ASI5111/ASI5211

LINEAR PCI/PCI EXPRESS AUDIO ADAPTERS

1 DESCRIPTION

The ASI5111/ASI5211 are professional PCI audio adapters designed for use in radio broadcast production.

The ASI5111/ASI5211 offer two stereo record stream from either a balanced analog input or AES/EBU digital input and four stereo play streams mixed to both a balanced analog output and an AES/EBU digital output.

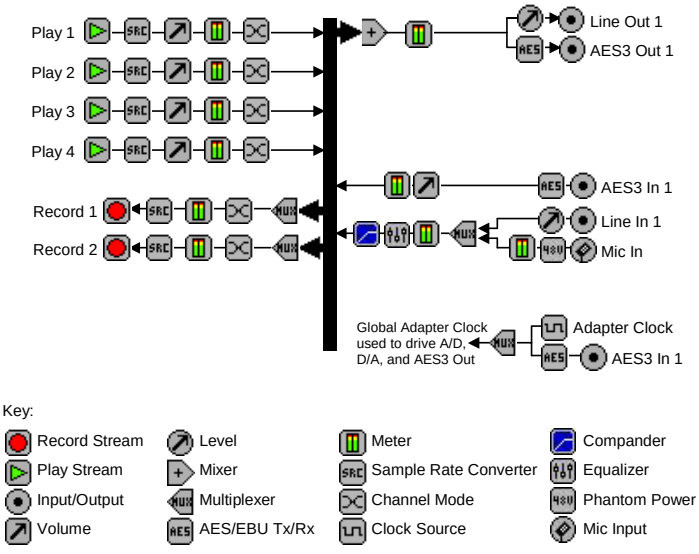
The ASI5111 is a PCI adapter and the ASI5211 is a PCI Express (PCIe) adapter. Additionally, the ASI5211 makes available two opto inputs and two relay outputs via a second bracket attached to the ASI5211 using a 10-pin ribbon cable.

Also included is a microphone input, with low noise pre-amp and a 48V phantom supply.

2 FEATURES

- Four stereo streams of PCM playback
- Two stereo streams of PCM record
- Balanced stereo analog input and output
- PCI interface (ASI5111) or PCIe interface (ASI5211)
- Two opto inputs and two relay outputs via a second bracket (ASI5211)
- AES/EBU or S/PDIF digital input and output (software selectable)
- Low noise microphone input with 48V phantom supply and DSP based compressor/limiter and 5-band equalizer
- 24bit analog-to-digital and digital-to-analog converters - 100dB SNR and 0.0025% THD+N
- 11 to 96kHz sample rates
- MRX™ multi rate mixing technology supports digital mixing of multiple sample rates
- SoundGuard™ transient voltage suppression protects against lightning and other high voltage surges on all I/O
- Up to 8 cards in one system
- Windows XP/Server 2003/Server 2008/7 and Linux software drivers available

ASI5111/ASI5211



3 SPECIFICATIONS

BALANCED INPUT/OUTPUT	
Connector	DB-9 Female
Input Level	-10 to +20dBu in 1dBu steps
Input Impedance	20K ohms
Output Level	-10 to +20dBu in 1dBu steps
Load Impedance	600ohms or greater
S/N Ratio [1]	> 100dB (record or play)
THD+N [2]	< 0.0025% (record or play)
Sample Precision	24bit Oversampling
Frequency Response	20Hz to 20kHz +/-0.25dB
	20Hz to 40kHz +0.25/-5dB[3]
MICROPHONE INPUT	
Connector	¼" TRS jack
Input Gain	20, 40 and 60dB software adjustable
Input Impedance	11K ohms (+ or – to ground)
Phantom Power	48V +/- 4V, software selectable on and off.
S/N Ratio [1]	90dB @ 40dB gain
THD+N [2]	0.005% @ 40dB gain
Frequency Response	20Hz to 20kHz +/-0.5dB
	20Hz to 40kHz +0.5/-5dB [3]
DIGITAL INPUT/OUTPUT	
Type	AES/EBU (EIAJ CP-340 Type I / IEC-958 Professional)
	S/PDIF (EIAJ CP-340 Type II / IEC-958 Consumer) (software selectable)
Connector	DB-9 Male
Sample Rates	32, 44.1, 48, 64, 88.2 and 96kHz
Sample Precision	24bit
SAMPLE RATE CLOCK	
Internal	32, 44.1, 48, 64, 88.2 and 96kHz
AES/EBU In	32, 44.1, 48, 64, 88.2 and 96kHz
SIGNAL PROCESSING	
DSP	Texas Instruments TMS320C6711@135MHz
Memory	8MB
Audio Formats	8 bit unsigned PCM
	16bit signed PCM
	32bit IEEE floating point PCM
BREAKOUT CABLES (INCLUDED)	
Analog	CBL1001: DB-9 to 2 in and 2 out XLR
Digital	CBL1003: DB-9 to 1 in and 1 out XLR
GENERAL	
Bus	Universal 32bit PCI (3.3V or 5V signaling)
Dimensions	PCI form factor – 6.75" x 3.9" x 0.6" (172mm x 100mm x 15mm)
Weight	8 oz (227g) max
Operating Temperature	0C to 70C
Power Requirements	+5V @ 600mA, +12V @ 150mA, -12V @ 70mA

[1] - S/N Ratio is the difference between a 1kHz digital full-scale sinewave and digital zero using an A weighting filter
[2] - THD+N measured using a +20dBu 1kHz sinewave sampled at 48kHz and A weighting filter
[3] – Using a 96kHz sampling rate

4 REVISIONS

Date	Description
10 June 2009	Updated format slightly. Added new block diagram.
22 July 2010	Updated datasheet format. Added ASI5211 (images to be added later to illustrate GPIO connector).
16 August 2010	Added image of ASI5211.

