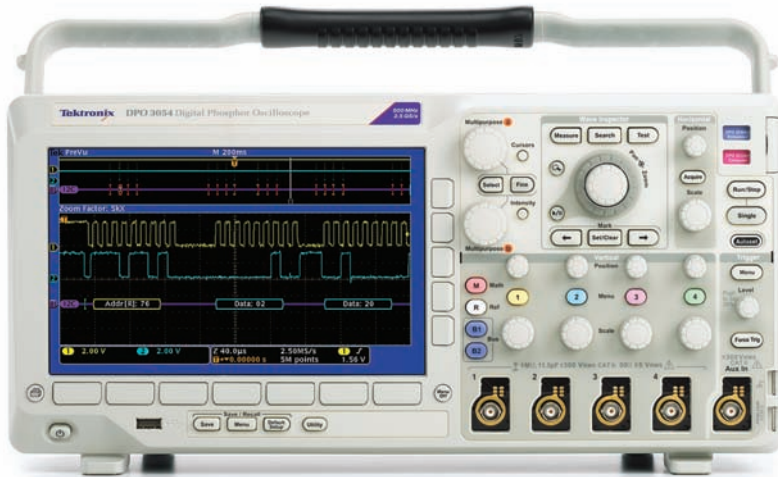# Digital Phosphor Oscilloscopes

▶ DPO3000 Series


DPO3000 Series Digital Phosphor Oscilloscopes

Feature-Rich Tools for Debugging Mixed Signal Designs

The Power to Solve Problems Quickly – The DPO3000 Series digital phosphor oscilloscopes (DPO) deliver the performance you need to visualize even your most demanding signals. Bandwidths range from 100 MHz to 500 MHz and with all models offering a minimum of 5x over-sampling on all channels and sin(x)/x interpolation standard, you can be confident that even the fastest transient events will be captured and displayed accurately. The standard 5M record length on all channels enables you to capture long windows of signal activity while maintaining fine timing resolution. The 50,000 wfm/s waveform capture rate maximizes the probability of capturing elusive glitches and other infrequent events.

The DPO3000 Series offers a variety of analytical solutions including cursors, 29 automatic measurements, statistics and waveform math. Despite a tiny footprint (only 5.4 in. deep) and light weight (9 lbs.), the DPO3000 Series offers exceptional performance, a large 9 in. WVGA widescreen display and knob-per-channel vertical controls.
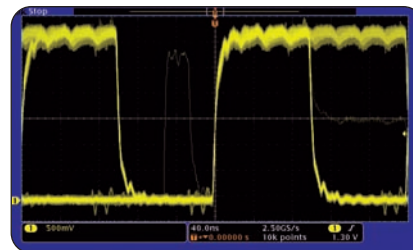
▶ Fast waveform capture rate maximizes the probability of capturing elusive glitches and other infrequent events.

▶ **Features & Benefits**

Key Performance Specifications
– 500, 300, 100 MHz bandwidth models
– 2 and 4 channel models
– Sample rates up to 2.5 GS/s on all channels
– 5 megasample record length on all channels
– 50,000 wfm/s maximum waveform capture rate
– Suite of advanced triggers

Serial Bus Trigger and Decode
– I^2C, SPI, CAN, LIN, RS232/422/485/UART serial triggering, decode and analysis options

Ease of Use Features
– Wave Inspector® controls provide unprecedented efficiency in waveform analysis
– 9 in. (229 mm) WVGA widescreen color display
– USB 2.0 on front panel for quick and easy data storage
– USB 2.0 device port for direct PC control of oscilloscope using USBTMC
– Built-in ethernet port
– Plug-and-play connectivity and analysis software solutions
– e*Scope® remote viewing and control
– TekVPI® probe interface supports active, differential and current probes for automatic scaling and units
– Small footprint and light weight – Only 5.4 in. (137mm) deep and 9 lbs. (4 kg)

▶ **Applications**

Embedded design and debug

Investigation of transient phenomena

Power measurements

Video design and debug

Spectral analysis

Automotive electronics design and debug
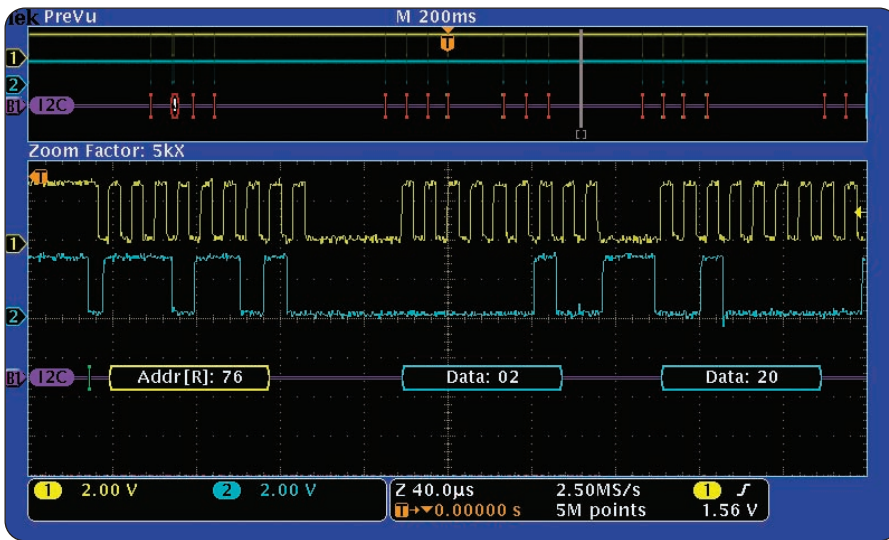
Manufacturing test and quality control

Electro-mechanical design and analysis

Bio-medical product development

Industrial control

Tektronix

Enabling Innovation

▶ Triggering on a specific data packet going across an I²C bus. The Yellow waveform is clock and the blue waveform is data. A Bus waveform provides decoded packet content including Start, Address, Read/Write, Data and Stop.

