Kodiak™ PCIe x16 Gen5 Analysis System
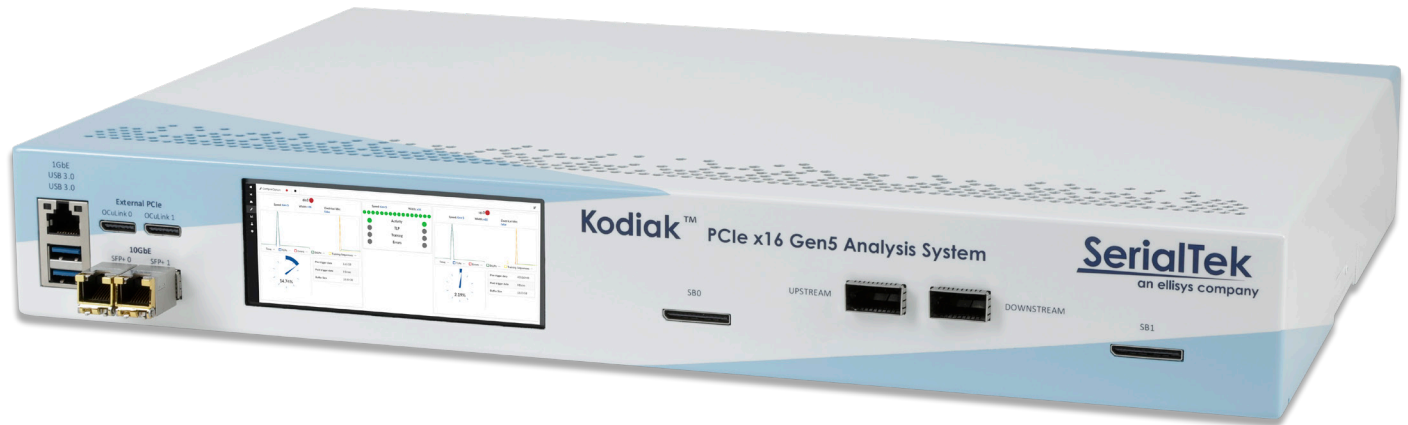
Kodiak™

Next-Generation Gen5 PCIe® Analyzer

Innovative ▪ Cutting-Edge ▪ Integrated

Sales Contact:

📞 720.204.2140　　@ sales@serialtek.com　　🌐 www.serialtek.com/kodiakgen5

PCIe Analysis Platform with Embedded Hardware, Calibration-Free SI-Fi™ Probing and Automatic Equalization, Internal SSD Storage, Touchscreen LCD, and Standard PCIe Cabling.

Powerful SerialTek Features

▪ No tuning (calibration) required, Kodiak's Rx automatically equalizes (EQs) the incoming PCIe signals at all data rates

▪ Embedded trace processing architecture and the fastest performance

▪ Deep 144GB Trace Buffers

▪ Internal 4TB Trace Storage (SSD) and access for multiple users

▪ Direct Attach Storage, including two PCIe OCuLink ports and two USB 3.2 ports

▪ Two 10GbE SFP+ (optical/copper) and one 1GbE RJ-45 connections for fast and reliable connectivity

▪ Real-time access to traces in memory prior to downloading

▪ Touchscreen LCD for analyzer setup and status

State-of-the-Art Architecture

The Kodiak PCIe Gen5 Analysis System represents the state-of-the-art in protocol analyzer design. The Kodiak platform includes an array of high-performance innovations, made possible by an advanced design that breaks free from cumbersome legacy data upload practices in favor of ultra-responsive embedded data processing. Interface responsiveness is markedly advanced, searches involving massive amounts of data are fast, and hardware filtering is flexible and powerful.

