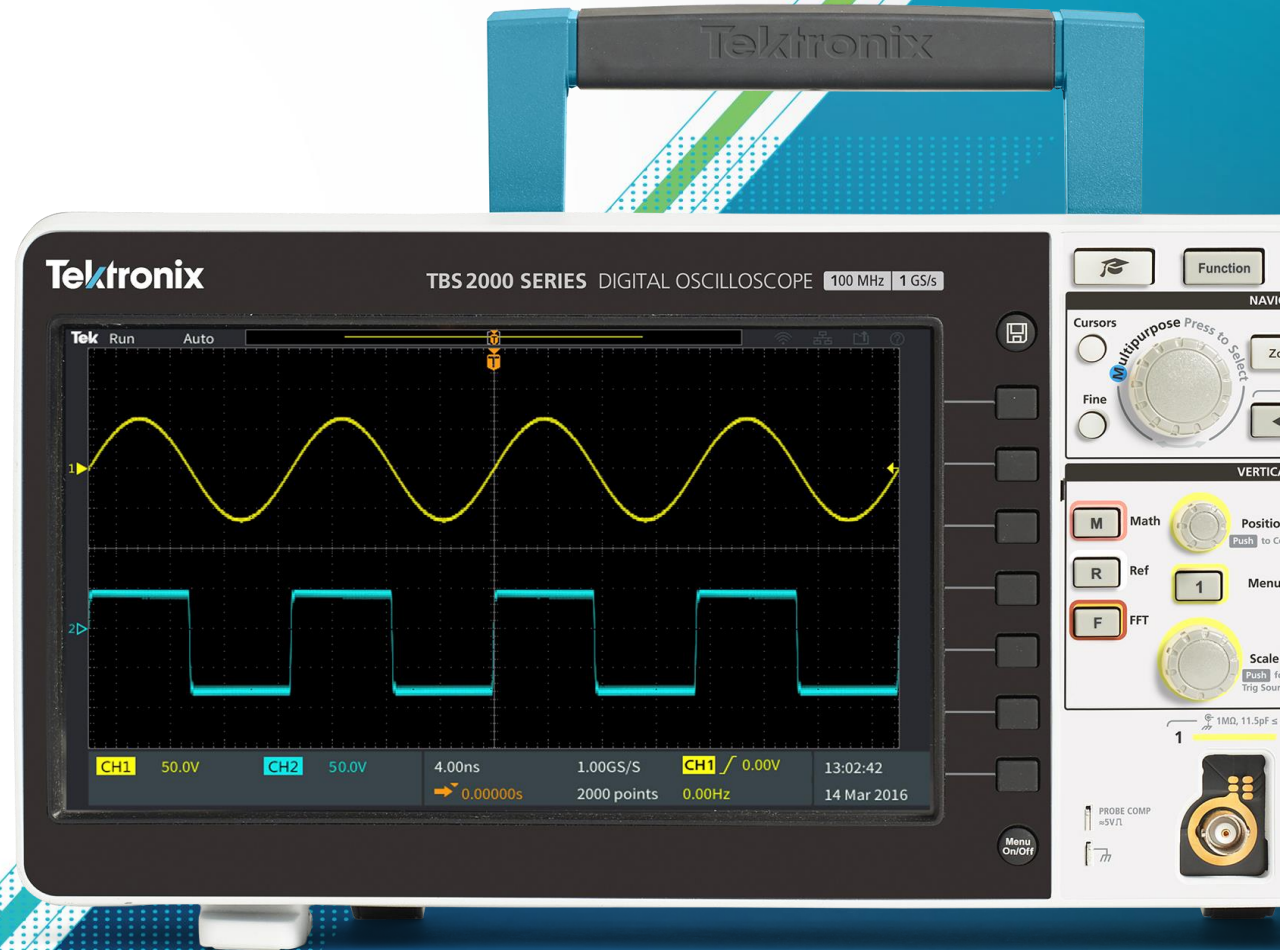


# Tektronix

## TBS2000B Oscilloscope *Overview*

13 FEBRUARY 2020



# Some Significant Challenges

## FOR TODAY'S BASIC OSCILLOSCOPE USERS

- Time to market pressures drive the need to reduce test times on today's complex signals.
- Need to collect data over time to review trends for debugging certain issues
- Need to test a wide variety of signals with passive probe that need to be manually setup leading to errors in testing process
- Confidence in measurements, both in terms of accuracy and choosing the right measurements for the signal at hand
- Teach larger number of students with more emphasis on hands-on lab work

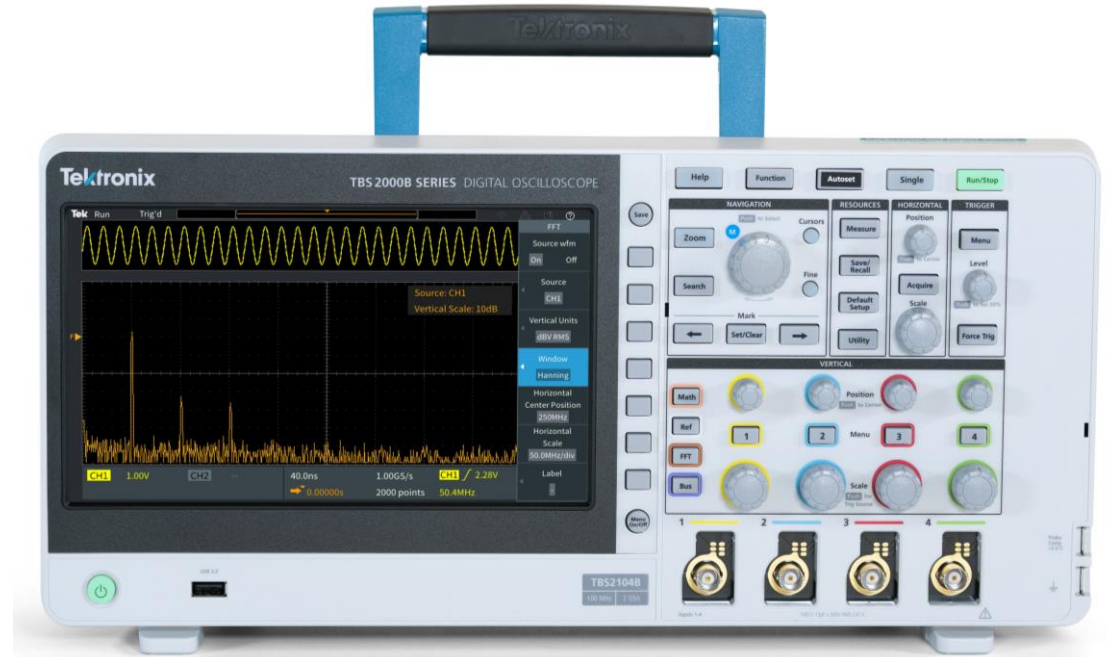
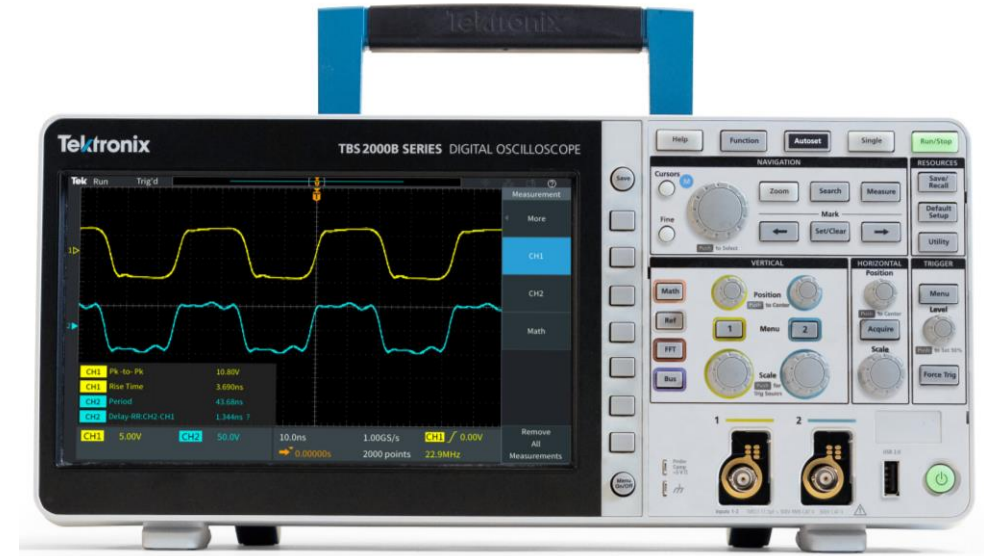