▶ Packet decode table showing decoded Identifier, DLC, Data and CRC for every CAN packet in a long acquisition.

▶ I²C decode showing results from a search for Address value 76. The white triangles indicate each instance of the Address value 76 in the record.

Perform Serial Debug for Common Standards

Serial Triggering and Analysis

One of the most common applications requiring long record length is serial data analysis in embedded system design. Embedded systems are literally everywhere. They can contain many different types of devices including microprocessors, microcontrollers, DSPs, RAM, EPROMs, FPGAs, A/Ds, D/As and I/O. These various devices have traditionally communicated with each other and the outside world using wide parallel buses. Today, however, more and more embedded systems are replacing these wide parallel buses with serial buses due to less board space required, fewer pins, lower power, embedded clocks, differential signaling for better noise immunity and most importantly, lower cost. While serial buses have a large number of benefits, they also present significant challenges that their predecessors (parallel buses) did not. Debugging bus and system problems can be more difficult, because it is harder to isolate

events of interest and it is more difficult to interpret what is displayed on the oscilloscope screen. The DPO3000 Series addresses these problems.

Bus Display – Provides a higher level, combined view of the individual signals (clock, data, chip enable, etc.) that make up your bus, making it easy to identify where packets begin and end and identifying sub-packet components such as address, data, identifier, CRC, etc.

Serial Triggering – Trigger on packet content such as start of packet, specific addresses, specific data content, unique identifiers, etc., on the popular serial interfaces I²C, SPI, CAN, LIN and RS232/422/485/UART.

Bus Decoding – Tired of having to visually inspect the waveform to count clocks, determine if each bit is a 1 or a 0, combine bits into bytes and determine the hex value? Let the oscilloscope do it for you! The oscilloscope can decode each packet on the bus and display the value in hex, binary, decimal, or ASCII (depending on the standard) in the bus waveform.

Packet Decode Table – In addition to seeing decoded packet data on the bus waveform itself, you can view all captured packets in a tabular view much like you would see on a logic analyzer. Packets are time-stamped and listed consecutively with columns for each component (Address, Data, etc.).

Search – Serial triggering is very useful for isolating the event of interest, but once you've captured it and need to analyze the surrounding data, what do you do? In the past, users had to manually scroll through the waveform counting and converting bits and looking for what caused the event. With the DPO3000 Series, you can have the oscilloscope search through the acquired data for user-defined criteria including serial packet content. Each occurrence is highlighted by a search mark. Rapid navigation between marks is as simple as pressing the **Previous** (←) and **Next** (→) buttons on the front panel.

▶ Wave Inspector Controls provide unprecedented efficiency in viewing, navigating and analyzing waveform data.

Designed to Make Your Work Easier

Wave Inspector® Navigation

Imagine trying to efficiently use the Internet if search engines such as Google and Yahoo didn't exist, web browser features such as Favorites and Links didn't exist, or Internet Service Providers like AOL or MSN weren't around. Now you know how most modern oscilloscope users feel when trying to actually use the long record length in their digital oscilloscope. Record length, one of the key specifications of an oscilloscope, is the number of samples it can digitize and store in a single acquisition. The longer the record length, the longer the time window you can capture with high resolution (high

sample rate). The first digital oscilloscopes could capture and store only 500 points which made it very difficult to acquire all relevant information around the event being investigated. Over the years, oscilloscope vendors have provided longer and longer record lengths to meet market demands for long capture windows with high resolution to the point that most mid-range oscilloscopes either come standard with, or can be optionally upgraded to, multi-million-point record lengths. These million-point record lengths often represent thousands of screens worth of signal activity. While standard record lengths have increased greatly over the years and can now satisfy the vast majority of applications in the marketplace, tools for effectively and efficiently viewing, navigating and analyzing long record length acquisitions have been sorely neglected until now. The DPO3000 Series addresses the need for working with long record lengths with the following innovative Wave Inspector controls:

Zoom/Pan – A dedicated, two-tier front-panel knob set provides intuitive control of both zooming and panning through acquired records. The inner knob adjusts the zoom factor (or zoom scale); turning it clockwise activates zoom and goes to progressively higher zoom factors, while turning it counter-

clockwise results in lower zoom factors and eventually turning zoom off. The outer knob pans the zoom box across the waveform to quickly get to the portion of the waveform you are interested in. The outer knob also utilizes force-feedback to determine how fast to pan on the waveform. The farther you turn the outer knob, the faster the zoom box moves. Pan direction is changed by simply turning the knob the other way. No longer do you need to navigate through multiple menus to adjust your zoom view.

Play/Pause – A dedicated **play/pause** button on the front panel scrolls the waveform across the display automatically while you look for anomalies or an event of interest. Playback speed and direction are controlled using the intuitive pan knob. Once again, turning the knob further makes the waveform scroll faster and changing direction is as simple as turning the knob the other way.

User Marks – See something interesting on your waveform? Press the **Set Mark** button on the front panel to leave one or more "bookmarks" on the waveform. Navigating between marks is as simple as pressing the **Previous** (←) and **Next** (→) buttons on the front panel.

Digital Phosphor Oscilloscopes
▶ DPO3000 Series

1 Zoom/Pan – Dedicated front panel controls for zooming and panning. The inner knob controls zoom factor while the outer ring pans the zoom box across the waveform. Navigating your waveform has never been easier.

2 Marks – Want to mark your waveform for future reference or for quick navigation between events of interest? Simply press the Set Mark button to place "bookmarks" on your waveform. Use the ← and → buttons to navigate through user marks and search generated marks.

