Test Equipment Solutions Datasheet

Test Equipment Solutions Ltd specialise in the second user sale, rental and distribution of quality test & measurement (T&M) equipment. We stock all major equipment types such as spectrum analyzers, signal generators, oscilloscopes, power meters, logic analysers etc from all the major suppliers such as Agilent, Tektronix, Anritsu and Rohde & Schwarz.

We are focused at the professional end of the marketplace, primarily working with customers for whom high performance, quality and service are key, whilst realising the cost savings that second user equipment offers. As such, we fully test & refurbish equipment in our in-house, traceable Lab. Items are supplied with manuals, accessories and typically a full no-quibble 2 year warranty. Our staff have extensive backgrounds in T&M, totalling over 150 years of combined experience, which enables us to deliver industry-leading service and support. We endeavour to be customer focused in every way right down to the detail, such as offering free delivery on sales, covering the cost of warranty returns BOTH ways (plus supplying a loan unit, if available) and supplying a free business tool with every order.

As well as the headline benefit of cost saving, second user offers shorter lead times, higher reliability and multivendor solutions. Rental, of course, is ideal for shorter term needs and offers fast delivery, flexibility, try-before-you-buy, zero capital expenditure, lower risk and off balance sheet accounting. Both second user and rental improve the key business measure of Return On Capital Employed.

We are based near Heathrow Airport in the UK from where we supply test equipment worldwide. Our facility incorporates Sales, Support, Admin, Logistics and our own in-house Lab.

All products supplied by Test Equipment Solutions include:

- No-quibble parts & labour warranty (we provide transport for UK mainland addresses).
- Free loan equipment during warranty repair, if available.
- Full electrical, mechanical and safety refurbishment in our in-house Lab.
- Certificate of Conformance (calibration available on request).
- Manuals and accessories required for normal operation.
- Free insured delivery to your UK mainland address (sales).
- Support from our team of seasoned Test & Measurement engineers.
- ISO9001 quality assurance.

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Digital Phosphor Oscilloscopes
DPO7000 Series

Unmatched Performance for Greater Insight Into Your Design to Get Your Work Done Faster

The DPO7000 Series are the new generation of real-time digital phosphor oscilloscopes and are 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 on the 2.5 GHz and 3.5 GHz models
- Option 2SR to double the maximum real-time sample rate for the 500 MHz and 1 GHz models
- High bandwidth up to 3.5 GHz, matched across 2, 3 or 4 channels and enabled by Tektronix proprietary DSP enhancement. The user-selectable DSP filter on each channel provides magnitude and phase correction plus extension to 3.5 GHz for more accurate signal fidelity for complex measurements. The DSP filter on each channel can also be switched off to take advantage of true 2.5 GHz analog bandwidth for applications needing the highest available raw data capture.
- The DPO7000 Series oscilloscopes include as a standard feature a series of user-selectable bandwidth limit filters. These filters preserve the instrument's bandwidth characteristics, flatness and phase linearity within the new frequency range, thereby reducing the effects of out-of-band noise on measurements. Now, designers can purchase one instrument for their highest bandwidth needs and easily optimize it to handle lower-frequency measurements as well.
- Very 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 channel on the DPO7000 Series
- Optional up to 400 million total data points on 2.5 GHz and 3.5 GHz models

Features & Benefits

3.5 GHz bandwidth model for serial and digital applications
2.5 GHz, 1 GHz and 500 MHz bandwidth models for all applications
Up to 40 GS/s real-time sample rate on one channel and up to 10 GS/s 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
User-selectable bandwidth limit filters for better low-frequency measurement accuracy
MyScope® custom windows and right mouse click menus for exceptional efficiency
Event search and mark to facilitate the comprehension of event relationships
Repoint® triggering provides the most flexible and highest performance triggering, with over 1400 combinations to address virtually any triggering situation.
Small footprint and light weight
12.1" largest XGA touch-screen display in the industry
Communications mask testing
Clock recovery from serial data streams
64 bit NRZ serial pattern trigger for isolation of pattern-dependent effects up to 1.25 Gb/s
NRZ serial test pattern triggering
Low-speed serial protocol triggering (I2C, SPI, RS-232, CAN)
Technology-specific software solutions provide built-in domain expertise for Ethernet, USB 2.0 compliance testing, jitter, timing, eye diagram, power, DDR memory bus analysis, CAN and LIN network design
OpenChoice® software with Microsoft Windows XP OS enables built-in networking and extended analysis

Applications

Signal integrity, jitter and timing analysis
Verification, debug and characterization of sophisticated designs
Debugging and compliance testing of serial data streams for telecom and datacom industry standards
Low-speed serial bus design (I2C, SPI, CAN, LIN, RS-232)
Investigation of transient phenomena
Power measurements and analysis
Spectral analysis

User-selectable bandwidth limiting choices.
Digital Phosphor Oscilloscopes

DPO7000 Series

– Optional up to 200 million total data points on the 500 MHz and 1 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

Unmatched Versatility

Get the Most of Your Oscilloscope by Fully Controlling its Waveform Acquisition and Display Parameters

You have the choice of three horizontal time base modes of operations. If you are simply doing signal exploration and want to interact with a lively signal, you will use the Automatic or interactive default mode that provides you with the liveliest display update rate. If you want a precise measurement and the highest real-time sample rate that will give you the most measurement accuracy, then the Constant Sample Rate mode is for you. It will maintain the highest sample rate and provide the best real-time resolution. The last mode is called the Manual mode because it ensures direct and independent control of the sample rate and record length.

