Green is life tmg

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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.

If you click on the "Click-to-Call" logo below, you can all us for FREE!

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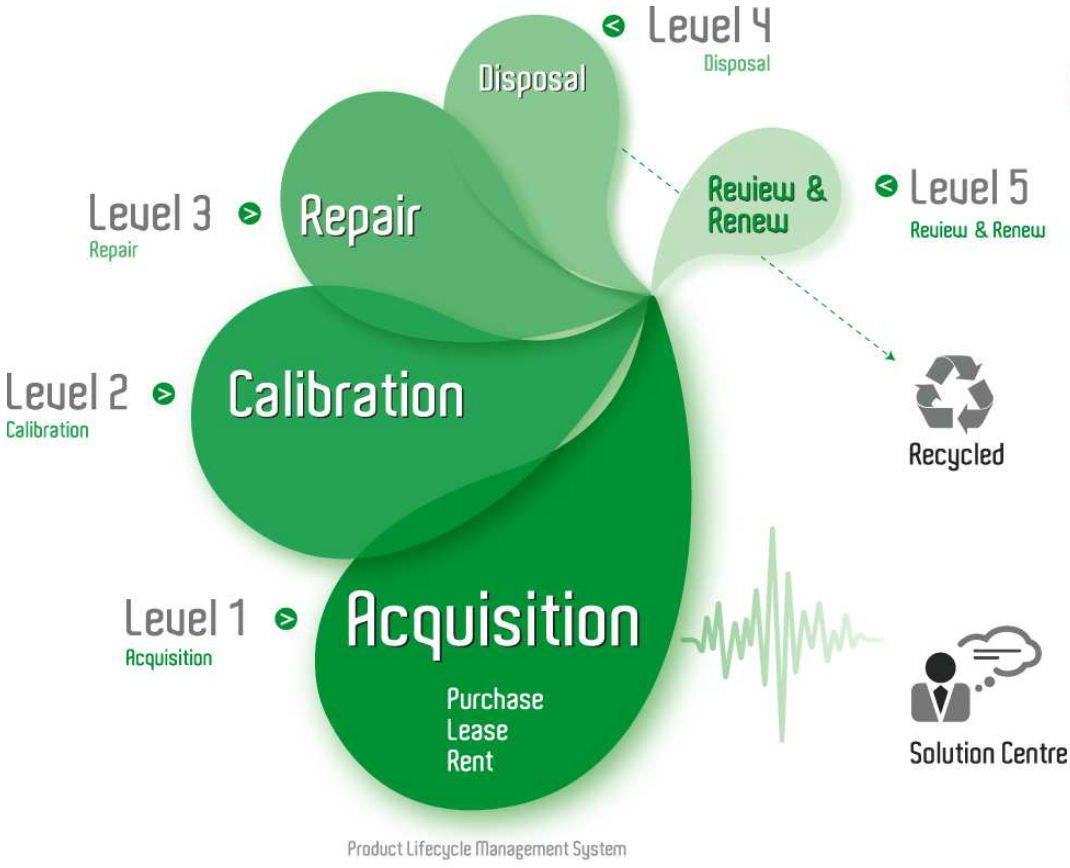


Digital Phosphor Oscilloscopes

▶ DPO7000 Series

Unmatched Performance and Versatility for Greater Insight into Your Design to Get Your Work Done Faster

The DPO7000 Series is a new generation of digital phosphor oscilloscopes and is the industry's best solution to the challenging signal integrity issues faced by designers verifying, characterizing, debugging and testing sophisticated electronic designs. The family features exceptional performance in signal acquisition and analysis, operational simplicity and unmatched debugging tools to accelerate your day-to-day tasks. The largest screen in the industry and the intuitive user interface provide easy access to the maximum amount of information.

Unmatched Acquisition Performance

Signal Fidelity of Tektronix Oscilloscopes Ensures Confidence in Your Measurement Results

- High sample rate on all models, on all channels, to capture more signal details (transients, imperfections, fast edges), 40 GS/s on one channel for the 2.5 GHz models
- Option 2SR to double the maximum real-time sample rate for the 500 MHz and 1 GHz models
- Best low jitter noise floor and vertical accuracy for very accurate measurements
- Longest acquisition of the industry to provide more resolution and longer time sequence
- Standard 10 million data points per channels, Optional up to 400 million data points on 2.5 GHz models
- Easily manage this deep record length, provide detailed comparison and analysis of multiple waveform segments with the MultiView Zoom feature. Automatically scroll through deep records visually or create a math expression to instantly highlight differences
- Highest performance probing solutions for differential and single-ended voltage signals as well as current measurement, because accurate design verification depends on high bandwidth access to critical signals and high-fidelity signal capture

▶ Features & Benefits

2.5 GHz, 1 GHz and 500 MHz Bandwidth Models

Up to 10 GS/s Real-time Sample Rate on All Four Channels

Up to 400 Megasamples Record Length with MultiView Zoom™ Feature for Quick Navigation

>250,000 wfms/s Maximum Waveform Capture Rate

MyScope® Custom Windows Enhance Productivity

Pinpoint™ Triggering Provides the Most Flexible and Highest Performance Triggering to Address Virtually Any Triggering Situation

Small Footprint and Light Weight

12.1" Largest XGA Touch Screen Display in the Industry

Clock Recovery from Serial Data Streams and NRZ Serial Pattern Trigger for Isolation of Pattern-dependent Effects

Low-speed Serial Protocol Triggering (I^2C, SPI, CAN)

Technology-specific Software Solutions Provide Built-in Domain Expertise for Jitter and Timing Measurements, Power Measurements, Ethernet and USB2.0 Compliance Testing

OpenChoice® Software with Microsoft Windows XP OS Enables Built-in Networking and Extended Analysis

▶ Applications

Signal Integrity, Jitter and Timing Analysis

Debugging and Compliance Testing of Serial Data Streams for Telecom and Datacom Industry Standards

Low-speed Serial Bus Design (CAN, SPI, I^2C, LIN)

