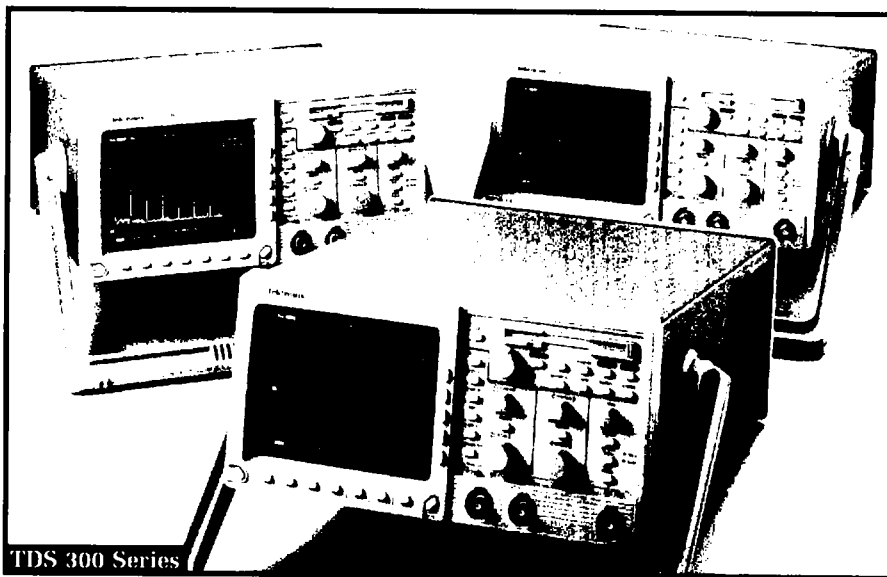


# Oscilloscopes



TDS 300 Series

## TEKTRONIX OSCILLOSCOPE SOLUTIONS FOR ALL THE JOBS YOU DO

Oscilloscopes are the window through which we view the electronic world. They are fundamental to developments in research, design, manufacturing, education and service. Today's measurement challenges demand oscilloscopes you can trust. Tektronix has been building reliable oscilloscopes for 50 years and is widely recognized as the leader in scope solutions worldwide.

### CHOOSE THE SCOPE THAT'S RIGHT FOR YOU

Often your application dictates the oscilloscope you choose. Other times it's purely a matter of personal preference or budget. Whether you choose analog or digital technologies, each has benefits and tradeoffs for you to consider.

Scopes are smarter today. Our low-cost TAS analog scopes give you powerful features such as cursor measurements and Auto Setup in an easy-to-operate and low-cost package.

The Tektronix TDS Series of digital scopes deliver the power of digital with the familiarity of analog. In all of our scope designs we've reversed the trend toward more buttons and menus. We've done our homework, tested our ideas with customers like you, and greatly improved access to important features without making the basic functions hard to find.

Volts/div, time/div and trigger level have dedicated knobs so you can just grab and turn. Measurements, trigger modes, and acquisition controls lie within easy reach behind a friendly graphical user interface (GUI).

## DIGITAL REAL-TIME CAPTURE FOR REAL-LIFE SIGNALS

Tektronix TDS Digital Real-Time oscilloscopes give you a guaranteed high sample rate-to-bandwidth ratio on each and every input channel. This oversampling provides no compromise capture and display of even single-shot events to the scope's full bandwidth. Our exclusive Digital Real-Time technology gives you the responsiveness of a real-time display with the advantages of digital waveform capture and analysis in an affordable, portable instrument.

## NO SUBSTITUTE FOR TEKTRONIX QUALITY

No matter which Tektronix oscilloscope you choose, you know you're buying quality and reliability. Our oscilloscope designs are thoroughly scrutinized and tested to ensure compliance with all applicable safety and environmental standards. And our service network is designed to help you keep your oscilloscope calibrated and working with fast turnaround.

The following pages present Tektronix analog and digital oscilloscope solutions offered through our worldwide organization of distribution professionals.

