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Digital Storage Oscilloscopes

TDS1000B Series • TDS2000B Series Data Sheet



Features & Benefits

- 40 MHz, 60 MHz, 100 MHz, and 200 MHz Bandwidths
- Sample Rates up to 2 GS/s Real Time
- 2 or 4 Channels
- Color or Monochrome LCD Display
- Removable Data Storage using the Front-panel USB Port
- Seamless PC Connectivity through the USB Device Port, with OpenChoice® and NI SignalExpress® PC Software
- Advanced Triggers including Pulse Width Trigger and Line-selectable Video Trigger
- FFT Standard on All Models
- 12 Automatic Measurements
- Multiple-language User Interface and Context-sensitive Help
- Direct Print to all PictBridge®-compatible Printers through the USB Device Port
- Lifetime Warranty*1

Applications

- Design and Debug
- Education and Training
- Manufacturing Test and Quality Control
- Service and Repair

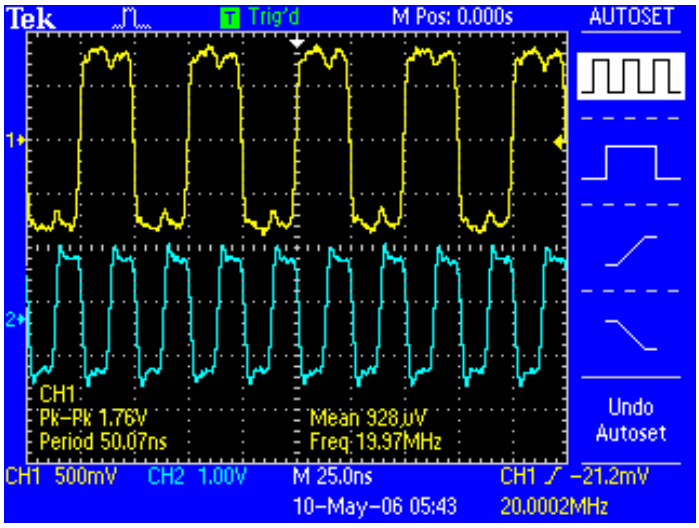
TDS1000B and TDS2000B Series Oscilloscopes

Instantly Productive. Incredibly Easy.

The TDS1000B and TDS2000B Series digital storage oscilloscopes deliver an unbeatable combination of performance and ease of use, at a price you can afford.

*1 Limitations apply. For terms and conditions, visit www.tektronix.com/lifetimewarranty.

Tektronix®



Quickly and easily capture waveforms.

Affordable Digital Precision

With up to 200 MHz bandwidth and 2 GS/s maximum sample rate, no other color digital storage oscilloscope offers as much bandwidth and sample rate for the price. The TDS1000B and TDS2000B Series oscilloscopes provide accurate real-time acquisition up to their full bandwidth, the same record length at all time base settings, advanced triggers to isolate signals of interest, and 12 standard automatic measurements on all models. Their Fast Fourier Transform (FFT) and waveform add, subtract, and multiply math functions allow you to analyze, characterize, and troubleshoot circuits.

Quick and Easy Waveform Capture

The simple user interface with classic analog-style controls makes these instruments easy to use, reducing learning time and increasing efficiency. Innovative features such as the Autoset Menu, Probe Check Wizard, Context-sensitive Help Menu, and color LCD display (TDS2000B Series) optimize instrument setup and operation.

Flexible Data Transfer

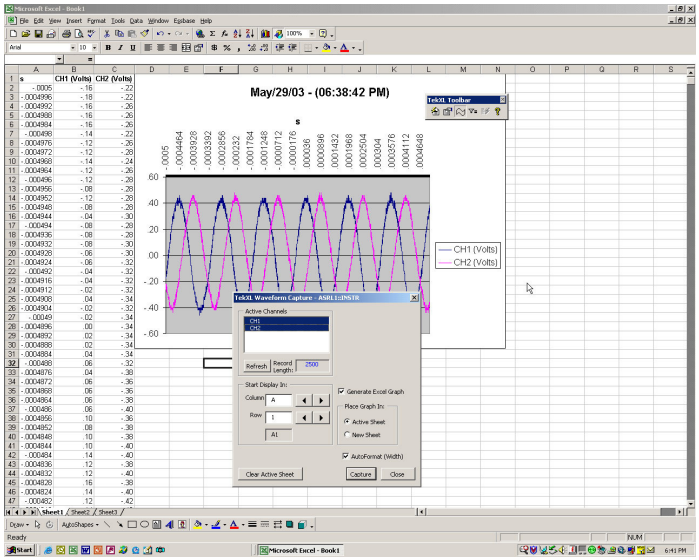
With USB host and device ports which enable removable data storage, seamless PC connectivity, and direct printing, no other color or monochrome digital storage oscilloscope offers as much flexibility and ease of data transfer for the price.

