

Digital Storage Oscilloscope

► TDS6000 Series



Uncompromised Performance Oscilloscope Solution — Probing, Acquisition, Analysis, Compliance and Debug

TDS6000 Series digital storage oscilloscopes provide unprecedented performance along with a complete feature set designed to address design validation, debug and compliance challenges of next generation computer, datacom and communications equipment. High bandwidth, high sample rate and deep memory also provide the ideal solution for data acquisition applications.

Uncompromised Acquisition

You won't need to trade off bandwidth, record length and sample rate for your serial data measurement and analysis needs. The TDS6000C DSOs provide acquisition architecture with 40 GS/s maximum sample rate and 64 Megasamples record length on two channels (20 GS/s and 32 Megasamples on each of the four channels simultaneously), for the acquisition power you need.

They provide the ultimate combination of bandwidth, sample rate and record length for the fastest signals. The TDS6154C provides matched 15 GHz performance across any two channels using advanced, Tektronix-proprietary DSP enhancement, important for high-speed channel-to-channel measurements. The user-selectable DSP filter on each channel provides magnitude and phase correction, plus extension of the analog bandwidth to 15 GHz for more accurate signal fidelity on high speed measurements—easily capturing the fifth harmonic of 3.125 GHz embedded clocks used in next-generation 6.25 Gb/s serial data standards, and even the third harmonic of 5 GHz clocks being developed for future systems. The DSP filter on each channel can also be switched off to take advantage of true 12 GHz analog bandwidth for applications needing the highest-available raw data capture.

► Features & Benefits

Bandwidths of 15 GHz (TDS6154C), 12 GHz (TDS6124C), 8 GHz (TDS6804B) and 6 GHz (TDS6604B)

Rise Times to 19 ps 20 to 80% (28 ps 10 to 90%) on TDS6154C
Typical Rise Time, with Channel-matched, User-selectable DSP

40 GS/s Real-time Sample Rate on Two Channels, 20 GS/s Real-time Sample Rate on All Four Channels with 500 fs/Sample Interpolated Points

Up to 64 Megasamples on Two Channels, up to 32 Megasamples Record Length on All Four Channels with MultiView Zoom™ Function for Quick Navigation

Pinpoint™ Triggering Provides the Most Flexible and Highest Performance Triggering, with Over 1400 Combinations to Address Virtually Any Triggering situation

Serial Pattern Triggering up to 3.125 Gb/s With 8b/10b Protocol Triggering

Serial Data Analysis and Compliance at Rates of 6.25 Gb/s and Above

OpenChoice® Software with Windows XP OS Delivers Built-in Networking and Analysis

Technology-specific Software Solutions Provide Built-in Domain Expertise for Serial Data, Jitter, Ethernet, DVI, USB 2.0, Communications and Power Measurements

System Includes: Dual Processor System (2.8 GHz Pentium 4 and 583 MHz PowerPC), High Resolution XGA Display, Front Panel CD-R/W, Front Panel USB 2.0 Port, and 1000Base-T Network Connection

► Applications

Signal Integrity, Jitter and Timing Analysis

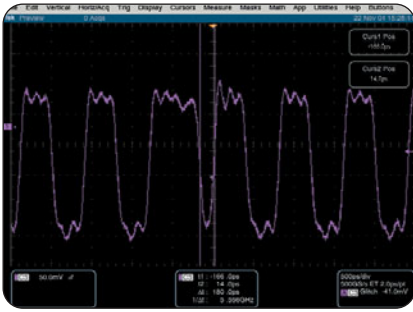
Validation, Debug, Characterization and Compliance of Next-generation Digital Designs

Computer, Datacom, Storage Area Network Equipment Designs and High-speed Backplanes

High Energy Physics Measurements and Data Acquisition

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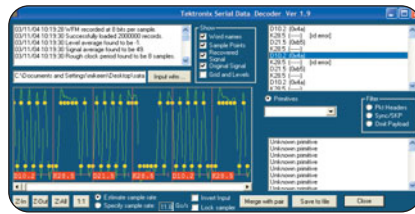
► Trigger on glitches down to 100 ps wide.

Pinpoint™ Triggering

The ability to trigger an oscilloscope on events of interest is paramount in high-speed debug and validation. Whether you're trying to find a system error or need to isolate a section of a complex signal for further analysis, Tektronix' Pinpoint™ triggering provides the solution. The Pinpoint trigger system uses Silicon Germanium (SiGe) technology to provide trigger sensitivity of up to 9 GHz (TDS6000C models) and allows selection of all trigger types on both A and B trigger circuits. It can capture glitches down to 100 ps wide with trigger jitter less than $1.3 \text{ ps}_{\text{RMS}}$ (TDS6000C models). Other trigger systems offer multiple trigger types only on a single event (A Event), with delayed trigger (B Event) selection limited to edge type triggering and often does not provide a way to reset the trigger sequence if the B-event doesn't occur. But Pinpoint triggering provides the full suite of advance trigger types on both A and B triggers with Reset triggering to begin the trigger sequence again after a specified time, state or transition so that even events in the most complex signals can be captured. Other oscilloscopes typically offer less than 20 trigger combinations; Pinpoint triggering offers over 1400 combinations, all at full performance.



