

# OSCILLOSCOPE

## SELECTION GUIDE



# OSCILLOSCOPE SELECTOR GUIDE

Tektronix offers oscilloscopes for many different applications and uses. To help you choose the right scope for your needs, the most common criteria for selecting a scope are listed below, along with helpful tips for determining your requirements.

## 1 Bandwidth

All oscilloscopes have a low-pass frequency response that rolls off at higher frequencies. Oscilloscope bandwidth is specified as being the frequency at which a sinusoidal input signal is attenuated to 70.7% of the signal's true amplitude – the -3 dB point. Your oscilloscope must have sufficient bandwidth to capture all relevant frequency components of your signal. If you regularly work with digital signals, it may be easier to consider bandwidth by comparing signal and oscilloscope rise time specifications. Use an oscilloscope with a rise time specification five times faster than your signal rise time to keep error below 2%.

**Rule: Bandwidth > 5 x Highest Signal Frequency**

## 2 Sample Rate

The faster an oscilloscope samples, the greater the resolution and detail of the displayed waveform, and the less likely that critical information or events will be lost. Tektronix recommends at least 5X oversampling to ensure signal details are captured and to avoid aliasing.

**Rule: Sample Rate > 5 x (Highest Frequency Component)**

## 3 Record Length

Record length is the number of samples the oscilloscope can digitize and store in a single acquisition. Since an oscilloscope can store only a limited number of samples, the waveform duration – or length of “time” captured – will be inversely proportional to the oscilloscope's sample rate. A longer record length enables a longer time window to be captured with high resolution.

**Rule: Captured Time = (Record Length) / (Sample Rate)**

## 4 Digital Channels and Spectrum Analyzer Input

Today's oscilloscopes offer more than just analog channels for system-level troubleshooting of complex designs.

- If you need to analyze a parallel bus or multiple serial buses, the Tektronix MSO Series of mixed signal oscilloscopes and MDO Series of mixed domain oscilloscopes offer 16 digital channels and up to 4 analog channels for analyzing multiple signals at once.
- If you are working with RF signals, the Tektronix MDO Series of mixed domain oscilloscopes offers a built-in spectrum analyzer for time-correlated analysis of analog, digital and RF signals.

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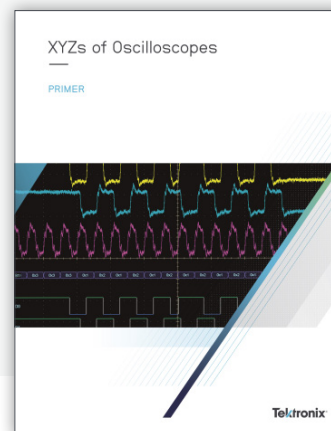
## 5 Features and Analysis Capability

Tektronix oscilloscopes offer a range of features and analysis capabilities. When choosing your scope, you should review available triggers, waveform search tools, automated measurements, and analysis packages such as serial bus analysis, jitter and power analysis to ensure they meet your needs.

# CHOOSING YOUR OSCILLOSCOPE

Engineers, technicians and educators all have different workloads, different measurement needs, and different environments. To meet your needs Tektronix offers a wide range of oscilloscopes. This guide gives an overview of the various types of oscilloscopes currently available, along with high-level specifications that you can use for comparison.

If you need a refresher on oscilloscope specifications, download the [XYZs of Oscilloscopes Primer](#).



## TYPES OF OSCILLOSCOPES



### Mixed Domain Oscilloscopes – 100 MHz to 1 GHz

The new standard for design and debug work. They offer the same capabilities as mixed signal oscilloscopes, but they also offer a built-in spectrum analyzer, adding RF debugging to the analog/digital capabilities.



### Mixed Signal Oscilloscopes – 70 MHz to 2 GHz

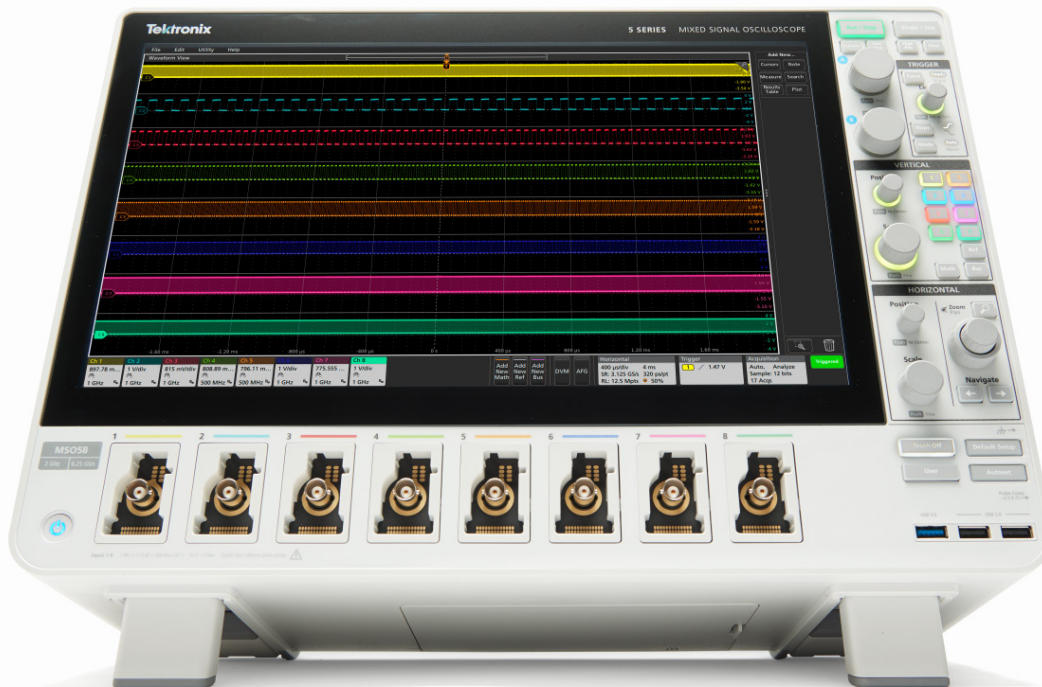
The engineer's choice for design and debug. They combine traditional oscilloscope input channels with 64 digital input channels, long record length with powerful search features, and protocol support for serial buses.



### Advanced Signal Analysis Oscilloscopes – 350 MHz to 70 GHz

The emphasis is on analysis. They provide high acquisition performance and run Windows, thus supporting a wide range of analysis software. MSO versions include digital channels. They can be equipped for serial data analysis, jitter analysis, standards testing, and serial decoding capability.

