

THE R&S MX03 OSCILLOSCOPE

Solo Wang
Application Engineer

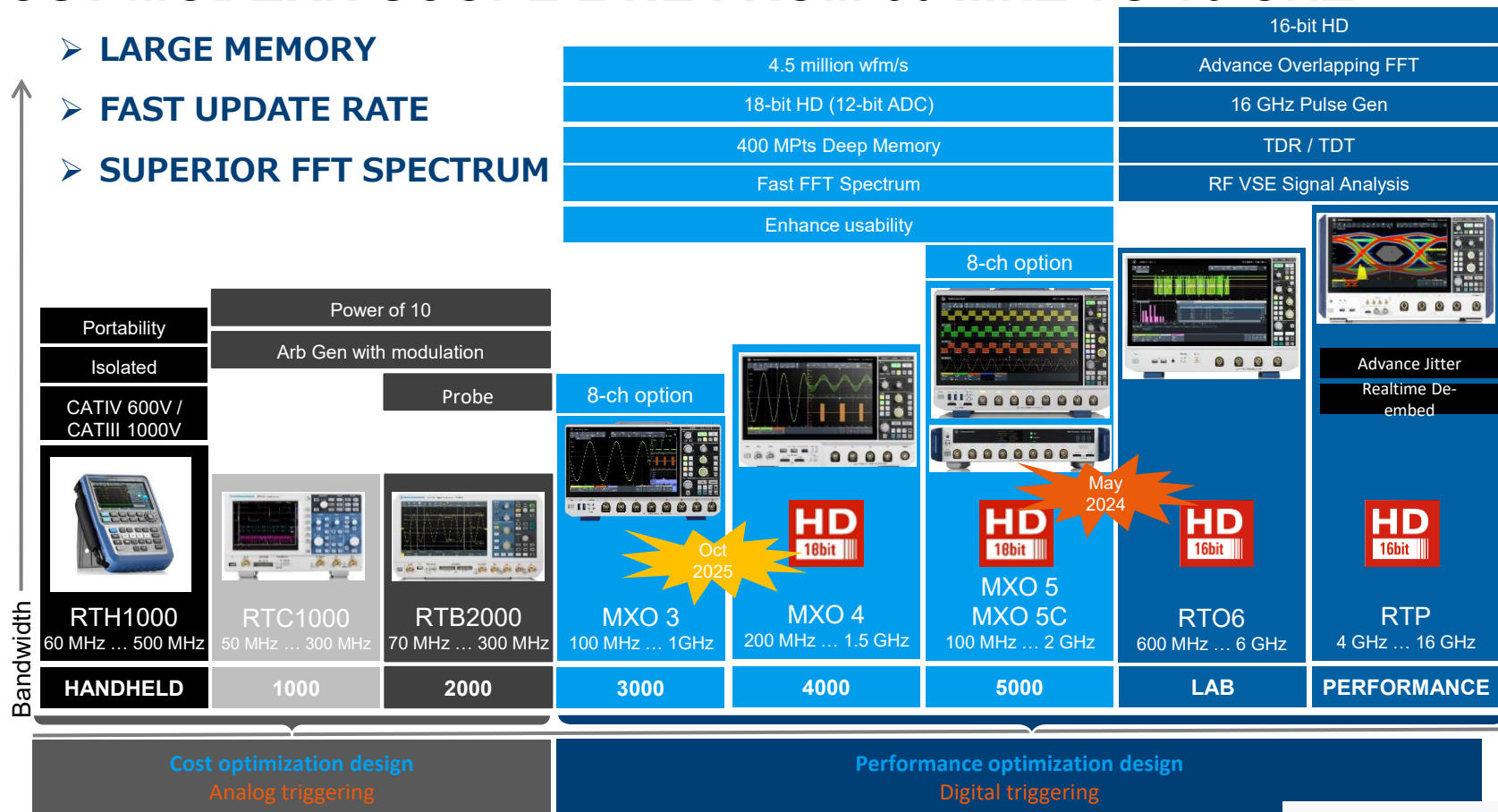
ROHDE & SCHWARZ

Make ideas real



COMPANY RESTRICTED

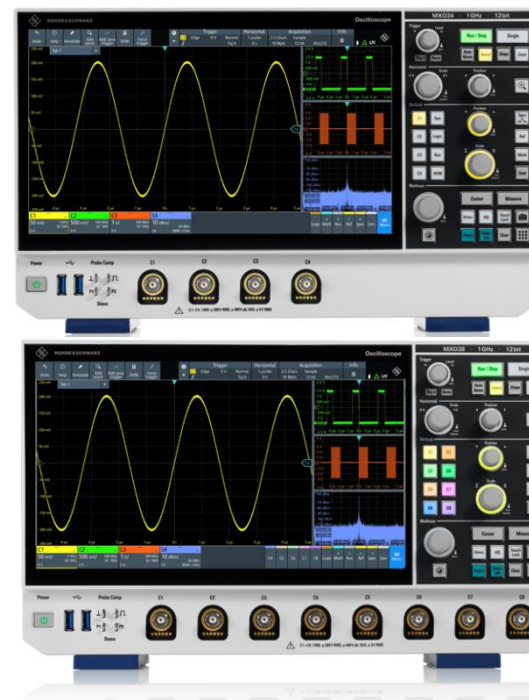
MOST MODERN SCOPE LINE FROM 50 MHz TO 16 GHz



MXO 3 SERIES

KEY SPECS

	MXO 3
Channels	4, 8
Bandwidth	100, 200, 350, 500 MHz, 1 GHz
Max SR	5 GSa/s
Record Length (Per Channel) / option	125 Mpts / 500 Mpts
Vertical resolution	12 bit (HW)
Max. Acquisition rate	4.5 M wfms/s
OS	Closed Linux
Warranty	3 years



4-ch MXO34

8-ch MXO38

MXO3 COMPACT.