3 Search – Tired of turning the horizontal position knob endlessly on your current scope to find the event you're looking for? Use the DPO3000's powerful Search feature to find and mark all occurrences of an event based on user specified criteria. Search types include edge, pulse width, runt, logic, setup and hold, rise/fall time, and I^2C, SPI, CAN, LIN and RS-232/422/485/UART packet content.

4 Serial Buses – Trigger on packet level content, view acquired data as a bus with all packets decoded into hex, binary, decimal or ASCII, search through acquisitions for specific packet content and even view all packets decoded in a tabular format, much like you would see on a logic analyzer. Serial standards supported include I^2C, SPI, CAN, LIN, and RS-232/422/485/UART packet content.

5 Stunning Display – The DPO3000 Series boasts a 9 in. (229 mm) widescreen high resolution (800x480 – WVGA) display.

6 USB – Use the front panel USB port for simple and convenient storage of screenshots, waveform data, and oscilloscope setups. Another USB host port is available on the rear panel for peripheral connections as well as a USB device port for instrument control using USBTMC.
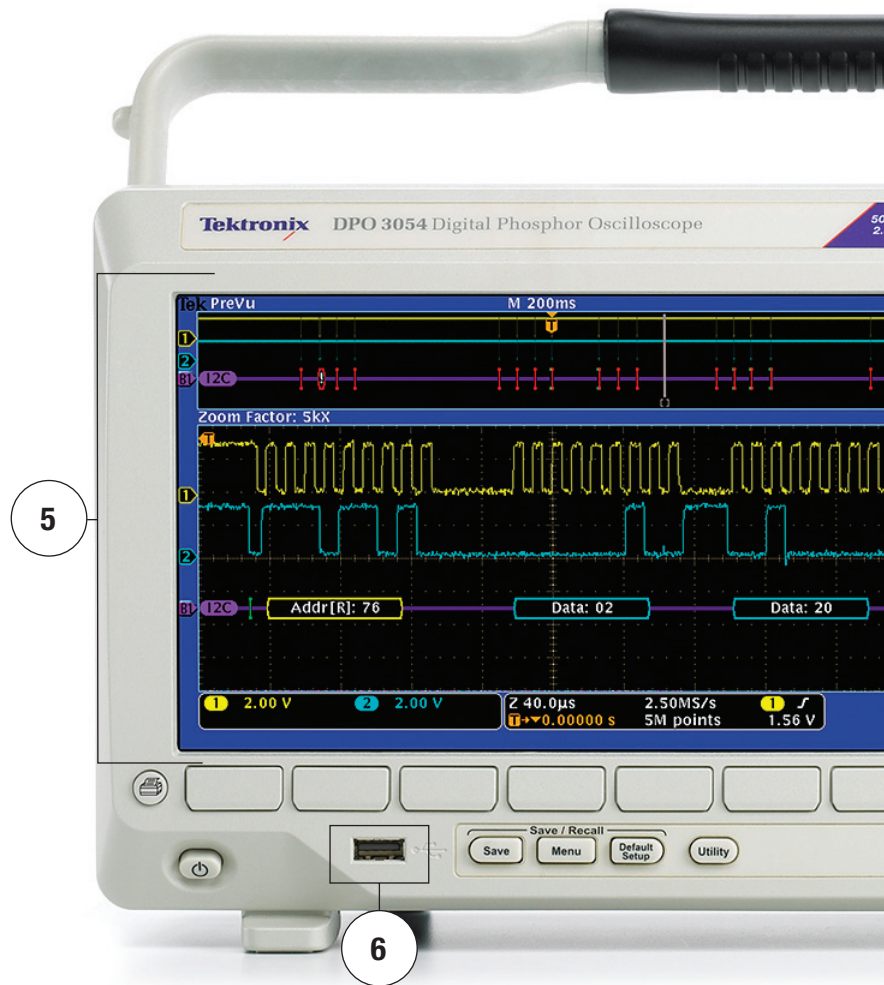
See the DPO3000 Serie
Try out the DPO3000 Virtual Oscilloscope
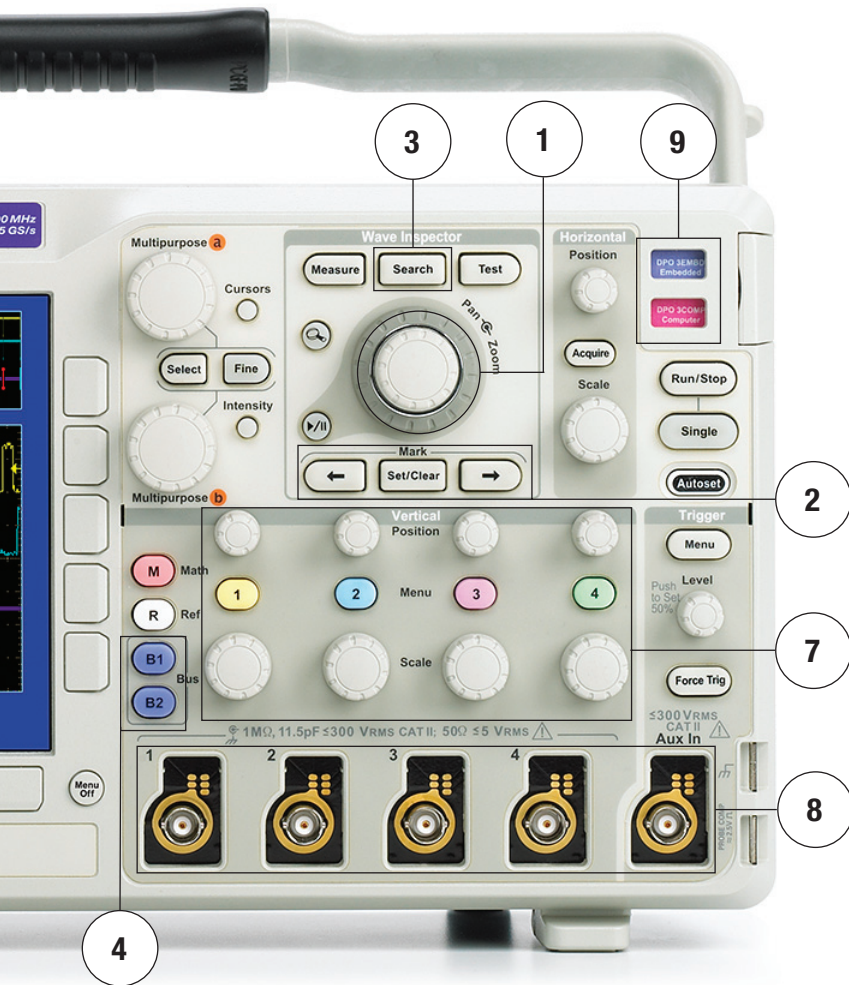
Only 5.4 in. Deep! – Despite the impressive performance, big display, and knob-per-channel controls, the DPO3000 Series is only 5.4 in. deep, saving you valuable space on your test bench.

