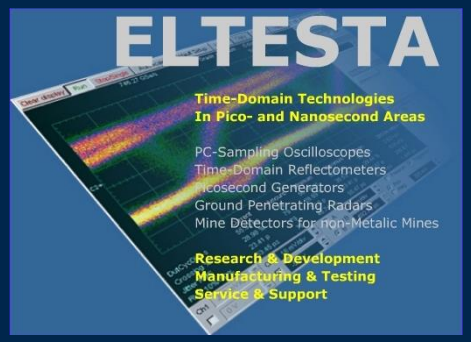


pico® Technology

PicoScope 9300 Series:
The New Trends in Sampling Oscilloscopes

Jakovas Rososkis

Kaunas, 2017

Introduction

Key specifications:

- 20 GHz (17.5 ps) electrical bandwidth on 2 or 4 channels
- 9 GHz optical bandwidth
- 64 fs, ~15 THz effective sample rate
- 14 GHz prescaled trigger, 2.5 GHz direct trigger and 100 MHz internal trigger
- 11.3 Gbps clock recovery trigger
- 5 ps/div to 1 s/div time base scales
- Pattern trigger of length 7 to 2^{23}-1
- Typical RMS Jitter <1.8 ps
- 16 bit, 60 dB dynamic range
- 55 ps rise time / 6 V TDR/TDT differential pulse generator
- 35 ps rise time / 200 mV TDR/TDT differential pulse generator
- 1 MS/s sample rate to 32 kS store
- Sequential equivalent time, Real time, Random equivalent sampling and Roll acquisition modes
- Automated direct or statistical measurements, Markers, Histogram, Math or FFT analysis, TDR/TDT analysis, Color-Graded Display, Parametric Limit Testing, Eye Diagram Measurements, Mask Template Testing

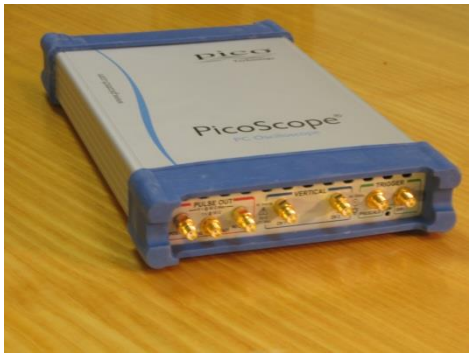
Family Structure

pico Technology

The PicoScope 9300 family: Six models

The PS9301: Dual-channel, 20 GHz

The PS9301: Dual-channel, 20 GHz with 11.3 Gbps clock recovery trigger



The PS9311: Dual-channel, 20 GHz with 55 ps rise time / 6 V TDR/TDT differential pulse generator

The PS9312: Dual-channel, 20 GHz with 35 ps rise time/200 mV TDR/TDT differential pulse generator

The PS9311: Dual-channel, 20 GHz with 9 GHz optical bandwidth and 11.3 Gbps clock recovery trigger

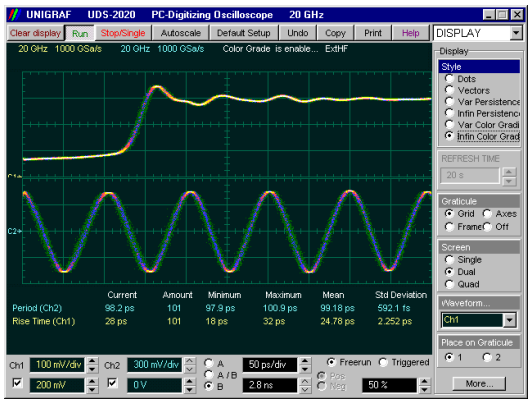
The PS9341: Four-channel, 20 GHz

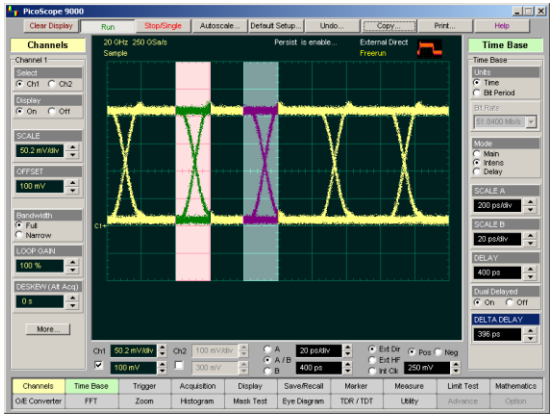
The third Family of PC-Sampling Oscilloscopes

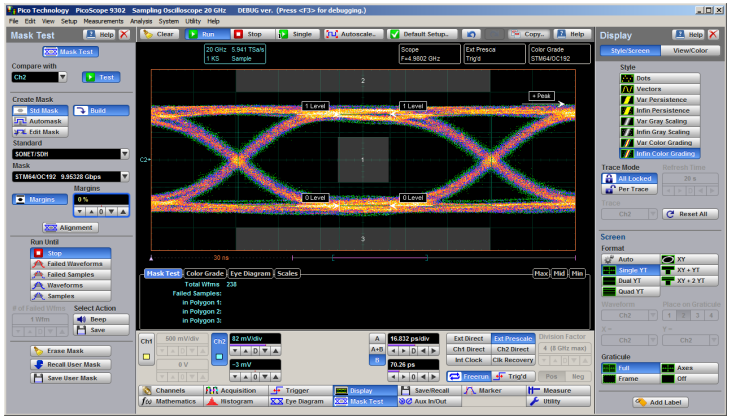
2001-2006: UDS-2000

2007-2014: PS9200

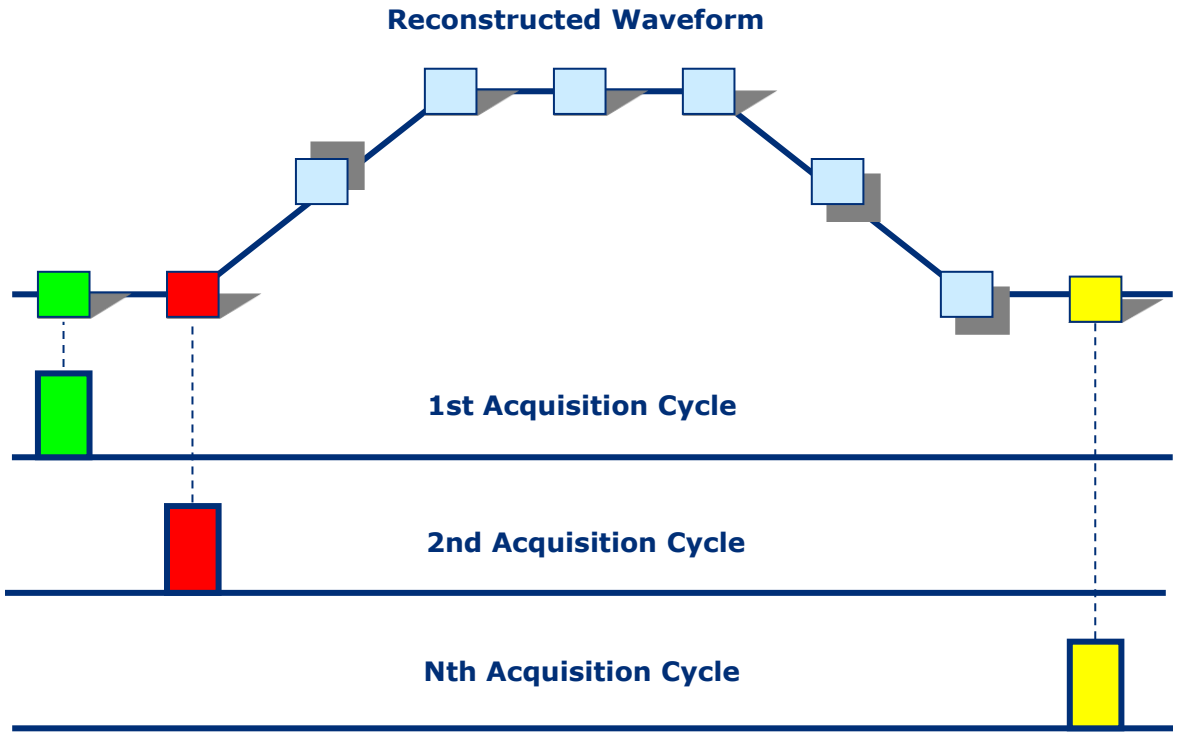
2012-2014: PS9300







Sequential equivalent time sampling

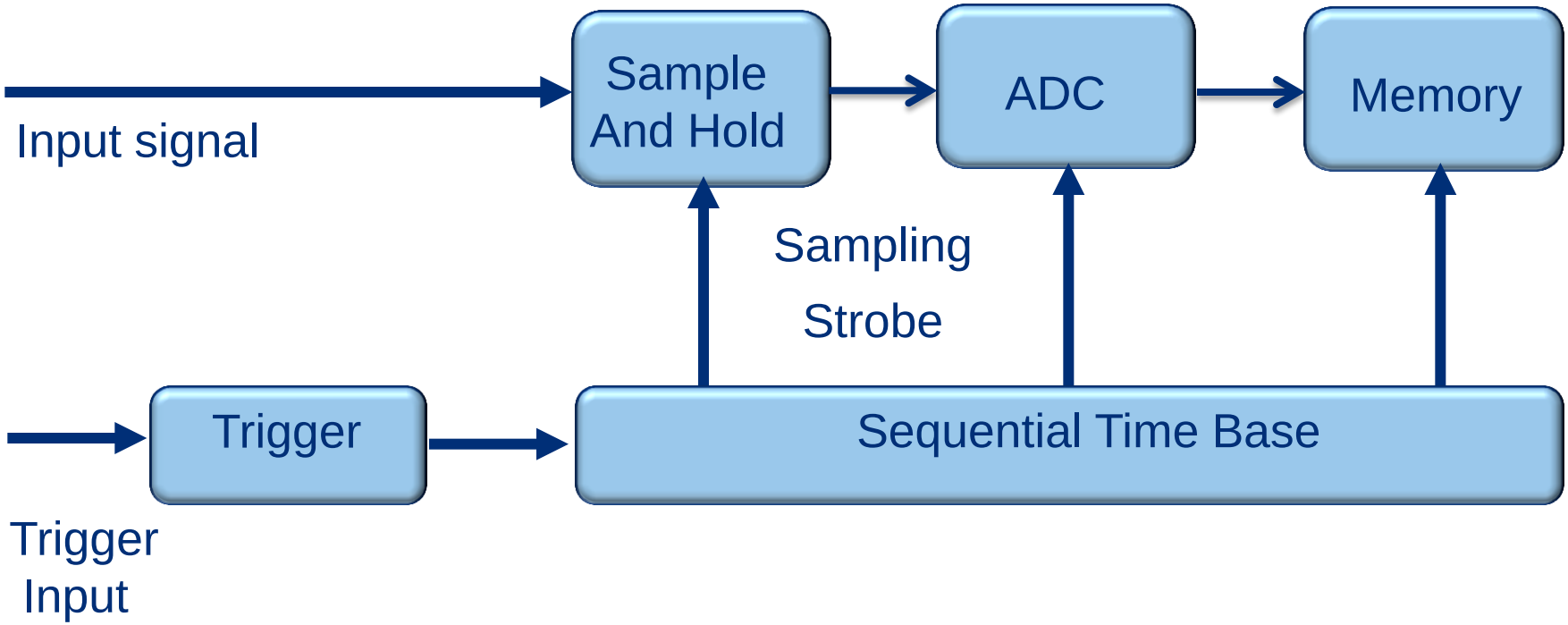


Sequential Sampling Technique means:

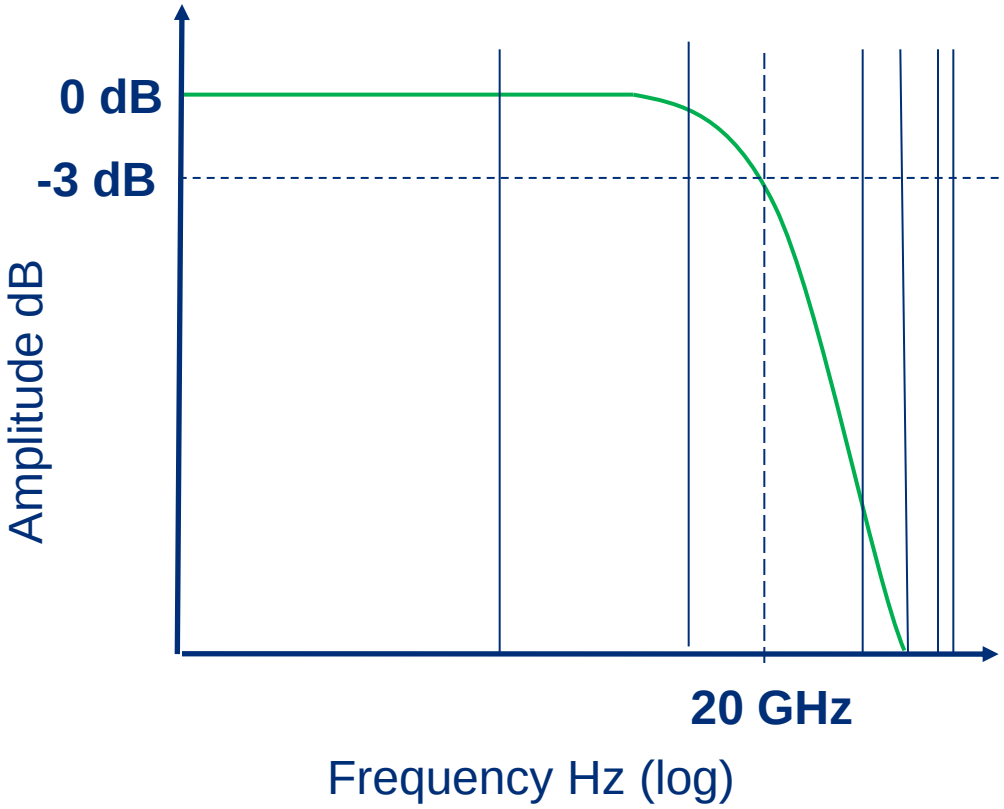
- Wide Bandwidth Applications (>20 GHz bandwidth
- Used with Repetitive Signals, NRZ or RZ signals.
- One sample is taken for each trigger
- Multiple Trigger Events Build Up Waveform
- No Pre-Trigger Information

PS9300 Sequential equivalent time sampling: 5 ps/div to 3.2 ms/div

Sequential equivalent time sampling (cont.)



Analog Bandwidth



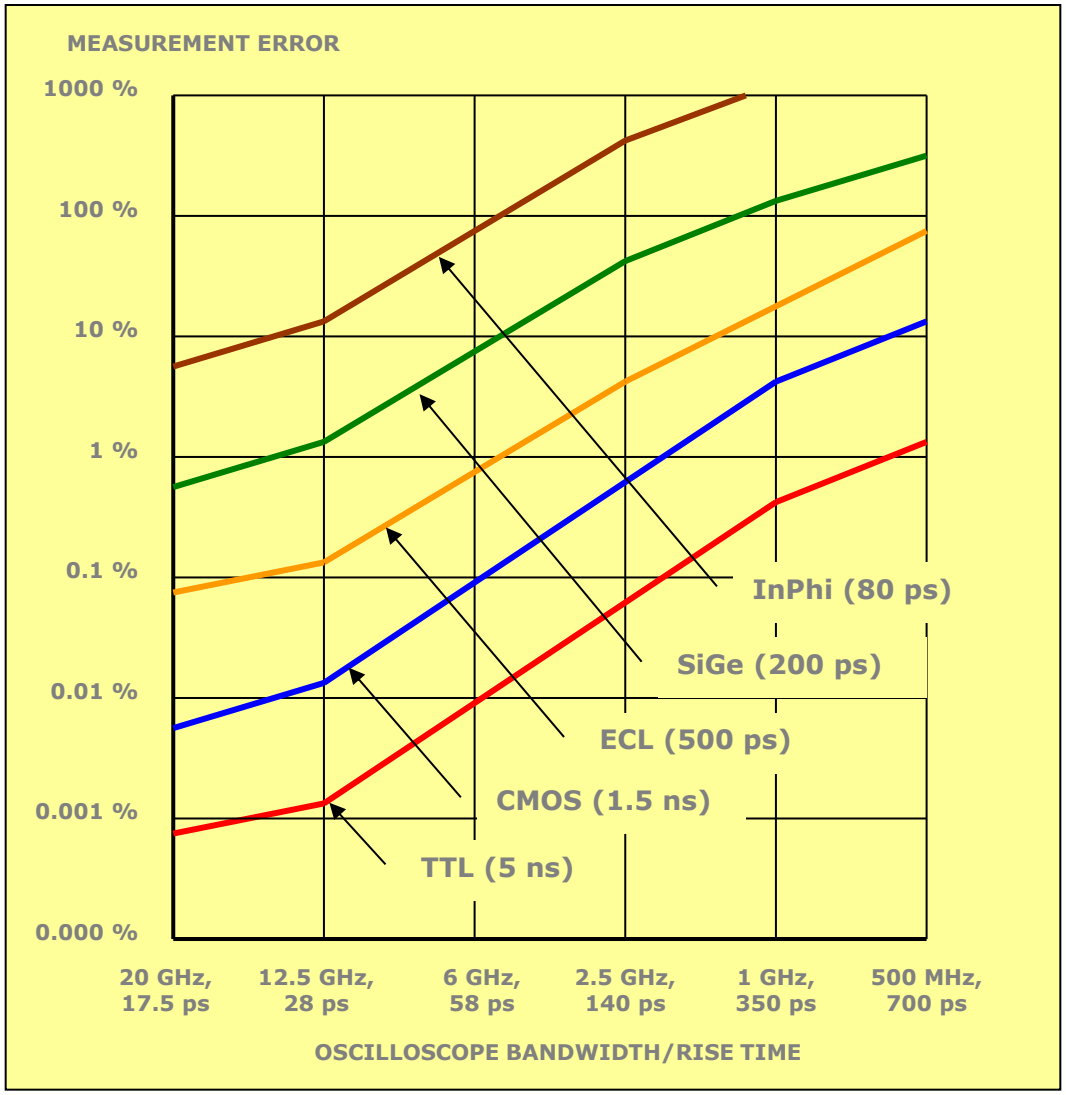
Choose a scope with enough bandwidth for the application:

- Signal transition time
- Signal clock or data rate
- Signal rise and fall time
- Signal narrowest pulse

Effects of too little bandwidth:

- Amplitude and timing errors
- Loss of high frequency aberrations and detail

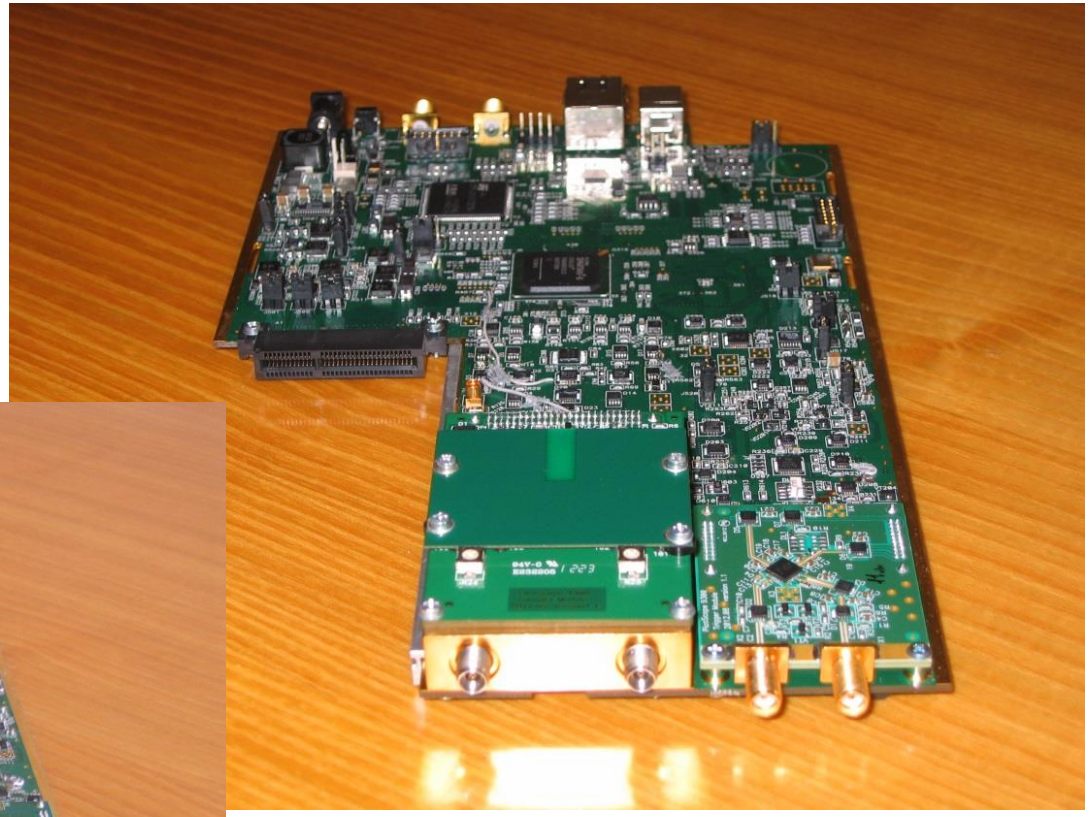
Electrical Rise Time Measurement Error vs. Oscilloscope Bandwidth

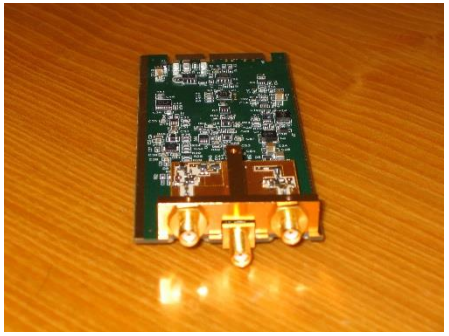


When the Scope Bandwidth (BW) is:	Rise Time Slowing Error is:
Equal to Signal Edge BW	▶ 41%
Twice as fast as Signal Edge BW	▶ 12%
Three times as fast as Signal Edge BW	▶ 5%
Five times as fast as Signal Edge BW	▶ 2%

Front and Rear Panels

PS9300 Modules





20 GHz Miniature Sampling Module

The PicoScope 9300 includes a dual-channel sampler. This sampler is designed for precise measurements on high speed, low amplitude signals and low-loss testing in applications such as microwave systems research and development, digital device characterisation, and high-speed digital communications circuit design. It provides an acquisition rise time of 17.5 ps, with a typical 20-GHz equivalent bandwidth, and maximum RMS noise 2 mV to ensure clean, undistorted signals. The electrical channel has both a 20 GHz mode for better waveform fidelity, and a 10 GHz mode for optimum noise performance. Changing the bias on the sampling bridge alters the bandwidth of both channels.

Key Specifications of the Sampler

- Number of Channels - 2 (Simultaneous acquisition)
- Bandwidth (-3dB) – Full BW: DC to 20 GHz,
  Narrow BW: DC to 10 GHz
- Rise Time (10%-90%) - Full BW: ≤17.5 ps,
  Narrow BW: ≤35 ps
- RMS Noise (maximum) - Full BW: ≤ 2 mV,
  Narrow BW: ≤ 1.5 mV
- Maximum operating input voltage - 1.0 V p-p at ± 1 V range
- Maximum Safe Input Voltage - 16 dBm, or ±2 V (dc+peak ac)
- Nominal Input Impedance - (50 ± 1) Ω
- Input connectors - 2.92 mm (K) female, SMA-compatible

Time Base

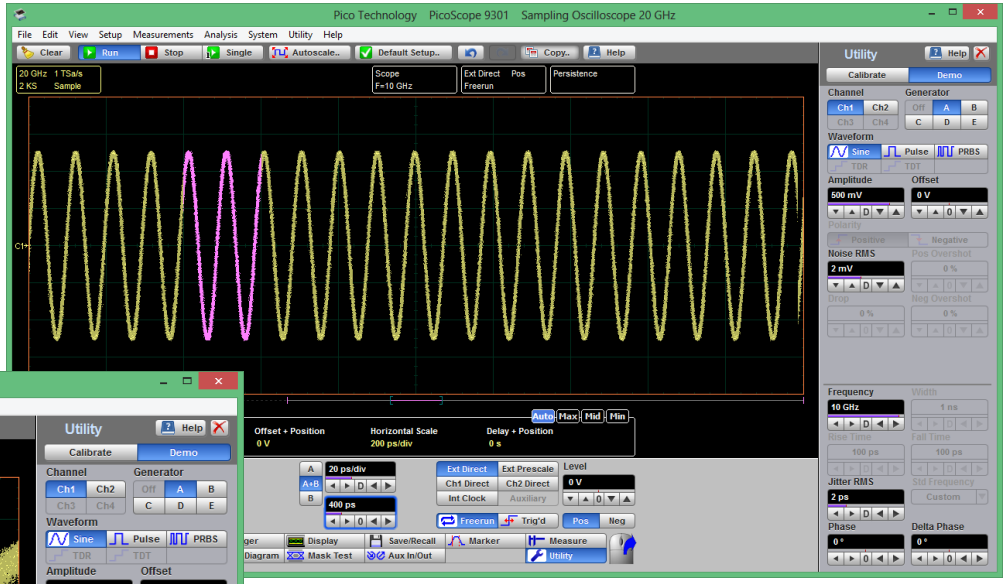
The PicoScope 9300 provides four acquisition modes: Sequential Equivalent Time Sampling, Real Time Sampling, Random Equivalent Time Sampling, Roll Sampling

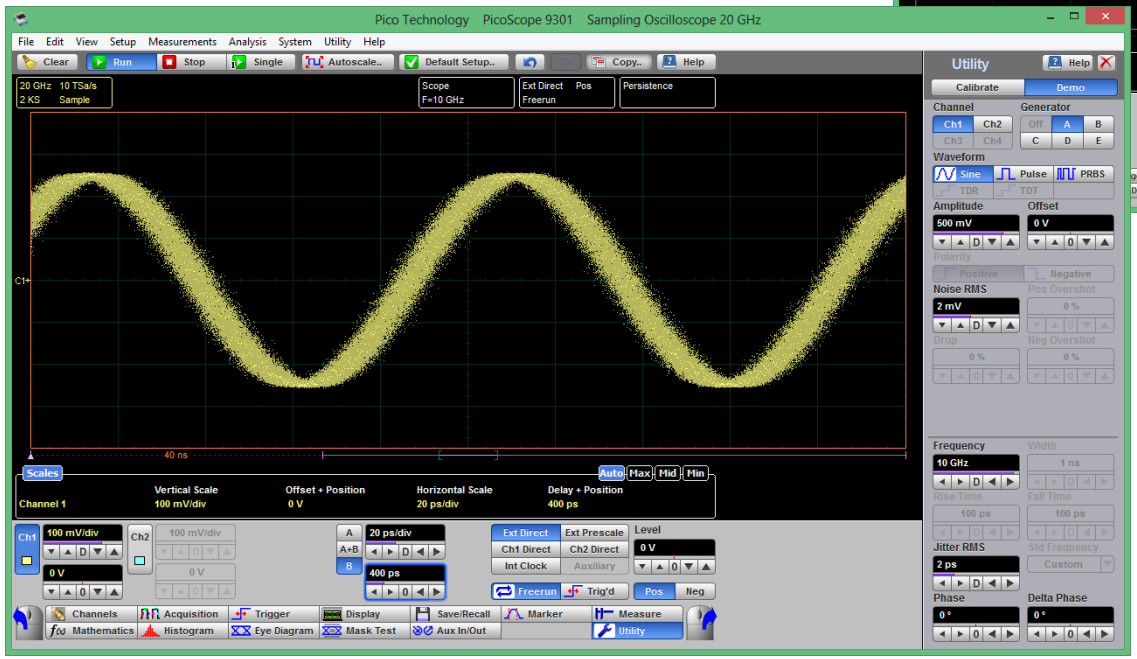
Sequential equivalent time:
5 ps/div to 3.2 ms/div

Real Time Sampling:
2 us/div to 100 ms/div (1 us resolution)

Random Equivalent Time Sampling:
50 ns/div to 50 us/div (4 ns resolution)

Roll Sampling:
200 ms/div to 10 s/div





Direct Trigger

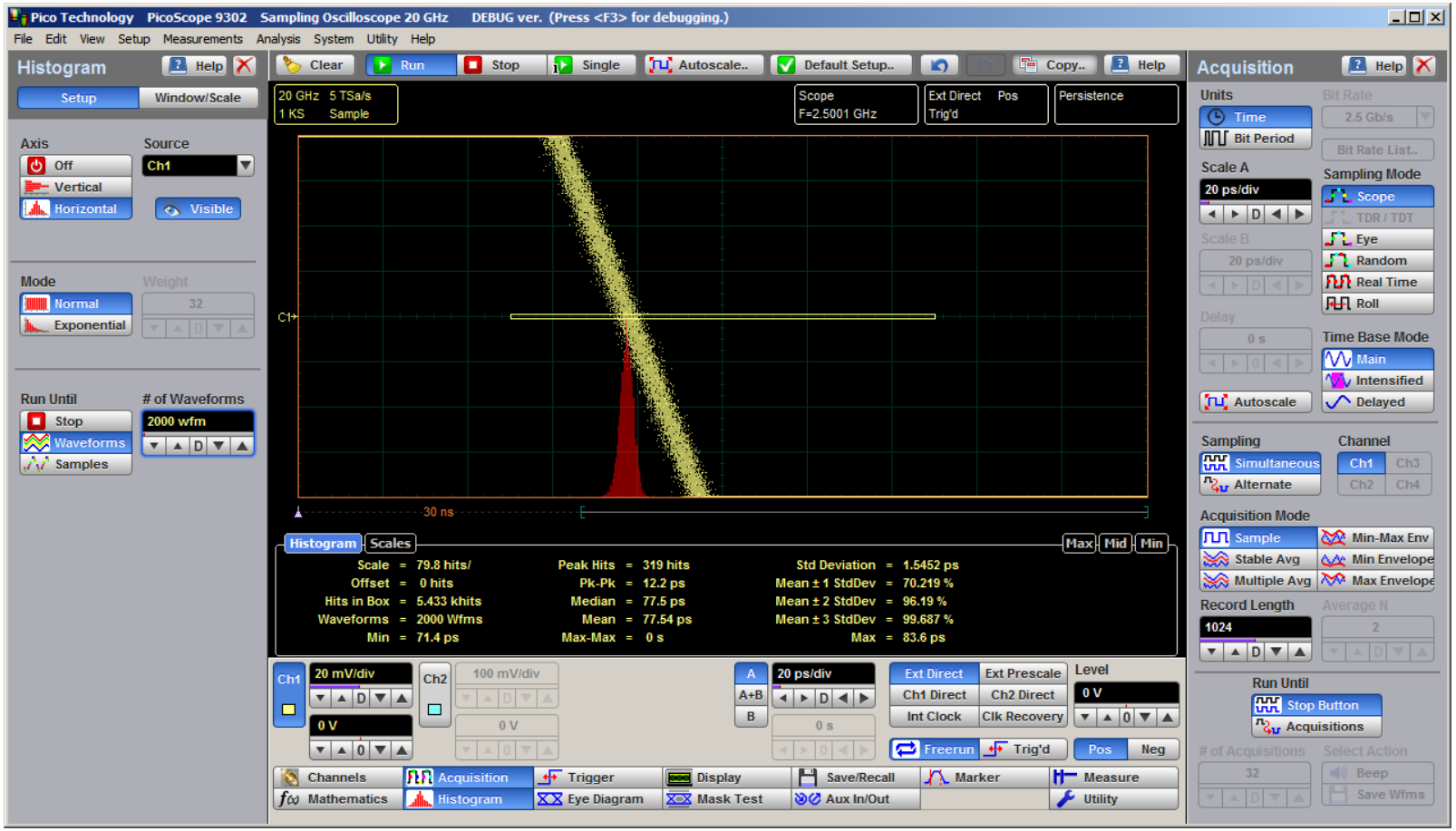
The power of wide-bandwidth sampling oscilloscopes is largely useless without fast, low-jitter triggering. The PicoScope 9300 is equipped with built-in direct trigger for signals up to 2.5 GHz repetitive rates without using an external trigger unit.