Investigation of Transient Phenomena

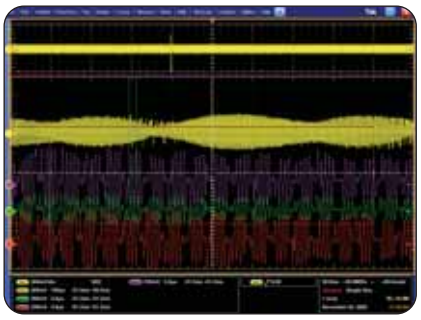
Power Measurements and Analysis

Automotive Electronics

Video Applications

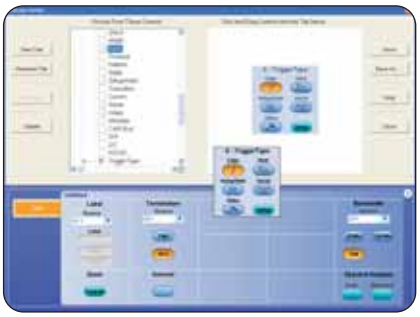
Tektronix

Enabling Innovation



► Zoom in on four areas of interest simultaneously to compare them.

► The TAP2500 Active FET probe achieves high-speed signal acquisition and measurement fidelity.



► Drag and drop menu items of interest to create the MyScope® control window.

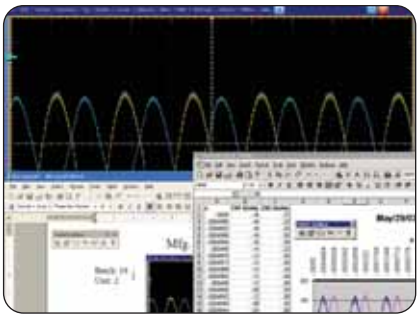
Unmatched Versatility

With the MyScope Feature, Create Your Own Control Windows with Only the Controls, Features and Capabilities that You Care About

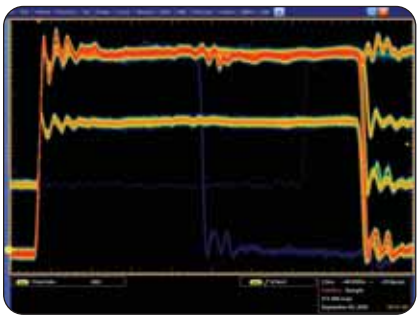
Easily create your own personalized "toolbox" of oscilloscope features in a matter of minutes using a simple, visual, drag-and-drop process. Once created, these custom-control windows are easily accessed through a dedicated MyScope button and menu selection on the oscilloscope button/menu bar, just like any other control window. You can make an unlimited number of custom control windows, enabling each person who uses the oscilloscope in a shared environment, to have their own unique control window. Everything you need is found in one control window rather than having to constantly navigate through menu after menu to repeat similar tasks.

With OpenChoice® Software, Customize Your Test and Measurement System with Familiar Analysis Tools

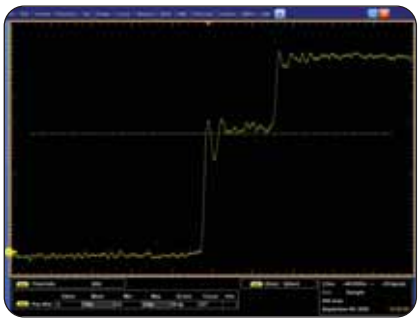
The analysis and networking features of OpenChoice software add more flexibility to Tektronix' Windows XP oscilloscopes: Using the fast embedded bus, waveform data can be moved directly from acquisition to analysis applications on the Windows desktop at much faster speeds than conventional GPIB transfers. Tektronix' implementation of industry standard protocols, such as TekVISA™ interface and ActiveX controls, are included for using and enhancing Windows applications for data analysis and documentation. IVI instrument drivers are included to enable easy communication with the oscilloscope using GPIB, serial data and LAN connections from programs running on the instrument or an external PC. Integration of the oscilloscope with external PCs and non-Windows hosts is also supported by the DPO7000 Series software solutions. Data transfer programs, such as the Excel or Word toolbar are used to simplify analysis and documentation on the Windows desktop or on an external PC.



► Capture data into Microsoft Excel using the unique Excel toolbar and create custom reports using the Word toolbar.



▶ Maximize the probability of capturing elusive glitches and other infrequent events with FastAcq acquisition mode.



▶ Isolate glitches down to 200 ps wide.

▶ Isolate set-up and hold violations down to 360 ps.

Accelerate the Debug of Complex Electrical Designs

FastAcq Acquisition Mode Expedites Debugging by Clearly Showing Imperfections

More than just color-grading, FastAcq enabled by Tektronix proprietary DPX® acquisition technology, captures signals at more than 250,000 waveforms per second on all four channels simultaneously, dramatically increasing the probability of discovering infrequent fault events. And with a simple turn of the intensity knob you can clearly see “a world others don’t see,” because frequency of occurrence is color coded. Some oscilloscope vendors claim high waveform capture rates for short bursts of time, but only DPO7000 Series Oscilloscopes, enabled by DPX technology, can deliver these fast waveform capture rates on a sustained basis – saving minutes, hours or even days by quickly revealing the nature of faults so sophisticated trigger modes can be applied to isolate them.

The Ability to Trigger an Oscilloscope on Events of Interest is Paramount in Complex Signal Debug and Validation

Whether you’re trying to find a system error or need to isolate a section of a complex signal for further analysis, Tektronix’ Pinpoint™ triggering provides the solution. The Pinpoint trigger system uses Silicon Germanium (SiGe) technology to provide trigger sensitivity of up to the bandwidth of the instrument, and allows selection of all trigger types on both A and B trigger circuits. It can capture very narrow glitches with very little trigger jitter. Other trigger systems offer multiple trigger types only on a single event (A event), with delayed trigger (B event) selection limited to edge type triggering and often do not provide a way to reset the trigger sequence if the B event doesn’t occur. But Pinpoint triggering provides the full suite of advance trigger types on both A and B triggers with Reset triggering to begin the trigger sequence again after a specified time, state or transition so that even events in the most complex signals can be captured. Other oscilloscopes typically offer less than 20 trigger combinations; Pinpoint triggering offers over 1400 combinations, all at full performance. Now you can even use a probe and the full functionality of the trigger system with the Auxiliary trigger input.

