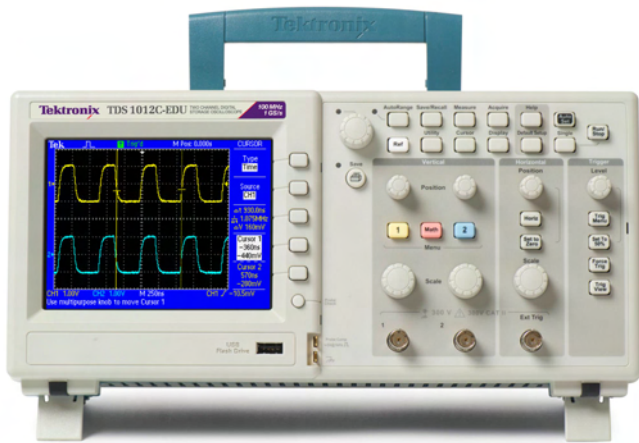


# Digital Storage Oscilloscopes

## TDS1000C-EDU Series Data Sheet



### Features & Benefits

#### Key Performance Specifications

- 100 MHz, 60 MHz, 40 MHz Bandwidth Models
- 2 Channels
- Up to 1 GS/s Sample Rate on All Channels
- 2.5k Point Record Length on All Channels
- Advanced Triggers including Pulse Width Trigger and Line-selectable Video Trigger

#### Ease-of-Use Features

- 16 Automated Measurements, and FFT Analysis for Simplified Waveform Analysis
- Autoset and Signal Auto-ranging
- Probe Check Wizard
- 11-Language User Interface and Context-sensitive Help
- 5.7 in. (144 mm) Active TFT Color Display
- Small Footprint and Lightweight – Only 4.9 in. (124 mm) Deep and 4.4 lb. (2 kg)

#### Connectivity

- USB 2.0 Host Port on the Front Panel for Quick and Easy Data Storage
- USB 2.0 Device Port on Rear Panel for Easy Connection to a PC or Direct Printing to a PictBridge®-compatible Printer

#### 3-year Warranty

### Performance You Need at a Price You Can Afford

The TDS1000C-EDU Digital Oscilloscope Series is designed specifically to meet the needs of today's schools and universities. Packed with features and built-in tools, the TDS1000C-EDU is easy to learn and simple to operate – ideal for first-time oscilloscope users and students. Featuring the same user interface as other members of the Tektronix TDS Oscilloscope Family, your students will learn to operate the world's most popular oscilloscope platform, with over 500,000 oscilloscopes in operation worldwide.

To simplify integration with your existing curriculum, the TDS1000C-EDU also includes an Education Resource CD filled with tools to help your students master the use of an oscilloscope. The TDS1000C-EDU offers the tools and performance you need at a price you can afford.

### Digital Precision for Accurate Measurements

With up to 100 MHz bandwidth and 1 GS/s maximum sample rate, no other digital storage oscilloscope offers as much bandwidth and sample rate for the price. Tektronix proprietary sampling technology provides real-time sampling with a minimum of 10X oversampling on all channels, all the time to accurately capture your signals. Sampling performance is not reduced when using multiple channels.

### Critical Tools for Troubleshooting Your Device

Advanced triggers – rising/falling edge, pulse width, and video – help you quickly isolate your signals of interest. Once you've captured a signal, advanced math capabilities and automated measurements can speed your analysis. Quickly perform an FFT or add, subtract, or multiply waveforms. Sixteen automated measurements quickly and reliably calculate important signal characteristics such as frequency or rise time, while the built-in Limit Test function enables you to easily identify problems in your signal.

### Designed to Make Your Work Easy

The TDS1000C-EDU Series oscilloscopes are designed with the ease of use and familiar operation you have come to expect from Tektronix.

#### Intuitive Operation

The intuitive user interface with dedicated per-channel vertical controls, auto-setup, and auto-ranging makes these instruments easy to use, reducing learning time and increasing efficiency.

