

## Data Sheet

# Digital Storage Oscilloscopes Models 2540B and 2542B



The 2540B and 2542B dual channel 60 MHz and 100 MHz digital storage oscilloscopes deliver performance and value, all in one portable solution. Maximize productivity using extensive features such as digital filtering, waveform recorder, pass/fail limit testing, and automatic measurements. These oscilloscopes offer powerful tools in a small affordable package with advanced triggering capabilities and deep waveform memory up to 2.4 Mpts.

Easily capture, save, and analyze measurement results with Comsoft PC software. All scope parameters can be controlled via a PC without the need for programming.

Additionally, these oscilloscopes can be integrated with arbitrary waveform generators (AWGs) using B&K Precision's waveform editing software, WaveXpress. WaveXpress allows users to easily modify waveforms downloaded from the scope and can also be used for analysis of deep memory acquisitions.



For more information, visit [www.bkprecision.com/WaveXpress](http://www.bkprecision.com/WaveXpress)

Educators will appreciate the ability to disable the Auto Set button that would automatically setup the scope to display a signal, circumventing the need to know how to set up scope parameters. This is key for teaching waveform measurement fundamentals as if it was an analog oscilloscope.

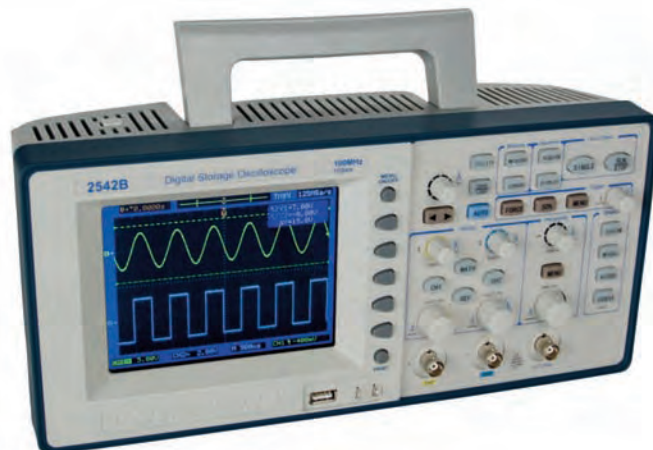
The 2540B and 2542B are ideal oscilloscopes for applications in design and debugging, service and repair, and education.

### Features and Benefits

- 60/100 MHz bandwidth (2540B / 2542B)
- 1 GSa/s sample rate
- Deep waveform memory up to 2.4 Mpts<sup>1</sup>
- 28 automatic measurements
- Four different math functions – Add, Subtract, Multiply, and FFT
- Pulse width, video, slope and alternate triggering
- Advanced tools include digital filter with adjustable limits, pass/fail testing, and waveform recorder mode
- Four shortcut keys for quick access of frequently used functions
- 11 different language user interfaces
- Built-in context sensitive help system
- For educators - ability to disable the Auto Set button
- LAN and USB connectivity for remote PC control through Comsoft PC software<sup>2</sup> or custom software using SCPI commands
- USB host port for convenient storing and recalling of waveform data, setups, and screenshots on a USB flash drive
- LAN interface for capturing screenshots via a web browser

<sup>1</sup>-Based on sample rate and accessible via remote interface

<sup>2</sup>-Available for download at the B&K Precision website



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**Front panel features**

**Display**  
5.7" color display.

**Menu On/Off button**  
Configure the menu parameters and hide the menu with the push of a button to view your signal in full screen.

**Waveform analysis with math and FFT**  
Analyze your signals with add, subtract, and multiply functions. View the signal's frequency spectrum and perform harmonic distortion analysis.

**Auto Set button**  
Vertical, horizontal, and trigger controls are automatically adjusted for fast signal display.

**Advanced triggering**  
Isolate the signal with advanced triggering including pulse width and selectable video trigger.

**Shortcut buttons**  
Use these buttons to quickly access your most frequently used functions or menus. The Custom button allows you to assign your own shortcut.

