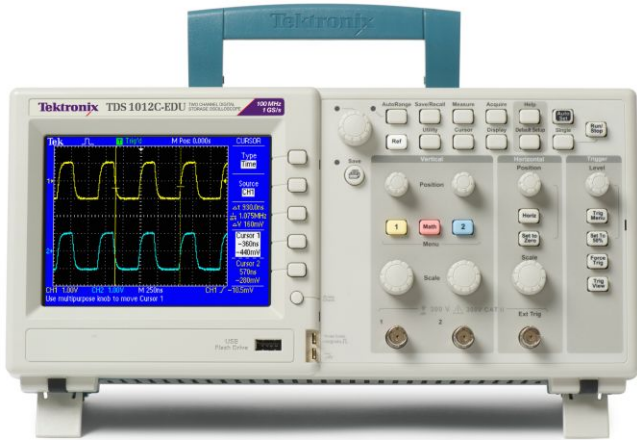


Digital Storage Oscilloscopes

TDS1000C-EDU Series Datasheet



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 - idea 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.

Key performance specifications

- 100 MHz, 60 MHz, 40 MHz bandwidth models
- 2 channels on all models
- 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

Key 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
- 144 mm (5.7 inch) active TFT color display
- Small footprint and lightweight - only 124 mm (4.9 inches) deep and 2 kg (4.4 lb)

- USB 2.0 Host Port on the front panel for quick and easy data storage
- USB 2.0 Device Port on the rear panel for easy connection to a PC or direct printing to a PictBridge[®]-compatible printer
- 3-year warranty

Performance and price

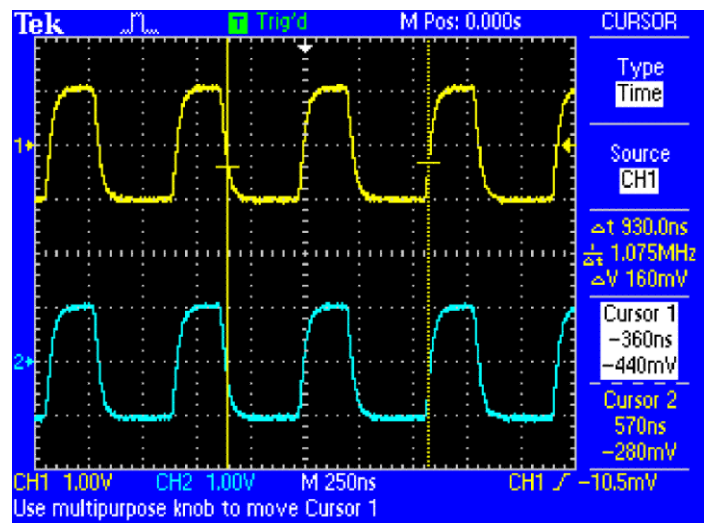
To simplify integration with your existing curriculum, the TDS1000C-EDU also includes an Education Resource CD filled with tools to help you students master the use of an oscilloscope. The TDS1000C-EDU offers the tools and performance you need at a price you can afford.

Digital precision for accurate measuring

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 you 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.



Quickly and easily capture waveforms

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

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

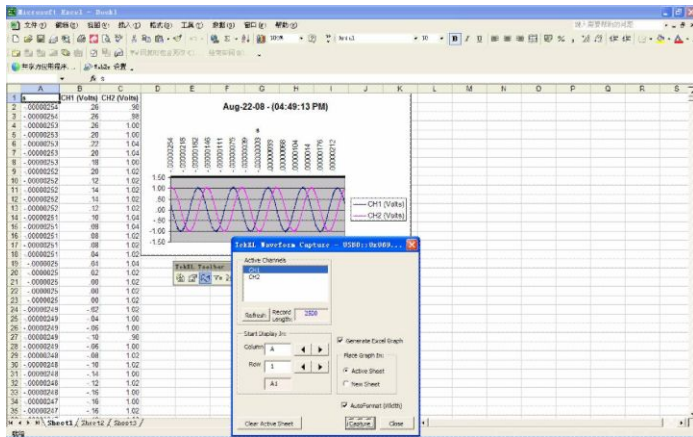
Check out your probe compensation before making measurements with just one button that starts a fast, easy procedure.