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. MyScope control windows will benefit all oscilloscope users, eliminating the ramp-up time that many face when returning to the lab after not using an oscilloscope for a while and enables the power user to be far more efficient. 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 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-COM 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. Or, use the Software Developer's Kit (SDK) to help create

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

Tektronix Active probes achieve high-speed signal acquisition and measurement fidelity.

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

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

3 modes of operation of the horizontal time base.

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custom software to automate multistep processes in waveform collection and analysis with Visual BASIC, C, C++, MATLAB, LabVIEW, LabWindows/CVI and other common Application Development Environments (ADE). Integration of the oscilloscope with external PCs and non-Windows hosts is also supported by the DPO7000 Series software solutions. In addition, the OpenChoice architecture provides a comprehensive software infrastructure for faster, more versatile operations. 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.

**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 up to more than 250,000 waveforms per second on all 4 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 the DPO7000 Series, 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, like a DDR read or write burst, 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 most 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 a full suite of advance 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 a 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.

With enhanced triggering, you can choose to compensate for the difference in time there is between the trigger path and the display path and eliminate virtually any trigger jitter at the trigger point. In this mode, the trigger point can be used as a measurement reference.

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

**I2C (Inter-Integrated Circuit) triggering is a standard feature and includes Start condition, Missing Acknowledge, Restart, Data Read, Address and/or Data Frame, in a 10 bit or 7 bit format with a specific selection to choose whether or not to include the R/W bit.**

**SPI (Serial Peripheral Interface) triggering is a standard feature and includes trig-**

**ering on a data pattern within a user-definable frame. RS-232 triggering is a standard feature.**

**CAN (Controller Area Network) trig-**

**gering 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, Overload), Identifier, Data, Missing Acknowledge and Bit Stuffing error.**

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

Isolate glitches down to 200 ps wide.

Isolate, setup and hold violations down to 360 ps.
Digital Phosphor Oscilloscopes
DPO7000 Series

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. This is a standard feature.

Serial Pattern Triggering: To debug serial architectures, use the serial pattern triggering option for NRZ serial data stream with built-in clock recovery (available on models DPO7254 and DPO7354 only). The instrument can recover the clock signal, identify the transitions and decode characters and other protocol data. With the combination of the Serial Trigger and Protocol Decode software, 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. This serial trigger option covers NRZ serial standards up to 1.25 Gb/s.

Pattern Lock Triggering adds a new dimension to NRZ serial pattern triggering by enabling the oscilloscope to take synchronized acquisitions of a long serial test pattern with outstanding time base accuracy. Pattern lock triggering can be used to remove random jitter from long serial data patterns. Effects of specific bit transitions can be investigated and averaging can be used with mask testing. This feature is included as part of Option PTM on the DPO7254 and 7354 models.

Large 12.1-inch XGA Display Screen
The DPO7000 Series has the largest display in the industry with a 12.1” XGA touch screen that gives up to 15% more waveform display than other oscilloscope series in its class. 10 vertical divisions give you 25% more vertical measurement resolution.

Unmatched Usability
The TekVPI™ probe interface provides versatility and ease of use enabled by intelligent bi-directional oscilloscope-to-probe communication. The DPO7000 Series are fast-responding instruments and contain a comprehensive suite of features, such as a touch-screen, shallow menu structures, intuitive graphical icons, knob per channel vertical controls, support for right mouse clicks, mouse wheel improvements, saving of waveforms and measurements available in Preview mode, Export/Save/Recall menu improvements.

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.
Digital Phosphor Oscilloscopes
DPO7000 Series

More Insight into Your Complex Electrical Design for Characterization and Compliance Testing

Such as a simple math expression, waveform mask testing, a pass/fail compliance test, event searching, event marking or a custom application that you develop yourself, 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 advanced spectral with the manual time base horizontal mode (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.

Basic spectral UI control window.
Digital Phosphor Oscilloscopes
DPO7000 Series

Jitter, Timing and Eye Diagram Analysis

Jitter, Timing and Eye Diagram Analysis (Opt. DJA) – Tight timing margins associated with today’s serial buses demand stable, low jitter designs. DPOJET extends the oscilloscope capability by making jitter, timing and eye diagram measurements over contiguous clock and data cycles in a single-shot real-time acquisition. With multiple measurements and a variety of analysis tools including spectral and trend plots, DPOJET quickly shows system timing under variable conditions. It also provides Rj/Dj on signals without a repeating pattern and without requiring a fixed pattern or length. You can get insight into the signal characteristics like SSC profile using the analysis features and perform pass-fail testing using eye-diagram masks and limit files for testing against statistical limits using the compliance features.