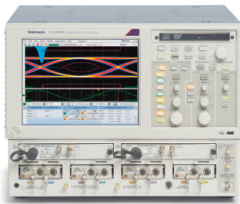
For an in-depth look at all of our products, including demos and 360-degree product explorers, please visit [www.tektronix.com](http://www.tektronix.com). All information on [www.tektronix.com](http://www.tektronix.com) supersedes all other information.



## 5 Series MSO

The most flexible, configurable and easy-to-use oscilloscope that delivers the fastest time-to-insight to designers and technicians developing modern embedded systems, by providing FlexChannel technology, 5-in-1 instrument integration, and a next-generation user interface.

[LEARN MORE](#)



## Sampling Oscilloscopes – DC to 80 GHz

For very high speed signal analysis, both electrical and optical, our sampling oscilloscopes support jitter and noise analysis with ultra-low jitter acquisitions. They also perform TDR and S-parameter measurements.



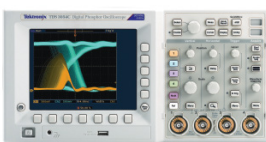
## Basic Oscilloscopes – 30 MHz to 200 MHz

For basic signal visualization and more, these instruments are solid performers with ample supporting materials, and generous warranties. Special features for education.



## Battery Powered Oscilloscopes with Isolated Channels – 100 MHz to 200 MHz

Safely and easily make 4-channel floating measurements, including 3-phase power measurements



## TDS Series Oscilloscopes – 50 MHz to 500 MHz

These capable industry-favorites have a large installed base, and thousands of companies rely on them as part of their test and measurement fleets. They continue to be fully supported.

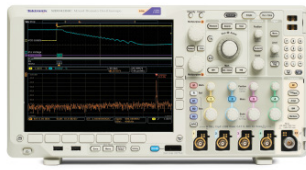


# MIXED SIGNAL AND MIXED DOMAIN OSCILLOSCOPES



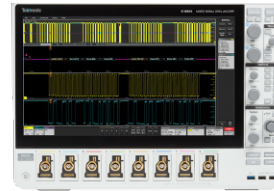
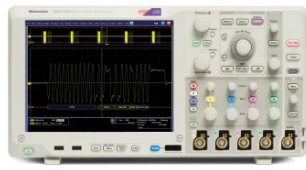
	MSO/DPO2000B	MDO3000
<b>Additional Resources</b>		
<b>Channels</b>	2, 4 analog channels; 16 digital channels (MSO2000B)	2, 4 analog channels; 16 digital channels (MDO3MSO option) 1 spectrum analyzer input 1 Arbitrary/Function Generator (MDO3AFG option)
<b>Bandwidth</b>	70 MHz to 200 MHz	100 MHz to 1 GHz
<b>Spectrum Analyzer Frequency Range</b>	—	Standard: 9 kHz to Analog Bandwidth Optional: 9 kHz to 3 GHz
<b>Sample Rate</b>	1 GS/s (analog); 1 GS/s (digital, only 1 pod); 500 MS/s (digital, both pods)	2.5 GS/s to 5 GS/s (analog); 121.2 ps (8.25 GS/s) MagniVu™ (digital)
<b>Max Record Length</b>	1 Mpoints	10 Mpoints
<b>Trigger Types</b>	Edge, Logic, Pulse Width, Runt, Setup and Hold, Rise/Fall Time, Video, I <sup>2</sup> C*, SPI*, CAN*, LIN*, RS-232/422/485/UART*, Parallel (MSO2000B) *Optional	Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Setup and Hold, Rise/Fall Time, Video, Extended Video, I <sup>2</sup> C*, SPI*, CAN FD*, CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, I <sup>2</sup> S/LJ/RJ/TDM*, MIL-STD-1553*, USB 2.0*, Parallel (with MDO3MSO option) *Optional
<b>Optional Serial Bus Decode and Analysis</b>	DPO2AUTO: CAN and LIN DPO2COMP: RS-232/422/485/UART DPO2EMBD: I <sup>2</sup> C, SPI DPO2BND: Includes DPO2AUTO, DPO2COMP, DPO2EMBD	MDO3AERO: MIL-STD-1553 MDO3AUDIO: I <sup>2</sup> S, LJ, RJ, TDM MDO3AUTO: CAN FD, CAN and LIN MDO3COMP: RS-232/422/485/UART MDO3EMBD: I <sup>2</sup> C, SPI MDO3FLEX: FlexRay MDO3USB: USB2.0 MDO3BND: Enables MDO3AERO, MDO3AUDIO, MDO3AUTO, MDO3COMP, MDO3EMBD, MDO3FLEX, MDO3LMT, MDO3PWR, MDO3USB
<b>Connectivity</b>	USB Host, USB Device, GPIB*, Optional DPO2CONN Module: LAN (10/100 Base-T Ethernet) and Video Out *Optional	USB Host (x2), USB Device, LAN (10/100 Base-T Ethernet, LXI Core 2011 Compliant), Video Out, GPIB* *Optional
<b>Waveform Math and Analysis</b>	29 Automated Measurements, Waveform and Screen Cursors: Arithmetic Waveform Math, FFT	44 Automated Measurements, Waveform and Screen Cursors, Advanced Math, FFT, Measurement Statistics, Waveform Histograms <b>Optional:</b> MDO3PWR: Power Analysis MDO3LMT: Limit/mask test MDO3BND: Enables MDO3AERO, MDO3AUDIO, MDO3AUTO, MDO3COMP, MDO3EMBD, MDO3FLEX, MDO3LMT, MDO3PWR, MDO3USB
<b>Software</b>	PC communications software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop
<b>Upgrade</b>	<ul style="list-style-type: none"> <li>Add serial bus triggering and decode</li> </ul>	<ul style="list-style-type: none"> <li>Increase bandwidth</li> <li>Add Arbitrary/Function generator</li> <li>Add 16 digital channels</li> <li>Increase spectrum analyzer maximum frequency to 3 GHz</li> <li>Add measurements and analysis (power, limit/mask)</li> <li>Add serial bus triggering and decode</li> <li>Add security for password control of ports and firmware updates</li> </ul>