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 use your PC, you can simply print your image directly to any PictBridge®-compatible printer.



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

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 Student Lab and Instructor's Guide explains the basics of oscilloscope operation complete with hands-on exercises for your students. The 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 and .



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

Specifications

All specifications are guaranteed unless noted otherwise. All specifications apply to all models unless noted otherwise.

Overview

	TDS1001C-EDU	TDS1002C-EDU	TDS1012C-EDU
Display (QVGA LCD)	TFT on all models		
Bandwidth	40 MHz	60 MHz	100 MHz
Channels	2 channels on all models		
External trigger input	Included on all models		
Sample rate on each channel	500 MS/s	1.0 GS/s	1.0 GS/s

Vertical system

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 impedance	1 MΩ in parallel with 20 pF
Input coupling	AC, DC, GND on all models

Horizontal system

Time base accuracy	50 ppm
Horizontal zoom	Horizontally expand or compress a live or stopped waveform

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, HR 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 the trigger signal while the Trigger View button is depressed.
Trigger signal frequency readout	Provides a frequency readout of the trigger source

Acquisition system

Acquisition modes	
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 μ s/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

Waveform measurements

Automatic waveform measurements	Period, Frequency, +Width, -Width, Rise Time, Fall Time, Max, Min, Peak-to-Peak, Mean, RMS, Cycle RMS, Cursor RMS, Duty Cycle, Phase, Delay
Cursors	
Types	Amplitude and time
Measurements	ΔT , $1/\Delta T$ (frequency), ΔV

Waveform math

Operators	Add, Subtract, Multiply, FFT
Sources	CH1 - CH2, CH2 - CH1, CH1 + CH2, CH1 x CH2
FFT	Windows, Hanning, Flat Top, Rectangular 2,048 sample points

Waveform math

Autoset menu	Single-button, automatic setup of all channels for vertical, horizontal, and trigger systems, with undo Autoset. Autoset-menu signal-type choices are:
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 Event Line: All or Selectable Line Number
Autorange	Automatically adjust vertical and/or horizontal oscilloscope settings when a probe is moved from point to point, or when a signal exhibits large changes

Display characteristics

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

Input-output interfaces

USB Ports	2 USB 2.0 ports The USB host port on the front panel supports USB flash drives The USB device port on the back of the instrument supports connection to a PC and to all PictBridge-compatible printers
GPIB	Optional

Nonvolatile storage

Reference waveform display	Two 2.5k point reference waveforms
Waveform storage without USB flash drive	Two 2.5k point for all models
Maximum USB flash drive size	64 GB
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	4,000 or more front-panel setups per 8 MB
Screen images with USB flash drive	128 or more screen images per 8 MB The actual number of images depends on the 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)

Power source

Power source

Source voltage	Full range: 100 to 240 V _{AC} RMS ±10%, Installation Category II (covers range of 90 to 264 V _{AC})
Power consumption	Power consumption: Less than 30 W at 85 to 275 V _{AC} input

Physical characteristics

Instrument dimensions

Height	158.0 mm (6.2 inches)
Width	326.3 mm (12.8 inches)
Depth	124.2 mm (4.9 inches)

Instrument weight

Instrument only	2.0 kg (4.4 lb)
Instrument with accessories	2.2 kg (4.9 lb)

Shipping package dimensions

Height	266.7 mm (10.5 inches)
Width	476.2 mm (18.7 inches)
Depth	228.6 mm (9.0 inches)

RM2000 rackmount dimensions

Height	177.8 mm (7.0 inches)
Width	482.6 mm (19.0 inches)
Depth	108.0 mm (4.3 inches)

EMC, environment, and safety

Temperature

Operating	0 to +50 °C
Non-operating	-40 to +71 °C

Humidity

Operating	Up to 80% RH at or below +40 °C
	Up to 45% RH up to +50 °C
Non-operating	Up to 80% RH at or below +40 °C
	Up to 45% RH up to +50 °C

