



# APx52x B Series | AUDIO ANALYZERS

Modular 2- and 4-channel performance audio analyzers



## KEY FEATURES

- ◆ Simultaneously measure up to 16 digital channels and 4 analog channels of audio data
- ◆ Typical THD+N < -110 dB [with AG52 option]
- ◆ > 1 MHz bandwidth @ 24 bits on two channels [with BW52 option]
- ◆ 1.2 M point FFTs
- ◆ Transfer Function Measurement (Sequence or Bench Mode)
- ◆ Open-Loop Measurements
- ◆ Broadest set of methodologies for detecting rub & buzz defects
- ◆ Support for the complete range of APx digital I/O options
- ◆ Optional Advanced Master Clock for Reference, Sync and Trigger



APx526 4-channel analyzer

## The ideal balance of analog performance and breadth of digital I/O

The **APx52xB Series** of audio analyzers combines our award-winning user interface and legendary performance with a comprehensive range of modular I/O options. The APx52x B Series brings AP innovations such as one-click measurements, code-free automation and sophisticated reporting to every interface in every combination.

### Outstanding performance and flexibility

The B Series APx525 ships with two channels of analog I/O and our Digital Interface Option (DIO) with AES/SPDIF digital inputs and outputs, and includes ASIO capability. If you need more than that, APx525 is ready with a full range of choices, from additional channels of analog to a chip-level digital serial interface (DSIO), HDMI+ARC, PDM (Pulse Density Modulation) or Bluetooth® wireless technology with built-in radio.

Need higher analog performance? With the BW52 enhanced analog bandwidth option installed, you can make a million-point FFT spectrum acquisition at 24 bits, across a bandwidth of DC to over 1 MHz on two channels. And with the AG52 enhanced analog generator option, typical system THD+N is as low as -110 dB.

The **B Series APx526** is a four channel version for those who require additional analog input channels.

### The power of APx measurement software

Across all measurements, the APx UI is fast and intuitive. Just click to select a measurement, then click to add a filter. Drag limits to set pass/fail points right on the results graph. Effortlessly specify computations for derived results. The APx generator can output steady tones, twin tones, sweeps, chirps, multitones or play WAV files as arbitrary waveforms.

### Automation and reporting

Repetitive bench tests and production testing can easily be automated with the built-in measurement sequencer and saved as a project that can be used with any APx analyzer. Production Test mode provides an optional simplified operator interface with multiple run statistics, created and supervised by a manufacturing engineer. Access the API if you prefer: documentation for VB.NET, C#.NET, MATLAB, and LabVIEW is included. Create powerful reports with Microsoft Word that let you define your own formatting and add graphs, tables and logos.

## OPTIONS

Select the options that match your needs. All models use the same software, so sharing projects is easy and modular hardware allows for future upgrades.

### PERFORMANCE

- AG52** Adds analog square wave and DIM generation, higher maximum output and improved system THN+D
- BW52** Adds two channel, 24 bit, 1MHz band with analysis

### DIGITAL I/O & CLOCK

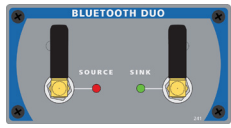
- Digital Serial** Adds interface for I<sup>2</sup>S, TDM, DSP
- Bluetooth** Adds Bluetooth radios for wireless audio test
- HDMI+ARC** Adds HDMI source, sink, monitor aux and ARC I/O

- PDM** Adds direct connectivity for digital MEMS mics
- AMC** Advanced Master Clock adds jitter clock, sync and trigger
- ADIO** Adds advanced Digital I/O and Advanced Master Clock modules



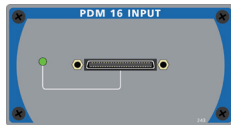
## APxDigital Options

APx B Series audio analyzers offer world-class performance and flexibility. Our modular systems allow you to select the interfaces and options that make sense for the work you do, covering the widest range of digital I/O in the industry. Select models support jitter generation and analysis when installed in AMC-configured APx analyzers.



### Bluetooth®

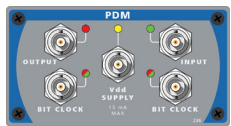
The B Series APx Bluetooth Duo supports A2DP, AVRCP, HFP, and HSP profiles for comprehensive wireless audio testing. With two integrated radios, APx Bluetooth Duo easily supports source/sink, audio gateway/handsfree, and target/controller profile roles.