# MIXED SIGNAL AND MIXED DOMAIN OSCILLOSCOPES



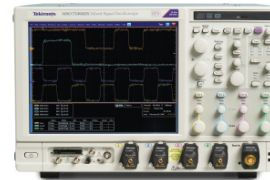
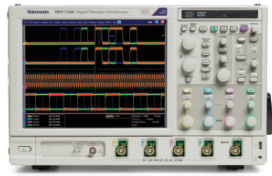
MDO4000C	
<b>Additional Resources</b>	
<b>Channels</b>	4 analog channels; 16 digital channels (with MDO4MSO option); 1 spectrum analyzer input (with SA3 or SA6 option); 1 Arbitrary/Function Generator (with MDO4AFG option)
<b>Bandwidth</b>	200 MHz to 1 GHz
<b>Spectrum Analyzer Frequency Range</b>	Optional: 9 kHz - 3 GHz or 9 kHz - 6 GHz
<b>Sample Rate</b>	2.5 GS/s to 5 GS/s (analog); 60.6 ps (16.5 GS/s) MagniVu™ (digital)
<b>Max Record Length</b>	20 Mpoints
<b>Trigger Types</b>	RF Power Level**, Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Setup and Hold, Rise/Fall Time, Video, Extended Video*, I <sup>2</sup> C*, SPI*, USB*, Ethernet*, CAN FD*, CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, I <sup>2</sup> S/LJ/RJ/TDM*, MIL-STD-1553*, Parallel* *Optional **With optional MDO4TRIG module, RF power level can be used as source for Pulse Width, Timeout, Runt, Logic, Sequence
<b>Optional Serial Bus Decode and Analysis</b>	DPO4AERO: MIL-STD-1553 DPO4AUDIO: I <sup>2</sup> S, LJ, RJ, TDM DPO4AUTO: CAN FD, CAN and LIN DPO4AUTOMAX: CAN FD, CAN, LIN and FlexRay DPO4COMP: RS-232/422/485/UART DPO4EMBD: I <sup>2</sup> C, SPI DPO4ENET: 10Base-T, 100Base-TX Ethernet DPO4USB: USB DPO4BND: Enables DPO4AERO, DPO4AUDIO, DPO4AUTO, DPO4COMP, DPO4EMBD, DPO4ENET, DPO4LMT, DPO4PWR, DPO4USB, DPO4VID
<b>Connectivity</b>	USB Host (x4), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Core 2011 Compliant), Video Out, GPIB* *Optional
<b>Waveform Math and Analysis</b>	44 Automated Measurements, Waveform and Screen Cursors, Spectrum Math, FFT, Advanced Math, Measurement Statistics, Waveform Histograms <b>Optional:</b> DPO4LMT: Limit and Mask Testing MDO4TRIG: Adv. RF Power Level Trigger DPO4PWR: Power Analysis DPO4VID: HDTV and Custom Triggering DPO4BND: Enables DPO4AERO, DPO4AUDIO, DPO4AUTO, DPO4COMP, DPO4EMBD, DPO4ENET, DPO4LMT, DPO4PWR, DPO4USB, DPO4VID
<b>Software</b>	PC Communications Software: OpenChoice® Desktop Vector Signal Analysis Software: SignalVu-PC
<b>Upgrade</b>	<ul style="list-style-type: none"> <li>• Increase bandwidth</li> <li>• Add Arbitrary/Function Generator</li> <li>• Add 16 digital channels</li> <li>• Add or upgrade spectrum analyzer channel</li> <li>• Add measurements &amp; analysis (power, limit/mask, video, RF trigger)</li> <li>• Add serial bus triggering and decode</li> <li>• Add security for password control of ports and firmware updates</li> </ul>

# ADVANCED SIGNAL ANALYSIS OSCILLOSCOPES



	MSO/DPO5000B	5 SERIES MSO
<b>Additional Resources</b>		
<b>Channels</b>	4 analog channels; 16 digital channels (MSO5000B)	4, 6, and 8 FlexChannels®; 8 digital channels per FlexChannel (optional); 1 Arbitrary/Function Generator (with 5-AFG option)
<b>Bandwidth</b>	350 MHz to 2 GHz	350 MHz to 2 GHz
<b>Sample Rate</b>	5 GS/s to 10 GS/s (analog); 60.6 ps (16.5 GS/s) MagniVu™ (digital)	6.25 GS/s (analog); 6.25 GS/s (digital)
<b>Max Record Length</b>	Up to 250 Mpoints	Up to 125 Mpoints
<b>Trigger Types</b>	Edge, Sequence, Logic, Pulse Width, Glitch, Runt, Timeout, Transition, Setup and Hold, Rise/Fall Time, Video, I²C*, SPI*, USB (Low, Full, High)*, RS-232/422/485/UART*, USB*, Ethernet*, CAN*, LIN*, FlexRay*, MIL-STD-1553*, Parallel (MSO5000B), Visual Trigger *Optional	Edge, Sequence, Logic, Pulse Width, Runt, Timeout, Window, Setup and Hold, Rise/Fall Time, I²C*, SPI*, USB*, Ethernet*, CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, I²S/LJ/RJ/ TDM*, Parallel *Optional
<b>Optional Serial Bus Decode and Analysis</b>	SR-AERO: MIL-STD-1553 SR-AUTO: CAN/LIN/FlexRay SR-COMP: RS-232/422/485/UART SR-DPHY: MIPI D-PHY SR-EMBD: I²C, SPI SR-ENET: 10/100Base-T Ethernet SR-USB: USB	5-SRAUDIO: I²S, LJ, RJ, TDM 5-SRAUTO: CAN, LIN, FlexRay 5-SRCOMP: RS-232/422/485/UART 5-SREMBD: I²C, SPI 5-SRENET: Ethernet 5-SRUSB2: USB 2.0
<b>Connectivity</b>	USB Host (x6), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), Video Out, GPIB* *Optional	USB Host (x7), USB 3.0 Device, LAN (10/100/1000 Base-T Ethernet, 1.4 LXI Core 2011 Compliant), Display Port, DVI-D, Video Out
<b>Waveform Math and Analysis</b>	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms, Waveform Limit Testing <b>Optional:</b> BRR: BroadR-Reach Compliance Test; DDRA: DDR Memory Bus Analysis; DJA: DPOJET Advanced Jitter and Eye Diagram Analysis; ET3: Ethernet Compliance Test Solution; MTM: Mask Testing; PWR: Power Analysis; SignalVu Vector Signal Analysis; USB2: USB Compliance Test Solution; MOST: MOST 50/150 Compliance Test Solution; HSIC: HSIC Electrical Validation; USBPWR: USB Power Adapter/ EPS Compliance Automated Test Solution	36 Automated Measurements, Waveform and Screen Cursors, Arithmetic Waveform Math, FFT, Advanced Math, Measurement Statistics <b>Optional:</b> 5-DJA: DPOJET Advanced Jitter and Eye Diagram Analysis; DVM/Trigger Frequency Counter (free with product registration)
<b>Software</b>	Optional: TekScope Anywhere™	Optional: TekScope Anywhere™
<b>Upgrade</b>	<ul style="list-style-type: none"> <li>• Add 16 digital channels</li> <li>• Add extended record length, up to 250 Mpoints</li> <li>• Add serial bus compliance testing</li> <li>• Add measurements and analysis (power, jitter, mask, RF)</li> <li>• Add serial bus triggering and decode</li> </ul>	<ul style="list-style-type: none"> <li>• Add serial bus triggering and decode</li> <li>• Add digital channels with each TLP058 logic probe</li> <li>• Add extended record length, up to 125 Mpoints</li> <li>• Add measurements and analysis (jitter)</li> </ul>