FITS ANYWHERE. BIG PERFORMANCE. SMALL FOOTPRINT.

- ▶ 4- and 8-ch models in incredibly small footprint
- ▶ Light weight (4 kg, 8.8 lbs.)
- ▶ 5U rackmount height

Bode Plot



Spectrum



Function Generator



Logic Analyzer



DMM



233 mm
(6.2")



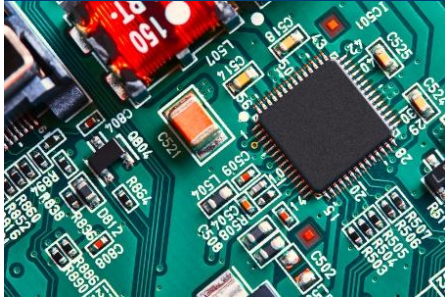
375 mm
(14.8 in)



BENCH / GENERAL PURPOSE APPLICATIONS

EVERYDAY USE CASES

Signal Integrity Debug



EMI Debug



Power Integrity



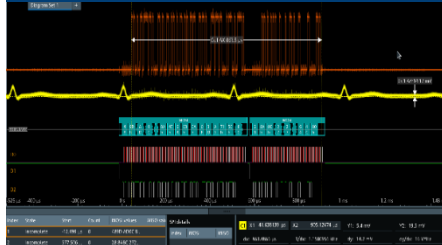
Bench



Logic Analysis



Protocol Analysis



Power Conversion



- HW bring up
- Basic debugging
- DUT power supply

THE ROHDE & SCHWARZ PROBE PORTFOLIO



Low noise



High voltage



Single ended
compact



Differential
modular



EMC near field



Power rail



Optical Isolated



Standard



Broadband



Differential High
voltage



Differential
compact



Precise V&I
Multichannel



Current



RF Frontend

PASSIVE

ACTIVE

SPECIALIZED

KEY FEATURE



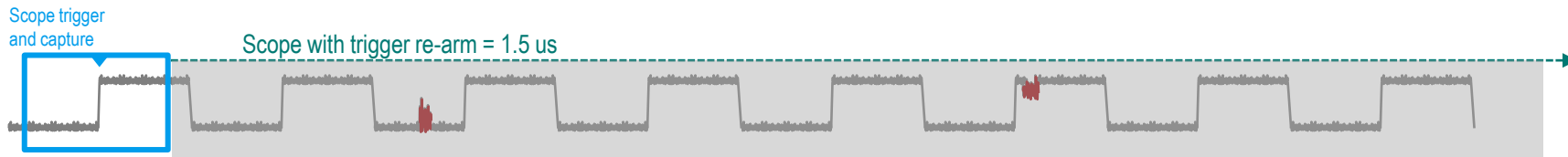
High Acquisition Rate

Long Memory Depth

Digital Trigger

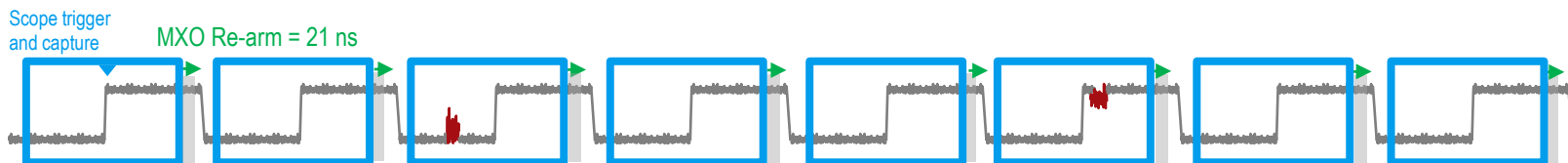
Add-on Applications

LOWEST BLIND TIME: SUPERIOR SIGNAL VISIBILITY

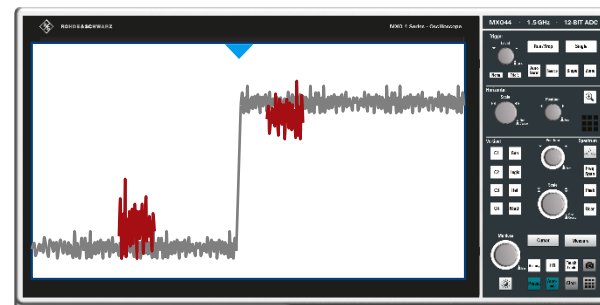


- ▶ During trigger re-arm, scope is blind
- ▶ Even scope at 600k wfm/s will have blind time > 1.5 us

Missing critical signal issues!