► Pinpoint trigger system provides the most advanced, highest performance triggering available.



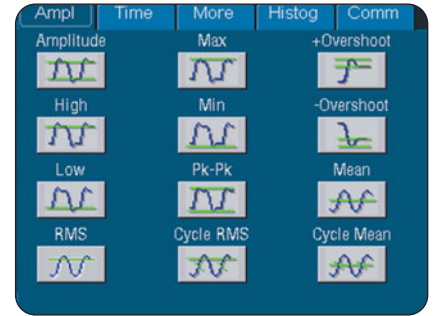
► Decode 8b/10b data streams and set up to 4 data words (40 bits) to trigger on.

Protocol Triggering and Decoding Software (Opt. PTD)

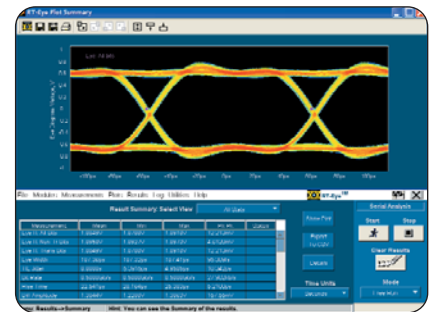
Easily decode 8b/10b and other encoded serial data streams and set desired encoded words for the serial pattern trigger to capture. The TDS6000C models can trigger on up to four consecutive 10-bit words or specified error conditions at data rates up to 3.125 Gb/s. And you can see the captured bit sequences decoded into their words for convenient analysis.

Unparalleled Analysis

Waveform data analysis can take many forms. Whether it's a simple math expression, waveform mask testing, a pass/fail compliance test, or a custom application that you develop, the TDS6000 Series



► Measurement System. Enables over 50 parametric measurements in the amplitude, time and statistical domain.



► 8.5 Gb/s TDSRT-Eye™ diagram on the TDS6154C.

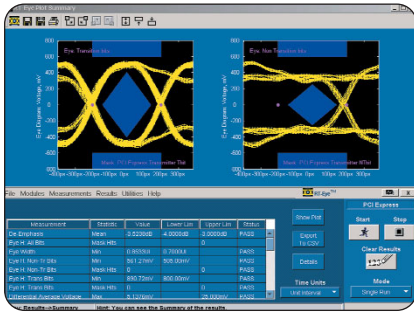


► Waveform Math Equation Editor. Enables boundless analysis on waveform data.

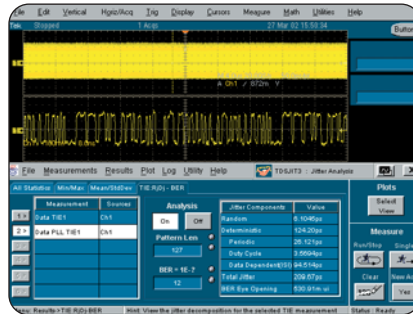
offers the industry's most comprehensive set of analysis and compliance tools.

Built-in Analysis Tools

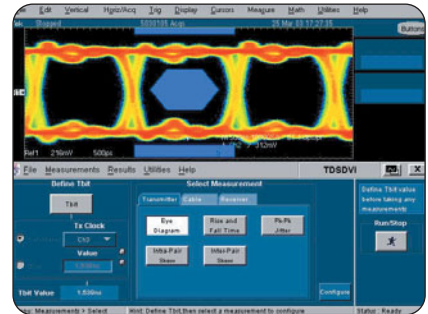
Standard tools built into the TDS6000 offer a wide range of analysis capabilities including Cursors, Measurements, Math Equation Editor, Serial Data Communications Mask Testing (with Opt. SM), and Spectrum Analysis.



▶ TDSRT-Eye™ software. Compliance and analysis for testing high speed serial standards. Eye diagrams at data rates to beyond 6.25 Gb/s. Software clock recovery to ≥10 Gb/s.



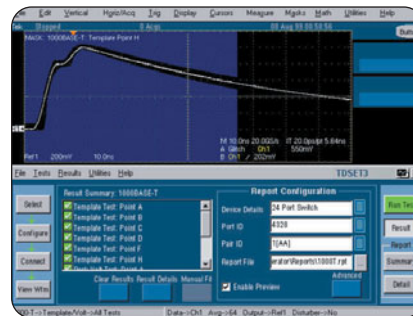
▶ TDSJIT3 v2.0 Jitter analysis for validation and debug high speed digital systems.



