming options on the AI-NC4 card.

Hook-Ups

All user wiring to the AI-NC4 card takes place at the female DB-25 connector on the cage rear.

DB-25—Analog Audio Connections

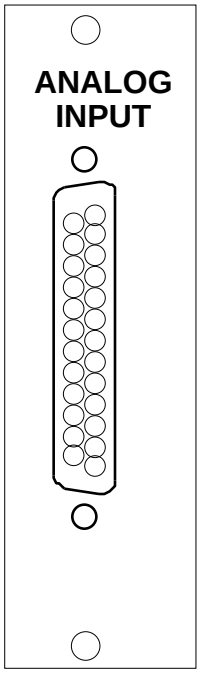
These include four (1-4) input sources. Pinout drawing on page 2-11 shows all wiring connections at a glance.

Pin 24 – HI Pin 12 – LO Pin 25 – SH	Channel 1 In	LT	Stereo 1 In
Pin 10 – HI Pin 23 – LO Pin 11 – SH	Channel 2 In	RT	
Pin 21 – HI Pin 9 – LO Pin 22 - SH	Channel 3 In	LT	Stereo 2 In
Pin 7 – HI Pin 20 – LO Pin 8 – SH	Channel 4 In	RT	
Pin 18 – HI Pin 6 – LO Pin 19 – SH	Channel 5 In	LT	Stereo 3 In
Pin 4 – HI Pin 17 – LO Pin 5 – SH	Channel 6 In	RT	
Pin 15 – HI Pin 3 – LO Pin 16 – SH	Channel 7 In	LT	Stereo 4 In
Pin 1 – HI Pin 14 – LO Pin 2 – SH	Channel 8 In	RT	

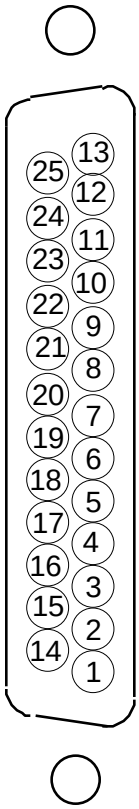
Mono Inputs

Mono analog sources can be wired in two ways. If you maintain the default stereo configuration, strap the mono source across both the left and right sides of the stereo input. But if you reconfigure the stereo input for two channel mono operation (please see the “Audio Configuration” section in the “XPoint Software Setup Guide”) you can then wire one mono source to the “left” input and a second mono source to the “right” input.

AI-NC4 Panel
Analog Input Connections



DB-25
Input Ports



CHANNEL 1 (STEREO 1 LT) IN SH	AUDIO GROUND
CHANNEL 1 (STEREO 1 LT) IN HI	CHANNEL 1 (STEREO 1 LT) IN LO
CHANNEL 2 (STEREO 1 RT) IN LO	CHANNEL 2 (STEREO 1 RT) IN SH
CHANNEL 3 (STEREO 2 LT) IN SH	CHANNEL 2 (STEREO 1 RT) IN HI
CHANNEL 3 (STEREO 2 LT) IN HI	CHANNEL 3 (STEREO 2 LT) IN LO
CHANNEL 4 (STEREO 2 RT) IN LO	CHANNEL 4 (STEREO 2 RT) IN SH
CHANNEL 5 (STEREO 3 LT) IN SH	CHANNEL 4 (STEREO 2 RT) IN HI
CHANNEL 5 (STEREO 3 LT) IN HI	CHANNEL 5 (STEREO 3 LT) IN LO
CHANNEL 6 (STEREO 3 RT) IN LO	CHANNEL 6 (STEREO 3 RT) IN SH
CHANNEL 7 (STEREO 4 LT) IN SH	CHANNEL 6 (STEREO 3 RT) IN HI
CHANNEL 7 (STEREO 4 LT) IN HI	CHANNEL 7 (STEREO 4 LT) IN LO
CHANNEL 8 (STEREO 4 RT) IN LO	CHANNEL 8 (STEREO 4 RT) IN SH
	CHANNEL 8 (STEREO 4 RT) IN HI

Digital Output Card (DO-NC4)

Overview

Each Digital Output card provides 4 physical AES-3 formatted outputs. An *Audio Configuration* form in the supplied XPoint software allows the user to set attributes for the output channels, including signal name, location, and Stereo/Mono. The 4 AES outputs are configured in software at the factory to be stereo *destinations.*

Each output card listens for connection commands from the NET-8 CPU, and then uses this information to connect the appropriate sources to their selected output channels. The selected audio data is fed to AES transmitters which format the 24 bit audio data according to the AES-3 standard.

Note: While it is possible to split the 4 stereo AES outputs into 8 mono channels, there are still only 4 physical wires, each containing the 2-channel AES formatted data.

AES Output Interface

The balanced digital audio outputs on the DO-NC4 card are transformer coupled and exhibit a nominal output impedance of 110Ω. This interface operates at a nominal output voltage of 5V p-p and conforms to the AES-3 1992 electrical specification. The DO-NC4 output cards operate at unity gain and transmit 24bit audio data word lengths at the system sample rate, which can be set to 44.1 kHz or 48 kHz. Optionally, the NET-8's *External AES Sync* input may be used to slave the system to a user provided 44.1 kHz or 48 kHz reference rate. Please refer to the NET-8 hardware section for details on external synchronization.

The digital output signal reference level is -20dBFS. A +4dBu analog input signal yields a -20dBFS digital output signal. Channel Status implementation complies with rules for "standard implementation" as described in the AES-3 1992 specification.

AES Channel Status Implementation

The following embedded channel status information is transmitted at the AES digital outputs along with the audio data.

Note: Channel Status bits are identically set for channels 1 and 2.

CHANNEL STATUS:	PROFESSIONAL
DATA USE:	AUDIO (normal mode)
EMPHASIS:	NO EMPHASIS
SOURCE Fs LOCK:	LOCKED
SAMPLE FREQUENCY:	44.1 kHz or 48 kHz
CHANNEL MODE:	STEREO
USER BITS MODE:	NONE
AUX BITS USE:	24 BIT - main audio
AUDIO WORD LENGTH:	24 BIT
REFERENCE SIGNAL:	NOT A REFERENCE SIGNAL
ORIGIN:	NOT INDICATED
DESTINATION:	NOT INDICATED
SAMPLE #:	Ø
TIME OF DAY:	ØØ : ØØ : ØØ
BLOCK CRC:	IS VALID

Internal Programming Options

There are no internal programming options on the DO-NC4 card.

Hook-Ups

All user wiring from the DO-NC4 card takes place at the female DB-25 connector on the cage rear.

Digital Audio Connections

These include four outputs. Pinout drawing on page 2-13 shows all wiring connections at a glance.

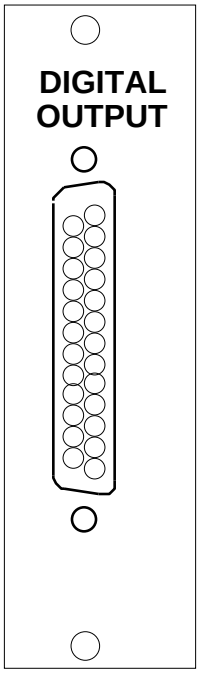
Pin 24 – HI
Pin 12 – LO
Pin 25 – SH
] AES 1 Out

Pin 10 – HI
Pin 23 – LO
Pin 11 – SH
] AES 2 Out

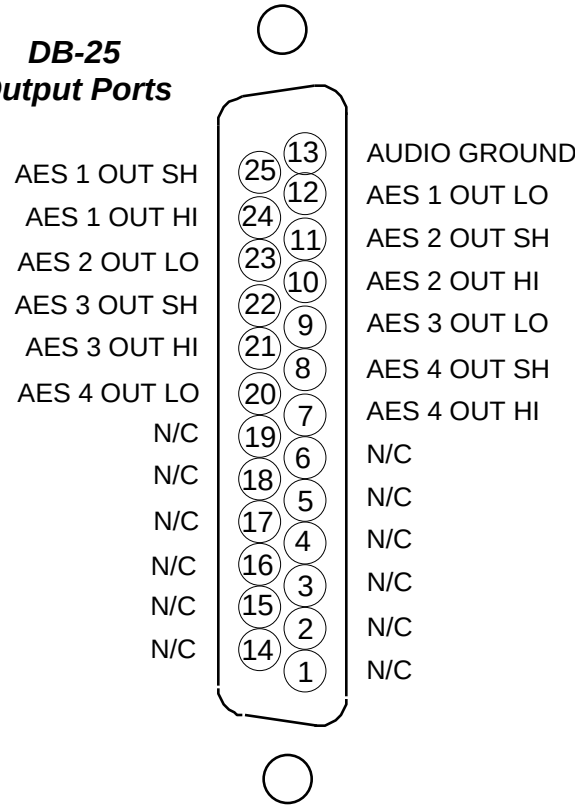
Pin 21 – HI
Pin 9 – LO
Pin 22 – SH
] AES 3 Out

Pin 7 – HI
Pin 20 – LO
Pin 8 – SH
] AES 4 Out

DO-NC4 Panel
Digital Output Connections



DB-25
Output Ports



Analog Output Card (AO-NC4)

Overview

Each Analog Output card provides 8 physical monaural *output channels*. These output channels are configured in software to be 4 stereo pairs. An *Audio Configuration* form in the supplied XPoint software allows the user to set attributes for the output channels, including signal name, location, and Stereo/Mono.

Each output card listens for connection commands from the CPU and then uses this information to connect the appropriate sources to their selected output channels. The selected audio data is fed to 24 bit, two-channel digital-to-analog converters. The D-A converter outputs are buffered by integrated differential output drivers.

Analog Output Interface

Each balanced unity gain output will drive loads of 600Ω or above and behaves much like a transformer in that either side of the balanced output may be grounded. The analog outputs are direct coupled with an output impedance of 50Ω and a nominal output signal level of +4dBu for an analog input signal of +4dBu (-20dBFs digital) .

Internal Programming Options

There are no internal programming options on the AO-NC4 card.

Hook-Ups

All user wiring from the AO-NC4 card takes place at the female DB-25 connector on the cage rear.

Analog Audio Connections

These include four outputs. Pinout drawing on page 2-17 shows all wiring connections at a glance.

Pin 24 – HI Pin 12 – LO Pin 25 – SH	Channel 1 Out	LT	Stereo 1 Out
Pin 10 – HI Pin 23 – LO Pin 11 – SH	Channel 2 Out	RT	
Pin 21 – HI Pin 9 – LO Pin 22 - SH	Channel 3 Out	LT	Stereo 2 Out
Pin 7 – HI Pin 20 – LO Pin 8 – SH	Channel 4 Out	RT	
Pin 18 – HI Pin 6 – LO Pin 19 – SH	Channel 5 Out	LT	Stereo 3 Out
Pin 4 – HI Pin 17 – LO Pin 5 – SH	Channel 6 Out	RT	
Pin 15 – HI Pin 3 – LO Pin 16 – SH	Channel 7 Out	LT	Stereo 4 Out
Pin 1 – HI Pin 14 – LO Pin 2 – SH	Channel 8 Out	RT	

Mono Outputs

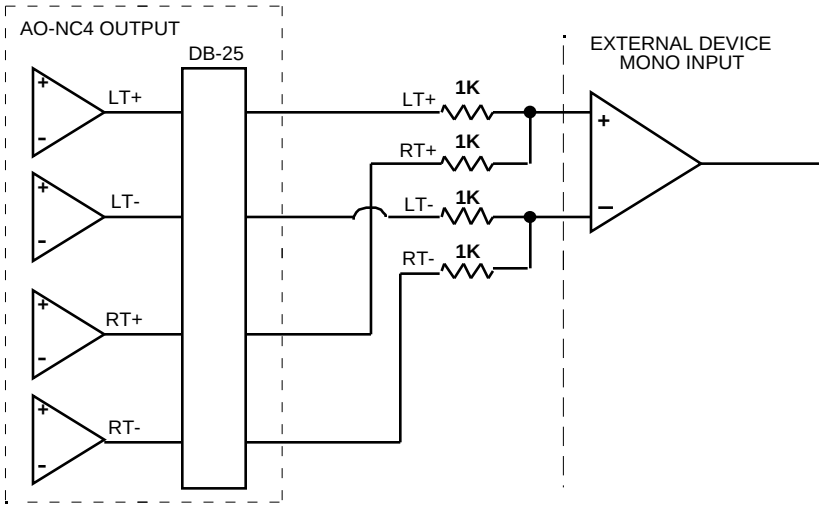
There are two ways to adapt the IOC-16 for mono operation. Externally sum a stereo output using 1kΩ resistors, or reconfigure the output in software for mono operation. Please see the "XPoint Audio Configuration" for details on configuring mono outputs.

Caution! If you route a stereo input to a software configured mono output, only one output channel will be present.

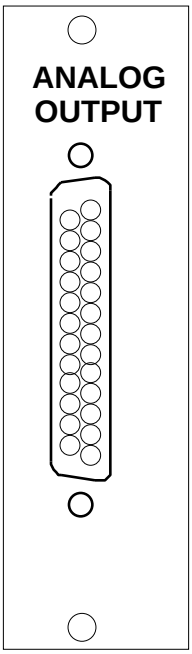
External Mono Summing

To sum an IOC-16 stereo analog output add a 1kΩ resistor in series with each leg of the balanced output. Add resistors as close as possible to the mono input.

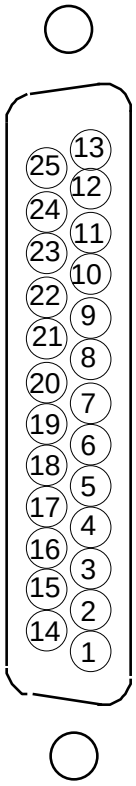
Example:



AO-NC4 Panel
Analog Output Connections



DB-25
Output Ports



CHANNEL 1 (STEREO 1 LT) OUT SH	AUDIO GROUND
CHANNEL 1 (STEREO 1 LT) OUT HI	CHANNEL 1 (STEREO 1 LT) OUT LO
CHANNEL 2 (STEREO 1 RT) OUT LO	CHANNEL 2 (STEREO 1 RT) OUT SH
CHANNEL 3 (STEREO 2 LT) OUT SH	CHANNEL 2 (STEREO 1 RT) OUT HI
CHANNEL 3 (STEREO 2 LT) OUT HI	CHANNEL 3 (STEREO 2 LT) OUT LO
CHANNEL 4 (STEREO 2 RT) OUT LO	CHANNEL 4 (STEREO 2 RT) OUT SH
CHANNEL 5 (STEREO 3 LT) OUT SH	CHANNEL 4 (STEREO 2 RT) OUT HI
CHANNEL 5 (STEREO 3 LT) OUT HI	CHANNEL 5 (STEREO 3 LT) OUT LO
CHANNEL 6 (STEREO 3 RT) OUT LO	CHANNEL 6 (STEREO 3 RT) OUT SH
CHANNEL 7 (STEREO 4 LT) OUT SH	CHANNEL 6 (STEREO 3 RT) OUT HI
CHANNEL 7 (STEREO 4 LT) OUT HI	CHANNEL 7 (STEREO 4 LT) OUT LO
CHANNEL 8 (STEREO 4 RT) OUT LO	CHANNEL 8 (STEREO 4 RT) OUT SH
	CHANNEL 8 (STEREO 4 RT) OUT HI

Logic Input/Output Card (LIO-NC4)

Overview

The LIO-NC4 is a programmable hardware interface with a feature set designed for broadcast studio control applications. Each Logic card provides twelve ports that may be programmed as inputs ***or*** outputs using SW1 -SW3 dipswitches. The twelve independent, opto-isolated solid state relay inputs/outputs may be programmed through the XPoint *Logic Configuration* form to function as routable logic or trigger ports.

Default Setting
Card 1 is configured as inputs. Card 2 is configured as outputs.

Routable logic allows the user to make logic signal crosspoints in the same way audio crosspoints are made. For instance, a closure on logic input port 1 can be cross connected to logic output port 1. Later, the same closure on input port 1 can be routed to logic output port 2, 3 or 4 etc. as required. The *output* ports may be programmed to follow the input port state or to invert it. Defining this behavior is useful when configuring the hardware for normally closed applications. Input and output ports may be configured as logic I/O only or may be "attached" to an audio signal. Routable logic signals may be included as part of a Salvo.

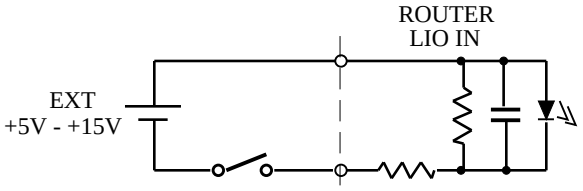
Trigger ports allow the user to program a logic *input* to fire a predefined Salvo or to make a temporary audio connection. Salvos make or break multiple audio and/or logic crosspoints, while temporary audio connections are useful for IFB or EAS applications. Note that trigger ports serve one, predefined function and are not routable.

See "Configuring Logic I/O" in the Software Setup guide.

Input Ports

Each of the twelve LH1522AB solid state relay input ports are configured as a floating photodiode, with the + input going to the opto's anode, and the - input to opto's cathode. A 475 ohm current limiting resistor in series with each negative input supports an external supply voltage range of +5Vdc to +15Vdc. For external supply voltages between +15Vdc and +24Vdc, install a current limiting resistor of 220 ohms in series with each + input connection. Maximum forward photodiode current is 50mA.

SIMPLE INPUT EXAMPLE



When interfacing to a logic input port, we recommend the positive side be connected to a fixed, positive dc voltage and the negative side switched to ground to activate the logic input.

Output Ports

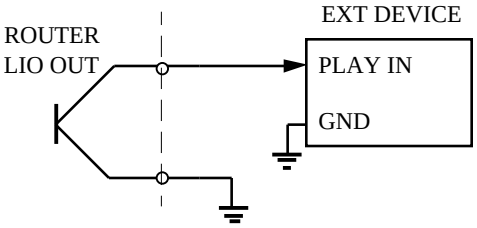
Each of the twelve LH1522AB solid state relay outputs may be configured in software to function as normally open or normally closed circuits when cross connected to an input.

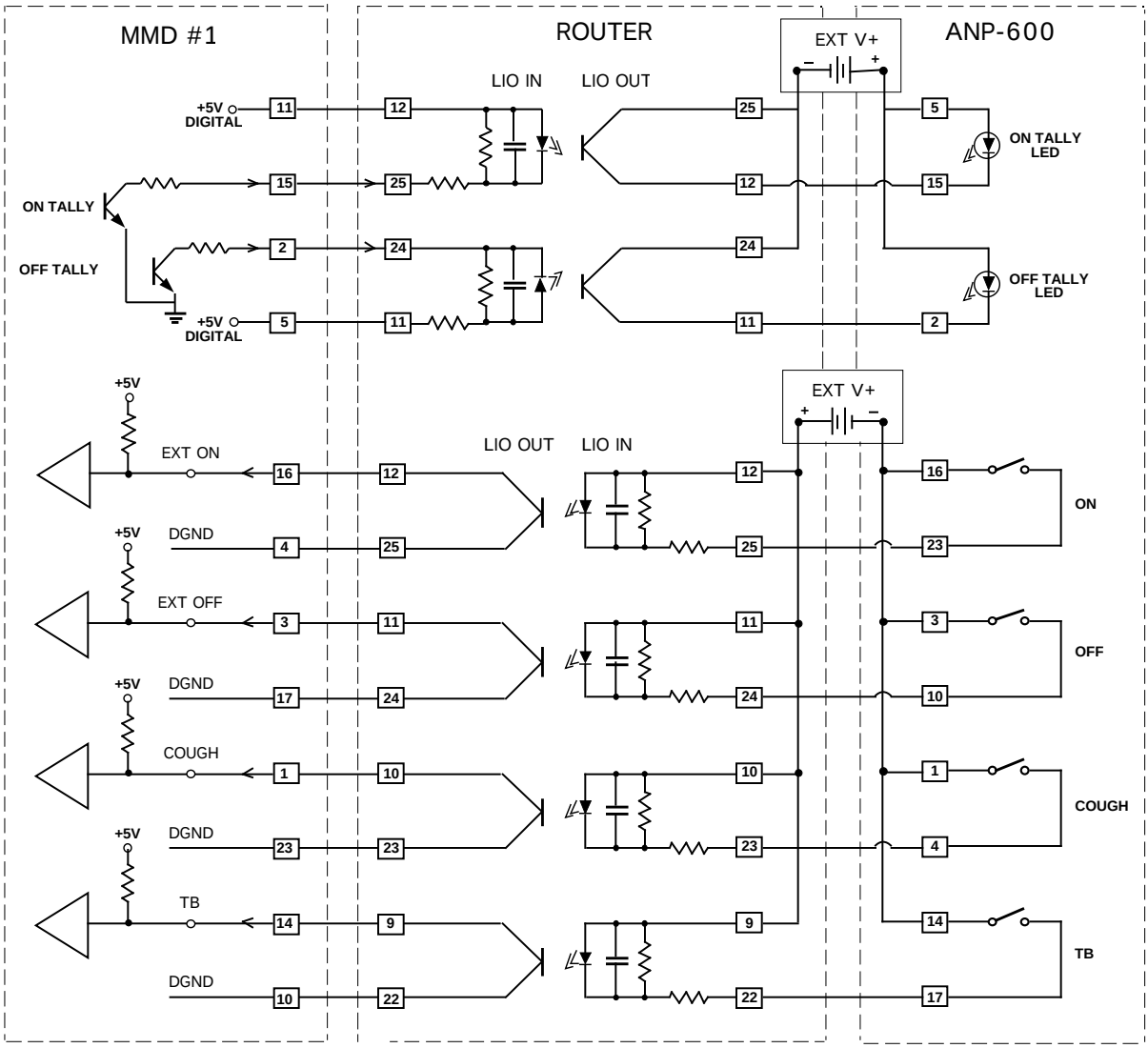
All outputs feature linear ac/dc operation, current limiting, and a low on resistance, typically 10 ohms.

Normal Operating Load Limits: 120mA, ±100V

Safety Note: *The LIO-NC4 is **NOT** designed to safely switch AC mains power*.

SIMPLE OUTPUT EXAMPLE





Software Programming

For details on programming the LIO-NC4, please refer to “Configuring Logic I/O” in the XPoint Software Setup Guide later in this manual.

Internal Programming Options

All internal programming options are made via PCB mounted dipswitches and jumpers.

