

Disk Drive Analysis Package

For Tektronix TDS 7000 Series Oscilloscopes

Features and Benefits

- *Guzik Hardware Accelerator Card integrated with Tektronix oscilloscope provides real-time signal analysis and data processing*
- *8Gbits/s complete PRML channel analysis with Tektronix TDS7404*
- *Digital PRML with PR4, EPR4, E²PR4 and custom Variable Target modes with automatic PRML channel optimization*
- *Digital PRML measurements including Bit Error Rate, SAM, Sample Values Distribution*
- *Industry-standard Disk Drive measurements including Parametric (TAA, PW, Asymmetry), NLTS, SNR*
- *Unique Pulse Profile Parametric measurements with high noise immunity*
- *Wide range of programmable digital filters including low-pass and high-pass IIR filters and 32-tap FIR equalizer*
- *Drive-specific triggers and gating simplify and speed up your work*
- *Convenient and intuitive Windows-based User Interface optimized for touch-screen applications*
- *Integration with Guzik RWAs and Spinstands*

Applications

- *Characterization of PRML channels in data storage and telecommunications*
- *Characterization and testing of magnetic heads and disk drives*
- *IDEMA measurements including TAA, PW50, SNR, Resolution and Asymmetry*

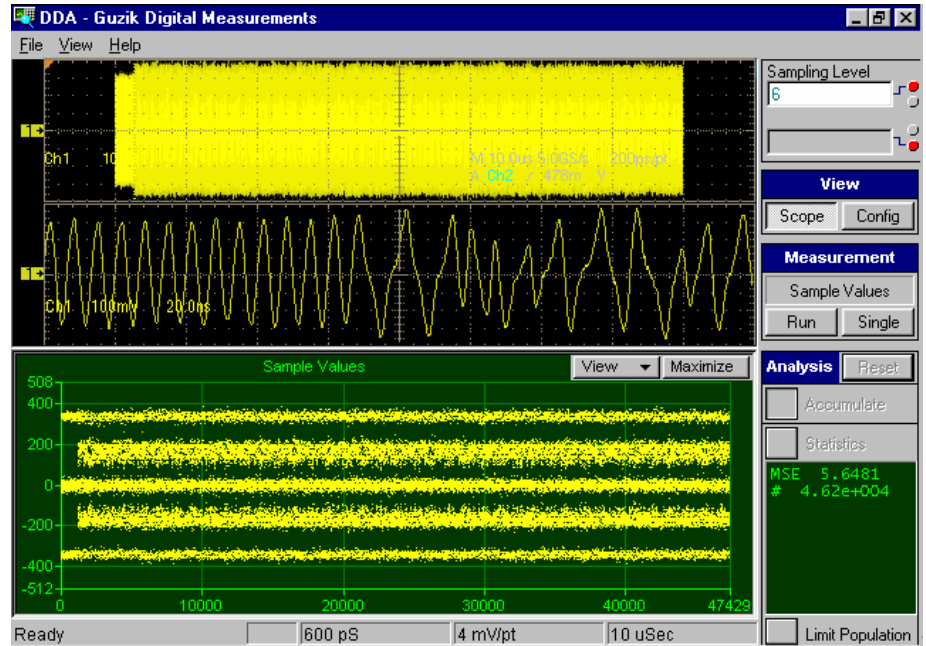


Fig.1. Sample Values Plot, EPR4

Maximum Performance

Disk Drive Analysis package from Guzik Technical Enterprises delivers fast disk drive measurements on digital oscilloscopes. The package includes the Guzik Hardware Accelerator card and Guzik software environment installed on the Tektronix oscilloscope. The 4 GHz analog bandwidth combined with 20 GS/s sampling rate of Tektronix TDS7404 oscilloscope makes possible to perform PRML channel analysis up to 8Gbit/s. The unique design and strategic location of Guzik Hardware Accelerator card gives possibility to perform most time-critical measurements by hardware and in real-time with the speed of the oscilloscope acquisition. Highly optimized Guzik graphical engine is capable to display large amounts of graphical data without slowing down the system.

Versatility

The Disk Drive Analysis package delivers wide range of disk drive oriented measurements including Parametric, NLTS, SNR and Pulse Profile. It integrates a highly flexible Digital PRML Channel with PR4, EPR4, E²PR4, and variable target PRML modes. The heart of the PRML channel is the digital clock and gain recovery with programmable bandwidth and customizable Viterbi decoder. The PRML channel also includes a wide range of programmable digital filters like low-pass and high-pass IIR filters and 32-tap FIR equalizer. Disk Drive Analysis application provides semi-automatic optimization of Digital PRML Channel, auto-setup of product parameters, disk drive specific oscilloscope triggers and measurement gating.



PRML Measurements

The Disk Drive Analysis package supports the wide range of PRML measurements and PRML channel performance evaluation tools:

- Semi-automatic PRML channel optimization procedure, which includes the isolated pulse shape capture, pulse reshaping and equalizer adjustment (see Fig. 2)
- Sample Values plot to display PRML samples at the output of the clock recovery over the time (see Fig.1)
- Sample Values Distribution plot with MSE calculation to display the synchronized histograms of PRML samples (see Fig.3)
- Comparator Error plot with BER calculation to display recovered user data along with reference data in NRZ format
- SAM Data plot to display Viterbi metric margins over the time
- SAM Histogram plot to display the histogram of Viterbi margins
- SAM Plot with SAM BER calculation to display the margins distribution
- TAA and Error Rate Track Profile (Bathtub Curve). Guzik RWA and spinstand is required for this test.

