OCTOBER 08

ASI8723, ASI8724, ASI8733, ASI8734

FOUR/EIGHT CHANNEL TV TUNER ADAPTERS

DESCRIPTION

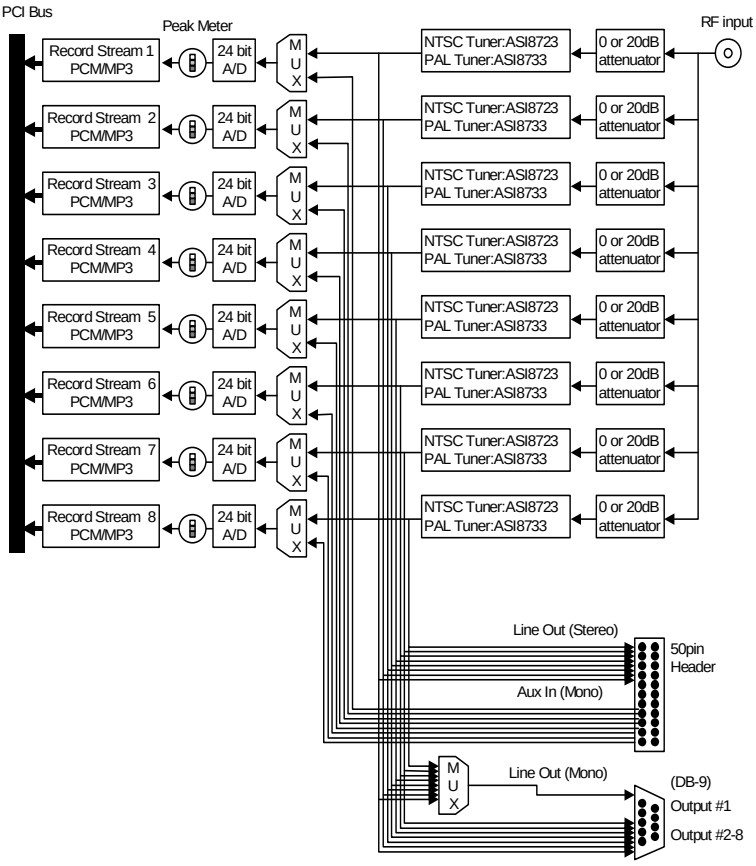
The ASI8700 series are professional PCI tuner adapters designed for use in NTSC-TV and PAL-TV broadcast audio monitoring and auditing.

Up to eight different channels can be received and recorded simultaneously from a single antenna input.

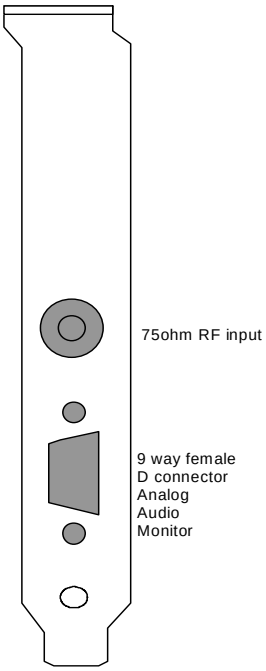
FEATURES

- Eight NTSC-TV tuners (ASI8723)
- Four NTSC-TV (ASI8724)
- Eight PAL-TV tuners (ASI8733)
- Four PAL-TV (ASI8734)
- Four/Eight PCM record streams (one for each tuner)
- FM stereo decoding
- Audio monitoring of all tuners simultaneously
- 8 to 48kHz sample rates
- Up to 8 cards in one system
- Windows 2000/XP/Server 2003/Vista and Linux software drivers available

ASI8723/8733



ASI8702 Connectors



1 SPECIFICATIONS

RF INPUT

Connector	F type 75 ohms
Input Level	-20dBmV minimum, +20dBmV Maximum
Frequency Response	0dB +10/-0dB, 100kHz to 110MHz (F connector input to any tuner input)

NTSC-TV TUNER (ASI8723 only)

TV System	M
Frequency range	50.00MHz – 801.25MHz
Sensitivity	0dBuV for 30dB S/N
S/N	55dB @ 60dBuV RF Level, 1kHz sinewave
Audio bandwidth	40Hz - 15kHz (+/-2dB)

