



KodiakTM Next-Generation Gen5 PCIe[®]/NVMe[®] Analyzer

Innovative - Cutting-Edge - Integrated

Sales Contact:







www.serialtek.com/kodiakgen5

PCIe/NVMe Analysis Platform with Embedded Hardware, Real-Time Protocol Processor™, Calibration-Free SI-Fi™ Interposer Probing and Automatic Equalization, Internal SSD Storage, Touchscreen LCD, and Standard PCIe Cabling.

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.

The Kodiak platform, with its new web browser based BusXpert (TM) application, is built to tackle the challenges presented by the complexities of rapidly advancing storage and datacenter I/O technologies.

Real-Time Protocol Processor

Kodiak employs an innovative system register processing concept called Real-Time Protocol Processor (RTPP[™]). This proprietary feature dynamically and automatically queries and saves PCI configuration space, host controller registers, and NVMe queues, whether the analyzer is actively recording or idle. This alleviates the need for time-consuming and highly impractical reboots, and provides the ability to precisely decode, trigger, and filter using current values.

Multiple Form Factor Support

SI-Fi[™] interposer form factors include AIC (x4), EDSFF, M.2, U.2, and U.3,. Additionally, U.2, U.3, single-port (1x4), and dual-port (2x2) analysis is combined into one interposer unit, providing significant cost savings in enterprise environments where all form factors are re- quired. SI-Fi[™] interposers also support all relevant side- bands, including SMBus (e.g., NVMe-MI) from the host or from external / third-party injection or generation tools.

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 2TB (with read-only access for other users). Direct attach storage choices include two USB 3.1 ports and two PCIe OCuLink ports.

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. Signal conditioning methods used for earlier PCIe generations/speeds now seem primitive compared to the complex approaches used for PCIe Gen5. Further challenges are presented by NVMe, which adds critical requirements like hot-plug and NVM Subsystem Reset (NSSR), where the PCIe signals are renegotiated. SerialTek's proprietary SI-Fi[™] technology meets and overcomes these challenges with the features and capabilities needed to work efficiently.

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 phasematched 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.

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.

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.



Powerful SerialTek Features

- No tuning (calibration) required
 Kodiak's Rx automatically equalizes (EQs) the PCIe signals at all data rates
- Embedded trace processing architecture and fastest performance
- Real-Time Protocol Processor
 - No boot trace needed
 - Automatically captures PCI Config Space, Controller Registers, and NVMe Queues
 - Native NVMe triggers by device (BDF), Queues, and Packet/Event
 - Native NVMe filters by device (BDF), Controller Registers, Queues, and Packet/Event
- Deep Trace Buffers
 - 72GB, 144GB
- Internal Trace Storage (SSD)
 - 2TB
 - Read-only access for non-primary users
- Direct Attach Storage
 - Two OCuLink (PCIe) ports
 - Two USB 3.1 ports
- Network and Direct Connectivity
 - Two 10GbE SFP+ (optical/copper)
 - One 1GbE RJ-45
- Single-port (1x4) and dual-port (2x2) analysis in one platform
- Real-time access to traces in memory (prior to downloading)
 Users can review and analyze captured traces without downloading the trace
- Touchscreen LCD for analyzer setup and status

Interposers with SI-Fi[™] Technology

- No tuning (calibration) required
 - Host and Device signals pass through the interposer, allowing for real-world PCIe link training and easier setup
- SI-Fi[™] interposer probes expand coverage to enable testing in critical areas, including link training (LTSSM), Power Management, Hot Plug, Reset, and other situations where the physical link/lane characteristics may change
- AIC (x4), M.2 (x4), U.2 (x4), and U.3 (x4)
 U.2, U.3, single-port (1x4), and dual-port (2x2) in one interposer
- Access to all sidebands, including SMBus

Next-Generation Gen5 PCIe/NVMe Analyzer

SerialTek an ellisys company

Real-Time Protocol Processor™

Automatically identifies & updates:

- PCIe configuration space
- Controller data structures (queue attributes, etc.)
- NVMe queue creation and deletion

Uses

- Capture and decode PCIe and NVMe protocols without a boot trace
- Easy analyzer set up
- Correctly decode trace if any of the above attributes change
- Native NVMe triggering: by event (packet), device (BDF), and queue - eliminates false triggers
- Native NVMe Filtering: by device (BDF), controller registers, and queue

	A Not sec	ure https://172.16.0	21/#/archives/8cd91442-31a6-60c0-8						ia 🖆	G (Not syncing	. 🌏
Name			Sample P									
Description			U3Gen4x4 🖋									
Labels			1									
Created			Wed Jun 08 2022 10:56:27 GMT-0700									
Num Devices			1									
Select Device:												
01:00.0: Micron Tec	heology Inc [0x134	4] Unknown [0x5196]										
•		PCIe Details		D	splay • Ca	or fig Space C	ontroller Augiste					
Vendor	Micron Technolog	y inc [0x1344]		-	Configuration	Space						
Device	Unknown [0x519	4		Ho	7	6	5	4	3	2	1	0
Subsystem				0				Ver	dor ID			
Class Code	A Mass storage o	ontroller Non-Volatile memory	controller NVM Express [0x010802]					1	944			
•		BARs										
BARO	[64-bit] (0 0x0	0000000_42520000		2				De	ice ID			
-		NVMe Detail:		3								
Memory Page Size	4895											
MSI-X BAR	8480			4	IDSEL Steppi	Parity Error	VGA Palette	Memory Wri.	Special Cycle	Bus Master	Memory Spa.	. VO Space E
MSI-X Table Offset	0100002000			5	•	v	Reserved			Anternant Dis	Fast Back Ta	SFRR4 Fina
							09			1	e	0
		LBA Data size		6	Fast Back To .	Reserved	66 MHz Cap.	Capabilities	Interrupt Sta		Reserved	
	1	512			0	Constant from		1 Reviewed Tex	e Financial Tex	0.04	e Fi Tinin	Martin Dat
	2	512		^	0	0	0	0	0	Dev.	0	0
	3	512		8				Revi	sienID			
	4	512							м			
	5	512		2				016602 (N	VM Express)			
	6	512		11								
	7	512										
	8	512		12				Cache	Line Size			

PCIe Hardware Triggers

	Savable Tri Search co	igger Inditic	and ons	Create with searc	triggers chable d nterface	easily lrag/drop		Sii sta	mple, ad te and r trig	dvan nulti ggeri	ced multi- -sequencer ng	-	Interch and Se	angeable earch conc	Trigger litions
														1.1	
	🕒 Kodiak - 433700	005 - Triggei	De 🗙 🔰 Login - Serial I	lek ×	∲ +									-	σ×
~	- > C 🏅	Not secu	re https://192.168.1.15	2/#/trigger									‰ €	The Not syncir	ng 🌏
	Saved Sequencers	«	✓ ★ Create							1				Trigger 🗸 Search 🗸	 ± ☆ ^
*	Create New	+	Visual Editor Visual Editor	ditor						•					
۶	🔶 Starred		Events	Start											Trigger
ы	O All (Showing 1-19 o	of 19)	Filter events	Ŧ		State 0	ā		State 1	ā					
		*	🖃 🕿 TLP - Transaction Layer Paci	kets	Conditions			Conditions							
д	H4 < 1	▼ > ₩	Fmt:0 - 3 DW w/o data Fmt:1 - 4 DW w/o data	L	-	TLP Fields CfgRd0	<u> </u>	• • •	TLP Fields CfgWr0	Î	J				
*	Config Read 1 Bar0					Actions			Actions						
	any_dllp		Fmt:3 - 4 DW w/data Any TLP		Branch to Stat	te 1 ¥	-	Trigger #		-					
¢	any_speed_width		- TLP Payload Data												
-	any_tllp		bull P - Data Link Layer Pack Deven Management	iets											
	CSKp eds		FC - Flow Control				Trigge	er 🗸				Se	arch✔		
	eleos		Any DLLP Acknowledge												
	elos		- Data Link Feature DLLP Data L	ink Feature											
	errors		NOP DLLP NOP MRInit Multi-Root Initialization			Clipplay +									
	gen1x2		- Nak DLLP No Acknowledge			Mex 7 0	6 Fml	3	4	3	2 Type	1 0			
	gen2x1		- Vendor DLLP Vendor			1 Reserved	(3 DW header	, no data) 🔹		Reserved	e4 (CrigRdo) + Attr[2]	UN TH			
	gen3x1		SKP Any Skin			2 TD	EP.	x • 4m/11	amfol	x	<u>ت</u> •	x x •			
	gen4x1		- Any OS			x •	X	• X •	x -		x •	XXX			
	sds		TS1 Train Seq 1 OS TS2 Train Seq 2 OS												
	skp		- FTS Fast Train Seq OS							000K					
	timer		EIOS Elect Idle OS EIEOS Elect Idle OS												
	trigger_immediate		- SDS Start Data OS			6				Tag XX					
	tsi		- EDS End Data Stream			7		Last DW BE			2 SE DW BE				
	ts2		- CSKP Control SKP			8			Bus	Number					
	Unload	+	- Timer			9		Device Num	ber		Functio	n Number X			
	opioud	-	- Counter			10		Reserved			Extended Register				
			- Errors PCIe Errors - Width Change PCIe			21			Register Number			Reserved			
4			- Speed Change PCIe			Channels									
٠			Resources			All									
Ø			▶ Counters			Clear All Fields						Done			
64			▶ Timers												-