Dipswitch / Jumper Settings

DIPSW1 -SW3 - Logic In/Out Settings

SW1 position 1 sets logic port 1 as logic input when ON or logic output when OFF.
SW1 position 2 sets logic port 2 as logic input when ON or logic output when OFF.
SW1 position 3 sets logic port 3 as logic input when ON or logic output when OFF.
SW1 position 4 sets logic port 4 as logic input when ON or logic output when OFF.
SW2 position 1 sets logic port 5 as logic input when ON or logic output when OFF.
SW2 position 2 sets logic port 6 as logic input when ON or logic output when OFF.
SW2 position 3 sets logic port 7 as logic input when ON or logic output when OFF.
SW2 position 4 sets logic port 8 as logic input when ON or logic output when OFF.
SW3 position 1 sets logic port 9 as logic input when ON or logic output when OFF.
SW3 position 2 sets logic port 10 as logic input when ON or logic output when OFF.
SW3 position 3 sets logic port 11 as logic input when ON or logic output when OFF.
SW3 position 4 sets logic port 12 as logic input when ON or logic output when OFF.

J3 - AGND to DGND - default is “CLOSED”

J3 connects Audio Ground to Digital Ground.

Hook-Ups

All user wiring from the LIO-NC4 card takes place at the female DB-25 connector on the cage rear.

Logic Connections

These include 12 input/output sources. Pinout drawing on page 2-22 shows all wiring connections at a glance.

Pin 12 – Logic 1 In/Out +
Pin 25 – Logic 1 In/Out -
Pin 11 – Logic 2 In/Out +
Pin 24 – Logic 2 In/Out -
Pin 10 – Logic 3 In/Out +
Pin 23 – Logic 3 In/Out -
Pin 9 – Logic 4 In/Out +
Pin 22 – Logic 4 In/Out -

Pin 8 – Logic 5 In/Out +
Pin 21 – Logic 5 In/Out -

Pin 7 – Logic 6 In/Out +
Pin 20 – Logic 6 In/Out -

Pin 6 – Logic 7 In/Out +
Pin 19 – Logic 7 In/Out -

Pin 5 – Logic 8 In/Out +
Pin 18 – Logic 8 In/Out -

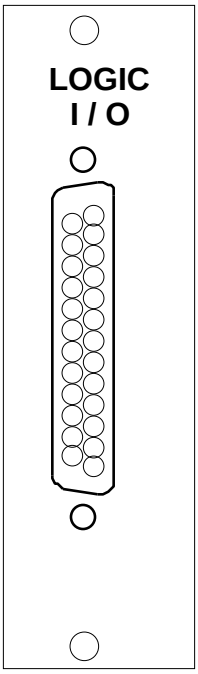
Pin 4 – Logic 9 In/Out +
Pin 17 – Logic 9 In/Out -

Pin 3 – Logic 10 In/Out +
Pin 16 – Logic 10 In/Out -

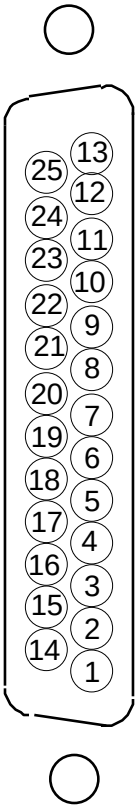
Pin 2 – Logic 11 In/Out +
Pin 15 – Logic 11 In/Out -

Pin 1 – Logic 12 In/Out +
Pin 14 – Logic 12 In/Out -

LIO-NC Panel
Logic Input / Output Connections



DB-25
Input/Output Ports



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

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

Dual Audio Network Card (AT-NC2)

Overview

The Dual Audio Network card provides the audio and logic link between the central NET-8, the IOC-16, and optionally, a NET-75 panel. All Audio Transport (AT) connections are made using UTP CAT-5 wired as *crossover* and terminated with RJ-45 connectors.

The 2 AT ports, LINK 1 and 2, are pre-configured in hardware and software. LINK-1 always connects to the NET-8. LINK-2 always connects to a NET-75 panel.

Which specific NET-8 port you connect LINK-1 to depends on the configuration you have loaded. XPoint software is used to load "canned" configurations that map the AT LINK-1 and 2 ports to specific NET-8 ports and NET-75 panels.

The AT-NC2 provides a tremendous amount of flexibility and routing power. Please note the following design aspects:

- The XPoint configuration you load determines how the system must be wired.
- IOC-16 cages always connect to the NET-8 central switch.
- NET-75 panels may connect to the NET-8 ***or*** the LINK-2 port on an IOC-16.

Internal Programming Options

All internal programming is done via PCB mounted switches.

Switch Settings

SW1 - Reset

Momentarily pressing the switch resets the LAN chip, while pressing and holding the switch also resets the FPGA.

DIPSW2

Pos.1 (labeled DIPSWØ on the circuit board)- Sample Rate Select - 48kHz / 44.1kHz

Selects the system's sample rate frequency: 48kHz or 44.1kHz.

48kHz when switch is ON,

44.1kHz when switch is OFF.

Note!!
Sample Rate must match on all D-75/NET-75 and IOC devices.

Pos.2 - 4 - Not Used

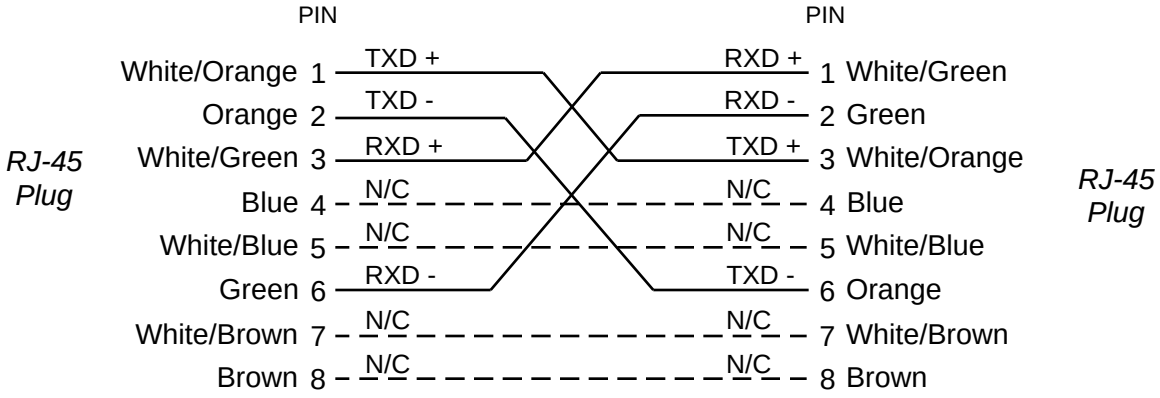
Hook-Ups

All user wiring to and from the AT-NC2 card's LINK1 and 2 RJ-45 connectors is made using UTP CAT5 cable wired as ***crossover***. For typical CAT5 cable pinouts see below.

LINK 1 and 2 RJ-45—CAT5 Audio Network Connectors

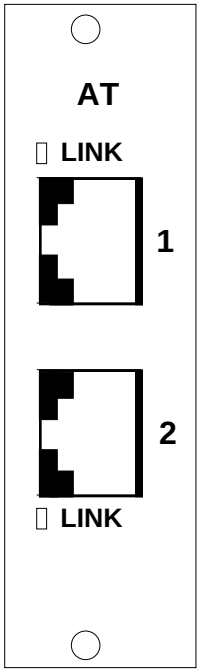
Pin 1 – TXD +
Pin 2 – TXD -
Pin 3 – RXD +
Pin 4 – N/C
Pin 5 – N/C
Pin 6 – RXD -
Pin 7 – N/C
Pin 8 – N/C

TYPICAL CROSSOVER CABLE

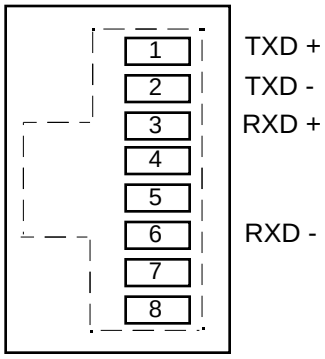


USED TO CONNECT THE LINK1 CONNECTOR TO THE NET-8 AND THE LINK 2 CONNECTOR TO AN OPTIONAL NET-75 PANEL IN A D-75 CONSOLE.

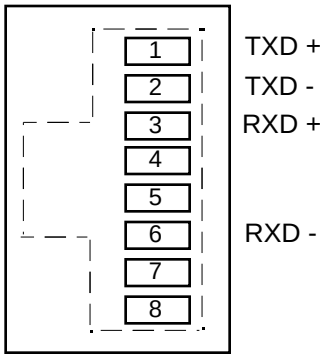
AT-NC Panel
Network Connections



LINK 1 - RJ-45



LINK 2 - RJ-45



XPoint Software Setup Guide

Chapter Contents

Caution!

Configuring the NET-8 Audioarts Network hardware is a relatively simple process. Improper configuration changes may cause improper operation or disable previously operating functions. If done properly, configuration changes can be made while "on the air" without disruption; however it is always best to restrict configuration changes to time periods when an error could be tolerated. When in doubt, please contact Wheatstone Technical Service to avoid any error in configuration changes.

NET-8 Ethernet / IP Address Quick Start

Ethernet Cabling

- Use a CAT 5 *crossover* Ethernet cable to connect a PC directly to the NET-8.
- Use a standard CAT5 Ethernet cable to connect the NET-8 to your network hub.

Default IP Address

The NET-8 IP Address is set to 192.168.1.160 at the factory. In order to connect using the XPoint software, the PC must have a matching network prefix (i.e 192.168.1.xxx). If your PC's current IP address does not match you must choose one of the following options:

- change the IP address of the PC running the XPoint software.

or

- change the IP address of the NET-8.

Changing your PC's IP Address

To set your PC's IP address you must access the TCP/IP Properties form for the network adapter. The exact procedure depends on the specific version of Windows™ you are running. Generally speaking:

- Navigate to the *Settings* • *Control Panel* • *Network configuration* form.
- Highlight the TCP/IP line item for your PC's ethernet adapter.
- Click the "Properties" button (the TCP/IP Properties form should open).
- Click "Specify an IP Address" (DHCP not supported).
- Enter an IP address in the range of 192.168.1.2 to 192.168.1.254 (excluding .160).
- Enter a Subnet Mask value of 255.255.255.0

When in doubt, check with your Windows ™ documentation or network administrator for specific details on altering the network adapter's TCP/IP properties.

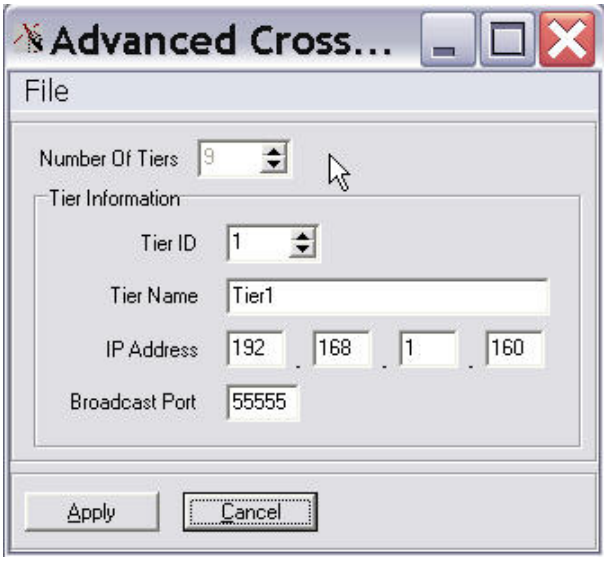
Changing the NET-8's IP Address

Changing the IP address of devices in the system requires the editing of a text file located on the NET-8's system CPU. You will need a third party FTP application to be able to FTP to the NET-8. We recommend the freeware FTP client FTP Surfer by Whisper Technology. Google to *"FTP Surfer "* to download the client. Windows Internet Explorer allows FTP, but in our experience it is not the best choice for this file maintenance application.

To change the IP address scheme, carefully follow the instructions in the *Configuring System IP Addresses* Appendix 1 at the back of this manual.

Configuring IP Address in XPoint Software

Next, start the XPoint application, log on as administrator (password=Admin), and navigate to the *Configure•System* menu item. The following form will appear.



Important:

• If you changed your PC's IP Address, enter the parameters exactly as displayed above.

• If you changed the NET-8's IP Address, enter the parameters you entered in the xp_net.txt network text file.

If you are connected to the router, you should see a "Connecting to..." message in the status bar at the bottom of the screen.

Loading the NET-8 Configuration

Once you connect for the first time be sure to load the “canned” configuration that best matches your actual system. There are three “canned” configurations included on the XPoint CD-ROM that cover most installations. Refer to the System Flow diagrams in this manual for details. If you are unsure of which configuration to use, please contact Audioarts Technical support for assistance. Audioarts also offers a custom configuration service. Please contact your sales representative for information.

Choose the *File• Load* main menu option from the toolbar and select the configuration from your CD ROM. When you make subsequent changes (e.g. rename Sources or Destinations, add controllers, etc.) be sure to save them.

XPoint Software Setup Guide

Getting Started

All Audioarts Engineering Audio Network System hardware is pre-configured at the factory. This approach greatly speeds the installation process getting you "online" faster. You will need to load an XPoint configuration that matches your system hardware.

After installation and cabling of all required hardware, the system administrator may use the XPoint software to customize the remainder of the installation.

To install the XPoint software be sure that the PC you are using is Windows compliant, has a CD-ROM drive, has at least 50MB of hard disk space available, and has an available Ethernet connection.

Important: Read the README.txt file on the CD before installing. It has information that applies to your particular installation and covers installation of XPoint and any other applications that are used in your system.

Once you've read the README.txt file, you begin installation by double-clicking the XPoint.msi file on the install CD. This program will run and install the XPoint software. Follow any instructions on the screen. Before running XPoint, make sure that you follow the instructions in the README.txt file regarding loading your configuration to avoid problems in integrating XPoint with your system.

The following sections will guide the user through all phases of the software configuration. The main items that may require attention are: any signal definition changes, source and destination signal naming, and logic port programming.

GUI Log-In

Once the XPoint software has been installed and started, a "Log In" dialog box will be displayed on the screen. There are three possible password protected log in identities that a user may log in as:

Guest - Allows the user to view crosspoint status only. No switching of I/O signals.

Administrator - allows logged in user complete access to hardware configuration, signal naming, I/O crosspoint switching, and destination locking.

Password

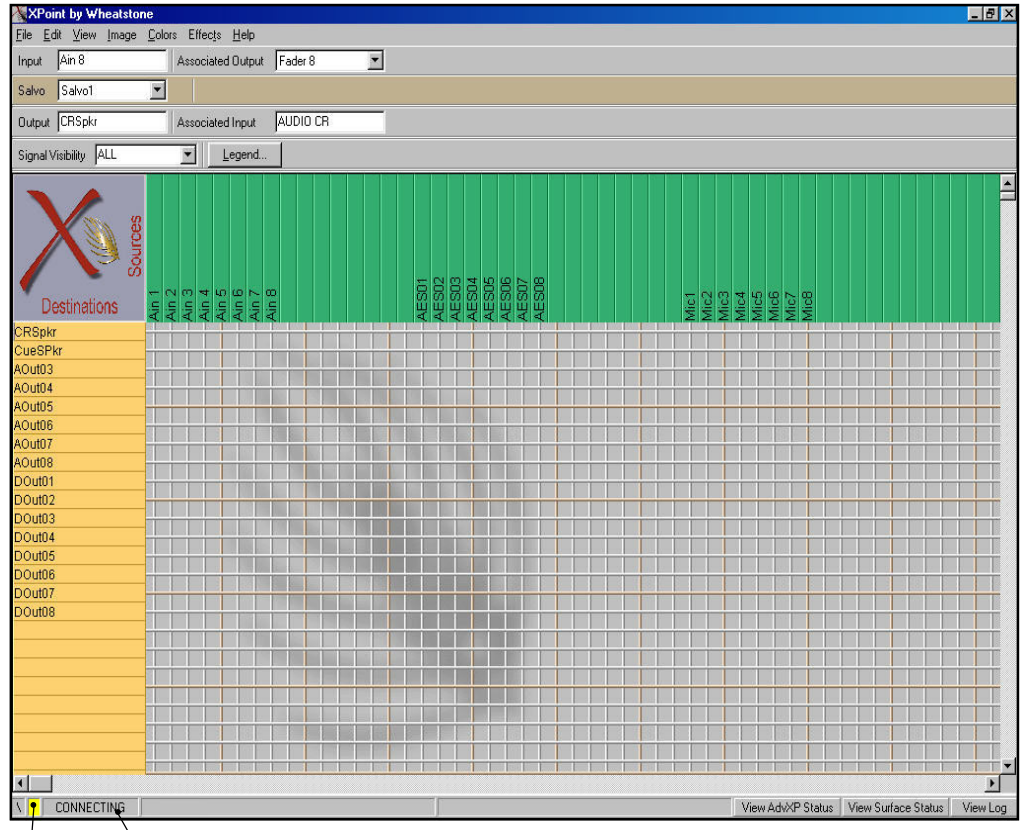
Default password is “Admin” for Administrator.

Once logged in as Administrator the GUI attempts to connect to the switch and uploads the current configuration and crosspoint status onto the PC. This may take 30 seconds or more. Check the lower left hand corner of the screen for connection status.

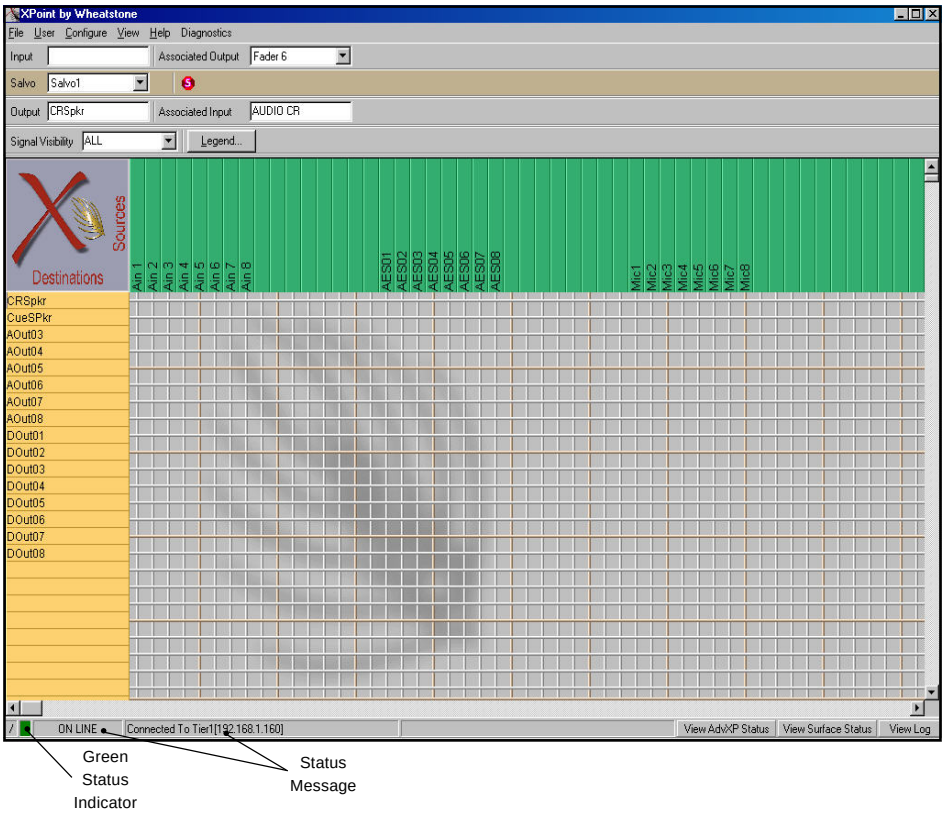
Connection Between the Configuration GUI and NET-8

While in OFFLINE mode, the GUI does not communicate to the Host CPU in the master rack. This is useful to work through initial hardware and signal definitions, which may be downloaded later. The program starts in ONLINE mode but can be switched to OFFLINE mode by selecting the *View / Mode / Offline* menu option.

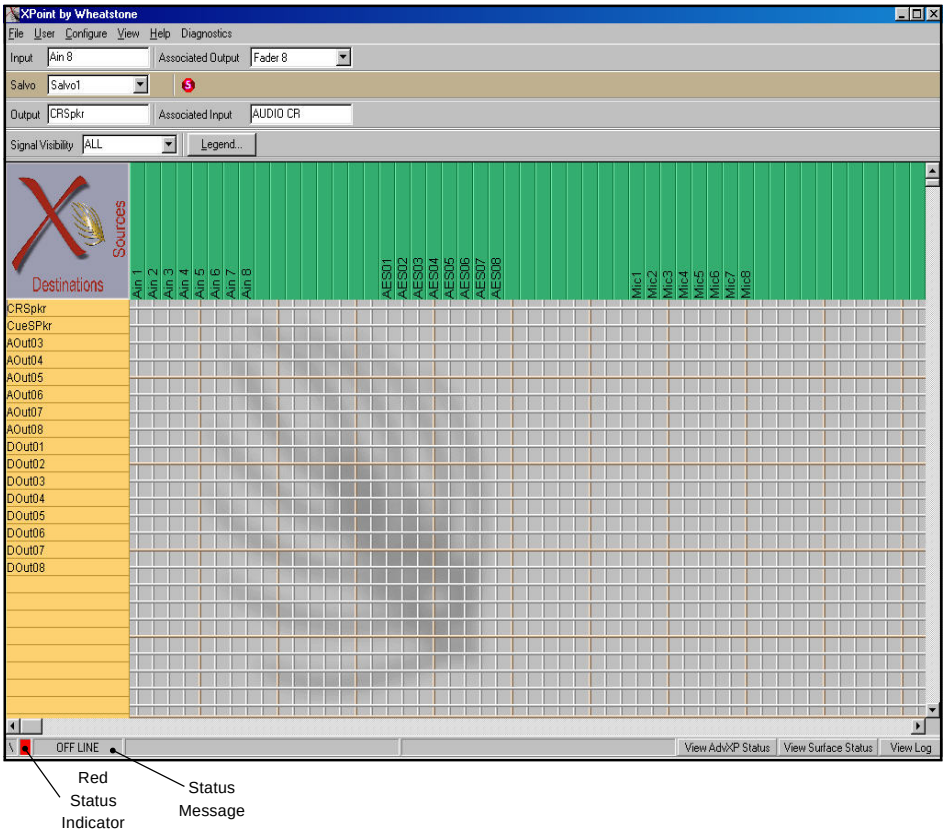
In ONLINE mode a TCP connection to the Host CPU will be attempted, as indicated by the status message and yellow status indicator shown below.



When the GUI successfully communicates with the NET-8 CPU software it will start receiving the configuration that the NET-8 CPU has stored in its nonvolatile memory. While downloading this configuration information the yellow status indicator turns green and the status message changes from CONNECTING to something similar to the following (varies with tier name and IP/address): “Downloading Config From 192.168.1.160 [Tier 1]”.



Once the configuration has been downloaded the GUI enters the ONLINE state as shown to the left.



