

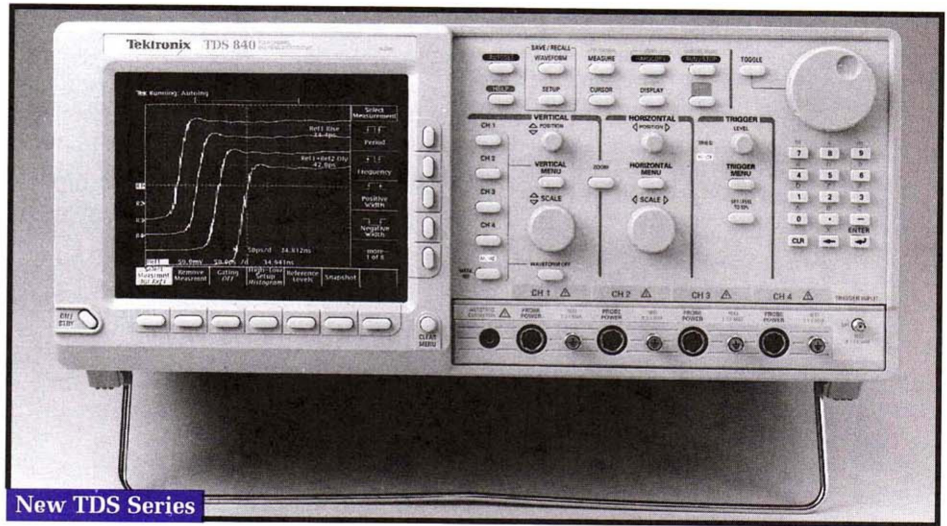
**TDS 820**  
**TDS 840**

*These high bandwidth, high resolution oscilloscopes are ideal for precise device characterization applications and for telecommunications service, manufacturing and installation.*

**TDS 820/840**

- 6-8 GHz BW
- 0.4 ps Timing Resolution
- 2 and 4 Input Channels
- 20 ps/div to 2 ms/div Sweep Speeds in 5 ps steps
- 2 GHz External Trigger Bandwidth
- 3 ps RMS Jitter
- Infinite and Variable Persistence Displays
- 14 Bit Vertical Resolution
- 27 Automatic Measurements
- Electronic Mask Drawing and Display
- Automatic Pass/Fail Limit Testing
- Full GPIB Programmability

# Digitizing Oscilloscopes



**SIGNAL ACQUISITION SYSTEM**

	<b>TDS 820</b>	<b>TDS 820 Opt. 1D</b>	<b>TDS 840</b>
Channels	2	2	4
Rise time	58 ps	44 ps	44 ps
Bandwidth (0.35/rise time)	6 GHz	8 GHz	8 GHz
Max operating input voltage	2 Vp-p; $\pm 3$ VDC	1 Vp-p; $\pm 1.5$ VDC	1 Vp-p; $\pm 1.5$ VDC
Sensitivity	2 m V/div to 200 mV/div	1 mV/div to 100 mV/div	1 mV/div to 100 mV/div
Random noise	1.2 mV max 600 $\mu$ V typical	600 $\mu$ V max 300 $\mu$ V typical	600 $\mu$ V max 300 $\mu$ V typical

**DC Gain Accuracy** –  $\pm 0.7\%$  after user-initiated automatic vertical calibration.

**Vertical Resolution** – 14 bits (16,384 levels over 10.24 vertical divisions).

**Input impedance** – 50  $\Omega$ .

**Between Channel Deskew** – Range: 0 to 10 ns. Resolution: 1 ps.

**ACQUISITION MODES**

**Normal** – New data acquired on each sweep.

**Envelope** – Max/min values acquired over one or more acquisitions.

**Average** – Waveform averages selectable from 2 to 10000.

**TIME BASE SYSTEM**

**Time Bases** – Main, Delayed.

**Time/Division Range** – 20 ps/division to 2 ms/division in 1-2-5 steps or settable from the numeric keypad in 5 ps steps.

