



Sampling Oscilloscope provides a comprehensive optical test solution for telecom and datacom applications, as well as general purpose optical component testing. The sampling oscilloscope optical modules provide > 30 GHz optical bandwidth, plus fully integrated Optical Reference Receivers (ORR)1 enabling both single mode and multi-mode conformance testing at 850 nm, 1310 nm, and 1550 nm bands.

Specifications :

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

Vertical system

- Rise time / bandwidth Determined by the sampling modules used
- Vertical resolution (nominal) 15.6 bits over the sampling modules' dynamic range

Horizontal system

- Main time base / horizontal scale 1 ps/div to 1 ms/div
- Record length > 80 M samples (PRBS23/PRBS23Q x 10 samples)

Trigger system

- Trigger source Clock Prescale Input (front panel)

Clock Prescale Input

- Clock input sensitivity 200 mVp-p at 0.5 GHz to 32 GHz
- Clock input range 200 mVp-p to 1.0 Vp-p (max); AC coupled
- Pattern lengths supported (Pattern Sync) Up to PRBS23 (8,388,607 symbols) inclusive up to maximum record length
- Clock input jitter in clockeye and clock-pattern trigger modes (max)
500 MHz to 2 GHz: < 1530 fs RMS (sinusoidal trigger waveform; typical square-wave performance similar to below values)

Note: Specifications are subject to change, Photos shown above are Indicative, Actual Product can Vary.



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- 2 to 3 GHz: < 600 fsRMS
- 3 to 9 GHz: < 580 fsRMS
- 9 to 32 GHz: < 500 fsRMS

Acquisition system

- Acquisition modes Pattern Sync (sample and average), Sequential [Pattern Sync disabled] (sample and average)
- Number of sampling modules
- accommodated
- Two (2) modules
- Number of simultaneously acquired
- inputs
- Four (4) inputs
- Maximum acquisition rate 300 kSa/s

Waveform measurements

- System measurement rate Supports up to 32 simultaneous measurement² with optional display of per-measurement statistics (min, max, mean and standard deviation)
- Cursor modes Vertical bar, horizontal bar, vertical and horizontal bar, and waveform cursors
- Waveform processing Bandwidth Enhancement/Impulse Response Correction (BWE), equalized waveform
- Histograms Supports up to 30 histograms on multiple windows
- Pulse measurements (standard) High, Low, Amplitude, Max, Min, Mid, Mean, Peak-Peak, Period, Frequency, Rise, Fall, Positive Cross, Negative Cross, Positive Width, Negative Width, RMS Jitter, Pk-Pk Jitter, Delay
- NRZ-Eye measurements (standard) High, Low, Amplitude, Extinction Ratio, OMA, Signal-to-Noise Ratio, RMS, AC RMS, RMS Noise, Eye Height, VECP, TDEC, Crossing Level, Crossing Percentage, Crossing Time, Bit Time, Bit Rate, Eye Width, RMS Jitter, Pk-Pk Jitter, Rise Time, Fall Time, DCD
- PAM4 measurements (license required) RLM, Level, Level Deviation, Level Thickness, OMA_{outer}, Extinction Ratio, Effective Symbol Levels, Eye Width, Eye Height, Transition Time, Overshoot, Undershoot, TDECQ

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Input / output ports**Front Panel**

- Anti-static protection connector - Banana-jack connector, 1 M Ω
- Clock Prescale Input - 200 mVp-p to 1 Vp-p operational, AC coupled with maximum DC offset (-2.2 V to +2.2 V); 2 Vp-p absolute maximum

Rear Panel

- Ethernet port RJ45 connector; supports IEEE 802.3TM Ethernet 100/1000BASE-T

Control

- Control interface Ethernet port
- Device information Instrument serial number, software version, other available using acquisition

Physical

- Height - 132 mm (5.18 in.)
- Width - 217 mm (8.55 in.)
- Depth - 590 mm (23.22 in.)
- Weight (with blank module) 5.4 kg (12.0 lbs.)

Environmental**Temperature**

- Operating 5 to 45 °C, above 1500 m de-rate 1 °C per 300 m; automatic shutdown for temperature > 55 °C \pm 5 °C ambient
- Nonoperating -20 to 60 °C

Altitude

- Operating 3,000 m (9642 ft.); derate maximum operating temperature by 1 °C per 300 m above 1,500 m (4821 ft.)
- Nonoperating 12,000 m (39,370 ft.)

Relative humidity

- Operating 5 to 95% relative humidity at or below 30 °C; 5 to 45% above 30 °C to below 45 °C, non-condensing
- Nonoperating 5 to 95% relative humidity at or below 30 °C; 5 to 45% above 30 °C to below 60 °C, non-condensing

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22235606.2.A and 22235606.2.B Specifications

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Optical inputs

Optical channel count

- 22235606.2.A One (1) optical channel
- 22235606.2.B Two (2) optical channels
- Wavelength range 750 to 1650 nm
- Calibrated wavelength (± 20 nm) 850 nm, 1310 nm, and 1550 nm

Unfiltered optical bandwidth

- Multi-mode 30 GHz
- Single mode > 30 GHz
- Fiber input 3 50 μ m FC/PC

Optical return loss

- Multi-mode > 16 dB
- Single mode > 16 dB

Optical inputs

- Acquisition delay adjustment range per channel ± 65 ps
- Power meter range -38 to +6 dBm at 1310 nm
- Power meter accuracy (typical) +/- [100 nW + (External Power Meter Reading) * [5% + 6% Uncertainty]
- RMS optical noise (hardware; typical)

Bandwidth ⁴	850 nm	1310 nm	1550 nm
12.6 GHz	4.2 μ W	2.8 μ W	3.0 μ W
13.28125 GHz	4.3 μ W	2.9 μ W	3.0 μ W
19.335 GHz	5.3 μ W	3.7 μ W	3.9 μ W
21 GHz	6.2 μ W	4.2 μ W	4.4 μ W
22.5 GHz	8.1 μ W	5.0 μ W	5.4 μ W

- RMS optical noise (hardware; maximum)

Bandwidth ⁴	850 nm	1310 nm	1550 nm
12.6 GHz	6.0 μ W	3.6 μ W	3.9 μ W
13.28125 GHz	6.0 μ W	3.6 μ W	3.9 μ W
19.335 GHz	7.5 μ W	4.5 μ W	4.8 μ W
21 GHz	8.3 μ W	5.0 μ W	5.4 μ W
22.5 GHz	11.1 μ W	6.7 μ W	6.9 μ W

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• Supported Optical Reference Receivers4

22235606.2.A and 22235606.2	Bandwidth electrical (GHz)	NRZ PAM2 standards	PAM4 standards
	8.96	-	26.5625 GBd MM
	11.2	-	26.5625 GBd MM
	12.6	25.78125 GBd MM	Available
	13.28125	Available	26.5625 GBd SM/MM
	19.335	25.78125 GBd SM/MM	Available
	21	32 GFC	Available
	22.5	Available	Available
	25.5625	-	53.125 GBd SM

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