- ▶ MXO 3 trigger re-arm time is only 21 ns



Faster scope = more chance to capture rare events

FIND SIGNAL ANOMALIES QUICKLY

R&S® MXO features

- ▶ Optimized signal processing & dedicated ASIC
- ▶ 4.5 million waveforms per second
- ▶ Smooth workflows – even with measurements, spectrum, math or long acquisitions

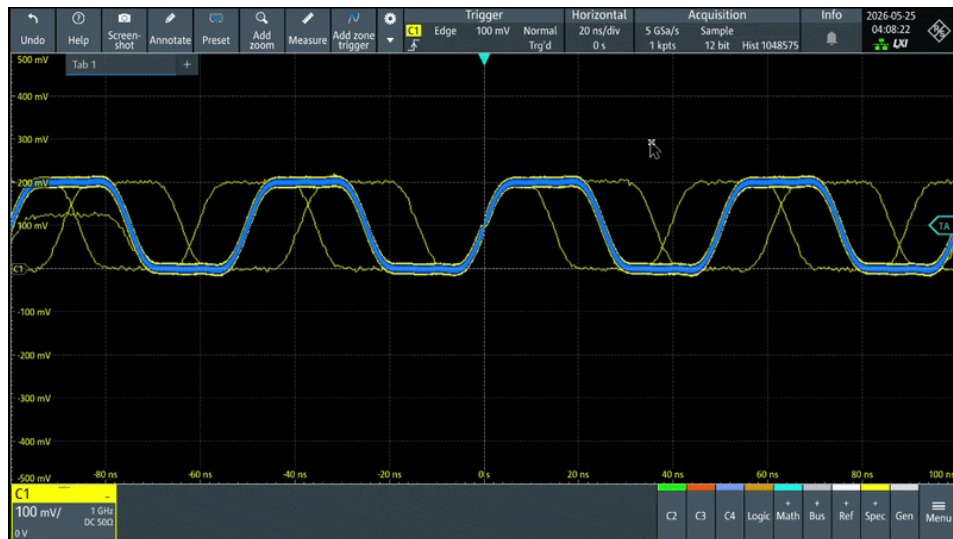
Benefits

- ▶ Catch Elusive Glitches & Anomalies Instantly
- ▶ Accelerate Debugging & Minimize Test Cycles

World's Fastest
Scope

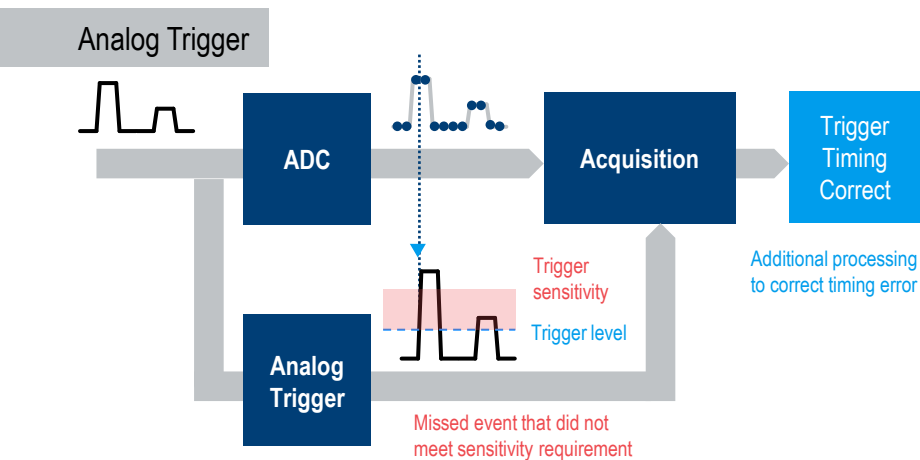
> 4.5M wfms/s

Minimal blind time



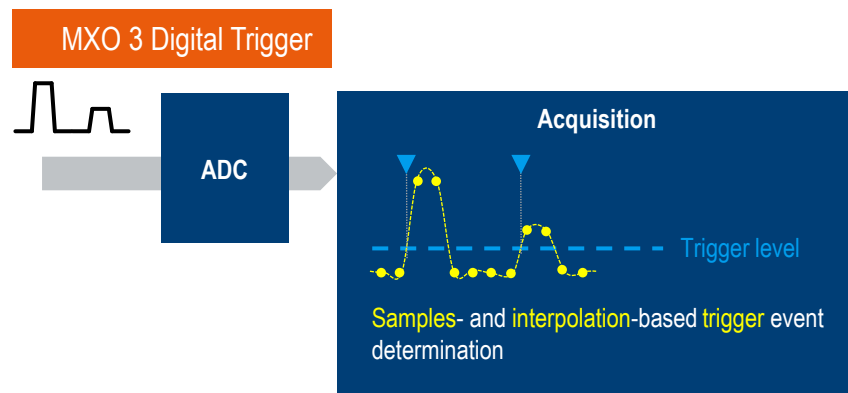
TRIGGER WITH MORE RESOLUTION

- In most 3000 class oscilloscope, limited processing power often use analog trigger



