APx500 v2.2
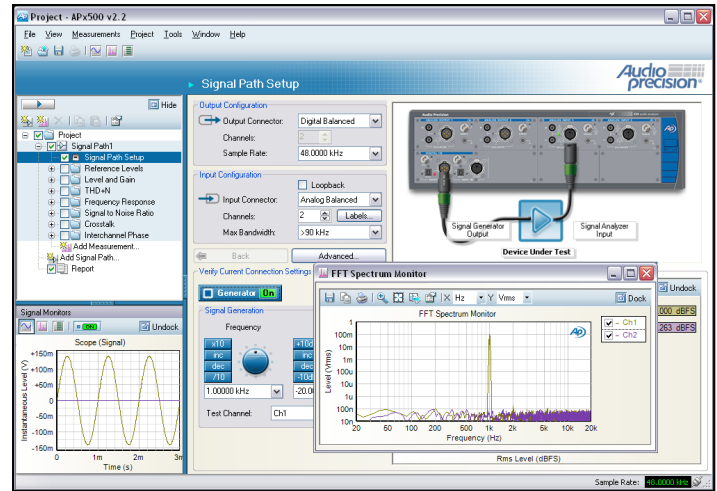## measurement software
for APx Series audio analyzers

What's new in v2.2

What's new in APx500 v2.2

APx500 Measurement Software v2.2 was released July 3, 2008. This document looks at the new and improved features in this release of the software.

1. Support for new APx models & modules
   a. APx520 two channel analyzer
   b. APx525 two channel analyzer with DIO
   c. HDMI option for APx585

2. New measurement features
   a. File playback function

3. Updates to the APx Resource Disc
   a. Revised Waveform Generation utility
   b. Addition of encoded test tones

4. Note to LabVIEW users
   a. New version requires short modification to existing VIs

For more information or a demonstration please contact your local AP sales partner or visit **http://ap.com**

Control PC Requirements

- Physical PC requirements have not changed with this new release:
    2 GHz processor
    2 GB RAM
    USB 2.0

- Operating System Support
  APx500 v2.2 is fully supported when running on computers using Microsoft Windows Vista and XP. This includes the ability to operate the software without special privileges, though administrator access is still required for the initial installation.

APx500 Measurement Software user interface

About the APx500 Series
next generation audio analyzer

The APx is a next generation audio analyzer that combines an award winning user interface with AP's legendary commitment to performance. It's the perfect audio analyzer for R&D and production test users who need speed and ease-of-use.

Now available in a 2, 8 or 16 channel configuration, the APx is capable of taking 14 measurements in as fast as 7 seconds, automatically generating a report of results and saving all test settings in a single, sharable project file.

The APx is designed for power amp and CD/DVD/MP3 manufacturers for use in R&D and production test, with multiple channels, Dolby/ DTS confidence testing, multitone analyzer, input regulation, and CEA-2006 & EIA/CEA-490-A measurements.

For more information visit http://ap.com.

Support for new APx models & modules

Support for APx520/525 audio analyzers

APx500 v2.2 is required to control the new APx520 and APx525 two channel audio analyzers. The two channel instruments have some features that are not available on the 8 and 16 channel models.

The additional features include:

1. Selectable source impedance
2. Selectable input termination
3. Common mode rejection ratio measurement, including support for the IEC60268-3 standard

For more information on the APx520 and APx525, visit **http://ap.com/products/apx525**

APx525 Two channel audio analyzer with digital I/O


APx520 Two channel audio analyzer

Support for APx HDMI Module

APx500 v2.2 adds support for the new APx HDMI module. The HDMI module adds a full HDMI 1.3A source and sink interface to the APx585. The Signal Path Setup has new controls for selecting the HDMI interface for the input or output when the HDMI module is detected. New advanced settings are available to control the output speaker allocation, video mode and HDCP configuration. There are also controls for disabling CEC data forwarding and for copying the E-EDID of a connected device for debugging purposes.

For more information on the APx585 with HDMI, visit **http://ap.com/products/apx_hdmi**