A typical picture of 2.5 GHz signal by using Direct Trigger

Key specifications of Direct Trigger:

- DC to 2.5 GHz trigger bandwidth
- 100 mV p-p DC to 100 MHz, 200 mV p-p at 2.5 GHz sensitivity
- <1.8 ps typical RMS jitter

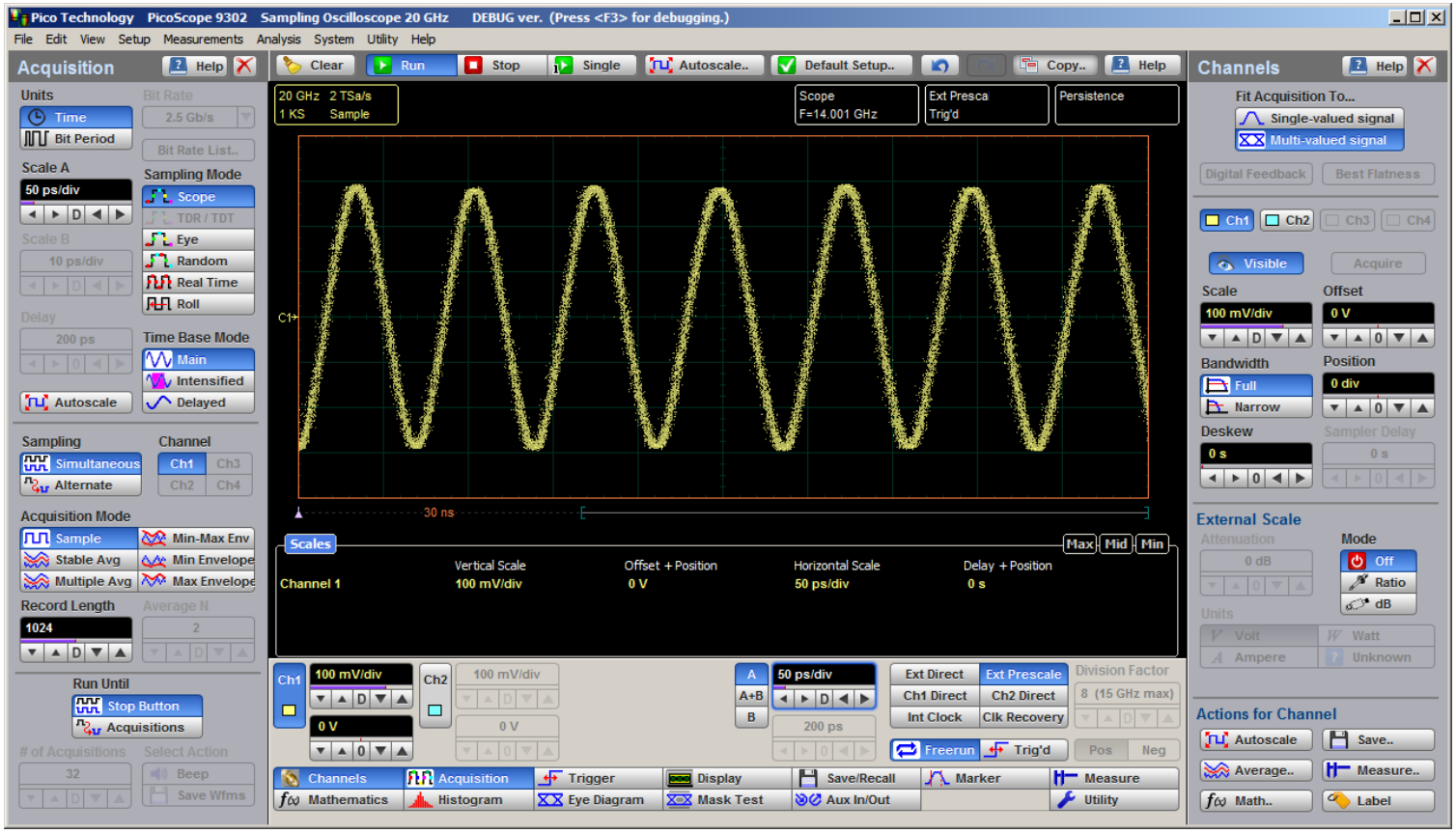
Direct Trigger Jitter



A typical picture showing 1.54 ps RMS Direct Trigger Jitter with 2.5 GHz sine wave

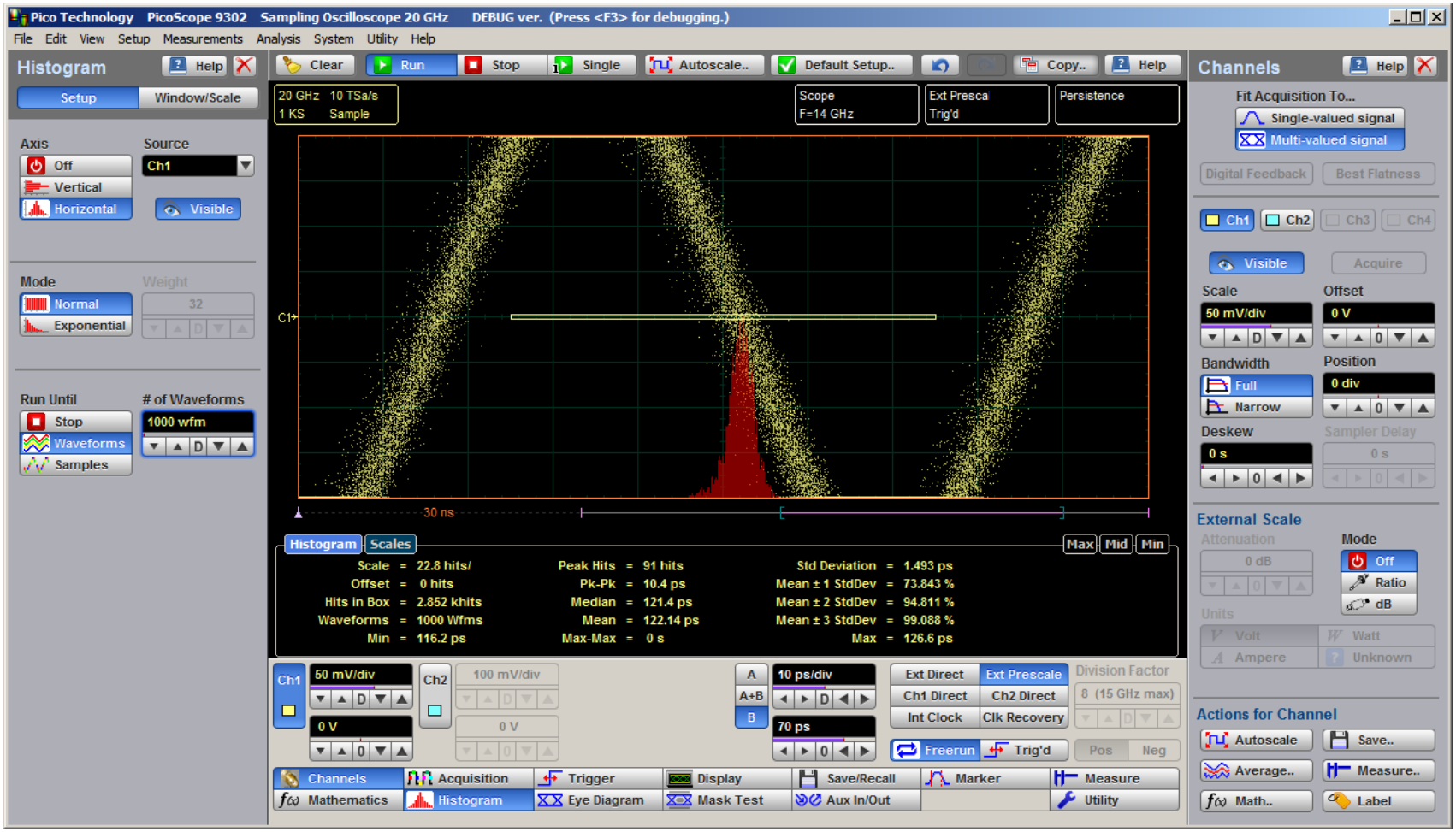
Prescaled Trigger

The PicoScope 9300's Prescaled trigger is an AC-coupled 14-GHz prescaler for triggering on high-speed data without cumbersome manual adjustment. The heart of the trigger is a low-noise GaAs frequency divider. Low RMS jitter <1.8 ps typ is available.



14-GHz Prescaled Trigger shown at 50 ps/div time base

Prescaled Trigger Jitter



14-GHz prescaled trigger with less than 1.5 ps rms jitter

Pattern Test: Bandwidth and Data Rate

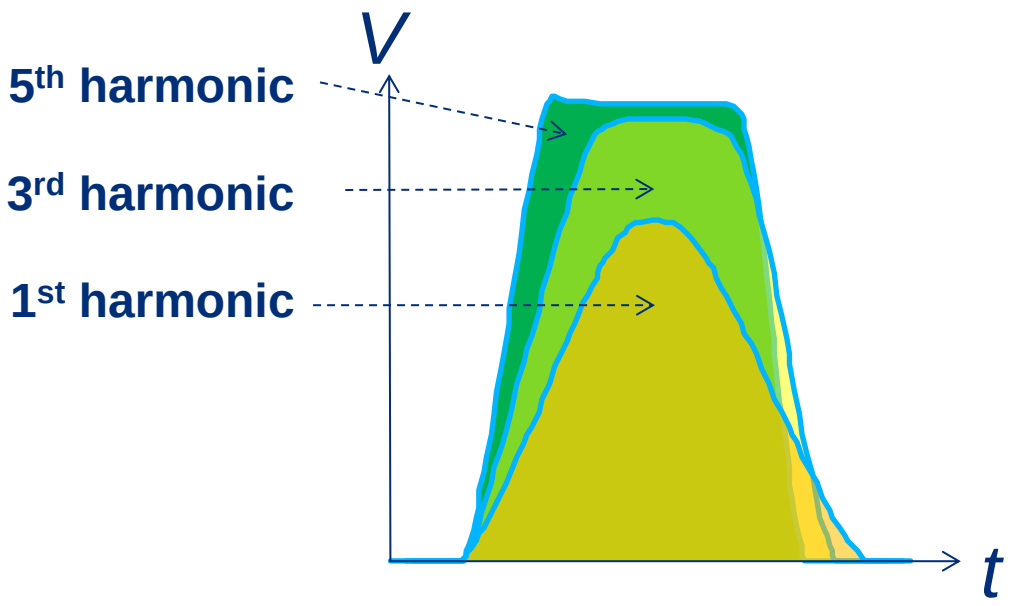
Calculating bandwidth from data rate:

3^{rd} Harmonic = 3 x $\frac{\text{Bit rate}}{2}$

5^{th} Harmonic = 5 x $\frac{\text{Bit rate}}{2}$

Application example

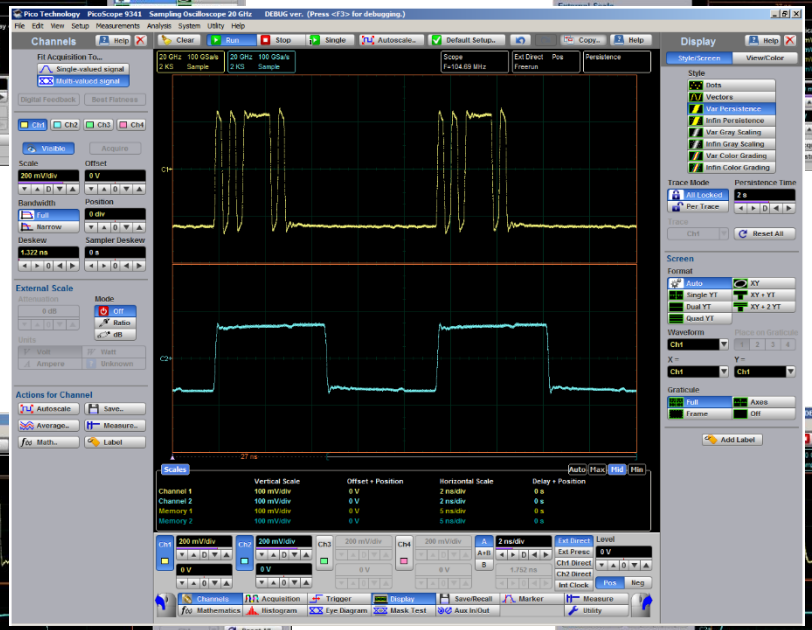
PCIe R1.0a has a data rate of 2.5 Gbps (1.25 GHz frequency)
Bandwidth required to see 5 harmonics is 1.25 GHz x 5 = **6.25 GHz**



Data Pattern

6.25-Gbps data pattern

Programmable Data Pattern



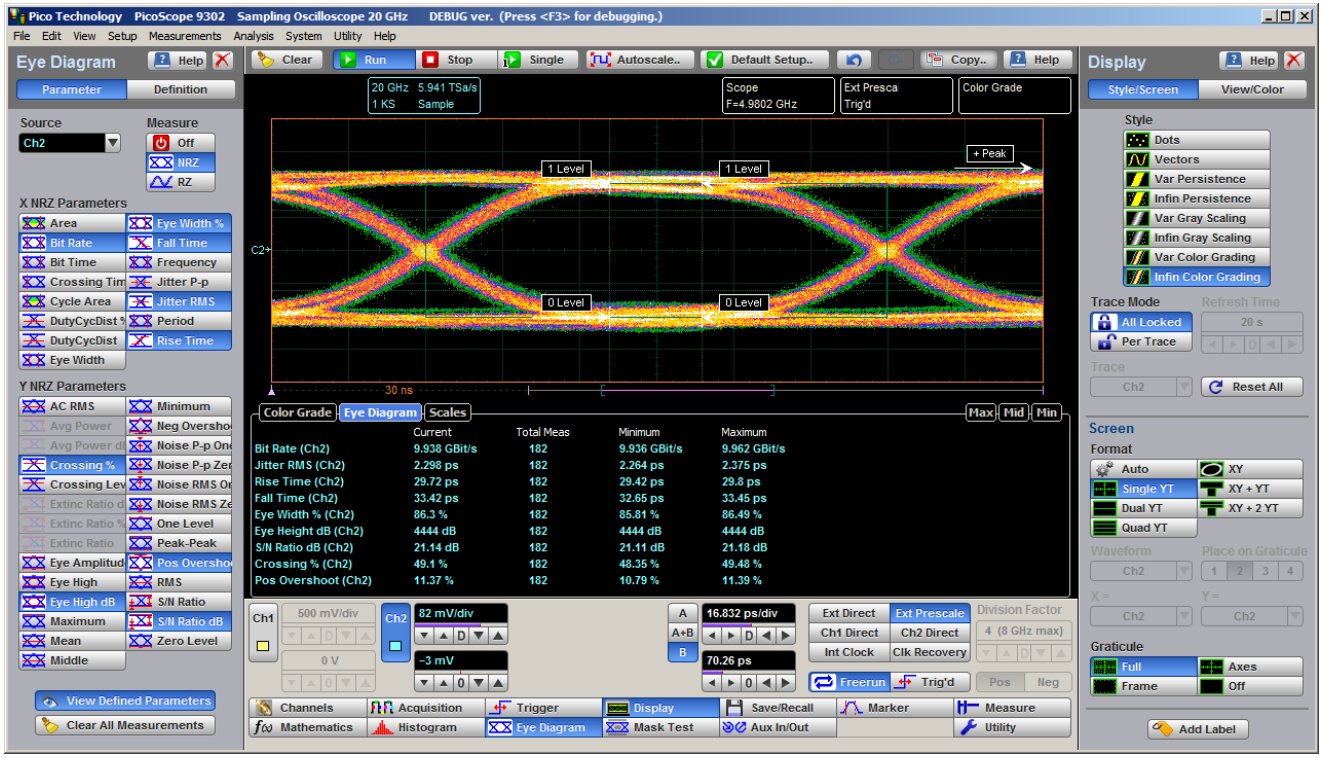
3-Gbps Data Patterns

12.5 Gbps Data Pattern

12.5-Gbps Data Pattern acquired with Tektronix PPG1251 Pattern Generator

77-ps pulse acquired with Tektronix PPG1251 Pattern Generator

Eye Diagram Measurements



10-Gbps eye-diagram at 16.8 ps/div time base

Why Eye-diagram?

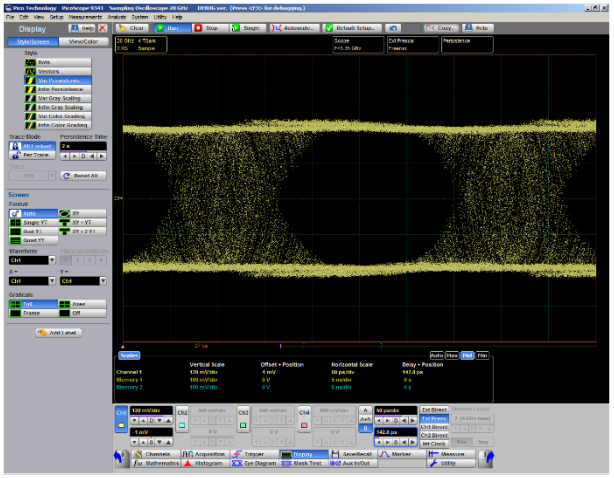
Eye Diagram is valuable because of comprehensive view of all signal integrity faults(except clock jitter):

- Noise
- Jitter
- Reflections
- Ringing
- Inter-symbol interference
- Power and ground coupling

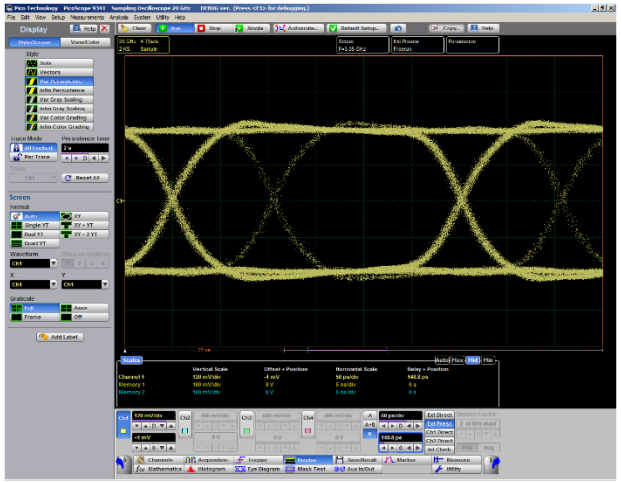
Eye Diagram Problems with Sequential Sampling Oscilloscope:

- It is not possible to resolve pattern dependencies
- Averaging is not available
- Input Dynamic Range ±400mV
- Random Noise and pattern dependent, deterministic errors mask each other

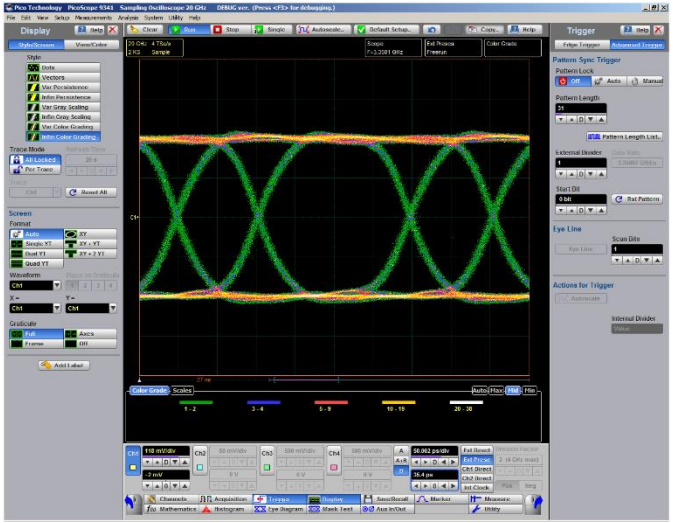
Eye Diagram with Jitter Insertion



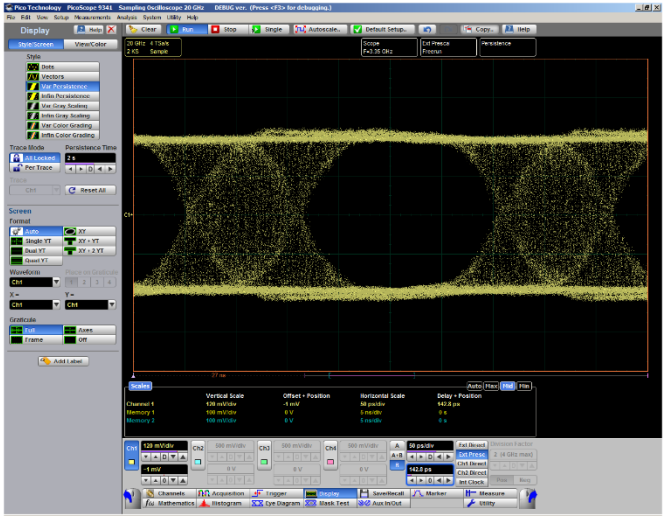
3.3 Gbps Eye Diagram with Random Jitter Insertion



