



Bluetooth option for APx

Built-in *Bluetooth* wireless technology for APx audio analyzers



APx525 2 channel analyzer with *Bluetooth* option and I²S digital serial option.

Key Features

- Comprehensive audio test over *Bluetooth*® wireless technology.
- Built-in *Bluetooth* radio and *Bluetooth* stack supports A2DP, HFP, HSP, AVRCP profiles and SBC, aptX, CVSD codecs.
- Built-in *Bluetooth* controls: Open a connection, ring a device, send AVRCP commands.
- Check every part of the audio chain with one analyzer: *Bluetooth* to analog, AES3 digital, S/PDIF, HDMI and I²S.
- Intuitive user interface with one-click measurements for 30+ audio tests.
- Automation built-in or via VB.NET, C#, or LabVIEW.
- Create custom reports using Microsoft Word templates.

The APx *Bluetooth*® option is the best solution in the world for testing audio over *Bluetooth* wireless technology. No other analyzer combines integrated *Bluetooth* controls with APx's best in class speed, ease-of-use and performance.

Today, engineers are limited to subjective listening tests, or to connection through components or systems that may subject the signal to unspecified and uncontrollable gain, distortion or sample rate conversion. APx's built-in *Bluetooth* radio and *Bluetooth* stack allows engineers to measure their *Bluetooth* devices directly, eliminating the uncertainty and inconvenience of adapters and making *Bluetooth* audio test faster, easier and more reliable.

Integrated *Bluetooth* control for reliable wireless connectivity

With APx, all *Bluetooth* controls are integrated into the analyzer software. In addition to standard commands like pairing or opening a connection, it's easy to switch between profiles and roles on the fly, specify a custom device class, connect with a preferred sample rate or codec, or force open a SCO without ringing. For deeper protocol analysis, a link key is available to cut and paste into a *Bluetooth* packet sniffer.

Comprehensive audio test from the recognized standard

Once connected, every audio characteristic can be measured. Key features include 30+ one-click audio measurements (including all standard weighting filters), one-million-point FFTs, real-time oscilloscope monitoring, custom reports, statistical calculations and quasi-anechoic acoustic measurements. With 21 measurements in one second, the APx multitone analyzer is ideal for *Bluetooth* production test.

Recommended models & options

(The APx *Bluetooth* option is compatible with APx520, 521, 525 and 585)



Handsfree & headsets (APx520)

APx's quasi-anechoic acoustic measurements and built-in SCO and AVRCP commands are ideal for handsfree devices and wireless speakers.



A/V Receivers & *Bluetooth* chips (APx585)

Ultimate connectivity. Test *Bluetooth*-to-HDMI, *Bluetooth*-to-surround speaker outputs, *Bluetooth*-to-S/PDIF, *Bluetooth*-to-I²S. Ideal for multichannel receivers or *Bluetooth* chips.



Automotive audio (APx521)

2 or 4 channels of high performance analog with 300 Vrms max input (bal) plus *Bluetooth* is ideal for automotive head units.



Smartphones (APx525)

APx switches between A2DP and HFP seamlessly and supports streaming over a SCO or .wav file playback for testing smartphones.

"No code" automation for production

APx is very easy to automate for production line tests. Complex routines can be designed by simply selecting measurements from a list and adding pass/fail limits and user prompts.

Projects can be locked before sharing with contract manufacturers or other partners. Alternatively, the APx API offers full control from any .NET application or LabVIEW.

Rich reports with color graphs and pass/fail results for an entire sequence or individual measurements can be generated automatically using APx's built-in reports, or by adding a custom Microsoft Word template.

