Tektronix®

6 Series Low Profile Digitizer

LPD64 Datasheet

Highest Performance. Unmatched Density. Oscilloscope Class Control.

Performance in numbers

Input channels

- 4 SMA inputs
- Each SMA input supports Analog, Spectral (using DDC), or both simultaneously

Performance for every channel

- Sample Rate: 25 GS/s
- Bandwidth: DC to 8 GHz (optional)
- Vertical Resolution: 12-bit ADC
- Real-Time 2 GHz DDC (optional)
- Record Length: 125 Mpts (std), 250 Mpts, 500 Mpts or 1 Gpts (optional)
- Lowest-in-class Noise
- Highest-in-class ENOB
- Best-in-class channel-to-channel isolation

Real-Time Digital Down Converter (DDC)

- Patented individual time domain and frequency domain controls
- Up to 2 GHz capture bandwidth (optional)
- IQ data transfers to PC for analysis (optional)
- Frequency vs time, Phase vs time and Magnitude vs time plotting (optional)
- RF vs Time Triggering (optional)

Superior low noise, vertical resolution and accuracy

- Low input noise enabled by new TEK061 front-end ASICs
- Noise at 1 mV/div: 54.8 uV @ 1 GHz
- Input Range: 10 mV to 10 V full scale
- DC Gain Accuracy: +/-1.0% at all gain settings >1 mV/div
- Effective Number of Bits (ENOB):
  - 8.2 bits at 1 GHz
  - 7.6 bits at 2.5 GHz
  - 7.25 bits at 4 GHz
  - 6.8 bits at 6 GHz
  - 6.5 bits at 8 GHz

Remote communication and connectivity

- Ethernet 10/100/1000 port
- USB 3.0 device port (USBTMC) up to 800 Megabits/second
- LXI 1.5 Certified (VXI-11)
- Easy remote access with e*Scope; just enter the instrument IP address into a browser
- Award-winning user interface
- Connect a Mouse, Keyboard, Monitor or KVM switch
- Drivers: IVI-C, IVI-COM, LabVIEW, VOSS Scientific DAAAC
- Support for VISA, MATLAB, Python, C/C++/C#, Sockets

Measurement analysis

- 36 standard measurements
- Jitter Measurements (optional)
- User-Defined Filtering (optional)
- DDR Measurements (optional)
- Power Measurements (optional)
- Advanced Spectrum View (optional)

Operating systems

- Closed Embedded OS (standard)
- Microsoft Windows 10 (option 6-WINM2)

Security & declassification (option 6-SEC)

- Password protect all user-accessible ports
- Locks down the digitizer, prevents on-instrument user data storage
- Meets the needs for top secret and high security environments

Dimensions

- 2U (3.5 in./89 mm) tall & rack ready out of the box (standard configuration)
- 17 in. (432 mm) wide
- Fits into standard 24 - 32 in. (610 - 813 mm) racks
- Air flow is left to right for rack setup

With the lowest input noise and up to 8 GHz analog bandwidth, the 6 Series Low Profile Digitizer LPD64 provides the best signal fidelity for analyzing and debugging signals in a compact 2U rack space. With four SMA inputs each supporting Analog, Spectral (using DDC), or both simultaneously, lowest-in-class noise, and highest-in-class ENOB, the 6 Series Low Profile Digitizer LPD64 is ready for next generation test rack designs.

The 6 Series family

The 6 Series Low Profile Digitizer (LPD64) represents the highest performance digitizer on all channels in its class. This high-speed digitizer has the functionality of a digitizer and the power of an oscilloscope, sharing a similar hardware platform as the 6 Series MSO.

The transition from a 6 Series MSO benchtop oscilloscope to a Low Profile Digitizer has never been easier for R&D engineers needing to move their code, test work and platform performance into manufacturing and automation. Both products support the same user interface, remote capability, performance characteristics and programming back-end to make this transition as simple and easy as possible. No need to rewrite test routines and development test cycle code!

The Low Profile family

The 6 Series Low Profile Digitizer expands the performance of the 5 Series MSO Low Profile by adding twice the number of Tektronix TEK049 ASICS in the same 2U footprint. Now with 25 GS/s and up to 8 GHz on all channels. Low Profile users now have the choice of extreme high channel count or extreme performance in the same rack form factor.

Two 6 Series Low Profile Digitizers (left) and two 5 Series MSO Low Profile oscilloscopes (right)

Quick Comparison	6 Series Low Profile Digitizer	5 Series MSO Low Profile Digitizer
Sample Rate	25 GS/s	6.25 GS/s

Table continued…

Quick Comparison	6 Series Low Profile Digitizer	5 Series MSO Low Profile Digitizer
Analog Bandwidth	Up to 8 GHz	up to 1 GHz
RF (DDC) Span Bandwidth	2 GHz	500 MHz
ENOB @ 1 GHz	8.2 bits	7.6 bits
LXI compliance version	1.5	-
Rack Dimensions	2U	2U

Machine diagnostics for physics

Physics is constantly leading the world to exciting new scientific discoveries in both matter and energy. These experiments require digitizers and oscilloscopes with improvements in precision, accuracy, performance and density when monitoring target test points. The 6 Series Low Profile Digitizer meets these requirements by bringing an industry leading performance, small form factor, Tektronix's class of reliability, easy remote accessibility, and award-winning user interface.

Common physics fields

- High Energy (Particle) Physics
- Nuclear Physics
- Atomic, Molecular and Optical Physics
- Condensed Matter

Research fields requiring single shot events or fast repetitive monitoring in their research labs; experiments like Photo Doppler Velocimetry (PDV), VISAR, gas guns, spectroscopy, accelerators and more. Many of these are diagnosing experiments and validating doppler shifts, phase alignments, beat frequencies, beam steering alignment or amplitudes. Doing this with reliable, high performance equipment is key for long term success.

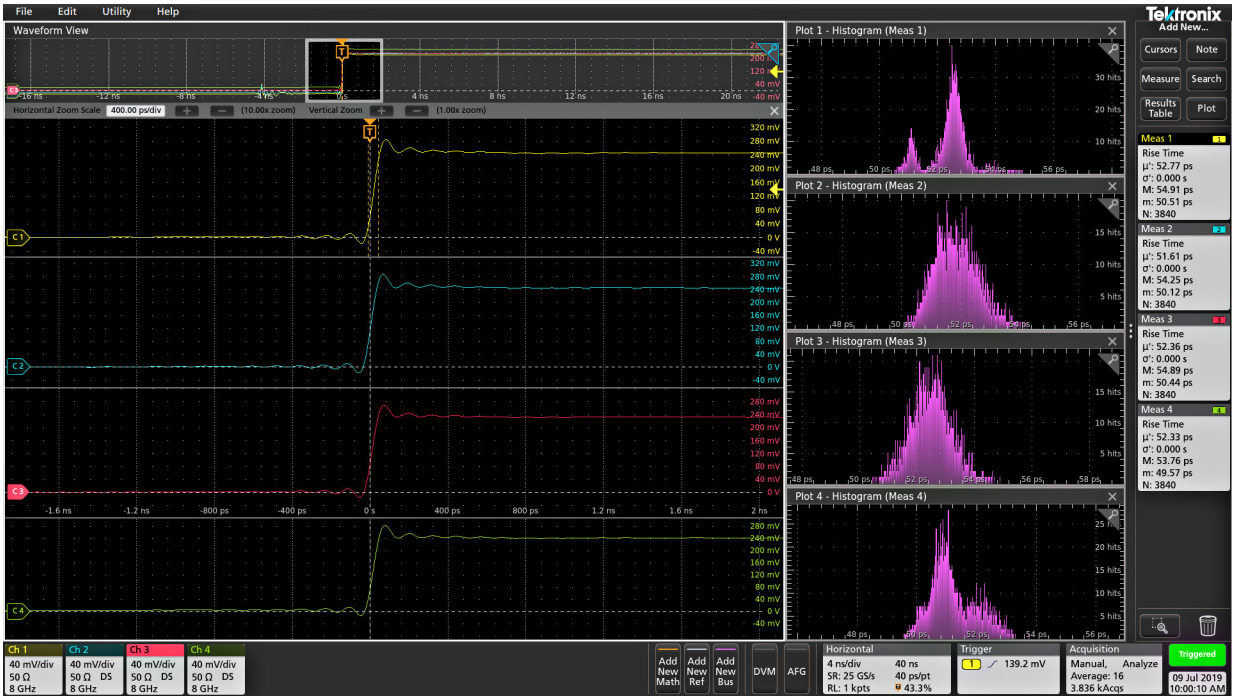
Performance on every channel

Tired of turning on multiple digitizer channels and wondering what the sample rate, record length or bandwidth settings are? The 6 Series Low

Profile Digitizer has industry leading performance on EVERY channel, always. No compromises!

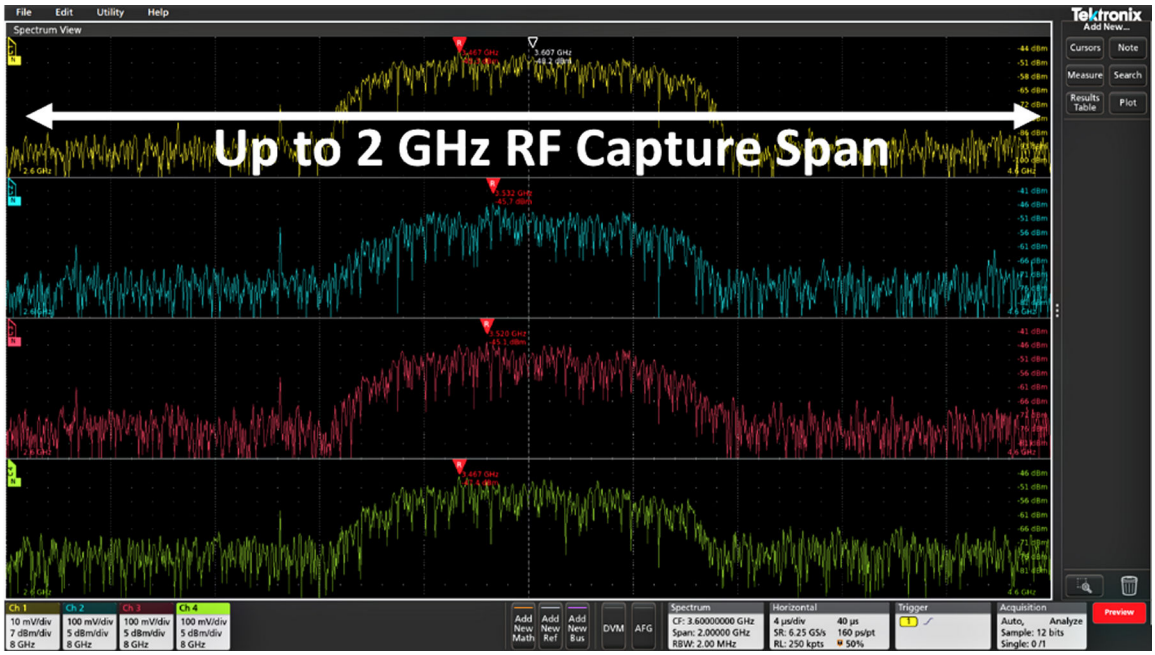
Key performance features:

- 25 GS/s on ALL channels
- DC to 8 GHz on ALL channels
- Up to 1 Billion samples on ALL channels
- Up to 2 GHz RF DDC capture bandwidth on ALL channels
- 12-bit analog-to-digital converters
- Best-in-class low noise
- Best-in-class Effective Number Of Bits
- Best-in-class channel isolation (crosstalk)



High Sample rate on each input enables a new class of density performance. In this example, 4 channels at 25 GS/s are measuring rising edges ~52 ps.

