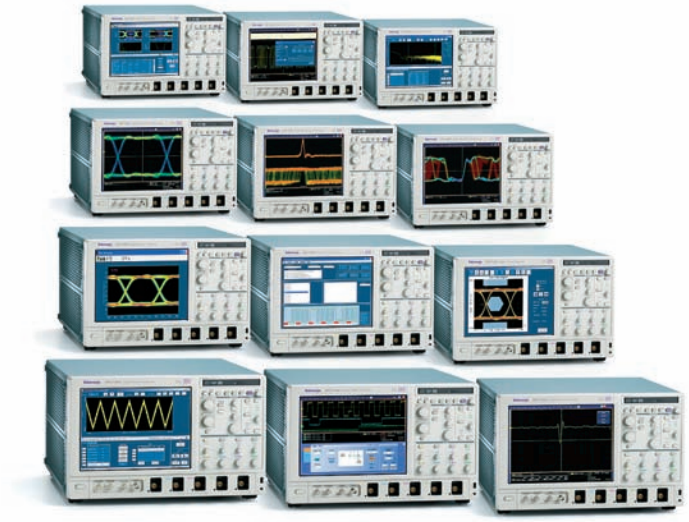
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

▶ DPO/DSA70000 Series



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

The DPO70000 and the DSA70000 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 specialized DSA70000 Series provides a complete and dedicated solution to address the challenges of high-speed serial 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 bandwidth up to 20 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 bandwidth extension to 20 GHz for more accurate representation of extremely fast signals. The DSP filter on each channel can also be switched off to take advantage of true analog bandwidth for applications needing the highest available raw data capture

▶ Bandwidth Enhance to the probe tip, extended to support bandwidth steps, gives you an oscilloscope with bandwidth adjustable to capture transitions accurately without excess frequencies and noise

20.0 GHz (DSP)
19.0 GHz (DSP)
18.0 GHz (DSP)
17.0 GHz (DSP)
16.0 GHz (DSP)
16.0 GHz (HW)
15.0 GHz (DSP)
14.0 GHz (DSP)
13.0 GHz (DSP)
12.0 GHz (DSP)
11.0 GHz (DSP)
10.0 GHz (DSP)
9.0 GHz (DSP)
8.0 GHz (DSP)
7.0 GHz (DSP)
6.0 GHz (DSP)
5.0 GHz (DSP)
4.0 GHz (DSP)
3.0 GHz (DSP)
2.0 GHz (DSP)
1.0 GHz (DSP)
500 MHz (DSP)

▶ User-selectable bandwidth limiting choices.

▶ Features & Benefits

On All Four Channels Simultaneously
- 20, 16, 12.5, 8, 6 and 4 GHz Bandwidth Models
- Up to 50 GS/s Real-time Sample Rate
- Up to 200 Msamples Record Length with MultiView Zoom™ Feature for Quick Navigation
- Fastest Waveform Capture Rate with >300,000 wfm/s Maximum per Channel

Digital Serial Analyzer Models with Dedicated Configuration for High-speed Serial Design and Compliance Testing

Enhanced Bandwidth to the Probe Tip Extended to Support Multiple Bandwidth Steps for Advanced Signal Integrity

Pinpoint® Triggering with Over 1400 Combinations to Address Virtually Any Triggering Situation

Unique Serial Pattern Triggering Up to 3.125 Gb/s and 8b/10b Standard Protocol Triggering for Isolation of Pattern-dependent Effects and NRZ Serial Test Pattern Triggering up to 6.25 Gb/s

Serial Data Analysis and Compliance for PCI Express, Serial ATA, FB-DIMM, SAS, Fibre Channel, IEEE 1394b, RapidIO, XAUI, HDMI, DVI, Ethernet, USB 2.0

Most Popular Jitter and Timing Measurement and Analysis Package

12.1" Largest XGA Touch Screen Display in the Industry

Event Search and Mark to Facilitate the Comprehension of Event Relationships

MyScope® Custom Windows and Right Mouse Click Menus for Exceptional Efficiency

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

▶ Applications

Signal Integrity, Jitter and Timing Analysis

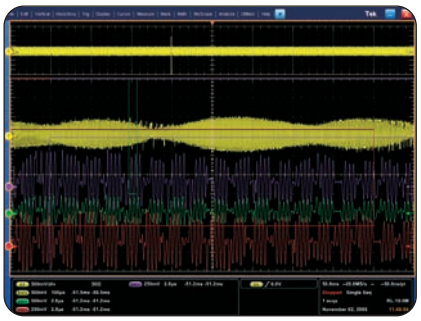
Verification, Debug and Characterization of Sophisticated Designs

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

Investigation of Transient Phenomena

Spectral Analysis

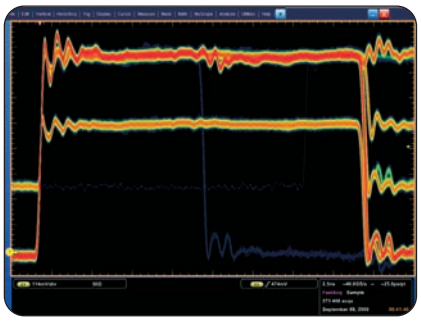
Tektronix
Enabling Innovation



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

► Highest performance P7500 TriMode™ probes.

- ► High sample rate on all models, on all channels, to capture more signal details (transients, imperfections, fast edges)
  - – 50 GS/s on all four channels for the 12.5, 16 and 20 GHz models
  - – 25 GS/s on all four channels for the 4, 6 and 8 GHz models
- ► Lowest 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 M samples per channel on the DPO70000 Series and 20 M on the DSA70000 Series
  - – Optional up to 100 M samples on all four channels for the 4, 6 and 8 GHz models
  - – Optional up to 200 M samples on all four channels for the 12.5, 16 and 20 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 with bandwidth enhanced to the probe tip for differential and single-ended voltage signals, because accurate design verification depends on high bandwidth access to critical signals and high-fidelity signal capture



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

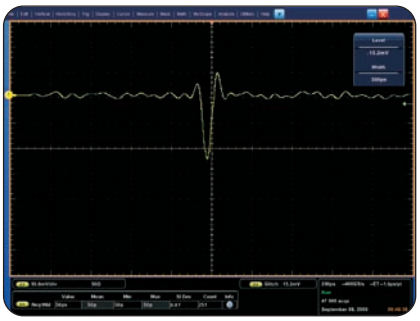
Accelerate the Debug of Complex Electrical Designs

FastAcq Acquisition Mode Expedites Debugging by Clearly Showing Imperfections

More than just color-grading, FastAcq's proprietary DPX® acquisition technology captures signals at more than 300,000 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," displaying the complete picture of your circuit's operation. Some oscilloscope vendors claim high waveform capture rates for short bursts of time, but only Tektronix 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 very high trigger sensitivity with very low trigger jitter and ability to capture very narrow glitches. Pinpoint



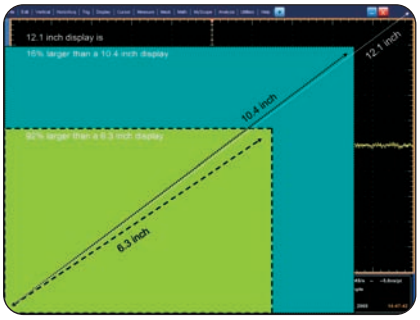
► Isolate glitches down to 100 ps wide.

