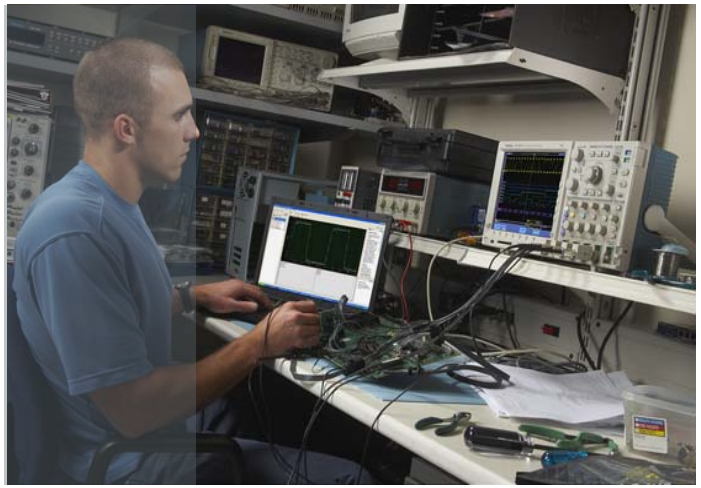
# MSO/DPO Series Oscilloscopes

Feature-rich tools for debugging mixed signal designs

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# MSO/DPO Series Oscilloscopes

## Analyze Analog and Digital Signals with a Single Instrument

| | 4000 Series | 3000 Series | 2000 Series |
|---|---|---|---|
| *Bandwidth* | 1 GHz, 500 MHz, 350 MHz | 500 MHz, 300 MHz, 100 MHz | 200 MHz, 100 MHz |
| *Channels* | 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) |
| *Record Length* | 10 M points | 5 M points | 1 M points |
| *Waveform Capture Rate* | >50,000 wfm/s | >50,000 wfm/s | 5,000 wfm/s |
| *Parallel Bus Analysis* | Yes (MSO Series) | Yes (MSO Series) | Yes (MSO Series) |
| *Optional Serial Bus Analysis* | ▪ $I^2C$, SPI<br>▪ CAN, LIN, FlexRay<br>▪ RS-232/422/485/UART<br>▪ $I^2S$/LJ/RJ/TDM | ▪ $I^2C$, SPI<br>▪ CAN, LIN<br>▪ RS-232/422/485/UART<br>▪ $I^2S$/LJ/RJ/TDM | ▪ $I^2C$, SPI<br>▪ CAN, LIN<br>▪ RS-232/422/485/UART |
| *Optional Analysis Packages* | ▪ Power Analysis<br>▪ HDTV and Custom Video | ▪ Power Analysis<br>▪ HDTV and Custom Video | |



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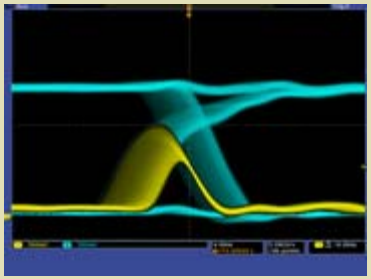
# Comprehensive Tools Speed *Every* Stage of Debug

## *Discover*



- Up to 50,000 wfm/s waveform capture rate
- Intensity-graded, digital phosphor display

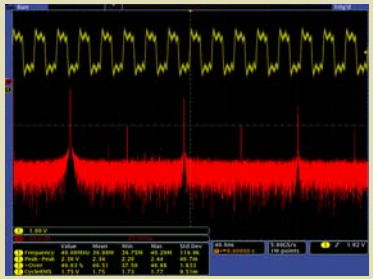
## *Capture*


- Up to 4 analog + 16 digital channels
- Up to 10 M record lengths
- Complete set of triggers, incl. serial packet content
- 5x oversampling (analog)
- MagniVu™ high speed acquisition (digital )

## *Search*


- Wave Inspector® controls
  - Pan/Zoom
  - Play/Pause
  - User marks
  - Automated search and mark for analog, digital, serial and parallel bus data

## *Analyze*



- 29 automated measurements
- Advanced waveform math
- Specialized application support:
  - Parallel bus analysis
  - Serial bus analysis
  - Power analysis
  - Video debug



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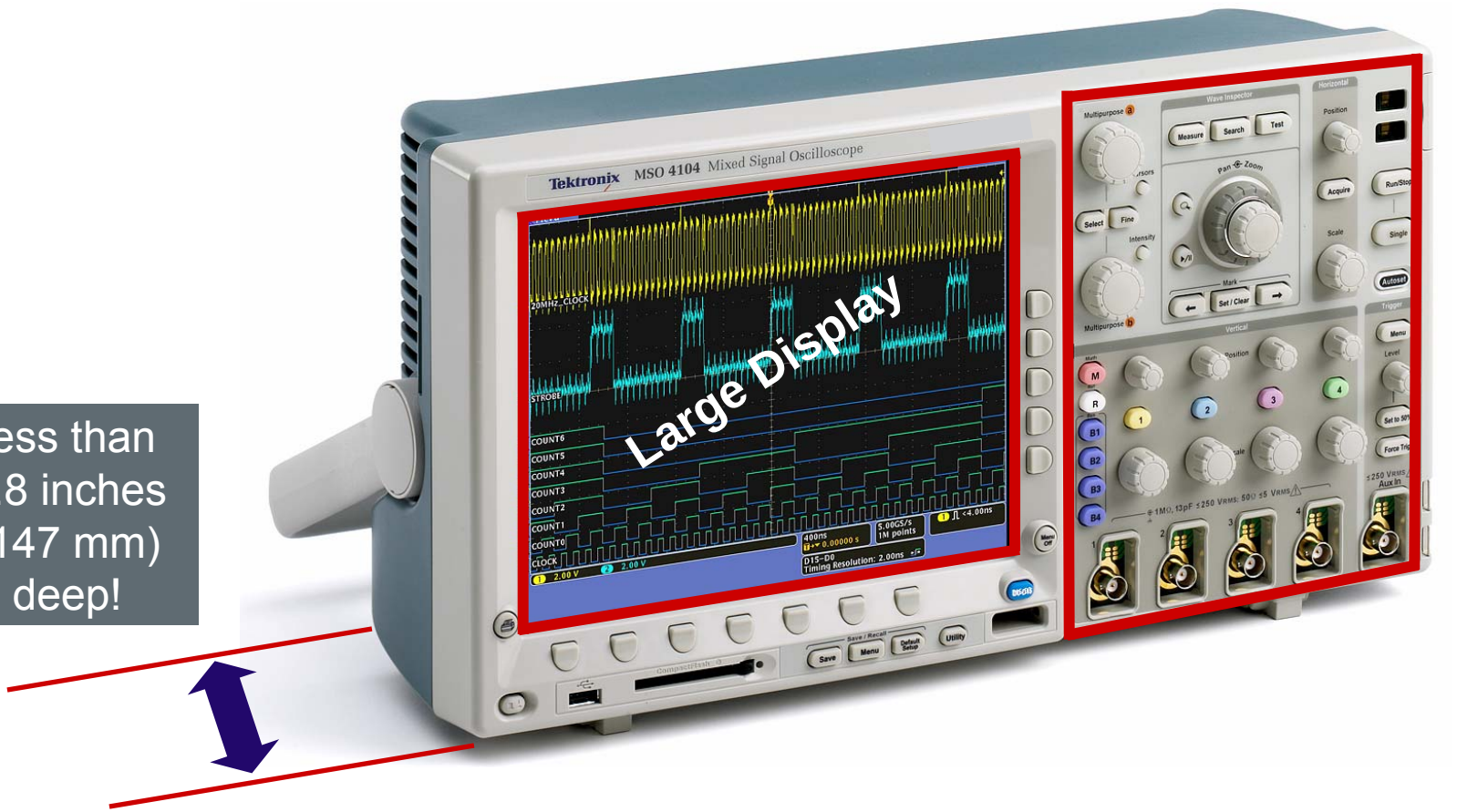
# A Tour of the MSO/DPO Series

Dedicated front-panel controls




Less than 5.8 inches (147 mm) deep!



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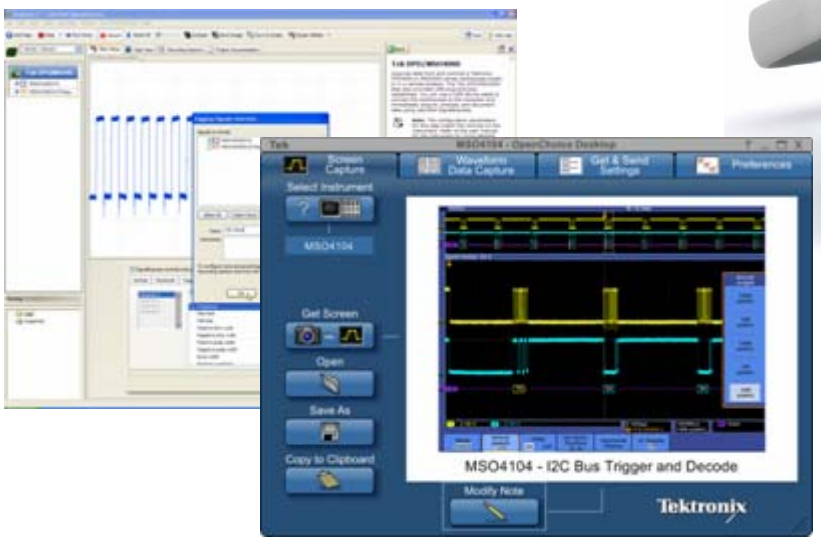
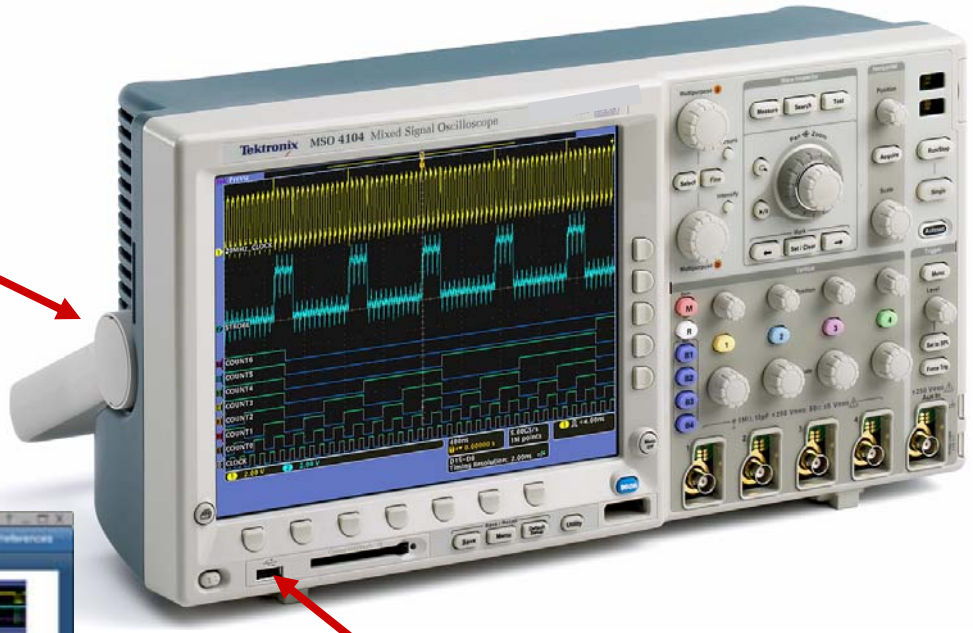
# Fast, Easy Connectivity

- PC connectivity software is included standard
  - Tektronix OpenChoice® Desktop
  - NI LabVIEW SignalExpress™ Tektronix Edition
  - e*Scope

USB host*, USB device, 10/100Base-T Ethernet, Video out ports on rear of the instrument




USB thumb drive on front of instrument

*Varies by Series



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# TekVPI® – Tektronix Versatile Probe Interface

- Smart communication between oscilloscope and probe
  - Automatic units displayed
  - Enables simpler deskewing of probes
  - Probe menu on oscilloscope interacts directly with probe
- Provides more power to probes
  - Enables greater flexibility in probe combinations
  - Enables direct connection to current probes (including ac/dc), differential probes, and single-ended active probes without external amplifiers*


* MSO/DPO2000 Series requires an external power supply



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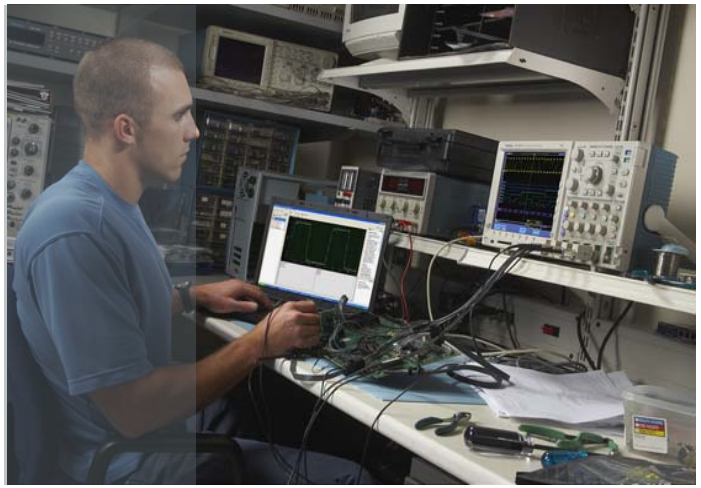
# Tools to Speed *Every* Stage of Debug