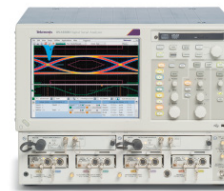
# ADVANCED SIGNAL ANALYSIS OSCILLOSCOPES



	DPO7000C	MSO/DP070000
<b>Additional Resources</b>		
<b>Channels</b>	4 analog channels	4 analog channels; 16 digital channels (MSO70000)
<b>Bandwidth</b>	500 MHz to 3.5 GHz	4 GHz to 33 GHz Analog
<b>Sample Rate</b>	10 GS/s to 40 GS/s	25 GS/s to 100 GS/s (analog); 80 ps (12.5 GS/s) (digital)
<b>Max Record Length</b>	Up to 500 Mpoints	Up to 1Gpoints
<b>Trigger Types</b>	Pinpoint™ Triggering, Edge, Glitch, Pulse Width, Runt, Time-out, Transition, Setup/Hold, Pattern, State, Window, Trigger Delay (by Time and by Event), I <sup>2</sup> C*, SPI*, USB (Low, Full)*, RS-232/422/485/UART*, I <sup>2</sup> C*, SPI*, USB*, Ethernet*, CAN*, LIN*, FlexRay*, RS-232/422/485/UART*, MIL-STD-1553, Visual Trigger *Optional	Pinpoint™ Triggering, Edge, Glitch, Pulse Width, Runt, Time-out, Transition, Setup/Hold, Pattern, State, Window, Trigger Delay (by Time and by Event), I <sup>2</sup> C*, SPI*, USB (Low, Full)*, RS-232/422/485/UART*, Serial Pattern*, Visual Trigger* *Optional
<b>Optional Serial Bus Decode and Analysis</b>	SR-AERO: MIL-STD-1553 SR-AUTO: CAN/LIN/FlexRay SR-COMP: RS-232/422/485/UART SR-DPHY: MIPI D-PHY SR-EMBD: I <sup>2</sup> C, SPI SR-ENET: 10/100Base-T Ethernet SR-PCIE: PCI Express SR-USB: USB	SR-AERO: MIL-STD-1553; SR-AUTO: CAN/LIN/FlexRay; SR-COMP: RS-232/422/485/UART; SR-DPHY: MIPI D-PHY; SR-EMBD: I <sup>2</sup> C, SPI; SR-ENET: 10/100Base-T Ethernet SR-PCIE: PCI Express; SR-USB: USB; SR-810B: 8b/10b; 10G-KR: 10GBASE-KR/KR4
<b>Connectivity</b>	USB Host (x5), LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), GPIB, eSATA, DVI, VGA	USB Host (x5), LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), GPIB, eSATA, DVI, VGA
<b>Waveform Math and Analysis</b>	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms, Waveform Limit Testing <b>Optional:</b> BRR: BroadR-Reach Compliance Test; DDRA: DDR Memory Bus Analysis; DJA: DPOJET Advanced Jitter and Eye Diagram Analysis; Ethernet Compliance; Waveform Limit Testing; Mask Testing; Power Analysis; USB2 and USB3 Compliance and Analysis; USB Power Adapter/ EPS Compliance Automated Test Solution; MOST 50/150 Compliance Test; SignalVu Vector Signal Analysis; HDMI Compliance Test; HSIC Electrical Validation; MIPI D-PHY and M-PHY Characterization and Analysis; SAS Testing; SFP+ Compliance and Debug; Serial Data Link Analysis; 10G-KR Compliance and Debug; PCIe Compliance and Debug; Thunderbolt Characterization, Compliance and Debug; UHS Measurements; PAM4 Transmitter Analysis Software; SignalCorrect Cable, Channel and Probe Compensation Software	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms <b>Optional:</b> BRR: BroadR-Reach Compliance Test; DDR Memory Bus Analysis; DPOJET Advanced Jitter and Eye Diagram Analysis; Ethernet Compliance; Waveform Limit Testing; Mask Testing; Power Analysis; USB2 and USB3 Compliance and Analysis; USB Power Adapter/ EPS Compliance Automated Test Solution; MOST 50/150 Compliance Test; SignalVu Vector Signal Analysis; HDMI Compliance Test; HSIC Electrical Validation; MIPI D-PHY and M-PHY Characterization and Analysis; SAS Testing; SFP+ Compliance and Debug; Serial Data Link Analysis; 10G-KR Compliance and Debug; PCIe Compliance and Debug; Thunderbolt Characterization, Compliance and Debug; UHS Measurements; PAM4 Transmitter Analysis Software; SignalCorrect Cable, Channel and Probe Compensation Software
<b>Software</b>	<b>Optional:</b> TekScope Anywhere™	<b>Optional:</b> TekScope Anywhere™
<b>Upgrade</b>	<ul style="list-style-type: none"> <li>Trade in older DPO7000 Series models for credit toward the newest DPO7000C version (50% credit of the old scope price)</li> <li>Add extended record length, up to 500 Mpoints</li> <li>Add serial bus compliance testing</li> <li>Add measurements and analysis (power, jitter, mask, RF)</li> <li>Add serial bus triggering and decode</li> </ul>	<ul style="list-style-type: none"> <li>Increase bandwidth</li> <li>Add 16 digital channels</li> <li>Upgrade older platforms to the latest platforms</li> <li>Add extended record length, up to 1 Gpoints</li> <li>Add serial bus compliance testing</li> <li>Add measurements and analysis (jitter, DDR, mask, RF)</li> <li>Add serial bus triggering and decode</li> </ul>

