



## What's New: APx500 version 5.0 December 2018



B Series APx555 supported by APx500 version 5.0

*This document looks at the new features in the latest release of the APx500 software for APx Series audio analyzers, and any hardware improvements.*

*For more information, please contact your local Audio Precision sales partner, or visit the AP website at [ap.com](http://ap.com) for datasheets, technical articles, and software downloads.*

## INTRODUCING APx500 VERSION 5.0

APx500 version 5.0 is a major release that brings software innovations, improved security, and B Series compatibility to the APx platform. APx 5.0 will only run in Demo Mode unless an authorizing Software Version License Key is present in the attached analyzer instrument. New B Series APx analyzers are shipped with the Software Version License Key installed; legacy APx analyzers require an APx KeyBox (see below) and the Software Version License Key for APx 5.0.

## SUPPORT FOR B SERIES ANALYZERS

Audio Precision began shipping APx B Series analyzer hardware in December 2018. The APx B Series is based on a new internal processor and supporting chipset, with hardware security, USB 3.0 connectivity, and more powerful capabilities for upcoming features. B Series analyzers are supported by APx500 software version 5.0 and later. Earlier, non B Series analyzers are referred to as legacy APx analyzers.

## TRANSFER FUNCTION MEASUREMENT

Transfer Function provides the difference between two audio signals by comparing the complex spectra of the two signals. Often, the signals are taken at the input and output of a device, so their comparison represents how the signal has changed having transferred through the device. Signals can also be taken at the output of two devices to compare their response to a common stimulus.

This feature, which uses FFT analysis on the two signals, is also called “Dual FFT.”

Transfer function is a powerful tool that can characterize a device, system or channel in great detail. It provides a frequency response measurement (both magnitude and phase) of electronic or electroacoustic audio systems using arbitrary broadband signals such as noise, music, or speech.

Transfer Function compares an FFT of a reference signal (typically the stimulus signal) with an FFT of the output of device under test. If the output of a device is used as the reference signal, Transfer Function can also be used to characterize the difference between that device and a second device, when both are stimulated by the same signal.

One of the most powerful aspects of this technique is that the stimulus signal can be tailored to suit the DUT, channel, or testing environment, as long as it is broadband with sufficient energy across the spectrum of interest. For example:

- some codecs are designed to pass music but don't respond well to steady tones.
- smart device systems algorithmically deconstruct acoustic input signals in ways that make sweeps or steady tones unusable for measurement.
- environments exposed to the public, such as broadcast channels or live performance venues, can be effectively stimulated by voice or music signals.

Transfer Function can also be used to compare two devices. For example, microphones used to work in an array typically are selected for closely matching frequency and phase characteristics. The physical mounting, axis of orientation and local acoustic environment can also affect how each array mic responds to a stimulus. When the output of one microphone is selected as the reference, and output of a second

microphone is selected as an input, the transfer function reveals their differences when subjected to a common acoustic stimulus signal.

## FOR THE APx555: THE ENHANCED ANALOG GENERATOR (EAG)

The B Series APx555 includes the Enhanced Analog Generator (EAG), which is also available as an upgrade to a legacy APx555. The EAG is supported by APx version 5.0.

The EAG provides improved analog audio performance, taking the already unmatched performance of the APx555 to another level. Independent configuration of analog channels is available with the EAG, along with switchable channel inversion, and a new feature called Single-Ended Configuration. A Precision Tune feature has been added, enabling greatly improved analog generator frequency accuracy. The EAG also supports the optional ADC Test Option configuration (see below).

## AN OPTION FOR THE EAG: ADC TEST CONFIGURATION

The Analog Balanced (ADC Test) output configuration is an option available to an EAG-equipped APx555. This option is designed to support design, testing and evaluation of analog-to-digital converter (ADC) chips by providing a common-mode dc offset capability called VBias, with protecting Pin Voltage Max and Min settings.

## SOFTWARE OPTIONS

Previously, Software Option keys were provided in an iButton, a physical container which was inserted in a Software Option Module, mounted on the APx rear panel.

For APx500 version 4.6 and later, the Software Option Module has been obsoleted and replaced by the APx KeyBox. Legacy iButtons are still supported by APx 4.6 and later, and can be inserted into an APx KeyBox for use.

However, Software Option Keys purchased after December 18, 2018, are enabled by a secure License File, typically delivered by email. The License File installs the Software Option Key(s) internally in an APx B Series analyzer, or into an APx KeyBox attached to a legacy APx analyzer.

Software Option Keys delivered by License File can only be installed in one APx B Series analyzer, or one APx KeyBox. Software Option keys delivered by License File are not transferable.

## THE APx KEYBOX



The APx KeyBox, which mounts on the rear-panel Software Options connector.

The APx KeyBox is a hardware security module that must be mounted on legacy APx analyzers to support APx500 version 4.6 software and later. A Software Version License Key must be purchased to authorize APx 5.0.

## ACKNOWLEDGEMENTS

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