9 Optional Application Modules – Application specific modules easily extend your oscilloscope's usage by adding serial bus triggering and decode or HDTV and custom video triggering.

- DPO3AUTO – Automotive bus serial triggering and decode with support for CAN and LIN buses.

- DPO3COMP – Computer bus serial triggering and decode with support for RS-232/422/485/UART buses.

- DPO3EMBD – Embedded bus serial triggering and decode with support for I^{2}C and SPI buses.

- DPO3VID – HDTV and custom video triggering.

7 Vertical Controls – Knob-per- channel vertical controls provide simple and intuitive operation. No longer do you need to share one set of vertical controls across all four channels!

8 TekVPI® – New TekVPI probe interface provides for direct connect current probes, intuitive comp box controls, remote control of probe settings and smarter communication between the oscilloscope and the probe.

es in action for yourself.
e at: www.tektronix.com/virtualdpo3000

Digital Phosphor Oscilloscopes
▶ DPO3000 Series
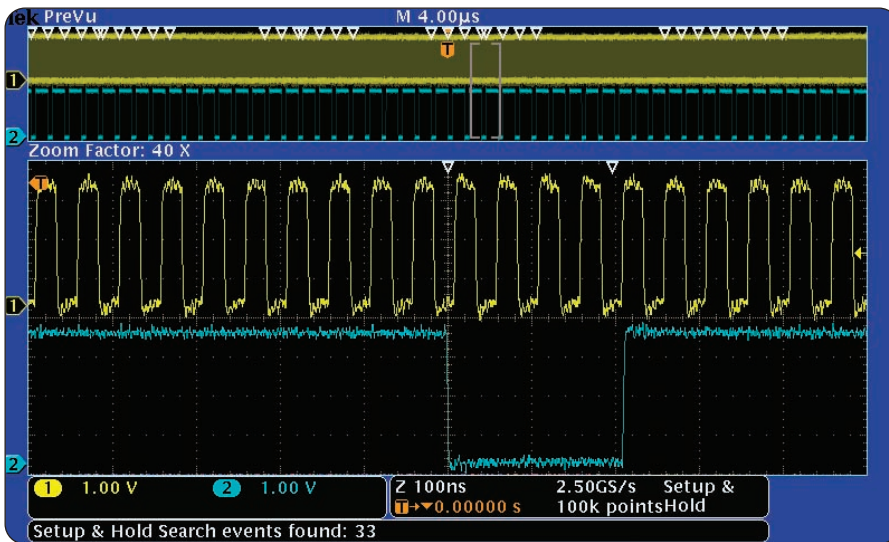
▶ Setup and Hold search results showing each violation of a setup and hold condition.

Search Marks – Don't want to take the time to inspect the entire acquisition to find the event you're looking for? The DPO3000 Series features robust waveform search that allows you to search through your long acquisition based on user-defined criteria. All occurrences of the event are highlighted with search marks and are easily navigated to, using the front panel's **Previous** (←) and **Next** (→) buttons. Search types include edge, pulse width, runt, logic, setup and hold, rise/fall time and I^2C, SPI, CAN, LIN, RS232/422/485/UART packet content.

PC Connectivity and USB Mass Storage

The DPO3000 Series delivers an unprecedented new level of USB plug-and-play operation and PC connectivity.

A USB port on the front panel enables easy transfer of screenshots, instrument settings and waveform data in the palm of your hand. Also, a second USB host port is on the rear of the instrument along with a USB device port which can operate as a USBTMC device port for controlling the oscilloscope remotely from a PC. An integrated 10/100 Ethernet port enables easy connection to networks. Acquiring data and measurements from the instrument is as simple as connecting a USB cable from the oscilloscope to the PC. Provided applications include NI LabVIEW SignalExpress™ Tektronix Edition, OpenChoice® Desktop and Microsoft Excel and Word toolbars enabling fast and easy direct communication with your Windows PC.
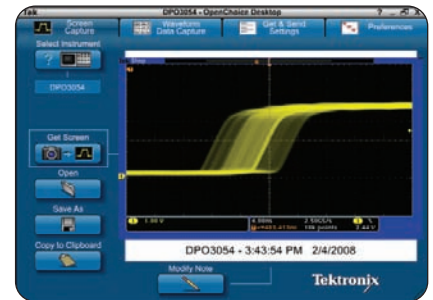
▶ OpenChoice® Desktop – Standard software seamlessly connects the oscilloscope to a PC.
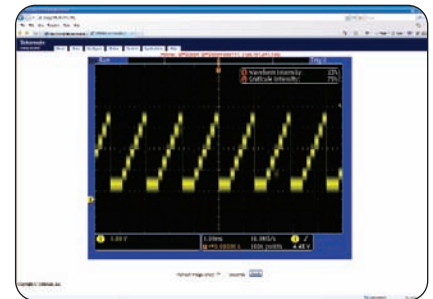
▶ e*Scope® enables control of your network connected oscilloscope from any network connected PC through a traditional browser interface.
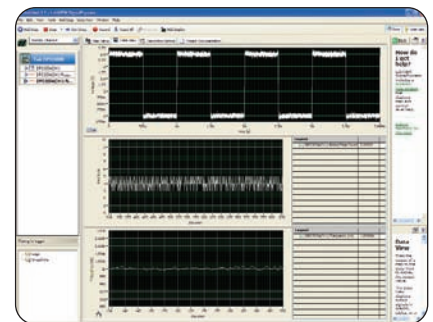
▶ NI LabVIEW SignalExpress Tektronix Edition – Fully interactive measurement acquisition and analysis software developed jointly with NI and optimized for the DPO Series.

