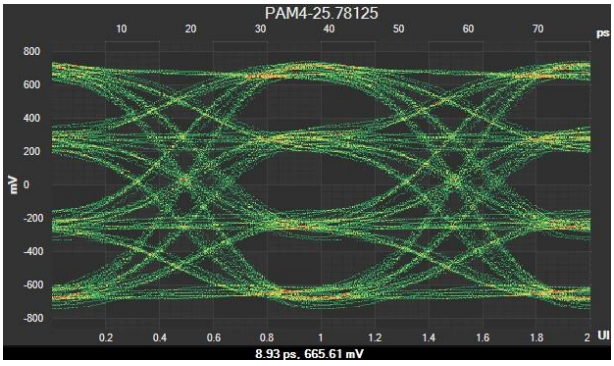
multiLane

Marketing Datasheet

ML4025
4 Channels

Electrical Sampling Oscilloscope

50 GHz or 32 GHz
Supports 400GAUI PAM4 Transmitter Qualification
High Throughput
High Sensitivity
Cost effective



SIGNAL INTEGRITY MEASUREMENT SOLUTION

multiLane

ML4025

50 GHz Electrical DSO

Summary

The ML4025 is a fully featured, cost effective four channels equivalent time sampling oscilloscope. It can be configured to have an analog bandwidth of 32 or 50 GHz.

Typical Applications

- General time domain measurements of high-speed digital communication signals
- High-speed SerDes testing
- High port count burn-in testing
- Transceiver manufacturing test
- Transceiver evaluation and validation
- Qualification of PAM-N and NRZ drivers.
- TP1-a stress calibration

Key Features

The ML4025 family of DSOs is truly powerful, boasting an extensive set of features and functions that are unique in the industry. These include:

- Up to 100 MHz sampling rate
- An extensive library of built-in DSP filters such as Bessel-Thomson, CTLE, DFE, FFE, de-embedding and component emulation, all available free of charge in the standard GUI.
- Can be calibrated up to the DUT to include losses of test fixtures and cables.
- Built-in standard masks library

[1] 50 GHz bandwidth

Specifications (Typical)

Parameter	Specification
Data Format Support	NRZ and PAM-4
Intrinsic jitter	200 fs rms
Input Swing Max	1200 mVpp
Rise/Fall Time	9.5 ps[1]
Vertical Resolution	12 bits
Electrical channel bandwidth	50 GHz or 32 GHz
Electrical channel Connectors	2.92 mm 2.4 mm optional
Clock input bandwidth	0.1 – 550 MHz
Clock input swing	225 ~ 1800 mVpp
Clock input connector	SMA (f), 50Ω
Sampling frequency	70 ~ 100 MHz
Memory	512 kSa. Per channel
Pattern Capture	Up to PRBS-13
SFDR (sine wave) **50 mVpp** **1 GS/s**	-58 dBc at 10 GHz -53 dBc at 30 GHz
Temperature range	0 ~ 75 °C
Power Rating	120/240 V, 1.5A/0.9A
Control Interface	FE
Weight	~ 1.5 kg

Supported Measurements

Coding	Measurement
PAM-4	TDECQ

SIGNAL INTEGRITY MEASUREMENT SOLUTION

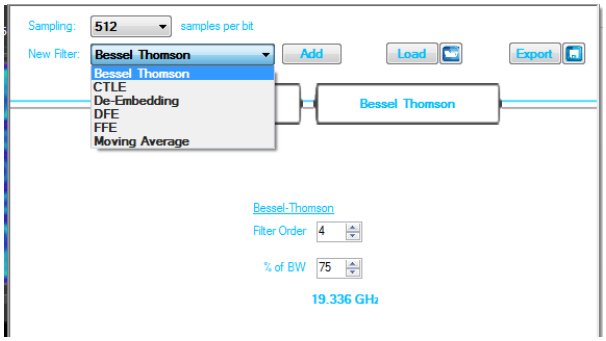
	SNDR
	RLM
	OMA_{outer}
	Eye Height by BER
	Eye Width by BER
NRZ	Top & Base
	Min & Max
	One & Zero
	Transition Time
	Crossing %
	AOP
	OMA
	Mask Margin
	Peak to Peak
	Eye Amplitude
	Eye Height
	Eye Width
	Jitter
	SNR
	ER
	VEC
	Vrms
	DJ & RJ
	Noise