**USB host port**  
Connect your USB flash drive to conveniently update firmware and store/recall waveform data, setups, and screenshots.

**Print button**  
Simply press the Print button to save a screenshot in bitmap format to a USB flash drive.

**Rear panel**

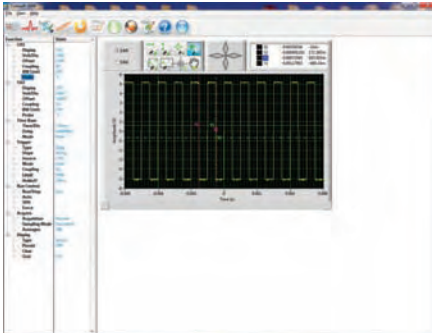
**Security loop**  
Use the built-in security loop to secure your instrument to your location.

**Communication**  
LAN, RS232, and USB ports enable remote PC control.

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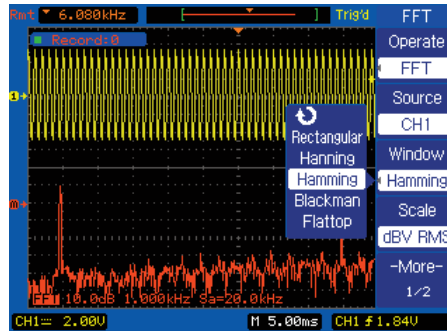
## The tools you need

### PC Connectivity



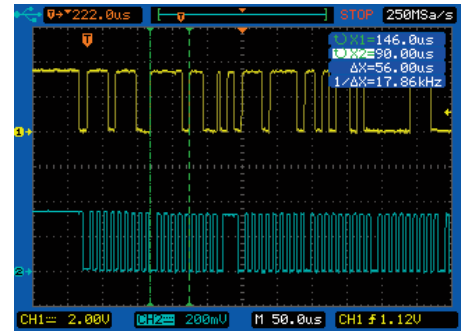
Comsoft software provides seamless integration between the oscilloscope and PC. Capture and transfer waveforms, screen images, setups, and measurement results to a Windows PC via the LAN and USB device port on the back of the instrument. A USB host port on the front allows for quick and easy screen saving to a USB flash drive.

### Powerful Measurement Functions



Display and measure the input signal's frequency spectrum. Select one of the 5 FFT windows: Rectangular, Hanning, Hamming, Blackman, and Flattop. Use cursors to measure the spectral component's magnitude and frequency.

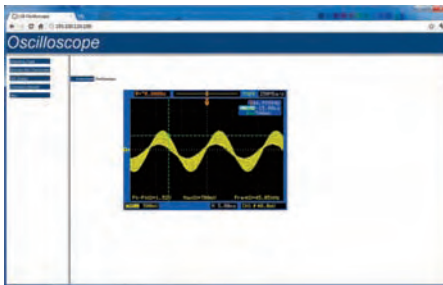
### Deep Memory



Beneficial for applications such as I<sup>2</sup>C serial data streams, deep memory lets you capture waveforms in high resolution while maintaining a high sample rate over a longer period of time. Up to 2.4 Mpts of memory can be captured in as fast as 5 seconds\* using binary transfer through the LAN or USB interface.

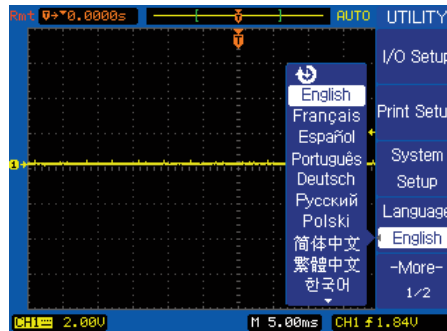
\*Typical time based on LAN speed testing.

