# multiLane

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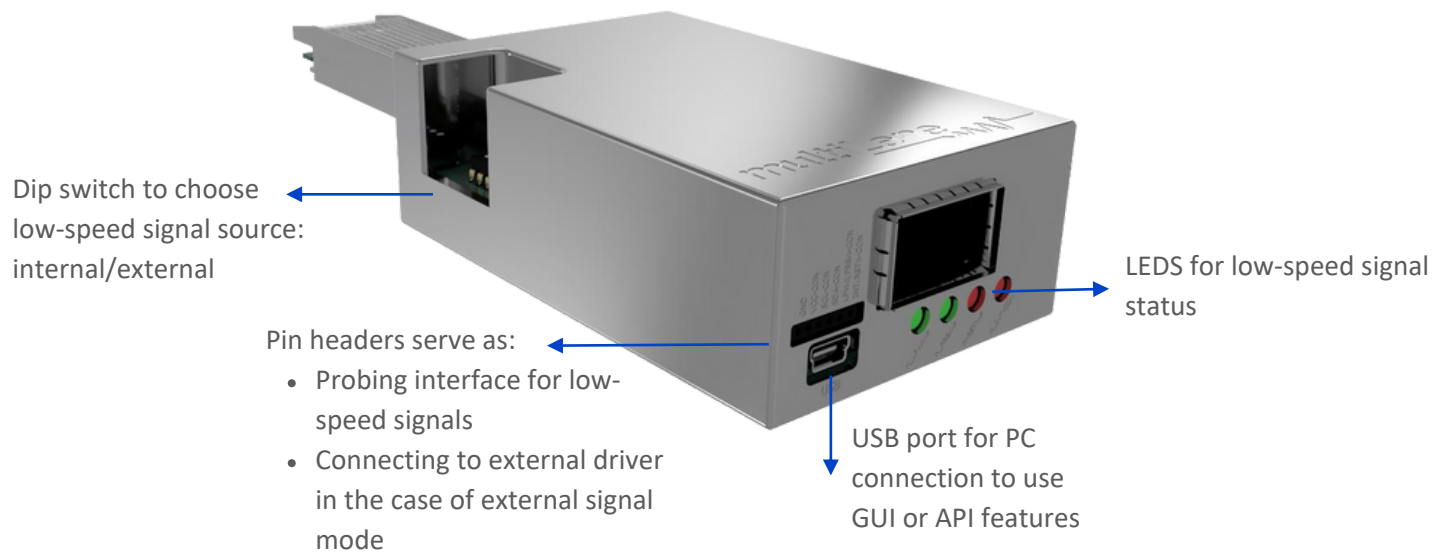
Nexus

Technical Product Sheet

As new CMIS standards are developed and adopted, with a wide variety of SFF/CMIS specifications available, CMIS testing becomes increasingly complex and time consuming. The MultiLane Nexus Analyzer is a direct response to this complexity, designed with speed and simplicity at its core. A CMIS/SFF debug tool for interoperability testing and CMIS/SFF failures, the Nexus Analyzer is equipped with a full feature sweep implemented in its GUI.
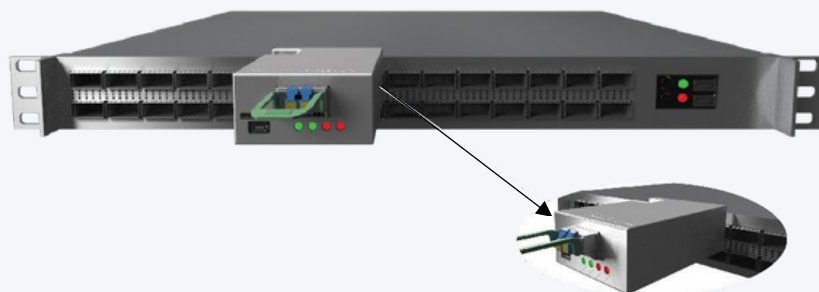

Starvoy Technologies

Demonstrations are available virtually, or in person at our Kanata Test Lab.

Dip switch to choose low-speed signal source: internal/external

Pin headers serve as:
- Probing interface for low-speed signals
- Connecting to external driver in the case of external signal mode

LEDS for low-speed signal status

USB port for PC connection to use GUI or API features

The Nexus Analyzer is used as an 800G verification tool to validate the CMIS/SFF implementation with:

- CMIS/SFF register sweep.
- State machine and data path state machine testing
- I2C R/W commands and packet analysis
- In-rush current and VCC measurements
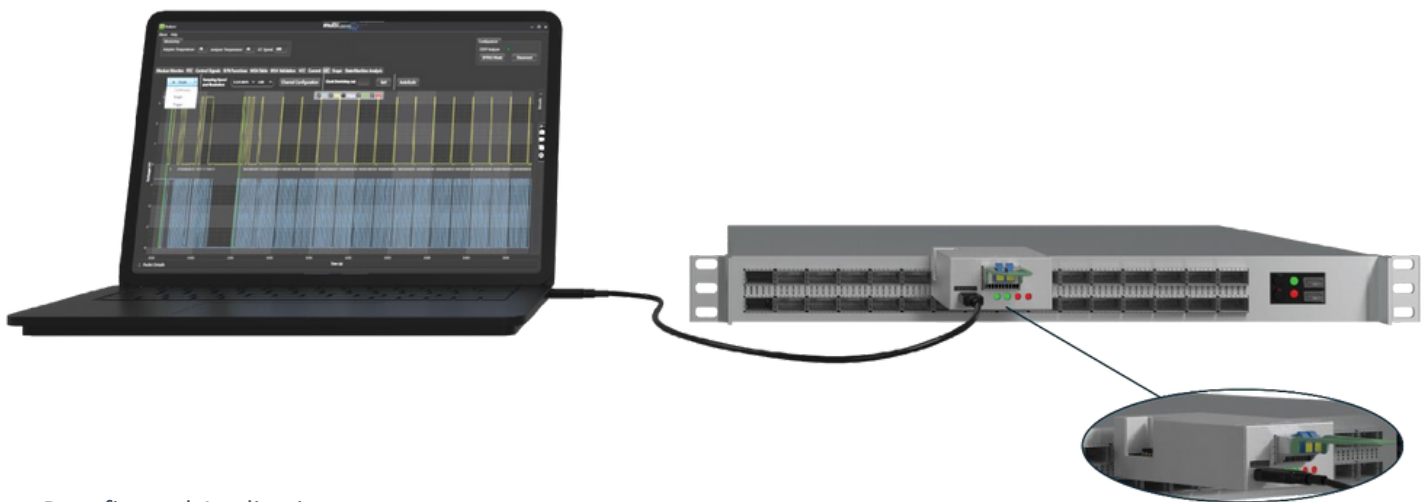
Benefits and Applications:

- System and host port characterization: I2C and low-speed signals.
- 800G capable SI traces
- Ecosystem interoperability testing: I2C sniffer between host and module
- Validates CMIS implementation on module in seconds.
- Voltage noise measurements
- Platform for active modules with module state machine, data path state machine tests and MBM
- validation tools

Analyzer gives access to

Nexus GUI for

interoperability debugging.
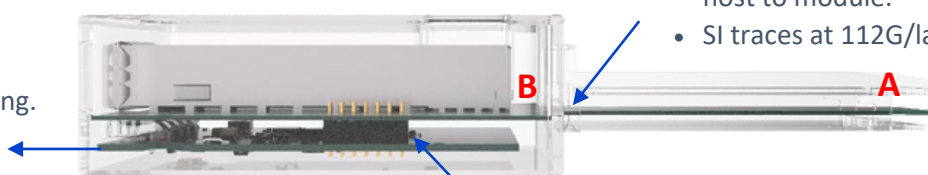
Port Extender/Adapter:
- Connects low-speed signals from host to module.
- SI traces at 112G/lane

B

A

Board to board connector: Adapter mating with analyzer through pin headers.

A: Signals from host side at OSFP800 plug

B: Signals to OSFP800 connector inside Nexus, going to module

| Low-speed Dip switch Front Pin Headers				
signals ON OFF DIP SWITCH ON				**DIP SWITCH OFF**
SCL	Plug connected to connector	Front pin headers to connector, plug side disconnected	Probing interface	External driver
SDA	Plug connected to connector	Front pin headers to connector, plug side disconnected	Probing interface	External driver
INT/RSTn	Plug connected to connector	Front pin headers to connector, plug side disconnected	Probing interface	External driver
LPWn/PRSn	Plug connected to connector	Front pin headers to connector, plug side disconnected	Probing interface	External driver

Adapter

- 800G Adapter Key Features:
- SI traces and connector support 112G rates
- Support up to 30W modules
- Current and temperature sensor
- Module power ripples and inrush current
- measurement
- Detection of power spikes during module state transitions
- Probing interface for Vcc and GND pins
- External I2C
- Dip switch to choose low-speed signal source: internal/external
- Available in all SFF/CMIS form factors
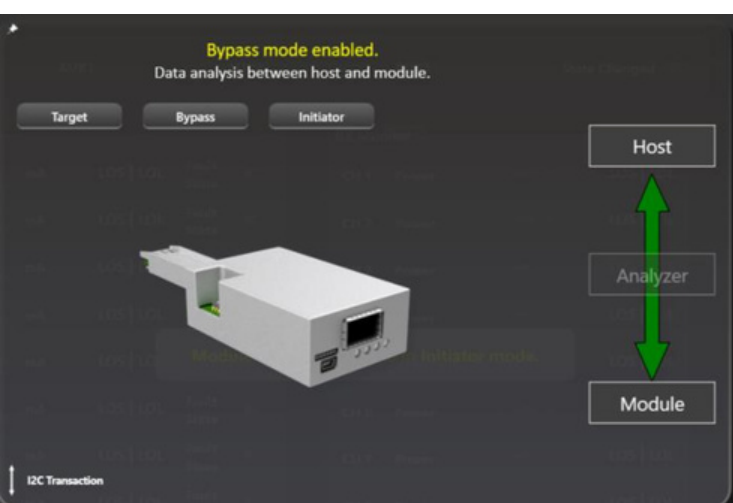
Analyzer

800G Analyzer Key Features:
- Voltage sensor
- ePPS signal validation
- 1 MHz I2C
- Probing interface for low-speed signals
- External control for any low-speed signal:
  - INT/RST
  - LPW/PRS
  - SDA
  - SCL
- LEDs for control/alarm signal status
- USB port for PC connection to use GUI or API features
- Available in all SFF/CMIS form factors

