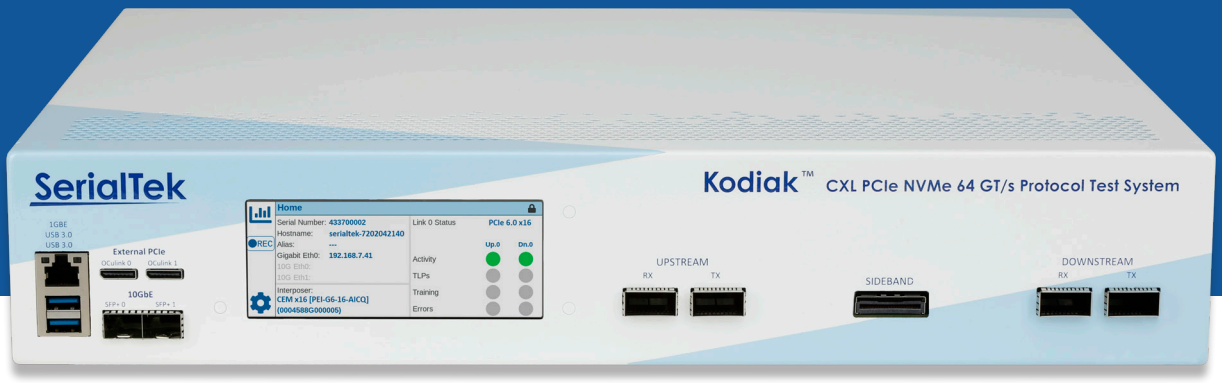
Kodiak™

PCIe® 6.x, CXL®, and NVMe® Advanced Protocol Test, Analysis, and Compliance System



■ Revolutionary ■ Powerful ■ Integrated

Kodiak – The Future of Protocol Test Systems

The revolutionary Kodiak PCIe® 6.x Protocol Test System redefines the benchmark for protocol test, analysis, and compliance solutions by providing PCIe®, CXL®, and NVMe® developers with paradigm-shifting capabilities, including a hyper-fast data management architecture, cloud-based multi-user accessibility, integrated power analysis, and more.

Streamline Workflow with BusXpert™

Kodiak's BusXpert application increases productivity by giving development teams multiple methods to access the system, including a web browser and a standalone desktop application.

The user-friendly interface allows users to quickly configure the system, monitor device statuses, and perform detailed test and analysis from any operating system, anywhere.

Multi-User Access For Smarter Analysis

The modern Kodiak architecture overcomes the limitations of traditional tools by providing a cloud-based approach to enable multi-user access via any OS, allowing teams, regardless of location, to collaborate in real time by viewing and analyzing traces and test results simultaneously.

Built-in Trace Storage

Kodiak includes nonvolatile trace storage, designed for secure access, viewing, and sharing of files. With up to 8TB of internal SSD storage, users can store a generous amount of trace data for analysis and reference. Users can efficiently download and compress files for offline analysis on other client devices.

Precision Control with Accelerated Insight

Kodiak's advanced suite of triggers, filters, compression, and high-performance trace processing enables granular control over data capture, enabling users to efficiently and accurately isolate critical events.

Ideal for silicon validation, debug of complex link behaviors, and qualification, Kodiak is an excellent choice for root cause identification, timing analysis, and protocol compliance—core challenges that matter most in high-stakes development and validation workflows.

SerialTek

Unrivaled Features for PCIe, CXL, and NVMe Development

- All PCIe link widths supported (x1, x2, x4, x8, x16) at all link rates up to 64GT/s
- PCIe, CXL, NVMe, DOE/IDE, SMBus and all sideband signals recorded
- Unmatched trace processing architecture and accelerated performance
- Up to 128GB trace buffers
- Internal SSD Trace 4TB & 8TB SSD Storage
- Integrated Power Analysis Module (PAM) from Quarch Technology Ltd.
- Direct Attach Storage:
  - Two OCulink (PCIe) ports
  - Two USB 3.2 ports
- Network and Direct Connectivity:
  - Two 10GbE SFP+ (optical/copper)
  - One 1GbE RJ-45
- Real-time access to traces in memory (prior to saving), enabling users to review and analyze traces without downloading the trace to a client
- Touchscreen LCD for setup, control, and status
- Interposers with proprietary SI-Fi™ Technology
- No interposer calibration/tuning (PCIe 5.x only)
- Modular design supports all common form factors and connection types (OCP NIC 3.0, EDSFF, M.2, CDFP, MCIO, etc.)

Transparency in Probe Design

As the demand for faster data transfers continues to grow, PCIe and CXL signaling has become more complex and challenging to monitor passively. To address these challenges, SerialTek developed its proprietary SI-Fi (Signal Integrity Fidelity) technology to efficiently record all PCIe and CXL speeds, ensuring each lane's transmitter threshold and pre-emphasis are sufficient to reach the link partner's receiver. This enables the link to train under more realistic conditions, ensuring the interposer remains transparent.

