GREENTEST TECHNOLOGIES

Eclipse UniPro/UFS
Protocol Analyzer/Exerciser Product Family

Key Features and Benefits

Analyzer

- Trace Validation™
  - Including Advanced Editors
- SmartTune™ Equalization
- Eye Monitor
- Streaming Capture
- Advanced Triggering
- Multiple views Link widths x1-x2
  - UniPro and UFS Decoding
  - Simple and Advanced Triggering
  - Pre-Capture Filtering
  - UFS Data Truncation

Exerciser

- Host Emulation
- Full UniPro stack in HW Full protocol emulation
- Error insertion
- Advanced Editors for Test Case Creation
- Extended stress test capabilities

CTS

- Conformance/compliance
  - UFSA-certified for the UFSA Compliance Test Matrix v1.3.
  - Corner case, margin and stress testing
  - Custom test case creation

System

- SMA probing
- Solder-down probing
- 40 Gbps Thunderbolt3 connection

The Eclipse family of UniPro/UFS Protocol Analyzer/Exercisers are the established industry standard with powerful protocol analysis and traffic generation capabilities with unprecedented flexibility. These analysis tools feature full decoding of the UniPro and UFS protocol layers, with unique Events views of low level packet information and raw symbols. The Eclipse product family offers many unique features such as; Trace Validation expert system analysis. SmartTuneTM Equalization, Eye Monitor to assist in signal acquisition, and UniPro and UFS protocol generation and exerciser capability. It also supports advanced editors for creation of individual custom exerciser scripts and test scenarios.

- **The Eclipse M52 Protocol Analyzer/Exerciser** is the latest in the family of Teledyne LeCroy UniPro/UFS Analyzer/Exercisers. The Eclipse M52 supports the latest specifications from JEDEC UFS 4.0, MIPI M-PHY 5.0 with HS-G5, and MIPI UniPro 2.0. It is an advanced Protocol Analyze/Exerciser that can capture or generate x2 links of UniPro/UFS traffic. The Eclipse M52 can be configured as an analyzer only, or as an analyzer/exerciser. The analyzer captures and decodes UniPro and UFS x2 bi-directional traffic. While configured as an exerciser The Eclipse M52 can generate line rate x2 bi-directional traffic while simultaneously capturing the response traffic from the DUT. The Exerciser can perform host emulation and execute the UniPro and JEDEC Compliance/Conformance Test Suites (CTS).
- **The Eclipse M42x Protocol Analyzer/Exerciser** is an advanced Protocol Analyze/Exerciser that can capture or generate x2 links of UniPro/UFS traffic. The Eclipse M42x can be configured as an analyzer only, or as an analyzer/exerciser. When configured as an exerciser, or traffic generator, the Eclipse M42x can generate up to x2 link traffic while simultaneously capturing the response traffic from the DUT. The Compliance/Conformance Test Suites (CTS) included with the Eclipse M42x Protocol Analyzer/Exerciser will verify and validate the relevant CTS specs for UniPro 1.8 and UFS 3.1.
- **The Eclipse T42 Protocol Analyzer** is an entry level protocol analyzer that can capture x2 links of UniPro/UFS at speeds up to HS-Gear4B. It supports M-PHY v4.1, MIPI UniPro v1.81 and UFS3.0. The Eclipse T42 can also be upgraded to the advance feature set of the Eclipse M42x Protocol Analyzer.

SmartTune™ Equalization[1]

In some instances, acquiring the signal from the DUT can be problematic when test fixture trace routing or the cabling required to connect to the test fixture causes poor signal integrity or probing issues.

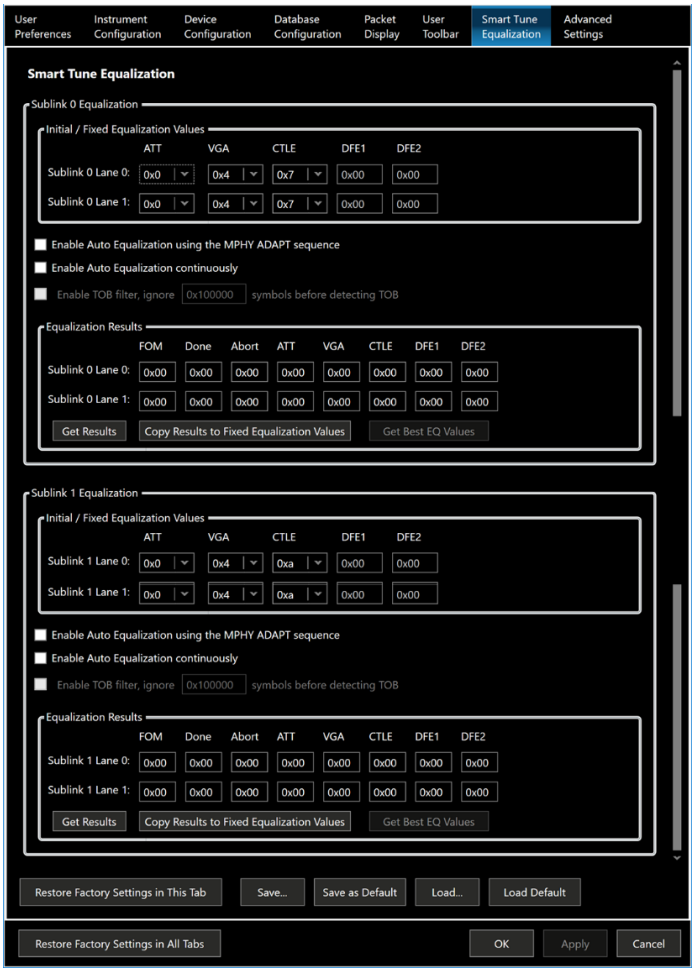
To optimize signal acquisition the Eclipse series offer Smart Tune™ equalization capability. Smart Tune allows the user to choose between setting fixed equalization values manually for the front-end PHY, auto equalizing using the M-PHY ADAPT capability or running auto equalization continuously every time a Burst is opened on the link.

