

### 1 DESCRIPTION

The ASI5020 is a professional PCI sound card designed for use in radio broadcast automation and production.

Providing 6 play streams that are mixed to 2 balanced stereo outputs and 4 record streams fed from 2 balanced stereo inputs, the ASI5020 features AudioScience's unique "anything to anywhere" mixing and routing.

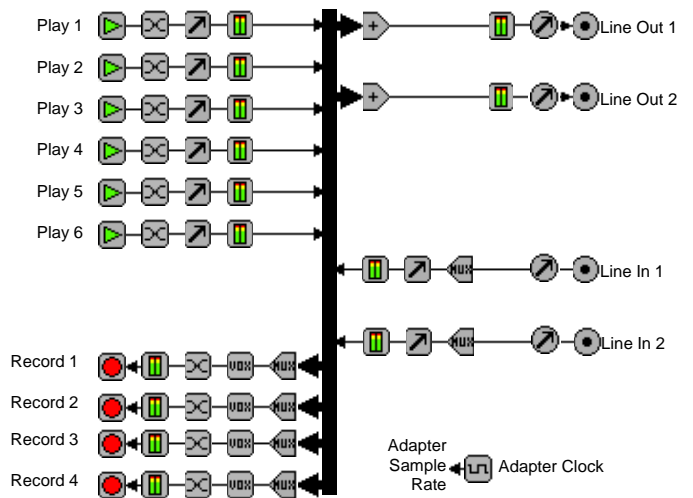
The ASI5020 provides balanced analog inputs and outputs. The maximum analog input and output level is +24dBu.



### 2 FEATURES

- Six stereo streams of PCM playback into two stereo outputs
- Four stereo streams of PCM record from 2 stereo inputs
- Balanced stereo analog inputs and outputs with levels to +24dBu
- Formats include 8, 16, 24 and 32bit PCM
- Sample rates of 32, 44.1, 48, 64, 88.2, 96 and 192kHz
- SoundGuard™ transient voltage suppression on all I/O
- Short length PCI card format (6.6 inches/168mm)
- Up to 4 cards in one system
- Windows 2000/XP/Server 2003/Vista and Linux software drivers available

ASI5020



- Key:
- Record Stream
  - Play Stream
  - Input/Output
  - Volume
  - Level
  - Mixer
  - Multiplexer
  - AES/EBU Tx/Rx
  - Meter
  - Sample Rate Converter
  - Channel Mode
  - Clock Source

### 3 SPECIFICATIONS

#### ANALOG INPUT/OUTPUT

Type	Balanced
Connector	Mini50 (SCSI-II type)
Input Level	-10 to +20dBu in 1dBu steps
Input Impedance	20K ohms
A/D converter	24bit Over sampling
Output Level	-10 to +20dBu in 1dBu steps
D/A converter	24bit Over sampling
Load Impedance	600ohms or greater
Dynamic Range [1]	>100dB (record or play)
THD+N [2]	<0.0015% (-96dB), record or play
Sample Rates	32, 44.1, 48, 64, 88.2, 96 and 192kHz
Frequency Response	20Hz to 20kHz +/-0.25dB, 20Hz to 50kHz +0.25/-3dB

#### SAMPLE RATE CLOCK

Internal	32, 44.1, 48, 64, 88.2, 96 and 192kHz
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#### SIGNAL PROCESSING

DSP	Texas Instruments TMS320C6205@190MHz
Memory	8MB
Audio Formats	8 bit unsigned PCM 16bit signed PCM 24bit signed PCM 32bit signed PCM

#### BREAKOUT CABLES (included)

Analog	CBL1022: Mini DB50 to 4 in and 4 out XLR
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#### GENERAL

Bus	Universal 32bit PCI (3.3V or 5V signaling)
Dimensions	PCI short-length form factor – 6.5" x 3.9" x 0.6" (165mm x 100mm x 15mm)
Weight	8 oz (227g) max
Operating Temperature	0C to 70C
Power Requirements	+3.3V@500mA, +12V @ 300mA, -12V @ 130mA (NOTE 3.3V must be available from the PCI bus)

