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 two, three or four 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 needed 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.
- 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.

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 megasamples record length with MultiView Zoom™ feature for quick navigation.
- Fastest waveform capture rate with >300,000 wfms/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 8 b/10 b 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 AIA, FB-DIMM, SAS, fibre channel, IEEE1394b, RapidIO, XAUI, HDMI, DVI, Ethernet, USB 2.0.

Most popular jitter timing and eye diagram analysis package.

- DDR memory bus analysis.
- 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.

User selectable bandwidth limiting choices.
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

DPO/DSA70000 Series

- 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

- Highest performance P7500 TriMode™ probes.

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

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

- Isolate glitches down to 100 ps wide.

- Isolate only the valid glitches.

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, like a DDR read or write burst, 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 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.

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 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. 10 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.

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 to remove the pre-emphasis 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, 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 DPO70000 and DSA70000 Series as Opt. DJA.

**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.

- 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*)
- 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)

*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.

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

UWB – 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.

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/DCM 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.

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.

Optional Ethernet Compliance Testing (Opt. ET3) – Provides Ethernet 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.

Optional DDR Memory System Analysis (Opt. DDRA) – Accelerate the validation of a memory system based on 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.
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 user-friendly. 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 four channels simultaneously.

4. With MultiView™
   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 MultiView™ create your own control window with any the controls you care about. With TekScope™ user interface allows you to see 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
   Four types of cursors. 53 automatic measurements. Waveform boundary tolerance testing. Many advanced math functions like Filtering and Spectral.

10. A Breadth of Optional Software Packages for Expanded Waveform Analysis and Compliance Testing
    For Insight into Your High-speed Serial Design Features types of vectors. 53 automatic measurements. Waveform boundary tolerance testing. Many advanced math functions like Filtering and Spectral.

11. For Insight into Your High-speed Serial Design
    Accelerate the research of specific events in an acquired waveform. Advanced filter and timing measurements. Application specific measurements and compliance testing.
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

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 provides 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 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 B b/10 b 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) XAUJ; Sonet/SDH (51.84 Mb/s to 2.4883 Gb/s); Fibre Channel (133 Mb/s to 4.25 Gb/s), 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, XAUJ, IEEE1394b, RapidI/O) 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).

* 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.
Characteristics

Vertical System

<table>
<thead>
<tr>
<th>DPO/DSA Models</th>
<th>70404</th>
<th>70604</th>
<th>70804</th>
<th>71254</th>
<th>71604</th>
<th>72004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Input Channels</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>4 GHz</td>
<td>6 GHz</td>
<td>8 GHz</td>
<td>12.5 GHz</td>
<td>16 GHz</td>
<td>2 settings: 20 GHz and 18 GHz</td>
</tr>
<tr>
<td>(user selectable DSP enhance)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rise Time 10% to 90% (typical)</td>
<td>93 ps</td>
<td>62 ps</td>
<td>47 ps</td>
<td>34.3 ps</td>
<td>27.5 ps</td>
<td>22.5 ps</td>
</tr>
<tr>
<td>Rise Time 20% to 80% (typical)</td>
<td>65 ps</td>
<td>43 ps</td>
<td>33 ps</td>
<td>23 ps</td>
<td>21 ps</td>
<td>17 ps</td>
</tr>
<tr>
<td>Hardware Analog Bandwidth (~3 dB)</td>
<td>4 GHz</td>
<td>6 GHz</td>
<td>8 GHz</td>
<td>12.5 GHz</td>
<td>16 GHz (typical)</td>
<td>16 GHz (typical)</td>
</tr>
</tbody>
</table>

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, 12 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: 10 mV/div or 1 V/div (100 mV to 10 V full scale)
- 20 GHz and 19 GHz: 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 Vpp 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 V/div: 0

Offset Accuracy

- 10 mV/div: ±0.35% (offset value-position) + 1.5 mV + 1% of full scale
- 100 mV/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)