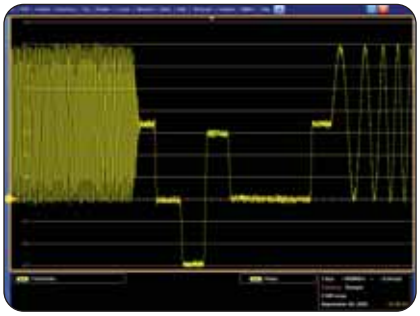
Trigger on the Most Relevant Bit Sequence of the Industry Standard Serial Bus

I^2C (Inter-Integrated Circuit) triggering is a standard feature of the DPO7000 Series Oscilloscopes, and includes Start condition, Missing Acknowledge, Restart, Data Read, Address and/or Data Frame, in a 10-Bit or 7-Bit format.

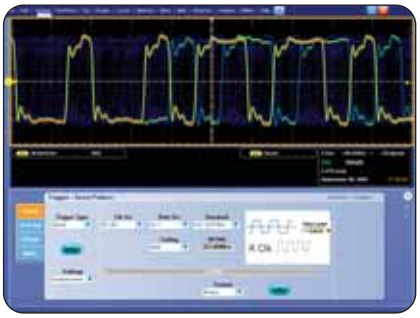
SPI (Serial Peripheral Interface) triggering is a standard feature of the DPO7000 Series Oscilloscopes, and includes triggering on a data pattern within a user-definable frame.

CAN (Controller Area Network) triggering is an optional feature (Opt. LSA), and includes synchronization to the Start or End of a CAN frame on any CAN high or CAN low signal, triggering on Type of Frame (Data, Remote, Error, Overload), Identifier, Data, Missing Acknowledge and Bit Stuffing error.

► Easily trigger on a specific I^2C address.



► Triggering on an analog HDTV tri-level sync signal and examining horizontal blanking interval.



► Serial pattern triggering to debug pattern dependent issues.

Analog HDTV/EDTV triggering for emerging standards like 1080i, 1080p, 720p and 480p as well as standard video triggering on any line within a field, all lines, all fields, odd or even fields for NTSC, SECAM and PAL video signals. In addition, IRE and mV graticules can be selected for easier measurements and visual inspection.

To debug serial architectures, use the serial pattern triggering for **NRZ serial data stream** with built-in clock recovery (available on model DPO7254 only, with Option PTM). Opt. PTM recovers the clock signal, identifies the transitions and decodes characters and other protocol data. You can see the captured bit sequences decoded into their words for convenient analysis (for 8 b/10 b and other encoded serial data streams), or you can set the desired encoded words for the serial pattern trigger to capture.

Interoperability with Logic Analyzers for Digital Design and Debug

Tektronix' Integrated View (iView™) data display enables digital designers to solve signal integrity challenges and effectively debug and verify their systems more quickly and easily. This integration allows designers to view time-correlated digital and analog data in the same display window and isolate the analog characteristics of the digital signals that are causing systems failures. No user calibration is required. And, once set up, the iView feature is completely automated.

More Insight into Your Complex Electrical Design for Characterization and Pre-compliance

Whether it's a simple math expression, waveform mask testing, a pass/fail compliance test or a custom application that you develop, the DPO7000 Series Oscilloscopes offer the industry's most comprehensive set of analysis and compliance tools.

A Wide Range of Built-in Advanced Waveform Analysis Tools

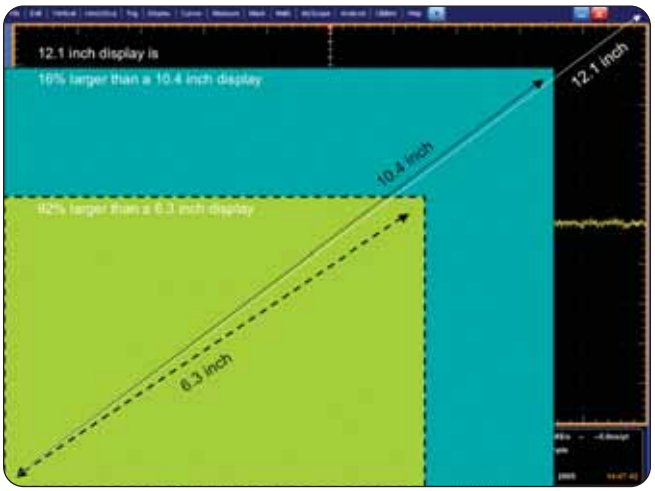
Waveform cursors make it easy to measure trace-to-trace timing characteristics, while cursors that link between YT and XY display modes make it easy to investigate phase relationships and Safe Operating Area violations.

Select from 53 automatic measurements using a graphical palette that logically organizes measurements into Amplitude, Time, Combination, Histogram and Communications categories. Gather further insight into your measurement results with statistical data such as mean, min, max, standard deviation and population.

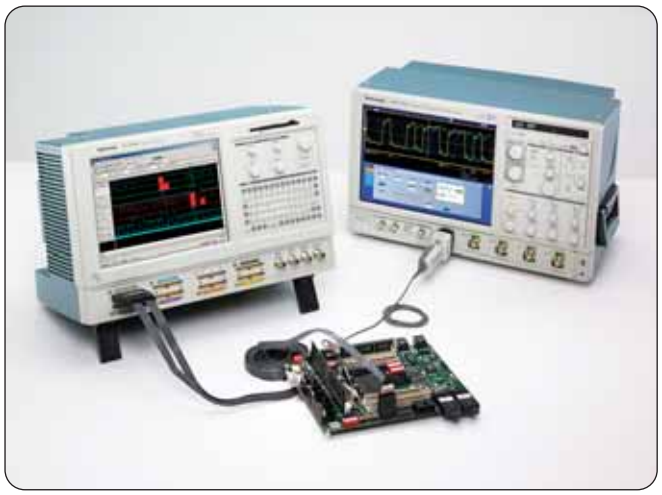
Define and apply math expressions to waveform data for on-screen results in terms that you can use. Access common waveform math functions with the touch of a button. Or, for advanced applications, create algebraic expressions consisting of live waveforms, reference waveforms, math functions, measurement values, scalars and user-adjustable variables with an easy-to-use calculator-style editor.