TekVPI® Probing

The TekVPI probe interface sets the standard for ease of use in probing. TekVPI probes feature status indicators and controls, as well as a probe **menu** button right on the comp box itself. This button brings up a probe menu on the oscilloscope display with all relevant settings and controls for the probe. The TekVPI interface utilizes a new probe power management architecture enabling direct attachment of current probes. Finally, TekVPI probes can be controlled remotely via USB, GPIB or Ethernet, enabling more versatile solutions in ATE environments.

Additional Application Support

Video Design and Development

Many video engineers have remained loyal to analog oscilloscopes, believing the intensity gradations on an analog display are the only way to see certain video waveform details. The DPO3000 Series fast waveform capture rate, coupled with its intensity-graded view of the signal, provides the same information-rich display as an analog oscilloscope, but with much more detail and all the benefits of digital scopes. With up to 500 MHz band-width, four inputs and a built-in 75Ω input termination, the DPO3000 Series provides ample performance for analog and digital video use.

Finally, the DPO3000 Series video functionality is further extended with the optional DPO3VID video application module. DPO3VID provides the industry's most complete suite of HDTV and custom (non-standard) video triggers.

▶ TekVPI probe interface.
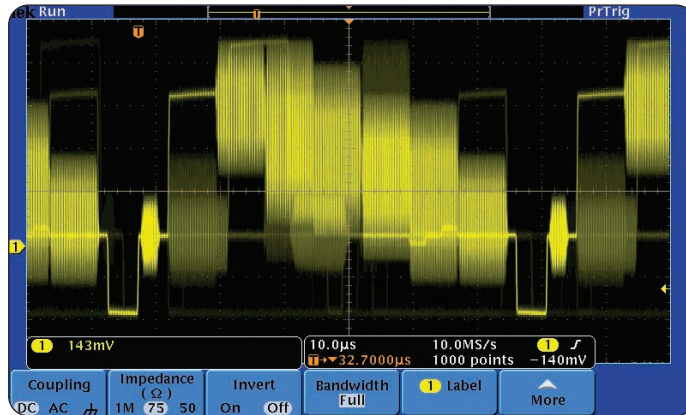
▶ Viewing an NTSC video signal. Notice the intensity-graded view provided by the DPO's ability to represent time, amplitude and distribution of amplitude over time.

Digital Phosphor Oscilloscopes
▶ DPO3000 Series

Digital Design and Debug

Today's digital designs often require careful layout of circuitry to guarantee consistent time alignment between clocks on circuit boards. Small differences in delays caused by routing issues or inconsistent propagation time across a circuit board can cause numerous issues with the operation of digital functional blocks. The DPO3000 Series can assist in finding those small phase shifts that occur between clocks as they migrate across a design. XY display of two clocks can give a quick visual indication of a phase difference between them. Frequency differences can also quickly be seen. This can be very helpful when determining how effective clock multiplier or divider networks are working.

The interoperability of the DPO3000 Series oscilloscope with the Tektronix TLA5000 Series logic analyzer made possible by Tektronix' Integrated View (iView™) feature enables digital designers to solve signal integrity challenges and effectively debug and verify their systems more quickly and easily. The iView feature fully integrates the industry-leading performance and measurement accuracy of a Tektronix oscilloscope with the multi-channel and powerful triggering capabilities of a Tektronix logic analyzer. This integration allows designers to view time-correlated digital and analog data in the same display window and isolate analog characteristics of digital signals that are causing failures in their systems. No user calibration is required. And, once set up, the iView feature is completely automated. The result – an integrated tool set for digital design and troubleshooting.
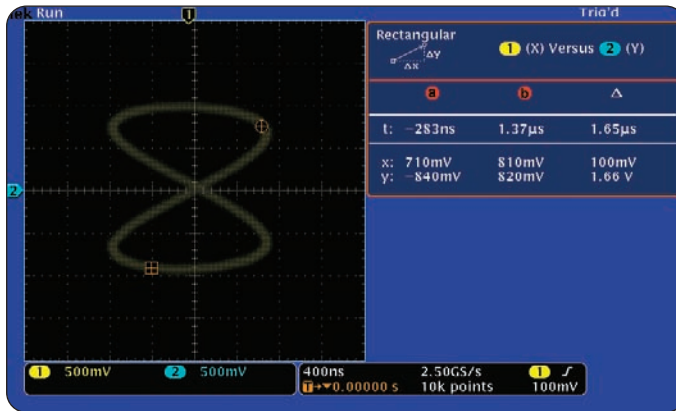
▶ XY display showing a 20 MHz clock and a 10 MHz clock.
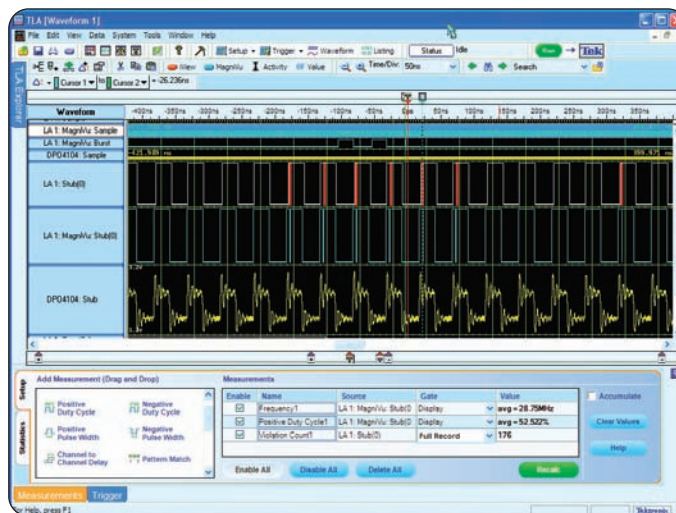
▶ Tektronix' Integrated View feature (iView™) fully integrates the performance and measurement accuracy of a Tektronix oscilloscope with the multi-channel and powerful triggering capabilities of a Tektronix logic analyzer in one display, allowing designers to quickly verify and debug their designs.