Altitude

Operating	Up to 3,000 m
Non-operating	Up to 3,000 m

Electromagnetic compatibility Meets Directive 2004/108/EC, EN 61326-2-1 Class A; Australian EMC Framework

Safety UL61010-1:2004, CSA22.2 No. 61010-1:2004, EN61010-1:2001, IEC61010-1:2001, EU Low Voltage Directive 2006/95/EC

Ordering information

Models

TDS1001C-EDU	40 MHz, 2 Ch, 500 MS/s, TFT DSO
TDS1002C-EDU	60 MHz, 2 Ch, 1 GS/s, TFT DSO
TDS1012C-EDU	100 MHz, 2 Ch, 1 GS/s, TFT DSO

Instrument options

Language options

Opt. L0	English (front-panel label on instrument)
Opt. L1	French (front-panel overlay)
Opt. L2	Italian (front-panel overlay)
Opt. L3	German (front-panel overlay)
Opt. L4	Spanish (front-panel overlay)
Opt. L5	Japanese (front-panel overlay)
Opt. L6	Portuguese (front-panel overlay)
Opt. L7	Simplified Chinese (front-panel overlay)
Opt. L8	Traditional Chinese (front-panel overlay)
Opt. L9	Korean (front-panel overlay)
Opt. L10	Russian (front-panel overlay)

User manual (PDF) in 11 languages are available on the documentation CD and for download from www.tek.com/manual/downloads. There are no printed user manuals.

Power plug options

Opt. A0	North America power plug (115 V, 60 Hz)
Opt. A1	Universal Euro power plug (220 V, 50 Hz)
Opt. A2	United Kingdom power plug (240 V, 50 Hz)
Opt. A3	Australia power plug (240 V, 50 Hz)
Opt. A4	North America power plug (240 V, 50 Hz)
Opt. A5	Switzerland power plug (220 V, 50 Hz)
Opt. A6	Japan power plug (100 V, 50/60 Hz)
Opt. A10	China power plug (50 Hz)
Opt. A11	India power plug (50 Hz)
Opt. A12	Brazil power plug (60 Hz)
Opt. A99	No power cord

Service options

Opt. D1	Calibration Data Report
Opt. R5	Repair Service 5 Years (including warranty)
Opt. SILV100	Standard warranty extended to 5 years

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.

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

Standard accessories

Probes

TPP0101	Two (2) 100 MHz 10X passive probes
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Accessories

Power cord	Please specify plug option
NIM/NIST	Traceable Certificate of Calibration
Documentation	TDS2000C and TDS1000C-EDU Compliance and Safety Instructions TDS2000C and TDS1000C-EDU Documentation CD
OpenChoice PC Communications Software	Enables fast and easy communication between a Windows PC and the TDS2000C Series using USB. Transfer and save settings, waveforms, measurements, and screen images
Educator Classroom and Lab Resource CD	Contains lab experiments for oscilloscopes and probes, and and primers.
3-year warranty	Covering labor and parts for defects in materials and workmanship for a minimum of 3 years, excluding probes and accessories. 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.

Recommended accessories

Probes

TPP0101	10X passive probe, 100 MHz bandwidth
TPP0201	10X passive probe, 200 MHz bandwidth
P2220	1X/10X passive probe, 200 MHz bandwidth
P6101B	1X passive probe (15 MHz, 300 V _{RMS} CAT II rating)
P6015A	1000X high-voltage passive probe (75 MHz)
P5100A	100X high-voltage passive probe (500 MHz)
P5200	High-voltage active differential probe (25 MHz)
P6021	15 A, 60 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

Accessories

TEK-USB-488	GPIO-to-USB converter
AC2100	Soft carrying case for instrument
HCTEK4321	Hard plastic carrying case for instrument
RM2000B	Rackmount kit
077-0444-xx	Programmer manual, English only, PDF only, downloadable from www.tek.com/manual/downloads
077-0446-xx	Service manual, English only, PDF only, downloadable from www.tek.com/manual/downloads
174-4401-xx	USB host to device cable, 3 feet long



Tektronix is registered to ISO 9001 and ISO 14001 by SRI Quality System Registrar.



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

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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.tek.com.

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