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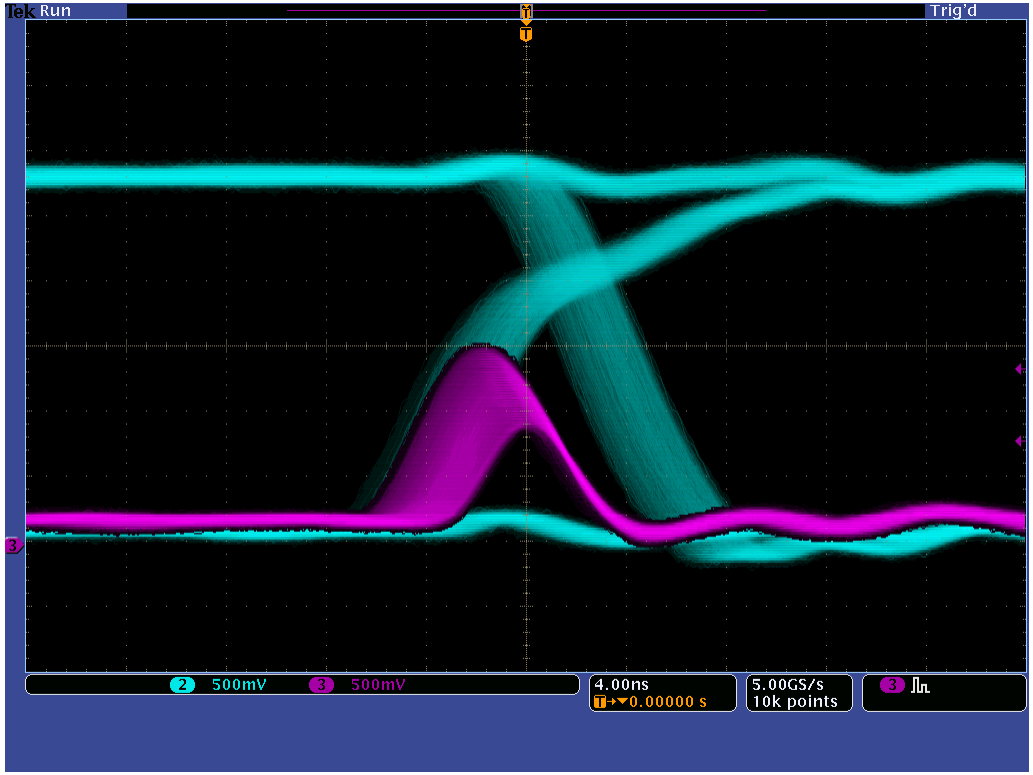
# Digital Phosphor Display

- > 50,000* waveforms per second capture rate
  - Finds elusive glitches and other transient events in seconds
- Variable persistence with intensity grading
  - Shows frequency of occurrence for better characterizing failures
  - Intensity grading is preserved when the instrument is stopped




*Varies by Series

Discover glitches and infrequent events in seconds



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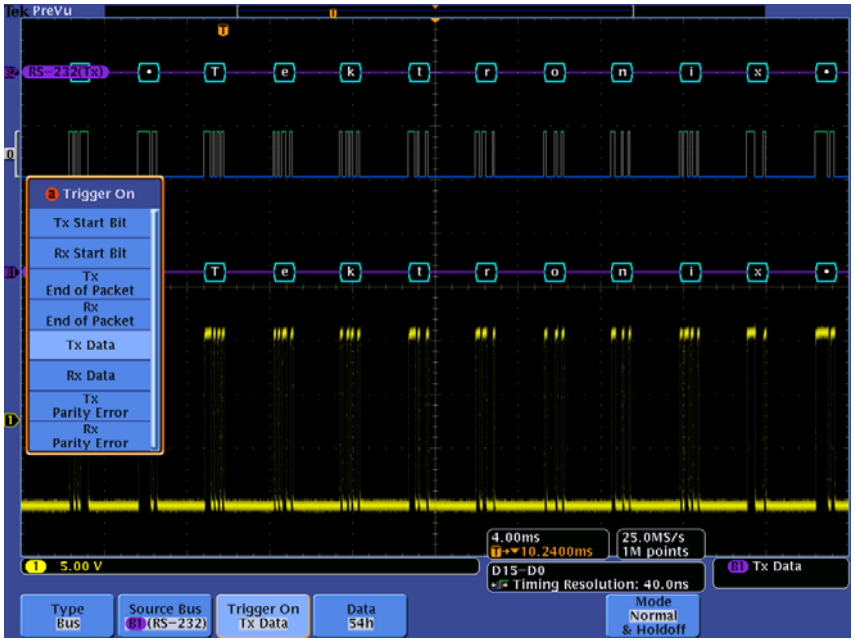
# Comprehensive Set of Triggers

- Over 125 trigger combinations, including:
  - Runt
  - Logic
  - Pulse width/glitch
  - Setup/hold
  - Serial packet
  - Parallel data
- Triggers cause acquisition of ***all*** channels simultaneously
  - All signals are time-correlated




Capture signal anomalies the first time



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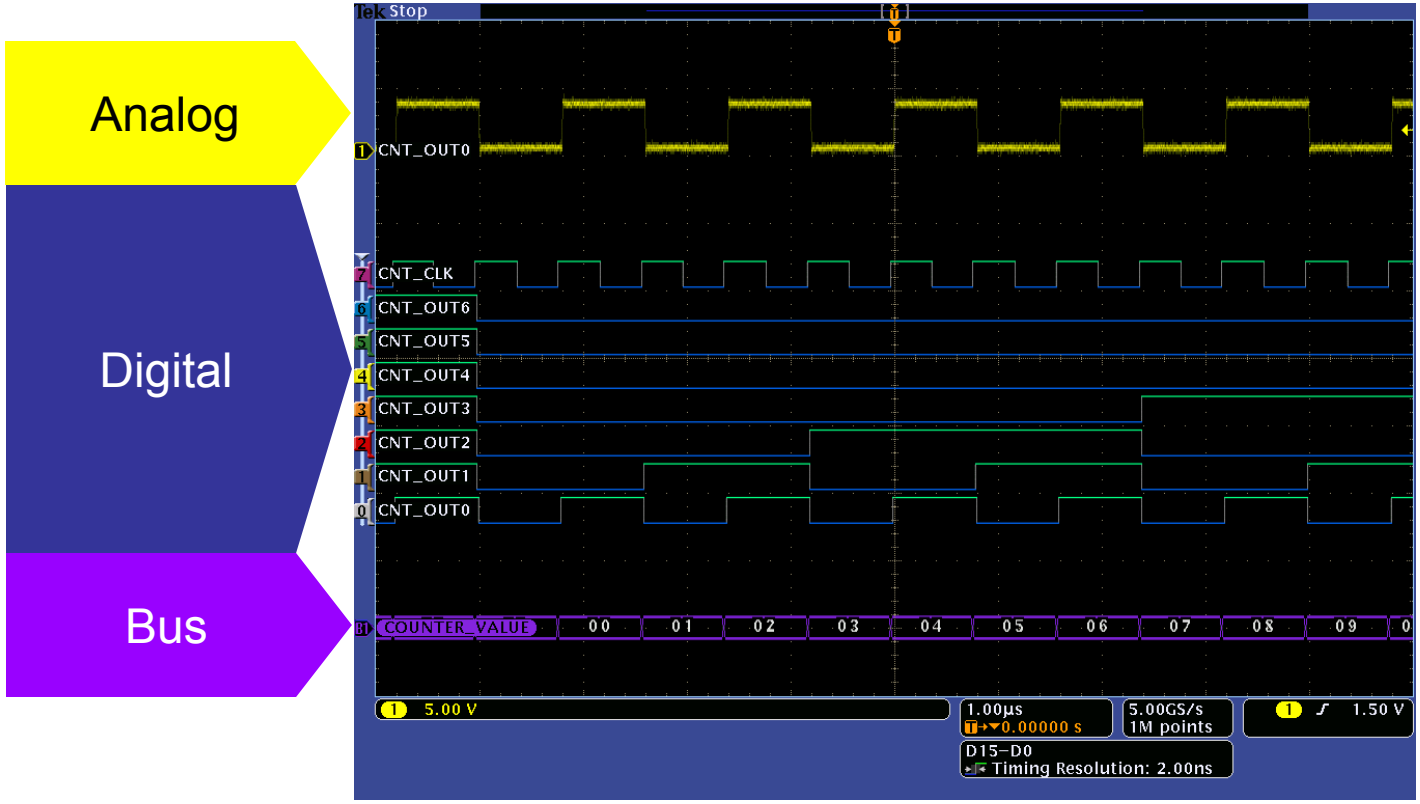
# Time-Correlation of Analog and Digital

- View up to 4 analog, 16 digital, and 4 decoded bus waveforms on a single instrument



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# Usable Long Record Length

- Up to 10 M* Record Length
  - Standard on all channels
  - High resolution capture
    - Long time spans
    - Extensive signal detail
  - No compromises
    - User selectable record length from 1000 points to 10 M points per channel
- Wave Inspector® controls simplify navigation and search


Up to 10 M points

*Varies by Series



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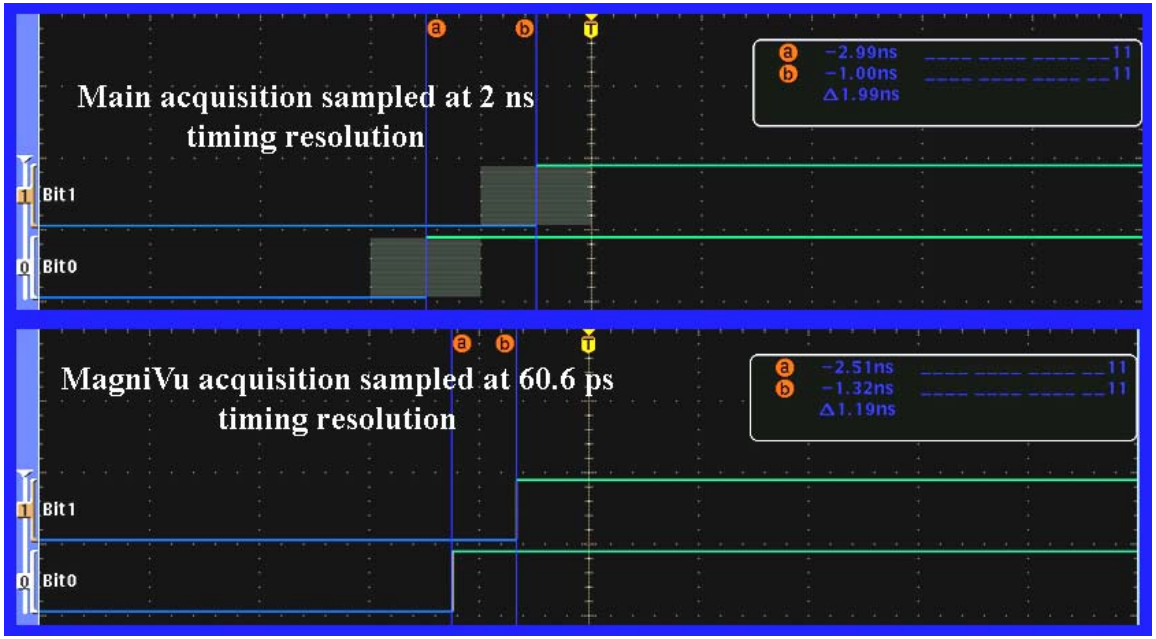
# MagniVu™ High Speed Digital Acquisition

- Acquire fine signal detail for 10k points around the trigger
  - 60.6 ps (16.5 GS/s) with the MSO4000 Series
  - 121.2 ps (8.25 GS/s) with the MSO3000 Series
- Essential for precision timing measurements
  - Setup/hold
  - Clock delay
  - Signal skew
  - Glitch



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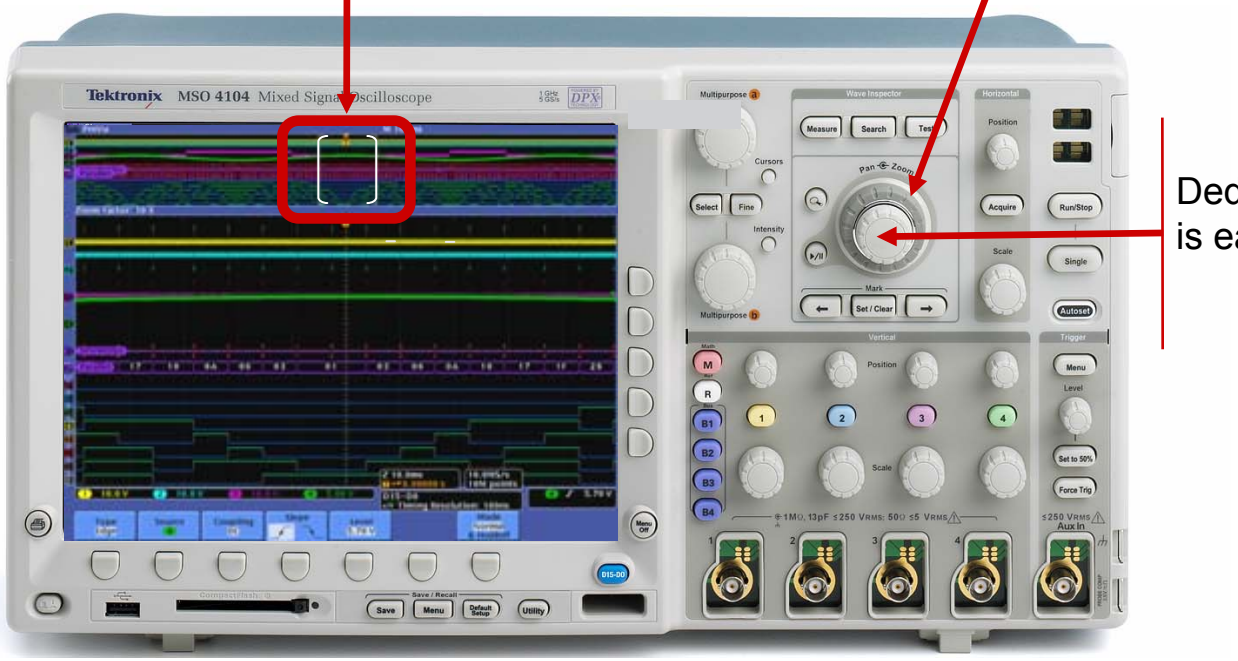
# Wave Inspector® Navigation

- Pan through your record in seconds
- Zoom in to see more detail

Brackets indicate area being inspected in large zoom window below.

