



The Best Value in Electronic Test & Measurement

SDS5000X

Introduction

Features & Benefits

Ordering Info



Touch for a solution

Front Panel



Quick Search/Navigate

Play, FFW, Replay capture data frames

10.1" Touch Screen

Easy use supports gestures

Probe Calibration Signal

3.3 V, 1 kHz Square wave

4 Analog Channels

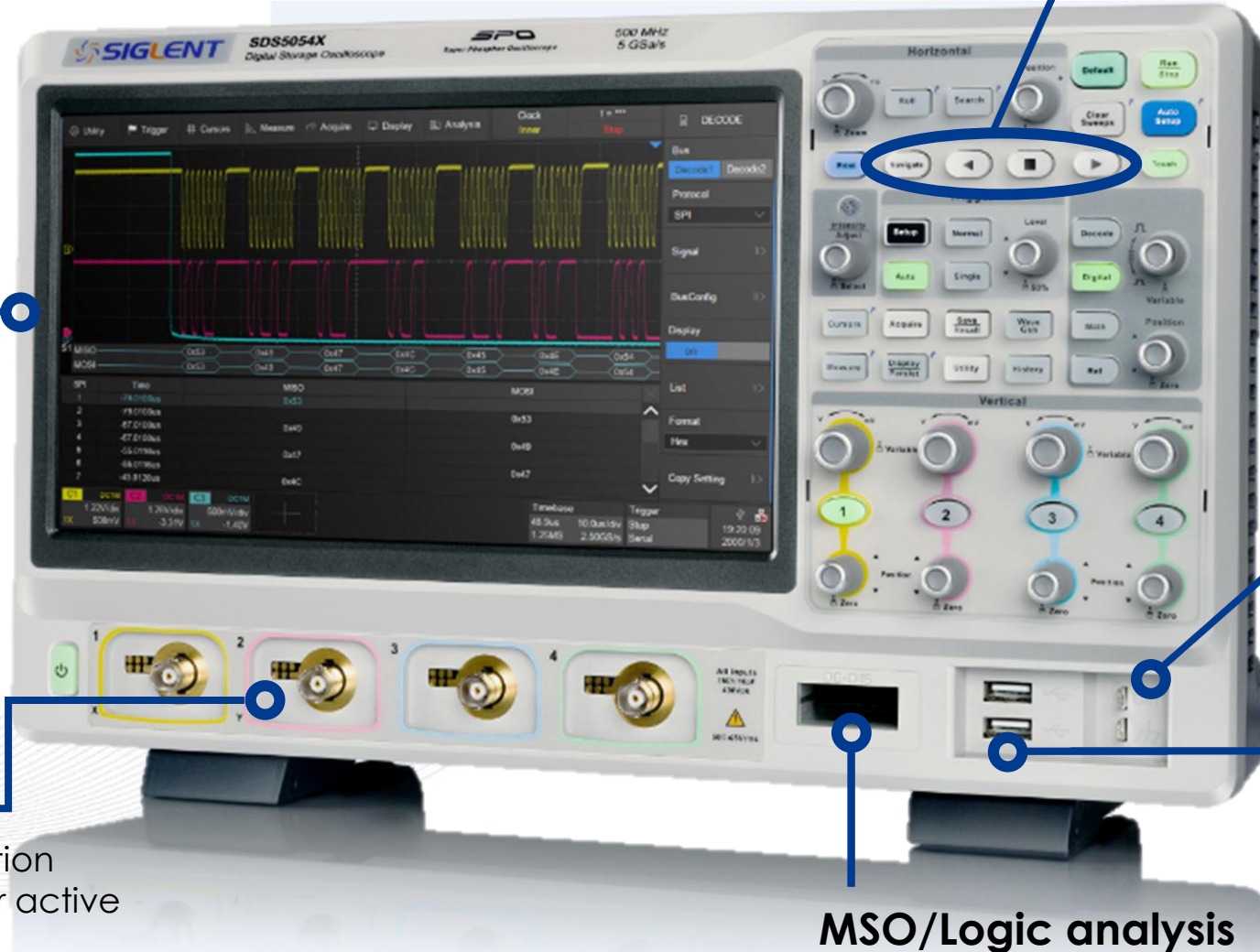
Auto attenuation and power for active probes

2 * USB HOST

Keyboard mouse and USB memory devices

MSO/Logic analysis

16 digital channels



Rear Panel

10 MHz IN/OUT

AUX OUT

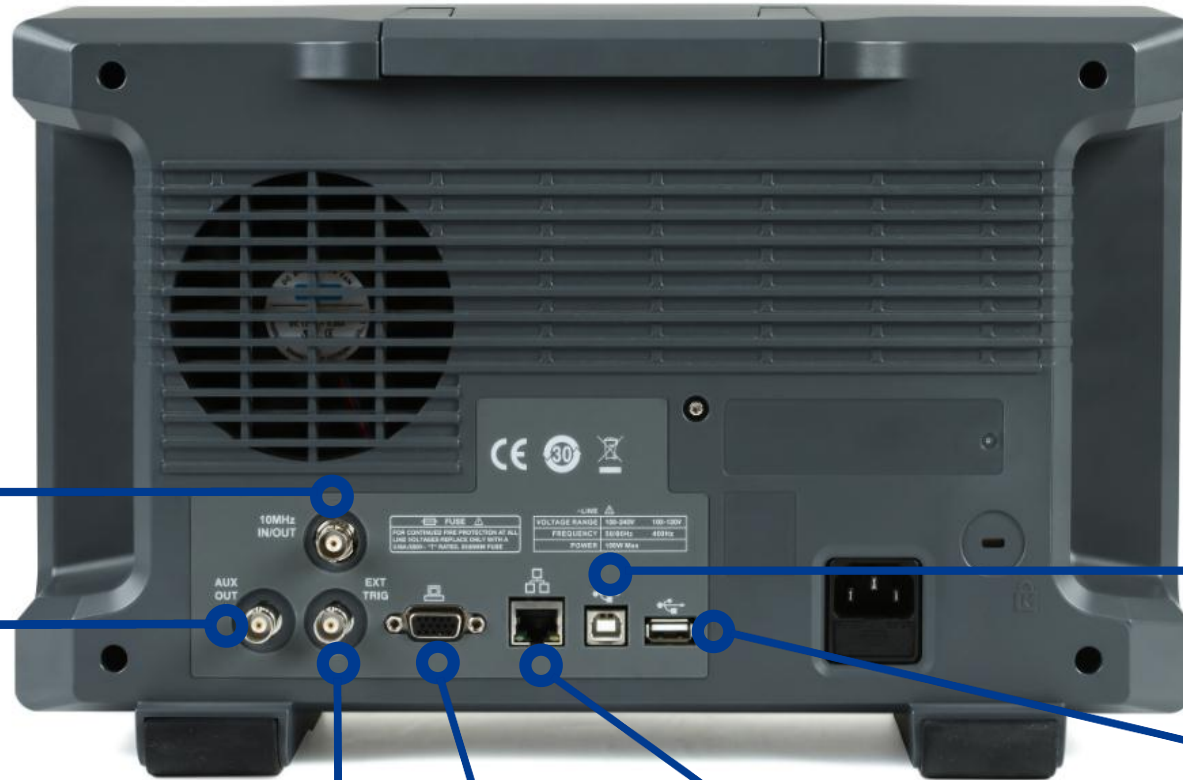
EXT TRIG

VGA OUTPUT

LAN INTERFACE
(VXI-11, telnet, socket, web)

USB-DEVICE(USBTMC)

USB HOST



LESS PRICE & MORE POWER

1 GHz

Bandwidth

5 GSa/s

Sample Rate

10.1''

Touch Screen

250 Mpts

Record Length

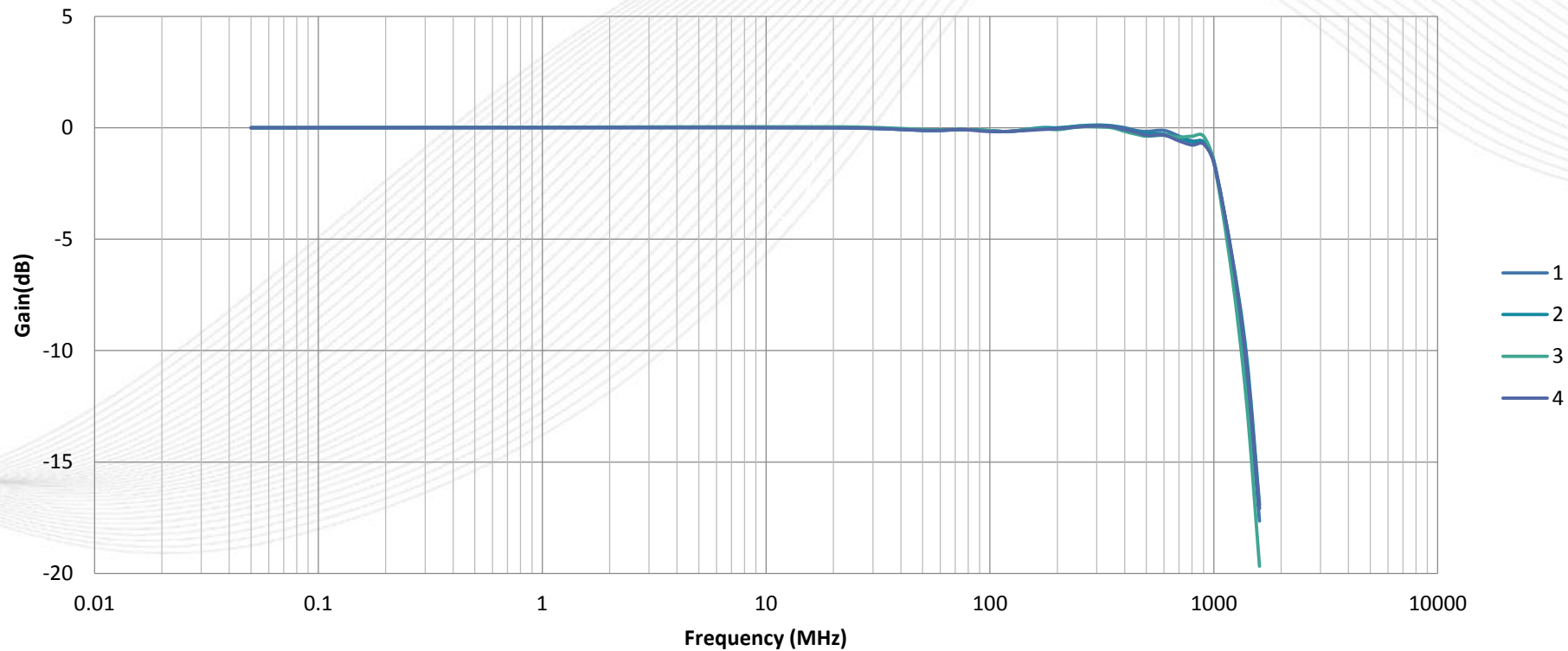
**110,000
wfm/s**

**Waveform
Capture Rate**

Bandwidth

- ↳ Increased accuracy for fast rise-time pulses and complex waveforms
- ↳ Precisely reproduce waveforms with high frequency components

SDS5104X Frequency Response



Waveform Capture Rate

- Up to 110,000 wfm/s (Normal mode)
- Up to 480,000 wfm/s (Sequence mode)
- Collect measurement data more quickly

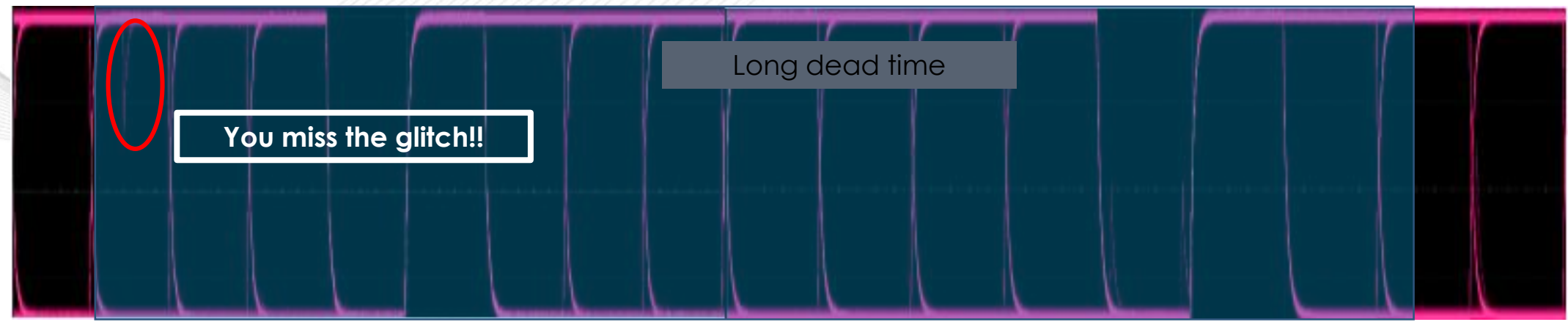
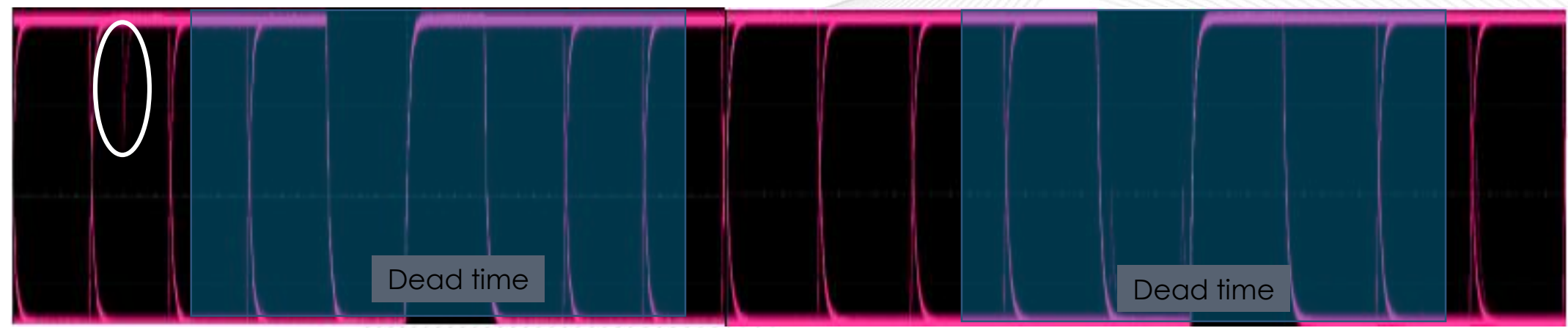
Higher Capture Rate