Limitation:

- Lower trigger sensitivity, more than 0.5 div
- Timing alignment between trigger and acquisition block



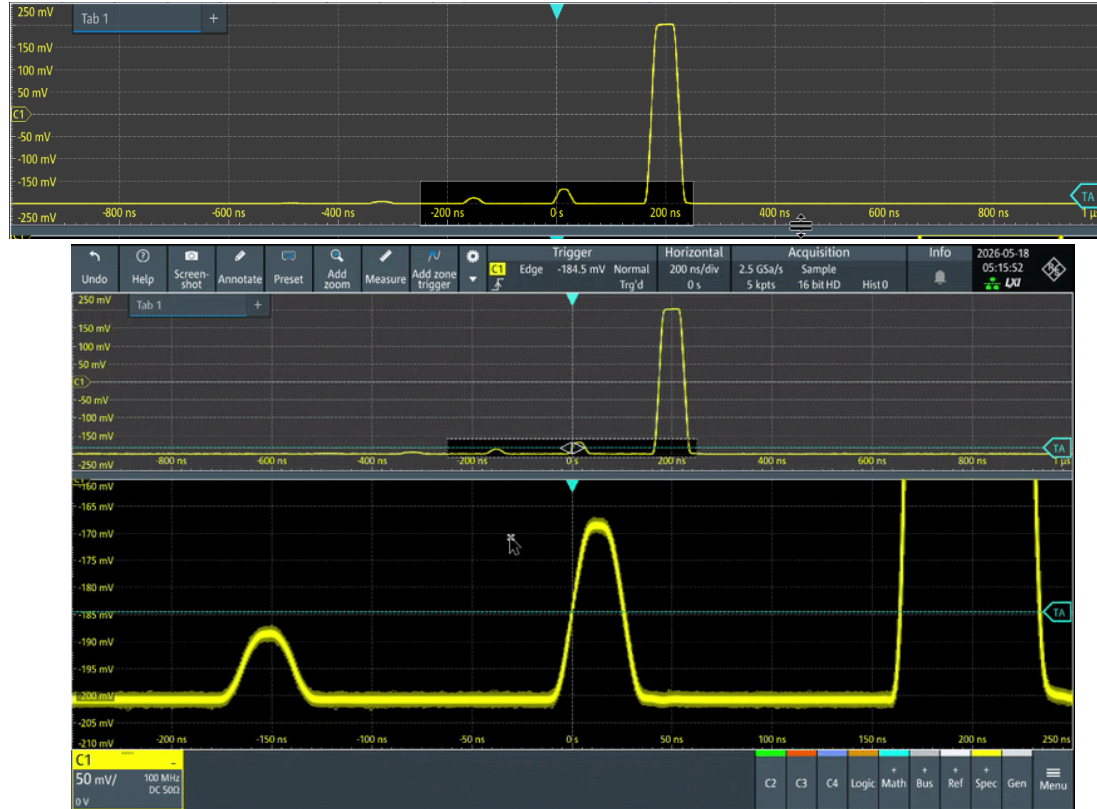
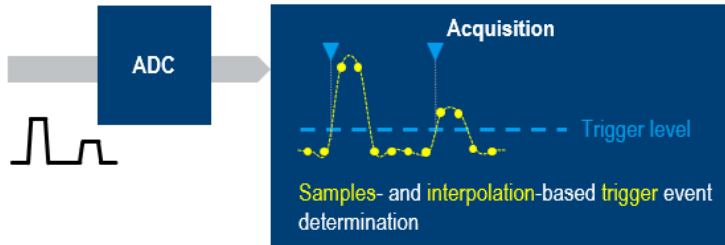
Advantages:

- Trigger sensitivity > ADC resolution
- Essentially no trigger jitter

TRIGGER WITH MORE RESOLUTION

Digital Trigger

- ▶ Detect trigger event on sampled waveforms
- ▶ Adjustable trigger sensitivity
- ▶ Minimal trigger jitter < 1ps
- ▶ 18 bit architecture



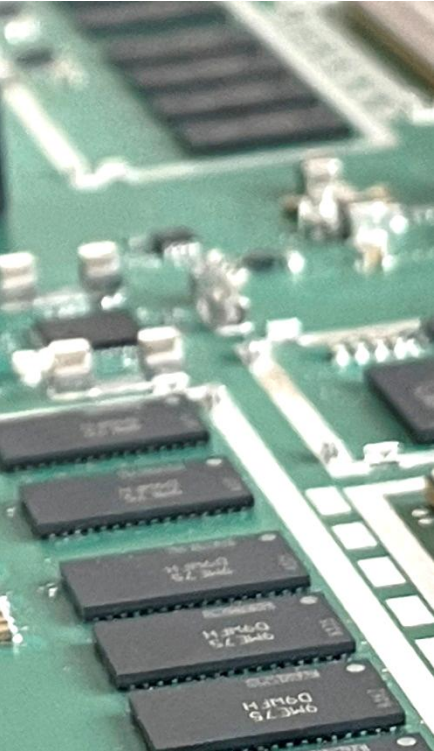
TRIGGER HYSTERESIS

Benefits

- ▶ Reduces false triggering on noisy signals
 - More stable trigger
- ▶ Can be represented as a region or box
 - Defined by trigger and hysteresis levels
- ▶ Signal must “cross the whole box” to be considered a valid trigger event