3.3 Gbps Eye Diagram with PulseJitter Insertion



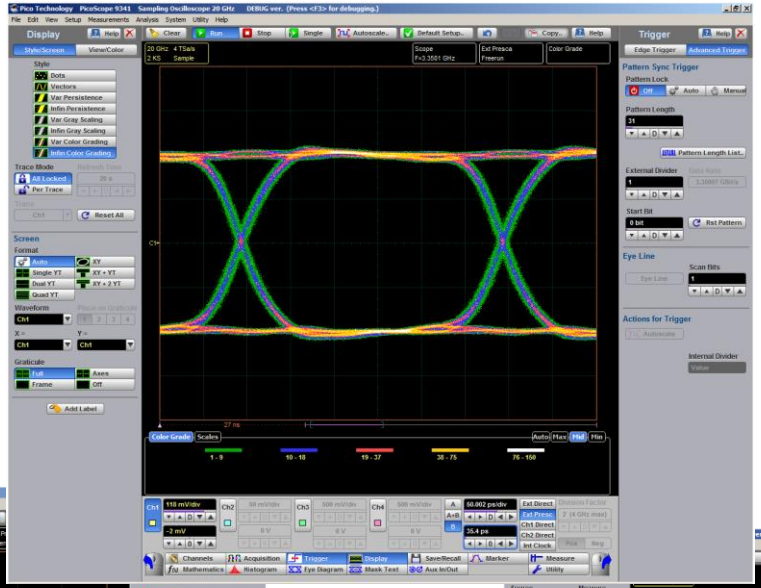
3.3 Gbps Eye Diagram with Meander Jitter Insertion



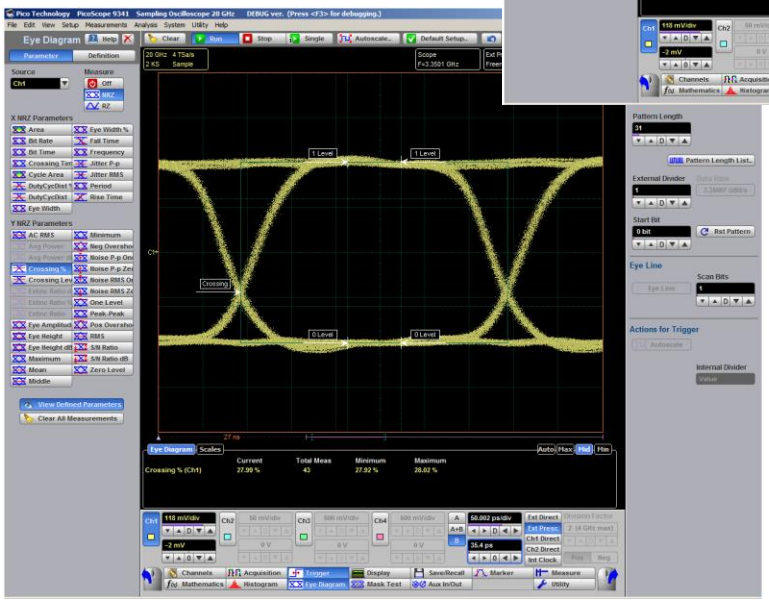
3.3 Gbps Eye Diagram with Sine-wave Jitter Insertion

Eye Diagram with different Crossing Level

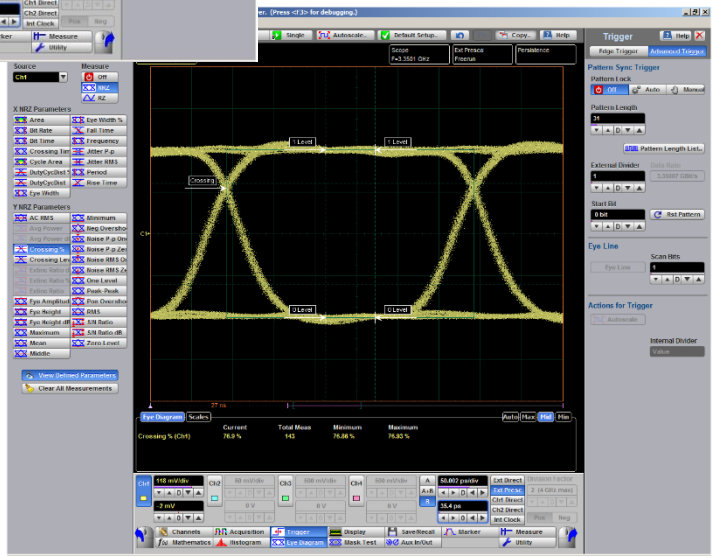
PicoScope 9341 with 3.3-GHz Agilent 81134A Pulse Pattern Generator



Crossing Level = 50%



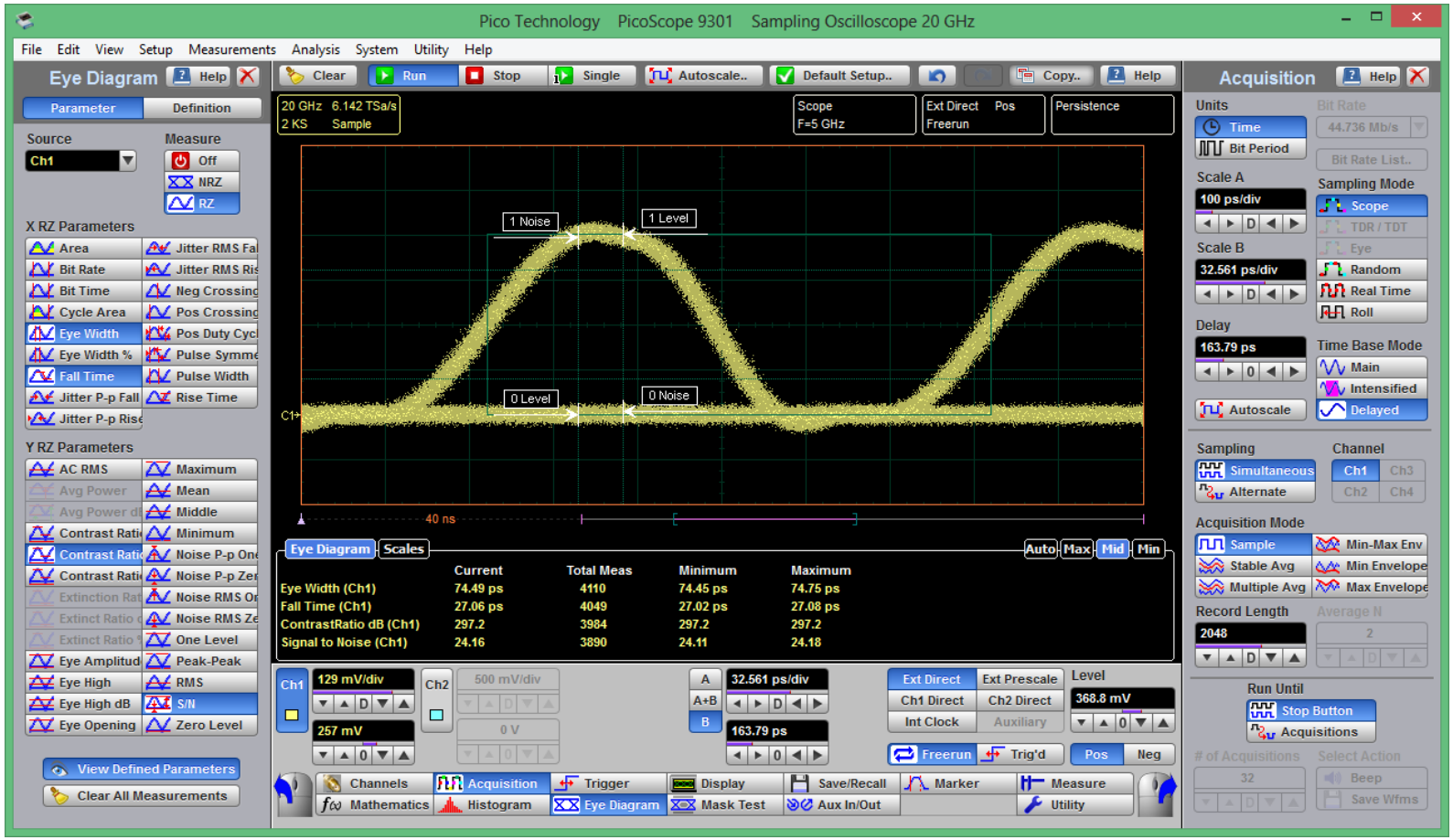
Crossing Level = 76%



Crossing Level = 28%

RZ Eye-Diagram Analysis

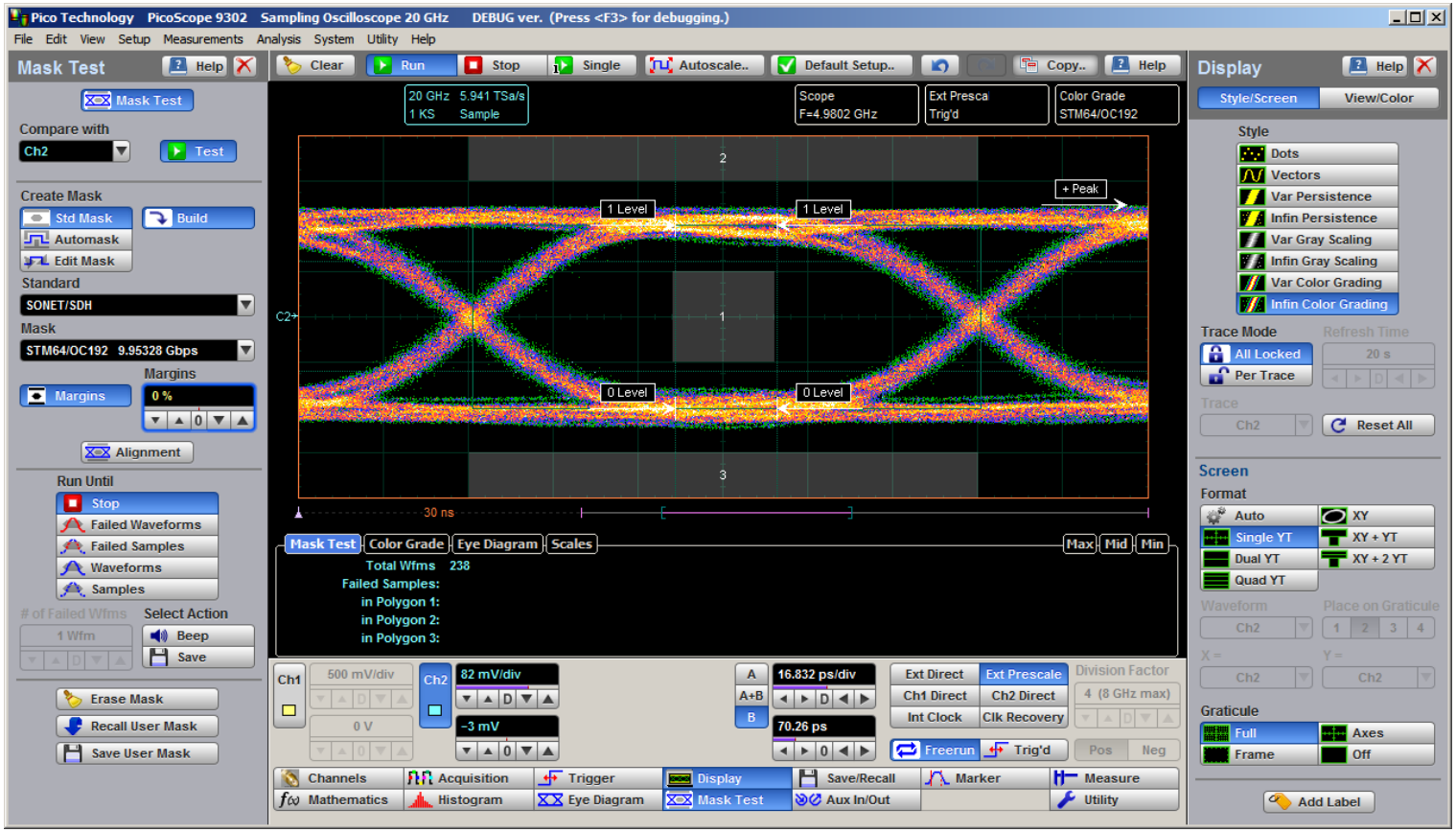
The PicoScope 9300 quickly measures more than forty fundamental parameters used to characterize an return-to-zero (RZ) signals. Up to ten parameters can be measured simultaneously.



The PicoScope 9201 measures 5-Gbps RZ eye-diagram

Mask Test

For eye-diagram masks, such as those specified by the SONET and SDH standards, the PicoScope 9300 supports on-board mask drawing for visual comparison. The display can create gray scaled or color-graded display to aid in analyzing noise and jitter in eye-diagrams.



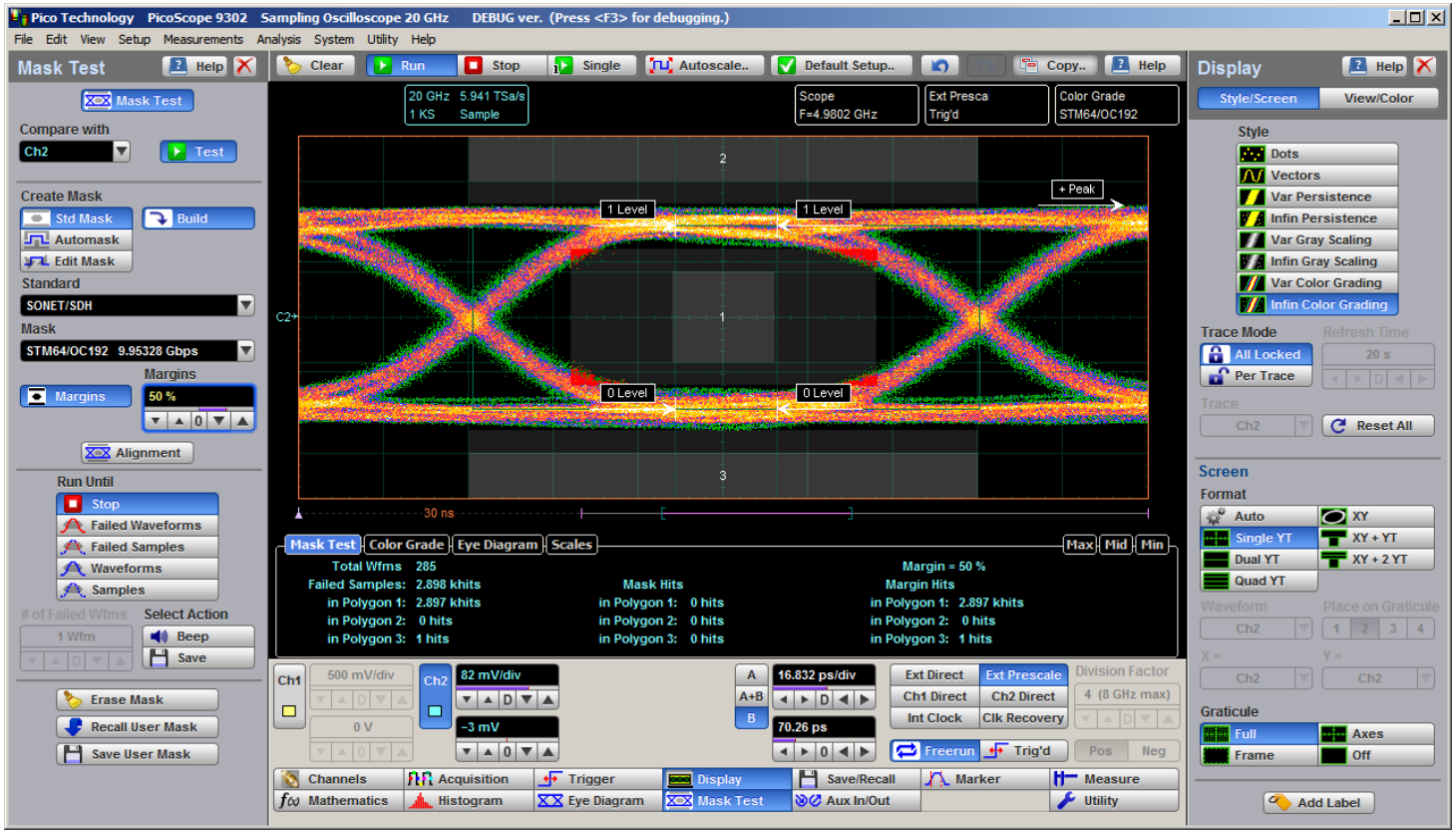
Mask Test quickly characterizes:

- **Noise**
- **Jitter**
- **Aberrations**
- **Rise Time**
- **Fall Time**

On-board mask drawing capability allows simple, operator-independent visual comparison of signal to standard mask. Picture demonstrates a 9.95 Gbps SONET/SDH (OC64/STM16) eye-diagram compared with the standard mask, showing a compliant waveform.