Shorter Dead Time



Quickly identify problems = Faster results

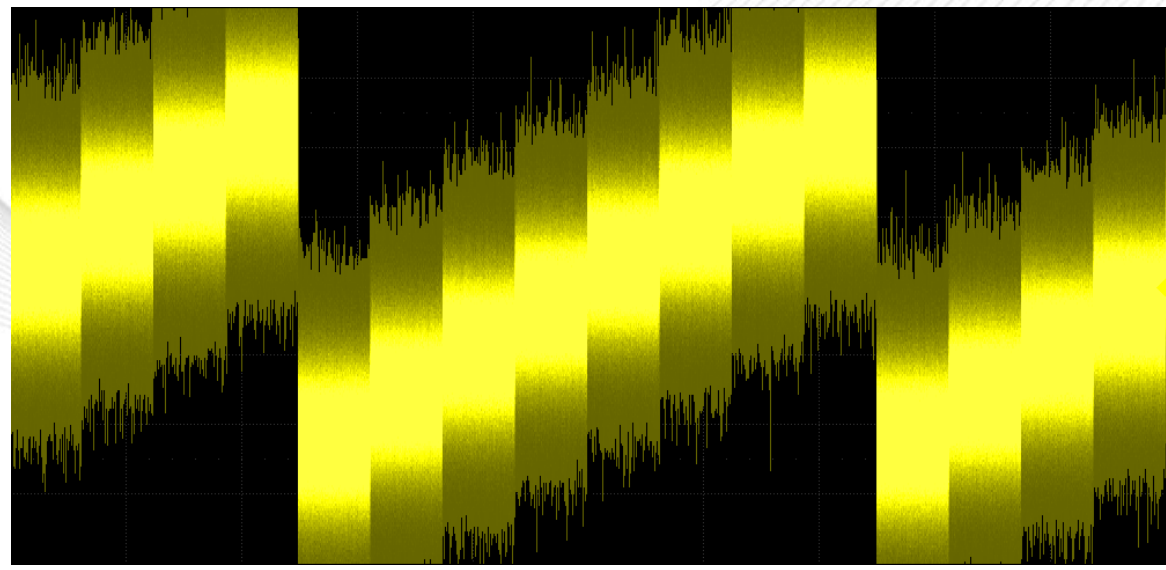


Color and intensity Display

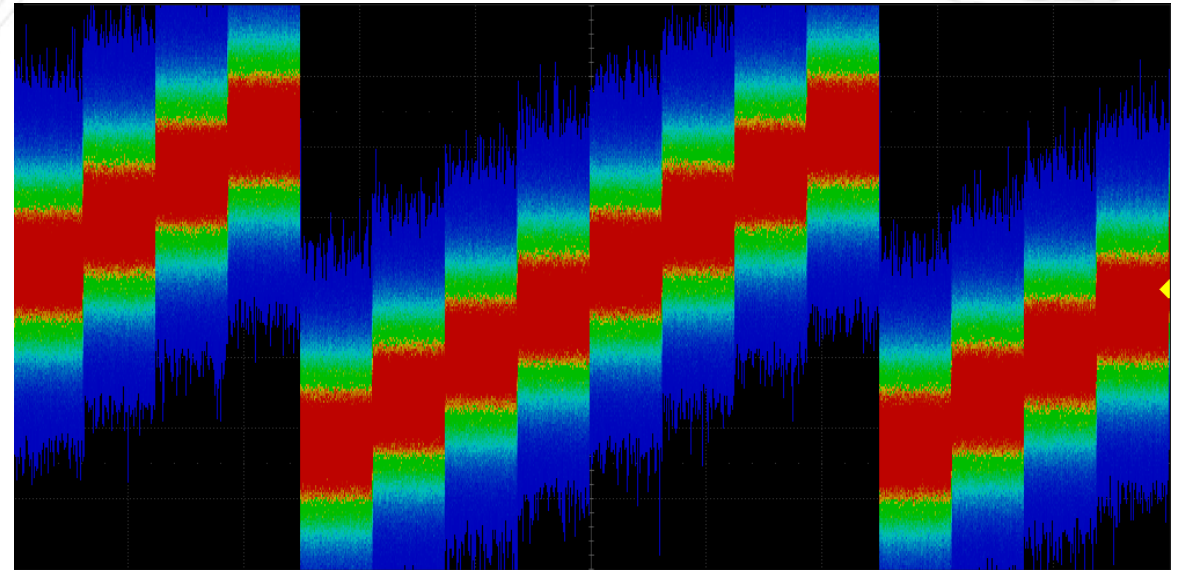
- More frequent events are brighter, or “hotter” (color display mode)
- Significantly increase the probability of observing intermittent and elusive events
- Reveal dynamic signal behavior



256-level intensity

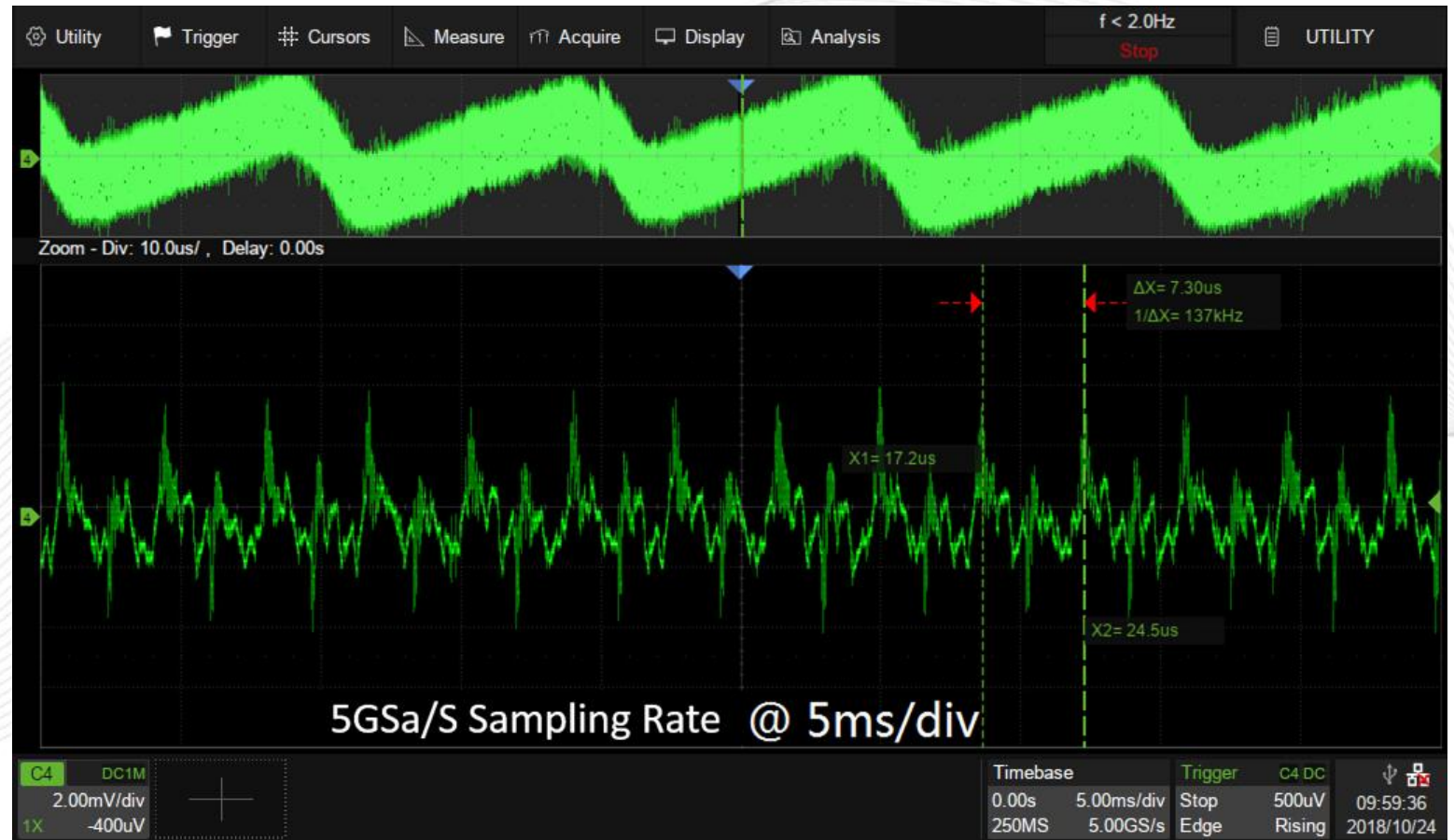


Color temperature display



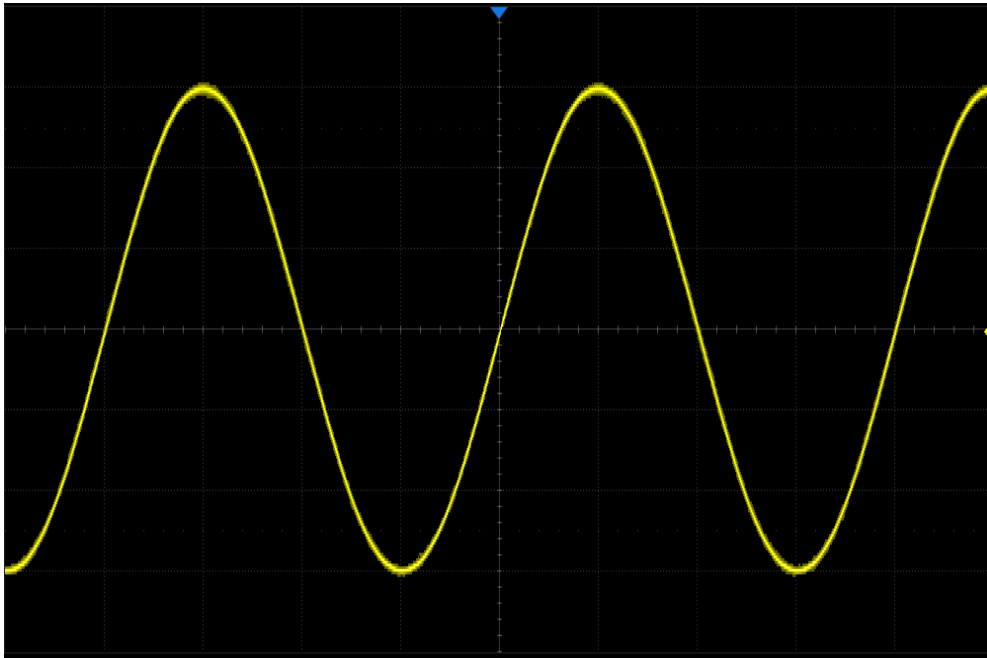
250 Mpts Record Length

- Hardware-based Zoom function
- Benefits: Capture more of signal and zoom in areas of interest
- Don't lose horizontal resolution, don't miss short intermittent signals.
- Monitor slow signals with high sample rate.. Capture seconds of data and still have resolution to see nanosecond scale details
- CH1 & CH2 share 250 Mpts memory
CH3 & CH4 share 250 Mpts memory



Digital Trigger System

SDS5000X Digital Trigger



Analog Trigger

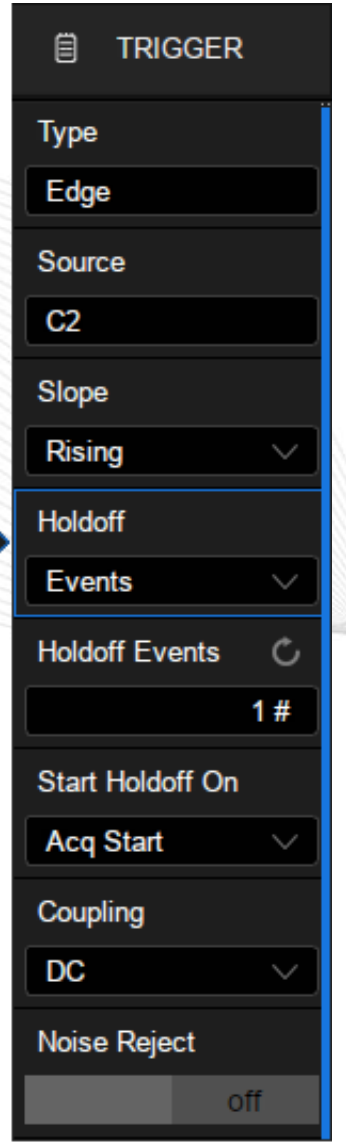
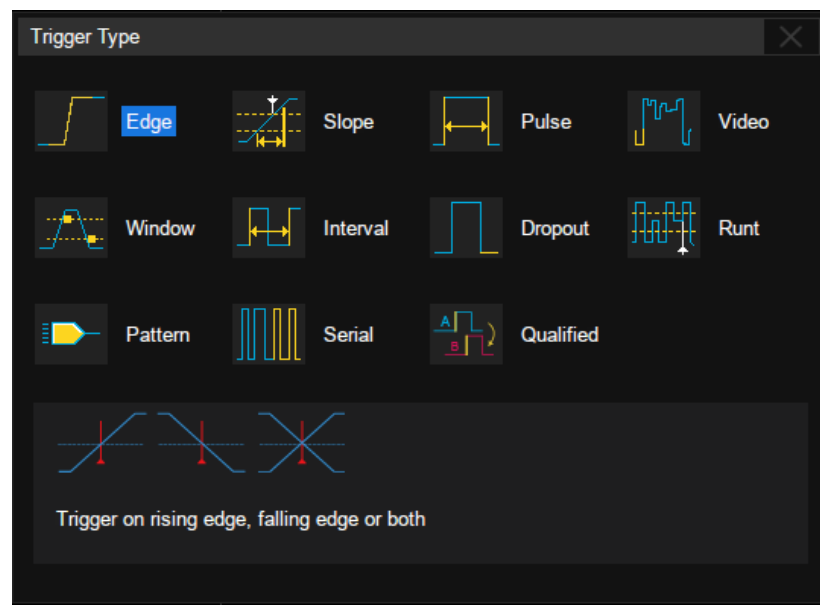