**Introducing the...**

TBS2000B Series Oscilloscopes

# New TBS2000B Series

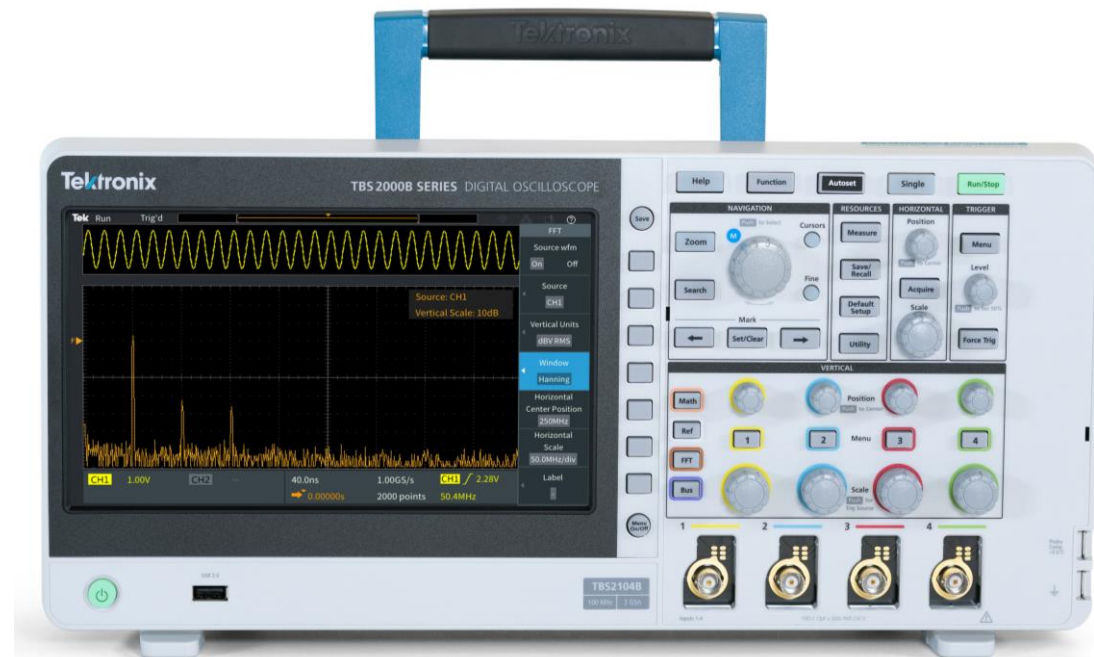
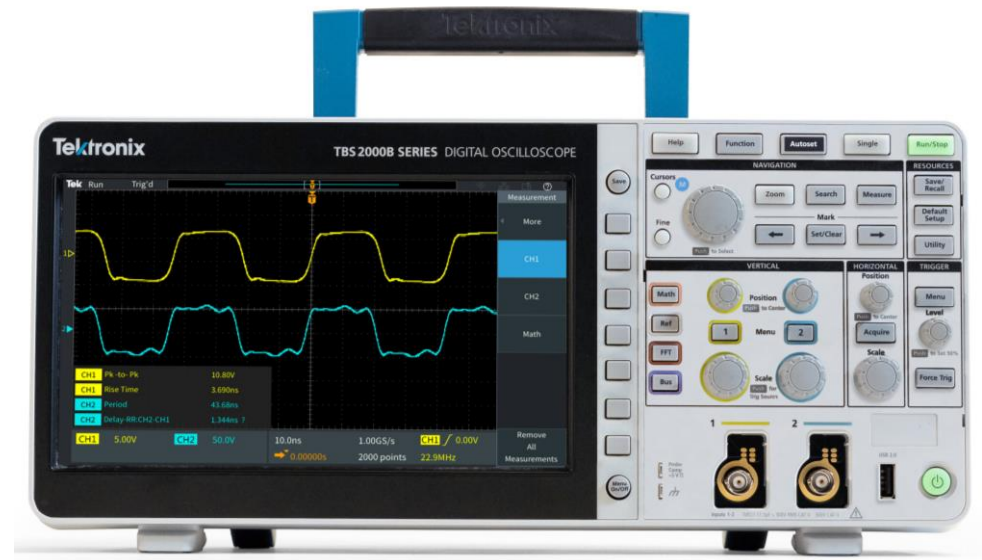
- Capture More
- See More
- Find More
- Analyze More
- Access More
- Learn More