Mask Test with Margins

Mask Margins are used to determine the margin of compliance for a standard or scaled mask. The PicoScope 9300 goes beyond basic testing with mask margin analysis for process monitoring.



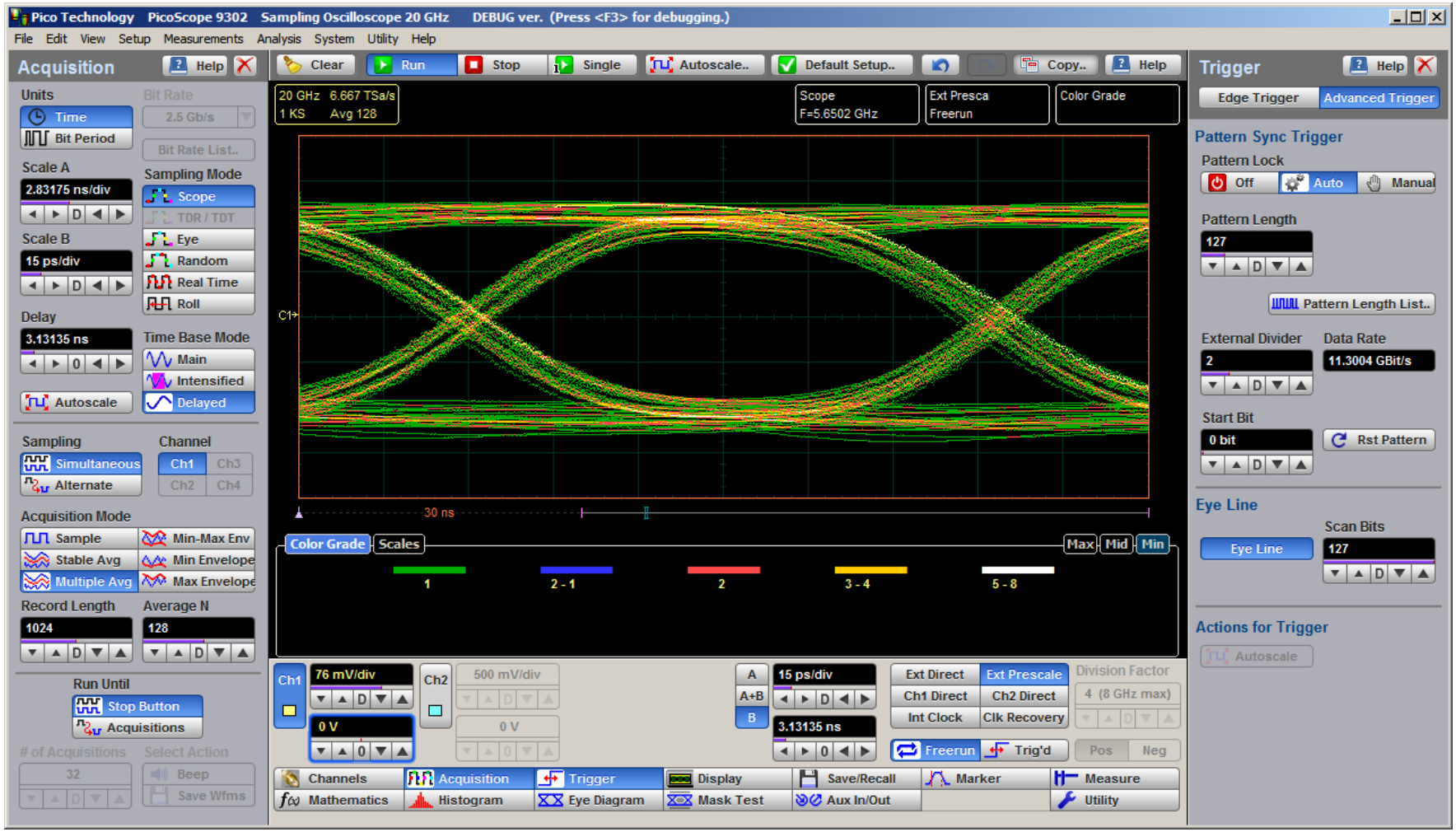
Mask hits/failures are easily viewed with red pixels.

Mask Test results show:

- **Total Waveforms**
- **Failed Samples**
- **Mask Hits**
- **Mask Margin Value**
- **Margin Hits**
- **Margin Hits In Polygon**

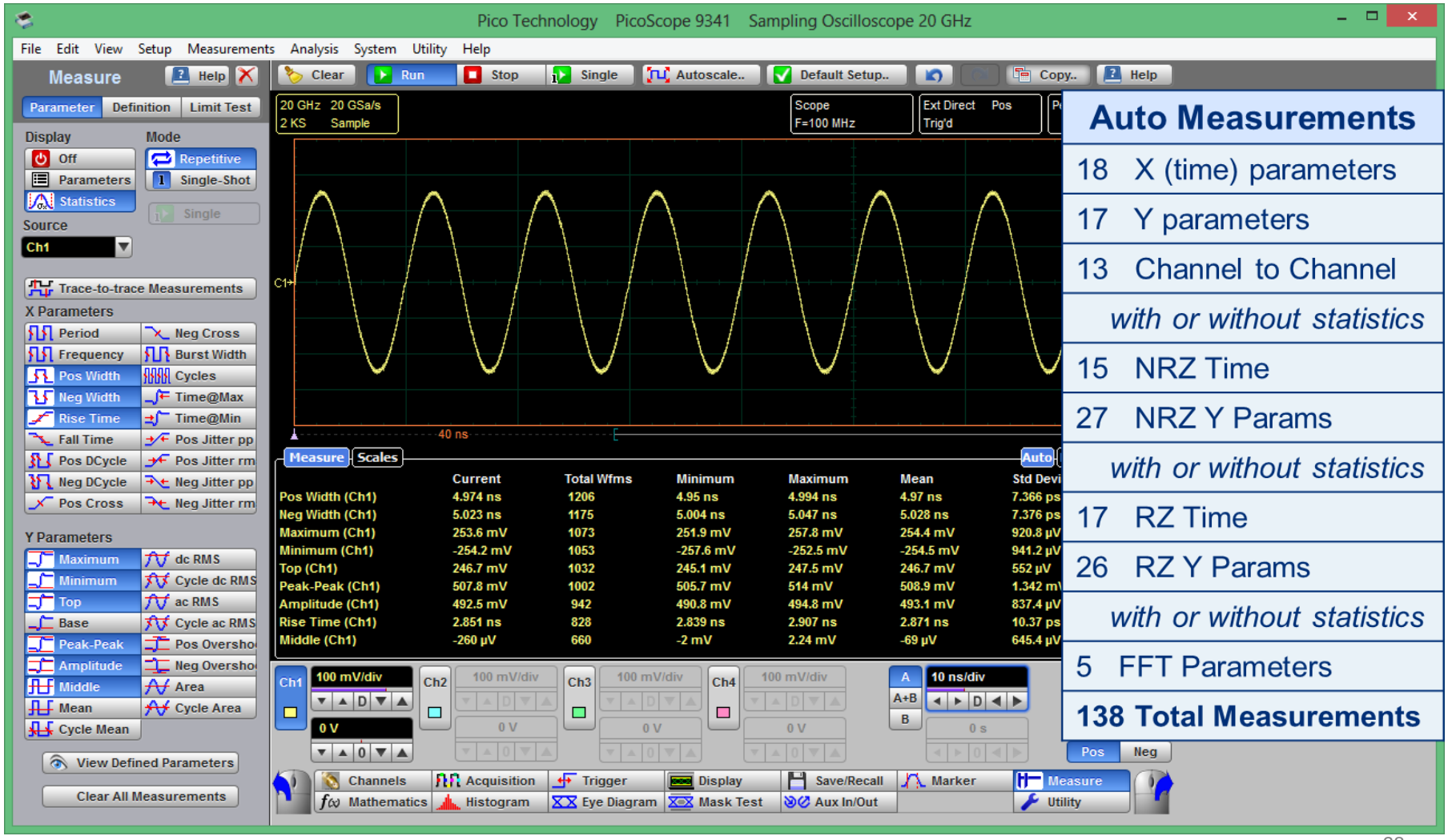
Mask margins are used to determine the margin of compliance for a standard 9.95 Gbps STM64/OC192 eye-diagram or scaled mask.

Eye Line Mode

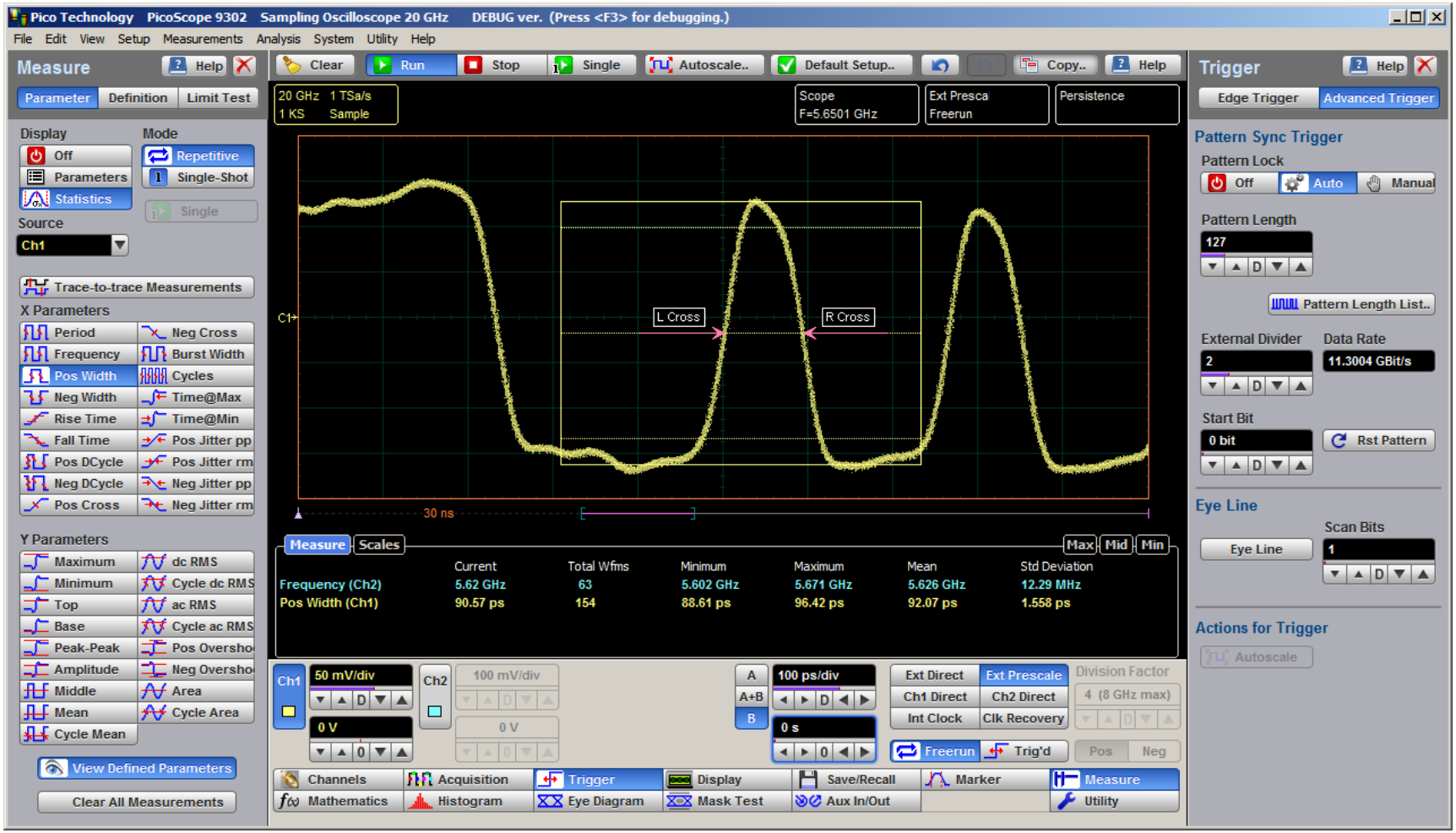


10-Gbps Averaged Eye Diagram acquired in Eye Line Mode

Comprehensive Measurements…



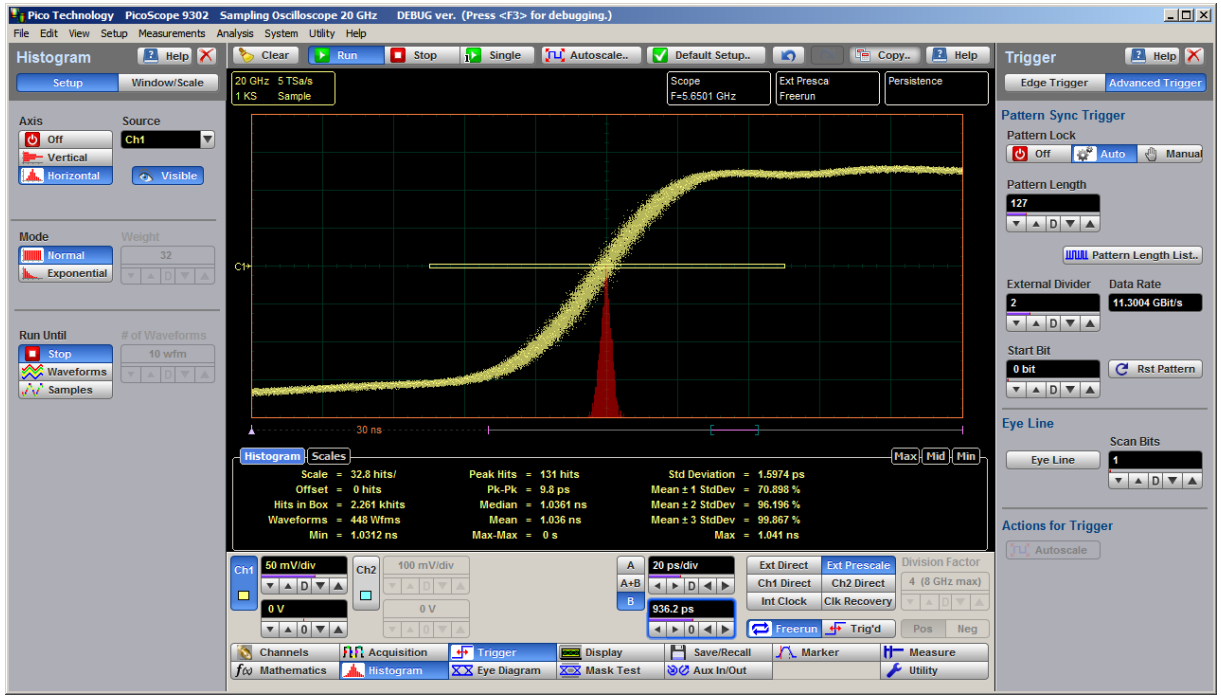
Defined Measurements



The PicoScope 9300 measures 92-ps width of selected pulse inside 11.3-Gbps pattern

Horizontal Histogram

A histogram is a probability distribution that shows the distribution of acquired data from a source within a user definable histogram window. The information gathered by the histogram is used to perform statistical analysis on the source. The most common use for vertical histogram is measuring and characterizing noise and jitter on displayed waveforms.