Integrated Power Measurements

Kodiak interposers incorporate a Power Analysis Module from Quarch Technology Ltd, a leader in power analysis and high-speed communications. This smart integration ensures exceptionally accurate measurements of voltage, current, and power, allowing for precise analysis and extended monitoring. Kodiak's integrated Power Analysis Module eliminates the need for separate current probes, oscilloscopes, or DC analyzers – simplifying setup and reducing cost. Additionally, the Power Analysis Module enables more efficient correlation of power measurements with PCIe and CXL traffic in trace captures – providing deeper insight into real-world performance across complex systems.

Figure 1 & 2: *SerialTek's SI-Fi interposers provide effortless, unmatched insight into PCIe traffic.*

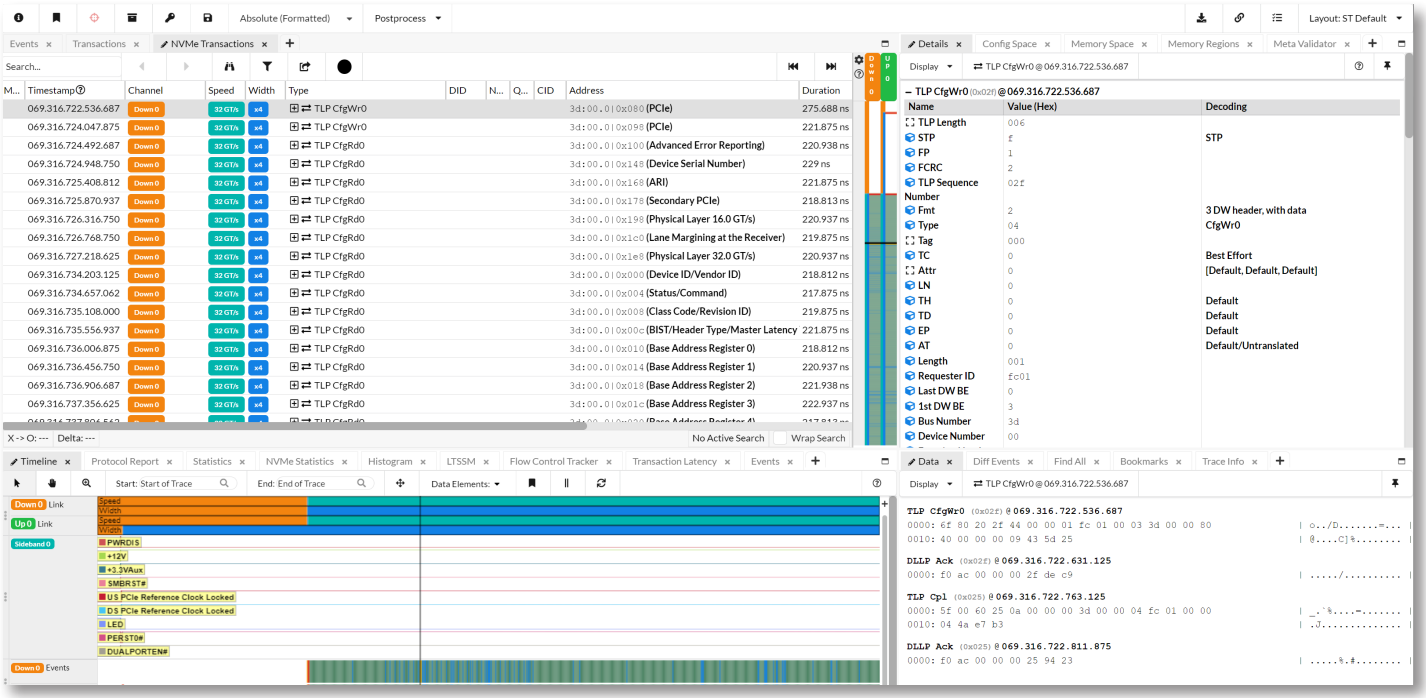


Figure 3: *Advanced visualization – trace example of TLPs and DLLPs non-flit mode.*

State-of-the-Art UI for Advanced Analysis

The SerialTek Kodiak interface – accessible via web browser or standalone application – offers advanced triggers, filters, and trace processing tools for effortless protocol analysis. Customizable views and widgets allow users to visualize trace data in multiple formats. A built-in layout manager further enhances usability by enabling users to tailor the Home, Capture, and Trace viewing screens to fit their unique workflow.

PCIe 6.x Protocol Tester

Investing in Kodiak enables developers to stay ahead of the curve in the dynamic world of high-speed interconnect protocols. Kodiak supports full PCIe compliance testing, including the latest Link and Transaction Layer specifications. Users can run tests individually or as a suite, customize test sequences, view device test history, and export results in various formats (e.g., CSV, JSON).