This tool is available for the DPO7000 Series as Opt. DJA and Opt. DJE.

Advanced Event Search and Mark (Opt. ASM) – Event Search and Mark will relieve the user from the tedious task of examining data by highlighting important events, skipping the unimportant ones and enhancing the comprehension of event relationships.

Limit Testing (Opt. LT) – This feature consists of comparing an acquired waveform to boundaries. These boundaries are typically defined by the user to specify a tolerance band around a reference waveform. If any part of the acquired waveform falls outside of the limit, the software returns a failure message and the location of the failure is shown on the waveform.

Communications Mask Testing (Opt. MTM) – This feature provides a complete portfolio of masks for verifying compliance to serial communications standards. It supports 156 Standards Masks –
- ITU-T (64 Kb/s to 155 Mb/s)
- ANSI T1.102 (1.544 Mb/s to 155 Mb/s)
- Ethernet IEEE 902.3, ANSI X3.263 (125 Mb/s to 1.25 Gb/s)
- Synchronous Optical Network/SDH (51.84 Mb/s to 622 Mb/s)
- Fibre Channel (133 Mb/s to 2.125 Gb/s)
- USB (12 Mb/s to 480 Mb/s)
- IEEE 1394 (491.5 Mb/s to 1.966 Gb/s)
- RapidIO (up to 2 Gb/s)
- OIF Standards (1.244 Gb/s)
- Video (143.18 Mb/s to 1.485 Gb/s)

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 enables CAN bus triggering and provides the solution to measure oscillator tolerance, propagation delay and simultaneously decode CAN and LIN messages, with the protocol leveraging the trigger capabilities.

This option is offered on DPO7354, DPO7254, DPO7104 and DPO7054 as Opt. LSA.

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. The HiRes acquisition mode delivers greater than 8 bits of vertical resolution on single-shot or repetitive signals at bandwidth up to 125 MHz. The powerful and flexible measurements, math and math-on-math capabilities make it an ideal solution for performing power measurements, such as voltage, current, instantaneous power and energy, for power-device designers. The new TekVPI™ interface provides smart communication between the oscilloscope and the probe. TekVPI probe interface also provides more power to the probe interface, allowing customers to directly connect current probes to the front of the oscilloscope.
Optional Ethernet Compliance Testing (Opt. ET3) – Provides compliance testing for 10/100/1000Base-T signals.

Optional USB Compliance Testing (Opt. USB) – Provides compliance testing for USB 2.0 signals.

Optional DDR Memory System Analysis (Opt. DDRA) – Accelerate the validation of a memory system based on DDR1, LP-DDR1, DDR2, DDR3 or DDR variants technology, like GDDR3. This new DDR search algorithm automatically detects the rates and the voltage levels of the data and strobe signals and marks every occurrence of read or write bursts. You can then generate an eye-diagram of the data or perform JEDEC standard measurements qualified on read or write bursts with DPOJET.

Optional Ultra-Wideband Spectral Analysis and Ultra-Wideband Spectral Analysis Essentials

UWBE: Ultra-Wideband microwave, optical and electrical signals require more real-time bandwidth than is possible with spectrum analyzer based solutions. Spectral analysis and digital down conversion of RF data is fast and easy and the down converted frequency span of interest may be exported for further analysis in tools such as RSAVu and MATLAB.

Ethernet compliance testing.

UWB in addition adds: With automatic packet, TFC and data rate detection, support for all band groups, Time Frequency Codes and data rates, WiMedia PHY 1.2 analysis provides a complete solution. Rapid visualization, debug and report generation of the spectrograms, power spectral density, QPSK/DQPSK constellations, EVM-vs-Symbol, EVM-vs-Subcarrier, Common-Phase Error-vs-Symbol and Voltage-vs-Time plots and complete measurements are captured and documented for each test condition.

SignalVu™ Vector Signal Analysis (Opt. SVE, SVP, SVM)

Easily validate wideband designs and characterize wideband spectral events. By combining the signal analysis engine of the RSA6100A Real-Time Spectrum Analyzer with that of the industry’s widest bandwidth digital oscilloscopes, you can now evaluate complex signals up to 20 GHz without the need of an external down converter. You get the functionality of a vector signal analyzer, a spectrum analyzer and the powerful trigger capabilities of a digital oscilloscope – all in a single package.

Whether your design validation needs include wideband radar, high data rate satellite links or frequency hopping communications, SignalVu™ vector signal analysis software can speed your time-to-insight by showing you time variant behavior of these wideband signals.

Power Measurement and Analysis.

USB compliance testing.

UWB WiMedia analysis and measurements.

Digital Phosphor Oscilloscopes
DPO7000 Series
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.

New Probe Interface

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

Exceptional Performance

The fastest waveform capture rate on 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.