TECHNOLOGY	DIGITAL REAL TIME					DIGITIZING			ANALOG	
	TDS 200		TDS 300			TDS 600	TDS 400		TAS 200	
Series	TDS 210	TDS 220	TDS 340A	TDS 360	TDS 380	TDS 640A	TDS 410A	TDS 420A	TDS 460A	TAS 250
Model	TDS 210	TDS 220	TDS 340A	TDS 360	TDS 380	TDS 640A	TDS 410A	TDS 420A	TDS 460A	TAS 250
Bandwidth MHz	60	100	100	200	400	500	200	200	400	50
Channels	2	2	2	2	2	4	2	4	4	2
Sample Rate	1GS/s	1GS/s	500MS/s	1GS/s	2GS/s	2GS/s	100MS/s	100MS/s	100MS/s	N/A
Record Length	2.5k	2.5k	1k	1k	1k	2k	30k 120k opt.	30k 120k opt.	30k 120k opt.	N/A
Minimum Vertical Sensitivity @ BW	10 mV @ 100 MHz 2 mV @ 20 MHz	10 mV @ 100 MHz 2 mV @ 20 MHz	2 mV @ 100 MHz	5 mV @ 200 MHz 2 mV @ 180 MHz	5 mV @ 400 MHz 2 mV @ 250 MHz	1 mV @ 500 MHz	1 mV @ 200 MHz	1 mV @ 200 MHz	1 mV @ 400 MHz	5 mV @ 50 MHz
Vertical Accuracy	3%	3%	2%	2%	2%	1.5%	1.5%	1.5%	1.5%	3%
Page #	40		45			44	41		48	

# Digital Real-Time Oscilloscopes

## TDS 210 and TDS 220



### Features

- 60 MHz or 100 MHz
- 8 bit Vertical Resolution
- Sample, Average and Peak Detect
- Cursor Readout
- Two Input Channels Plus External Trigger
- 2.5K Record Length
- 1 GS/s Sample Rate
- Dual Timebase
- Autoset
- Two Waveform and Five Setup Memories
- Automatic Measurements
  - Period, Frequency, Cycle RMS, Mean, Peak to Peak
- Multi-Language User Interface
- RS-232, GPIB Module
- Printer Port Module
- $\pm 0.01\%$  Horizontal Accuracy
- Edge Video, Set to 50% Triggering



### Applications

- Manufacturing
- Education
- Service/Repair Providers
- Trigger Type: Edge (Rising or Falling). Video Set to 50%



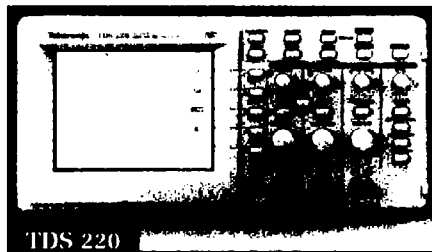
Product Us, complies with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.



See Tektronix on the World Wide Web: <http://www.tek.com>



Tektronix Measurement products are manufactured in ISO registered facilities.



### SAVE TIME, SAVE MONEY WITH DIGITAL SCOPES

The TDS 200 Series offers unprecedented high performance and affordability in a digital benchtop oscilloscope. The analog-like user interface of the TDS 200 Series offers responsive direct access controls and a "flat" menu structure. This provides established analog users an easy transition to digital technology. The TDS 200 Series delivers a benchtop oscilloscope that takes up significantly less bench space, provides portability benefits, and still offers the power of Digital Real-Time technology.

### Characteristics

#### SIGNAL ACQUISITION SYSTEM

##### Sensitivity (with calibrated fine adjustment):

10 mV to 5 V/div at full bandwidth; 2 mV to 5 mV/div at 20 MHz.

**Vertical Zoom:** Vertically expand or compress a live or stopped waveform.

#### TIME BASE SYSTEM (MAIN AND WINDOW)

**Horizontal Zoom:** Horizontally expand or compress a live or stopped waveform.

**Time/Division Range:** 5 ns to 5 s/div.

#### TRIGGERING SYSTEM (MAIN ONLY)

**Trigger Modes:** Auto, Normal, Single Sweep.

**Trigger Source:** CH1, CH2, Ext, Ext/5.

**Trigger View:** Displays trigger signal while trigger view button depressed.

#### WAVEFORM PROCESSING

**Arithmetic Operators:** Add, Subtract, Invert.

**Sources:** CH1, CH2.

#### DISPLAY SYSTEM

Robust, backlit LCD with adjustable multi-level contrast.

**Modes:** Vector, Dots, Dot Persistence.

**Format:** YT and XY.

#### TDS2HM HARDCOPY EXTENSION MODULE

**Includes:** Centronics-type parallel port

#### TDS2CM COMMUNICATIONS EXTENSION MODULE

**Includes:** Centronics, GPIB and RS232 Ports.

#### ENVIRONMENTAL AND SAFETY

##### Temperature:

Operating: 0 to +50° C.