Force-feedback ***Pan*** control speeds navigation




Dedicated ***Zoom*** control is easy to find and use



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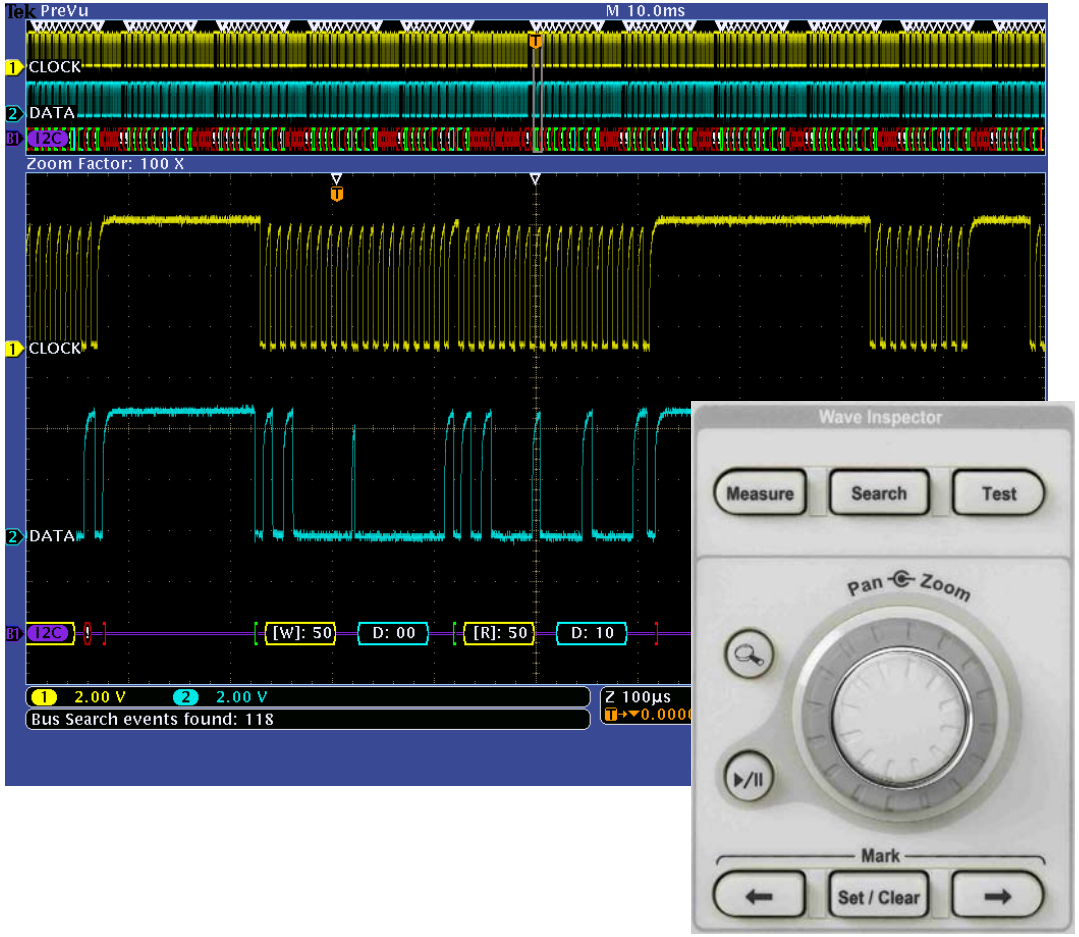
# Wave Inspector® Automated Search and Mark




1. Define your search criteria
   - Serial packet content
   - Parallel data
   - Common trigger combinations
2. Wave Inspector marks every instance
3. Use arrow buttons to jump from event to event

Search your entire record instantly



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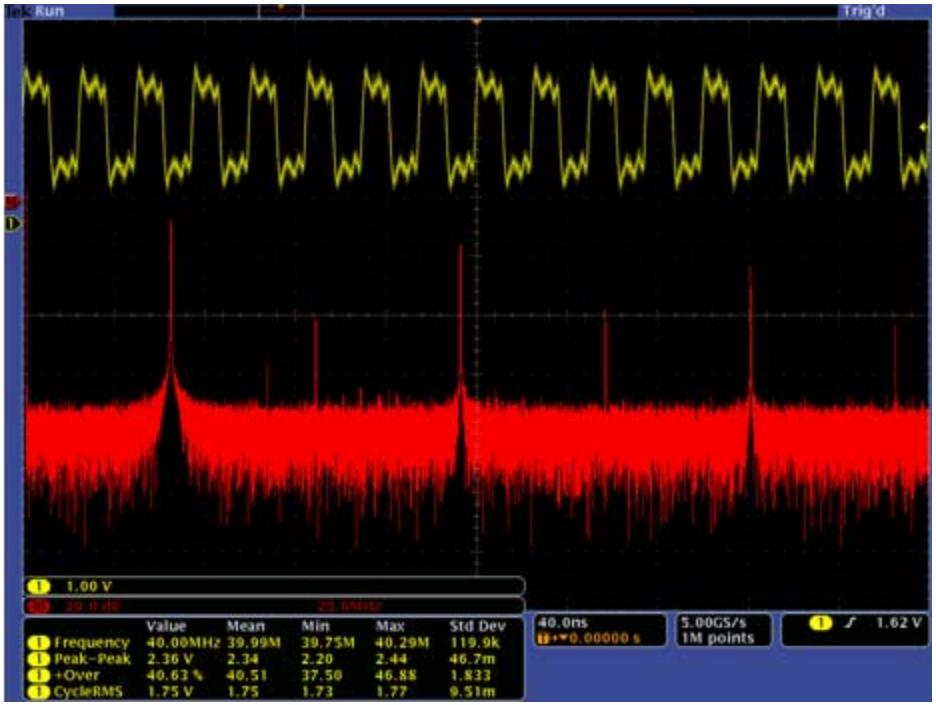
# Built-In Waveform Analysis Tools

- 29 automated measurements
  - Period, frequency, phase
  - Rise time, fall time, duty cycle, pulse width
  - Amplitude, overshoot, peak-to-peak
  - RMS
  - And many more
- Measurement statistics*
  - Mean, min, max, std. dev.
- Advanced waveform math
  - Arithmetic
  - Integrate, differentiate*
  - FFT
  - Arbitrary equation editing*
  - Trend plots*
- Cursors
- Gating




Simplify analysis of your device

* Not available on the MSO/DPO2000 Series



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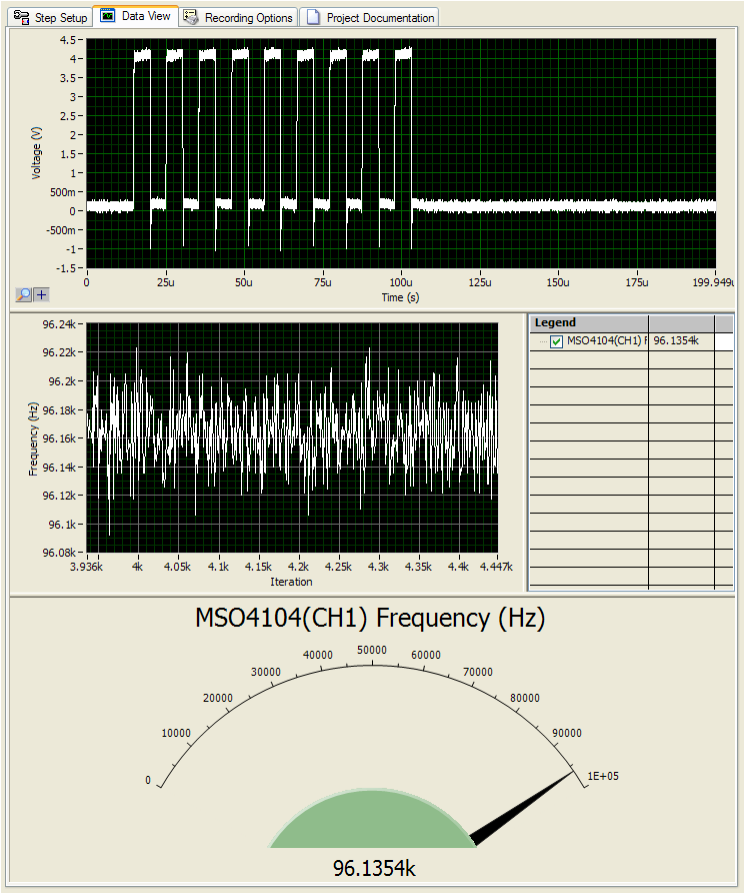
# Extended Analysis with NI LabVIEW SignalExpress™

- Over 200 built-in functions
  - Time and frequency domain
  - Advanced analysis
  - Measurement trending
  - Automated sweeping
  - Limit testing
  - Data logging
- Intuitive drag-and-drop user interface simplifies measurements
- Customizable graphs for detailed reporting
- Enables true USB plug-and-play connectivity to a PC



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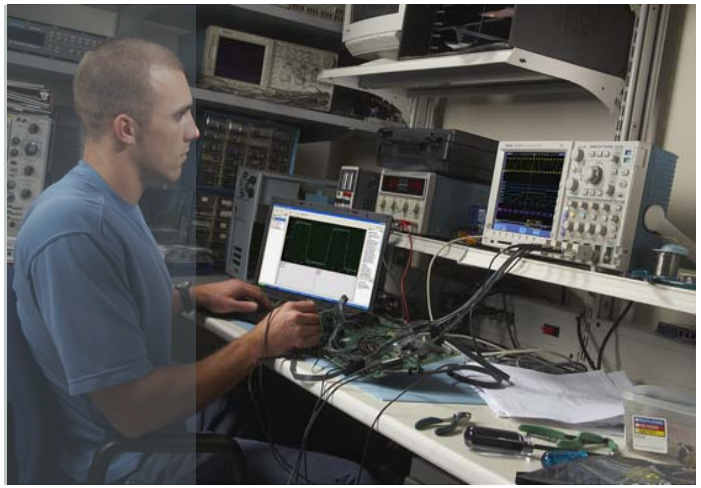
# Serial Bus Triggering and Analysis

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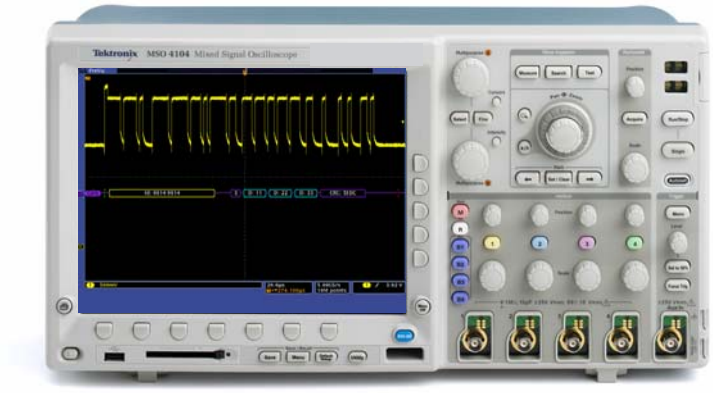
# Serial Triggering and Decode

- Serial buses are pervasive in mixed signal design today
- Designers are typically interested in knowing:
  - Is the hardware working correctly?
  - Is the software programmed correctly?
  - Is system noise affecting my bus transfers?
  - What is happening in the rest of my system when a certain command is transmitted on the bus?
- Designers need to capture and decode their bus to determine if any of these issues exists



# MSO/DPO Series Oscilloscopes

## Automated Trigger, Decode and Search for Serial Buses

| | 4000 Series | 3000 Series | 2000 Series |
|---|---|---|---|
| *Bandwidth* | 1 GHz, 500 MHz, 350 MHz | 500 MHz, 300 MHz, 100 MHz | 200 MHz, 100 MHz |
| *Channels* | 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) |
| *Record Length* | 10 M points | 5 M points | 1 M points |
| *Serial Bus Analysis* | ▪ $I^2C$, SPI<br>▪ CAN, LIN, FlexRay<br>▪ RS-232/422/485/UART<br>▪ $I^2S$/LJ/RJ/TDM | ▪ $I^2C$, SPI<br>▪ CAN, LIN<br>▪ RS-232/422/485/UART<br>▪ $I^2S$/LJ/RJ/TDM | ▪ $I^2C$, SPI<br>▪ CAN, LIN<br>▪ RS-232/422/485/UART |
| *# of Simultaneous Decoded Buses* | 4 (MSO Series)<br>2 (DPO Series) | 2 | 2 |



