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Test & Measurement

- sales
- rentals
- calibration
- repair
- disposal

Complimentary Reference Material

This PDF has been made available as a complimentary service for you to assist in evaluating this model for your testing requirements.

TMG offers a wide range of test equipment solutions, from renting short to long term, buying refurbished and purchasing new. Financing options, such as Financial Rental, and Leasing are also available on application.

TMG will assist if you are unsure whether this model will suit your requirements.

Call TMG if you need to organise repair and/or calibrate your unit.

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Acquisition

Purchase
Lease
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Solution Centre

Product Lifecycle Management System

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Form 080/01

NATA   CERTIFIED MANAGEMENT SYSTEM   AIDN

Digital Storage Oscilloscopes

▶ **TDS1000B Series • TDS2000B Series**

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.

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 band-
width, the same record length at all time
base settings, advanced triggers to isolate
signals of interest, and 11 standard auto-
matic measurements on all models. Their
Fast Fourier Transform (FFT) and wave-
form 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 instru-
ments 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.

Tektronix

Enabling Innovation

Digital Storage Oscilloscopes
▶ TDS1000B Series • TDS2000B Series

▶ Quickly and easily capture waveforms.

▶ Conveniently use your USB flash drive to store screen shots and waveform data.
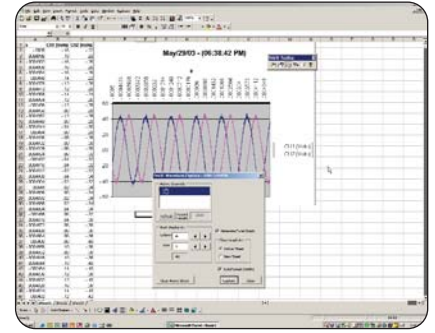
▶ Easily capture, save and analyze measurement results with OpenChoice® PC Communications Software.

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 can simply print your image directly to any PictBridge compatible printer via 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	2.5 K 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								

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

▶ **TDS1000B and TDS2000B Series Digital Storage Oscilloscopes (continued)**

	TDS1001B	TDS1002B	TDS1012B	TDS2002B	TDS2004B	TDS2012B	TDS2014B	TDS2022B	TDS2024B
DC Vertical Accuracy	+3% on all models								
Vertical Zoom	Vertically expand or compress a live or stopped waveform								
Maximum Input Voltage	300V$_{RMS}$ CAT II; derated at 20 dB/decade above 100 kHz to 13V$_{pk-pk}$ 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 20pF								
Time Base Range	5 ns to 50 sec/div	5 ns to 50 sec/div	5 ns to 50 sec/div	5 ns to 50 sec/div	5 ns to 50 sec/div	5 ns to 50 sec/div	5 ns to 50 sec/div	2.5 ns to 50 sec/div	2.5 ns to 50 sec/div
Time Base Accuracy	50 ppm								
Horizontal Zoom	Horizontally expand or compress a live or stopped waveform								

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								
GPIB	Optional								

Non-volatile Storage

	TDS1001B	TDS1002B	TDS1012B	TDS2002B	TDS2004B	TDS2012B	TDS2014B	TDS2022B	TDS2024B
Reference Waveform Display	(2) 2.5 K point reference waveforms								
Waveform Storage w/o USB Flash Drive	(2) 2.5 K point	(2) 2.5 K point	(2) 2.5 K point	(2) 2.5 K point	(4) 2.5 K point	(2) 2.5 K point	(4) 2.5 K point	(2) 2.5 K point	(4) 2.5 K point
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)								