BusXpert Software

Web Browser and Standalone Application - Two NEW User Interfaces

Based on an embedded software framework and REST API, The BusXpert software 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.



Customizable Views – Widgets

One major aspect of the new GUI are the widgets and how the user interacts with the trace data through them. The widgets contain controls that are specific to them and there is a global toolbar that applies to all widgets.

There are a collection of widgets that a user can user to analyze the trace data in several different formats, easily accessed via a layout manager used to customize your Home, Capture, and Trace Viewing screens.



Easy Automation - REST API

The Kodiak 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.

Kodiak - 433700022 - API Specification	× +			~	-	0	3
→ C ▲ Not secure	https://172.16.0.21/#/help/api		Q	Ŀ	$\dot{\mathbf{x}}$		4
ALCHINGGLON Helphil Stuff	MICH /device/capture/settings/user/[settingsid]						
	Update a saved capture settings object in user settings						
- capture	Required Privileges Login						
/device/capture/devicemem/(devi ce)/live	Request	Responses					
/device/capture/devicement/devi co/saved	Para	200 The saved capture settings					
/device/capture/settings/curren							
device/capture/settings/default		 400 The settings were invalid 					
/device/capture/settings/live							
/device/capture/settings/user		 S00 An internal error has occurred 					
/device/capture/settings/user	I Down						
/device/capture/settings/user/[se	Stiena Franzie						
/device/capture/settings/user/ PA30 [settingski]	H + C 4 Cress						
/device/capture/settings/validat	T 'type": "object"						
/device/capture/settings/validat	Mescription": "Collection of settings to apply to a capture" " "properties" : { d items						
/device/capture/start	* "shannels" : () 3 (ters						
idevice/capture/status	* "mode" : () 2 iters						
/device/capture/stop	Trigger": () 2 ites						
/device/capture/loadptraces	"archiveld": () 2 (ters						
/device/capture/trigger	The second section is a second s						
/device/capture/trigger/status	1 + 0 : () 2 iters						
/device/capture/capabilities G							
* device							
/device/capabilities G	Clear Response	Try it Out					
/device/odevs G							
/device/odevs/(odevtName)							
/device/lock							
/device/lock	ST .						
/device/status							
/device/unlock PO	<u>न</u>						



Trace Widgets

Trace widgets are a collection of views used to analyze the trace data in several different formats, including Events (i.e. spreadsheet), PCIe Transaction, and NVMe Transaction widgets.

ar and	* Memory Regions
Market Market Market Market Market Market Market 000000000000000000000000000000000000	Uspays memory regions and revine queues in the date and the
No. No. <th></th>	
	Statistics Displays statistics across the entire trace
l Speed Widek Erron	* Trace Summary A widget that displays sumamry information about the open trace, including speed and width changes and any errors
An Antibiotic Stranger Market of Constitutions	Trace Info A widget that displays information about the open trace
	Transactions
	Nyme Transactions Displays a table of all NVMe transactions returned from the current location of the NVMe transaction builder

Events

Displays a table of all events returned from the current location of the curser.

Edit View W	Smontherrasy Indox Help	Sowniceds/	Sea Sull	Be on pikkini O sitene	•												×
		r: Cronbor	and Open	reate Carcolitert et	VINC arrow	ŵ.	Applete -	Colpress. •							12	Lend of	stell
interactions in	invoctos a	Loris a															+
	a) e	, .	r i		DOM THE R	a.											1.
theodore	Cheved	0.000		1 and		a characteristic and		Constitution	/execute:	Constitutes	the and function	Constitution Care	les.	A			
2283073526300	1 100	SAND.	10,000	LIMM/10/02		6.0000	0000 06062870	Compensator	120420	CRATERS.	1.26 293 145-52	Ciripcian i ne	0.000	Southers			
225307568.3950	Sec. 1	Gas	.44	LINE DOM:		0.000	2225 24642042	V Barstan V Carest	JAN IS GOVERNO	04000	0600060002	00000000082700	0.000				
10030733214920		Gess	104	TERMINA		04930	0008-546400.000		00/000		De000000011		0.000				
120.007.430.500.0	1 100	646	wl	TRADICOL		0.0000	0008,04014100		0<2900		0-0000000		0.000				
120.007.432.599.0	1 10 0	GeoG	wi	7100054(a-c)		0.0000	0008,09944700		0.0900		0600010007		0.000				
120.0073327655	19.0	0460	wi	10084653		6-MM	1008,049,64000		0<2905		0.0000000		0.000				
3183073316/95	100	6865		LIMMAN		6.0000	2018-0441-000		0.5706		0.000001		0.000				
115387-12166/3		Gaia	.49	LINGAROSSI		63000	0008-09646800		0.01500		0.0000000		0.000				
12010/0222/082	16.1	Genb	194	LTN 054 Galer		04000	0008,0494ee00		100/100		0600000030		0.000				
120-007-832-720-5	5 (SEC)	Gest	wi	TERMINAN		0.0000	0008_04944700		0,0905		0.0000000		0.000				
120.007430319.5	1970	- 6ec4	wl	TREAMOND		0.000	0008,0404400		6<1900		0.0000000		0.000				
1288072322220	1.00	6895		UNRATIONS		\$.000	2008-08-41(900		5.0700		0.0000000		0.000				
225307.72258830	7 m.v	949	.41	FLAKER PROPERTY.		0.000	COLO MANAGAN		5.07.002		0.0000000		0.000				
100387-33210030	1 6 .0	Gao	- 14	LTM (INH) and		048830	0008_0X64ex00		00/30		DECODERADO		0.000				
1201017-832 61000	1 1 40	GetC	wi	TRANSFORM		0.0000	0008,09914:00		0<900		060000000		0.000				
120.0073304605	19.0	- Geo.5	wf.	T106846-20		6.000	0004,049,04000		0.0900		0.0000000		0.000				
315807.722.525.5	100	6865	.41	0.000940300		6.0000	00010446.000		15.57400		0.0000000		0.000				
225387.3235275		Gais	44	LTM-044-0322		64000	0005 0/640/00		0.01900		0.0000000		0.000				
1004073212698	1 1 1	Geno	194	LPR0N4/acci		069930	0008,046660000		00/200		0600000000		0.000				
120.007.431.000.5	- 1	Geo.0	wi	71100237(5/25)		0.0000	0000,34414000		0,0900		0400004821		0.000				
126.007.535.524.0	Sec. 1	- Geo./5	wi	"FROMAD COMP.		$\sim mn$	1000_0009004		6-3935		0.00000002		0.000				
120.007.454.179.5	firum3		wl	TIPROD/Cores		0.000	0000_000199900		0<0000		0-0000003		0.000				
128.807356709.5	190	- Gen5	- 14	TEMBOSICS		6.000	0004 04/401680		0.0000				0.000				
225307-235234-3	Sec.1	548.9	.e1	FLAD 2020		0.000	2005 06662840	 Newsault Constitution 	1001112-01502	04000	0.000.0007	000000.000.827.0	0.000				
225388336255560	2 6 60	Gaio	- 14	LTM MANAGEMENT		04400	0005 0466 3000		00/300				0.000				
120,000,154,477,0	Drue 1	Gend	- 14	TERICOLO (PARA)		0.0000	0008_04640900	🖌 🖌 Soconartis Dompie	tim (500200	04000	0401514530	0.000200000000	0.000				
120,000,121,022,5	19.0	GeoG	wi	710004tores		0.000	000,000,000		0.0900		0.0000000		0.000				
518,808,324,832,5	100.00	GeeG		1190632-5-05		6.0000	1000 Exc. 680		0.<900		0.0009823		0.000				
1103663205003	Divers?	Galo	44	L1M4032052		6.0000	2000 1008/004		0.0000		0.0000003		0.000				
1253AAA3522.41030	Deres 2	Gent	104	LUNG 20050		04000	0000 2008/9900		0.0400		060000034		0.000				
12040033420040		GMO	wi	TENERSON		0.000	0008,0001990		0,0995				0.000				
176.0001311146.0	i feast	0460	wi	THE REAL PROPERTY.		s-mn	soot jaraana k	🖌 🖌 far sectir Dough	sion (7/2+7905	04000	0.0000009	00000000000000	0.000				
128.888357292.0		Gen5	- 1%	TERMINICIST		\$.000	0005-06540800		6.5206		Di-064-009e		0.000				
22530545574733	14.1	985	.41	LING NO.		0.0000	0000 84/04/00		104/50		060000023		0.000				
1253083355 1550	a and a second	Gena	- 14	LT 10 40 32 (30 C)		044430	0000 a006/0844		0.04900		DECODERAM		0.000				
120-003122241-0	i farral	Gend	wi	TERMINATORY		049935	0000_x004/00s		00000		040000001		0.000				
120.000355260.0	from 1	646	- 14	TIPREMINER		0.000	0000_/AMM/000		0.650				0.000				
120.000.152.921.0		Geoló	w	TIP:038(200)		0.000	0000,000,000	🗸 Sacarol i Comple	elos (30:650	0,5400	0.04474000	000400.0007/230	0.000				
STRANGEST COLD	Fires 1	Gen/A	w4	11100530-001		6.000	0000 / NM 1000		6.0005		0.0000000		0.000				
1153656352 5/000	DOWN J	6415	.x1	L1M4032-0540		6.0000	2000 ±0886004		0.0800		0.0000000		0.000				
115,000,011,0125	Devel	Gas		1110120-22		64000	0000 ±0084005		0.69900		060000000		0.000				
120-003-044-020-2		Gen	- 14	1100220000		0.0000	0000_1004/001		0.69930		DeCCORRECT!		0.000				