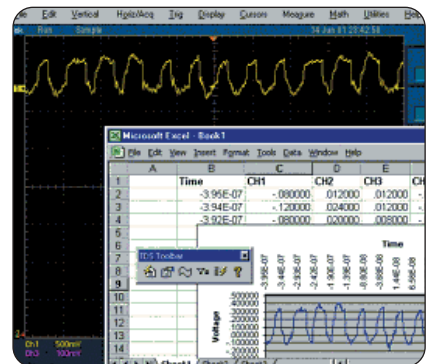
▶ TDS DVI Digital Visual Interface Compliance.

Technology-specific Software Solutions

Validation, debug and compliance testing often require automated test tools that quickly analyze waveform data and provide the answers you need. The TDS6000 models provide complete “turnkey” solutions for the most demanding technologies. Software options are also available for performing validation and compliance measurements on emerging industry standards.



▶ TDSET3 10/100/1000Base-T Compliance.



▶ Access data seamlessly for your own custom application, such as this Excel example.

OpenChoice® Analysis

Designing your own custom solution? The analysis and networking features of OpenChoice software adds more flexibility to Tektronix open Windows XP oscilloscopes:

- ▶ Fast, PCI bus speed communication between the data acquisition processor and the Microsoft Windows desktop.
- ▶ ActiveX controls to connect the oscilloscope to popular Windows applications – WITHOUT leaving the application.

- ▶ PnP drivers to control the scope from LabVIEW and Lab Windows/CVI running directly on the oscilloscope, or running on external PCs.

Support for application development environments includes Visual BASIC, .NET, C, C++, MATLAB, LabVIEW and LabWindows/CVI.

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Differential Probing with Performance to >12 GHz

Most high speed signals today are differential. The P7313 12.5 GHz Differential Probing System provides true differential connection to the device under test for a variety of connection requirements: solder-in, hand held, and fixtured. Typical system performance with the TDS6000C models exceeds 12 GHz bandwidth. The P7313 offers the lowest loading, highest signal fidelity, and lowest cost per connection in the industry. Versatile, inexpensive Tip-Clip™ adapters provide the optimum solution for virtually any connection need.

The P7380SMA Differential Probing System provides a 50 Ω per side termination network with a termination voltage. The termination voltage can be applied externally or through the TekConnect® interface from the TDS6000 probe menu, or not used at all. A gain switch provides two different sensitivity settings of the probe and an Aux Out provides an inverted version of the signal for driving other equipment. The P7380SMA probing system used with the TDS6000 oscilloscopes provides an ideal solution for validation and compliance testing of high speed serial data links.



► P7313 12.5 GHz Differential Probe.

▶ Characteristics

▶ Vertical System

	TDS6604B	TDS6804B	TDS6124C	TDS6154C
Input Channels	4	4	4	4
Bandwidth, Rise Time (DSP)	N/A	8 GHz 50 ps (10 to 90%) (typical) 35 ps (20 to 80%) (typical)	12 GHz 35 ps (10 to 90%) (typical) 24 ps (20 to 80%) (typical)	15 GHz 28 ps (10 to 90%) (typical) 19 ps (20 to 80%) (typical)
True Analog Bandwidth (-3 dB), Typical Rise Time	6 GHz 70 ps (10 to 90%) (typical) 53 ps (20 to 80%) (typical)	7 GHz 62 ps (10 to 90%) (typical) 43 ps (20 to 80%) (typical)	12 GHz 35 ps (10 to 90%) (typical) 24 ps (20 to 80%) (typical)	12 GHz 35 ps (10 to 90%) (typical) 24 ps (20 to 80%) (typical)
Hardware Bandwidth Limits (Requires TCA-1 MEG Adapter)	Full, 250 MHz or 20 MHz			
Input Coupling	DC, GND			
Input Impedance	50 Ω ±2.5%		50 Ω ±2%	
Input Sensitivity, 50 Ω	Full scale 100 mV to 10 V (10 mV/div to 1 V/div). Full scale is the peak-to-peak digitizer range at a given sensitivity. Volts/div = Full scale ÷ 10		Full scale 100 mV to 10 V (5 mV/div ¹ to 1 V/div). Full scale is the peak-to-peak digitizer range at a given sensitivity. Volts/div = Full scale ÷ 10	
Vertical Resolution	8-Bit (>11-Bit with averaging)			
Max Input Voltage, 50 Ω	<1 V _{RMS} for <100 mV/div, <7 V _{RMS} for ≥100 mV/div settings. Also determined by TekConnect® accessory		<1 V _{RMS} for <1 V Full scale, <7 V for ≥1 V Full scale. Also determined by TekConnect accessory	
DC Gain Accuracy	±(2.5% + (2% x offset))		±2%	
Position Range	±5 divisions			
Offset Range ²	Full scale settings: 100 mV to 500 mV: ±0.5 V 505 mV to 995 mV: ±0.25 V 1 V to 5 V: ±5 V 5.05 V to 10 V: ±2.5 V		Full scale settings: 100 mV: ±0.45 V 200 mV: ±0.4 V 500 mV: ±0.25 V 1 V: ±4.5 V 2 V: ±4.0 V 5 V: ±2.5 V 10 V: 0 General formula for offset range 100 mV to 995 mV: ±10.5V - Full scale/21 1 V to 10 V: ±15V - Full scale/21	
Offset Accuracy	±(0.5% of channel offset + 15 mV + 0.1 div x V/div setting) for ranges >100 mV/div			
Channel-to-Channel Isolation for Any Two Channels at Equal Vertical Scale	≥80:1 at 1.5 GHz and ≥15:1 at rated bandwidth		≥80:1 at 10 GHz and ≥30:1 at 12 GHz	
Noise (analog only, DSP turned off)	Full scale settings: (when zoom is turned off, divide by 10 for volts/div)			
	100 mV: 600 μV _{RMS} 200 mV: 970 μV _{RMS} 500 mV: 2.3 mV _{RMS} 1 V: 5.9 mV _{RMS} 2 V: 9.7 mV _{RMS} 5 V: 22.5 mV _{RMS} 10 V: 47.7 mV _{RMS}			