Simple Documentation and Analysis

Easily capture, save, and analyze measurement results with OpenChoice PC Communications Software. Simply pull screen images and waveform data into the stand-alone desktop application or directly into Microsoft Word and Excel. To complement OpenChoice, National Instruments SignalExpress Tektronix Edition Software provides you with extended capabilities, including advanced analysis, remote oscilloscope control, and live waveform analysis. Alternatively, if you prefer not to use the PC, you



Conveniently use your USB flash drive to store screenshots and waveform data.



Easily capture, save, and analyze measurement results with OpenChoice PC Communications Software.

can simply print your image directly to any PictBridge-compatible printer using the USB device port.

Performance You Can Count On

Depend on Tektronix to provide you with performance you can count on. In addition to industry-leading service and support, every TDS1000B and TDS2000B Series oscilloscope comes backed with a Lifetime Warranty*[1] as standard.

*[1] Limitations apply. For terms and conditions, visit www.tektronix.com/lifetimewarranty.

Characteristics

TDS1000B and TDS2000B Series Digital Storage Oscilloscopes

	TDS1001B	TDS1002B	TDS1012B	TDS2002B	TDS2004B	TDS2012B	TDS2014B	TDS2022B	TDS2024B
Display (1/4 VGA LCD)	Mono	Mono	Mono	Color	Color	Color	Color	Color	Color
Bandwidth*2	40 MHz	60 MHz	100 MHz	60 MHz	60 MHz	100 MHz	100 MHz	200 MHz	200 MHz
Channels	2	2	2	2	4	2	4	2	4
External Trigger Input	Included on all models								
Sample Rate on Each Channel	500 MS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	1.0 GS/s	2.0 GS/s	2.0 GS/s
Record Length	2.5K points at all time bases on all models								
Vertical Resolution	8 bits								
Vertical Sensitivity	2 mV to 5 V/div on all models with calibrated fine adjustment								
DC Vertical Accuracy	±3% on all models								
Vertical Zoom	Vertically expand or compress a live or stopped waveform								
Maximum Input Voltage	300 V_{RMS} CAT II; derated at 20 dB/decade above 100 kHz to 13 V_{p-p} AC at 3 MHz								
Position Range	2 mV to 200 mV/div +2 V; >200 mV to 5 V/div +50 V								
Bandwidth Limit	20 MHz for all models								
Input Coupling	AC, DC, GND on all models								
Input Impedance	1 MΩ in parallel with 20 pF								
Time Base Range	5 ns to 50 s/div	5 ns to 50 s/div	5 ns to 50 s/div	5 ns to 50 s/div	5 ns to 50 s/div	5 ns to 50 s/div	5 ns to 50 s/div	2.5 ns to 50 s/div	2.5 ns to 50 s/div
Time Base Accuracy	50 ppm								
Horizontal Zoom	Horizontally expand or compress a live or stopped waveform								
I/O Interfaces									
USB Ports	USB host port on front panel supports USB flash drives USB device port on back of instrument supports connection to PC and all PictBridge-compatible printers								
GPIB	Optional								
Nonvolatile Storage									
Reference Waveform Display	(2) 2.5K point reference waveforms								
Waveform Storage w/o USB Flash Drive	(2) 2.5K point	(2) 2.5K point	(2) 2.5K point	(2) 2.5K point	(4) 2.5K point	(2) 2.5K point	(4) 2.5K point	(2) 2.5K point	(4) 2.5K point
Maximum USB Flash Drive Size	64 GB								
Waveform Storage with USB Flash Drive	96 or more reference waveforms per 8 MB								
Setups w/o USB Flash Drive	10 front-panel setups								
Setups with USB Flash Drive	4000 or more front-panel setups per 8 MB								
Screen Images with USB Flash Drive	128 or more screen images per 8 MB (the number of images depends on file format selected)								
Save All with USB Flash Drive	12 or more Save All operations per 8 MB A single Save All operation creates 3 to 9 files (setup, image, plus one file for each displayed waveform)								

*2 Bandwidth is 20 MHz at 2 mV/div, all models.

Acquisition Modes

Peak Detect – High-frequency and random-glitch capture. Captures glitches as narrow as 12 ns (typical) at all time base settings from 5 µs/div to 50 s/div.

Sample – Sample data only.

Average – Waveform averaged, selectable: 4, 16, 64, 128.

Single Sequence – Use the Single Sequence button to capture a single triggered acquisition sequence.