5 CONTENTS

1 DESCRIPTION 1

2 FEATURES 1

3 SPECIFICATIONS 2

4 REVISIONS 3

5 CONTENTS 4

6 CONNECTORS 5

6.1 MIC, ANALOG, DIGITAL 5
6.2 GPIO PINOUTS (ASI5211 ONLY) 5

7 CABLES 6

8 HARDWARE INSTALLATION 6

8.1 SETTING ADAPTER INDEX – ONE ADAPTER IN THE PC 6
8.1.1 Setting Adapter Index - Two or More Adapters in the PC 6

9 SOFTWARE INSTALLATION 7

9.1 DRIVERS FOR WINDOWS XP/SERVER 2003/SERVER 2008/7 7
9.1.1 WAVE Driver 7
9.1.2 WDM Driver 7
9.1.3 Combo Driver 7
9.1.4 ASIO 7
9.1.5 Driver Failure 8
9.2 DRIVERS FOR LINUX 8
9.3 APPLICATIONS FOR WINDOWS 8
9.3.1 ASIControl 8
9.3.2 ASIMixer 8

10 OPERATION USING ASICONTROL 7

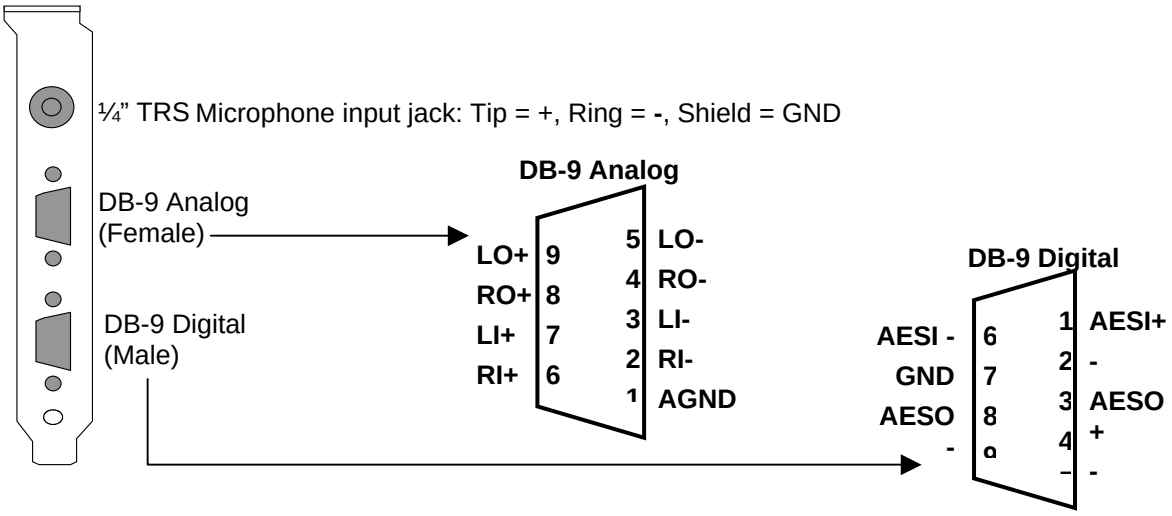
10.1 USER INTERFACE 9
10.1.1 Adapter List Window 9
10.1.2 Adapter Topology Window 9
10.1.3 Node Controls Window 10
10.2 CONTROLS 10
10.2.1 Adapter Information 10
10.2.2 Adapter Mode 11
10.2.3 GPIO 11
10.2.4 MICROPHONE INPUT 12
10.2.5 BALANCED ANALOG I/O 13
10.2.6 AES/EBU I/O 14
10.3 CHANNEL STATUS AND USER DATA 15
10.3.1 COMPANDER 16
10.3.2 PARAMETRIC EQUALIZER 17
10.3.3 SAMPLE RATE CLOCK and MRX MIXER 18

11 REFERENCES 18

11.1 SPECIFICATIONS 18
11.2 HPI MIXER 19
11.3 AUDIO FORMATS 19

6 CONNECTORS

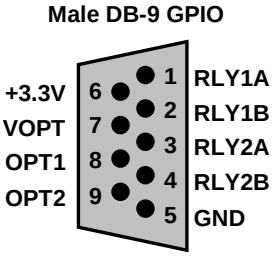
6.1 Mic, Analog, Digital



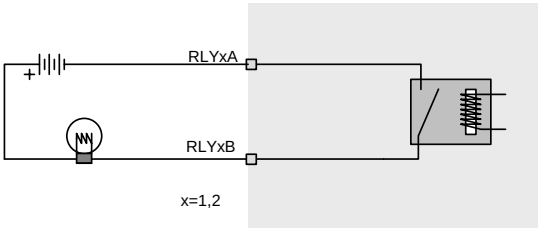
6.2 GPIO Pinouts (ASI5211 Only)

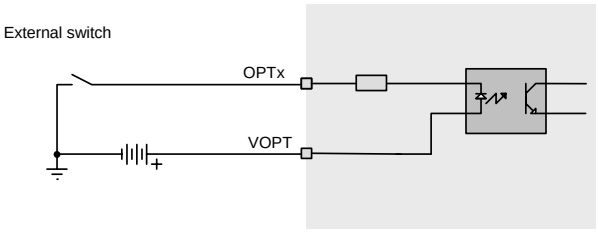
GPIO for the ASI5211 is made available on a second bracket. This second bracket is attached to the ASI5211 via a 10-pin ribbon cable. The red ribbon-edge is "1" and is connected to J9 on the ASI5211, with the bottom, left pin being "1."

Images of the second bracket, attached to the ASI5211, will be added soon.

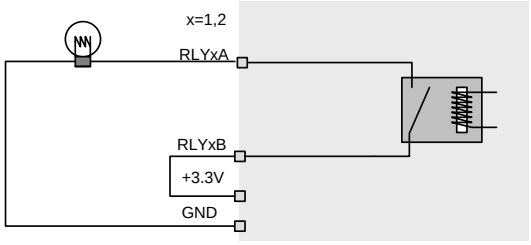


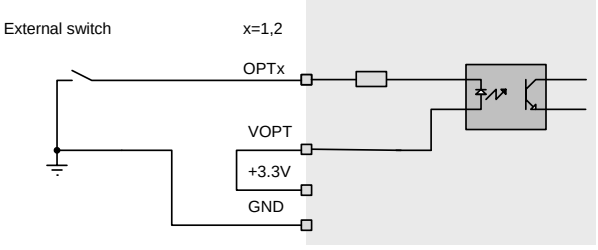
Isolated





TTL Compatible Non-isolated





7 CABLES

The analog cable is CBL1001; a DB-9 to 2 in and 2 out XLR.
The digital cable is CBL1003; a DB-9 to 1 in and 1 out XLR.
The cables are included with the ASI5111/ASI52111.

8 HARDWARE INSTALLATION

This section explains how to install one or more AudioScience adapters in a computer.

8.1 Setting Adapter Index – One Adapter in the PC

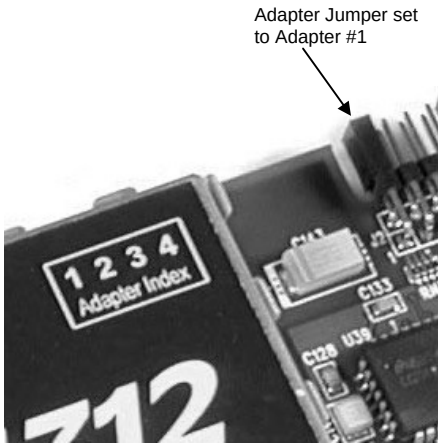
1. Make sure your computer is turned off.