#### Help When You Need It, Where You Need It

The built-in Help menu provides you with important information on your oscilloscope's features and functions. Help is provided in the same language as the user interface.

### Probe Check Wizard

Check out your probe compensation before making measurements with just one button that starts a fast, easy procedure.

### Flexible Data Transfer

The USB host port on the front panel enables you to save your instrument settings, screenshots, and waveform data in a flash.

### Easy PC Connectivity

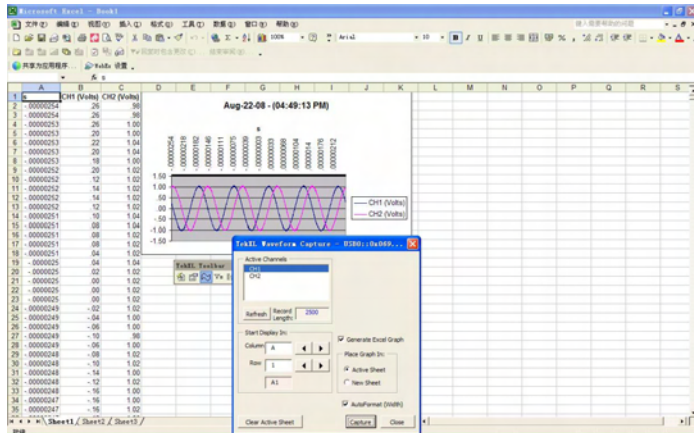
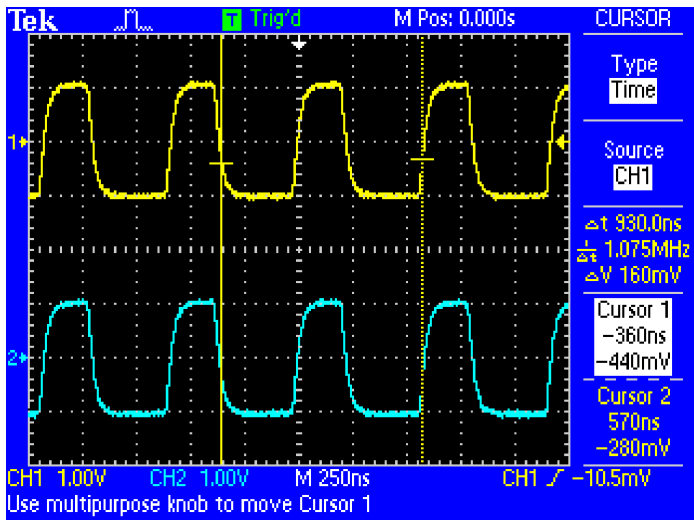
Easily capture, save, and analyze measurement results by connecting to your PC with the rear-panel USB device port and the included copy of OpenChoice® PC Communications Software. Simply pull screen images and waveform data into the stand-alone desktop application or directly into Microsoft Word and Excel. Alternatively, if you prefer not to use your PC, you can simply print your image directly to any PictBridge®-compatible printer.

### Performance You Can Count On

In addition to industry-leading service and support, every TDS1000C-EDU Series oscilloscope comes backed with a 3-year warranty as standard.

### Education Resources

Every TDS1000C-EDU model includes an Education Resource CD filled with tools to help your students master the use of an oscilloscope. The Education Resource CD includes two Student Labs and Instructor's Guides, and two Primers. The *Introduction to Oscilloscopes* Student Lab and Instructor's Guide explains the basics of oscilloscope operation complete with hands-on exercises for your students. The *Introduction to Oscilloscope Probes* Student Lab and Instructor's Guide explains the fundamentals of probing and how probes can affect measurement quality. The two Primers included are the most popular and widely-used from Tektronix – the *XYZs of Oscilloscopes* and *ABCs of Probes*.



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

Quickly and easily capture waveforms.