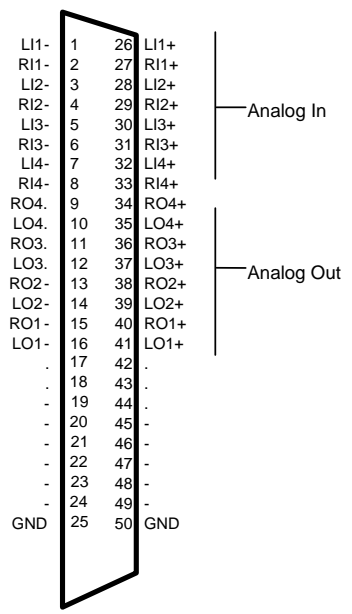
[2] - THD+N measured using a +20dBu 1kHz sine wave sampled at 48kHz, 20-20kHz b/w and A weighting filter  
 [1] – Dynamic Range is the THD+N of a –60dBFS 1kHz sinewave + 60dB with a level of +20dBu and 20-20kHz bandwidth

## 4 REVISIONS

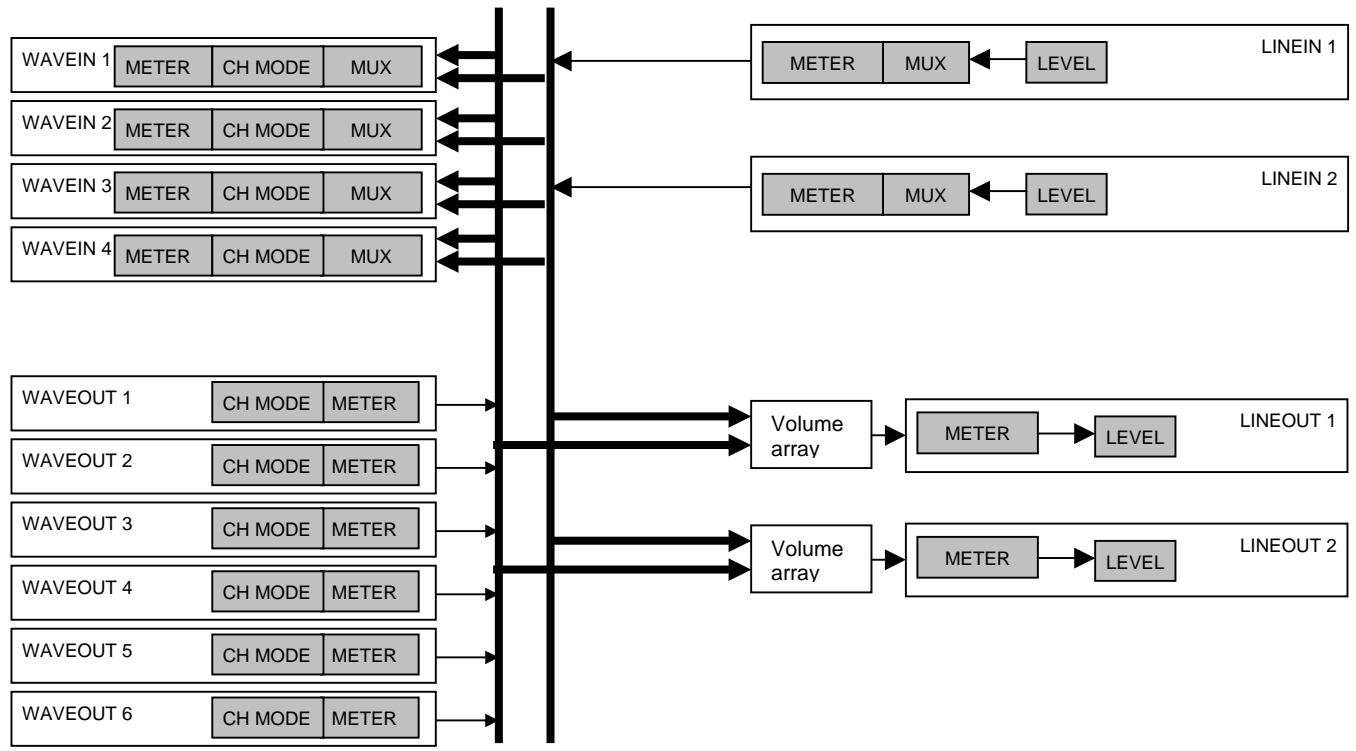
Date	Description
11 March 2009	Updated format. Added sample offset errata. Section 8 – added supported formats for each mode.
08 March 2010	Page 2: Noted that cable is included and corrected connector type on cable.