### Web-Enabled



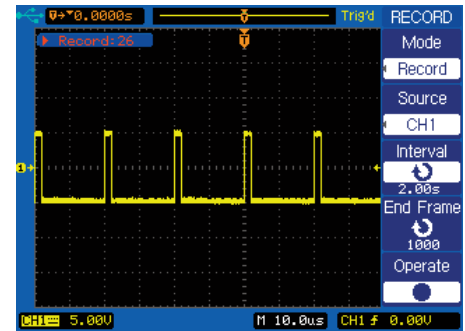
The built-in LAN interface allows you to easily capture screenshots with any standard web browser. This feature can be useful in an education setting.

### Multi-Language Interface



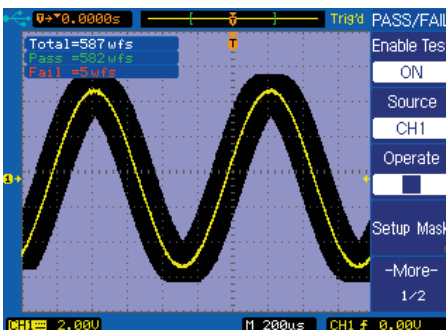
Operate the oscilloscope in a language you understand best with the built-in multi-language interface. Choose from English, Simplified Chinese, Traditional Chinese, Korean, Japanese, French, German, Russian, Spanish, Portuguese, and Polish.

### Waveform Recorder



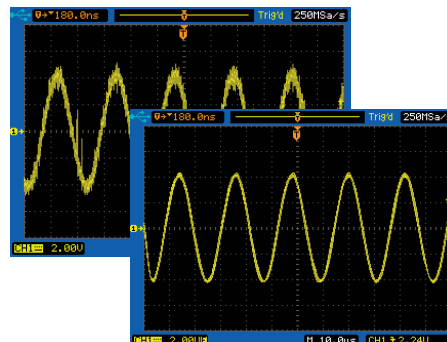
Monitor and analyze long-term signal behavior by recording data continuously over an extensive period of time and playing it back for post acquisition analysis. Data is recorded in a sequence of up to 1000 frames.

### Pass/Fail Testing



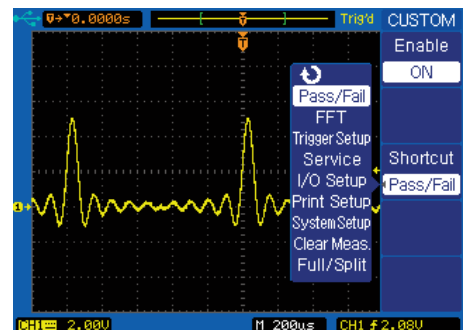
Generate user-defined pass/fail limits to quickly identify go/no go test results.

### Digital Filtering



Filter out unwanted signal components such as various types of noise with built-in digital filters. Choose from Low-Pass, High-Pass, Band-Pass, and Band-Stop filters.

### Custom Shortcut Key



Generate your own shortcut key from the shortcut menu to quickly access your most frequently used function.