Included Education Resource CD is filled with tools to help your students master the use of an oscilloscope.

## Characteristics

### TDS1000C-EDU Series Digital Storage Oscilloscopes

Characteristic	TDS1001C-EDU	TDS1002C-EDU	TDS1012C-EDU
Display (QVGA)	Color TFT	Color TFT	Color TFT
Bandwidth*1	40 MHz	60 MHz	100 MHz
Channels	2	2	2
External Trigger Input	Included on all models		
Sample Rate on each Channel	500 MS/s	1.0 GS/s	1.0 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 <sub>RMS</sub> CAT II; derated at 20 dB/decade above 100 kHz to 13 V <sub>P-P</sub> 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
Time Base Accuracy	50 ppm		
Horizontal Zoom	Horizontally expand or compress a live or stopped waveform		

\*1 Bandwidth is 20 MHz at 2 mV/div, all models.

Characteristic	TDS1001C-EDU	TDS1002C-EDU	TDS1012C-EDU
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#### I/O Interfaces

USB Ports	Included on all models: 2 USB 2.0 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		
GPIOB	Optional		

#### Nonvolatile Storage

Reference Waveform Display	(2) 2.5k point reference waveforms		
Waveform Storage without USB Flash Drive	(2) 2.5k point	(2) 2.5k point	(2) 2.5k point
Waveform Storage with USB Flash Drive	96 or more reference waveforms per 8 MB		
Setups without 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)		

## Acquisition Modes

Characteristic	Description
Peak Detect	High-frequency and random glitch capture. Captures glitches as narrow as 12 ns (typical) using acquisition hardware 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 at a time
Roll Mode	At acquisition time base settings of >100 ms/div

## Trigger System

Characteristic	Description
Trigger Modes	Auto, Normal, Single Sequence

## Trigger Types

Characteristic	Description
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

CH1, CH2, 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

Characteristic	Description
Types	Amplitude, Time
Measurements	[Δ]T, 1[Δ]T (frequency), [Δ]V

## Automatic Waveform Measurements

Period, Frequency, +Width, -Width, Rise Time, Fall Time, Max, Min, Peak-to-Peak, Mean, Cycle RMS, RMS, Cursor RMS, Duty Cycle, Phase, Delay.

## Waveform Math

Characteristic	Description
Operators	Add, Subtract, Multiply, FFT
FFT	Windows, Hanning, Flat Top, Rectangular, 2048 sample points
Sources	CH1 - CH2, CH2 - CH1, CH1 + CH2, CH1 × CH2

## 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, Multi-cycle, Rising or Falling Edge
Sine Wave	Single-cycle, Multi-cycle, 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**

Characteristic	Description
Display	QVGA color TFT
Interpolation	Sin (x)/x
Display Types	Dots, vectors
Persistence	Off, 1 s, 2 s, 5 s, infinite
Format	YT and XY

**Environmental**

Characteristic	Description
Temperature	
Operating	0 °C to +50 °C
Nonoperating	-40 °C to +71 °C
Humidity	
Operating and Nonoperating	Up to 80% RH at or below +40 °C. Up to 45% RH up to +50 °C

**Regulatory**

Characteristic	Description
Electromagnetic Compatibility	Meets EMC Directive 2004/108/EC, meets EN61326 Class A; meets Australian EMC Framework
Safety	UL61010-1:2004 CSA, C22.2 No. 61010-1:2004, EN61010-1:2001, IEC61010-1:2001. EU Low Voltage Directive 2006/95/EC

**Physical Characteristics**

Instrument		
Dimension	mm	in.
Height	158.0	6.2
Width	326.3	12.8
Depth	124.2	4.9
Weight		
	kg	lb.
Instrument Only	2.0	4.4
with Accessories	2.2	4.9