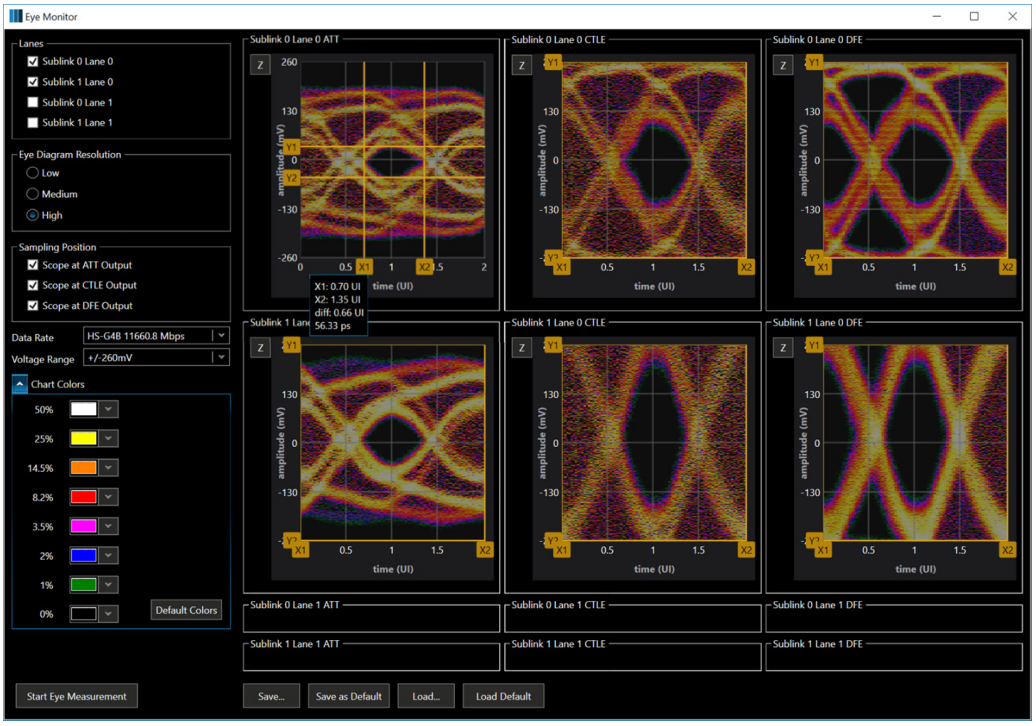
To set equalization values manually individual values can be entered in the Sublink 0 and Sublink 1 Initial/Fixed Equalization Values section or saved values can be loaded from a file.

To implement auto equalization using ADAPT select Enable Auto Equalization using the MPHY ADAPT sequence, then execute a Link Startup Sequence on the DUT and run the ADAPT sequence between the Host and Device.

To run auto equalization continuously select Enable Auto Equalization continuously and then execute a Link Startup Sequence on the DUT and change power mode.

With Auto Equalization the Eclipse will calculate and load the optimal ATT (Attenuation), VGA (variable-gain amplification), CTLE (continuous time linear equalization), and DFE (decision feedback equalization) values into the PHY. This capability supports all HS modes, including HS-G1 to HS-G5.





Eye Monitor

Eye Monitor is used to assess the quality of the eye and can be used in conjunction with Smart Tune™ equalization to optimize the eye for superior signal acquisition to ensure error-free M-PHY symbol capture. Eye Monitor constructs an eye diagram of the link to determine link quality, and qualitative measurements can be done on the eye diagram for jitter, noise, and eye opening.

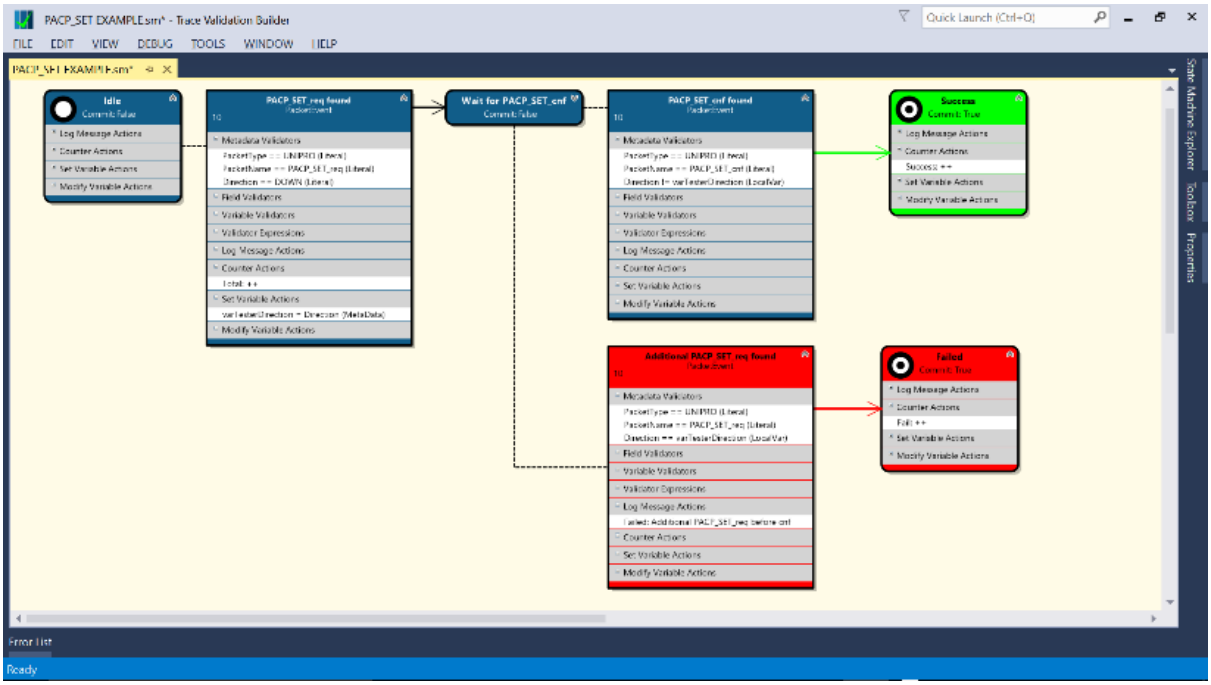
1. Actual capability and implementation may vary between v2.6 and v3.0 FW/SW

Trace Validation

Trace Validation is a patented artificial intelligence (AI) tool that uses complex state machine logic to analyze traces algorithmically without user inference or discernment. Trace Validation can perform complex analysis of link traffic, such as UFS packet latency or UniPro Link Startup Sequences.