Trigger the same 25 MHz Sine wave

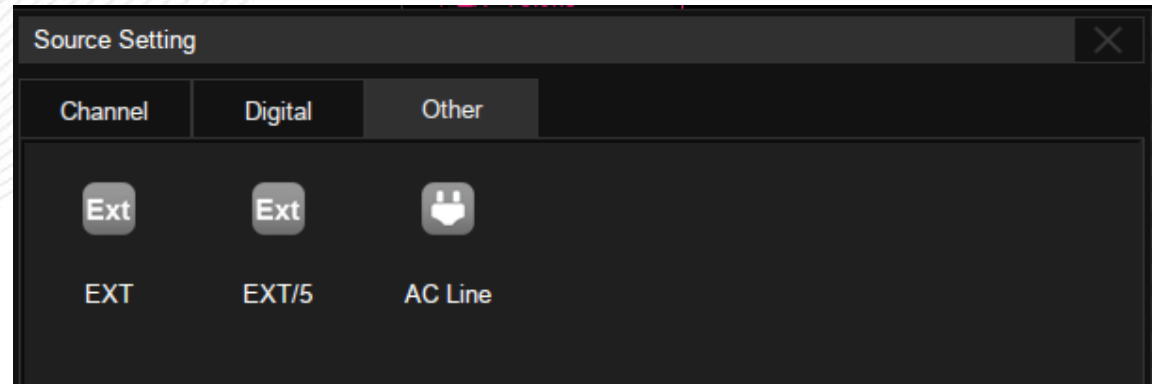
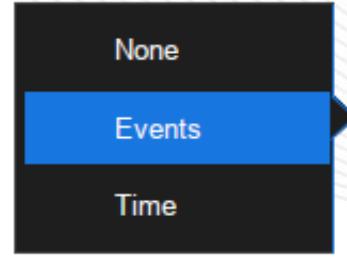
Unique digital trigger system: **higher trigger sensitivity, lower trigger jitter** (less than 100 ps)

Intelligent Triggers

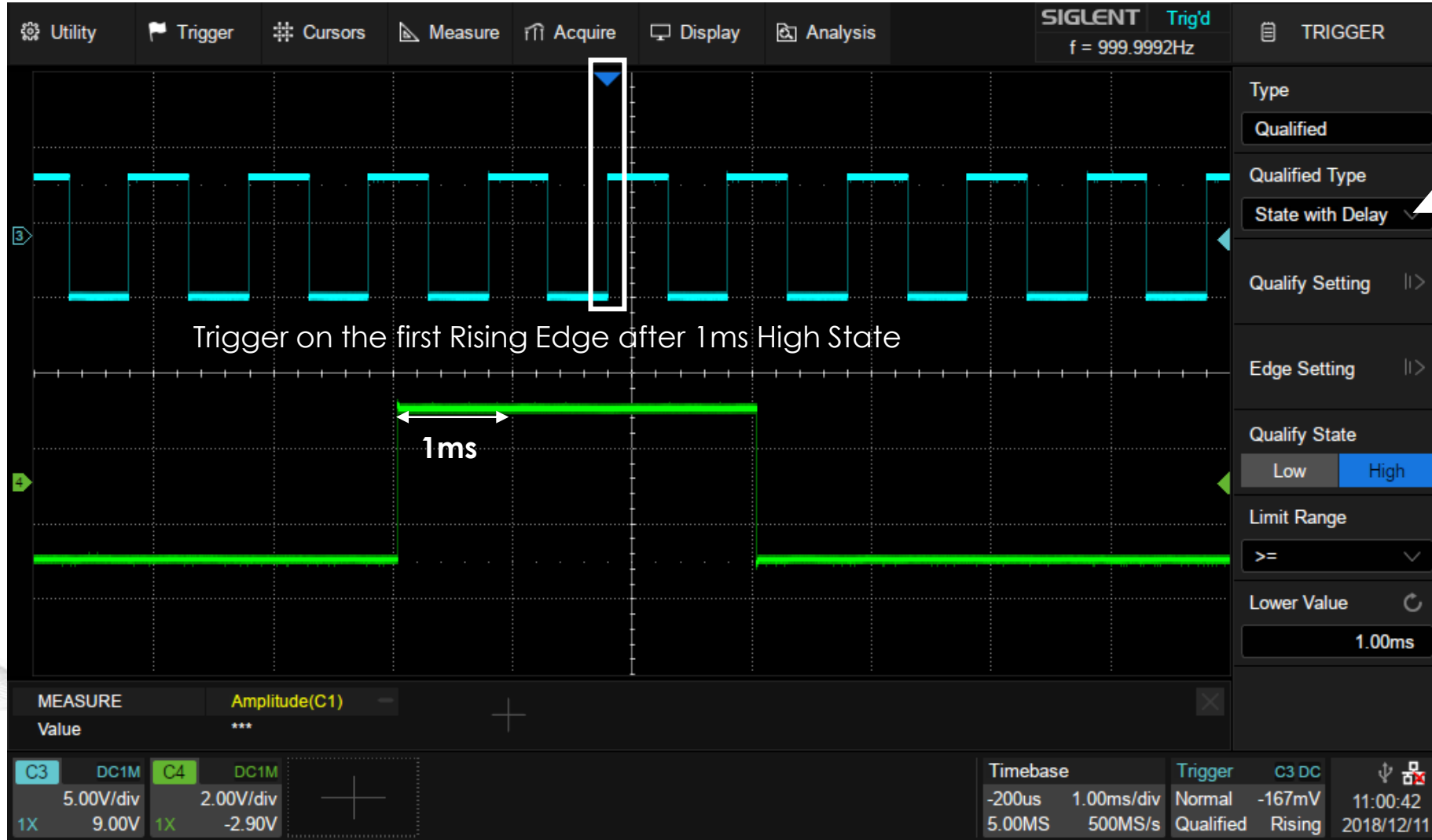
- Featuring Qualified and Zone Trigger
- Hardware trigger: Faster, less jitter



- Multiple trigger types
- Trigger source analog + digital channels + Other
- Hold off by Events or Time



Qualified Trigger

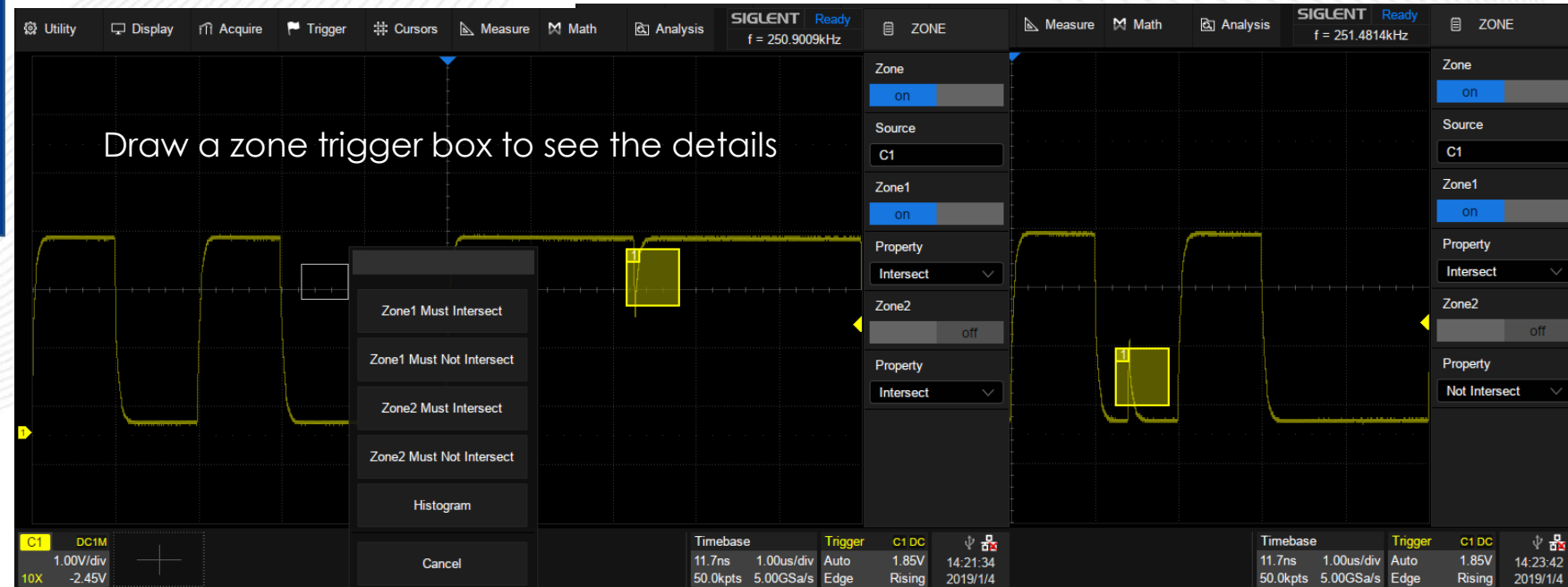
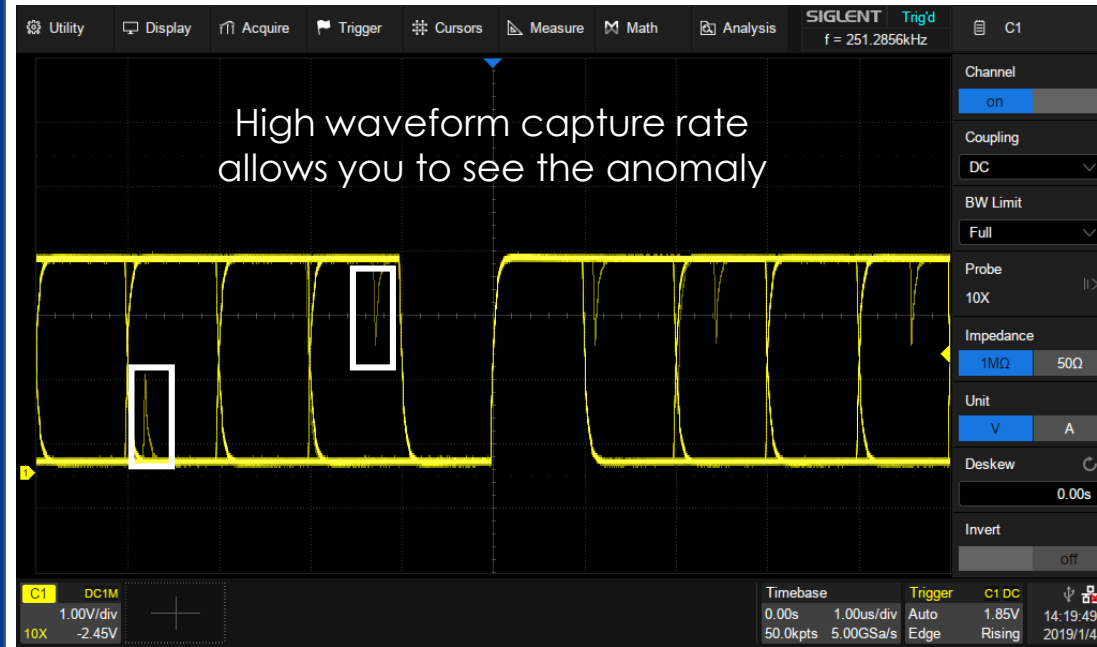


- State
- State with Delay
- Edge
- Edge with Delay

Zone Trigger

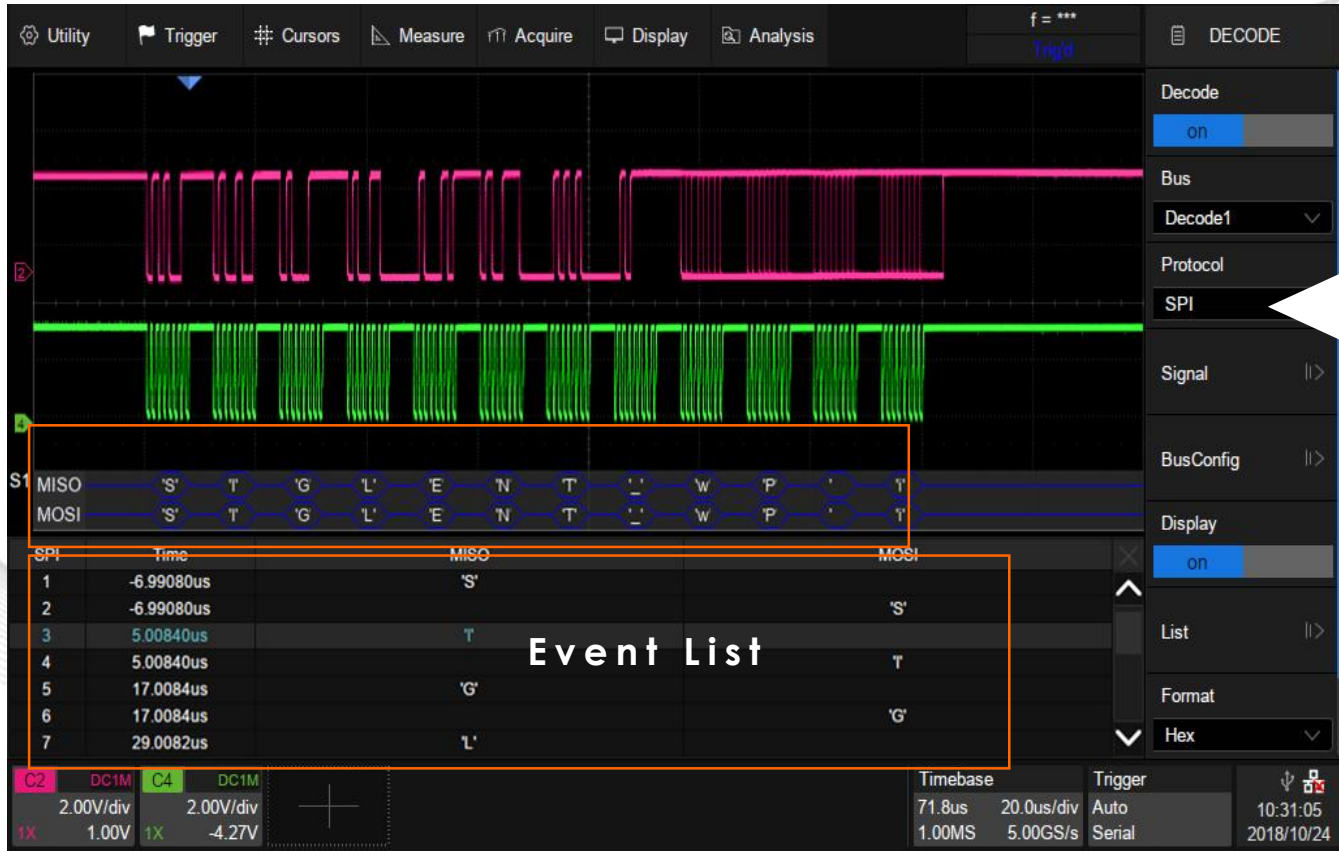


- Once you see a glitch, draw a Zone Trigger box to locate it
- Zone trigger easily isolates it without complicated traditional trigger settings.



