Audio precision

2015 AUDIO TEST SOLUTIONS

APx500 AUDIO TEST SOFTWARE
A versatile, powerful audio test experience

APx SERIES AUDIO ANALYZERS
The state of the art in audio test

APx DIGITAL I/O OPTIONS
Versatility in digital interfaces

ELECTRO-ACOUSTIC TEST
Measurement solutions for R&D and Production

2700 SERIES & ATS-1 AUDIO ANALYZERS
Performance and reliability in audio test

A versatile, powerful audio test experience

With its redesigned software platform, the powerful APx Audio Analyzer Series provides never-before-seen flexibility and usability.

This bold new interface offers users two easy-to-use modes. 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.

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

APx500 Measurement Software metadata recorder tracking HDMI metadata changes.

Sharing projects & reporting results

All settings for a test are saved in a single project file, making it easy to replicate test setups between R&D and production facilities anywhere in the world. Project files are compatible with all APx instruments and each project is self-contained, so there's never any worry about dependencies or broken links. Users can even embed waveform files and images within a project file.

For customers, contract manufacturers or management, APx automatically generates rich graphic reports, with highlighted pass / fail limits and options to export as PDF, HTML, Excel, CSV, RTF or MATLAB files.

Code-free automation & complete API

APx500 Measurement Software is the most advanced audio measurement interface available. Complex procedures that include user prompts, limits, and calls to external applications can be created directly in the GUI, saving time and money while ensuring painless updates over time, as no development is required.

Create custom interfaces and application-to-application automation using the comprehensive APx API for integration in VB.NET, C#.NET, MATLAB, and LabVIEW development environments. Projects and automation can be shared with other APx units anywhere in the world.
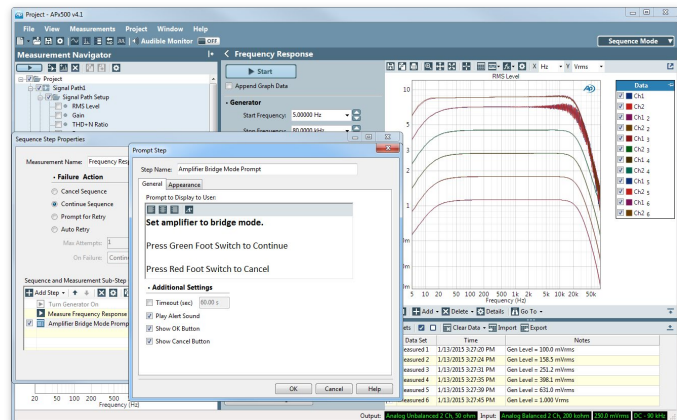
A test engineer adds footswitch interaction to a sequence without a single line of code required.

APx SERIES AUDIO ANALYZERS

The APx Series of audio analyzers represents the state of the art in audio test, with models and options to suit every need from R&D to high-speed production test. Industry-leading analog performance, flexible software with a multi-mode UI, and a wide range of digital I/O and software options make APx the most powerful and versatile series of instruments we've ever produced.

APx555

High-performance, modular 2-channel audio analyzer

The New Standard: The APx555 is the highest performance and most versatile audio analyzer ever made, specifically designed for audio engineers requiring the lowest distortion and greatest flexibility possible.
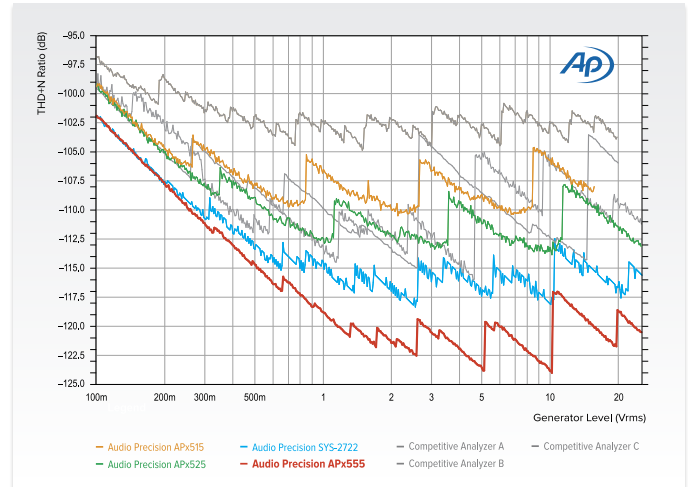
Total Harmonic Distortion + Noise (THD+N) comparison chart

APx52x Series

Modular 2- and 4- channel performance analyzers

The APx52x is a flexible, performance-oriented 2- or 4-channel analyzer with support for high-performance analog options and all APx digital options. Pair with SWR-2755 Switchers to expand channel count up to 192 inputs and 192 outputs.

