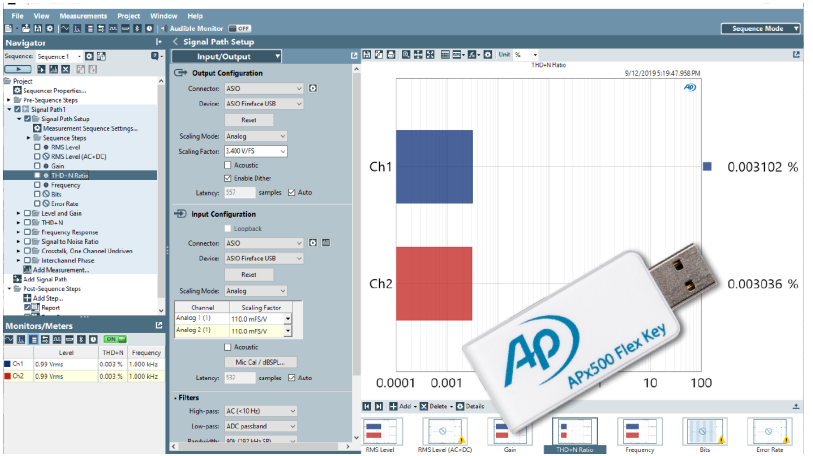
APx500 Flex
AUDIO ANALYZER

Installation Instructions
and Getting Started Guide

APx500 Flex audio analyzer

Installation Instructions & Getting Started Guide



APx500 Flex

August 2025

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Documentation and Support

This booklet contains safety information, installation instructions, a user guide and full specifications for the Audio Precision APx500 Flex audio analyzer.

The APx500 User's Manual

Detailed information on the operation of the APx500 Flex is available from the embedded Help installed with the APx500 measurement software, and in the APx500 User's Manual PDF, included on the APx500 Application USB and on the Web at ap.com; additional copies can be ordered from Audio Precision or your local distributor.

ap.com

Visit the Audio Precision Web site at ap.com for APx support information. APx resources are available at ap.com. You can also contact our Technical Support staff at techsupport@ap.com, or by telephoning 503-627-0832 ext. 4, or 800-231-7350 ext. 4 (toll free in the U.S.A.).

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Getting Started Guide

Welcome to APx500

APx500 is the measurement software used with Audio Precision APx audio analyzers and with supported third-party audio interfaces. The APx500 Flex product includes APx500 measurement software and an APx500 Flex Key, a USB license key which enables measurements to be made, via file analysis or by using a supported ASIO audio interface, without connecting to APx analyzer hardware. The APx500 Flex Key can also be updated to enable optional measurements and lets you quickly move your measurement license from one computer to another. APx Flex can be used with version 5.0.2, or later, APx500 measurement software.

APx500 software version 5.0.2 can be initialized in two different modes:

- **Demo Mode**
  Default mode if no authorizing Software Version License Key is detected (APx500 Flex Key or APx analyzer hardware). The interface can be explored but no measurements can be made.
- **Analyzer Mode**
  An APx hardware analyzer or an APx500 Flex Key is attached and an authorizing Software Version License Key is detected.

Getting Started with APx500 Flex

APx500 Flex requires a PC with the following characteristics and capabilities:

- Operating system: Microsoft Windows 11 or Windows 10 (64-bit) or Windows 8.1 (64-bit). Windows 11 is recommended.
- Intel i5 or better processor running at a clock speed of at least 2.5 GHz. AMD Processors with similar specifications are also supported.

- At least 8 GB of RAM. 16 GB is recommended.
- At least 1.5 GB of free hard disk space. An SSD for the operating system drive is highly recommended.
- A CD-ROM optical disc drive or Internet connection to download and install software.
- A USB 2.0 port or USB 3.0 port.
- A color monitor with SXGA (1280 x 1024) video graphics support. Video resolution of 1900 x 1080 or greater is recommended.

System performance is sensitive to processor speed; faster processors will yield faster results.

APx500 is data intensive and it is recommended that other data-intensive applications not be run concurrently.