# TBS2000B Series Overview

	TBS2072B TBS2074B	TBS2102B TBS2104B	TBS2202B TBS2204B
Bandwidth	70MHz	100MHz	200MHz
Analog Channels	2 or 4		
Sample Rate	1GS/s (All) 2GS/s (Half)		
Record Length	5M Points		
Vertical Resolution	8 Bit		
Probe Interface	TekVPI with support for passive BNC probes, Active Voltage, Current and Power probes		
Trigger	Edge, Pulse Width, Runt		
Analysis	32 Automated Measurements, Math, Ref, Cursors, FFT, Search and Mark, Zoom, Autoset		
Display Size	9in WVGA		
I/O	USB Host, USB Device, LAN, Aux Out, WiFi (Optional)		
Security	Kensington Lock		
Software	Courseware, TekSmartLab, OpenChoice, TekBench, Kickstart		
Warranty	5 Year		
Price Range	\$1,370 - \$3,030		

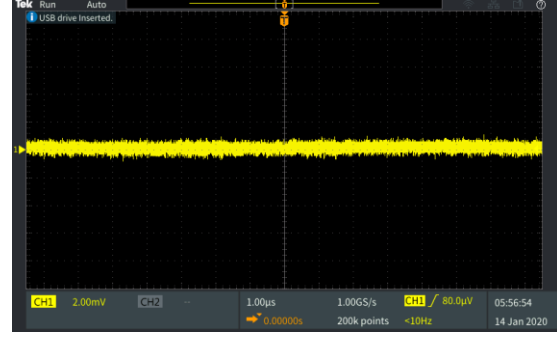
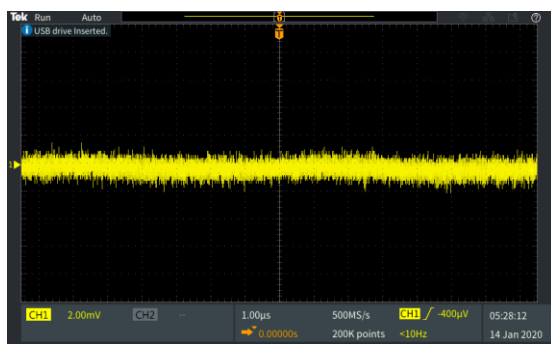
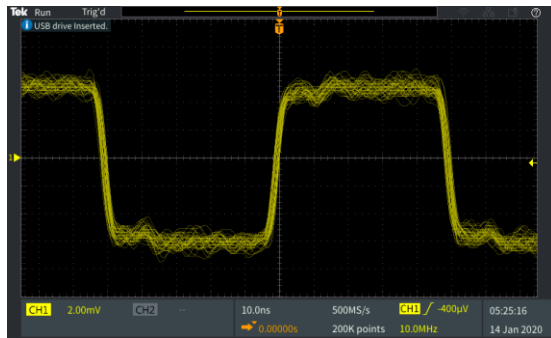


# Capture More

Designed to capture a wide variety of signals accurately.

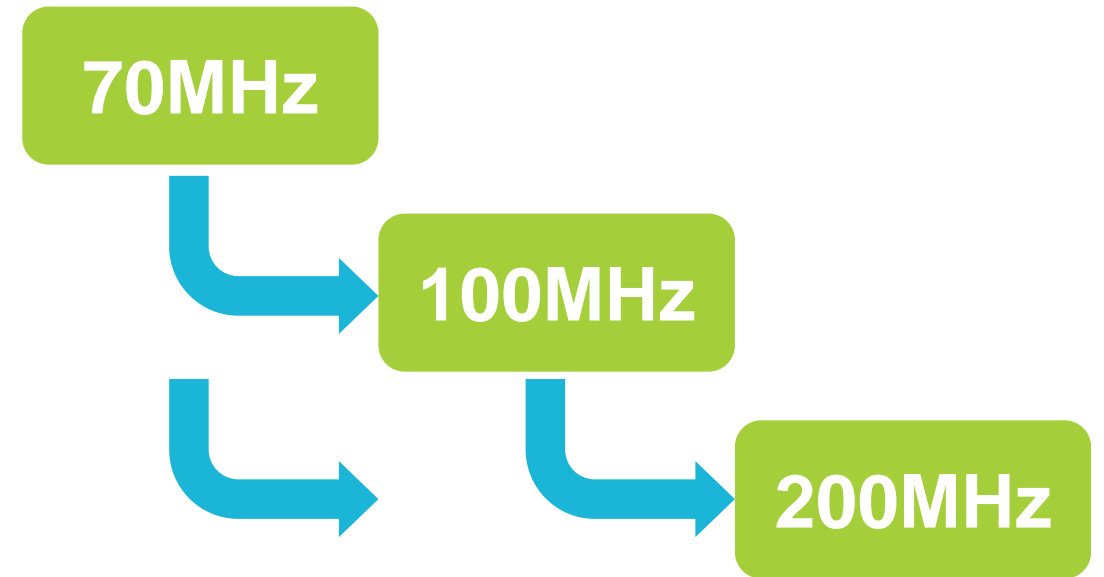
# New Acquisition System

- New Lower Noise front end design
  - Lower random noise
  - Better Signal Integrity
  - Accurate measurements
  - 200MHz bandwidth with 2GS/s
- Flexible Bandwidth – upgrade when you want.



TBS2000

TBS2000B



# Flexible Probing Solutions

## MEASURE A WIDER RANGE OF SIGNALS

- TekVPI™ probe interface supports wide range of passive and active probes
  - Passive Probes
  - Current Probes
  - Differential Probes
  - High Voltage Probes
- Supports voltage and current probes with standard BNC interfaces
- Probes automatically communicate scale factors to the oscilloscope
- Active probes are powered by the oscilloscope. No external power needed.