### PDM 16

The B Series APx PDM 16 option provides 16 acquisition channels for audio devices that have

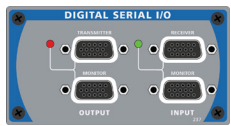
a PDM output (such as MEMS microphones), connecting through the module's PDM 16 remote pod. All 16 channels can be measured simultaneously to provide sample-accurate interchannel timing information. With cables available in lengths of 2, 5, and 10 meters, the acoustically silent remote pod can be placed next to the analyzer or up to 10 meters away, facilitating anechoic chamber testing.



### PDM

The APx PDM option provides direct connectivity for audio devices that have a PDM output

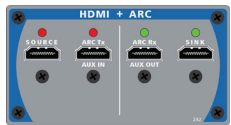
(such as a MEMS microphone) or input (such as the decoder on a smartphone chip). In addition to all the standard audio measurements, APx provides variable DC voltage, variable sample rate, and a PSR (Power Supply Rejection) measurement to test the device's full operating parameters. This option is jitter capable.



### Digital Serial

The Digital Serial I/O option adds a multichannel digital serial interface.

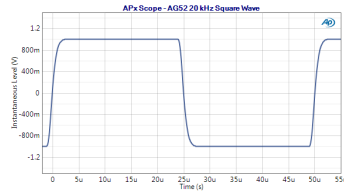
This provides a direct connection to chip-level interfaces such as I2S and supports all popular serial interface formats including left justified, right justified, and DSP. This option is jitter capable.



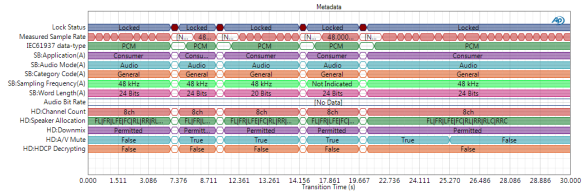
### HDMI

The B Series APx HDMI option (HDMI+ARC) allows you to measure HDMI audio quality

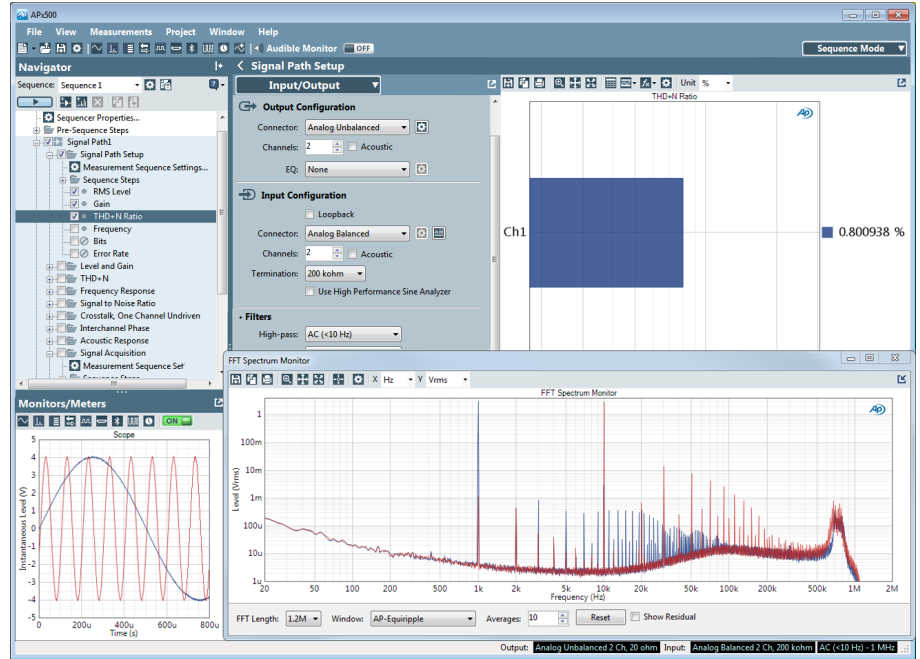
and audio format compatibility on devices such as surround sound receivers, set-top boxes, HDTVs, smartphones and tablets, and DVD or Blu-ray Disc™ players.



20 kHz square wave generated with the AG52 option



HDMI Metadata Monitor showing Number hotplug errors in-stream



APx500 UI with 24-bit 1 MHz FFT spectrum monitor display

## Vesatile, Powerful Audio Test

Combined with APx audio measurement software, the B Series APx audio analyzers integrate power, flexibility and ease-of-use. Choose between Bench Mode for real-time visibility into device behavior across a variety of parameters, and Sequence Mode for fast production testing and automated measurements.