Combined with the BusXpert user interface, the Kodiak PCIe x16 Gen5 Analyzers features and benefits really shine. Based on an embedded software framework and REST API, BusXpert integrates with Kodiak hardware seamlessly. Accessed via a web browser or SerialTek's Electron®-based app, BusXpert includes a suite of powerful triggers, filters, and trace processing capabilities coupled with a new user interface for fast, easy, and reliable decoding. Users can work with trace files collaboratively in real-time and even remotely verify proper configuration of the analyzer and interposers, including visual identification of cables, link status, recording status, and much more. The new REST API makes automation straightforward and efficient, providing programmatic facilities for monitoring and capturing traffic, statistical analyses, and detailed searching. Kodiak's advanced hardware design also means there is no need to download a multi-gigabyte trace before the user can begin to review the analysis – data is ready immediately.
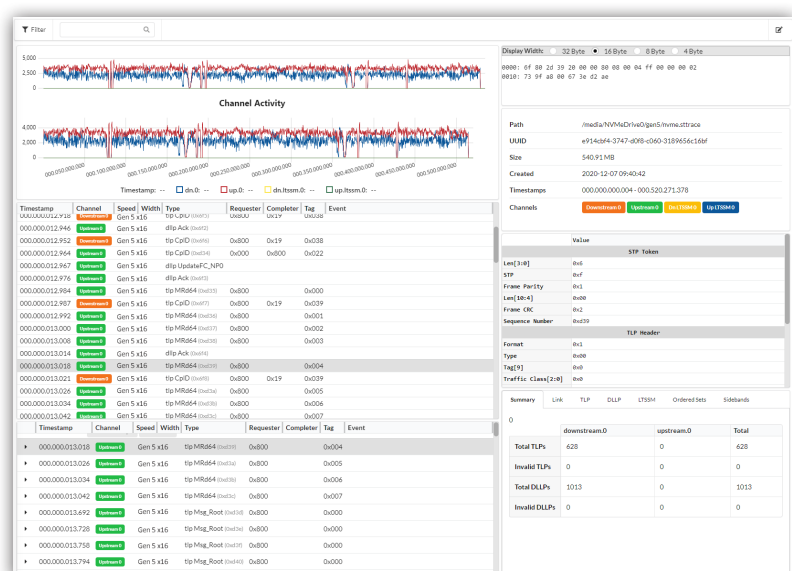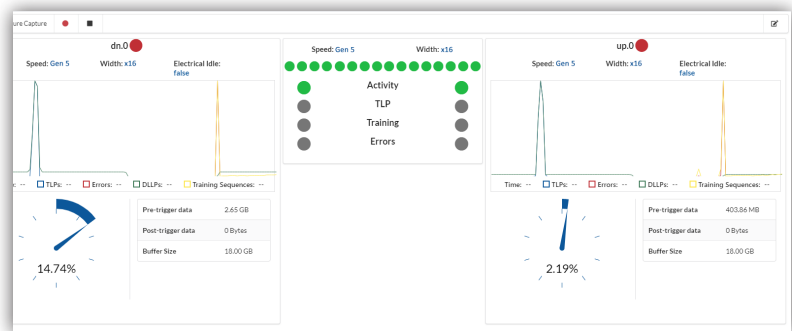
Transparency in Probe Design is Key

Driven by the need for ever-faster data transfers, PCI Express signaling has become exceptionally complex in design and difficult to monitor unobtrusively. With SerialTek's SI-Fi™ interposer technology, the transmitter threshold and pre-emphasis from one link partner reaches the receiver of the other link partner, so the link properly trains to optimum conditions, making the interposer as transparent as possible.

At the core of this technology is a highly specialized linear amplifier design where PCIe analog signals are received at a differential input and distributed to two separate phase-matched differential outputs with a nominal, idealized gain of 0dB.

This approach results in easier set up of the analyzer and product under test and avoids a variety of limitations inherent to other probing approaches where link training sequences don't pass through the interposer.

SerialTek's SI-Fi™ interposer technology expands and enables coverage in critical test areas, including link training (LTSSM), Power Management, Hot Plug, Reset, and other situations where the physical link/lane characteristics may change.

Flexible Trace Storage and Retrieval

Kodiak includes two 10GbE SFP+ ports and a GbE port to offload traces to a host computer or network and internal SSD trace storage of up to 4TB (with read-only access for other users). Direct attach storage choices include two USB 3.1 ports and two PCIe 3.0 OCuLink ports.