Spectrum View

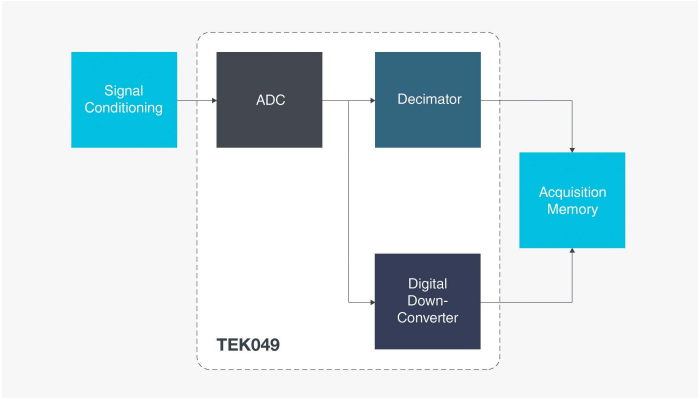


Intuitive spectrum analyzer controls like center frequency, span and resolution bandwidth (RBW), independent from time domain controls, provide easy setup for frequency domain analysis. A spectrum view is available for each analog input, enabling multichannel mixed domain analysis.

It is often easier to debug an issue by viewing one or more signals in the frequency domain. Oscilloscopes and digitizers have included math-based FFTs for decades in an attempt to address this need. However, FFTs are notoriously difficult to use as they are driven by the same acquisition system that's delivering the analog time-domain view. When you optimize acquisition settings for the analog view, your frequency-domain view isn't what you want. When you get the frequency-domain view you want, your analog view is not what you want. With math-based FFTs, it is virtually impossible to get optimized views in both domains.

Spectrum View changes all of this. Tektronix' patented technology provides both a decimator for the time-domain and a digital down-converter for the frequency-domain behind each input. The two different acquisition paths let you simultaneously observe both time- and frequency-domain views of the input signal with independent acquisition settings for each domain. Other manufacturers offer various 'spectral analysis' packages that claim ease-of-use, but they all exhibit the limitations described above. Only Spectrum View provides both exceptional ease-of-use and the ability to achieve optimal views in both domains simultaneously.

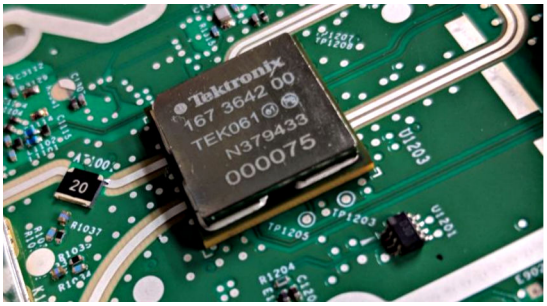
Waveform and IQ data can easily be transferred from the 6 Series Low Profile to a PC using a variety of programming commands and API interfaces that come standard on all Tektronix 5 Series & 6 Series products.



Tektronix's TEK049 ASIC has a patented signal path enabling signals to travel from the ADC to both a traditional decimator (scope) and Digital Down Converter (DDC - RF) for independent control of both the time and frequency domains.

Behind the performance

The Tektronix-designed TEK049 ASIC contains 12-bit analog-to-digital converters (ADCs) that provide 16 times more resolution than traditional 8-bit ADCs. The TEK049 is paired with the new Tektronix TEK061 front-end amplifier with industry leading low noise that enables the best signal fidelity possible to capture small signals with high resolution.



Lowest in class noise enabled by new front-end amplifier

A key attribute to being able to view fine signal details on small, high-speed signals is noise. The higher a measurement systems' intrinsic noise, the less actual signal detail will be visible. This becomes more critical on a digitizer when the vertical settings are set to high sensitivity (like ≤ 10 mV/div) to view small signals that are prevalent in high-speed bus topologies. The 6 Series Low Profile has a new front-end ASIC, the TEK061, that enables breakthrough noise performance at the highest sensitivity settings.

In addition, a new High Res mode applies a hardware-based unique Finite Impulse Response (FIR) filter based on the selected sample rate. The FIR filter maintains the maximum bandwidth possible for that sample rate while preventing aliasing and removing noise from the digitizer amplifiers and ADC above the usable bandwidth for the selected sample rate. High Res mode always provides at least 12 bits of vertical resolution and extends all the way to 16 bits of vertical resolution at ≤ 625 MS/s sample rates and 200 MHz of bandwidth.

Building a next-generation test rack

Looking for a modern way to refresh your test rack, view, download or analyze your data? Looking to replace obsolete hardware without rewriting your code?

We understand that test rack designs take time and include numerous tradeoffs. Tektronix has heard your voice loud and clear and is blazing a new path to provide a richer set of tools to enable flexible ways to access data and replace obsolete hardware. If that means you're automating a test rack with LabVIEW, Python or another interface, we have an expanding number of drivers and numerous support resources available.

Maybe you require an easy way to view waveforms on a remote computer. Not a problem, Tektronix has a software team designing new ways to control the instrument from a browser (E*Scope), store your data in the cloud (TekCloud), or stream data to our PC (TekScope). Providing modern age tools at your fingertips.

Lastly, users familiar with keyboards, mice, monitors, and KVM switches can continue to operate as they always have!

TekCloud

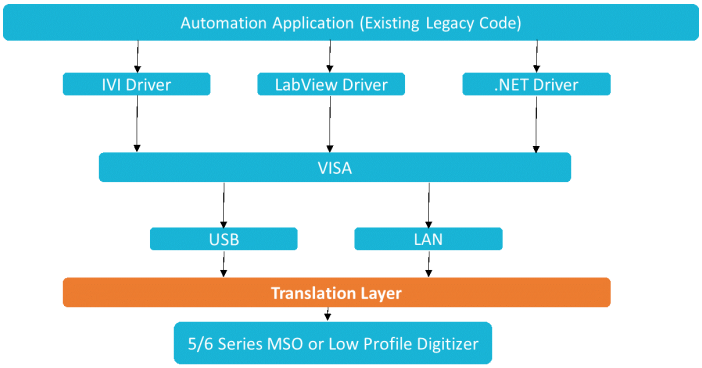
All your data in one place.

Upgrade Automated Test Equipment (ATE) systems quickly and smoothly

Was your automation code written in the 1970s, 1980s, or 1990s?

Anyone working closely with automated test systems knows that moving to a new model or platform can be painful. Modifying an existing codebase for a new product can be prohibitively expensive and complicated. Now there's a solution.

All 5 and 6 Series Low Profile instruments include a Programmatic Interface (PI) Translator. When enabled, the PI Translator acts as an intermediate layer between your test application and the digitizer. The PI translator recognizes a subset of legacy commands from the popular DPO/MSO5000B, DPO7000C, and DPO70000C oscilloscope platforms and translates them on the fly into supported commands. The interface is designed to be human-readable and easily extensible, which means that you can customize its behavior to minimize the amount of effort required when transitioning from obsolete instruments to the newest Tektronix platform.

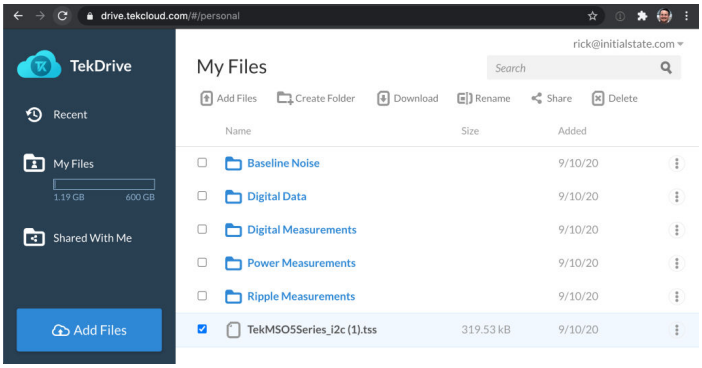


How the PI Translator works from Automation software to Tek instrument

Access data in all the new ways you can dream about

Using TekDrive, you can upload, store, organize, search, download, and share any file type from any connected device. TekDrive is natively integrated into the 6 Series Low Profile instrument for seamless sharing and recalling of files - no USB stick is required. Analyze and explore standard files like .wfm, .isf, .tss, and .csv, directly in a browser with smooth interactive waveform viewers. TekDrive is purpose-built for integration, automation, and security.

Programming with a Low Profile in a test rack has never been easier

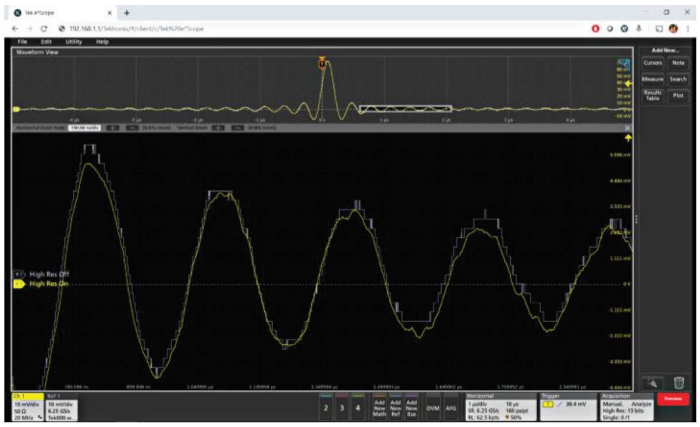


TekDrive collaborative workspace - save files directly from your 6 Series Low Profile and share across your team

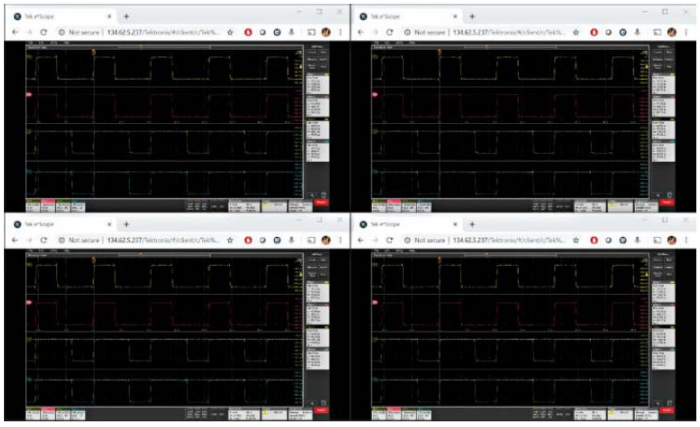
Get the analysis capability of an award-winning oscilloscope on your PC. Analyze waveforms anywhere, anytime. The basic license lets you view and analyze waveforms, perform many types of measurements and decode the most common serial buses - all while remotely accessing your oscilloscope. Advanced license options add capabilities such as multi-scope analysis, more serial bus decoding options, jitter analysis and power measurements. TekScope Multi-Scope enables you to connect and download data from up to 4 instruments (16-32 max channels) for easy viewing and cross-instrument analysis.