¹ 5 mV/div is a SW zoom with 20 divisions across the full scale range.

² Offset range in addition to ±5 division position range.

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► Timebase System

	All Models
Timebase Range	25 ps to 40 s/div; interpolation down to 500 fs/pt
Timebase Delay Time Range	5 ns to 250 s
Channel-to-Channel Deskew Range	±75 ns
Trigger Jitter (RMS)	TDS6000C Models <1.1 ps _{RMS} (typical) TDS6000B Models <1.5 ps _{RMS} (typical)
Long-term Sample Rate and Delay Time Accuracy	2.5 ppm over any ≥100 ms interval
Clock Stability	<1 ppm (typical) <2.5 ppm (guaranteed)
Jitter Noise Floor	420 fs _{RMS} (typical) over 2 μs duration or less
Delta Time Accuracy	635 fs _{RMS} over <100 ns duration, single shot

► Acquisition System

	TDS6000B Models	TDS6000C Models
Max Sample Rate	20 GS/s on 4 channels	40 GS/s on 2 channels, 20 GS/s on 4 channels
Equivalent Time Sample Rate (max)	2 TS/s	
Maximum Record Length per Channel	32 M (requires Opt. 4M)	64 M on two channels; 32 M on all 4 channels (requires Opt. 4M)
Standard	2 M on all 4 channels	4 M on two channels; 2 M on all 4 channels
with Memory Opt. 2M	8 M on all 4 channels	16 M on two channels; 8 M on all 4 channels
with Memory Opt. 3M	16 M on all 4 channels	32 M on two channels; 16 M on all 4 channels
with Memory Opt. 4M	32 M on all 4 channels	64 M on two channels; 32 M on all 4 channels

► Maximum Time Duration Captured at Highest Real-time Resolution (all channels)

	TDS6000B Models (All Channels)	TDS6000C Models (Two Channels)
Max Duration with Standard Memory	100 μs	100 μs
Max Duration with Opt. 2M	400 μs	400 μs
Max Duration with Opt. 3M	800 μs	800 μs
Max Duration with Opt. 4M	1.6 ms	1.6 ms

► Acquisition Modes

All Models	
Waveform Database	Accumulate Waveform Database providing three-dimensional array of amplitude, time and counts
Sample	Acquire sampled values
Peak Detect	Captures narrow glitches at all real-time sampling rates
Minimum Peak Detect Pulse Width	50 ps
Averaging	From 2 to 10,000 waveforms included in average
Envelope	From 2 to 2x10 ⁹ waveforms included in min-max envelope
Hi-Res	Real-time boxcar averaging reduces random noise and increases resolution
FastFrame™ Acquisition	Acquisition memory divided into segments; maximum trigger rate >310,000 waveforms per second. Time of arrival recorded with each event
Roll Mode	200 kS/s at 8 M record length and 500 kS/s at 4 M record length on all channels