With MultiView Zoom™

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

Unmatched Usability

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

Accelerate the Debug of Complex Designs with Pinpoint® Triggering

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

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.

Easy Connectivity

Built-in USB port at the front for easy access to save your work on a memory stick. Most standard input/output ports available on the side of the instrument.

A Wide Range of Advanced Analysis Tools

Linked XY and YT cursors.

53 automatic measurements.

Waveform boundary tolerance testing.

Many math functions, some advanced (like FFT or Filtering).

For Insight into Your Low-speed Serial Designs

Serial Protocol Triggering for PCIe, SPI, CAN, plus a complete CAN and LIN Timing and protocol analysis software package.

For Insight into Your High-speed Serial Designs

Optional NRZ Serial Pattern triggering plus Recovered Clock and Recovered Data available on the front of the DPO7254 or the DPO7354 instruments.

A Breadth of Optional Software Packages for Expanded Waveform Analysis

Event Search and Mark for faster event analysis.

Advanced Jitter and Timing, application-specific, and compliance measurements and tests.

Digital Phosphor Oscilloscopes
DPO7000 Series

1 Large 12.1-inch XGA Touch Screen Display
2 New Probe Interface
3 Exceptional Performance
4 With MultiView Zoom™
5 Unmatched Usability
6 Accelerate the Debug of Complex Designs with Pinpoint® Triggering
7 FastAcq Acquisition Expedites Debugging by Clearly Showing Faults
8 Easy Connectivity
9 A Wide Range of Advanced Analysis Tools
10 For Insight into Your Low-speed Serial Designs
11 For Insight into Your High-speed Serial Designs
12 A Breadth of Optional Software Packages for Expanded Waveform Analysis

DPO7000 Series • www.tektronix.com/oscilloscopes
## Characteristics

### Vertical System

<table>
<thead>
<tr>
<th></th>
<th>DPO7054</th>
<th>DPO7104</th>
<th>DPO7254</th>
<th>DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Channels</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Bandwidth (DSP Bandwidth Enhance)</td>
<td>n/a</td>
<td>n/a</td>
<td>n/a</td>
<td>3.5 GHz*1</td>
</tr>
<tr>
<td>Hardware Analog Bandwidth (-3 dB)</td>
<td>500 MHz</td>
<td>1 GHz</td>
<td>2.5 GHz</td>
<td>2.5 GHz</td>
</tr>
<tr>
<td>Rise Time 15% to 90% (typical)</td>
<td>460 ps</td>
<td>330 ps</td>
<td>160 ps</td>
<td>145 ps</td>
</tr>
<tr>
<td>Rise Time 20% to 80% (typical)</td>
<td>310 ps</td>
<td>203 ps</td>
<td>100 ps</td>
<td>95 ps</td>
</tr>
<tr>
<td>DC Gain Accuracy</td>
<td>±1% with offset/position set to 0</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bandwidth Limits</td>
<td>Depending on instrument model: 3.0 GHz, 2.5 GHz, 1 GHz, 500 MHz, 250 MHz or 20 MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Coupling</td>
<td>AC, DC, GND</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Impedance (software selectable)</td>
<td>1 MΩ ±1% with 13 pF ±2 pF or 50 Ω ±1%</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Input Sensitivity</td>
<td>1 MΩ: 1 mV/div to 10 V/div</td>
<td>50 Ω: 1 mV/div to 1 V/div</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vertical Resolution</td>
<td>8 bit (≈11 bit gain averaging)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Input Voltage, 1 MΩ</td>
<td>±150 V CAT I, derate at 20 dB/decade to 9 V rms above 200 kHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Max Input Voltage, 50 Ω</td>
<td>5 V rms, with lower limit = ±3 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Position Range</td>
<td>±5 divisions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Range</td>
<td>0.0 mV to 50 mV/div, 0.1 V</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offset Accuracy</td>
<td>0.0 mV to 9.95 mV/div, ±0.2% (offset value-position) ±0.1 div ±1.5 mV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delay between any two channels (typical)</td>
<td>±100 ps (DC coupling and equal V/div) or ±250 ps (AC coupling and equal V/div)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel-to-channel Deskew Range</td>
<td>±100 ns ±100 MHz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta Time Measurement Accuracy</td>
<td>(∆t/2 s ±(2.5 ppm x Reading)) RMS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Jitter (RMS)</td>
<td>1.5 ps RMS (typical) with enhanced triggering OFF</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jitter Noise Floor</td>
<td>&lt;1 ps RMS (&lt;2 ps peak) for record duration &lt;10 µs (typical)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Base Accuracy</td>
<td>±0.5 ppm + Aging &lt;1 ppm per year</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*1 3 GHz for sine wave of more than 4 div amplitudes (typically).