**Measured Insertion Loss data of 800G Adapter:**
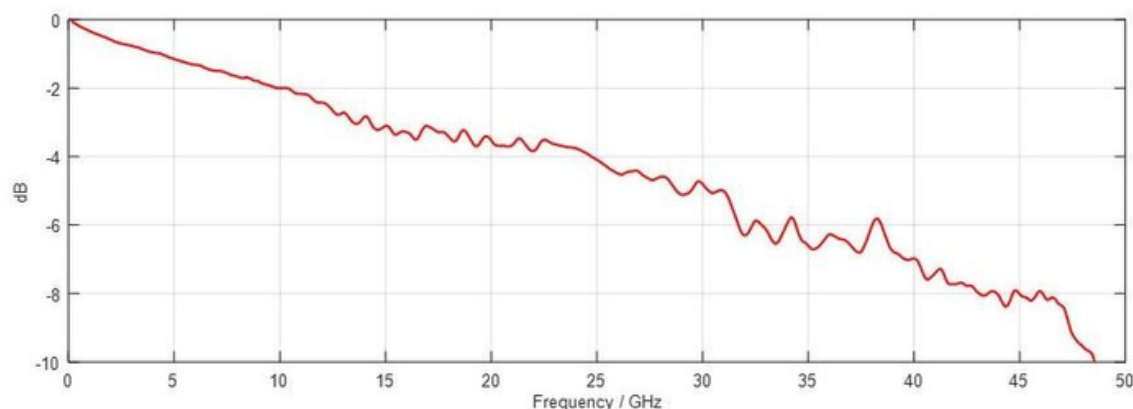
| Nexus GUI Features Description	
Monitor Tab	Diagnostic and Versatile Diagnostic Monitoring
FEC Tab	Monitor FEC status on their module.
Common Data Block (CDB) Tab	Update their module firmware.
Control Signals	Access to low-speed signals in three different modes
R/W Functions Tab	I2C read/write operations
MSA Table Tab	Gives the user access to their module memory.
MSA Validation Tab	Full CMIS/SFF register sweep.
VCC Tab Continuous	VCC Supply measurements.
Current Tab	Continuous and in-rush current measurements.
I2C Tab	I2C packets capturing and packet details analysis.
Scope Mode Tab (any 2 signals at realtime ideal to detect root cause of issues)	SCL, SDA, VCC and Current measurements.
State Machine Analysis Tab	State Machine, Data Path State Machine, and Module State Behavior tests available.

Nexus operates in three modes:

• Target mode: the analyzer acts as a module for a host DUT

• Initiator mode: the analyzer acts as a host for a module DUT

• Bypass mode: the analyzer monitors exchange between host and module.
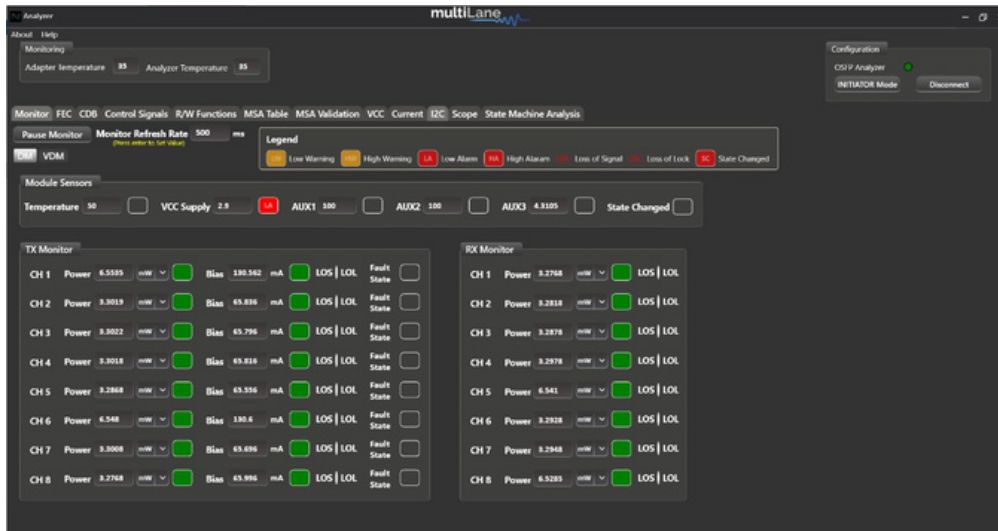
Digital and Versatile Diagnostic Monitoring:

- Module monitoring interface
- Color coded high alarms/ high warnings.
- Color coded low alarms/ low warnings.
- Indexing available for alarms and warnings.
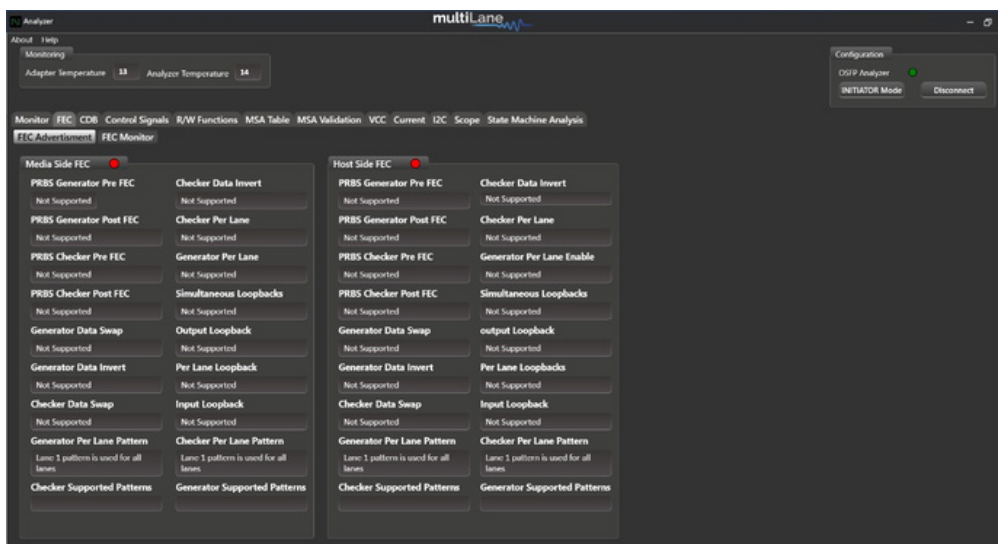
**FEC Advertisement and Monitoring:**

