



# Windows ASIO Driver



## 1. INTRODUCTION

The AudioScience Audio Stream In/Out (ASIO)<sup>1</sup> 2.0 driver enables multi-track recording, production, and mixing of PCM digital audio on a PC platform under the Windows 8, 7 or XP OS. This driver follows the ASIO philosophy of providing a simple, low latency, PCM audio pass-through from the hardware to the application.

The ASIO driver interface is implemented as an add-on to the AudioScience Windows WAVE, WDM or Combo drivers. As such, ASIO applications may share the audio hardware's resources with other audio applications that use WAVE, DirectSound, or the HPI interfaces.

The AudioScience ASIO driver can present all AudioScience adapters in a machine as one ASIO device.<sup>2</sup> The adapters need to be all of the same type and use a common sample rate clock source. See Section 5 for more information.

AudioScience's low latency mode changes the operation of an AudioScience adapter so that a single multichannel audio play stream and a single multichannel audio record stream are presented to the operating system, enabling live sound processing in ASIO applications.<sup>3</sup> See the [Low Latency datasheet](#) for a table of supported adapters, driver versions, and other requirements.

## 2. FEATURES

- Implementation follows the ASIO standard available from the [Steinberg](#) website
- Supports ASI5000 and ASI6000 adapters
- All adapter input and output channels exposed to ASIO interface
- Simultaneous start and stop of all input and output channels
- 16, 24, 32 bit or 32 bit floating formats
- Fast and predictable ASIO ping-pong buffer implemented
- Provides low latency monitoring via ASIO's "direct monitor" feature<sup>4</sup>
- Drivers are freely available from the download section of the AudioScience website
- Multiple AudioScience cards can be listed as one ASIO device
- Low latency mode allows for live sound processing

## 3. REQUIREMENTS

Adapters should be used in stereo mode or low latency mode with ASIO. Mono mode will not work.

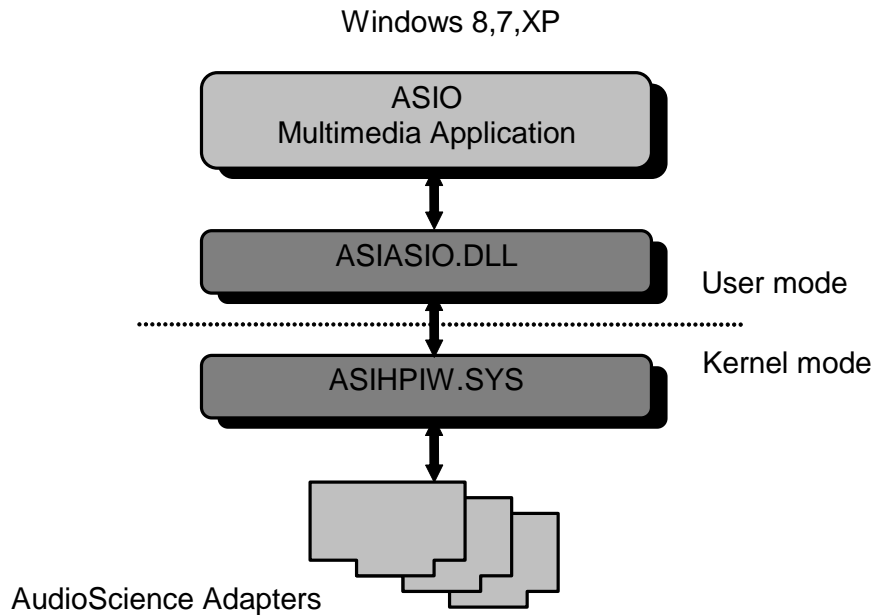
<sup>1</sup> ASIO is a trademark and software of Steinberg Media Technologies GmbH.

<sup>2</sup> Starting with driver 3.14.00.

<sup>3</sup> Starting with driver 4.06.00 and 4.08.00, depending on adapter type (see datasheet link above).

<sup>4</sup> Stereo inputs on ASI5000 and ASI6000 adapters don't support panning so each channel, when monitored, is panned hard-left or hard-right.