# Digital Storage Oscilloscopes

▶ Front Panel Features
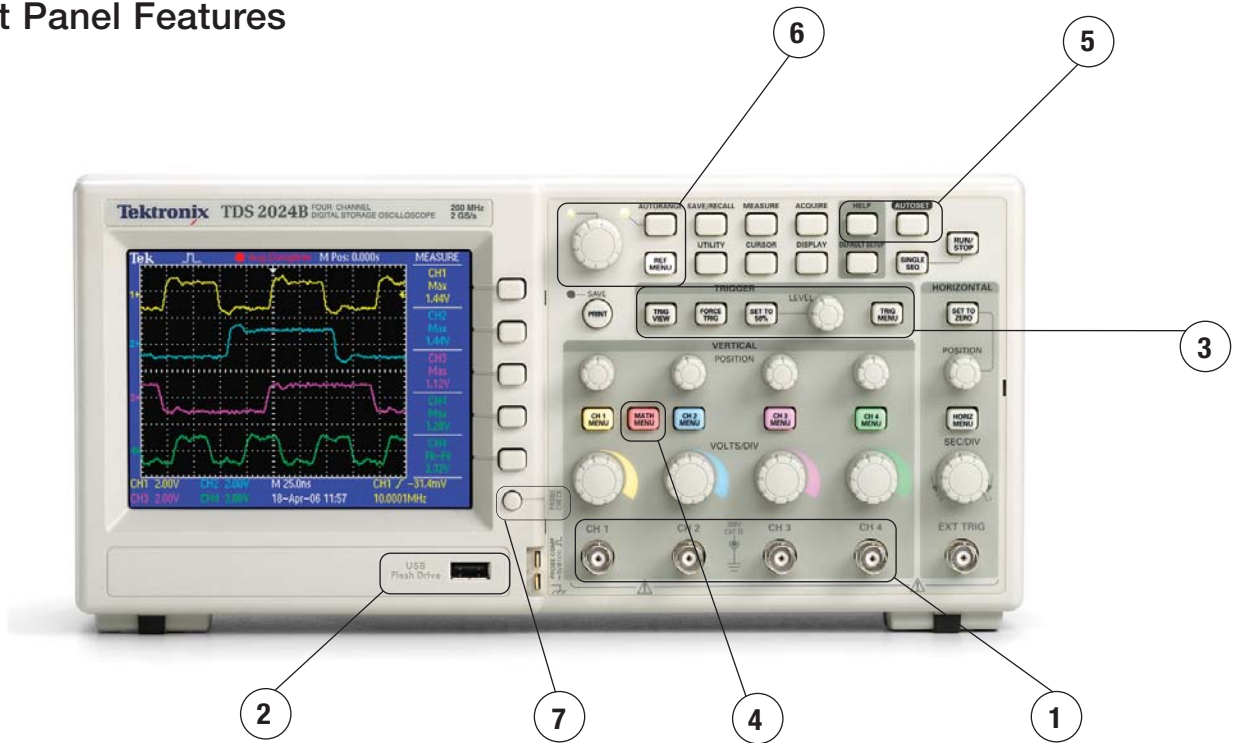
1 Digital Real-Time Technology – Quickly debug and characterize a wide range of signal types on four channels simultaneously with Tektronix' unique digital real-time (DRT) sampling technology. This acquisition technology allows you to capture high-frequency, non-repetitive information, such as glitches and edge anomalies, that eludes other oscilloscopes in its class.

2 USB Host Port – Conveniently use your USB flash drive to store your personal oscilloscope setups, screen shots, and waveform data for later use. Also use the USB host port to easily update your instrument firmware.

3 Advanced Triggers – Quickly capture your event of interest with advanced triggers including pulse width and line selectable video triggers.

4 Easy and Precise On-board Analysis – Fast Fourier Transform (FFT) and waveform add, subtract and multiply math functions come standard on all models. FFT function displays frequency domain spectrums for fast harmonic distortion analysis or other frequency based analysis.

5 Simple Setup and Operation – Simplify setup with smart Autoset function which identifies the type of waveform, adjusts controls to produce a usable display of the input signal, and allows you to select how the waveform should be presented (for example, single versus multiple cycles).

Built-in context-sensitive help further eases the operation by providing indexed and linked topics that allow you to selectively learn about the operation of various oscilloscope features and functions. Help is provided in the same languages as the user interface.

6 Simple User Interface – The most frequently used functions are brought forth to the panel for direct accessibility (for example, single sequence button, print button and default setup button).

Dedicated reference button allows you to quickly recall your "golden" waveform for quick comparisons.