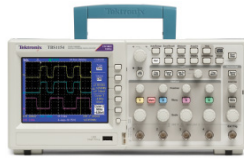


# ADVANCED SIGNAL ANALYSIS AND SAMPLING OSCILLOSCOPES



	DP070000SX	DSA8300
<b>Additional Resources</b>		
<b>Channels</b>	2 or 4 analog channels	Six modules support up to 8 single ended or 4 differential channels and/or 2 optical channels
<b>Bandwidth</b>	23 GHz to 70 GHz	Up to 70+ GHz Electrical bandwidth and 80+ Optical bandwidth modules available with intrinsic jitter as low as <100 fs RMS
<b>Sample Rate</b>	50 GS/s to 200 GS/s	300 ks/s Maximum sample rate
<b>Max Record Length</b>	Up to 1Gpoints	50 to 16,000 per channel native record length; with up to 1M points when using available IConnect Signal Integrity Software, 10M samples (100k unit intervals, 100 samples per unit interval) when equipped with available 80SJNB Jitter, Noise and BER Analysis software
<b>Trigger Types</b>	Pinpoint™ Triggering, Edge, Glitch, Pulse Width, Runt, Time-out, Transition, Setup/Hold, Pattern, State, Window, Trigger Delay (by Time and by Event), Visual Trigger* *Optional	Clock Input/Prescale Trigger, TDR clock (generated internally), Clock Recovery from Optical Sampling modules and Electrical Clock Recovery modules, and Phase Reference time base supports acquisitions Free Run mode and Trigger Direct Input for <100 fs RMS intrinsic jitter typical
<b>Optional Serial Bus Decode and Analysis</b>	SR-COMP: RS-232/422/485/UART; SR-EMBD: I2C, SPI; SR-ENET: 10/100Base-T Ethernet SR-PCIE: PCI Express; SR-USB: USB; SR-810B: 8b/10b	80SJNB Jitter, Noise, BER, Serial Data Link and PAM4 Analysis Software; IConnect Signal Integrity Software; 100GBASE-SR4 Transmitter & Dispersion Eye Closure (TDEC) Automation Test Solution
<b>Connectivity</b>	USB2.0 Host (4 on front)/3.0 Host (4 on rear), USB Device, LAN (10/100/1000 Base-T Ethernet, LXI Class C Compliant), DVI, VGA, DisplayPort (2)	3 USB 2.0 Port(s) connector on the front panel, 4 USB 2.0 Ports on the rear panel; LAN PORT, RJ-45 connector, supports 10BASE-T, 100BASE-T, 1000BASE-T on rear panel; 1 Serial Port, DB-9 COM1, COM2 ports; 1 DVI IEEE488.2 connector on rear panel; 1 DVI connector, female on rear panel, DVI to VGA 15-pin D-sub connector adapter provided; PS2 Serial Ports Mouse and keyboard inputs; Audio Ports 1/8 in. microphone input and line output
<b>Waveform Math and Analysis</b>	53 Automated Measurements, Waveform and Screen Cursors, Arithmetic and Advanced Waveform Math, FFT, Measurement Statistics, Waveform Histograms <b>Optional:</b> DPOJET Noise, Jitter and Eye Analysis Tools; Frequency Counter-Timer; PAM4 Transmitter Analysis Software; Serial Data Link Analysis; 10G/40G/100G KR4/CR4 Transmitter Compliance; DDR Memory Bus Analysis; DisplayPort 1.2/1.4 Test Software; MIPI D-PHY Transmitter Debug and Compliance Test Solution; EDP Compliance Test Package; Ethernet Compliance Testing; Fiber Channel Essentials; HDMI 2.0 Analysis and Compliance; High Speed Serial Link Training Analysis; HDMI Compliance Testing; MIPI M-PHY Debug and Compliance Test; NBASE-T TekExpress Conformance and Debug Software; PCI Express Gen1/2/3/4 TekExpress Compliance/Debug; Power Measurement and Analysis Software; SAS-3 Tx Compliance Test; SATA PHY Transmitter Test; SignalCorrect Cable, Channel, and Probe Compensation Software; SFP+ Compliance and Debug Solution; Embedded Serial Triggering and Analysis (I2C, SPI); USB 2.0/3.0/3.1 Automated Compliance Test; SignalVu Vector Signal Analysis	Over 120 automated measurements include RZ, NRZ, and pulse signal types, and the following measurement types, plus 8 math waveforms using the following math functions: Add, Subtract, Multiply, Divide, Average, Differentiate, Exponential, Integrate, Natural Log, Log, Magnitude, Min, Max, Square Root, and Filter. In addition, measurement values can be utilized as scalars in math waveform definitions; Mask support for many applications, standard masks are available as predefined, built-in masks; Automated Masked Margin based on Mask Hit Ratio as required by many standards.
<b>Software</b>	Optional: TekScope Anywhere™	Windows® 7 Ultimate (32-bit) Operating System; IConnect Signal Integrity Software for frequency domain analysis, S-parameter measurements, and impedance characterization 80SJNB Jitter, Noise, BER, and Serial Link analysis including Cross-Talk aware TJ (BUJ and PAM4 Analysis); 80SJARB Jitter Analysis of Arbitrary Data with J2-J9 measurements, and support for pattern lengths to PRBS31; 100GBASE-SR4 (IEEE 802.3bm) optical transmitter characterization measurements, including TDEC, signaling rate, Average Launch Power, OMA, ER, Transmitter Eye Mask
<b>Upgrade</b>	<ul style="list-style-type: none"> <li>• Increase bandwidth</li> <li>• Upgrade older platforms to the latest platforms</li> <li>• Add extended record length, up to 1 G points</li> <li>• Add measurements and analysis (jitter, mask, RF)</li> </ul>	<ul style="list-style-type: none"> <li>• Modular architecture lets you add channels or bandwidth</li> <li>• Add TDR, optical and electrical standards support</li> <li>• Add advanced analysis, compliance test, frequency domain analysis software</li> <li>• Add clock recovery trigger pickoff (CRTP) to select optical modules</li> <li>• Enhance system jitter floor performance to &lt;100 fs RMS</li> </ul>

# BASIC OSCILLOSCOPES



	TBS1000	TBS1000B/ TBS1000B-EDU	TBS2000
Additional Resources			
Channels	4	2	2, 4
Bandwidth	60 MHz to 150 MHz	30 MHz* to 200 MHz * 30 MHz TBS1032B available in North America and Europe	70 MHz , 100 MHz
Sample Rate	1 GS/s	500 MS/s to 2 GS/s	1 GS/s
Max Record Length	2.5 k points	2.5 k points	20 M points
Trigger Types	Edge, Pulse (width), Video	Edge, Pulse (width), Video	Edge, Pulse (width), Runt
Optional Serial Bus Decode and Analysis	—	—	—
Connectivity	USB Host, USB Device, <b>Optional:</b> GPIB	USB Host, USB Device, <b>Optional:</b> GPIB	USB Host, Wi-Fi adapter support, 10/100 Base-T Ethernet port
Waveform Math and Analysis	16 Automated Measurements, Arithmetic Waveform Math, FFT, Waveform Limit Testing, Automated Datalogging	34 Automated Measurements, Arithmetic Waveform Math, FFT, Dual-Channel Frequency Counter, Waveform Limit Testing*, TrendPlot™ function*, Automated Datalogging* * Not available on EDU models	32 Automated Measurements, Arithmetic Waveform Math, FFT, Frequency Counter
Software	PC Communications Software: OpenChoice® Desktop, Educator Classroom and Lab Resource CD	PC Communications Software: OpenChoice® Desktop Software, PC Courseware Editor Tool, Product Documentation and Lab Resource CD	PC Communications Software: OpenChoice® Desktop, PC Courseware Editor
Battery Operation	—	—	—

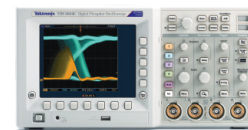
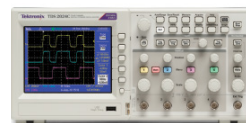
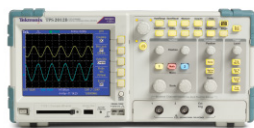


## Teaching Oscilloscopes

TBS2000 and TBS1000B-EDU Oscilloscopes have unique features designed to meet the needs of schools and universities. They use an innovative courseware system that enables educators to build teaching materials into the oscilloscope. Along with a powerful PC Courseware Editor Tool and a courseware website, these oscilloscopes support a complete education ecosystem that makes it easier to teach engineering and easier to learn.