## KEY SPECIFICATIONS

### SYSTEM PERFORMANCE

Residual THD+N (20 kHz BW)  
 -105 dB + 1.3  $\mu$ V  
 Typical <-108 dB (1 kHz, 2.5 V)  
 Typical <-110 dB (1 kHz, 2.5 V) [with AG52]

### GENERATOR PERFORMANCE

Sine Frequency Range  
 0.1 Hz to 80.1 kHz  
 Square Frequency Range [requires AG52]  
 10.0 Hz to 30.0 kHz  
 Frequency Accuracy  
 3 ppm

IMD Test Signals  
 SMPTE, MOD, DFD; DIM [requires AG52]  
 Maximum Amplitude (balanced)  
 21.21 Vrms  
 26.66 Vrms bal, 13.33 Vrms unbal,  
 when  $F_s \geq 10$  Hz [with AG52]

Amplitude Accuracy  
 $\pm 0.03$  dB (+15° C to +30° C)  
 Flatness (20 Hz - 20 kHz)  
 $\pm 0.008$  dB

Analog Output Configurations  
 Unbalanced and balanced

Digital Output Sampling Rate  
 27 kS/s - 200 kS/s\*

Dolby / DTS Generator  
 Yes (encoded file)

### ANALYZER PERFORMANCE

Maximum Rated Input Voltage  
 230 Vpk

Maximum Bandwidth  
 >90 kHz  
 >1 MHz [with BW52]

IMD Measurement Capability  
 SMPTE, MOD, DFD

Amplitude Accuracy (1 kHz)  
 $\pm 0.03$  dB (+15° C to +30° C)  
 Amplitude Flatness (20 Hz - 20 kHz)  
 $\pm 0.008$  dB

Residual Input Noise (20 kHz BW)  
 1.3  $\mu$ V

Individual Harmonic Analyzer  
 d2-d10

Maximum FFT Length  
 1248K points

DC Voltage Measurement  
 Yes



Accredited by A2LA  
 under ISO/IEC: 17025  
 for equipment calibration

\*Optical 27 kS/s to 108 kS/s

## APx52x Series Software Options

APx500 software options provide measurements and functionality beyond the core set of capabilities standard for the APx52x B Series analyzers. A variety of options are available for electro-acoustic and perceptual audio test needs.

Software licensing options provide APx users several choices for accessing new software releases. Perpetual licenses are available via the SW-EXT (purchased with a new analyzer) or SW-MAINT (purchased for an existing analyzers) options. Time-limited licenses are available via software subscriptions (SW-SUBSCR) and, in the case of subscriptions, provide access to all software versions and options (excluding PESQ and POLQA).



### ELECTRO-ACOUSTIC MEASUREMENTS

Part No.	Description	Measurements/Features
APX-SW-SPK-PT	Loudspeaker Test: Production	Combines an acoustic measurement (Frequency Response, Phase, Distortion and the broadest set of methodologies available for detecting rub & buzz defects) and an electromechanical impedance measurement (Impedance Response Curves plus a subset of Thiele-Small). Also includes Acoustic Response (APx v4.0 or later) and Modulated Noise.
APX-SW-SPK-RD	Loudspeaker Test: R&D	Acoustic Response (with Rub & Buzz), Impedance / Thiele-Small, Modulated Noise. Includes all measurements in APX-SW-SPK-PT plus the APx Polar Plot and APx Waterfall Graph utilities.

### PERCEPTUAL AUDIO

Part No.	Description	Measurements/Features
APX-SW-STI	Speech Transmission Index	Plug-in for conducting Speech Transmission Index (STI) measurements using the STIPA method.
APX-SW-PESQ	PESQ	Widely-used, enhanced perceptual measurement for voice quality on low-bandwidth devices.
APX-SW-POLQA2	POLQA	Successor to PESQ with support for HD Voice, 3G, 4G/LTE and VoIP technologies. (2 channels)
APX-SW-ABC-MRT	ABC-MRT	Provides an objective measure of speech intelligibility following the paradigm of the Modified Speech Ryme Test.

### SOFTWARE LICENSING OPTIONS

Part No.	Description	Measurements/Features
SW-MAINT-1/3/5	Software Maintenance	Provides 1,3, or 5 years of software maintenance for an existing APx Legacy or B Series audio analyzer (perpetual licenses).
SW-EXT-3/5	Software Maintenance	Provides 2 or 4 additional years of software maintenance with the purchase of a new APx B Series analyzer (perpetual licenses).
SW-SUBSCR-1/3/5YR	Software Subscription	Provides 1, 3, or 5 year software subscriptions (time-limited licenses).

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