PAL-TV TUNER (ASI8733 only)

TV System	B,D,G,H,I,K
Frequency range	48.25MHz – 863.25MHz
Sensitivity	0dBuV for 30dB S/N
S/N	55dB @ 60dBuV RF Level, 1kHz sinewave
Audio bandwidth	40Hz - 15kHz (+/-2dB)

AUX LINE INPUT (MONO)

Connector	50pin 0.1” Header
Level	4Vpp max

LINE OUTPUT

Connector	DB-9 on bracket (Left channel only) and 50pin 0.1” Header (Stereo)
Level	4Vpp max

SIGNAL PROCESSING

DSP	Texas Instruments TMS320C6713@216MHz
Memory	8MB
Sample rates	8, 11.025, 12, 16, 22.05, 24, 32, 44.1, 48kHz
Audio Formats	8 bit unsigned PCM 16bit signed PCM 32bit IEEE floating point PCM MPEG-1 Layer 3(MP3) [revH hardware and higher] (MPEG Layer-3 audio coding technology licensed from Fraunhofer IIS and THOMSON multimedia)

BREAKOUT CABLES CBL3002 (Included)

GENERAL

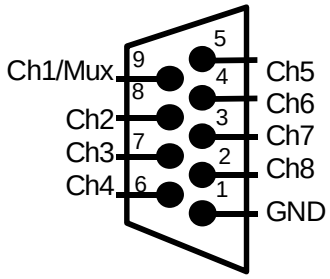
Bus	Universal 32bit PCI (3.3V or 5V signaling)
Dimensions	PCI form factor - 13" x 4.5" x 0.8" (330mm x 115mm x 20mm) (excluding edge connector
Weight	<TBD> max
Operating Temperature	0°C to 60°C
Power Requirements	
	ASI8723, ASI8733: +5V @ 2A, +3.3V @ 1.5A, +12V @ 500mA, -12V @ 10mA ASI8724, ASI8734: +5V @ 1.2A, +3.3V @ 1.5A, +12V @ 200mA, -12V @ 10mA

2 CONNECTORS

2.1 DB-9

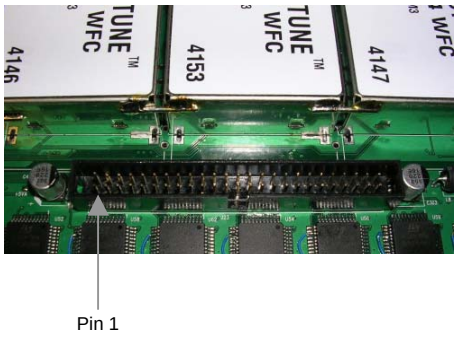
The DB-9 connector makes available the left channel of each tuner output. Ch1 is sourced from a software-controlled mux and may be programmed to output Ch1... 8. The output level is 2Vpp into 10Kohms.

Monitor - 9pin female D



2.2 50pin Header

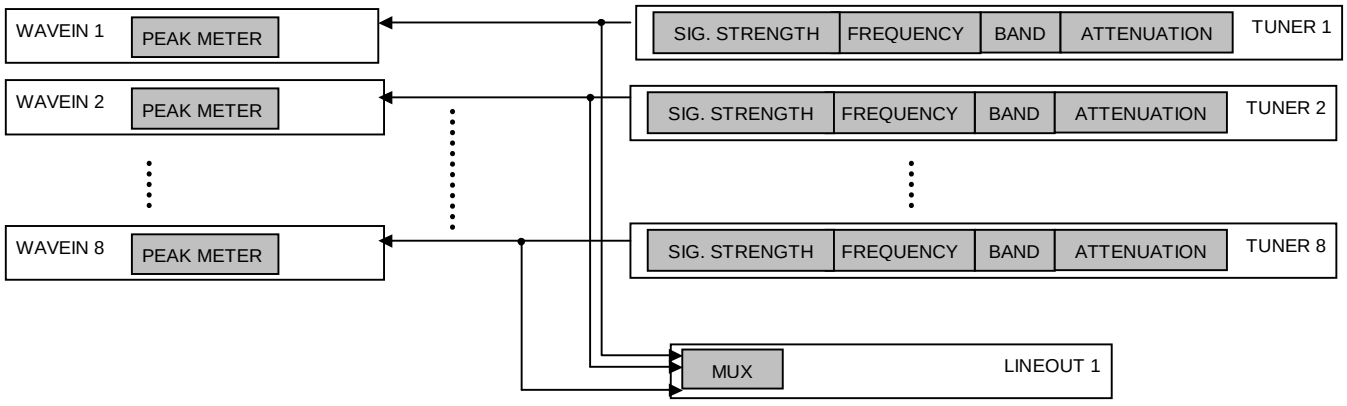
50 pin audio header is two rows by 25 pins with 0.1" spacing. It makes available the stereo outputs of each tuner and 8 auxiliary inputs (AUXIN0...7). The input and output signal level is 4Vpp max.