Open Traces				
Path	Size	Created	Modified	Actions
/media/NVMeDrive0/gen5/nvme.sttrace	540.91 MB	2020-12-07 09:40:42	2020-12-07 09:23:24	×

Available Traces			
Path	Size	Created	Modified
/media/NVMeDrive0/gen5/raw/live_capture/dn_full.sttrace	6.99 GB	2020-12-17 01:05:30	2020-12-17 01:05:30
/media/NVMeDrive0/gen5/raw/live_capture/up_full.sttrace	558.58 MB	2020-12-17 12:32:05	2020-12-17 12:32:05
/media/NVMeDrive0/gen5/raw/live_capture/up_live.sttrace	571.47 MB	2020-12-17 08:08:12	2020-12-17 08:08:12
/media/NVMeDrive0/gen5/raw/live_capture/live_full.sttrace	5.08 GB	2020-12-17 12:45:34	2020-12-17 12:45:34
/media/NVMeDrive0/gen5/raw/live_capture/dn_live.sttrace	3.77 GB	2020-12-16 05:12:22	2020-12-16 05:12:22
/media/NVMeDrive0/gen5/raw/live_capture/up_live_saved.sttrace	58.43 MB	2020-12-16 03:09:37	2020-12-16 03:09:37
/media/NVMeDrive0/gen5/raw/live_capture/dn_gen4.sttrace	3.77 GB	2020-12-16 12:37:11	2020-12-16 12:37:11
/media/NVMeDrive0/gen5/raw/live_capture/live_up_test.sttrace	1.37 MB	2020-12-15 08:59:45	2020-12-15 08:59:45
/media/NVMeDrive0/gen5/raw/live_capture/live_dn.sttrace	1.38 MB	2020-12-15 08:46:21	2020-12-15 08:46:21
/media/NVMeDrive0/gen5/raw/live_capture/live.sttrace	2.75 MB	2020-12-15 01:40:26	2020-12-15 01:40:26

No Need for Calibration

Competing PCIe Gen5 analyzers and interposers require tuning, or calibration, which leads to reliability issues as modern PCIe link training sequences can occur dynamically, not just at boot-up. PCIe x16 Gen5 SI-Fi interposers are highly accurate electrically, simple to use, and secure safely to the customer's device. No tuning (calibration) is required. Host and endpoint signals pass through the interposer, allowing for real-world PCIe link training and easier setup. With SI-Fi™ technology and Kodiak's adaptive EQ capabili¬ties, users can save hours in setup time. And if the link characteristics change (e.g., Hot Plug or NSSR), Kodiak can follow those changes dynamically, ultimately saving your test.

Capture Settings

▸ Recording

▸ Pre-Filter

▾ Link

Upstream	Downstream
Speed Control	Speed Control
Auto (Up to Gen 5 <32 GT/s>)	Auto (Up to Gen 5 <32 GT/s>)
Lane Control	Lane Control
Auto	Auto
Equalization	Equalization
Auto	Auto
☐ Enable SRIS	☐ Enable SRIS

Interposer Settings

Channel Length

Short

Apply

SI-FI™ PCIe Gen5 Interposers

SerialTek's PCIe Gen5 Slot (AIC) Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the PCIe slot and a PCIe endpoint to intercept and relay a copy of the high-speed signaling and discrete data lines to the Kodiak PCIe Analysis system in real-time. Together with the Kodiak™, SerialTek's Gen5 (32.0 GT/s) PCI Express® (PCIe®) interposers with SI-Fi™ allow users to monitor an unprecedented variety of PCIe bus traffic with unparalleled power and ease.

Enabled by SerialTek's proprietary SI-Fi™ technology, users can save hours over legacy approaches requiring interposer calibration.

This technology improves critical test coverage by providing high signal integrity, even over changing conditions, such as link training (LTSSM), Power Management, Hot Plug, Reset, and other tests where the physical link/lane characteristics may change.

SI-Fi™ PCIe Gen5 Interposers continue SerialTek's TCO approach. With the focus on signal integrity, QSFP-DD based cables connect each interposer to the analyzer. These cables are readily available and rated greater than 32GHz, resulting in uncompromised SI at all PCIe transfer rates. All sideband signals are passed through the interposer from Root Complex (Host) to Controller (Device), and all are made available to the analyzer for trigger, decode, and analysis.

