FEATURES & BENEFITS

- Compliant with PCI Express 1.0, 2.0 and 3.0 specifications

- Wide variety of interposers designed to help accurately capture PCIe data traffic at all line rates including 8 GT/s, 5 GT/s and 2.5 GT/s

- Interposers offered include: slot, M.2, and U.2

- Uses "passive" tapping to avoid masking, hiding or "cleaning up" electrical and/or link issues

- User set-able jumpers to change long, short, and gain values

ADVANTAGES

- Adaptive slot interposers that can operate at various bus widths providing significant overall solution cost savings; a SerialTek x8 slot interposer can operate at x1, x2, x4, and x8 with card reducer edge adapters. Similarly a x4 can operate at x1, x2, and x4

- Low-cost, flexible, high performance cabling for reliable analyzer to interposer connections provides real cost advantages over competing solutions that use cumbersome, bulky, and expensive iPass-type cabling

- Scope output option on Slot Interposers allows for interoperability with high speed oscilloscopes

SerialTek provides two market-leading PCI Express® (PCIe®) analysis solutions, the BusXpert PRO and the BusXpert Micro (*see figures 3 and 4 on page 2*), for designing and validation of products that integrate PCIe technology. This includes host bus storage adapters, computer systems, servers, and storage products.

Figure 1: Gen 3 x8 Slot Interposer (with scope outputs)

A wide range of cost-effective and flexible probing options are available for BusXpert Analyzer users. These interposer solutions are designed to provide maximum performance and flexibility when capturing PCI Express communication data between hosts and devices; these interposer types include slot (*see figure 1 and 2*), M.2 and U.2 interposers.

Cost-effective, reliable, and high performance SFF-8644 cables are used to connect an interposer to the SerialTek PCIe Analyzer. These cables are rated at 12 Gb/s making them a suitable interconnect for PCIe analysis; yet, unlike some other high speed cables, SFF-8644 cables are easier to handle and easier to use. One competing solution utilizes very bulky, expensive, and hand-built iPass-type cabling. Such cables can cost upwards of several thousands of dollars to purchase and replace. SerialTek's PCIe cabling technologies are far more reliable and cost substantially less. Be sure to factor this into your decision making when you are calculating the total cost of ownership of your complete analysis solution.

Figure 2: Gen 3 x8 Slot Interposer (Short version)

All SerialTek interposers are compliant with the PCI Express 1.0, 2.0 and 3.0 specifications. They are rated for 8 GT/s yet they also inter-operate at lower data rates. This contrasts greatly with competing solutions that offer a confusing and bewildering number of slot interposer options -- some rated for Gen 2 and others for Gen 3, some passive and others active.

For its slot interposers, SerialTek provides an industry first -- offering optional scope outputs on all varieties (x1, x4 or x8) of the slot interposers. These output connectors permit a high speed oscilloscope to connect directly to the SerialTek slot interposer to gain access to the PCIe traffic
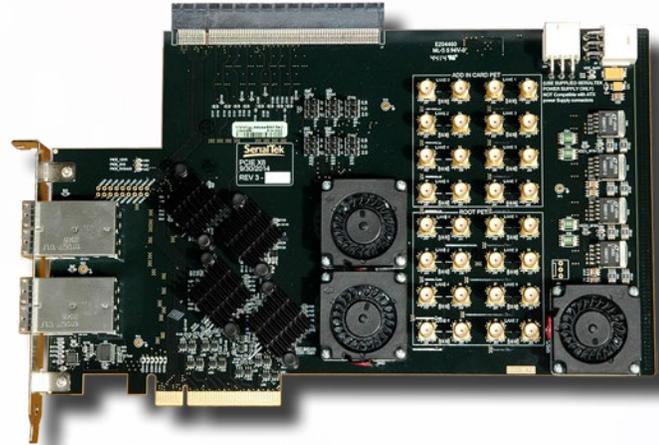
Figure 3 (Top Unit): BusXpert Micro PCI Express Gen 3 Protocol Analyzer

Figure 4 (Bottom Unit): BusXpert PRO PCI Express Gen 3 Protocol Analyzer

between the host and device. This operation is completely transparent to the BusXpert PCIe protocol analyzer. No other solution in the marketplace offers such a capability.

The slot interposers are also adaptive and can operate at various bus widths with the appropriate card reducer edge adapters. Competing solutions force their users to purchase interposers in the exact card slot width. Thus, if an engineer needed to perform x1, x4 and x8 analysis, she or he would need to purchase three different slot interposers. The SerialTek slot interposers work at different bus widths providing significant overall solution cost savings. A typical setup is shown in figure 5.

SerialTek interposers also "passively" tap into the PCI Express bus -- communication data is not re-timed. Active Gen 3 slot interposer solutions, such as those from competing products, are simpler to develop and manufacture. Such interposers retransmit and re-time the PCIe traffic that they are probing. This may potentially hide, correct and/or mask electrical and link issues and problems.