CAPTURE EVEN MORE TIME



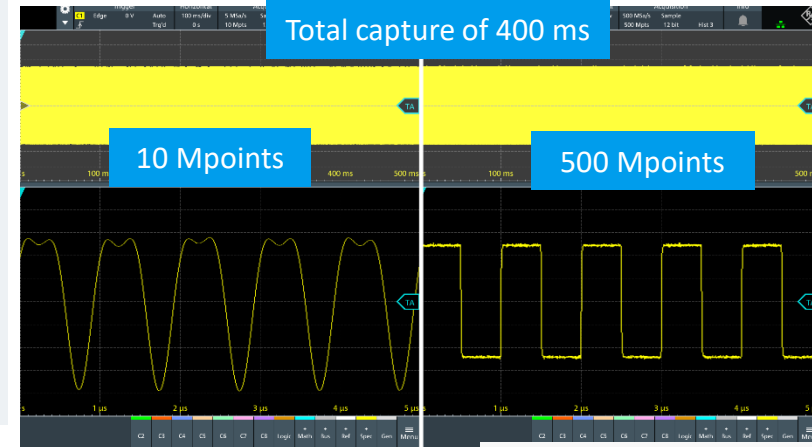
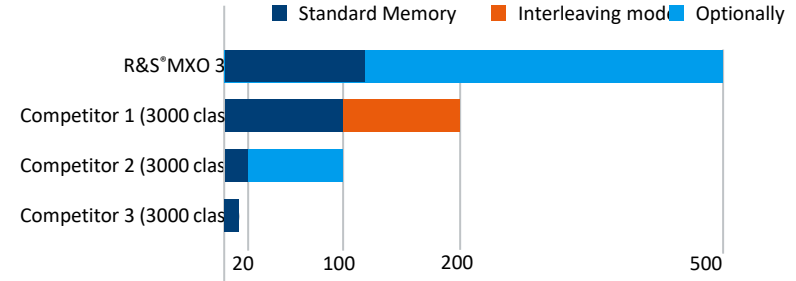
Deep memory

- ▶ 125 Mpts per channel (Standard)
- ▶ 500 Mpts per channel (Option)
- ▶ Segmented memory & History mode

Benefits

- ▶ Measure more (at high sample rate)
- ▶ Capture distant trigger events
- ▶ Analyze previous acquisitions

Memory Per channel



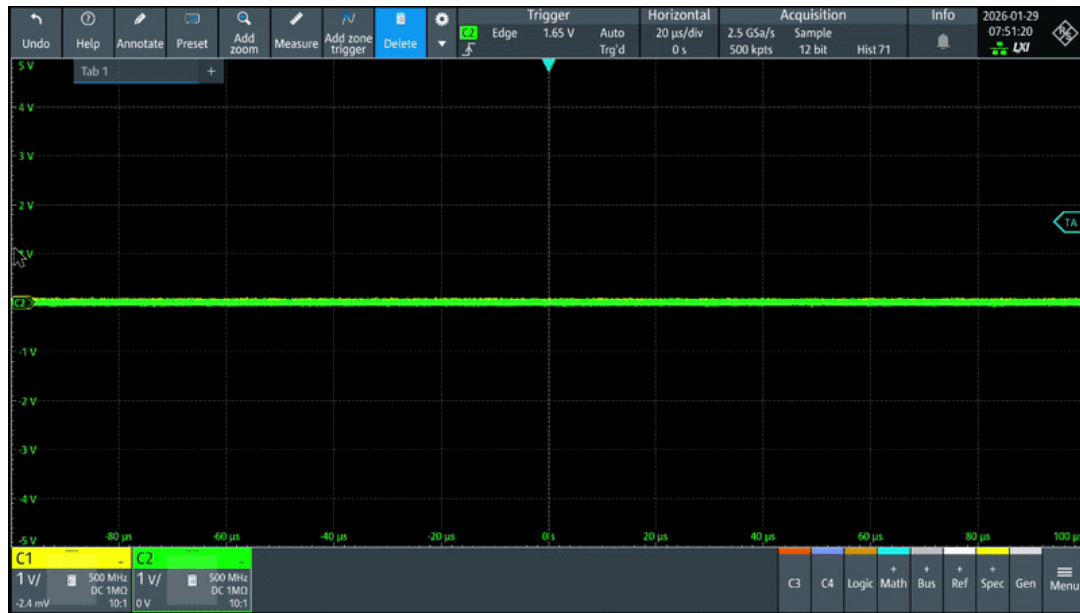
HISTORY MODE : REPLAY SIGNALS

History mode

- ▶ Seamless Background Recording Upon Start-up
- ▶ Deep Memory for Massive Packet Analysis

Benefits

- ▶ Review events you might have missed
- ▶ Instantly replay anomalies after they happen