► Pinpoint™ Trigger System

All Models	
Sensitivity	
Internal DC Coupled	0.5 div DC to 50 MHz increasing to 2.5 div at 7 GHz (TDS6000B models, typical), 4 div at 9 GHz (TDS6000C models, typical)
External (auxiliary input)	200 mV from DC to 50 MHz increasing to 500 mV at 2 GHz
Trigger Characteristics	
Main Trigger Modes	Auto, Normal and Single
A Event & Delayed B Event Trigger Types	Edge, Glitch, Runt, Width, Transition Time, Timeout, Pattern, State, Setup/Hold, Window—all except Edge, Pattern and State can be Logic State qualified by up to two channels
Trigger Sequences	Main, Delayed by Time, Delayed by Events, Reset by Time, Reset by State, Reset by Transition. All sequences can include separate horizontal delay after the trigger event to position the acquisition window in time
Communications-related Triggers (requires Opt. SM)	Support for AMI, HDB3, BnZS, CMI, MLT3 and NRZ encoded communications signals up to 3.125 Gb/s. Select among isolated positive or negative one, zero pulse form or eye patterns as applicable to standard
Serial Pattern Trigger	64-Bit serial word recognizer, bits specified in binary (high, low, don't care) (requires Opt. ST) or hex format. Trigger on NRZ-encoded data up to 1.25 Gbaud. TDS6000C models only: trigger on encoded data up to 3.125 Gbaud (40 bits)
Trigger Level Range	
Internal	±12 divisions from center of screen
External (auxiliary in)	±5 V
Line	Fixed at 0 V
Trigger Coupling	DC, AC (attenuate <60 Hz), HF reject (attenuate >30 kHz) LF reject (attenuates <80 kHz) Noise reject (reduce sensitivity)
Trigger Holdoff Range	250 ns minimum to 12 s maximum

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Trigger Types

Edge – Positive and/or negative slope on any channel or front panel auxiliary input. Coupling includes DC, AC, noise reject, HF reject and LF reject.

Glitch – Trigger on or reject glitches of positive, negative or either polarity. Minimum glitch width is down to 100 ps with rearm time of 250 ps.

Width – Trigger on width of positive or negative pulse (down to 100 ps) either within or out of selectable time limits.

Runt – Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again. Optional time qualification.

Timeout – Trigger on an event which remains high, low or either, for a specified time period, selectable from 360 ps to 1 s.

Transition – Trigger on pulse edge rates that are faster or slower than specified. Slope may be positive, negative or either.

Setup/Hold – Trigger on violations of both setup time and hold time between clock and data present on any two input channels.

Pattern – Trigger when pattern goes false or stays true for specified period of time. Pattern (AND, OR, NAND, NOR) specified for four input channels defined as HIGH, LOW or Don't Care.

State – Any logical pattern of channels (1, 2, 3) clocked by edge on channel 4. Trigger on rising or falling clock edge.

Window – Trigger on an event that enters or exits a window defined by two user-adjustable thresholds. Event can be time or logic qualified.

Trigger Delay by Time – 5 ns to 250 seconds.

Trigger Delay by Events – 1 to 10,000,000 Events.

Waveform Measurements

Amplitude – Amplitude, High, Low, Maximum, Minimum, Peak-to-Peak, Mean, Cycle Mean, RMS, Cycle RMS, Positive Overshoot, Negative Overshoot.

Time – Rise Time, Fall Time, Positive Width, Negative Width, Positive Duty Cycle, Negative Duty Cycle, Period, Frequency, Delay.

Combination – Area, Cycle Area, Phase, Burst Width.

Histogram-related – Waveform Count, Hits-in-Box, Peak Hits, Median, Maximum, Minimum, Peak-to-Peak, Mean (μ), Standard Deviation (σ), $\mu + 1\sigma$, $\mu + 2\sigma$, $\mu + 3\sigma$.

Eye Pattern-related – Extinction Ratio (absolute, %, and dB), Eye Height, Eye Top, Eye Base, Eye Width, Crossing %, Jitter (peak-to-peak, RMS and 6σ), Noise (peak-to-peak and RMS), S/N ratio, Cycle Distortion, Q-factor.

Waveform Processing/Math

Algebraic Expressions – Define extensive algebraic expressions including waveforms, scalars and results of parametric measurements e.g.

(Integral (CH.1–Mean(CH.1)) x 1.414).

Arithmetic – Add, subtract, multiply, divide waveforms and scalars.

Relational – Boolean result of comparison $>$, $<$, \geq , \leq , $=$, \neq .

Calculus – Integrate, differentiate.

Frequency Domain Functions – Spectral magnitude and phase, real and imaginary spectra.

Vertical Units – Magnitude: Linear, dB, dBm;

Phase: Degrees, Radians.

Window Functions – Rectangular, Hamming, Hanning, Kaiser-Bessel, Blackman-Harris, Gaussian, Flattop2, Tek Exponential.

Waveform Definition – As arbitrary math expressions.

Display Characteristics

Display Type – Liquid crystal active-matrix color display.

Display Size – Diagonal: 264 mm (10.4 in.).

Display Resolution – 1024 horizontal x 768 vertical pixels.

Waveform Styles – Vectors, Dots, Variable Persistence, Infinite Persistence.

Computer System and Peripherals

CPU – Intel Pentium 4 processor, 2.8 GHz.

PC System RAM – 1 GB (266 MHz DDR).

Hard Disk Drive – 40 GB removable hard disk drive: rear-panel standard or front-panel (Opt FHD).

USB Ports – One front panel, four on rear panel, USB 2.0 compliant.

CD-R/W Drive – Front-panel CD-R/W standard or rear-panel (Opt. FHD).

Mouse – Optical scroll wheel model included, USB interface.