User set-able jumpers allow user control of various electrical parameters including ISE long, short, and gain to compensate for connector and electrical trace induced signal integrity issues. On the rare occasion when the BusXpert analyzer is experiencing link up challenges, manipulating the jumper settings can often resolve them. Furthermore, these electrical parameters can be changed from the calibration menu in the BusXpert software. This is a capability unique to SerialTek PCIe slot interposers and not available on competing products.
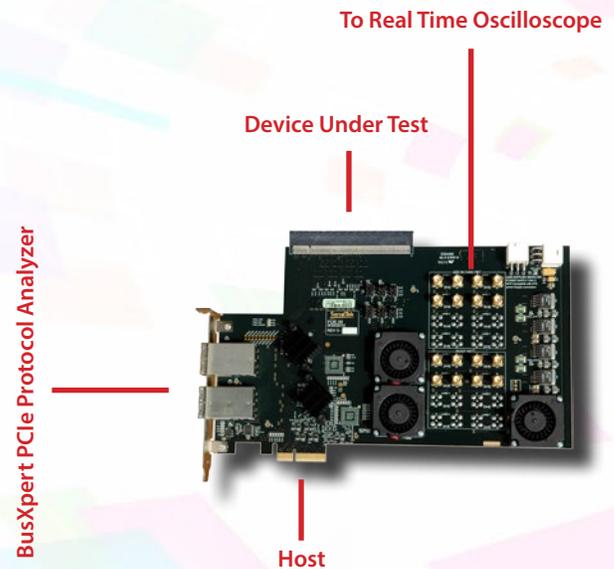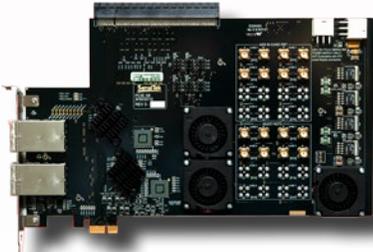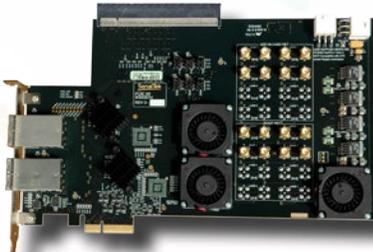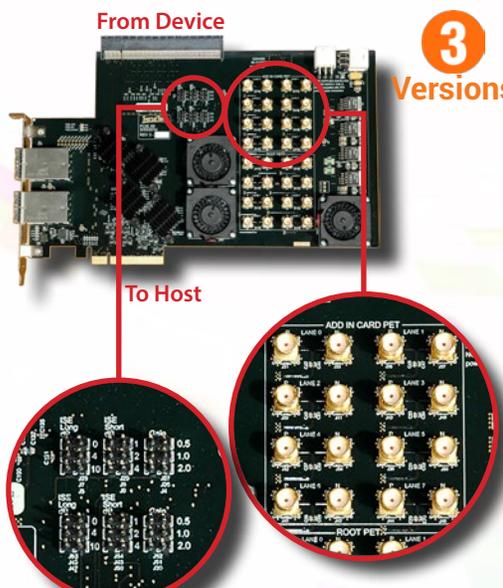

Figure 5: Slot Interposer Setup (Typical)

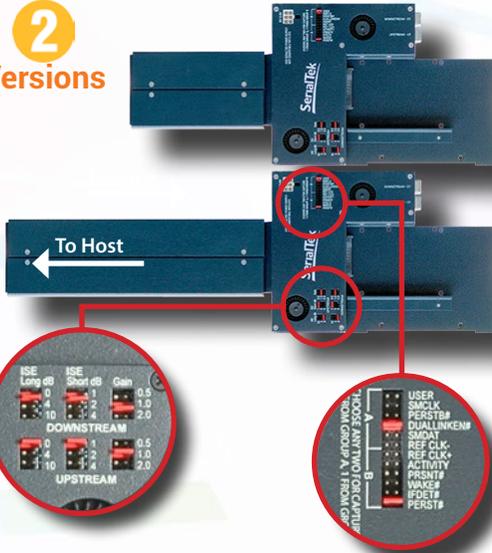## Interposer Specifications

x1 Slot Interposer

3 Versions

Model Numbers	Int-PCI-8x1 (w/o scope outputs), Int-PCI-8x1-S (w/ scope outputs), Int-PCI-8x1-SH (Short version)
Specification Compliancy	PCIe 1.0, 2.0 and 3.0
Data Rates Supported	2.5, 5.0 and 8 GT/s
Widths Supported	x1
Analyzer Connector	2 SFF-8644 (SerialTek proprietary cabling)[1]
Impedance (Differential)	95 Ohms (+/- 5%)
Jumpers	ISE Long dB, ISE Short dB, Gain (two sets - host and device)
Power	12V DC External[2]
Dimensions	10.1in (length) x 6.5in (height) / 257mm x 165mm **Short version:** 9.9in (length) x 3.6in (height) / 251mm x 91mm
Weight	9.13 ozs / 259 grams **Short version:** 5.4 ozs / 153 grams