APx515

2-channel audio analyzer

The APx515 is a fixed-configuration analyzer with a small footprint, designed for high-speed production, electro-acoustic test, and a range of R&D applications.

APx58x Series

8- and 16-channel modular analyzers

Ideal for multichannel devices, the APx58x offers 8 analog output and 8 or 16 analog input channels with support for all APx digital options.

APx511

Hearing instrument audio analyzer

Designed to meet the needs of hearing instrument manufacturers, the APx511 offers the specific measurements and I/O required for hearing instrument production test, including automated routines for IEC60118-7 and ANSI S3.22.*

* The APx511 is not intended to be used for medical diagnostic or therapeutic purposes, and is not intended to be used in or on the human body. It is not intended to be used by audiologists or for any patient-specific purpose.

FEATURES

FEATURES	APx511	APx515	APx52x	APx58x	APx555
Analog input channels	1 auto-ranging	2	2 (APx525) 4 (APx526)	8 (APx582 / 585) 16 (APx586)	2
Analog output channels	2	2	2	2 (APx582) 8 (APx585 / 586)	2

Analog Analyzer Performance

	APx511	APx515	APx52x	APx58x	APx555
Bandwidth	>20 kHz	>90 kHz	>90 kHz	>90 kHz	>1 MHz - 2 channels
Maximum Rated Input Voltage	48 Vpp	125 Vpk	230 Vpk	160 Vpk	230 Vpk

Analog Generator Performance

	APx511	APx515	APx52x	APx58x	APx555
Sine Frequency Range	100 Hz - 20 kHz	2 Hz - 80.1 kHz	0.1 Hz - 80.1 kHz	0.1 Hz - 80.1 kHz (APx582) 5.0 Hz - 80.1 kHz (APx585 / 586)	0.001 Hz - 80.1kHz, DAC 5 Hz - 204 kHz, analog
Maximum Amplitude (balanced)	16.12 Vpp	16.00 Vrms	21.21 Vrms 26.66 Vrms (option AG52)	21.21 Vrms (APx582) 14.40 Vrms (APx585 / 586)	26.66 Vrms

System Performance

	APx511	APx515	APx52x	APx58x	APx555
Residual THD+N (20 kHz BW)	−80 dB + 1.4 µV	−102 dB + 1.4 µV	−105 dB + 1.3 µV	−103 dB + 1.3 µV	−117 dB + 1.0 µV
Residual Input Noise (20 kHz BW)	1.4 µV	1.4 µV	1.3 µV	1.3 µV	1.0 µV

Analog Options List

	APx511	APx515	APx52x	APx58x	APx555
BW52 High Bandwidth (2 Ch - 1 MHz)	-	-	(Opt)	-	Standard
AG52 Square Wave, DIM	-	-	(Opt)	-	Standard
Tone Burst	-	-	-	-	Standard
Intermodulation Distortion	-	(Opt)	Standard	Standard	Standard

Digital Options List

	APx511	APx515	APx52x	APx58x	APx555
ASIO	-	(Opt)	Standard	Standard	Standard
Digital I/O (AES3 / SPDIF)	-	Standard	Standard	Standard	Standard
Advanced Digital I/O (ADIO)*	-	-	(Opt)	(Opt)	Standard
HDMI	-	-	(Opt)	(Opt)	(Opt)
Bluetooth	-	-	(Opt)	(Opt)	(Opt)
PDM	-	-	(Opt)	(Opt)	(Opt)
Digital Serial I/O	-	-	(Opt)	(Opt)	(Opt)
Advanced Master Clock (AMC)*	-	-	(Opt)	(Opt)	Standard