Statistics

Statistics +	•											+ =
Summary	Link	Orror	TLP	DLLP	Ordered Sets	Throughput	LTSSM	Transactions	Transaction Latency			
					Down 0			90		Down LTSSM 0	UpLTSSMO	Total
Total TLPs					4101353		626	405				\$0446759
Total DLLPs			25947815					1005				38140121
Errors		191					4	1787				43920
Total Bytes		2.37.18				2.2	718				4,74.18	
Paylead Bytes					1019.09 MB		1.0	o GB				2.00 GB
Link Utilisatio	n				0.1138		0.0	94%				
Paylead Utilis	ation	0.0416			0.0	4195						
LTSSM State C	tanges									34	18084	18138
Restant Cha												

Transaction View Widgets

Events are collated into sequences that make up transactions on the bus. The transactions consist mainly of commands coming from one side of the stream and responses coming from the other. The transactions can be expanded (all events visible) or collapsed (only the transaction summary visible). Each row contains information about the packet it represents, and the columns are filled with the information from that packet.

PCIe Transactions

A start for any family and the		Rear adultad D annua			_							
and an experimental second		a a sport a second										
e tou vee wrant i	es p											
о н о ш с	Aberlin in Barry Bar	net de cellen all de la company de la strate	B Associate	Delastra -						6	i Loost	diam'r.
and the stars of the star	V Form V											+
(au 4) 4	у т	A 2 O DENTA	16.05									4 10
H. There Ore	el Speed STS	1 104	2010/2512064	Completion/Ratur	Dantifien	Assister	Payled Preview	Proventer -	Completer	Teg	sono:	
191/00000aaato	C215 14	Real ILP Cyber - Sales fai	Sacarna ¹⁴	 Sacanada (Serra at an SK) 	001000000000000000000000000000000000000	20030-00080	Gr14620921	04936	06000	06000		
1919202204880	0 (AL) 14	4 TIP Cig000 (Lotin)			ost cococerer.s	26000-04900		04994		0,000		
193 2000030960	6415-34	# D(1948(a)m)			995.000.000.00L5							
23 700 000 0 A 0	6411 H	TPC(D)=		 Second (Completion (90) 	445 CCC 208 APr. 5		0.1.020001	0499	0.000	0.001		
31200001000	5 (Feit 14	# 001945cmt			005 000 000 000 5							
134 300 038 177.0	feet at	EEDPC/MASSORIA	Second	 An order Concerning (AC) 	495 000 000 000 5	49-000-04-48	0-14810003	045.94	6-1998	0.005		
134 200 0000 1770	0 0 d	4 TPO(800.0402)			dat coordinate d	09-000-0x1R		040.08		0.00		
28/20080913	1.1.2 41	♦ ULLPAREAST:			000.000000000.5							
58070039826459 ww	6.00 #1	 EPCsiDicate 		 Boundary Constitution SK1 	000.000.000.000.5		0.16610803	CARE	65900	0.005		
125 /000058980	C03 H	♦ DEL*Actions			000.00000000000000000000000000000000000							
100.00004.0000	6112.14	B ≓ ID Call 0 - Secold	562.01	 Successive Completion SQL 	000.00000025-55	99000 04668	0.1.41000c	0004	68.W	0.000		
511/2000A.3010	G113 14	 Inclusions 			002/00000000000000000	PACCO CK293		Crebt		0.000		
19170000044800	CHIS 14	# DLLTAGE LOTE			GOLCCC DEGURRES							
31700000000 G00	6915 94	# TPGD1-T		 Stores (concerned by) 	ODECCCORD WELS		0101092	CARDA	oconi	Record		
33300004/5400	6415 M	+ D(19426.571)			9910000000005							
33,700,000,00000	6411-14	tel et TIP Cipen - Super fu	Doctorsoftal	 Successful Constantion (90) 	444.000.000.000.004.5	08000-04/23	0-190100-9	04994	econ.	0.001		
19170000040000	C215 14	 Theology service 			GOLCCCCCCURC.5	2/8000-04174		04656		(accel		
91700000.1400 Q.O	6715 54	# DEFEASURING			AND COCOCOUNTLY							
947000000000	6415-24	+ IPQD151		 Proveni coult to bet 	000000000000000000000000000000000000000		0.1301.01.5	04004	100 001	HCCH		
-347/00/22/00	64.1.11	+ INTERNAL CONTRACTOR			1010000000000	44.11.1.1.1.11	4.41.00004	1.0.04				
100 200 200 200 0	6.1.4	Call of the part of the tr	11 10.14	• (1.10/11.100/11.10.001)	000 000 000 000 0	(#12.5.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1.1	1111-1224	0.004	10.000	0.000		
		A margaretteri			AN CONTRACT							
		+ 000 - 200 - 500			030000000000							
La competent	0.07 11	d marcheologica		 Magoa (magina 36) 	the constants		0.00.00.00		10000	00.000		
Las contra tract	Corp. 14	With the second	Annuald	of the second of The second second second	404.000.000.000		0.107110717	d calif.	1.4.11	0.260		
141 COCCA AND	Cost of	A UNCONCOME.	A	• 2000 PV (VIII) II II II	400.000.000.000	where over	Viat- Liver-	Conte		0.000		
101 /00/2010/00/	C113 14	# INI CARDON			100.000.000.000	2.2227 1.22A				44.744		
	6411 14			and discovered as if some values hitle	001 011 010 001 1		de la contra de la contra de	0.0014		0.000		
122 200 200 200 200 200	G111 14	1 PULLANCE		 Landana Company Product 	000.000.000.000.0		GILWINGT	24414	0200	10000		
100000000000000000000000000000000000000	6411 H	Martin Colors, Consula	Assessed	of Assessed & Companying Mary	000 000 000 000 0	200220-0-144	0.101000	244.04	0.000	0.000		
10.000000000000000000000000000000000000	6411 H	A TACKNER			000.000.000.000.0	ABORD CONTRACTOR		0.00		0.000		
100 000 000 000 000 000	feel at	A FUE Advances			000.000.000.000.0							
133 510 997 977 5	6113 at	A 196-60-000		of Second Concerns With	000.000.000.000.5		0.101002	242.04	0.0000	0.700		
100 PC00002155 8	1 10 M	+00200000			0000000000000							
23 700 007 914 5	Sec1 41	to en TEPCIAN Accental	And provided	 Second Consisting (6) 	000 000 000/072 5	08000-0410	0.0/010010	0.010	0.000	0.000		
120 200 002 014 5	fril at	+ TPCIAE Join			005000000000000000000000000000000000000	09-000-0x138		0.024		0.000		
124 FC (2000) 100 5	feet at	♦ OUP data set			000000000000000000000000000000000000000							
100 CO000000 0 000	1	• 10%-01/20/20		 An excit Consistent NLL 	that concerning a		11/20/07/01/12	00.05	0.000	0.00		
540,000,000,020,0	1.00 M	+ LELY AND ON			OM COORDINALS							
101/00/06/01/2	5512 14	E = ILCOMP (Local)	No.	 Excessive Correction SK1 	001000000258.5	98000 DKR0	0.00010822	046500	64700	0.000		
LIN COLUMN 1	D111 14	4 DPOMMOND			430 000 000 MILLS	10000 0430		5/210		0.200		
						· · · · · · · · · · · · · · · ·						_