### 3. BLOCK DIAGRAM



### 4. APIs SUPPORTED

<b>Initialization/Termination</b>	ASIOCanSampleRate	ASIOOutputReady
ASIOInit	ASIOGetSampleRate	<b>Miscellaneous</b>
ASIOExit	ASIOSetSampleRate	ASIOControlPanel
<b>Start/Stop</b>	ASIOGetClockSources	ASIOFuture
ASIOStart	ASIOSetClockSource	<b>Callbacks</b>
ASIOStop	ASIOGetSamplePosition	bufferSwitch
<b>Inquiry methods and sample rate</b>	ASIOGetChannellInfo	bufferSwitchTimeInfo
ASIOGetChannels	<b>Buffer preparation</b>	sampleRateDidChange
ASIOGetLatencies	ASIOCreateBuffers	asioMessage
ASIOGetBufferSize	ASIODisposeBuffers	

### 5. ASIO DRIVER CONFIGURATION

Driver 3.14 and later, see appendix for instructions on earlier driver setup.

#### 5.1 Aggregate ASIO Device

Starting with driver 3.14.00, multiple AudioScience adapters, all of the same type, can be aggregated together as a single ASIO device, allowing for higher channel count. See Section 5.3 on aggregating adapters.

##### 5.1.1 Aggregation Requirements

- The adapters must be all of the same type
- The adapter must use a common sample rate clock source; see section 5.3 below

## 5.2 ASIO Driver Clocking

Starting with driver 3.14.00, if multiple adapters are grouped into a single ASIO device, sample clocks on each of the adapters must run at the same rate. Card specific synchronization steps follow:

### 5.2.1 ASI6416

Multiple CobraNet adapters will be synchronized to the network CobraNet clock, so the sample clocking requirements are taken care of by the CobraNet protocol.

### 5.2.2 ASI66xx/ASI65xx

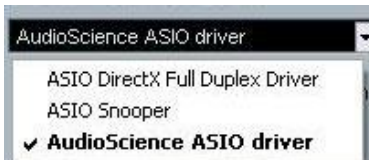
Multiple ASI66xxs are configured to use a common same sample clock by selecting the SampleClock source to be an AES/EBU sync input and supplying an AES/EBU sync input.

### 5.2.3 ASI50xx

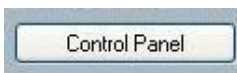
Multiple ASI50xxs are configured to use a common same sample clock by selecting the SampleClock source to be one of the AES/EBU inputs and making sure that all AESEBU input audio across the multiple adapters are fed from synchronized AES/EBU inputs.

## 5.3 ASIO Driver Application Setup, v3.14.00 and Later – General

- Open the application and look for the dropdown list for driver selection, similar to the one below. Select “AudioScience ASIO driver.”



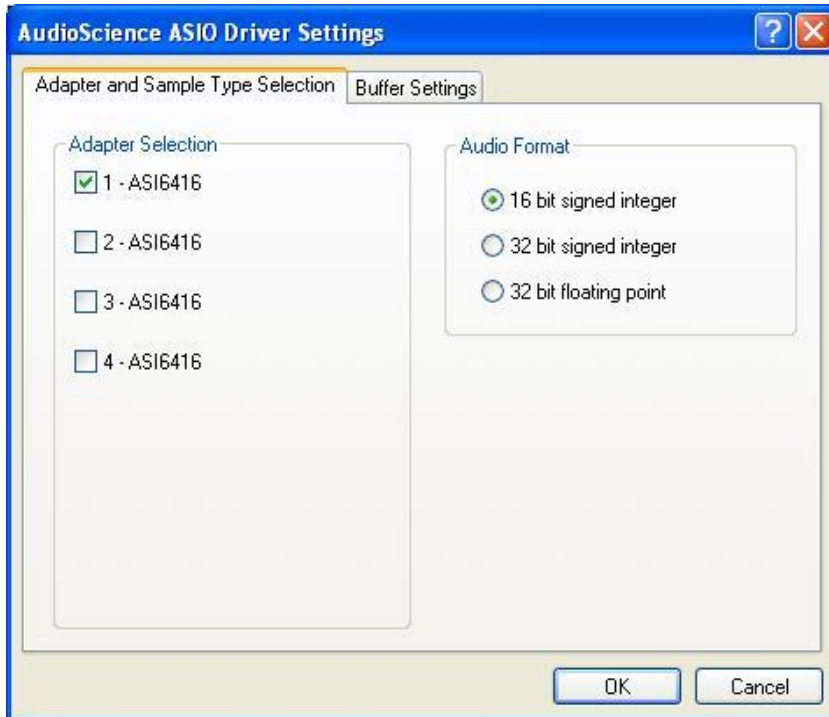
- There will be a checkbox that says something similar to “Release ASIO Driver in Background.” It is recommended to leave this unchecked, otherwise if another application that uses the ASIO driver is opened, the current application using the ASIO driver will stop playing/recording.
- Next, look for a Control Panel button in the application, similar to the image below, and click on it. Or, launch the Control Panel from Start→All Programs→AudioScience→AsiAsio Control Panel.



