Digital Real-Time™ Oscilloscopes

TDS 210 • TDS 220

Features

- 60 MHz or 100 MHz
- 1 GS/s Sample Rate
- Dual Time Base
- Autoset
- Waveform and Setup Memories
- Automatic Measurements
- Multi-Language User Interface
- Compact, Lightweight

TDS2HM HARDCOPY EXTENSION MODULE (OPTIONAL)

- Centronics Parallel Port

TDS2CM COMMUNICATIONS EXTENSION MODULE (OPTIONAL)

- Centronics Parallel Port
- RS-232 Port
- GPIB Port

TDS2MM MEASUREMENT EXTENSION MODULE (OPTIONAL)

- FFT
- Rise Time/Fall Time
- Negative/Positive Pulse Width
- Centronics Parallel Port
- RS-232 Port
- GPIB Port

ELECTRONIC PRODUCTS
1996 PRODUCT OF THE YEAR AWARD

Product(s) available through your local Tektronix Distributor listed in the back of this catalog.

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

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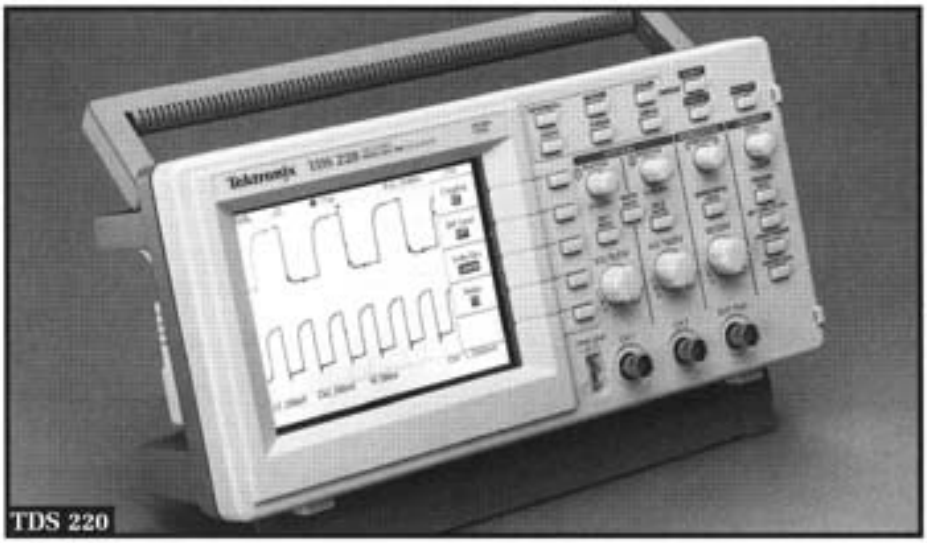
ISO 9001 *Tektronix Measurement products are manufactured in ISO registered facilities.*



Digital Technology at an Analog Price

Tektronix, the worldwide leader in oscilloscope technology, offers breakthrough Digital Real-Time advantages at low-cost analog oscilloscope prices. The 60 MHz TDS 210 and 100 MHz TDS 220 Digital Real-Time Oscilloscopes are an unbeatable value for performance, reliability, and affordability. Fast, error free measurements, low cost, and a familiar user interface encourage analog users to move to digital oscilloscopes.

DIGITAL REAL-TIME PERFORMANCE

No other digital oscilloscope offers as much bandwidth and sample rate for the price. By sampling at 16 and 10 times their bandwidths on both channels, the TDS 200 Series oscilloscopes provide accurate real-time acquisition up to their full bandwidth.

Digital storage technology supports features not available on analog oscilloscopes, including automatic measurements, peak detect, storage of two reference waveforms and five instrument setups, and autoset. Peak detect and high sample rates minimize aliasing while capturing waveform details that remain unseen on analog oscilloscopes.