Two LPD64 instruments being analyzed on PC running TekScope's 'Multi-Scope'

E*Scope is an easy method of viewing and controlling a 6 Series Low Profile instrument over a network connection in the same way that you do in-person with a monitor or keyboard. Simply type the instrument's IP address into a browser to display the LXI landing page, then select the Instrument Control to access E*Scope. There are no drivers needed. It's all self-contained within the browser and you can control the instrument. It's fast, responsive, and perfect for controlling or visualizing single or multiple instrument situations.



*Live browser control is available using e*Scope via a browser like Chrome, Firefox, or Edge.*



*Tile multiple e*Scope browser tabs on a monitor for viewing live data*

Synchronizing

Synchronize multiple instrument channels within 200 ps using manual deskew and the Aux Trigger input

When synchronizing multiple instruments its important to have the smallest amount of skew between instrument channels to allow for data timing accuracy. Generally speaking this can be broken down into two types of skew; the part that comes from uncertainty between the aux trigger to analog channel, and the part that comes from trigger jitter. By calibrating out the effects of channel delay to the aux input we can reduce the amount of timing inaccuracy between instrument channels to just the jitter. This process is called deskewing an instrument.

Deskewing can be done to a reference channel that is simultaneously feeding a trigger edge (preferably over 1 Vpp) into the Aux Trigger input of multiple instruments and to the reference channel. When everything is adjusted, instrument to instrument channels can be within a very tight tolerance of only a couple sample points and within our specification of 200 ps. Whether you have 16 channels or 200 channels, all the data can be easily synchronized and analyzed.

Enhanced security option

The optional 6-SEC enhanced security option enables password-protected enabling/disabling of all instrument I/O ports and firmware upgrades. In addition, option 6-SEC provides the highest level of security by ensuring that internal memory never stores user settings or waveform data, in compliance with National Industrial Security Program Operating Manual (NISPOM) DoD 5220.22-M, Chapter 8 requirements and Defense Security Service Manual for the Certification

and Accreditation of Classified Systems under the NISPOM. This ensures that you can confidently move the instrument out of a secure area.

Arbitrary/Function Generator (AFG)

The instrument contains an optional integrated arbitrary/function generator, perfect for simulating sensor signals within a design or adding noise to signals to perform margin testing. The integrated function generator provides output of predefined waveforms up to 50 MHz for sine, square, pulse, ramp/triangle, DC, noise, sin(x)/x (Sinc), Gaussian, Lorentz, exponential rise/fall, Haversine and cardiac. The AFG can load waveform records up to 128 k points in size from an internal file location or a USB mass storage device.

The AFG feature is compatible with Tektronix' ArbExpress PC-based waveform creation and editing software, making creation of complex waveforms fast and easy.

Digital Voltmeter (DVM) and Trigger Frequency Counter

The instrument contains an integrated 4-digit digital voltmeter (DVM) and 8-digit trigger frequency counter. Any of the analog inputs can be a source for the voltmeter, using the same probes that are already attached for general oscilloscope usage. The trigger frequency counter provides a very precise readout of the frequency of the trigger event on which you're triggering.

Both the DVM and trigger frequency counter are available for free and are activated when you register your product.

User-defined filtering (optional)

In the broad sense, any system that processes a signal can be thought of as a filter. For example, an oscilloscope channel operates as a low pass filter where its 3 dB down point is referred to as its bandwidth. Given a waveform of any shape, a filter can be designed that can transform it into a defined shape within the context of some basic rules, assumptions, and limitations.

Digital filters have some significant advantages over analog filters. For example, the tolerance values of analog filter circuit components are high enough that high order filters are difficult or even impossible to implement. High order filters are easily implemented as digital filters. Digital filters can be implemented as Infinite Impulse Response (IIR) or Finite Impulse Response (FIR). The choice of IIR or FIR filters are based upon design requirements and application.

The 6 Series Low Profile has the ability to apply designated filters to math waveforms through a MATH arbitrary function. Option 6-UDFLT takes this functionality a level deeper, providing more than MATH arbitrary basic functions and adds flexibility to support standard filters and can be used for application centric filter designs.

Filters can be created through the Math dialog. Once a filter is edited, it can be easily applied, saved, and recalled for use or modification later.

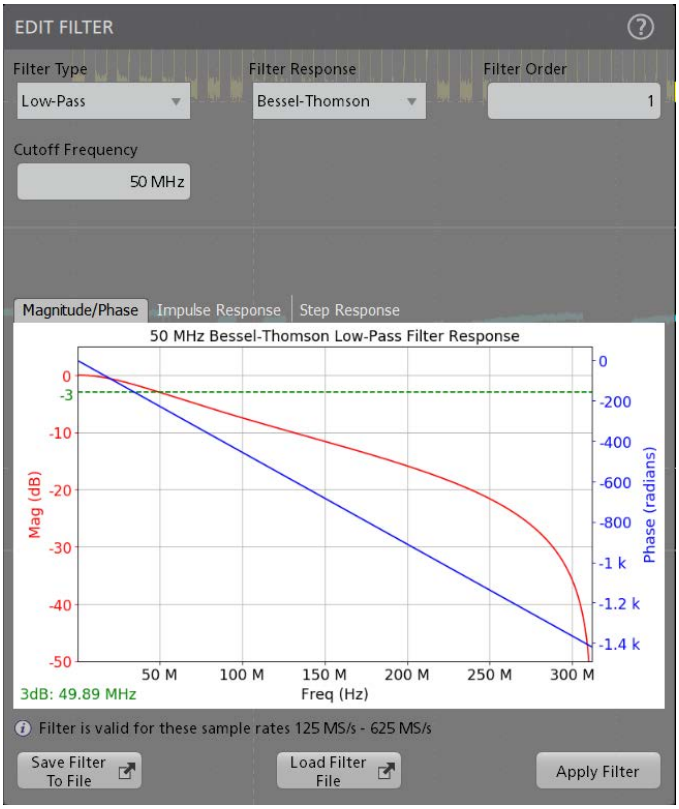
Filter types supported on the 6 Series Low Profile include:

- Low pass
- High pass
- Band pass
- Band stop
- All pass
- Hilbert
- Differentiator
- Custom

Filter response types supported on the 6 Series Low Profile include:

- Butterworth
- Chebyshev I
- Chebyshev II
- Elliptical
- Gaussian
- Bessel-Thomson

The Filter Response control is available for all Filter Types except All-pass, Hilbert, or Differentiator.



Filter creation dialog showing selection for Filter Type, Filter Response, Cutoff Frequency, Filter Order, and a graphical representation of Magnitude/Phase, Impulse Response, and Step Response

Filter designs can be saved, recalled, and applied once any editing has been completed.

Specifications

All specifications are guaranteed and apply to all models unless noted otherwise.

Model overview

LPD64 Low Profile Digitizer

Characteristic	LPD64
Analog inputs	4
Bandwidth (calculated rise time)	1 GHz (400 ps), 2.5 GHz (160 ps), 4 GHz (100 ps), 6 GHz (66.67 ps), 8 GHz (50 ps)
DC Gain Accuracy	50 Ω: ±2.0% [1], (±2.0% at 2 mV/div, ±4.0% at 1 mV/div, typical) 50 Ω: ±1.0% [2] of full scale, (±1.0% of full scale at 2 mV/div, ±2.0% at 1 mV/div, typical)
ADC Resolution	12 bits
Vertical Resolution (all channels)	8 bits @ 25 GS/s; 8 GHz 12 bits @ 12.5 GS/s; 4 GHz 13 bits @ 6.25 GS/s (High Res); 2 GHz 14 bits @ 3.125 GS/s (High Res); 1 GHz 15 bits @ 1.25 GS/s (High Res); 500 MHz 16 bits @ ≤625 MS/s (High Res); 200 MHz
Sample Rate	25 GS/s on all channels
Record Length	125 Mpoints on all channels (standard) 250 Mpoints, 500 Mpoints or 1 Gpoints on all channels (optional)
Waveform Capture Rate	>500,000 wfms/s (Peak Detect, Envelope acquisition mode), >30,000 wfms/s (all other acquisition modes)
Arbitrary/Function Generator (option)	13 predefined waveform types with up to 50 MHz output
DVM	4-digit DVM (free with product registration)
Trigger Frequency Counter	8-digit frequency counter (free with product registration)

Vertical system

Input coupling DC

Input impedance 50 Ω, DC coupled 50 Ω ±3%

Input sensitivity range

50 Ω 1 mV/div to 1 V/div in a 1-2-5 sequence
Note: 1 mV/div is a 2X digital zoom of 2 mV/div.

1 Warranted specification, immediately after SPC, add 2% for every 5 °C change in ambient temperature.
2 Warranted specification, immediately after SPC, add 1% for every 5 °C change in ambient temperature. At full scale is sometimes used to compare to other manufactures.

Maximum input voltage

2.3V_{RMS}, at < 100 mV/div, with peaks ≤±20 V (Pulse Width ≤ 1 us).

5.5V_{RMS}, at ≥ 100 mV/div, with peaks ≤±20 V (Pulse Width ≤ 200 us)

Effective bits (ENOB), typical

2 mV/div, High Res mode, 50 Ω, 10 MHz input with 90% full screen

Bandwidth	ENOB
4 GHz	5.9
3 GHz	6.1
2.5 GHz	6.2
2 GHz	6.35
1 GHz	6.8
500 MHz	7.2
350 MHz	7.4
250 MHz	7.5
200 MHz	7.75
20 MHz	8.8

50 mV/div, High Res mode, 50 Ω, 10 MHz input with 90% full screen

Bandwidth	ENOB
4 GHz	7.25
3 GHz	7.5
2.5 GHz	7.6
2 GHz	7.8
1 GHz	8.2
500 MHz	8.5
350 MHz	8.8
250 MHz	8.9
200 MHz	9
20 MHz	9.8

2 mV/div, Sample mode, 50 Ω, 10 MHz input with 90% full screen

Bandwidth	ENOB
8 GHz	5.1
7 GHz	5.3
6 GHz	5.5
5 GHz	5.65
4 GHz	5.9
3 GHz	6.05
2.5 GHz	6.2

Table continued…

Bandwidth	ENOB
2 GHz	6.35
1 GHz	6.8
500 MHz	7.2
350 MHz	7.3
250 MHz	7.5
200 MHz	7.3
20 MHz	7.6

50 mV/div, Sample mode, 50 Ω, 10 MHz input with 90% full screen

Bandwidth	ENOB
8 GHz	6.5
7 GHz	6.6
6 GHz	6.8
5 GHz	7
4 GHz	7.2
3 GHz	7.4
2.5 GHz	7.6
2 GHz	7.7
1 GHz	8.2
500 MHz	8.4
350 MHz	8.7
250 MHz	8.8
200 MHz	7.8
20 MHz	7.9

DC balance

0.1 div with DC-50 Ω digitizer input impedance (50 Ω terminated)

0.2 div at 1 mV/div with DC-50 Ω digitizer input impedance (50 Ω terminated)

Position range

±5 divisions

Offset ranges, maximum

Input signal cannot exceed maximum input voltage for the 50 Ω input path.