Serial Bus Trigger and Decode

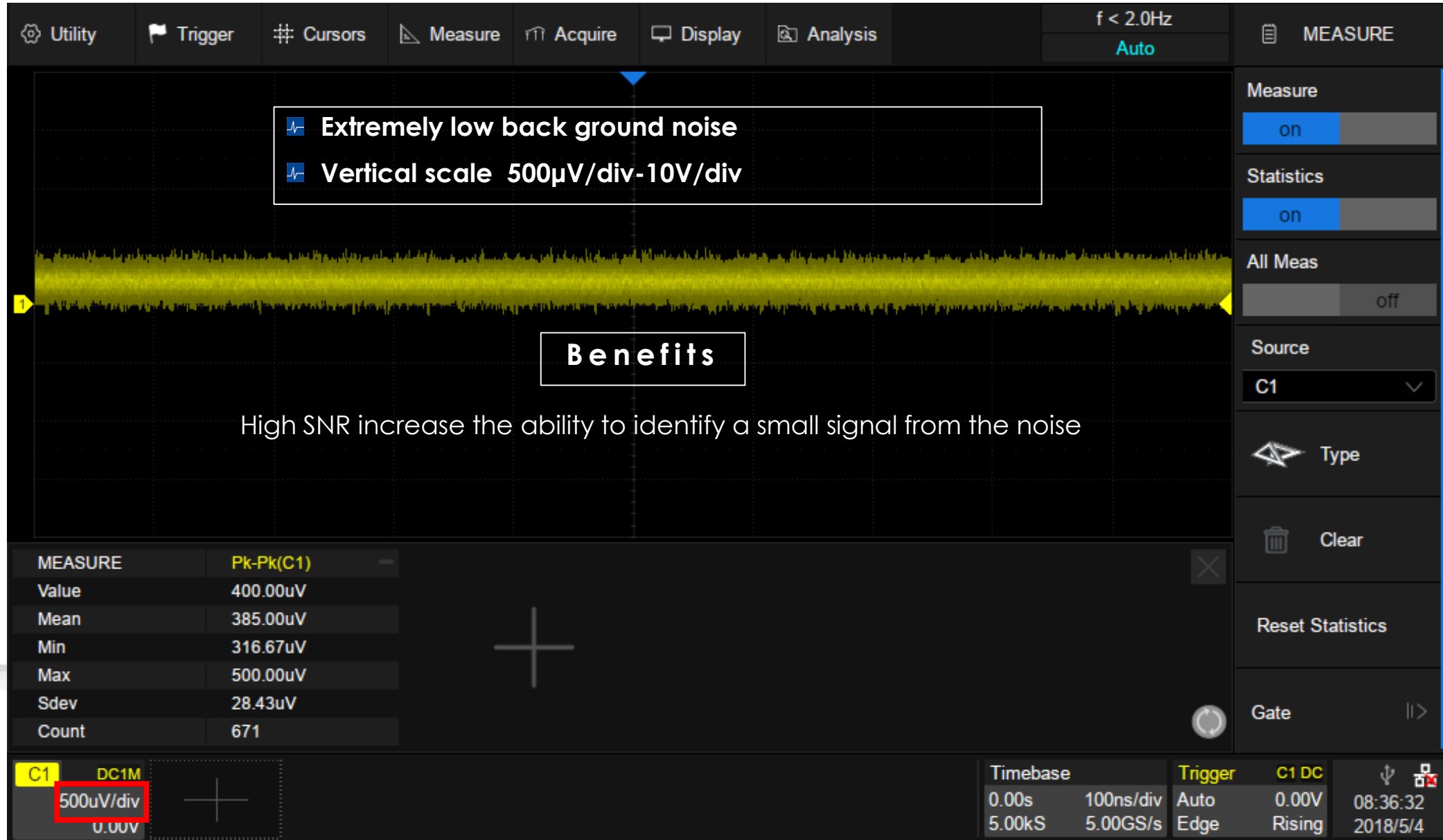
Trigger source: 2/4 analog + 16 digital channels



- Protocol**
- I²C, SPI** Embedded serial trigger and analyze
 - UART** Computer serial trigger and analyze
 - CAN, CAN FD, LIN** Automotive serial trigger and analyze
 - FlexRay** serial trigger and analyze
 - I²S** Audio serial trigger and analyze
 - MIL-STD 1553B** serial trigger and analyze

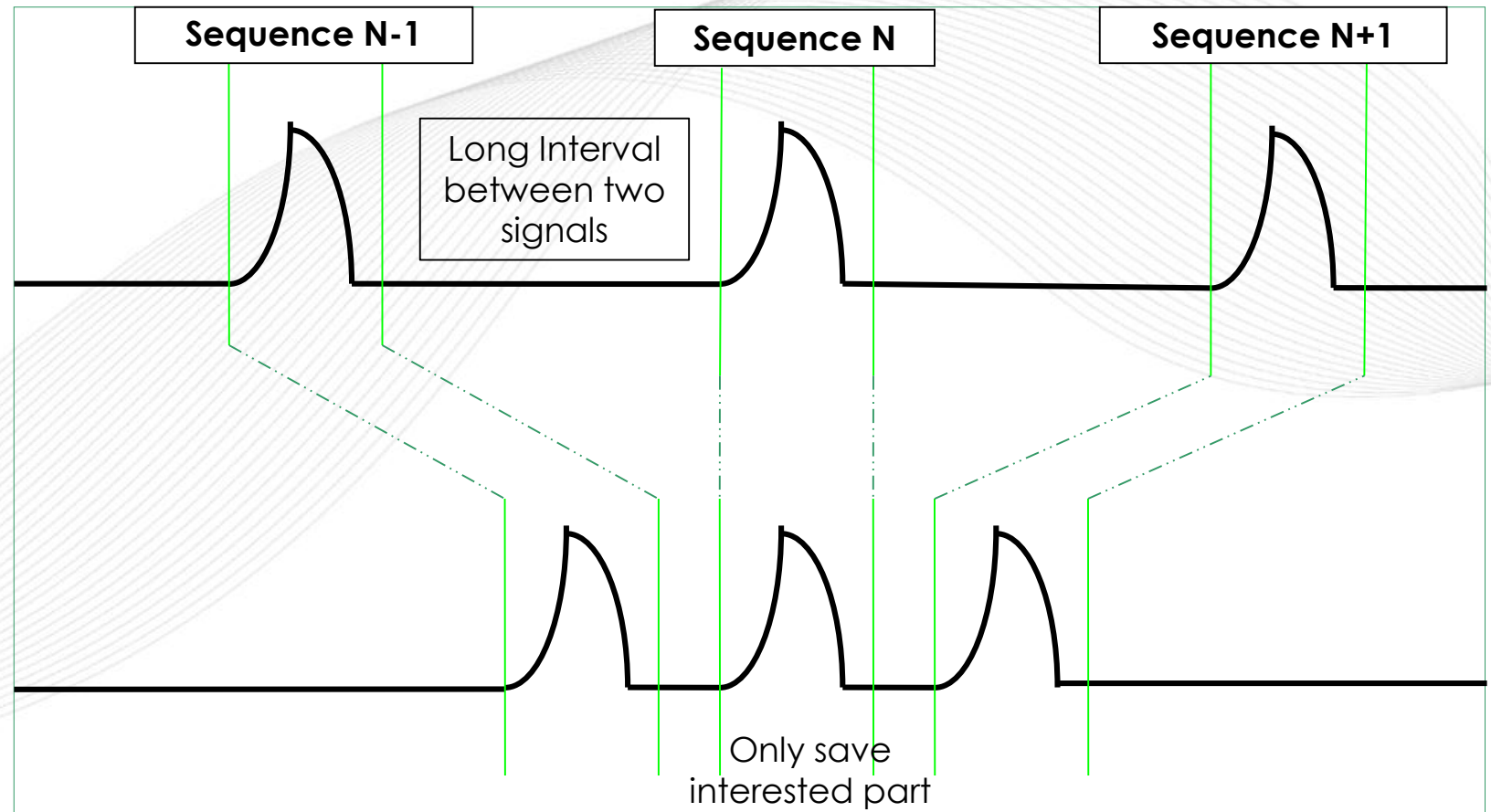
- Format**
- Binary
 - Decimal
 - Hex
 - ASCII

Analog Front End



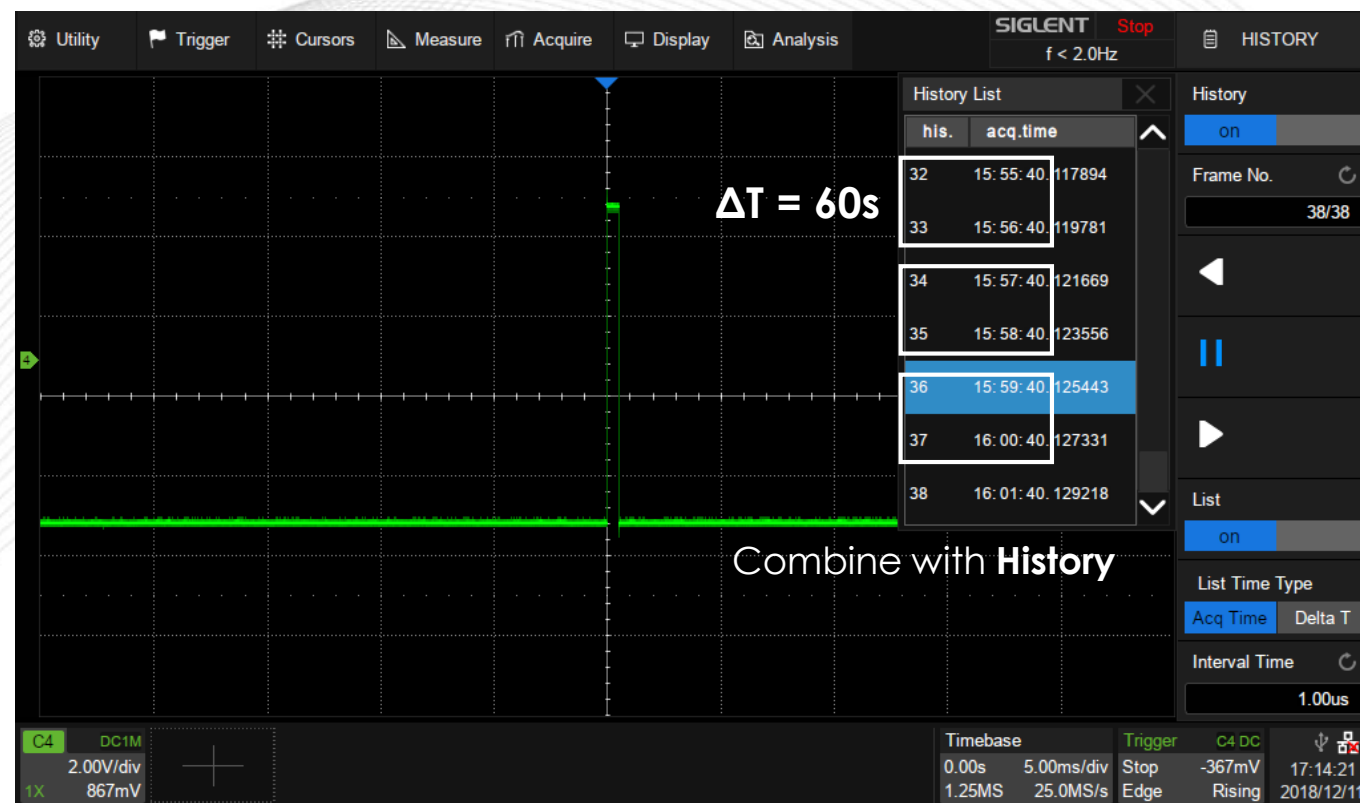
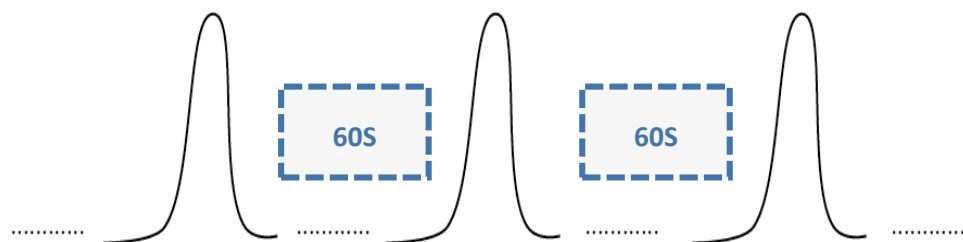
Sequence

- In Sequence mode, the dead time is only 1/5 of normal mode. Increasing the probability to capture anomalies.

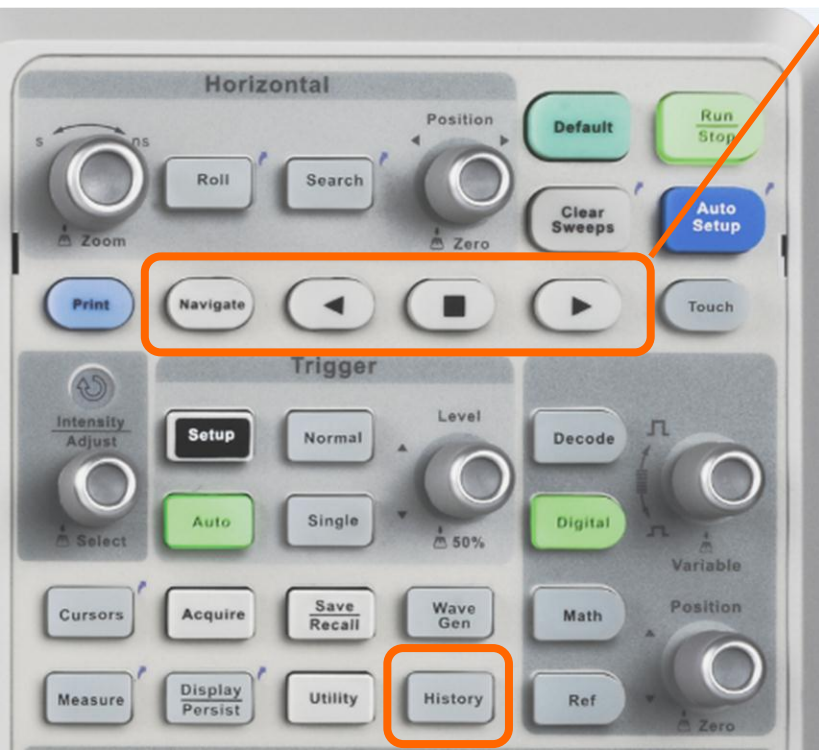


Sequence

- Capture long interval important signals and leave out idle time
- Time stamp of each segment to analyze the frequency of the event.