Users can control link states – such as speed changes, width specification, hot reset, retraining, enabling/disabling the link, redoing equalization at various speeds, and adjusting power states (D0, D1, D2, D3 Hot, ASPM). Sideband states, power control, and EQ settings (e.g., preset requests, final coefficients, precoding, lane ordering) are also configurable. Lane margining is supported, with exportable results.

Kodiak Tester offers valuable, in-depth diagnostic tools that include Action Runner, Action Sequence, and Trace:

- **Action Runner** provides built-in actions for tasks such as configuration space access, device enumeration, error injection, and link resets.
- **Action Sequence** enables users to combine actions into programmable sequences, with support for JSON and Python formats via REST API for automation.
- **Trace** displays transmitted and received data, aiding in validation and issue diagnosis, with up to 64 GB of capture buffer.

Comprehensive Compliance Testing

Kodiak provides full support for PCI-SIG® Link and Transport Layer Compliance Testing:

- Complete Compliance Test Suites for PCIe 4.x, 5.x, and 6.x.
- Auto full test suite execution in less than 15 minutes (< 10 minutes for PCIe 5).

Figure 4: *Accelerate Debugging and Compliance for PCIe 6.0 and CXL with SerialTek Protocol Tester.*

See Critical Activity That Other Platforms Overlook

Kodiak's Live Traffic Monitor offers industry-first, real-time visibility into link states and activity, giving engineers insight into all upstream and downstream interactions with the DUT by sharing indicators for LTSSM states, link rate, and live counts of TLPs, DLLPs, Training Sequences, and Errors in a scrolling plot of Tx and Rx traffic. Additionally, the monitor tracks sideband signals, including PERST#, CLKREQ#, SMBUS activity, and Power state changes, facilitating precise debugging of device enumeration issues and power management behavior—all in real time.

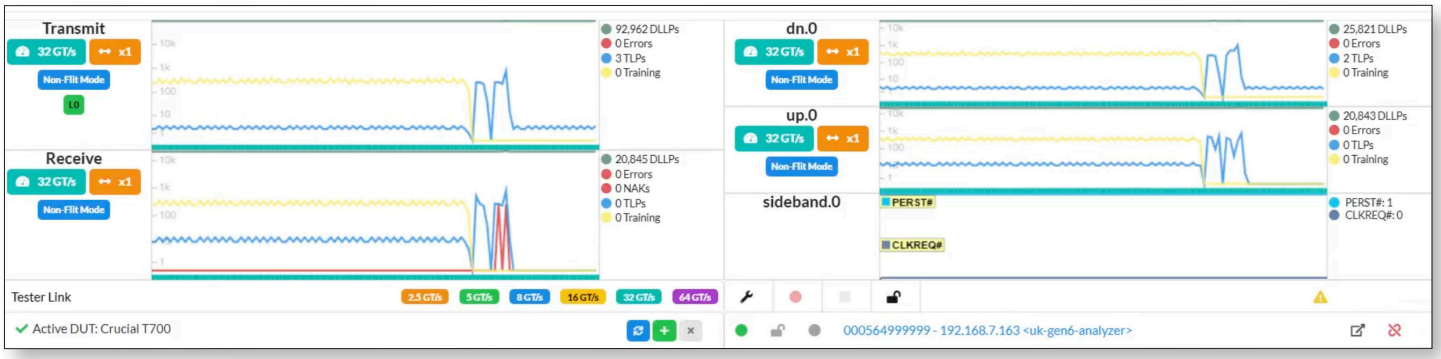


Figure 5: *See traffic in a real-time, scrolling display – a valuable analysis feature not offered with competitive devices.*

Technical Specifications & Support

Kodiak Enclosure	
Dimensions	443 x 81 x 331 mm (17" x 3.2" x 13")
Weight	10 kg (22 lbs.)
Mounting	19" Rack Mount Option, Tilt Feet Option
Temperature Range	5°C – 35°C (ambient operating temperature) at ≤ 2133 m (7000 ft.) MSL

Warranty	
Professional Edition (Kodiak Platform)	2-year
Enterprise Edition (Kodiak Platform)	3-year
Interposer/Fixture	6-month limited

Maintenance & Licensing

Lifetime software updates at no extra cost, with no hidden maintenance fees. Manage SerialTek hardware from any computer using a web browser or standalone software. No seat licenses required, making it easy to share traces and collaborate efficiently.

Front Panel	
Touchscreen LCD	800 x 320 4.6" WCGA
Interposer/Fixture Connections	4x QSFP-DD, MCIO
Ethernet	1GbE (RJ45), 10GbE (2x SFP+)
USB Interface	2x USB 3.1 Type A
PCIe Interface	2x OCuLink

Rear Panel	
Power	IEC C13, 90-264 Vac, 47-63 Hz
Clock In/Out	SMA, 50 Ω, 3.3 Vdc, 10 MHz
Trigger In/Out	SMA, 50 Ω, 3.3 Vdc
Maintenance	RJ45, USB Micro-B

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