## 5 ANALOG CONNECTOR

Mini 50pin - Analog



## 6 MIXER MAP



## 7 AUDIO FORMATS

The ASI5020 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

**NOTE – not all Modes support all formats (see below)**

## 8 ADAPTER MODES

The ASI5020 supports sample rates up to 192 kHz, but not all rates are available in all modes, or at full sample resolution. The following tables describe the bit resolutions available at various sample rates on an ASI5020. A restart is required after selecting a new mode. The mode setting is saved on the adapter EEPROM.

### 8.1 Adapter Mode 1 (default) – Standard Sample Rate

This mode supports 6 Play streams and 4 Record Streams on the ASI5020. 24-bit sampling is supported up to 48 kHz.

Formats supported: PCM8, PCM16, PCM24, PCM32, FLOAT32

Sample Rate (kHz)	Analog sample resolution
32-48	24
64-96	Not supported
192	Not supported

### 8.2 Adapter Mode 2 – High Sample Rate

This mode supports 6 Play streams and 4 Record Streams on the ASI5020. All sample rates are supported. At sample rates higher than 48 kHz, 16-bit sample resolution is used.

Formats supported: PCM8, PCM16, PCM24, PCM32

Sample Rate (kHz)	Analog sample resolution
32-48	24
64-96	16
192	16

## 9 BALANCED ANALOG I/O

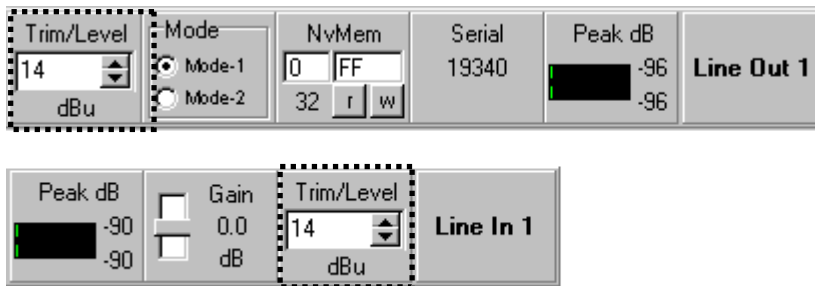
The ASI5020 has stereo balanced analog inputs and outputs on a mini 50 pin female connector.

### 9.1 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 LineOut and LineIn panels in the ASI Mixer:



#### 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 ERRATA

### 10.1 0.25 sample offset between odd and even numbered inputs and outputs.

Relative to Line Out 1 and 3, samples on Line Out 2 and 4 are delayed 0.25 of a sample period. At 44.1 kHz this corresponds to 5.7us (2 degrees of phase @ 1 kHz, 40 degrees @ 20 kHz, 2mm at the speed of sound).

Relative to Line In 1 and 3, samples on Line In 2 and 4 are delayed 0.25 of a sample period. At 44.1 kHz this corresponds to 5.7us (2 degrees of phase @ 1 kHz, 40 degrees @ 20 kHz, 2mm at the speed of sound).

[end]