Audio Precision®

APx Digital Serial I/O Option
Next generation multichannel chip-level interface for audio

APx585 shown with Digital Serial I/O and HDMI options

Ideal For Testing:

- HDMI RECEIVERS
- HDMI TRANSMITTERS
- A-to-D CONVERTERS
- D-to-A CONVERTERS
- SAMPLE RATE CNVTRS
- DIGITAL PROCESSORS

Digital Serial and HDMI

The Digital Serial option by itself has many applications, but when used in conjunction with the APx HDMI option, truly unique audio test solutions become available.

The connectivity between the two options creates a fast and simple solution for HDMI chip developers who need the ability to debug at the circuit board level.

It is also the only analyzer in the world that can interface directly to HDMI receiver and transmitter chips, and the only analyzer that can stream high bit rate audio signals such as dts-HD over a multichannel serial interface.

Digital Serial Key Features

- 8 channels of simultaneous audio data on TDM or multiple data lines
- Dedicated, buffered oscilloscope monitors
- Built-in support for left or right justified, I²S and DSP formats
- Automatic rate calculators and active timing diagrams
- Independent input and output clocks

The Digital Serial I/O option adds a multichannel digital serial interface to the APx500 series of audio analyzers. 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. In addition the option supports TDM or multiple data line configurations for up to 8 channels of audio data.

The digital serial capability is essential in R&D for evaluating designs at the circuit board level. It allows direct connectivity to CODECs, DSPs, analog-to-digital and digital-to-analog converters, sample rate converters, and all types of audio processing and interface chips. Users can access and test board-side inputs and outputs to HDMI (when used in conjunction with the APx HDMI option), SPDIF, and other digital interface transmitters and receivers.

Pulse voltage, sample rate, word length, data length and the time relationship between clock and data are variable to accommodate a wide range of devices and applications.

Hardware connectivity

The transmitter and receiver are interfaced via HD-15 connectors. Each connector breaks out to a master, frame, channel, and bit clock in addition to four data lines. Eight channels of audio data can be carried across the four data lines or the system can be configured for TDM (time division multiplexing) and 8 channels can be carried on a single wire.

In addition both the transmitter and receiver signals can be monitored via dedicated, buffered monitor ports. These duplicate the signals at the transmitter or receiver and allow direct monitoring via an external oscilloscope.

The APx Digital Serial I/O option includes independent, programmable master clocks for both the transmitter and receiver. This allows the use of two different clocks simultaneously, an important advantage in SRC testing when compared to single-clock serial interface.

APx500 Measurement Software
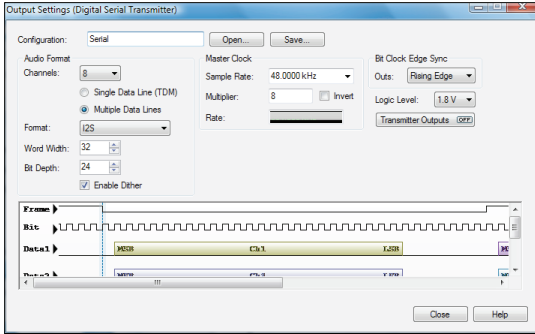
Digital Serial I/O Timing Diagram
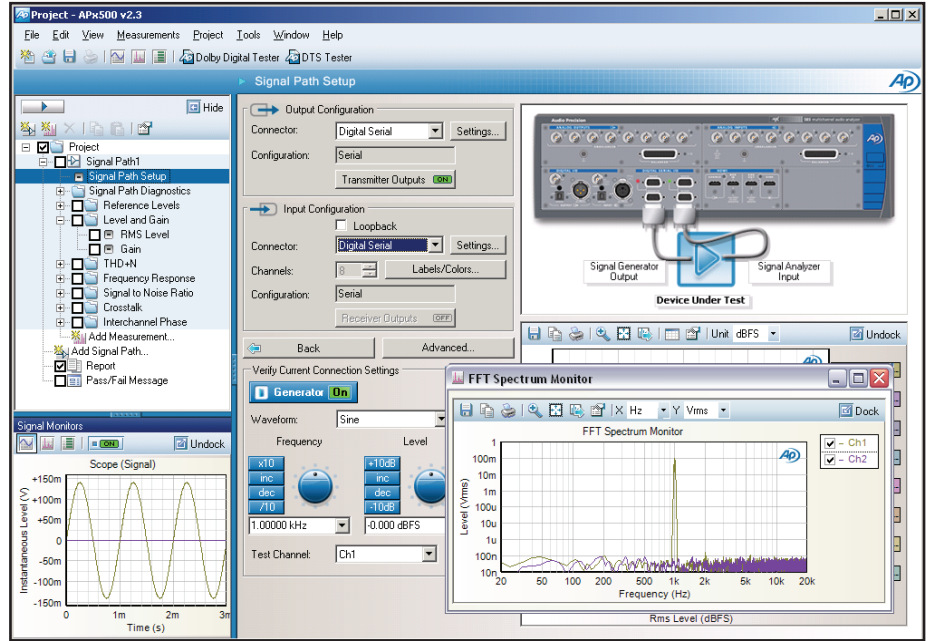
Useful presets & simplified setup

The Digital Serial option meets the high standard set by APx for ease-of-use. Setup panels include automatic rate calculators and active timing diagrams, and there is built-in support for left justified, right justified, I²S and DSP formats. Presets for testing popular audio devices are also included. Digital Serial configurations can be saved within a project file or saved independently for reuse in multiple projects.

All APx500 measurements are available when using the Digital Serial interface. New features have been added for diagnostics, including digital-only generator functions such as Walking Ones, Walking Zeros and Constant Value, and analyzer functions such as Bit Test, which allows APx to verify that the digital output of any device is bit-for-bit accurate.

No digital serial interface is easier to use.

— Winner of —
Pro Audio Review's
Hot Gear Award 2008
— and —
Test & Measurement World's
Best in Test 2007

Digital Serial Specifications

Pulse voltage
1.8 V, 2.5 V, 3.3 V

Formats
Left Justified, Right Justified, I²S, DSP

Master Clock rates
22 kHz to 49.152 MHz

Sample rates
22 kHz to 192 kHz

Master Clock inversion
Yes

Bit clock edge synchronization
Rising or Falling

Word length
8 to 32 bits

Data length
8 to 24 bits

Dither
Selectable ON or OFF

Master Clock Direction
Selectable IN, OUT or OFF

Bit/Frame Clock Direction
Selectable IN or OUT

Multichannel configurations
TDM: 2, 4 or 8 channels
Multiple datalines: 4 or 8 channels

Compatible with any APx instrument that has the 192K Digital I/O (APx525,526,585,586)

APx500 Series Audio Analyzer Key Specifications

SYSTEM PERFORMANCE

Residual THD+N (20 kHz BW)
−105 dB + 1.3 µV [APx520-26]
−103 dB + 1.4 µV [APx585/6]

GENERATOR PERFORMANCE

Sine Frequency Range
0.1 Hz to 80.1 kHz [APx520-26]
5 Hz to 80.1 kHz [APx585/6]

Frequency Accuracy
2 ppm [APx520-26]
3 ppm [APx585/6]

IMD Test Signals
SMPTE, MOD, DFD

Maximum Amplitude (balanced)
21.21 Vrms [APx520-26]
14.4 Vrms [APx585/6]

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
300 Vrms (bal) / 160 Vrms (unbal) [APx520-26]
110 Vrms (bal/unbal) [APx585/6]

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 µV

Individual Harmonic Analyzer
d2–d10

Max FFT Length
1024K points

DC Voltage Measurement
Yes

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

5750 SW Arctic Drive
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