Interposer Key Features

- No tuning (calibration) required. Host and Device signals pass through the interposer, allowing for real-world PCIe link training and easier setup

- Supports PCI Express Gen 1.0, 2.0, 3.0, 4.0 and 5.0

- Access to all sidebands, including SMBus

- Accurate capture of PCIe traffic at line rates from 32.0 GT/s (Gen5) down to 2.5 GT/s (Gen1)

- Passive tapping to avoid masking, hiding, or cleaning up electrical and/or link issues

- Low-cost, flexible, high-performance cabling for reliable analyzer to interposer connections

AIC Interposers

PCI Express slots are ubiquitous in ATX or ATX-based form factors in computing, storage, networking, and communication equipment applications. SerialTek's PCIe Gen5 slot interposers support analysis of x1, x2, x4, x8, and x16 link-widths. All relevant sidebands, including SMBus from the host or from external/third-party injection or generation tools are supported.

AIC Interposer Overview

- Dimensions: 309 x 167 x 31 mm (12 x 6.5 x 1in)
- Power connector: 4 Pin Mini DIN
- Analyzer connectors: QSFP-DD
- Device connector: PCIe CEM slot x16 straddle mount connector
- Host module connectors: PCIe CEM x16 Edge fingers

- SMBUS injection connector: 2×5 pin 0.1" header, 3.3 Vdc
- REFCLK output connectors: 2x U.FL, AC coupled LPHCSL
- REFCLK output control connector: 2 pin 0.1" header
- REFCLK buffer control connector: 3 pin 0.1" header
- Sideband signal access connector: 2×9 pin

AIC Sideband Signals

- JTAG (5), SMBUS (2), CLKREQ#, WAKE#, PWRBRK#, PRSNT# (4), RSVD (3)

Technical Specifications

Kodiak Enclosure

- Dimensions: 443 x 67 x 305 mm (17 x 2.6 x 12")
- Weight: 7 kg (15 lbs)
- Mounting: 19" Rack Mount Option, Tilt Feet Option
- Ambient Operating Temperature: 5-35°C at up to 2133m (7000 feet) altitude

Displays and Indicators

- Front Panel LCD: 800x320 4.6" WCGA, Touchscreen
- System Status: RGB LED

Warranty

- Two-year limited warranty, Analyzers
- Six-month limited warranty, Interposers

Front-Panel Connectors

- Interposer Connection: 4x QSFP-DD
- Ethernet (10 GbE): 2x SFP+ (10 GbE)
- Ethernet (1 GbE): RJ45
- PCIe Interface: 2x OCuLink
- USB Interface: 2x USB 3.2 Type A

Maintenance and Licensing

- Includes lifetime software updates – no maintenance fees
- Includes full-featured viewer software – easily share annotated traces between computers and colleagues and replay captured traffic
- Use SerialTek hardware on any computer – no additional licenses needed

Rear-Panel Connectors

- Power: IEC C13, 90-264 Vac, 47-63 Hz
- Clock Out: SMA, 50 Ω, 3.3 Vdc, 10 MHz
- Clock In: SMA, 50 Ω, 3.3 Vdc, 10 MHz
- Trigger Out: SMA, 50 Ω, 3.3 Vdc
- Trigger In: SMA, 50 Ω, 3.3 Vdc
- Maintenance: RJ45, USB Micro-B (Not for customer use)

Minimum Requirements

- Intel Core, 2 GHz or compatible processor
- 4 GB of RAM
- 1280 x 1024 display resolution with at least 65,536 colors
- 64-bit OS only (Windows 7, Ubuntu 14, Centos7 or higher)
- 1GbE controller

Configurations and Purchase Information

Kodiak PCIe Gen5 Analyzers

Description	Code
Kodiak Gen5 PCIe x16 Protocol Analyzer	**PK2A-G5-16**

PCIe Gen5 SI-FI Interposers

Description	Code
PCIe Gen5 x16 Slot Interposer	**PEI-G5-16-SLS**

> " *Once installed in a customer test environment the Kodiak's features and benefits are immediately obvious," said* **Paul Mutschler, CEO of SerialTek**. *"The user interface is modern, easy to use, and flexible. And in addition to being easy to setup and saving time, the calibration-free design supports 'real-world' PCIe link-training between the PCIe host and endpoint, making it more accurate.* "

More information at: www.serialtek.com/kodiakgen5

DS2000-PK2A-A-022021