Trace Validation identifies transactions on the link by analyzing millions of packets in a trace capture, then evaluates the complete protocol sequences and individual packets for conformance to the specification.

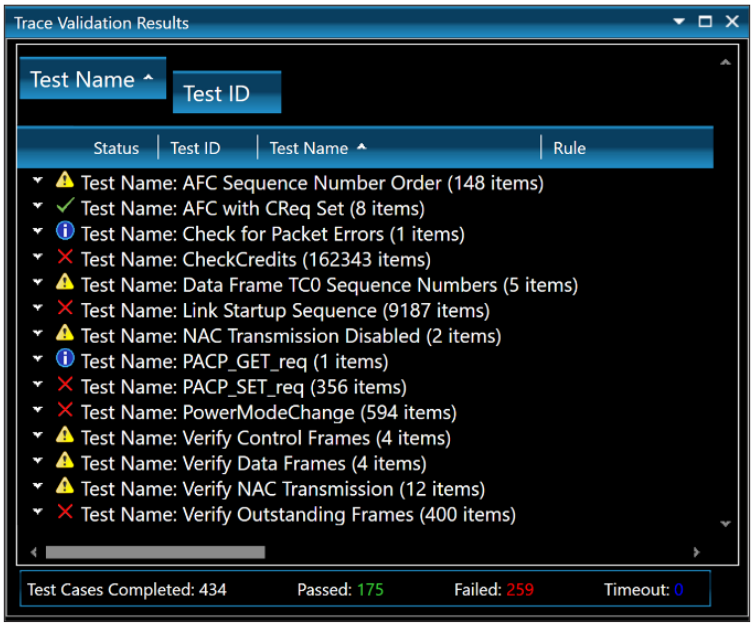
With Trace Validation, complex transactions such as power mode changes, Link Startup Sequence and NAC/Replay events can be automatically analyzed and easily debugged. Complex measurements such as UFS packet latency can also be performed and evaluated against pass/fail metrics.



Trace Validation state machine model

Trace Validation results are flagged as follows:

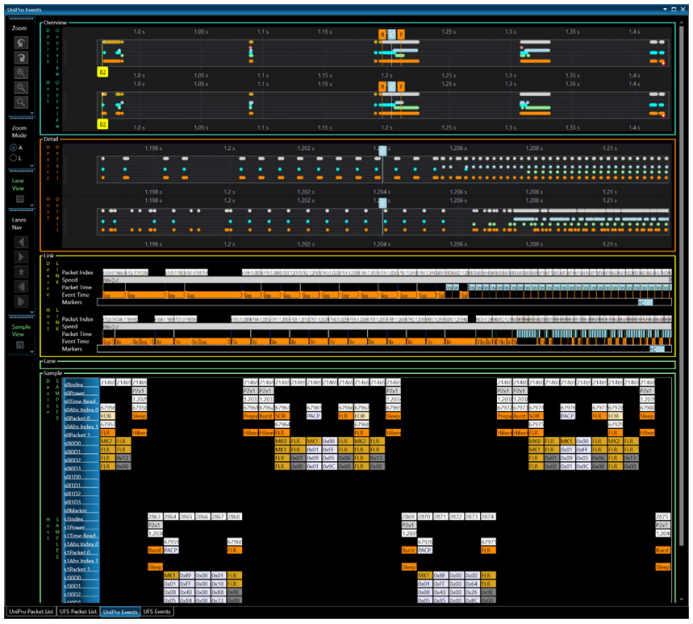
- **Failure** ✗ and **Warning** ⚠ status flags
  - A Failure is a transaction or packet that does not meet a defined primary rule. This rule may be defined by the JEDEC JESD224x CTS, UniPro CTS or by the user.
  - A Warning is a transaction or packet that does not meet a defined secondary rule. This rule may be defined by the JEDEC JESD220x spec, UniPro spec or by the user.
- **Pass** ✓ and **Info** ⓘ and **Debug** 🔍 status flags
  - Any transaction or packet that conforms the rule set is marked as Pass
  - Any packets not inspected due to run conditions are highlighted and explained with the Info flag
  - Information on state machine execution of an inspection rule can be provided with Debug messages



Trace Validation pass/fail messages

Events Views

UniPro and UFS Events views complement the Packet List windows, showing all events on the bus in both directions in one single snapshot linked to the selected packet and bookmarks. Zooming in on any event or series of events will show the time-aligned packet data and expanded packet information in detail down to raw trace K-Code information, including the One Hot and Hex values.