Supported DSP Functions

- Frequency response correction of O/E & analog front end.
- Bessel Thomson 4th Order
- CTLE Adaptive/manual
- FFE Adaptive/manual
- DFE Adaptive/manual
- De-embedding S4P
- Emulating S4P
- Normalizing Filter
- Moving Average

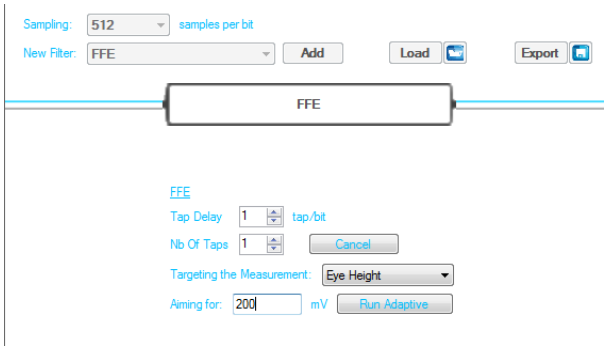
Applying Filters

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.

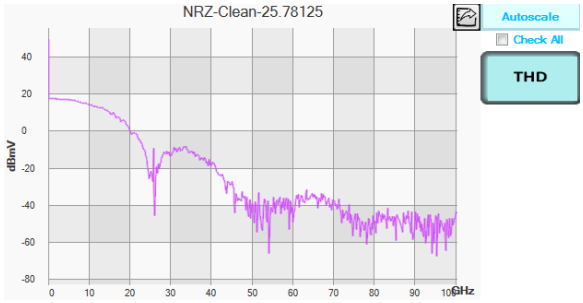


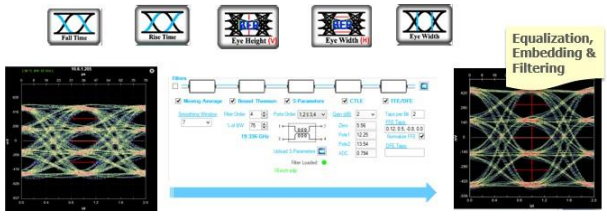
Measuring Insertion Loss

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.

Spectrum Analysis view & THD

The DSO uses DFT to derive the spectral content of the signal present at the input. It also calculates the Total Harmonic Distortion figure



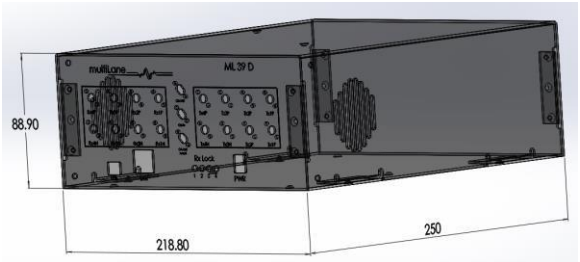


Ordering Information

OPTION	DESCRIPTION
ML4025-XX	
-XX	Bandwidth of electrical channel = **32** or **50** GHz[1]
3YW	3-year warranty

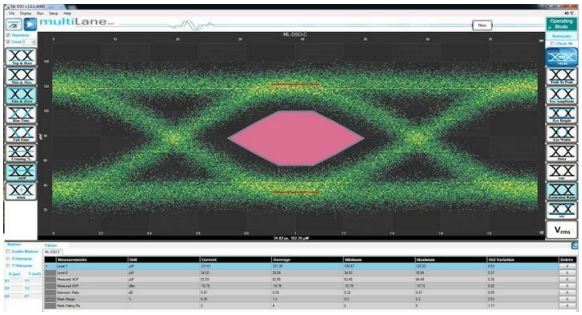
Mechanical Dimensions

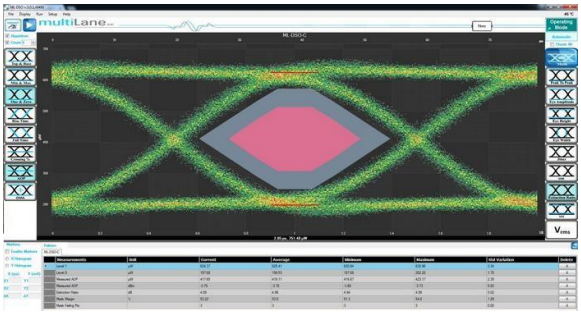
The ML4025 is a benchtop instrument that also fits in a 19 inch 2U rack. Two ML4025s arranged side by side take up one 2U slot in your rack. Multilane also supplies the needed brackets.



SIGNAL INTEGRITY MEASUREMENT SOLUTION

Annex A: PAM4 and NRZ Sample Measurements





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