2. PCI adapters should be installed in any empty PCI slot and PCIe adapters should be installed in any x1 (or greater) PCIe slot.

3. Make sure the adapter jumper is set to adapter index #1, the factory default. For a new card no changes need to be made. For an AudioScience adapter from another installation, check that it is set to adapter index #1.

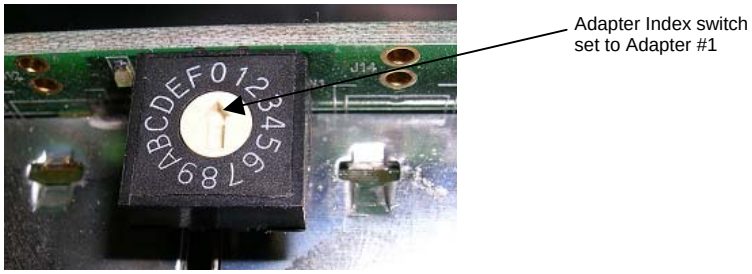
Depending on the adapter family, there are different ways of setting the adapter index.

For ASI5000 and ASI6000 families, there is an adapter jumper that must be set. The left most position represents adapter index #1.



For ASI5300, ASI6300, ASI8700, and ASI8900 families, there is a rotary switch.

NOTE: Position 0 (zero) represents adapter #1, position 1 is adapter #2, etc.



4. Turn on the computer and let it boot. Under Windows, a dialog box will pop up informing you that the computer has detected a new Multimedia Audio card. Cancel out of this dialog box and proceed to the software installation section of this datasheet.

8.1.1 Setting Adapter Index - Two or More Adapters in the PC

1. Make sure your computer is turned off.

2. PCI adapters should be installed in any empty PCI slots and PCIe adapters should be installed in any x1 (or greater) PCIe slots. Different adapter types can coexist in the same computer; for example, an ASI6416 and ASI8921 will work correctly if installed in the same PC. Different adapter types still require unique adapter index numbers.

3. Each adapter in the PC needs to have its adapter jumper/rotary switch position set to unique numbers. For example if you are installing two adapters, the first one would be set to adapter index #1 and the second to adapter index #2.

3.1. For ASI5000 and ASI6000 families, the position to the right of index #1, when jumpered, represents adapter index #2. The next position represents #3, and the rightmost position, when jumpered, represents #4.

3.2. For ASI5300, ASI6300, ASI8700, and ASI8900 families, rotate the rotary switch to indicate what position is required.

4. Turn on the computer and let it boot. Under Windows, a dialog box will pop up informing you that the computer has detected a new Multimedia Audio card. Cancel out of this dialog box and proceed to the software installation section of this datasheet.

9 SOFTWARE INSTALLATION

AudioScience makes audio adapters and drivers for various operating systems. Enhancements to an adapter's utility come from the integrators software that uses the audio driver to implement sophisticated audio playback and recording functions.

9.1 Drivers for Windows XP/Server 2003/Server 2008/7

The first step is what type of driver is needed for the adapter. There are two types of drivers for Windows: The WAVE driver and the WDM driver. Typically this will be decided by the application used with the AudioScience adapter. For any application that uses DirectSound, use the WDM driver.

Driver 3.10 and later present the user with three install options during installation:

- Install Standard PCI/PCIe Driver.
- Install Standard + Network Audio Driver.
- Remove all driver components

Traditional installs should select the first of these options. Users of AudioScience CobraNet products should select the second option with the "+Network Audio Driver." in the text.

9.1.1 WAVE Driver

Download the file named ASIWAVE_xxxxxx.EXE from www.audioscience.com and run it (_xxxxxx is the version number). After the EXE has run, reboot the computer and the audio adapter will be operational. If the cover is off the computer, one can see one or two blinking LEDs on top of the card indicating its DSP is running and communicating with the driver.

Verify that the adapter is running using ASIControl (see ASIControl section in this document).

9.1.2 WDM Driver

Download the file named ASIWDM_xxxxxx.EXE from www.audioscience.com and run it (_xxxxxx is the version number). After the EXE has run, reboot the computer and the audio adapter will be operational. If the cover is off the computer, one can see one or two blinking LEDs on top of the card indicating its DSP is running and communicating with the driver.

Verify that the adapter is running using ASIControl (see ASIControl section in this document).

9.1.3 Combo Driver

The Combo driver presents both Wave and WDM devices to the user. Download the file named ASICOMBOV_xxxxxx.EXE from www.audioscience.com and run it (_xxxxxx is the version number). After the EXE has run, reboot your computer and the audio adapter will be operational. If the cover is off the computer, one can see one or two blinking LEDs on top of the card indicating its DSP is running and communicating with the driver.

Verify that the adapter is running using ASIControl (see ASIControl section in this document).

9.1.4 ASIO

All AudioScience drivers also install an ASIO driver interface. It is installed by default.

9.1.5 Driver Failure

In the event that an adapter's driver fails to load correctly, the OS's event viewer should be checked. The event log is viewed as follows:

XP: The system event log is accessed from \Start\Control Panel\Administrative Tools\Event Viewer. The System view should be selected.

7: The system event log is accessed from \Start\Control Panel\System and Maintenance\Administrative Tools\Event Viewer. The Windows Logs\System view should be selected.

If two or more adapters are installed in the same system, the first thing to check is that the adapters were assigned unique adapter numbers. If issues persist, please email support@audioscience.com.

9.2 Drivers for Linux

The latest Linux driver can be downloaded from the AudioScience website – www.audioscience.com

9.3 Applications for Windows

AudioScience provides two application for adapter set-up and configuration: ASIControl and ASIMixer.

9.3.1 ASIControl

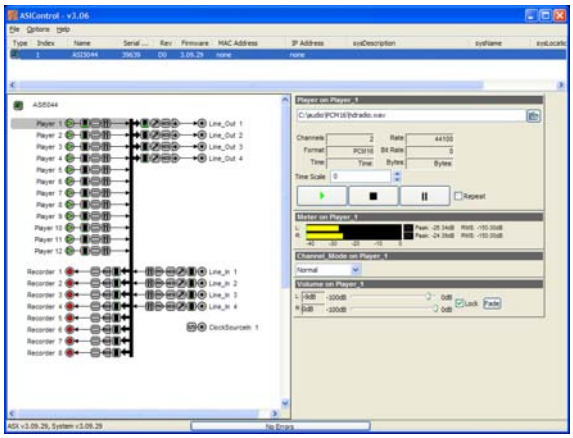
All Windows drivers install an AudioScience application called ASIControl that can be used to setup and verify functionality of adapters. ASIControl provides a common interface for users across all driver types.