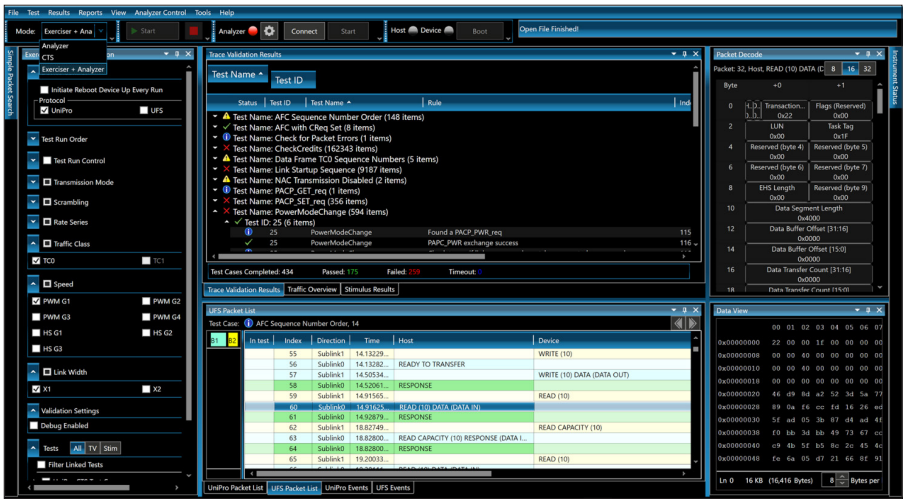


UniPro Events View

Streaming Capture

Streaming capture uses the full 40Gbs bandwidth of Thunderbolt 3 to store link traffic directly to disk in real time. As a trace is captured it is buffered through the instrument memory to the controller PC's system RAM and then saved to the SSD disk.

Streaming performance is dependent on a variety of factors including PC load, SSD speed, link bandwidth utilization and hardware filtered packets. To increase streaming efficiency the pre-capture hardware filter should be used to remove as many unnecessary events as possible before transmission over the Thunderbolt 3 interface.



Pass/fail analysis using Trace Validation Results

Compliance/Conformance Verification

The Eclipse M32x and Eclipse M42x advanced Protocol Analyzer/Exercisers can execute UniPro and UFS Compliance Test Specification (CTS) tests, using Trace Validation to verify that the resulting protocol sequences and packets conform to the CTS. The UniPro v1.1 CTS and JEDEC JESD224A CTS are currently supported. The updated UniPro 1.8 and UFS 3.0 CTS specs will be supported once released from the respective special interest groups.

Extensive reporting and analysis tools include reports by test parameters – status, individual tests, or test rules, and within tests by packet characteristics such as packet number, byte, speed, link, etc. Summary and full reports and pass/fail reports are also provided.

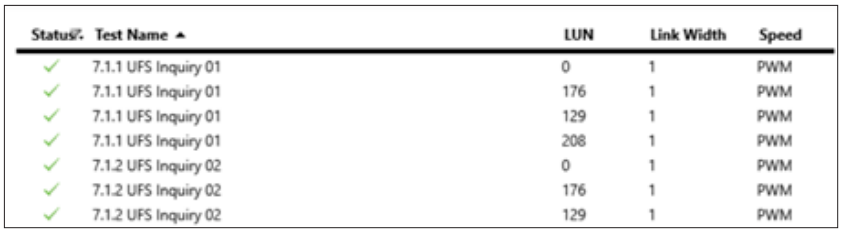
Stimulus with Full UniPro Stack in HW

The Eclipse M series exercisers utilize a full UniPro stack embedded in hardware so the user can:

- Emulate a host
- Create specific traffic on the link
- Put the DUT into known states
- Insert errors into the UniPro or UFS traffic stream
- Create custom stimulus sequences to execute complex events, e.g. NAC Conditions or Power Mode Changes
- Automate with Run Control for stress testing

Run Time Control

- **UFS device CTS compliance**
  - Verifies test cases defined in JESD224 for JESD220B
  - Verifies test cases defined in JESD224A for JESD220B, JESD220C and JESD220-2
  - Preliminary test cases for UFS 3.x JESD220D, JESD220E and JESD220-2A have been added
  - Preliminary test cases for UFS 4.0 will be added

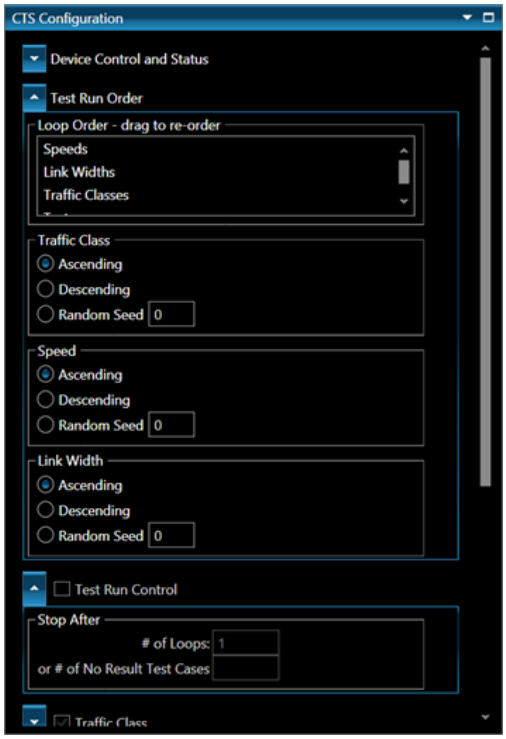


Status	Test Name	LUN	Link Width	Speed
✓	7.1.1 UFS Inquiry 01	0	1	PWM
✓	7.1.1 UFS Inquiry 01	176	1	PWM
✓	7.1.1 UFS Inquiry 01	129	1	PWM
✓	7.1.1 UFS Inquiry 01	208	1	PWM
✓	7.1.2 UFS Inquiry 02	0	1	PWM
✓	7.1.2 UFS Inquiry 02	176	1	PWM
✓	7.1.2 UFS Inquiry 02	129	1	PWM

- **UniPro CTS conformance**
  - Verifies test cases as defined in the UniPro v1.61 and v.18 CTS.
  - Preliminary test cases for UniPro 2.0 will be added.