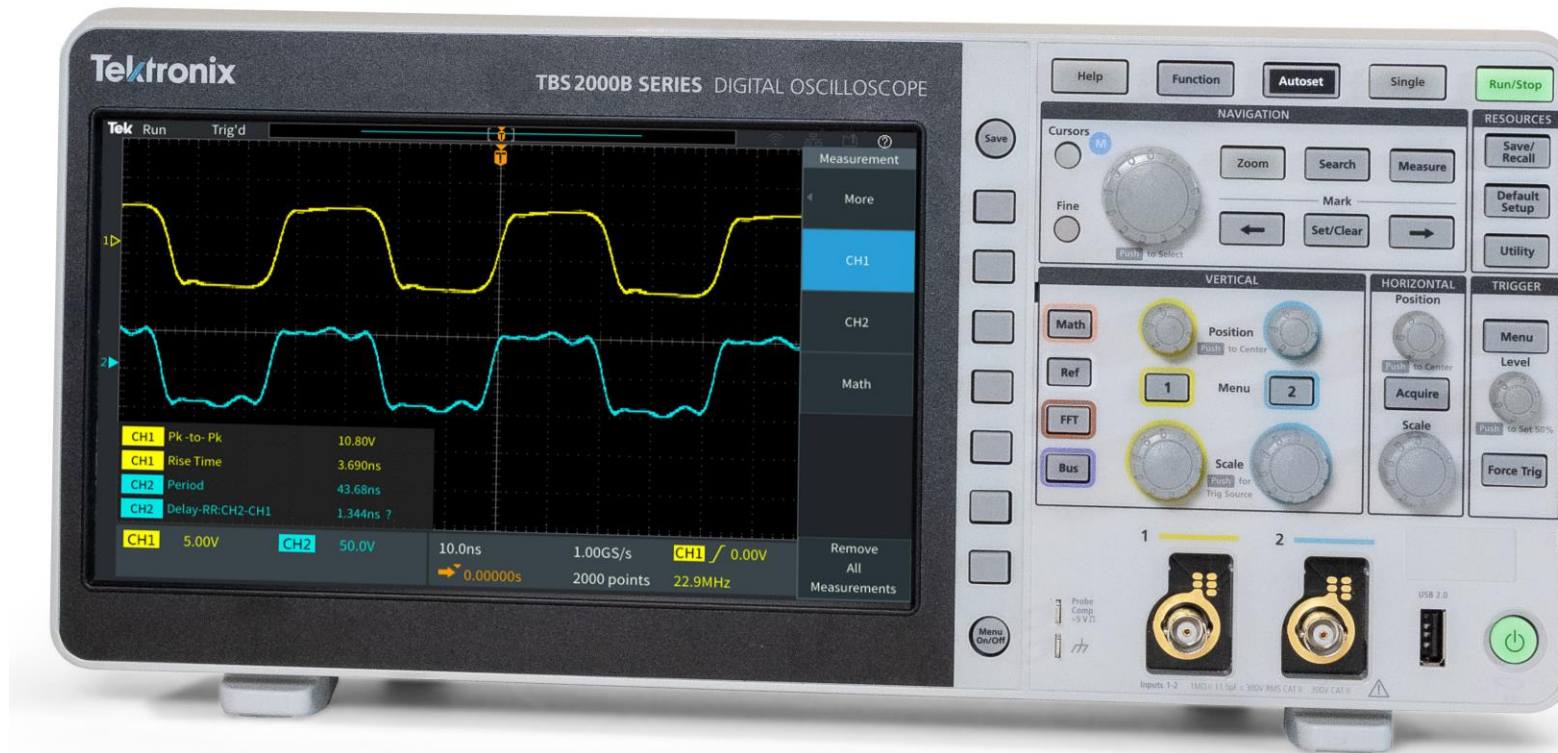


# See More

Designed to display more signal than ever.

# The Standout Differences

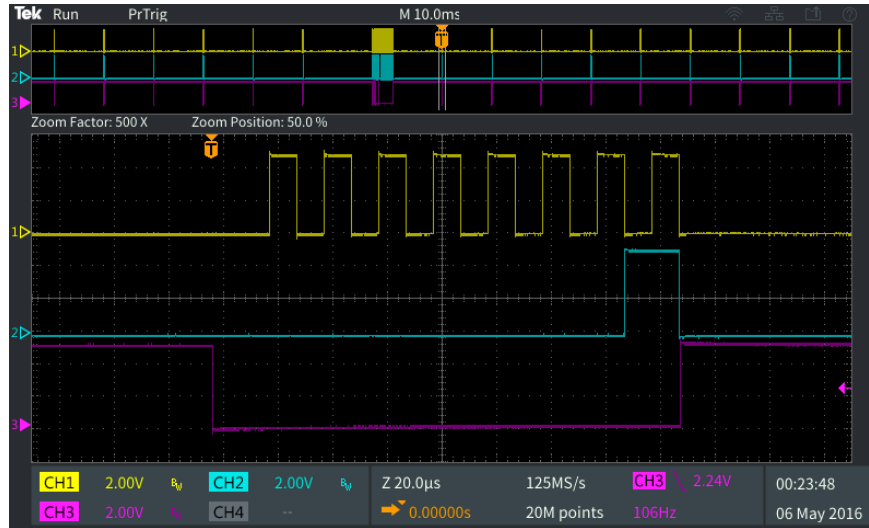
LARGE SIGNAL VIEWING AREA WITH UPDATED FRONT PANEL



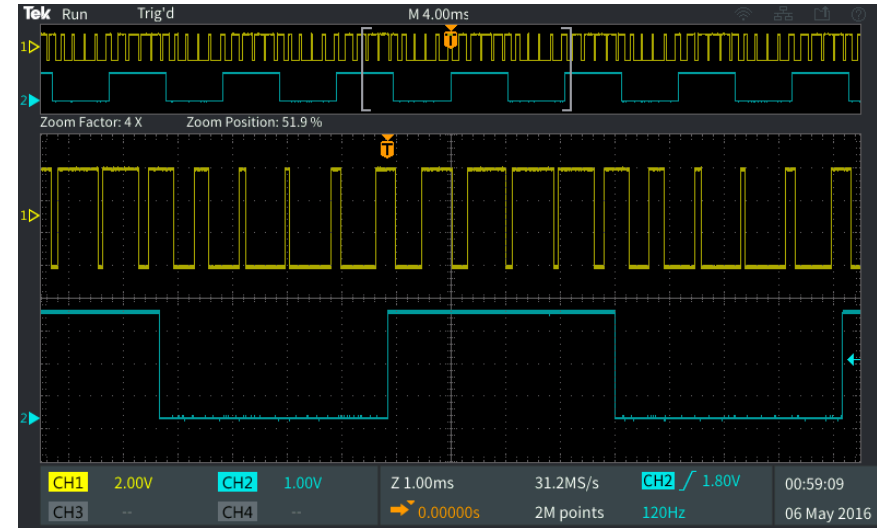
- Large 9in display with 15 horizontal divisions gives more time per screen
- Easily pan and zoom through long records with front-panel waveform navigation controls

# More Signal to See

SEE MORE TIME PER CAPTURE AND PER SCREEN



Digital Data Packets



PWM Waveform

- 5M record length to capture long time windows
- Easily pan and zoom through long records with front-panel waveform navigation controls