APx585 Multichannel audio analyzer with HDMI option
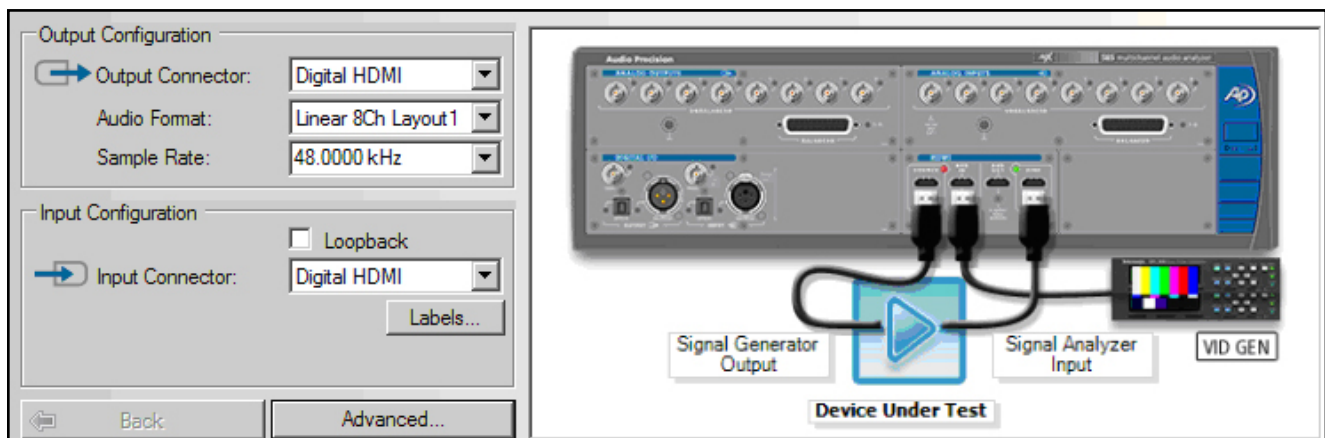
APx500 Software: Signal Path Setup for HDMI configuration

New measurement features

File playback function

APx500 v2.2 adds a new file playback function which allows the system to generate signals loaded from a computer file saved on the control PC. The system has a 32 Megasample buffer.

The system can play back the following file types:

- **.wav** – Type 1 MS-RIFF files
- **.dts** – dts Digital Surround 5.1 files
- **.cpt** – Compacted .dts files
- **.dtshd** – dts-HD Master Audio and High Res files
- **.ac3** – Dolby Digital 5.1 files
- **.ec3** – Dolby Digital Plus files

The file playback function is available for both analog and digital outputs. When a file is played back using a digital output the Bit Exact checkbox can be set. When Bit Exact is set the signal is streamed directly out without re-dithering, sample rate conversion, or gain change.

Selected audio files are embedded in the project file, making projects easy to share with peers, with the single project file containing all the settings and signal sources required.

Finally, when a stereo .wav file is loaded on a multichannel output, the user can control how the two channels of the .wav file are mapped to the output channels of the instrument.
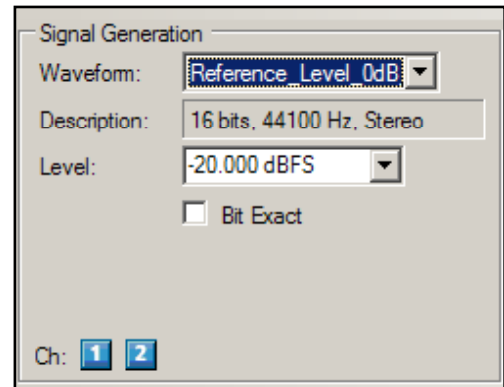
Waveform control dialog: .wav file selected for playback

Advanced settings dialog: File to generator channel mapping

Updates to the Resource Disc

Revised Waveform Generator

The WfmGeneration.exe utility has been revised to add a variety of new waveforms.

These include:

- **Polarity** – An asymmetrical waveform that can be used to test for device polarity
- **Square** – A 1 kHz square wave
- **White Noise** – A noise signal with equal energy per Hz
- **Pink Noise** – A noise signal with equal energy per octave
- **1 kHz + 1 kHz reversed polarity** – A stereo signal with the two channels inverted in phase
- **1 kHz + 80 Hz** – A stereo signal with one channel containing 1 kHz and the other 80 Hz.
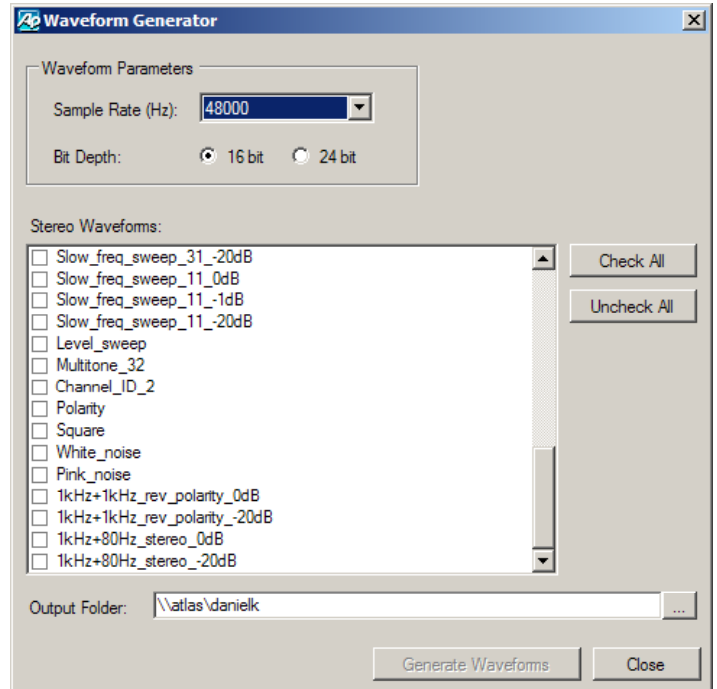
Waveform Generator setup dialog

Encoded Audio Test Tones

Users testing HDMI audio may chose to use the File playback function to stream encoded audio streams out to their device under test.