The following list of controls are uniquely supported in ASIControl (as opposed to ASIMixer):

- ASI8700 tuner pre-emphasis
- ASI8900 tuner FM stereo indication
- ASI8914 HD Radio Digital status field
- ASI8900 tuner RBDS
- ASI8914 HD Radio PSD field
- ASI8914 HD Radio Digital program number selection

From the Windows Start menu, navigate to Start→Programs→AudioScience and run the ASIControl program.

When started, ASIControl will look something like the following:



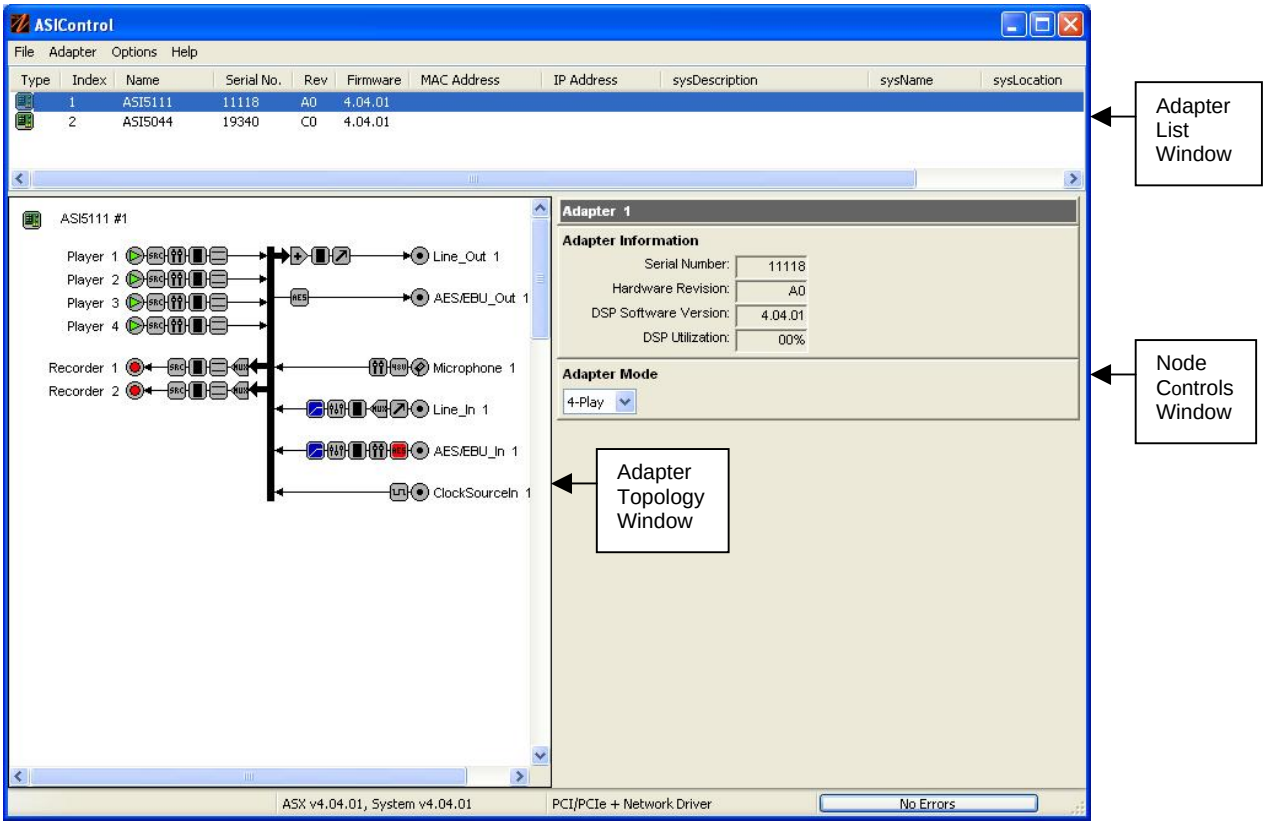
9.3.2 ASIMixer

ASIMixer is specific to the Wave and Combo drivers and is available from the AudioScience website. It uses the Wave/Mixer interface to control AudioScience adapters. Users of driver version 3.10 and later are encouraged to use ASIControl for manipulating adapter controls.

See the list of controls in the previous section that that are only available in ASIControl.

10 OPERATION USING ASICONTROL

Using ASIControl, the ASI5111 will look like so:



10.1 User Interface

ASIControl consists of three main windows: the adapter list in the top portion of the window, the adapter topology view on the left hand side, and the node control list on the right hand side.

10.1.1 Adapter List Window

The top portion of ASIControl shows a list of all the adapters that the application has found. By default, only bus based (i.e. PCI and/or PCI Express) adapters will be shown. If the network portion of the driver is installed (by selecting “Install Standard + Networked Audio Driver” after running the driver installer) and “Local PCI(e) + Networked adapters” is selected from ASIControl’s Options→Configure adapter interface, then AudioScience and other third party CobraNet devices will be shown.

Adapters are listed in order of adapter index. For bus-based adapters, this is determined by the adapter index jumper on the card. For AudioScience CobraNet devices this is calculated from the unit’s MAC address. Third party CobraNet devices are listed last as they have no AudioScience index.

10.1.2 Adapter Topology Window

The left hand side of ASIControl contains the topology view of the adapter. It is essentially a block diagram of the device showing the available physical inputs and outputs on the right hand side. On the left hand side, bus based adapters show player and recorder streams, while CobraNet adapters show their network connections.

Each of these inputs and outputs is referred to as a Node and each Node contains one or more Controls on it. The topology shows each Control as a small square icon. A non-exhaustive list of nodes follows:

Line In	Recorder
Line Out	Tuner
AES/EBU In	Clock Source In
AES/EBU Out	CobraNet In
Player	CobraNet Out

Hovering the mouse over a particular node will highlight it. Clicking on a node will bring up the controls resident on that node in the right hand control list.

There is an adapter node in the top left corner of the topology window. Clicking on this will show adapter-specific controls and properties on the right hand side.

10.1.3 Node Controls Window

The right hand side of ASIControl shows the controls associated with the selected node in the topology view. The controls are arranged, from top to bottom, in order of audio signal flow, i.e. the audio signal can be viewed as entering the node at the top control and leaving at the bottom control.
For further information on controls common to all AudioScience adapters and how to operate ASIControl, please see the ASIControl manual, available from www.audioscience.com and also installed by the driver.

10.2 Controls

For further information of controls common to all AudioScience adapters and how to operate ASIControl, please see the ASIControl manaul, available from www.audioscience.com and also installed by the driver.