► Characteristics

Vertical System	DPO3012	DPO3014	DPO3032	DPO3034	DPO3052	DPO3054
Input Channels	2	4	2	4	2	4
Analog Bandwidth (–3dB)	100 MHz	100 MHz	300 MHz	300 MHz	500 MHz	500 MHz
Calculated Rise Time 5 mV/div (typical)	3.5 ns	3.5 ns	1.17 ns	1.17 ns	700 ps	700 ps
Hardware Bandwidth Limits	20 MHz or 150 MHz					
Input Coupling	AC, DC, GND					
Input Impedance	1 MΩ ±1%, 75 Ω ±1%, 50 Ω ±1%					
Input Sensitivity Range, 1 MΩ	1 mV/div to 10 V/div					
Input Sensitivity Range, 75 Ω, 50 Ω	1 mV/div to 1 V/div					
Vertical Resolution	8 bits (11 bits with Hi-Res)					
Max Input Voltage, 1 MΩ	300 V_{RMS} with peaks ≤±450 V					
Max Input Voltage, 75 Ω, 50 Ω	5 V_{RMS} with peaks ≤± 20 V					
DC Gain Accuracy	±1.5% with offset set to 0 V					
Offset Range	**1 MΩ**			**50 Ω, 75 Ω**		
1 mV/div to 99.5 mV/div	±1 V			±1 V		
100 mV/div to 995 mV/div	±10 V			±5 V		
1 V/div	±100 V			±5 V		
1.01 V/div to 10 V/div	±100 V			NA		
Channel-to-Channel Isolation (Any Two Channels at Equal Vertical Scale)	≥ 100:1 at ≤100 MHz and ≥ 30:1 at > 100 MHz up to the rated BW					

Horizontal System

All DPO3000 Models

Maximum Sample Rate (all channels) – 2.5 GS/s.
Maximum Record Length (all channels) – 5 M points.
Maximum Duration of Time Captured at Highest Sample Rate (all channels) – 2 ms.
Time base Range (S/div) – 1 ns to 1000 s.
Time base Delay Time Range – −10 divisions to 5000 s.
Channel-to-Channel Deskew Range – ±100 ns.
Timebase Accuracy – ±10 ppm over any ≥ 1 ms interval.

Trigger System

Main Trigger Modes – Auto, Normal and Single.
Trigger Coupling – DC, AC, HF reject (attenuates >50 kHz), LF reject (attenuates <50 kHz), noise reject (reduces sensitivity).
Trigger Holdoff Range – 20 ns to 8 s.

Sensitivity

Internal DC Coupled – 0.4 div DC to 50 MHz, increasing to 1 div at rated bandwidth.
External (Auxiliary Input) – 200 mV from DC to 50 MHz increasing to 500 mV at 250 MHz.

Trigger Level Range

Any Channel – ±8 divisions from center of screen.
External (auxiliary input) – ±8 V.

Acquisition Modes

Sample – Acquire sampled values.
Peak Detect – Captures narrow glitches at all real-time sampling rates.
Averaging – From 2 to 512 waveforms included in average.
Envelope – Min-max envelope reflecting Peak Detect data over multiple acquisitions.
Hi-Res – Real-time boxcar averaging reduces random noise and increases resolution.
Roll – Scrolls waveforms right to left across the screen at sweep speeds slower than or equal to 40 ms/div.

Trigger Modes

Edge – Positive or negative slope on any channel or front panel auxiliary input. Coupling includes DC, AC, HF reject, LF reject and noise reject.
Pulse Width – Trigger on width of positive or negative pulse that are >, <, = or ≠ a specified period of time.
Runt – Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again.
Logic – Trigger when any logical pattern of channels goes false or stays true for specified period of time. Any input can be used as a clock to look for the pattern on a clock edge. Pattern (AND, OR, NAND, NOR) specified for four input channels defined as High, Low or Don't Care.
Setup and Hold – Trigger on violations of both setup time and hold time between clock and data present on any two input channels.