Non-operating: -20 to +60° C.

##### Humidity:

Up to 90% RH at or below +40° C.

Up to 60% RH from 41 to 50° C.

(operating and non-operating)

##### Altitude:

Operating: Up to 2000 m

Nonoperating: Up to 15,000 m

##### Electromagnetic Emissions: Meets

Directive 89/336/EEC for Electromagnetic Compatibility; FCC Code of Federal Regulations, 47 CFR, Part 15, Subpart B, Class A.

**Safety:** UL 3111, EN61010, CAN/CSA-C22.2 No. 1010.1-92.

#### PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Width:	304.8	12.0
Height:	151.4	5.96
Depth:	120.7	4.75
Weight	kg	lb.
Oscilloscope only.	1.5	3.25
w/accessories:	1.7	3.75

### ORDERING INFORMATION

#### TDS 210/TDS 220 DIGITAL REAL-TIME OSCILLOSCOPES

**Includes:** Two each P6112B 100 MHz 10X Passive Probes, User Manual - English, Power Cord - U.S., NIST-Traceable Certificate of Calibration.

**Warranty Information:** Three year warranty covering all labor and parts, excluding probes.

**AC220:** Soft Carrying Case

#### MANUALS

**Service Manual:** (TDS 210 and TDS 220)  
English only (070-9693-00)

#### TDS2CM Programmer's Manual:

English only (070-9576-00)

#### SOFTWARE

**WSTR31:** WaveStar[R] Waveform Capture Software

#### ACCESSORY CABLES

**GPIB:** 1 m (3.3 ft) (012-0991-01)

2 m (6.6 ft) (012-0991-00)

**RS-232:** 9-pin female to 9-pin female connectors, null modem, 76 in. (1.9 m), for AT style computers (012-1379-00)

9-pin female to 25-pin female connectors, null modem, 76 in. (1.9 m), for PC style computers (012-1380-00)

9-pin female to 25-pin male connectors, null modem, 9 ft (2.7 m), for serial interface printers (012-1298-00)

9-pin female to 25-pin male connectors, 15 ft (4.6 m), for modems (012-1241-00)

#### Centronics:

25-pin male to 36-pin Centronics, 2.4 m (8 ft), for parallel printer interfaces (012-1214-00)

# Digitizing Oscilloscopes

TDS 460A • TDS 420A • TDS 410A

*These Products are sold through distributors in the US only.*



## Features

### TDS 410A/TDS 420A/TDS 460A

- 200 and 400 MHz Bandwidths
- 100 MS/s Sampling Rate on 4 Channels
- 30 K Records Standard, 120 K Optional
- 3.5 inch DOS format floppy drive
- 1.5% Accuracy 1 – 10 V/div
- Proprietary Hi-Res Mode for up to 12-Bits of Single Shot Vertical Resolution
- Extended Waveform Math/FFT (Option)
- 10 ns Peak Detect Mode for Glitch Capture
- 25 Automatic Measurements
- Pass/Fail (Template) Waveform Testing
- Roll and Triggered Roll Modes
- RS-232 and Centronics Type Interfaces
- Tek Secure

### DIFFERENTIAL MEASUREMENTS

- ADA400A Analog Differential Amplifier (10  $\mu$ V/div sensitivity)
- P5200/P5205 High Voltage Differential Probes (up to 1300 V) for Floating Measurements

(Please see pages 493 and 494 for details on ADA400A, P5200 and P5205)



## Applications

- Biophysical Research
- Biomedical Research
- Electrophysical and Electromechanical System Design
- Audio System Measurement and Analysis
- Manufacturing Test and Quality Control
- Power Supply and Power-related Design
- Product Service and Maintenance