Below is a list of controls in ASIControl specific to this adapter.

10.2.1 Adapter Information

This control displays information about the installed adapter or ASI2416.

10.2.1.1 Interface

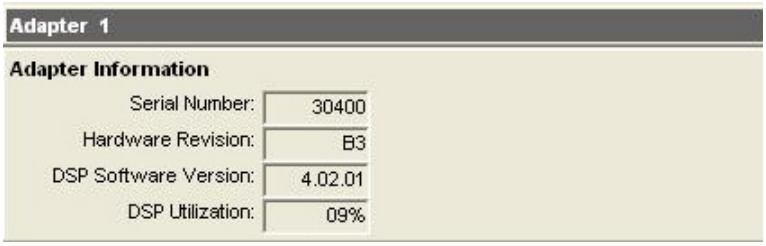


Figure 1. Adapter information seen in right side of ASIControl.

Serial Number:
The serial number is displayed here.

Hardware Revision:
This lists the hardware revision.

DSP Software Version:
The DSP software version is displayed; usually the same as the driver version installed.

DSP Utilization:
This shows the loading of the adapter's DSP in percent.
Note: Utilization should be kept below 90%.

10.2.2 Adapter Mode

The Adapter_Mode control changes the number of players/recorders/lineouts that an adapter has. On certain adapters, not all sample rates/formats are supported; changing the mode of the adapter allows for best functionality with certain sample rates/formats. Different adapters will have different modes available, and not all adapters have modes. Please see datasheets on specific adapters, available at www.audioscience.com, to learn more.

10.2.2.1 Interface

Figure 2. Adapter Mode in ASIControl.

Selecting the appropriate mode from the list using the dropdown arrow changes the Adapter_Mode setting. A reboot is necessary after changing adapter mode. The mode setting is saved to the adapter's EEPROM

The ASI5111/ASI5211 supports two adapter modes: 1-Play and 4-Play.

10.2.2.2 1-Play

This mode supports 1 Play stream and 1 record stream.

10.2.2.3 4-Play

This modes supports 4 Play streams and 2 Record streams with full mixing capabilities.

10.2.3 GPIO

The GPIO interface in ASIControl is located on the adapter node. Note only a few device types/configurations support GPIO.

10.2.3.1 Interface

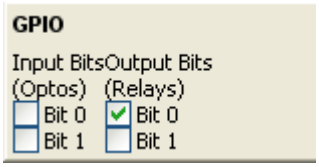


Figure 3. A view of 2 GPIO opto inputs and relay outputs.

10.2.3.2 Developer

Not all GPIO APIs are supported by every device type. See below table:

Device	WAVE – Windows	HPI - Windows	HPI - Linux	ASX - Windows	ASX - Linux	SNMP
ASI2416		•	•	•	•	
ASI2202				•		•
ASI5211	•	•	•	•		

10.2.3.3 Windows APIs

WAVE – GPIO inputs and outputs are accessed using MIXERCONTROL_CONTROLTYPE_BOOLEAN and the Windows mixerSetControlDetails() and mixerGetControlDetails() calls.
HPI – GPIO inputs and outputs are accessed using the HPI_GPIOxxx()API.
ASX – GPIO inputs and outputs are accessed using the ASX_GPIO_xxx() API.
SNMP – ASI2202 only

Variable	SNMP address
RLY1	OID : 1.3.6.1.4.1.2680.1.3.3.3.1.2.57 or stdUserInteger.57
RLY2	OID : 1.3.6.1.4.1.2680.1.3.3.3.1.2.58 or stdUserInteger.58

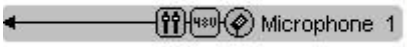
Note: stdUserInteger is defined by the CobraNet MIB (available on request from AudioScience).

10.2.3.4 Linux APIs

HPI – GPIO inputs and outputs are accessed using the HPI_GPIOxxx()API.
ASX – GPIO inputs and outputs are accessed using the ASX_GPIO_xxx() API.
SNMP – ASI2202 only (see above table).

10.2.4 MICROPHONE INPUT

The ASI5111/ASI5211 has a balanced microphone input using a ¼" stereo jack. Click on the Microphone 1 node in the topology pane of ASIControl to access Phantom Power and the Microphone 1 gain.

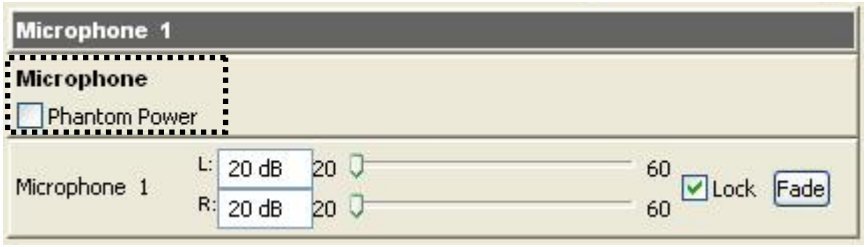


10.2.4.1 Phantom Power

When phantom power is enabled, +48V is present on both the + and – signal inputs (tip and ring of ¼" jack). This is used to drive professional condenser type microphones. If you are using a dynamic microphone, make sure that the phantom power is off as it may damage the mic.

User

Phantom power is turned on and off by checking or unchecking the Phantom Power checkbox in ASIControl:



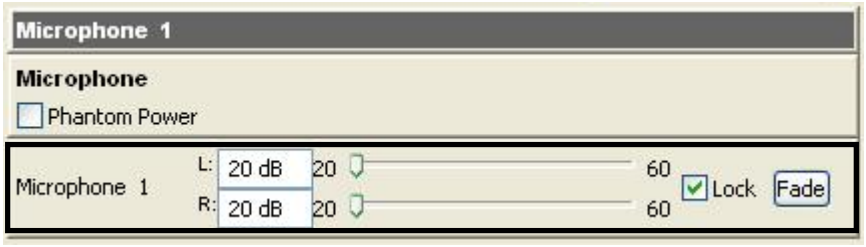
Developer

Windows – Phantom power is controlled using….
HPI – Phantom power is controlled using the HPI_Microphone_SetPhantomPower() API

10.2.4.2 Programmable Gain

The microphone preamp has a software programmable gain of +20, +40 or +60dB.
Note: The gain interface is the same one used on stereo line ins and line outs. For the Microphone 1 on the ASI5111/ASI5211, the Fade button and the Lock checkbox will not work properly and the right channel is ignored. Though it is in a slider format, only values of +20, +40, or +60 are accepted.

User
Microphone gain is adjusted using the following control in the ASIControl:



Developer
Windows – Microphone gain is controlled using….
HPI – Microphone is controlled using a Volume control on the MICROPHONE source node. Use HPI_VolumeSetGain() API.