Volts/div Setting	Maximum offset range, 50 Ω Input
1 mV/div - 99 mV/div	±1 V
100 mV/div - 1 V/div	±10 V

Offset accuracy

±(0.005 X | offset - position | + DC balance); Offset, position, and DC Balance in units of Volts

Bandwidth selections

8 GHz model, 50 Ohm	20 MHz, 200 MHz, 250 MHz, 350 MHz, 500 MHz, 1 GHz, 2 GHz, 2.5 GHz, 3 GHz, 4 GHz, 5 GHz, 6 GHz, 7 GHz, and 8 GHz
6 GHz model, 50 Ohm	20 MHz, 200 MHz, 250 MHz, 350 MHz, 500 MHz, 1 GHz, 2 GHz, 2.5 GHz, 3 GHz, 4 GHz, 5 GHz, and 6 GHz
4 GHz model, 50 Ohm	20 MHz, 200 MHz, 250 MHz, 350 MHz, 500 MHz, 1 GHz, 2 GHz, 2.5 GHz, 3 GHz, and 4 GHz
2.5 GHz model, 50 Ohm	20 MHz, 200 MHz, 250 MHz, 350 MHz, 500 MHz, 1 GHz, 2 GHz, and 2.5 GHz
1 GHz model, 50 Ohm	20 MHz, 200 MHz, 250 MHz, 350 MHz, 500 MHz, and 1 GHz

Bandwidth filtering optimized for

Flatness or Step response

Random noise, RMS, typical

50 Ω, typical

25 GS/s, Sample Mode, RMS

V/div	1 mV/div	2 mV/div	5 mV/div	10 mV/div	20 mV/div	50 mV/div	100 mV/div	1 V/div
8 GHz	158 µV	158 µV	208 µV	342 µV	630 µV	1.49 mV	3.46 mV	29.7 mV
7 GHz	141 µV	143 µV	192 µV	311 µV	562 µV	1.31 mV	3.11 mV	26.2 mV
6 GHz	127 µV	127 µV	165 µV	274 µV	489 µV	1.18 mV	2.71 mV	23.6 mV
5 GHz	112 µV	113 µV	149 µV	239 µV	446 µV	1.05 mV	2.42 mV	21.1 mV

12.5 GS/s, HiRes Mode, RMS

V/div	1 mV/div	2 mV/div	5 mV/div	10 mV/div	20 mV/div	50 mV/div	100 mV/div	1 V/div
4 GHz	97.4 µV	98.7 µV	124 µV	192 µV	344 µV	817 µV	1.92 mV	16.3 mV
3 GHz	82.9 µV	84 µV	105 µV	160 µV	282 µV	680 µV	1.62 mV	13.6 mV
2.5 GHz	76.5 µV	77.5 µV	93.8 µV	144 µV	257 µV	606 µV	1.44 mV	12.1 mV
2 GHz	68.1 µV	69.1 µV	83.6 µV	131 µV	226 µV	528 µV	1.28 mV	10.6 mV
1 GHz	54.8 µV	51.2 µV	63.4 µV	90.9 µV	160 µV	378 µV	941 µV	7.65 mV
500 MHz	39.7 µV	39.8 µV	48.1 µV	65.1 µV	115 µV	280 µV	666 µV	5.6 mV
350 MHz	33.8 µV	33.5 µV	40 µV	54.8 µV	94.3 µV	217 µV	560 µV	4.35 mV
250 MHz	30.8 µV	31.2 µV	36.1 µV	49.9 µV	80.3 µV	187 µV	482 µV	3.75 mV
200 MHz	25.3 µV	25.4 µV	29.7 µV	44 µV	70.7 µV	165 µV	445 µV	3.3 mV
20 MHz	8.68 µV	8.9 µV	10.4 µV	15.1 µV	27.5 µV	70.4 µV	158 µV	1.41 mV

Crosstalk (channel isolation), typical

≥ -80 dB up to 2 GHz

≥ -65 dB up to 4 GHz

≥ -55 dB up to 8 GHz

for any two channels set to 200 mV/div.

Horizontal system

Time base range

40 ps/div to 1,000 s/div

Sample rate range

6.25 S/s to 25 GS/s (real time)

50 GS/s to 2.5 TS/s (interpolated)

Record length range

All acquisition modes are 250 M maximum record length, down to 1 k minimum record length, adjustable in 1 sample increments.

Standard: 125 Mpoints

Option 6-RL-2: 250 Mpoints

Seconds/Division range

Record length	1 K	10 K	100 K	1 M	10 M	62.5 M	125 M	250 M	500M	1 G
Standard: 125 M	40 ps - 16 s	400 ps - 160 s	4 ns - 1000 s			2.5 µs - 1000 s	5 µs - 1000 s	N/A	N/A	N/A
Option 6-RL-2: 250 M	40 ps - 16 s	400 ps - 160 s	4 ps - 1000 s			2.5 µs - 1000 s	5 µs - 1000 s	10 µs - 1000 s	N/A	N/A
Option 6-RL-3: 500 Mpts	40 ps - 16 s	400 ps - 160 s	4 ps - 1000 s			2.5 µs - 1000 s	5 µs - 1000 s	10 µs - 1000 s	20 us - 1000 s	N/A
Option 6-RL-4: 1 Gpts	40 ps - 16 s	400 ps - 160 s	4 ps - 1000 s			2.5 µs - 1000 s	5 µs - 1000 s	10 µs - 1000 s	20 us - 1000 s	40 us - 1000 s

Aperture uncertainty (sample jitter)

Time duration	Typical jitter
<1 µs	80 fs
<1 ms	130 fs

Timebase accuracy

±1.0 x10^{-7} over any ≥1 ms time interval

Description	Specification
Factory Tolerance	±12 ppb; at calibration, 25 °C ambient, over any ≥1 ms interval
Temperature stability	±20 ppb across the full operating range of 0 °C to 50 °C, after a sufficient soak time at the temperature; tested at operating temperatures
Crystal aging	±300 ppb; frequency tolerance change at 25 °C over a period of 1 year

Delta-time measurement accuracy, nominal

$$DTA_{pp}(typical) = 10 \times \sqrt{\left(\frac{N}{SR_1}\right)^2 + \left(\frac{N}{SR_2}\right)^2 + \left(0.450\ ps + \left(1 \times 10^{-11} \times t_p\right)\right)^2} + TBA \times t_p$$

$$DTA_{RMS} = \sqrt{\left(\frac{N}{SR_1}\right)^2 + \left(\frac{N}{SR_2}\right)^2 + \left(0.450ps + \left(1 \times 10^{-11} \times t_p\right)\right)^2} + TBA \times t_p$$

(assume edge shape that results from Gaussian filter response)

The formula to calculate delta-time measurement accuracy (DTA) for a given instrument setting and input signal assumes insignificant signal content above Nyquist frequency, where:

SR_1 = Slew Rate (1st Edge) around 1st point in measurement

SR_2 = Slew Rate (2nd Edge) around 2nd point in measurement

N = input-referred guaranteed noise limit (V_{RMS})

TBA = time base accuracy or reference frequency error

t_p = delta-time measurement duration (sec)

Maximum duration at highest sample rate

5 ms (standard) or 10 ms (option 6-RL-2, 250 Mpoints)

Time base delay time range

-10 divisions to 5,000 s

Deskew range

-125 ns to +125 ns with a resolution of 40 ps (for Peak Detect and Envelope acquisition modes).
-125 ns to +125 ns with a resolution of 1 ps (for all other acquisition modes).

Delay between analog channels, full bandwidth, typical

≤ 10 ps for any two channels with input impedance set to 50 Ω, DC coupling with equal Volts/div or above 10 mV/div

Trigger system

Trigger modes

Auto, Normal, and Single

Trigger coupling

DC, HF Reject (attenuates > 50 kHz), LF Reject (attenuates < 50 kHz), noise reject (reduces sensitivity)

Trigger holdoff range

0 ns to 10 seconds

Trigger bandwidth (edge, pulse and logic), typical

Model	Trigger type	Trigger bandwidth
8 GHz	Edge	8 GHz
8 GHz	Pulse, Logic	4 GHz
6 GHz	Edge	6 GHz
6 GHz	Pulse, Logic	4 GHz
4 GHz, 2.5 GHz, 1 GHz:	Edge, Pulse, Logic	Product Bandwidth

Edge-type trigger sensitivity, DC coupled, typical

Path	Range	Specification
50 Ω path	1 mV/div to 9.98 mV/div	3.0 div from DC to instrument bandwidth
	≥ 10 mV/div	< 1.0 division from DC to instrument bandwidth
Line	90 V to 264 V line voltage at 50 - 60 Hz line frequency	103.5 V to 126.5 V
AUX Trigger in		250 mV_{PP}, DC to 400 MHz

Edge-type trigger sensitivity, not DC coupled, typical

Trigger Coupling	Typical Sensitivity
NOISE REJ	2.5 times the DC Coupled limits
HF REJ	1.0 times the DC Coupled limits from DC to 50 kHz. Attenuates signals above 50 kHz.
LF REJ	1.5 times the DC Coupled limits for frequencies above 50 kHz. Attenuates signals below 50 kHz.

Trigger jitter, analog channels, typical

≤ 1.5 ps_{RMS} for sample mode and edge-type trigger

≤ 2 ps_{RMS} for edge-type trigger and FastAcq mode

≤ 40 ps_{RMS} for non edge-type trigger modes

Trigger jitter, AUX input, typical

≤ 40 ps_{RMS} for sample mode and edge-type trigger

AUX In trigger skew between instruments, typical

±100 ps jitter on each instrument with <450 ps skew; <550 ps total between instruments. Can be manually deskewed so channel-to-channel total skew is <200ps between instruments using AUX In.

Skew improves for pulse input voltages ≥1 V_{pp}

Trigger level ranges

This specification applies to logic and pulse thresholds.

Source	Range
Any Channel	±5 divs from center of screen
Aux In Trigger	±5 V
Line	Fixed at about 50% of line voltage

Trigger types

Edge: Positive, negative, or either slope on any channel. Coupling includes DC, AC, noise reject, HF reject, and LF reject

Pulse Width: Trigger on width of positive or negative pulses. Event can be time- or logic-qualified

Timeout: Trigger on an event which remains high, low, or either, for a specified time period. Event can be logic-qualified

Runt: Trigger on a pulse that crosses one threshold but fails to cross a second threshold before crossing the first again. Event can be time- or logic-qualified

Window: Trigger on an event that enters, exits, stays inside or stays outside of a window defined by two user-adjustable thresholds. Event can be time- or logic-qualified

Logic: Trigger when logic pattern goes true, goes false, or occurs coincident with a clock edge. Pattern (AND, OR, NAND, NOR) specified for all input channels defined as high, low, or don't care. Logic pattern going true can be time-qualified

Setup & Hold: Trigger on violations of both setup time and hold time between clock and data present on any input channels

Rise / Fall Time: Trigger on pulse edge rates that are faster or slower than specified. Slope may be positive, negative, or either. Event can be logic-qualified

Video: Trigger on all lines, odd, even, or all fields of NTSC, PAL, and SECAM video signals

Sequence: Trigger on B event X time or N events after A trigger with a reset on C event. In general, A and B trigger events can be set to any trigger type with a few exceptions: logic qualification is not supported, if A event or B event is set to Setup & Hold, then the other must be set to Edge, and Ethernet and High Speed USB (480 Mbps) are not supported

Visual trigger Qualifies standard triggers by scanning all waveform acquisitions and comparing them to on-screen areas (geometric shapes). An unlimited number of areas can be defined with In, Out, or Don't Care as the qualifier for each area. A boolean expression can be defined using any combination of visual trigger areas to further qualify the events that get stored into acquisition memory. Shapes include rectangle, triangle, trapezoid, hexagon and user-defined.