**Delta Time Measurement Accuracy –**

Time Interval	Accuracy
$T \geq 1$ ns	0.1% x interval +15 ps
100 ps	5 ps
10 ps	2 ps

**Record Length** – 500, 1000, 2000, and 5000, and 15,000 samples per channel.

**Pre-Trigger View Time** – 1.5 ns (TDS 820 only).

**Minimum Trigger to Sample Delay:** **TDS 840** and **TDS 820 with Opt. 1D** – 16 ns.

**TRIGGERING SYSTEM**

**Trigger Sources** – External input, internal rate generator, CH 1, CH 2 (CH 1 and CH 2 sources not available with Opt. 1D or TDS 840).

**External Trigger Sensitivity** – 40 mVp-p from DC to 200 MHz, increasing linearly to 200 mVp-p at 2 GHz.

**External Trigger Minimum Pulse Width** – 0.25 ns.

**Internal Trigger Sensitivity** – 80 mVp-p from DC to 200 MHz, increasing linearly to 400 mVp-p at 1 GHz (Internal trigger source is not available with Opt. 1D or TDS 840).

**Trigger Delay Jitter** – 3 ps RMS + 30 ppm of time base delay.

**Holdoff Range** – 15  $\mu$ s to 2 s.

**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.

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

**Format** – YT and XY.

**CRT Type** – 7 in. diagonal, magnetic deflection. Horizontal raster-scan. P4 White phosphor.

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

To order, contact your local sales office (listed on the inside back cover) or call the National Marketing Center at 1-800-426-2200, Ext. 99.



# Digitizing Oscilloscopes

**TDS 820**  
**TDS 840**

DIGITIZING OSCILLOSCOPES

## 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
+ Cross	– Cross

Continuous update of up to four measurements on any combination of waveforms.

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

**Cursor Measurements** – Absolute, delta; Volts, Time, Frequency.

**Cursor Types** – Horizontal bars (volts); Vertical bars (time).

## WAVEFORM PROCESSING

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

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

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

## COMPUTER INTERFACE

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

## HARD COPY

**Printer** – HP Thinkjet, Epson, PostScript, Interleaf, Deskjet, Laserjet.

**Plotter** – HPGL.

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

## STORAGE

**Waveforms** – Up to 50,000 points.

**Setups** – 10 front panel setups.

## POWER REQUIREMENTS

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

**Line Frequency** – 47 to 63 Hz.

**Power Consumption** – 250 Watts max.

## ENVIRONMENT AND SAFETY

**Temperature** – Operating: 0 to +50°C. Non-operating: -40 to +75°C.

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

**Altitude** – Operating: 15,000 ft., non-operating: 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, CSA Bulletin 556B, Sept. 1973; Tektronix self-certification to comply with IEC 348 recommendations.

## PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Height	164	6.5
w/ acc. pouch	177	7.0
Width	362	14.3
Depth w/front cover	491	19.3
Weight	kg	lbs.
Net	13.2	29.1
Shipping	23.6	52.0