- **UniPro and UFS device spec conformance**
  - Trace Validation engine evaluates UniPro and UFS protocol sequences, “shall” statements and logical requirements

- **Custom test cases**
  - Create stimulus and Trace Validation analysis test cases
  - Executable with Run Control
  - Build tests from scratch, or use existing CTS and debug tests cases as a starting point



- **Stress Testing**
  - Execute any loop order by Speed, Link widths, LUNs or individual test cases
  - Each category can be run ascending, descending, or random seed order
  - Stop after a specified number of test case configuration loops or No Result Test Cases have occurred

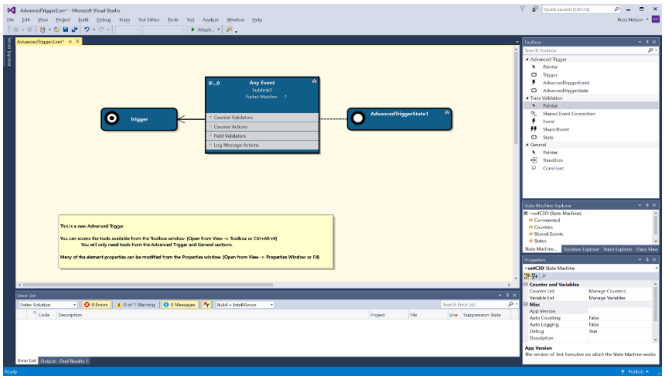
- **Group, filter and summarize test results by test parameters – status, individual tests, or test rules**

- **Summary reports and full file export**

Advanced Editors

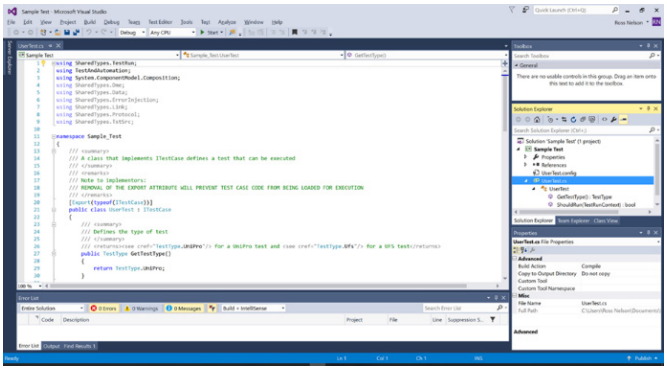
The Eclipse family include advance Editors for creating trigger and Trace Validation tests, and the Eclipse series exercisers include custom stimulus Editors that can be used to create unique stimulus tests. Tests created with the Stimulus Editors can be used with run time Control for automated margin, corner case and stress testing.

Custom tests can be created from scratch, or they can be based on the pre-defined tests provided in the software library.



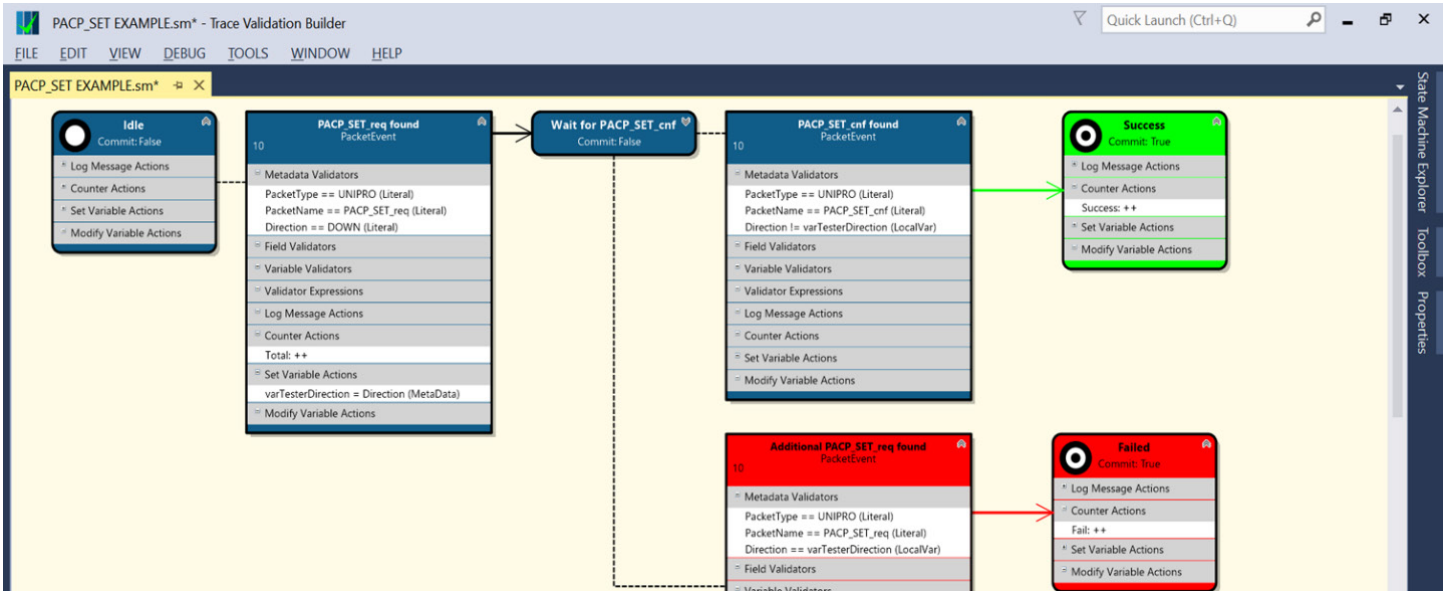
Stimulus capabilities available with custom Stimulus Editors include:

- Host emulation
- Put DUT into known states
- Create specific link traffic
- Insert errors into the traffic stream
- Create stimulus sequences to execute complex events, e.g. NAC Conditions or Power Mode Changes
- Automate with Run Control for stress testing



Analysis capabilities available with the Trace Validation Editor include:

- Analyze traffic on any trace file captured “sniffer” style from any bi-directional link
- Use complex state machine logic to verify all trace attributes
- Log messages and attributes with Failure, Warning, Pass, Info and Debug flags
- Easy-to-use graphical user interface:



- **UFS device CTS compliance**
  - Verifies test cases defined in JESD224 for JESD220B.
  - Verifies test cases defined in JESD224A for JESD220B, JESD220C and JESD220-2.
  - New test cases for the updated UFS3.0 JEDEC JESD224x CTS will be added in the future to verify JESD220D and JESD220-2A