FFT – To analyze your signal in the spectral domain, use the basic spectral (provides you with the best parameter), or use the advanced spectral (to directly control the frequency span, center frequency and resolution bandwidth).

Filtering – Enhance your ability to isolate or remove some important component of your signal (noise or specific harmonics of the signal) by creating your own filters or using the filters provided as standard with the instrument.



▶ How does 12.1" display compare to the display size of other oscilloscopes?



▶ An integrated toolset for digital design and troubleshooting.

A Breadth of Optional Packages to Extend Waveform Analysis Even Further

Optional jitter and timing measurement and analysis package (Opt. JA3) – Tight timing margins demand stable, low jitter designs. This software option extends the oscilloscope capability by making jitter measurements over contiguous clock cycles from every valid pulse in a single-shot acquisition. Multiple measurements and trend plots quickly show system timing under variable conditions.

Optional CAN and LIN Timing and Protocol Decode Software (Opt. LSA) – When you need to ensure seamless and reliable operation of a CAN or LIN network, this option measures oscillator tolerance, propagation delay, and simultaneously decodes CAN and LIN messages with the built-in protocol, leveraging the trigger capabilities.

Optional Power Measurement and Analysis (Opt. PWR) – Analyze power dissipation in power supply switching devices and magnetic components and generate detailed reports in customizable formats.

Optional Communications Mask Testing (Opt. MTM) – Opt. MTM provides a complete portfolio of masks for verifying compliance to serial communications standards.

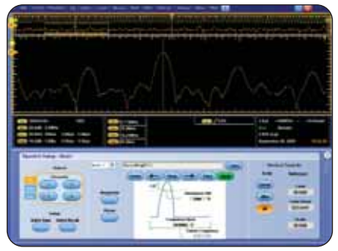
Optional Ethernet (Opt. ET3) – Provides compliance testing for 10/100/1000Base-T signals.

Optional USB (Opt. USB) – Provides compliance testing for USB2.0 signals.

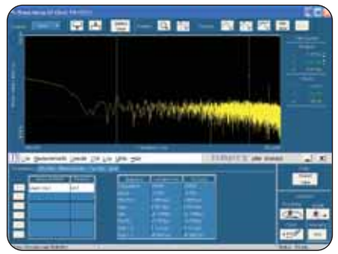
▸ Characteristics

Trigger Modes

Edge – Positive or negative slope on any channel or front panel auxiliary input. Coupling includes DC, AC, noise reject, HF reject and LF reject.
Glitch – Trigger on or reject glitches of positive, negative or either polarity. Minimum glitch width is down to 200 ps (typical) with re-arm time of 250 ps (only on DPO7254).
Width – Trigger on width of positive or negative pulse either within or out of selectable time limits (down to 225 ps).
Runt – Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again. Event can be time- or logic-qualified.
Timeout – Trigger on an event which remains high, low or either, for a specified time period. Selectable from 300 ps.
Transition – Trigger on pulse edge rates that are faster or slower than specified. Slope may be positive, negative or either.
Setup/Hold – Trigger on violations of both setup time and hold time between clock and data present on any two input channels.
Pattern – Trigger when pattern goes false or stays true for specified period of time. Pattern (AND, OR, NAND, NOR) specified for four input channels defined as high, low, or don't care.
State – Any logical pattern of channels (1, 2, 3) clocked by edge on channel 4. Trigger on rising or falling clock edge.
Window – Trigger on an event that enters or exits a window defined by two user-adjustable thresholds. Event can be time- or logic-qualified.
Trigger Delay by Time – 5 ns to 250 s.
Trigger Delay by Events – 1 to 10,000,000 events.