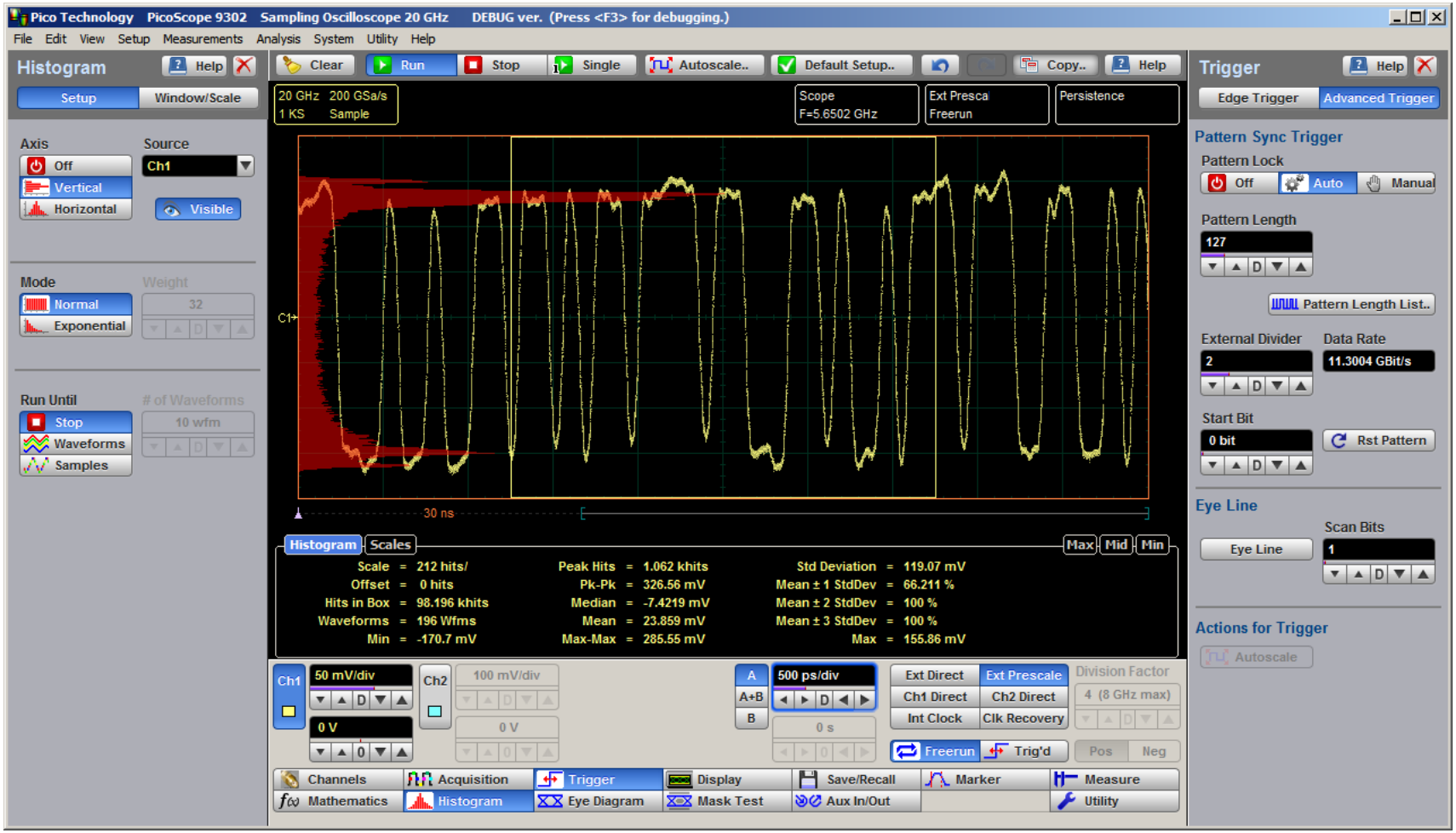


The PicoScope 9300 measures 1.59 ps rms jitter of transient having near 40 ps rise time

The list of histogram statistics includes:

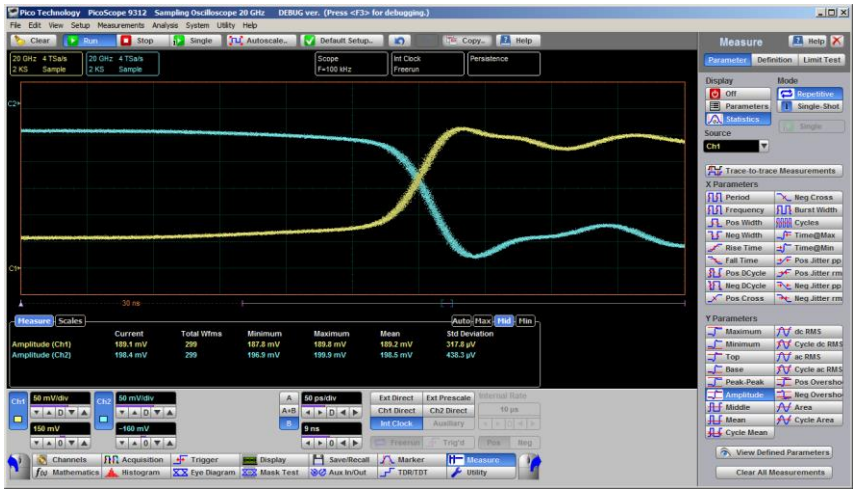
- Scale lists the display scale in hits per division or dB per division.
- Offset lists the offset in hits or dB. Offset is the number of hits or dB at the bottom of the display, as opposed to the center of the display.
- Hits in Box-The total number of samples included in the histogram box.
- Waveforms - Displays the number of waveforms that have contributed to the histogram.
- Peak Hits - The number of hits in the histogram's greatest peak.
- Pk – Pk - The width of histogram.
- Median - 50 % of the histogram samples are above the median and 50% are below the median.
- Mean - Mean is the average value of all the points in the histogram.
- StdDev - The Standard deviation (σ) value of the histogram.
- $\mu \pm 1$ StdDev, $\mu \pm 2$ StdDev, $\mu \pm 3$ StdDev - The percentage of points that are within $\pm 1\sigma$, $\pm 2\sigma$, or $\pm 3\sigma$ of the mean value.

Vertical Histogram

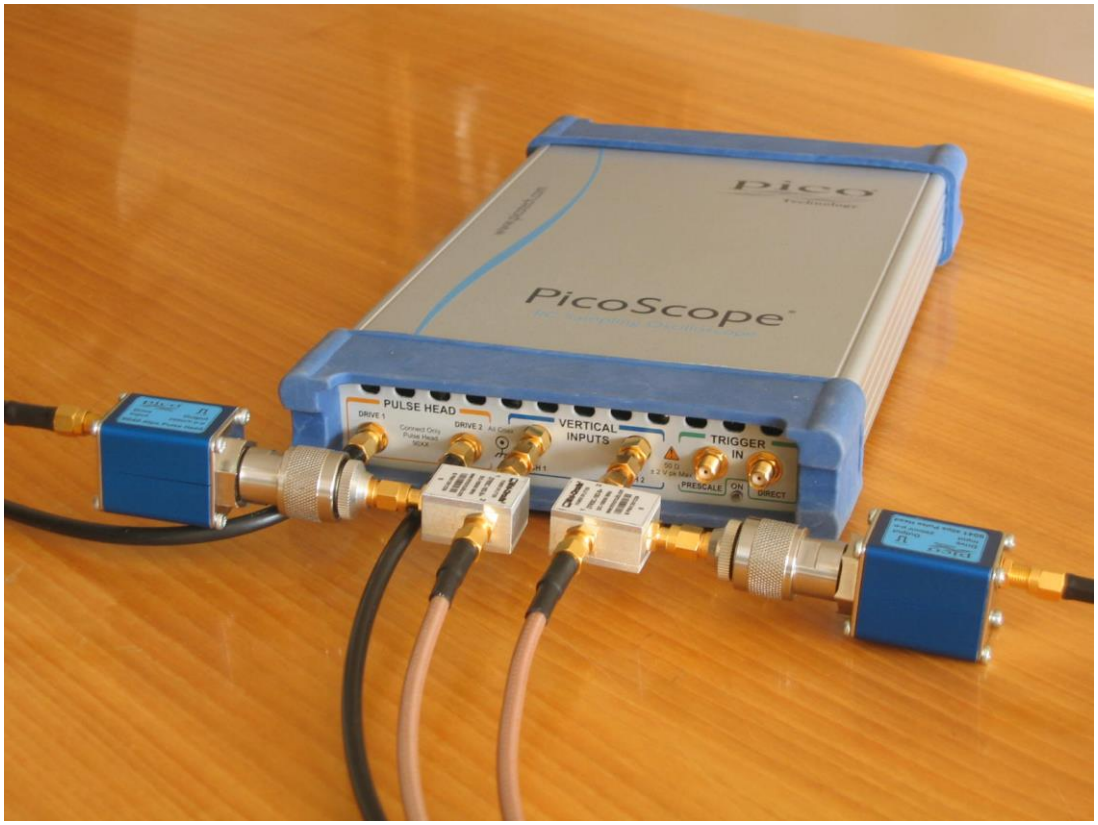


The PicoScope 9300 measures vertical histogram of data pattern

35-ps Differential Pulse Generator



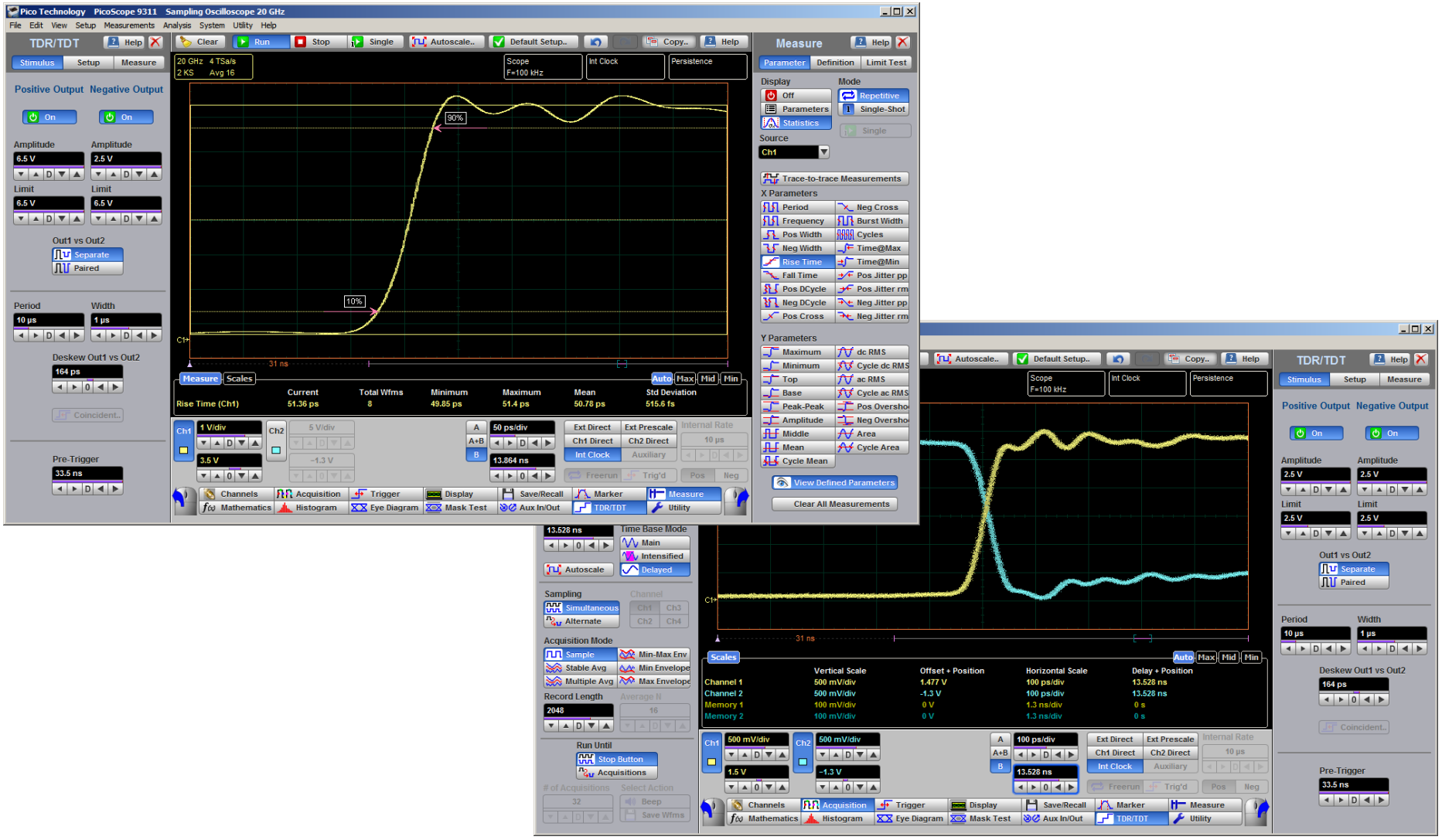
40-ps TDR / TDT



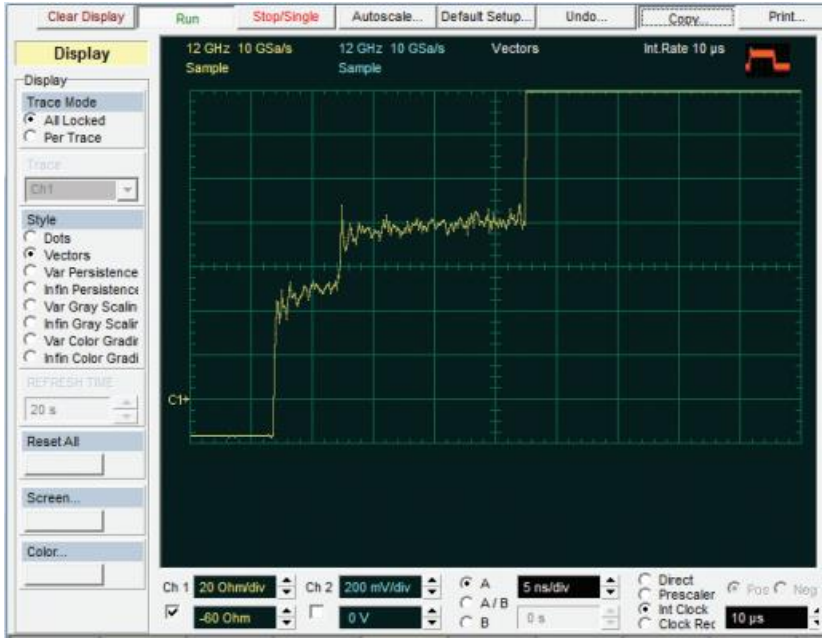
PicoScope 9312

- Differential TDR
- 40 ps, 200 mV step generator
- Plot voltage, impedance or reflection coefficient against time or distance

55-ps / 6 V Differential Pulse Generator



60-ps TDR / TDT



PicoScope 9311

- Differential TDR
- 65 ps, 6 V step generator built in
- Plot voltage, impedance or reflection coefficient against time or distance