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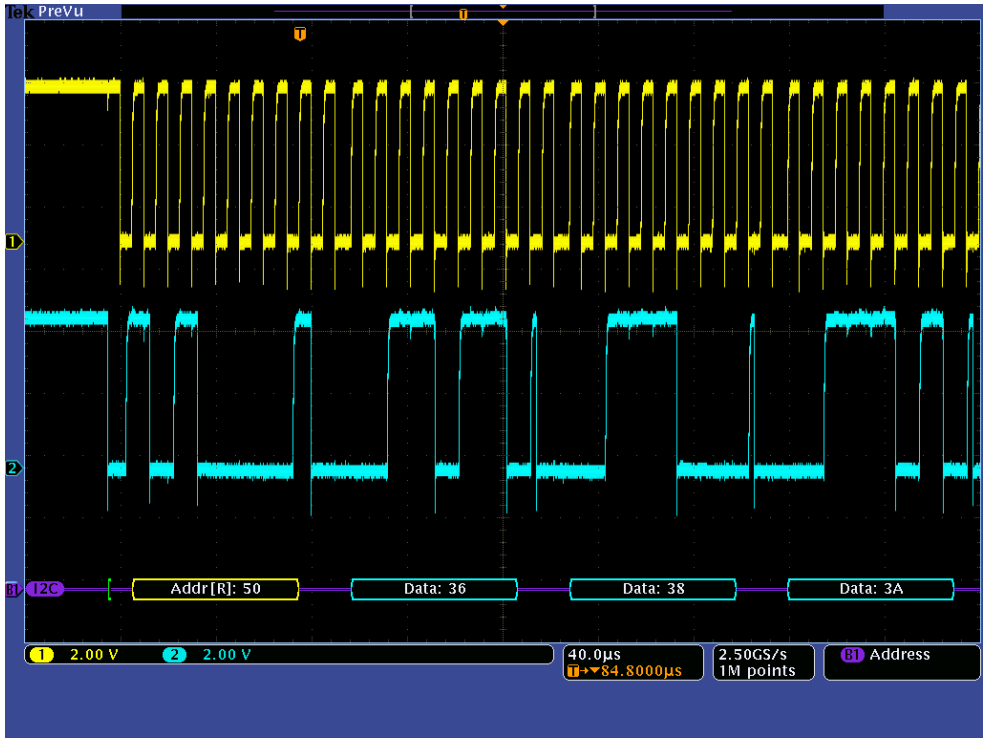
# Automated Decode




- Every packet on the bus will be decoded
- Value displayed in*:
  - Hex
  - Binary
  - Decimal *(LIN and FlexRay)*
  - Signed decimal *($I^2S$/LJ/RJ/TDM)*
  - Or, ASCII *(RS-232/422/485/UART)*
- Decoded packets are time-aligned with bus signals

*Varies by Standard



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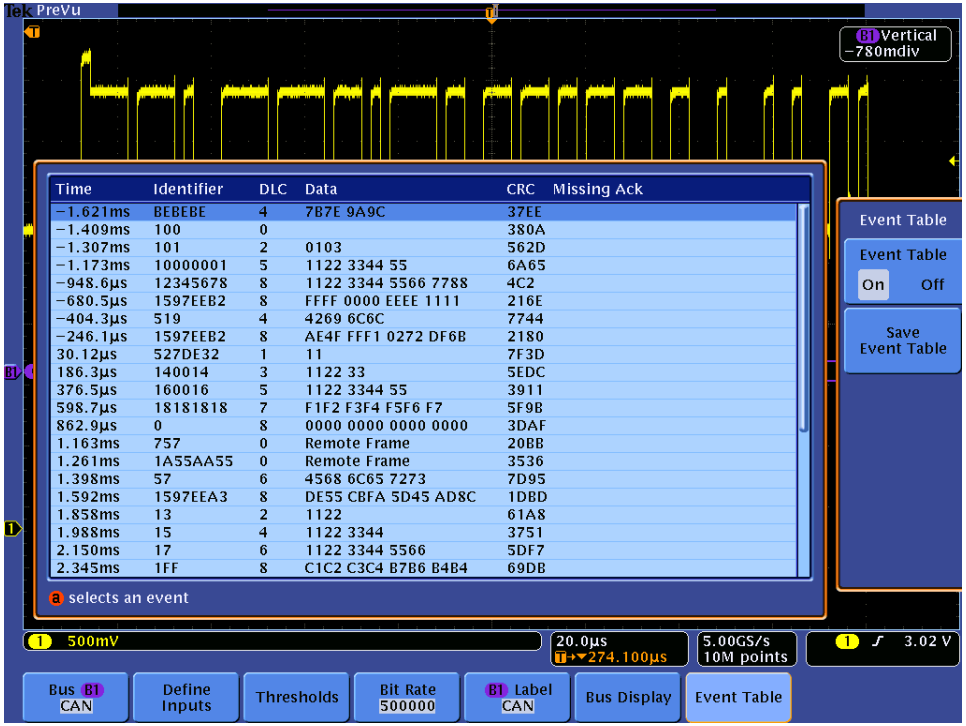
# Event Table for Viewing Bus Traffic

- Shows decoded message content with time stamps
- View bus traffic in tabular format
- Compare with software listings
- Easy timing measurements



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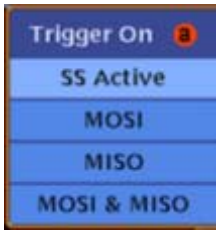
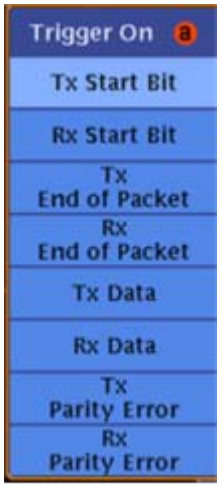
# Serial Triggering

- Trigger on packet content
  - Start of packet
  - Specific addresses
  - Specific data content
  - Unique identifiers
  - And more…
- Full or partial specification




SPI


$I^2C$




RS-232


FlexRay


CAN


LIN



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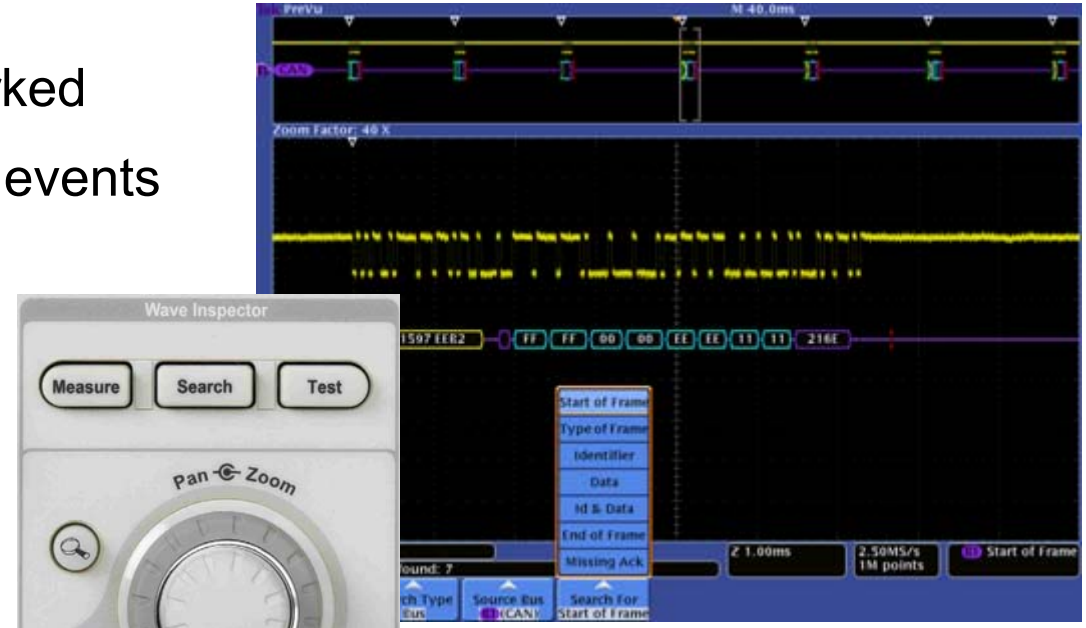
# Automated Search

1. Use Wave Inspector to search for specific packet content
   - Same criteria as triggers
   - Full or partial specification
2. Every instance will be marked
3. Quickly navigate between events with ← and → buttons









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# FlexRay Physical Layer Analysis Software

- Eye diagram analysis
  - Masks for test points 1 and 4 (TP1, TP4)
  - Eye violations highlighted in red
- Sync measurements
  - Previous, next
  - Cycle to cycle
- Timing measurements
  - Rise, fall time
  - TSS duration
  - Frame time
  - Average bit time
- Time interval error (TIE) plot
- Frame errors indicated in red in decode table
- Runs on external PC connected via USB or Ethernet


*Included with DPO4AUTOMAX on the MSO/DPO4000 Series*



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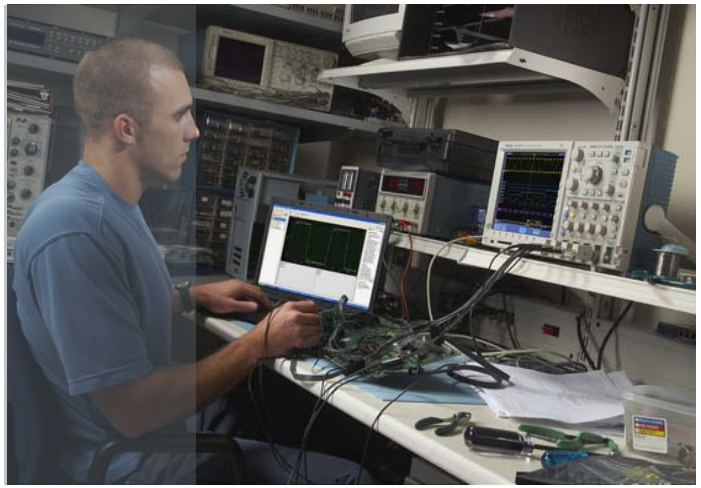
# Mixed Signal Design and Analysis

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| *Channels* | 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) |
| *Record Length* | 10 M points | 5 M points | 1 M points |
| *Digital Sample Rate* | ▪500 MS/s (main)<br>▪16.5 GS/s (MagniVu™) | ▪500 MS/s (main)<br>▪8.25 GS/s (MagniVu™) | ▪500 MS/s (pods 1 and 2)<br>▪1 GS/s (pod 1 only) |
| *# of logic families simultaneously monitored* | 16 (per-channel thresholds) | 2 (per-pod thresholds) | 2 (per-pod thresholds) |
| *Standard Probe* | P6516<br>20 kΩ \|\| 3 pF loading | P6316<br>101 kΩ \|\| 8 pF loading | P6316<br>101 kΩ \|\| 8 pF loading |



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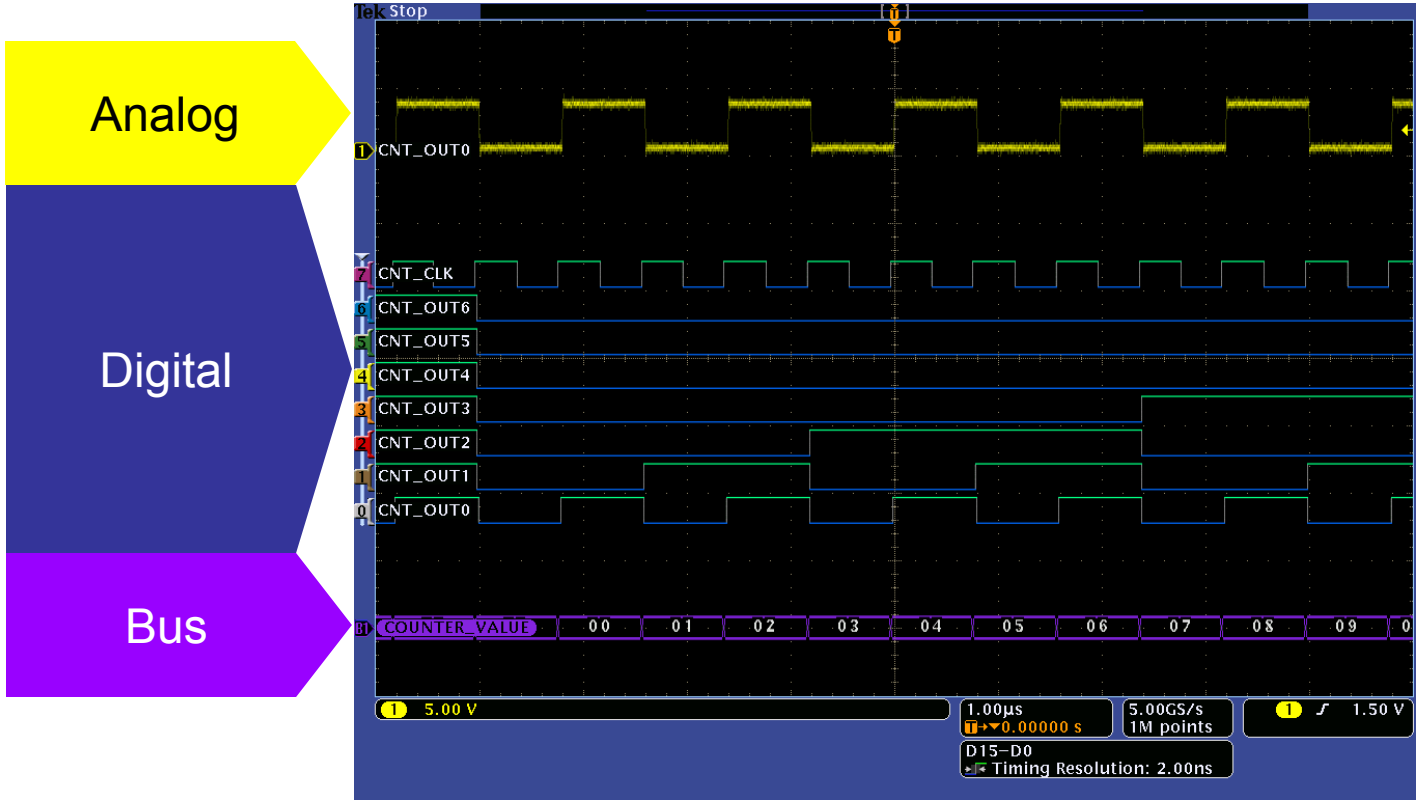
# Time-Correlation of Analog and Digital

- View up to 4 analog, 16 digital, and 4 decoded bus waveforms on a single instrument