### Time Base System

<table>
<thead>
<tr>
<th></th>
<th>DPO7054</th>
<th>DPO7104</th>
<th>DPO7254/DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Base Range</td>
<td>100 ps/div to 10000 s/div</td>
<td>50 ps/div to 1000 s/div</td>
<td>25 ps/div to 1000 s/div</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>50 ps/div to 1000 s/div</td>
<td>25 ps/div to 1000 s/div</td>
<td></td>
</tr>
<tr>
<td>Time Resolution (in ET/IT mode)</td>
<td>1 ps</td>
<td>500 fs</td>
<td>250 fs</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>500 fs</td>
<td>250 fs</td>
<td>-</td>
</tr>
<tr>
<td>Time Base Delay Time Range</td>
<td>5 ns to 250 s</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel-to-channel Deskew Range</td>
<td>±75 ns</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta Time Measurement Accuracy</td>
<td>(∆t/2 s ±(2.5 ppm x Reading)) RMS</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Jitter (RMS)</td>
<td>1.5 ps RMS (typical) with enhanced triggering OFF</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jitter Noise Floor</td>
<td>&lt;1 ps RMS (&lt;2 ps peak) for record duration &lt;10 µs (typical)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time Base Accuracy</td>
<td>±0.5 ppm + Aging &lt;1 ppm per year</td>
<td></td>
<td></td>
</tr>
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</table>
Acquisition System

### Real-time Sample Rates

<table>
<thead>
<tr>
<th></th>
<th>DPO7054</th>
<th>DPO7104</th>
<th>DPO7254/DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 channel (max)</td>
<td>10 GS/s</td>
<td>20 GS/s</td>
<td>40 GS/s</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>20 GS/s</td>
<td>40 GS/s</td>
<td>–</td>
</tr>
<tr>
<td>2 channels (max)</td>
<td>5 GS/s</td>
<td>10 GS/s</td>
<td>20 GS/s</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>10 GS/s</td>
<td>20 GS/s</td>
<td>–</td>
</tr>
<tr>
<td>3-4 channels (max)</td>
<td>2.5 GS/s</td>
<td>5 GS/s</td>
<td>10 GS/s</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>5 GS/s</td>
<td>10 GS/s</td>
<td>–</td>
</tr>
</tbody>
</table>

### Equivalent Time Sample Rate (max)

4 TS/s (for repetitive signals)

### Maximum Record Length per Channel

<table>
<thead>
<tr>
<th></th>
<th>DPO7054</th>
<th>DPO7104</th>
<th>DPO7254/DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>with Standard Configuration</td>
<td>40 M (1-CH.), 20 M (2-CH.), 10 M (4-CH.)</td>
<td>80 M (1-CH.), 40 M (2-CH.), 20 M (4-CH.)</td>
<td>200 M (1-CH.), 100 M (2-CH.), 50 M (4-CH.)</td>
</tr>
<tr>
<td>with Record Length Opt. 2RL</td>
<td>–</td>
<td>–</td>
<td>400 M (1-CH.), 200 M (2-CH.), 100 M (4-CH.)</td>
</tr>
<tr>
<td>with Record Length Opt. 5RL</td>
<td>–</td>
<td>–</td>
<td>200 M (1-CH.), 100 M (2-CH.), 50 M (4-CH.)</td>
</tr>
</tbody>
</table>

### Maximum Duration at Highest Real-Time Resolution (1-CH)

<table>
<thead>
<tr>
<th></th>
<th>DPO7054</th>
<th>DPO7104</th>
<th>DPO7254/DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>100 ps (10 GS/s)</td>
<td>50 ps (20 GS/s)</td>
<td>25 ps (40 GS/s)</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>50 ps (20 GS/s)</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>Max Duration with Standard Record Length and Sample Rate</td>
<td>4 ms</td>
<td>2 ms</td>
<td>1 ms</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>2 ms</td>
<td>1 ms</td>
<td>–</td>
</tr>
<tr>
<td>Max Duration with Opt. 2RL</td>
<td>8 ms</td>
<td>4 ms</td>
<td>2 ms</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>4 ms</td>
<td>2 ms</td>
<td>–</td>
</tr>
<tr>
<td>Max Duration with Opt. 5RL</td>
<td>20 ms</td>
<td>10 ms</td>
<td>5 ms</td>
</tr>
<tr>
<td>with Opt. 2SR</td>
<td>10 ms</td>
<td>5 ms</td>
<td>–</td>
</tr>
<tr>
<td>Max Duration with Opt. 10RL</td>
<td>–</td>
<td>–</td>
<td>10 ms</td>
</tr>
</tbody>
</table>