Keyboard – Small keyboard included (fits in pouch). Order 119-6297-xx for full-size keyboard; USB interface and hub.

Input/Output Ports

Front Panel

Fast Edge Output – Front panel SMA connector provides fast edge signal. Amplitude 350 mV $\pm 20\%$ into a $\geq 50 \Omega$ load, frequency 1 kHz $\pm 5\%$, 200 ps typical rise time.

Recovered Clock – SMA connector, ≤ 1.25 Gb/s, Output swing ≥ 130 mV_{pk-pk} into 50 Ω . Requires Opt. SM or Opt. ST to enable.

Recovered Data – SMA connector, ≤ 1.25 Gb/s, Output swing of 1010 repeating pattern 200 mV into 50 Ω . Requires Opt. SM or Opt. ST to enable.

DC Probe Calibration Output – BNC connector, ± 10 V DC for DC probe calibration. (Signal available only during probe calibration.)

AUX Trigger Output – BNC connector, provides a TTL-compatible, polarity switchable pulse when the oscilloscope triggers.

USB 2.0 Port – One in front. Allows connection or disconnection of USB keyboard, mouse or storage device while oscilloscope is on.

Rear Panel

External Time Base Reference In – BNC connector; allows time base system to phase-lock to external 10 MHz reference.

Time Base Reference Out – BNC connector; provides TTL-compatible output of internal 10 MHz reference oscillator.

Aux Trigger Input – BNC, see Ext Trigger specification.

Parallel Port – IEEE 1284, DB-25 connector.

Audio Ports – Miniature phone jacks for stereo microphone input and stereo line output.

USB 2.0 Ports – Four in back. Allows connection or disconnection of USB keyboard, mouse or storage device while oscilloscope power is on.

Keyboard Port – PS-2 compatible.

Mouse Port – PS-2 compatible.

LAN Port – RJ-45 connector, supports 10Base-T, 100Base-T, and 1000Base-T.

Serial Port – DB-9 COM1 port.

Windows Video Port – 15 pin D-Sub connector on the rear panel; connect a second monitor to use dual-monitor display mode allowing analysis results and plots to be viewed along with the oscilloscope display. Video is DDC2B compliant.

GPIO Port – IEEE 488.2 standard.

Scope XGA Video Port – 15 pin D-Sub connector on the rear panel, video is IBM XGA compatible. Connect to show the oscilloscope display, including live waveforms on an external monitor or projector. The primary Windows desktop can also be displayed on an external monitor using this port.

Power Source

Power – 100 to 240 V_{RMS}, ±10%, 50/60 Hz; 115 V_{RMS} ±10%, 400 Hz; CAT II, <500 W typical (650 VA).

Option SM

156 Standards Masks Supported –

ITU-T (1.544 Mb/s to 155 Mb/s).

ANSI T1.102 (1.544 Mb/s to 155 Mb/s).

Ethernet IEEE Std 802.3, ANSI X3.263 (1.544 Mb/s – 3.125 Gb/s XAUJ).

Sonet/SDH (51.84 Mb/s to 2.4883 Gb/s).

Fibre Channel (133 Mb/s to 4.25 Gb/s³).

InfiniBand (2.5 Gb/s).

USB (12 Mb/s to 480 Mb/s).

Serial ATA (1.5 Gb/s, 3.0 Gb/s).

Serial Attached SCSI (1.5 Gb/s, 3.0 Gb/s).

IEEE 1394b (491.5 Mb/s to 1.966 Gb/s).

RapidI/O (1.25 Gb/s to 3.125 Gb/s).

OIF Standards (2.488 Gb/s to 3.11 Gb/s).

PCI Express (2.5 Gb/s).

Physical Characteristics

BENCHTOP CONFIGURATION

Dimensions	mm	in.
Height	282	11.1
Width	457	18.0
Depth	540	23.25
Weight	kg	lb.
Net	21	47
Shipping	32.3	71.2

RACKMOUNT CONFIGURATION

Dimensions	mm	in.
Height	267	10.5
Width	491	19.3
Depth	638	25.1
Weight	kg	lb.
Net	22	49
Kit	5.6	12.25

Mechanical

Cooling –

Required Clearance	mm	in.
Top	0 or >76	0 or >3
Bottom	25	1
Left side	76	3
Right side	76	3
Front	0	0
Rear	0	0

³ 4.25Gb/s mask supported using Glitch Trigger.

Environmental

Temperature

Operating – +5 °C to +50 °C, excluding CD-R/W drive; +10 °C to +45 °C, including CD-R/W drive.

Nonoperating – –22 °C to +60 °C.

Humidity

Operating – 20% to 80% relative humidity with a maximum wet bulb temperature of +29 °C at or below +50 °C, noncondensing. Upper limit derated to 25% relative humidity at +50 °C.

Nonoperating – 5% to 90% relative humidity with a maximum wet bulb temperature of +29 °C at or below +60 °C, noncondensing. Upper limit derated to 20% relative humidity at +60 °C.