Parallel Bus: Trigger on a parallel bus data value. Parallel bus can be from 1 to 4 bits (from the analog channels) in size. Supports Binary and Hex radices

I^2C Bus (option 6-SREMBD): Trigger on Start, Repeated Start, Stop, Address (7 or 10 bit), Data, or Address and Data on I^2C buses up to 10 Mb/s

I^3C Bus (option 6-SRI3C) Trigger on Start, Repeated Start, Stop, Address, Data, I^3C SDR Direct, I^3C SDR Broadcast, Missing ACK, T-Bit Error, Broadcast Address Error, Hot-Join, HDR Restart, HDR Exit on I^3C buses up to 10 Mb/s

SPI Bus (option 6-SREMBD): Trigger on Slave Select, Idle Time, or Data (1-16 words) on SPI buses up to 20 Mb/s

RS-232/422/485/UART Bus (option 6-SRCOMP): Trigger on Start Bit, End of Packet, Data, and Parity Error up to 15 Mb/s

CAN Bus (option 6-SRAUTO): Trigger on Start of Frame, Type of Frame (Data, Remote, Error, or Overload), Identifier, Data, Identifier and Data, End Of Frame, Missing Ack, and Bit Stuff Error on CAN buses up to 1 Mb/s

CAN FD Bus (option 6-SRAUTO):	Trigger on Start of Frame, Type of Frame (Data, Remote, Error, or Overload), Identifier (Standard or Extended), Data (1-8 bytes), Identifier and Data, End Of Frame, Error (Missing Ack, Bit Stuffing Error, FD Form Error, Any Error) on CAN FD buses up to 16 Mb/s
LIN Bus (option 6-SRAUTO):	Trigger on Sync, Identifier, Data, Identifier and Data, Wakeup Frame, Sleep Frame, and Error on LIN buses up to 1 Mb/s
FlexRay Bus (option 6-SRAUTO):	Trigger on Start of Frame, Indicator Bits (Normal, Payload, Null, Sync, Startup), Frame ID, Cycle Count, Header Fields (Indicator Bits, Identifier, Payload Length, Header CRC, and Cycle Count), Identifier, Data, Identifier and Data, End Of Frame, and Errors on FlexRay buses up to 10 Mb/s
SENT Bus (option 6-SRAUTOSEN)	Trigger on Start of Packet, Fast Channel Status and Data, Slow Channel Message ID and Data, and CRC Errors
SPMI Bus (option 6-SRPM):	Trigger on Sequence Start Condition, Reset, Sleep, Shutdown, Wakeup, Authenticate, Master Read, Master Write, Register Read, Register Write, Extended Register Read, Extended Register Write, Extended Register Read Long, Extended Register Write Long, Device Descriptor Block Master Read, Device Descriptor Block Slave Read, Register 0 Write, Transfer Bus Ownership, and Parity Error
USB 2.0 LS/FS/HS Bus (option 6-SRUSB2):	Trigger on Sync, Reset, Suspend, Resume, End of Packet, Token (Address) Packet, Data Packet, Handshake Packet, Special Packet, Error on USB buses up to 480 Mb/s
Ethernet Bus (option 6-SRENET):	Trigger on Start of Frame, MAC Addresses, MAC Q-tag, MAC Length/Type, MAC Data, IP Header, TCP Header, TCP/IPV4 Data, End of Packet, and FCS (CRC) Error on 10BASE-T and 100BASE-TX buses
Audio (I^2S, LJ, RJ, TDM) Bus (option 6-SRAUDIO):	Trigger on Word Select, Frame Sync, or Data. Maximum data rate for I^2S/LJ/RJ is 12.5 Mb/s. Maximum data rate for TDM is 25 Mb/s
MIL-STD-1553 Bus (option 6-SRAERO):	Trigger on Sync, Command (Transmit/Receive Bit, Parity, Subaddress / Mode, Word Count / Mode Count, RT Address), Status (Parity, Message Error, Instrumentation, Service Request, Broadcast Command Received, Busy, Subsystem Flag, Dynamic Bus Control Acceptance, Terminal Flag), Data, Time (RT/IMG), and Error (Parity Error, Sync Error, Manchester Error, Non-contiguous Data) on MIL-STD-1553 buses
ARINC 429 Bus (option 6-SRAERO):	Trigger on Word Start, Label, Data, Label and Data, Word End, and Error (Any Error, Parity Error, Word Error, Gap Error) on ARINC 429 buses up to 1 Mb/s
RF Magnitude vs. Time and RF Frequency vs. Time (option 6-SV-RFVT):	Trigger on edge, pulse width and timeout events

Acquisition system

Sample	Acquires sampled values
Peak Detect	Captures glitches as narrow as 160 ps at all sweep speeds
Averaging	From 2 to 10,240 waveforms Maximum averaging speed = 180 waveforms/s
Fast Hardware Averaging	An acquisition mode for acquiring a large number of averages in a short amount of time. Fast hardware averaging optimizes the acquisition path, reducing storage truncation error and smoothing out fine scale non-linearity imperfections via an optional offset dithering technique. This feature is available through programmatic interface commands. From 2 to 1,000,000 waveforms Maximum averaging speed = 32,000 waveforms/s

Envelope	Min-max envelope reflecting Peak Detect data over multiple acquisitions
High Res	Applies a unique Finite Impulse Response (FIR) filter for each sample rate that maintains the maximum bandwidth possible for that sample rate while preventing aliasing and removing noise from the oscilloscope amplifiers and ADC above the usable bandwidth for the selected sample rate. High Res mode always provides at least 12 bits of vertical resolution and extends all the way to 16 bits of vertical resolution at ≤ 625 MS/s sample rates.
FastAcq®	FastAcq optimizes the instrument for analysis of dynamic signals and capture of infrequent events. Maximum waveform capture rate: • >500,000 wfms/s (Peak Detect or Envelope Acquisition mode) • >30,000 wfms/s (All other acquisition modes)
Roll mode	Scrolls sequential waveform points across the display in a right-to-left rolling motion, at timebase speeds of 40 ms/div and slower, when in Auto trigger mode.
History mode	Makes use of the maximum record length, allowing you to capture many triggered acquisitions, stop when you see something of interest, and quickly review all stored triggered acquisitions.The number of available acquisitions stored in history is (Maximum record length) / (Current record length setting).
FastFrame™	Acquisition memory divided into segments. Maximum trigger rate >5,000,000 waveforms per second Minimum frame size = 50 points Maximum Number of Frames: For frame size ≥ 1,000 points, maximum number of frames = record length / frame size. For 50 point frames, maximum number of frames = 1,000,000

Waveform measurements

Cursor types	Waveform, V Bars, H Bars, V&H Bars, and Polar (XY/XYZ plots only)

DC voltage measurement accuracy, Average acquisition mode

Measurement Type	DC Accuracy (In Volts)
Average of ≥ 16 waveforms	±((DC Gain Accuracy) * |reading - (offset - position)| + Offset Accuracy + 0.05 * V/div setting)
Delta volts between any two averages of ≥ 16 waveforms acquired with the same oscilloscope setup and ambient conditions	±(DC Gain Accuracy * |reading| + 0.1 div)

Automatic measurements	36, of which an unlimited number can be displayed as either individual measurement badges or collectively in a measurement results table

Amplitude measurements	Amplitude, Maximum, Minimum, Peak-to-Peak, Positive Overshoot, Negative Overshoot, Mean, RMS, AC RMS, Top, Base, and Area
Timing measurements	Period, Frequency, Unit Interval, Data Rate, Positive Pulse Width, Negative Pulse Width, Skew, Delay, Rise Time, Fall Time, Phase, Rising Slew Rate, Falling Slew Rate, Burst Width, Positive Duty Cycle, Negative Duty Cycle, Time Outside Level, Setup Time, Hold Time, Duration N-Periods, High Time, Low Time, Time to Minimum, and Time to Maximum
Jitter measurements (standard)	TIE and Phase Noise
Measurement statistics	Mean, Standard Deviation, Maximum, Minimum, and Population. Statistics are available on both the current acquisition and all acquisitions
Reference levels	User-definable reference levels for automatic measurements can be specified in either percent or units. Reference levels can be set to global for all measurements, per source channel or signal, or unique for each measurement
Gating	Screen, Cursors, Logic, Search, or Time. Specifies the region of an acquisition in which to take measurements. Gating can be set to Global (affects all measurements set to Global) or Local (all measurements can have a unique Time gate setting; only one Local gate is available for Screen, Cursors, Logic, and Search actions).
Measurement plots	Histogram, Time Trend, Spectrum, Eye Diagram (TIE measurement only), Phase Noise (Phase Noise measurement only) Fast eye rendering: Shows the Unit Intervals (UIs) that define the boundaries of the eye along with a user specified number of surrounding UIs for added visual context Complete eye rendering: Shows all valid Unit Intervals (UIs)
Measurement limits	Pass/fail testing for user-definable limits on measurement values. Act on event for measurement value failures include Save Screen Capture, Save Waveform, System Request (SRQ), and Stop Acquisitions

Jitter analysis (option 6-DJA) adds the following:

Measurements	Jitter Summary, TJ@BER, RJ- δδ, DJ- δδ, PJ, RJ, DJ, DDJ, DCD, SRJ, J2, J9, NPJ, F/2, F/4, F/8, Eye Height, Eye Height@BER, Eye Width, Eye Width@BER, Eye High, Eye Low, Q-Factor, Bit High, Bit Low, Bit Amplitude, DC Common Mode, AC Common Mode (Pk-Pk), Differential Crossover, T/nT Ratio, SSC Freq Dev, SSC Modulation Rate
Measurement plots	Digital power management (option 6-DPM) adds the following: Eye Diagram and Jitter Bathtub Fast eye rendering: Shows the Unit Intervals (UIs) that define the boundaries of the eye along with a user specified number of surrounding UIs for added visual context Complete eye rendering: Shows all valid Unit Intervals (UIs)
Measurement limits	Pass/fail testing for user-definable limits on measurement values. Act on event for measurement value failures include Save Screen Capture, Save Waveform, System Request (SRQ), and Stop Acquisitions
Eye diagram mask testing	Automated mask pass/fail testing

Power analysis (option 6-PWR) adds the following:

Measurements	Input Analysis (Frequency, V_{RMS}, I_{RMS}, voltage and current Crest Factors, True Power, Apparent Power, Reactive Power, Power Factor, Phase Angle, Harmonics, Inrush Current, Input Capacitance)
	Amplitude Analysis (Cycle Amplitude, Cycle Top, Cycle Base, Cycle Maximum, Cycle Minimum, Cycle Peak-to-Peak)
	Timing Analysis (Period, Frequency, Negative Duty Cycle, Positive Duty Cycle, Negative Pulse Width, Positive Pulse Width)
	Switching Analysis (Switching Loss, dv/dt, di/dt, Safe Operating Area, R_{DSon})
	Magnetic Analysis (Inductance, I vs. Intg(V), Magnetic Loss, Magnetic Property)
	Output Analysis (Line Ripple, Switching Ripple, Efficiency, Turn-on Time, Turn-off Time)
	Frequency Response Analysis (Control Loop Response Bode Plot, Power Supply Rejection Ratio, Impedance)
Measurement Plots	Harmonics Bar Graph, Switching Loss Trajectory Plot, and Safe Operating Area

Digital Power Management (option 6-DPM) adds the following:

Measurements	Ripple Analysis (Ripple)
	Transient Analysis (Overshoot, Undershoot, Turn On Overshoot, DC Rail Voltage)
	Power Sequence Analysis (Turn-on, Turn-off)
	Jitter Analysis (TIE, PJ, RJ, DJ, Eye Height, Eye Width, Eye High, Eye Low)
	Power Supply Induced Jitter (PSIJ)

DDR3/LPDDR3 memory debug and analysis option (6-DBDDR3) adds the following:

Measurements	Amplitude Measurements (AOS, AUS, Vix(ac), AOS Per tCK, AUS Per tCK, AOS Per UI, AUS Per UI)
	Time Measurements (tRPRE, tWPRE, tPST, Hold Diff, Setup Diff, tCH(avg), tCK(avg), tCL(avg), tCH(abs), tCL(abs), tJIT(duty), tJIT(per), tJIT(cc), tERR(n), tERR(m-n), tDQSCK, tCMD-CMD, tCKSRE, tCKSRX)

LVDS debug and analysis option (option 6-DBLVDS) adds the following:

Data Lane Measurements	Generic Test (Unit Interval, Rise Time, Fall Time, Data Width, Data Intra Skew (PN), Data Inter Skew (Lane-to-Lane), Data Peak-to-Peak)
	Jitter Test (AC Timing, Clock Data Setup Time, Clock Data Hold Time, Eye Diagram (TIE), TJ@BER, DJ Delta, RJ Delta, DDJ, De-Emphasis Level)
Clock Lane Measurements	Generic Test (Frequency, Period, Duty Cycle, Rise Time, Fall Time, Clock Intra Skew (PN), Clock Peak-to-Peak)
	Jitter Test (TIE, DJ, RJ)
	SSC On (Mod Rate, Frequency Deviation Mean)

Waveform math

Number of math waveforms	Unlimited

Arithmetic	Add, subtract, multiply, and divide waveforms and scalars
Algebraic expressions	Define extensive algebraic expressions including waveforms, scalars, user-adjustable variables, and results of parametric measurements. Perform math on math using complex equations. For example (Integral (CH1 - Mean(CH1)) X 1.414 X VAR1)
Math functions	Invert, Integrate, Differentiate, Square Root, Exponential, Log 10, Log e, Abs, Ceiling, Floor, Min, Max, Degrees, Radians, Sin, Cos, Tan, ASin, ACos, and ATan
Relational	Boolean result of comparison >, <, ≥, ≤, =, and ≠
Logic	AND, OR, NAND, NOR, XOR, and EQV
Filtering function (standard)	Loading of user-definable filters. Users specify a file containing the coefficients of the filter.
Filtering function (option 6-UDFLT)	
Filter types	Low pass, High pass, Band pass, Band stop, All pass, Hilbert, Differentiator, and Custom
Filter response types	Butterworth, Chebyshev I, Chebyshev II, Elliptical, Gaussian, and Bessel-Thomson
FFT functions	Spectral Magnitude and Phase, and Real and Imaginary Spectra
FFT vertical units	Magnitude: Linear and Log (dBm) Phase: Degrees, Radians, and Group Delay
FFT window functions	Hanning, Rectangular, Hamming, Blackman-Harris, Flattop2, Gaussian, Kaiser-Bessel, and TekExp

Spectrum View

Center Frequency	Limited by instrument analog bandwidth
Span	74.5 Hz – 1.25 GHz (Standard) 74.5 Hz – 2 GHz (option 6-SV-BW-1) Coarse adjustment in a 1-2-5 sequence
RF Measurements	Channel Power (CHP), Adjacent Channel Power Ratio (ACPR), and Occupied Bandwidth (OBW) measurements on Spectrum View trace data and display
RF vs. Time Traces	Magnitude vs. time, Frequency vs. time, Phase vs. time (with option 6-SV-RFVT)
RF vs. Time Trigger	Edge, pulse width, and timeout trigger on RF Magnitude vs. Time and RF Frequency vs. Time (with option 6-SV-RFVT)

Spectrograms

RF Frequency vs. Time vs. Amplitude display with frequency on x-axis, time on y-axis, and power level indicated by variations in color (with option 6-SV-RFVT)

Resolution Bandwidth (RBW)

93 µHz to 62.5 MHz

93 µHz to 100 MHz (with option 6-SV-BW-1)

IQ capture

The data is stored as in-phase and quadrature (I&Q) samples and precise synchronization is maintained between the time domain data and the I&Q data.

When RF vs. Time traces are activated (with option 6-SV-RFVT), IQ data can be captured and exported to file for more analysis within 3rd party applications.

The max acquisition time varies with span and sample rate. At 25 GS/s and 2 GHz span, the max acquisition time is 0.086 seconds. For 1 GHz span, the max acquisition time is 0.172 seconds. For 40 MHz span, the max acquisition time is 2.749 seconds. For 1 MHz span, the max acquisition time is 87.961 seconds.

Window types and factors

Window type	Factor
Blackman-Harris	1.90
Flat-Top 2	3.77
Hamming	1.30
Hanning	1.44
Kaiser-Bessel	2.23
Rectangular	0.89

Spectrum Time

FFT Window Factor / RBW

Reference level

Reference level is automatically set by the analog channel Volts/div setting

Setting range: -42 dBm to +44 dBm

Vertical Position

-100 divs to +100 divs

Vertical units

dBm, dBµW, dBmV, dBµV, dBmA, dBµA

Horizontal scaling

Linear, Log

Multi-channel spectrum analysis

Each FlexChannel input can be configured with Spectrum View, RF vs. Time traces (with option RFVT), and Spectrogram (with option RFVT).

Multiple RF measurements can be performed simultaneously across channels.

Spectrum Time and Center Frequency settings can be unlocked and moved independently from each other across channels. All Spectrum View channels must share the same Span, Resolution Bandwidth and Window Type.

Search

Number of searches	Unlimited
Search types	Search through long records to find all occurrences of user specified criteria including edges, pulse widths, timeouts, runt pulses, window violations, logic patterns, setup & hold violations, rise/fall times, and bus protocol events. Search results can be viewed in the Waveform View or in the Results table.

Save

Waveform type	Tektronix Waveform Data (.wfm), Comma Separated Values (.csv), MATLAB (.mat)
Waveform gating	Cursors, Screen, Resample (save every nth sample)
Screen capture type	Portable Network Graphic (*.png), 24-bit Bitmap (*.bmp), JPEG (*.jpg)
Setup type	Tektronix Setup (.set)
Report type	Adobe Portable Documents (.pdf), Single File web Pages (.mht)
Session type	Tektronix Session Setup (.tss)

Display (available only through the video out ports or e*Scope)

Display type	External monitor
Display resolution	1,920 horizontal × 1,080 vertical pixels (High Definition)
Display modes	Overlay: traditional oscilloscope display where traces overlay each other Stacked: display mode where each waveform is placed in its own slice and can take advantage of the full ADC range while still being visually separated from other waveforms. Groups of channels can also be overlaid within a slice to simplify visual comparison of signals.
Zoom	Horizontal and vertical zooming is supported in all waveform and plot views.
Interpolation	Sin(x)/x and Linear
Waveform styles	Vectors, dots, variable persistence, and infinite persistence
Graticules	Movable and fixed graticules, selectable between Grid, Time, Full, and None
Color palettes	Normal and inverted for screen captures Individual waveform colors are user-selectable

Format	YT, XY, and XYZ
Local Language User Interface	English, Japanese, Simplified Chinese, Traditional Chinese, French, German, Italian, Spanish, Portuguese, Russian, Korean
Local Language Help	English, Japanese, Simplified Chinese

Arbitrary-Function Generator (optional)

Function types Arbitrary, sine, square, pulse, ramp, triangle, DC level, Gaussian, Lorentz, exponential rise/fall, sin(x)/x, random noise, Haversine, Cardiac

Amplitude range Values are peak-to-peak voltages

Waveform	50 Ω	1 MΩ
Arbitrary	10 mV to 2.5 V	20 mV to 5 V
Sine	10 mV to 2.5 V	20 mV to 5 V
Square	10 mV to 2.5 V	20 mV to 5 V
Pulse	10 mV to 2.5 V	20 mV to 5 V
Ramp	10 mV to 2.5 V	20 mV to 5 V
Triangle	10 mV to 2.5 V	20 mV to 5 V
Gaussian	10 mV to 1.25 V	20 mV to 2.5 V
Lorentz	10 mV to 1.2 V	20 mV to 2.4 V
Exponential Rise	10 mV to 1.25 V	20 mV to 2.5 V
Exponential Fall	10 mV to 1.25 V	20 mV to 2.5 V
Sine(x)/x	10 mV to 1.5 V	20 mV to 3.0 V
Random Noise	10 mV to 2.5 V	20 mV to 5 V
Haversine	10 mV to 1.25 V	20 mV to 2.5 V
Cardiac	10 mV to 2.5 V	20 mV to 5 V

Sine waveform

Frequency range	0.1 Hz to 50 MHz
Frequency setting resolution	0.1 Hz
Frequency accuracy	130 ppm (frequency ≤ 10 kHz), 50 ppm (frequency > 10 kHz) This is for Sine, Ramp, Square and Pulse waveforms only.
Amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z; 10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Amplitude flatness, typical	±0.5 dB at 1 kHz
	±1.5 dB at 1 kHz for < 20 mV_{pp} amplitudes

Total harmonic distortion, typical	1% for amplitude ≥ 200 mV_{pp} into 50 Ω load 2.5% for amplitude > 50 mV AND < 200 mV_{pp} into 50 Ω load This is for Sine wave only.
Spurious free dynamic range, typical	40 dB (V_{pp} ≥ 0.1 V); 30 dB (V_{pp} ≥ 0.02 V), 50 Ω load

Square and pulse waveform

Frequency range	0.1 Hz to 25 MHz
Frequency setting resolution	0.1 Hz
Frequency accuracy	130 ppm (frequency ≤ 10 kHz), 50 ppm (frequency > 10 kHz)
Amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z; 10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Duty cycle range	10% - 90% or 10 ns minimum pulse, whichever is larger Minimum pulse time applies to both on and off time, so maximum duty cycle will reduce at higher frequencies to maintain 10 ns off time
Duty cycle resolution	0.1%
Minimum pulse width, typical	10 ns. This is the minimum time for either on or off duration.
Rise/Fall time, typical	5 ns, 10% - 90%
Pulse width resolution	100 ps
Overshoot, typical	< 6% for signal steps greater than 100 mV_{pp} This applies to overshoot of the positive-going transition (+overshoot) and of the negative-going (-overshoot) transition
Asymmetry, typical	±1% ±5 ns, at 50% duty cycle
Jitter, typical	< 60 ps TIE_{RMS}, ≥ 100 mV_{pp} amplitude, 40%-60% duty cycle

Ramp and triangle waveform

Frequency range	0.1 Hz to 500 kHz
Frequency setting resolution	0.1 Hz
Frequency accuracy	130 ppm (frequency ≤ 10 kHz), 50 ppm (frequency > 10 kHz)
Amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z; 10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Variable symmetry	0% - 100%
Symmetry resolution	0.1%

DC level range	±2.5 V into Hi-Z ±1.25 V into 50 Ω
Random noise amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z