Software Installation

To install the measurement software, do one of the following:

- Download and install the APx500 software from ap.com. If you do not have an account on the ap.com website, you will have to create one before accessing the ap.com download pages.
- Insert the APx500 CD-ROM into the optical drive on the PC and follow the instructions in the installation dialog.

NOTE: You must have local administrator rights to install APx500 software. Go to User Accounts in the Windows Control Panel, or check with your network administrator.

Connecting the APx500 Flex Key to your PC

After the APx500 software has been installed, insert the USB APx500 Flex Key into an available USB 2.0 port.

Launch APx500 software by double-clicking on the installed shortcut. When the APx500 software starts, you will be presented with the opening screen.

To make a measurement, you can use file analysis or an ASIO audio interface (internal or external) configured and connected to a DUT.

Most measurements using an ASIO audio interface can be made using either balanced or unbalanced connections. Some measurements, however, such as Impedance/Thiele-Small, require a balanced input connection.

NOTE: The APx500 software is enabled when an APx500 Flex Key is installed on the PC or when APx audio analyzer hardware is attached via USB cable to the PC. If both an APx500 Flex Key and an APx audio analyzer are connected to the same PC, the APx500 software connects to the analyzer and any licensed measurements specific to the APx Flex are unavailable. To run the software with the APx500 Flex license, disconnect any other APx analyzer hardware and restart the APx500 software.

About ASIO

ASIO is a license-free sound device protocol for Microsoft Windows that provides a high-quality, low-latency connection to an internal sound card or external audio device. Other common interfaces such as PCI, Ethernet, etc. are supported. The APx500 implementation enables input and output through any ASIO-compatible device. ASIO was developed and specified by Steinberg GmbH.

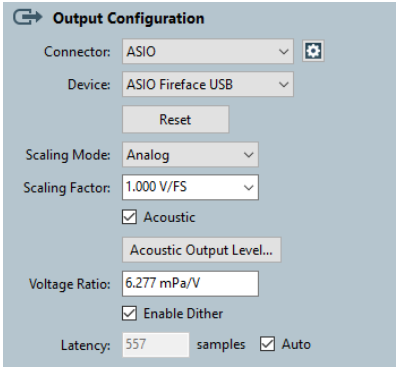
ASIO avoids the intermediary layers of the Windows operating system, bypassing its relatively poor quality sample rate conversion and mixing capabilities and allowing applications to have bit-exact access to the audio streams from a large number of independent channels from a sound card. ASIO supports the use of 24-bit samples and sample rates up to 192K samples per second.

ASIO devices vary in their compatibility with other ASIO systems. Features such as channel count, sample rate, bit depth and overall audio quality also vary widely. Properly implemented, ASIO devices can be bit-accurate while signals remain unmolested in the digital domain; whether or not a particular device achieves this performance depends upon its design.

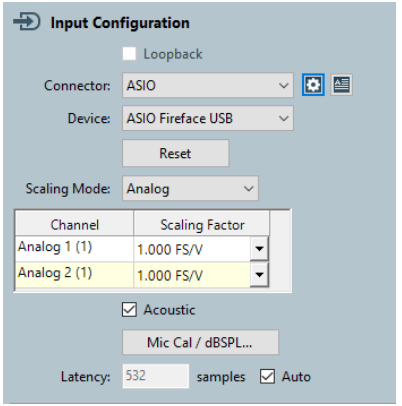
ASIO Output and Input Configuration Settings

To connect to an ASIO audio interface, first be sure that you have the current manufacturer's ASIO driver for your device properly installed on the PC that is running APx500 software, and that you have the device connected to the PC and turned on. For information on configuring third-party audio devices, see "Configuring ASIO Audio Interfaces" on page 12

Go to Signal Path Setup and select ASIO as the output and input configuration connector. Then select your device from the ASIO Device list and choose the scaling mode and other relevant options.



ASIO Output Configuration in Signal Path Setup



ASIO Input Configuration in Signal Path Setup

Acoustic

When the scaling mode is set to Analog, then the **Acoustic** checkbox is available. Checking the **Acoustic** checkbox expresses levels in acoustic units.