[LEARN MORE](#)

# BATTERY POWERED OSCILLOSCOPES WITH ISOLATED CHANNELS AND TDS SERIES OSCILLOSCOPES



	THS3000	TPS2000B	TDS2000C	TDS3000C
<b>Additional Resources</b>				
<b>Channels</b>	4 (isolated)	2, 4 (isolated)	2, 4	2, 4
<b>Bandwidth</b>	100 MHz to 200 MHz	100 MHz to 200 MHz	50 MHz to 200 MHz	100 MHz to 500 MHz
<b>Sample Rate</b>	2.5 GS/s to 5 GS/s	1 GS/s to 2 GS/s	500 MS/s to 2 GS/s	1.25 GS/s to 5 GS/s
<b>Max Record Length</b>	10 k points	2.5 k points	2.5 k points	10 k points
<b>Trigger Types</b>	Edge, Pulse (width), Event, Video, Non-interlaced	Edge, Pulse (width), Video	Edge, Pulse (width), Video	Edge, Logic (Pattern, State), Pulse (Glitch, Width, Runt, Slew Rate), Video, <b>Optional:</b> Extended Video, Comm
<b>Optional Serial Bus Decode and Analysis</b>	—	—	—	—
<b>Connectivity</b>	USB Host, USB Device	RS-232 (includes RS-232-to-USB Host Serial Cable), Centronics, CompactFlash	USB Host, USB Device, <b>Optional:</b> GPIB	USB Host, LAN (10Base-T Ethernet) <b>Optional:</b> TDS3GV Module: GPIB, RS-232, and Video Out
<b>Waveform Math and Analysis</b>	21 Automated Measurements, Arithmetic Waveform Math, FFT	11 Automated Measurements, Arithmetic Waveform Math, FFT <b>Optional:</b> TPS2PWR1: Power Measurement and Analysis	16 Automated Measurements, Arithmetic Waveform Math, FFT, Waveform Limit Testing, Automated Datalogging	25 Automated Measurements, Arithmetic Waveform Math, FFT <b>Optional:</b> TDS3LIM: Limit Testing, TDS3TMT: Telecom Mask Testing, TDS3VID: HDTV & Custom Video Triggering
<b>Software</b>	PC Communications Software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop	PC Communications Software: OpenChoice® Desktop
<b>Battery Operation</b>	One THSBAT Battery Pack Included Standard	One TPSBAT Battery Pack Included Standard	—	Requires Optional TDS3BATC Battery Pack

# OSCILLOSCOPE PROBES AND ACCESSORIES

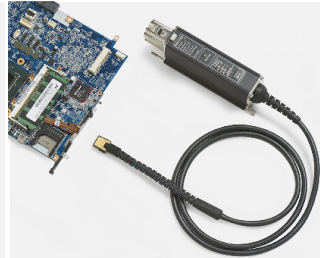
Tektronix probes and accessories are perfectly matched to our industry-leading oscilloscopes. With over 100 choices available, you will find the probe you need.



## Isolated Measurement Systems

- High-resolution measurements in the presence of common mode signals or noise
- Up to 1 GHz bandwidth
- Complete galvanic isolation
- 1 Million to 1 (120 dB) of common mode rejection at 100 MHz

[tek.com/isolated-measurement-systems](http://tek.com/isolated-measurement-systems)



## Low Voltage Differential Probes

- Bandwidth up to 33 GHz
- Easily measure differential signals
- Low input capacitance: down to < 0.3 pF
- High common mode rejection ratio (CMRR)
- Wide range of probe tips for easier circuit access

[tek.com/differential-probe-low-voltage](http://tek.com/differential-probe-low-voltage)



## High Voltage Differential Probes

- Dynamic range to  $\pm 6000$  V
- Bandwidth up to 200 MHz
- Most extensive set of probe accessories

[tek.com/differential-probe-high-voltage](http://tek.com/differential-probe-high-voltage)



## Current Probes

- Easy to use and accurate AC/DC current measurements
- DC up to 2 GHz
- Amplitude measurements from 1 mA to 2,000 A
- Split core and solid core construction

[tek.com/current-probe](http://tek.com/current-probe)



## Passive Probes

- Best-in-class bandwidth up to 1 GHz
- Best-in-class input capacitance as low as 3.9 pF, which minimizes probe loading effects
- Dynamic range to 300 V CAT II
- Rugged and reliable

[tek.com/passive-probe](http://tek.com/passive-probe)



## Low Voltage Single-ended Probes

- Bandwidth up to 4 GHz
- True signal reproduction and fidelity
- Low input capacitance: down to < 0.8 pF
- Small, compact probe heads for probing small geometry circuit elements

[tek.com/low-voltage-probe-single-ended](http://tek.com/low-voltage-probe-single-ended)



## High Voltage Single-ended Probes

- Bandwidth up to 800 MHz
- Dynamic range to 2500 V
- Best-in-class probe loading with input capacitance as low as 1.8 pF

[tek.com/high-voltage-probe-single-ended](http://tek.com/high-voltage-probe-single-ended)



## Optical

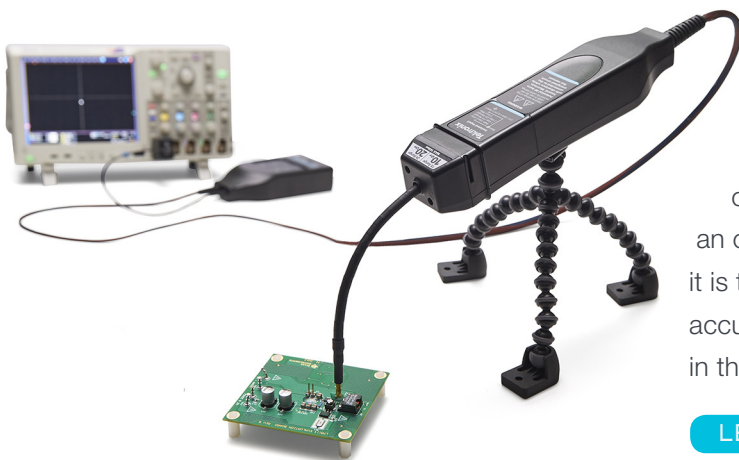
- Broad Wavelength Response: 500 to 950 nm or 1100 to 1700 nm
- High-bandwidth DC up to 1.2 GHz
- High Gain 1 V/mW
- Low Noise <11 pW $\sqrt{\text{Hz}}$

[tek.com/optical-probe](http://tek.com/optical-probe)

# INTERACTIVE PROBE SELECTOR TOOL

Need help finding the right probe for your application? The online Tektronix Probe Selector Tool will guide you through a few easy questions to match your need to the right probe. Visit us anytime, anywhere at: [tektronix.com/probes](http://tektronix.com/probes).