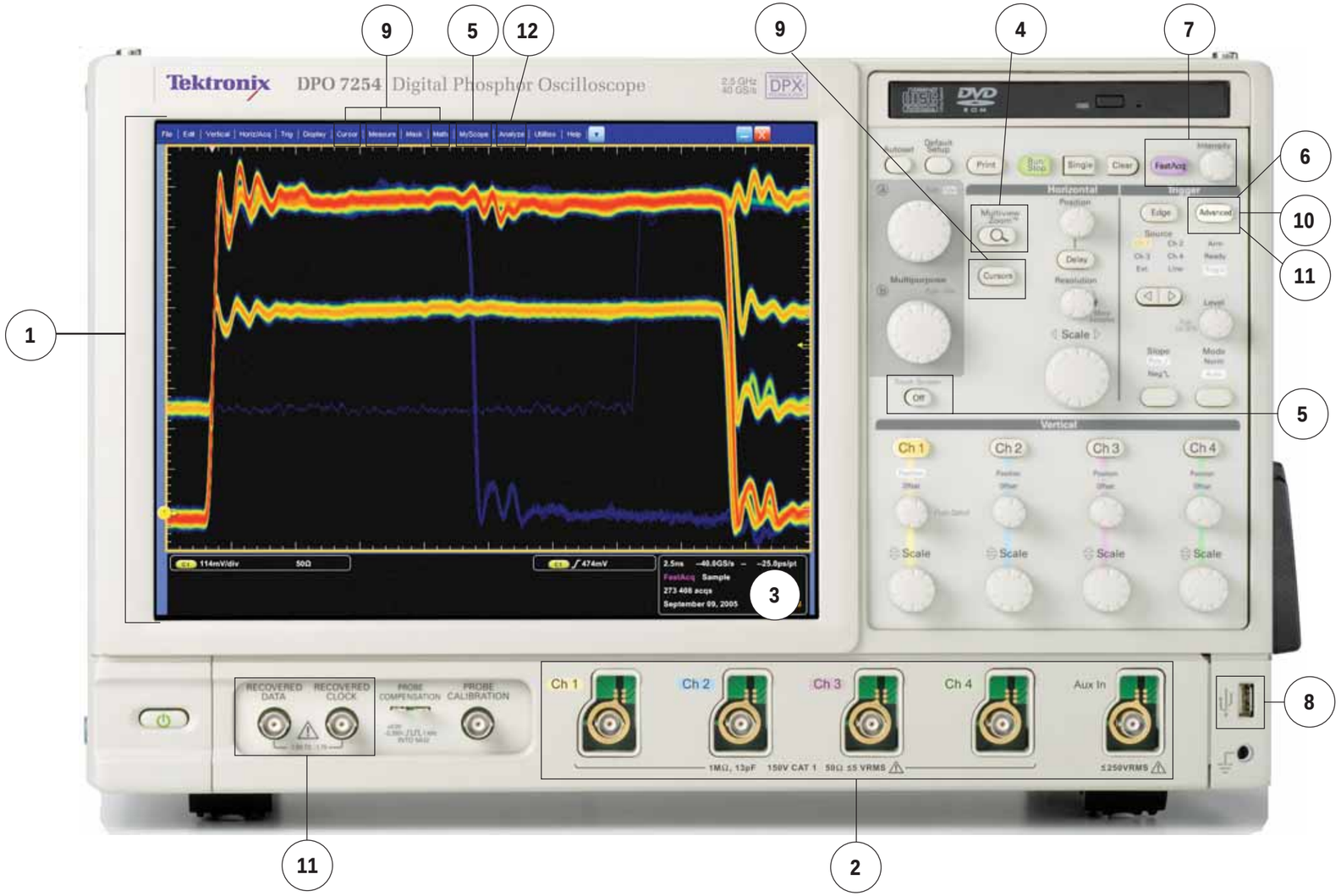


► Basic spectral UI control window.

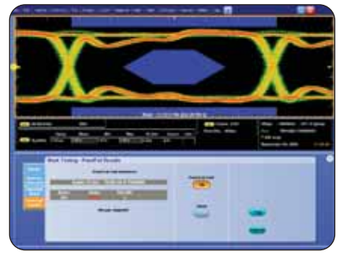


► Jitter and Timing Measurement.

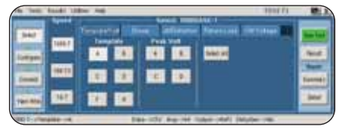
► CAN and LIN Timing and Protocol Decode.



► Power measurement.



► Testing a 622 Mb/s signal against the mask specified by the standard.



► Ethernet compliance testing.

► USB compliance testing.

1 Large 12.1-inch XGA Touch Screen Display

The DPO7000 series touch screen gives up to 15% more waveform display than other oscilloscopes of its class.

2 New Probe Interface

TekVPI™ probe interface provides versatility and ease of use enabled by intelligent bi-directional oscilloscope-to-probe communication.

3 Exceptional Performance

The performance of the highest bandwidth oscilloscope in a mid-range offering with up to 40 GS/s real-time sample rate and 400 M record length on one channel.

4 With MultiView Zoom™

Easily deep into very long record of acquired data, analyze multiple waveform segments simultaneously and scroll automatically through the deepest records visually.

5 Unmatched Usability

With MyScope,® create your own control window with only the controls you care about. The versatile user interface allows to use touch screen or the mouse.

6 Accelerate the Debug of Complex Designs with Pinpoint™ Triggering

Access up to 1400 trigger combinations to address virtually any triggering situations.

7 FastAcq Acquisition Expedites Debugging by Clearly Showing Faults

More than 250,000 waveforms per second, and with a simple turn of the intensity knob, clearly see the frequency of occurrence.

8 Easy Connectivity

Built-in USB port at the front, to ease the saving of your work.

Most standard input/output ports available on the side of the instrument.

9 A Wide Range of Built-in Advanced Analysis Tools

Cursors that link between XY and YT.

53 automatic measurements.

Many math functions, common and more advanced (like FFT and Spectral).

10 For Insight into Your Low-speed Serial Designs

Serial Protocol Triggering for I^2C, SPI, CAN plus a complete CAN and LIN timing and protocol analysis software package.

11 For Insight into Your High-speed Serial Designs

NRZ Serial Pattern triggering on the DPO7245 plus Recovered Clock and and Recovered Data available on the front of the DPO7254 instrument.

12 A Breadth of Optional Software Packages for Expanded Waveform Analysis

► Vertical System

	DPO7054	DPO7104	DPO7254
Input Channels		4	
Hardware Analog Bandwidth (–3 dB)	500 MHz	1 GHz	2.5 GHz[*1]
Rise Time 10% to 90% (Typical)	415 ps	225 ps	150 ps
Rise Time 20% to 80% (Typical)	260 ps	160 ps	100 ps
DC Gain Accuracy	±1.25% (±1% typical) with offset/position set to 0		
Hardware Bandwidth Limits	250 MHz or 20 MHz		
Input Coupling	AC, DC, GND		
Input Impedance (Software Selectable)	1 MΩ ±1% or 12pF ±2pF or 50 Ω ±1%		
Input Sensitivity	1 MΩ: 1 mV/div to 10 V/div; 50 Ω: 1 mV/div to 1 V/div		
Vertical Resolution	8 bit (>11 bit with averaging)		
Max Input Voltage, 1 MΩ	±150 V CAT I, derate at 20 dB/decade to 9 V_{RMS} above 200 kHz		
Max Input Voltage, 50 Ω	5 V_{RMS}, with peaks less than ±24 V		
Position Range	±5 divisions		
Offset Range	1 mV/div to 50 mV/div: ±1 V 50.5 mV/div to 99.5 mV/div: ±0.5 V 100 mV/div to 500 mV/div: ±10 V 505 mV/div to 995 mV/div: ±5 V 1 V/div to 5 V/div: ±100 V 5.05 V/div to 10 V/div: ±50 V		
Offset Accuracy	1 mV/div to 9.95 mV/div: ±0.2% (offset value-position) ±0.1 div ±1.5 mV 10 mV/div to 99.5 mV/div: ±0.35% (offset value-position) ±0.1 div ±1.5 mV 100 mV/div to 1 V/div: ±0.35% (offset value-position) ±0.1 div ±15 mV 1.01 V/div to 10 V/div: ±0.25% (offset value-position) ±0.1 div ±150 mV		
Delay Between Any Two Channels (Typical)	≤100 ps (50 Ω, DC coupling and equal V/div at or above 10 mV/div)		
Channel-to-Channel Isolation (Any Two Channels at Equal Vertical Scale Settings)	≥100:1 at ≤100 MHz and ≥30:1 above		

[*1] Typical system bandwidth of DPO7254 with TAP2500 is 2.5 GHz.