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# Specifications

Model	2540B	2542B
<b>Performance Characteristics</b>		
Bandwidth	60 MHz	100 MHz
Real Time Sampling Rate	Single Channel: 1 GSa/s	
Channels	2	
Rise time	<5.83 ns	<3.50 ns
Max Memory Depth (based on sample rate)	1 GSa/s: 16 kpts 500 MSa/s: 8 kpts (dual channel) 500 MSa/s: 2.4 Mpts* (single channel) ≤ 250 MSa/s: 1.2 Mpts* (single and dual channel) *Maximum number of points can only be extracted via remote control using the USB, RS232C, or LAN interface.	
Vertical Resolution	8 bits	
Vertical Sensitivity	2 mV/div -5 V/div (1-2-5 order)	
DC Gain Accuracy	10 mV/div to 5 V/div: ±3.0% 2 mV/div, 5 mV/div: ±4.0%	
Maximum input voltage	400 V (DC+AC PK-PK, 1 MΩ input impedance, X10), CAT I	
Position Range	±8 divisions away from the center of the screen	
Bandwidth Limit	20 MHz selectable	
Horizontal Scan Range	2 ns/div to 50 s/div	
Timebase Accuracy	±0.01 %	
Input Coupling	AC, DC, GND	
Input Impedance	1 MΩ    18 pF	
Vertical and Horizontal Zoom	Vertically or horizontally expand or compress a live or stopped waveform	
<b>I/O Interface</b>		
USB	USB host port for flash drives, USB device port for remote control via PC and Comsoft software	
RS232	Remote control via PC and Comsoft software	
LAN	Connect to PC and web browser	
Pass/Fail	Pass/Fail output	
<b>Acquisition Modes</b>		
Normal	Display sample data only	
Peak Detect	Capture the maximum and minimum values of a signal	
Average	Waveform averaged, selectable from 2, 4, 8, 16, 32, 64, 128, 256	
<b>Trigger System</b>		
Trigger Types	Edge, Pulse Width, Video* *Support signal Formats: PAL/SECAM, NTSC Trigger condition : odd field, even field, all lines, or line number	
Trigger Modes	Auto, Normal, Single	
Trigger Coupling	AC, DC, LF reject, HF reject	
Trigger Source	CH1, CH2, EXT, EXT/5, AC Line, Alternating	
Pulse Width Trigger	Trigger Modes: Positive Pulse (>, <, =), Negative Pulse (>, <, =)	
Slope Trigger	Time: 20 ns-10 s	
Alternative Trigger	CH1 trigger type: Edge, Pulse, Video, Slope CH2 trigger type: Edge, Pulse, Video, Slope	

<b>Hardware Frequency Counter</b>	
Reading resolution	5 digits
Range	up to oscilloscope's maximum bandwidth
<b>Waveform Math and Automatic Measurements</b>	
Math operation	Add, Subtract, Multiply, FFT
FFT	Window mode: Rectangular, Hanning, Hamming, Blackman, Flattop Sampling points: 1024
Measurements	Max, Min, VPP, High, Low, Amplitude, Average, RMS, Overshoot, Preshoot, Cycle average, Cycle RMS, Frequency, Period, Rise time, Fall time, +Width, -Width, +Duty, -Duty, Delay, Phase, X at MAX, X at MIN
<b>Cursors</b>	
Types	Voltage, Time
Measurements	ΔV, ΔT, 1/ΔT (frequency)
<b>Auto Set</b>	
Function	Single button automatic setup of both channels for vertical, horizontal and trigger system. Can be disabled for training purposes
Requirements	Minimum voltage > 10 mVpp, 0.5% duty and minimum frequency > 50 Hz
<b>Display System</b>	
Display	5.7 in. Color TFT, 320 x 234 resolution, 24-bit true color
Wave display range	8 x 12 div
Wave display mode	Dots, Vector
Persistence	Off, Infinite
Waveform interpolation	Sin(x)/x, Linear
Color mode	Normal, Inverted
<b>Environmental and Safety</b>	
Temperature	Operating: 32° F to 104° F (0 °C to +40 °C) Non-operating: -4° F to 131° F (-20 °C to +55 °C)
Humidity	Maximum 80% R.H. for temperatures up to 87.8 °F (31 °C), decreasing linearly to 50% R.H. at 104 °F (40 °C)
Altitude	Operating: 9,842.5 ft (3,000 m) Non-operating: 49,212.6 ft (15,000 m)
Electromagnetic Compatibility	Meets EMC Directive 2004/108/EC, meets EN61326 Class A
Safety	EN61010-1:2001, EU Low Voltage Directive 2006/95/EC
<b>General</b>	
Power Requirements	100-240 VAC, CAT II, 50 VA max, 47 Hz to 440 Hz
Dimensions (WxHxD)	12.6" x 6.16" x 4.84" (320 x 156.5 x 123 mm)
Weight	6.17 lbs. (2.8 kg)
<b>Three-Year Warranty</b>	
Supplied Accessories: User manual, two 150 MHz 10:1 passive probes (model PR37A), power cord, USB interface cable, and certificate of calibration	