► Isolate only the valid glitches.

triggering allows selection of virtually all trigger types on both A and B trigger events. 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 advanced trigger types on both A and B triggers, logic qualification to control when to look for these events and 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.

▶ NRZ Pattern Lock Triggering of a 640-bit long serial test pattern SATA 6Gb/s.

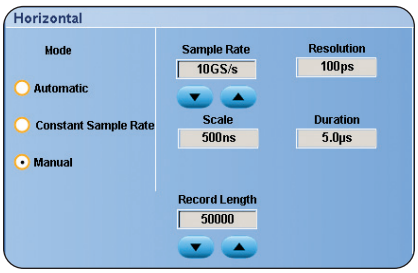


▶ How does a 12.1" display compare to the display size of other oscilloscopes?

Protocol and Serial Pattern Triggering

To debug serial architectures, use the serial pattern triggering for NRZ serial data stream with built-in clock recovery and correlate events across physical and link layer. This feature comes standard on the DSA70000 series and is available on DPO70000 models as Opt. PTH. The instrument can recover the clock signal, identify transitions and allow you to set the desired encoded words for the serial pattern trigger to capture. Opt. PTH and the DSA70000 Series cover serial standards up to 3.125 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 supports up to 6.25 Gb/s NRZ serial data stream and is standard



▶ Three modes of operation of the horizontal time base.

on the DSA70000 instruments, or included as part of Option PTH on the DPO70000 models.

Large 12.1" XGA Display Screen

The DPO/DSA70000 Series have the largest display in the industry with a 12.1" XGA touch screen that gives up to 15% more waveform display than other oscilloscopes of their classes.

Ten vertical divisions give you 25% more vertical measurement resolution than other oscilloscopes.

Unmatched Usability

The TekConnect™ probe interface provides versatility and ease of use enabled by intelligent bi-directional oscilloscope-to-probe communication and maintain signal fidelity.

The DPO/DSA70000 Series instruments 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 operation and intuitive Export/Save/Recall menus.

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.

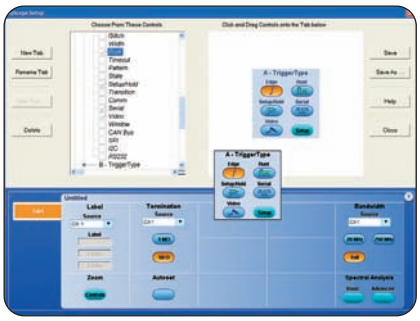
Unmatched Versatility

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

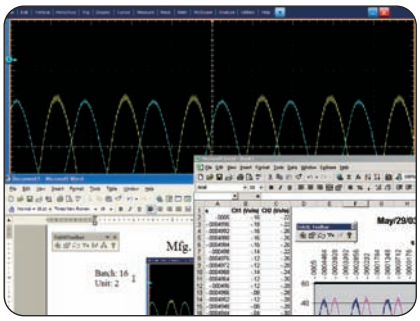
You have the choice of three horizontal time base modes of operations. If you are simply doing signal exploration and want to interact with a lively signal, you will use the *Automatic* or interactive default mode that provides you with the liveliest display update rate. If you want a precise measurement 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.



► 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.

► Basic spectral UI control window.

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. Or, use the Software Developer's Kit (SDK) to help create custom software to automate multi-step 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. 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.

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 DPO/DSA70000 Series offers 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.

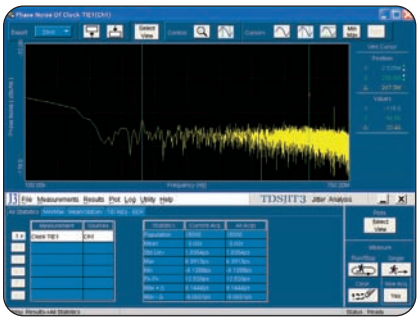
Define and apply math expressions to waveform data for on-screen results in terms that you can use. Access common waveform math functions with the touch of a button. Or, for advanced applications, create algebraic expressions consisting of live waveforms, reference waveforms, math functions, measurement 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. These customizable FIR filters can be used to implement today's preferred signal-filtering techniques, including Decision Feedback Equalization (DFE) or to minimize the effects of fixtures and cables connected to the device under test.

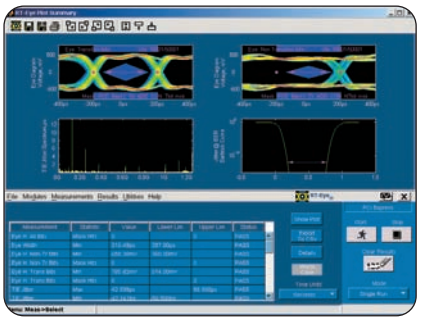
A Breadth of Tools to Extend Waveform Analysis Even Further

Jitter and Timing Measurement and Analysis – Tight timing margins demand stable, low jitter designs. This feature 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. It also provides Rj/Dj on signals without a repeating pattern and without requiring the pattern length. You can get insight into the signal and noise characteristics like SSC modulation range and profile.



▶ Jitter and Timing Measurement.

▶ Accelerating the research of specific events in an acquired waveform.



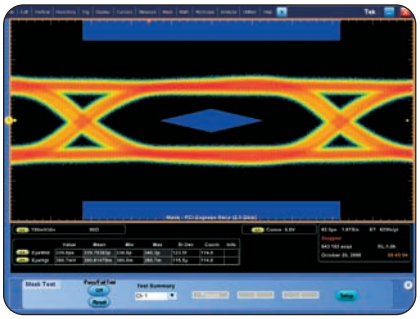
▶ RT-Eye® version 2.0 – PCI Express Rev1.1 Compliance test.

This analysis tool is standard on the DSA70000 Series and comes as Opt. JA3 or Opt. JE3 on the DPO70000 Series. JE3 provides a subset of the measurements.

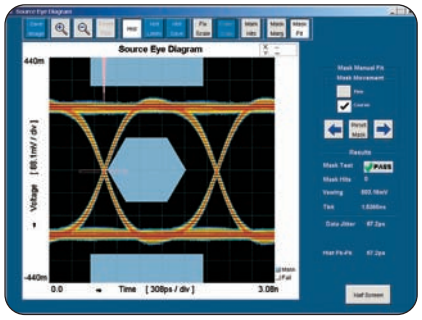
Advanced Event Search and Mark (Opt. ASM) – Event Search and Mark will relieve the user from the tedious task of examining data by highlighting important events, skipping the unimportant ones, and enhancing the comprehension of event relationships. You can navigate between the events of interest effortlessly. A basic event (edge-only) search and mark is provided as a standard feature; and support for more advanced event types like transition, setup and hold or logic pattern, is provided with the ASM option on the DPO70000 Series, standard on the DSA70000.