EXTENSION MODULES

Three useful modules are available with capabilities not possible on analog oscilloscopes. The Hardcopy Extension Module allows printing of screen shots via a Centronics-type parallel port. The Communications Extension Module provides the same printer port plus RS-232 and GPIB programmability. The Measurement Extension Module combines the features of the Communication Module plus Fast Fourier Transform (FFT) analysis and four additional automatic measurements.

EASY TO USE

The user interface is similar to that of an analog oscilloscope, but with improvements that reduce learning time and increase efficiency. Knobs and buttons are grouped by function and provide direct access to controls. Readouts or menus are displayed on-screen at all times, allowing users to more quickly and accurately determine instrument settings. The display responds quickly to control adjustments and has a fast update rate.

The reliable, backlit liquid crystal display permits the instrument to be only 4.75 inches (11 cm) from front to back, while lightweight, rugged construction allows for portability. A built-in security loop helps prevent theft.

Both models have a multi-language user interface. Menus and help text are provided in a user-selectable language: English, Spanish, French, German, Italian, Portuguese, Korean, Japanese, Traditional Chinese, or Simplified Chinese.

FROM ANALOG TO DIGITAL

The TDS 210 and TDS 220 oscilloscopes are designed for people who need the low cost and facility of analog oscilloscopes but want the capabilities made possible by digital technology. If an inexpensive yet high performance oscilloscope is needed for the production line, bench, or training lab for users who are considering changing from analog to digital, a TDS 200 Series Digital Real-Time Oscilloscope is the best choice.

Digital Real-Time™ Oscilloscopes
TDS 210 • TDS 220

Characteristics

SIGNAL ACQUISITION SYSTEM
Bandwidth –
TDS 210: 60 MHz
TDS 220: 100 MHz

Sample Rate –
1 GS/s on each channel

Channels –
2 identical channels plus external trigger

Sensitivity (with calibrated fine adjustment) –
10 mV to 5 V/div at full bandwidth; 2 mV to 5 V/div at 20 MHz

Vertical Zoom – Vertically expand or compress a live or stopped waveform

Calibrated Position Range –
V/div Setting: 2 mV to 200 mV/div; >200 mV to 5 V/div
Offset Range: ±2 V; ±50 V

DC Gain Accuracy – ±3%

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

AUTOMATIC MEASUREMENTS
Period, Frequency, Cycle RMS, Mean, Peak to Peak

ACQUISITION MODES
Sample, Average, Peak Detect – High frequency and random glitch capture; captures glitches as narrow as 10 ns using acquisition hardware at all time/div settings between 5 µs/div and 5 s/div

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

Record Length –
2500 sample points per channel

Horizontal Accuracy – ±0.01%

NON-VOLATILE STORAGE
Waveforms – Two 2500 point reference waveforms

Setups – 5 front panel setups

TRIGGERING SYSTEM (MAIN ONLY)
Trigger Type – Edge (Rising or Falling). Video, Set to 50%

Video Trigger Type – Triggers on Fields or Lines from sync-negative composite video; triggers on broadcast standard NTSC, PAL, or SECAM video

Trigger Modes – Auto, Normal, Single Sweep

Trigger Source – CH1, CH2, Ext, Ext/5

Trigger View – Displays trigger signal while trigger view button depressed

CURSORS
Types – Voltage, Time

Measurements – ΔT, 1/ΔT, ΔV

WAVEFORM PROCESSING
Arithmetic Operators – Add, Subtract, Invert.

Sources – CH1, CH2.

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

DISPLAY SYSTEM
Robust, backlit LCD with adjustable multilevel contrast.

Interpolation – Sin(x)/x.

Modes – Vector, Dots, Dot Persistence.

Format – YT and XY.

ENVIRONMENTAL AND SAFETY
Temperature –
0° C to +50° C (Operating).
–20° C to +60° C (Nonoperating).

Humidity –
Up to 90% RH at or below +40° C.
Up to 60% RH from 41° C to 50° C (Operating and Nonoperating).

Altitude –
Up to 2000 m (Operating).
Up to 15,000 m (Nonoperating).

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 3111-1 Listed, EN61010, Certified CAN/CSA-C22.2 No. 1010.1-92.