Time Base System

<table>
<thead>
<tr>
<th>DPO/DSA Models</th>
<th>70404</th>
<th>70604</th>
<th>70804</th>
<th>71254</th>
<th>71604</th>
<th>72004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time Base Range</td>
<td>20 ps/div to 1000 s/div</td>
<td></td>
<td></td>
<td></td>
<td>10 ps/div to 1000 s/div</td>
<td></td>
</tr>
<tr>
<td>Time Resolution (in ET/IT mode)</td>
<td>200 fs</td>
<td></td>
<td></td>
<td></td>
<td>100 fs</td>
<td></td>
</tr>
<tr>
<td>Time Base Delay Time Range</td>
<td>≤5.0 ns to 1.0 ns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Channel-to-channel Delay Range</td>
<td>Range ≤75 ns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta Time Measurement Accuracy (typical)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Over &lt;100 ns duration; single shot, with signal rise time</td>
<td>888 fs</td>
<td>695 fs</td>
<td>611 fs</td>
<td>504 fs</td>
<td>482 fs</td>
<td>525 fs</td>
</tr>
<tr>
<td>Trigger slew rate (≤1.2X scope rise time)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trigger Jitter (RMS) (typical)</td>
<td>1 ps/div, (typical) with enhanced triggering OFF</td>
<td>&lt; 100 fs/div, with enhanced triggering ON</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Jitter Noise Floor (typical) (With BW+ bandwidth enhance enabled)</td>
<td>450 fs</td>
<td>450 fs</td>
<td>450 fs</td>
<td>300 fs</td>
<td>300 fs</td>
<td>400 fs</td>
</tr>
<tr>
<td>Time Base Accuracy</td>
<td>±1.5 ppm initial accuracy, aging &lt;1 ppm per year</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

► DPO/DSA70000 Series

► 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
E/T Mode (max) 5 TS/s

Maximum Record Length per Channel

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Channel Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>With Standard Configuration</td>
<td>10 M on all four channels (DPO70000 Series only)</td>
</tr>
<tr>
<td>With Record Length Opt. 2XL</td>
<td>20 M on all four channels (DSA70000 Series only)</td>
</tr>
<tr>
<td>With Record Length Opt. 5XL</td>
<td>50 M on all four channels</td>
</tr>
<tr>
<td>With Record Length Opt. 10XL</td>
<td>100 M on all four channels</td>
</tr>
<tr>
<td>With Record Length Opt. 20XL</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Maximum Duration at Highest Real-time Resolution

<table>
<thead>
<tr>
<th>DPO/DSA Models</th>
<th>70404/70604/70804</th>
<th>71254/71604/72004</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolution</td>
<td>40 ps (25 GS/s)</td>
<td>20 ps (50 GS/s)</td>
</tr>
<tr>
<td>Max Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Standard Memory</td>
<td>0.4 ms DPO70000 Series; 0.8 ms for DSA70000 Series</td>
<td>0.2 ms DPO70000 Series; 0.4 ms for DSA70000 Series</td>
</tr>
<tr>
<td>With Opt. 2XL</td>
<td>0.8 ms (DPO70000 Series only)</td>
<td>0.4 ms (DPO70000 Series only)</td>
</tr>
<tr>
<td>Max Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Opt. 5XL</td>
<td>2.0 ms</td>
<td>1.0 ms</td>
</tr>
<tr>
<td>Max Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Opt. 10XL</td>
<td>4.0 ms</td>
<td>2.0 ms</td>
</tr>
<tr>
<td>Max Duration</td>
<td></td>
<td></td>
</tr>
<tr>
<td>With Opt. 20XL</td>
<td>N/A</td>
<td>4.0 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
>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 2x10^9 waveforms included in min-max envelope

H-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

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
**Trigger Modes**

<table>
<thead>
<tr>
<th>Trigger Related Triggers</th>
<th>Requires Opt. MTH</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Communications-related Triggers</strong></td>
<td>Support for AMI, HD83, Bn2S, CMII, MLT3 and NRZ encoded communications signals</td>
<td>Standard</td>
</tr>
<tr>
<td><strong>Serial Pattern Trigger</strong></td>
<td>Requires Opt. PTH</td>
<td>Standard</td>
</tr>
<tr>
<td>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 8 b/10 b-encoded data from 1.25 to 3.125 GBaud (40 bits)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Clock Recovery System**

<table>
<thead>
<tr>
<th>Requires Opt. PTH or MTH</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clock Recovery Phase Locked Loop Bandwidth</strong></td>
<td>Fixed at FBaud/1600</td>
</tr>
<tr>
<td><strong>Frequency Range</strong></td>
<td>1.5 MBaud to 3.125 GBaud</td>
</tr>
<tr>
<td><strong>Clock Recovery Jitter (rms)</strong></td>
<td>&lt;0.25% bit period + 2 ps</td>
</tr>
<tr>
<td><strong>Tracking/Acquisition Range</strong></td>
<td>±2% of requested baud</td>
</tr>
<tr>
<td><strong>Minimum Signal Amplitude needed for Clock Recovery</strong></td>
<td>1.0 div up to 1.25 GBaud</td>
</tr>
<tr>
<td><strong>Trigger Holdoff Range</strong></td>
<td>250 ns min to 12 s max</td>
</tr>
</tbody>
</table>