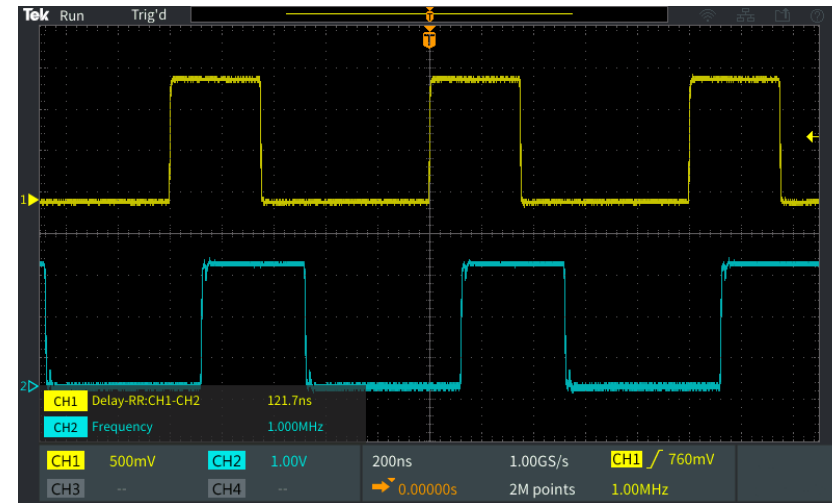
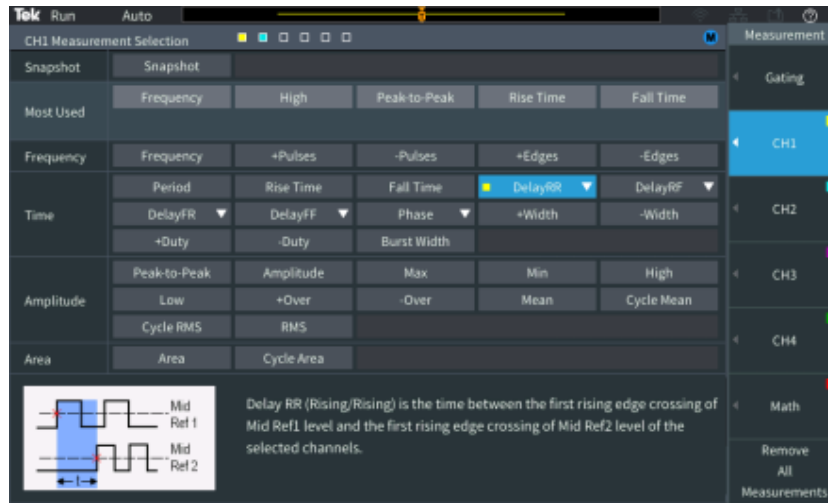
# Analyze More

Designed to perform wide range of Measurements and Complex Analysis.



# Automatic Measurements

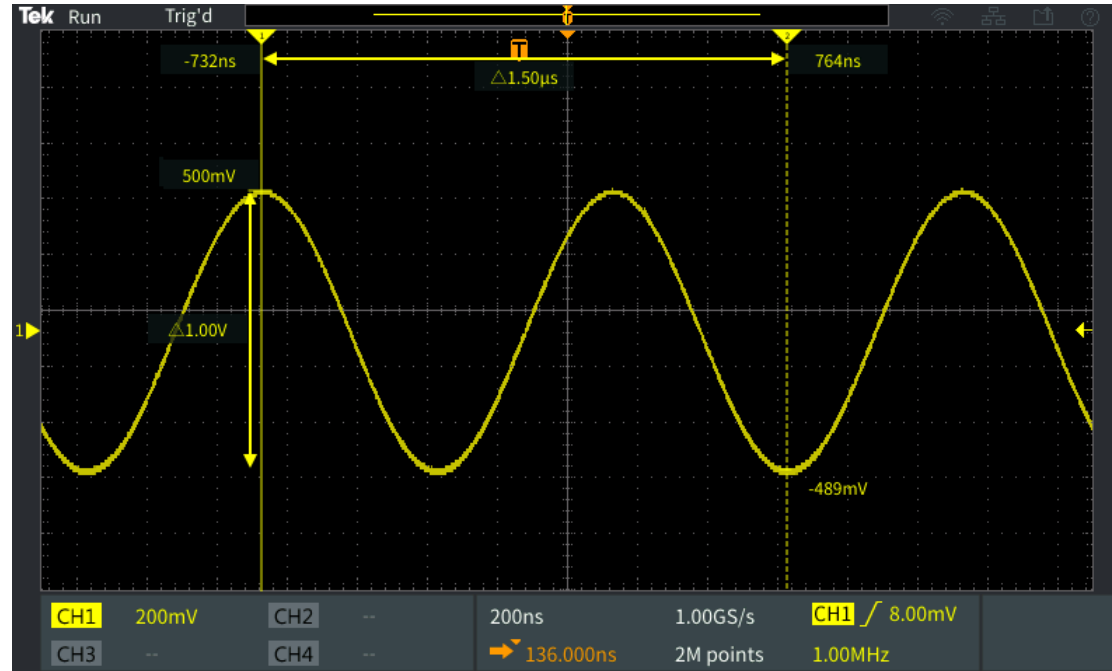
## MEASURE WITH CONFIDENCE



- 32 Automatic Measurements enable you to measure the most commonly needed parameters
- Measurements can be gated by cursors or the screen
- Take a “snapshot” of all measurements for a specific channel or display up to 6 measurements on any channel
- Choose measurements from a single screen, without sifting through menus
- HelpEverywhere provides on-screen descriptions of each measurement