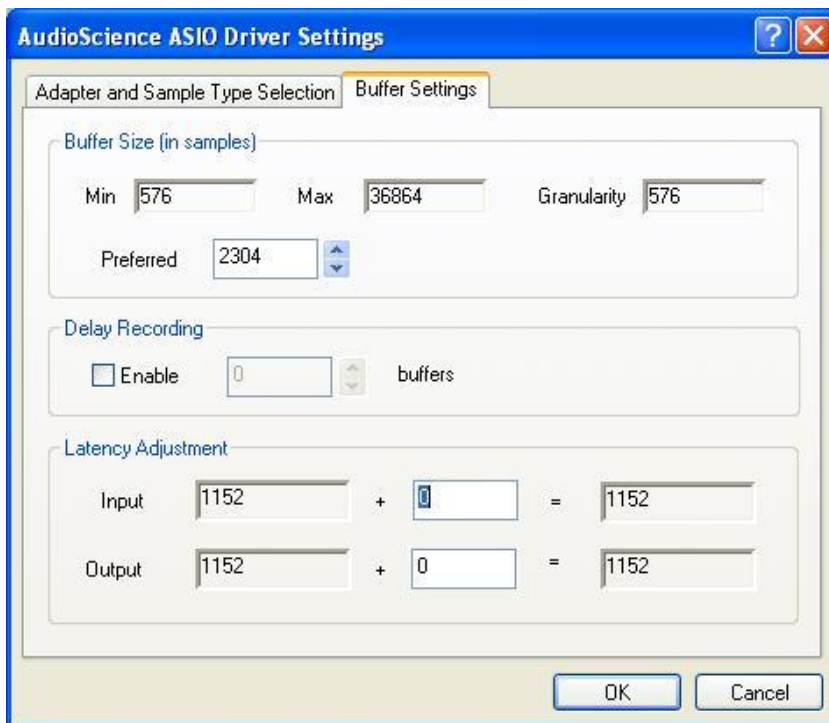
- **Aggregating Adapters**

The “AudioScience ASIO Driver Settings” window will open. If not selected, click on the “Adapter and Sample Type Selection” tab, then select the AudioScience adapter(s) and Audio Format to use then click “OK”. In the example below, if all 4 ASI6416s are selected then all 4 adapters will be aggregated into one ASIO device.

**The adapters need to be all of the same type and use a common sample rate clock source when aggregating into one ASIO device.**



- It is recommended to use the default settings in the “Buffer Settings” tab. However, if the audio is glitching, select this tab to change settings. These settings will affect all AudioScience adapters in the machine.



## 5.4 ASIO Driver Application Setup, v3.14.00 and Later - Audition v2.0 and greater

To specifically select the AudioScience ASIO driver in Audition 2.0 and greater:

- Open Audition and go to Edit→Audio Hardware Setup...
- Select "AudioScience ASIO driver" from the Audio Driver dropdown list
- Uncheck, if needed, "Release ASIO Driver in Background"
- If more than one AudioScience adapter installed in the PC, click on Control Panel... to select the adapter(s) to use, click OK
- Select the Default Inputs and Default Outputs as necessary

It is recommended to leave "Release ASIO Driver in Background" unchecked, unless more than one application using the ASIO driver is required.

## 5.5 ASIO Driver Application Setup, v3.14.00 and Later - Nuendo

To specifically select the AudioScience ASIO driver in Nuendo:

- Open Nuendo and go to Devices→ Device Setup...
- In the left column, click on VST Audio System
- Select "AudioScience ASIO driver" from the ASIO Driver dropdown list (not "ASIO DirectX Full Duplex Driver"), when prompted "Do you want to switch the ASIO driver?" click on Switch
- Uncheck, if needed, "Release Driver when Application is in Background"
- In the left column, click on "AudioScience ASIO driver" that now appears under VST Audio System
- If more than one AudioScience adapter installed in the PC, click on "Control Panel" to select the adapter(s) to use; click OK.
- Select the inputs and outputs to use in the Ports list

## 6. ERRATA

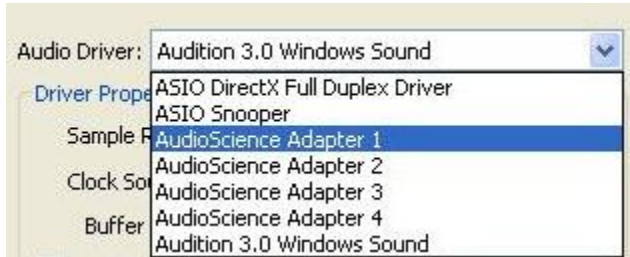
### 6.1 Driver v3.14 and later

Starting with driver 3.14, the AudioScience ASIO driver supports on-the-fly sample rate change for applications which will not shut down the audio engine when changing the sample rate. If the user experiences any synchronization problems after changing the sample rate (i.e. cursor position seems off relative to the audio being played or audio keeps playing for a couple seconds when stopped), it is recommended to restart the application after changing sample rates.

