

BERTScope® Digital Pre-emphasis Processor

DPP Series Data Sheet

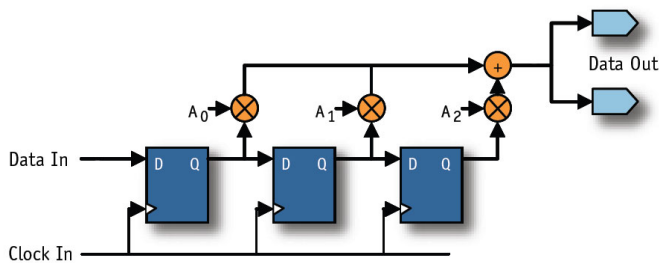
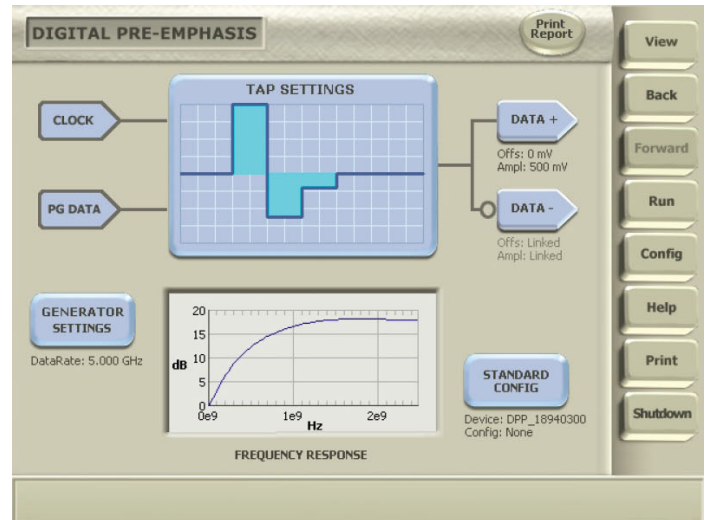


Applications

- Design Characterization for High-speed, Sophisticated Designs
- Certification Testing of Serial Data Streams for Industry Standards
- Design/Verification of High-speed I/O Components and Systems

Features & Benefits

- 1 to 12.5 Gb/s for Support of Hardware-based Equalization of 2nd- and 3rd-generation Serial Standards
- 3- or 4-tap for Full Support of Compliance Testing for 802.3ap, Serial Attached SCSI, 10GBASE-KR Backplanes, DisplayPort™, USB 3.0 PCI Express® Gen3
- Pre-cursor or Post-cursor Adjustment for Optimizing Compensation for ISI and Loss
- Exceptionally Easy Setup with Concurrent Multiple Domain Views Ideal for Operation as a Stand-alone Instrument Controlled by a Remote PC, or with a BERTScope for Complete Software Integration
- Precise Control to Correct for Effects such as Backplane ISI or Optical Effects with Adjustability through Tap Weights or Step Response provides the Flexibility Needed for Complete Design Characterization



Example functional block diagram (3-Tap shown).

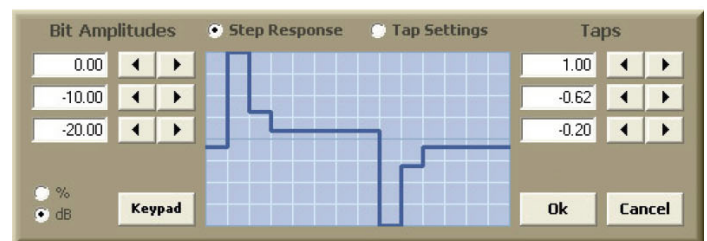
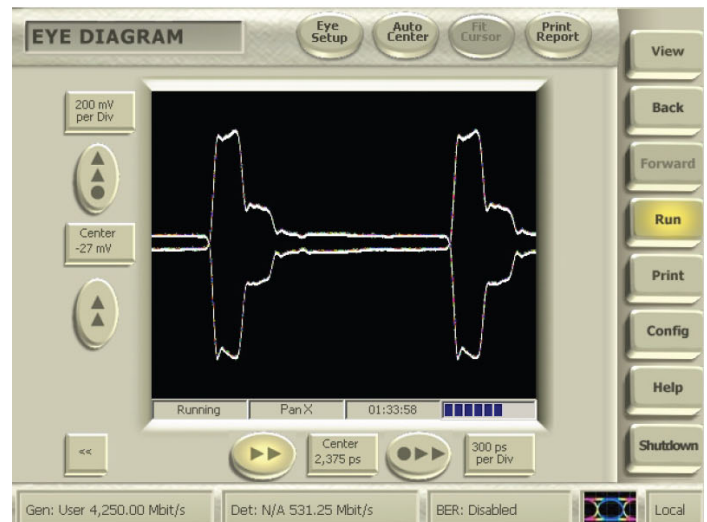
The BERTScope DPP Series is a nonlinear signal conditioner capable of adding controllable amounts of pre-emphasis to a signal. It takes in single-ended inputs of data and clock.