Altitude

Operating – 10,000 ft. (3,048 m).

Nonoperating – 40,000 ft. (12,190 m).

Random Vibration

Operating – 0.000125 g²/Hz from 5 to 350 Hz, –3 dB/octave from 350 to 500 Hz, 0.0000876 g²/Hz at 500 Hz. Overall level of 0.24 g_{RMS}.

Nonoperating – 0.0175 g²/Hz from 5 to 100 Hz, –3 dB/octave from 100 to 200 Hz, 0.00875 g²/Hz from 200 to 350 Hz, –3 dB/octave from 350 to 500 Hz, 0.006132 g²/Hz at 500 Hz. Overall level of 2.28 g_{RMS}.

Certifications

Electromagnetic Compatibility – 89/336/EEC.

Safety – UL 3111-1, CSA1010.1, EN61010-1, IEC 61010-1.

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► Ordering Information

TDS6154C

15 GHz Digital Storage Oscilloscope.

TDS6124C

12 GHz Digital Storage Oscilloscope.

TDS6804B

8 GHz Digital Storage Oscilloscope.

TDS6604B

6 GHz Digital Storage Oscilloscope.

TDS6000B and TDS6000C Models Include:

Accessory pouch, front cover, USB mouse, PS2 mini-keyboard, user manual (071-1503-xx), quick reference kit (020-2552-xx), Documentation CD-ROM (063-3760-xx), product software CD-ROM (063-3761-xx), operating system restoration CD-ROM (063-3762-xx), optional applications software CD-ROM (063-3478-xx), performance verification procedure PDF file, GPIB programmer's reference (on product software CD-ROM), calibration certificate documenting NIST traceability, 2 540-1 compliance and ISO9000, power cord, one year warranty. (4) TekConnect® to SMA adapters (TCA-SMA), Deskew Fixture (067-0484-xx). Please specify power plug when ordering.

Instrument Options

Power Plug Options

Opt. A0 – North America power.

Opt. A1 – Universal EURO power.

Opt. A2 – United Kingdom power.

Opt. A3 – Australia power.

Opt. A5 – Switzerland power.

Opt. A6 – Japan power.

Opt. A10 – China power.

Opt. A99 – No power cord or AC adapter.

Disk Drive Options

Opt. FHD – Front-panel 40 GB removable hard disk drive, replaces front panel CD-R/W which is moved to the back.

Cables

GPIB Cable (1 m) – Order 012-0991-01.

GPIB Cable (2 m) – Order 012-0991-00.

RS-232 Cable – Order 012-1298-00.

Centronics Cable – Order 012-1214-00.

Mounting Options

1K – K4000 Oscilloscope Cart.

1R – Rackmount Kit.

Service Options

Opt. C3 – Calibration Service 3 Years.

Opt. C5 – Calibration Service 5 Years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 Years (requires Opt. C3).

Opt. D5 – Calibration Data Report 5 Years (with Opt. C5).

Opt. R3 – Repair Service 3 Years.

Opt. R5 – Repair Service 5 Years.

Acquisition Memory Options

TDS6000B Models:

2M – 8 M samples on all channels.

3M – 16 M samples on all channels.

4M – 32 M samples on all channels.

TDS6000C Models:

2M – 16 M samples on two channels; 8 M samples on all channels.

3M – 32 M samples on two channels; 16 M samples on all channels.

4M – 64 M samples on two channels; 32 M samples on all channels.

Software Options

CP2¹ – TDSCPM2 ANSI/ITU Telecom pulse compliance testing software (requires Opt. SM).

DVD – TDSDVD Optical storage analysis.

DVI – TDS DVI compliance test solution.

ET3 – TDSET3 Ethernet compliance test software.

HT3 – HDMI compliance test software.

JA3 – TDSJIT3 v2.0 Advanced jitter analysis software.

JE3 – TDSJIT3 v2.0 Essentials jitter analysis software.

J2 – TDSDDM2 Disk drive analysis software.

PW3² – TDSPWR3 Power measurement and analysis software.

RTE – TDSRT-Eye™ Serial Data Compliance and Analysis Software.

RJA – Software Bundle of TDSJIT3 v2.0 (Opt. J3A), TDSRT-Eye (Opt. RTE), and Protocol Trigger Decode (Opt. PTD).

RSA – Software Bundle of TDSJIT3 v2.0 (Opt. J3A), RT-Eye (Opt. RTE), Serial Trigger (Opt. ST), Protocol Trigger and Decode (Opt. PTD) and Serial Mask testing (Opt. SM).

PCE³ – PCI Express Compliance Module for Opt. RTE.

PTD – Protocol Trigger and Decode (provides protocol decode on all models, requires Opt. ST for protocol triggering on the TDS6000C series only).

IBA³ – InfiniBand Compliance Module for Opt. RTE.