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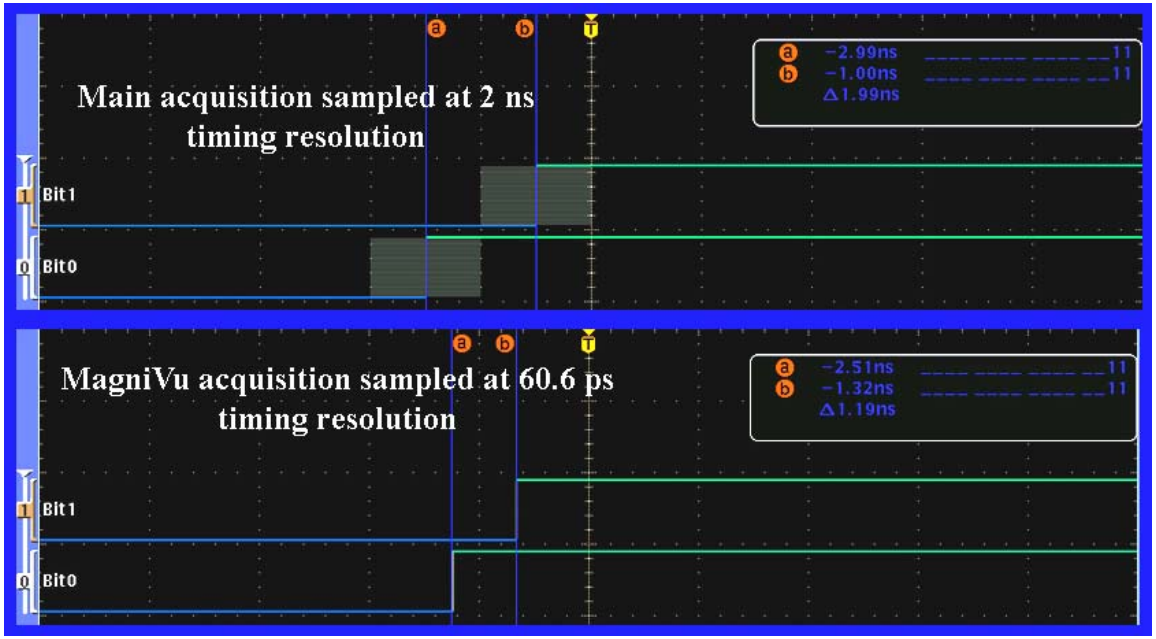
# MagniVu™ High-Speed Acquisition

- Acquire fine signal detail for 10k points around the trigger
  - 60.6 ps (16.5 GS/s) with the MSO4000 Series
  - 121.2 ps (8.25 GS/s) with the MSO3000 Series
- Essential for precision measurements
  - Setup/hold
  - Clock delay
  - Signal skew
  - Glitch



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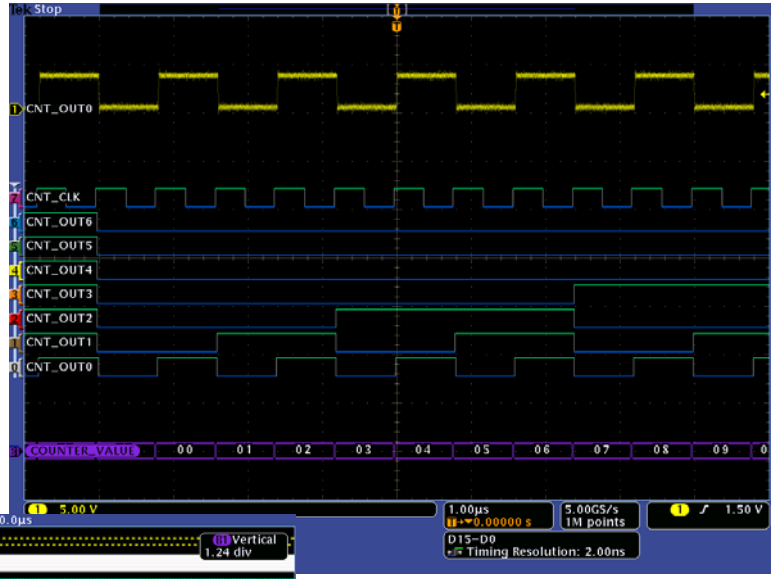
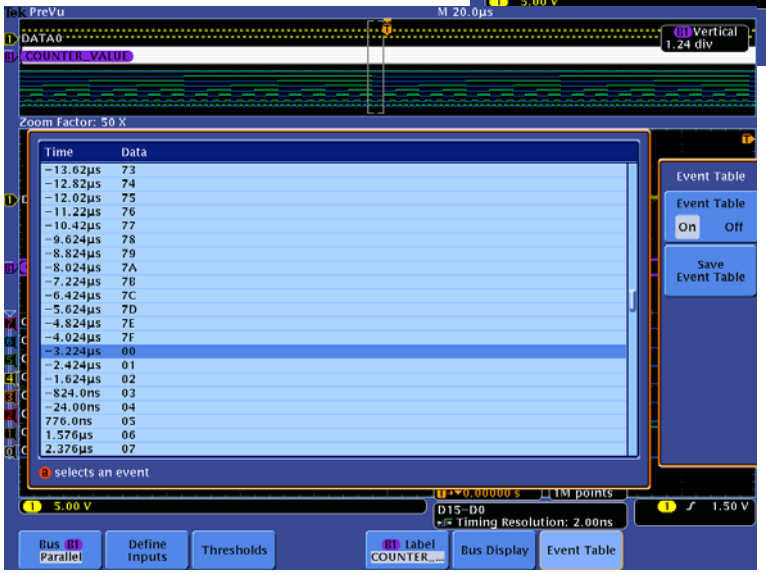
# Parallel Bus Trigger, Decode and Search

- Trigger on parallel bus data
  - clocked or unclocked
- View decoded data in hex or binary
- Search and mark on a specific data value with Wave Inspector
- See data in an Event Table format



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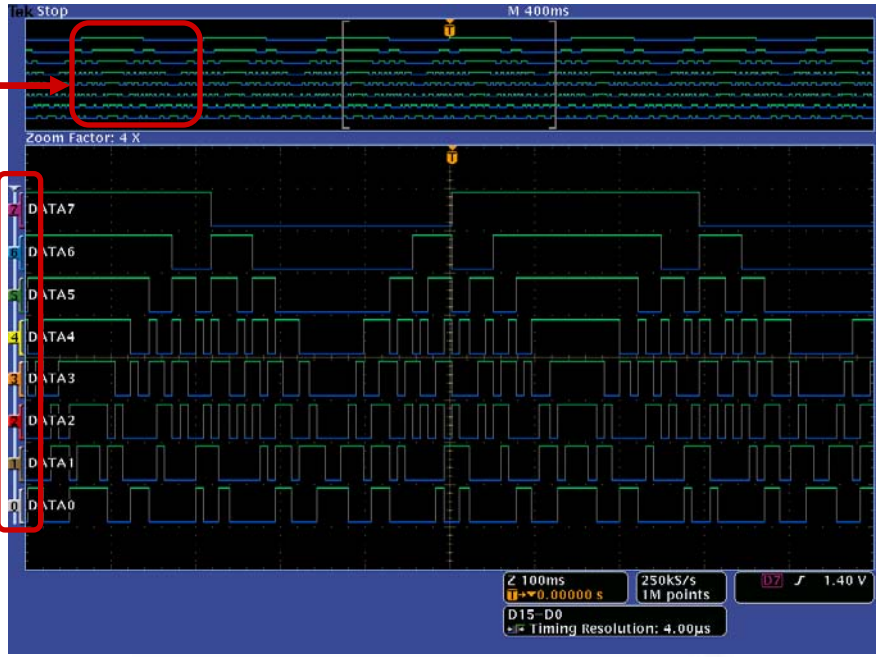
# Color-Coded Digital Waveform Display

- Logical highs are identified in **Green** and lows in **Blue**
- Waveform grouping simplifies positioning digital waveforms on screen
- Digital channel indicators are color coded to match the channel labels on the digital probe



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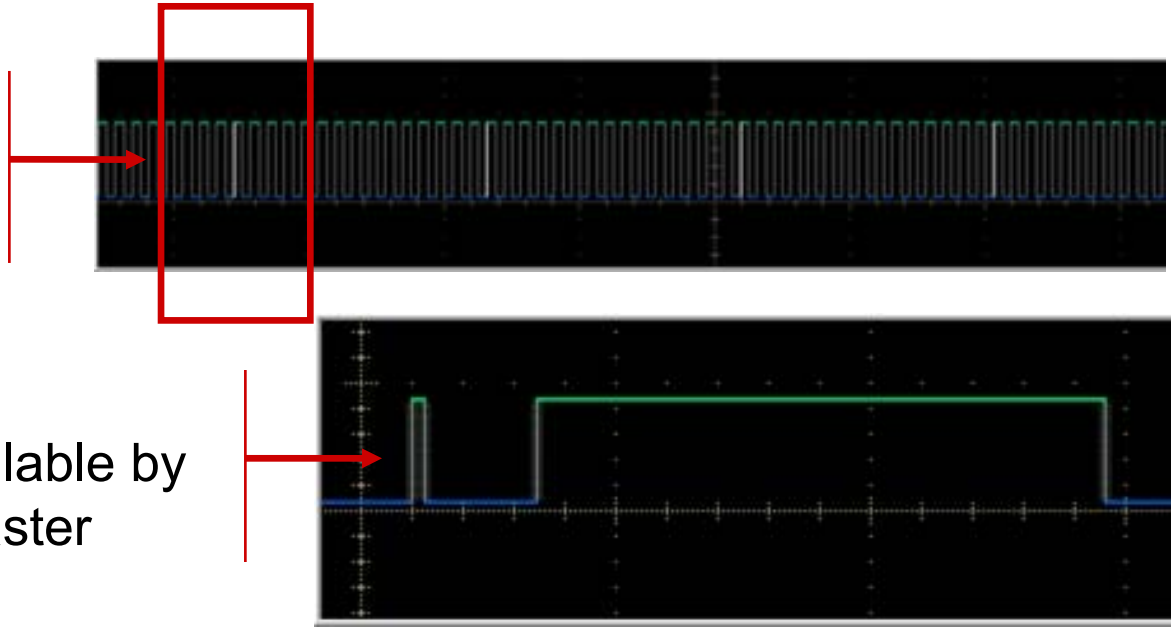
# Multiple Transition Detection Hardware

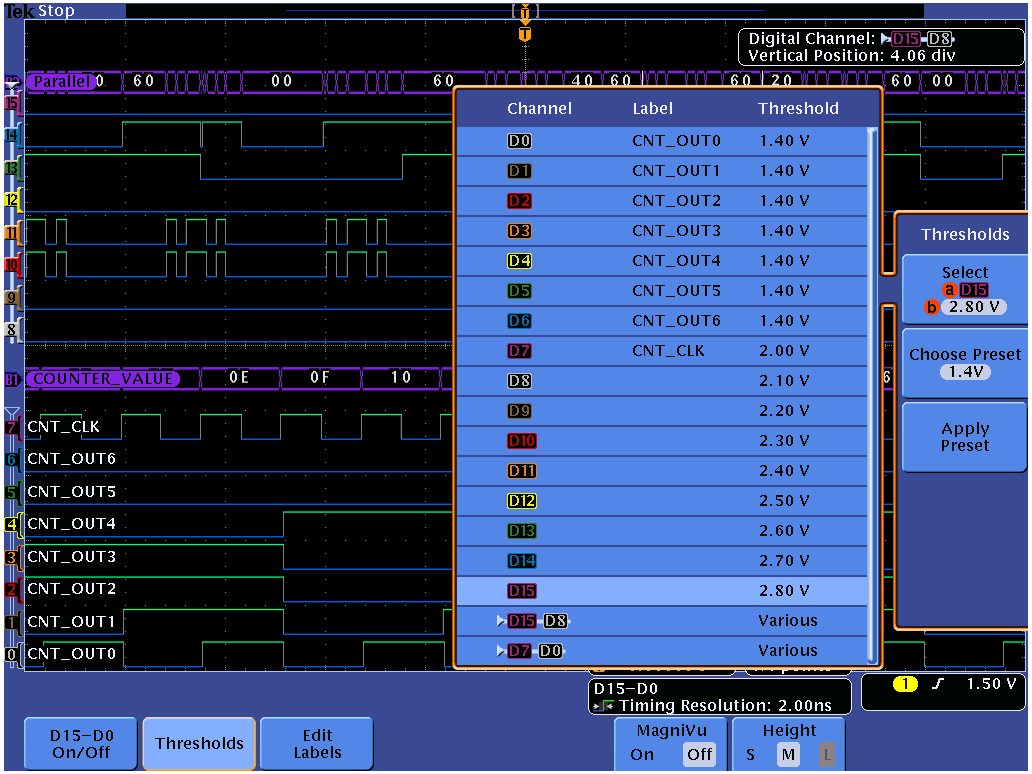
- If multiple transitions are detected, a white edge is shown



- More information is available by zooming in or using a faster sample rate

# Per-Channel Thresholds

- Acquire many different logic families simultaneously for true mixed signal acquisition
- MSO3000 and MSO2000 Series offer per-pod thresholds