10.2.5 BALANCED ANALOG I/O

The ASI5111/ASI5211 has a stereo balanced analog input and output on a DB-9 female connector.

10.2.5.1 Analog I/O Level

The analog Level (or Trim) is software programmable independently for the input and output. It can be set from –10 to +20dBu in 1dB increments.

User
Analog levels are adjusted using the Trim/Level controls located on the LineIn and LineOut panels in the ASIControl:

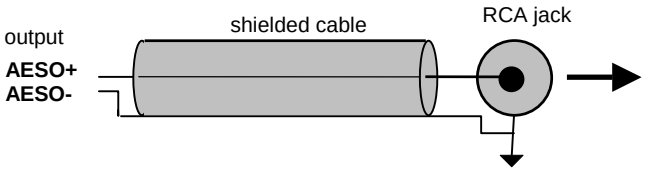
Developer
Windows – Analog levels are controlled using mixerSetControlDetails() on a control of type signed and with the name Level/Trim.
HPI – Analog levels controlled using the HPI_LevelSet() API

10.2.6 AES/EBU I/O

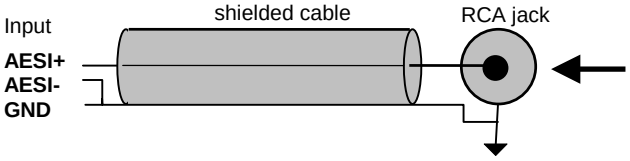
The ASI5111/ASI5211 has an AES/EBU digital audio input and output on a DB-9 male connector. This maybe also operated as S/PDIF. The AES/EBU I/O operates at either 32, 44.1, 48, 64, 88.2 or 96kHz. The bitstream contains samples of 24bit precision. When a valid AES/EBU source is connected to the ASI5111/ASI5211, the card will automatically generate the sample clock from that source (see Sample Clock section)

10.2.6.1 Operating as S/PDIF

The AES/EBU I/O can be operated as S/PDIF (IEC958). When this happens, the impedance of the I/O changes to 75ohms and the signal level becomes ~0.5Vpp. As well as programming the correct settings in the card, the AES/EBU signals must be connected as follows. For S/PDIF output, connect the "-" side of the AES signal to the S/PDIF shield. The "+" side becomes the S/PDIF signal.

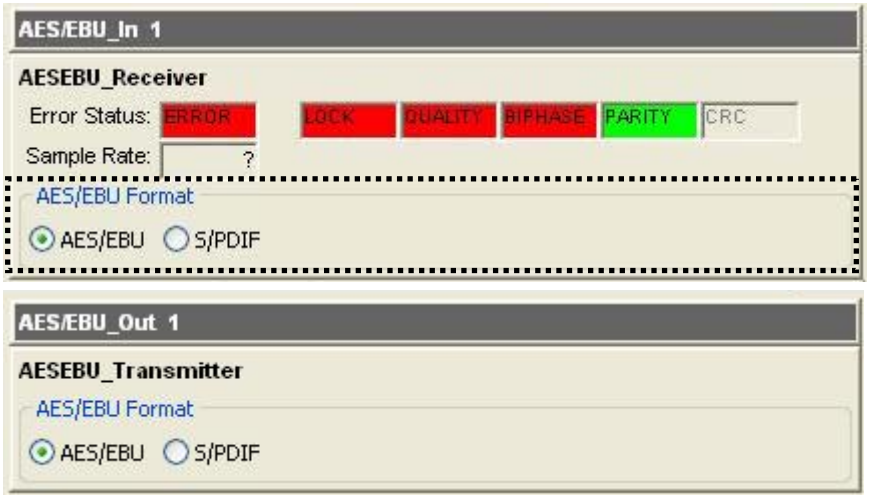


For S/PDIF input, connect the "-" side of the AES signal to the shield and ground. The "+" side becomes the signal.



User

Use the following controls in ASI Mixer to toggle between AES/EBU and S/PDIF



Developer

Windows – Use Digital I/O controls – see the “AudioScience WavX Specification” (SPCWAVX.PDF)
HPI – Use the HPI_AESEBU_Receiver_SetSource() and HPI_AESEBU_Transmitter_SetFormat() API

10.3 Channel Status and User Data

The ASI Mixer does not setup the Channel Status and User Data in the AES/EBU output. This must be done by the application using the following APIs:

Windows – Use Digital I/O controls – see the "AudioScience WavX Specification" (SPCWAVX.PDF)
HPI – Use HPI_AESEBU_Transmitter_SetChannelStatus() and HPI_AESEBU_Transmitter_SetUserData() APIs

Your application can also read the Channel Status and User Data of the AES/EBU input using the following APIs:

Windows – Use Digital I/O controls – see the "AudioScience WavX Specification" (SPCWAVX.PDF)
HPI – Use HPI_AESEBU_Receiver_GetChannelStatus() and HPI_AESEBU_Receiver_GetUserData() APIs

10.3.1 COMPANDER

The ASI5111/ASI5211 contains a compressor/expander (Compander), which is used to reduce or expand the dynamic range of the signal it acts on. It is located on the LineIn input and maybe used on both the Line In and Microphone signals.