► Time Base System

	DPO7054	DPO7104	DPO7254
Time Base Range with Opt. 2SR	100 ps/div to 1000 s/div 50 ps/div to 1000 s/div	50 ps/div to 1000 s/div 25 ps/div to 1000 s/div	25 ps/div to 1000 s/div —
Time Resolution (in ET Mode) with Opt. 2SR	1 ps 500 fs	500 fs 250 fs	250 fs —
Time Base Delay Time Range	5 ns to 250 s		
Channel-to-Channel Deskew Range	±200 ns		
Delta Time Measurement Accuracy	((0.06/sample rate)+(2.5 ppm x Reading)) RMS		
Trigger Jitter (RMS)	1.5 ps_{RMS} (typical)		
Jitter Noise Floor	<1 ps RMS (<2 ps peak) for record duration <10 µs <2.5 ps RMS for record duration <30 ms <65 parts/trillion for record durations <10 s		
Time Base Accuracy	±2.5 ppm + Aging <1 ppm per year		

▸ Acquisition System

	DPO7054	DPO7104	DPO7254
Real-time Sample Rates			
1 Channel (Max)	10 GS/s	20 GS/s	40 GS/s
With Opt. 2SR	20 GS/s	40 GS/s	—
2 Channels (Max)	5 GS/s	10 GS/s	20 GS/s
With Opt. 2SR	10 GS/s	20 GS/s	—
3 to 4 Channels (Max)	2.5 GS/s	5 GS/s	10 GS/s
With Opt. 2SR	5 GS/s	10 GS/s	—
Equivalent Time Sample Rate (Max)	4 TS/s (for repetitive signals)		
Maximum Record Length per Channel with Standard Configuration	40 M (1-CH.), 20 M (2-CH.), 10 M (4-CH.)		
With Record Length Opt. 2RL	80 M (1-CH.), 40 M (2-CH.), 20 M (4-CH.)		
With Record Length Opt. 5RL	200 M (1-CH.), 100 M (2-CH.), 50 M (4-CH.)		
With Record Length Opt. 10RL	—	—	400 M (1-CH.), 200 M (2-CH.), 100 M (4-CH.)

▸ Maximum Duration at Highest Real-time Resolution (1-CH)

	DPO7054	DPO7104	DPO7254
Resolution (Single-shot) With Opt. 2SR	100 ps (10 GS/s) 50 ps (20 GS/s)	50 ps (20 GS/s) 25 ps (40 GS/s)	25 ps (40 GS/s) —
Max Duration with Standard Memory With Opt. 2SR	4 ms 2 ms	2 ms 1 ms	1 ms —
Max Duration w/Opt. 2RL With Opt. 2SR	8 ms 4 ms	4 ms 2 ms	2 ms —
Max Duration w/Opt. 5RL With Opt. 2SR	20 ms 10 ms	10 ms 5 ms	5 ms —
Max Duration w/Opt. 10RL	—	—	10 ms

Acquisition Modes

FastAcq Acquisition Mode – FastAcq optimizes the instrument for analysis of dynamic signals and capture of infrequent events.

Maximum FastAcq Waveform Capture Rate – >250,000 wfms/s.

Waveform Database – Accumulate waveform database providing three-dimensional array of amplitude, time, and counts.

Sample – Acquire sampled values.

Peak Detect – Captures narrow glitches at all real-time sampling rates: 1 ns at ≤125 MS/s; 1/sample rate at ≥250 MS/s.

Averaging – From 2 to 10,000 waveforms included in average.

Envelope – From 1 to 2 x 10^9 waveforms included in min-max envelope.

Hi-Res – Real-time boxcar averaging reduces random noise and increases resolution.

Roll Mode – Up to 10 MS/s with a maximum record length of 40 M.

▸ Pinpoint™ Trigger System (See description of trigger modes on page 5)

	DPO7054 / DPO7104 / DPO7254
Sensitivity	
Internal DC Coupled	0.5 div DC to 50 MHz increasing to 1 div at 2 GHz
External (Auxiliary Input) 1 MΩ	250 mV from DC to 50 MHz increasing to 350 mV at 250 MHz
Trigger Characteristics	
A Event and Delayed B Event Trigger Types	Edge, Glitch, Runt, Width, Transition Time, Timeout, Pattern, State, Setup/Hold, Window – all except Edge, Pattern and State can be Logic State qualified by up to two channels
Low Speed Serial Protocol Trigger Type (A Event Only)	I^2C, SPI, RS-232, CAN (only with Opt. LSA). Trigger on address, data, and special handshaking states and other conditions

► Pinpoint™ Trigger System (Continued)

	DPO7054 / DPO7104 / DPO7254
Main Trigger Modes	Auto, Normal and Single
Trigger Sequences	Main, Delayed by Time, Delayed by Events, Reset by Time, Reset by State, Reset by Transition. All sequences can include separate horizontal delay after the trigger event to position the acquisition window in time
Communications-related Triggers (Requires Opt. MTM)	Support for AMI, HDB3, BnZS, CMI, MLT3 and NRZ encoded communications signals. Select among isolated positive or negative one, zero pulse form or eye patterns as applicable to the standard
Serial Pattern Trigger (On DPO7254 Only, and Requires Opt. PTM)	Up to 64 bit serial word recognizer, bits specified in binary (high, low, don't care) or hex format. Trigger on NRZ-encoded data up to 1.25 GBaud
Video Type Trigger Formats and Field Rates	Triggers from negative sync composite video, field 1 or field 2 for interlaced systems, any field, specific line, or any line for interlaced or non-interlaced systems. Supported systems include NTSC, PAL, SECAM, and HDTV 1080/24sF, 1080p/25, 1080i/50, 1080i/60, 1080p/24, 720p/60, 480p/60
Clock Recovery System (On DPO7254 Only and Optional Only)	
Clock Recovery Phase Locked Loop Bandwidth	Fixed at FBaud/500
Frequency Range	1.5 MBaud to 1.56 GBaud
Clock Recovery Jitter (RMS)	<0.25% bit period + 5 ps_{RMS} for PRBS data patterns <0.25% bit period + 5 ps_{RMS} for repeating "0011" data pattern
Tracking/Acquisition Range	±5% of requested baud
Minimum Signal Amplitude needed for Clock Recovery	1 $division_{p-p}$ up to 1.56 GBaud
Trigger Level Range	
Internal	±12 divisions from center of screen
AUX Trigger	TekVPI interface; ±5 V (50 Ω); 150 V CAT I, derate at 20 dB/decade to 9 V_{RMS} above 200 KHz (1 MΩ)
Line	Fixed at 0 V
Trigger Coupling	DC, AC (attenuates <60 Hz), HF Rej (attenuates >30 kHz), LF Rej (attenuates <80 kHz), Noise Reject (reduces sensitivity)
Trigger Holdoff Range	250 ns min to 12 s max