History



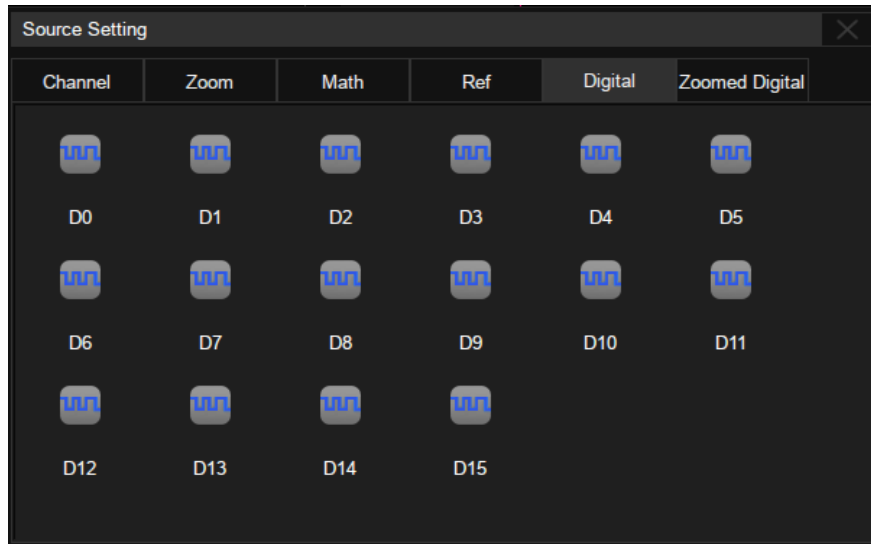
The screenshot shows the oscilloscope's software interface. A 'History List' window is open, displaying a table of acquisition records. The table has two columns: 'his.' and 'acq.time'. The record for '7539' is highlighted in blue. The waveform display shows a square wave signal. The interface includes various menu items like 'Utility', 'Trigger', 'Cursors', 'Measure', 'Acquire', 'Display', and 'Analysis'. The frequency is set to 'f = 390.0000kHz'. The 'HISTORY' panel on the right shows 'History' is 'on', 'Frame No.' is '7539/8118', and 'List Time Type' is 'Acq Time'. The 'Interval Time' is '20.0ms'. The status bar at the bottom shows 'C1 DC1M', '1.00V/div', '-2.00V', 'Timebase 0.00s 1.00us/div 50.0kS 5.00GS/s', 'Trigger Stop 2.02V 12:57:42 2018/4/28', and 'Edge Rising'.

his.	acq.time
7538	00: 29: 18. 269182
7539	00: 29: 18. 269341
7540	00: 29: 18. 269500
7541	00: 29: 18. 269659
7542	00: 29: 18. 269818
7543	00: 29: 18. 269977
7544	00: 29: 18. 270136

Navigation between frames

- Running in background
- Maximum records 100,000 frames

Measurement



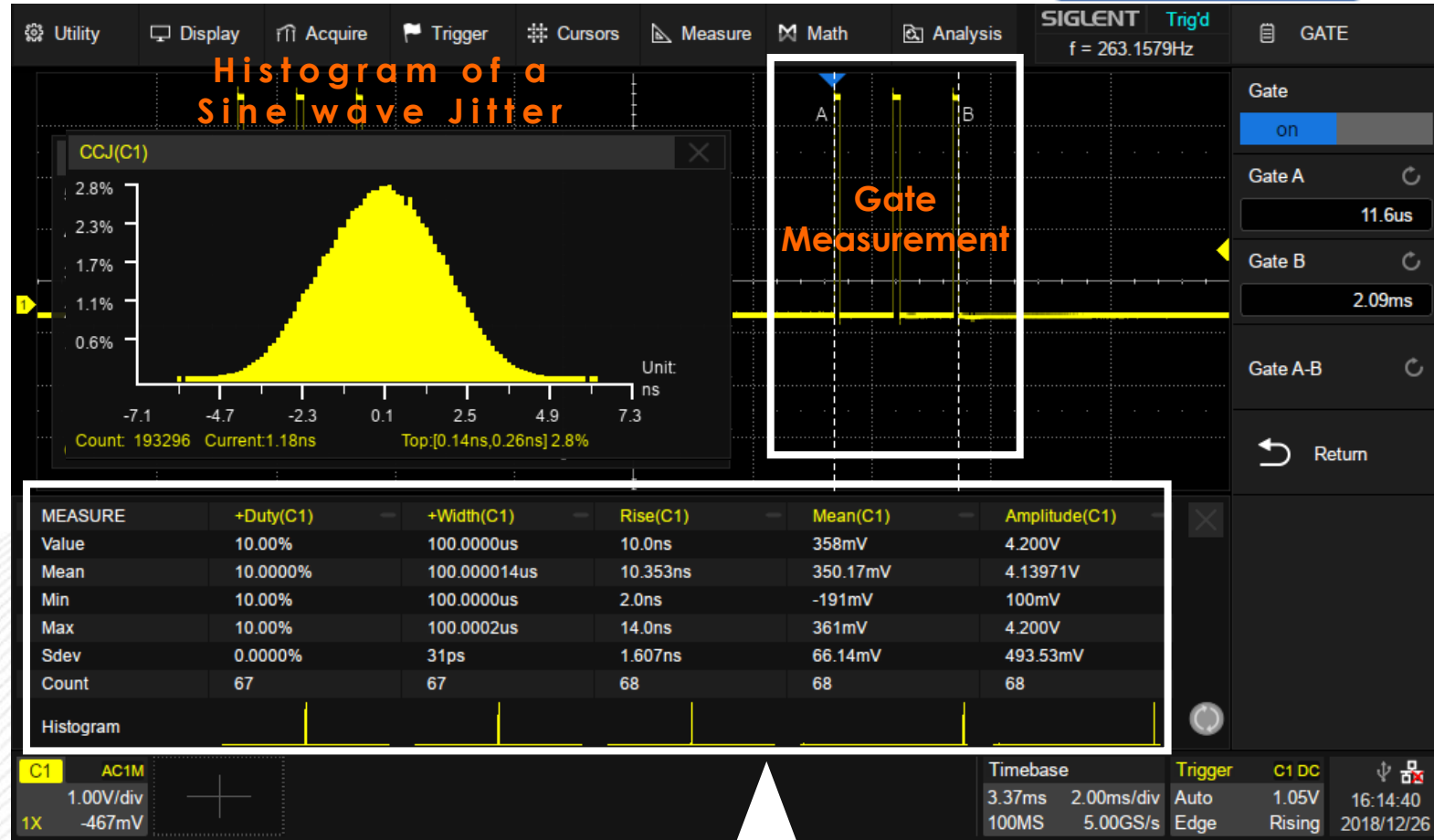
39 kinds of measurements

Vertical: Amplitude values, Mean&Stdev&RMS calculations, Overshoot parameters, Level measured at trigger position

Horizontal: Period, Frequency, Time difference between edges, Rise/Fall time, Duty, Delay, Difference between two continuous periods

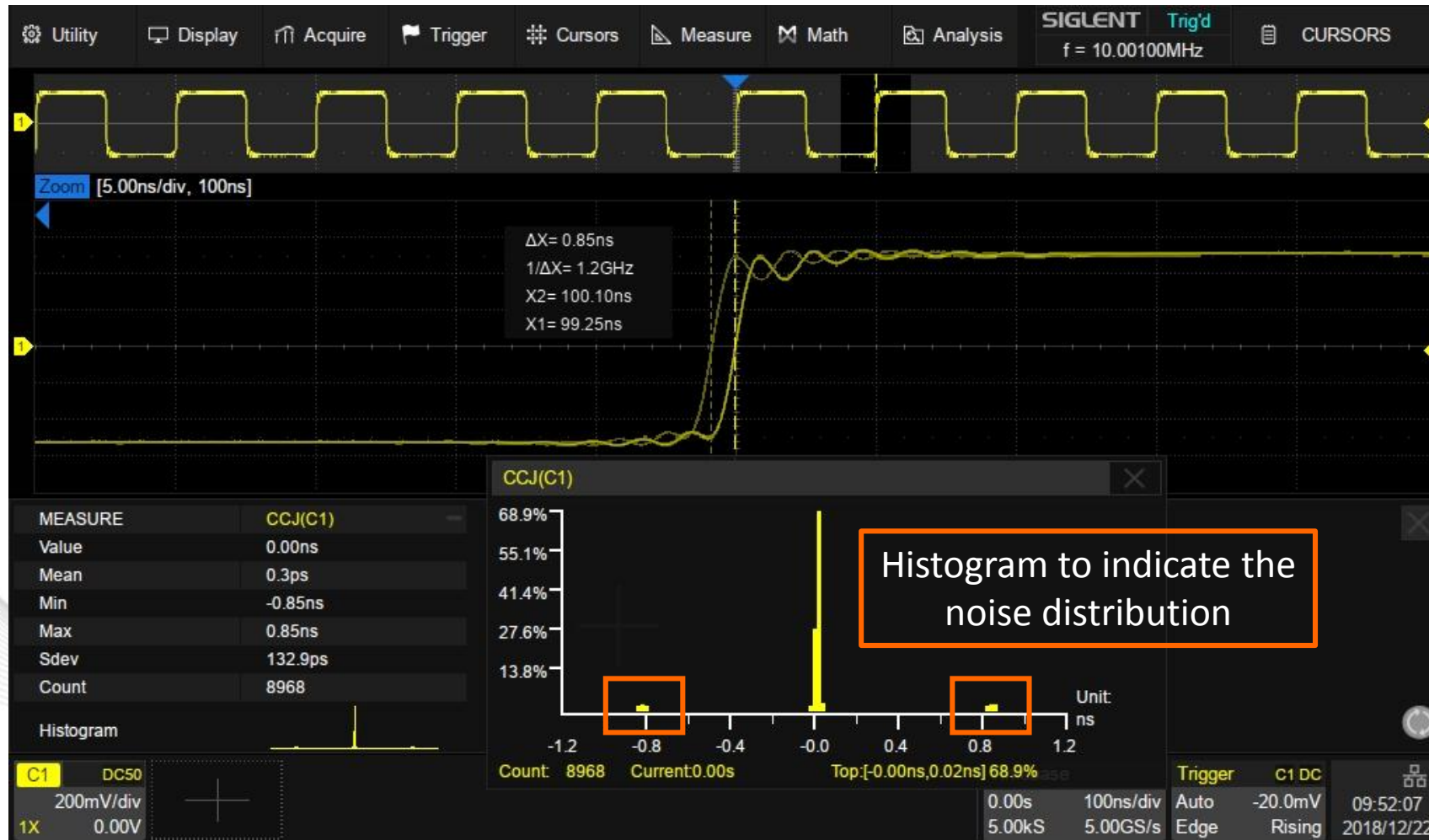
CH Delay: Phase difference, Time interval between two channels edges, Skew

Jitter Measurement



- Display 5 measurement statistics simultaneously
- 39 automatic measurements
- Gate measurement by cursors supported
- Measure on analog and digital channels, zoom, math, and Ref

Jitter Measurement

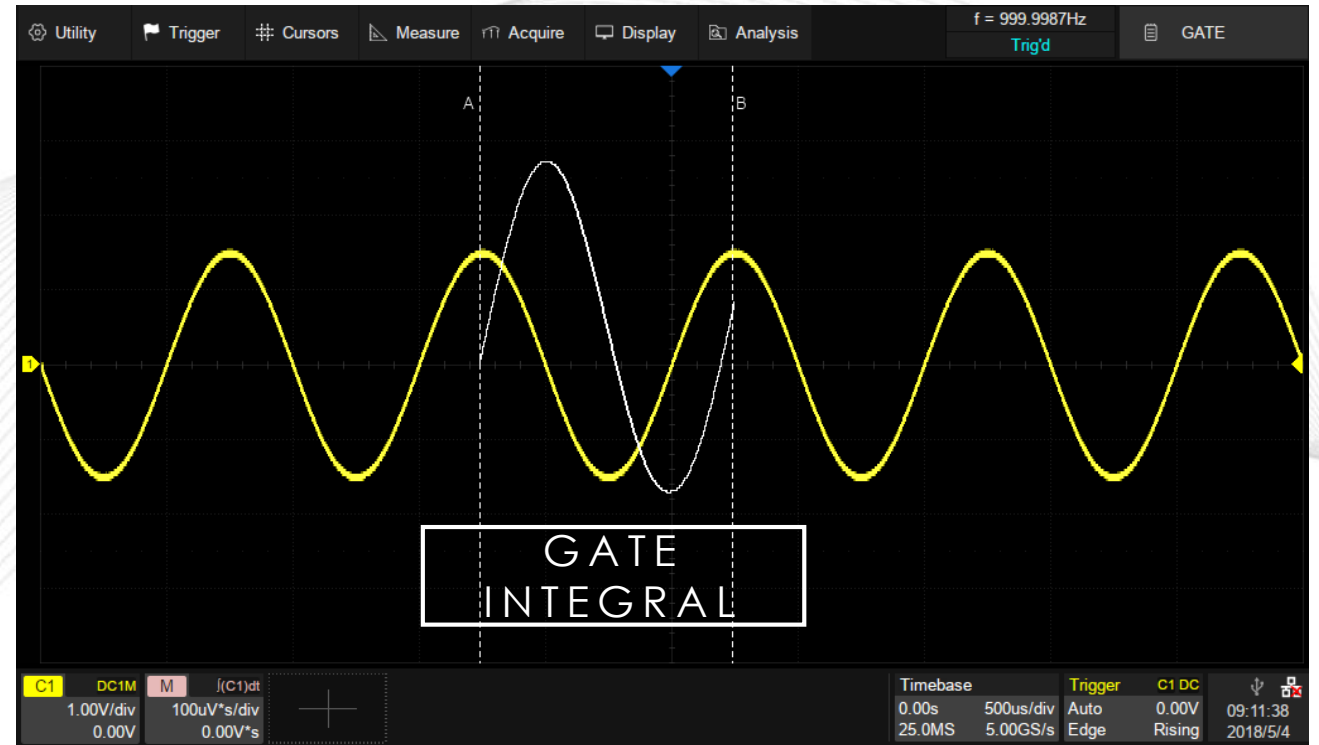


- Measure the jitter of a 10.001 MHz signal generated by DDS technology.
- Simple steps: Trigger, Zoom, Measure

MATH



- View a differential signal without differential probe
- Power Calculations ($P = IV$ onscreen)
- Integrate power to calculate energy
- Ratio of amplified signals



2Mpts FFT

- Rectangle
- Blackman
- Von Hann
- Hamming
- Flattop

MATH

on

Function

f(x) g[f(x)]