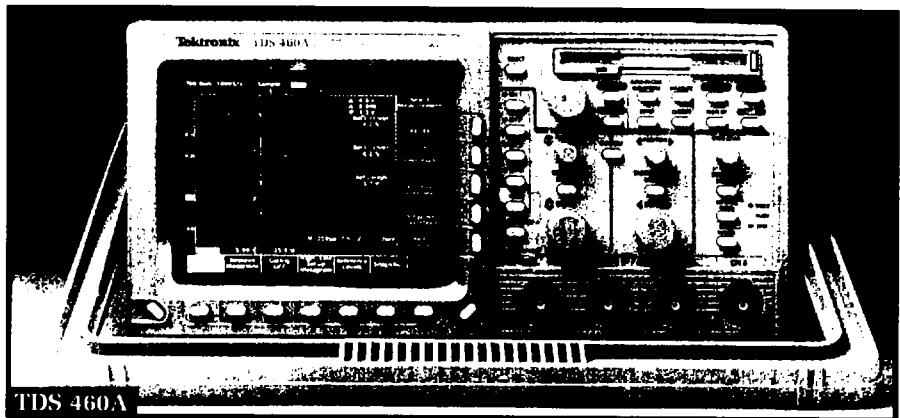
Product(s) complies with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.



See Tektronix on the World Wide Web.  
<http://www.tek.com>



ISO 9001 Tektronix Measurement products are manufactured in ISO registered facilities



TDS 460A

*The TDS 460A 400 MHz, four channel, Personal Lab Scope.*

## TDS 400A Personal Lab Oscilloscopes

For professionals who demand high precision and fidelity from their measurements, the TDS 400A Personal Lab Scopes combine excellent performance and a broad feature set, all at affordable prices. A choice of 2 and 4 channel models ranging from 200 MHz to 400 MHz with 100 MS/s on all channels makes the TDS 400A Series a worthy fit for a variety of demanding applications.

## Characteristics

### SIGNAL ACQUISITION SYSTEM

**Bandwidth** – 200 MHz (TDS 410A, TDS 420A), 350 MHz (TDS 460A).

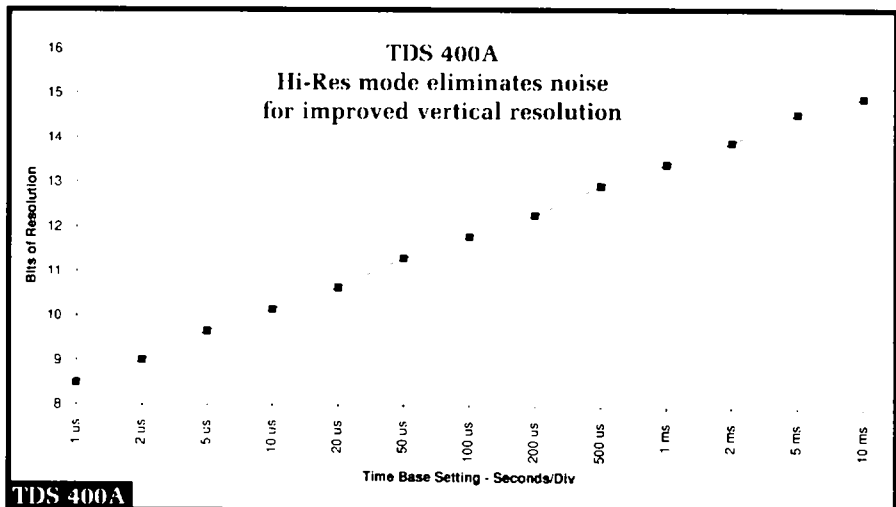
**Channels** – 4 (2 on TDS 410A).

**Digitizers** – 4 (2 on TDS 410A).

**Sample Rate** – 100 MS/s on all channels.

**Sensitivity** – 1 mV to 10 V/div (with calibrated fine adjust).

**Position Range** –  $\pm 5$  Divisions.



*Theoretically achievable resolution with TDS 400A Hi-Res Mode.*

# Digitizing Oscilloscopes

TDS 460A • TDS 420A • TDS 410A

**Offset Range** –  $\pm 1$  V from 1 to 99.5 ;  
 $\pm 10$  V from 100 mV to 995 ;  $\pm 100$  V from  
1 to 10 V/div.

**DC Gain Accuracy** –  $\pm 1.5\%$ .

**Vertical Resolution** – 8-Bits (256 levels over  
10.24 vertical divisions).

**Analog Bandwidth Selections** – 20 MHz,  
100 MHz, and full.

**Input Coupling** – AC, DC or GND.

**Input Impedance Selections** – 1 M $\Omega$  in parallel  
with 15 pF, or 50  $\Omega$  (AC and DC coupling).

**Maximum Input Voltage** –  $\pm 400$  V  
(DC + peak AC). Derate at 20 dB/decade  
above 1 MHz. 1 M $\Omega$  or GND coupled.