x4 Slot Interposer

3 Versions

Model Numbers	Int-PCI-8x4 (w/o scope outputs), Int-PCI-8x4-S (w/ scope outputs), Int-PCI-8x4-SH (Short version)
Specification Compliancy	PCIe 1.0, 2.0 and 3.0
Data Rates Supported	2.5, 5.0 and 8 GT/s
Widths Supported	Native x4; x1 with card reducer edge adapter
Analyzer Connector	2 SFF-8644 (SerialTek proprietary cabling)[1]
Impedance (Differential)	95 Ohms (+/- 5%)
Jumpers	ISE Long dB, ISE Short dB, Gain (two sets - host and device)
Power	12V DC External[2]
Dimensions	10.1in (length) x 6.5in (height) / 257mm x 165mm **Short version:** 9.9in (length) x 3.6in (height) / 251mm x 91mm
Weight	9.13 ozs / 259 grams **Short version:** 5.4 ozs / 153 grams

x8 Slot Interposer

From Device

3 Versions

To Host

Model Numbers	Int-PCI-8x8 (w/o scope outputs), Int-PCI-8x8-S (w/ scope outputs), Int-PCI-8x8-SH (Short version)
Specification Compliancy	PCIe 1.0, 2.0 and 3.0
Data Rates Supported	2.5, 5.0 and 8 GT/s
Widths Supported	Native x8, x1 and x4 with card reducer edge adapter
Analyzer Connector	4 SFF-8644 (SerialTek proprietary cabling)[1]
Impedance (Differential)	95 Ohms (+/- 5%)
Jumpers (User selectable)	ISE Long dB, ISE Short dB, Gain (two sets - host and device)
Power	12V DC External[2]
Dimensions	10.1in (length) x 6.5in (height) / 257mm x 165mm **Short version:** 9.9in (length) x 3.6in (height) / 251mm x 91mm
Weight	10 ozs / 283 grams **Short version:** 5.86 ozs / 166 grams

Notes	[1] Used to connect slot interposer to analyzer; must use SerialTek supplied "SFF-8644"-type cables [2] Must use SerialTek supplied power supply

Interposer Specifications (cont'd)

M.2
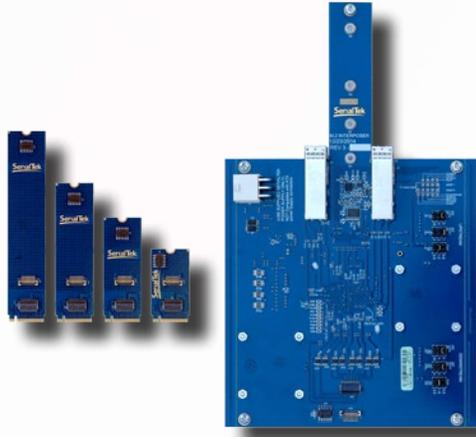
Model Number	Int-PCI-8M2-Kit
Specification Compliancy	PCIe 1.0, 2.0 and 3.0
Data Rates Supported	2.5, 5.0 and 8 GT/s
Widths Supported	up to x4
Device/Drive Lengths Supported	30mm, 42mm, 60mm, 110mm
Analyzer Connector	2 SFF-8644 (SerialTek proprietary cabling)[1]
Impedance (Differential)	95 Ohms (+/- 5%)
Jumpers	ISE Long dB, ISE Short dB, Gain (two sets - host and device)
Power	12V DC External[2]
Dimensions	8.8in (length) x 5.3in (width) / 224mm x 135mm
Weight	1.55 ozs / 44 grams (without host slot adapter board)
Notes	[1] Used to connect M.2 interposer to analyzer; Must use SerialTek supplied "SFF-8644"-type cables [2] Must use SerialTek supplied power supply

U.2

2 Versions

Model Number	Int-PCI-8639-Kit, Int-PCI-8639-E-Kit (Extended version)
Specification Compliancy	PCIe 1.0, 2.0 and 3.0
Data Rates Supported	2.5, 5.0 and 8 GT/s
Widths Supported	up to x4
Analyzer Connector	2 SFF-8644 (SerialTek proprietary cabling)[3]
Impedance (Differential)	95 Ohms (+/- 5%)
Jumpers	**SET 1:** USER, SMCLK, PERSTB#, DIALLINKEN#, SMDATA, REF CLK-, REF CLK+, ACTIVITY, PRSNT#, WAKE#, IFDET#, PERST# **SET 2:** ISE Long dB, ISE Short dB, Gain (two sets - host and device)
Power	12V DC External[4]
Dimensions	14in (length) x 6.1in (width) / 356mm x 155mm **Extended Version:** 18.6in (length) x 6.1in (width) / 472mm x 155mm
Weight	13.10 ozs / 371 grams **Extended Version:** 15.70 ozs / 445 grams
Notes	[3] Used to connect SFF-8639 interposer to analyzer; must use SerialTek supplied "SFF-8644"-type cables [4] Must use SerialTek supplied power supply

To Host

SerialTek

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