Waveform 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 the limit, the software returns a failure message and the location of the failure on the waveform.

Communications Mask Testing – This feature provides a complete portfolio of masks for verifying compliance to serial communications standards. It supports 156 Standards Masks.



▶ Test eye diagram in equivalent time against the standard mask.



▶ HDMI compliance testing.

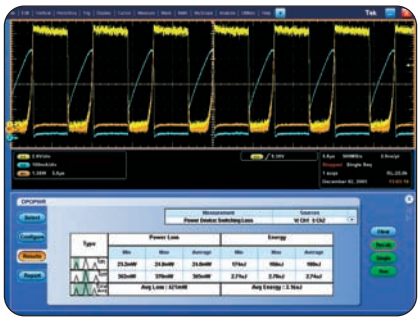
- ITU-T (1.544 Mb/s to 155 Mb/s)
- ANSI T1.102 (1.544 Mb/s to 155 Mb/s)
- Ethernet IEEE 802.3, ANSI X3.263 (1.544 Mb/s to 3.125 Gb/s XAUI)
- Sonet/SDH (51.84 Mb/s to 2.4883 Gb/s)
- Fibre Channel (133 Mb/s to 4.25 Gb/s[*1])
- InfiniBand (2.5 Gb/s)
- USB (12 Mb/s to 480 Mb/s)
- Serial ATA (1.5 Gb/s, 3 Gb/s)
- Serial Attached SCSI (1.5 Gb/s, 3 Gb/s)
- IEEE 1394b (491.5 Mb/s to 1.966 Gb/s)
- Rapid I/O (1.25 Gb/s to 3.125 Gb/s)
- OIF Standards (2.488 Gb/s to 3.11 Gb/s)
- PCI Express (2.5 Gb/s)

Serial Data Compliance and Analysis – Patented Real-time Eye (RT-Eye® clock recovery and eye-rendering) provides high-speed serial data domain expertise to enable analysis and compliance measurements for testing high-speed serial standards like PCI Express, Serial ATA, SAS, InfiniBand and FB-DIMM, as well as Front Side Bus (FSB), XAUI, Fibre Channel, IEEE 1394b and RapidIO. It recovers the clock of the serial stream to ≥10 Gb/s and generates very high precision eye diagrams with an accumulated waveform database. Serial data compliance and analysis comes standard on the DSA70000 Series and optional on the DPO70404, DPO70604 and DPO70804 as Opt. RTE. The compliance modules for PCI Express, Serial ATA, SAS, InfiniBand and FB-DIMM are options on both DSA70000 Series and DPO70000 Series (Opt. PCE, SST, IBA or FBD).

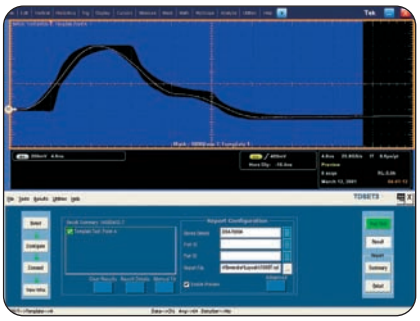
Optional HDMI Compliance Testing (Opt. HT3) – Compliance testing: This is your complete solution for HDMI compliance testing, enabling unprecedented efficiency by offering a complete solution of unmatched reliable automation to support the widest range of tests in the industry.

[*1] A 4.25 Gb/s mask supported using Glitch Trigger. It is standard on the DSA70000 Series and optional as Opt. MTH on DPO70404, DPO70604 and DPO70804.

► UWB WiMedia analysis and measurements.



► Power measurements and analysis.



► Ethernet compliance testing.

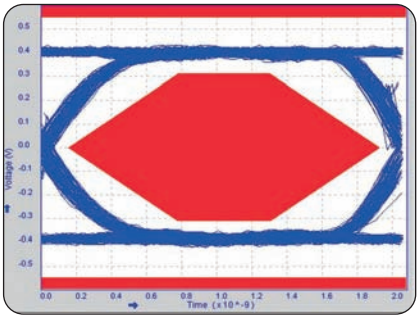
Optional Ultra Wideband WiMedia Analysis (Opt. UWB) – Excellent amplitude and phase flatness as well as low phase noise make the DPO/DSA70000 the ideal tool for engineers designing WiMedia Ultra Wideband radios into Certified Wireless USB, WiNet and UWB Bluetooth devices. UWB WiMedia analyzes all data rates, Time Frequency Codes and Band Groups on the DPO/DSA71604 or DPO/DSA72004. Included in the easy-to-setup-and-use package are frequency domain and modulation domain analysis from the Tektronix Real-Time Spectrum Analyzers including Constellation patterns, Error Vector Magnitude, Spectrograms, Power Spectral Density and Adjacent Channel Power Ratio from single shot Ultra Wideband RF.

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 eight 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.

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

Optional DVI Compliance Testing (Opt. DVI) – Provides Digital Visual Interface physical layer validation and compliance testing with automated eye diagram generation and parametric testing.

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



► USB compliance testing.

DSA70000 Series

For Developing with Today's High-speed Serial Standards, the DSA70000 Digital Serial Analyzer Is Your Uncompromised High-Performance, Dedicated Solution to Efficiently Address Your Design Challenges

The DSA70000 Series is a new generation of real-time digital serial analyzers based on the same advanced technology as the DPO70000 real-time digital phosphor oscilloscopes. As high-speed serial technology becomes more pervasive, more designers are looking for easy to use, complete, and dedicated solutions for verifying, characterizing, debugging and testing sophisticated high-speed serial designs. The DSA70000 Series is specifically targeted to address the challenging high-speed serial design issues faced by designers, by encapsulating extended high-speed serial data domain expertise. It inherits exceptional signal acquisition performance, operational simplicity, and unmatched debugging tools from the DPO70000 Series, to accelerate your day-to-day tasks. It also features the extended analysis tools that enable high-speed serial signal analysis and compliance measurements in a specialized instrument.

The DSA70000 Series Analyzers provide the **signal fidelity of Tektronix oscilloscopes** to ensure confidence in your measurement results: high sample rate on all models, on all channels, to capture more signal details (transients, imperfections, fast edges), 25 GS/s on all four channels for the 4, 6 and 8 GHz models, 50 GS/s on all four channels for the 12.5, 16 and 20 GHz models, bandwidth enhancement as well as the best low-jitter noise floor and vertical accuracy for very accurate measurements.