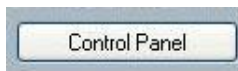
## 7. Appendix

### 7.1 ASIO Driver Application Setup, 3.12.00 and Earlier - General

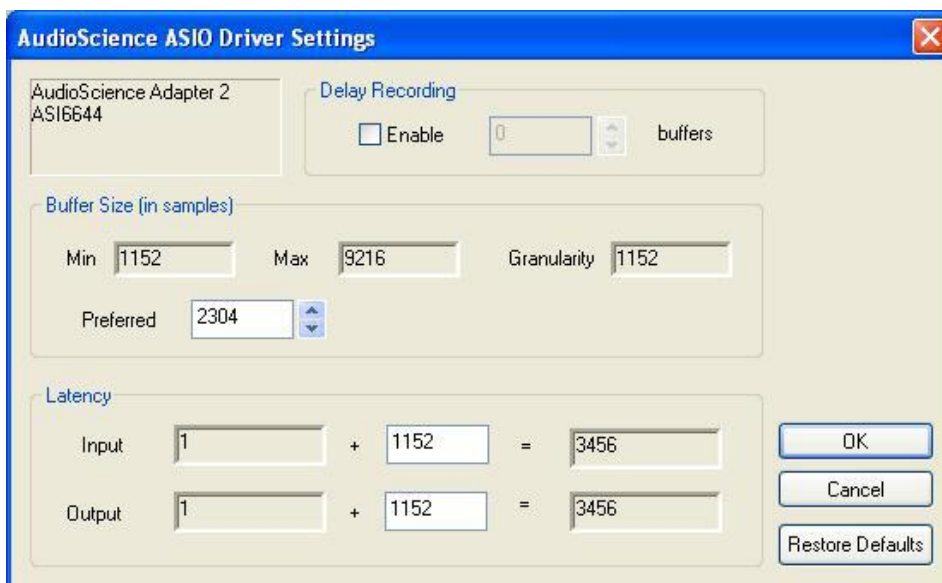
- Open the application and look for the dropdown list for audio driver selection, similar to the one below. Select "AudioScience ASIO *N*" where *N* is the number of the AudioScience adapter in the machine. (If only one AudioScience adapter in the machine, then *N*=1.)



- There will be a checkbox that says something similar to "Release ASIO Driver in Background." It is recommended to leave this unchecked, otherwise if another application that uses the ASIO driver is opened, the current application using the ASIO driver will stop playing/recording.
- There should be another area to select particular inputs/outputs of the adapter; look for this and set the inputs/outputs accordingly, if needed.
- There is a "Control Panel" button in the application, similar to the one below. Click on it to open the "AudioScience ASIO Driver Settings" screen (see below).



- It is recommended to use the default settings in the "Buffer Size" section. However, if audio is glitching, increase buffer size here.



## 7.2 ASIO Driver Application Setup, v3.12.00 and Earlier - Audition 2.0 and greater

To select the AudioScience ASIO driver in Audition 2.0 and greater:

- Open Audition and go to Edit→Audio Hardware Setup...
- Select "AudioScience Adapter *N*" (where *N* is the number of the AudioScience adapter in the PC) from the Audio Driver dropdown list
- Uncheck, if needed, "Release ASIO Driver in Background"
- In the Edit View Ports, select the Default Input and Default Output if not already selected
- Click on "OK"

## 7.3 ASIO Driver Application Setup, v3.12.00 and Earlier - Nuendo

To select the AudioScience ASIO driver in Nuendo:

- Open Nuendo and go to Devices→ Device Setup...
- In the left column, click on "VST Audio System"
- Select "AudioScience ASIO driver" from the ASIO Driver dropdown list (not "ASIO DirectX Full Duplex Driver"); when prompted "Do you want to switch the ASIO driver?" click on Switch
- Uncheck, if needed, "Release Driver when Application is in Background"
- In the left column, click on "AudioScience Adapter *N*" that now appears under VST Audio System
- Select the inputs and outputs to use in the Ports list

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