# Cursor Measurements

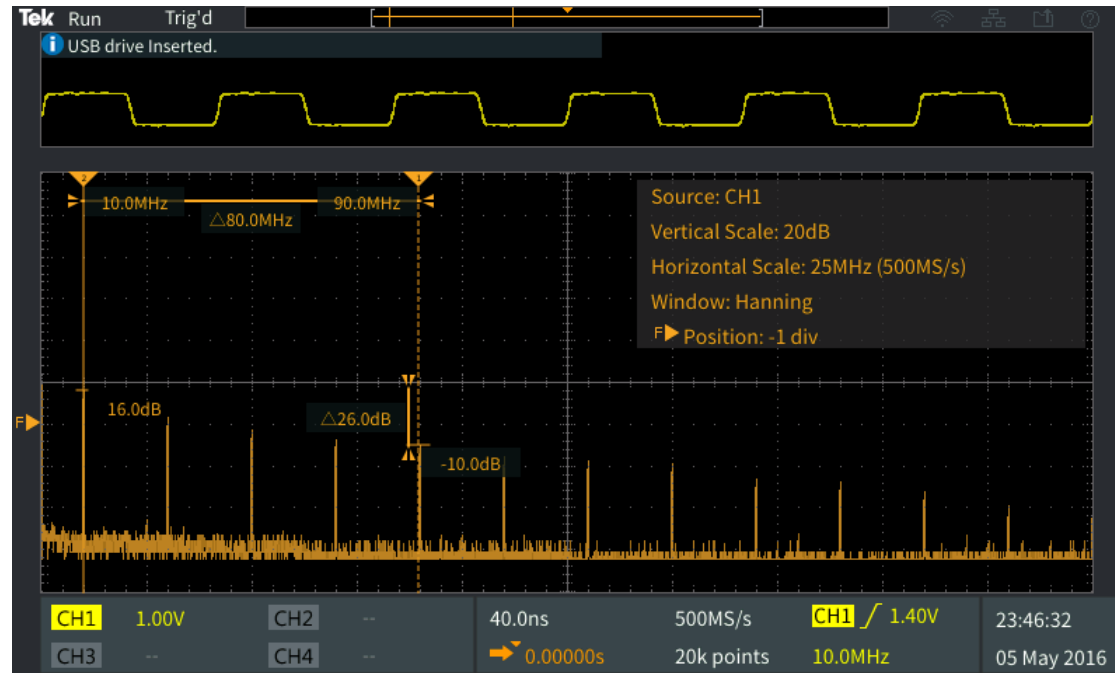
## MEASURE WITH ON-WAVEFORM READOUTS



- 3 types of cursors are supported
  - Time : Measure time delta
  - Amplitude : Measure amplitude delta
  - Screen Cursors : Measure time / amplitude delta
- Cursor measurements are placed on waveforms – just like a textbook!

# FFT with Source Waveform

SEE FREQUENCY AND TIME DOMAIN REPRESENTATIONS



- Time domain source waveform can be displayed above the FFT
- Transparent readout panel maintains visibility of the FFT
- Linear RMS and dBv RMS vertical units

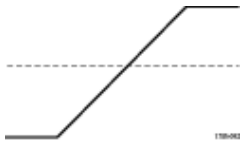
# Find More

Designed to Trigger, capture and search for events of interest.

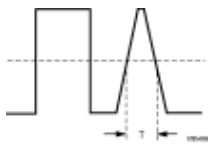


# Versatile Triggering

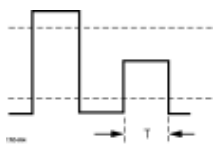
SEE ANOMALIES FAST, ESPECIALLY ON DIGITAL SIGNALS



- Edge
  - Rise/Fall



- Pulse Width
  - Positive or Negative
  - Width: >, <, =, !=



- Runt
  - Positive or Negative
  - Dual-thresholds
  - Width: any, >, <, =, !=



- Aux Out enables synchronization other equipment based on a trigger event on the scope

# Search and Mark

## SEARCH FOR EVENTS OF INTEREST

- Use the trigger definition to Mark all events of interest with in an acquisition
- Navigate to each occurrence with dedicated front panel controls easily for closer examination



# Access More

Designed with flexible I/O for data transfer and remote access to Instrument.

# Three Interfaces to Choose From

## THE RIGHT INTERFACE FOR THE JOB

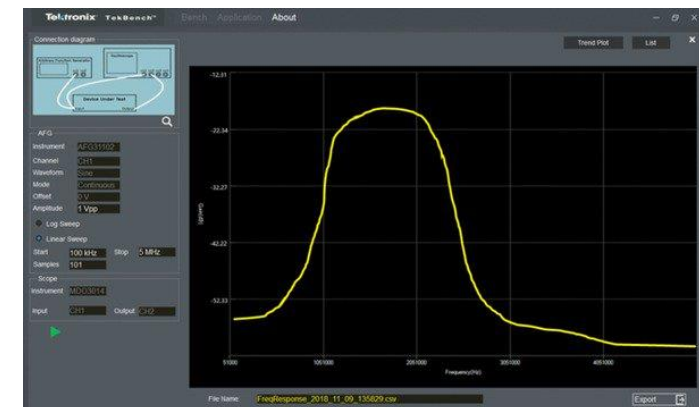
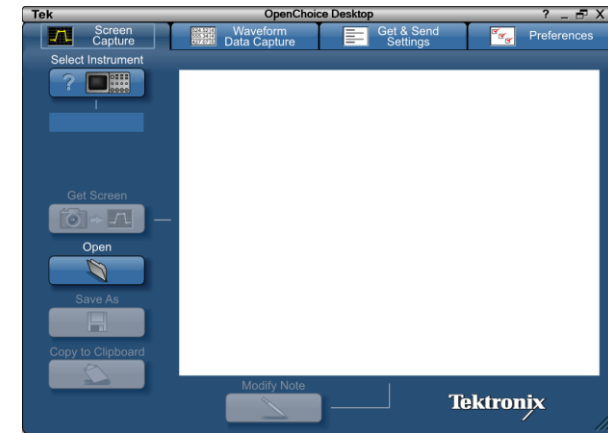
- Support for a variety of interfaces
  - USB host port
    - For saving or loading waveforms / setups from USB flash drive
    - Add WiFi capability with a WiFi adapter
  - USB device port
    - Remotely control the instrument using TekVisa
  - 100-BaseT Ethernet port
    - Remotely control the instrument using TekVisa
- First basic oscilloscope family with Wi-Fi adapter support
  - Configured from the front panel
  - Available from Tek or as an off-the-shelf device





# Extended Capabilities

- Tools for extending the capabilities of the instrument
  - OpenChoice Desktop
    - Screen Capture
    - Waveform Data Capture
    - Get / Send instrument settings
  - TekBench
    - Connect and control an AFG and a Scope
    - Automated measurement data logging and trend plotting
    - Automated Frequency Response analysis

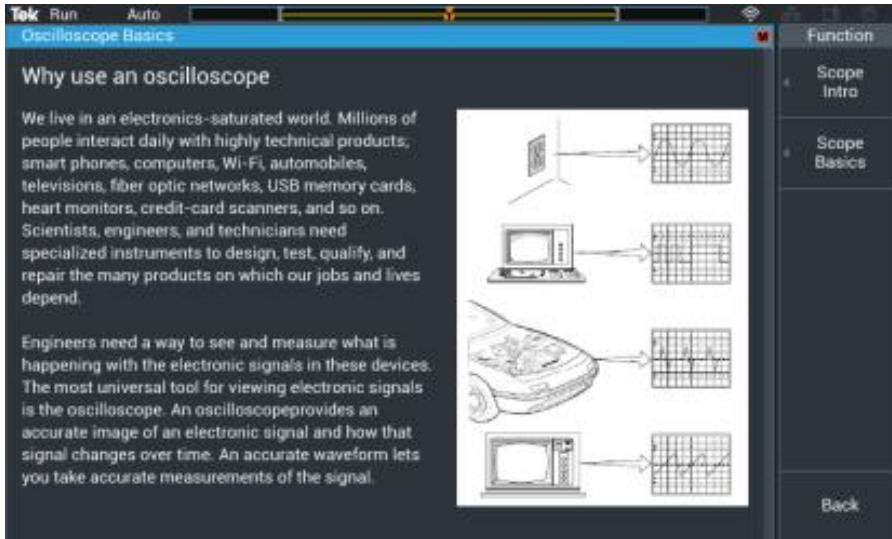


# Learn More

Unique capabilities for enhancing education.