**Channel Isolation** –  $>100:1$  at 100 MHz for  
any two channels.

**AC Coupled Low Frequency Limit** –  
 $\leq 10$  Hz when AC 1 M $\Omega$  coupled.  $\leq 200$  kHz  
when AC 50  $\Omega$  coupled.

## ACQUISITION MODES

**Peak Detect** – High frequency and random  
glitch capture. Captures glitches of 10 ns  
using acquisition hardware at all real-time  
sampling rates.

**Sample** – Sample data only.

**Envelope** – Max/min values acquired over  
one or more acquisitions, selectable from  
2 to 2000, infinite.

**Average** – Waveform averages selectable  
from 2 to 10,000.

**Hi-Res** – Vertical resolution improvement and  
noise reduction on low-frequency signals,  
e.g. 12-Bits at 10 ms/div and slower. Enhanced  
vertical resolution ( $>12$ -Bits) for noise reduc-  
tion, on low frequency signals. Make precise  
low-level signal measurements (up to 5  $\mu$ V)  
with differential amplifier (ADA400A).

## TIME BASE SYSTEM

**Time Bases** – Main, Delayed.

**Time/Division Range** – 1 ns to 20 s/div.

**Time Base Accuracy** – 0.005% over any  
interval  $>1$  ms.

**Record Length (real time and  
equivalent time)** – Sample points per channel:  
500 to 15,000. Opt. 1M offers 60,000 points.

**Pre-Trigger Position** – Selectable from  
0 to 100% of record.

## TRIGGERING SYSTEM

**Triggers** – Main, Delayed.

**Main Trigger Modes** – Auto, Normal,  
Single Sequence.

**Delayed Trigger** – Delayed by time or events.

**Time Delay Range** – 0 ns to 20 s.

**Events Delay Range** – 2 to 10,000,000 events.

**External Rear Input** –  $>1.5$  k $\Omega$ ; Max input  
voltage is  $\pm 6$  V (DC + AC peak).

**Video Trigger Types** – NTSC, PAL, SECAM,  
and Custom; TV Field, field 2 or both. Any line  
within a field. Line Rates –10 kHz to 64 kHz,  
interlaced, non-interlaced, composite.

**Video Trigger Sensitivity** – 0.6 divisions of  
composite SYNC will achieve a stable display.

## DISPLAY

**Waveform Style** – Dots or vectors. Infinite and  
variable persistence from 250 ms to 10 s.

**Gray Scaling** – With variable persistence  
selected, waveform points gradually decay  
through 16 levels of intensity, providing "z-axis"  
information about rapidly changing waveforms.

**Update Rate** – 200 ea. 500 point waveforms  
per sec with infinite persistence mode selected.

**Graticules** – Full, grid, cross hair, frame.

**Format** – YT and XY.

**VGA Out** – Drives VGA display monitors.

## ZOOM

The zoom feature allows waveforms to be  
expanded, compressed and positioned in both  
vertical and horizontal axes. Allows precise  
comparison and study of fine waveform detail  
without affecting ongoing acquisitions. When  
used with Hi-Res or Average acquisition modes,  
Zoom provides an effective vertical dynamic  
range of 1000 divisions or 100 screens.

## MEASUREMENT SYSTEM

**Automatic waveform measurements** –

Period	Frequency
High	Low
+ Width	– Width
Maximum	Minimum
Rise	Fall
Peak to Peak	Amplitude
+ Duty cycle	– Duty cycle
+ Overshoot	– Overshoot
Propagation delay	Burst Width
Mean	Cycle Mean
RMS	Cycle RMS
Area	Cycle Area
Phase	

Continuous update of up to four measure-  
ments on any combination of waveforms.

**Thresholds** – Settable in percentage or voltage.

**Gated** – Any region of the record may be iso-  
lated for measurement using vertical bars.

**Snapshot** – Performs all measurements on  
any one waveform showing results from one  
instant in time.

**Cursor Measurements** – Absolute, Delta,  
Volts, Time, Frequency.

**Cursor Types** – Horizontal bars (volts); Vertical  
bars (time), paired: operated independently or  
in tracking mode.