Operation

FFT

Source

C1

Window Type

Von Hann

FFT Mode

Normal

Center Freq

125.0MHz

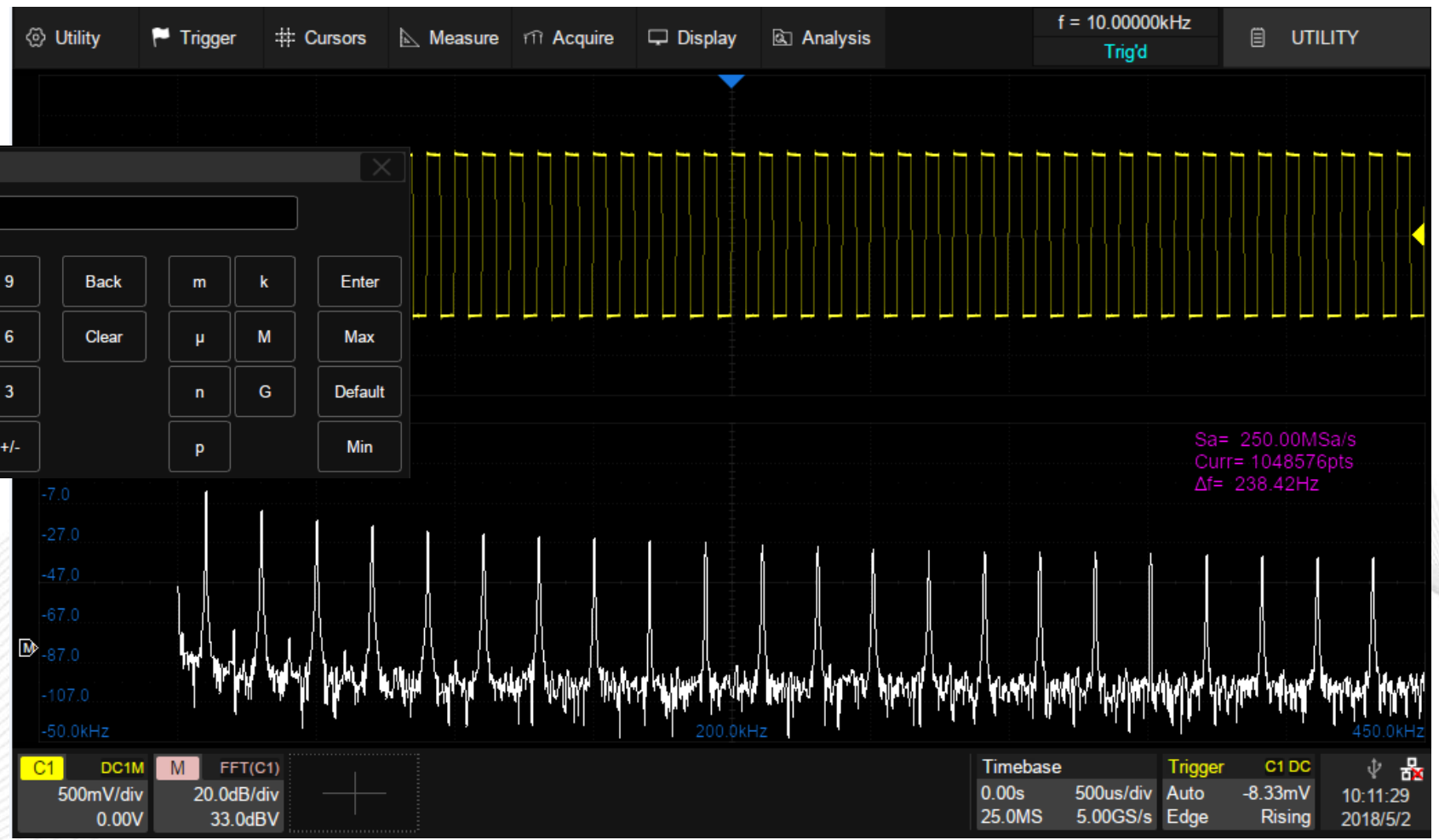
Hz/div

500MHz/div

Input Pad

125.0MHz

7	8	9	Back	m	k	Enter
4	5	6	Clear	μ	M	Max
1	2	3		n	G	Default
0	.	+/-		p		Min



Edit Center Freq and division with pop-up keyboard easily

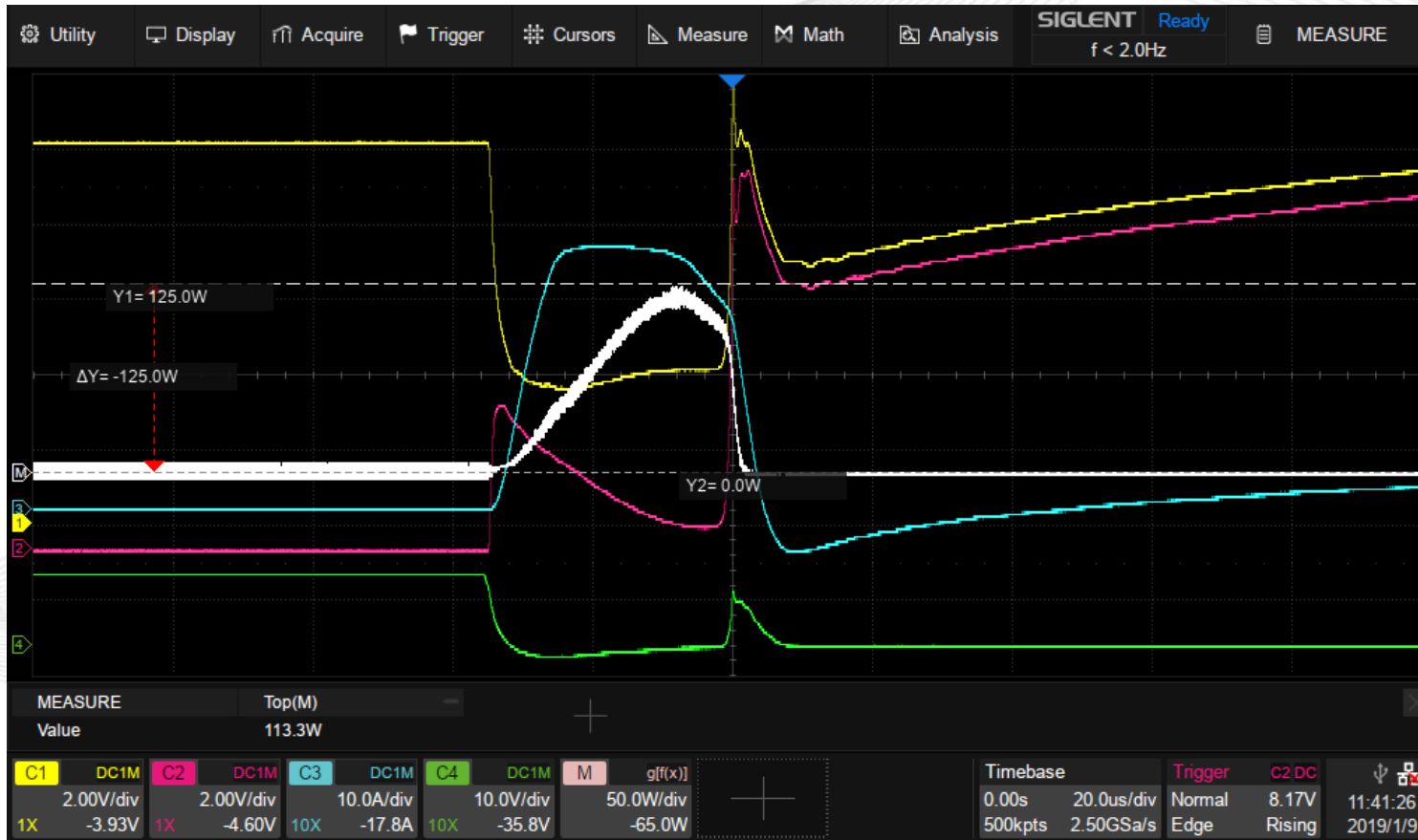
- High calculation speed
- Five types of Windows
- Normal, Max-Hold, Average FFT mode

Extremely high FFT resolution

The frequency resolution depends on the sampling rate and the number of FFT points (f_s/N).

MATH on MATH

- Measure the instant power on a MOSFET without a differential probe
- $P = V_{DS} * I_D$
- CH1 = V_D , CH2 = V_S , CH3 = I_D , CH4 = V_G , $P = (CH1 - CH2) * CH3$



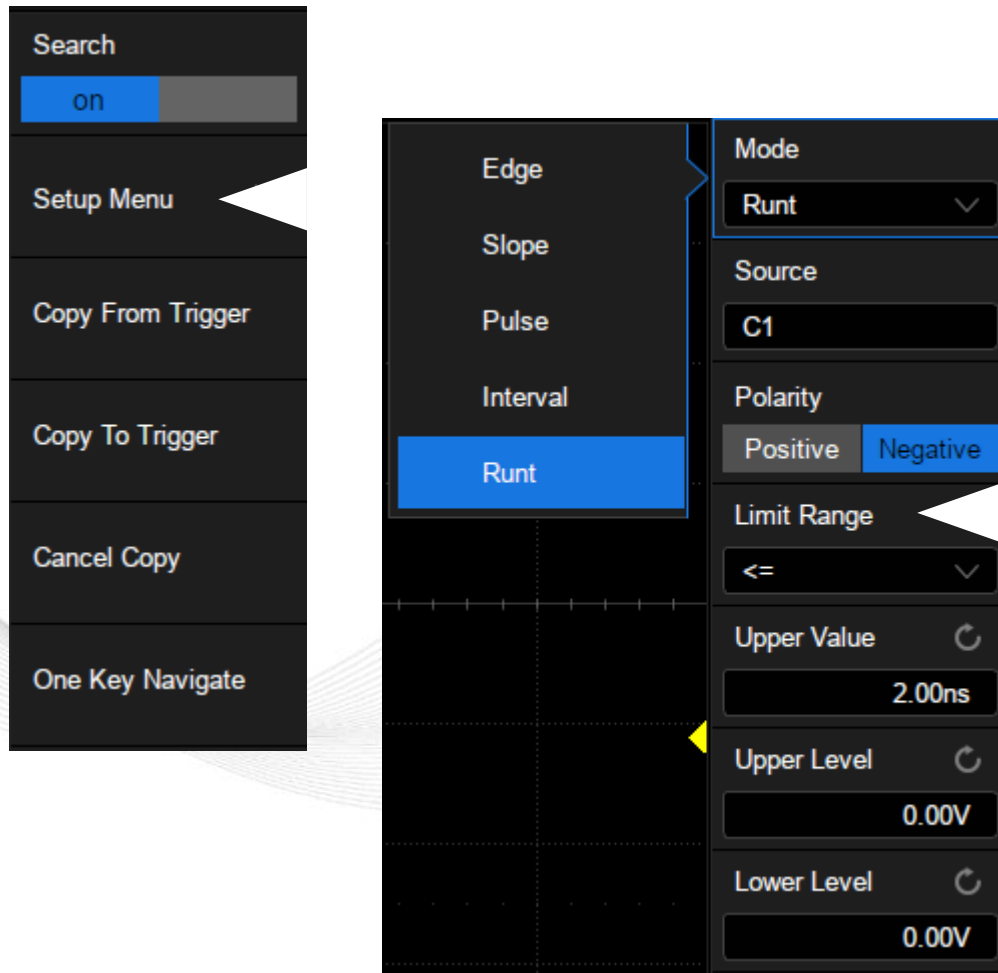
- Use a differential probe to measure V_{DS} then perform an integral on power to calculate the energy generated when MOSFET is powered on