- **UniPro CTS conformance**
  - Verifies test cases as defined in the v1.1 CTS.
  - Method of Implementation (MOI) approved by the MIPI Alliance Test Work Group
  - New test cases for the updated MIPI UniPro v1.8 CTS will be added in the future

- **UniPro and UFS device spec conformance**
  - Trace Validation engine evaluates UniPro and UFS protocol sequences, “shall” statements and logical requirements

- **Custom test cases**
  - Create stimulus and Trace Validation analysis test cases
  - Executable with Run Control
  - Build tests from scratch, or use existing CTS and debug tests cases as a starting point

- **Stress Testing**
  - Execute any loop order by Speed, Link widths, LUNs or individual test cases
  - Each category can be run ascending, descending, or random seed order
  - Stop after a specified number of test case configuration loops or No Result Test Cases have occurred

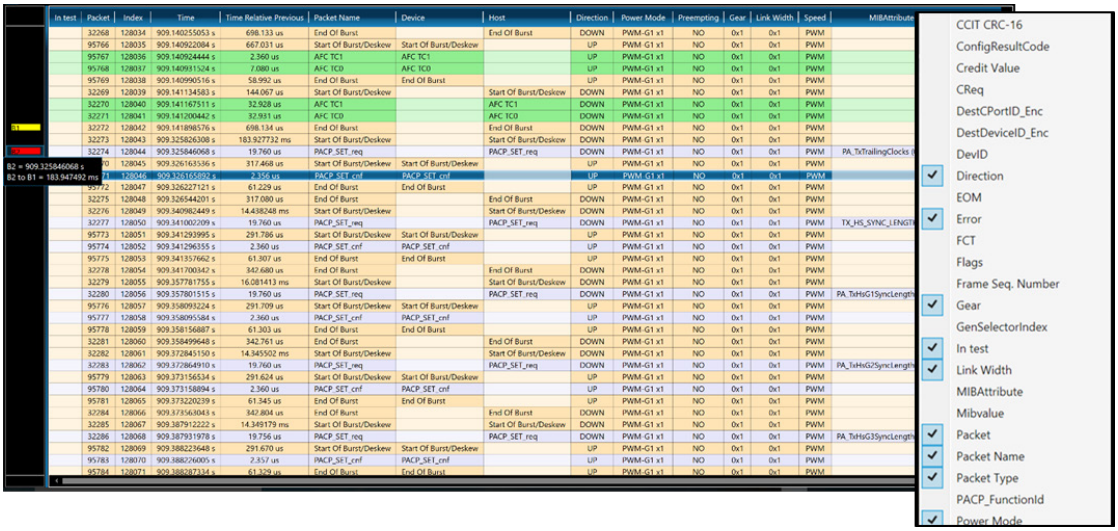
- **Group, filter and summarize test results by test parameters – status, individual tests, or test rules**

- **Summary reports and full file export**

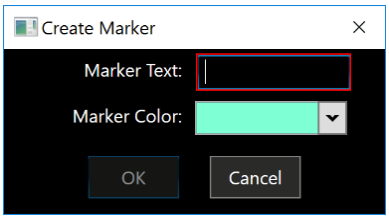
Powerful Debug Capabilities

The UniPro M Series Protocol Suite application software includes extensive general protocol analysis capabilities, including Packet List, Packet Decode and Data windows, bookmarks and navigation, triggers and pre and post capture filters.

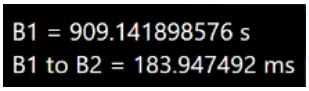
Packet List windows display all packets in a trace. The information displayed in the Packet List can be changed by right-clicking in the column header bar and selecting different columns from the list available.



The **Packet Decode** window displays the packet header information and the Data View window displays the entire packet, including header and payload for a selected packet.

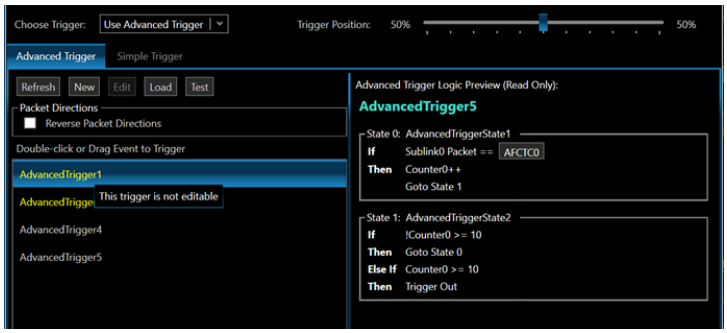


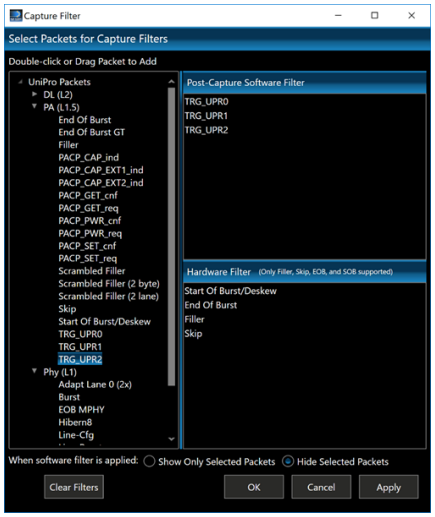
Navigation within the windows can be accomplished with Bookmarks. Bookmarks can be added to any packet in a Packet List window by right-clicking and selecting Add Bookmark. By right-clicking and selecting Edit Bookmark an existing bookmark can be renamed or given a different color.



Hovering over a bookmark will display a tooltip indicating timestamp and delta time to other bookmarks.

Simple and Advanced Triggers monitor all sublinks for any packet type, packet header or payload value and trigger the analyzer to stop capturing when the trigger criteria are met.





Filters permit the filtering of specific packet types either before or after the trace has been stored and saved.