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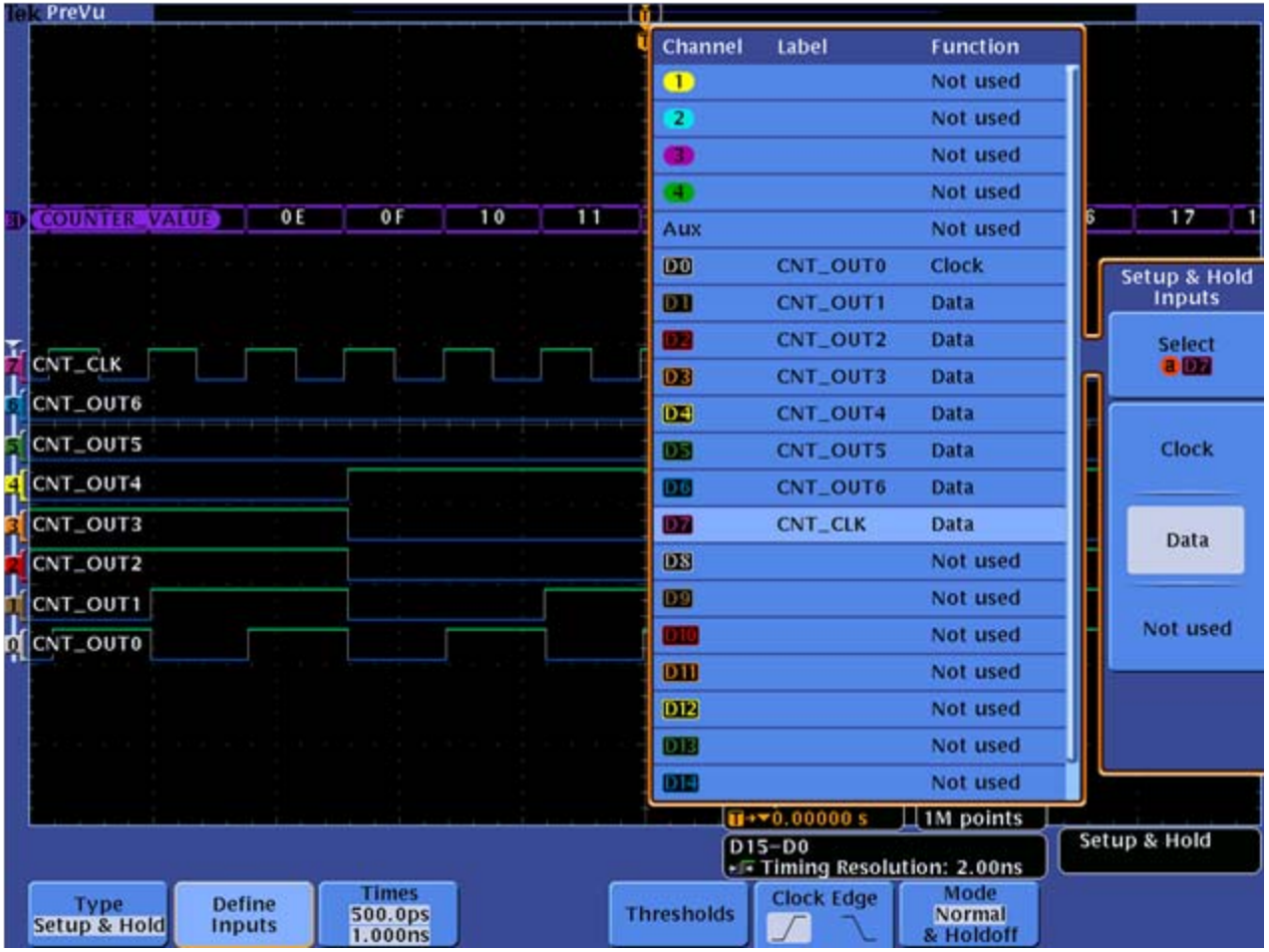
# Multi-Channel Setup and Hold Triggering

- Trigger on setup and hold violations across multiple channels



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# Innovative Digital Probes

- 16 Channels
  - 2 pods of 8 channels
- Colored probe connections match signal color-coding on display
- A variety of ground connection methods provided for ease of use
- P6516 MSO Probe (MSO4000)
  - 20 kΩ || 3 pF loading
- P6316 MSO Probe (MSO3000, MSO2000)
  - 101 kΩ || 8 pF loading

**P6516**
MSO Probe

**P6316**
MSO Probe



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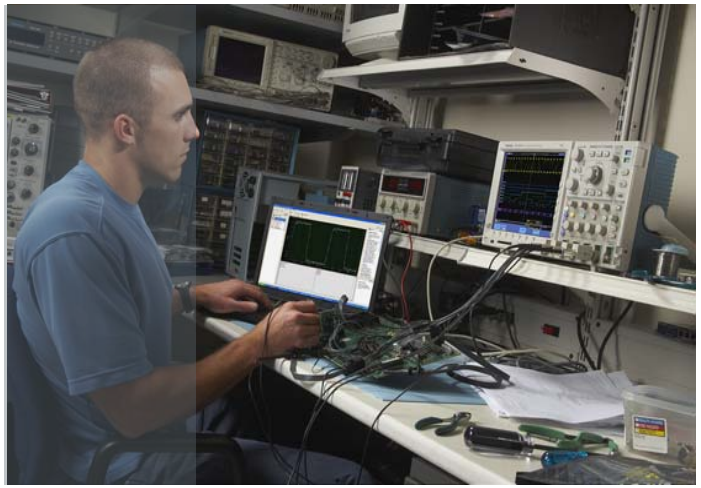
# Additional Application Support

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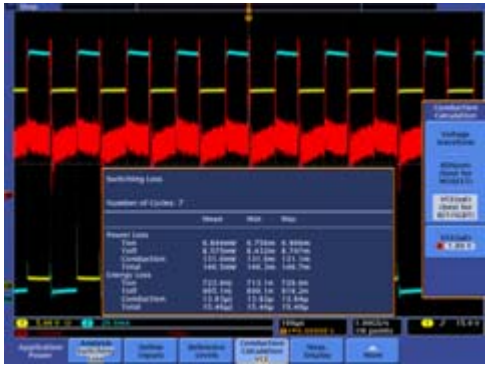
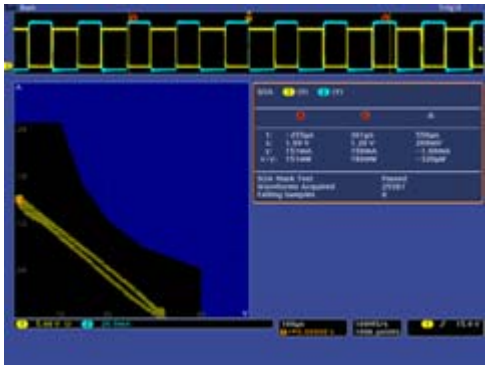
# Fast, Easy and Repeatable Power Analysis*

- Automated power measurements
  - Power quality
  - Harmonics
  - Switching loss measurements
  - Safe Operating Area (SOA)
  - Slew rate
  - Ripple
  - Modulation
- Completely integrated into the oscilloscope
- Automated deskew of probes

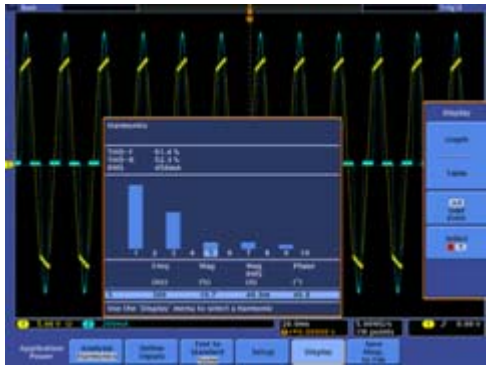


***Switching Loss***

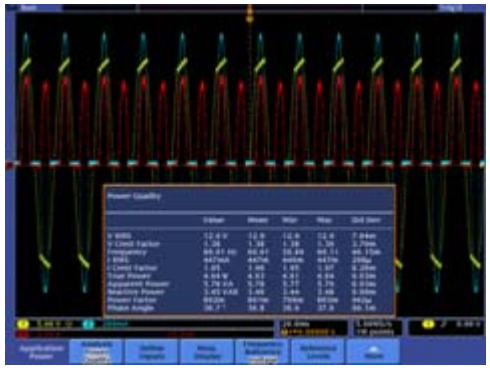


***Safe Operating Area***

*Optional on 4000 and 3000 Series



***Harmonics***



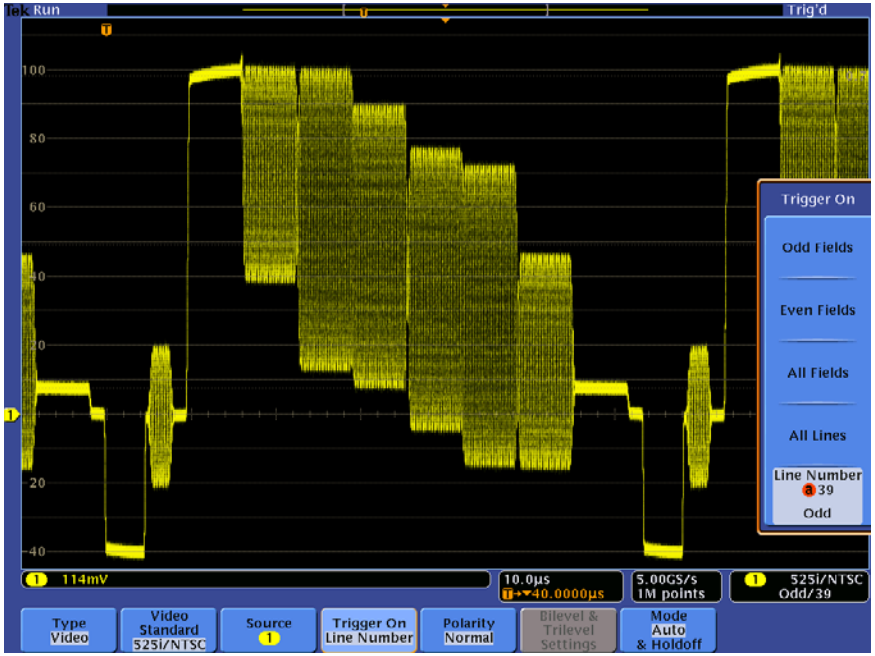
***Power Quality***



Tektronix

# Video Triggering and Analysis

- Industry's most comprehensive video triggering
  - SDTV
  - EDTV
  - HDTV*
  - Custom video*
- mV and IRE graticules
- True video autoset




*Triggering on line 39 of an NTSC signal*

*Optional on 4000 and 3000 Series



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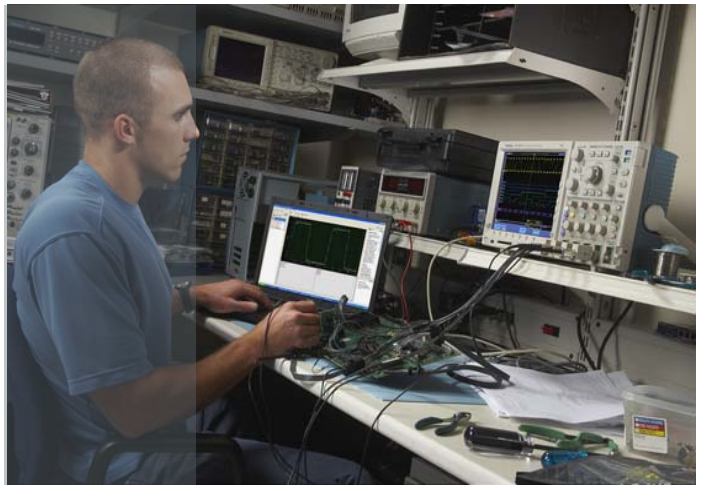
# A Complete Solution




Tektronix®

# Localization in 11 Languages

- Includes translated manual and front-panel overlay
  - English
  - French
  - Italian
  - German
  - Spanish
  - Japanese
  - Portuguese
  - Simplified Chinese
  - Traditional Chinese
  - Korean
  - Russian

# Measurement Accuracy Begins at the Probe Tip

- Tektronix offers the industry's widest range of oscilloscope probes
- TekVPI® probes feature:
  - Status indicators and controls for degaussing current probes
  - Controls for easy removal of probe offset
  - Remote control through USB, GPIE Ethernet

**TAP Series**
Active Probes

**TCP Series**
Current Probes

**TDP Series**
Differential Probes

For a complete listing of probes, visit us at www.tektronix.com/probes



Tektronix

# Maintain Your Oscilloscope at Peak Performance

- Standard 3-year warranty on all parts and labor, excluding probes
- Repair and calibration plans are available to extend your coverage

## Tektronix Repair Coverage

- Repair of the product problem
- Free shipping both ways*
- Installation of all safety modifications and mandatory reliability modifications
- Installation of firmware updates

## Tektronix Calibration Coverage

- Full calibration with adjustments
- Calibration certificate or Certificate of Compliance
- Free shipping both ways*
- Installation of all safety modifications and mandatory reliability modifications
- Installation of firmware updates
- Available with complete calibration data

*Within end-user country



Tektronix

# *NEW* Power Solution Bundles

- Provide all of the commonly-used power measurement accessories in one convenient carrying case, all at a 25% discount

| | |
|---|---|
| **Software** | **DPOxPWR** power analysis module |
| **Probes & Adapters** | **P5205** 1300V high-voltage differential probe<br>**TDP0500** 42V mid-voltage differential probe<br>**TCP0030** AC/DC, 30A current probe<br>**TPA-BNC** TekVPI™ Interface Adapter |
| **Deskew Equipment** | **TEK-DPG** Deskew Pulse Generator<br>**067-1686-xx** Power Measurement Deskew Fixture |
| **Case** | Hard-sided carry case |



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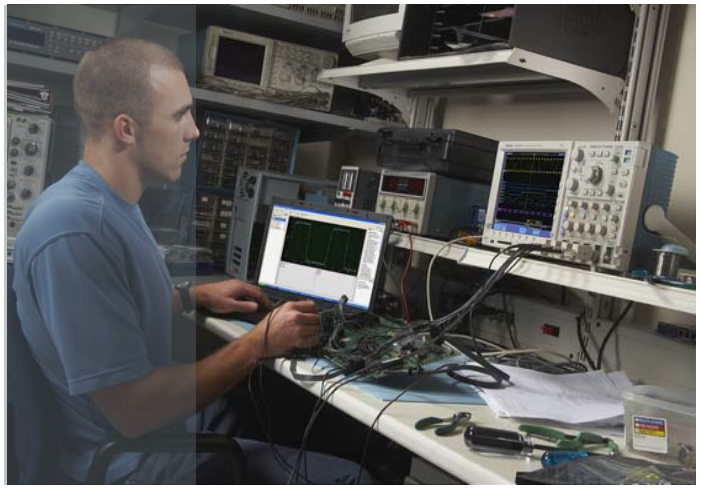
# A Detailed Family Comparison