### 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 on all 4 channels simultaneously

**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/sample rate at ≤10 GS/s

**Averaging**
From 2 to 10,000 waveforms included in average

**Envelope**
From 1 to 2x10⁹ waveforms included in min-max envelope

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

**FastFrame™ Acquisition**
Acquisition memory divided into segments; maximum trigger rate >310,000 waveforms per second

**Time of arrival recorded with each event. Frame finder tool helps to visually identify transients**

**Roll Mode**
Up to 10 MS/s with a maximum record length of 40 M
Digital Phosphor Oscilloscopes
DPO7000 Series

Pinpoint® Trigger System

<table>
<thead>
<tr>
<th>DPO7054/DPO7104/DPO7254/DPO7354</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sensitivity</td>
</tr>
<tr>
<td>Internal DC Coupled</td>
</tr>
<tr>
<td>External (Auxiliary Input) 1 MΩ</td>
</tr>
<tr>
<td>Trigger Characteristics</td>
</tr>
<tr>
<td>A Event and Delayed B Event Trigger Types</td>
</tr>
<tr>
<td>Low Speed Serial Protocol</td>
</tr>
<tr>
<td>Trigger Type (in Event only)</td>
</tr>
<tr>
<td>Main Trigger Modes</td>
</tr>
<tr>
<td>Enhanced Triggering</td>
</tr>
<tr>
<td>Trigger Sequences</td>
</tr>
<tr>
<td>Communications-Related Triggers</td>
</tr>
<tr>
<td>Serial Pattern Trigger</td>
</tr>
<tr>
<td>Video Type Trigger Formats and Field Rates</td>
</tr>
<tr>
<td>Clock Recovery System</td>
</tr>
<tr>
<td>Clock Recovery Phase</td>
</tr>
<tr>
<td>Frequency Range</td>
</tr>
<tr>
<td>Clock Recovery Jitter (RMS)</td>
</tr>
<tr>
<td>Tracking/Acquisition Range</td>
</tr>
<tr>
<td>Minimum Signal Amplitude</td>
</tr>
<tr>
<td>AUX Trigger</td>
</tr>
<tr>
<td>Trigger Coupling</td>
</tr>
<tr>
<td>Trigger Holdoff Range</td>
</tr>
</tbody>
</table>

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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 170 ps (typical) with a rise time of 250 ps (for DPO7254 or DPO7354).
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 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 threshold. 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.
Comm – Provided as part of Opt. MTM. Support for AMI, HDB3, BnZS, CMI, MLT3 and NRZ encoded signals.
I2C, SPI and RS-232 – Protocol trigger on DPO7054, DPO7154, DPO7254 or DPO7354.
CAN – Protocol trigger on DPO7054, DPO7154, DPO7254 or DPO7354 as part of Opt. LSA.
Serial Pattern (option PTM) – Captures serial data stream with built-in clock recovery for NRZ standards up to 1.25 Gb/s. Extended with pattern lock triggering to capture repeated acquisitions of long serial test patterns.

Search and Mark Events
Basic – Mark any events and document waveforms. Search positive, negative slopes or both on any channels. Event table summarizes all found events. All events are time stamped in reference to trigger position. Users can choose to stop acquisitions when an event is found.
Advanced – Search glitches or runs, as well as transition rate, pulse width, setup and hold, timeout, window violations or find any logic or state pattern on any number of channels. Search DDR read or write bursts with Opt. DROA.

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.
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 (sigma), µ±1sigma, µ±2sigma, µ±3sigma.

Waveform Processing/Math
Arithmetic – Add, Subtract, Multiply, Divide, Waveforms and Scalars.
Algebraic Expressions – Define external algebraic expressions including Waveforms, Scalars, User-definable Variables and Results of Parametric Measurements e.g., integral (CH.1-Mean(CH.1)x1.414W/µs).
Math Functions – Average, Integrate, Differentiate, Square Root, Exponential, Log10, Log e, Abs, Ceiling, Floor, Min, Max, Sin, Cos, Tan, ASin, ACos, Atan, Sign, 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 in ns 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. Filter files provided.
Mask Function – A function that generates a Waveform Database popup 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-RW drive with CD-RW software application.
DVD Drive – Read only.
Mouse – Optical wheel mouse, USB interface.
Printer (optional) – Thermal printer; fits in accessories pouch provided with instrument.
Keyboard – Order 119-7083-00 for small keyboard (fits in pouch); USB interface and Hub.

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 or DPO7354 only) – BNC connector, ±1.25 GHz, Output swing ±190 mVp-p into 50 Ω. Requires option to enable.
Recovered Data (for DPO7254 or DPO7354 only) – BNC connector, ±1.25 GHz, Output swing 200 mV into 50 Ω. Requires option to enable.
USB 2.0 Port – One USB 2.0 connector.
Aux Trigger Input – See Trigger specification.

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Digital Phosphor Oscilloscopes
DPO7000 Series

Side Panel
Parallel Port – IEEE 1284, DB-25 connector.
Audio Ports – Miniature phone jacks (disabled).
Keyboard Port – PS-2 compatible.
Mouse Port – PS-2 compatible.
USB Ports – Four USB 2.0 connectors.
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. Supports basic requirements of PC99 specifications.