35

TDR / TDT Normalization @ 500 ps/div

1 ns Corrected Rise Time

200 ps Corrected Rise Time

5%/div Vertical Scale

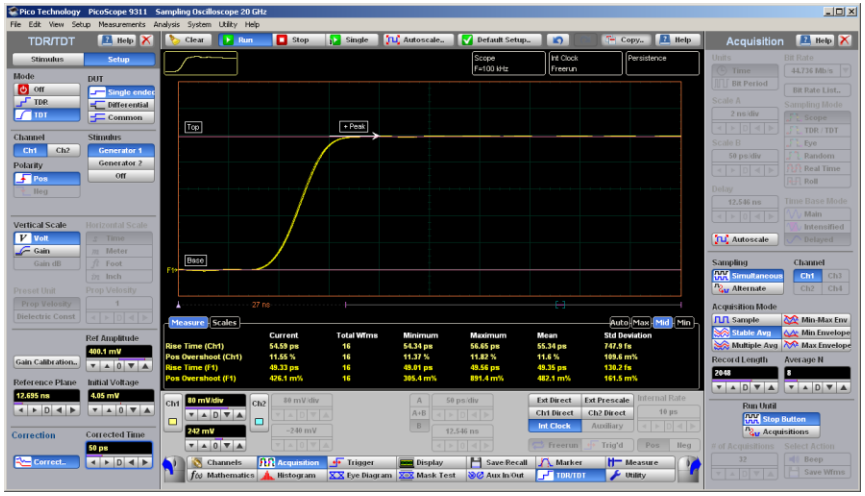
100 ps Corrected Rise Time

40 ps Corrected Rise Time

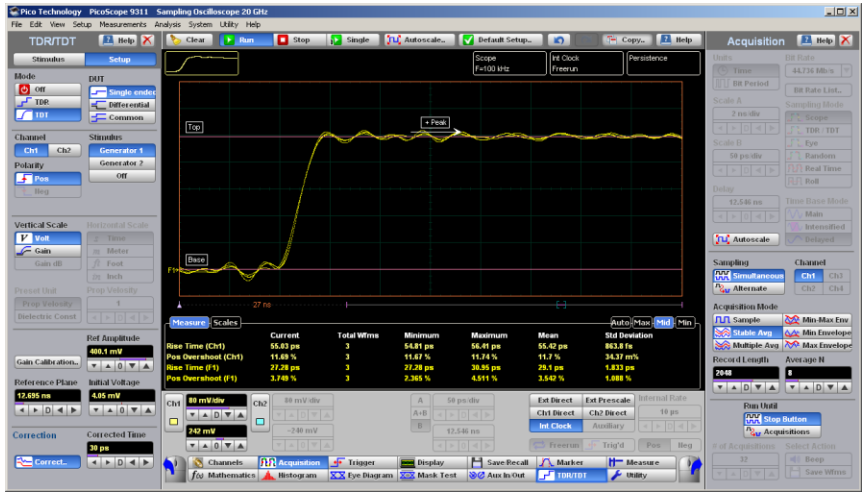
TDR / TDT Normalization @ 50 ps/div

140 ps Corrected Rise Time

100 ps Corrected Rise Time

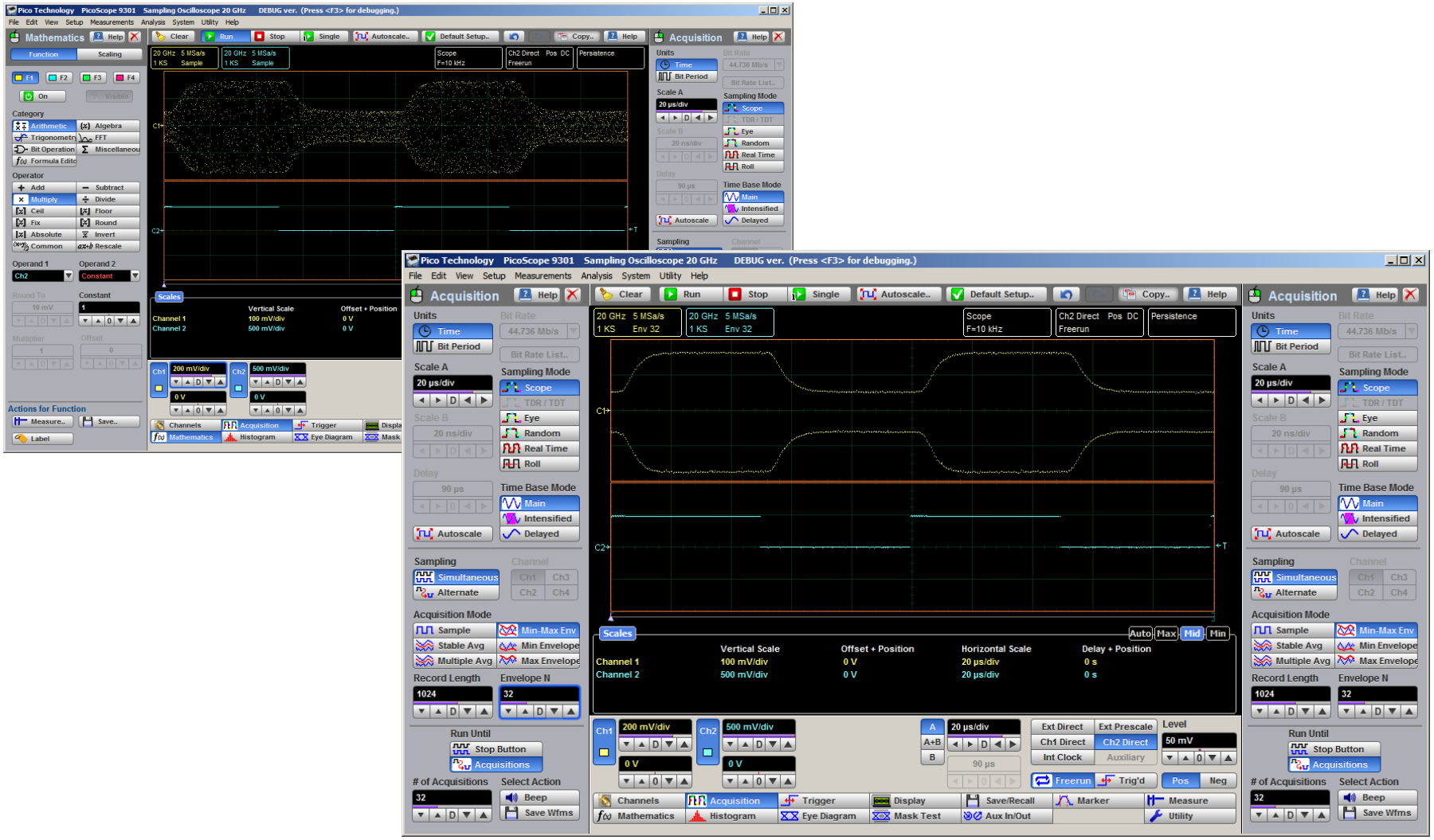


50 ps Corrected Rise Time



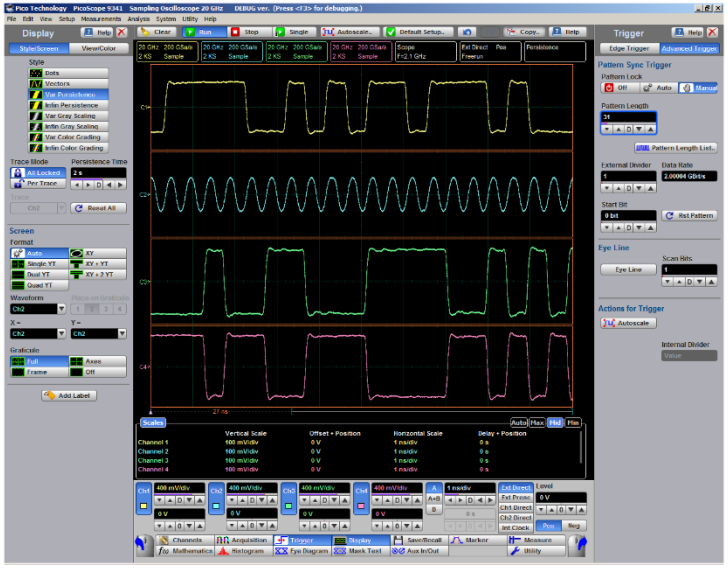
30 ps Corrected Rise Time

SW Envelope


Pico Technology PicoScope 9301 Sampling Oscilloscope 20 GHz DEBUG ver. (Press <F3> for debugging.)
File Edit View Setup Measurements Analysis System Utility Help
Mathematics
Acquisition
Clear Run Stop Single Autoscale.. Default Setup.. Copy.. Help
Scales
Channel 1 100 mV/div 0 V 20 µs/div 0 s
Channel 2 500 mV/div 0 V 20 µs/div 0 s
Vertical Scale Offset + Position Horizontal Scale Delay + Position
Auto Max Mid Min
Sampling Simultaneous Alternate
Acquisition Mode Sample Min-Max Env Stable Avg Min Envelope Multiple Avg Max Envelope
Record Length 1024
Envelope N 32
Run Until Stop Button Acquisitions
# of Acquisitions 32
Select Action Beep Save Wfms
Channels Acquisition Trigger Display Save/Recall Marker Measure
Mathematics Histogram Eye Diagram Mask Test Aux In/Out Utility

PS9341: Four-channel oscilloscope

1 Gbps patterns and clocks

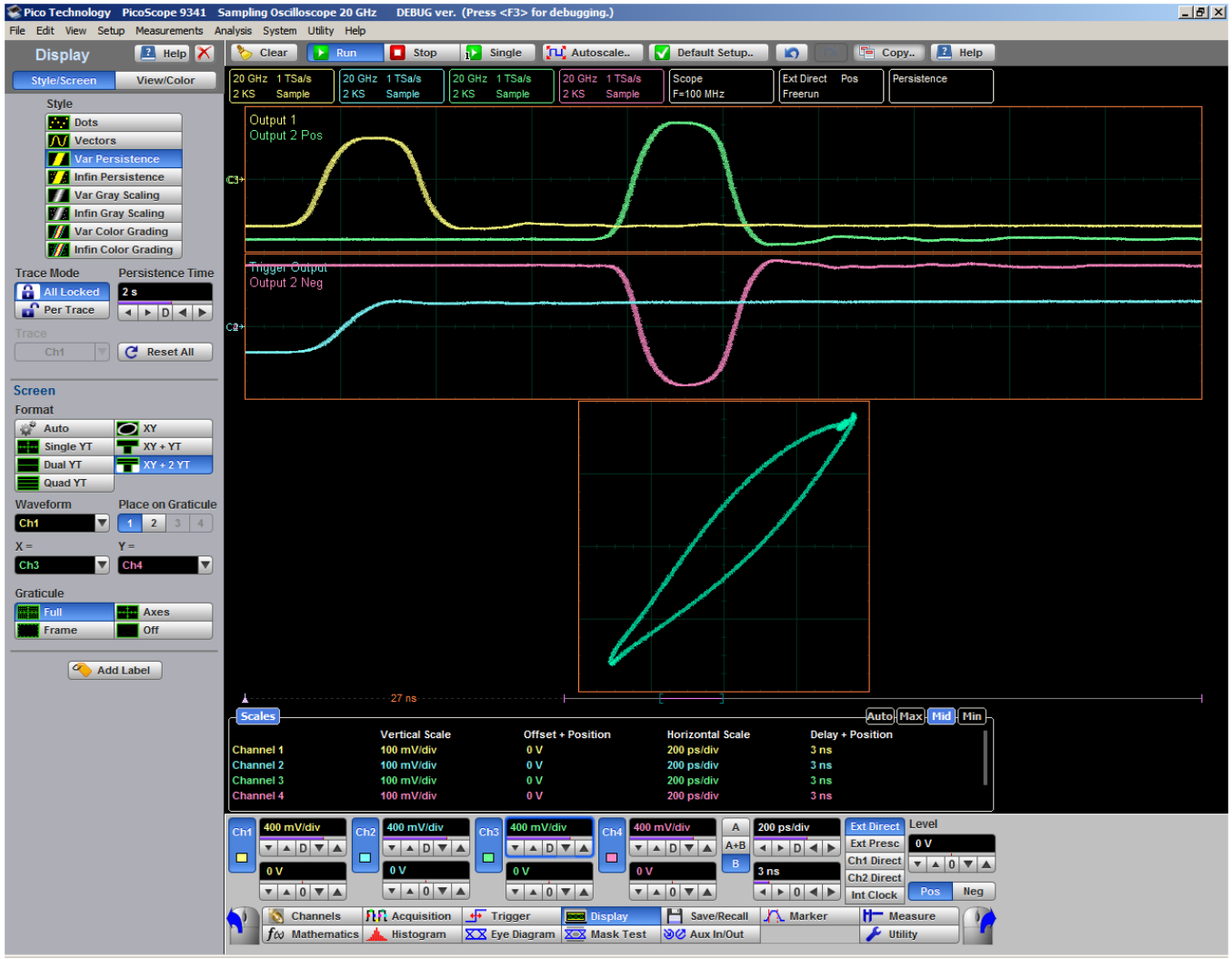


3.3 Gbps waveforms

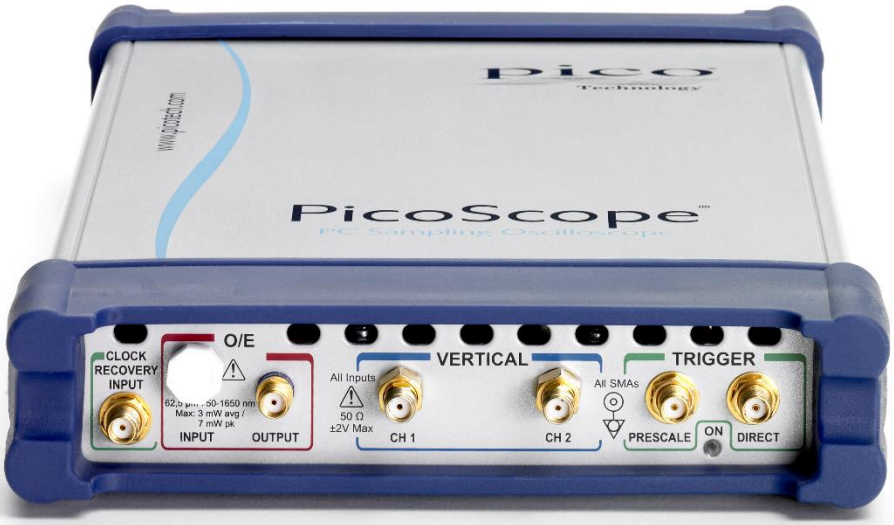
PicoScope 9300: Display Options

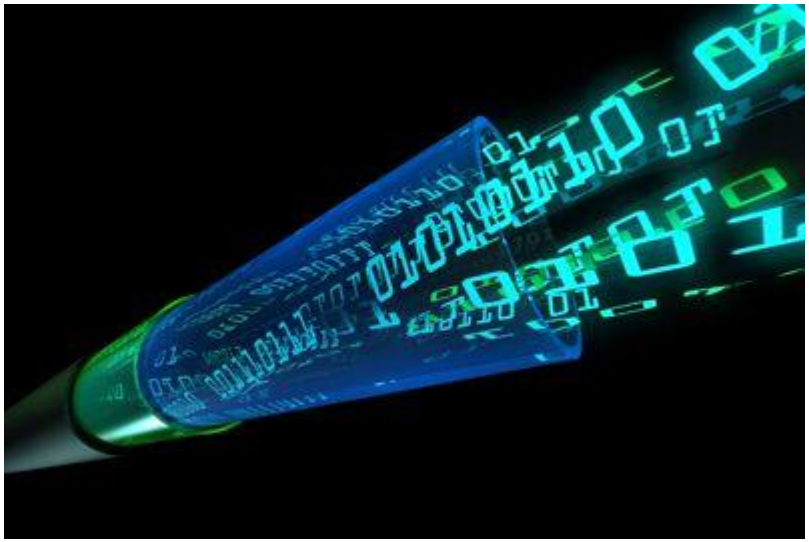
Display Style:

- Dots
- Vectors
- Variable Persistence
- Infinite Persistence
- Variable Gray Scaling
- Infinite Gray Scaling
- Variable Color Grading
- Infinite Color Grading



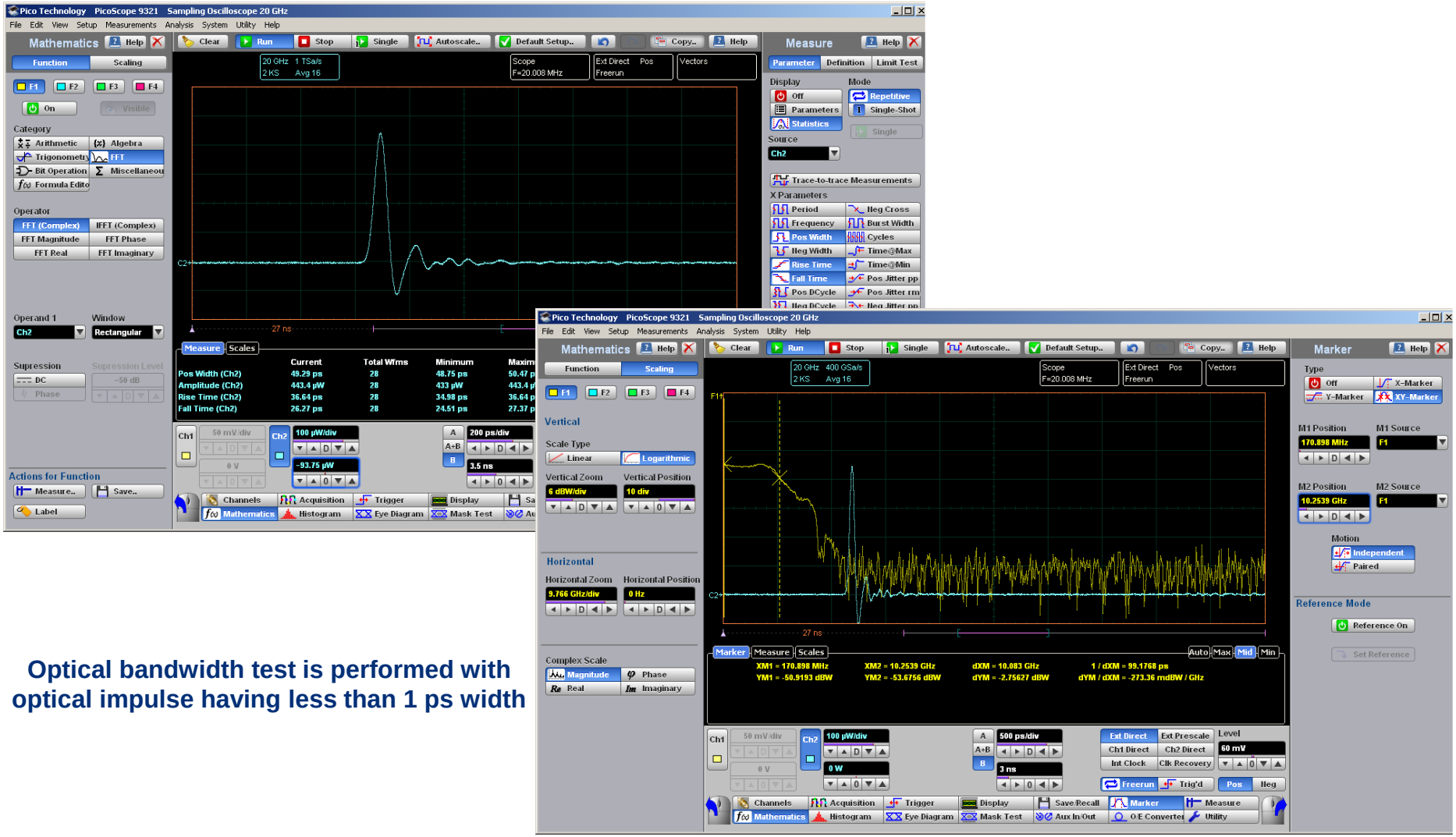
PS9321: Optical Sampling Oscilloscope





- 9.5 GHz precision O/E converter
- SM & MM connectors
- 750 to 1650 nm
- Automatic measurements
  - Extinction ratio
  - S/N ratio
  - Eye height & width