**Instrument Shipping**

Package Dimensions		
	mm	in.
Height	266.7	10.5
Width	476.2	18.7
Depth	228.6	9.0
RM2000B Rackmount		
	mm	in.
Height	482.6	19.0
Width	177.8	7.0
Depth	108.0	4.3

**Ordering Information**

Model	Description
TDS1001C-EDU	40 MHz, 2 Ch, 500 MS/s, Color Digital Storage Oscilloscope
TDS1002C-EDU	60 MHz, 2 Ch, 1 GS/s, Color Digital Storage Oscilloscope
TDS1012C-EDU	100 MHz, 2 Ch, 1 GS/s, Color Digital Storage Oscilloscope

**Standard Accessories**

Accessory	Description
TPP0101	Two (2) 100 MHz 10X passive probes
Power Cord	(Please specify plug option)
NIM/NIST	Traceable Certificate of Calibration
Documentation	(Please specify preferred language option)
Educator Classroom and Lab Resource CD	Contains lab experiments for oscilloscopes and probes, and XYZs of Oscilloscopes and ABCs of Probes Primers
OpenChoice® PC Communications Software	Enables fast and easy communication between a Windows PC and the TDS1000C-EDU Series through USB. Transfer and save settings, waveforms, measurements, and screen images
3-year Warranty	Covering labor and parts for defects in materials and workmanship for a minimum of 3 years, excluding probes and accessories*2

\*2 Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the data sheet of each probe and accessory model for its unique warranty and calibration terms.

**Recommended Accessories**

Accessory	Description
TEK-USB-488	GPIB to USB converter
AC2100	Soft Carrying Case for Instrument
HCTEK4321	Hard Plastic Carrying Case for Instrument (requires AC2100)
RM2000B	Rackmount Kit
077-0444-xx	Programmer Manual – English Only
077-0446-xx	Service Manual – English Only
174-4401-00	USB host to device cable, 3 feet long

**Power Plug Options**

Option	Description
A0	North America power
A1	Universal Euro power
A2	United Kingdom power
A3	Australia power
A5	Switzerland power
A6	Japan power
A10	China power
A11	India power
A12	Brazil power
A99	No power cord or AC adapter

**User Manual Options**

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

Option	Description
L0	English manual
L1	French manual
L2	Italian manual
L3	German manual
L4	Spanish manual
L5	Japanese manual
L6	Portuguese manual
L8	Standard Chinese manual
L9	Korean manual
L10	Russian manual

**Recommended Probes**

Probe	Description
TPP0101	100 MHz 10X passive probes
TPP0201	200 MHz 10X passive probes
P2220	10X-1X switchable passive probe (200 MHz when 10X is selected)
P6101B	1X passive probe (15 MHz, 300 V <sub>RMS</sub> CAT II rating)
P6015A	1000X high-voltage passive probe (75 MHz)
P5100	100X high-voltage passive probe (250 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	150 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\*2**

Option	Description
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 Option C3)
Opt. D5	Calibration Data Report 5 Years (with Option C5)
Opt. R5	Repair Service 5 Years

\*2 Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the data sheet of each probe and accessory model for its unique warranty and calibration terms.

**Service Offerings (Available after purchase)**

Option	Description
TDS10xxC-EDU-R1PW	Repair Service Coverage, 1 Year Post Warranty
TDS10xxC-EDU-R2PW	Repair Service Coverage, 2 Years Post Warranty
TDS10xxC-EDU-R5DW	Repair Service Coverage, 5 Years (includes product warranty period). 5-year period starts at time of customer instrument purchase

**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:

- Access to the source of product knowledge; unsurpassed technical expertise
- Your challenges solved by front-line technical experts, design engineering reinforcement, and online support tools
- Comprehensive and thorough support provided worldwide, including software and firmware updates, data reports, and adjustments
- 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 trouble shooting 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



Product(s) are manufactured in ISO registered facilities.



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



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\* European toll-free number. If not accessible, call: +41 52 675 3777

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**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](http://www.tektronix.com)



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