Autorange function automatically scales each waveform as you move your probe from test point to test point.

7 Probe Check Wizard – Quickly verify that your probe is calibrated and operating properly.

▶ Side and Rear Panel Features
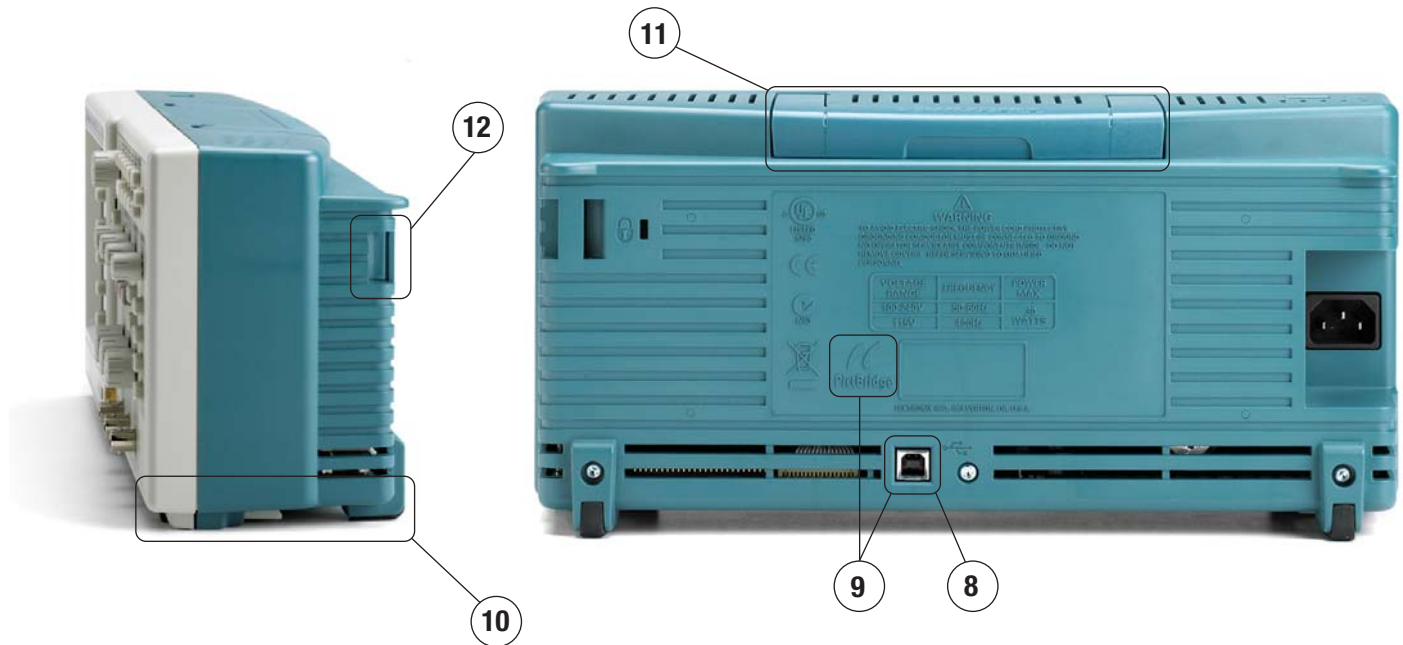
8 **USB Device Port Combined with OpenChoice® and NI SignalExpress® TE for Seamless PC Connectivity –** Easily communicate with other instruments, peripherals or systems via USB or GPIB (optional). The USB device port allows you full programmable control for automated measurements and remote display and archiving.

For seamless integration to your PC without programming, OpenChoice PC communications software and NI SignalExpress TE interactive measurement software enable transferring of waveform data, screen images and front panel setups between the oscilloscope and the PC. Both allow you to transfer your data into a stand-alone desktop application, Microsoft Word or Microsoft Excel. NI SignalExpress TE software provides extended capabilities, including advanced analysis, remote oscilloscope control and live waveform analysis.