## IsoVu<sup>®</sup> Isolated Measurement Systems See What's Been Hidden - Until Now



Common mode interference often causes engineers to design, debug, evaluate, and optimize “blind.”

Revolutionary IsoVu™ technology uses optical communications and power-over-fiber for

complete galvanic isolation. When combined with an oscilloscope equipped with the TekVPI interface, it is the first, and only, measurement system capable of accurately resolving high bandwidth differential signals in the presence of large common mode voltage.

[LEARN MORE](#)



# SERIAL SUPPORT BY MSO/DPO PRODUCT SERIES AND REQUIRED OPTIONAL SOFTWARE

		MSO/DPO7000C/DX Series			DPO7000C Series			
		Serial Standard	Decode & Search	Serial Trigger	Compliance Test	Decode & Search	Serial Trigger	Compliance Test
Embedded	I <sup>2</sup> C		SR-EMBD	SR-EMBD	-	SR-EMBD	SR-EMBD	-
	SPI		SR-EMBD	SR-EMBD	-	SR-EMBD	SR-EMBD	-
	RS-232/UART		SR-COMP	SR-COMP	-	SR-COMP	SR-COMP	-
	I <sup>2</sup> S		-	-	-	-	-	-
Transportation	CAN		SR-AUTO	SR-AUTO	-	SR-AUTO	SR-AUTO	-
	CAN FD		-	-	-	-	-	-
	LIN		SR-AUTO	SR-AUTO	-	SR-AUTO	SR-AUTO	-
	FlexRay		SR-AUTO	SR-AUTO	-	SR-AUTO	SR-AUTO	-
	MOST		-	-	MOST	-	-	MOST
	BroadR-Reach		-	-	BRR	-	-	BRR
	MIL-STD-1553B		SR-AERO	SR-AERO	-	SR-AERO	SR-AERO	-
Computer / Peripherals	USB 2.0		SR-USB	SR-USB (LS, FS)	USB2	SR-USB	SR-USB (LS, FS)	USB2
	USB 3.0		SR-USB	-	USB3, TEKEXP Opt. USB-RMT, USB-TX	-	-	-
	HSIC		HSIC	-	HSIC	HSIC	-	HSIC
	MIPI D-PHY		SR-DPHY	-	D-PHY, TEKEXP Opt. D-PHYTX	SR-DPHY	-	D-PHY TEKEXP Opt. D-PHYTX
	MIPI M-PHY		-	-	M-PHY, M-PHYTX, M-PHYRX	-	-	-
	HEAC		-	-	TEKEXP Opt. HEAC	-	-	TEKEXP Opt. HEAC
	PCIe		SR-PCIE	-	PCE3	SR-PCIE	-	-
	DiiVA		-	-	TEKEXP Opt. DIIVA	-	-	-
	DisplayPort		-	-	DP12 TEKEXP Opt. DP-SINK	-	-	-
	HDMI		-	-	HT3, HT3DS	-	-	-
	MHL		-	-	MHD	-	-	-
	SATA		-	-	SATA-RSG, SATA-TSG	-	-	-
	SAS3		-	-	SAS3, SAS-TSG, SAS-TSGW	-	-	-
	Thunderbolt		-	-	TBT-TX	-	-	-
UHS-II		-	-	UHS2	-	-	-	
Memory	DDR		-	-	DDRA, DDR-LP4	-	-	DDRA
Datacom	Ethernet		SR-ENET	-	ET3, XBGT2, NBASET	SR-ENET	-	ET3, XBGT2, NBASET
	Comm. Mask Testing		-	-	MTH	-	-	MTM
	Fibre Channel		-	-	FC-16G	-	-	-
	10GBASE-T KR		-	-	10G-KR	-	-	-
	SFP+		-	-	SFP-TX, SFP-WDP	-	-	-
Advanced Analysis	Custom Serial		SR-CUST	-	-	SR-CUST	-	-
	8b/10b		SR-810B	-	-	SR-810B	-	-
	NRZ Serial		-	ST6G	-	-	ST1G	-
	PAM4		-	-	PAM4	-	-	-
	Serial Data Link Analysis		-	-	SDLA64	-	-	-
	Jitter & Eye Diagram Analysis		-	-	DJA (DJE incl. std), DJAN	-	-	DJA (DJE incl. std), DJAN