Roll Mode – At acquisition time base settings of >100 ms/div.

Trigger System

Trigger Modes – Auto, Normal, Single Sequence.

Trigger Types

Edge (rising/falling) – Conventional level-driven trigger. Positive or negative slope on any channel. Coupling selections: AC, DC, Noise Reject, HF Reject, LF Reject.

Video – Trigger on all lines or individual lines, odd/even or all fields from composite video, or broadcast standards (NTSC, PAL, SECAM).

Pulse Width (or Glitch) – Trigger on a pulse width less than, greater than, equal to, or not equal to, a selectable time limit ranging from 33 ns to 10 s.

Trigger Source

2-channel Models – CH1, CH2, Ext, Ext/5, AC Line.

4-channel Models – CH1, CH2, CH3, CH4, Ext, Ext/5, AC Line.

Trigger View

Displays trigger signal while trigger view button is depressed.

Trigger Signal Frequency Readout

Provides a frequency readout of the trigger source.

Cursors

Types – Amplitude, Time.

Measurements – ΔT, 1/ΔT, ΔV.

Automatic Waveform Measurements

Period, Frequency, +Width, –Width, Rise Time, Fall Time, Max, Min, Peak-to-Peak, Mean, RMS, Cycle RMS.

Waveform Math

Operators – Add, Subtract, Multiply, FFT.

FFT – Windows: Hanning, Flat Top, Rectangular; 2048 sample points.

Sources –
2-channel models: CH1 – CH2, CH2 – CH1, CH1 + CH2, CH1 × CH2.
4-channel models: CH1 – CH2, CH2 – CH1, CH3 – CH4, CH4 – CH3, CH1 + CH2, CH3 + CH4, CH1 × CH2, CH3 × CH4.

Autoset Menu

Single-button, automatic setup of all channels for vertical, horizontal, and trigger systems, with undo Autoset.

Signal Type	Autoset Menu Choices
Square Wave	Single Cycle, Multicycle, Rising or Falling Edge
Sine Wave	Single Cycle, Multicycle, FFT Spectrum
Video (NTSC, PAL, SECAM)	Field: All, Odd, or Even Line: All or Selectable Line Number

Autorange

Automatically adjust vertical and/or horizontal oscilloscope settings when probe is moved from point to point, or when the signal exhibits large changes.

Display Characteristics

Display –
Color models: ¼ VGA passive color LCD with color on black background with adjustable multilevel contrast.
Monochrome models: ¼ VGA backlit passive LDC with adjustable multilevel contrast and inverse video selectable from front panel.

Interpolation – Sin(x)/x.

Display Types – Dots, vectors.

Persistence – Off, 1 s, 2 s, 5 s, infinite.

Format – YT and XY.

Multiple-language User Interface and Context-sensitive Help

Languages Available – English, French, German, Italian, Japanese, Korean, Portuguese, Russian*3, Simplified Chinese, Spanish, Traditional Chinese.

Environmental and Safety

Temperature –
Operating: 0 to +50 ºC.
Nonoperating: –40 to +71 ºC.

Humidity –
Operating and Nonoperating: Up to 80% RH at or below +40 ºC.
Operating and Nonoperating: Up to 45% RH up to +50 ºC.

Altitude –
Operating and Nonoperating: Up to 3,000 m.

Electromagnetic Compatibility – Meets Directive 89/336/EEC, amended by 93/68/EEC, meets or exceed EN55011 Class A Radiated and Conducted Emissions; FCC 47 CFR, Part 15, Subpart B, Class A; Australian EMC Framework, demonstrated per Emission Standard AS/NZS 2064; Russian GOST EMC regulations.

Safety – UL61010-1:2003, CSA22.2 No. 61010-1:2003, EN61010-1:2001, IEC61010-1:2001.

Physical Characteristics

Instrument

Dimensions	mm	in.
Width	326.3	12.85
Height	158.0	6.22
Depth	124.2	4.89
Weight	**kg**	**lb.**
Instrument Only	2.0	4.4
With accessories	2.2	4.9

Instrument Shipping

Package Dimensions	mm	in.
Width	476.2	18.75
Height	266.7	10.5
Depth	228.6	9.0
RM2000B Rackmount	**mm**	**in.**
Width	482.6	19.0
Height	177.8	7.0
Depth	108.0	4.25

*3 Requires Russian firmware, indicated by "RUS" suffix.