Scale 100uJ/div

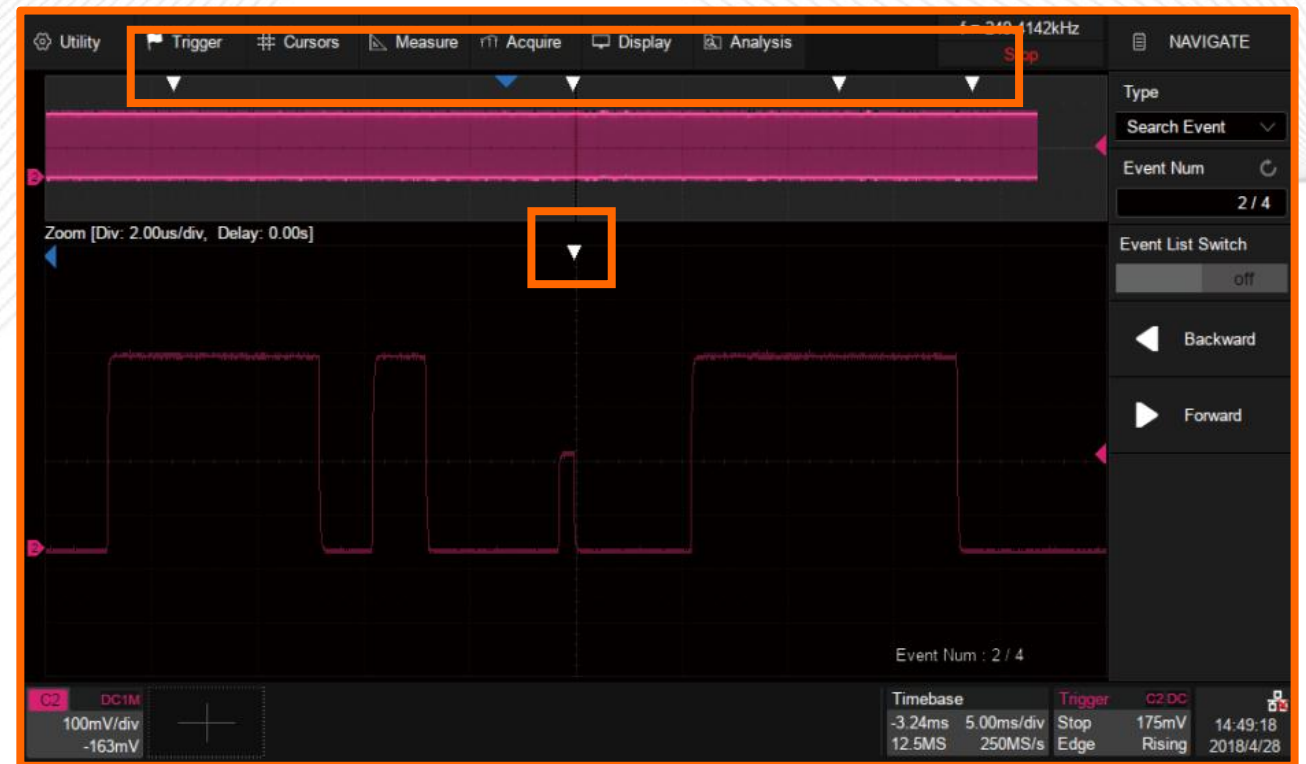
Position -138uJ

Summary $g[f(x)] = \int(C1*C2)dt$

Search and Navigate



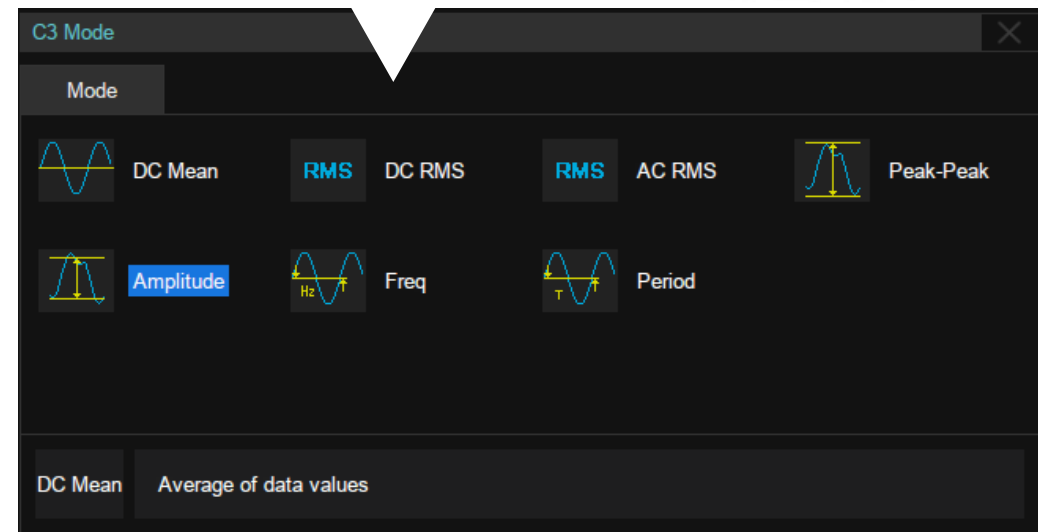
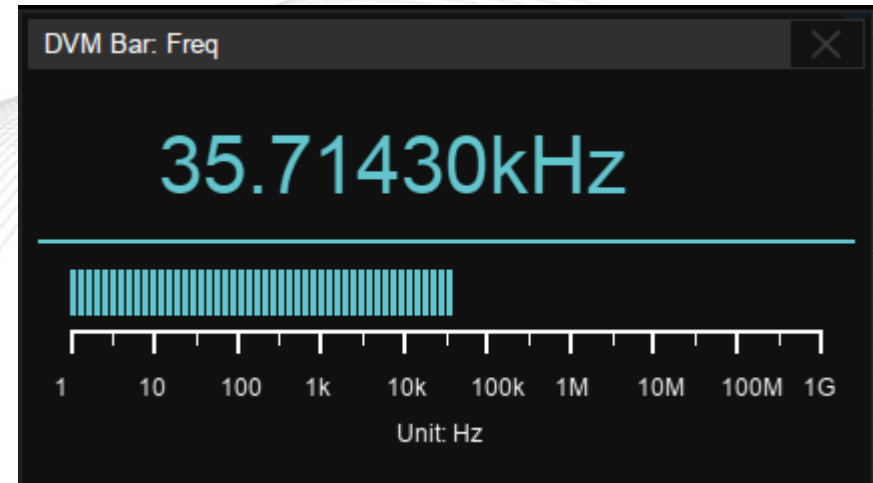
- Set up search criteria
- One Key Navigate – Elements that match search are marked with a white arrow for easy identification.
- Find and mark events you are interested within one second



DVM & Frequency Counter

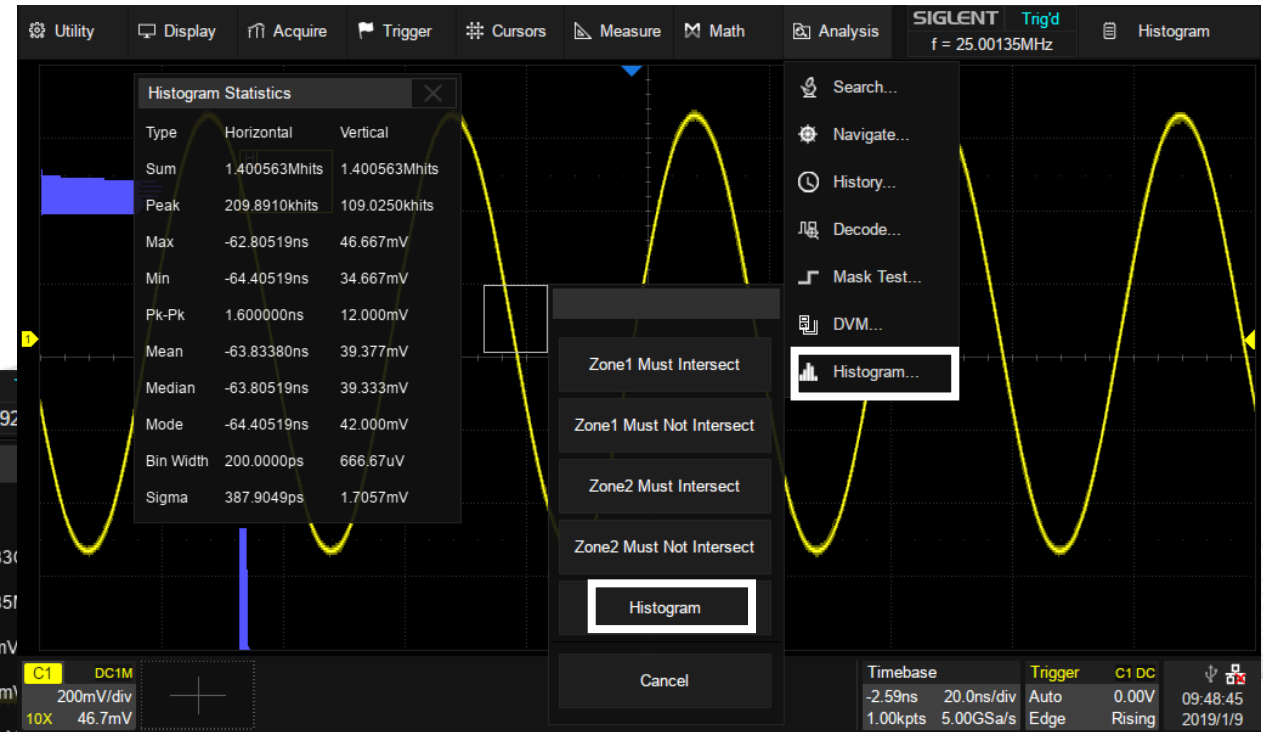
- Built-in standard 4-digit digital voltmeter
- Support Auto Range, Bar, Trend, Histogram
- The same probe as the oscilloscope channels
- DVM measurements and scope acquisition are independent

- 7-digit frequency counter with bandwidth up to 1 GHz, useful in many high frequency applications



Waveform Histogram

- Draw a box to locate area of interest
- See the vertical and horizontal signal value changes

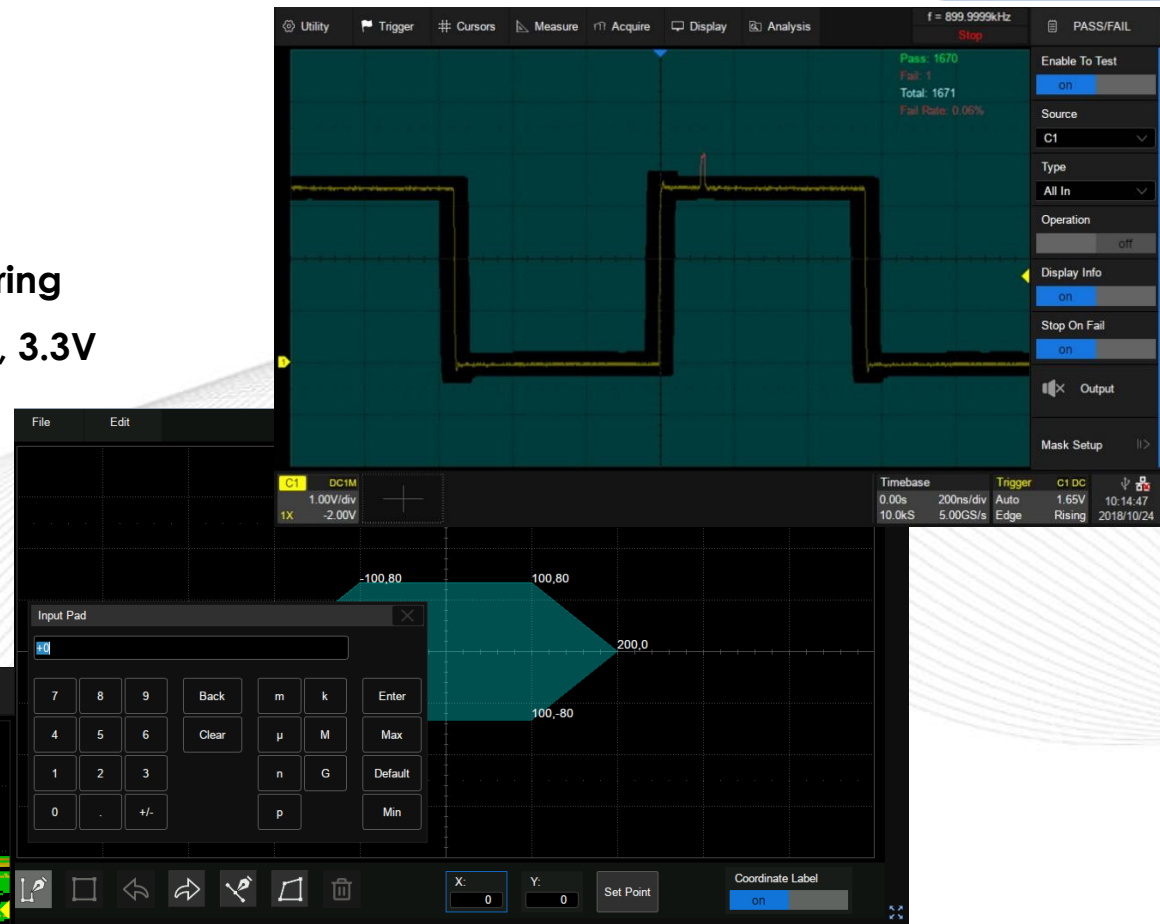
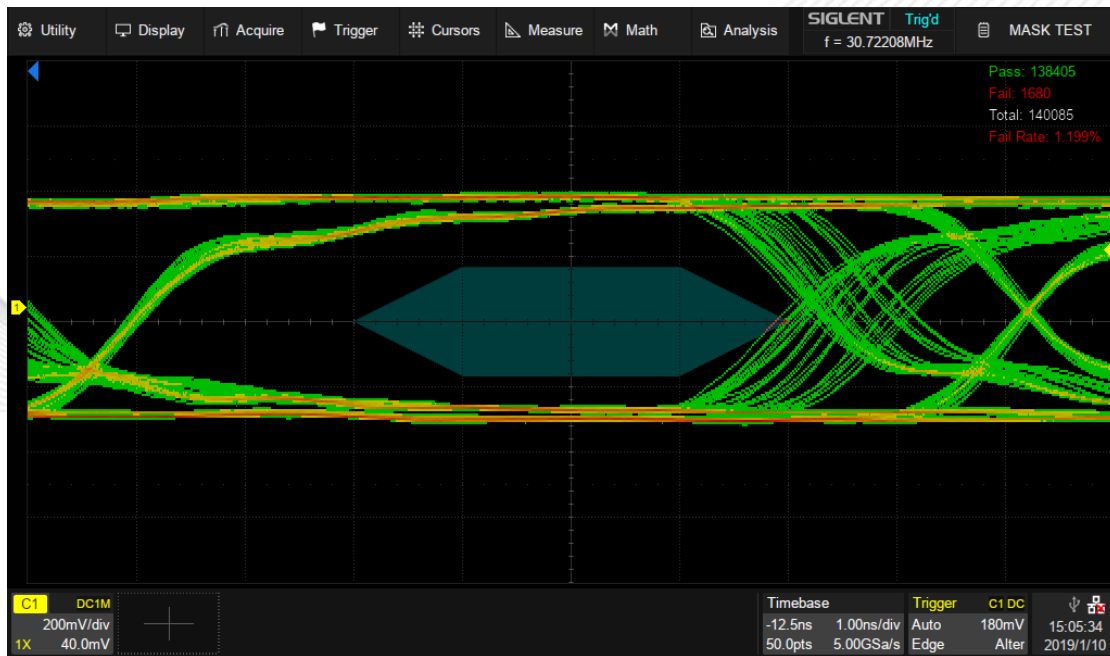


MASK TEST



High speed Pass/Fail test

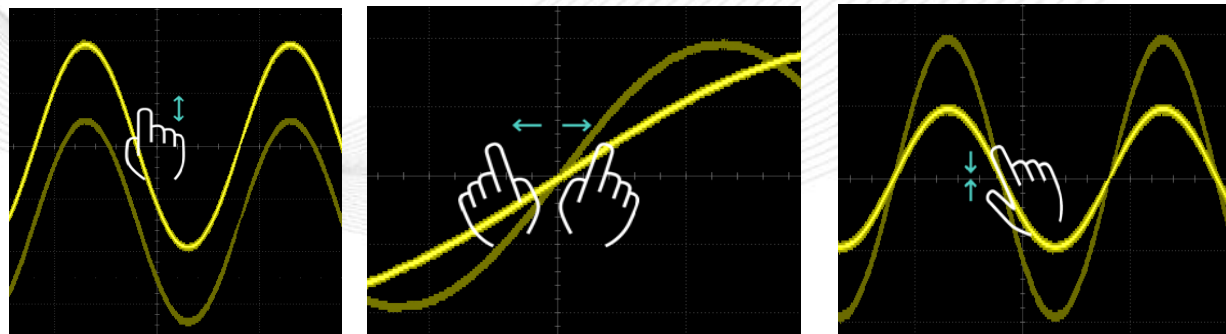
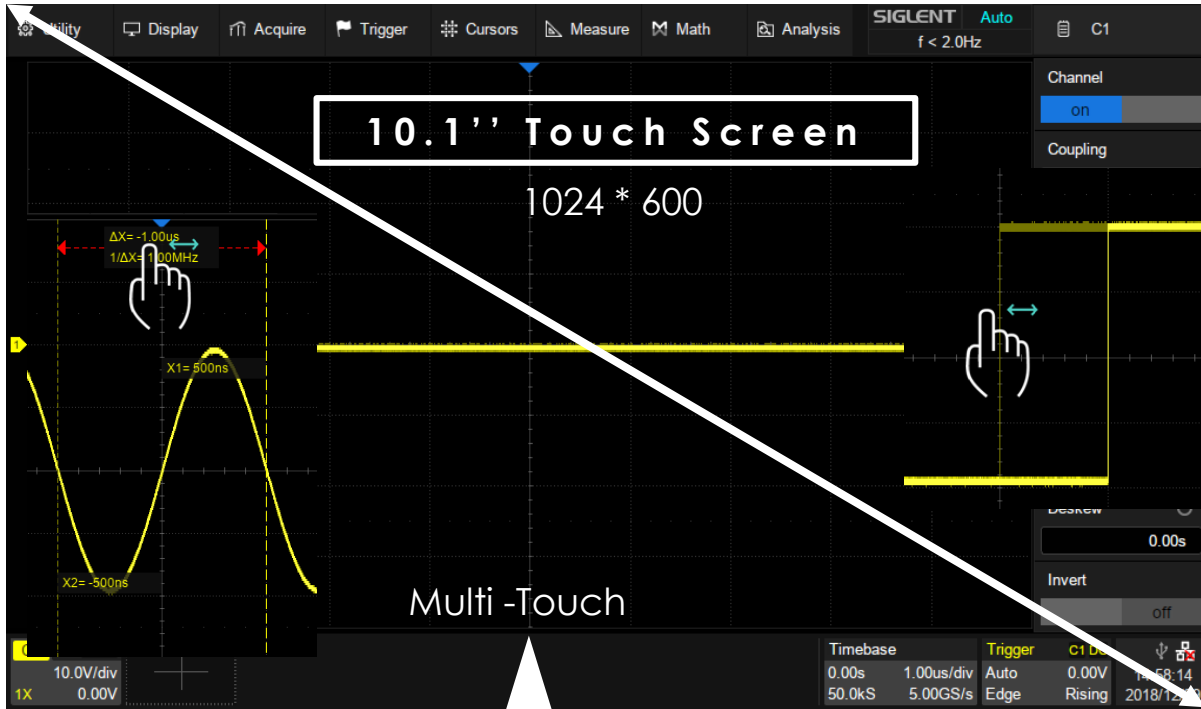
- Customize template, specified standards in manufacturing
- Automatic test environment: stop acquiring, beep alert, 3.3V TTL output as external source (Pass/Fail out)
- Implemented by hardware, test rate up to 110,000 times/s