Rise/Fall Time – Trigger on pulse edge rates that are faster or slower than specified. Slope may be positive, negative or either.
Video – Trigger on all lines, odd, even or all fields on NTSC, PAL and SECAM video signals.
Extended Video (optional) – Trigger on 480p/60, 576p/50, 720p/30, 720p/50, 720p/60, 875i/60, 1080i/50, 1080i/60, 1080p/24, 1080p/24sF, 1080p/25, 1080p/30, 1080p/50, 1080p/60 and custom bi-level and tri-level sync video standards.
I²C (optional) – Trigger on Start, Repeated Start, Stop, Missing ACK, Address (7 or 10 bit), Data or Address and Data on I²C buses up to 3.4 Mb/s.
SPI (optional) – Trigger on SS, MOSI, MISO or MOSI and MISO on SPI buses up to 10.0 Mb/s.
CAN (optional) – Trigger on Start of Frame, Frame Type (data, remote, error, overload), Identifier (standard or extended), Data, Identifier and Data, End of Frame, Missing ACK, or Bit Stuffing Error on CAN signals up to 1 Mb/s. Data can be further specified to trigger on ≤, <, =, >, ≥ or ≠ a specific data value. User-adjustable sample point is set to 50% by default.
LIN (optional) – Trigger on Sync, Identifier, Data, Id and Data, Wakeup Frame, Sleep Frame, Error up to 100 kb/s.
RS-232/422/485/UART (optional) – Trigger on Tx Start Bit, Rx Start Bit, Tx End of Packet, Rx End of Packet, Tx Data, Rx Data, Tx Parity Error and Rx Parity Error.
Trigger Delay by Time – 4 ns to 8 s.
Trigger Delay by Events – 1 to 9,999,999 events.

Waveform Measurements

Cursors – Waveform and Screen.

Automatic Measurements – 29, of which up to four can be displayed on screen at any one time. Measurements include: Period, Frequency, Delay, Rise Time, Fall Time, Positive Duty Cycle, Negative Duty Cycle, Positive Pulse Width, Negative Pulse Width, Burst Width, Phase, Positive Overshoot, Negative Overshoot, Peak to Peak, Amplitude, High, Low, Max, Min, Mean, Cycle Mean, RMS, Cycle RMS, Rising Edge Count, Falling Edge Count, Positive Pulse Count, Negative Pulse Count, Area and Cycle Area.

Measurement Statistics – Mean, Min, Max, Standard Deviation.

Reference Levels – User-definable reference levels for automatic measurements can be specified in either percent or units.

Gating – Isolate the specific occurrence within an acquisition to take measurements on, using either the screen, or waveform cursors. Measurements use full record by default.

Waveform Math

Arithmetic – Add, subtract, multiply and divide waveforms.

Math Functions – Integrate, Differentiate, FFT.

FFT – Spectral magnitude. Set FFT Vertical Scale to Linear RMS or dBV RMS and FFT Window to Rectangular, Hamming, Hanning, or Blackman-Harris.

Advanced Math – Define extensive algebraic expressions including waveforms, math functions, scalars, up to two user-adjustable variables and results of parametric measurements e.g.,(Intg(Ch1-Mean(Ch1)) x 1.414 x VAR1).

Software

NI LabVIEW SignalExpress™ Tektronix Edition – A fully interactive measurement software environment optimized for the DPO3000 Series, enables you to instantly acquire, generate, analyze, compare, import and save measurement data and signals using an intuitive drag-and-drop user interface that does not require any programming.

Standard DPO3000 Series support for acquiring, controlling, viewing and exporting your live signal data. A 30-day trial period of the Full Version provides additional signal processing, advanced analysis, mixed signal, sweeping, limit testing and user-defined step capabilities. Order SIGEXPTE for permanent Full Version capability.

OpenChoice® Desktop – Enables fast and easy communication between a Windows PC and the DPO3000 Series, via USB or LAN. Transfer and save settings, waveforms, measurements and screen images.

IVI Driver – Provides a standard instrument programming interface for common applications such as LabVIEW, LabWindows/CVI, Microsoft .NET and MATLAB.

Display Characteristics

Display Type – 9 in. (228.6 mm) wide format liquid crystal TFT color display.

Display Resolution – 800 horizontal x 480 vertical pixels (WVGA).

Waveform Styles – Vectors, Dots, Variable Persistence, Infinite Persistence.

Graticules – Full, Grid, Cross Hair, Frame, IRE and mV.

Format – YT and XY.

Waveform Capture Rate – Up to 50,000 wfm/s.

Input/Output Ports

USB 2.0 High Speed Host Port – Supports USB mass storage devices and printers. One port available on rear-panel and one on front-panel.

USB 2.0 High Speed Device Port – Rear panel connector allows for control of oscilloscope via USBTMC or GPIB with a TEK-USB-488.

LAN Port – RJ-45 connector, supports10/100Base-T.

Video Out Port – DB-15 female connector, connect to show the oscilloscope display on an external monitor or projector.

Auxiliary Input – Front panel BNC connector. Input Impedance 1MΩ. Max input 300V$_{RMS}$ Cat II with peaks ≤± 450 V.

Probe Compensator Output – Front panel pins. Amplitude 2.5 V. Frequency 1 kHz.

Trigger Out – Rear-panel BNC connector, provides a positive polarity pulse when the oscilloscope triggers.

Kensington Lock – Rear-panel security slot connects to standard Kensington lock.

Power Source

Power Source Voltage – 85 to 265 V ±10%.

Power Source Frequency – 45 to 440 Hz (85 to 265 V).

Power Consumption – 120 W maximum.

Optional TekVPI® Power Supply – Output Voltage – 12 V; Output Current – 5 A; Power Consumption – 60 W.

Physical Characteristics

Dimensions	mm	in.
Height	203.2	8
Width	416.6	16.4
Depth	137.2	5.4
Weight	**kg**	**lbs.**
Net	4.17	9.2
Shipping	8.62	19
Rackmount Configuration	5U	
Cooling Clearance	2 in. (51mm) required on left side and rear of instrument	

General Characteristics

Environmental

Temperature
Operating – 0 °C to +50 °C.
Non-operating – −40 °C to +71 °C.

Humidity
Operating – High: 30 °C to 50 °C, 5% to 45% Relative Humidity, Low: 0 °C to 30 °C, 5% to 95% Relative Humidity.
Non-operating – High: 30 °C to 50 °C, 5% to 45% Relative Humidity, Low: 0 °C to 30 °C, 5% to 95% Relative Humidity.