The DSA70000 Series provides the **longest acquisition of the industry** to provide more resolution and longer time sequence – a standard 20 M on the DSA Series, or an optional up to 100 M samples on all four channels for the 4, 6

and 8 GHz models, 200 M samples on all four channels for the 12.5, 16 and 20 GHz models. Easily manage this deep record length and provide detailed comparison and analysis of multiple waveform segments with the MultiView Zoom™ feature.

The DSA70000 analyzers share the DPX technology of the DPO70000 and can deliver high waveform capture rate at more than 300,000 waveforms per second. The DSA70000 Series capture these intermittent fault events that can break a design with the **FastAcq acquisition mode**. With **Pinpoint® triggering**, the DSA70000 series is also equipped to isolate a section of a complex signal for further analysis.

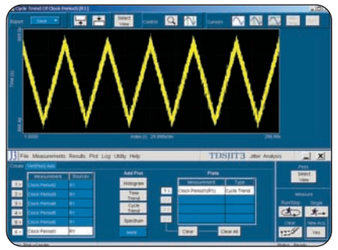
To debug serial architectures, the DSA70000 Series features the **NRZ serial pattern triggering and protocol decode** with built-in clock recovery. It recovers the clock signal, identifies the transitions and decodes characters and other protocol data. You can see the captured bit sequences decoded into their words for convenient analysis (for 8b/10b and other encoded serial data streams), or you can set the desired encoded words for the serial pattern trigger to capture. Lastly, you can synchronize long serial test pattern acquisitions up to 6.25 Gb/s to remove random jitter. The DSA70000 Series covers serial standards up to 3.125 Gb/s.

The DSA70000 Series features the **highest accuracy jitter and timing measurements as well as comprehensive analysis algorithms**. Tight timing margins demand stable, low-jitter designs. You can make 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. It also includes Random Jitter and Deterministic Jitter separation as well as Total Jitter measurement at Bit Error Ratio to 10^{-18}

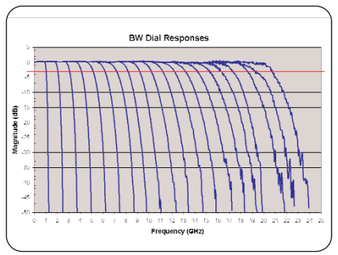
Communications Mask Testing provides a complete portfolio of masks for verifying compliance to serial communications standards. It supports 156 Standards Masks – ITU-T (1.544 Mb/s to 155 Mb/s)/ANSI T1.102 (1.544 Mb/s to 155 Mb/s); Ethernet IEEE 802.3; ANSI X3.263 (1.544 Mb/s to 3.125 Gb/s XAUI); Sonet/SDH (51.84 Mb/s to 2.4883 Gb/s); Fibre Channel (133 Mb/s to 4.25 Gb/s[*1]). InfiniBand (2.5 Gb/s); USB (12 Mb/s to 480 Mb/s); Serial ATA (1.5 Gb/s, 3 Gb/s); Serial Attached SCSI (1.5 Gb/s, 3.0 Gb/s); IEEE 1394b (491.5 Mb/s to 1.966 Gb/s); Rapid I/O (1.25 Gb/s to 3.125 Gb/s); OIF Standards (2.488 Gb/s to 3.11 Gb/s); PCI Express (2.5 Gb/s).

Accurate, Simple and Customizable Physical Layer Testing on High-speed Serial Standards. When designing to industry standards, analog validation and compliance testing (Front Side Bus, PCI Express, FB-DIMM, Serial ATA, Serial Attached SCSI, Fibre Channel, XAUI, IEEE1394b, RapidIO) is critical to ensure device interoperability. Patented Real-Time (RT-Eye®) clock recovery and Eye Rendering provides standard-specific clock recovery, high-precision eye diagrams for transition and non-transition bits and accurate jitter measurements, and de-emphasis measurements. Standard-specific compliance and analysis modules that configure the pass/fail waveform mask and measurement limit testing are also available as an option for PCI Express (Option PCE), for Serial ATA and SAS (Option SST), for FB-DIMM (Fully Buffered – Dual Inline Memory Module) (Option FBD) or InfiniBand (Option IBA).

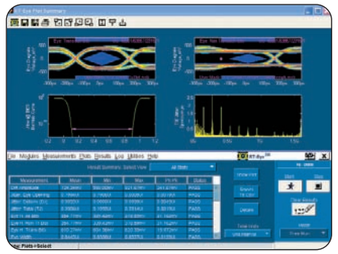
[*1] A 4.25 Gb/s mask supported using Glitch Trigger. It is standard on the DSA70000 Series and optional as Opt. MTH on DPO70404, DPO70604 and DPO70804.



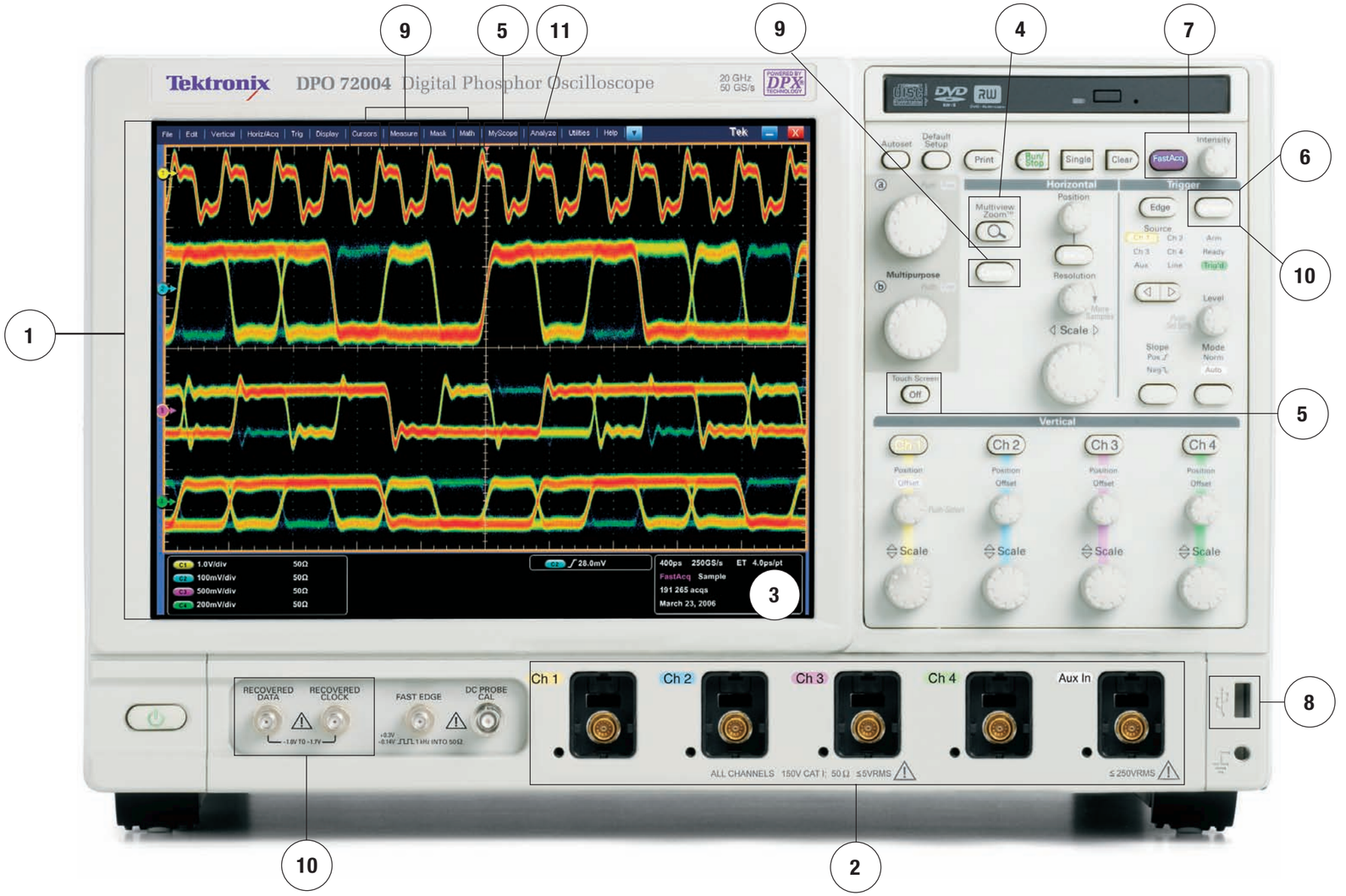
▶ Spread Spectrum Clock profiling.