Enable Dither

When the **Enable Dither** checkbox is checked ☑, dither is **ON** (the default). When **ON**, dither is set according to the bit depth, using TPDF (triangular probability density function) dither at ±1 LSB.

Uncheck ☐ the checkbox to turn dither **OFF**.

For more information, see Signal Path Setup in the APx Measurement Software User's Manual.

Latency

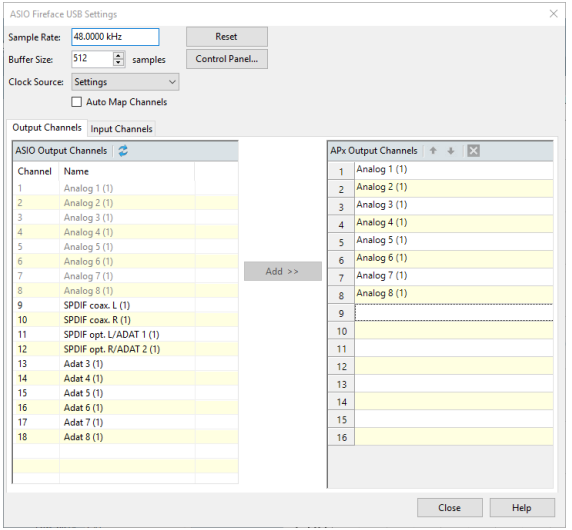
When the Latency **Auto** checkbox is selected, the APx software automatically sets the default latency reported by the ASIO audio interface to compensate for delay through the interface. The latency only affects measurements when both input and output are set to ASIO. To change the default latency, uncheck the **Auto** checkbox and enter a new value in the Latency field.

Although more than one ASIO device can be simultaneously connected to the PC and displayed in the ASIO Device list, only one device can be selected as an active, connected device for each APx Signal Path. A different ASIO device can be selected for other Signal Paths within a Project.

Click the **Settings** button to make additional settings for your ASIO device.

ASIO Settings

There is one Settings dialog for both ASIO output and ASIO input. Click the **Output Channels** or **Input Channels** tab on the ASIO channel list table to view the corresponding channel mapping.



The ASIO Settings dialog provides a panel to set buffer size and clock source, and to map the ASIO device output and input channels to the APx analyzer output and input channels.

Sample Rate

This field presents you with the supported sample rates in the currently selected ASIO audio device. Changing the sample rate here will issue a command to the ASIO device to change its sample rate.

Reset

Click **Reset** at any time to re-initialize and refresh the connection. The **Refresh Device Channels** button on the ASIO channel list tables has the same function.

Buffer Size

This field presents you with the supported buffer sizes in the currently selected ASIO audio device. Changing the buffer size here will issue a command to the ASIO device to change its buffer size.

Control Panel

Most ASIO devices provide a control panel where other parameters and readings can be addressed. Some devices provide access to their control panels through an ASIO-specified protocol. In such cases, clicking the Control Panel button will open the device control panel. Other devices may provide control panels that must be accessed in some other way, such as launching a mixing application, etc.

Clock Source

This drop-menu presents you with a list of clock sources supported by the currently selected ASIO audio device. Selecting a clock source here will issue a command to the ASIO device to use that clock source. If options are not available in this menu, the clock source may need to be

defined in the ASIO audio interface settings directly. See your ASIO audio interface documentation for more information.

Auto Map Channels and Channel List tables

The APx ASIO interface supports mapping of up to 16 output and 16 input channels.

The channel list table to the left shows the available device output or input channels, and the channel list table to the right shows the corresponding APx output or input channels. These lists work in conjunction with the **Auto Map Channels** checkbox as follows:

When Auto Map Channels is checked ☑ (the default), APx will map all device output and input channels (up to 16) to the 16 APx output and input channels, in the order provided by the device driver.

When the **Auto Map Channels** ☐ checkbox is unchecked, APx will map the first device output and input channel to the first APx output and input channel. You can then highlight more device channels and use the **Add >>** button to map them to the APx outputs or inputs.

Moving or deleting mapped channels

Uncheck ☐ **Auto Map Channels** to move or delete mapped channel connections in the APx output or input channel list.