Intuitive Control with Many Views

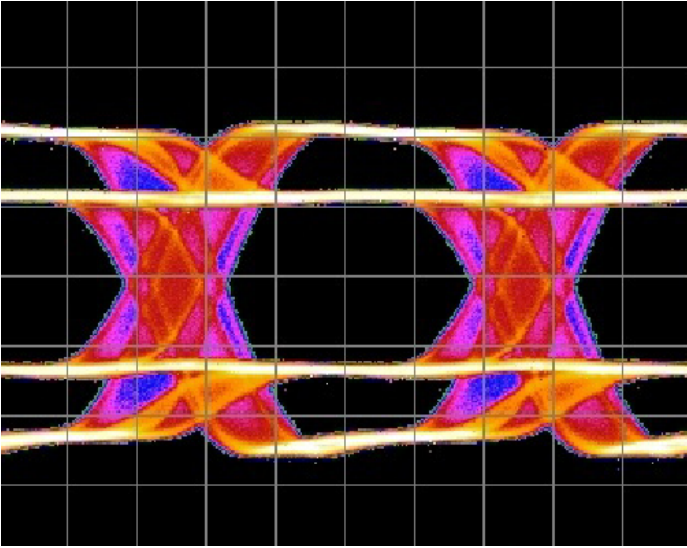
The wave shape can be adjusted in the user interface by either directly entering tap weights, or through an amplitude-weighted time domain bitmap showing the step response. In addition to these two views, a frequency-domain Bode plot is calculated and displayed to show the effect being implemented. This is particularly helpful when counteracting the effects of circuit board ISI with a measured frequency response.

Adjustable Output

Output amplitude is user adjustable in amplitude and offset, and is offered differentially.



Intuitive user interface gives multiple views of the output waveform.

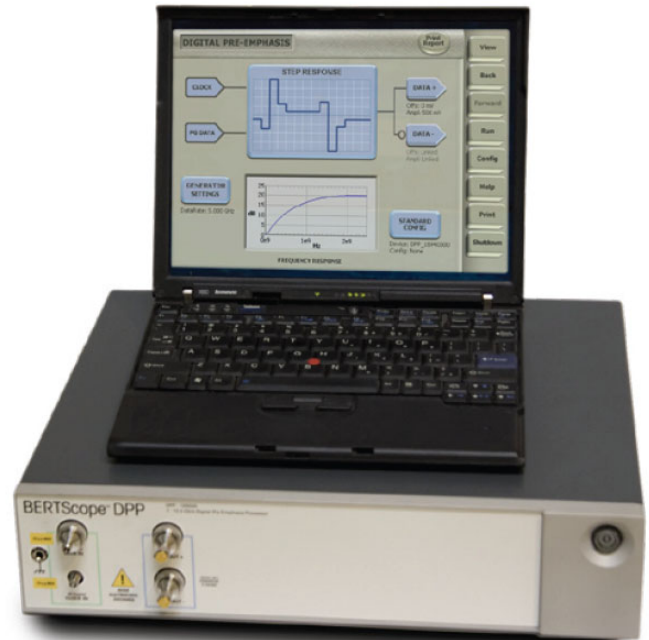


De-emphasized signal with sinusoidal jitter from a BERTScope.

Characteristics

Specifications

Characteristic	Specification	Notes
Data Rate Range	1-12.5 Gb/s	
Inputs		
Clock	Single Ended	SMA
Sensitivity	150 mV	
Termination	50 Ω , AC coupled	
Maximum jitter transfer	1:1	Input Clock to Output Data
Data	Single Ended	SMA
Sensitivity	150 mV	PN31 pattern
Termination	50 Ω , AC coupled	
Outputs		
Data	Differential	SMA
Amplitude	Up to 1.8 V (typ.)	Differential, Adjustable
Diff. skew	<2 ps (typ.)	
DC offset	Adjustable to ± 500 mV	
Coupling	AC	AC-coupled data with DC-coupled output offset
Function	3- or 4-tap, clocked FIR	
Random jitter	<350 fs _{RMS} (typ.)	Additive, 1010 pattern
Tap range	-100 to +100 (including 0) in 1% steps	
Tap resolution	1% or 0.1 dB, any tap	
Transition time	<40 ps (typ.)	All taps, 1010 pattern
General		
Control Interface	USB 2.0	
Dimensions (W × H × D)	39.4 × 9.5 × 33.6 cm (15.5 × 3.75 × 13.25 in.)	
Weight	9 lb. (4 kg)	
Power Consumption	<150 W	
Voltage	100-240 V AC, 45-63 Hz	Auto-range, IEC power plug



The BERTScope DPP Series can operate as a stand-alone instrument controlled by a PC, or with a BERTScope for complete software integration. It can be fully automated, and with its compact size, the DPP will easily fit into a manufacturing environment.

Emerging Standards Requirements

Standard	Required Number of Taps	Notes
802.3ap, 10GBASE-KR 10GbE Backplane	3	
PCI Express 2.5 GT/s Receiver	2	0.7 dB for receiver testing
PCI Express 5 GT/s Transmitter	2	Selectable 3.5 dB and 6.0 dB levels on transmitters
PCI Express 8 GT/s	3	Proposed for transmitter
SAS 6 Gb/s	2	2 dB for reference transmitters 2-4 dB for device transmitters
DisplayPort Transmitter 1.62 Gb/s and 2.7 Gb/s	2	Selectable 3.5 dB, 6 dB, or 9.5 dB on transmitters
USB 3.0 Transmitter 5 GT/s	2	3.5 dB nominal ± 0.5 dB on transmitters



BERTScope DPP back panel.

Ordering Information

DPP125
1-12.5 Gb/s 3-Tap Digital Pre-emphasis Processor.

Opt. 4T
Optional 4-Tap Digital Pre-emphasis Processor for DPP125.

The DPP can be operated stand-alone with a PC (not included) or with a suitable BERTScope model.
All Models Include: Power cable (US), USB cable, 2 SMA input cables, and CD-ROM with software.

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Updated 25 May 2010

For Further Information. Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com



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15 Jul 2010

65W-25473-1