Waveform Measurements

Automatic Measurements – 53, of which 8 can be displayed on screen at any one time; measurement statistics, user-definable reference levels, measurement within gates isolating the specific occurrence within an acquisition to take measurements on.
Amplitude Related – Amplitude, High, Low, Maximum, Minimum, Peak to Peak, Mean, Cycle Mean, RMS, Cycle RMS, Positive Overshoot, Negative Overshoot.
Time Related – Rise Time, Fall Time, Positive Width, Negative Width, Positive Duty Cycle, Negative Duty Cycle, Period, Frequency, Delay.
Combination – Area, Cycle Area, Phase, Burst Width.
Histogram Related – Waveform Count, Hits in Box, Peak Hits, Median, Maximum, Minimum, Peak to Peak, Mean (μ), Standard Deviation (σ), {μ}+1σ, {μ}+2σ, {μ}+3σ.
Eye Pattern Related – Extinction Ratio (absolute,%, dB), Eye Height, Eye Width, Eye Top, Eye Base, Crossing %, Jitter (Peak to Peak, RMS, 6σ), Noise (Peak to Peak, RMS), Signal/Noise Ratio, Cycle Distortion, Q-Factor.

Waveform Processing/Math

Arithmetic – Add, Subtract, Multiply, Divide Waveforms and Scalars.
Algebraic Expressions – Define extensive algebraic expressions including Waveforms, Scalars, User-adjustable Variables and Results of Parametric Measurements e.g., (Integral (CH.1-Mean(CH.1)) x 1.414 x VAR1).
Math Functions – Average, Invert, Integrate, Differentiate, Square Root, Exponential, Log_{10}, Log_e, Abs, Ceiling, Floor, Min, Max, Sin, Cos, Tan, ASin, ACos, ATan, Sinh, Cosh, Tanh.
Relational – Boolean result of comparison >, <.
Frequency Domain Functions – Spectral Magnitude and Phase, Real and Imaginary Spectra.
Vertical Units – Magnitude: Linear, dB, dBm. Phase: Degrees, radians, group delay. IRE and mV units.
Window Functions – Rectangular, Hamming, Hanning, Kaiser-Bessel, Blackman-Harris, Gaussian, Flattop2, Tek Exponential.
Waveform Definition – As an arbitrary math expression.
Filtering Functions – User-definable filters. Users specify a filter containing the coefficients of the filter. Several filter files provided.
Mask Function – A function that generates a Waveform Database pixmap from a sample waveform. Sample count can be defined.

Display Characteristics

Display Type – Liquid crystal active-matrix color display.
Display Size – Diagonal: 307.3 mm (12.1 in.).
Display Resolution – XGA 1240 horizontal x 768 vertical pixels.
Waveform Styles – Vectors, Dots, Variable Persistence, Infinite Persistence.
Color Palettes – Normal, Green, Gray, Temperature, Spectral and User-defined.
Display Format – YT, XY.

Computer System and Peripherals

Operating System – Windows XP.
CPU – Intel Pentium 4, 3.4 GHz processor.
PC System Memory – 2 GB.
Hard Disk Drive – Rear-panel, removable hard disk drive, 80 GB capacity.
CD-R/W Drive – Front-panel CD-R/W drive with CD creation software application.
Printer (Optional) – Thermal printer; fits in accessories pouch provided with instrument.

Input/Output Ports

Front Panel

Probe Compensator Output – Front panel pins. Amplitude 1 V ±20% into a ≥50 Ω load; 500 mV from base to top into a 50 Ω load, frequency 1 kHz ±5%.
Recovered Clock (For DPO7254 Only) – BNC connector, ≤1.25 Gb/s, Output swing ≥130 mV_{p-p} into 50 Ω. Requires option to enable.
Recovered Data (For DPO7254 Only) – BNC connector , ≤1.25 Gb/s, Output swing 200 mV into 50 Ω. Requires option to enable.
USB 2.0 Port – One front panel and four side panel mounted USB2.0 connectors.
Aux Trigger Input – See Trigger specification.

Side/Rear Panels

Parallel Port – IEEE 1284, DB-25 connector.
LAN Port – RJ-45 connector, supports 10Base-T, 100Base-T and Gigabit Ethernet.
Serial Port – DB-9 COM1 port.
VGA Video Port – DB-15 female connector; connect a second monitor to use dual-monitor display mode.
Oscilloscope VGA Video Port – DB-15 female connector, connect to show the oscilloscope display, including live waveforms on an external monitor or projector.
Power – 90 to 264 V_{RMS}, 47 to 63 Hz; CAT II, <400 VA.
Analog Signal Output – BNC connector provides a buffered version of the signal that is attached to the Ch 3 input when Ch 3 is selected as trigger source 50 mV/div ±20% into a 1 MΩ load, 25 mV/div ±20% into a 50 Ω load. 100 MHz into a 50 Ω load.
External Time Base Reference In – BNC connector, time base system can phase-lock to external 10 MHz reference.
Time Base Reference Out – BNC connector accepts TTL-compatible output of internal 10 MHz reference oscillator.
Aux Trigger Output – BNC connector provides a TTL-compatible, polarity switchable pulse when the oscilloscope triggers.
GPIB Port – IEEE 488.2 standard.