Signal	Pin #	Pin #	Signal
CH1L	1	2	GND
CH1R	3	4	GND
CH2L	5	6	GND
CH2R	7	8	GND
CH3L	9	10	GND
CH3R	11	12	GND
CH4L	13	14	GND
CH4R	15	16	GND
CH5L	17	18	GND
CH5R	19	20	GND
CH6L	21	22	GND
CH6R	23	24	GND
CH7L	25	26	GND
CH7R	27	28	GND
CH8L	29	30	GND
CH8R	31	32	GND
AUXIN1	33	34	GND
AUXIN2	35	36	GND
AUXIN3	37	38	GND
AUXIN4	39	40	GND
AUXIN5	41	42	GND
AUXIN6	43	44	GND
AUXIN7	45	46	GND
AUXIN8	47	48	GND
N.C.	49	50	GND

3 MIXER MAP

The mixer layout for the ASI87xx in Windows is as follows:



4 AUDIO FORMATS

The ASI87xx supports the following audio 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 floating point PCM (+/-1.0)	HPI_FORMAT_PCM32_FLOAT	WAVE_FORMAT_IEEE_FLOAT
MPEG-1 Layer 2	HPI_FORMAT_MPEG_L2	WAVE_FORMAT_MPEG -fwHeadLayer=ACM_MPEG_LAYER2 -fwHeadMode=ACM_MPEG_SINGLECHANNEL, ACM_MPEG_DUALCHANNEL, ACM_MPEG_STEREO
MPEG-1 Layer 3 (MP3) (revH h/w and higher)	HPI_FORMAT_MPEG_L3	WAVE_FORMAT_MPEG - fwHeadLayer=ACM_MPEG_LAYER3 -fwHeadMode=ACM_MPEG_SINGLECHANNEL, ACM_MPEG_DUALCHANNEL, ACM_MPEG_STEREO OR WAVE_FORMAT_MPEGLAYER3

Not all combinations of channels, samplerates and bitrates are allowed for MP3. The following table shows the supported variations, assuming all eight recording streams are being used:

Sample Rate (kHz)	Channels	Bitrates (kbs)
8, 11.025, 12	Mono/Stereo	16,32,40,48,56
16, 22.05, 24	Mono/Stereo	16,32,40,48,56,64,96,112,128
32	Mono only	32,40,48,56,64,80,96,112,128

NOTE – for maximum efficiency, you must use one sample rate for all streams and set the global sample rate of the ASI87xx to this rate. See Section 7

5 TUNER

For each tuner, the band, frequency and input attenuation can be set, and the RF level can be monitored.

User
The tuner is controlled and monitored using the Tuner panel in ASIMIXER.EXE.
The following sections explain the panel operation.

5.1 Gain

The Gain control switches an optional 20dB attenuator at the input to each tuner.
Therefore the gain can be set to 0dB or –20dB.

User
The RF attenuator is switched on/off using the Gain slider on the Tuner panel.

Developer
Windows – use standard Windows control of type MIXERCONTROL_CONTROLTYPE_DECIBELS. Use MIXERCONTROLDETAILS_UNSIGNED to set or get control details. Units are in 10ths of a dB.
HPI – HPI_Tuner_SetGain()

5.2 Band

Set the band type to tune over. Possible bands are a subset of AM, TV, FM, FM-STEREO, TV NTSC-M, TV PAL-BG, TV PAL-BK, TV PAL-DK, TV SECAM-L, Aux Input. Within the FM band it is possible to select either mono or stereo.