# SERIAL SUPPORT BY MSO/DPO PRODUCT SERIES AND REQUIRED OPTIONAL SOFTWARE

		5 Series MSO			MSO/DPO5000B Series			
		Serial Standard	Decode & Search	Serial Trigger	Compliance Test	Decode & Search	Serial Trigger	Compliance Test
Embedded	I <sup>2</sup> C		5-SREMBD	5-SREMBD	-	SR-EMBD	SR-EMBD	-
	SPI		5-SREMBD	5-SREMBD	-	SR-EMBD	SR-EMBD	-
	RS-232/UART		5-SRCOMP	5-SRCOMP	-	SR-COMP	SR-COMP	-
	I <sup>2</sup> S		5-SRAUDIO	5-SRAUDIO	-	-	-	-
Transportation	CAN		5-SRAUTO	5-SRAUTO	-	SR-AUTO	SR-AUTO	-
	CAN FD		-	-	-	-	-	-
	LIN		5-SRAUTO	5-SRAUTO	-	SR-AUTO	SR-AUTO	-
	FlexRay		5-SRAUTO	5-SRAUTO	-	SR-AUTO	SR-AUTO	-
	MOST		-	-	-	-	-	MOST
	BroadR-Reach		-	-	-	-	-	BRR
	MIL-STD-1553B		-	-	-	SR-AERO	SR-AERO	-
Computer / Peripherals	USB 2.0		5-SRUSB2	5-SRUSB2	-	SR-USB	SR-USB	USB2
	USB 3.0		-	-	-	-	-	-
	HSIC		-	-	-	HSIC	-	HSIC
	MIPI D-PHY		-	-	-	SR-DPHY	-	-
	MIPI M-PHY		-	-	-	-	-	-
	HEAC		-	-	-	-	-	-
	PCIe		-	-	-	SR-PCIE	-	-
	DiiVA		-	-	-	-	-	-
	DisplayPort		-	-	-	-	-	-
	HDMI		-	-	-	-	-	-
	MHL		-	-	-	-	-	-
	SATA		-	-	-	-	-	-
	SAS3		-	-	-	-	-	-
	Thunderbolt		-	-	-	-	-	-
UHS-II		-	-	-	-	-	-	
Memory	DDR		-	-	-	-	-	DDRA
Datacom	Ethernet		5-SRENET	5-SRENET	-	SR-ENET	SR-ENET	ET3
	Comm. Mask Testing		-	-	-	-	-	MTM
	Fibre Channel		-	-	-	-	-	-
	10GBASE-T KR		-	-	-	-	-	-
	SFP+		-	-	-	-	-	-
Advanced Analysis	Custom Serial		-	-	-	SR-CUST	-	-
	8b/10b		-	-	-	SR-810B	-	-
	NRZ Serial		-	-	-	-	-	-
	PAM4		-	-	-	-	-	-
	Serial Data Link Analysis		-	-	-	-	-	-
	Jitter & Eye Diagram Analysis		-	-	5-DJA	-	-	DJA (DJE incl. std), DJAN

# SERIAL SUPPORT BY MDO PRODUCT SERIES AND REQUIRED OPTIONAL SOFTWARE

		MD04000C Series			MD03000 Series			
		Serial Standard	Decode & Search	Serial Trigger	Compliance Test	Decode & Search	Serial Trigger	Compliance Test
Embedded	I <sup>2</sup> C	DPO4EMBD	DPO4EMBD	-	MD03EMBD	MD03EMBD	-	
	SPI	DPO4EMBD	DPO4EMBD	-	MD03EMBD	MD03EMBD	-	
	RS-232/UART	DPO4COMP	DPO4COMP	-	MD03COMP	MD03COMP	-	
	I <sup>2</sup> S	DPO4AUDIO	DPO4AUDIO	-	MD03AUDIO	MD03AUDIO	-	
Transportation	CAN	DPO4AUTO	DPO4AUTO	-	MD03AUTO	MD03AUTO	-	
	CAN FD	DPO4AUTO	DPO4AUTO	-	MD03AUTO	MD03AUTO	-	
	LIN	DPO4AUTO	DPO4AUTO	-	MD03AUTO	MD03AUTO	-	
	FlexRay	DPO4AUTOMAX	DPO4AUTOMAX	-	MD03FLEX	MD03FLEX	-	
	MOST	-	-	-	-	-	-	
	BroadR-Reach	-	-	-	-	-	-	
	MIL-STD-1553B	DPO4AERO	DPO4AERO	-	MD03AERO	MD03AERO	-	
Computer / Peripherals	USB 2.0	DPO4USB	DPO4USB	-	MD03USB	MD03USB	-	
	USB 3.0	-	-	-	-	-	-	
	HSIC	-	-	-	-	-	-	
	MIPI D-PHY	-	-	-	-	-	-	
	MIPI M-PHY	-	-	-	-	-	-	
	HEAC	-	-	-	-	-	-	
	PCIe	-	-	-	-	-	-	
	DiVA	-	-	-	-	-	-	
	DisplayPort	-	-	-	-	-	-	
	HDMI	-	-	-	-	-	-	
	MHL	-	-	-	-	-	-	
	SATA	-	-	-	-	-	-	
	SAS3	-	-	-	-	-	-	
	Thunderbolt	-	-	-	-	-	-	
	UHS-II	-	-	-	-	-	-	
Memory	DDR	-	-	-	-	-	-	
Datacom	Ethernet	DPO4ENET	DPO4ENET	-	-	-	-	
	Comm. Mask Testing	-	-	DPO4LMT	-	-	MD03LMT	
	Fibre Channel	-	-	-	-	-	-	
	10GBASE-T KR	-	-	-	-	-	-	
	SFP+	-	-	-	-	-	-	
Advanced Analysis	Custom Serial	-	-	-	-	-	-	
	8b/10b	-	-	-	-	-	-	
	NRZ Serial	-	-	-	-	-	-	
	PAM4	-	-	-	-	-	-	
	Serial Data Link Analysis	-	-	-	-	-	-	
	Jitter & Eye Diagram Analysis	-	-	-	-	-	-	

# SERIAL SUPPORT BY MSO/DPO PRODUCT SERIES AND REQUIRED OPTIONAL SOFTWARE

		MSO / DPO2000B Series			
		Serial Standard	Decode & Search	Serial Trigger	Compliance Test
Embedded	I <sup>2</sup> C		DPO2EMBD	DPO2EMBD	-
	SPI		DPO2EMBD	DPO2EMBD	-
	RS-232/UART		DPO2COMP	DPO2COMP	-
	I <sup>2</sup> S		-	-	-
Transportation	CAN		DPO2AUTO	DPO2AUTO	-
	CAN FD		-	-	-
	LIN		DPO2AUTO	DPO2AUTO	-
	FlexRay		-	-	-
	MOST		-	-	-
	BroadR-Reach		-	-	-
	MIL-STD-1553B		-	-	-
Computer / Peripherals	USB 2.0		-	-	-
	USB 3.0		-	-	-
	HSIC		-	-	-
	MIPI D-PHY		-	-	-
	MIPI M-PHY		-	-	-
	HEAC		-	-	-
	PCIe		-	-	-
	DiVA		-	-	-
	DisplayPort		-	-	-
	HDMI		-	-	-
	MHL		-	-	-
	SATA		-	-	-
	SAS3		-	-	-
	Thunderbolt		-	-	-
UHS-II		-	-	-	
Memory	DDR		-	-	-
Datacom	Ethernet		-	-	-
	Comm. Mask Testing		-	-	-
	Fibre Channel		-	-	-
	10GBASE-T KR		-	-	-
	SFP+		-	-	-
Advanced Analysis	Custom Serial		-	-	-
	8b/10b		-	-	-
	NRZ Serial		-	-	-
	PAM4		-	-	-
	Serial Data Link Analysis		-	-	-
	Jitter & Eye Diagram Analysis		-	-	-





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**Spain\*** 00800 2255 4835  
**Sweden\*** 00800 2255 4835  
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**Taiwan** 886 (2) 2656 6688  
**Thailand** 1 800 011 931  
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**USA** 1 800 833 9200  
**Vietnam** 12060128

\* European toll-free number. If not accessible, call: +41 52 675 3777

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