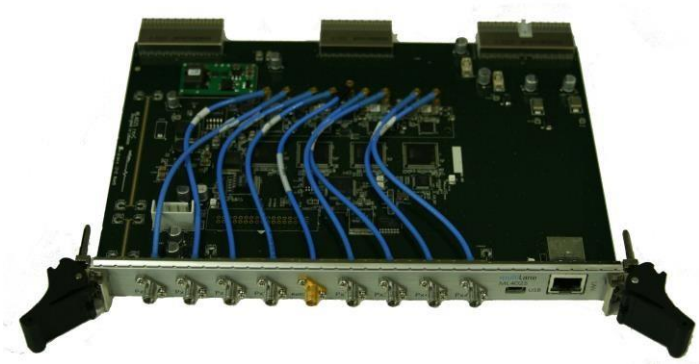
multiLane

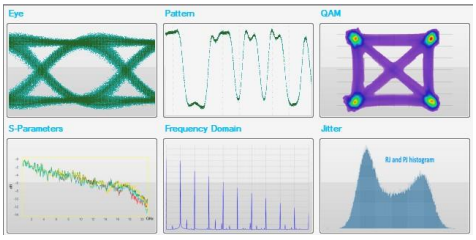
Marketing Datasheet

ML4025



4-Lane Sampling Scope

Jitter Components Decomposition
Eye Pattern Measurement
Eye Mask Test
Advanced Pattern Acquisition
Pre and Post emphasis Measurement
CDR Option

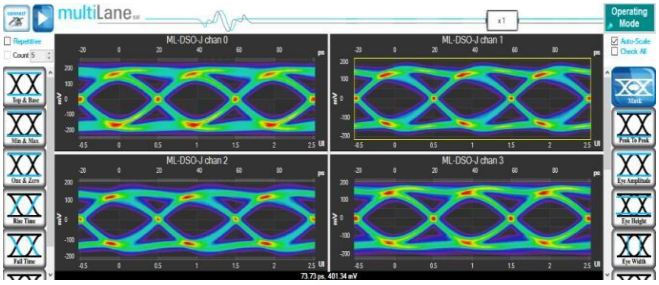


Advance product information subject to change. MultiLane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.

ML4025

4x32GHz DSO
Or 4x50GHz DSO

4-Channel Digital Sampling Oscilloscope providing SerDes testing & characterization for transmitters rates up to 50Gbps per lane



Summary

*The **ML4025** is a state of the art Digital Sampling Oscilloscope with CDR, automatically performing accurate eye-diagram analysis at 32GHz or 50GHz to characterize the quality of transmitters and receivers, implementing a statistical under-sampling technique with comprehensive software libraries used for eye measurements, jitter analysis and processing of NRZ/PAM4 data. It is designed for characterization as well as manufacturing.*

Key Features

- Low cost quadruple 32GHz or 50GHz Digital Sampling Scope optimized for high speed data analysis.
- CDR up to 30 Gbps
- High Fidelity Signal Capture.
- Low intrinsic Jitter.
- cPCI friendly interface, allows control of multiple modules through either Fast Ethernet.
- User friendly GUI, high throughput APIs and libraries. The software supports both Linux and Windows.
- Supports external API calls from other software e.g. LabView.
- Repeatable performance and traceable to standards.
- Single ended and differential electrical inputs for each of the four channels.
- Color graded persistence in eye and pattern capture modes.
- Ability to analyze and load data that you capture into the Simulator.
- Capability to save statistical measurement and data files for multiple DSOs.
- Full eye measurements can be attained in the tens of milliseconds.

Applications

- High-Speed SerDes Testing & Characterization.
- Design/Verification of Telecom and Datacom Components and Systems.
- Electro-optical Transceiver Testing.
- Handheld 10-25 G test equipment for field Installation and maintenance.
- Multi-port system testing of Line Cards.
- In-Situ testing of high port count systems.
- Telecoms Equipment Test for Installation and Maintenance.
- Fiber Channel, Ethernet, PON, Parallel Optics, etc*.
- High port count burn-in test.

DSO Measurements

NRZ Mode

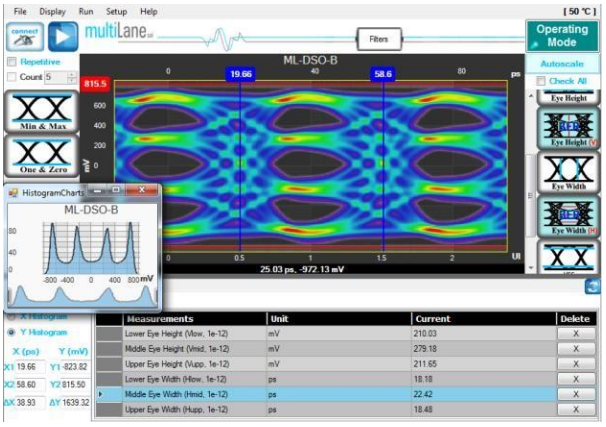
- Total Jitter & Jitter decomposition:
  - DJ, RJ
- Mask Margin, alternate Mask Margin rules available.
- The mask margin (positive or negative) can be extracted for a defined number of points that fail, thus allowing for DUT quality assessment, control and binning.
- Number of failing points for a region can be returned as well as the actual points that failed.
- Eye opening, eye height and width, eye amplitude, top, base, max, min, peak to peak.
- Rise/fall time, single edge measurement in pattern capture.