The APx Resource Disc now includes a library of Dolby and dts encoded audio files. These files are similar to the files of the same name and format available on the APx-BD1 Blu-ray disc, described in the PDF document "Audio Precision Test Signals on Blu-ray Disc".

File formats include

- Dolby Digital 5.1 channels
- dts Digital Surround 5.1 channels
- dts HD Master Audio 8 channel @ 48 kHz SR
- dts HD Master Audio 8 channel @ 96 kHz SR
- dts HD Master Audio 6 channel @ 192 kHz SR

Snapshot of encoded audio test tones library

Note to LabVIEW users upgrading from APx500 v2.1 to v2.2

LabVIEW VIs that interface with the APx500 control software are version specific. If you are currently using APx-LabVIEW VIs developed with APx500 version 2.1 and you upgrade to version 2.2, any VIs that reference the APx500 API will need to be modified.

Figure 1 illustrates the error message generated when the sample VI named InitializeAPx500.vi (created for Apx500 V2.1) is run after installing Apx500 V2.2. The first modification required is to change the reference on the .NET constructor node that references the APx500 Class. To do so, create a new .NET constructor node to replace it, as follows:

1. Select a Constructor Node from the .NET palette and drop it onto the diagram. Then, in the Select .Net Constructor dialog, select the assembly Audio.Precision.API(2.2.0.0), and the Object APx500 (see Figure 2). This changes the .NET reference to correctly point to V2.2 of the API.
2. Delete the old APx500 constructor node and replace it with the one you just created.

In addition to the above change, as of this writing, it is necessary to "refresh" several of the .NET property nodes and invoke nodes within LabVIEW VIs. This problem appears to be a result of LabVIEW maintaining references to the previous version of the APx500 API within VIs. Audio Precision is working with National Instruments to resolve this issue. In the meantime, we have determined that, in most cases, "refreshing" the property nodes and invoke nodes seems to remove any references to the previous version of the APx500 API, thereby rendering the VIs operable.

Figure 3 shows the type of error that results from a property node having an invalid reference.
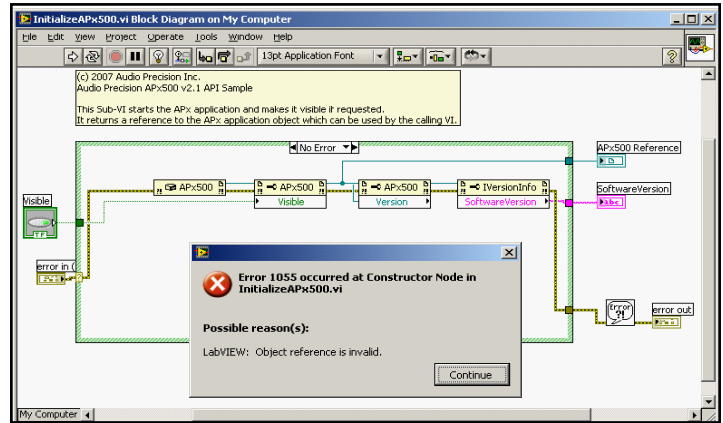

Figure 1. This example shows the error message generated when the VI named InitializeAPx500 which was created with APx500 V2.1 is run after installing V2.2
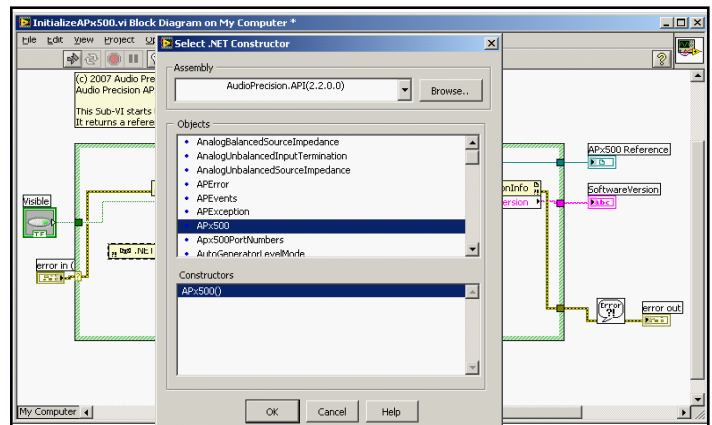