Easy to Use

The Disk Drive Analysis package provides intuitive Windows-based GUI optimized for oscilloscope touch-screen. For added convenience it supports second external monitor and front-panel oscilloscope knobs.

Digital Oscilloscopes Supported

Oscilloscope Model	Platform	
	Guzik DSP Hardware Accelerator	Oscilloscope Sampling Rate
Tektronix TDS7104	?	10GS/s
Tektronix TDS7154	?	20GS/s
Tektronix TDS7254	?	20GS/s
Tektronix TDS7404	?	20GS/s

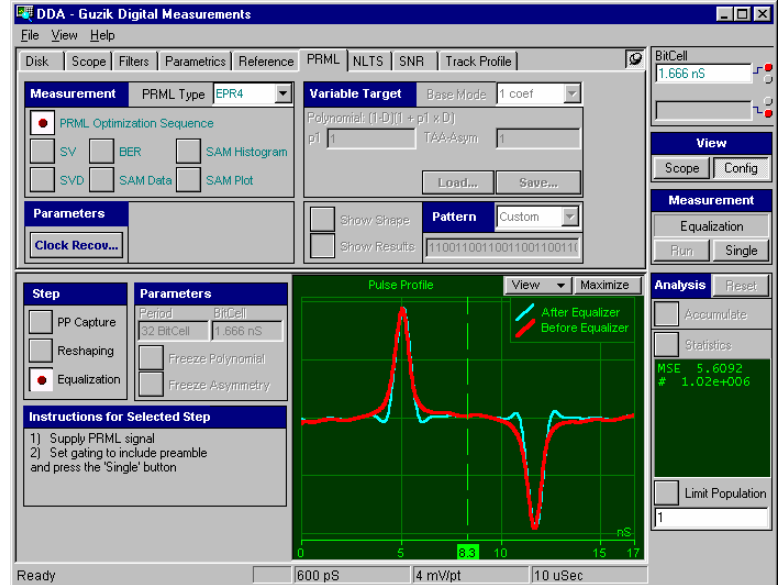


Fig. 2. PRML Channel Optimization, (Pulse Profile Capture and Reshaping)

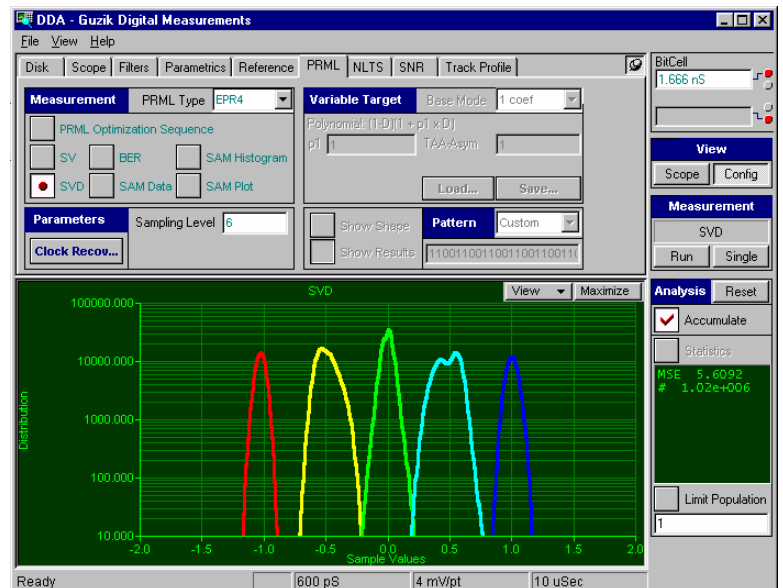


Fig. 3. Sample Values Distribution Plot, EPR4



Specifications

PRML Max Bit Rate	TDS7104:	2Gbit/s
	TDS7154:	3Gbit/s
	TDS7254:	5Gbit/s
	TDS7404:	8Gbit/s
Acquisition Length	Up to 32 MSamples*	
PRML Modes	Variable Target, PR4, EPR4, E ² PR4	
PRML Measurements	Sample Values Plot, Sample Values Distribution Plot, MSE, Comparator Error Plot, Bit Error Rate (BER), SAM Data Plot, SAM Histogram Plot, SAM BER	
PRML Channel Optimization	Automatic and semiautomatic based on signal quality monitor	
Parametric Measurements	TAA, TAA+, TAA-, TAA Asymmetry, TAA Resolution, PW, PW+, PW-, PW Asymmetry, RMS	
SNR Measurements	Autocorrelation SNR, TAA/RMS (Guzik) SNR, RMS/RMS SNR	
NLTS Measurements	NLTS Dipulse Extraction, NLTS Autocorrelation	
Pulse Profile	Noise suppression up to 15dB SNR Repetitive patterns required	
Track Profile	Combined TAA profile and Error Rate profile (Guzik RWA and Spinstand required)	
Acquisition Trigger	Manual, Sector, Read Gate, Custom modes	
Measurement Gating	Manual, By oscilloscope cursors, By external Read Gate	
Parametric Measurements Accuracy (For Repetitive Patterns):	TAA	± 0.5% (down to 15dB SNR)
	PW	± 1.0% (down to 15dB SNR)
	Guzik SNR	± 0.2dB (down to 15dB SNR)
	TAA Resolution	± 3.0%

* Limited only by oscilloscope's available record length and current channel configuration, up to 32MSamples on Tektronix TDS7404.

Contact Information

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