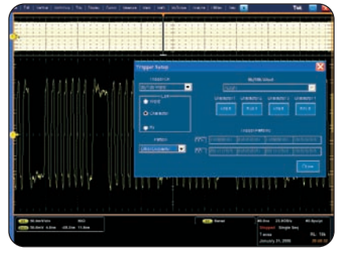


▶ User-selectable bandwidth limit for optimal performance.

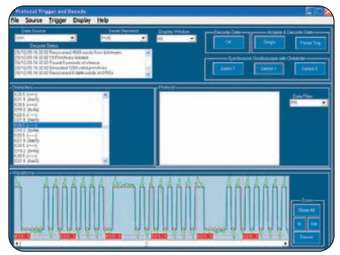


▶ Compliance testing for many serial standards like HDMI, XAUI, PCI-Express and FB-DIMM.





▶ Protocol Trigger.



▶ Protocol Trigger and Decode.

▶ User-definable FIR filters for advanced analysis.

1 Large 12.1-inch XGA Touch Screen Display

The DPO70000 and the DSA70000 Series touch screen gives up to 15% more waveform display than any other oscilloscopes of its class.

2 TekConnect® Probe Interface

It provides performance, versatility and ease of use. It enables bi-directional communication between the oscilloscope and the probe and bandwidth enhancement down to the probe tip.

3 Exceptional Performance

A very lively instrument and the performance of the highest oscilloscope with 50 GS/s real-time sample rate and 200 M record length on all 4 channels simultaneously.

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 graphical user interface allows you to use the touch screen or the mouse.

6 Accelerate the Debug of Complex Designs with Pinpoint™ Triggering

With the industry's largest trigger combinations, you can address virtually any triggering situation. Take synchronized snapshot of test patterns up to 6.25 Gb/s.

7 FastAcq Acquisition Expedites Debugging by Clearly Showing Faults

More than 300,000 waveforms per second, and with a simple turn of the intensity knob, you can see the frequency of occurrence.

8 Easy Connectivity

Built-in USB port at the front for easy access to easily save your work on a memory stick. Front access to recovered clock and data.

9 A Wide Range of Built-in Advanced Analysis Tools

4 types of cursors.

53 automatic measurements.

Waveform boundary tolerance testing

Many advanced math functions like Filtering and Spectral.

10 For Insight into Your High-speed Serial Designs

40 bit 8b/10b Serial Pattern triggering with clock recovery plus industry-unique protocol decode and triggering to capture problems at the link or at the physical layers.

11 A Breadth of Optional Software Packages for Expanded Waveform Analysis and Compliance Testing

Accelerate the research of specific events in an acquired waveform. Advanced jitter and timing measurements. Application-specific measurements and compliance testing.

Digital Phosphor Oscilloscopes and Digital Serial Analyzers
▸ DPO/DSA70000 Series

▸ Characteristics

▸ Vertical System

DPO/DSA Models	70404	70604	70804	71254	71604	72004
Input Channels	4	4	4	4	4	4
Bandwidth (user-selectable DSP enhance)	4 GHz	6 GHz	8 GHz	12.5 GHz	16 GHz	2 settings: 20 GHz and 18 GHz
Rise Time 10% to 90% (typical)	93 ps	62 ps	47 ps	34.3 ps	27.5 ps	22.5 ps
Rise Time 20% to 80% (typical)	65 ps	43 ps	33 ps	23 ps	21 ps	17 ps
Hardware Analog Bandwidth (–3 dB)	4 GHz	6 GHz	8 GHz	12.5 GHz	16 GHz (typical)	16 GHz (typical)
DC Gain Accuracy	±2% (of reading)					
Bandwidth Limits	Depending on instrument model: 19 GHz, 18 GHz, 17 GHz, 16 GHz, 15 GHz, 14 GHz, 13 GHz,11 GHz, 10 GHz, 9 GHz, 8 GHz, 7 GHz, 6 GHz, 5 GHz, 4 GHz, 3 GHz, 2 GHz, 1 GHz or 500 MHz					
Input Coupling	DC (50 Ω), GND					
Input Impedance	50 Ω ±1.5%, 1 MΩ with TCA-1MEG adapter					
Input Sensitivity 18 GHz and Below 20 GHz and 19 GHz	10 mV/div to 1 V/div (100 mV to 10 V full scale) 20 to 99.5 mV/div and 200 mV/div to 1 V/div					
Vertical Resolution	8 bit (11 bit with averaging)					
Max Input Voltage, 50 Ω	< 5.5 V_{RMS} for ≥1 V full scale; also determined by TekConnect accessory					
Position Range	±5 div					
Offset Range	10 mV/div: ±450 mV 20 mV/div: ±400 mV 50 mV/div: ±250 mV 100 mV/div: ±4.5 V 200 mV/div: ±4.0 V 500 mV/div: ±2.5 V 1.0 V/div: 0					
Offset Accuracy	10 mV/div - 99.5 mV/div: ± (0.35% (offset value-position) + 1.5 mV + 1% of full scale) 100 mV/div - 1 V/div : ± (0.35% (offset value-position) + 15 mV + 1% of full scale)					
Delay Between Any Two Channels (typical)	≤100 ps for any two channels with equal V/div and coupling settings ≤50 ps with BW enhance enabled (BW+)					
Channel-to-Channel Isolation (any two channels at equal vertical scale settings)	≥120:1 (for input frequency 0 to 10 GHz) ≥80:1 (for input frequency >10 GHz to 12 GHz) ≥50:1 (for input frequency >12 GHz to 15 GHz) ≥25:1 (for input frequency >15 GHz)					

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 150 ps (typical) with re-arm time of 300 ps.