- FEC advertisement for transceiver characteristics
- Access to post FEC
- FEC Monitoring interface for BER, error count, and SNR
- Reads FEC diagnostics from module, implements MSA formatting and presents final BER data
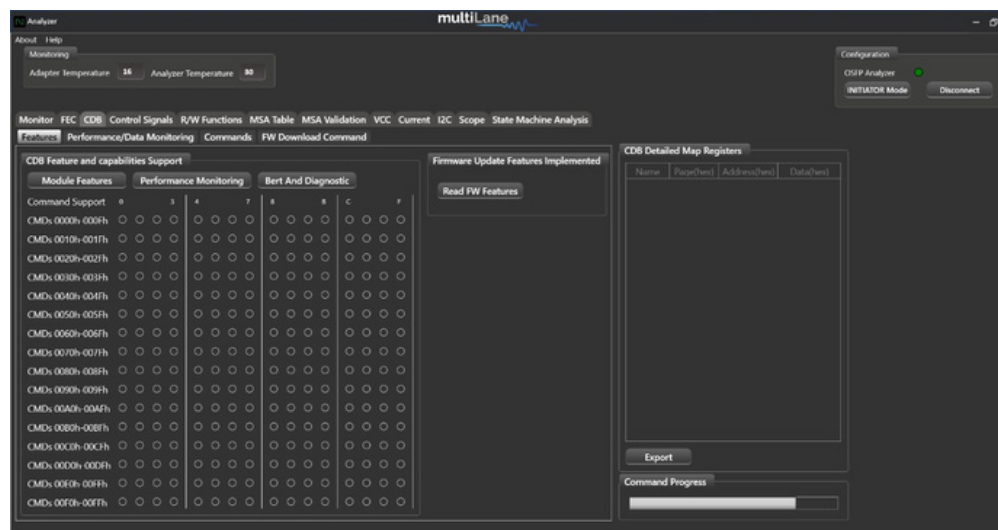

Common Data Block Management (CDB):