## WAVEFORM PROCESSING

**Waveform Functions** – Interpolate-selectable  
 $\sin(x)/x$  or linear, Average, Envelope.

**Advanced Waveform Functions** –  
FT, Integration, Differentiation (optional).

**Arithmetic Operators** – Add, Subtract,  
Multiply, Invert.

**Autosetup** – Single button, automatic setup  
on selected input signal for vertical, horizontal  
and trigger systems.

**Waveform Limit Testing** – Compares incoming  
waveform to a reference waveform's upper and  
lower limits.

## COMPUTER INTERFACE

**GPIB (IEEE 488.2) Programmability** –  
Full talk/listen modes. Control of all modes,  
settings, and measurements.

## HARDCOPY/DESKTOP PUBLISHING

**Printer** – HP ThinkJet, Epson, PostScript,  
Interleaf, DeskJet, LaserJet, TIFF, PCX, BMP  
(Microsoft Windows).

**Plotter** – HPGL.

**Interface** – GPIB standard.

**Optional Hardcopy Interface** –  
Centronics Type and RS-232.

**Optional Printer Pack** – 4 in. thermal printer  
and storage pouch.

## STORAGE

**Waveforms** – 30,000 waveform points of  
non-volatile storage, 120,000 points optional.

**Floppy Drive** – 3.5 in. 1.44 MB or 720 KB  
DOS compatible (store waveforms, screen  
data, and setups)\*\*

**Setups** – 10 front-panel setups.

## CRT

**Type** – 7 in. diagonal, magnetic deflection,  
Horizontal raster-scan, P31 green phosphor.

**Resolution** – 640 horizontal by 480 vertical  
displayed pixels.

\*\* Waveforms can be stored to file in MathCAD  
and Spreadsheet/Excel, Lotus 1-2-3 formats for  
analysis.

# Digitizing Oscilloscopes

TDS 460A • TDS 420A • TDS 410A

## POWER REQUIREMENTS

**Line Voltage Range** – 90 to 250 V RMS.

**Line Frequency** – 48 to 63 Hz.

**Power Consumption** – 240 W max.

*\* Waveforms can be stored to file, in MathCAD and spreadsheet (Excel, Lotus 1-2-3) format for analysis.*

## ENVIRONMENTAL AND SAFETY

**Temperature** – Operating: 0°C to +50°C.

Nonoperating: –40°C to +75°C.

**Humidity** – Operating and nonoperating: Up to 95% relative humidity at or below +40°C; to 75% relative humidity from +41°C to +50°C.

**Altitude** – Operating: 15,000 ft., nonoperating: 40,000 ft.

**Electromagnetic Compatibility** – Meets MIL-STD-461C, CE-03, Part 4, Curve # 1, RE-02, Part 7; meets VDE 0871, Category B, FCC rules and regulations, Part 15, Subpart J, Class A.

**Safety** – Listed UL 1244, certified to CAN/CSA – C22.2 No. 231-M89; Tektronix self-certification to comply with IEC 348 recommendations.

## PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Height	164	6.4
w/acc. pouch	177	7.5
Width	362	14.25
Depth		
w/front cover installed	491	19.25
w/handle extended	576	22.2
<b>Weight</b>	<b>kg</b>	<b>lb.</b>
Net	9.1	22.5
Shipping	12.5	32

## ORDERING INFORMATION

### TDS 410A

Two-Channel, 200 MHz Digitizing Oscilloscope.

### TDS 420A

Four-Channel, 200 MHz Digitizing Oscilloscope.

### TDS 460A

Four-Channel, 400 MHz Digitizing Oscilloscope.

**All include:** Probe (2 P6138A 10X Passive Probes); Reference Manual (070-8035-03); User Manual (070-8034-03); Programmer's Manual (070-8709-07); Performance Verification Document (070-8721-02); U.S. Power Cord (161-0230-01).