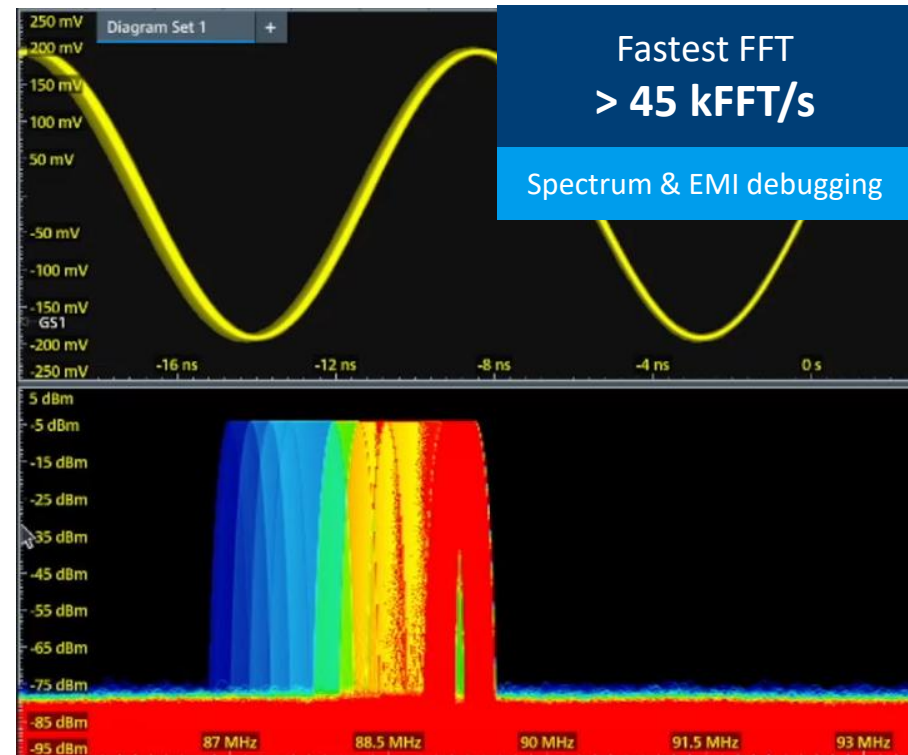
SPECTRUM ANALYSIS

R&S® MXO 3 features

- ▶ Fastest RF insights into your measurement
- ▶ Independent span/RBW control vs time base
- ▶ Automatic peak list and max/min-hold measurement
- ▶ Standard spectrum features

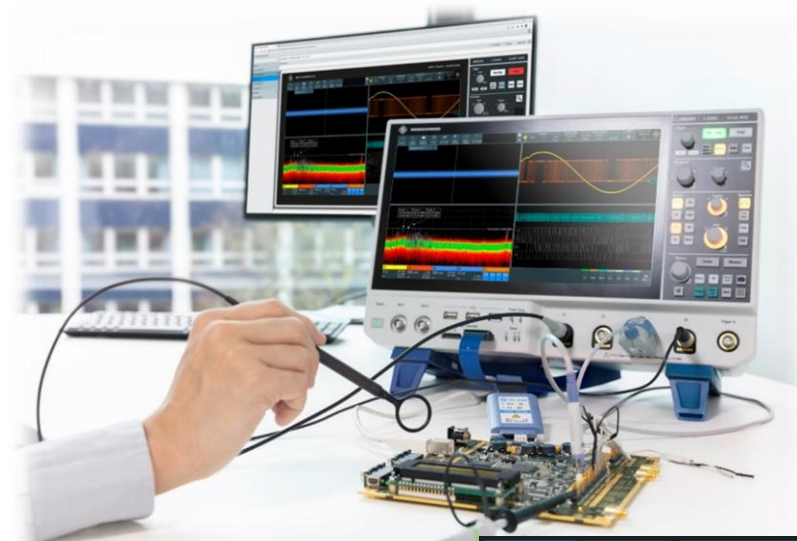
CF Span	Start Stop	Full span
Center	Span	
900 MHz	1.8 GHz	
Auto RBW	Span/RBW	
On	1000	
Traces		
Norm	Min Hold	Max Hold
		Average

RF Characteristic	
Spectrum Update Rate	> 45k FFT/s
Sensitivity / Noise density	-160 dBm (1 Hz)
Noise figure	14 dB
Dynamic range	92 dB
SFDR	68 dBc
2nd Harmonic distortion	-52 dBc
3rd Harmonic distortion	-46 dBc