Reference/Sync (AMC module)

|	APx511	APx515	APx52x	APx58x	APx555
AES11 DARS Reference In/Out	-	-	(Opt)	(Opt)	Standard
Sync In/Out	-	-	(Opt)	(Opt)	Standard
Trigger In/Out	-	-	(Opt)	(Opt)	Standard

* ADIO includes AMC module

ADVANCED DIGITAL I/O INTERFACE

ADVANCED DIGITAL I/O
UNBAL — UNBAL
PUSH
OPTICAL — BALANCED — BALANCED — OPTICAL
OUTPUT — INPUT
219

Advanced capabilities for AES/SPDIF/TOSLINK

The APx ADIO module enables the generation of advanced impairments for sophisticated test of devices via AES/SPDIF/TOSLINK. It also includes the Advanced Master Clock (AMC) module, which handles input and output clock signals for synchronizing an APx with external equipment (or vice versa). AMC also provides jitter generation and measurement functionality for jitter-enabled I/O modules such as ADIO and DSIO.

HDMI + ARC

HDMI + ARC
SOURCE — ARC Tx — ARC Rx — SINK
AUX IN — AUX OUT
214
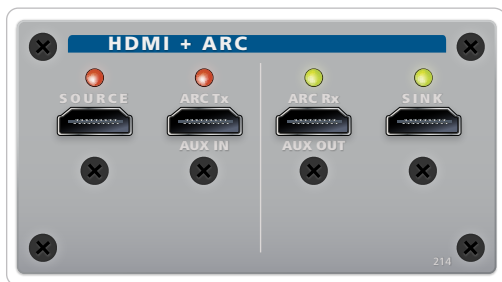
Systematic test for HDMI+ARC

The APx HDMI option allows engineers to measure HDMI audio quality and audio format compatibility on devices such as surround sound receivers, set-top boxes, smartphones, tablets, TVs, and DVD or Blu-ray Disc™ players. APx can stream both lossless and compressed formats from pre-encoded audio test files, making it easy to troubleshoot component compatibility and issues related to downsampling, downmixing, or transcoding.

BLUETOOTH WIRELESS

BLUETOOTH
SOURCE
SINK
RF
213
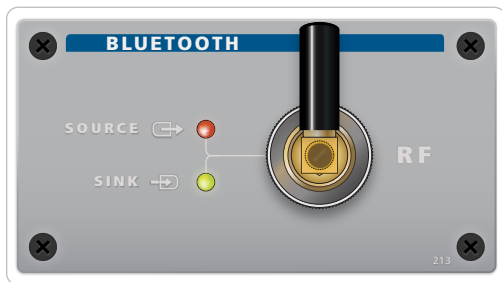
Integrated *Bluetooth*® wireless technology

APx's Bluetooth module, with built-in radio and software stack, allows engineers to measure their Bluetooth devices directly. All Bluetooth controls are integrated into the analyzer software and APx supports A2DP, HFP, HSP, and AVRCP profiles. Codec support includes SBC, aptX, CVSD, and wideband speech (mSBC).

DIGITAL SERIAL INTERFACE

DIGITAL SERIAL I/O
TRANSMITTER — RECEIVER
MONITOR — MONITOR
OUTPUT — INPUT
216
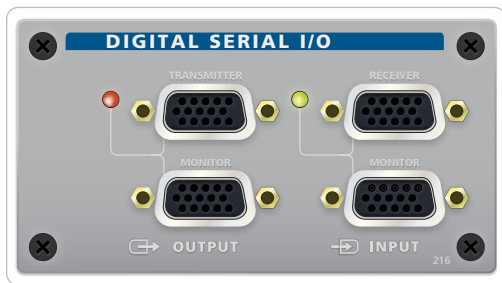
Multichannel chip-level connectivity

Digital serial capability is essential in R&D for evaluating designs at the circuit board level. The Digital Serial I/O (DSIO) option provides a direct multichannel connection to chip-level interfaces such as I2S, TDM, and other popular serial interface formats including left-justified, right-justified, and DSP.