## INSTRUMENT OPTIONS

**Opt. 1K** – K212 Cart.

**Opt. 1M** – 120,000 Point Record Length.

**Opt. 1R** – Rack Mount.

**Opt. 02** – Front Cover and Accessories Pouch.

**Opt. 1F** – 3.5 in. DOS Floppy Drive.

**Opt. 2A** – Video Trigger and 120,000 Point Record Length.

**Opt. 2F** – Extended Waveform Math; FFT, Integration, Differentiation.

**Opt. 3P** – Printer Pack with Thermal Printer and RS-232C/Centronics Interfaces.

**Opt. 05** – Video Trigger with Video Clamp Pod.

**Opt. 13** – RS-232C and Centronics Hardcopy Interfaces.

**Opt. 22** – Two Additional P6138A Probes.

**Opt. 28** – ADA400A Analog Differential Amplifier.

**Opt. 95** – NIST, MIL-STD-45662A and ISO 9000 Calibration Data Report.

**Opt. 96** – Calibration Certificate.

**Opt. J2** – 2 year Post Warranty Repair.

**Opt. J5** – 5 year Calibration Services.

## PROBES

### Differential Probes –

100 MHz, –50 dB CMRR, 50X/100X. Order P5205.

### High Voltage Probes –

2.5 kV, 25 MHz, 2.75 pF/10M, 100X. Order P5100.  
20 kV, 75 MHz, 3pF/100M, 1000X, 3.1 m. Order P6015A.

### High Voltage Differential Probe –

Up to 1300 V, 25 MHz. Order P5200.  
Up to 1300 V, 100 MHz. Order P5205.

**Passive Probe 1x** – Order P6101B

**Passive Probe** – Order P6138A.

**FET Probe** – Order P6205.

**SMT Probe** – Order P6562A

**TTL Logic Probe** – Order P6408

### Optical Converters –

500nm to 950nm. Order P6711  
1100 nm to 1700nm. Order P6713.

**DC/AC Current Probe System** – Order AM 503S.

## RECOMMENDED ACCESSORIES

**Analog Differential Amplifier** –

10  $\mu$ V sensitivity. Order ADA400A.

**Current Measurement Capability** –

Order TDS 400A and AM 503S.

**Plotter** – GPIB and Centronics Standard.

Order HC100.

**Scope Cart** – Order K212.

**Rackmount Kit** – Order 016-1166-00.

**Soft-sided Carrying Case** – Order 016-1158-00.

**Transit Case** – Order 016-1157-00.

## SOFTWARE SUPPORT

**WaveStar™** – Data Management Software  
Order WSTR31.

**LabWindows®** – Order S3FG910.

## CABLES

**GPIB** – 1 meter. Order 012-0991-01.  
2 meters. Order 012-0991-00.

## Service Manual.

## INTERNATIONAL POWER OPTIONS

**Opt. A1** – Universal Euro 220 V, 50 Hz.

**Opt. A2** – UK 240 V, 50 Hz.

**Opt. A3** – Australian 240 V, 50 Hz.

**Opt. A4** – North American 240 V, 60 Hz.

**Opt. A5** – Switzerland 220 V, 50 Hz.

International power options required on instruments and selected accessories for operation outside U.S. For operation outside U.S., specify A1-A5 power options.

## WARRANTY INFORMATION

Three years warranty, covering all labor and parts, including CRT, and excluding probes.



*Products comply with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.*



*See Tektronix on the World Wide Web:  
<http://www.tek.com>*



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# Digital Real-Time Oscilloscope

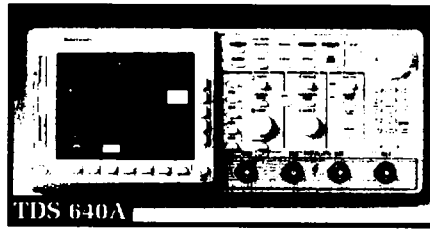
These Products are sold through distributors in the US only.

## TDS 640A



### Features

- 500 MHz Bandwidth
- 2 GS/s Sample Rate on 4 Channels
- Time Interval, 2 ns Glitch, Runt, Pattern, and State Triggering
- 1 mV to 10 V/div Sensitivity
- Infinite and Variable Persistence
- Record Length to 2000 Points
- 8-Bit Resolution 11-Bit with Averaging
- 1.5% Vertical Accuracy
- FFT, Integration, Differentiation
- 25 Automatic Measurements
- Full GPIB Programmability
- HDTV Triggering (Optional)



The TDS 640A oscilloscope provides an excellent combination of affordability and high performance. It delivers full 500 MHz bandwidth and 2 GS/s Digital Real-Time acquisition on all channels simultaneously. Its intuitive interface combines dedicated controls with graphical displays, icon-based menus, and on-line help. The TDS 640A scope also offers extensive triggering capabilities and 25 automatic measurements.