NVMe Transactions

Nexpert - Cyliner Smarth	homer (for an issue (spec	allinen pittinilli errane								-		_
re tot Vew Window	r Hep											
	Chardene Brand	an helder and the second state of the second s	ntra Deserver									
the formation & Conservation	CONTRACTOR NO.											
SERVICENCE (C)	4 > T	AL 22 🕘 DESTIMING									н	н
H. There On	Stead Start	arr tex	Transities Steries	Cherco et de Streta e	Accent	Recenter-	Consister	Tag	Servey			
100 046 3750640	C013 14	III # N1465c0miakerDoodsc1+Quare Dc2	Salacitadu I		0.400000000 30025046	019/000		C.000	Queries 15 (000, Q10) 7			
180 046 37708840	Aven Cons of	ROP 121 MARKIN Second	Superside		0480803330 \$2017046	015000		04040				
180.046.895086C	Seed Cent of	4 TIPE (2.17 strain)			0490900000,40017046	0x9000		0.000				
100.040.099.203.5	601 140	DEFAMONS										
180.010.898,698.0	10 deit 24	16 at NYMERC: Buy See york, Gauge Dr.F.	fuorentui	 Examinita (Completion (SC)) 	0480999953_05180008	0x1900	0,000	cinni	Device \$8,000, QID: 8			
180,046,875,6680	Cent 14	Here Command Fidahis Sacatafa	SLOCO-RL	 Subcovituli Compétition (SC) 	0490000003_05490000	015900	04990	04000	Casos Entry: D			
180.046.8955480	6615 34	Hu*TIP HRss4+Supports1	Supravita	 Suprantul Completion (SC) 	0499999933,55452009	043900	04990	Com				
.30.010.899.Wato	10 CA11 H	4 11 MI((4) -6 0)			040000003_00440000	041900		onn				
10 212 8987966	6415 J	a STRANS		4			1.444	0.000				
- 10 D10 D00000 0		A TRADITION		 Normality (spinor); 		247400	CONC	onn				
100 144 (100 (100)	Coll of	Tel De adar antis	B-100 B-1		0.000000031-0.0000	7=3400		0.000				
141 MR-101 WR 1		開始 III March State and	hearth		100000002.0000000	100000		0.000				
Set Heave 200 a	1000 M	2 Print Print			-0488888882 http://	100700		0.000				
LAU DESCRIPTION A	Last at	\$ 202A4.0400										
100 046 800 2000	500 M	But of Month's Baseding	Same and a		C48030027 5/867200	548,202		C.000				
180 046 50 12940	C013 14	 b"Ment+kepp 			C48080002/ 10191220	010,000		CAUNU				
180046608.3760	Cent of	4 EUPAdebace										
182.046.600,698.0	Cent 14	HATTIP West-Accord	Suprantal		0490900022,85545700	013900		0.000				
180 046 020 0290	•• CALL 14	2 TE MANUPACE			040000002_31521200	0,1900		own				
100 210 222-017.5	event dest ut	 STRAtysco 										
180.0466002400	ac Cent of	Hart Dr Hord-Adecound	Supravital		049090002,0091000	0x5900		04969				
130.046600,047,0	601 (M	↑ 12 MoN4 (star)			040000007,35545200	0x3900		0.000				
180 010 00040300	5411 (ALT 14	 All PAR(star) 										
10.3127257986	10 (Art 1	First List March Springer	fuorendu :		04000005_0100100	2,1900		0.000				
-30.517.525798.0	66 (Feel at	+ TIP Hand parts			0.0000002_0101100	0,000		0.000				
-31567963895	inel feel d	4 SIPAADAD										
540 MICSN-4540	10 U.S. 4	2 H TO WAR A Second	New York		14000002 525/2010	(8390)		0.000				
280 516 565 6580	0 000 4	4 C14400 3003			0.0000007 050750	00702		0.000				
201210000100.0	0.03 8	• survisiterin										
1010400000	C	A Distantia Social	SINDA		Call 100 Control 1	149.711		0.000				
UNING AND DOD.	(21) 1	A DIRACher II										
1011046458-0003-5	Cert 1	But 10 Martin Accounts	Secondal		040000002 254020	0-500		0.000				
100000000000000000000000000000000000000	Cent of	2 11 Meloi ha m			0400000027 24141720	0,1202		0.000				
180 246 (206) 177.5	1011 (ALL 14	e STRARPLE										
10.2105-83866	6415 at	Hat TR March - Second	Supremble		04000002_0101000	0,9900		0.000				
1000460483900	40 Gett of				049090002, 2593820	045900		Centra				
100040040419.0		4 STPARINEN										
10001004040.5	10 (Art 14	Mat 7 P March - Second	fuorents)		040000002_0102000	0x1000		0.000				
30317546923	10 (A) (A)	# TERMAN parts			04000002_0151900	0,1900		0.000				
-2151/5/6/665		A NURSERIE	_		_	_	_	_	_	 _		

Flow Control

Tracks flow control credit usage over the duration of the trace.





LTSSM

A timeline view of the "Link Training and Status State Machine" as seen in the trace data. The widget is arranged by up & down streams of the link. The data is shown as a tree that expands out and can be zoomed in to view data with finer granularity.



Packet Details

Provides a detailed breakdown of contents of an events payload.