Altitude
Operating – 3,000 meters (9,843 feet).
Non-operating – 12,000 meters (39,370 feet).

Random Vibration
Operating – 0.31 G$_{RMS}$ from 5 to 500 Hz, 10 minutes each axis, 3 axes, 30 minutes total.
Non-operating – 2.46 G$_{RMS}$ from 5 to 500 Hz, 10 minutes each axis, 3 axes, 30 minutes total.

Regulatory
Electromagnetic Compatibility – 89/336/EEC.
Safety – UL61010-1,Second Edition; CAN/CSA C22.2 No. 1010.1 1992, EN61010-1:2001; IEC 61010-1:2001.

► Ordering Information

DPO3000 Series

DPO3012 – 100 MHz, 2.5 GS/s, 5M record length, 2-channel digital phosphor oscilloscope.

DPO3014 – 100 MHz, 2.5 GS/s, 5M record length, 4-channel digital phosphor oscilloscope.

DPO3032 – 300 MHz, 2.5 GS/s, 5M record length, 2-channel digital phosphor oscilloscope.

DPO3034 – 300 MHz, 2.5 GS/s, 5M record length, 4-channel digital phosphor oscilloscope.

DPO3052 – 500 MHz, 2.5 GS/s, 5M record length, 2-channel digital phosphor oscilloscope.

DPO3054 – 500 MHz, 2.5 GS/s, 5M record length, 4-channel digital phosphor oscilloscope.

Included: All models include: One P6139A 500MHz, 10x Passive Probe per Channel, Front Cover (200-5052-xx), User Manual, Documentation CD (063-4104-xx), OpenChoice® Desktop Software, NI LabVIEW SignalExpress™ Tektronix Edition LE Software, Calibration Certificate Documenting Traceability to National Metrology Institute(s) and ISO9001 Quality System Registration, Power Cord, Accessory Pouch (016-2008-xx), Three-year Warranty. Please specify power plug and manual language version when ordering.

Application Modules

DPO3AUTO – Automotive Serial Triggering and Analysis Module. Enables triggering on packet level information on CAN bus and LIN bus as well as analytical tools such as digital views of the signal, bus views, packet decoding, search tools and packet decode tables with timestamp information.

DPO3EMBD – Embedded Serial Triggering and Analysis Module. Enables triggering on packet level information on I^2C and SPI buses as well as analytical tools such as digital views of the signal, bus views, packet decoding, search tools and packet decode tables with timestamp information.

DPO3COMP – Computer Serial Triggering and Analysis Module. Enables triggering on packet level information on RS-232/422/485/UART buses as well as analytical tools such as digital views of the signal, bus views, packet decoding, search tools and packet decode tables with timestamp information.

DPO3VID – HDTV and Custom (non-standard) Video Triggering Module.

Instrument Options

Power Plug Options.

Opt. A0 – North America.

Opt. A1 – Universal Euro.

Opt. A2 – United Kingdom.

Opt. A3 – Australia.

Opt. A5 – Switzerland.

Opt. A6 – Japan.

Opt. A10 – China.

Opt. A11 – India.

Opt. A99 – No power cord.

Language Options[1]

Opt. L0 – English manual.

Opt. L1 – French manual.

Opt. L2 – Italian manual.

Opt. L3 – German manual.

Opt. L4 – Spanish manual.

Opt. L5 – Japanese manual.

Opt. L6 – Portuguese manual.

Opt. L7 – Simplified Chinese manual.

Opt. L8 – Traditional Chinese manual.

Opt. L9 – Korean manual.

Opt. L10 – Russian manual.

Opt. L99 – No manual.

Service Options[2]

Opt. C3 – Calibration Service 3 years.

Opt. C5 – Calibration Service 5 years.

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

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. R5 – Repair Service 5 years (including warranty).

Recommended Probes

TAP1500 – 1.5 GHz TekVPI® active voltage probe.

TDP0500 – 500 MHz TekVPI differential voltage probe with ±42 V differential input voltage.

TDP1000 – 1 GHz TekVPI differential voltage probe ±42 V differential input voltage.

TCP0030 – 120 MHz TekVPI 30 Ampere AC/DC current probe.

TCP0150 – 20 MHz TekVPI 150 Ampere AC/DC current probe.

TCPA300/400[3] – Current measurement systems.

P5205[3] – 1.3 kV, 100 MHz high-voltage differential probe.

P5210[3] – 5.6 kV, 50 MHz high-voltage differential probe.

P5100[3] – 2.5 kV, 100X high-voltage passive probe.

ADA400A[3] – 100X, 10X, 1X, 0.1X high-gain differential amplifier.

Recommended Accessories

Service Manual – Order 071-2422-xx (English only).

SIGEXPTE – NI LabVIEW SignalExpress Tektronix Edition Software.

TPA-BNC – TekVPI to TekProbe™ BNC adapter.

TekVPI® External Power Supply – Order 119-7465-xx.

TEK-USB-488 – GPIB to USB adapter.

Soft Transit Case – Order ACD4000.

Hard Transit Case – Order HCTEK4321 (requires ACD4000).

Rackmount Kit – Order RMD3000.

Warranty

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

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[1] Language options include translated front panel overlay for the selected language(s).

[2] Probes and accessories are not covered by the oscilloscope warranty and Service Offerings. Refer to the datasheet of each probe and accessory model for its unique warranty and calibration terms.

[3] Requires TekVPI® to TekProbe BNC adapter (TPA-BNC).

Digital Phosphor Oscilloscopes

▶ DPO3000 Series

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Updated 12 November 2007

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**

CE   ISO 9001   GPIB IEEE-488

Product(s) are manufactured in ISO registered facilities.

Product(s) complies with IEEE Standard 488.1-1987, RS-232-C and with Tektronix Standard Codes and Formats.

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