TDS2CM Comm. Extension Module


AC220 Soft Carrying Case

Accessories

TDS2CM COMMUNICATIONS EXTENSION MODULE
Parallel Port – Centronics-type.

RS-232 Programmability – Full talk/listen modes. Control of all modes, settings, and measurements. Baud Rate up to 19,200. 9-Pin, DTE.

GPIB Programmability – Full talk/listen modes. Control of all modes, settings, and measurements (IEEE Std 488–1987).

TDS2HM HARDCOPY EXTENSION MODULE
Parallel Port – Centronics-type.

Accessories

TDS2MM MEASUREMENT EXTENSION MODULE
Ports – Centronics, RS-232 and GPIB.

FFT – Windows: Hanning, Rectangular, Flat top. Samples: 2048.

Automatic Measurements – Rise time, Fall time, Negative and Positive Pulse Width.

HARDCOPY CAPABILITY
Printer/File Formats – Thinkjet, Deskjet, Laserjet, Epson (9- or 24-Pin), BMP, PCX, IMG, EPS, DPU411, DPU412.

Hardcopy Layout – Landscape or Portrait.

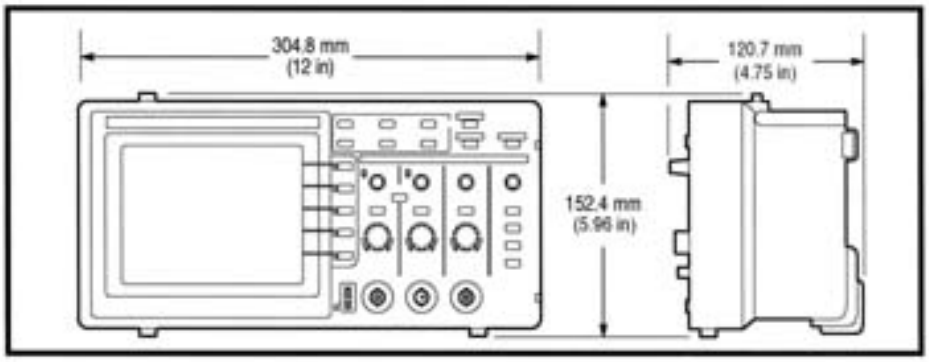
Note: All 1.0 firmware versions will require FREE firmware upgrade.

AC220
- Protects & Stores TDS 200 Series Scopes and Accessories During Transport from Site to Site

Digital Real-Time™ Oscilloscopes
TDS 210 • TDS 220

PHYSICAL CHARACTERISTICS

Dimensions	mm	in.
Width	304.8	12.0
Height	151.4	5.96
Depth	120.7	4.75
Weight	**kg**	**lbs.**
oscilloscope only	1.5	3.25
w/ accessories	1.7	3.75



ORDERING INFORMATION

For price information: Outside the U.S. contact your local Tektronix representative, inside the U.S. see the price list in the back of this catalog.

TDS 210/220
Two each P6112 100 MHz 10X Passive Probes
Includes: User Manual: English, Power Cord: U.S., NIST-Traceable Certificate of Calibration.

WARRANTY INFORMATION
Three year warranty covering all labor and parts, excluding probes.

TEKTRONIX MEASUREMENT SERVICE
Tektronix CAL and REP Service programs allow you to pre-purchase genuine Return to Tektronix Services – ask your Distributor for details.

INTERNATIONAL POWER PLUG OPTIONS
Standard – U.S. (161-0230-01).
Opt. A1 – Universal Euro 220 V, 50 Hz (161-0104-07).
Opt. A2 – United Kingdom 240 V, 50 Hz (161-0104-06).
Opt. A3 – Australia 240 V, 50 Hz (161-0104-05).
Opt. A4 – North America 240 V, 60 Hz (161-0104-08).
Opt. A5 – Switzerland 220 V, 50 Hz (161-0167-00).