**Waveform Measurements**

<table>
<thead>
<tr>
<th>Requires Opt. PTH or MTH</th>
<th>Standard</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Waveform Definition</strong></td>
<td>As an arbitrary math expression.</td>
</tr>
<tr>
<td><strong>Waveform Database</strong></td>
<td>Pixmap from a sample waveform.</td>
</tr>
<tr>
<td><strong>Waveform Definition – A function that generates a waveform Database pixmap from a sample waveform. Sample count can be defined.</strong></td>
<td></td>
</tr>
</tbody>
</table>
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

DPO/DSA70000 Series

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, ±125 kHz, Output swing ±130 mV 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, ±125 kHz, 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.
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%; 610 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 output 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.
LAN Port – RJ-45 connector, supports 10Base-T, 100Base-T and 1000Base-T traffic. SMA connector, 0 to 3 V; ≤1.25 Gb/s, ≤1.25 Gb/s, ≤1.25 Gb/s, ≤1.25 Gb/s, ≤1.25 Gb/s.
Serial Port – DB-9 COM1 port.
Scope XGA Video Port – 15 pin D-sub connector on the rear panel; connects a second monitor to use the primary Windows desktop can also be displayed on an external monitor or projector. The primary Windows desktop can also be displayed on an external monitor or projector. The primary Windows desktop can also be displayed on an external monitor or projector.
TekLink™ – Proprietary interface for connecting multiple Tektronix instruments.

Power – 100 to 240 VAC ±10%, 50/60 Hz; 115 VAC ±10%, <870 Watts, 400 Hz; CAT II, <1100 VA typical.

Environmental
Temperature
Operating – 5 ºC to +45ºC.
Non-Operating – –20ºC to +60ºC.
Humidity
Operating – 8% to 80% relative humidity (RH) at up to 32ºC, 5% to 45% RH above +32ºC up to +69ºC.
Non-Operating – 5% to 95% relative humidity (RH). Upper limit derated to 45% RH above +30ºC up to +60ºC.
Altitude
Operating – 10,000 ft. (3,048 m).
Non-Operating – 40,000 ft. (12,190 m).

Regulatory
Certifications – UL 3111-1, CSA1010.1, EN611469,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.

**DPA71254**
12.5 GHz Digital Phosphor Oscilloscope.

**DPO71604**
16 GHz Digital Phosphor Oscilloscope.

**DPA72004**
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.


**Recommended Accessories**

- **Probes**
  - P7520 – 20 GHz TriMode™ probe.
  - 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.
  - P6251 – 125 to 1 GHz, 420, Differential Probe (requires TCA-BNC adapter).
  - P6250 – 50 MSamples/ch, 420, Differential Probe (requires TCA-BNC adapter).
  - P7360A – 6 GHz Z-Active differential probe.
  - P7340A – 4 GHz Z-Active differential probe.

- **Cables**
  - GPB Cable (1 m) – 012-0991-01.
  - GPB Cable (2 m) – 012-0991-02.
  - RS-232 Cable – 012-1296-00.
  - Centronics Cable – 012-1214-00.

- **Adapters**
  - TCA-292MM – TekConnect to 2.92 mm connectors.
  - TCA-5MA – TekConnect-to-SMA adapter.
  - TCA-N – TekConnect-to-N adapter.
  - TCA-BNC – TekConnect-to-BNC adapter.
  - TCA-240S – 4 GHz precision TekConnect 240 Ω to 50 Ω adapter (requires TCA-BNC adapter).

- **Accessories**
  - Instrumented DIMM for DDR3 – Order Scope NEXV card for UDIMM Raw Card E. (Contact www.nexvtechnology.com).
  - Transmit Case – 016-1977-00.
  - Rackmount Kit – 016-1985-00.
  - Oscilloscope Cart – 012-1293-00.

- **Software Options for DPO70000 Series and DSA70000 Series**

- **Power Plug Options**

- **Service Options**
  - Opt. C5 – Calibration Service 5 Years.

- **Recommended Accessories**

- **Adapters**
  - TCA-292MM – TekConnect-to-2.92 mm connectors.
  - TCA-5MA – TekConnect-to-SMA adapter.
  - TCA-N – TekConnect-to-N adapter.
  - TCA-BNC – TekConnect-to-BNC adapter.
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  - Transmit Case – 016-1977-00.
  - Rackmount Kit – 016-1985-00.
  - Oscilloscope Cart – 012-1293-00.