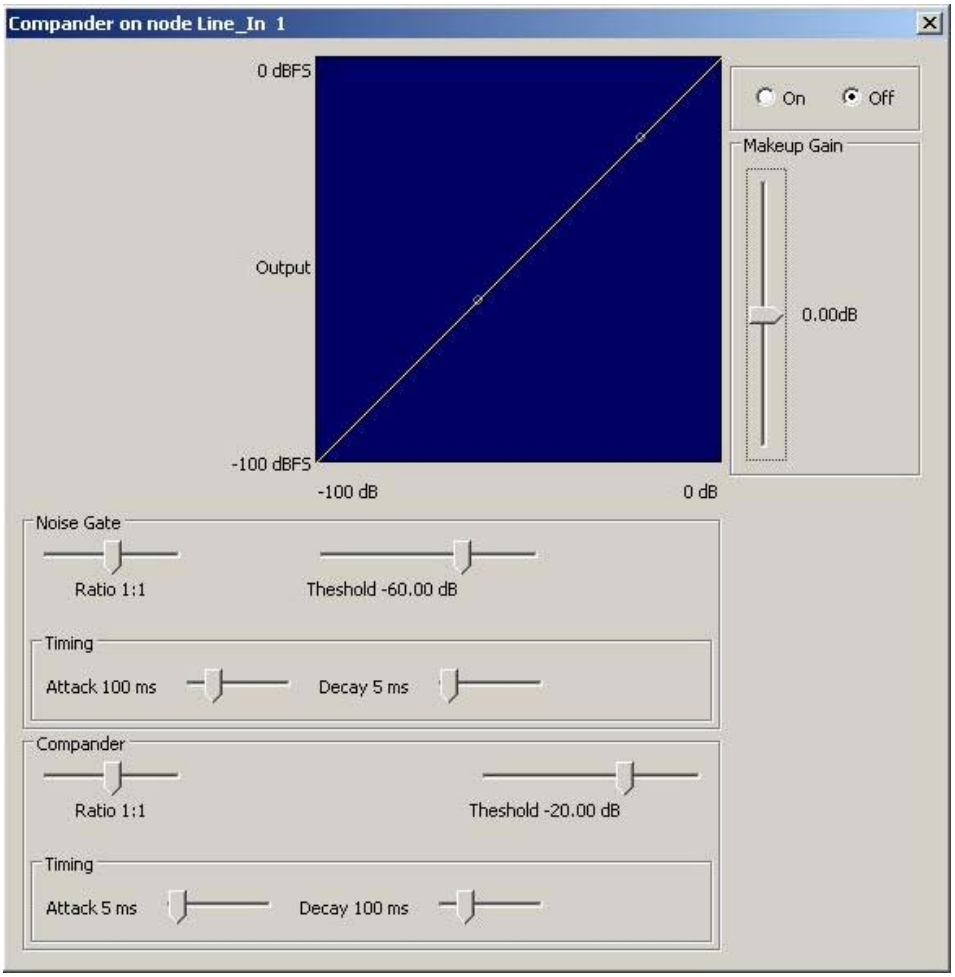
User

The Compander is accessed from the ASI Mixer by clicking on the "Compander" button on the LineIn panel. The following parameters can be set:

Compression Threshold – the input signal level at which the compression starts
Compression Ratio – The ratio of the input signal level to the output signal level
Makeup Gain – additional gain applied the compressed/expanded signal
Attack – Attack time of compander in milliseconds. Sets the time that the compressor takes to act
Decay – Decay time of compander in milliseconds. Sets the time for the signal gain to return to normal after compression
Noise Gate –

Developer

Windows – Use the Compander control – see the "AudioScience WavX Specification" (SPCWAVX.PDF)
HPI – Use the HPI_Compandor_XXXX APIs - see the "AudioScience HPI Specification" (SPCHPI.PDF)



10.3.2 PARAMETRIC EQUALIZER

The ASI5111/ASI5211 contains a 5 band parametric equalizer. It is located on the LineIn input and maybe used on both the Line In and Microphone signals. Each of the equalizers 5 bands may be individually programmed with filter type (eq, low-pass, high-shelf etc), Q (sharpness) and center frequency.

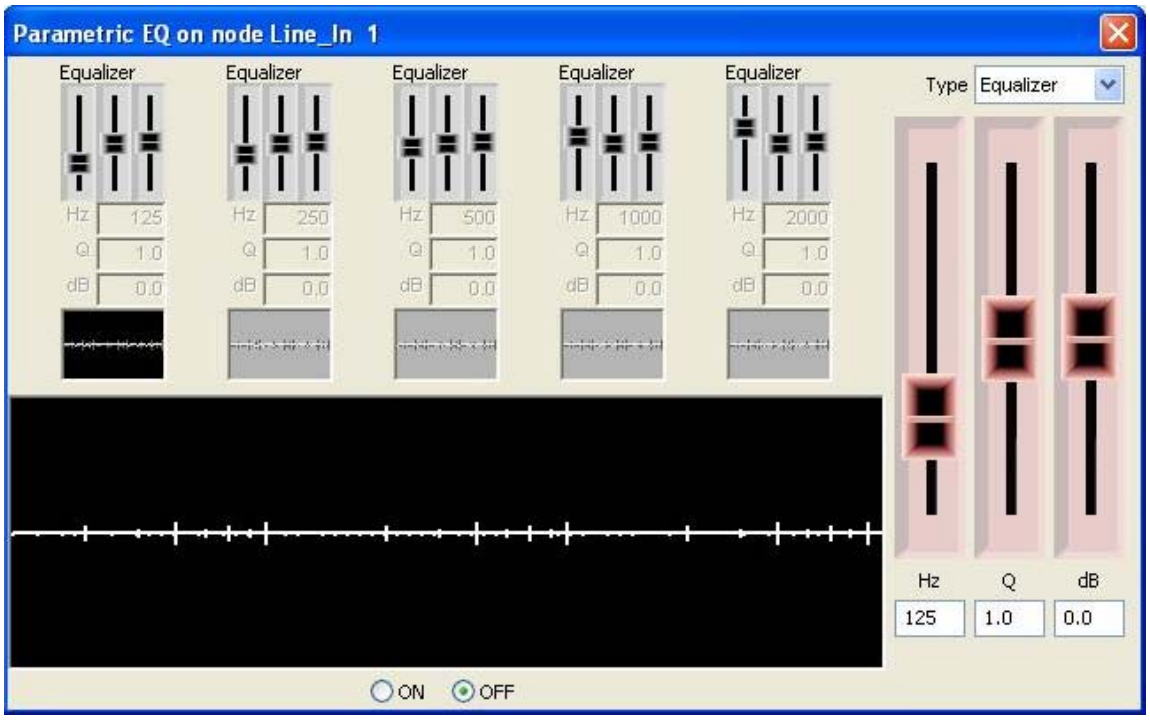
User

The Parametric Equalizer is accessed from the ASI Mixer by clicking on the "EQ" button on the LineIn panel. The EQ window contains controls for setting the filter parameters of each of the 5 bands, with a graph showing the combined frequency response of the 5 bands.

Each filter band has the following parameters:
Filter Type – The shape of the filter. Can be Eq (default), Lowpass, Highpass, Bandpass, Lowshelf, Highshelf.
Filter Freq – The center frequency of the filter.
Filter Q – The sharpness of the filter. The higher the Q, the more selective the filter is.
Filter Gain – The gain of the filter at the center frequency.

