Protocol Insight® UniPro Test Executive™

UNI16COMP Test Executive provides complete protocol debug and analysis of UniPro devices.

- v1.1 Conformance Test Suite (CTS) verification
- Trace Validation™ analysis of UniPro v1.61 protocol sequences and packet characteristics
- Link stimulus, stress and corner case testing
- Custom test case creation
- Statistical analysis
Key Features and Benefits

**Trace Validation** analyzes bi-directional UniPro links, performing protocol sequence and packet inspection rule checking based on the nature of the traffic. Trace Validation uses a unique protocol-aware rule checker engine to perform validation against the MIPI UniPro v1.61 specification.

**Conformance Verification** of UniPro v1.61 with Conformance Test Suite (CTS) v1.1 and MIPI Alliance approved MOI. Executes a range of CTS test cases, analyzing results using the intelligent Trace Validation engine and generating summary reports.

**Stimulus** allows Test Executive to control the Keysight U4431A packet generator to create specific traffic on the link, and has the ability to do error insertion into the UniPro traffic stream.

**Perform extensive stress testing** in CTS and Stimulus modes, executing hundreds of thousands of tests automatically. Stop after any number of loops or No Result Test Cases. All failures and warnings are tagged, allowing the user to find, view and analyze the full test sequence in the Keysight analyzer.

**Design custom test cases** to test corner cases or introduce errors for margin, stress, or error recovery testing.

**Statistics** window provides an overview of trace characteristics in CTS and Trace Validation modes, enabling sum, filter and sort by various datatypes.

**Trace Validation mode**

Intelligent 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 UniPro 1.61 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.

Trace Validation results are flagged according to the following:

- **Failure ✗ and Warning 🔴 status flags**
  - A Failure is a transaction or packet does not meet a defined primary rule. This rule may be defined by the UniPro v1.1 CTS or by the user.
  - A Warning is a transaction or packet does not meet a defined secondary rule. This rule may be defined by the UniPro v1.61 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 is provided with Debug messages
CTS mode
In CTS mode Test Executive initiates conformance test cases, then uses the Trace Validation engine to verify that the resulting protocol sequences and packets conform to the UniPro v1.1 CTS.

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.

![CTS pass/fail analysis with packet listing](image)

Stimulus mode
Stimulus allows Test Executive to control the Keysight U4431A packet generator to create specific traffic on the link

- Put DUT into known states
- Insert errors into the UniPro 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
Performance

- **UniPro v1.1 CTS conformance**
  - Verifies test cases as defined in the CTS, covering all device configurations supported by Keysight analyzer and specified in the UniPro CTS Annex C.
  - Method of Implementation (MOI) is approved by the MIPI Alliance Test Work Group

- **UniPro 1.61 spec conformance**
  - Trace Validation engine evaluates UniPro v1.61 protocol sequences, “shall” statements and logical requirements

- **Custom test cases**
  - Available in Trace Validation and Stimulus modes
    - Global Variables and Run Conditions control Transactions
    - Script execution for device control
    - Packet construction and Transaction analysis based on Trace Validation engine

- **Stress Testing**
  - Execute any loop order by Speed, Link widths, 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

- Statistics window provides an overview of trace characteristics in Trace Validation mode
  - Sum, filter and sort by Test, Variable, Attribute, or Value
  - Example variables include TRG_UPR, Start-of-burst and End-of-burst, NAC, and PACP_CAP

- Summary reports and full file exports
Specifications
Test Executive operates in conjunction with the Keysight Technologies U4431A MIPI M-PHY protocol analyzer with Command Line Packet Generator, and supports UniPro lane widths and speeds within the capabilities of the U4431A hardware:

- x1 through x4 link widths
- PWM-G1 to HS-G3 speeds
- Traffic Class 0 (TC0) only

General Characteristics
System requirements:

- Windows 7 64 bit OS is required.
- Minimum 12Gb RAM recommended for stress testing with multilevel grouping.

The Keysight U4431A MIPI M-PHY protocol analyzer is required for trace capture, and option 613 Command Line Packet Generator is required for CTS and Stim modes. Compatibility with Keysight FW and SW is listed at: http://www.protocolinsight.com/sw-compatibility/.

Ordering Information

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<tr>
<td>UNI16COMPMAS</td>
<td>12 month license extension, with maintenance and support</td>
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UNI16COMP UniPro Test Executive is available as a 12 month license with an annual renewal option, and will de-activate after 12 months if not renewed. To extend use beyond 12 months UNI16COMPMAS may be ordered up front or when the initial license is due to expire; these will extend license activation 12 months. Multiple Maintenance and Support extensions may be ordered to extend activation beyond that.

UNI16COMP operates in conjunction with the Keysight Technologies U4431A MIPI M-PHY protocol analyzer for trace capture and packet generation.

Contact Information
For additional information, to request a demonstration or quote, or place an order, please contact: sales@protocolinsight.com

Support materials and examples files are available at www.protocolinsight.com/support

For technical support please contact: support@protocolinsight.com