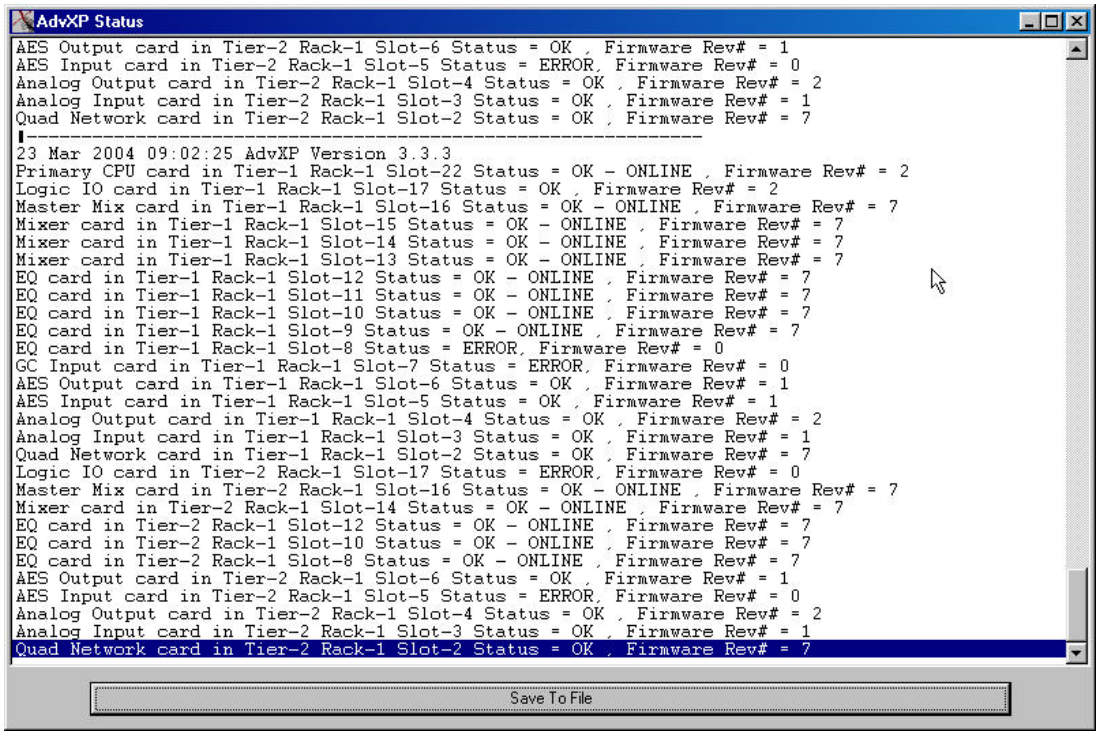
To disconnect from the NET-8 CPU and go to OFFLINE mode, select the *View / Mode / Offline* menu option. The status indicator on the screen will then change as shown to the left.

To connect to the NET-8 CPU while in OFFLINE mode, select the *View / Mode / Online* menu option. The status indicator on the screen will then change to CONNECTING as discussed above.

If the user made changes to a few crosspoints in OFFLINE mode and then goes to ONLINE mode, this message box pops-up:

Choose YES to save OFFLINE changes.

There are three tabs, *View AdvXP Status / View Surface Status / View Log*, on the bottom of the Configuration GUI form to view rack configuration, status of all active installed hardware, and card firmware revisions. A window like the following will appear when you click on the *View AdvXP Status* tab.



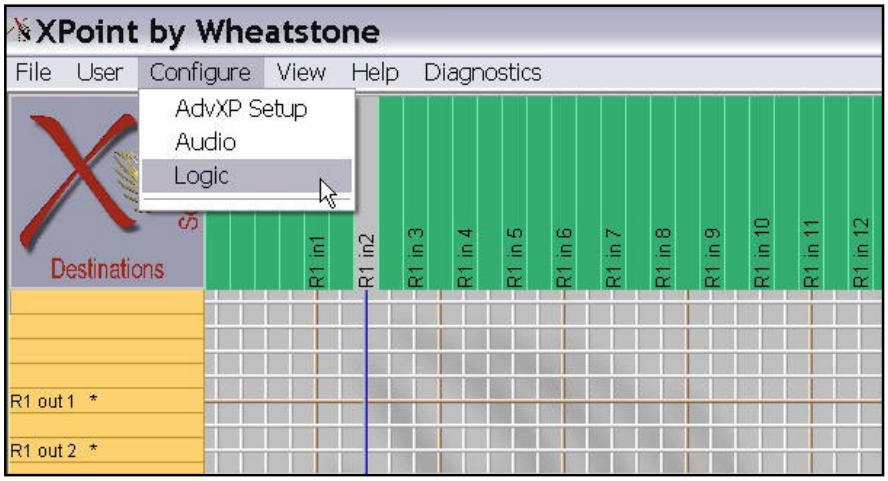
System Configuration Menus

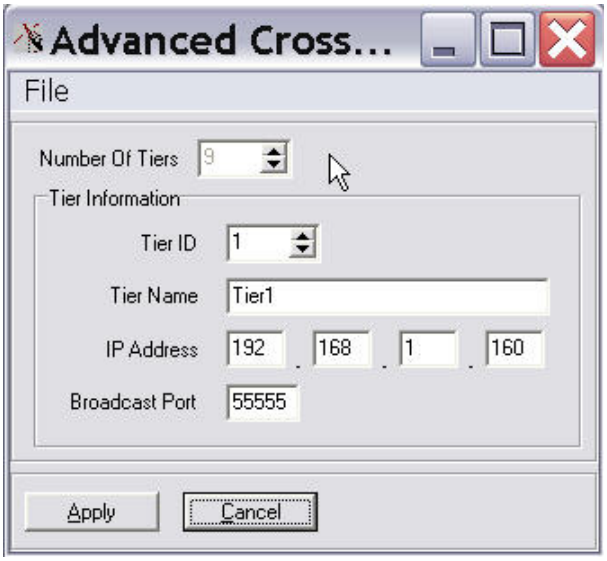
From the user point of view, configuration of the NET-8 system is relatively simple, since the Configuration GUI does much of the actual underlying configuration assignment work automatically. This section will outline a general procedure for configuring a NET-8 system.

Tier Configuration

Note that your system was pre-configured and this step is not necessary unless you have changed the IP address of the NET-8.

Before you can connect to the system the Configuration GUI must be setup with some information regarding the NET-8's network parameters. This is done by selecting the *Configure / AdvXP Setup* menu option; the following Tier Configuration form appears.





Important Note!
This form tells the XPoint software where the Host CPU is located on the network. To modify the actual network settings of the Host CPU card located in the system's Master Rack, see Configuring System IP Addresses Appendix 1.

The IP Address and Broadcast Port values *for Tier ID1* must match the current settings of the NET-8 CPU in order to connect.

Leave the IP Addresses for Tiers 2 through 9 set to "0.0.0.0" since only the NET-8 requires an IP address.

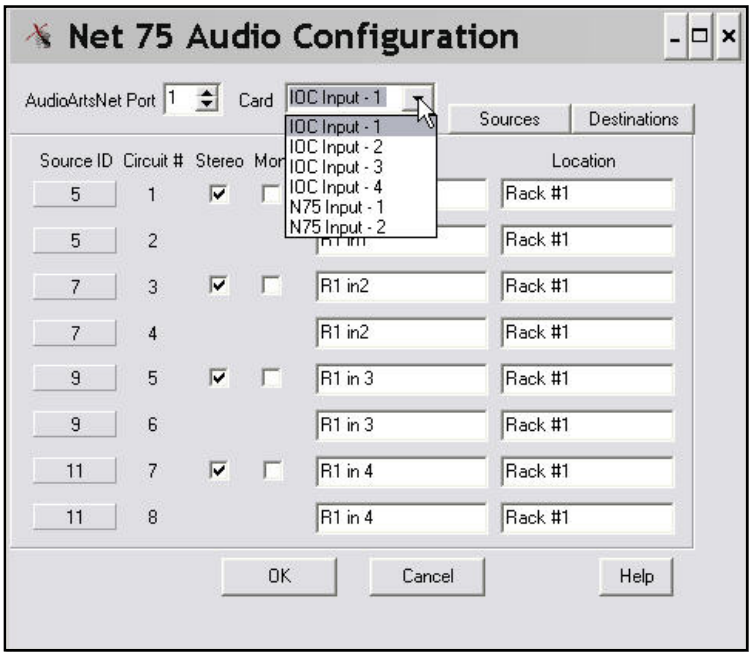
After clicking the Apply button the GUI software will be in the "CONNECTING" state, as discussed in the next section. This completes the Tier Configuration process.

A Word about Tiers

The AudioArts Network is divided into 9 sections called Tiers. The NET-8 is always Tier 1. There are 8 network ports on the NET-8 that correspond to Tiers 2 through 9. When you connect an I/O Center rack or NET-75 panel to a NET-8 port, the audio and logic signals wired to that rack or panel become part of the Tier associated with that port.

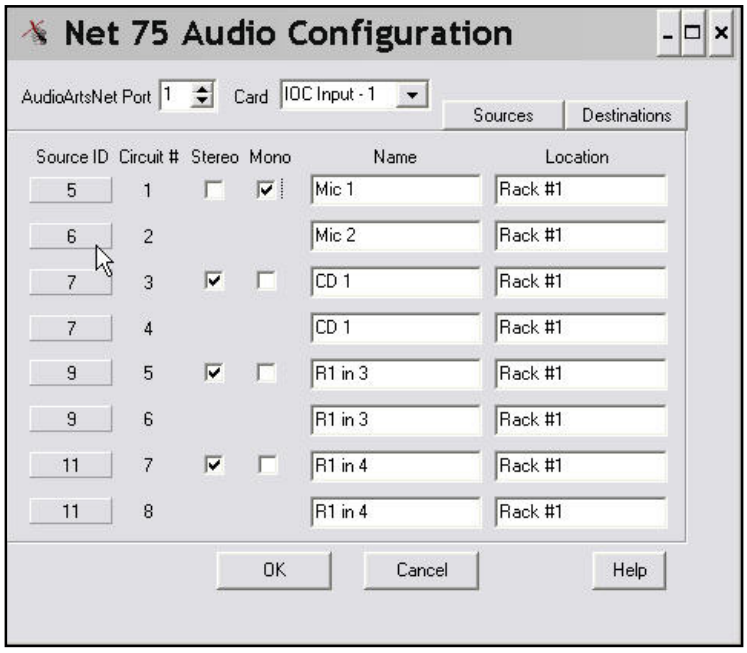
Audio Configuration

Before you begin routing audio signals it is a good idea to rename the default signal names so that they make sense to you. You may also choose to split some stereo signals into two Mono signals. You will need to know which signals are wired to which I/O Center racks or NET-75 panels. A spreadsheet showing your entire signal list and where they connect to the AudioArts Network hardware is an invaluable tool when programming the system. To access the Audio Configuration form navigate to the menu bar item *Configure-Audio*; the following form appears.



AudioArts Net Port

Use the spinbox arrows to select the group of signals you wish to edit. Valid number are 1-8 and correspond to the 8 ports located on the back of the NET-8. Each AANet Port is a Tier and all I/O Center and NET-75 panel signals connected to that Port will be available for editing.



Sources and Destination Tabs

Click on the *Sources* tab to edit inputs or *Destinations* tab to edit outputs.

Sources - any audio input or NET-75 panel mix busses.

Destinations - any audio output or NET-75 panel fader.

Card Selection

Use this drop down list to select the specific card you wish to edit. Remember that the *AANetPort* you selected determines which physical rack you are working with.

Sources

IOC Input 1 - 4 Corresponds to the 4 physical input cards installed in the IO Center.

N75 Input 1 Corresponds to the PGM, AUD, AUX, and UTL mixes on the D-75.

N75 Input 2 Corresponds to analog inputs 5 and 6 on the NET75 panel.

Destinations

IOC Output 1 - 4 Corresponds to the 4 physical output cards installed in the IO Center.

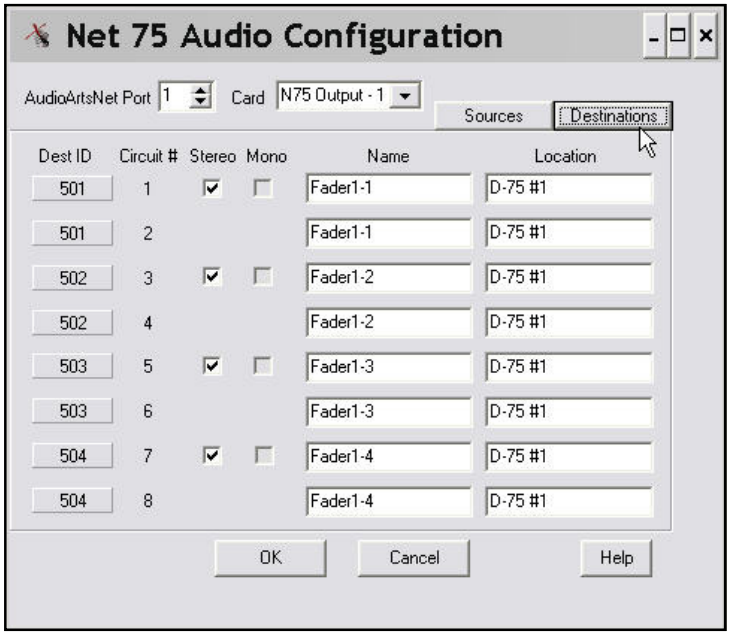
N75 Output 1 Corresponds to faders 1-4 on the NET75 panel.

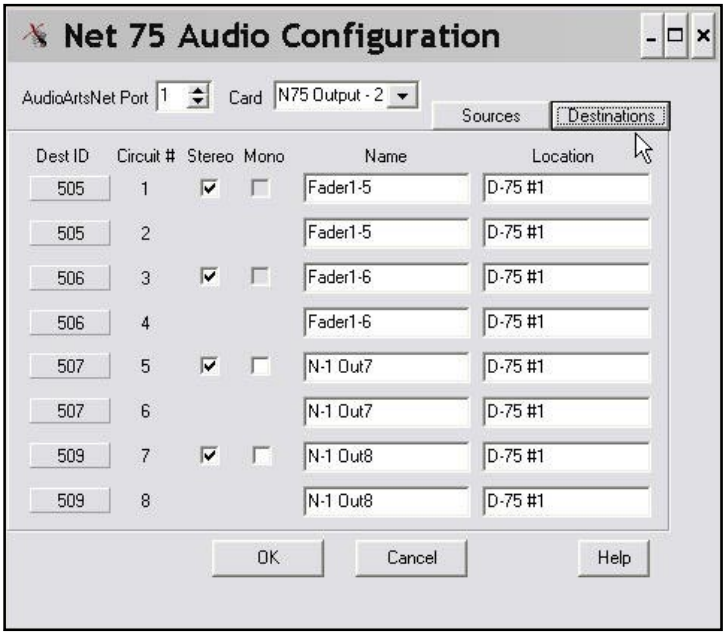
N75 Output 2 Corresponds to faders 5 &6 and analog audio outputs 7&8 on the NET75 panel.

Source ID and Circuit #'s

The XPoint software's signal space is laid out in an X-Y grid with Sources positioned along the horizontal X axis and Destinations stacked in the vertical Y axis. Source ID is a number that uniquely identifies the signal and corresponds to its position in the grid. The ID is automatically created by the XPoint software and is non-editable. When you split a Stereo signal into two mono channels, the right channel's Source ID will increment by one.

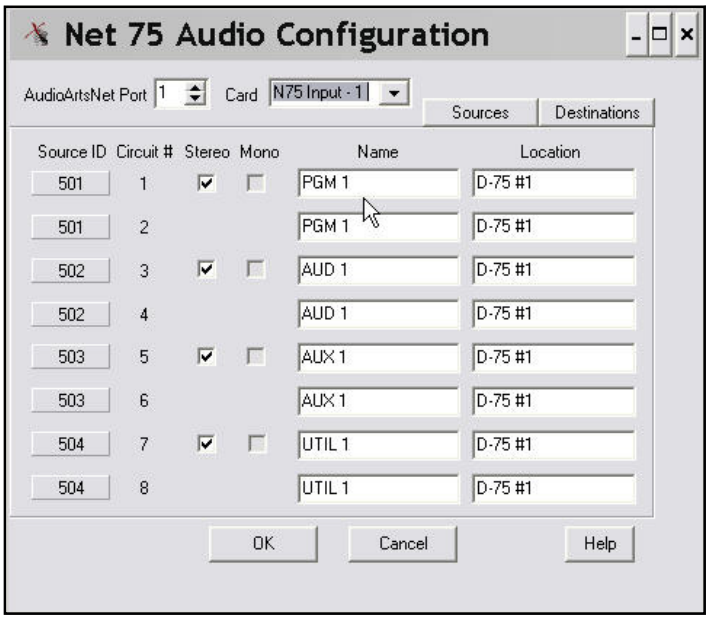
Each physical audio channel wired to the router is given a circuit number. There are a total of 8 circuits per audio input or output card (four stereo). Stereo input 1-Left uses *Circuit*1, Stereo input 1-Right uses *Circuit* 2, etc. When you split a Stereo signal into 2 mono channels, mono1 uses the left channel circuit and mono2 uses the right channel circuit.





Signal Naming

Simply type a new 8 character name for each signal in the *NAME* box. The location field may also be edited to match the physical location of the rack or device.



Creating Mono Signals

By default, all input and output signals are configured to be stereo. You can split a stereo signal into two mono signals. When a stereo signal is split, the left channel becomes signal A and the right channel becomes signal B. These two signals may then be independently named and routed.

To create a mono signal, check the MONO checkbox for the desired stereo pair. Notice that the signal ID is incremented by one for the right channel.

Configuring Logic I/O

Overview

The AudioArts network incorporates an integral GPI/GPO router. Any logic card port in the system may be routed just like audio or mapped to follow specific audio signals as they are routed. Configuring logic generally means telling the XPoint software what you want each GPI and GPO to do.

It is important to understand that there are two primary ways to configure the physical logic ports in software - routable logic or triggered ports. Which type you choose depends on the particular application you are implementing.

For example, GPO solid state relay ouputs may be mapped to audio sources and configured to start machines wired to any logic card in the system from any NET-75 panel fader. Logic inputs may be configured to make temporary audio connections (great for EAS and talkback) connect a set of previously saved crosspoints, or remotely turn NET-75 fader chanels ON and OFF.

Logic Hardware

Each IO Center may be fitted with logic cards in slots 1 and 2. Each IO Center logic card has 12 general purpose i/o ports whose direction (in or out) is set via dipswitch settings on the card. Each NET-75 panel has 6 fixed input and 6 fixed output ports.

IOCenter LIO

An IO center logic card may have any combination of input and output ports. By default, the 12 ports in slot 1 are inputs and the 12 ports in slot 2 are outputs. This arrangement is easily changed as required by the end user.

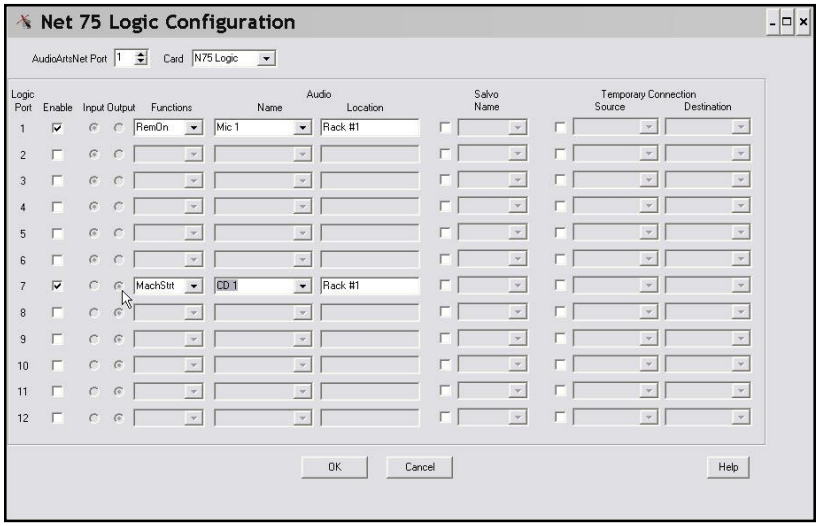
DIPSWITCH settings - use the four-position dipswitches SW-1 to 3 to set each port's direction. OFF = OUT and ON = IN.

NET-75 LIO

The NET-75's port combination is fixed. Ports 1-6 are inputs and Ports 7-12 are outputs. There are no dipswitch settings.

Logic Configuration in Software

Mapping out logic ports and their functions on paper before you configure the software makes programming much easier. Once you know *where* you want to wire machine starts, tally outputs, rem on/off inputs, etc., it is easy to tell XPoint what to do. Group your logic signal list by AANet Port, Card, LogicPort #, and direction, In or Out.



AudioArts Net Port

Use the spinbox arrows to select the group of signals you wish to edit. Valid choices are 1-8 and correspond to the 8 ports located on the back of the NET-8. Each AANet Port is a Tier and all I/O Center and NET-75 panel signals connected to that Port will be available for editing.

Card Selection

Use this drop down list to select the specific card you wish to edit. Remember that the *AANetPort* you selected determines which physical rack you are working with.

IOC Logic 1 Corresponds to the 12 physical ports installed in IO Center Slot1.

IOC Logic 2 Corresponds to the 12 physical ports installed in IO Center Slot 2.

N75 Logic Corresponds to the 6 input and 6 output ports on the N75 panel.

Associated Logic

Logic Port - each port is numbered from 1-12 .

Enable - check this box to map an *associated* audio signal to the logic port.

Input/Output - sets the direction for the port. Note that IOCenter logic cards have 12 dipswitches that MUST match the direction you set in software.

Functions - this is a drop down list of available control functions. The function you select describes how the logic output works. Certain functions are used with input logic, others are outputs. See the Function Type section for a detailed list of functions.

Associated Signal - this drop down list of audio signals allows you to map the logic port to a specific audio signal. This is called *associated* logic. The Location field is included to help identify the audio signal's physical location in the system.

Triggered Logic

Triggered logic is a special type of audio routing control that works with logic inputs only. You can configure logic inputs to fire pre-defined Salvos or to make Temporary connections by clicking on the Salvo or Temp Connection checkbox for any given port.