Detai	ils 🗙	Сс	onfig Space	× Mem	iory Space	× Book	marks 🗙		+ 🗆						
Displ	lay 🔻	T	LP MWr3@	0 128.809.03	9.055.0				4 ¥						
- TLF	P MWr32	2 (0×	:553)												
Hex	7		6	5	4	3	2	1	0						
0	2 (3	DW	Fmt / header, wi	th data)			Type 00 (MWr)								
1	Tag [9 0]	c	TC (Best Effor	t)	Tag [8] 0	Attr[2] 0 (Default)	LN 0	TH ○ (Default)						
2	TD 0 (Defau	ılt)	EP 0 (Default)	Attr[1] 0 (Default)	Attr[0] 0 (Default)	/ 0 (Default/	AT Untransla	L	ength 001						
3															
4					Requi	ester ID 000									
5															
6					1	Tag DO									
7			Last [DW BE			1st D' f	W BE							
8					Ad d00:	dress Lc000									
11															

Config Space & Memory Space

0	R 0 8	live 🗃 Absolute +	Postprocesa •					Exyout: default
Con	Ag Space 🗴							+
Dist	play = 01,00.0 = 4	• 316.122.521.139.5						
- 6	onfiguration Space							
Hes	c 7	6	5	4	3	2	1	0
0				Vendo 15b1	(ID 7			
1								
2				Device	e ID			
				501	•			
3								
4	IDSEL Stepping/Wait Cycle C	Parity Error Response	VGA Palette Snoop	Memory Write and Invalidate	Special Cycle Enable	Bus Master Enable	Merrory Space Enable	NO Space Enable
5			Reserved			Interrupt Disable	Fast Back To Back Transactions	SERR# Enable
			60			1		•
6	Fast Back To Back Transaction	Reserved	66 MHz Capable	Capabilities List	Interrupt Status		Reserved	
7	Detected Parity Error	Signaled System Error	Recieved Master Abort	Recieved Target Abort	Signaled Target Abort	DEV	rSEL Timing	Master Data Parity Error
8				Revisio	nID			
9				Class C atomat (NVM	ode A Farress)			
11								
40				Columb	ta Cito			
12				10	ie size			
13				Master Later	ncy Timer			
				08				
14				Header	(Abs.			
15				815	т			
16				Base Address f7b8N	Register 0			
19								

Diff Events

Highlights differences between two selected trace events.

Diff E	Ever	nts	×															+ =	
Disp	lay	•		1270	593)	K @	019	9.27	7.33	4.38	89.0			d	ì	1	1	Ŧ	
Left:																			
127693	3 x	TS:	1 @	019	.27	7.3	34.	389	.0										
0000:	1e	1e	1e	1e	01	01	01	01	00	01	02	03	ff	ff	ff	ff			
0010:	1e	1e	1e	1e	00	00	00	00	aa	aa	aa	aa	05	05	05	05			
0020:	31	31	31	31	80	80	80	80	4a	4a	4a	4a	4a	4a	4a	4a			
0030:	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a			
Right:	:																		
170 x	TS	L @	019	. 29	7.8	07.	318	.5	(+0	00.	020	.47	2.9	29.	5)				
0000:	1e	1e	1e	1e	01	01	01	01	00	01	02	03	ff	ff	ff	ff			
0010:	1e	1e	1e	1e	00	00	00	00	b2	b2	b2	b2	05	05	05	05			
0020:	31	31	31	31	80	80	80	80	4a	4a	4a	4a	4a	4a	4a	4a			
0030:	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a	4a			

Packet Data

Provides a detailed breakdown of the data/payload of an event.

Display	•		Unk	now	n @	9 180).723	3.588	3.326	5.5							Ű	1	Ŧ
≓ PRP	Li	st	Fet	ch	» S	ucc	ess	ful											
0000:	00	00	5a	bc	07	00	00	00	00	a0	ea	bc	07	00	00	00			
0010:	00	c0	4f	bc	07	00	00	00	00	c0	5a	bc	07	00	00	00			
0020:	00	40	5a	bc	07	00	00	00	00	c0	ea	bc	07	00	00	00			
0030:	00	80	0c	d4	07	00	00	00	00	e0	4f	bc	07	00	00	00			
0040:	00	a0	4f	bc	07	00	00	00	00	e0	0d	d4	07	00	00	00			
0050:	00	fO	5a	bc	07	00	00	00	00	d0	4f	bc	07	00	00	00			
0060:	00	a0	4f	bc	07	00	00	00	00	e0	0d	d4	07	00	00	00			
0070:	00	fO	5a	bc	07	00	00	00	00	d0	4f	bc	07	00	00	00			
0080:	00	20	5a	bc	07	00	00	00	00	00	8a	bc	07	00	00	00			
0090:	00	b0	f1	d3	07	00	00	00	00	d0	35	b9	07	00	00	00			
00a0:	00	e0	5a	bc	07	00	00	00	00	a0	12	c7	07	00	00	00			
00b0:	00	50	5a	bc	07	00	00	00	00	fO	35	b9	07	00	00	00			
00c0:	00	00	0d	d4	07	00	00	00	00	30	5a	bc	07	00	00	00			
00d0:	00	d0	0b	c4	07	00	00	00	00	40	0b	c4	07	00	00	00			
00e0:	00	00	0d	d4	07	00	00	00	00	30	5a	bc	07	00	00	00			
00f0:	00	d0	0b	c4	07	00	00	00	00	40	0b	c4	07	00	00	00			
0100:	00	80	fa	b8	07	00	00	00	00	20	0e	aa	07	00	00	00			
0110:	00	30	0e	aa	07	00	00	00	00	40	0e	aa	07	00	00	00			
0120:	00	50	0e	aa	07	00	00	00	00	60	0e	aa	07	00	00	00			
0130:	00	70	0e	aa	07	00	00	00	00	00	00	00	00	00	00	00			

Additional Widgets / Functions

- Real-time Link Statistics
- Global & User Bookmarks
- Quick Search: Contextual type search field
- Trace Summary Information
- Buffer Status
- LED's
- Concurrent user trace access (Events & Transactions Views)
- User, User Groups, User Permissions, & LDAP support

SerialTek Kodiak[™]





Protocol Trace Widgets

Low-level and stacked protocol elements are hierarchically and chronologically displayed in easily configurable views.

BusXpert - C:\Users\SimonThomas\Downloads\Gen5x4BootupWithIO.sttrace

Fast & Advanced Search

Quickly find events using a contextual search field. Includes multi-state search, and copy/paste from the trace views.