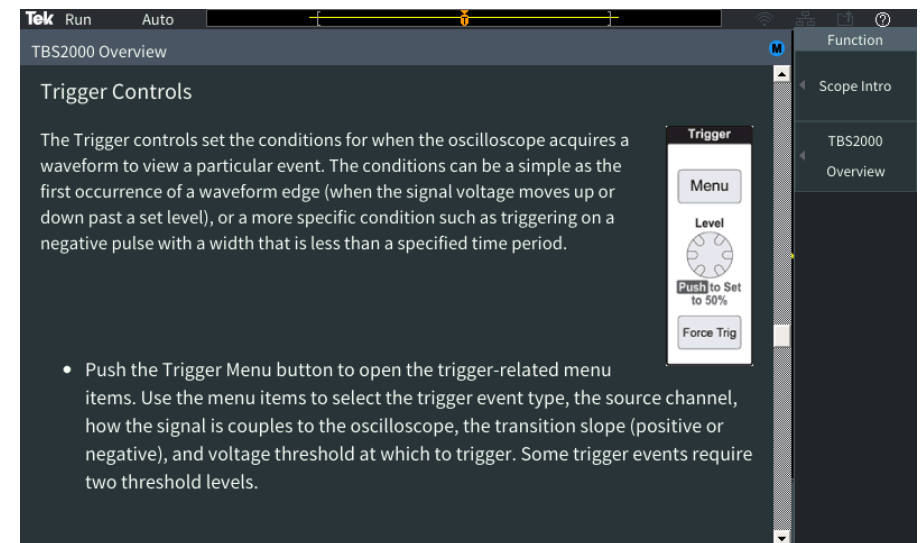
# Scope Intro Integrated Handbook

## LEARN ABOUT SCOPES – RIGHT ON THE SCOPE



- A basic oscilloscope primer helps new users come up to speed quickly

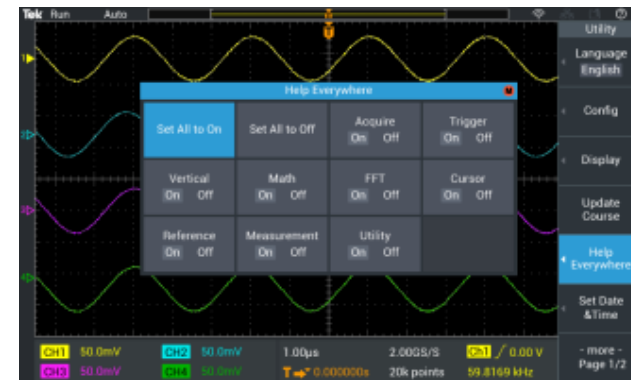
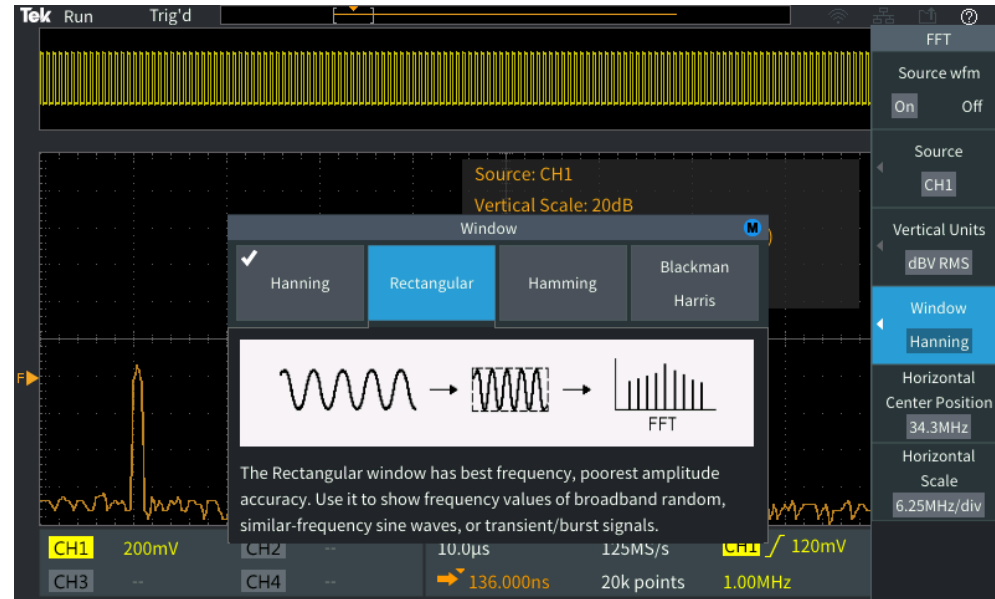
- TBS2000 Overview explains key controls, and walks through instrument usage for signal capture and analysis



# HelpEveryWhere

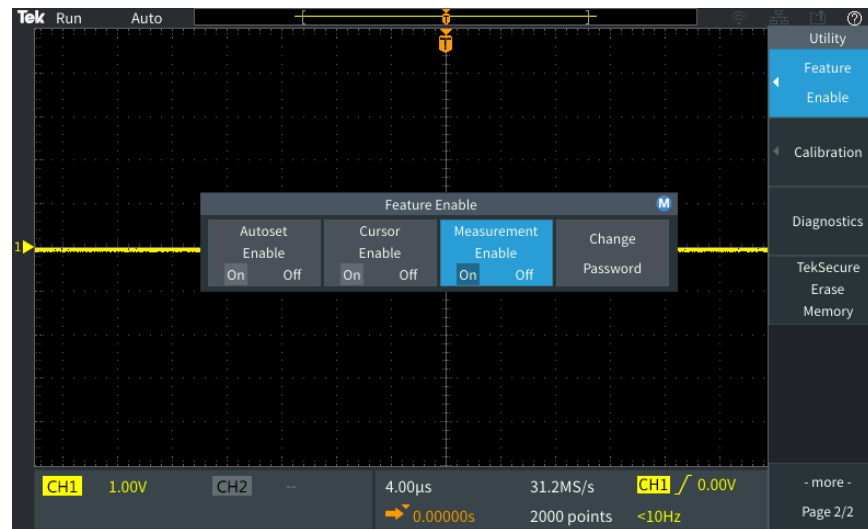
## LEARN ON THE FLY WITH TIPS ON CHALLENGING TOPICS