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# MSO/DPO Series: Choosing the Right Oscilloscope

| | 4000 Series | 3000 Series | 2000 Series |
|---|---|---|---|
| *Bandwidth* | 1 GHz, 500 MHz, 350 MHz | 500 MHz, 300 MHz, 100 MHz | 200 MHz, 100 MHz |
| *Channels* | 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) | 2 or 4 analog<br>16 digital (MSO Series) |
| *Record Length* | 10 M points | 5 M points | 1 M points |
| *Waveform Capture Rate* | > 50,000 wfm/s | > 50,000 wfm/s | 5,000 wfm/s |
| *Parallel Bus Analysis* | Yes (MSO Series) | Yes (MSO Series) | Yes (MSO Series) |
| *Serial Bus Analysis* | ▪$I^2C$, SPI<br>▪CAN, LIN, FlexRay<br>▪RS-232/422/485/UART<br>▪$I^2S$/LJ/RJ/TDM | ▪$I^2C$, SPI<br>▪CAN, LIN<br>▪RS-232/422/485/UART<br>▪$I^2S$/LJ/RJ/TDM | ▪$I^2C$, SPI<br>▪CAN, LIN<br>▪RS-232/422/485/UART |
| *Optional Analysis Packages* | ▪Power Analysis<br>▪HDTV and Custom Video | ▪Power Analysis<br>▪HDTV and Custom Video | |
| *Color Display* | 10.4” (264 mm) | 9” (229 mm) | 7” (180 mm) |



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# MSO/DPO Series: Detailed Differences

| | 4000 Series | 3000 Series | 2000 Series |
|---|---|---|---|
| *Connectivity* | 1 USB host port (front) | 1 USB host port (front) | 1 USB host port (front) |
| | 2 USB host + 1 USB device ports (rear) | 1 USB host + 1 USB device ports (rear) | 1 USB device port (rear) |
| | LAN + Video Out (rear) | LAN + Video Out (rear) | Optional LAN + Video Out (rear) (order DPO2CONN) |
| *Probing* | TekVPI | TekVPI | TekVPI |
| | One P6139A per analog channel | One P6139A per analog channel | One P2221 per analog channel |
| | On-board Probe Power (up to 50W) | On-board Probe Power (up to 20W) | External Power Adapter Available (order 119-7465-xx) |
| | 1MΩ, 50Ω | 1MΩ, 50Ω, 75Ω | 1MΩ (requires adapter for 50Ω, 75Ω) |
| *Digital* | P6516 logic probe | P6316 logic probe | P6316 logic probe |
| | Per Channel Threshhold | Per Pod Threshhold | Per Pod Threshhold |
| | 500 MS/s all channels | 500 MS/s all channels | 1 GS/s Sample Rate for D0…D7 |
| | MagniVu (16.5 GS/s sample rate for 10 kpoints around trigger) | MagniVu (8.25 GS/s sample rate for 10 kpoints around trigger) | 500 MS/s Sample Rate when any D8…D15 channel is on |
| | 1.5 ns Min. Detectable Pulse Width | 2 ns Min. Detectable Pulse Width | 5 ns Min. Detectable Pulse Width |
| *Other* | Front cover included | Front cover included | Protective front cover not included (bundled with soft carrying case) |



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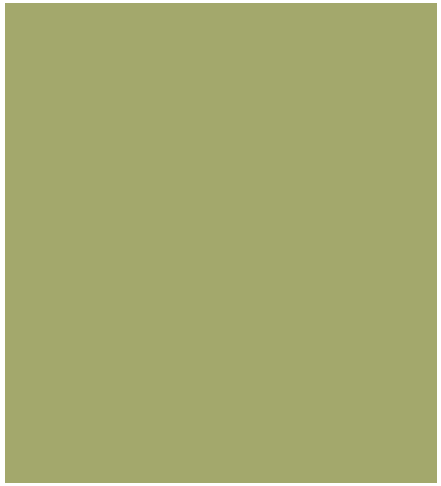
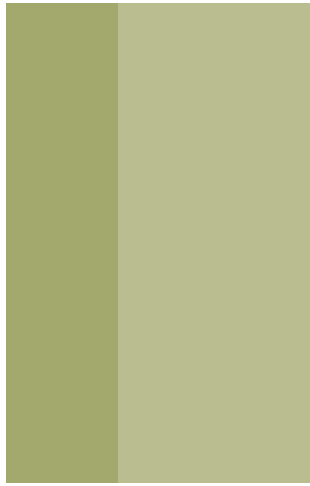
# MSO/DPO4000 Series

## Ordering Information







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# MSO4000 Series: Key Specifications

| | MSO4034 | MSO4054 | MSO4104 |
|---|---|---|---|
| Bandwidth | 350 MHz | 500 MHz | 1 GHz |
| Channels (analog + digital) | 4 + 16 | 4 + 16 | 4 + 16 |
| Sample Rate (analog) | 2.5 GS/s | 2.5 GS/s | 5 GS/s |
| Sample Rate (digital) | Full Record - 500 MS/s, MagniVu Record - 16.5 GS/s | | |
| Record Length (analog) | 10 M points | | |
| Record Length (digital) | Full Record - 10 M points, MagniVu Record - 10 k points | | |
| Input Impedance | 50 Ω, 1 MΩ | | |
| Waveform Capture Rate | >50,000 wfm/s | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, $I^2S$/LJ/RJ/TDM, CAN, LIN, FlexRay | | |
| Other Application Solutions (optional) | Power Analysis, HDTV and Custom Video Triggering | | |
| Display (resolution) | 10.4 in. XGA (1,024x768) | | |



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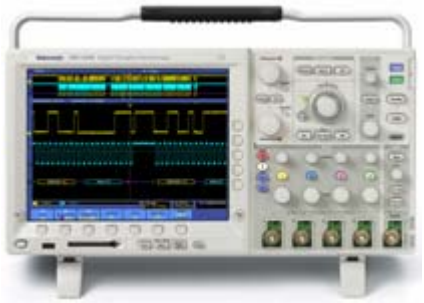
# DPO4000 Series: Key Specifications



| | DPO4034 | DPO4054 | DPO4104 |
|---|---|---|---|
| Bandwidth | 350 MHz | 500 MHz | 1 GHz |
| Channels | 4 | 4 | 4 |
| Sample Rate (all channels) | 2.5 GS/s | 2.5 GS/s | 5 GS/s |
| Record Length (all channels) | 10 M points | | |
| Input Impedance | 50 Ω, 1 MΩ | | |
| Waveform Capture Rate | >50,000 wfm/s | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, $I^2S$/LJ/RJ/TDM, CAN, LIN, FlexRay | | |
| Other Application Solutions (optional) | Power Analysis, HDTV and Custom Video Triggering | | |
| Display (resolution) | 10.4 in. XGA (1,024x768) | | |



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# Product Ordering Information

| Product | Description |
|---|---|
| DPO4034 | 350 MHz, 2.5 GS/s, 10M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| DPO4054 | 500 MHz, 2.5 GS/s, 10M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| DPO4104 | 1 GHz, 5 GS/s, 10M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| MSO4034 | 350 MHz, 2.5 GS/s, 10M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |
| MSO4054 | 500 MHz, 2.5 GS/s, 10M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |
| MSO4104 | 1 GHz, 5 GS/s, 10M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |

# MSO/DPO4000 Application Modules

| Product | Description |
|---|---|
| DPO4EMBD | Embedded serial triggering and analysis module for MSO/DPO4000 Series oscilloscopes. Supports $I^2C$ and SPI buses |
| DPO4COMP | Computer serial triggering and analysis module for MSO/DPO4000 Series oscilloscopes. Supports RS-232 / RS-422 / RS-485 / UART buses |
| DPO4AUTO | Automotive serial triggering and analysis module for MSO/DPO4000 Series oscilloscopes. Supports CAN and LIN buses |
| DPO4AUTOMAX | Extended automotive serial triggering and analysis module for MSO/DPO4000 Series oscilloscopes. Supports CAN, LIN, and FlexRay buses. Includes FlexRay eye diagram analysis software. |
| DPO4AUDIO | Audio serial triggering and analysis module for MSO/DPO4000 Series oscilloscopes. Supports $I^2S$/LJ/RJ/TDM buses. |
| DPO4PWR | Power analysis module for MSO/DPO4000 Series oscilloscopes. Supports power quality, switching loss, harmonics, ripple, modulation, safe operating area, and slew rate analysis. |
| DPO4VID | HDTV and custom video trigger for MSO/DPO4000 Series oscilloscopes |

# Standard Accessories

| Product | Description |
|---|---|
| P6139A – One per channel | 500 MHz, 10x Passive voltage probe with accessories |
| P6516 (MSO4000 only) | 16-channel logic probe |
| Memory Card | CompactFlash memory card |
| Power Cord | Country specific – please order a power cord option |
| User Manual | Country specific – please order a language option (includes language overlay for front panel label) |
| Software Kit | Tektronix OpenChoice™ Desktop PC Communication Software and NI LabVIEW Signal Express Tektronix Edition |
| Documentation CD | CD containing all relevant documentation |
| Front Cover | Front panel cover to protect instrument when transporting |
| Calibration Certificate | Calibration certificate documenting traceability to National Metrology Institute(s) and ISO9001 Quality System Registration |
| Accessory Bag | Bag for probe accessories |
| Three Year Warranty | Three year product warranty |

# Recommended Probes

| Product | Description |
|---|---|
| TAP1500 | TekVPI™ 1500 MHz single-ended active probe |
| TDP0500 | TekVPI™ 500 MHz differential active probe |
| TDP1000 | TekVPI™ 1 GHz differential active probe |
| TCP0030 | TekVPI™ DC to 120 MHz, 30 A current probe |
| TCP0150 | TekVPI™ DC to 20 MHz, 150 A current probe |
| P5100* | Level II TekProbe 2.5 kV, 100X, 250 MHz high voltage passive probe |
| P5200 | Level II TekProbe 1300 V, 50X/500X, 25 MHz high voltage active differential probe |
| P5205* | Level II TekProbe 1300 V, 50X/500X, 100 MHz high voltage active differential probe |
| P5210* | Level II TekProbe 5600 V, 100X/1000X, 50 MHz high voltage active differential probe |
| ADA400A* | Level II TekProbe 100X, 10X, 1X, 0.1X, high-gain differential amplifier |
| DPO4PWRBND | Comprehensive suite of products to make common power measurements, bundled at a discounted price. Includes DPO4PWR module, probes (P5205, TDP0500, TCP0030), TPA-BNC adapter, probe deskew fixture and pulse generator, all in a hard-sided carrying case. |

*** Requires TPA-BNC adapter**

# Recommended Accessories

| Product | Description |
|---|---|
| 071-1844-XX | Service Manual (English only) |
| ACD4000 | Soft Transit Case |
| HCTEK4321 | Hard Transit Case (Requires ACD4000) |
| RM4000 | Rackmount Kit |
| SIGEXPTE | NI LabVIEW SignalExpress™ Tektronix Edition Software (Full Version) |
| FPGAVIEW-xx | MSO support for Altera and Xilinx FPGAs |
| TPA-BNC | TekVPI™ to TekProbe™ BNC Adapter |
| TLAHRA with (2) 196-3476-01 | High Impedance Adapter and Leadsets for P6515 MSO Probe |
| AMT75* | Level II TekProbe 1 GHz, 75Ω adapter |
| TEK-DPG | TekVPI™ Deskew Pulse Generator Signal Source |
| 067-1686-00 | Probe deskew and calibration fixture |
| 119-6827-00 | CompactFlash to USB Memory Card Reader |
| TEK-USB-488 | GPIB to USB Adapter |
| NEX-HD2HEADER | Mictor connector breakout to 0.1” header pins |



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# MSO/DPO3000 Series

## Ordering Information



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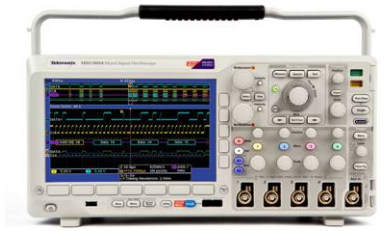
# MSO3000 Series: Key Specifications



| | MSO3012 | MSO3014 | MSO3032 | MSO3034 | MSO3054 |
|---|---|---|---|---|---|
| Bandwidth | 100 MHz | 100 MHz | 300 MHz | 300 MHz | 500 MHz |
| Channels (analog + digital) | 2 + 16 | 4 + 16 | 2 + 16 | 4 + 16 | 4 + 16 |
| Sample Rate (analog) | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s |
| Sample Rate (digital) | Full Record - 500 MS/s, MagniVu Record - 8.25 GS/s | | | | |
| Record Length (analog) | 5 M points | | | | |
| Record Length (digital) | Full Record - 5 M points, MagniVu Record - 10 k points | | | | |
| Input Impedance | 50 Ω, 75 Ω, 1 MΩ | | | | |
| Waveform Capture Rate | >50,000 wfm/s | | | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, $I^2S$/LJ/RJ/TDM, CAN, LIN | | | | |
| Other Application Solutions (opt.) | Power Analysis, HDTV and Custom Video Triggering | | | | |
| Display (resolution) | 9 in. WVGA (800x480) | | | | |