The pre-capture Hardware Filter can eliminate Fillers, Skips, Start of Bursts, End of Bursts and AFC_TC0 packets. The UFS payload can also be filtered out. Since these are filtered out prior to trace capture they are not stored or saved with the pitx trace.

Post-Capture Software Filter captures and stores all packets, but suppresses the selected UniPro packet types from the UniPro List window. The Traffic Summary window will still display all packets but it highlights and deactivates those that have been filtered.

Specifications

Product specifications are subject to change without notice.

Eclipse M52

Can be configured for an Analyzer or Analyzer/Exerciser. Supports up to UFS 3.1, MIPI UniPro 1.8 and M-PHY 4.1 HS-G4. Upgradeable to UFS 4.0, UniPro 2.0 and M-PHY 5.0 HS-G5.

Eclipse M52 Analyzer/Exerciser (M-PHY Type-I)	
Protocols Supported	M-PHY Type-I
Host Machine Minimum Requirements	Microsoft Windows 10 64-bit operating system; Intel® Core™ i7 or i9 processor or equivalent; 32 GB RAM recommended, 16 GB minimum; NVMe solid state drive with 500GB free space recommended, 256GB minimum free space; Thunderbolt 3 enabled type-c connector is required
Software Requirements	Windows 10 64-bit operating system; Microsoft SQL Server 2014 or later; Microsoft Visual Studio 2015 Community or Professional editions, or Microsoft Visual Studio 2015 Isolated Shell; Teledyne LeCroy software and firmware version 1.6.4.[xxx] or later
Speeds	High-Speed (HS) Gear1, Gear2, and Gear3, Rate Series A/B; Low-speed Pulse-width Modulation (PWM) Gear1 to Gear4 in Type-I LS implementation
Link Width	x1 and x2
Trace Capture Memory Depth	8 GB, shared between exerciser and analyzer
Probing Options	SMA and solder-down available, with optional probe pod. SMA is required for exerciser functionality
Dimensions (W x H x D)	12.7” x 2.7” x 9.9”, 32.4cm x 6.9cm x 25.0cm (Bumper adds 0.21”, or 5mm to the height and 0.28” or 7mm to the width)
Weight	5.9lbs (2.7kg)
Compliance CTS Support	UFS 2.x, UFS 3.x preliminary, UFS 4.x preliminary
Conformance CTS Support	UniPro 1.6x, UniPro 1.8, UniPro 2.0 preliminary

Available Upgrades

- Upgrade Analyzer UFS 4.0, UniPro 2.0 and M-PHY 5.0 HS-G5

Eclipse T42 and Eclipse M42x

Supports UFS3.0, MIPI UniPro v1.8 and M-PHY v4.1 up to HS-G4B.

Eclipse T42 (M-PHY Type-I)	
Protocols Supported	M-PHY Type-I
Host Machine Minimum Requirements	Microsoft Windows 10 64-bit operating system; Intel® Core™ i7 or i9 processor or equivalent; 32 GB RAM recommended, 16 GB minimum; NVMe solid state drive with 500GB free space recommended, 256GB minimum free space; Thunderbolt 3 enabled type-c connector is required
Software Requirements	Windows 10 64-bit operating system; Microsoft SQL Server 2014 or later; Microsoft Visual Studio 2015 Community or Professional editions, or Microsoft Visual Studio 2015 Isolated Shell; Teledyne LeCroy software and firmware version 1.6.4.[xxx] or later
Speeds	High-Speed (HS) Gear1, Gear2, Gear3, and Gear 4, Rate Series A/B; Low-speed Pulse-width Modulation (PWM) Gear1 to Gear4 in Type-I LS implementation
Link Width	x1 and x2
Trace Capture Memory Depth	8 GB
Probing Options	SMP and solder-down included, with probe pod optional
Dimensions (W x H x D)	12.7” x 2.7” x 9.9”, 32.4cm x 6.9cm x 25.0cm (Bumper adds 0.21”, or 5mm to the height and 0.28” or 7mm to the width)
Weight	5.9lbs (2.7kg)

Eclipse M42x Analyzer/Exerciser (M-PHY Type-I)	
Protocols Supported	M-PHY Type-I
Host Machine Minimum Requirements	Microsoft Windows 10 64-bit operating system; Intel® Core™ i7 or i9 processor or equivalent; 32 GB RAM recommended, 16 GB minimum; NVMe solid state drive with 500GB free space recommended, 256GB minimum free space; Thunderbolt 3 enabled type-c connector is required
Software Requirements	Windows 10 64-bit operating system; Microsoft SQL Server 2014 or later; Microsoft Visual Studio 2015 Community or Professional editions, or Microsoft Visual Studio 2015 Isolated Shell; Teledyne LeCroy software and firmware version 1.6.4.[xxx] or later
Speeds	High-Speed (HS) Gear1, Gear2, Gear3 A/B, and Gear 4, Rate Series A/B; Low-speed Pulse-width Modulation (PWM) Gear1 to Gear4 in Type-I LS implementation
Link Width	x1 and x2
Trace Capture Memory Depth	8 GB, shared between exerciser and analyzer
Probing Options	SMA and solder-down available, with optional probe pod; SMA required for exerciser functionality
Dimensions (W x H x D)	12.7” x 2.7” x 9.9”, 32.4cm x 6.9cm x 25.0cm (Bumper adds 0.21”, or 5mm to the height and 0.28” or 7mm to the width)
Weight	5.9lbs (2.7kg)
Compliance CTS Support	UFS 2.x, UFS 3.0 planned
Conformance Support	UniPro 1.6x, UniPro 1.8

Available Upgrades

- Analyzer to Exerciser upgrade for MIPI M-PHY v4.1 HS-G4B (Eclipse M42x Analyzer only)

Orderable Accessories

- Enhanced Connectivity Kit – includes Thunderbolt3 6ft/2m 40Gbps active cable and cable retention device
- Solder-down probe - HS-G3 and HS-G4B x2 bundle (included with the Raptor series)
- Solder-down probe pod - HS-G4B solder-down probe pod for superior probing in demanding test environments with less than optimal signal integrity