- Upgrade module firmware
- Performance Monitoring using CDB

**Communication interface between Host and Module**
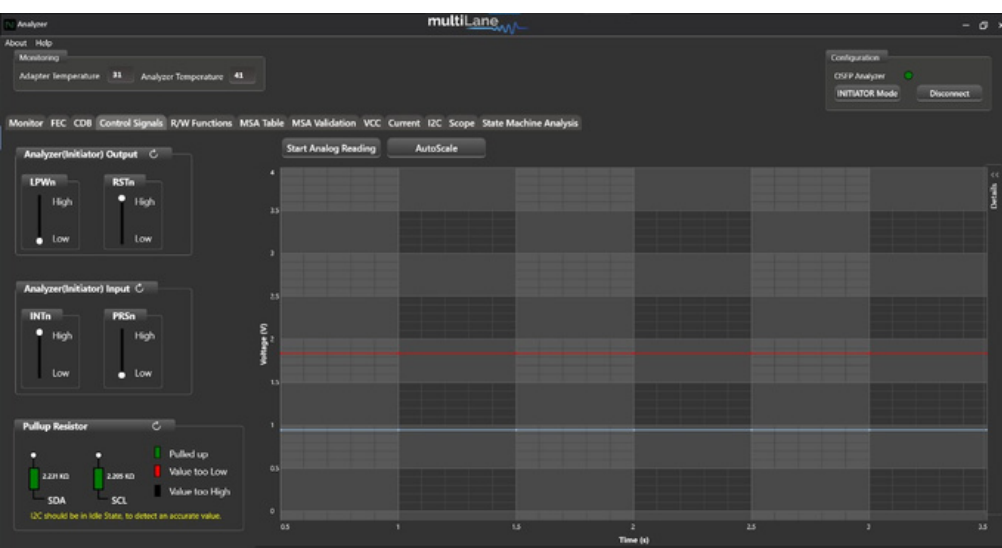
Control Signals:

- INTn/PRSn and LPWn/RSTn
  - Read/ drive control signals
  - Analog sampling of signals in real time
- Graph features vertical and horizontal markers.
- Pull up resistors
- Ability to export/import data
- Access to low-speed signals in three different modes: initiator, target and bypass.
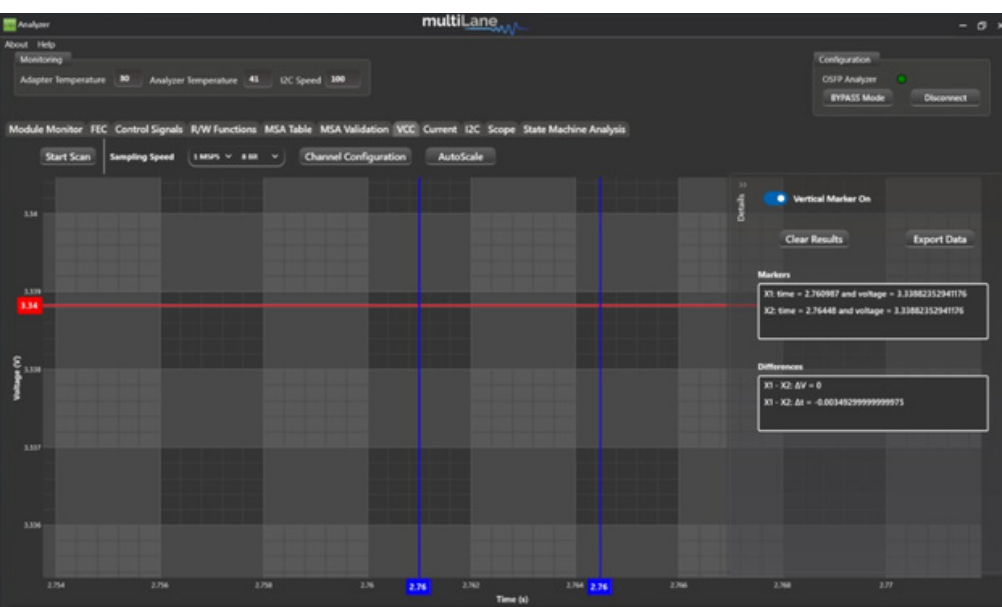

Voltage measurements

- <12 mv accuracy
- Different sampling speeds available
- Graph features vertical and horizontal markers.
- Ability to export/import data
- Ideal for monitoring voltage drops,
- and voltage noise measurements.
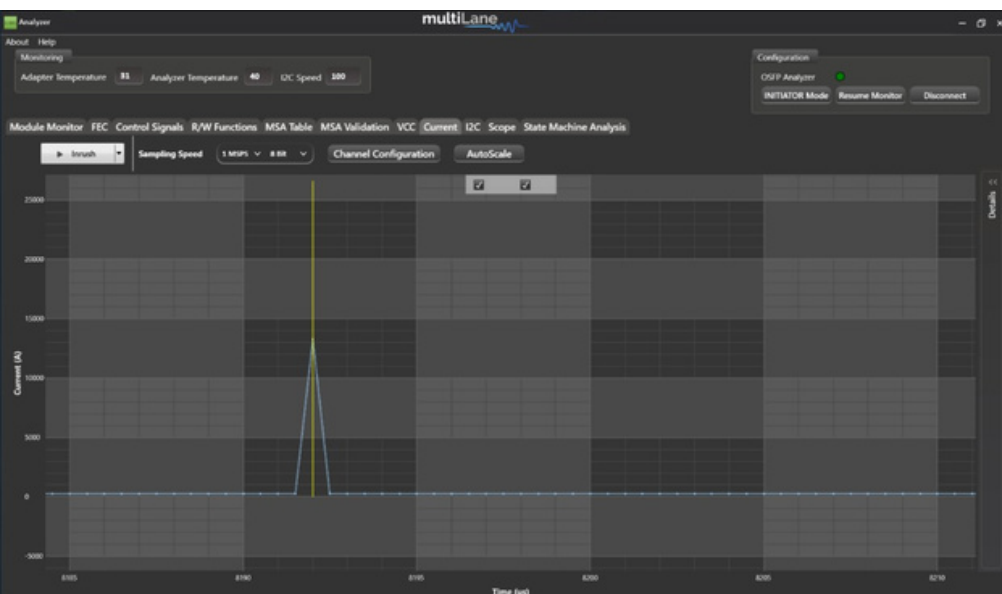
Current measurements:

- Continuous measurements
- In-rush measurements
- Different sampling speeds available
- Graph features vertical and horizontal markers.
- Ability to export/import data

Validate CMIS/SFF Implementation in seconds:
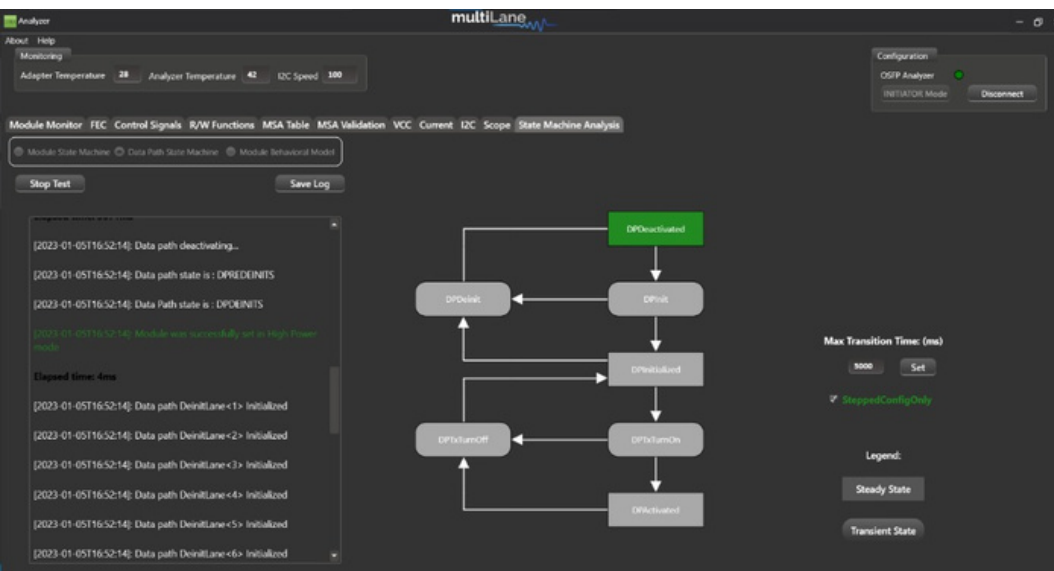
Data path state machine test:

• Logs with timestamps available, available for export
• Test activated from any user defined state
• Data Path State Machine test ideal for active modules
• Module Behavioral Model available for appsel code verification
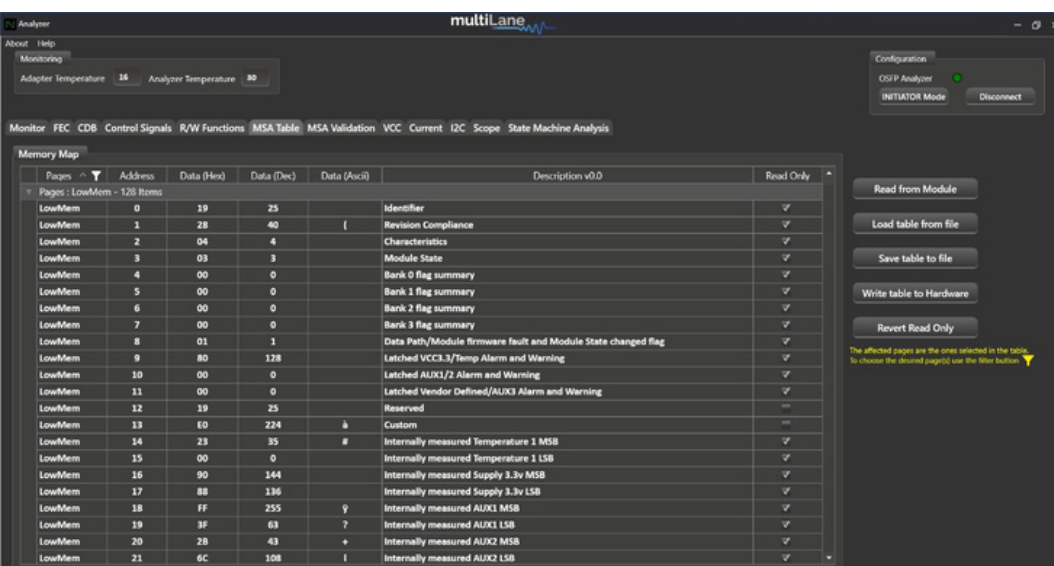
MSA/CMIS Table:

• Load/Read complete or partial CMIS memory map pages
• Load custom MSA memory maps
• Read/Write registers
• Ability to export/import data
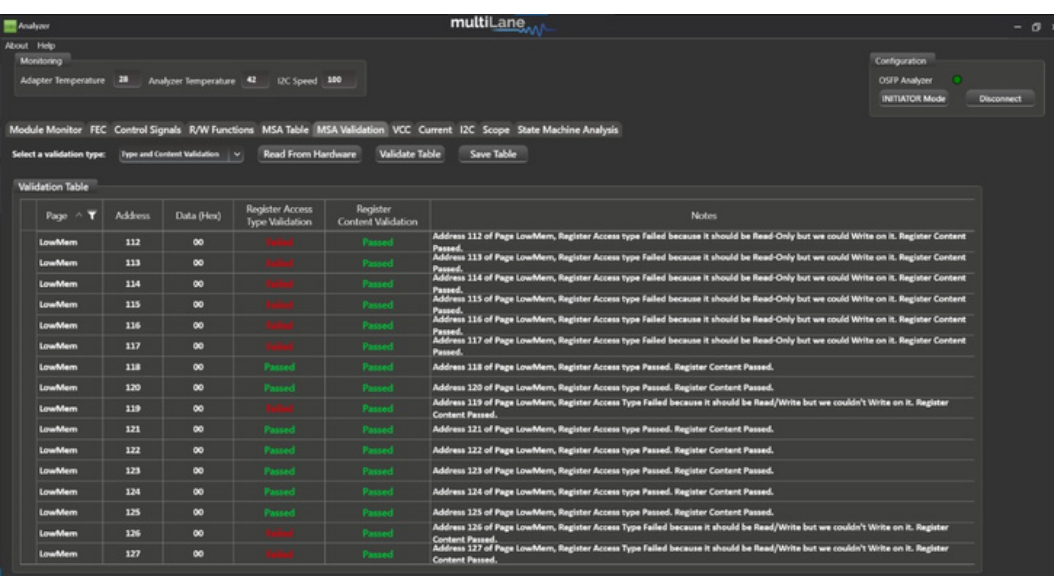
MSA validation with a full CMIS/SFF sweep:

• Register Access Type Validation
• Register Content Validation
• Validate all memory pages at once against CMIS/SFF standards
• Custom memory pages are validated based on register access type validation
• Ability to export/ import data
• Test report generation