Physical Characteristics

Benchtop Configuration

Dimensions	mm	in.
Height	292	11.48
Width	451	17.75
Depth	265	10.44
Weight	kg	lbs.
Net	15	32
Shipping	28.9	63.75

Rackmount Configuration

Dimensions	mm	in.
Height	323	12.25
Width	479	18.85
Depth	231.75	9.12
Weight	kg	lbs.
Net	17.4	37.5
Kit	2.5	5.5

Mechanical

Cooling — Required Clearance – Right Side: 76 mm (3 in.).

Environmental

Temperature

Operating – +10 ºC to +45 ºC.
Non-Operating – –40 ºC to +71 ºC.

Humidity

Operating – 5% to 95% relative humidity +29 ºC, non-condensing. Upper limit derated to 45% RH above +30 ºC up to +50 ºC.
Non-Operating – 5% to 95% relative humidity +29 ºC, non-condensing. Upper limit derated to 45% RH above +30 ºC up to +50 ºC.

Altitude

Operating – 10,000 ft. (3,048 m).
Non-Operating – 40,000 ft. (12,190 m).

Random Vibration

Operating – Overall level of 0.27 G_{RMS}.
Non-Operating – Overall level of 2.28 G_{RMS}.

Regulatory

Electromagnetic Compatibility – 93/68/EEC; EN61326:1997 +A1 1998+A2:2000.
Certifications – UL 3111-1, CSA1010.1, ISO11469,EN61010-1, IEC 61010-1.

▸ Ordering Information

DPO7054

500 MHz Digital Phosphor Oscilloscope.

DPO7104

1 GHz Digital Phosphor Oscilloscope.

DPO7254

2.5 GHz Digital Phosphor Oscilloscope.

All Models Include: Accessory pouch, front cover, mouse, quick start user manual (071-173x-xx), probe calibration and deskew fixture (067-0405-xx), DPO700 Series product software CD-ROM, DPO7000 Series operating system restoration CD-ROM, Optional applications software CD-ROM, performance verification procedure PDF file, GPIB programmer's reference (on product software CD-ROM), calibration certificate documenting NIST traceability, Z 540-1 compliance and ISO9001, power cord, one year warranty. User to specify quick start user manual language and power plug when ordering.

DPO7054 Also Includes: (4) P6139A 500 MHz, 10x passive probes.

Instrument Options

Record Length Options –

Opt. 2RL – 80 MSamples max, 20 MSamples/ch.

Opt. 5RL – 200 MSamples max, 50 MSamples/ch.

Opt. 10RL – 400 Msamples max, 100 Msamples/ch[*1].

[*1] DPO7254 only.

Hardware Options –

Opt. 2SR – Double maximum real time sample rate: DPO7104: 40 GS/s (1 channel), 20 GS/s (2 channels), 10 GS/s (3 or 4 channels) DPO7054: 20 GS/s (1 channel), 10 GS/s (2 channels), 5 GS/s (3 or 4 channels)*1.

Opt. 1P – Thermal printer in the pouch.

Software Options –

Opt. JE3 – TDSJIT3 Essentials Jitter Analysis Software.

Opt. LSA – Low Speed Serial Analysis includes CAN/LIN Trigger, Decode and Analysis.

Opt. ET3*2 – TDSET3 Ethernet Compliance Test Software.

Opt. JA3 – TDSJIT3 Advanced Jitter Analysis Software.

Opt. USB*3 – TDSUSBS USB2.0 Compliance Test S/W.

Opt. MTM – Serial Communications Mask Testing.

Opt. PTM*4 – Protocol Triggering for NRZ Serial Signals includes NRZ serial pattern trigger and hardware clock recovery for DPO7254.

Opt. PWR – DPOPWR Power Measurement and Analysis Software.

Instrument Upgrades

To upgrade your oscilloscope, order options as noted below:

DPO7UP with options RL02, RL05, RL010*4, RL25, RL210*4, RL510*4, CP2, DVI, RTE, SST, J2, VNM, JE3, ET3, JA3, USB, MTM, PTM*4, PWR, LSA.

User Manual Options

Opt. L0, Opt. L1, Opt. L3, Opt. L5, Opt. L7, Opt. L8, Opt. L9, Opt. L10.

Power Plug Options

Opt. A0, Opt. A1, Opt. A2, Opt. A3, Opt. A5, Opt. A6, Opt. A10, Opt. A11, Opt. A99.

Service Options

Opt. CA1, Opt. C3, Opt. C5, Opt. D1, Opt. D3, Opt. D5, Opt. R3, Opt. R5.

Recommended Accessories

TAP2500 – 2.5 GHz TekVPI™ active single-ended probe.

TAP1500 – 1.5 GHz TekVPI active single ended probe.

P6158 – 3 GHz, 20x low C probe.

P6247*4– 1 GHz differential probe.

P6248*4– 1.5 GHz differential probe.

P6246 – 400 MHz differential probe.

P6101B – 1x passive probe 15 MHz.

P5200/P5205/P5210*5 – High voltage differential probes.

TCP0030 – 100 MHz TekVPI AC/DC 30 A current probe.

GPIB Cable (1 m) – Order 012-0991-01.

GPIB Cable (2 m) – Order 012-0991-00.

Mini Keyboard (USB interface) – Order 119-7083-00.

Service Manual – Order 071-1740-xx.

Rackmount Kit – Order 016-1965-xx.

Oscilloscope Cart – Order K420.

Thermal Printer Paper– Order 016-1969-xx.

WSTRO– WaveStar™ waveform capture and documentation software.

TDSUSBF – Test fixture for use with Opt. USB.

Power Deskew Fixture – Order 067-1478-xx.

Ethernet Test Fixture – Order through Crescent Heart Software (http://www.c-h-s.com).

TPA-BNC – TekVPI to BNC adapter.

*1 DPO7054 and DPO7104 only.

*2 Requires Ethernet Test Fixture.

*3 Requires TDSUSBF (USB Test Fixture).

*4 DPO7254 only.

*5 Probe requires TPA-BNC adapter.

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www.tektronix.com

Product(s) are manufactured in ISO registered facilities.

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