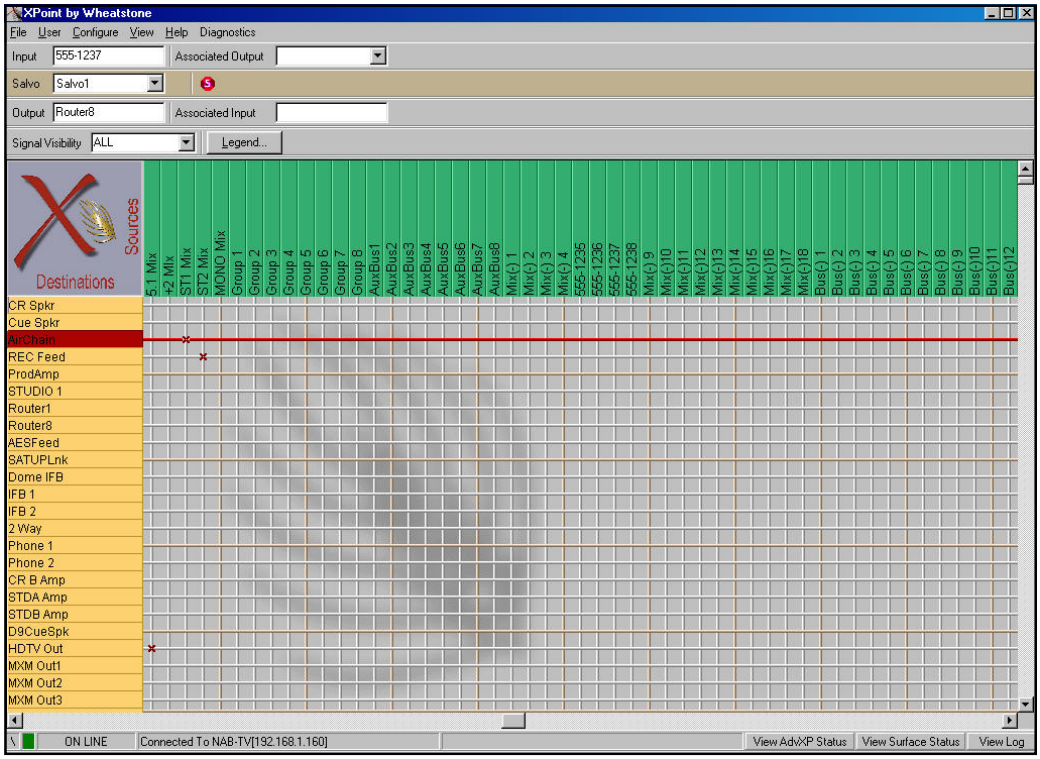
Salvos are analogous to Macros and are simply a list of simultaneously executed crosspoints. Create and name your Salvo before triggering it from logic. See the Salvo section for details on creating Salvos. Once created, select one from the drop downlist.

Temporary connections can be thought of as "interrupts", where an audio path is broken and a new source routed to the destination. The interrupt is active for the duration of the logic input, and the original connection is restored when deactivated. To set up a Temporary Connection choose click on the checkbox for the desired input port. Choose the destination you want to interrupt, then choose the source that will be temporarily inserted.

Signal Locking

To lock a signal, *right* click on the desired output channel on the crosspoint grid and select “Lock Connection”.

That crosspoint output signal becomes locked as indicated by the red line through the signal on the GUI display and shown on form below.



Note that you must be in ONLINE mode to lock a connection.

Salvo Definition

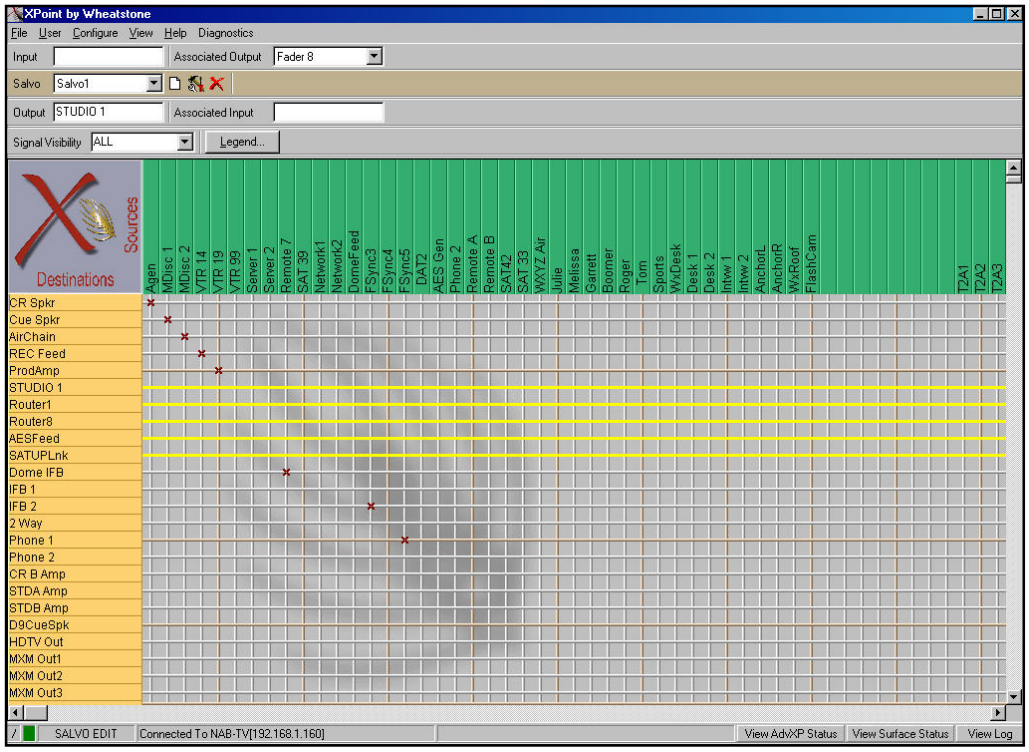
Macro control of the NET-8 is accomplished by creating and firing Salvos. A Salvo is simply a group of cross connects, disconnects and "do nothings" that occur when the selected Salvo is fired. Each Salvo has a unique name and can be programmed to be visible to any XY controller.

To define a Salvo, use the Configuration GUI and enter *Salvo Edit Mode* by selecting the *View / Mode / Edit Salvos* menu. The operator may then choose to modify the grid connections in an existing Salvo, or use the Salvo toolbar icons to rename an existing Salvo or to create a new one. By making and breaking connections on the crosspoint grid, the operator builds up a Salvo definition. ***The order in which Salvo actions are created determines the "playback" order.*** It is important to disconnect a source routed to a destination signal that has logic attached *before* routing the source to a new destination to avoid illegal logic state conditions.

When completed, the operator leaves *Salvo Edit Mode*, at which point the newly defined Salvos are available for use. If the application is connected to a switch (ONLINE mode) the new Salvo definitions are automatically sent to the switch. It is a good idea to save the newly created Salvos on the PC by choosing *File / Save...* from the main menu.

Note that clicking on the Delete Salvo icon in the Salvo Toolbar will initially delete all the connections defined in a Salvo; a subsequent click on this button will delete the Salvo from the Salvo list. This is a useful way to clear out an existing Salvo and then redefine the connections within that Salvo. To cancel changes made to a Salvo select*View / Mode / Cancel Salvo Edits* from the main menu.

An example of Salvo Edit mode is shown below.



<-Salvo Tool Bar
• Rename Salvo
• New Salvo
• Clear/Delete Salvo

Caution!
A yellow line through a connection means the connection will be switched OFF when the Salvo is fired.

Main Menu Summary

The following is a summary of all the available menu choices when logged into XPoint as the Administrator.

File Menu

Open: Opens the *Load Configuration* form to load previously saved configuration elements for OFFLINE viewing/editing, or to download to the Host CPU.

Save: Opens the *Save Configuration* form to save any or all changes.

Send Cfg To Switch: Initiates download of currently loaded configuration to the Host CPU module. Use this to update the system hardware with config changes.

Request Cfg From Switch: Request the current configuration from the router.

Export Signals: Export signal names to a comma separated format suitable for speadsheet input.

Import Signals: Factory use only.

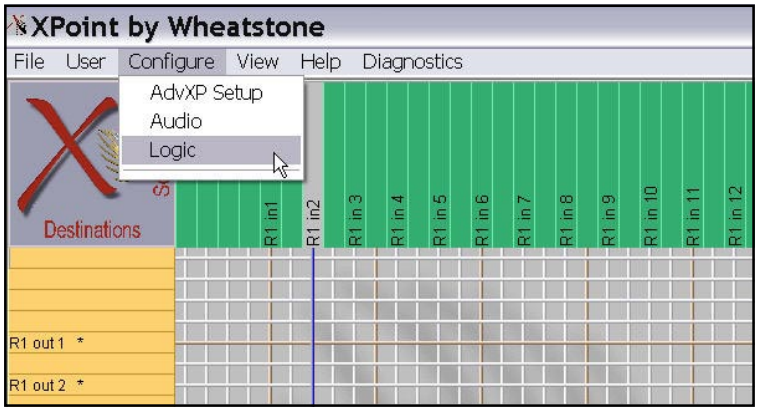
Exit: Exits the XPoint program.

User Menu

LogIn/LogOut: Opens the *XPoint Log-in* form if currently logged out, else logs out if logged in.

Change Password: Allows the Administrator to change the XYC or Admin access level Log-in passwords.

Configure Menu



AdvXP Setup: Configure tier, TCP/IP network, and Host port parameters.

Audio: Rename audio signals, split stereo to dual mono.

Logic: Map logic ports to audio, setup salvos, or setup temporary connections.

View Menu

Mode-OffLine: Select OFFLINE to edit configuration. Be sure to Save configuration prior to returning ONLINE. This menu option is only available if you are currently ONLINE.

Mode-Online: Initiates network connection to Host CPU, uploads Host configuration once connected. View real time status of all crosspoints. This menu option is only available if you are currently OFFLINE.

Mode-Salvo Edit: Create, define and edit Salvos in this mode. This menu option is only available if you are not in Salvo Edit mode.

Mode-Leave Salvo Edit: Exit Salvo Edit mode. This menu option is only available if you are in Salvo Edit mode.

Mode-Cancel Salvo Edits: Cancels any edits made in Salvo Edit mode and exits Salvo Edit mode. This menu option is only available if you are in Salvo Edit mode.

Tools-Inputs: Toggles visibility of the Input toolbar.

Tools-Salvo: Toggles visibility of the Salvo toolbar.

Tools-Outputs: Toggles visibility of the Output toolbar.

Tools-Signal Visibility: Toggles visibility of the Signal Visibility toolbar.

Zoom 1x-2x-3x: Zoom in and out of the XPoint grid.

Help Menu

How To...: Opens help hints text file.

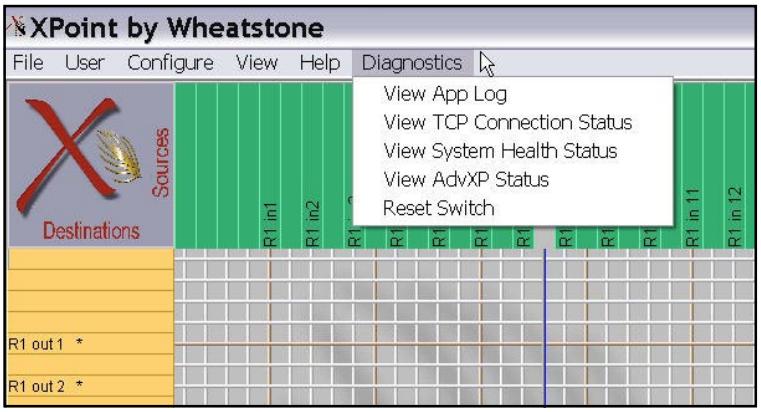
About: Shows XPoint software revision.

Diagnostics Menu

View App Log: Opens the network communications activity log. You can save the log to a file for technical support purposes.

View TCP Connection Status: Opens a window displaying TCP/IP connection status for the router and all surfaces.

View System Health Status: Lists all NET-8 ports, shows partner IOC or NET-75 panels and CAT5 link status. Reveals intermittent or broken cabling and devices.

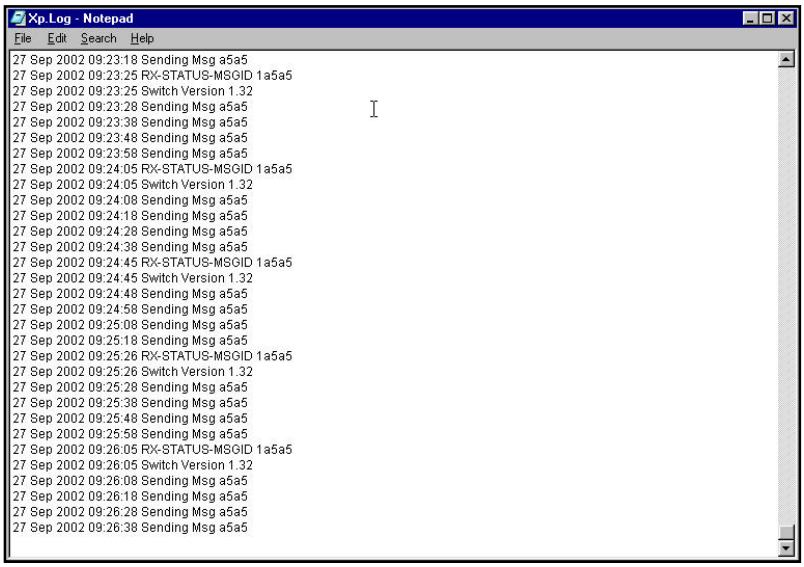


View AdvXP Status: Lists all active installed hardware, card firmware revisions.

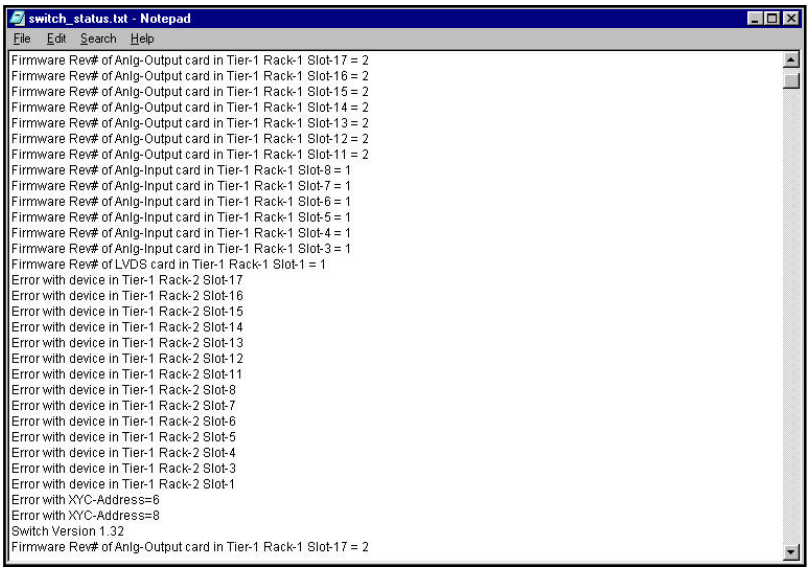
Reset Switch: Initiates a Host CPU reboot. Use this function with caution!

Diagnostics Menu Examples

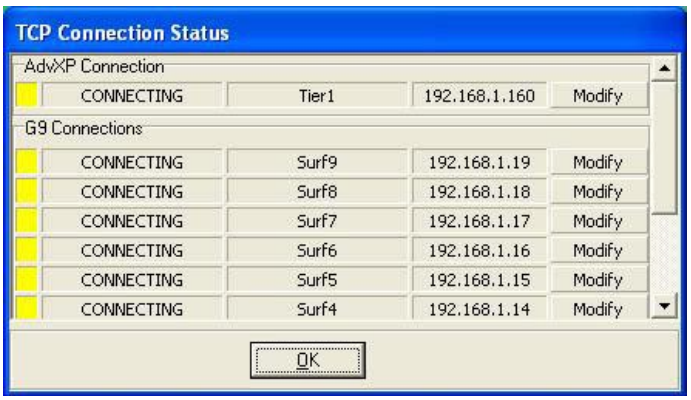
View App Log Form:



View AdvXP Status Form:

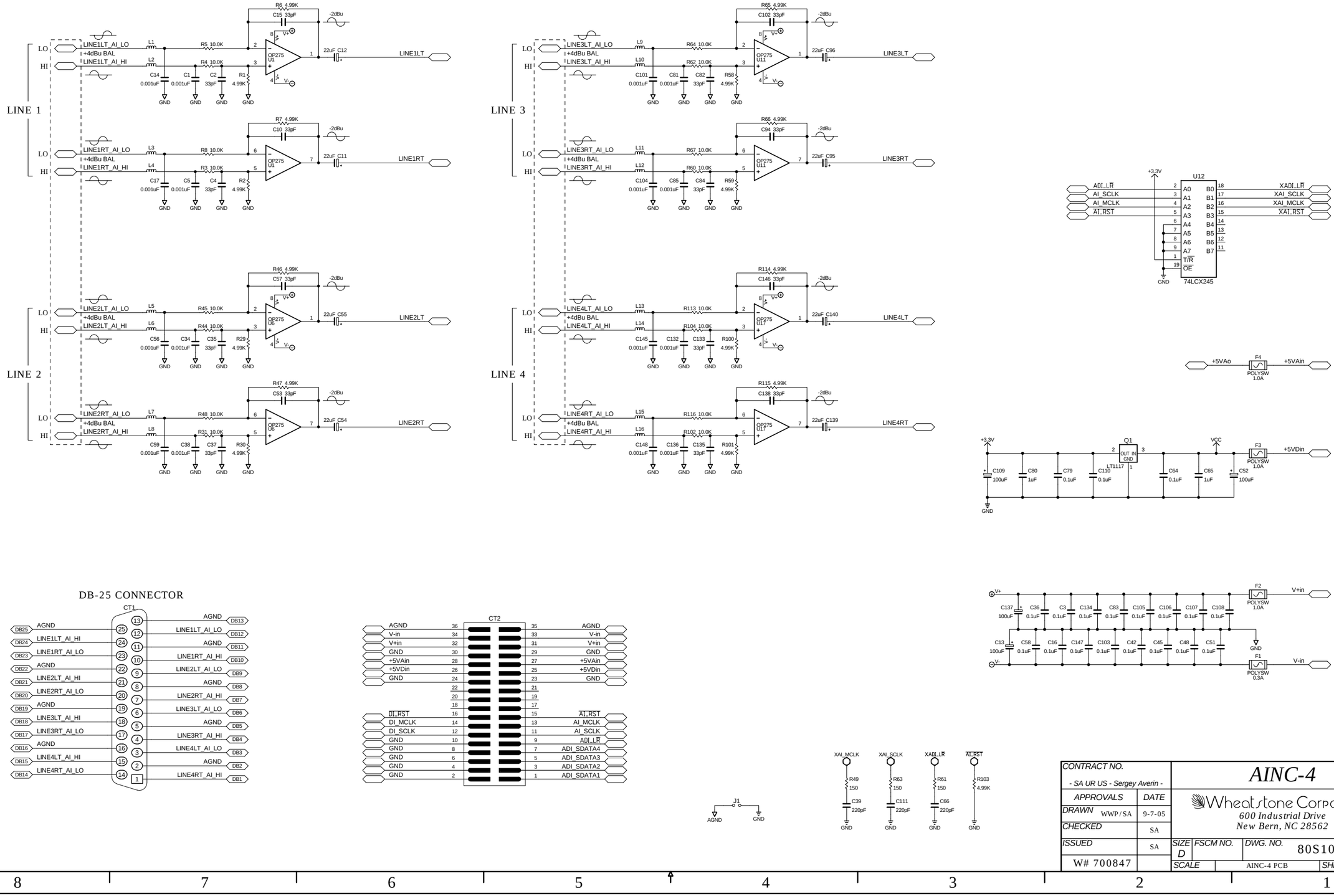


View TCP Form:

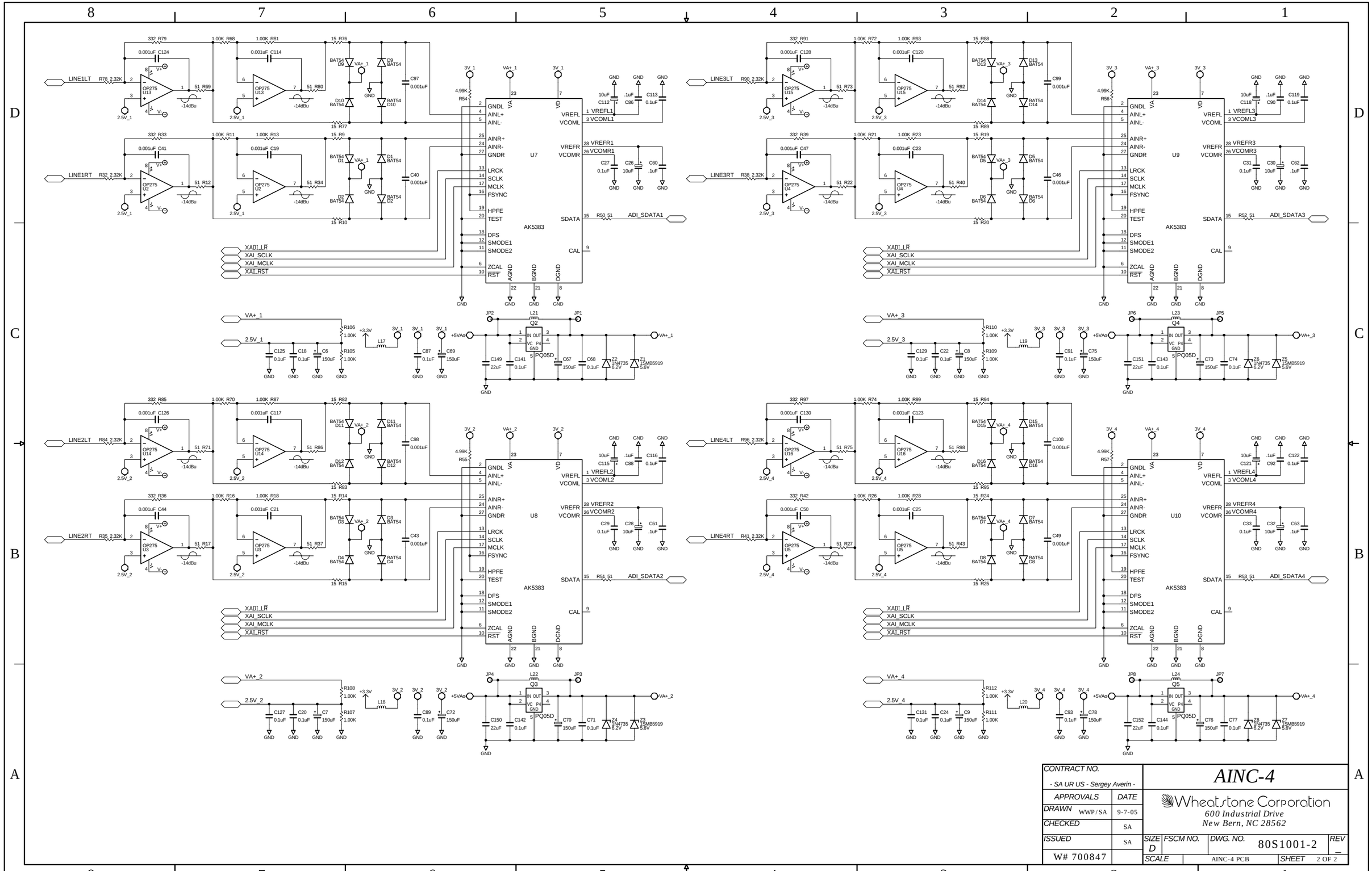


I/O Schematic Drawings

Chapter Contents



CONTRACT NO.	AINC-4
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN WWP/SA 9-7-05	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D / FSCM NO. / DWG. NO. 80S1001-1 / REV --
W# 700847	SCALE AINC-4 PCB / SHEET 1 OF 2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LINE1RT
LINE2LT
LINE2RT
LINE3LT
LINE3RT
LINE4LT
LINE4RT
OP275
AK5383
U7
U8
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U13
U2
U3
U14
U15
U4
U5
U16
XADI_LR
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XAI_MCLK
XAI_RST
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ADI_SDATA2
ADI_SDATA3
ADI_SDATA4
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Q2
Q3
Q4
Q5
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- SA UR US - Sergey Averin -
APPROVALS
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ISSUED SA
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New Bern, NC 28562
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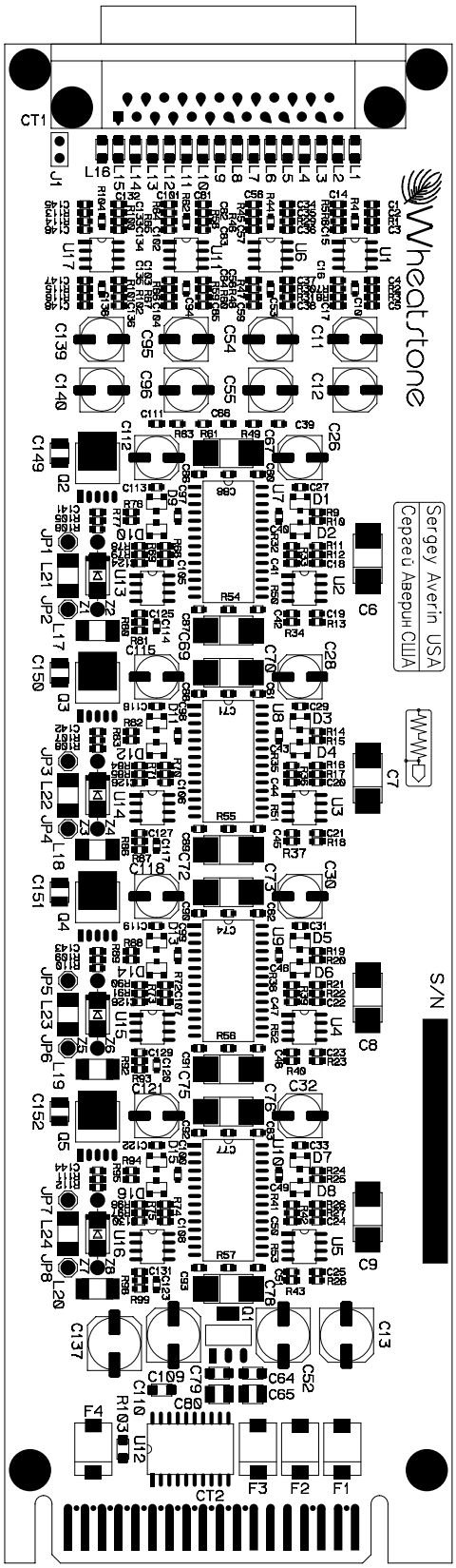
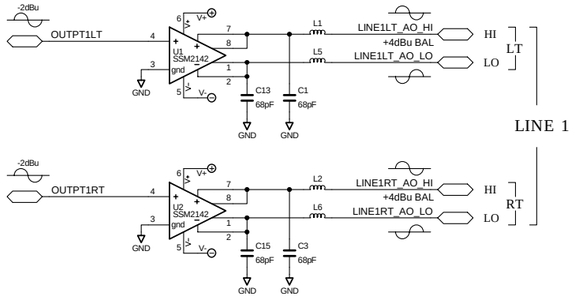
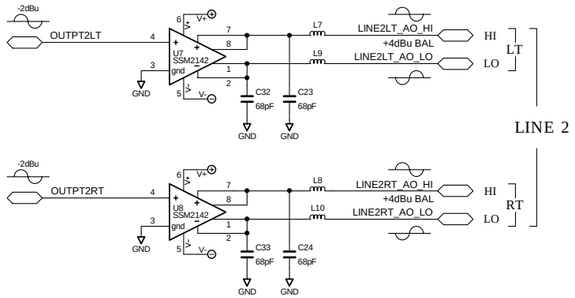
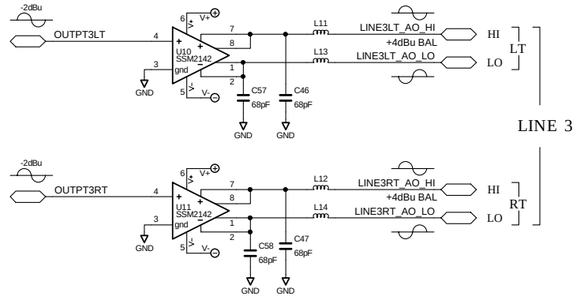
REV _
SCALE
AINC-4 PCB
SHEET 2 OF 2

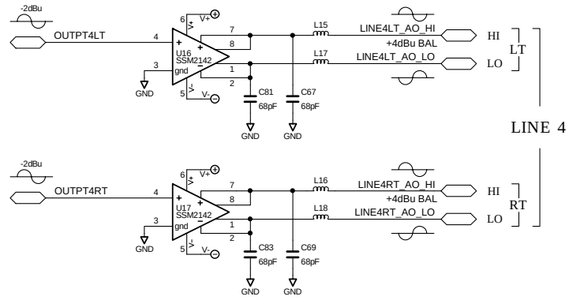


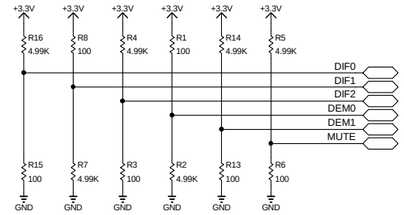
4 Analog Inputs Network I/O Center (AINC-4) - Load Sheet

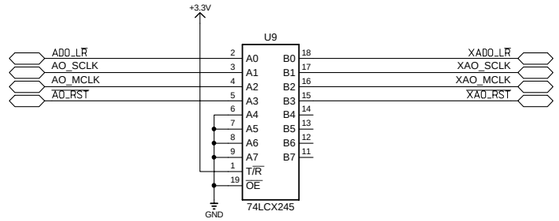


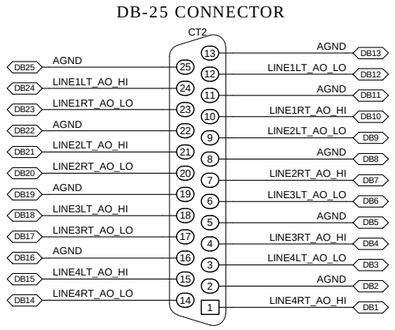


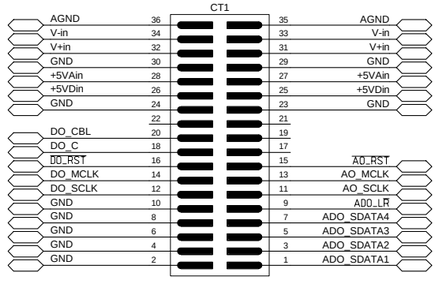


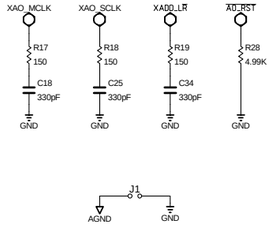


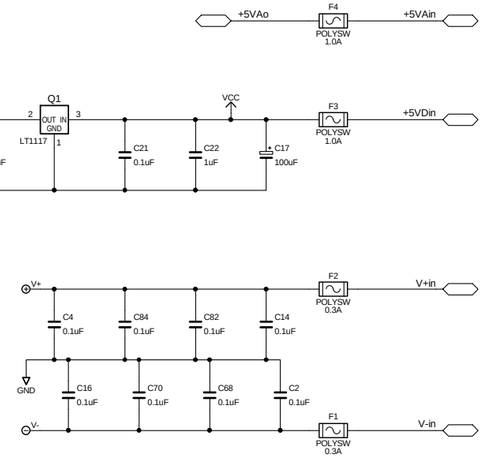




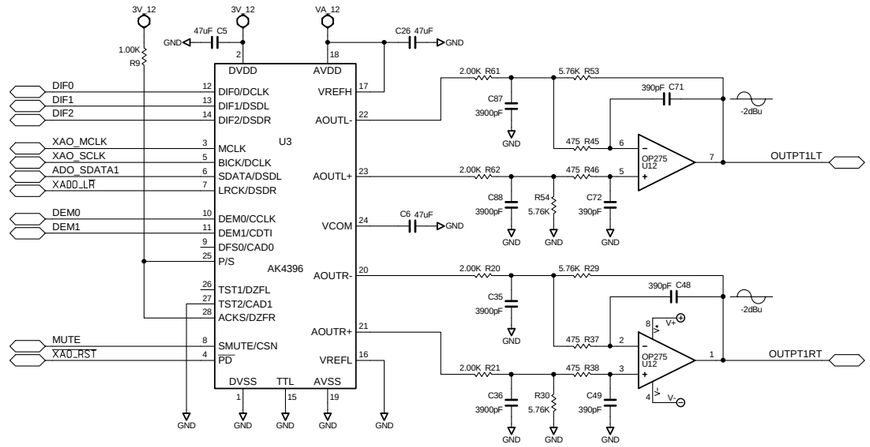


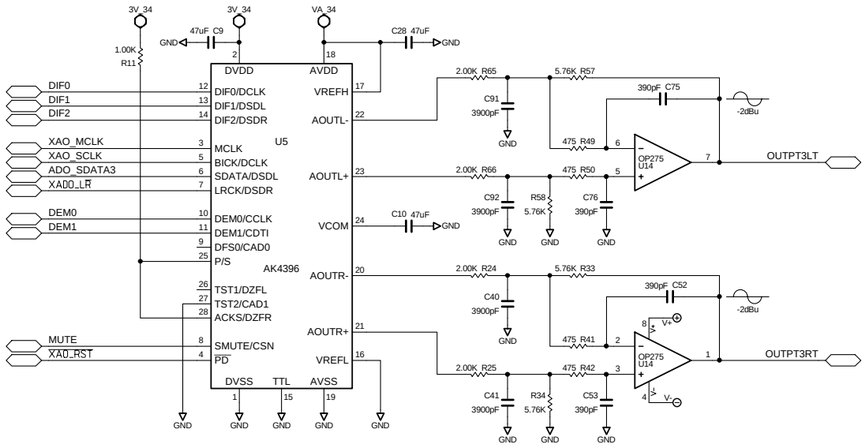


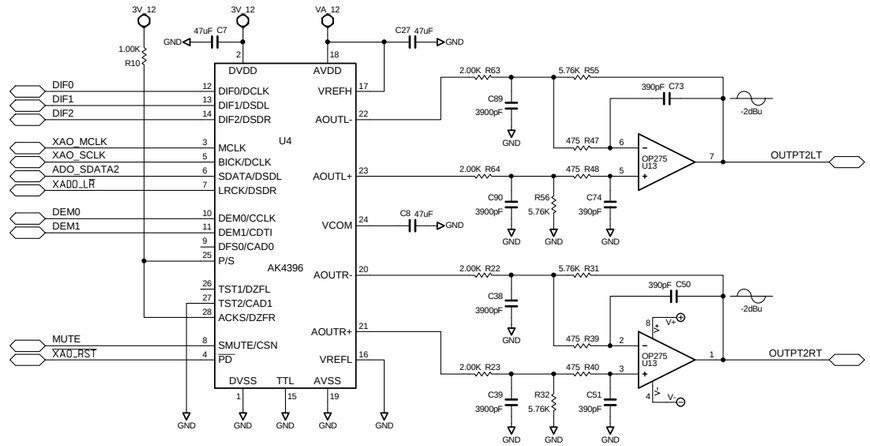


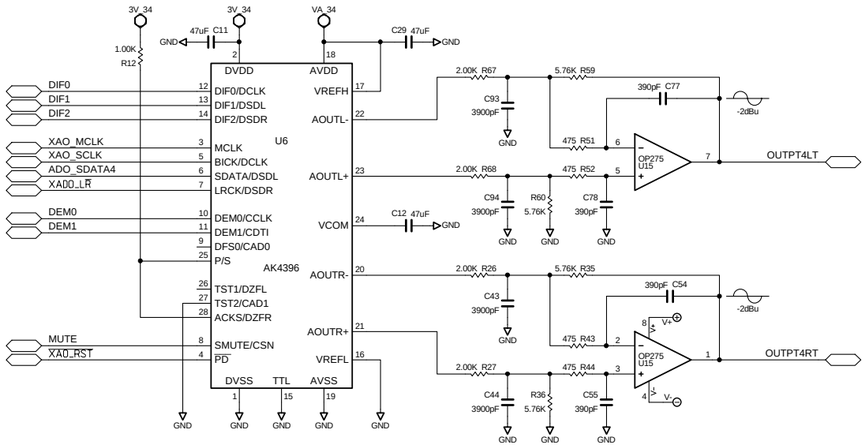


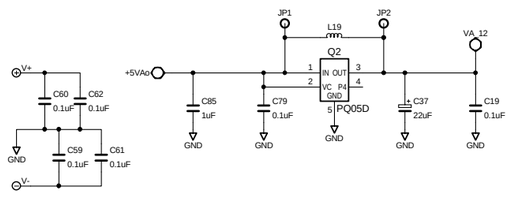
CONTRACT NO. - SA UR US - Sergey Averin -		AONC-4
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN WWP/SA	1-29-07	
CHECKED	SA	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1002-1 / REV A
W# 700848		SCALE AONC-4A PCB / SHEET 1 OF 2

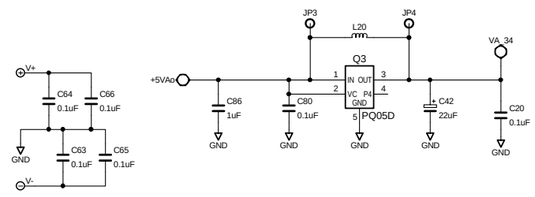




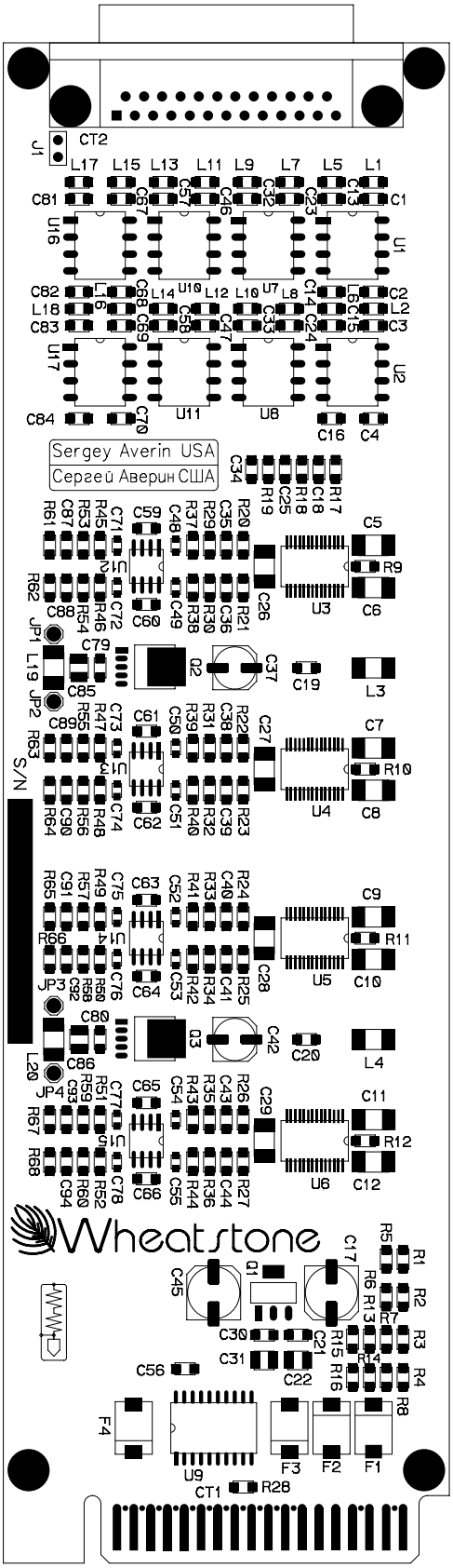




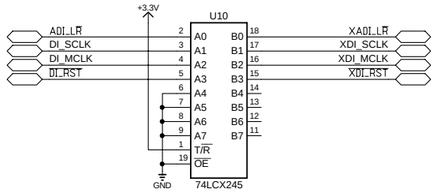


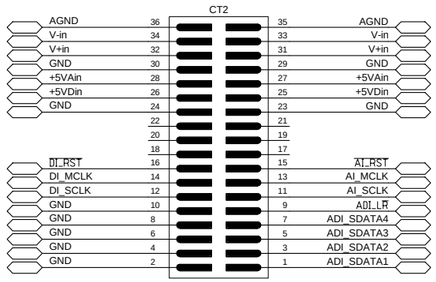


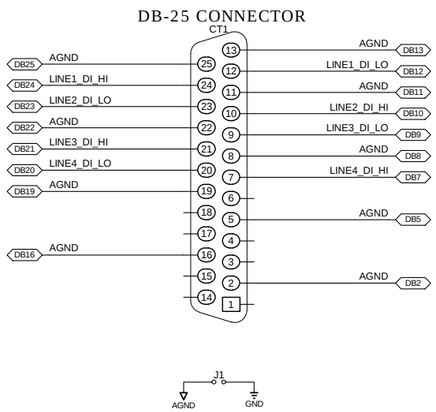
CONTRACT NO. - SA UR US - Sergey Averin -		AONC-4
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN WWP/SA	1-29-07	
CHECKED	SA	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1002-2 / REV A
W# 700848		SCALE / AONC-4A PCB / SHEET 2 OF 2

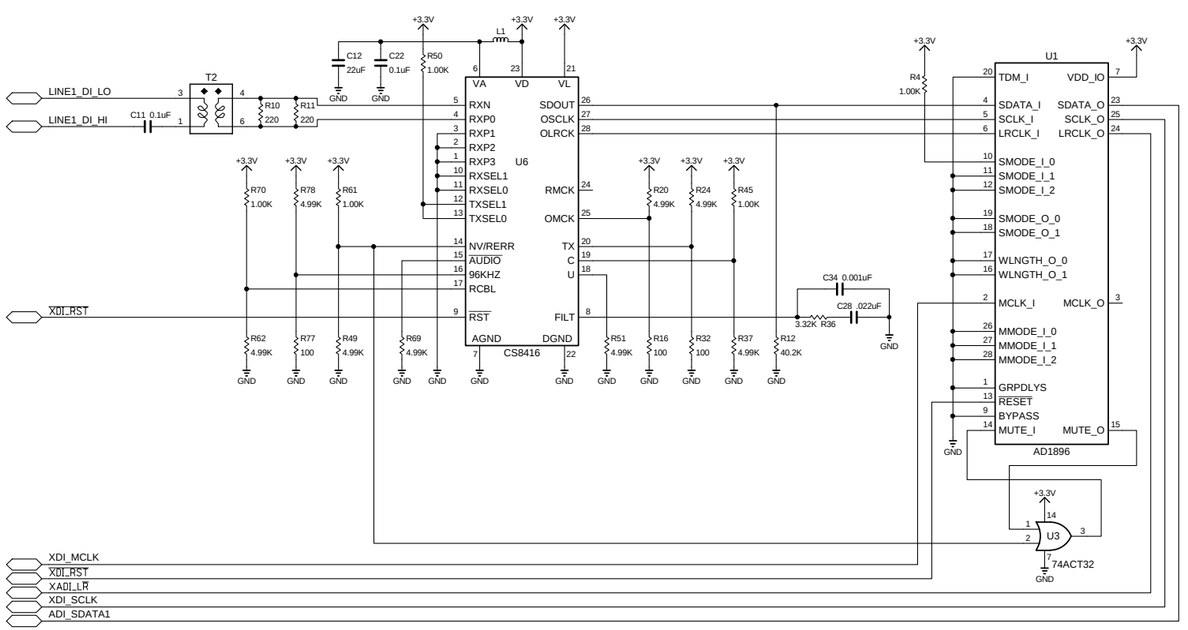


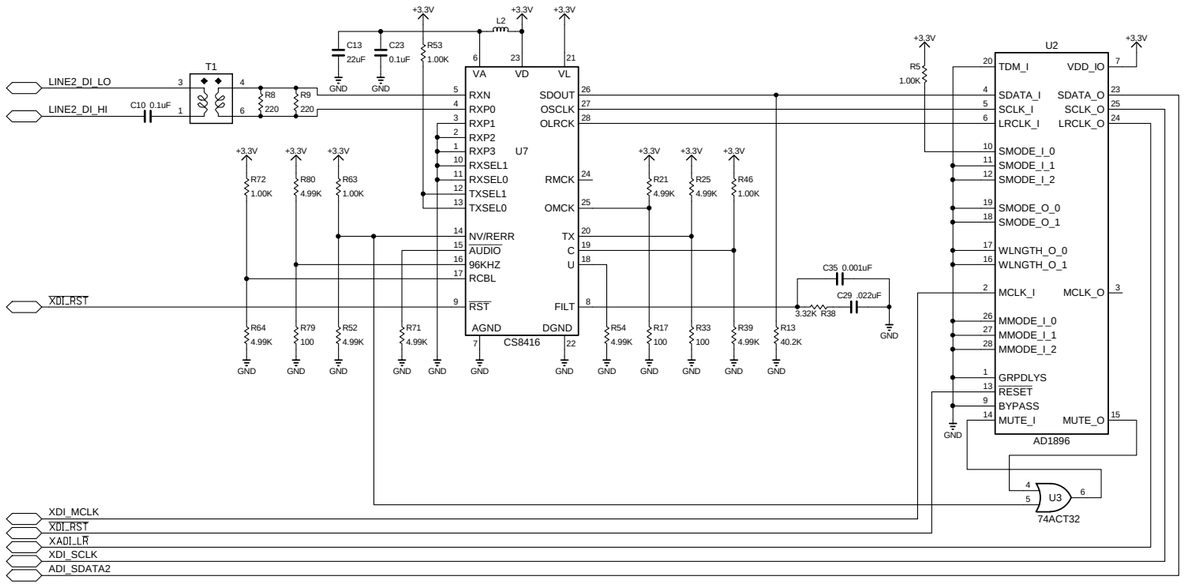
4 Analog Outputs Network I/O Center (AONC-4) - Load Sheet