Select a channel and use the **Move Selected Channel Up** ↑ or **Move Selected Channel Down** ↓ buttons to change the mapping. Use the **Delete Channel** ✕ button to remove a channel from the mapping.

Configuring ASIO Audio Interfaces

Audio Precision has tested and verified the following ASIO interfaces as compatible with the APx500 software when configured correctly:

- RME Fireface UC
- RME Fireface 802
- RME Fireface UCX II
- Lynx Aurora(n)™
- Lynx E22
- Echo AIO-A2
- Echo AIO-SA
- Danville Signal spDAQ

Three of these interfaces have configuration information included in this guide. Visit the Technical Library on ap.com to download an APx500 Flex Setup Guide for each of the tested interfaces. As additional interfaces are tested and verified, configuration information will be posted in the Technical Library at ap.com. Other ASIO audio interfaces may work when configured appropriately, but ASIO hardware and driver implementations vary in quality and Audio Precision cannot guarantee compatibility across all third party ASIO interfaces. To configure the three compatible ASIO interfaces documented here, refer to the following sections:

- “RME Fireface UC Device Configuration” on page 13
- “Lynx Aurora(n) Device Configuration” on page 13
- “Lynx E22 Audio Interface Configuration” on page 14

To configure other ASIO interfaces, the following resources are available:

- “Configuring Analog Scaling Values” on page 14
- *TechNote 139: Qualifying an Audio Interface for APx500 Flex* and additional interface configuration guides are available on the Audio Precision website (ap.com).

RME Fireface UC Device Configuration

Before an RME Fireface UC can be used with the APx500 software, the current device driver must be installed and the Fireface interface settings configured appropriately using the TotalMix FX application. You can download a workspace configuration file from ap.com with configuration settings. Follow the steps below to set up your device.

1. Launch TotalMix FX in the Digital Audio Workstation mode and configure inputs, outputs, and buffers.
2. Confirm that your gain, faders, and main output are all set to 0.0 dB.
3. Launch the APx500 software.
4. Create a new APx500 project, (**File** > **New Project**) and select the **RME FireFace UC** template from the **APx500 Flex Configuration** template group.
5. Select **Create Template** to load the new template.

The included template sets the input scaling factors to appropriate values for the XLR connections on channel one and channel two. However, input sensitivities are different if you are using a TRS connector for those channels and the scaling factor will need to be adjusted accordingly.

Additional information on configuring the RME Fireface UC ASIO audio interface can be downloaded from ap.com.

Lynx Aurora(n) Device Configuration

Before a Lynx Aurora(n) audio interface can be used with the APx500 software, the latest device driver must be installed and the Aurora(n) interface settings configured appropriately. Follow the installation instructions included with your device, connect the audio interface to your computer, and follow the steps below to ensure proper interoperability with the APx500 software. Settings are configured through the front panel of the Aurora(n).

1. Configure Inputs, Outputs, and Routing from the Aurora(n) front panel:
   - Set the Line Trim values.
   - Set the routing for Line Out and USB.

2. Launch the APx500 software.
3. Create a new project, (**File** > **New Project**) and select the **Lynx Aurora (N)** template from the **APx500 Flex Configuration** template group.
4. Select **Create Template** to load the new template.

The included template configures input and output channels 1-8 with the appropriate scaling factors.

Additional information on configuring the Lynx Aurora(n) ASIO audio interface can be downloaded from ap.com.

Lynx E22 Audio Interface Configuration

Before a Lynx E22 audio interface can be used with the APx500 software, the current device driver must be installed and the settings configured appropriately using the Lynx Mixer. Follow the steps below to set up your device.

1. Launch the Lynx Mixer.
2. Select **Mixer** > **Restore Defaults**, and verify the following settings:
   - Gain is set to 0.0 on all analog channels.
   - Analog Trim (Input and Output) is set to +20 dBu FS.
3. Launch the APx500 software.
4. Load a new project (**File** > **New Project**) and select the **Lynx E22** template from the **APx500 Flex Configuration** template group.
5. Select **Create Template** to load the new template.