User
The tuner band is selected using the tuner band dropdown.

Developer
Windows – use standard Windows control of type MIXERCONTROL_CONTROLTYPE_SINGLESELECT. Use MIXERCONTROLDETAILS_LISTTEXT to retrieve the list of names and then MIXERCONTROLDETAILS_BOOLEAN to get or set the current selection.
HPI – Tuner band is selected using the HPI_Tuner_SetBand() API

5.3 RF Level

Each tuner can measure the RF level of the current channel. The level is returned in units of dBuV.

User
The RF level is displayed in the Rflevel section of the Tuner panel.

Developer
Windows – use standard Windows control of type MIXERCONTROL_CONTROLTYPE_SIGNED. This is a read-only control. Units are dBuV. Use MIXERCONTROLDETAILS_SIGNED structure for call to mixerGetControlDetails().
HPI – HPI_Tuner_GetRFLevel()

5.4 Frequency

Sets the radio frequency to which a tuner receives. The selected band determines the available range of frequencies, so band should be selected first. The frequency is expressed in kHz
AM range 520kHz to 1720kHz
FM range 75.9MHz to 108.1MHz
NTSC-TV range 50.00MHz to 801.25MHz
PAL-TV range 48.25MHz – 863.25MHz

User
Entering a number in the Freq edit box of the Tuner panel sets frequency.
Frequency must be specified in kilohertz (e.g. for 98.6MHz FM station, enter 98600).

Developer
Windows – use a standard Windows control of type MIXERCONTROL_CONTROLTYPE_UNSIGNED. Use MIXERCONTROLDETAILS_UNSIGNED structure for calls to set/get control details. Units are in kHz.
HPI – Tuner frequency is set using the HPI_Tuner_SetFrequency() API

5.5 FM De-emphasis

Sets the FM de-emphasis. Available in driver version 3.09.11 or later. Geographic regions around the world utilize differing de-emphasis settings. The USA uses 75 µsec, while Europe uses 50 µsec. This control allows the user to set the FM tuner de-emphasis. The default is 75 µsec.

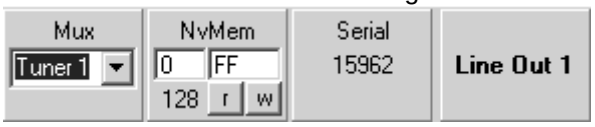
User
Select the de-emphasis setting in ASIControl.
ASIMixer does not show the FM de-emphasis.

Developer
Windows – not supported.
HPI – FM Tuner de-emphasis is set using the HPI_Tuner_FM_SetDeemphasis () API

6 ANALOG AUDIO MONITOR

The ASI87xx adapters have a mono analog output on a D-9 female connector.
This output can be used to monitor the received audio from one of the eight tuners.

User
Select which tuner to monitor using the Mux section of the Line Out 1 panel



Developer
Windows – uses standard Windows control of type MIXERCONTROL_CONTROLTYPE_MUX. Use MIXERCONTROLDETAILS_LISTTEXT to retrieve the list of names and then MIXERCONTROLDETAILS_BOOLEAN to get or set the current selection.
HPI –

7 SAMPLE RATE CLOCK

The ASI87xx operates at a single sampling frequency. This is set by the first stream to start recording or playing. While any stream is active, the sample rate cannot be changed.

The sample rates that are supported are 16, 22.05, 24, 32, 44.1and 48kHz.

8 CABLES

The ASI87xx comes with the CBL3002 DB9 to RCA breakout cable.

9 Cooling

The ASI87xx adapters can dissipate a significant amount of heat. AudioScience does not control the deployment environment of the cards, but recommends:

a) where possible there should be space between cards for improved airflow.
b) additional cooling fan(s) should be added to the system enclosure if required.
c) a fully populated system should be bench tested to check cooling operation.

10 REFERENCES

Specifications

SPCHPI.PDF - Hardware Programming Interface (HPI) Specification

SPCWAVX.PDF - WavX - AudioScience Windows Multimedia Extensions

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

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