- Get help through the entire application
- Help is offered through a combination of text and pictures for novice users
- The help system can be enabled / disabled by each section
  - Acquire,
  - Trigger,
  - Vertical,
  - Math,
  - FFT,
  - Cursor,
  - Reference,
  - Measurement,
  - Utility



# Education Focused

- Password protected Enable / Disable
  - Autoset
  - Cursors
  - Measurement
- Enables Educators to teach
  - How to operate the instrument
  - Basic concepts of signal capture and analysis



# Built-in Courseware Lab Viewer

LEARN ELECTRONICS THROUGH HANDS-ON LABS

Course Name: ArduinoLabs

Available Labs

1. ArduinoPeriodFrequency
2. ArduinoPhaseDelay
3. ArduinoFFTSpectrum
4. ArduinoOvershootMeasurement

Course

- ScopeTutorials
- AcademicLabs

Lab Name: OpampIntegrator

THEORY

Key concepts:

- >> An opamp is a high-gain differential amplifier with very high input impedance.
- >> OPAMP integrator circuit produces output proportional to integral of its input.

Integrator

$$V_{out} = \int_0^t \frac{V_{in}}{RC} dt$$

OpampIntegrator

- Overview
- Procedure
- Data Collection
- Reports
- Back

Multiple lab exercises can be loaded into the scope and displayed on the screen.

Each lab exercise can include an overview and procedure. Data can be saved for any step in the procedure and a report can be generated for further editing



# TekSmartLab Application V3.0

## TEACHING ASSISTANT APPLICATION SOFTWARE



### Professors

- Monitor and control instruments remotely to help students without running from bench to bench
- Preset instrument parameters or update firmware on multiple instruments centrally
- Demonstrate exercises with windowed instrument displays, lab procedures and live video
- Distribute and collect lab materials electronically



### Students

- Save and retrieve test results wirelessly using their own smart devices
- Submit labs electronically to the lab server

# Ordering Information

The background features a dark grey gradient with several overlapping geometric shapes. A prominent shape is a large, light grey parallelogram with a fine dot pattern, oriented diagonally. Other solid grey shapes of various sizes and orientations are layered on top and bottom, creating a modern, architectural feel.

# TBS2000B Base Models

## BASE PRODUCTS

Model	Description
TBS2072B	Digital Storage Oscilloscope: 70 MHz bandwidth, 2 GS/s sample rate, 2 Channel, Optional 5 Mpts record length
TBS2074B	Digital Storage Oscilloscope: 70 MHz bandwidth, 2 GS/s sample rate, 4 Channel, Optional 5 Mpts record length
TBS2102B	Digital Storage Oscilloscope: 100 MHz bandwidth, 2 GS/s sample rate, 2 Channel, Optional 5 Mpts record length
TBS2104B	Digital Storage Oscilloscope: 100 MHz bandwidth, 2 GS/s sample rate, 4 Channel, Optional 5 Mpts record length
TBS2202B	Digital Storage Oscilloscope: 200 MHz bandwidth, 2 GS/s sample rate, 2 Channel, Optional 5 Mpts record length
TBS2204B	Digital Storage Oscilloscope: 200 MHz bandwidth, 2 GS/s sample rate, 4 Channel, Optional 5 Mpts record length

### Standard Accessories

- Appropriate TPP probe one per channel
- Power cord
- Installation and safety manual
- Calibration certificate documenting traceability to National Metrology Institute(s) and ISO9001 quality system registration
- Programmer manual, available on tek.com
- 5 year standard warranty

*Usual power cord options (A0/1/2/3/5/6/10/11/12/99) all priced at \$0*

# TBS2000B Bandwidth Upgrades

## POST-PURCHASE BANDWIDTH UPGRADES

Option	Description
<b>SUP2-BW7T102</b>	Bandwidth Upgrade; from 70 MHz to 100 MHz on (2) Channel models of TBS2000B Series oscilloscopes
<b>SUP2-BW7T104</b>	Bandwidth Upgrade; from 70 MHz to 100 MHz on (4) Channel models of TBS2000B Series oscilloscopes
<b>SUP2-BW7T202</b>	Bandwidth Upgrade; from 70 MHz to 200 MHz on (2) Channel models of TBS2000B Series oscilloscopes
<b>SUP2-BW7T204</b>	Bandwidth Upgrade; from 70 MHz to 200 MHz on (4) Channel models of TBS2000B Series oscilloscopes
<b>SUP2-BW10T202</b>	Bandwidth Upgrade; from 100 MHz to 200 MHz on (2) Channel models of TBS2000B Series oscilloscopes
<b>SUP2-BW10T204</b>	Bandwidth Upgrade; from 100 MHz to 200 MHz on (4) Channel models of TBS2000B Series oscilloscopes

- Instrument bandwidths can be upgraded in the field with a license

# Recommended Accessories

Model	Description
TPA-BNC	TekVPI™ to TekProbe® BNC adapter
ACD2000	Soft transit case, for 2 Channel TBS2000B Series Oscilloscope
ACD4000	Soft transit case, for 4 Channel TBS2000B Series Oscilloscope
TEK-DPG	TekVPI Deskew pulse generator signal source
067-1686-XX	Power measurement deskew and calibration fixture
2-WiFi	USB Wi-Fi* dongle for TBS2000 series only
TEK-USB-488	GPIB-to-USB adapter

\* Certified to comply with CE, FCC and IC regulations. Available in Australia, Canada, China, EU Region, New Zealand, and United States. For other compatible Wi-Fi adapters, see Compatible USB-WIFI dongles under Input/output ports specifications in datasheet

# Recommended Probes

Model	Description
P5100A	2.5 kV, 500 MHz, 100X high-voltage passive probe
TDP0500	500 MHz TekVPI™ differential voltage probe with $\pm 42$ V differential input voltage
THDP0200	$\pm 1.5$ kV 200 MHz high-voltage differential probe
THDP0100	$\pm 6$ kV 100 MHz high-voltage differential probe
TAP1500	1.5 GHz TekVPI active voltage probe
TCP0020	50 MHz TekVPI 20 Ampere AC/DC current probe
TCP0030A	120 MHz TekVPI 30 Ampere AC/DC current probe
TCP0150	20 MHz TekVPI 150 Ampere AC/DC current probe
TCP2020	50 MHz TekVPI 20 Ampere AC/DC current probe



**Telxtronix®**

Find more valuable resources at [TEK.COM](https://www.tek.com)

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