SM – Serial communications mask testing (enables hardware clock recovery).

SST – SATA and SAS Analysis Software Module for Opt. RTE.

ST – Serial pattern trigger (enables hardware clock recovery)

USB⁴ – TDSUSBS USB 2.0 Compliance test S/W only.

Recommended Accessories

P7313 – 12.5 GHz Differential Probe.

P7380 – 8 GHz Differential Probe.

P7380SMA – 8 GHz Differential Probing System.

AFTDS – Telecom differential electrical interface adapter (for line rates <8 MB/sec; requires TCA-BNC adapter).

Keyboard (USB interface) full-size keyboard with 4 port USB hub – Order 119-6297-00.

Transit Case – Order 016-1942-00.

TekConnect Adapters –

TCA-1MEG: TekConnect high-impedance buffer amplifier. Includes P6139A passive probe.

TCA-SMA: TekConnect-to-SMA Adapter.

TCA-N: TekConnect-to-N Adapter.

TCA-BNC: TekConnect-to-BNC Adapter.

TCA75: 4 GHz precision TekConnect 75 Ω to 50 Ω adapter with 75 Ω BNC input connector.

Oscilloscope Cart – Order K4000.

Software – WSTRO: WaveStar™ waveform capture and documentation software.

Test Fixtures – TDSUSBF: TDSUSB test fixture for use with Opt. USB.

¹ Requires Option SM.

² Option 3M and a TCA-1MEG TekConnect 1 MΩ buffer amplifier are recommended for use with this software.

³ Requires Option RTE (Serial Data Compliance and Analysis).

⁴ Requires Option TDSUSBF (USB Test Fixture).

**After Purchase Upgrades of
 TDS6000B and TDS6000C
 Series Oscilloscopes**

To upgrade your oscilloscope, order option
 as noted.

Acquisition Record Length:

Current Record Length	Desired	Order
Standard	8 Msamples (16 Msamples TDS6000C)	TDS6BUP Opt. M02
	16 Msamples (32 Msamples TDS6000C)	TDS6BUP Opt. M03
	32 Msamples (64 Msamples TDS6000C)	TDS6BUP Opt. M04
8 Msamples	16 Msamples (32 Msamples TDS6000C)	TDS6BUP Opt. M23
	32 Msamples (64 Msamples TDS6000C)	TDS6BUP Opt. M24
16 Msamples	32 Msamples (64 Msamples TDS6000C)	TDS6BUP Opt. M34

Desired Option	Order
Serial Comm Mask Testing	TDS6BUP Opt. SM
Serial Pattern Trigger	TDS6BUP Opt. ST
Hardware Clock Recovery for Serial Data Stream	Included in Opt. SM and Opt. ST
Analysis and Compliance Software	
ANSI/ITU Telecom Pulse Compliance	TDS6BUP Opt. CP2 (requires Opt. SM)
DVD Optical Storage Analysis	TDS6BUP Opt. DVD
DVI Compliance Test	TDS6BUP Opt. DVI
Ethernet Compliance	TDS6BUP Opt. ET3
JIT3 V2.0 Advanced Jitter Analysis Software	TDS6BUP Opt. JA3
JIT3 V2.0 Essentials Jitter Analysis Software	TDS6BUP Opt. JE3
DDM2 Disk Drive Analysis Software	TDS6BUP Opt. J2
Power Measurement/Analysis	TDS6BUP Opt. PW3
Protocol Trigger and Decode (trigger capability for TDS6000C only, requires Opt. ST)	TDS6BUP Opt. PTD
RT-Eye Serial Data Compliance and Analysis Software	TDS6BUP Opt. RTE
PCI Express Compliance Module for Opt. RTE	TDS6BUP Opt. PCE (requires Opt. RTE or RJA or RSA)
InfiniBand Compliance Module for Opt. RTE	TDS6BUP Opt. IBA (requires Opt. RTE or RJA or RSA)
USB 2.0 Compliance, Software Only	TDS6BUP Opt. USB (requires TDSUSBF test fixture)
RT-Eye Serial Data Analysis Software and TDSJIT3 v2.0 Advanced Jitter Analysis, Protocol Debug Software Bundle	TDS6BUP Opt. RJA
RT-Eye Serial Data Analysis, TDSJIT3 v2.0 Advanced Jitter Analysis, Opt. SM Serial Mask, Opt. ST Serial Trigger, Opt. PTD Protocol Trigger and Decode Software Bundle	TDS6BUP Opt. RSA

Digital Storage Oscilloscope

► TDS6000 Series

DPO - Digital Phosphor Technology

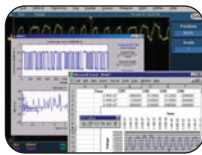
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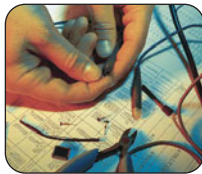
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Last Updated 1 November, 2004

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