### Characteristics

**Bandwidth** – 500 MHz

**Channels** – 4

**Max Sample Rate Per Channel** – 2 GS/s

**Sensitivity** – 1 mV to 10 V/div

**Position Range** –  $\pm 5$  div

**Offset** –

$\pm 1$  V from 1 to 99.5 mV/div

$\pm 10$  V from 100 to 995 mV/div

$\pm 100$  V from 1 to 10 V/div (all 4 channels)

**DC Gain Accuracy** –  $\pm 1.5\%$

**Vertical Resolution** – 8 bits

**Monitor** – 7 inch, 640 x 480 Monochrome

**VGA Output** – Monochrome

### TIME BASE SYSTEM

**Time Bases** – Main, Delayed

**Time/Div Range** – 500 ps to 5 s/div

**Time Base Accuracy** –  $\pm 100$  ppm over any interval  $\geq 1$  ms

**Record Length** – 500 to 2000 points

**Pre-Trigger Position** – 20% to 80% of record

### TRIGGER SYSTEM

**Trigger Types** – Edge (Main and Delayed), Pulse (Width, Glitch, and Runt), Logic

(Pattern and State), Video (NTSC, PAL, FlexFormat™)

**Main Trigger Modes** – Auto, Normal, Single

**Delay Trigger Modes** – Delay by time and/or events

### STORAGE

**Waveforms** – 4 full 2000-point records

**Setups** – 10 front panel setups

### VERTICAL SYSTEM

**Bandwidth Selections** – 20 MHz, 100 MHz, and Full

**Input Coupling** – AC, DC, or GND

**Input Impedance Selections** – 1 M $\Omega$  in parallel with 10 pF, or 50  $\Omega$  (AC and DC coupling)

**Maximum Input Voltage** –  $\pm 400$  V (DC + Peak AC); derate at 20 dB/decade above 1 MHz

**Channel Isolation** –  $>100:1$  at 100 MHz;  $>30:1$  at bandwidth for any two channels with equal V/div settings

**AC Coupled LF Limit** –  $\leq 10$  Hz when AC 1 M $\Omega$  coupled;  $\leq 200$  kHz when AC 50  $\Omega$  coupled

### DISPLAY SYSTEM

**Waveform Style** – Dots or vectors, infinite and variable persistence

**Display Formats** – YT and XY

### AUTOMATIC MEASUREMENTS

Period - Frequency; High - Low; (+)Width - (-)Width; Maximum - Minimum; Rise - Fall; Peak-to-Peak - Amplitude; (+)Duty Cycle - (-)Duty Cycle; (+)Overshoot - (-)Overshoot; Propagation Delay - Burst Width; Mean - Cycle Mean; RMS - Cycle RMS; Area - Cycle Area; Phase

### PHYSICAL CHARACTERISTICS

Dimensions	cm	in.
Height	23.6	9.2
Width	44.5	17.4
Depth	43.2	16.8
<b>Weight</b>	<b>kg</b>	<b>lb.</b>
Net	12.3	27.2

**Power Requirements** – 90 to 250 V RMS, 47 to 63 Hz, 300 W maximum

**Safety Certification** – UL 1244, CAN/CSA-C 22.2 No. 231-M89



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<http://www.tek.com>



**ISO 9001** Tektronix Measurement products are manufactured in ISO registered facilities.

### TDS 640A DIGITIZING OSCILLOSCOPE

**Includes:** 4 each P6139A passive voltage probes, Reference Card (070-8711-01), User Manual (070-8715-03), Programmer's Manual (070-8709-01), front cover (200-3696-00), U.S. power cord (161-0203-01), performance verification (070-9717-02)

### INSTRUMENT OPTIONS

**Opt. 05** – Video Trigger  
**Opt. 13** – RS-232-C and Centronics-type Interfaces  
**Opt. 1F** – 3.5 in., 1.44 MB Floppy Drive  
**Opt. 1K** – K420 Scope Cart  
**Opt. 1R** – Rack Mount Kit  
**Opt. 4D** – Delete 4 Standard P6139A Probes  
**Opt. 2F** – Extended Waveform Math (FFT, Integration, Differentiation)

**Opt. A1 – A5** – International Power Cords and Plugs

**Opt. C5** – Adds five years of Calibration Service

**Opt. R2** – Adds two years of post-warranty Repair Protection

### WARRANTY

3 years. Covers all labor and parts, including CRT. Excludes probes.