Ordering Information

TDS1001B: 40 MHz, 2 Ch, 500 MS/s, Monochrome DSO.
TDS1002B: 60 MHz, 2 Ch, 1 GS/s, Monochrome DSO.
TDS1012B: 100 MHz, 2 Ch, 1 GS/s, Monochrome DSO.
TDS2002B: 60 MHz, 2 Ch, 1 GS/s, Color DSO.
TDS2004B: 60 MHz, 4 Ch, 1 GS/s, Color DSO.
TDS2012B: 100 MHz, 2 Ch, 1 GS/s, Color DSO.
TDS2014B: 100 MHz, 4 Ch, 1 GS/s, Color DSO.
TDS2022B: 200 MHz, 2 Ch, 2 GS/s, Color DSO.
TDS2024B: 200 MHz, 4 Ch, 2 GS/s, Color DSO.

Standard Accessories

Passive Probes – 200 MHz (one per channel).
Power Cord – (Please specify plug option).
NIM/NIST – Traceable Certificate of Calibration.
Documentation – User Manual (Please specify preferred language option).
OpenChoice PC Communications Software – Enables fast and easy communication between a Windows PC and the TDS1000B and TDS2000B Series using USB. Transfer and save settings, waveforms, measurements, and screen images.
National Instruments SignalExpress Tektronix Edition Interactive Measurement Software - Base Version – A fully interactive measurement software environment optimized for the TDS1000B and TDS2000B Series. Enables you to instantly acquire, generate, analyze, compare, import, and save measurement data and signals using intuitive drag-and-drop user interface that does not require any programming. Standard TDS1000B and TDS2000B Series support for acquiring, controlling, viewing, and exporting your live signal. A 30-day trial period of the Professional Version provides additional signal processing, advance analysis, mixed signal, sweeping, limit testing, and user-defined step capabilities. Order SIGEXPTE for permanent Professional Version capability.
Limited Lifetime Warranty[*4] covering labor and parts for defects in materials and workmanship for a minimum of 10 years, excluding probes and accessories[*5].

International Power Plugs

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. A11 – India power.
Opt. A99 – No power cord or AC adapter.

User Manual Options

Opt. L0 – English manual.
Opt. L1 – French manual.
Opt. L2 – Italian manual.
Opt. L3 – German manual.
Opt. L4 – Spanish manual.
Opt. L5 – Japanese manual.
Opt. L6 – Portuguese manual.
Opt. L7 – Simple Chinese manual.
Opt. L8 – Standard Chinese manual.
Opt. L9 – Korean manual.
Opt. L10 – Russian manual.

Translated front-panel overlays included with their respective user manuals.

Recommended Accessories

TEK-USB-488 – GPIB-to-USB converter.

SIGEXPTE – National Instruments SignalExpress Tektronix Edition Interactive Measurement Software - Professional Version.

AC2100 – Soft Carrying Case for Instrument.

HCTEK4321 – Hard Plastic Carrying Case for Instrument (requires AC2100).

RM2000B – Rackmount Kit.

071-1075-xx – Programmer Manual - English Only.

071-1828-xx – Service Manual - English Only.

TNGTDS01 – Operator Training Kit - Extensive instructions and step-by-step lab exercises provide education about the operation of TDS1000B and TDS2000B Series oscilloscopes. Kit includes self-paced CD-ROM-based manual and signal source board.

174-4401-xx – USB host to device cable, 3 feet long.

Recommended Probes

P2220 – 10x to 1x Switchable Passive Probe (200 MHz when 10x is selected).

P6101B – 1x passive probe (15 MHz, 300 V_{RMS} CAT II rating).

P6015A – 1000x high-voltage passive probe (75 MHz).

P5100 – 100x high-voltage passive probe (75 MHz).

P5200 – High-voltage active differential probe (25 MHz).

P6021 – 15 A, 60 MHz AC current probe.

P6022 – 6 A, 120 MHz AC current probe.

A621 – 2000 A, 5 to 50 kHz AC current probe.

A622 – 100 A, 100 kHz AC/DC current probe/BNC.

TCP303/TCPA300 – 15 A, 15 MHz AC/DC current probe/amplifier.

TCP305/TCPA300 – 50 A, 50 MHz AC/DC current probe/amplifier.

TCP312/TCPA300 – 30 A, 100 MHz AC/DC current probe/amplifier.

TCP404XL/TCPA400 – 500 A, 2 MHz AC/DC current probe/amplifier.

Service Options*5

Opt. C3 – Calibration Service 3 Years.

Opt. C5 – Calibration Service 5 Years.

Opt. D1 – Calibration Data Report.