INTERNATIONAL USER MANUALS (TDS 210 AND TDS 220).
Standard – English (070-8483-XX).
Opt. L1 – French (070-8520-XX).
Opt. L2 – Italian (070-8980-XX).
Opt. L3 – German (070-8484-XX).
Opt. L4 – Spanish (070-9560-XX).
Opt. L5 – Japanese (070-9562-XX).
Opt. L6 – Portuguese (070-9561-XX).
Opt. L7 – Simplified Chinese (070-9563-XX).
Opt. L8 – Traditional Chinese (070-9568-XX).
Opt. L9 – Korean (070-9564-XX).
French, Italian, German, Spanish, Portuguese front panel overlays included with their respective user manuals.

MEASUREMENT SERVICE OPTIONS
Tektronix CAL and REP Service programs allow you to pre-purchase genuine Return to Tektronix Services – ask your Distributor for details.

INTERNATIONAL USER MANUALS (TDS2CM, TDS2HM, TDS2MM).
Standard – English (070-9565-XX).
Opt. L1 – French (070-9567-XX).
Opt. L2 – Italian (070-9569-XX).
Opt. L3 – German (070-9566-XX).
Opt. L4 – Spanish (070-9570-XX).
Opt. L5 – Japanese (070-9572-XX).
Opt. L6 – Portuguese (070-9571-XX).
Opt. L7 – Simplified Chinese (070-9573-XX).
Opt. L8 – Traditional Chinese (070-9574-XX).
Opt. L9 – Korean (070-9575-XX).

RECOMMENDED ACCESSORIES
Also see page 438.
TDS2MM – Measurement Extension Module w/FFT.
Note: All 1.0 firmware versions will require FREE firmware upgrade.
TDS2HM – Hardcopy Extension Module.
TDS2CM – Communications Extension Module.
AC220 – Soft Carrying Case.
HC411 – Thermal Printer.
RM200 – Rackmount Kit.

SERVICE MANUAL (TDS 210 AND TDS 220)
English only (070-9693-XX).

TDS2CM, TDS2MM PROGRAMMER'S MANUAL
English only (070-9576-XX).

SOFTWARE
WSTR31 – WaveStar™ Waveform Capture Software.
WSTR31U – DocuWave® Software Upgrade to WSTR31.

PROBES
P6015A – 1000X High Voltage Probe.
P6021 – 60 MHz AC Current Probe.
P6022 – 120 MHz AC Current Probe.
A621 – 2000 A AC Current Probe/BNC.
A622 – 100 A AC/DC Current Probe/BNC.
P5100 – 100X High Voltage Passive Probe.
P5200 – High Voltage Differential Probe.
P6101B – 1X Passive Voltage Probe (15 MHz).
P6109B – 10X Passive Voltage Probe (100 MHz).
P6111B – 10X Passive Voltage Probe (200 MHz).
P6129B – 1X/10X Switchable Passive Voltage Probe (100 MHz).
P6243S – Active FET Probing System (1 GHz).
P6408 – Word Recognizer/Trigger Probe.
P6561A – SMD Small Geometry Probe.
AM503S – AC/DC Current Probe System.

ACCESSORY CABLES
GPIB, 1 m (3.3 ft) – Order 012-0991-01.
GPIB, 2 m (6.6 ft) – Order 012-0991-00.
RS-232 – 9-Pin female to 9-Pin female connectors, null modem, 76 inch (for AT style computers) Order 012-1379-00, 9-Pin female to 25-Pin female connectors, null modem, 76 in. (for PC style computers) (012-1380-00), 9-Pin female to 25-Pin male connectors, null modem, 9 ft. (for serial interface printers) (012-1298-00), 9-Pin female to 25-Pin male connectors, 15 ft. (for modems) (012-1241-00).
Centronics – 25-Pin male to 36-Pin Centronics, 2.4 meter (8 ft.) (for parallel printer interfaces) (012-1214-00).

Product(s) available through your local Tektronix Distributor listed in the back of this catalog.

GPIB IEEE-488 *Product(s) complies with IEEE Standard 488.1-1987, and with Tektronix Standard Codes and Formats.*

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