Validate and debug I2C communication:
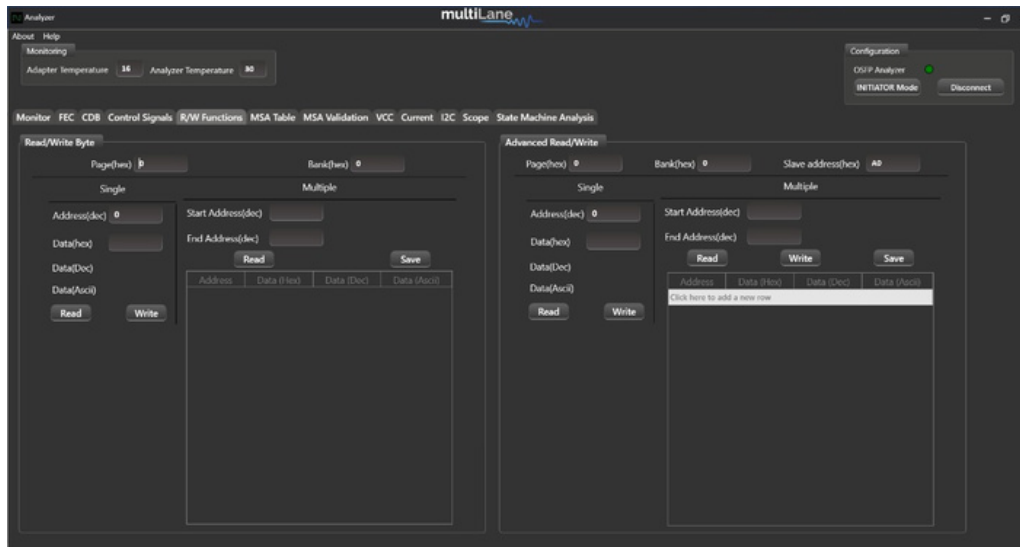
I2C Read/Write operations:

- Single byte read/ write operations
- Multiple byte read operations
- Advanced R/W
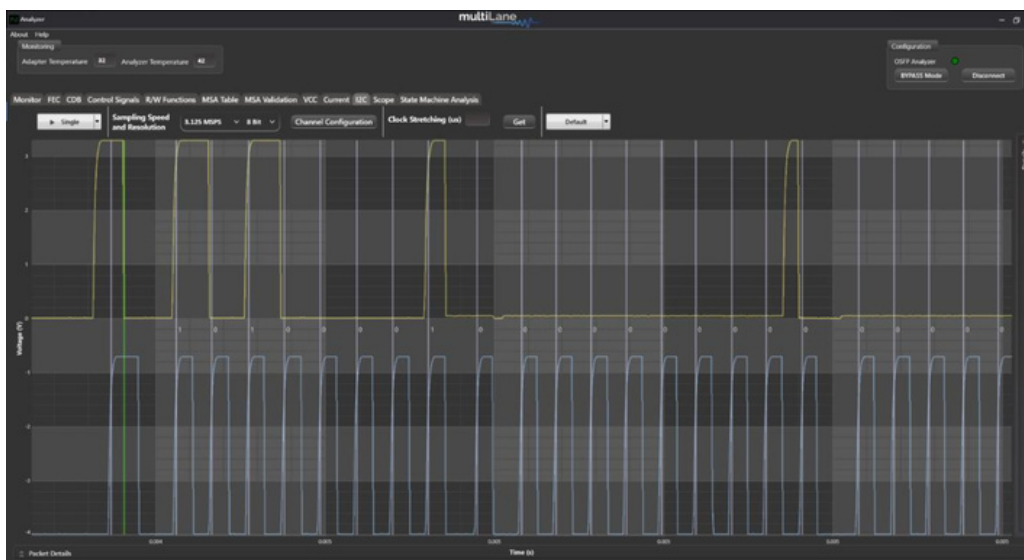
I2C communication between the host and module:

- Single and continuous captures
- I2C trigger and tracking events
- Different sampling speeds available
- Represent SCL, SDA, ACK/NACK, and I2C edges graphically
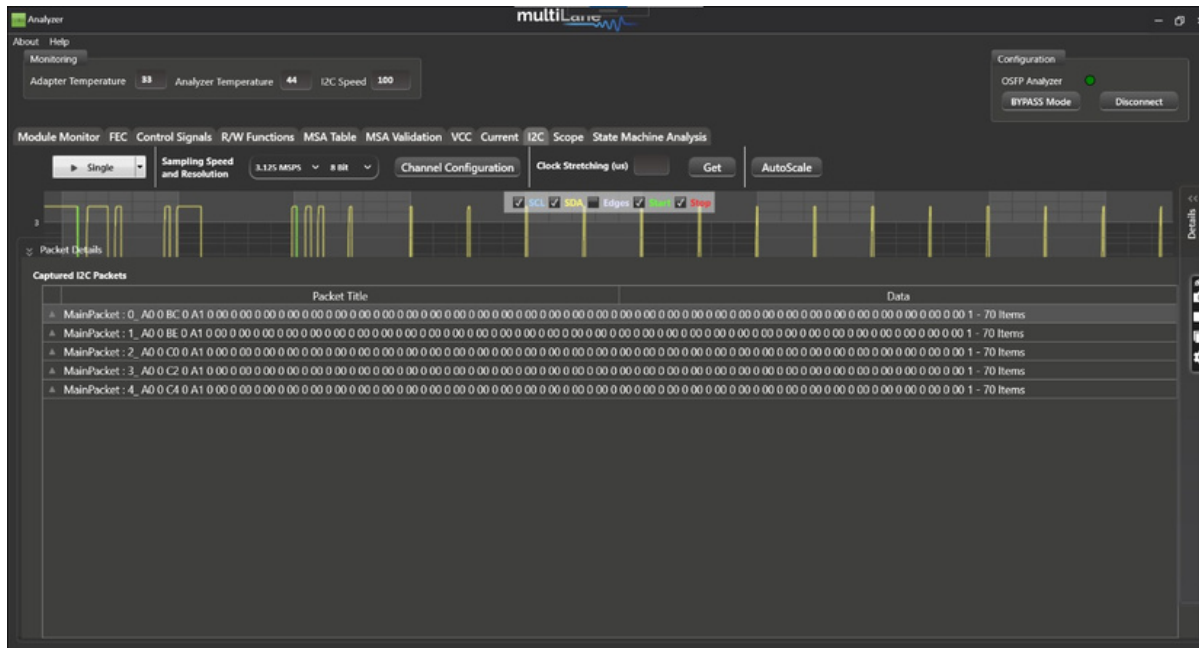- Graph features vertical and
- horizontal markers.