# DPO3000 Series: Key Specifications

| | DPO3012 | DPO3014 | DPO3032 | DPO3034 | DPO3054 |
|---|---|---|---|---|---|
| Bandwidth | 100 MHz | 100 MHz | 300 MHz | 300 MHz | 500 MHz |
| Channels | 2 + 16 | 4 + 16 | 2 + 16 | 4 + 16 | 4 + 16 |
| Sample Rate (all channels) | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s | 2.5 GS/s |
| Record Length (all channels) | 5 M points | | | | |
| Input Impedance | 50 Ω, 75 Ω, 1 MΩ | | | | |
| Waveform Capture Rate | >50,000 wfm/s | | | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, $I^2S$/LJ/RJ/TDM, CAN, LIN | | | | |
| Other Application Solutions (opt.) | Power Analysis, HDTV and Custom Video Triggering | | | | |
| Display (resolution) | 9 in. WVGA (800x480) | | | | |



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# Product Ordering Information

| Product | Description |
|---|---|
| DPO3012 | 100 MHz, 2.5 GS/s, 5M Record Length, 2-Ch, Digital Phosphor Oscilloscope |
| DPO3014 | 100 MHz, 2.5 GS/s, 5M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| DPO3032 | 300 MHz, 2.5 GS/s, 5M Record Length, 2-Ch, Digital Phosphor Oscilloscope |
| DPO3034 | 300 MHz, 2.5 GS/s, 5M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| DPO3054 | 500 MHz, 2.5 GS/s, 5M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| MSO3012 | 100 MHz, 2.5 GS/s, 5M Record Length, 2+16-Ch, Mixed Signal Oscilloscope |
| MSO3014 | 100 MHz, 2.5 GS/s, 5M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |
| MSO3032 | 300 MHz, 2.5 GS/s, 5M Record Length, 2+16-Ch, Mixed Signal Oscilloscope |
| MSO3034 | 300 MHz, 2.5 GS/s, 5M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |
| MSO3054 | 500 MHz, 2.5 GS/s, 5M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |

# MSO/DPO3000 Application Modules

| Product | Description |
|---|---|
| DPO3EMBD | Embedded serial triggering and analysis module for MSO/DPO3000 Series oscilloscopes. Supports $I^2C$ and SPI buses |
| DPO3COMP | Computer serial triggering and analysis module for MSO/DPO3000 Series oscilloscopes. Supports RS-232 / RS-422 / RS-485 / UART buses |
| DPO3AUTO | Automotive serial triggering and analysis module for MSO/DPO3000 Series oscilloscopes. Supports CAN and LIN buses |
| DPO3AUDIO | Audio serial triggering and analysis module for MSO/DPO3000 Series oscilloscopes. Supports $I^2S$/LJ/RJ/TDM buses. |
| DPO3PWR | Power analysis module for MSO/DPO3000 Series oscilloscopes. Supports power quality, switching loss, harmonics, ripple, modulation, safe operating area, and slew rate analysis. |
| DPO3VID | HDTV and custom video trigger for MSO/DPO3000 Series oscilloscopes |

# Standard Accessories

| Product | Description |
|---|---|
| P6139A – One per channel | 500 MHz, 10x Passive voltage probe with accessories |
| P6316 (MSO3000 only) | 16-channel logic probe |
| Power Cord | Country specific – please order a power cord option |
| User Manual | Country specific – please order a language option (includes language overlay for front panel label) |
| Software Kit | Tektronix OpenChoice™ Desktop PC Communication Software and NI LabVIEW Signal Express Tektronix Edition |
| Documentation CD | CD containing all relevant documentation |
| Front Cover | Front panel cover to protect instrument when transporting |
| Calibration Certificate | Calibration certificate documenting traceability to National Metrology Institute(s) and ISO9001 Quality System Registration |
| Accessory Pouch | Pouch for probe accessories |
| Three Year Warranty | Three year product warranty |

# Recommended Probes

| Product | Description |
|---|---|
| TAP1500 | TekVPI™ 1500 MHz single-ended active probe |
| TDP0500 | TekVPI™ 500 MHz differential active probe |
| TDP1000 | TekVPI™ 1 GHz differential active probe |
| TCP0030 | TekVPI™ DC to 120 MHz, 30 A current probe |
| TCP0150 | TekVPI™ DC to 20 MHz, 150 A current probe |
| P5100* | Level II TekProbe 2.5 kV, 100X, 250 MHz high voltage passive probe |
| P5200 | Level II TekProbe 1300 V, 50X/500X, 25 MHz high voltage active differential probe |
| P5205* | Level II TekProbe 1300 V, 50X/500X, 100 MHz high voltage active differential probe |
| P5210* | Level II TekProbe 5600 V, 100X/1000X, 50 MHz high voltage active differential probe |
| ADA400A* | Level II TekProbe 100X, 10X, 1X, 0.1X, high-gain differential amplifier |
| DPO3PWRBND | Comprehensive suite of products to make common power measurements, bundled at a discounted price. Includes DPO3PWR module, probes (P5205, TDP0500, TCP0030), TPA-BNC adapter, probe deskew fixture and pulse generator, all in a hard-sided carrying case. |

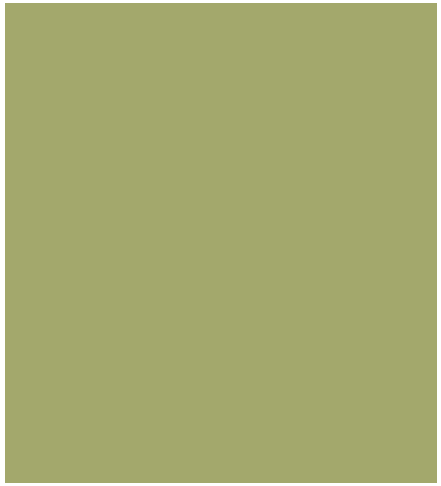
*** Requires TPA-BNC adapter**

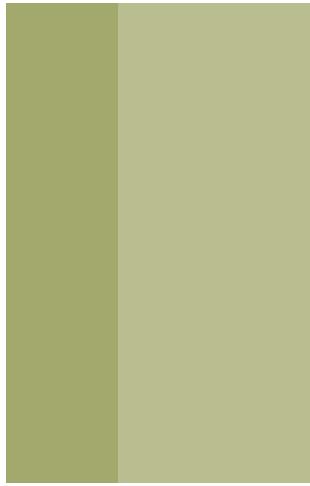
# Recommended Accessories

| Product | Description |
|---|---|
| 071-2667-XX | Service Manual (English only) |
| ACD4000 | Soft Transit Case |
| HCTEK4321 | Hard Transit Case (Requires ACD4000) |
| RMD3000 | Rackmount Kit |
| SIGEXPTE | NI LabVIEW SignalExpress™ Tektronix Edition Software (Full Version) |
| FPGAVIEW-xx | MSO support for Altera and Xilinx FPGAs |
| TPA-BNC | TekVPI™ to TekProbe™ BNC Adapter |
| TEK-DPG | TekVPI™ Deskew Pulse Generator Signal Source |
| 067-1686-00 | Probe deskew and calibration fixture |
| TEK-USB-488 | GPIB to USB Adapter |
| 119-7465-xx | TekVPI® External Power Supply |

# MSO/DPO2000 Series

## Ordering Information







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# MSO2000 Series: Key Specifications

| | MSO2012 | MSO2014 | MSO2024 |
|---|---|---|---|
| Bandwidth | 100 MHz | 100 MHz | 200 MHz |
| Channels (analog + digital) | 2 + 16 | 4 + 16 | 4 + 16 |
| Sample Rate (analog) | 1 GS/s | 1 GS/s | 1 GS/s |
| Sample Rate (digital) | 1 GS/s (8 ch), 500 MS/s (16 ch) | | |
| Record Length (analog) | 1 M points | | |
| Record Length (digital) | 1 M points | | |
| Input Impedance | 1 MΩ | | |
| Waveform Capture Rate | 5,000 wfm/s | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, CAN, LIN | | |
| Display (resolution) | 7 in. WQVGA (480x234) | | |



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# DPO2000 Series: Key Specifications

| | DPO2012 | DPO2014 | DPO2024 |
|---|---|---|---|
| Bandwidth | 100 MHz | 100 MHz | 2 MHz |
| Channels | 2 | 4 | 4 |
| Sample Rate (all channels) | 1 GS/s | 1 GS/s | 1 GS/s |
| Record Length (all channels) | 1 M points | | |
| Input Impedance | 1 MΩ | | |
| Waveform Capture Rate | 5,000 wfm/s | | |
| Serial Trigger & Decode (optional) | $I^2C$, SPI, RS-232/422/485/UART, CAN, LIN | | |
| Display (resolution) | 7 in. WQVGA (480x234) | | |



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# Product Ordering Information

| Product | Description |
|---|---|
| DPO2012 | 100 MHz, 1 GS/s, 1M Record Length, 2-Ch, Digital Phosphor Oscilloscope |
| DPO2014 | 100 MHz, 1 GS/s, 1M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| DPO2024 | 200 MHz, 1 GS/s, 1M Record Length, 4-Ch, Digital Phosphor Oscilloscope |
| MSO2012 | 100 MHz, 1 GS/s, 1M Record Length, 2+16-Ch, Mixed Signal Oscilloscope |
| MSO2014 | 100 MHz, 1 GS/s, 1M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |
| MSO2024 | 200 MHz, 1 GS/s, 1M Record Length, 4+16-Ch, Mixed Signal Oscilloscope |

# MSO/DPO2000 Application Modules

| Product | Description |
|---|---|
| DPO2EMBD | Embedded serial triggering and analysis module for MSO/DPO2000 Series oscilloscopes. Supports $I^2C$ and SPI buses |
| DPO2COMP | Computer serial triggering and analysis module for MSO/DPO2000 Series oscilloscopes. Supports RS-232 / RS-422 / RS-485 / UART buses |
| DPO2AUTO | Automotive serial triggering and analysis module for MSO/DPO2000 Series oscilloscopes. Supports CAN and LIN buses |

# Standard Accessories

| Product | Description |
|---|---|
| P2221 – One per channel | 200 MHz, 1x/10x Passive voltage probe with accessories |
| P6316 (MSO2000 only) | 16-channel logic probe |
| Accessory Bag (MSO2000 only) | Pouch for MSO probe accessories |
| Power Cord | Country specific – please order a power cord option |
| User Manual | Country specific – please order a language option (includes language overlay for front panel label) |
| Software Kit | Tektronix OpenChoice™ Desktop PC Communication Software and NI LabVIEW Signal Express Tektronix Edition |
| Documentation CD | CD containing all relevant documentation |
| Calibration Certificate | Calibration certificate documenting traceability to National Metrology Institute(s) and ISO9001 Quality System Registration |
| Three Year Warranty | Three year product warranty |

# Recommended Probes

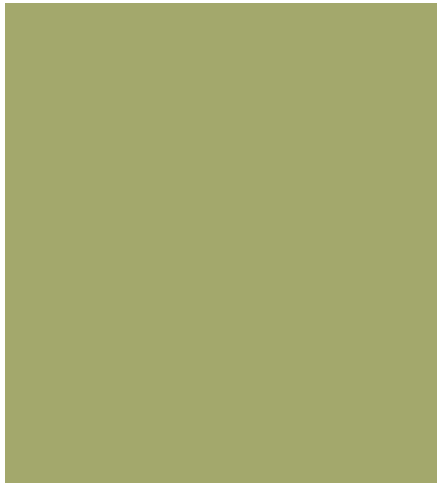
| Product | Description |
|---|---|
| TAP1500 | TekVPI™ 1500 MHz single-ended active probe |
| TDP0500 | TekVPI™ 500 MHz differential active probe |
| TCP0030 | TekVPI™ DC to 120 MHz, 30 A current probe |
| TCP0150 | TekVPI™ DC to 20 MHz, 150 A current probe |
| P5100* | Level II TekProbe 2.5 kV, 100X, 250 MHz high voltage passive probe |
| P5200 | Level II TekProbe 1300 V, 50X/500X, 25 MHz high voltage active differential probe |
| P5205* | Level II TekProbe 1300 V, 50X/500X, 100 MHz high voltage active differential probe |
| P5210* | Level II TekProbe 5600 V, 100X/1000X, 50 MHz high voltage active differential probe |
| ADA400A* | Level II TekProbe 100X, 10X, 1X, 0.1X, high-gain differential amplifier |

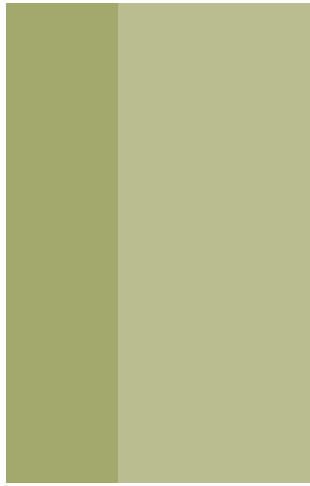
*** Requires TPA-BNC adapter**

# Recommended Accessories

| Product | Description |
|---|---|
| 071-2331-XX | Service Manual (English only) |
| ACD2000 | Soft Transit Case |
| HCTEK4321 | Hard Transit Case (Requires ACD2000) |
| RMD2000 | Rackmount Kit |
| SIGEXPTE | NI LabVIEW SignalExpress™ Tektronix Edition Software (Full Version) |
| FPGAVIEW-xx | MSO support for Altera and Xilinx FPGAs |
| TPA-BNC | TekVPI™ to TekProbe™ BNC Adapter |
| TEK-DPG | TekVPI™ Deskew Pulse Generator Signal Source |
| 067-1686-00 | Probe deskew and calibration fixture |
| TEK-USB-488 | GPIB to USB Adapter |
| DPO2CONN | Adds Ethernet (10/100Base-T) and Video Out Port to the MSO/DPO2000 Series |
| 119-7465-xx | TekVPI® External Power Supply |

# Thank You







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