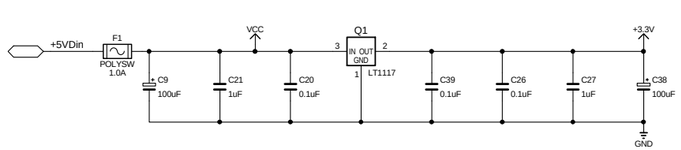


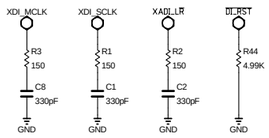




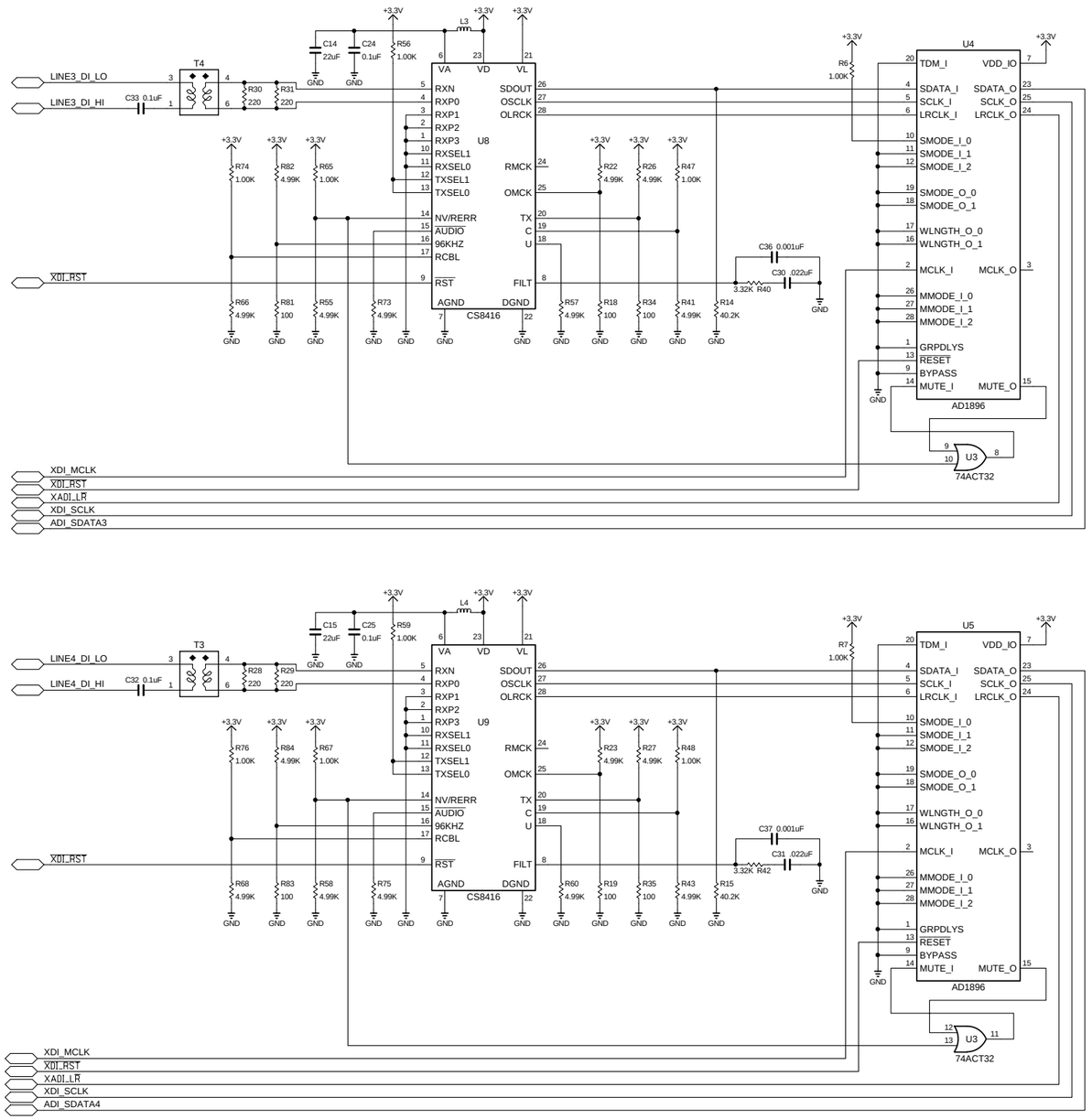




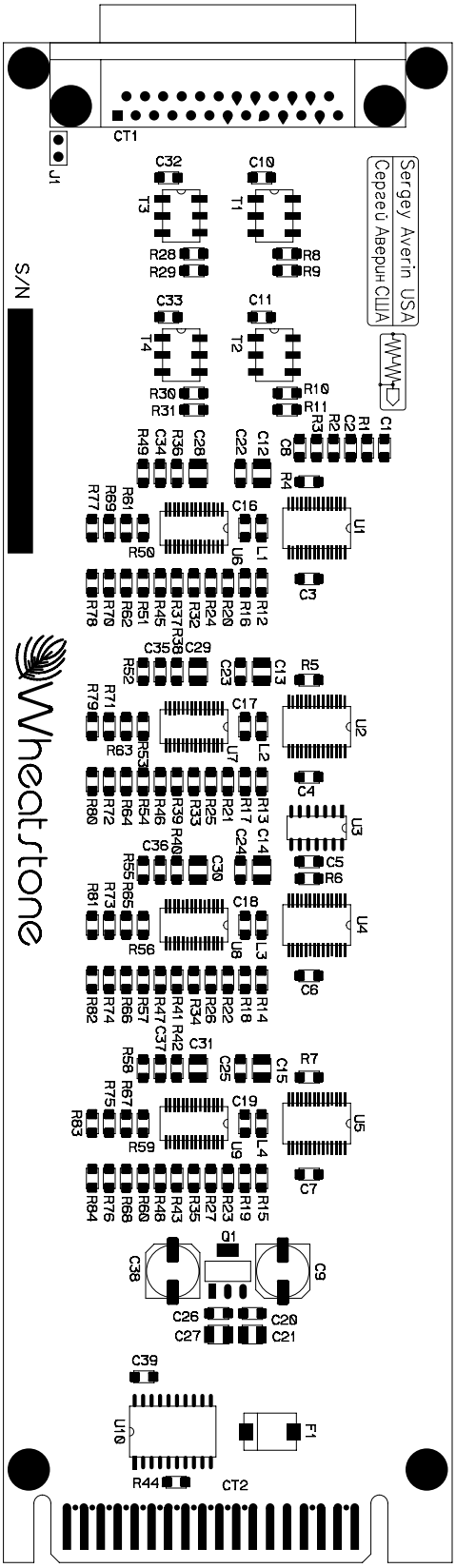




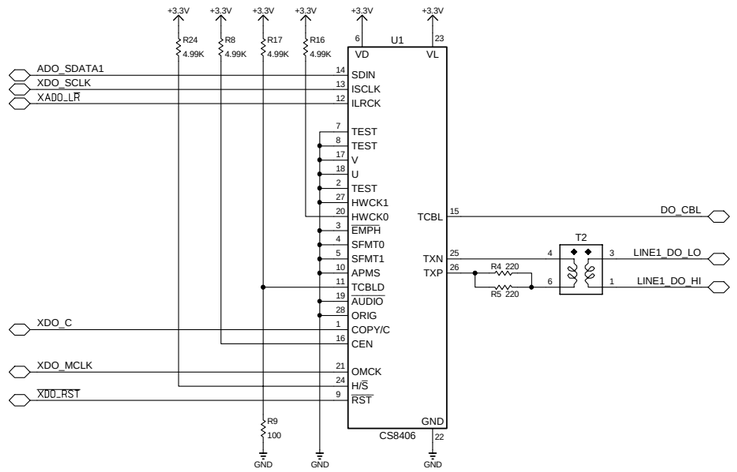
CONTRACT NO. - SA UR US - Sergey Averin -		DINC-4
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562
DRAWN WWP/SA	9-21-06	
CHECKED	SA	
ISSUED	SA	
W# 700849		SIZE D · FSCM NO. · DWG. NO. 80S1003-1 · REV A SCALE · DINC-4A PCB · SHEET 1 OF 2

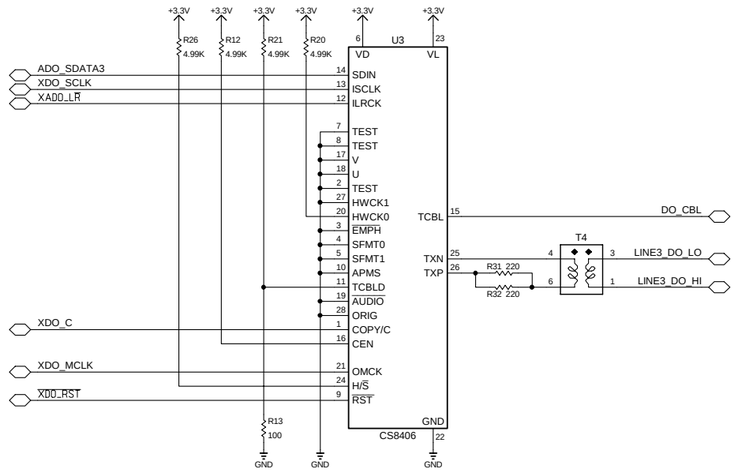


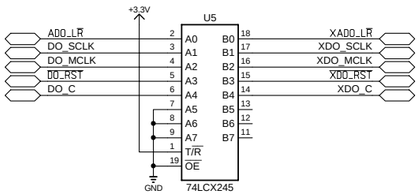
CONTRACT NO.		DINC-4
- SA UR US - Sergey Averin -		
APPROVALS	DATE	Wheatstone Corporation
DRAWN WWP/SA	9-21-06	600 Industrial Drive, New Bern, NC 28562
CHECKED	SA	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1003-2 / REV A
W# 700849		SCALE / DINC-4A PCB / SHEET 2 OF 2

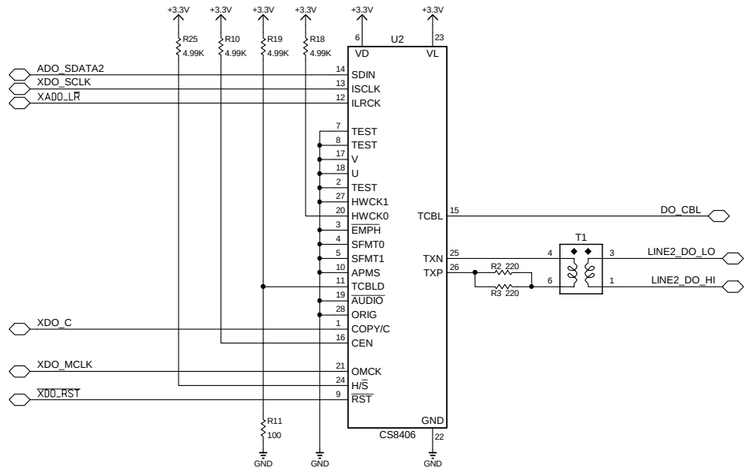


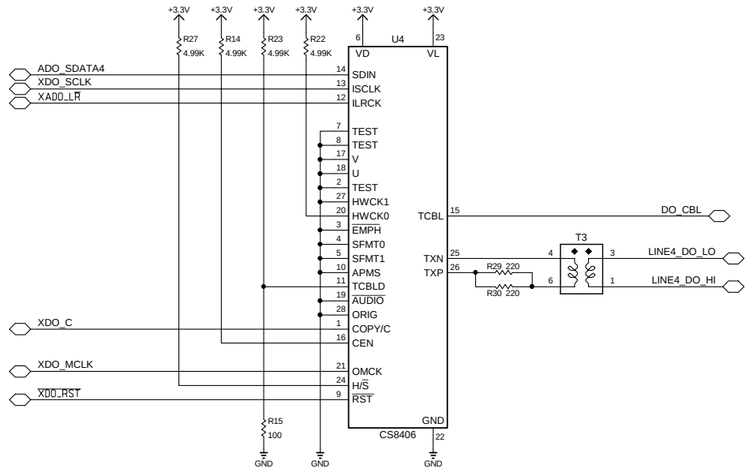
4 Digital Inputs Network I/O Center (DINC-4) - Load Sheet

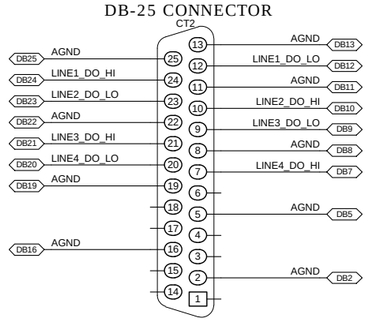


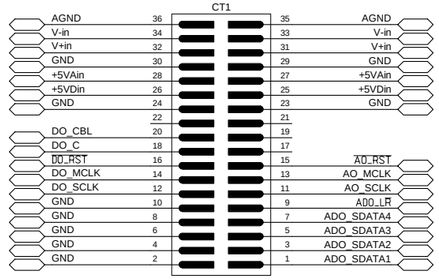


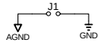


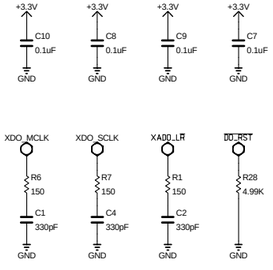


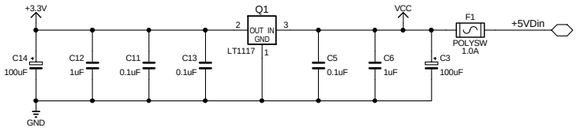




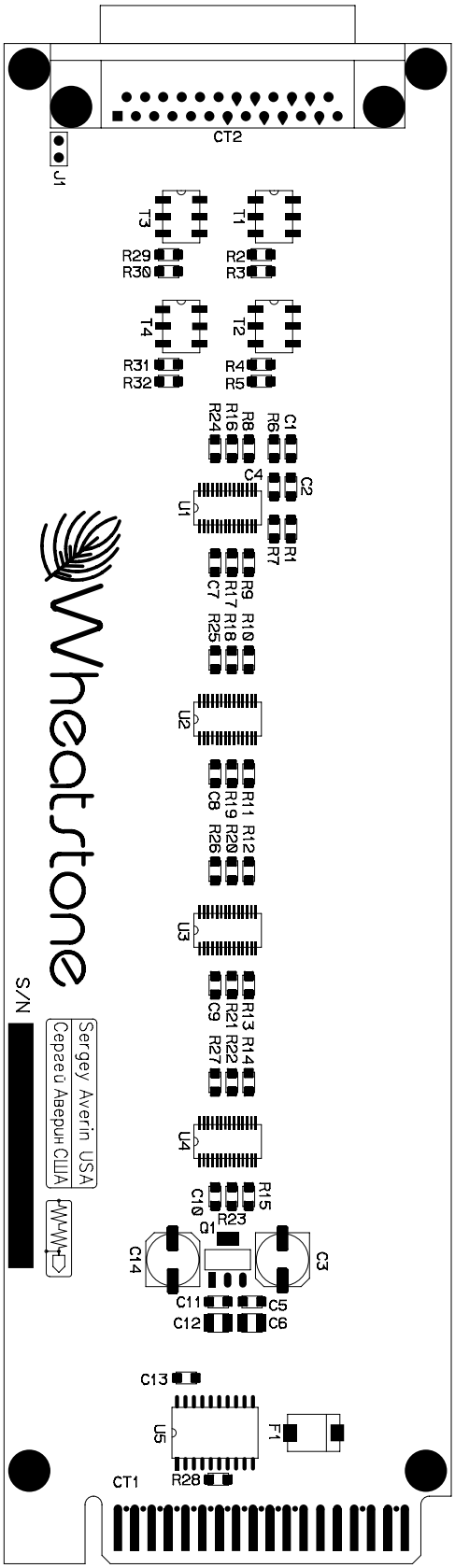






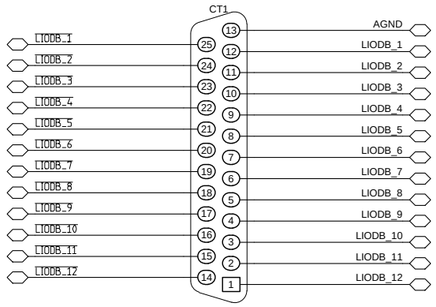


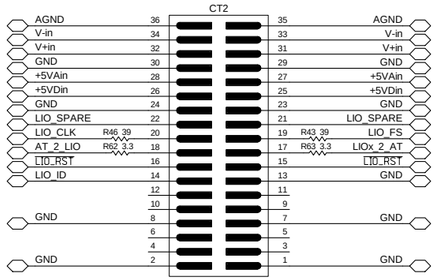
CONTRACT NO. - SA UR US - Sergey Averin -		DONC-4	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN WWP / SA	9-5-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1004 / REV A	
W# 700850		SCALE DONC-4A PCB / SHEET 1 OF 1	

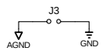


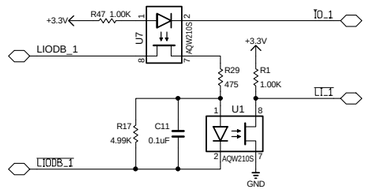
4 Digital Outputs Network I/O Center (DONC-4) - Load Sheet

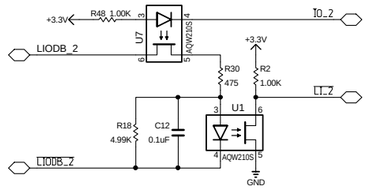
DB-25 CONNECTOR

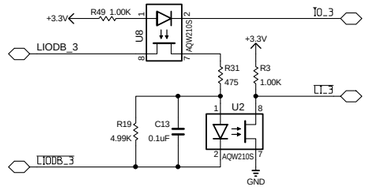


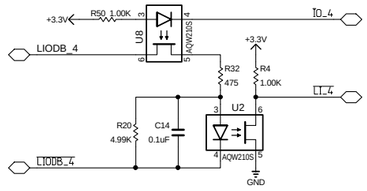


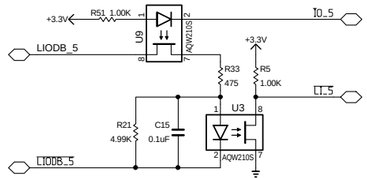


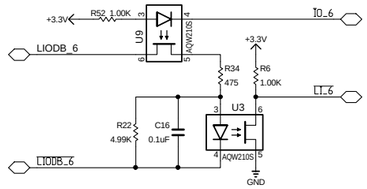


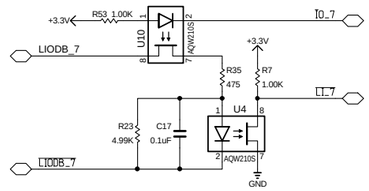


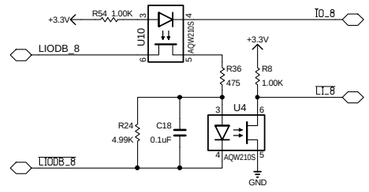


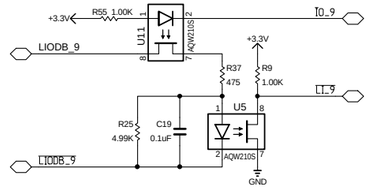


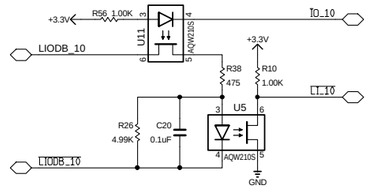


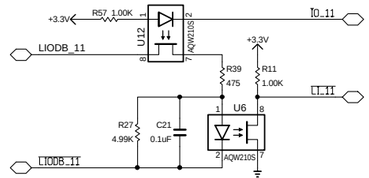


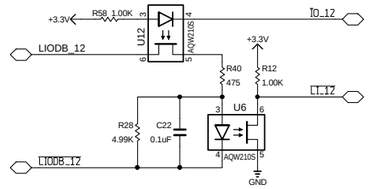


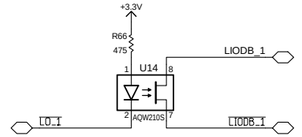


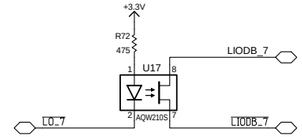


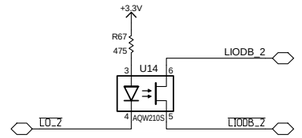


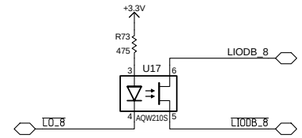


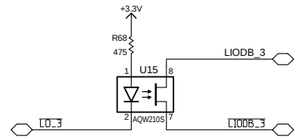


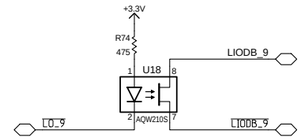


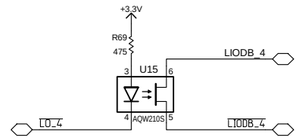


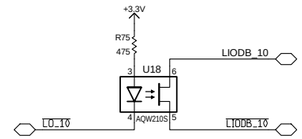


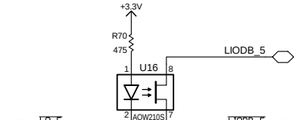


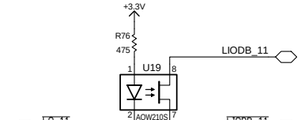


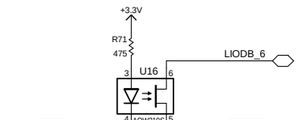


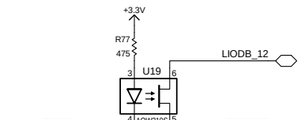


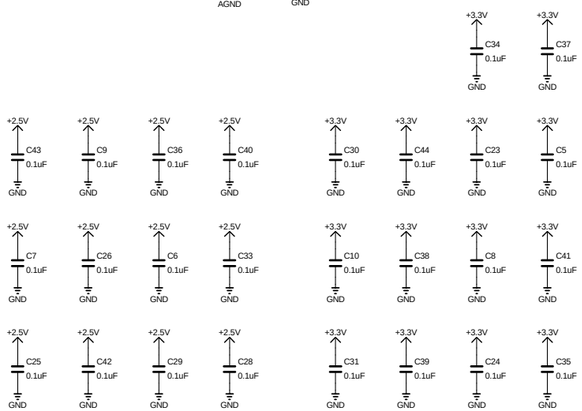


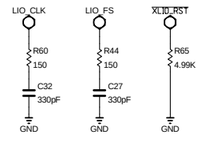


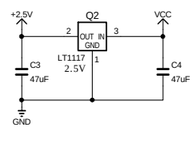


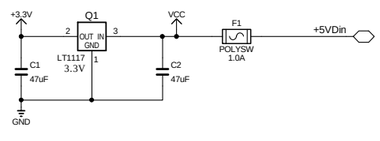












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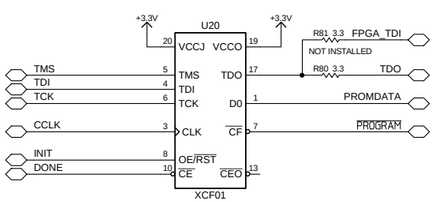
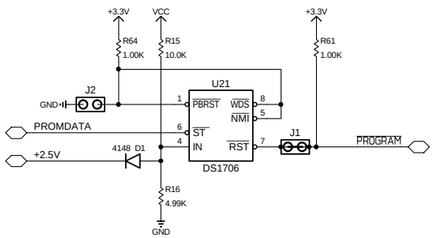
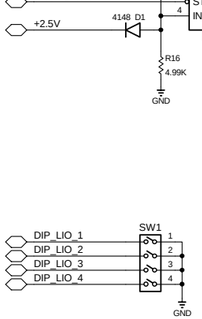
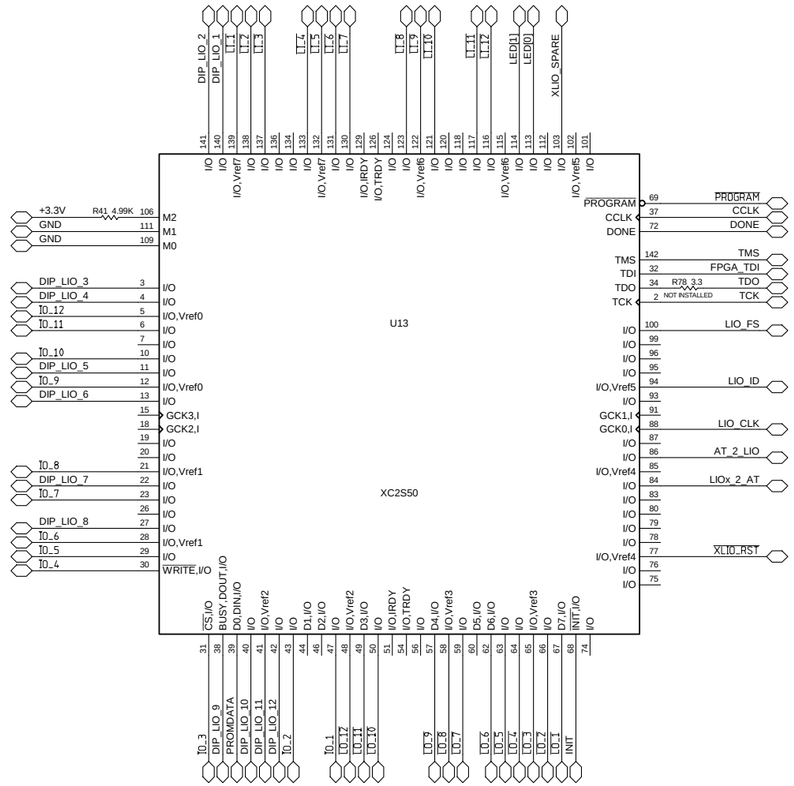
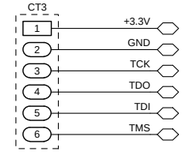
- SA UR US - Sergey Averin -		
APPROVALS	DATE	Wheatstone Corporation
DRAWN WWP/SA	9-12-06	600 Industrial Drive
CHECKED	SA	New Bern, NC 28562
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1007 / REV B
W# 700853		SCALE LIONC-12B PCB / SHEET 1 OF 2