	10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Sin(x)/x	
Maximum frequency	2 MHz
Gaussian pulse, Haversine, and Lorentz pulse	
Maximum frequency	5 MHz
Lorentz pulse	
Frequency range	0.1 Hz to 5 MHz
Amplitude range	20 mV_{pp} to 2.4 V_{pp} into Hi-Z
	10 mV_{pp} to 1.2 V_{pp} into 50 Ω
Cardiac	
Frequency range	0.1 Hz to 500 kHz
Amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z
	10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Arbitrary	
Memory depth	1 to 128 k
Amplitude range	20 mV_{pp} to 5 V_{pp} into Hi-Z
	10 mV_{pp} to 2.5 V_{pp} into 50 Ω
Repetition rate	0.1 Hz to 25 MHz
Sample rate	250 MS/s
Signal amplitude accuracy	±[(1.5% of peak-to-peak amplitude setting) + (1.5% of absolute DC offset setting) + 1 mV] (frequency = 1 kHz)
Signal amplitude resolution	1 mV (Hi-Z)
	500 µV (50 Ω)
Sine and ramp frequency accuracy	130 ppm (frequency ≤10 kHz)
	50 ppm (frequency >10 kHz)
DC offset range	±2.5 V into Hi-Z
	±1.25 V into 50 Ω

DC offset resolution	1 mV (Hi-Z) 500 µV (50 Ω)
DC offset accuracy	±[(1.5% of absolute offset voltage setting) + 1 mV] Add 3 mV of uncertainty per 10 °C change from 25 °C ambient

Digital volt meter (DVM)

Measurement types	DC, AC_{RMS}+DC, AC_{RMS} , Trigger frequency count
Voltage resolution	4 digits
Voltage accuracy	
DC:	±((1.5% * |reading - offset - position|) + (0.5% * |(offset - position)|) + (0.1 * Volts/div)) De-rated at 0.100%/°C of |reading - offset - position| above 30 °C Signal ± 5 divisions from screen center
AC:	± 3% (40 Hz to 1 kHz) with no harmonic content outside 40 Hz to 1 kHz range AC, typical: ± 2% (20 Hz to 10 kHz) For AC measurements, the input channel vertical settings must allow the V_{PP} input signal to cover between 4 and 10 divisions and must be fully visible on the screen

Trigger frequency counter

Resolution	8-digits
Accuracy	±(1 count + time base accuracy * input frequency) The signal must be at least 8 mV_{pp} or 2 div, whichever is greater.
Maximum input frequency	10 Hz to maximum bandwidth of the analog channel The signal must be at least 8 mV_{pp} or 2 div, whichever is greater.

Processor system

Host processor	Intel x6413E at 1.5 GHz (HFM) / 3.0 GHz (Turbo). Elkhart Lake 4-Core. Intel i5-4400E, 2.7 GHz, 64-bit, dual core processor, 8 GB system RAM
Operating system	Closed Embedded OS (std configuration). No access to OS file system. Instrument with option 6-WINM2 installed: Microsoft Windows 10

Internal storage	≥ 80 GB. Form factor is an 80 mm m.2 card with a SATA-3 interface 512 GB m.2 drive with a SATA-3 interface (with option 6-WINM2)

Input-Output ports

DisplayPort connector	A 20-pin DisplayPort connector; connect to show the oscilloscope display on an external monitor or projector
DVI connector	A 29-pin DVI-I connector; connect to show the oscilloscope display on an external monitor or projector
VGA	DB-15 female connector; connect to show the oscilloscope display on an external monitor or projector

Probe compensator signal, typical

Connection:	Connectors are located on the lower front right of the instrument
Amplitude:	0 to 2.5 V
Frequency:	1 kHz
Source impedance:	1 kΩ

External reference input	The time-base system can phase lock to an external 10 MHz reference signal . There are two ranges for the reference clock. The instrument can accept a high-accuracy reference clock of 10 MHz ±2 ppm or a lower-accuracy reference clock of 10 MHz ±1 kppm.
USB interface (Host, Device ports)	Front panel USB Host ports: Two USB 2.0 Hi-Speed ports, one USB 3.0 SuperSpeed port Rear panel USB Host ports: Two USB 2.0 Hi-Speed ports, two USB 3.0 SuperSpeed ports Rear panel USB Device port: One USB 3.0 SuperSpeed Device port providing USBTMC support
Ethernet interface	10/100/1000 Mb/s
Auxiliary output	Rear-panel BNC connector. Output can be configured to provide a positive or negative pulse out when the oscilloscope triggers, the internal oscilloscope reference clock out, or an AFG sync pulse

Characteristic	Limits
Vout (HI)	≥ 2.5 V open circuit; ≥ 1.0 V into a 50 Ω load to ground
Vout (LO)	≤ 0.7 V into a load of ≤ 4 mA; ≤0.25 V into a 50 Ω load to ground

Kensington-style lock	Rear-panel security slot connects to standard Kensington-style lock
LXI	Class: LXI Core 2016 Version: 1.5

Power source

Power

Power consumption	360 Watts maximum
Source voltage	100 - 240 V ±10% at 50 Hz to 60 Hz 115 V ±10% at 400 Hz

Physical characteristics

Dimensions	Height: 3.44 in (87.3 mm) Width: 17.01 in (432 mm) Depth: 23.85 in (605.7 mm) Fits rack depths from 24 inches to 32 inches
Weight	29.4 lbs (13.34 kg)
Cooling	The clearance requirement for adequate cooling is 2.0 in (50.8 mm) on the left and right sides of the instrument. Air flows from left to right through the instrument.
Rackmount configuration	2U rack mount kit is included as standard configuration

Environmental specifications

Temperature

Operating	+0 °C to +50 °C (32 °F to 122 °F)
Non-operating	-20 °C to +60 °C (-4 °F to 140 °F)

Humidity

Operating	5% to 90% relative humidity (% RH) at up to +40 °C 5% to 55% RH above +40 °C up to +50 °C, noncondensing
Non-operating	5% to 90% relative humidity (% RH) at up to +60 °C, noncondensing

Altitude

Operating	Up to 3,000 meters (9,843 feet)
Non-operating	Up to 12,000 meters (39,370 feet)

EMC, Environmental, and Safety

Safety certification	US NRTL Listed - UL61010-1 and UL61010-2-030 Canadian Certification - CAN/CSA-C22.2 No. 61010.1 and CAN/CSA-C22.2 No 61010.2.030 EU Compliance - Low Voltage Directive 2014-35-EU and EN61010-1. International Compliance - IEC 61010-1 and IEC61010-2-030

Regulatory	CE marked for the European Union and CSA approved for the USA and Canada RoHS compliant

Software

IVI driver	Provides a standard instrument programming interface for common applications such as LabVIEW, LabWindows/CVI, Microsoft .NET, and MATLAB. Compatible with Python, C/C++/C# and many other languages through VISA.
e*Scope®	Enables control of the oscilloscope over a network connection through a standard web browser. Simply enter the IP address or network name of the oscilloscope and a web page will be served to the browser. Transfer and save settings, waveforms, measurements, and screen images or make live control changes to settings on the oscilloscope directly from the web browser. Optionally configure e*Scope authentication to password protect access to control and view the oscilloscope.
LXI Web interface	Connect to the oscilloscope through a standard Web browser by simply entering the oscilloscope's IP address or network name in the address bar of the browser. The Web interface enables viewing of instrument status and configuration, status and modification of network settings, and instrument control through the e*Scope web-based remote control. All web interaction conforms to LXI specification, version 1.5.
Programming Examples	Programming with the 4/5/6 Series platforms has never been easier. With a programmers manual and a GitHub site you have many commands and examples to help you get started remotely automating your instrument. See *HTTPS://GITHUB.COM/TEKTRONIX/PROGRAMMATIC-CONTROL-EXAMPLES*.

Ordering Information

Use the following steps to select the appropriate instrument and options for your measurement needs.

Step 1

Start by selecting the model.

Model	Number of channels
LPD64	4

Each model includes

Rackmount attachments installed

Installation and safety manual

Embedded Help

Power cord

Calibration certificate documenting traceability to National Metrology Institute(s) and ISO9001/ISO17025 quality system registration

One-year warranty covering all parts and labor on the instrument.

Step 2

Configure your Low Profile Digitizer by selecting the analog channel bandwidth you need

Choose the bandwidth you need today by choosing one of these bandwidth options. You can upgrade it later by purchasing an upgrade option.

Bandwidth Option	Bandwidth
6-BW-1000	1 GHz
6-BW-2500	2.5 GHz
6-BW-4000	4 GHz
6-BW-6000	6 GHz
6-BW-8000	8 GHz

Step 3

Add instrument functionality

Instrument functionality can be ordered with the instrument or later as an upgrade kit.

Instrument option	Built-in functionality
6-RL-2	Extend record length from 125 Mpts/channel to 250 Mpts/channel
6-RL-3	Extend record length from 125 Mpts/channel to 500 Mpts/channel
6-RL-4	Extend record length from 125 Mpts/channel to 1 Gpts/channel
6-AFG	Add Arbitrary / Function Generator

Table continued…

Instrument option	Built-in functionality
6-SEC [3] [4]	Security package adds enhanced security that restricts user data from being saved to the instrument, password-protected enabling for USB ports and firmware updates. Recommended for highly classified data environments.
6-WINM2[4]	Instrument replaces std. embedded OS with Windows 10 Operating system on a m.2 512 GB drive.

Each purchased bundle has two duration options:

- A 1-year subscription includes all features and free upgrades for the purchased bundle for one year; after which time the features are disabled. Additional 1-year subscription can be purchased for the selected bundle.
- A perpetual subscription enables all features for the purchased bundle permanently. A perpetual subscription includes 1-year of free upgrades to the bundle feature set. After the year, the feature set is frozen to those enabled by the last update made.

  Perpetual bundles can continue to receive upgrades following the 1 year activation period with the purchase of a maintenance license. Maintenance license information can be found in the maintenance license table below and must be purchased for an existing Starter, Pro, or Ultimate bundle.

Maintenance license	Description
6-STARTER-MNT-1Y	Includes Perpetual Starter Bundle updates for 1 Year on 6 Series MSO
6-PRO-MNT-1Y	Includes Perpetual Pro Bundle updates for 1 Year on 6 Series MSO
6-ULTIMATE-MNT-1Y	Includes Perpetual Ultimate Bundle updates for 1 Year on 6 Series MSO

Step 4

Add optional serial bus triggering, decode, and search capabilities

Choose the serial support you need today by choosing from these serial analysis options. You can upgrade later by purchasing an upgrade kit.

Instrument Option	Serial Buses Supported
6-RFNFC	ISO/IEC 15693, 14443A, 14443B, and FeliCa (decode and search only)
6-SRAERO	Aerospace (MIL-STD-1553, ARINC 429)
6-SRAUDIO	Audio (I^2S, LJ, RJ, TDM)
6-SRAUTO	Automotive (CAN, CAN FD, LIN, FlexRay, and CAN symbolic decoding)
6-SRAUTOSEN	Automotive sensor (SENT)
6-SRCOMP	Computer (RS-232/422/485/UART)
6-SREMBD	Embedded (I^2C, SPI)
6-SRENET	Ethernet (10BASE-T, 100BASE-TX)

Table continued…

[3] This option is not compatible with option 6-WINM2.

[4] This option must be purchased at the same time as the instrument. Not available as an upgrade.