PDM INTERFACE

PDM
OUTPUT — INPUT
POWER SUPPLY
15 mA MAX
BIT CLOCK — BIT CLOCK
215

Complete PDM analysis for smartphones and MEMS

The APx PDM option provides direct connectivity for audio devices that have a PDM (pulse density modulation) output such as a MEMS microphone, or an input such as the decimator on a smartphone chip. In addition to standard audio measurements, APx provides variable DC voltage, variable sample rate, and PSR (power supply rejection) measurements for testing devices' full operating parameters. Also supports DSD, up to DSD256.

APx ELECTRO-ACOUSTIC

The electro-acoustic test software options for APx analyzers form a comprehensive solution, allowing designers and production engineers to test electro-acoustic products end-to-end. Measurements, results, reports and automation can be easily shared among platform family members, allowing designers and production engineers to collaborate and ensure quality, even when separated by great distances.

Research & Development

The **APX-SW-SPK-RD** option delivers a complete suite of measurements and results tailored to the needs of designers and engineers developing electro-acoustic audio products. It includes key measurements and results such as complete Thiele-Small characterization; time-gated, quasi-anechoic Acoustic Response; Impedance analysis; plus the Loudspeaker Production Test measurements.

Production

The **APX-SW-SPK-PT** option enables high-speed production test of electro-acoustic devices, providing key loudspeaker measurements in a single one-second sweep. Results include Rub & Buzz detection, essential Thiele-Small parameters, and impedance magnitude and phase. A proprietary modulated noise measurement is also provided to aid in detecting enclosure air leaks.

Acoustic Test Accessories

AP offers accessories and fixtures that extend the capabilities of APx audio analyzers, and is an authorized reseller of products from G.R.A.S. Sound and Vibration of Denmark.
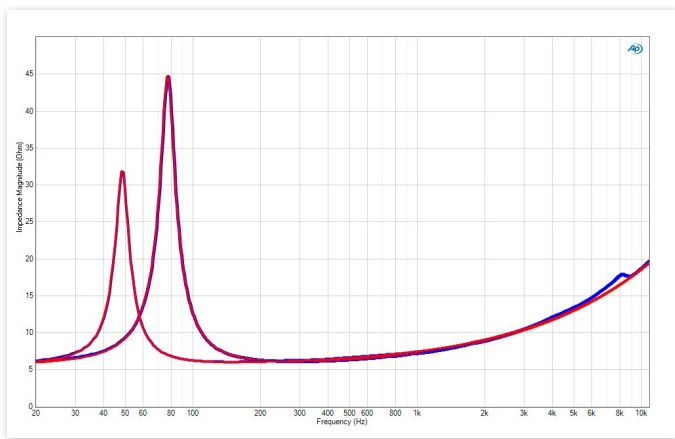
The Impedance Magnitude measurement is included in both the R&D (SPK-RD) and Production Test (SPK-PT) electro-acoustic software options.

	SPK-RD	SPK-PT
Impedance/Thiele-Small	✔	✔
Full Thiele-Small Parameters	•	
Impedance Real	•	
Impedance Imaginary	•	
Impedance Magnitude	•	
Impedance Phase	•	
Loudspeaker Production Test	✔	✔
Optimized Thiele-Small Parameters	•	•
Rub & Buzz Detection	•	•
Impedance Magnitude	•	•
Impedance Phase	•	•
Frequency Response	•	•
Relative Level	•	•
Phase	•	•
Distortion Product Ratio	•	•
Distortion Product Level	•	•
Acoustic Response	✔	
Rub & Buzz Detection	•	
Impulse Response	•	
Energy Time Curve	•	
Frequency Response	•	
Relative Level	•	
Phase	•	
Distortion Product Ratio	•	
Distortion Product Level	•	
Modulated Noise Air Leak Detection	✔	✔

G.R.A.S. Microphones and Test Fixtures	Type 1 and Type 2 Measurement Microphones, KEMAR Head and Torso simulators, artificial ears, mouth simulators and more.
Impedance Fixture IMP1	Connect loudspeakers in multiple configurations with two selectable values of sense resistor (0.1Ω and 1.0Ω) and several combinations of amplifier and driver.

APx PERCEPTUAL AUDIO TEST

Voice quality test for mobile and hands-free devices

APx PESQ and POLQA measurements test voice quality on mobile phones, VoIP networks, and hands-free devices. Tests return MOS (Mean Opinion Score) values with a high correlation to results obtainable using human subjects.