Advance product information subject to change. MultiLane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.

- Statistics histograms and histogram measurements. EH and EW by BER
- Crossing percentage.
- Pre-emphasis positive & negative (amplitude width).
- Advanced Pattern Measurements
  - Eye measurements on specific properties of the pattern.
- Zooming, markers, X and Y histograms, overlays, and multiple measurements, statistics.

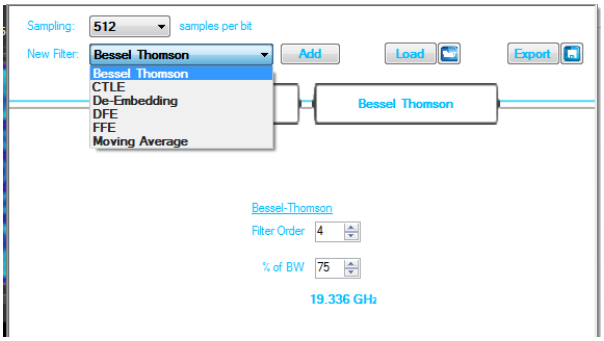
PAM4 Mode

PAM4 scope measurements are currently following the latest OIF contribution.



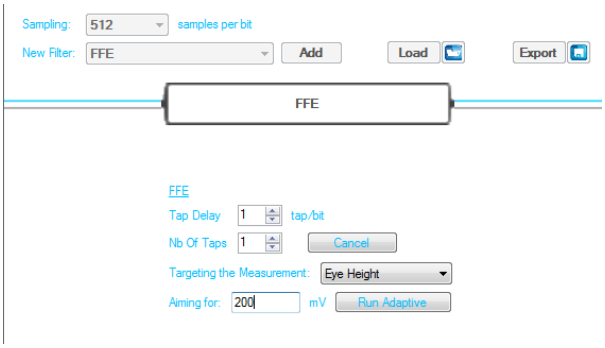
Applying Filters

Several filters including FFE, DFE, CTLE, Bessel-Thomson, etc are available in NRZ as well as PAM mode. Concatenation of several filters is also possible and the effect of each filter is shown immediately on the eye or pattern.



One may also import s2p or s4p files to de-embed fixtures.

A very useful function in determining the ideal CTLE gain for a given trace or the FFE number of taps for a certain target amplitude is the adaptive equalization feature available in the DSO.



Measuring Insertion Loss

If you have a source such as an ML BERT, you can measure the insertion loss (S21) of your device using the DSO. The available dynamic range is 70 dB. The user is guided through the process by a wizard.

Advance product information subject to change. MultiLane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.

Advance product information subject to change. MultiLane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.

DSO Specifications						
Parameter	***Symbol***	***Condition***	***Min***	***Typ***	***Max***	***Unit***
Input Bandwidth (programmable)					32/50	**GHz**
Input Amplitude		S.E./Diff.			600/1200	**mVpp**
Input Rise / Fall Time (20% to 80%)	t_{RT}, t_{FT}			14 for 32GHz 11 for 50GHz		**pS**
Vertical Resolution				12		**bits**
Clock Input range (normal mode)		____	10KHz		550	**MHz**
Clock Input range (bypass mode)			10KHz		125	**MHz**
Clock Input Amplitude		SE			1000	**mV**
Input Impedance	Z			50		**Ω**
Intrinsic Jitter (excluding DDJ)		*Note[1]*			200fS	**rms**
Amplitude Error (rms)		*Note[2]*		4		**mV $_{rms}$**
Data Format support				NRZ,PAM4		
PRBS Pattern Capture		*Note[3]*			PRBS13	
CDR Sensitivity				**100**		**mV**
CDR LBW				**10**		**MHz**
Spurious-Free Dynamic Range (sine wave)	SFDR		**-58 dBc at 10 GHz, 50 mVpp, 1 GS/s -53 dBc at 30 GHz, 50 mVpp, 1GS/s**			
Memory depth				256k		**Samples**
Power rating				1.6A @12Vdc		
Return Loss		20 GHz			-15	**dB**

1. Intrinsic Jitter is the additional jitter uncertainty of the DSO as the statistical sum of sampler, the timing generator and DSO interconnect.
2. Related to calibration time @600mV input over operating temperature range.
3. For all measurements that require pattern lock. For all other measurements the ML4025 supports up to PRBS 31

Advance product information subject to change. MultiLane SAL reserves the right to make changes to its product specifications at any time without notice. The information furnished herein is believed to be accurate; however, no responsibility is assumed for its use.