Instrument Option	Serial Buses Supported
6-SRI3C	MIPI I3C
6-SRPM	Power Management (SPMI)
6-SRUSB2	USB (USB2.0 LS, FS, HS)

Step 5

Add optional serial bus compliance testing

Choose the serial compliance testing packages you need today by choosing from these options. You can upgrade later by purchasing an upgrade kit. All options in the table below require option 6-WIN (SSD with Microsoft Windows 10 operating system).

Instrument Option	Serial Buses Supported
6-CMNBASET	2.5 and 5 GBASE-T Ethernet automated compliance test solution. 2.5 GHz is recommended

Step 6

Add optional memory analysis

Instrument option	Advanced analysis
6-DBDDR3	DDR3 and LPDDR3 Debug and Analysis

Step 7

Add optional analysis capabilities

Instrument option	Advanced analysis
6-DBLVDS	TekExpress automated LVDS test solution (requires option 6-DJA)
6-DJA	Advanced Jitter and Eye Analysis
6-DPM	Digital Power Management
6-MTM	Mask and Limit testing
6-PAM3	PAM3 analysis (requires options 6-DJA and 6-WIN)
6-PWR	Power Measurement and Analysis
6-SV-BW-1	Increase Spectrum View Capture Bandwidth to 2 GHz
6-SV-RFVT	Spectrum View RF vs. Time traces, triggers, Spectrograms, and IQ capture
6-UDFLT	User Defined Filter Creation Tool
6-VID	NTSC, PAL, and SECAM video triggering

Step 8

Add accessories

Optional Accessory	Description
020-3180-xx	Benchtop conversion kit including four (4) instrument feet and a strap handle
016-2139-xx	Hard transit case with handles and wheels for easy transportation
003-1929-xx	SMA 8-lb Torque Wrench for connecting SMA cables
174-6211-xx	2x Matched SMA cables (within 1 pS)
174-6212-xx	4x Matched SMA cables (within 1 pS)
174-6215-00	Power Divider, 2-way, 50 Ohm, DC-18 GHz
174-6214-00	Power Divider, 4-way, 50 Ohm, DC-18 GHz
GPIB to Ethernet adapter	Order model 4865B (GPIB to Ethernet to Instrument Interface) directly from ICS Electronics *www.icselect.com/gpib_instrument_intfc.html*

Step 9

Select power cord option

Power Cord Option	Description
A0	North America power plug (115 V, 60 Hz) Includes mechanism that retains power cord to instrument
A1	Universal Euro power plug (220 V, 50 Hz)
A2	United Kingdom power plug (240 V, 50 Hz)
A3	Australia power plug (240 V, 50 Hz)
A5	Switzerland power plug (220 V, 50 Hz)
A6	Japan power plug (100 V, 50/60 Hz)
A10	China power plug (50 Hz)
A11	India power plug (50 Hz)
A12	Brazil power plug (60 Hz)
A99	No power cord

Step 10

Protect your investment and your uptime with a service package for your instrument.

Optimize the lifetime value of your purchase and lower your total cost of ownership with a calibration and extended warranty plan for your instrument. Plans range from standard warranty extensions covering parts, labor, and 2-day shipping to Total Product Protection with repair or replacement

coverage from wear and tear, accidental damage, ESD or EOS. See the table below for specific service options available on the 6 Series Low Profile Digitizer family of products.

Additionally, Tektronix is a leading accredited calibration services provider for all brands of electronic test and measurement equipment, servicing more than 140,000 models from 9,000 manufacturers. With 100+ labs worldwide, Tektronix serves as a global partner, delivering tailored whole-site calibration programs with OEM quality at a market price.

Add extended service and calibration options

Service Option	Description
T3	Three-year Total Protection Plan, includes repair or replacement coverage from wear and tear, accidental damage, ESD or EOS.
R3	Standard warranty extended to 3 years. Covers parts, labor and 2-day shipping within country. Guarantees faster repair time than without coverage. All repairs include calibration and updates. Hassle free - a single call starts the process.
C3	Calibration service for 3 years. Includes traceable calibration or functional verification where applicable, for recommended calibrations. Coverage includes the initial calibration plus 2 years of calibration coverage.
T5	Five year Total Protection Plan, includes repair or replacement coverage from wear and tear, accidental damage, ESD or EOS.
R5	Standard warranty extended to 5 years. Covers parts, labor and 2-day shipping within country. Guarantees faster repair time than without coverage. All repairs include calibration and updates. Hassle free - a single call starts the process.
C5	Calibration service for 5 years. Includes traceable calibration or functional verification where applicable, for recommended calibrations. Coverage includes the initial calibration plus 4 years of calibration coverage.

Feature upgrades after purchase

Add feature upgrades in the future

The 6 Series products offer many ways to easily add functionality after the initial purchase. Node-locked licenses permanently enable optional features on a single product. Floating licenses allow license-enabled options to be easily moved between compatible instruments.

Upgrade feature	Node-locked license upgrade	Floating license upgrade	Description
Add instrument functions	SUP6-AFG	SUP6-AFG-FL	Add arbitrary function generator
	SUP6-RL-1T2	SUP6-RL-1T2-FL	Extend record length from 125 Mpts to 250 Mpts / channel
	SUP6-RL-1T3	SUP6-RL-1T3-FL	Extend record length from 125 Mpts to 500 Mpts / channel
	SUP6-RL-1T4	SUP6-RL-1T4-FL	Extend record length from 125 Mpts to 1 Gpts / channel
	SUP6-RL-2T3	SUP6-RL-2T3-FL	Extend record length from 250 Mpts to 500 Mpts / channel
	SUP6-RL-2T4	SUP6-RL-2T4-FL	Extend record length from 250 Mpts to 1 Gpts / channel
	SUP6-RL-3T4	SUP6-RL-3T4-FL	Extend record length from 500 Mpts to 1 Gpts / channel

Table continued…

Upgrade feature	Node-locked license upgrade	Floating license upgrade	Description
Add protocol analysis	SUP6-RFNFC	SUP6-RFNFC-FL	ISO/IEC 15693, 14443A, 14443B, and FeliCa (decode and search only)
	SUP6-SRAERO	SUP6-SRAERO-FL	Aerospace serial triggering and analysis (MIL-STD-1553, ARINC 429)
	SUP6-SRAUDIO	SUP6-SRAUDIO-FL	Audio serial triggering and analysis (I^2S, LJ, RJ, TDM)
	SUP6-SRAUTO	SUP6-SRAUTO-FL	Automotive serial triggering and analysis (CAN, CAN FD, LIN, FlexRay, and CAN symbolic decoding)
	SUP6-SRAUTOSEN	SUP6-SRAUTOSEN-FL	Automotive sensor serial triggering and analysis (SENT)
	SUP6-SRCOMP	SUP6-SRCOMP-FL	Computer serial triggering and analysis (RS-232/422/485/UART)
	SUP6-SREMBD	SUP6-SREMBD-FL	Embedded serial triggering and analysis (I^2C, SPI)
	SUP6-SRENET	SUP6-SRENET-FL	Ethernet serial triggering and analysis (10Base-T, 100Base-TX)
	SUP6-SRI3C	SUP6-SRI3C-FL	MIPI I3C serial triggering and analysis
	SUP6-SRPM	SUP6-SRPM-FL	Power Management serial triggering and analysis (SPMI)
	SUP6-SRSPACEWIRE	SUP6-SRSPACEWIRE-FL	Spacewire (decode and search only)
	SUP6-SRSVID	SUP6-SRSVID-FL	Serial Voltage Identification (SVID) serial triggering and analysis
	SUP6-SRUSB2	SUP6-SRUSB2-FL	USB 2.0 serial bus triggering and analysis (LS, FS, HS)
	SUP6-SREUSB2	SUP6-SREUSB2-FL	Embedded USB2 (eUSB2) serial decoding and analysis
	SUP6-CMXGBT	SUP6-CMXGBT-FL	10 GBASE-T Ethernet automated compliance test solution. ≥4 GHz is recommended
Add serial compliance All serial compliance products require option 6-WINM2 (Microsoft Windows 10 operating system)	SUP6-CMNBASET	SUP6-CMNBASET-FL	Ethernet automated compliance test solution.

Table continued…

Upgrade feature	Node-locked license upgrade	Floating license upgrade	Description
Add advanced analysis	SUP6-DBLVDS	SUP6-DBLVDS-FL	LVDS debug and analysis (requires option 6-DJA and 6-WINM2)
	SUP6-DJA	SUP6-DJA-FL	Advanced jitter and eye analysis
	SUP6-PWR	SUP6-PWR-FL	Advanced power measurements and analysis
	SUP6-DPM	SUP6-DPM-FL	Digital power management
	SUP6-SV-RFVT	SUP6-SV-RFVT-FL	Spectrum View RF vs. Time traces, triggers, Spectrograms, and IQ capture
	SUP6-SV-BW-1	SUP6-SV-BW-1-FL	Increase Spectrum View capture bandwidth to 2 GHz
	SUP6-PAM3	SUP6-PAM3-FL	PAM3 analysis (requires option 6-DJA)
	SUP6-UDFLT	SUP6-UDFLT-FL	User Defined Filter Creation Tool
Add memory analysis	SUP6-DBDDR3	SUP6-DBDDR3-FL	DDR3 and LPDDR3 debug and analysis
Add digital voltmeter	N/A	N/A	Add digital voltmeter / trigger frequency counter (Free with product registration at *www.tek.com/register6mso*)
Add Expansion SSD with Windows 10	SUP6LP-WINM2	N/A	Drive upgrade; Removable M.2 drive with Windows 10 License; Must choose appropriate option for the type of computer in LPD64.

Add bandwidth upgrades in the future

The analog bandwidth of 6 Series LPD's can be upgraded after the initial purchase. Bandwidth upgrades are purchased based on the current bandwidth and the desired bandwidth. All bandwidth upgrades can be performed in the field by installing a software license and a new front panel label.

Bandwidth upgrade product	Upgrade option	Upgrade option description
SUP6LP-BW4	6LP-BW10T25-4	License; Bandwidth Upgrade for LPD64; Upgrade from 1 GHz to 2.5 GHz bandwidth
	6LP-BW10T40-4	License; Bandwidth Upgrade for LPD64; Upgrade from 1 GHz to 4 GHz bandwidth
	6LP-BW10T60-4	License; Bandwidth Upgrade for LPD64; Upgrade from 1 GHz to 6 GHz bandwidth
	6LP-BW10T80-4	License; Bandwidth Upgrade for LPD64; Upgrade from 1 GHz to 8 GHz bandwidth
	6LP-BW25T40-4	License; Bandwidth Upgrade for LPD64; Upgrade from 2.5 GHz to 4 GHz bandwidth
	6LP-BW25T60-4	License; Bandwidth Upgrade for LPD64; Upgrade from 2.5 GHz to 6 GHz bandwidth
	6LP-BW25T80-4	License; Bandwidth Upgrade for LPD64; Upgrade from 2.5 GHz to 8 GHz bandwidth
	6LP-BW40T60-4	License; Bandwidth Upgrade for LPD64; Upgrade from 4 GHz to 6 GHz bandwidth
	6LP-BW40T80-4	License; Bandwidth Upgrade for LPD64; Upgrade from 4 GHz to 8 GHz bandwidth
	6LP-BW60T80-4	License; Bandwidth Upgrade for LPD64; Upgrade from 6 GHz to 8 GHz bandwidth

Tektronix is ISO 14001:2015 and ISO 9001:2015 certified by DEKRA.