APX-SW-POLQA2	Next-generation voice quality test with support for wideband speech and acoustical interfaces.
APX-SW-PESQ	Perceptual audio test (speech) for low-bandwidth devices, such as mobile phones and smartphones.

2700 SERIES

High-performance, modular 2-channel audio analyzer

The Classic Standard: Combining dual-domain functionality with very low distortion and noise performance, the 2700 Series is the classic standard for audio analysis, perfect for audio engineers who need high performance, low distortion and reliability.

KEY FEATURES

- Dedicated analog circuitry for very low residual noise and THD+N

- 192 kHz digital input and output capabilities

- Generate and analyze MLS, white and pink noise and other special purpose waveforms

- API automation with AP Basic scripting and "learn mode"

- LabVIEW driver and an IEEE.488 GPIB interface option

- User-defined sweeps, switcher support up to 192 channels

MODEL OPTIONS

SYS-2722   **Dual-domain.** Two-channel analog input/output, analog analyzer and generator, DSP analyzer and generator, plus 192k digital input/output.

SYS-2712   **Analog domain only.** Two-channel analog input/output, analog analyzer and generator, DSP analyzer and generator.

SYS-2702   **Analog domain only.** Two-channel analog input/output, analog analyzer and generator.

KEY FEATURES

- Indepedent analog and digital signal generators

- Digital interface analysis

- GPIB emulation mode for drop-in replacement of aging HP8903 instruments

- Full complement of graphing and reporting options

- Wide range of analog and digital test signals

ATS-1

Self-contained 2-channel audio analyzer

ATS-1 analyzers bring bench-quality, high-precision test and measurement to maintenance, engineering and production facilities. Whether in broadcast, communications, bench or production use, the ATS-1 offers a complete, easy-to-use audio analyzer housed in a rugged metal case that's ready for almost anything.

MODEL OPTIONS

ATS-1A   ATS-1 Access Audio Test System with IEEE-488 GPIB interface.

ATS-1DD   ATS-1 Dual Domain (digital and analog) Audio Test System with IEEE-488 GPIB interface. 96 kHz digital audio.

Ap WORLDWIDE PARTNERS

Canada	GERR AUDIO	www.gerr.com
China (North and West)	ELECTRONIC SCIENTIFIC ENGINEERING	www.ese.com.hk
China (South and East)	AP TECHNOLOGY, LTD.	www.AudioAPT.com
Czech Republic	TRI INSTRUMENTS	www.trinstruments.cz
Denmark, Norway, Sweden	NORTELCO	www.nortelcoelectronics.dk
Finland, Estonia, Lithuania	AUDIOBUILDERS	www.audiobuilders.fi
France	EQUIPEMENTS SCIENTIFIQUES	www.es-france.com
Germany, Austria, Switzerland	ADMESS VERTRIEBS GMBH	www.admess.de
Hungary	FOLDER TRADE	www.foldertrade.hu
India	COMCON TECHNOLOGIES LTD.	www.comcon.co.in
Israel	DAN-EL TECHNOLOGIES, LTD.	www.danel.co.il
Italy	AUDIO LINK, SRL	www.audiolink.it
Japan	CORNES TECHNOLOGIES LTD.	www.cornestech.co.jp
Malaysia	TME SYSTEMS PTE. LTD.	www.tmesystems.com.sg
Mexico	GRUPO DIEZ TECNOLOGÍA	www.grupodiez.com.mx
Mexico	INCELERIS	www.inceleris.com
Netherlands, Belgium, Luxembourg	HEYNEN	www.heynen.com
Poland	MERSERWIS	www.merserwis.pl
Romania	ROMTEK ELECTRONICS SRL	www.romtek.ro
Russia	DATATEST, LTD.	www.audiop.ru
Singapore	TME SINGAPORE	www.tmesystems.net
South Korea	B&P INTERNATIONAL	www.bandp.co.kr
Spain	ALAVA INGENIEROS S.A.	www.alava-ing.es
Taiwan	AUDIO TECHNOLOGY, LTD.	www.audiotech.com.tw
Turkey	ATEKSIS	www.ateksis.com
Vietnam	SYSTEM INTERLACE	tuonglam@syscovn.com

ap.com   (800) 231-7350   sales@ap.com

Audio Precision