Width – Trigger on width of positive or negative pulse either within or out of selectable time limits (down to 150 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 – 3.2 ns to 3 Ms.

Trigger Delay by Events – 1 to 2 G events.

Comm – Standard feature on the DSA70000, provided as part of Opt. MTH on the DPO70000 Series. Support for AMI, HDB3, BnZS, CMI, MLT3 and NRZ encoded signals.

Serial Pattern – Trigger on NRZ-encoded data up to 3.125 Gbaud; above 1.25 Gbaud requires 8b/10b encoded data. Extended with pattern lock triggering to capture repeated acquisitions of long serial test patterns up to 6.25 Gb/s.

► Time Base System

DPO/DSA Models	70404	70604	70804	71254	71604	72004
Time Base Range	20 ps/div to 1000 s/div			10 ps/div to 1000 s/div		
Time Resolution (in ET/IT mode)	200 fs			100 fs		
Time Base Delay Time Range	–5.0 ks to 1.0 ks					
Channel-to-Channel Deskew	Range ±75 ns					
Delta Time Measurement Accuracy (typical) Over <100 ns Duration; Single Shot; w/Signal Rise Time = 1.2X Scope Rise Time	888 fs	695 fs	611 fs	504 fs	482 fs	525 fs
Trigger Jitter (RMS)	1 ps_{RMS} (typical) with enhanced triggering OFF < 100 fs_{RMS} with enhanced triggering ON					
Jitter Noise Floor (typical)(with BW+ bandwidth enhance enabled)	450 fs	450 fs	450 fs	300 fs	300 fs	400 fs
Time Base Accuracy	±1.5 ppm initial accuracy, aging <1 ppm per year					

Acquisition System

DPO/DSA Models	70404/70604/70804	71254/71604/72004
Sample Rates		
Real-time Mode 1, 2, 3 or 4 Channel (max)	25 GS/s	50 GS/s
ET/IT Mode (max)	5 TS/s	10 TS/s
Maximum Record Length per Channel		
With Standard Configuration	10 M on all four channels (DPO70000 Series only) 20 M on all four channels (DSA70000 Series only)	
With Record Length Opt. 2XL	20 M on all four channels (DPO70000 Series only)	
With Record Length Opt. 5XL	50 M on all four channels	
With Record Length Opt. 10XL	100 M on all four channels	
With Record Length Opt. 20XL	N/A	200 M on all four channels

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 runts, 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.

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 (p-p, RMS, 6σ), Noise (p-p, 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 1.414xVAR1).

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 >, <, ≥, ≤, =, ≠.

► Maximum Duration at Highest Real-time Resolution

DPO/DSA Models	70404 / 70604 / 70804	71254 / 71604 / 72004
Resolution	40 ps (25 GS/s)	20 ps (50 GS/s)
Max Duration with Standard Memory	0.4 ms DPO70000 Series; 0.8 ms for DSA70000 Series	0.2 ms DPO70000 Series; 0.4 ms for DSA70000 Series
Max Duration with Opt. 2XL	0.8 ms (DPO70000 Series only)	0.4 ms (DPO70000 Series only)
Max Duration with Opt. 5XL	2.0 ms	1.0 ms
Max Duration with Opt. 10XL	4.0 ms	2.0 ms
Max Duration with Opt. 20XL	N/A	4.0 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	>300,000 wfms/s on all four 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 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
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

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 file 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 1024 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.
DVD Drive – Read only.
Mouse – Optical wheel mouse, USB interface.
Keyboard – USB interface.

Input/Output Ports

Front Panel

Aux Trigger Input – See trigger specifications.
Recovered Clock – SMA connector, ≤1.25 Gb/s, Output swing ≥130 mV_{p-p} into 50 Ω at 1.25 Gb/s. Requires Opt. PTH or Opt. MTH to enable on DPO70000, standard on DSA70000.
Recovered Data – SMA connector, ≤1.25 Gb/s, Output swing of 1010 repeating pattern 200 mV into 50 Ω at 1.25 Gb/s. Requires Opt. PTH or Opt. MTH to enable on DPO70000, standard on DSA70000.
DC Probe Calibration Output – BNC connector, ±10 V DC for DC probe calibration. (Signal available only during probe calibration.)
Fast Edge Output – SMA connector provides fast edge signal. 1 kHz ±20%; 810 mV (base to top) ±20% into ≥10 kΩ load; 440 mV ±20% into a 50 Ω load.
AUX Trigger Output – BNC connector, provides a TTL-compatible, polarity switchable pulse when the oscilloscope triggers.
USB2.0 Port – One in front, four on back. Allows connection or disconnection of USB keyboard, mouse or storage device while oscilloscope is on.

Rear Panel

External Time Base Reference In – BNC connector; allows time base system to phase lock to external 10/100 MHz reference .Optimized (via a software switch) for either a highly stable clock or tracking mode.
Time Base Reference Out – BNC connector; provides TTL-compatible output of internal 10 MHz reference oscillator.
AUX Trigger Output – BNC connector, 0 to 3 V; default output is A-Event Trigger low true.
Parallel Port – IEEE 1284, DB-25 connector.
Audio Ports – Miniature phone jacks for stereo microphone input and stereo line output.
USB2.0 Ports – Four in back. Allow connection or disconnection of USB keyboard, mouse or storage device while oscilloscope power is on.
Keyboard Port – PS/2 compatible.
Mouse Port – PS/2 compatible.