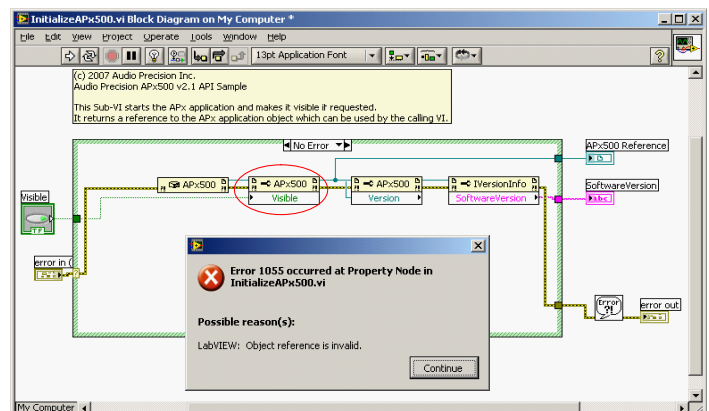Figure 2. Create the new APx500 Constructor Node.

Figure 3. This error message indicates that a property node needs to be "refreshed" as explained in the text.

To "refresh" a property node, click on one of the properties of the node to expose the property pick list and click on a different property to select it (see Figure 4). Then change the property back to its original value (Figure 5). This procedure usually restores the .NET reference to the correct version of the API.

The same procedure can be used to "refresh" an invoke node: Click on one of the methods of the node to expose the method pick list, and click on a different method to select it. Then change the method back to its original value. This procedure usually restores the .NET reference to the correct version of the API.

In some cases the above "refresh" procedure does not work. If it does not, delete the problem property node or invoke node and replace it with a new one from the .NET palette. To avoid coding errors, disconnect any input and output wires from the problem node and drag it out of the way. Then rebuild the node from the .NET palette to match the properties or methods of the node being replaced. Once the replacement node is wired in place, the problem node can be deleted.
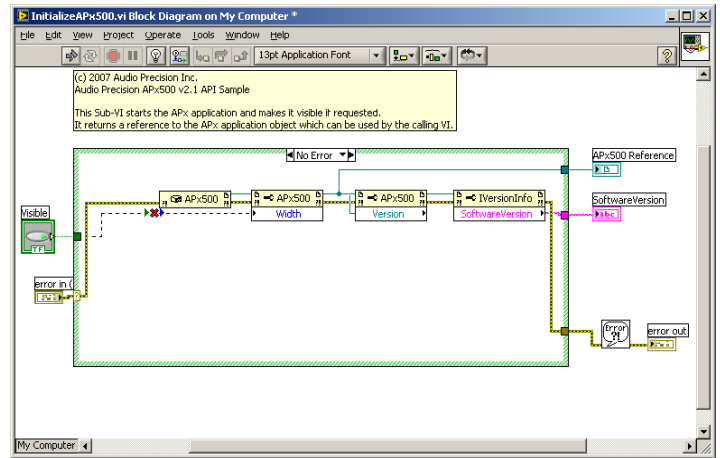

Figure 4. To "refresh" the APx500 property node shown in Figure 3, first change its property from Visible to some other property by clicking on it to expose the property list. In this example, "Width" was selected. Then change the property back to Visible, as shown in Figure 4.
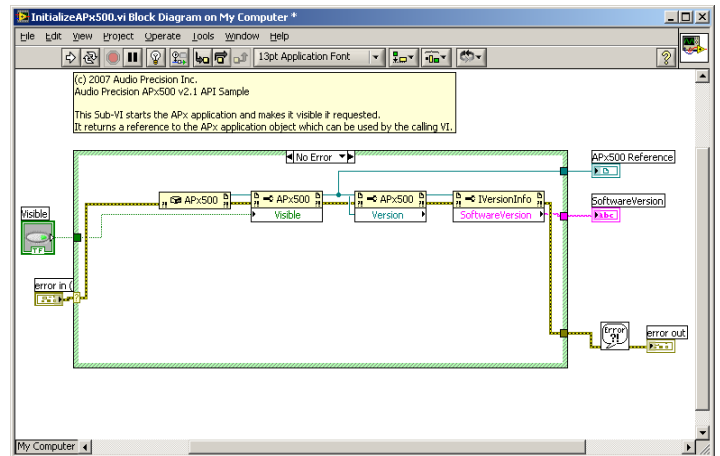

Figure 5. To "refresh" the APx500 property node shown in Figure 3, first change its property from Visible to some other property by clicking on it to expose the property list. In this example, "Width" was selected.