Functional MASK EDITOR with touch screen

- Create MASK point-by-point
- Input coordinates by touch screen
- Draw polygon on screen
- Easy to save and load mask files

Ease-Of-Use



10 kinds of one button quick access

Measure

Navigate

Cursors

Clear

Display

History

Print

Auto

Search

Default

Four ways to control scope:

Touch screen like your smart phone

Front panel buttons and knobs for traditional users

USB Keyboard and Mouse support

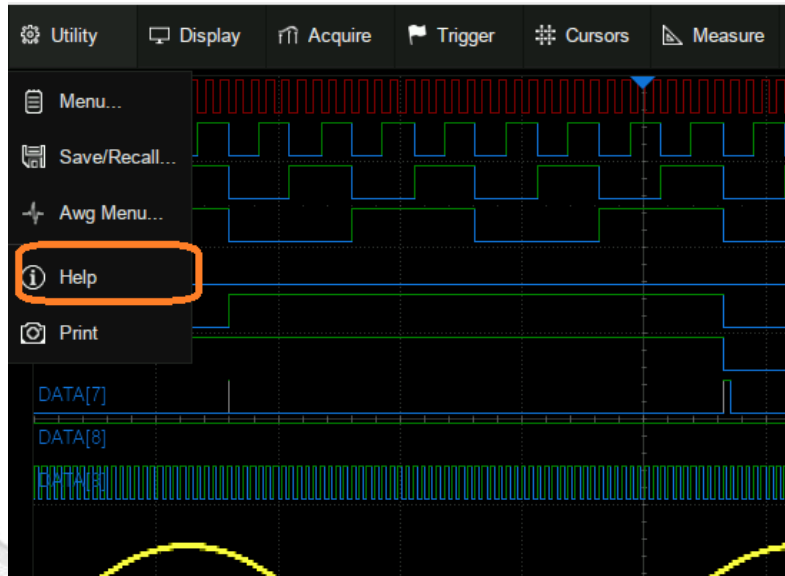
Web server for remote control

Focus on your design, but not instruments

Increase work efficiency and productivity

Ease-Of-Use

Deep on-board Help for quick access to information:



Help-7.1 Front Panel Overview

Help-SDS5000X>7 Quick Start >7.1 Front Panel Overview

SDS5000X>7 Quick Start >7.1 Front Panel Overview

A photograph of the SDS5000X oscilloscope front panel. Callout A points to the touch screen display. Callout B points to the front panel controls (knobs and buttons). Callout C points to the probe compensation/ground terminal.

- 1 Introduction
- 2 General Safety S...
 - 2.1 Safety Term...
 - 2.2 Working Env...
 - 2.3 Cooling Req...
 - 2.4 AC Power
 - 2.5 Power and g...
 - 2.6 Calibration
 - 2.7 Cleaning
 - 2.8 Abnormal Co...
- 3 First steps
 - 3.1 Delivery Che...
 - 3.2 Quality Assu...
 - 3.3 Maintenance...
- 4 Document Conve...
- 5 Getting Started
 - 5.1 Power on
 - 5.2 Shut down
 - 5.3 System Status
 - 5.4 Install Options
- 6 Probe
- 7 Quick Start
 - 7.1 Front Panel ...
 - 7.2 Rear Panel ...
 - 7.3 Connecting t...
- 8 Touch Screen Dis...
- 9 Front Panel
- 10 Multiple Approac...
- 11 Quickly Capture ...

A. Touch Screen Display: The display and major functions area. See "Touch Screen Display" chapter for more details.

B. Front Panel: Includes knobs and buttons. See "Front Panel" chapter for more details.

C. Probe Compensation/ Ground Terminal: Supplies a 0-3 V 1 kHz square wave for compensating the probes.

Web Server

- Remote control scope without software
- Save time to export measurement data to PC
- Monitor and control SDS5000X from anywhere via the internet
- Control scope via mouse in real time
- Take screen shot , save data and FW upgrade

- Insert IP address of SDS5000X into browser
- Go to Home page see the SDS5000X info



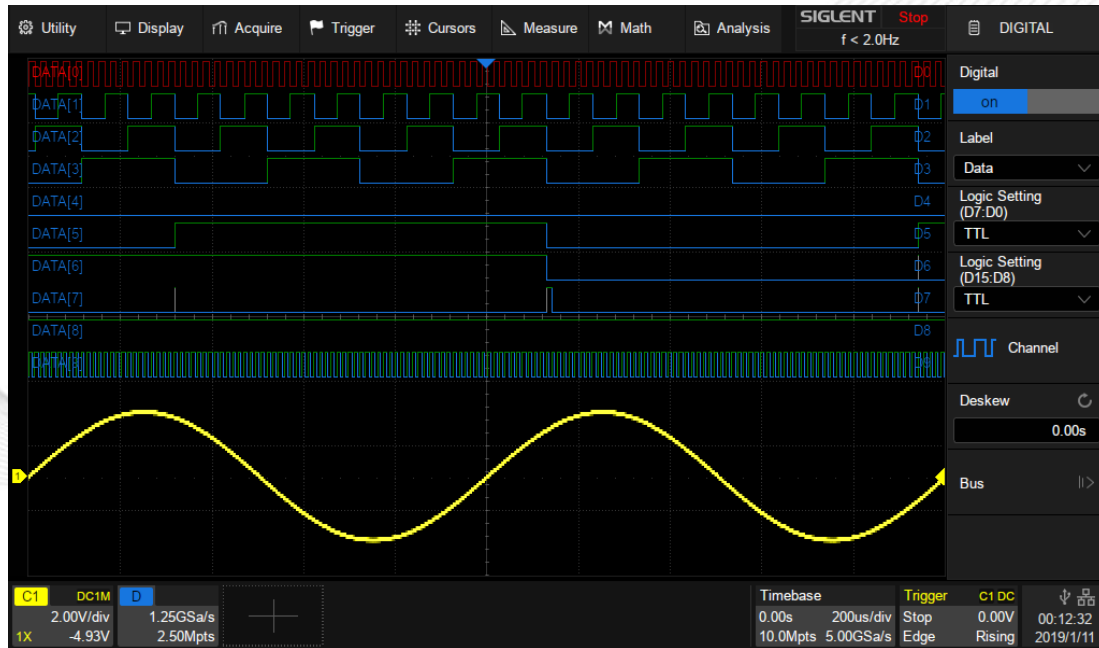
The screenshot shows the 'Instrument Information' page of the web interface. On the left is a vertical navigation menu with buttons for Home, LAN Configuration, Instrument Control, and SCPI. The main content area is titled 'Instrument Information' and lists the following details:

- Instrument Model
- Manufacturer
- Serial Number
- LXI Extended Functions
- LXI Version
- MAC Address
- TCP/IP Address
- Software Version
- Instrument Address String

Below the list, there is a 'Command:' section with a text input field for 'SCPI command', a 'Send' button, and a 'Response' section with a text input field for the response.

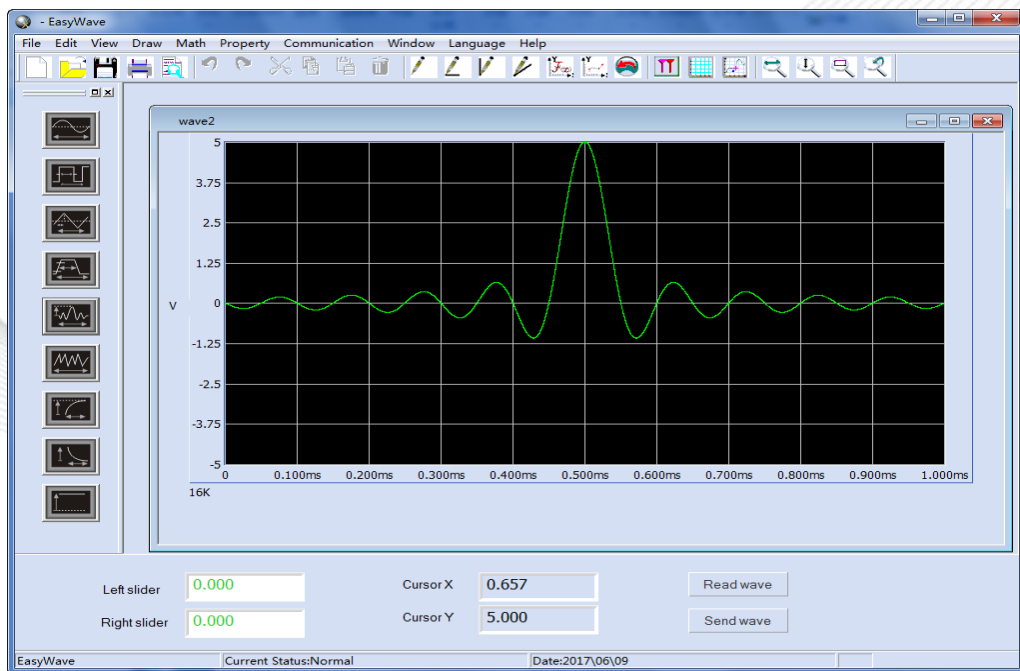
16 Digital Channels / MSO (Option)

- View digital and analog channels on one timebase
- Full trigger and decoding on all analog and digital channels
- 16 channels; maximum waveform capture rate up to 1.25GSa/s; record length up to 62.5 Mpts
- User defined label names, channel groups, and more



25 MHz Function/Arbitrary Waveform Generator (Option)

- Connect via USB Host
- Stimulus output of Sine, Square, Ramp, Pulse, Noise, DC and 45 built-in waveforms to DUT
- Edit arbitrary waveforms via Easy Wave PC software
- Store waveforms from analog channels then output



Model Selection

SDS5000X Models	SDS5034X SDS5032X	SDS5054X SDS5052X	SDS5104X SDS5102X
Bandwidth	350 MHz	500 MHz	1 GHz
Rise time (typical) @50 Ω	1.0 ns	0.7 ns	0.4 ns
Analog Channels	2/4 CH + EXT		
Sample Rate (Max.)	5G Sa/s (single-channel), 2.5G Sa/s (dual-channel)		
Record Length (Max.)	250 Mpts (single-channel), 125 Mpts (dual-channel)		
Waveform Capture Rate (Max.)	110,000 wfm/s (normal mode), 480,000 wfm/s (sequence mode)		
Trigger Types	Edge, Slope, Pulse, Window, Runt, Interval, Dropout, Pattern, Qualified, Video, Zone		
Serial Trigger and Decode	I2C, SPI, UART, CAN, LIN, CAN FD, FlexRay, MIL 1553B, I2S		
I/O	USB Host, USB Device, LAN, Pass/Fail, Trigger Out, 10 MHz In, 10 MHz Out, VGA Output		
Probe (standard)	SP2035A: 350 MHz or SP3050A: 500 MHz 1 probe supplied for each channel		
Display	10.1" TFT-LCD with capacitive touch screen(1024*600)		

The reason to Choose SDS5000X

- Touch for a solution
- Flat frequency response curve
- High waveform capture: Quickly identify problems
- Color display: Reveal dynamic signal behavior
- Large memory: Capture seconds of data and still have resolution to see nanosecond scale details
- Digital trigger: Higher trigger sensitivity, lower trigger jitter
- Hardware intelligent trigger: Faster, less jitter
- Zone trigger: Draw a box to locate interested signals
- Multiple serial protocols trigger and decode
- Extremely low back ground noise
- Standard Sequence, History, Search, Navigate
- Measurement with Histogram; Jitter measurement
- Math on Math, 2 Mpts FFT
- Standard DVM & Frequency Counter
- Eres Mode: Improve resolution up to 11 bits
- Mask test and Mask creator with touch screen
- Quick access Help
- Web control
- 16 digital channels
- 25 MHz function generator

Ordering information

Standard Accessories

USB cable*1

Quick start*1

Passive probe*2 (2-ch model); *4(4-ch model)
SP2035A: 350 MHz or SP3050A: 500 MHz

Certificate of calibration*1

Power cord*1

Optional Accessories

Description

SDS-5000X-BW05	350 MHz to 500 MHz bandwidth upgrade
SDS-5000X-BW10	500 MHz to 1 GHz bandwidth upgrade
SDS-5000X-FG	Waveform generator software
SAG1021	25 MHz USB function/arbitrary waveform generator
SDS-5000X-16LA	16 digital channels (software)
SPL2016	16-channel logic probe
STB3	STB3 demo signal source
SAP1000	1 GHz active probe
HPB4010	High voltage probe
CP4020/CP4050/CP4070/ CP4070A/ CP5030/ CP5030A/CP5150/CP5500	Current probe
DPB4080/DPB5150/ DPB5150A/ DPB5700/ DPB5700A	High voltage differential probe
SDS-5000X-I2S	I2S trigger & decode
SDS-5000X-CANFD	CAN FD trigger & decode
SDS-5000X-FlexRay	FlexRay trigger & decode
SDS-5000X-1553B	MIL-STD-1553B trigger & decode

Thank You

SIGLENT—The Best Value in Electronic Test & Measurement



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