- **Software Options for DPO70000 Series**
  - Opt. PH – 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. MTH – Mask testing for Serial Standards up to 4.25 Gb/s. Includes hardware clock recovery.
  - Opt. ASM – Advanced Event Search and Mark.

- **Recommended Accessories**
  - Probes and Pattern Lock
  - P7380SMA – 8 GHz TekConnect differential SMA probe.
Digital Phosphor Oscilloscopes and Digital Serial Analyzers

Instrument Upgrades

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

**X026** — To upgrade record length on DPO70000 Series from standard configuration to Opt. 2XL configuration.

**X05** — To upgrade record length from standard configuration to Opt. 5XL configuration.

**X010** — To upgrade record length from standard configuration to Opt. 10XL configuration.

**X020** — To upgrade record length from standard configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

**X025** — To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 5XL configuration.

**X0210** — To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 10XL configuration.

**X0220** — To upgrade record length on DPO70000 Series from Opt. 2XL configuration to Opt. 20XL configuration (only available on instruments of bandwidth >= 12.5 GHz).

**X0510** — To upgrade record length on DPO70000 Series or DSA70000 Series from Opt. 5XL configuration to Opt. 10XL configuration.

**XL520** — 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).

**XL520** — 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).

**XL520** — 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).

**DDRA** — To upgrade DPO70000 or DSA70000 Series with Opt. DDRA.

**DJAH** — To upgrade DPO70040, 70604, 70804 with Opt. DJA.

**DJAU** — To upgrade DPO7125A, 71604, 72004 with Opt. DJA.

**DJP** — To upgrade DSA70000 with Opt. DJA.

**DVI** — To upgrade DPO70000 Series or DSA70000 Series with Opt. DVI.

**SST5** — To upgrade DPO70000 Series or DSA70000 Series with Opt. SST.

**ET3** — To upgrade DPO70000 Series or DSA70000 Series with Opt. ET3.

**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** — To upgrade DPO70000 Series or DSA70000 Series with Opt. PCE.

**IBA** — To upgrade DPO70000 Series or DSA70000 Series with Opt. IBA.

**FBD** — To upgrade DPO70000 Series or DSA70000 Series with Opt. FBD.

**HT3** — To upgrade DPO70000 Series or DSA70000 Series with Opt. HT3.

**MTH** — To upgrade DPO70000 Series with Opt. MTH.

**PTH** — To upgrade DPO70000 Series with Opt. PTH.

**CP2** — TDS/CPM2 ANSI/ITU Telecom pulse compliance testing software (requires Opt. MTH on DPO70000 Series).

**UWBE** — To upgrade DPO70000 Series or DSA70000 Series with Opt. UWBE.

**UBW** — To upgrade DPO70000 Series or DSA70000 Series with Opt. UBW.

**J2** — TDS/CM2 disk drive analysis software.

**VNM** — TDS/VNM CAN and LIN Timing and Protocol Decode (no CAN triggering included).

**ASM** — To upgrade DPO70000 Series with Opt. ASM.

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**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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Contact Tektronix:

**ASEAN / Australasia**

Australia: +61 52 675 3777

Balkans, Israel, South Africa and other ISE Countries: +41 52 675 3777

Belgium: 07 81 60166

Brazil & South America

Canada: 1 900 661 5625

Central Europe, Ukraine and the Baltics: +41 52 675 3777

Central Europe & Greece: +41 52 675 3777

Denmark: +45 80 88 1401

Finland: +41 52 675 3777

France: +33 (1) 1 69 86 81 81

Germany: +49 (221) 94 77 400

Hong Kong: (852) 2858-6688

India: 91 80-2227577

Italy: +39 (02) 25086 1

Japan: 81 (0) 6714-3010

Luxembourg: +352 2227577

Middle East, Asia and North Africa: +41 52 675 3777

The Netherlands: 0900 02 02179

Norway: 800 16098

People’s Republic of China: 86 (10) 6235 1230

Poland: +41 52 675 3777

Portugal: 80 06 12870

Republic of Korea: 82 (2) 917-5500

Russia & CIS: +7 (495) 7448490

South Africa: +27 11 206 8360

Spain: +34 901 988 054

Sweden: 020 688071

Switzerland: +41 52 675 3777

Taiwan: 886 (2) 2722-9622

United Kingdom & Eire: +44 (3) 1344-392400

For other areas contact Tektronix, Inc. at 1 800 267-7111

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