I2C Trigger events:

- Control Signals:
  - Module Interrupt
  - Module Present
  - Reset
  - Low Power
- State Machine
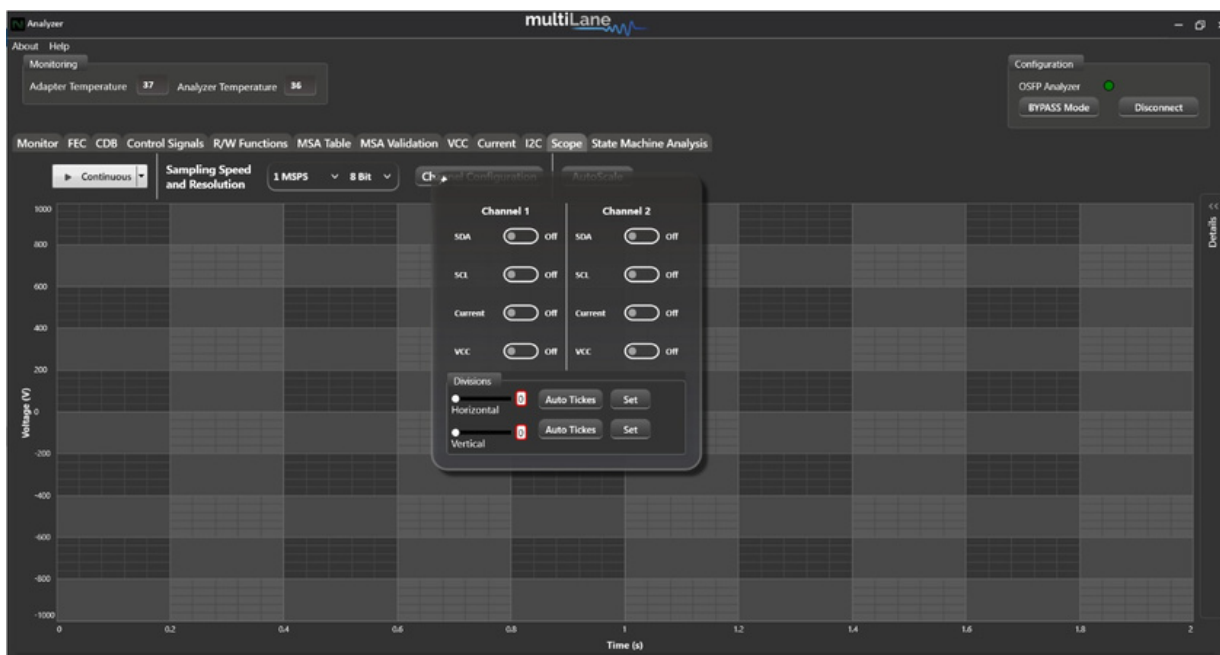- I2C Signal:
  - Start
  - Stop
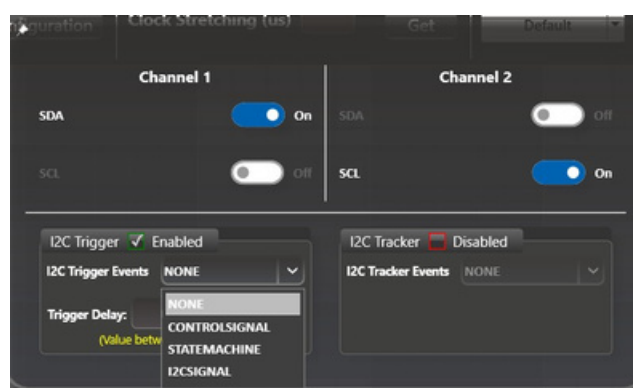
I2C Tracker events:

- Read
- Write

List packet details:

- Select specific packet and locate it on the graph
- Select specific byte from packet and locate on graph
- Data available for all packets captured

Real time probing of OSFP800 low-speed signals

Scope mode:

- SDA, SCL, current, and VCC measurements available as well as combined low-speed signals
- Ability to export/import data
- Graph features horizontal and vertical markers

Ordering Options

Ordering Options	Description
ML4066-NX-HW-OSFP	Nexus HW is the basic hardware package which provides 800G SI paths between host and module, with diagnostic probing interface for low-speed signals
ML4066-NX-Pro-OSFP	Nexus Pro enables all Nexus GUI features including all future CMIS/SFF updates