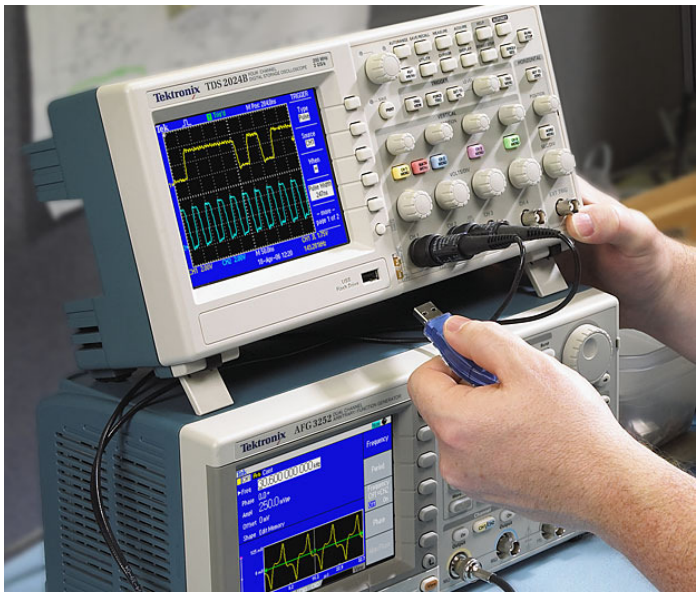
Opt. D3 – Calibration Data Report 3 Years (with Opt. C3).

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

Opt. CA1 – Provides a single calibration event or coverage for the designated calibration interval, whichever comes first.

*4 Lifetime is defined as five years after Tektronix discontinues manufacturing the product, but the warranty length shall be at least ten years from date of original purchase. Lifetime warranty is nontransferable, proof of original purchase is required. Limitations apply. For terms and conditions visit www.tektronix.com/lifetimewarranty.

*5 Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the datasheet of each probe and accessory model for its unique warranty and calibration terms.

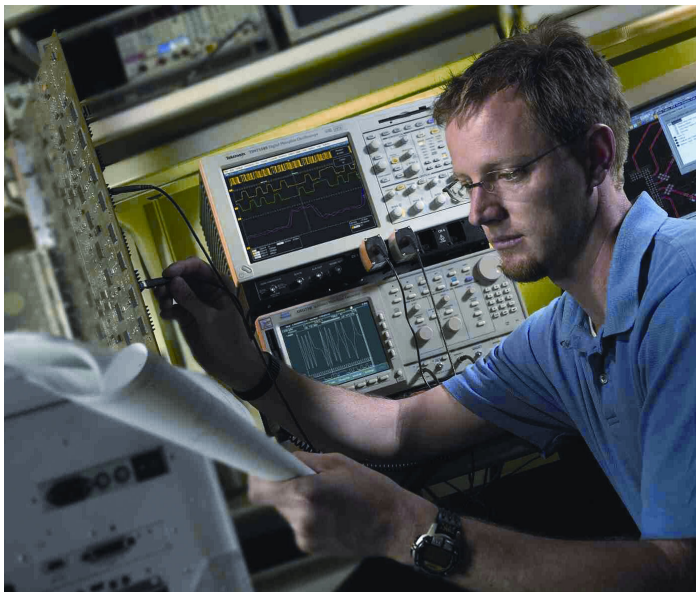


Service Offerings (Available after purchase)

TDSxxxxB-CA1 – Provides a single calibration event or coverage for the designated calibration interval, whichever comes first.

The Complete Measurement Solution

The AFG3000 Series arbitrary function generator pairs with the TDS2000B and TDS1000B Series digital storage oscilloscopes to deliver the two elements of a complete measurement solution – stimulus and acquisition. This instrument combines the capabilities of a function generator with the power of an arbitrary waveform generator, offering the performance needed to accurately verify, validate, and characterize designs with ease and confidence at a price you can afford.



The Tektronix Customer Service Advantage

You can trust Tektronix to offer unequalled engineering expertise and a customer-centric approach to ensure the optimal performance of your Tektronix products and maximize the lifetime value of your Tektronix investment. With service from Tektronix you get:

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- Efficiency and convenience; no hassle service from initial service call to turnaround and delivery
- Flexible repair and calibration service with access to the best on-call technical troubleshooting staff in the industry, with over 20 years of training per support engineer
- Customer-centric approach dedicated to serving your needs everyday with services designed to optimize your product performance, increase productivity and ROI by delivering a fixed cost of ownership, and efficient management of service

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ISO 9001 Product(s) are manufactured in ISO registered facilities.

GPIB IEEE-488 Product(s) complies with IEEE Standard 488.1-1987, RS-232-C, and with Tektronix Standard Codes and Formats.

Artisan Technology Group is an independent supplier of quality pre-owned equipment

Gold-standard solutions

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We buy equipment

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