9 **USB Device Port Combined with PictBridge® for Direct Print –** Directly print your screen image to any PictBridge compatible printer via the USB device port. Each image can be stamped with date, time and instrument model and serial number (if supported by printer).

10 **Compact 124.2 mm (4.8 in) Depth –** Free up valuable space on your bench or desktop.

11 **Integrated Handle –** Easily carry your ultra-lightweight (2.0 kg [4.4 lb]) portable instrument into the field or to another room on a different floor of your building.

12 **Integrated Security Loop and Kensington Lock –** If necessary, secure your oscilloscope in place. Security slots connect to Kensington lock or allow cable to pass through.

Digital Storage Oscilloscopes
▶ TDS1000B Series • TDS2000B Series

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 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
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 – [Δ]T, 1[Δ]T (frequency), [Δ]V.

▶ 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

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

Waveform Math
Operators – Add, Subtract, Multiply, FFT.
FFT –
Windows, Hanning, Flat Top, Rectangular, 2048 sample points.
Sources –
2-channel Models: CH1 to CH2, CH2 to CH1, CH1+CH2, CH1xCH2.
4-channel Models: CH1 to CH2, CH2 to CH1, CH3 to CH4, CH4 to CH3, CH1+CH2, CH3+CH4, CH1xCH2, CH3xCH4.

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 multi-level contrast. Monochrome models: ¼ VGA backlit passive LDC with adjustable multi-level 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.

Environmental and Safety
Temperature –
Operating: 0 ºC to +50 ºC.
Non-operating: –40 ºC to +71 ºC.

Humidity –
Operating and Non-operating: Up to 80% RH at or below +40 ºC. Operating and Non-operating: Up to 45% RH up to +50 ºC.
Altitude –
Operating and Non-operating: 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 –
UL610100-1:2003, 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**	**lbs.**
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

RM2000B Rackmount	mm	in.
Width	482.6	19
Height	177.8	7
Depth	108	4.25

► 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

P2220 – 200 MHz 10x to 1x Switchable Passive Probes (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 via 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 SlGEXPTE for permanent Professional Version capability.

Limited Lifetime Warranty[*1] – Covering labor and parts for defects in materials and workmanship for a minimum of 10 years, excluding probes and accessories.[*2]

[*1] 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 non-transferable, proof of original purchase is required. Limitations apply. For terms and conditions visit www.tektronix.com/lifetimewarranty.

[*2] 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.

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 – Simplified 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.

174-4401-00 – 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.

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[*2]

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.

Service Offerings (Available After Purchase)

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

Digital Storage Oscilloscopes
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Contact Tektronix:

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:

▶ Access to the source of product knowledge; unsurpassed technical expertise

▶ Your challenges solved via 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
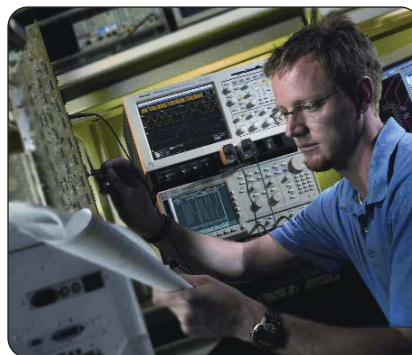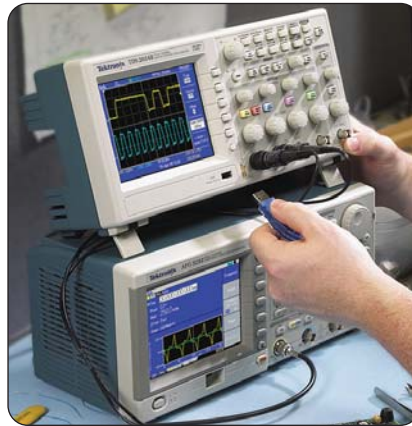
▶ Customer-centric approach dedicated to serving your needs everyday with services designed to optimize your product performance, increase productivity and ROI by delivering a fixed cost of ownership and efficient management of service

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Our most up-to-date product information is available at:
www.tektronix.com

CE ISO 9001 GPIB IEEE-488

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.

6/06   HB/WOW   3GW-19558-0

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