## ORDERING INFORMATION

- TDS 820** – 2 Channel 6 GHz Digitizing Oscilloscope ..... \*1  
**Includes:** 2 P6207 Probes; Reference (070-8511-00), User Manual (070-8512-00), Programmer Manual (070-8513-01), U.S. Power Cord (161-0230-01), two 12-inch 50 Ω Male-to-Male SMA Cable (174-1428-00), Antistatic Grounding Wrist Strap (006-3415-04), SMA "T" (015-1016-00), SMA Female-to-Female Adapter (015-1012-00), two SMA Short Circuit Male Terminations (015-1020-00), Front Cover (200-3696-00).
- TDS 840** – 4 Channel 8 GHz Digitizing Oscilloscope ..... \*1  
**Includes:** 4 P6207 Active Probes (4 GHz), Reference (070-8511-00), User Manual (070-8512-00), Programmer Manual (070-8513-01), U.S. Power Cord (161-0230-01), four 12-inch 50 Ω Male-to-Male SMA Cables (174-1364-00), 60-inch 50 Ω Male-to-Male SMA Cable (174-1428-00), Antistatic Grounding Wrist Strap (006-3415-04), SMA "T" (015-1016-00), SMA Female-to-Female Adapter (015-1012-00), four SMA Short Circuit Male Terminations (015-1020-00), Front Cover (200-3696-00).
- Opt. 1D** – (TDS 820 only) Delete Delay Lines.....-\$450  
**Opt. 2D** – Delete 2 P6207 Probes..... \*1  
**Opt. 4D** – (TDS 840 only) Delete 4 P6207 Probes..... \*1  
**Opt. 13** – RS232/CENTRONICS..... \*1  
**Opt. 19** – (TDS 820 only) Add 2 P6206 Probes .....+\$2,990<sup>2</sup>  
**Opt. 20** – Add 4 P6206 Probes..... \*1  
**Opt. 22** – (TDS 820 only) Add 2 P6207 Probes.....+\$5,360<sup>2</sup>  
**Opt. 23** – Add 4 P6207 Probes..... \*1  
**Opt. 29** – (TDS 820 only) TD100 Data Manager.....+\$2,495<sup>2</sup>  
**Opt. 1K** – K218 Scope Cart .....+\$695  
**Opt. 1P** – HC100 Plotter with Opt. 1 .....+\$1,180  
**Opt. 1R** – Rack Mount.....+\$400  
**Opt. 9C** – NIST & MIL STD-45552A Cal. certificate .....+\$125  
**Opt. B1** – Service Manual.....+\$125

## INTERNATIONAL POWER PLUG OPTIONS

Opt. A1-A5 available.

See General Customer Information Section for description.

## WARRANTY-PLUS SERVICE OPTIONS

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

- Opt. M2** – Repair Protection.  
TDS 820 .....+\$545  
TDS 840 ..... \*1
- Opt. M8** – Calibration Service.  
TDS 820 .....+\$750  
TDS 840 ..... \*1

**SOFTWARE** – TD100 Data Manager. Order S34TDSL.....\$795

## PROBES

- Active** – 1 GHz, 2 pF/1MΩ, 1.7 m. Order P6206.....\$1,495  
4 GHz, 0.4 pF/100 kΩ, 1 m. Order P6207.....\$3,495
- Differential** – 100 MHz, Active Differential, 6 ft.  
Order P6046.....\$2,195
- 50 Ω Divider** – Tips 1X, 10X. 9 GHz, 0.15 pF/500 Ω, 1 m.  
Order P6150.....\$995

**CARTS** – TDS Scope TD100 with Keyboard Tray  
Order K220 and 436-0240-00.....\$775

## CAMERA/HARD COPY DEVICE

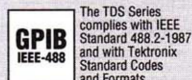
- Camera** – Order C9 with Opt. 1A and Opt. 05 .....\$730  
**Hood Adapter** – Order 016-1145-00 .....\$60  
**Plotter** – Order HC100 Opt. 01 .....\$1,180  
**Plotter Interface** – GPIB, Centronics. Order 016-1145-00.....\$60

## ADDITIONAL ACCESSORIES

- Security Cable** – Order 012-1388-00.....\$42  
**Soft-sided Carrying Case** – Order 016-0909-00 ..... \*1  
With TD100/RIC386. Order 016-1095-00 .....\$330  
**Transit Case** – With TD100/RIC386. Order 016-1135-00 .....\$550  
**Time to Voltage Converter** – Requires TM 500/5000 Mainframe. Order TVC 501 .....\$2,500

\*1 Contact your nearest Tektronix representative for price information.

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The TDS Series complies with IEEE Standard 488.2-1987, and with Tektronix Standard Codes and Formats.