▸ Pinpoint® Trigger System

	DPO Models 70404/70604/70804/71254/71604/72004	DSA Models 70404/70604/70804/71254/71604/72004
Sensitivity		
Internal DC Coupled	4% of full scale from DC to 50 MHz 10% of full scale at 4 GHz 20% of full scale at 8 GHz 50% of full scale at 11 GHz	
External (Auxiliary Input) 50 Ω	250 mV from DC to 50 MHz, increasing to 350 mV at 1.0 GHz	
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	
Main Trigger Modes	Auto, Normal, and Single	
Enhanced Triggering	User-selectable; it corrects the difference in timing between the trigger path and the acquired data path (it supports all Pinpoint trigger types on both A- and B-Events except pattern trigger and not available in FastAcq)	
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. MTH**	**Standard**
	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	**Requires Opt. PTH**	**Standard**
	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	
	Trigger on 8b/10b-encoded data from 1.25 to 3.125 GBaud (40 bits)	
Clock Recovery System	**Requires Opt. PTH or Opt. MTH**	**Standard**
Clock Recovery Phase Locked Loop Bandwidth	Fixed at FBaud/1600	
Frequency Range	1.5 MBaud to 3.125 GBaud	
Clock Recovery Jitter (RMS)	<0.25% bit period + 2 ps_{RMS} for PRBS data patterns <0.25% bit period + 1.5 ps_{RMS} for repeating "0011" data pattern	
Tracking/Acquisition Range	±2% of requested baud	
Minimum Signal Amplitude needed for Clock Recovery	1 div_{p-p} up to 1.25 Gbaud 1.5 div_{p-p} above 1.25 Gbaud	
Trigger Level Range Internal	±120% of full scale from center of screen	
AUX Trigger	TekConnect interface: ±5 V	
Line	Fixed at 0 V	
Trigger Coupling	DC, AC (attenuates <100 Hz), HF Rej (attenuates >20 kHz), LF Rej (attenuates <200 kHz), Noise Reject (reduces sensitivity)	
Trigger Holdoff Range	250 ns min to 12 s max	

LAN Port – RJ-45 connector, supports 10Base-T, 100Base-T and 1000Base-T.
Serial Port – DB-9 COM1 port
Windows Video Port – 15 pin D-sub connector on the rear panel; connects a second monitor to use dual-monitor display mode allowing analysis results and plots to be viewed along with the oscilloscope display. Video is DDC2B compliant.

GPIB Port – IEEE 488.2 standard.
Scope XGA Video Port – 15 pin D-sub connector on the rear panel, video is IBM XGA compatible. Connects to show the oscilloscope display, including live waveforms on an external monitor or projector. The primary Windows desktop can also be displayed on an external monitor using this port.

TekLink™ – Proprietary interface for connecting multiple Tektronix instruments.
Power – 100 to 240 V_{RMS}, ±10%, 50/60 Hz; 115 V_{RMS} ±10%, <870 Watts, 400 Hz; CAT II, <1100 VA typical.

Physical Characteristics

Benchtop Configuration

Dimensions	mm	in.
Height	298	11.74
Width	451	17.75
Depth	489.97	19.29
Weight	**kg**	**lbs.**
Net	20	44
Shipping	34	75

Rackmount Configuration

Dimensions	mm	in.
Height	311	12.25
Width	480.1	18.9
Depth (from rack mounting ear to back of instrument)	546.1	21.5
Weight	**kg**	**lbs.**
Net	20	44
Kit	2.7	6

Mechanical

Cooling – Required Clearance

	mm	in.
Top	0	0
Bottom	0	0
Left side	76	3
Right side	76	3
Front	0	0
Rear	0	0

Environmental

Temperature

Operating – 5 ºC to +45 ºC
Non-Operating – –20 ºC to +60 ºC

Humidity

Operating –
8% to 80% relative humidity (RH) at up to 32 ºC.
5% to 45% RH above +32 ºC up to +45 ºC.
Non-operating –
5% to 95% relative humidity (RH). Upper limit derated to 45% RH above +30 ºC up to +60 ºC.

Altitude

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

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

DPO70404
4 GHz Digital Phosphor Oscilloscope.

DPO70604
6 GHz Digital Phosphor Oscilloscope.

DPO70804
8 GHz Digital Phosphor Oscilloscope.

DPO71254
12.5 GHz Digital Phosphor Oscilloscope.

DPO71604
16 GHz Digital Phosphor Oscilloscope.

DPO72004
20 GHz Digital Phosphor Oscilloscope.

DSA70404
4 GHz Digital Serial Analyzer.

DSA70604
6 GHz Digital Serial Analyzer.

DSA70804
8 GHz Digital Serial Analyzer.

DSA71254
12.5 GHz Digital Serial Analyzer.

DSA71604
16 GHz Digital Serial Analyzer.

DSA72004
20 GHz Digital Serial Analyzer.

All Models Include: Accessory pouch, front cover, mouse, keyboard, quick start user manual (071-173x-xx), probe calibration and deskew fixture, DPO70000 Series product software CD/DVD-ROM, DPO70000 Series operating system restoration CD/DVD-ROM, Optional applications software CD/DVD-ROM, performance verification procedure PDF file, GPIB programmer's reference (on product software CD/DVD-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. Four TekConnect® to 2.92 mm adapters (TCA-292MM) and one Tekconnect to BNC adapter (TCA-BNC).

Options

Instrument Options

Record Length Options for DPO70000 Series

Opt. 2XL – 20 MSamples/ch.
Opt. 5XL – 50 MSamples/ch.
Opt. 10XL – 100 MSamples/ch.
Opt. 20XL[*9] – 200 MSamples/ch.

Record Length Options for DSA70000 Series

Opt. 5XL – 50 MSamples/ch.
Opt. 10XL – 100 MSamples/ch.
Opt. 20X[*9] – 200 MSamples/ch.

Software Options for DPO70000 Series

Opt. JE3 – Essentials Jitter Analysis Software.
Opt. PTH – Protocol Triggering and Decoding for 8b/10b-encoded Serial Signals up to 3.125 Gb/s. Includes hardware clock recovery and pattern lock triggering.
Opt. RTE – RT-Eye® Serial Data Compliance and Analysis Software.
Opt. JA3 – Advanced Jitter Analysis Software.
Opt. MTH – Mask testing for Serial Standards up to 4.25 Gb/s. Includes hardware clock recovery.
Opt. ASM – Advanced Event Search and Mark.

Software Options for DPO70000 Series and DSA70000 Series

Opt. LT – Waveform Limit Testing.
Opt ASM – Advanced Event Search and Mark.
Opt. ET3[*2] – Ethernet Compliance Test Software.
Opt. USB[*3] – USB2.0 Compliance Test Software only.
Opt. PWR[*4] – Power Measurement and Analysis Software.
Opt. HT3 – HDMI Compliance Test Software.
Opt. DVI – DVI Compliance Test Solution.
Opt. PCE[*5] – PCI Express™ Compliance Module for RT-Eye Serial Data Compliance and Analysis Software.
Opt. SST[*5] – SATA and SAS Analysis Software Module for RT-Eye Serial Data Compliance and Analysis Software.
Opt. FBD[*5] – FB-DIMM Compliance Module for RT-Eye Serial Data Compliance and Analysis Software.
Opt. IBA[*5] – InfiniBand Compliance Module for RT-Eye Serial Data Compliance and Analysis Software.
Opt UWB – Ultra Wide Band WiMedia Analysis.

[*2] Requires Ethernet Test Fixture.

[*3] Requires TDSUSBF (USB Test Fixture).

[*4] At least Opt. 2XL and a TCA-1MEG TekConnect 1 MΩ buffer amplifier are recommended for use.

[*5] Requires Opt. RTE on DPO70000 Series.