Recommended Accessories

- Mini-Circuits ZFRSC-183-S+ DC-18 GHz power splitter
- Centric RF C581-086-12 SMA to SMA cables, ≥18GHz, 12 inches length
- Thunderbolt3 Cable, 6ft/2m 20Gbps cable

To take full advantage of streaming capture with v2.0.0 and later FW/SW:

- The fastest processor available, e.g. Intel i9-8950HK Processor (4.8GHz turbo)
- 64GB of RAM recommended, 32GB minimum
- 1TB NMVe SSD with Sustained Write Bandwidth of 2.5GB/s recommended, 2.1GB/s minimum
- Thunderbolt 3 enabled type-c connector required

For streaming capture with existing PCs you can verify if your SSD has acceptable Sustained Write Bandwidth at https://ssd.userbenchmark.com, which provides a good tool for SSD Sustained Write Bandwidth benchmarking.

DUT Requirements to sync analyzer to a UniPro link		
Attribute	**Spec**	**Typical**
TxHsG1SyncLength (0x1552)	256 Symbols, 0x48 Capability value	64 Symbols, 0x46 Capability value
TxHsG2SyncLength (0x1555)	256 Symbols, 0x48 Capability value	64 Symbols, 0x46 Capability value
TxHsG3SyncLength (0x1556)	256 Symbols, 0x48 Capability value	64 Symbols, 0x46 Capability value
TxHsG4SyncLength (0x15D0)	256 Symbols, 0x48 Capability value	64 Symbols, 0x46 Capability value
TxHsG1PrepareLength(0x1553)	0xA Capability value	0x3 Capability value
TxHsG2PrepareLength(0x1554)	0xA Capability value	0x3 Capability value
TxHsG3PrepareLength(0x1557)	0xA Capability value	0x3 Capability value
TxHsG4PrepareLength(0x15D1)	0xA Capability value	0x3 Capability value
RxLsPrepareLength	0xA Capability value	0x1 Capability value
RxPwmBurstClosureLength	0x1F Capability value	0x1 Capability value
To sync to existing link	one Start of Burst	one Start of Burst

The typical settings assume configuration with 50/50 splitter and recommended cables. Actual performance may vary depending on the probing and the signal integrity of the DUT.

DUT Requirements to establish a UniPro link with the Eclipse exerciser

- The device must execute a UniPro 1.61 or 1.8 compliant Link Startup Sequence.

Teledyne LeCroy, UniPro/UFS Protocol Technology Expert and Market Leader for Protocol Analysis and Traffic Generation

Teledyne LeCroy has been shipping UniPro/UFS analysis tools since 2015 and shipping M-PHY HS-GEAR4 UniPro/UFS analyzers and exercisers since 2017. We are a contributing company to the development of the UniPro 1.61 and 1.8 specs and Conformance Test Specs, and a member of the JEDEC J64 Embedded Memory Storage and Removable Memory Card committee. Teledyne LeCroy has supported all UniPro Interoperability (IOT) workshops since the initial event.

Compliance

Patents: Trace Validation™ is patented by Protocol Insight® and protected under US Patent No. 10,613,963

Export Control Classification Number (ECCN): 3B992 b.4.b.1, No License Required

US Export Schedule-B harmonization code: 9030.89.0100

Safety, Compliance and Environmental Information

Conforms to UL STD 60950-1

Certified to CSA STD C22.2 # 60950-1

ETL Control Number: [xxxxxxx]

Complies with IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013 Manufacturer's Declaration of Conformity to European Directive 2014/35/EU (Low Voltage Directive)

Compliant with Radiated Emissions (CISPR 32:2012), 7 Power Port Conducted Emissions (CISPR 32:2012), 8 Harmonics (IEC 61000-3-2:2014), 9 Flicker, (IEC 61000-3-3:2013), 10 Electro-Static Discharge Immunity Test (IEC 61000-4-2:2008), 11 Radiated, Radio-Frequency, Electromagnetic Immunity (IEC 61000-4-3:2010), 12 Electrical Fast Transient/Burst Immunity Test (IEC 61000-4-4:2012), 13 Immunity to Surges (IEC 61000-4-5:2014), 14 Conducted, Radio-Frequency, Electromagnetic Immunity Test (IEC 61000-4-6:2013), 15 Voltage Dips/Interruptions Immunity Test (IEC 61000-4-11:2004)

Compliant with the European Union directive 2002/95/EC and 2011/65/EU on the Restriction of the use of certain hazardous substances in electrical and electronic equipment and components (RoHS).

Ordering Information

Product Description	Product Code
Eclipse M52 for Gear 4 Analyzer	MPHY-M52-4-TAA
Eclipse M52 Analyzer	MPHY-M52-TAA
Eclipse M52 for Gear 4 Analyzer/Exerciser	MPHY-M52-4-TZA
Eclipse M52 Analyzer/Exerciser	MPHY-M52-TZA
Eclipse M42x Analyzer	MPHY-M42X-TAA-X
Eclipse M42x Analyzer/Exerciser	MPHY-M42X-TZA-X
Eclipse T42	MPHY-T42-TAA-X
Eclipse M52 Gear 4 to Gear5 upgrade	MPHY-M52-G4G5 -U
Eclipse T42 Pro Upgrade	MPHY-T42-PRO-U
M-PHY Gear4 Multi-lead Pod	MPHY-MP4-001-X
M-PHY Gear4 Multi-lead solder down Tip	MPHY-ML4-AC001-X
M-PHY Gear 4 Multi-lead Cable with Pwr	MPHY-MLP-AC004-X
M-PHY Gear4 Multi-lead x1 Bundle	MPHY-M42-ML001-B
M-PHY Gear4 Multi-lead x2 Bundle	MPHY-M42-ML002-B
Eclipse Advanced Thunderbolt connectivity kit	MPHY-M42-ECK-X

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