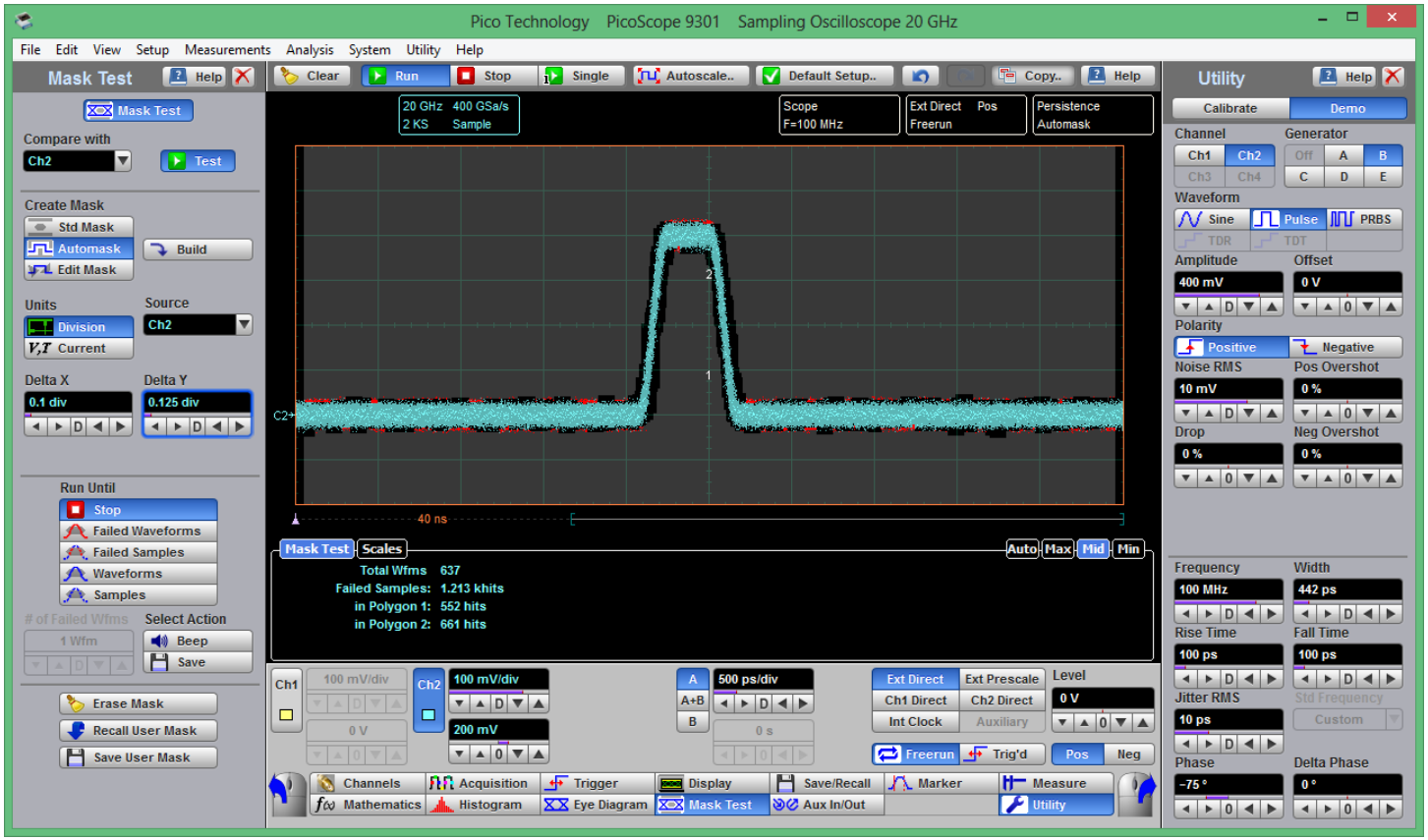
Optical Bandwidth Test



Optical bandwidth test is performed with optical impulse having less than 1 ps width

On-fly Limit Test

The PicoScope 9300 offers fully automatic pass-fail limit testing. You can built a limit template from acquired waveforms or download a template from disk.



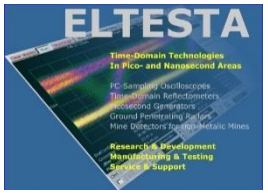
Mask Test results show:

- **Total Waveforms**
- **Failed Samples**
- **Hits In Polygon**

Using a reference waveform method (Automask), masks are constructed by adding a Delta X and Delta Y tolerance around a reference waveform. This method is simple to use, though not as flexible as the polygon method. The PicoScope 9300's automatic, on-the-fly limit testing makes manufacturing pass-fail testing simple.

Trend function

Trend measures time base linearity with resolution less than 1 ps



PicoScope 9300 Applications

pico® Technology

SIGNAL ANALYSIS

- Electrical standards compliance testing
- Eye-diagram analysis

RF COMPONENT TESTING

- RF components
- Cables and connectors
- Pulsed RF switches

R & D

- Microwave & RF characterisation
- High-energy physics
- Digital design

HIGH-SPEED DIGITAL COMMUNICATIONS

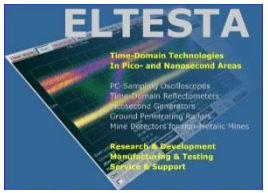
- Design and verification of telecom and datacoms elements
- Manufacturing and testing for ITU / ANSI conformance
- Mask testing

SEMICONDUCTOR TESTING

- Microwave & RF characterisation
- High-energy physics
- Digital design
- Informative waveform displays

MANUFACTURING

- Limit and mask testing
- Testing for ITU / ANSI conformance
- Automatic test systems
- Auto-calibration routine

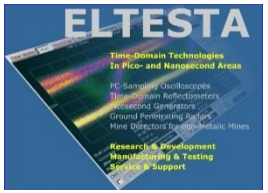


Summary

pico® Technology

9300 Sampling Oscilloscopes

- Economical 20 GHz solution
- Broad range of SI measurements
- Eye diagram analysis
- Mask testing for production
- Support for popular industry standards
    - PCIe, SATA, SONET/SDH, Ethernet, RapidIO, InfiniBand . . . plus user-defined
- TDR/TDT for validation of cables, connectors, interconnects etc.
- Optical
- Signal & timing analysis, testing and design of high-speed digital communication systems, network analysis, & semiconductor testing



EDN Hot 100 products of 2013.
Hot 100 products in Test & measurement

pico® Technology

- **Access Master MT9083x2 OTDRs**
"...allows field technicians to conduct accurate measurements of fiber cables, connections, and splices when installing and maintaining high-speed optical fiber networks."
Anritsu

- **AirMagnet Spectrum ES wireless spectrum analyzer**
"... connects to a Windows laptop or a Surface tablet that displays the local wireless spectrum produced by Wi-Fi routers, macrocells, microcells, femtocells, and picocells."
Fluke Networks

- **AQ6150 series optical wavelength meters**
"...[uses] an extended-life internal reference laser with an estimated life span of 40,000 hours."
Yokogawa Electric

- **ESR26 EMI test receiver**
...[can] perform standard-compliant measurements up to 6000 times faster than other testers, completing EMI measurements in just seconds.
Rohde & Schwarz

- **InfiniiVision 4000 X-Series DSOs**
"...lets you substitute virtually any tablet device for the scopes' built-in displays and many of their front-panel controls."
Agilent Technologies

- **Model 2450 source measure unit**
"...offers a capacitive touchscreen graphical user interface."
Keithley Instruments

- **N9322C spectrum analyzer**
"Intended for cost-constrained applications in R&D, manufacturing, maintenance, education labs, and bench repair."
Agilent Technologies

- **PA4000 power analyzer**
"...features a proprietary Spiral Shunt design, which includes dual internal spiral shunts in each module for stable measurements from micro-amps to high-current motor drives."
Tektronix

- **PicoScope 9300 PC sampling oscilloscope**
"... offers 20-GHz bandwidth on two channels and a sampling rate of 1 Msample/s for analyzing high-speed electrical signals."
Pico Technology

- **USB-2405 signal-acquisition module**
"...a USB 2.0-based dynamic signal-acquisition module equipped with four analog-input channels that simultaneously sample at rates of up to 128 ksamples/s with 24-bit resolution."
Adlink Technology

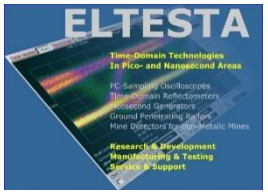
EDN NETWORK

Compact PC sampling oscilloscopes offer 20-GHz bandwidth

Susan Nordyk - July 9, 2013

A space-saving alternative to conventional bench instruments, the PicoScope 9300 series of PC-based oscilloscopes from Pico Technology offers 20-GHz bandwidth on two channels and a sampling rate of 1 Msample/s for analyzing high-speed electrical signals, including 10-Gbps Ethernet, 10x Fibre Channel, InfiniBand, and PCI Express. In addition, the small size of the sequential-sampling scopes allows them to be positioned next to the device under test, minimizing cable losses and eliminating the need for expensive active probes or pull-out sampling modules.

Key specifications include an effective sampling rate of over 15 terasamples/s, an input rise time of 17.5 ps, dual time bases from 5 ps/div, and a prescaled trigger bandwidth of up to 14 GHz. A built-in signal generator has a minimum bit interval of 4 ns in PRBS (pseudo-random binary sequence) mode and a minimum waveform period of 8 ns in pulse mode. The oscilloscopes also provide LAN and USB interfaces, as well as display features like density profiling, multiple trace windows, histograms, and statistics.



Best-in-Test 2014: Signal Integrity/High-Speed

pico Technology

2014 Best-in-Test Finalists

Here are the finalists for EDN's Best-in-Test awards in the Signal Integrity/High-Speed Test category. Please give them a review, then follow the links to vote or to return to the name Best-in-Test page to see finalists in other categories.

MP1800A Signal Quality Analyzer, Anritsu

The MP1800A BERT now has a high-sensitivity error detector (ED) that features an Auto Adjust function, as well as 4PAM/8PAM converters and MP1825B 32 Gbit/s 4Tap Emphasis. The enhanced MP1800A meets complex signal integrity measurement requirements associated with physical layer devices and modules with transmission speeds up to 32Gbps.

PicoScope 9312 20 GHz sampling scope with 40 ps differential TDR/TDT, Pico Technology

The PicoScope 9312 evolved from the PicoScope 9200 series. It features 20GHz bandwidth, two channels, clock recovery up to 11.3Gb/S, built in pattern generator with extensive automated measurements, statistics, histograms, and mask testing. All of this is in a compact, portable, PC connected device. The PicoScope 9312 allows the user to plot voltage, impedance or reflection coefficient against time or distance as well as characterize transmission lines, PCB traces, connectors & cables. It provides support for popular industry standards: PCIe, SATA, SONET/SDH, Ethernet, RapidIO, and InfiniBand plus user-defined masks. With the PicoScope 9312, you would be able to measure:Clock distribution, Signal path design, Stubs, Noise margin, Impedances and loading, Transmission line effects, Signal path return currents, Termination, Decoupling, Power distribution and more.

NI PXIe-5162 Digitizer, National Instruments

The NI PXIe-5162, 1.5 GHz digitizer uses updates to the LabVIEW Jitter Analysis Toolkit to enhance the PXI platform for traditional oscilloscope applications. The NI PXIe-5162 digitizer's PXI platform and flexibility make it an ideal general-purpose instrument for test and measurement applications. The high-speed, high-channel, and high-resolution measurements offered by the NI PXIe-5162 digitizer lets traditional oscilloscope users move beyond traditional box instruments. Pairing the four-channel NI PXIe-5162 digitizer with the PXI platform, engineers can build an oscilloscope with up to 68 channels in a single chassis with tight synchronization.

MSO/DPO70000DX Series Performance Oscilloscopes, Tektronix

The MSO/DPO70000DX Series offers 23, 25 & 33GHz models that enable complete system visibility of high speed serial bus system designs. With 16 digital channels on all Tektronix MSO's, engineers can observe a greater amount of their design's electrical behavior at one time, shortening debug cycles and system validation. The MSO70000DX instruments provide 80ps timing resolution on its 16 digital channels. This enables engineers evaluate logic or protocol performance for serial buses like USB, I^2C, and SPI in real-time while performing analog validation of high speed DDR memory on the 4 analog channels.

EE Times 2014.02.14. Vilnius: Oscilloscope Capital of Eastern Europe

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Blog

Vilnius: Oscilloscope Capital of Eastern Europe

Martin Rowe, Senior Technical Editor
2/14/2014 10:41 AM EST
2 comments post a comment

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The Lithuanian capital is still the home of oscilloscope development. This pictorial essay takes you through the development of oscilloscopes behind the former Iron Curtain.

Every so often, we hear about oscilloscopes and test equipment built in the Soviet Union and later Russia, but most of the oscilloscopes come from Vilnius, the capital of Lithuania. How did Vilnius become the center of life for oscilloscopes in Eastern Europe? Learn the story from Jakovas Rososkis and Aleksandr Denisov who are still involved in the design and manufacture of oscilloscopes in Vilnius.

Through a pictorial essay, Rososkis and Denisov take you on a tour of oscilloscopes that came from the Soviet Union. Their company is what remains of the oscilloscope business in Vilnius, but engineers are still designing and building modern USB oscilloscopes for UK manufacturer Pico Technology.

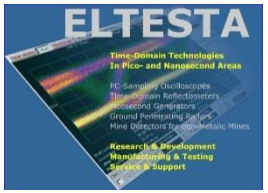
See some 40 photos at A history of oscilloscope development in Vilnius.

Most Recent Comments

Duane Benson David - That's funny. I do recall reading that one. The other annoyance I've been tripped by is the occasionsal the-terminal regulator with a different pin-out. I've seen these...

10/31/2014
2:02:12 AM

Radio



EDN 2014.02.14. A history of oscilloscope development in Vilnius

pico Technology

A history of oscilloscope development in Vilnius

Aleksandr Denisov & Jakovas Rososkis -February 14, 2014

10 Comments

During the Soviet era that ended in 1991, trade between the Soviet Union and the outside world was largely blocked. Some test equipment managed to get in or out but by and large, the Soviet Union developed and manufactured its own oscilloscopes. The center of oscilloscope design and manufacturing was, for many years, in Vilnius, now the capital of Lithuania. Through the following photos, we've assembled a history of oscilloscopes designing and manufactured in Vilnius, both during and after the Soviet era.

Before WWII: Poland

The first electronics company in Vilnius was established in 1925. At that time, Vilnius was a provincial capital of Poland. The first Elektrit factory was built in 1934 on Shepticky Street in the Naujamiestis district. Before WWII, this was the largest factory in Vilnius, designing and producing radio receivers for civil use. It occupied 10,000m² and had its own power station, six assembly lines, and 1100 engineers and workers. The plant produced 54,000 radio receivers

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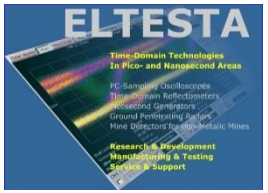
Eltesta won the nomination of the best 2014 Lithuanian company in category "Innovative solutions leader"

Apdovanojimai "Verslo diena 2014"

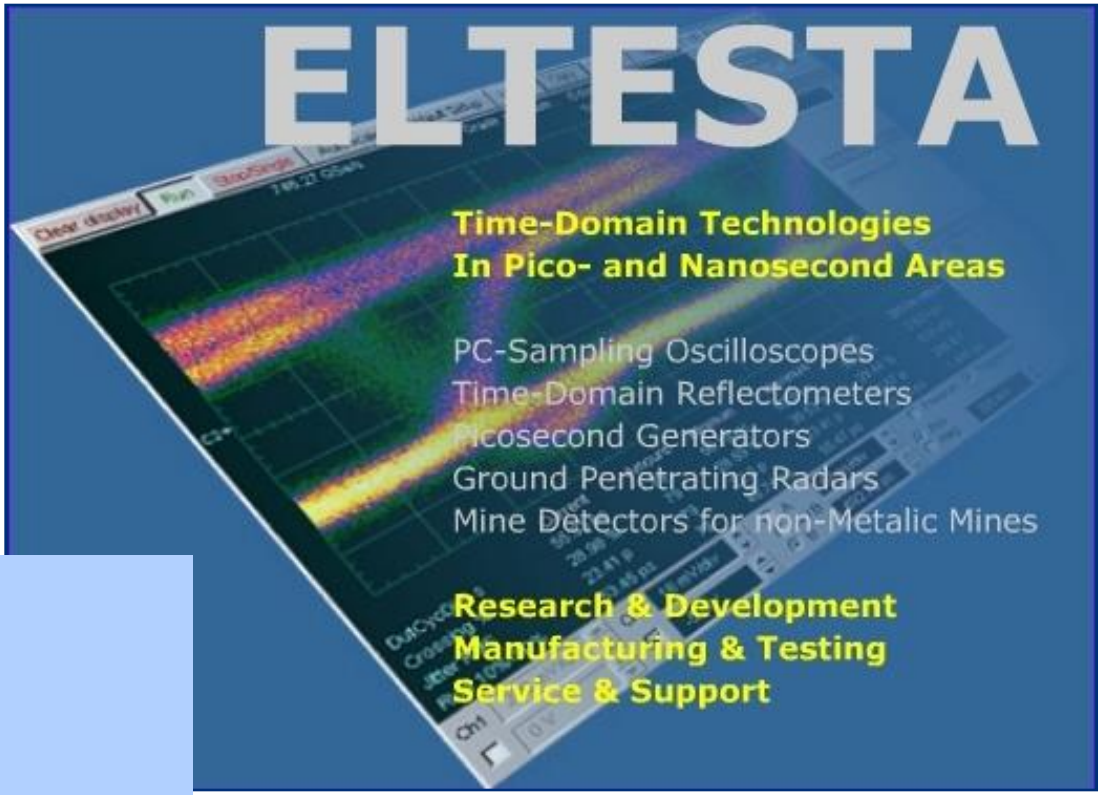
On Thursday, 2014.11.22 through the „Business Day“ organized by Ministry of Economy the best of businessmen of the country were awarded "For merits in business". The event was opened by Prime Minister Algirdas Butkevitcius and the Minister of Economy Evaldas Gustas. From the applications received, the commission established by the Ministry of Economy has selected three best companies in each of nine nominations. Readers also could vote through portal DELFI.

The best company in category "Innovative solutions leader" was elected "Eltesta." Vilnius-based company is well-known as a manufacturer of T&M electronic instruments such as sampling an digital storage oscilloscopes, picosecond pulse generators, underground radars and non-metallic mine detectors.



The End

pico® Technology



Thank You for Your time

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info@eltesta.com

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