Isolation of audio stages

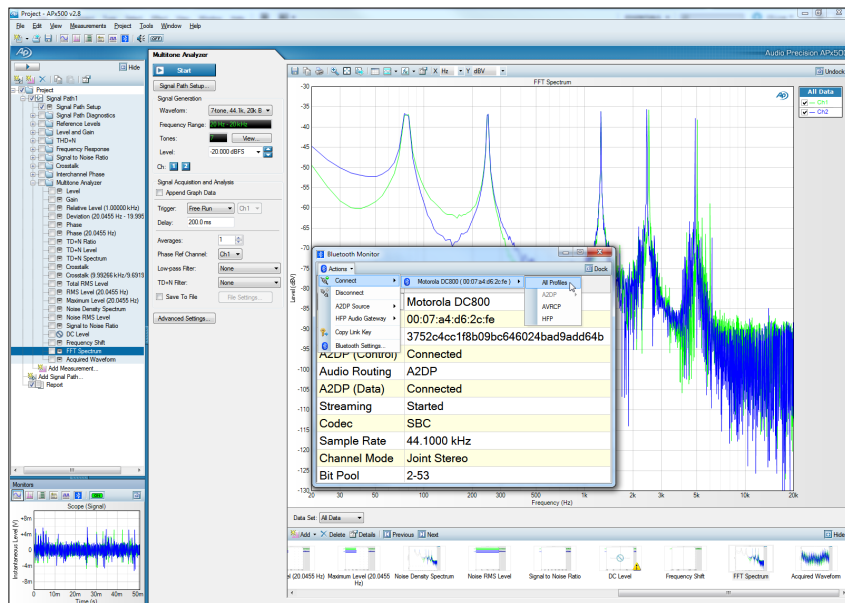
With APx, nearly any combination of input and output can be measured directly: Bluetooth, analog (2, 4 or 8 channels), AES3 or S/PDIF digital, I²S digital serial and HDMI are all available.

Quasi-anechoic acoustic test

Most Bluetooth devices have Bluetooth at one end of the audio chain and a transducer at the other. APx's Acoustic Response measurements makes 14 key acoustic measurements in 3 seconds and uses an energy time curve to find the ideal time gate quickly and easily.

Perceptual audio tests

APx facilitates perceptual audio testing by being able to play and record vocal reference .WAV files over Bluetooth. Because APx adds no vocal impairment of its own, it can serve as an ideal Bluetooth transmitter or receiver, allowing the device under test to be accurately assessed.



▲ FAST & INTUITIVE UI

A test engineer switches between profiles before running another multitone sequence that generates 21 measurements in 2 seconds. All key Bluetooth data is available in the Bluetooth monitor.

Bluetooth Specs

Bluetooth Core Version
2.1+EDR

Profiles / Roles Supported
A2DP Source; A2DP Sink; HFP Audio Gateway; HFP Hands-Free; HSP Audio Gateway; HSP Headset; AVRCP Controller

Codecs supported
SBC; aptX; CVSD

RF Connection
Type N female jack. Antenna with N to SMA adapter included.

RF Input Impedance
50 Ohm Typical

RF Output Impedance
50 Ohm Typical

RF Power
0 dBm Typical

RF Sensitivity
(0.1% BER)
-81 dBm Typical



APx500 Series Audio Analyzer Key Specifications

SYSTEM PERFORMANCE

Residual THD+N (20 kHz BW)
-105 dB + 1.3 μ V [APx520-25]
-103 dB + 1.4 μ V [APx585]

GENERATOR PERFORMANCE

Sine Frequency Range
0.1 Hz to 80.1 kHz [APx520-25]
5 Hz to 80.1 kHz [APx585]

Frequency Accuracy
2 ppm [APx520-25]
3 ppm [APx585]

IMD Test Signals
SMPTE, MOD, DFD

Maximum Amplitude (balanced)
21.21 Vrms [APx520-25]
14.4 Vrms [APx585]

Amplitude Accuracy
 ± 0.05 dB

Flatness (20 Hz–20 kHz)
 ± 0.008 dB

Analog Output Configurations
unbalanced & balanced

Digital Output Sampling Rate
22 kHz–192 kHz

Dolby / DTS Generator
Yes

ANALYZER PERFORMANCE

Maximum Rated Input Voltage
300Vrms (bal) / 160Vrms (unbal)
[APx520-25]
110Vrms (bal/unbal) [APx585]

Maximum Bandwidth
>90 kHz

IMD Measurement Capability
SMPTE, MOD, DFD

Amplitude Accuracy (1 kHz)
 ± 0.05 dB

Amplitude Flatness (20 Hz–20 kHz)
 ± 0.008 dB

Residual Input Noise (20 kHz BW)
1.3 μ V

Individual Harmonic Analyzer
d2–d10

Max FFT Length
1024K points

DC Voltage Measurement
Yes



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

Specifications subject to change.

This equipment contains a radio module that may require authorization from the national authorities prior to sale or lease.
This device is not, and may not be, offered for sale or lease, or sold or leased, until the necessary authorization is obtained.