Rear Panel
Power –
100 to 240 VRMS ± 10%, 47 to 63 Hz, <550 W
115 VRMS ± 10%, 400 Hz,
CAT I, <500 VA.
Analog Signal Output – BNC connector provides a buffered version of the signal that is attached to the Ch 3 input.
Amplitude – 50 mV/div ±20% into a 1 MΩ load,
25 mV/div ±20% into a 50 Ω load.
Bandwidth – 100 MHz into a 50 Ω load.
Software – Switchable BNC Connector.
External Time Base Reference In – BNC connector, time base system can phase-lock to external 10 MHz reference.
Time Base Reference Out – BNC connector, provides 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

<table>
<thead>
<tr>
<th>Benchtop Configuration</th>
<th>Dimensions mm</th>
<th>in.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Height</td>
<td>292</td>
<td>11.48</td>
</tr>
<tr>
<td>Width</td>
<td>451</td>
<td>17.75</td>
</tr>
<tr>
<td>Depth</td>
<td>285</td>
<td>10.44</td>
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<tr>
<td>Weight kg</td>
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<td>32</td>
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<tr>
<td>Shipping</td>
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<td>63.75</td>
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<table>
<thead>
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<th>Rackmount Configuration</th>
<th>Dimensions mm</th>
<th>in.</th>
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<tbody>
<tr>
<td>Height</td>
<td>323</td>
<td>12.75</td>
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<tr>
<td>Width</td>
<td>479</td>
<td>18.85</td>
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<tr>
<td>Depth (from rackmounting ear to back of instrument)</td>
<td>231.75</td>
<td>9.12</td>
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<tr>
<td>Weight kg</td>
<td>17.4</td>
<td>37.5</td>
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<tr>
<td>Rackmount Kit</td>
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<td>5.5</td>
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</tbody>
</table>

Mechanical
Cooling — Required Clearance

<table>
<thead>
<tr>
<th>Top</th>
<th>Bottom</th>
<th>Left side</th>
<th>Right side</th>
<th>Front</th>
<th>Rear</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

Environmental

Temperature
Operating – 0 °C to +50 °C, excluding CD-RW drive; +10 °C to +45 °C, including CD-RW drive.
Nonoperating – -40 °C to +71 °C.

Humidity
Operating – 5% to 95% relative humidity (RH) with a maximum wet bulb temperature of +29 °C at or below +50 °C, noncondensing. Upper limit derated to 45% RH above +30 °C up to +50 °C.
Nonoperating – 5% to 95% relative humidity (RH) with a maximum wet bulb temperature of +29 °C at or below +60 °C, noncondensing. Upper limit derated to 45% RH above +30 °C up to +50 °C.

Altitude
Operating – 10,000 ft. (3,048 m).
Nonoperating – 40,000 ft. (12,190 m).

Random Vibration
Operating – 0.000125 g^2/Hz from 5 to 350 Hz,
–3 dB/octave from 350 to 500 Hz, 0.0000876 g^2/Hz at 500 Hz. Overall level of 0.27 GRMS.
Nonoperating – 0.0175 g^2/Hz from 5 to 100 Hz,
–3 dB/octave from 100 to 200 Hz, 0.00875 g/Hz from 200 to 350 Hz; –3 dB/octave from 350 to 500 Hz, 0.006132 g/Hz at 500 Hz. Overall level of 2.28 GRMS.

Regulatory
Certifications – UL 3111-1, CSA1010.1, ISO11469, EN61010-1, IEC 61010-1.
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Ordering Information
DPO7000 Series
DPO7054 – 500 Msamples/ch.
DPO70104 – 1 GHz Digital Phosphor Oscilloscope.
DPO7254 – 2.5 GHz Digital Phosphor Oscilloscope.
DPO7354 – 3.5 GHz Digital Phosphor Oscilloscope for Serial and Digital applications.

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

DPO7054 also includes: (4) P6139A 500 MHz, 10x passive probes. (Probes and accessories are not included in the oscilloscope warranty. Refer to the data sheet for each probe for its unique warranty and calibration terms.)

Options

Instrument Options
Record Length Options
Opt. 2RL – 400 Msamples max, 50 Msamples/ch.
Opt. 10RL – 400 Msamples max, 100 Msamples/ch.

Hardware Options
Opt. 1P – Thermal printer in the pouch. Printer option is available for all models.

DPO70104/DPO7054 only
Opt. 2SRT – Double maximum real-time sample rate.

DPO70104 – 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).

Software Options
Opt. LSA – Low Speed Serial Analysis includes CAN/USB Trigger, Decode and Analysis.
Opt. MTM – Mask Testing for Serial Communication Standards (up to 1.5 Gbaud) – Includes hardware clock recovery on DPO7254/DPO7354.

Opt. ASM – Advanced Event Search and Mark.
Opt. ET3 – TDSET3 Ethernet Compliance Test Software.
Opt. USB – TDSUSB USB 2.0 Compliance Test Software only.
Opt. SWP – Advanced Signal Analysis (including pulse measurements). Requires option SVE.
Opt. SVM – General Purpose Modulation Analysis. Requires option SVE.

DPO70254/DPO70354 only
Opt. PTM – 8b/10b protocol triggering, and NRZ serial pattern triggering. Includes hardware clock recovery up to 1.5 Gbaud and pattern lock triggering.