File	Edit Vie	ew Wi	ndow	Help											
0	R	0	H	C:\Users	SimonThom	nas\Dov	vnload	ls\Gen5x4	BootupW	/ithIO.sttrace		Absolute 👻	Postprocess 💌		
Nvn	ne Transactions	5 x T	Fransact	ions ×	Events ×										
6	earch		٩	•	•	T	А	Ċ		Delta Time	e: N/A				
м	Timestamp	,	Cha	nnel	Speed	Widt	h Ty	/pe					Transaction Status	Completion Status	Address
	128.821.2	63.253.5	Do	wm 0	Gen 5	x4	Œ		e Submiss	sion Doorbell »	Queue I	D: 6	Successful		0x00000000_d001
	128.821.2	63.835.5	Up	0	Gen 5	x4	Đ		e I/O: Rea	ad Command »	Queue II	D: 6	Successful	 Successful Completion (SC) 	0x0000008_0413
	128.821.3	33.243.0	Up	0	Gen 5	x4	Đ		e MSI-X V	/ector			Successful		0x00000000_fee0a
	128.821.3	35.703.0	Do	wm 0	Gen 5	x4	Đ		e Comple	tion Doorbell :	Queue l	D: 6	Successful		0x0000000_d001
	128.821.3	44.802.0	Do	wn 0	Gen 5	x4	Đ		e Submiss	sion Doorbell »	Queue I	D: 6	Successful		0x0000000_d001
	128.821.3	45.386.0	Up	0	Gen 5	x4	E		e I/O: Rea	ad Command »	Queue I	D: 6	Successful	 Successful Completion (SC) 	0x0000008_0413
	128.821.3	45.386.0	Up	0	Gen 5	x4		∃≓⊂	ommand	Fetch » Succes	sful		Successful	 Successful Completion (SC) 	0x0000008_0413
	128.821.4	13.183.0	Up	0	Gen 5	x4		⊡≓D	ata » Suco	cessful			Successful		0x0000008_056e
	128.821.4	13.183.0	Up	0	Gen 5	x4		Ŧ	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.201.0	Up	0	Gen 5	x4		±∓	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.240.0	Up	0	Gen 5	x4		∓	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.257.5	Up	0	Gen 5	x4		Ŧ	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.295.0	Up	0	Gen 5	x4		∓	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.312.5	Up	0	Gen 5	x4		±∓	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
	128.821.4	13.351.5	Up	0	Gen 5	x4		Ŧ	± TLP M\	Wró4 » Succes	sful		Successful		0x0000008_056e
														8 more	≥ ×
	128.821.4	14.050.5	Up	0	Gen 5	x4		∃≓0	ommand	Completion » S	Successfu	I Completion	Successful Comple	ti	0x0000008_0466
	128.821.4	14.320.5	Up	0	Gen 5	x4	Đ]≓NVM	e MSI-X V	/ector			Successful		0x00000000_fee0a
	128.821.4	15.987.0	Do	wmO	Gen 5	x4	Đ]≓NVM	e Comple	tion Doorbell :	• Queue I	D: 6	Successful		0x0000000_d001
	128.821.4	19.651.5	Do	wm O	Gen 5	x4	Ð	∃≓ NVM	e Submiss	sion Doorbell »	Queue I	D: 6	Successful		0x00000000_d001
	128.821.4	20.231.5	Up	0	Gen 5	x4	Đ]≓NVM	e I/O: Rea	ad Command »	Queue II	D: 6	Successful	 Successful Completion (SC) 	0x0000008_0413
	128.821.4	90.094.5	Up	0	Gen 5	x4	Đ]≓NVM	e MSI-X V	/ector			Successful		0x00000000_fee0a
	128.821.4	91.720.5	Do	wnO	Gen 5	x4	Đ	∃≓ NVM	e Comple	tion Doorbell :	Queue l	D: 6	Successful		0x00000000_d001
	128.821.8	37.859.5	Do	wm O	Gen 5	x4	Đ	∃≓ NVM	e Submiss	sion Doorbell »	Queue I	D: 31	Successful		0x00000000_d001
	128.821.8	38.441.5	Up	0	Gen 5	x4	Ð]≓NVM	e I/O: Rea	ad Command »	Queue II	D: 31	Successful	 Successful Completion (SC) 	0x0000008_080b
	128.821.8	49.533.0	Do	wn O	Gen 5	x4	Đ]≓NVM	e Comple	tion Doorbell :	Queue I	D: 31	Successful		0x00000000_d001
	128.821.8	56.581.5	Do	wn O	Gen 5	x4	Đ]≓NVM	e Submiss	sion Doorbell »	Queue I	D: 31	Successful		0x00000000_d001
	128.821.8	57.163.5	Up	0	Gen 5	x4	Ð]≓NVM	e I/O: Rea	ad Command »	Queue I	D: 31	Successful	 Successful Completion (SC) 	0x0000008_080b
1 -	400.004.0		_		~ ~				<u> </u>		~ .		~ ~ · ·		





Timestamp: -- 🔲 Down 0: -- 🔲 Up 0: -- 🛄 Up LTSSM 0: -- 🛄 Down LTSSM 0: --

Precision Timestamping

Every event is given a precise timestamp and synchronized across all views. Measuring delta time is easy via ctl+ selecting any two events in the trace.

Whole Trace Timing Views

Every event, synchronized across all views, can be displayed in a custom graphing widget. Measuring is easily set via right-clicking the mouse.

SerialTek Kodiak™

Next-Generation Gen5 PCIe/NVMe Analyzer



Quickly show/hide links, sidebands, LTSSM, and protocol events.

Real-Time Protocol Processor

Automatically queries/saves the Configuration space, controller registers, and NVMe queues, whether recording or idle.



SerialTek

														(=)	Layo	ut: defa	ult 🔻
					+ 🗆	Details	× (Config Sp	ace 🕷 Memory Space	е ж Во	okmarks :	c					+ =
				144	₩	Display	•	Unknown	@128.821.345.386.0						iال	1	¥
	Requester	Completer	Tag	Summary		- ≓ Con	mmand	Fetch = S	Successful								
9030	0×5000		0x000	Device: 59:0	0.0, QID: ć	Name	_		Value (Hex)			Decoding					
0000	0x5900	0x000	0x000	Device: 59:0	0.0, QID: ć	Opcod Second Second	de Onera	tion	02			Read	neration				
000	0x5900		0x000			& Reserv	ved	cioni	0			i vormar oj	peration				
9034	0×5000		0x000	Device: 59:0	0.0, QID: ć	🚳 PRP or	r SGL f	or Data	0			PRP					
9030	0x5000		0x000	Device: 59:0	0.0, QID: ć	Transfer	hand Id	entifier	0201								
040	0x5900	0x000	0x000	Device: 59:0	0.0, QID: ć	& Name	Space	enemer	00000001								
040	0x5900	0x000	0x000	Queue Entry	: 1	Identifier											
5000	0x5900		0x000			🗞 Reserv	ved tata Po	inter	00000000000000000								
5000	0x5900		0x000			& PRP E	ntry 1		00000008056e5000								
5100	0x5900		0x000			🚳 PRP E	ntry 2		000000000000000000000000000000000000000								
5200	0x5900		0x000			🗞 Startir	ng LBA	nicel	0000000000000008								
5300	0x5900		0x000			Blocks	eroric	gical	0007								
5400	0x5900		0x000			🗞 Reserv	ved		000								
5500	0x5900		0x000			Protection Information	ction ion Fiel	a	0								
5600	0x5900		0x000			& Force	Unit A	ccess	0								
	0.0700		0.000			🚳 Limite	d Retry	у	0								
1010	0~5900		0×000	Queue Entry	1 Dhase	& Access	s Frequ	iency	0			No freque	ency info	mation p	rovide	d Gara	
010	0,5700		0000	Queue Entry	. 1, Phase.	& Access	s Laten ntial R	eauest	0			no inform	ation on	nrormatio sequentia	al acces	iaea. Is is pro	vided
000	0x3900		0,000			& Incom	pressib	ole	0			no inform	ation on	compress	ion is p	rovide	d
1034	0x5000		0x000	Device: 59:0	0.0, QID: c	& Reserv	ved		000000								
030	0x5000		0x000	Device: 59:0	0.0, QID: 6	& Expect	ted Init lock Re	tial ference	0000000								
080	0x5900	0x000	0x000	Device: 59:0	0.0, QID: 6	Tag	ioen ne	.rerence									
000	0x5900		0x000			& Expect	ted Log	gical	0000								
9034	0x5000		0x000	Device: 59:0	0.0, QID: 6	& Expect	ted Log	an iag gical	0000								
90f8	0x5000		0x000	Device: 59:0	0.0, QID: 3	Block App	plicatio	on Tag									
0000	0x5900	0x000	0x000	Device: 59:0	0.0, QID: 3	Mask											
90fc	0×5000		0x000	Device: 59:0	0.0, QID: 3	- ≓ Dat	ta » Suc	cessful									
90f8	0x5000		0x000	Device: 59:0	0.0, QID: 3	No Detail	s Availa	able									
040	0x5900	0x000	0x000	Device: 59:0	0.0, QID: 3	- ≓ Con	nmand	Complet	tion » Successful Completi	ion							
	0.0000		0 000	- · · · ·		Data ×	Da	ta ×	Diff Events × Trace	Info ×							+ -
					+ 🗆	Display		Linknows	@ 128 821 345 386.0						dii	4	I
					7	Display		01161044							-	'	T
						≓ Comma	and F	etch »	Successful								
						0000:0	02 00	01 02	01 00 00 00 00 00 0	00 00 00	00 00 00						
1 1	. I.	1				0020: 0	00 00	00 00	00 00 00 00 00 08 00 0		00 00 00						
						0030: 0	07 00	00 00	00 00 00 00 00 00 0	00 00 00	00 00 00						
						≓ Data	» Su	ccessfi	11								
	AFE AND AN	LM				≓ Comm	and C	ompleti	ion » Successful Cor	mpletion							
HUI	LUN BURNE	1 14				0000: 0	00 00	00 00	00 00 00 00 02 00 0	06 00 01	02 01 00						
	MANAM	M MI															
VVIV			A		_												
- 00	0	0.00-0.00	0.00	0													

User-Configurable Views & Layouts

Easily modify tab sets and protocol views by adding or re- moving widgets, columns, and more.

