APx Programmable Serial I/O Option

Next generation multichannel chip-level interface for audio

KEY FEATURES

- Ideal for testing HDMI receivers, HDMI Transmitters, A-to-D Converters, D-to-A Converters, Sample Rate Converters, and Digital Processors
- 16 channels of simultaneous audio data
- Acoustically silent remote pod with up to 10 m cable
- Dedicated, buffered oscilloscope monitors
- Built-in support for left or right justified, I²S and TDM formats
- Automatic rate calculators and active timing diagrams
- Independent input and output clocks
- Automatically synchronize receiver clocks to transmitter clocks

Programmable Serial I/O module

The Programmable Serial I/O (PSIO) module is a next-generation multichannel digital serial interface for the APx platform. 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 and multiple data line configurations for up to 16 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 HDMI2+eARC option), SPDIF, and other digital interface transmitters and receivers.

With enhanced capabilities compared to the Digital Serial I/O (DSIO) module it replaces, the hightly configurable pulse voltage, sample rate, word length, data length and time relationship between clock and data accommodates a wide range of devices and applications.

Hardware Connectivity

The transmitter and receiver are interfaced via the 14-pin IDC connectors on the front of remote PSIO pod. The connectors break out to master clock, frame clock, channel clock, bit clock, and four data lines. Up to sixteen channels of audio data can be carried across the four data lines.

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 or logic analyzer.

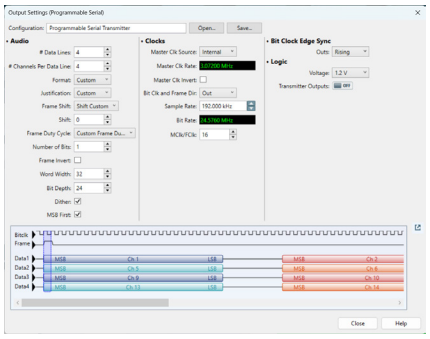
The APx Programmable Serial I/O option includes independent, programmable master clocks for both the transmitter and receiver. This allows the use of two different clocks simultaneously, an important advantage in SRC testing when compared to single-clock serial interface.

Programmable Serial and HDMI

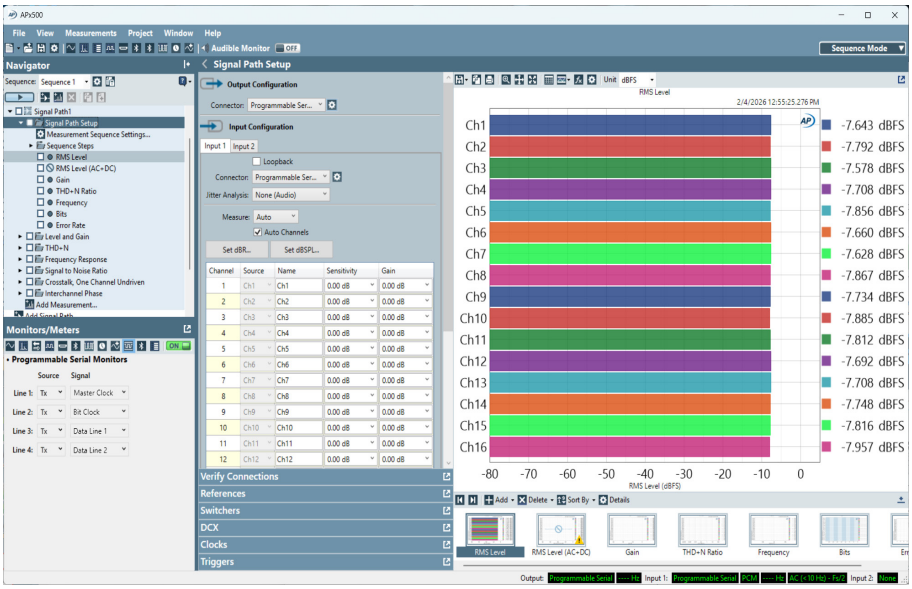
The Digital Serial option by itself has many applications, but when used in conjunction with the APx HDMI2+eARC option, truly unique audio test solutions become available.

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.



Programmable Serial I/O Timing Diagram



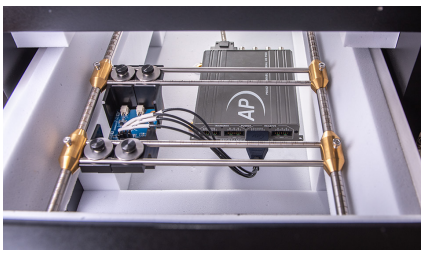
APx500 UI with Programmable Serial I/O configuration options

Useful presets & simplified setup

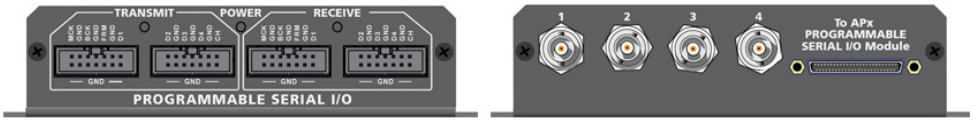
The Programmable Serial option meets the high standard set by APx for ease-of-use. Setup panels include automatic rate calculators and active timing diagrams, and there is built-in support for left justified, right justified, I²S and TDM formats. Presets for testing popular audio devices are also included. Programmable 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 Programmable Serial interface. Features are available 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.



PSIO Pod in Acoustic Chamber with DUT



Programmable Serial I/O Pod front and rear connectors

PROGRAMMABLE SERIAL I/O SPECIFICATIONS

Pulse Voltage
1.2, V 1.8 V, 2.5 V, 3.3 V

Formats
Left Justified, Right Justified, I²S, DSP, Zero Padding

MAster Clock Rates
4 kHz to 56 MHz

Sample Rates
4 kHz to 768 kHz

Master Clock Inversion
Yes

Bit Clock Edge Synchronization
Rising or Falling

Bit Depth
8 to 32 bits

Word Width
8 to 256 bits

Data Length
8 to 32 bits

Dither
Selectable ON or OFF

Master Clock Source
Transmitter: INTERNAL (ON or OFF)
Receiver: INTERNAL or EXTERNAL

Bit/Frame Clock Direction
Transmitter: OUT
Receiver: IN or OUT

Multichannel Configuration
1-16 channels

PROGRAMMABLE SERIAL I/O ACCESSORIES

Included Accessories

APX-PSIO POD
APx PSIO acoustically silent remote interface pod

CAB-POD-2/5/10M
PSIO/PDM16 pod interface cable.
Available in 2 m, 5 m, or 10 m length based on selected configuration.

Optional Accessories

CAB-PSIO-2P
IDC16F to 4 2-pin breakout cable for PSIO, 25 cm.
One cable is required for a single data line (transmitter or receiver).

Two cables are required for 2-4 data lines (transmitter or receiver)

CAB-BNC-3
91.4 cm BNC-M to BNC-M cable to connect up to 4 signal monitors to an oscilloscope or logic analyzer.

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