The included template sets the input scaling factors to appropriate values for XLR balanced connections. If you are using an unbalanced connection for the two channels, you may need to adjust the scaling factors.

Additional information on configuring the Lynx E22 ASIO audio interface can be downloaded from ap.com.

Configuring Analog Scaling Values

The templates for the three verified ASIO audio interfaces include the analog scaling values. For other audio interfaces, the configuration can be done by measuring input and output scaling factors using an APx analyzer and then assigning them to the corresponding controls in Signal Path Setup of the APx500 software.

Always use the same connectors and connector types during configuration that you will use for testing.

Obtaining Input Scaling Values

Input scaling values are set by channel. Different channels and connections may require different scaling factors so all channels should be checked individually. To determine and set input scaling values:

1. Make sure current ASIO drivers are installed, and any ASIO interface software is installed, and that all settings have been set to appropriate levels (gain, mix, pan, generator test levels, etc.).
2. Connect the ASIO interface and the APx analyzer to the computer.

You do not need to have the APx500 Flex Key installed when connected to the APx analyzer with an ASIO option installed.

3. Connect cables from the APx output channels to the ASIO input channels.
4. Select the appropriate analog output in the Output Configuration panel in Signal Path Setup. Make sure that the signal paths are through the cables that are connected to the ASIO interface inputs.
5. Select **ASIO** as the connector for the Input Configuration and select your ASIO audio interface from the Device pull-down menu.
6. Set Scaling Mode to **Digital**.
7. Configure the following Generator settings:
   - Ch1: 1.0 Vrms
   - Frequency: 1kHz
8. Turn the generator on and note the gain results in the Gain graph panel.
9. Change the input Scaling Mode to **Analog**. For each measured channel, enter the noted gain value in the **Scaling Factor** field. Then check the RMS level graph and verify that the measurement reads close to 1.0 Vrms for each updated channel.

Obtaining Output Scaling Value

The output scaling value applies to all output channels. Determine and set the output scaling value using the following steps:

1. Connect a cable from the ASIO interface output channel to the APx analyzer input channel.
2. Select **ASIO** as the Connector in the Output Configuration panel in Signal Path Setup and select your ASIO interface from the Device pull-down menu.
3. Set Scaling Mode to **Analog** and set the scaling factor to 1.0 V/FS.
4. Select the appropriate analog input in the Input Configuration panel in Signal Path Setup. Make sure that the signal path is through the cable that is connected to the ASIO interface output.
5. Configure the following Generator settings:
   - Ch1: 1.0 Vrms
   - Frequency: 1.0 kHz
6. Turn the generator on and note the RMS level in the RMS Level graph.
7. Enter the noted Vrms value in the **Scaling Factor** field for Analog Output. Then check the measured Vrms in the RMS Level graph and verify that the measurement reads close to 1.0 Vrms.

Safety Information

The APx500 Flex Key contains a lithium battery. It is not rechargeable or serviceable. The APx500 Flex Key enclosure was not designed to be opened. The following safety precautions should be taken when using the APx500 Flex Key:

- Do not overheat. Do not store the APx500 Flex Key in environments that exceed 125 degrees Centigrade.
- Do not store in direct sunlight.
- When discarding the APx500 Flex Key, follow local laws for disposal or recycling.

Safety Standards

UL 62368-1, Second Edition / CSA C22.2 No. 62368-1 Safety of Audio/Video, Information and Communication Technology Equipment, Second Edition

EN 62368-1:2014, Safety of Audio/Video, Information and Communication Technology Equipment, Second Edition

IEC 62368-1, Second Edition Safety of Audio/Video, Information and Communication Technology Equipment, Second Edition

Operating Temperature Range - 0 to 45 Degree C

Additional Resources

For more information, go to https://www.ap.com. You'll find manuals, specifications, tech notes, application notes, white papers, audio test signals, Performance Check, utilities, APx sample projects, VB.NET / C#.NET / LabVIEW samples and more.

You can also contact our Technical Support staff at techsupport@ap.com, or by telephoning 503-627-0832 ext. 4, or 800-231-7350 ext. 4 (toll free in the U.S.A.).

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