Developer

Windows – Use the equalizer mixer control – see the "AudioScience WavX Specification" (SPCWAVX.PDF)
HPI – Use the HPI_ParametricEQ_XXXX APIs – see the "AudioScience HPI Specification" (SPCHPI.PDF)



10.3.3 SAMPLE RATE CLOCK and MRX MIXER

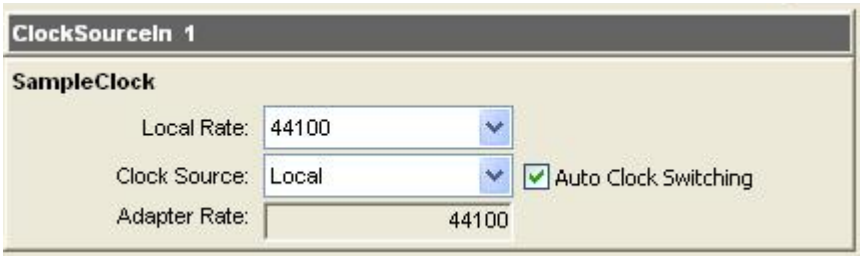
The ASI5111/ASI5211 sample rate clock is used to drive the MRX digital mixer, Analog to Digital Converter (ADC), Digital to Analog Converter (DAC) and AES/EBU output. There are two sources of sample rate clock – internal and the AES/EBU input.

The internal adapter clock is generated from a low jitter frequency synthesizer and may be set to 32, 44.1, 48, 64, 88.2 and 96kHz. When a valid AES/EBU bitstream is connected to the AES/EBU input, the ASI5111/ASI5211 will **automatically** switch to using this as the sample rate clock. This is needed so that digital audio from the AES/EBU input can be synchronized with the other audio streams present in the mixer. There is no way to override this.

Note that the sample rate clock does not determine the sample rates of the audio streams that may be played and recorded. These are independently set using the MRX multi rate mixer, so that, for instance, you can have the adapter running at 96kHz, but be playing files of 44.1 and 48kHz and recording files of 32 and 88.2khz.

User

In ASIControl, click on the ClockSourceIn 1 node in the topology pane to access the Local Rate, Clock Source, and Adapter Rate. Local Rate is used to select the internal adapter rate. Note the SampleClk source control is not user selectable as the adapter automatically switches depending whether a valid AES/EBU input is present.



Developer

Windows –

HPI – Use the HPI_SampleClock_XXXX APIs.

11 REFERENCES

11.1 Specifications

SPCWAVX.PDF - WavX - AudioScience Windows Multimedia Extensions

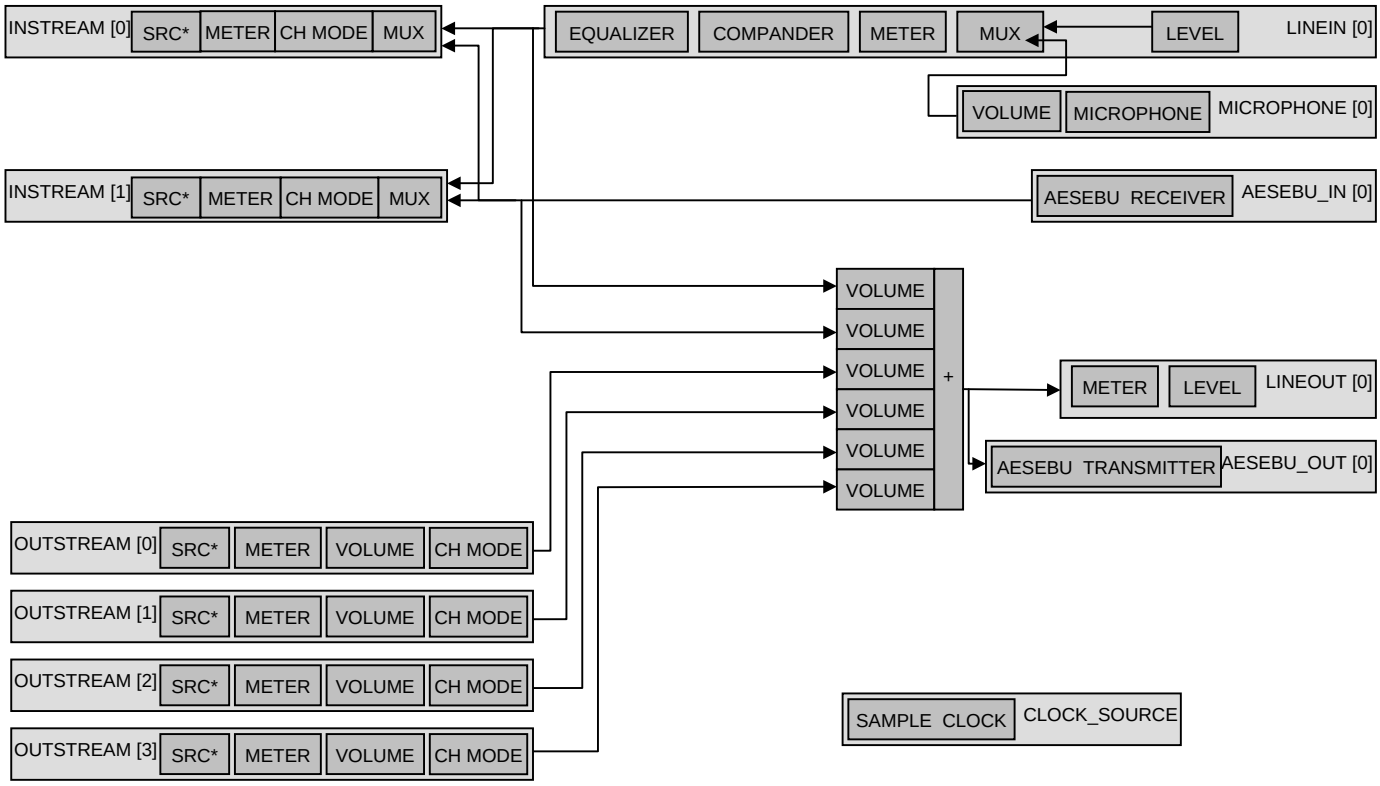
SPCHPI.PDF - Hardware Programming Interface (HPI) Specification

All these documents are available from www.audioscience.com in the Technical Info section

11.2 HPI Mixer

The mixer layout for the ASI5111/ASI5211 is represented by the HPI is as follows. For details on each HPI control type, see the HPI specification (SPCHPI.PDF).

* SRC = Sample Rate Converter, not visible as an HPI object



11.3 Audio Formats

The ASI5111/ASI5211 supports record and play of the following formats:

Format	HPI format	Windows format
8 bit unsigned PCM	HPI_FORMAT_PCM8_UNSIGNED	WAVE_FORMAT_PCM, wBitsPerSample=8
16 bit signed PCM	HPI_FORMAT_PCM16_SIGNED	WAVE_FORMAT_PCM, wBitsPerSample=16
32 bit signed PCM	HPI_FORMAT_PCM32_SIGNED	WAVE_FORMAT_PCM, wBitsPerSample=32
32 bit floating point PCM (+/- 1.0)	HPI_FORMAT_PCM32_FLOAT	WAVE_FORMAT_IEEE_FLOAT

<end>