Export Everything

All data is exportable to JSON or CSV. Exports are customizable.



SI-Fi[™] Interposers

SerialTek's Gen5 (32.0 GT/s) PCI Express® (PCIe®) and Non-volatile Memory Express® (NVMe®) interposers with SI-Fi[™] allow users to monitor an unprecedented variety of PCIe and NVMe 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.

Each lane's analog signal is received at the probe's differential input and distributed to two separate phase matched differential outputs with a nominal gain of 0dB, allowing the host and device signals to pass through the interposer, allowing for real-world PCIe link training and easier set-up of the analyzer and DUT.

SI-Fi[™] PCIe Gen5 Interposers continue SerialTek's TCO approach. With the focus on signal integrity, flexible, low-cost, SFF-8644-based cables connect each interposer to the analyzer. These cables are readily available and rated greater than 20GHz, 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.

Key Features

- SI-Fi[™] Interposers require no calibration
- Supports PCI Express Gen 1.0, 2.0, 3.0, and 4.0
- Accurate capture of PCIe data traffic at line rates including:
 - 32.0GT/s (Gen5), 16.0GT/s (Gen4), 8.0 GT/s (Gen3), 5.0 GT/s (Gen2), and 2.5 GT/s (Gen1)
- Single U.2 / U.3 interposer supports single-port and dualport capture (only one analyzer is needed for dual-port)
- "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



Gen5 Slot/AIC Interposer

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 supports analysis of x1, x2, x4, x8, and x16 link-widths. SerialTek's PCIe Gen5 Slot (AIC) Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the PCIe host 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. 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. All relevant sidebands, including SMBus (e.g., NVMe-MI) from the host or from external/third-party injection or generation tools are supported.

Overview

- Dimensions: 25 x 116 x 248 mm (1 x 4.5 x 9.7")
- Power connector: Molex 87427-0602
- 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 0.1" header, 3.3 Vdc



M.2 Interposer

M.2 is a specification supporting specifically keyed modules of different lengths that facilitate the addition or expansion of functions via a small form factor. The PCIe M.2 form factor is typically used for PCIe adaptation and small form factor NVMe SSD's. SerialTek's M.2 interposer supports all relevant keys, link-widths, and sidebands, including SMBus (e.g., NVMe-MI) from the host or from external / thirdparty injection or generation tools. SerialTek's PCIe Gen4 M.2 Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the M.2 port and an M.2 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.

Overview

- Dimensions: 154 x 34 x 232 mm (6 x 1.3 x 9")
- Power connector: Molex 87427-0602
- Analyzer connectors: 2x SFF-8644
- Device connector: M.2 Socket 3, Key M, 22110, 2280, 2260, 2242, 2230
- Host module connectors: 2x MCIO 38 pin
- 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, 3.3 Vdc
- REFCLK buffer control connector: 3 pin 0.1" header, 3.3 Vdc
- Sideband signal access connector: 2×9 pin 0.1" header, 3.3 Vdc





EDSFF Interposer

SerialTek's EDSFF interposer is mechanically modular and easily converts from E1.S to E1.L to E3.S form factors. The included EDSFF host adapters are easy to change and plug into a host system. High-quality cabling (instead of lossy PCB material) from the interposer to the storage enclosure preserves signal quality while adding flexibility, saving customers money, and providing for safe placement of the device under test (DUT) on a bench or in a test rack. SerialTek's EDSFF Interposer supports all relevant sidebands, including SMBus (e.g., NVMe-MI) from the host or from external / third-party injection or generation tools. SerialTek's PCIe Gen5 EDSFF Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the EDSFF port and an E1.x or E3.x EDSFF target to intercept and relay a copy of the high-speed signaling and discrete data lines to the Kodiak PCIe Analysis system in real-time.

Overview

- Dimensions: 154 x 34 x 232 (6 x 1.3 x 9")
- Power connector: Molex 87427-0602
- Analyzer connectors: 2x SFF-8644
- Device connectors: SFF-TA-1009
- Host connectors: SFF-TA-1009
- SMBUS injection connector: 2×5 pin 0.1" header, 3.3 Vdc
- REFCLKA output connectors: 2x U.FL, AC coupled LPHCSL
- REFCLKA output control connector: 2 pin 0.1" header
- REFCLKA buffer control connector: 3 pin 0.1" header
- REFCLKB output connectors: 2x U.FL,AC coupled LPHCSL
- REFCLKB output control connector: 2 pin 0.1" header
- REFCLKB buffer control connector: 3 pin 0.1" header
- Sideband signal access connector: 2×9 pin 0.1" header, 3.3 Vdc



PCIe Cable Interposer

PCIe External Cabling provides an electrically efficient channel to connect external or internal PCIe components directly to a root port, daughter card, backplane, adapter, or other PCIe based ports. Cable interposers support OCuLink (SFF-8611) and SlimSAS (SFF-8654) form factors and supports all relevant sidebands, including SMBus (e.g., NVMe-MI) from the host or from external / third-party injection or generation tools. SerialTek's PCIe Gen5 Cable Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the OCuLink (SFF-8611) or SlimSAS (SFF-8654) host port and its endpoint to intercept and relay a copy of the highspeed signaling and discrete data lines to the Kodiak PCIe Analysis system in real-time.

Overview

- Dimensions: 154 x 34 x 232 mm (6 x 1.3 x 9")
- Power connector: Molex 87427-0602
- Analyzer connectors: 2x SFF-8644
- Device connectors: SFF-8611 (OCuLink), SFF-8654 (SlimSAS)
- Host connectors: SFF-8611 (OCuLink), SFF-8654 (SlimSAS)
- SMBUS injection connector: 2×5 pin 0.1" header, 3.3 Vdc
- REFCLKA output connectors: 2x U.FL, AC coupled LPHCSL
- REFCLKA output control connector: 2 pin 0.1" header
- REFCLKA buffer control connector: 3 pin 0.1" header
- REFCLKB output connectors: 2x U.FL,AC coupled LPHCSL
- REFCLKB output control connector: 2 pin 0.1" header
- REFCLKB buffer control connector: 3 pin 0.1" header
- Sideband signal access connector: 2×9 pin 0.1" header, 3.3 Vdc



SerialTek Kodiak[™]

Next-Generation Gen5 PCIe/NVMe Analyzer

SerialTek an ellisys company

U.2/U.3 Interposer

SerialTek's U.2 and U.3 interposers support standard and extended length storage bays, and all relevant sidebands, including SMBus (e.g., NVMe-MI) from the host or from external / third-party injection or generation tools. SerialTek's PCIe Gen5 U.2 and U.3 Interposers with SI-Fi technology are specially designed test adapters that are physically placed in between the U.2/U.3 port and an U.2/U.3 target to intercept and relay a copy of the high-speed signaling and discrete data lines to the Kodiak PCIe Analysis system in real-time.

Overview

- Dimensions: 194 x 29 x 337 mm (7.6 x 1 x 13")
- Power connector: Molex 87427-0602
- Analyzer connectors: 4x SFF-8644
- Device connector: SFF-8639 receptacle
- Host connectors: SFF-8639 plug
- SMBUS injection connector: 2×5 pin 0.1" header, 3.3 Vdc
- REFCLKA output connectors: 2x U.FL, AC coupled LPHCSL
- REFCLKA output control connector: 2 pin 0.1" header
- REFCLKA buffer control connector: 3 pin 0.1" header
- REFCLKB output connectors: 2x U.FL,AC coupled LPHCSL
- REFCLKB output control connector: 2 pin 0.1" header
- REFCLKB buffer control connector: 3 pin 0.1" header
- Sideband signal access connector:

2×9 pin 0.1" header, 3.3 Vdc



"

I've been using protocol analyzers for 31 years and PCIe analyzers and interposers extensively for the past 5 years. We use them for important assignments that affect revenue and customer satisfaction," said **John Wehman, Principal Applications Engineer at Phison Technology**. "With other analyzers I have had to abandon my testing many times, because I could not find a good quality signal lock. SerialTek's Kodiak analyzer and SI-Fi interposers have changed all that. I have 100% confidence in Kodiak's ability to achieve lock and give me the trace I need to do my job. Kudos to Ellisys and SerialTek for creating not only an electrically reliable platform, but the actual mechanical hardware itself is beautiful.