[*9] For models of bandwidth ≥12.5 GHz only.

User Manual Options

Opt. L0 – English manual.

Opt. L1 – French manual.

Opt. L3 – German manual.

Opt. L5 – Japanese manual.

Opt. L7 – Simplified Chinese manual.

Opt. L8 – Standard Chinese manual.

Opt. L9 – Korean manual.

Opt. L10 – Russian manual.

Opt. L99 – No manual.

Power Plug Options

Opt. A0 – North America.

Opt. A1 – Universal European Union.

Opt. A2 – UK.

Opt. A3 – Australia.

Opt. A5 – Switzerland.

Opt. A6 – Japan.

Opt. A10 – China.

Opt. A11 – India.

Opt. A99 – No power cord.

Service Options

Opt. CA1 – Provides a single calibration event or coverage for the designated calibration interval, whichever comes first.

Opt. C3 – Calibration Service 3 years.

Opt. C5 – Calibration Service 5 years.

Opt. D1 – Calibration Data Report.

Opt. D3 – Calibration Data Report 3 years (with Opt. C3).

Opt. D5 – Calibration Data Report 5 years (with Opt. C5).

Opt. R3 – Repair Service 3 years.

Opt. R5 – Repair Service 5 years.

Recommended Accessories Probes

P7516 – 16 GHz TriMode™ probe.

P7513 – 13 GHz TriMode probe.

P7313 – 13 GHz Z-Active™ differential probe.

P7313SMA – 13 GHz TekConnect® differential SMA probe.

P7380A – 8 GHz Z-Active differential probe.

P7380SMA – 8 GHz TekConnect differential SMA probe.

P7360A – 6 GHz Z-Active differential probe.

P7340A – 4 GHz Z-Active differential probe.

TCPA300/TCPA400 – Series current measurement systems.

P5200/P5205/P5210 – High voltage differential probes.

Adapters

TCA-292MM – TekConnect to 2.92 mm connectors.

TCA-SMA – TekConnect-to-SMA adapter.

TCA-N – TekConnect-to-N adapter.

TCA-BNC – TekConnect-to-BNC adapter.

TCA75 – 4 GHz precision TekConnect 75 Ω to 50 Ω adapter with 75 Ω BNC input connector.

TCA-1MEG – TekConnect high-impedance buffer amplifier. Includes P6139A passive probe.

Cables

GPIB Cable (1 m) – Order 012-0991-01.

GPIB Cable (2 m) – Order 012-0991-00.

RS-232 Cable – Order 012-1298-00.

Centronics Cable – Order 012-1214-00.

Accessories

Service Manual – Order 071-1740-xx.

Transit Case – Order 016-1977-00.

Rackmount Kit – Order 016-1985-00.

Oscilloscope Cart – Order K4000.

TDSUSBF – Test fixture for use with Opt. USB.

Probe Calibration and Deskew Fixture (4 GHz) – Order 067-0484-xx.

Probe Deskew Fixture (>4 GHz) – Order 067-1586-xx.

Power Deskew Fixture – Order 067-1686-xx.

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

Instrument Upgrades

To upgrade your DPO70000 Series Oscilloscope or your DSA70000 Series Serial Analyzer, order option as noted:

XL02[*6] – To upgrade record length on DPO70000 Series from standard configuration to Opt. 2XL configuration.

XL05 – To upgrade record length from standard configuration to Opt. 5XL configuration.

XL010 – To upgrade record length from standard configuration to Opt. 10XL configuration.

XL020[*9] – To upgrade record length from standard configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

XL25[*6] – To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 5XL configuration.

XL210[*6] – To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 10XL configuration.

XL220*9[*6] – To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

XL510 – To upgrade record length on DPO70000 Series or DSA70000 Series from Opt. 5XL configuration to Opt. 10XL configuration.

XL520[*9] – To upgrade record length on DPO70000 Series or DSA70000 Series from Opt. 5XL configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

XL1020[*9] – To upgrade record length on DPO70000 Series or DSA70000 Series from Opt. 10XL configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

DVI – To upgrade DPO70000 Series or DSA70000 Series with Opt. DVI.

RTE – To upgrade DPO70000 Series with Opt. RTE or TDSRT-Eye software.

SST[*5] – To upgrade DPO70000 Series or DSA70000 Series with Opt. SST.

JE3 – To upgrade DPO70000 Series with Opt. JE3.

ET3 – To upgrade DPO70000 Series or DSA70000 Series with Opt. ET3.

JA3 – To upgrade DPO70000 Series with Opt. JA3.

LT – To upgrade DPO70000 Series or DSA70000 Series with Opt. LT.

ASM – To upgrade DPO70000 Series with Opt. ASM.

USB – To upgrade DPO70000 Series or DSA70000 Series with Opt. USB.

PWR – To upgrade DPO70000 Series or DSA70000 Series with Opt. PWR.

PCE[*5] – To upgrade DPO70000 Series or DSA70000 Series with Opt. PCE.

IBA[*5] – To upgrade DPO70000 Series or DSA70000 Series with Opt. IBA.

FBD[*5] – To upgrade DPO70000 Series or DSA70000 Series with Opt. FBD

HT3 – To upgrade DPO70000 Series or DSA70000 Series with Opt. HT3.

MTH[*6] – To upgrade DPO70000 Series with Opt. MTH.

PTH[*6] – To upgrade DPO70000 Series with Opt. PTH.

CP2[*7] – TDSCPM2 ANSI/ITU Telecom pulse compliance testing software (requires Opt. MTH on DPO70000 Series).

UWB – To upgrade DPO70000 Series or DSA70000 Series with Opt. UWB.

J2 – TDSDDM2 disk drive analysis software.

VNM[*8] – TDSVNM CAN and LIN Timing and Protocol Decode (no CAN triggering included).

[*5] Requires Opt. RTE on DPO70000 Series.

[*6] DPO70000 only.

[*7] Requires Opt. MTH on DPO70000 Series.

[*8] Requires ATM1 CAN/LIN trigger module – order through Crescent Heart Software.

[*9] For models of bandwidth ≥12.5 GHz only.

The Tektronix Customer Service Advantage

Ensure the optimal performance of your Tektronix products and maximize the lifetime value of your Tektronix investment.

This is what you get with the Tektronix Customer Service Advantage:

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Summary of Basic Service Coverage:

Repair Service Coverage

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- Applicable product updates
- Applicable safety and reliable updates

Calibration Service Coverage

- Accredited Calibration
- Traceable Calibration
- Functional Verification
- Applicable product updates
- Applicable safety and reliability updates
- Calibration records retention

On-site Service

- Your instruments remain in your workplace
- Turn-around time is measured in hours, not days
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- Service is pre-arranged to fit your schedule
- Factory trained experts perform the work at your location

For more information on Tektronix Services:

www.tektronix.com/serviceandsupport

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