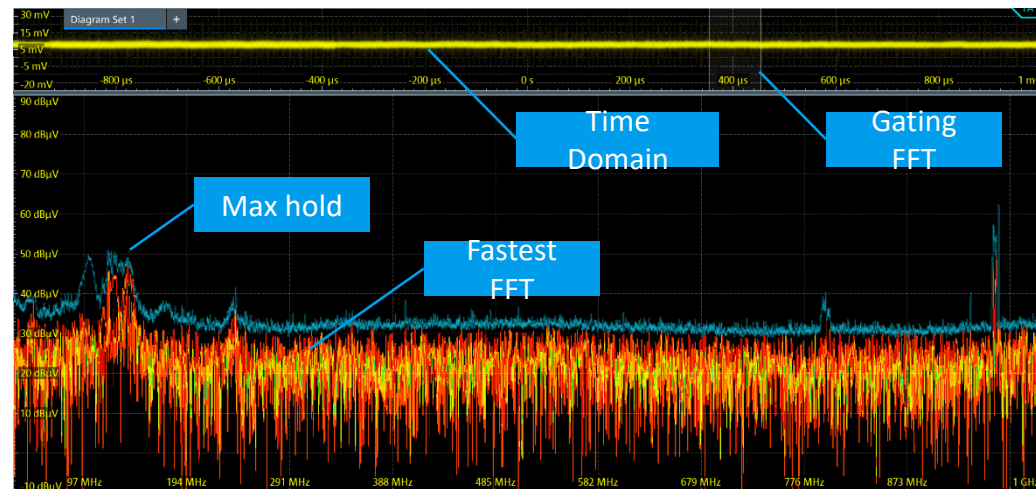


Your Go-To Tool

INSIGHTFUL EMI DEBUG



CF Span	Start Stop	Full span
Center	900 MHz	1.8 GHz
Auto RBW	On	Span/RBW
		1000
Traces		
Norm	Min Hold	Max Hold
		Average



- ▶ Fast FFT to capture intermitted EMI fault
- ▶ Supports log-log scale and dBuV display
- ▶ Time and Spectrum correlated to find emission
- ▶ Peaklist, min/max-hold and intensity grading

Responsive and easy setup for debug work



Rohde & Schwarz

COMPANY RESTRICTED

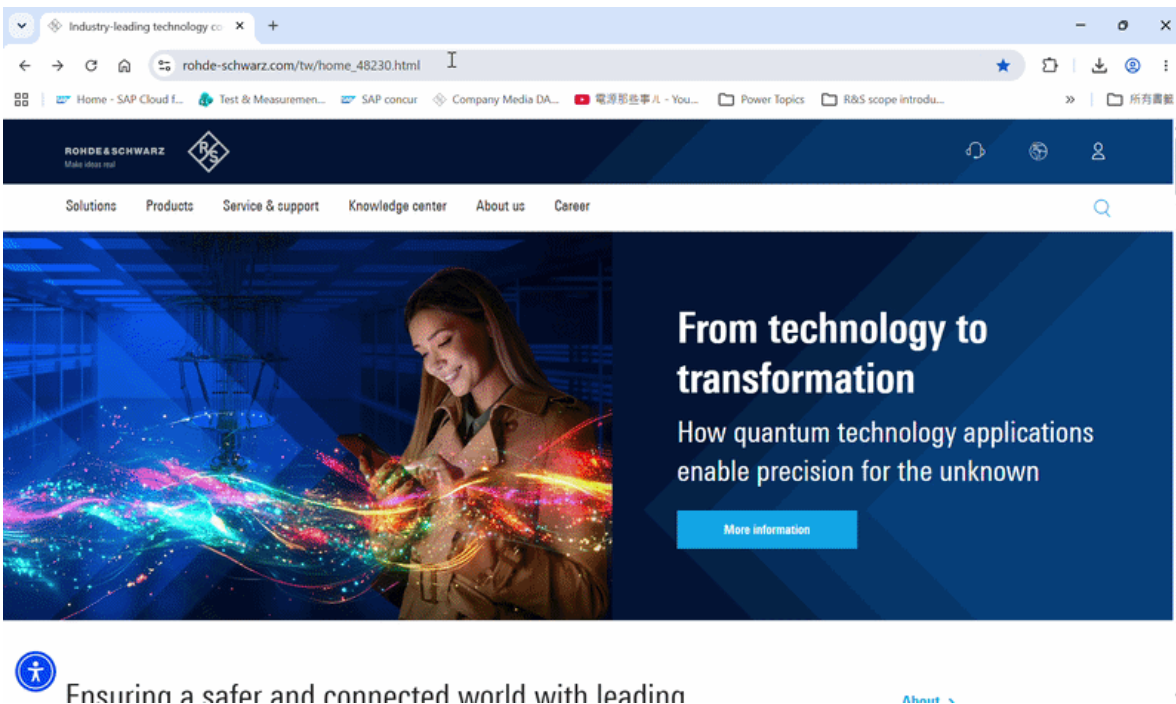
REMOTE CONTROL

Remote control

- ▶ Browser-Based Remote Access
- ▶ Identical Virtual Front Panel UI
- ▶ One-Click Data Export to Local Download Path

Benefits

- ▶ Zero-Software Setup & Cross-Platform Flexibility
- ▶ Streamlined Documentation & Instant Data Logging



SCOPE STUDIO

- Reload of scope waveforms for further analysis and reporting
 - Test & Support **offline**:
 - Measurement, cursors, track
 - Spectrum, Math and filtering
 - Zoom and annotation
 - Decoding



MXO 3 SERIES MSO-ENABLED: 16 DIGITAL CHANNELS (OPTION MXO3-B1)



► MSO enabled:

- just add MXO3-B1
- 16 digital channels
- 5 Gsa/s
- 125 Mpts



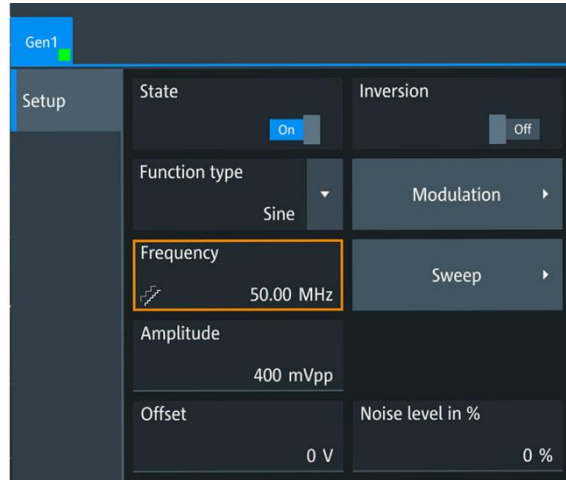
MXO 3 SERIES: SERIAL BUS TRIGGER AND DECODE OPTIONS



Option	Description	Buses
MXO3-K510	Low-speed serial	I2C, SPI, RS-232,, RS-422, RS-485, UART, QUAD-SPI, Custom NRZ
MXO3-K520	Automotive	CAN, CAN FD, CAN XL, LIN, SENT
MXO3-K530	Aerospace	ARINC 429, MIL-STD 1553, SpaceWire
MXO3-K550	MIPI low-speed	SPMI, RFFE, I3C
MXO3-K560	Automotive Ethernet	10BASE-T1S

MXO 3 SERIES: ARBITRARY WAVEFORM GENERATOR

OPTION MXO3-B6



- Flexible waveform generator
- Record and replay signals for further debug

ARB GEN: MXO3- B6	
Analog output	1 output with 50 or 1M Ω selection
Frequency range	1 mHz to 50 MHz
ARB memory	32 K samples
Sample rate	up to 312.5 M samples/s
Vertical resolution	14 bits
Waveform types	Sine, square, ramp, DC, pulse, cardinal sine, cardiac, Gauss, Lorentz, haversine, exponential rise/fall, arbitrary
Modulation & sweep	PWM on square, AM, FM, FSK on sine, frequency sweep on sine

MXO 3 SERIES: FREQUENCY RESPONSE ANALYSIS (BODE PLOT)

(OPTION MXO3-K36, REQUIRES MXO3-B6)



- ▶ Applications
 - CLR
 - PSRR
 - Passive component characterization
- ▶ Amplitude profile support for best SNR
- ▶ 10 mHz to 50 MHz
- ▶ Parallel display of time and bode plots

MXO 3 SERIES: POWER ANALYSIS OPTION

OPTION MXO3-K31



Harmonic Analysis

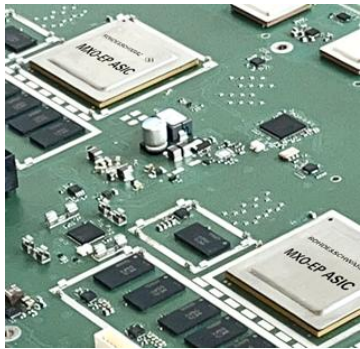
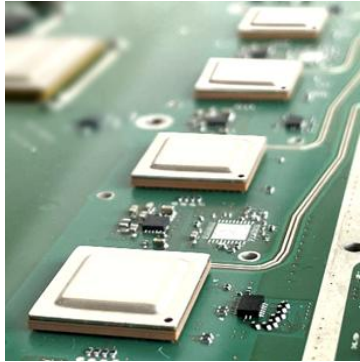
- ▶ In line with EN 61000-3-2 classes A, B, C, D, MIL-STD-1399 and RTCA DO-160
- ▶ Supports 3 simultaneous measurements (e.g. 3x harmonics)



Power Quality

- ▶ Easily determine active, reactive and apparent power, crest factor and phase angle
- ▶ Supports 3 simultaneous measurements (e.g. 3x power quality)

MXO 3: YOUR ALL-IN-ONE BENCH SOLUTION



- ▶ **Catch Glitches Instantly with High Waveform Update Rate**
Industry-leading update rate combined with **Digital & Zone Triggers** to eliminate blind spots and capture rare, elusive anomalies in real time.
- ▶ **Rewind & Replay with Deep Memory Capabilities**
Massive **Deep Memory** power-ups the **History Mode**, automatically logging data so you can rewind and analyze past packets at any time.
- ▶ **Streamline Workflows via Seamless Remote Access**
Browser-based **Remote Control** offers a 1:1 virtual interface mirroring, allowing zero-software setup and direct data export straight to your PC.
- ▶ **Expand Capabilities with Advanced Analysis Options**
Features high-performance built-in **FFT**, while supporting flexible upgrades like **FRA (Bode Plot)** and **Protocol Decode** to secure your future testing needs.

A woman with blonde hair tied back, wearing a dark shirt, is looking intently at a computer monitor. The monitor displays a network diagram with green lines and nodes. The background is dark with blue and green bokeh lights. The text "Thank you" is overlaid in the center.

Thank you