Kodiak PCIe WebUI – Remote Access!

Access from Anywhere

- Easily connect to Kodiak via your web browser
- Real-time online system and recording status and I/O graphs
- Real-time Analyzer and Interposer configuration information, including cable status
- Online Trace file management

Interposers

- Real-time information for the PCIe Gen5 interposer and its status; including type, serial number, and connectivity state
- Kodiak automatically detects any good, bad, and unnecessary cable connections with easy to identify colors (green, orange, red)

System Settings

- Linux, easy for IT to manage
- Supports User Names, User Groups, and LDAP
- 1G and 10G ethernet ports (DHCP, Static IP settings)
- Update and/or verify Kodiak firmware remotely
- Update and/or verify Kodiak licenses remotely
- Remote system restart or full reset

Management and System Reset

- Secure and manage Kodiak remotely
- Configure user permissions (read, read/write, update, admin, ...)
- Reboot and recover the analyzer
- Reset analyzer to factory settings (with or without user data)
- Remote factory reset

Trace Storage and Management

- Save traces to Kodiak's internal NVMe SSD storage
- Open traces while saved in Kodiak or download them to a client
- Zip traces in Kodiak and then download





Record on Los					
Index Service	2	License Information			
Device Config	/	System License			
Network	4	optembernie			
Firmware	•	1 Upload License			Apply Key
License Information	6	Issue Date	Thu Jan 06 2022 13:25:37 GM	17-0800	
Users	4	Serial Number	433700016		
Experimental Features		Features	butter: \$44 capture-width: 4	dual-port: 1 eth-30g: 2 internal-storage: 2000	mme-mk1 pcle-gen: 5 search-seq:
System Reset	c		trigger-seq: 1		
		Interposer License O			
			Valid	•	
		POD	UID	01231a52cdf657b0ee	
			Subscription	A No subscription	
			Valid	•	
		Device	UID	0123761471a83529ee	
			Assigned POD	01231a52cdf657b0ee	
			Valid	•	
		Host	UID	01238a62ec9a1730ee	
			Assigned POD	01231a52ct#657b0ee	

System Settings





SerialTek Kodiak™

Next-Generation Gen5 PCIe/NVMe Analyzer



Configurations and Purchase Information

Edition	Speed	Width	NVMe	CXL (future)	Buffer	Internal Storage	Multi-State Triggering	Multi-State Search	10GE	Dual-Port
Enterprise	Gen5	x16	Yes	Yes	144	2TB	Yes	Yes	2x	Yes
Enterprise	Gen5	x8	Yes	Yes	144	2TB	Yes	Yes	2x	Yes
Enterprise	Gen5	x4	Yes	Yes	144	2TB	Yes	Yes	2x	Yes
Professional	Gen5	x4	Yes	Yes	144	2TB	Yes	Yes	2x	No
Standard	Gen5	x4	Yes	n/a	72	2TB	Yes	Yes	1x	No

Kodiak PCIe Analyzers

Description	Code
Kodiak Gen5 PCIe x16 Protocol Analyzer Enterprise Edition	PK2A-G5-16-ENT
Kodiak Gen5 PCIe x8 Protocol Analyzer Enterprise Edition	PK2A-G5-08-ENT
Kodiak Gen5 PCIe x4 Protocol Analyzer Enterprise Edition	PK2A-G5-04-ENT
Kodiak Gen5 PCIe x4 Protocol Analyzer Professional Edition	PK2A-G5-04-PRO
Kodiak Gen5 PCIe x4 Protocol Analyzer Standard Edition	PK2A-G5-04-STD
Kodiak Gen4 PCIe x16 Protocol Analyzer Enterprise Edition	PK2A-G4-16-ENT
Kodiak Gen4 PCIe x8 Protocol Analyzer Enterprise Edition	PK2A-G4-08-ENT
Kodiak Gen4 PCIe x4 Protocol Analyzer Enterprise Edition	PK2A-G4-04-ENT
Kodiak Gen4 PCIe x4 Protocol Analyzer Professional Edition	PK2A-G4-04-PRO

SI-Fi Interposers

Description	Code
PCIe Gen5 x16 slot interposer	PEI-G5-16-AIC
PCIe Gen5 x8 slot interposer	PEI-G5-08-AIC
PCIe Gen5 x4 slot interposer	PEI-G5-04-AIC
PCIe Gen5 U2 interposer	PEI-G5-04-U2E
PCIe Gen5 U3 interposer	PEI-G5-04-U3E
PCIe Gen5 EDSFF interposer	PEI-G5-04-EDS
PCIe Gen5 M.2 interposer	PEI-G5-04-M2S
PCIe Gen5 MCIO Cable interposer	PEI-G5-04-MCS
PCIe Gen4 Slim-SAS Cable Interposer	PEI-G5-04-SCS
PCIe Gen5 x4 Premium Package; U2, U3, EDSFF, M.2	PEI-G5-04-PRE



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



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 3.1 Type A



Rear-Panel Connectors

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

Interposer Power Unit (Common)

- Input: 100-240 Vac/50-60 Hz
- Output: 5 Vdc
- Power: 50 W
- Plug: Molex 039-01-2060
- Safety: UL, CUL, CE, TUV-GS, PSE
- EMI: CE, FCC
- Environmental: ROHS, WEEE, VI

M.2 Interposer

- Dimensions: 154 mm(W) x 34 mm(H) x 232 mm(L) (6 x 1.3 x 9")
- Power connector: Molex 87427-0602
- Analyzer connectors: 2x SFF-8644
- Device connector: M.2 Socket 3, Key M, 22110, 2280, 2260, 2242, 2230
- Host module connectors: 2x MCIO 38 pin
- SMBUS injection connector: 2x5 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, 3.3 Vdc
- REFCLK buffer control connector: 3 pin 0.1" header, 3.3 Vdc
- Sideband signal access connector: 2x9 pin 0.1" header, 3.3 Vdc

U.2/3 Interposer

- Dimensions: 194 x 29 x 337 mm (7.6 x 1 x 13")
- Power connector: Molex 87427-0602
- Analyzer connectors: 4x SFF-8644
- Device connector: SFF-8639 receptacle
- Host connectors: SFF-8639 plugSMBUS injection connector:
- 2x5 pin 0.1" header, 3.3 Vdc REFCLKA output connectors:
- 2x U.FL, AC coupled LPHCSL
- REFCLKA output control connector: 2 pin 0.1" header
- REFCLKA buffer control connector: 3 pin 0.1" header
- REFCLKB output connectors: 2x U.FL,AC coupled LPHCSL
- REFCLKB output control connector: 2 pin 0.1" header
- REFCLKB buffer control connector: 3 pin 0.1" header
- Sideband signal access connector: 2x9 pin 0.1" header, 3.3 Vdc

X4 Slot Interposer

- Dimensions: 25 x 116 x 248 mm (1 x 4.5 x 9.7")
- Power connector: Molex 87427-0602
- Analyzer connectors: 2x SFF-8644
- Device connector: PCIe CEM slot x16
 straddle mount connector
- Host module connectors: PCIe CEM x4 Edge fingers
- SMBUS injection connector: 2x5 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: 2x9 pin 0.1" header, 3.3 Vdc

Maintenance and Licensing

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

Warranty

- 1, 2, and 3 year limited warranties available, Basic and Standard Editions
- Six-month limited warranty, Interposers

Minimum Requirements

- Intel Core, 2 GHz or compatible processor
- 4 GBytes 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

More information at: www.serialtek.com/kodiakgen5

©Copyright SerialTek. PCI Express® and PCIe® are registered trademarks of PCI-SIG® Corporation. NVM Express®, NVMe® and NVMe-oF™ are trademarks of NVM Express, Inc. Other trademarks and trade names are those of their respective owners.