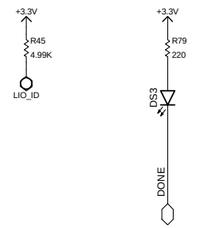




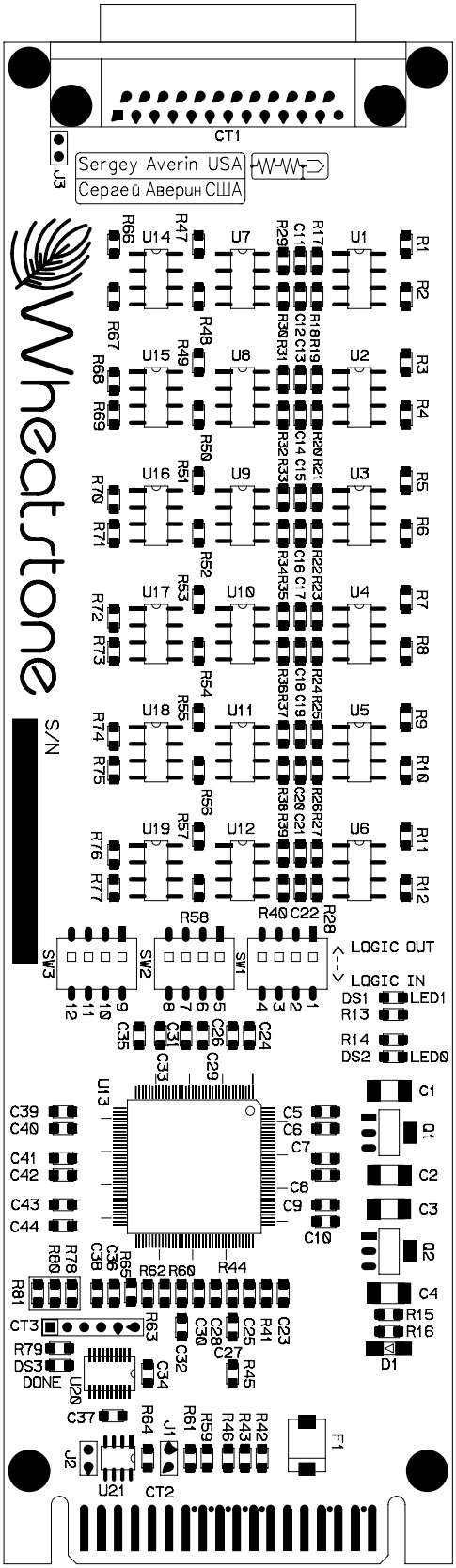




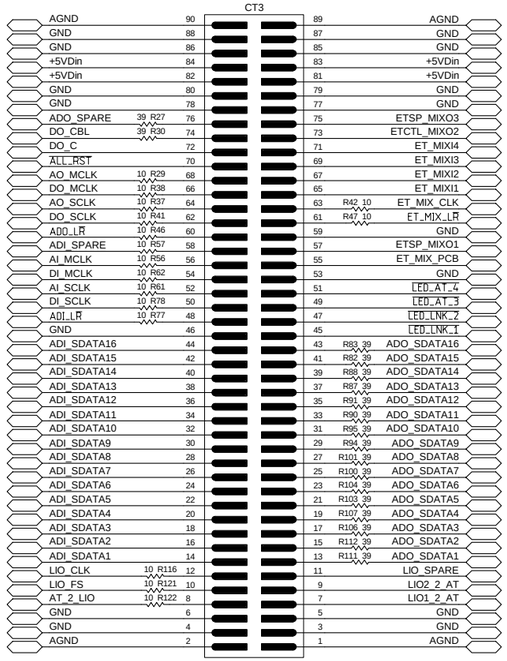


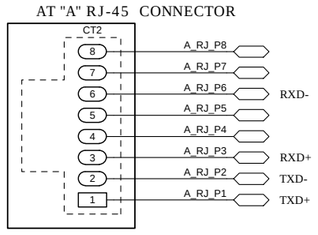


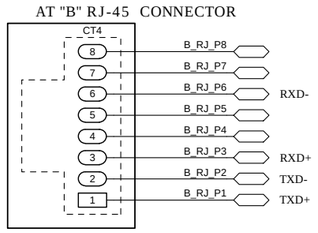
CONTRACT NO. - SA UR US - Sergey Averin -		LIONC-12	
APPROVALS	DATE	Wheatstone Corporation 600 Industrial Drive New Bern, NC 28562	
DRAWN WWP/SA	9-12-06		
CHECKED	SA		
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1007 / REV B	
W# 700853		SCALE / LIONC-12B PCB / SHEET 2 OF 2	

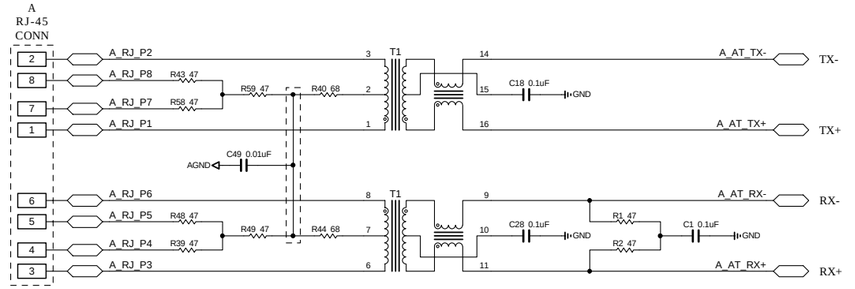


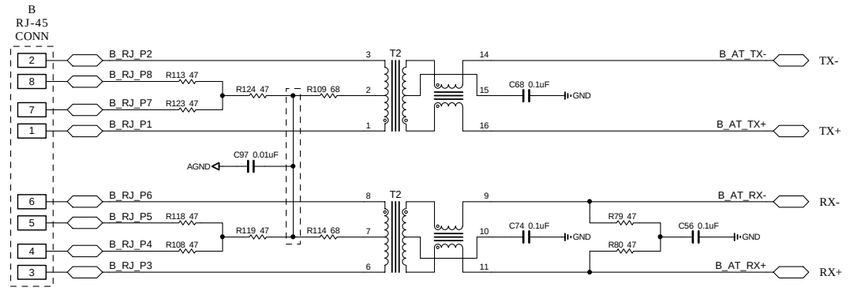
Logic Interface Network I/O Center (LIONC-12) - Load Sheet

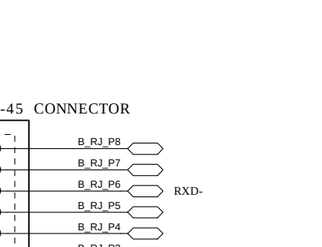












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- SA UR US - Sergey Averin -			
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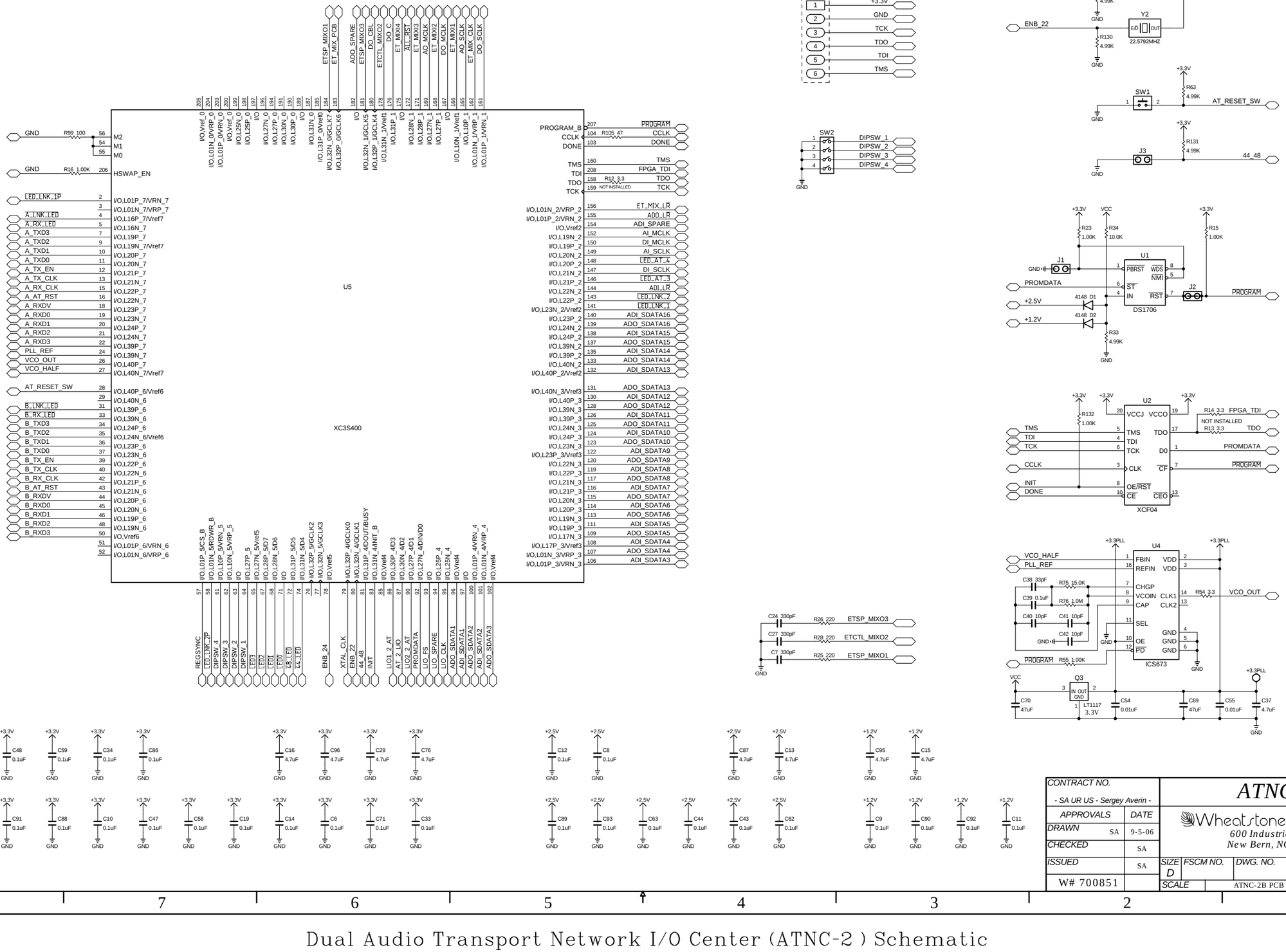
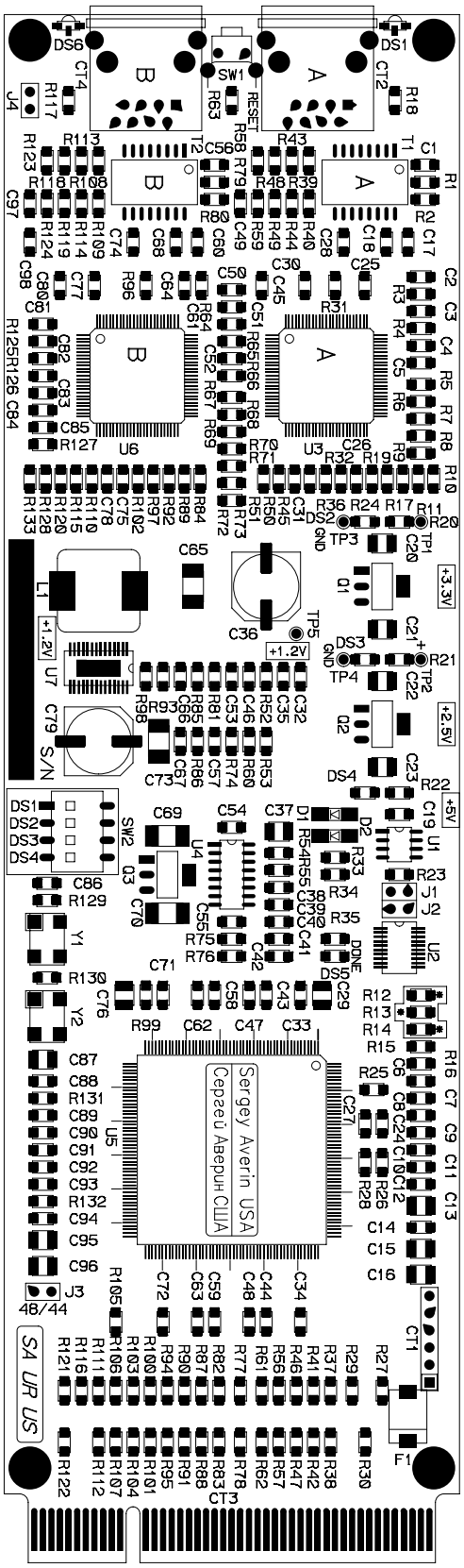
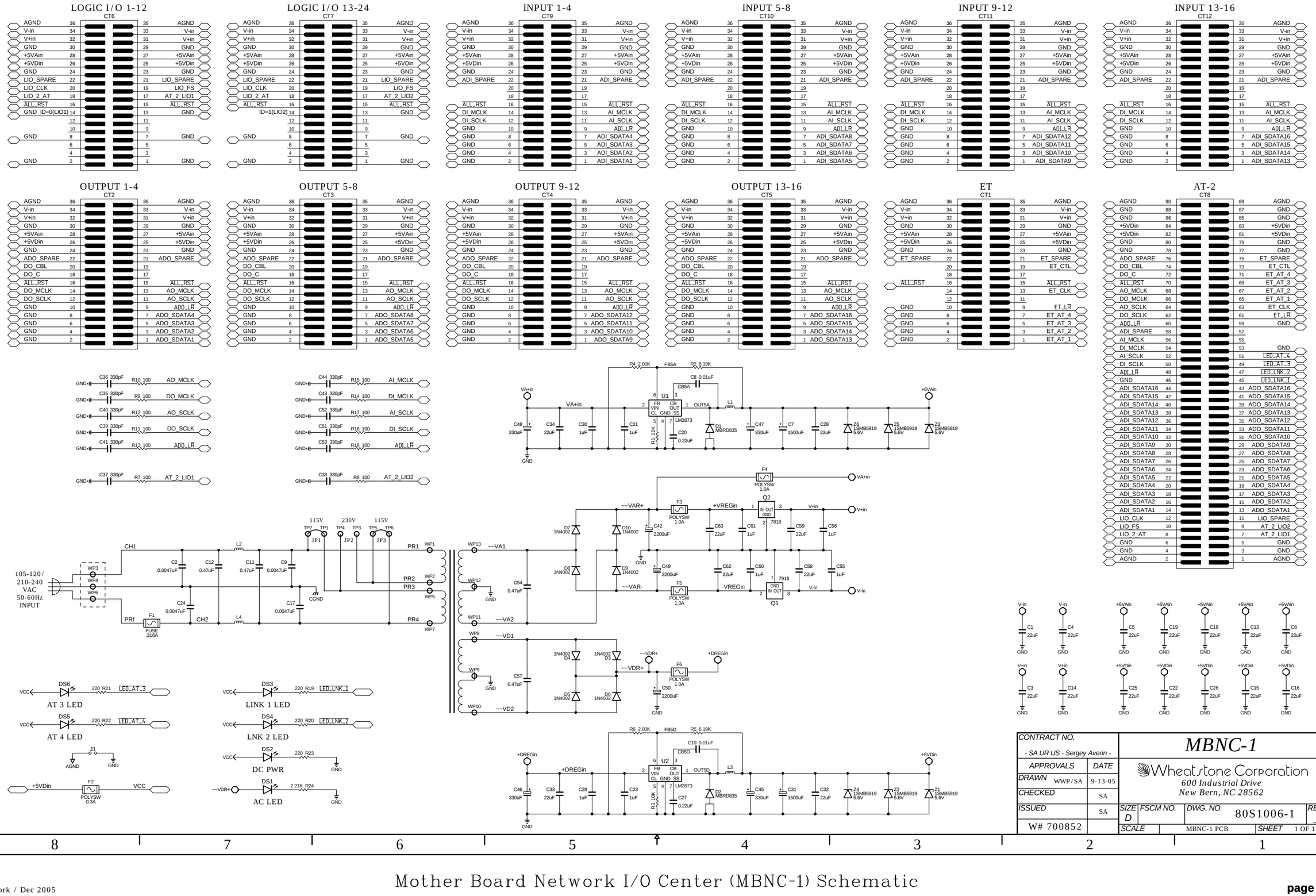
DRAWN	SA 9-5-06	600 Industrial Drive	
CHECKED	SA	New Bern, NC 28562	
ISSUED	SA	SIZE D / FSCM NO. / DWG. NO. 80S1005-1 / REV B	
W# 700851		SCALE ATNC-2B PCB / SHEET 1 OF 3	

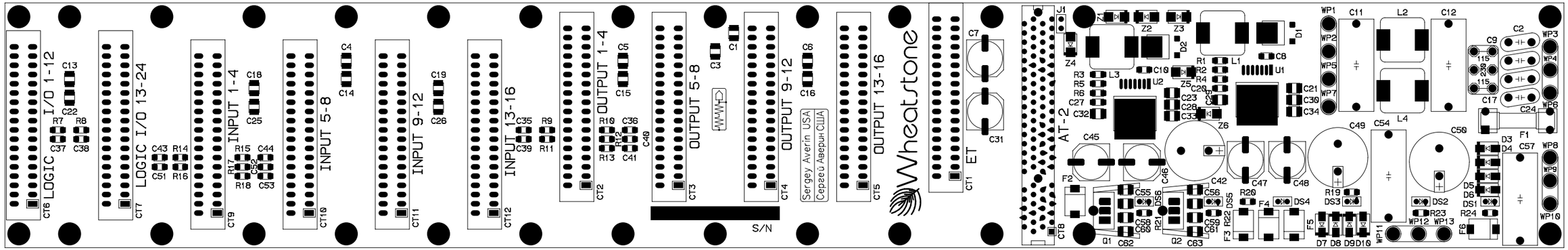


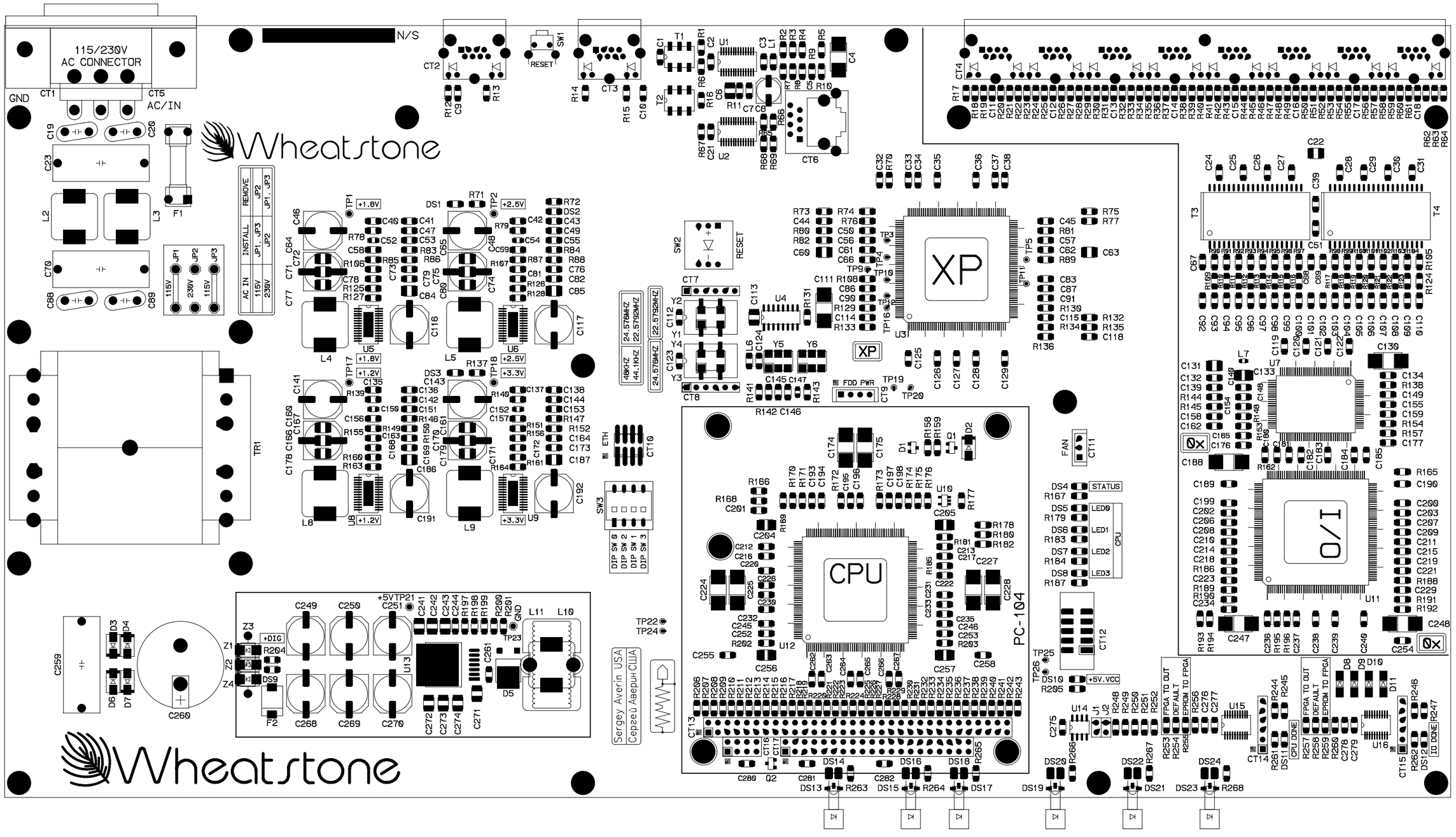
CONTRACT NO.	ATNC-2
- SA UR US - Sergey Averin -	
APPROVALS / DATE	Wheatstone Corporation
DRAWN SA 9-5-06	600 Industrial Drive
CHECKED SA	New Bern, NC 28562
ISSUED SA	SIZE D · FSCM NO. · DWG. NO. 80S1005-2 · REV B
W# 700851	SCALE · ATNC-2B PCB · SHEET 2 OF 3