DPO7354 only

Bundle Options
Opt. PS1 – Power Bundle option includes TPA-BNC adapter, Probe Calibration and deskew fixture 077-1686-x, P5205, TCP0030 and Opt. PWR.

User Manual Options

Power Plug Options
Opt. A2 – UK.

** Requires Ethernet Test Fixture.
* Requires TDSUSB USB Test Fixture.

Service Options
(Probes and accessories are not included in the oscilloscope warranty. Refer to the data sheet for each probe for its unique warranty and calibration terms.)

Opt. C5 – Calibration Service 5 Years.

Recommended Accessories

Probes
TCP0150 – 20 MHz TekVPI® AC/DC 150 A current probe.
TCP202 – DC coupled current probe.
TDP0500 – 500 MHz TekVP high voltage differential probe.
TP1000 – 1 GHz TekVP high voltage differential probe.
TP1500 – 1.5 GHz TekVP high voltage differential probe.
TCP3500 – 3.5 GHz TekVP high voltage differential probe.
TAP3500 – 3.5 GHz TekVP active single-ended probe.
TAP5000 – 2.5 GHz TekVP active single-ended probe.
TAP1500 – 1.5 GHz TekVP active single-ended probe.
TCP0030 – >120 MHz TekVP AC/DC 30 A current probe.
TBP-BNC – TekProbe-BNC Level 2 to TekVP adapter.
P6139A – 500 MHz, passive probe.
P6158 – 3 GHz, 20x low C probe.
P6247* – 1 GHz differential probe.
P6243* – 1 GHz active probe.
P6245* – 1.5 GHz active probe.
P6248* – 1.5 GHz differential probe.
P6330* – 3 GHz differential probe.
P6246* – 400 MHz differential probe.
P6101B – 1x passive probe 15 MHz.
TCP300/TCP400* – Series current measurement systems.
P5200/P5205/P5210* – High voltage differential probes.
P5100/P6015A – High voltage probes.

* Requires Opt. SVE or SWM.
** Probe requires TPA-BNC adapter.
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Cables
GPB Cable (1 m) – Order 012-0991-01.
GPB Cable (2 m) – Order 012-0991-00.
RS-232 Cable – Order 012-1298-00.
Centronics Cable – Order 012-1214-00.

Accessories
Mini Keyboard (USB interface) – Order 119-7055-00.
Keyboard (USB interface) – Full-size keyboard with 4 port USB hub. Order 119-6297-00.
Instrumented DIMM for DDR3 – Order scope NEXVu card for UDIMM Raw Card E (Contact www.neuseasttechnology.com).
Transit Case – Order 016-1970-00.
Video Display Clamp Order – Order 013-0278-xx.

Test Fixtures
TDUSBF – Test fixture for use with Opt. USB.
Probe Calibration/Power Deskew Fixture – Test fixture for use with Opt. USB.
TPM*2 – Other Upgrades:
Opt. PTM. Opt. SVM.
Opt. DJA. Opt. ASM.
Opt. DJE. Opt. LSA.
Opt. EJ. Opt. LT.
Opt. DMA. Opt. ASM.
Opt. DDRA. Opt. ASM.
Opt. DVI. Opt. ASM.
Opt. USB. Opt. ASM.
Opt. TDSDDM2 disk drive analysis software.
Opt. TDSRT-Eye software.
Opt. LSA.
Opt. LT.
Opt. DJM.
Opt. DJA.
Opt. DJE.
Opt. UWE.
Opt. UWB.
Opt. MTM.
Opt. LSA.
Opt. SVM.
Opt. SVEM.

Instrument Upgrades
To upgrade your DPO7000 Series Oscilloscope order option as noted:

To upgrade record length:
DPO70UP with Opt. RL02 – From standard configuration to Opt. 2RL configuration.
DPO7054 from standard configuration to Opt. 5RL configuration.
RL010*2 – On DPO7254 or DPO7354 from standard configuration to Opt. 10RL configuration.
RL25 – From Opt. 2RL configuration to Opt. 5RL configuration.
RL210*2 – On DPO7254 or DPO7354 from Opt. 2RL configuration to Opt. 10RL configuration.
RL510*2 – On DPO7254 or DPO7354 from Opt. 5RL configuration to Opt. 10RL configuration.

To upgrade DPO7000 Series with:
DDRA*4 – Opt. ASM.
DVI*3 – Opt. DVI.
UWB*5 – Opt. UWB.
DPO7UP with Opt. RL02 – From standard configuration to Opt. 2RL configuration.
DPO7254 with Opt. RL02 – From standard configuration to Opt. 2RL configuration.
DPO7354 with Opt. RL02 – From standard configuration to Opt. 2RL configuration.

Other Upgrades:
PTM*2 – To upgrade DPO70254 or DPO7354 with Opt. PTM.

For Further Information
Tektronix maintains a comprehensive, constantly expanding collection of application notes, technical briefs and other resources to help engineers working on the cutting edge of technology. Please visit www.tektronix.com

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