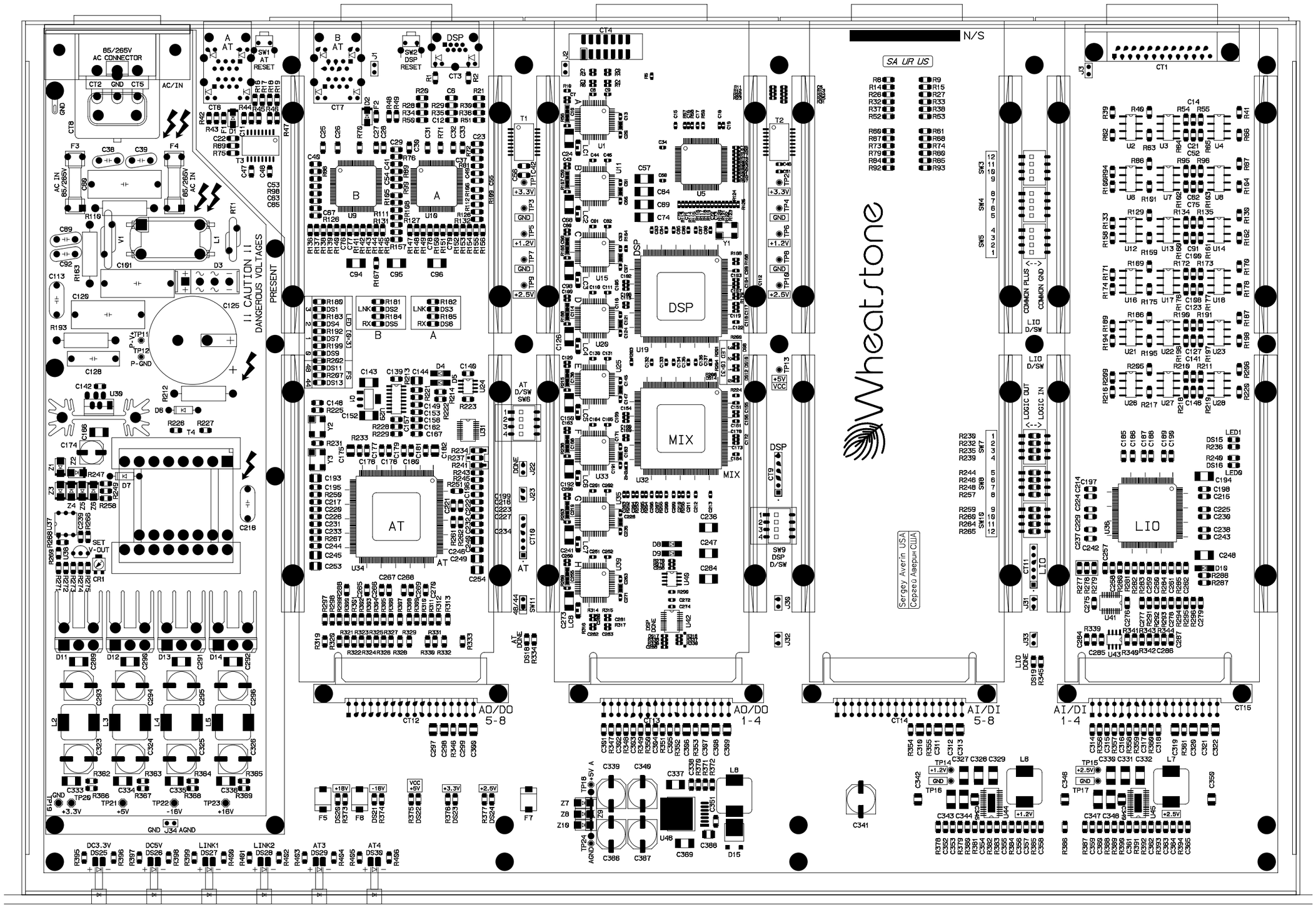


Dual Audio Transport Network I/O Center (ATNC-2) - Load Sheet


LOGIC I/O 1-12
CT6
LOGIC I/O 13-24
CT7
INPUT 1-4
CT9
INPUT 5-8
CT10
INPUT 9-12
CT11
INPUT 13-16
CT12
OUTPUT 1-4
CT2
OUTPUT 5-8
CT3
OUTPUT 9-12
CT4
OUTPUT 13-16
CT5
ET
CT1
AT-2
CT8
AGND
V-in
V+in
GND
+5VAin
+5VDin
LIO_SPARE
LIO_CLK
LIO_2_AT
ALL_RST
GND ID=0(LIO1)
ID=1(LIO2)
LIO_FS
AT_2_LIO1
AT_2_LIO2
DI_MCLK
DI_SCLK
AI_MCLK
AI_SCLK
ADJ_LR
ADI_SDATA1
ADI_SDATA2
ADI_SDATA3
ADI_SDATA4
ADI_SDATA5
ADI_SDATA6
ADI_SDATA7
ADI_SDATA8
ADI_SDATA9
ADI_SDATA10
ADI_SDATA11
ADI_SDATA12
ADI_SDATA13
ADI_SDATA14
ADI_SDATA15
ADI_SDATA16
ADO_SPARE
DO_CBL
DO_C
DO_MCLK
DO_SCLK
AO_MCLK
AO_SCLK
ADO_LR
ADO_SDATA1
ADO_SDATA2
ADO_SDATA3
ADO_SDATA4
ADO_SDATA5
ADO_SDATA6
ADO_SDATA7
ADO_SDATA8
ADO_SDATA9
ADO_SDATA10
ADO_SDATA11
ADO_SDATA12
ADO_SDATA13
ADO_SDATA14
ADO_SDATA15
ADO_SDATA16
ET_SPARE
ET_CTL
ET_CLK
ET_LR
ET_AT_1
ET_AT_2
ET_AT_3
ET_AT_4
LED_AT_3
LED_AT_4
LED_LNK_1
LED_LNK_2
AO_MCLK
DO_MCLK
AO_SCLK
DO_SCLK
ADO_LR
AI_MCLK
DI_MCLK
AI_SCLK
DI_SCLK
ADI_LR
AT_2_LIO1
AT_2_LIO2
105-120/
210-240
VAC
50-60Hz
INPUT
115V
230V
115V
JP1
JP2
JP3
CH1
CH2
PRf
PR1
PR2
PR3
PR4
CGND
FUSE
.316A
POLYSW
1.0A
POLYSW
0.3A
LM2673
MBRD835
TSMB5919
5.6V
7818
7918
Q1
Q2
AT 3 LED
AT 4 LED
LINK 1 LED
LNK 2 LED
DC PWR
AC LED
+DREGin
-VDR+
-VAR+
-VAR-
~~VA1
~~VA2
~~VD1
~~VD2
+VREGin
-VREGin
VA+in
+5VDin
+5VAin
+DREGin
CONTRACT NO.
- SA UR US - Sergey Averin -
APPROVALS
DATE
DRAWN WWP/SA 9-13-05
CHECKED SA
ISSUED SA
W# 700852
MBNC-1
Wheatstone Corporation
600 Industrial Drive
New Bern, NC 28562
SIZE D
FSCM NO.
DWG. NO. 80S1006-1
REV —
SCALE
MBNC-1 PCB
SHEET 1 OF 1


I/O 1-12
LOGIC I/O 13-24
INPUT 1-4
INPUT 5-8
INPUT 9-12
INPUT 13-16
OUTPUT 1-4
OUTPUT 5-8
OUTPUT 9-12
OUTPUT 13-16
ET
AT-2
S/N
Sergey Averin USA
Сергей Аверин США


115/230V
AC CONNECTOR
GND
CT1
CT5
AC/IN
N/S
Wheatstone
INSTALL
REMOVE
AC IN
115V
230V
JP1, JP3
JP2
JP1
JP2
JP3
115V
230V
115V
TR1
RESET
SW1
SW2
SW3
CT2
CT3
CT4
CT6
CT7
CT8
CT10
CT11
CT12
CT13
CT14
CT15
CT16
CT17
T1
T2
T3
T4
U1
U2
U3
U4
U5
U6
U7
U8
U9
U10
U11
U12
U13
U14
U15
U16
XP
CPU
I/O
PC-104
FDD PWR
FAN
STATUS
LED0
LED1
LED2
LED3
CPU
+1.8V
+2.5V
+1.2V
+3.3V
+5V
+5V.VCC
+DIG
24.576MHZ
22.5792MHZ
48KHZ
44.1KHZ
DIP SW 0
DIP SW 1
DIP SW 2
DIP SW 3
FPGA TO OUT
DEFAULT
EPROM TO FPGA
CPU DONE
IO DONE
Sergey Averin USA
Сергей Аверин США



Micro Satellite Main Card (MCS-8) - Load Sheet

Glossary

The terminology used in this manual is defined as follows.

- ***Channel*** - A single, monaural audio stream. The IOC-16 can switch up to 32 discrete inputs to 32 discrete outputs (16 x 16 stereo) per tier.
- ***Signal*** - Information from a single audio source. A signal may take up one (mono) or two (stereo) channels.
- ***Chassis or Rack*** - A single unit backplane.
- ***GUI*** *(pronounced "goo-eee")* - refers to the Windows XPoint program Graphical User Interface.
- ***XYC GUI*** - refers to the XPoint program running in XY controller mode.
- ***Slot*** - A position within a rack where a single card is located.
- ***Tier*** - The IOC-16 is based on advanced X-Point software that support multiple hardware levels called Tiers. While the software supports multiple tiers, the IOC-16 hardware only support one tier.
- ***Salvo*** - A logical grouping of connections that may be made by the operator via a single action (on the Configuration GUI, XYC GUI, or XY Controller).

The following terms apply to Router configuration.

- ***Switch ID*** - A unique identifier assigned to each IOC-16.
- ***Rack ID*** - The physical chassis ID number.
- ***Slot ID*** - The physical slot number in each chassis (numbered from 1-12).
- ***Channel ID*** - Channel IDs within a chassis run from 0-32. Input Channel IDs are assigned directly to the input devices. Output Channel IDs are assigned directly to the output devices.
- ***Signal Type*** - Each input and output in the IOC-16 is associated with a type of signal, either mono or stereo. The importance of this information at configuration time is the number of channels each signal consumes. Mono signals use 1 channel and stereo signals use 2.

Appendices

Appendix 1

Appendix 2

Appendix 1

Contents

Configuring System IP Addresses

Caution! Your system has been pre-configured at the factory for a default IP address of 192.168.1.160. Incorrect editing of network files will cause system malfunction. Check the IP address label inside the master rack before making changes. Please consult Wheatstone support if you are having trouble connecting your system to a network.

Overview

In order to communicate to the NET-8 over ethernet, appropriate network parameters must be loaded. Constraints on the router configuration were made to simplify the installation, while still providing the flexibility to connect the router to existing customer networks. They are:

1. The router and any attached GUIs must exist on the same subnet. The router has no ability to route across subnets.

2. If dynamic address allocation is used on the network (e.g. DHCP), the router must be given a "permanent" address allocation. In order to allow the router to run on simple networks or at sites with little system admin support, dynamic address allocation schemes (such as DHCP or BOOTP) were not used to provide an IP address to the router.

Editing Network Parameters

The NET-8 stores its network IP address and subnet information in a simple text file on its flash hard disk. Changing the NET-8's network parameters requires the user to download the xp_net.txt file via FTP from the NET-8, edit as required, then move the edited file back onto the NET-8. Once the editing process is complete, a system re-boot will initialize the new addressing scheme.

Setting up FTP Site Profiles

Typical FTP clients allow the user to create Site Profiles for frequently visited FTP sites. These site profiles store log-on information and site location information that would otherwise have to be entered every time you access the site. The NET-8 is a "site". Required profile information is:

Site Name - identify the CPU you are connecting to (e.g. "NET-8")

IP address of FTP site (NET-8 default 192.168.1.160)

User Name = knockknock (lower case)

Password = whosthere (lower case)

Open the third party FTP application and create a site profile for the NET-8's CPU using the *current* IP address (default is 192.168.1.160).

We recommend the freeware FTP client FTP Surfer by Whisper Technology. Windows Internet Explorer allows FTP, but in our experience it is not the best choice for this file maintenance application.

Editing the Network Text Files

Note: It is very important to save the edited file on your PC. This can help in the event a typo prevents you from connecting after re-boot.

Once connected via FTP to the NET-8's flash hard drive you will see a directory listing of files and an FDOS folder.

- Locate the "xp_net.txt" file in the file list.
- Copy this file to your desktop.
- Edit the IP address(es) and subnet mask as required.
- Locally Save, then Copy the edited xp_net.txt file back onto the router.
- Re-boot the system (Cycle power on the NET-8).
- Change your PC's IP address and the XPoint software IP address via the *Configure-AdvXP Setup* form. The NET-8 CPU and the PC must be on the same subnet.

Sample network text files are included on the next page for reference.

Sample NET-8 CPU Network File

NET-8 CPU - xp_net.txt

```
NAME:HUB                  << 8 Character limit
TIERID:1                  << Do NOT Edit - must match physical Tier location
NUMTIERS:9                << Do NOT Edit
IPADDR1:192.168.1.160     << Edit IP addresses as required
IPADDR2:0.0.0.0           << Do NOT edit addresses 2 - 9
IPADDR3:0.0.0.0
IPADDR4:0.0.0.0
IPADDR5:0.0.0.0
IPADDR6:0.0.0.0
IPADDR7:0.0.0.0
IPADDR8:0.0.0.0
IPADDR9:0.0.0.0
GATEWAY:255.255.255.255   << Do NOT Edit
SUBNET:255.255.255.0      << Edit Subnet mask as required
BCAST:55555               << Do NOT Edit
FAILIP:0.0.0.0            << Do NOT Edit
```

Appendix 2

Contents

For the most part there are no user-replaceable parts in the IOC-16, NET-8 and MCS-8 units. Exceptions are those controls and components that in the course of normal use may need maintenance. A complete list of available components follows. Contact Audioarts technical support for further information.

Wheatstone Corporation (600 Industrial Drive, New Bern, North Carolina, USA 28562) may be reached by phone at 252-638-7000, fax 252-637-1285, electronic mail “techsupport@wheatstone.com”.

REPLACEMENT PARTS — IOC-16

COMPONENT	DESCRIPTION	*WS P/N*
AI-NC4 LOADED CARD	ANALOG INPUT CARD ASSEMBLY	***"008810"***
AO-NC4 LOADED CARD	ANALOG OUTPUT CARD ASSEMBLY	***"008811"***
DI-NC4 LOADED CARD	DIGITAL INPUT CARD ASSEMBLY	***"008812"***
DO-NC4 LOADED CARD	DIGITAL OUTPUT CARD ASSEMBLY	***"008813"***
AT-NC LOADED CARD	AUDIO NETWORK CARD ASSEMBLY	***"008814"***
LIO-NC LOADED CARD	LOGIC CARD ASSEMBLY	***"008815"***
MB-NC LOADED CARD	MOTHERBOARD CARD ASSEMBLY	***"008802"***
AI-NC REAR	ANALOG INPUT REAR PANEL	***"008820"***
AO-NC REAR	ANALOG OUTPUT REAR PANEL	***"008821"***
DI-NC REAR	DIGITAL INPUT REAR PANEL	***"008827"***
DO-NC REAR	DIGITAL OUTPUT REAR PANEL	***"008828"***
AT-NC REAR	AUDIO NETWORK REAR PANEL	***"008824"***
LIO-NC REAR	LOGIC REAR PANEL	***"008825"***
BK-NC REAR	BLANK REAR PANEL	***"008822"***
CONNECTOR KIT	FULL CONNECTOR KIT FOR IOC-16	***"008817"***
POWER CORD	7 1/2' BLACK POWER CORD	***"150017"***
I/O CONNECTOR	RIGHT ANGLE 25 PIN PC MOUNT CONNECTOR .318 FEMALE	***"220120"***
I/O CONNECTOR	RIGHT ANGLE SHIELDED RJ-45 CONNECTOR	***"260049"***
PLUG FOR DB-25 I/O CONNECTOR	DB25 INDIVIDUAL CRIMP PIN PLUG	***"200100"***
PIN FOR I/O CONNECTOR	MALE PIN FOR DB25 PLUG	***"200101"***
HOOD FOR DB-25 PLUG	METALIZED PLASTIC STRAIGHT HOOD FOR DB25 PLUG	***"200102"***
CRIMP TOOL	CRIMP TOOL FOR DB CONNECTOR	***"850067"***
TOOL EXTRACTOR	PIN EXTRACTOR TOOL	***"850069"***
FRONT PANEL LED	RECTANGULAR GREEN LED	***"600003"***
TRANSFORMER	POWER TRANSFORMER	***"800062"***
POWER FILTER	POWER LINE FILTER MODULE	***"960013"***

REPLACEMENT PARTS — AUDIOARTS NET-8

COMPONENT	DESCRIPTION	*WS P/N*
IBA-1NC LOADED CARD	PROCESSOR LOADED CARD ASSEMBLY W/O COMPUTER	***"008498"***
POWER CORD	7 1/2' BLACK POWER CORD	***"150017"***
I/O CONNECTOR	8 GANG RJ45 ASSEMBLY WITH GREEN/YELLOW LED	***"220137"***
I/O CONNECTOR	SINGLE RIGHT ANGLE RJ45 CONNECTOR WITH GREEN/YELLOW LED	***"220138"***
POWER CORD	POWER CORD CONNECTOR WITH PRINTED CIRCUIT TERMINALS	***"230071"***
SOCKET	20 PIN DIL SOCKET	***"250057"***
SOCKET	34 PIN DIL SOCKET	***"250058"***
HEADER	3 PIN .098" HEADER	***"250062"***
HEADER	4 PIN .098" HEADER	***"250063"***
PLUG	4 PIN .098" PLUG FOR #26 AWG	***"230029"***
SWITCH	MOMENTARY PCB MOUNTED RIGHT ANGLE SWITCH	***"510248A"***
SWITCH	NKK SWITCH W/BRIGHTER GREEN LED	***"510289"***
SWITCH CAP	GREEN SWITCH CAP	***"530001"***
FRONT PANEL LED	RECTANGULAR GREEN LED	***"600003"***
FRONT PANEL LED	RECTANGULAR RED LED	***"600004"***
FRONT PANEL LED	RECTANGULAR YELLOW LED	***"600005"***
TRANSFORMER	POWER TRANSFORMER	***"800021"***
SOFTWARE	SOFTWARE CD FOR AUDIOARTS NET-8 SYSTEM	***"071779"***
MANUAL	AUDIOARTS NET-8 SYSTEM OWNER'S MANUAL	***"008468"***

REPLACEMENT PARTS — MICROSATELLITE MCS-8

COMPONENT	DESCRIPTION	*WS P/N*
AI-NC4 LOADED CARD	ANALOG INPUT CARD ASSEMBLY	***"008810"***
AO-NC4 LOADED CARD	ANALOG OUTPUT CARD ASSEMBLY	***"008811"***
DI-NC4 LOADED CARD	DIGITAL INPUT CARD ASSEMBLY	***"008812"***
DO-NC4 LOADED CARD	DIGITAL OUTPUT CARD ASSEMBLY	***"008813"***
MCS-8 LOADED CARD	MOTHERBOARD CARD ASSEMBLY	***"009818"***
AI-NC REAR	ANALOG INPUT REAR PANEL	***"008820"***
AO-NC REAR	ANALOG OUTPUT REAR PANEL	***"008821"***
DI-NC REAR	DIGITAL INPUT REAR PANEL	***"008827"***
DO-NC REAR	DIGITAL OUTPUT REAR PANEL	***"008828"***
BK-NC REAR	BLANK REAR PANEL	***"008822"***
POWER CORD	7 1/2' BLACK POWER CORD	***"150017"***
I/O CONNECTOR	25 PIN DB PREWIRE CONNECTOR	***"200022"***
CONNECTOR HOOD	25 PIN DB CONNECTOR HOOD	***"200025"***
I/O CONNECTOR	2 PORT STACKED MODULAR JACK RJ45	***"260069"***
FRONT PANEL LED	RECTANGULAR GREEN LED	***"600003"***
TRANSFORMER	POWER TRANSFORMER	***"800068"***
FUSE	SMALL 2 AMP FUSE ROHS COMPLIANT	***"830015"***
POWER FILTER	POWER LINE FILTER MODULE R/A	***"960015"***