

Summit™ M5x Protocol Analyzer / Jammer for PCI Express® 4.0



Key Features

Find errors fast

- One button error check
- Fast upload speed
- Large trace memory
- Powerful triggering/filtering

See and understand the traffic

- Get useful information
- More choices of data views
- More ways to analyze data
- Custom decoding and reports

Data capture

- 100% data capture at 16.0 GT/s

Deep memory buffer

- Up to 128 GB depth

PCIe storage protocols supported

- NVMe Express
- NVMe-MI
- SATA Express (ATA/AHCI-PCIe)
- SCSI Express (SOP-PQI)

Virtualization protocols

- SRIOV
- MRIOV
- ATS

Sideband signaling

- SMBus
- CLKREQ#
- WAKE#
- PERST#

Jammer (Real-Time Error Injector)

BitTracer™

The Summit M5x is Teledyne LeCroy's highest performance PCI Express analyzer, and offers advanced features such as: real-time error injection (jammer) for PCIe spec 4.0 or later; data rates of 2.5 GT/s, 5.0 GT/s, 8.0 GT/s, and 16.0 GT/s; full data capture on bidirectional link widths of x1, x2, x4, x8 and x16 for 16GT/s; and up to 128GB of trace memory. The product is ideal for high-performance protocol development for add-in boards, switches, servers and workstations, and for customers currently working on PCIe 4.0 at x16 linkwidths.

Flexible Hardware

The Summit M5x protocol analyzer/jammer features the PCIe industry's first PCIe 4.0 compliant jamming test capability. The Summit M5x can modify, replace, insert or delete real-time traffic between a PCIe root complex and endpoint to verify adherence to design specifications and identify potential errors in protocol behavior. Unlike PCIe jammers of past years, jamming the transmission between the root complex and endpoint is done within normal operating PCIe specifications instead of breaking the specification by creating out of spec latencies and retransmissions. The Summit M5x also introduces for the first time NVMe and NVMe-MI protocol jamming as well. The analyzer and jammer combination features on the Summit M5x make this a powerful testing tool for PCIe validation and development labs.

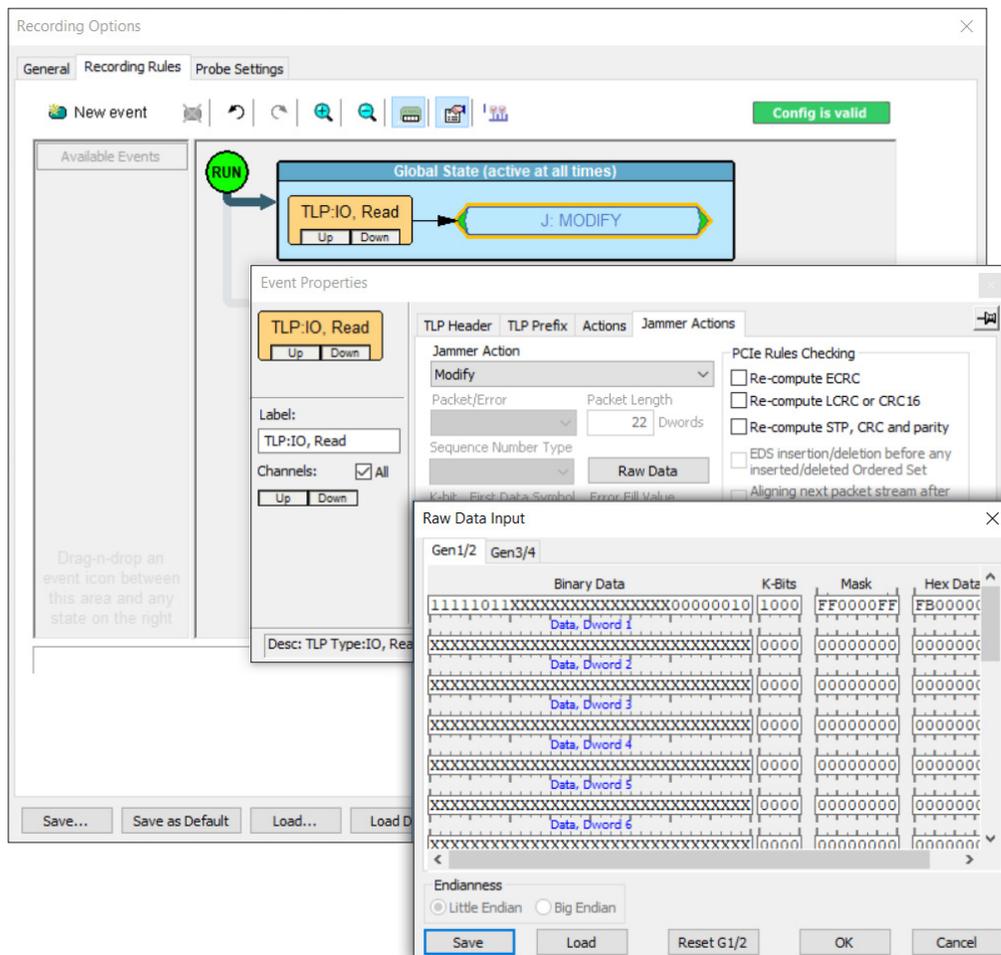
The Summit M5x platform is also capable of supporting speeds up to 32 GT/s, meaning that it is ready to support the next evolution PCIe 5.0 specification. Monitoring and analyzing other high-speed protocols that leverage the PCIe electrical specification but may run at other speeds

using their own protocols such as GenZ and CCIX will also be possible in the future on this analysis platform.

Summit M5x introduces a new probing methodology that eliminates the need of a traditional "interposer" type probe to interface with systems under test. This is ideal for server based systems that utilize horizontal insertion. The Summit M5x supports PCIe 4.0 at up to x16 link widths and its memory buffer can be configured up to 128GB, which is advantageous for users requiring long protocol recordings. The protocol analyzer can be controlled through USB or remotely through 1000baseT Ethernet. The Summit M5x protocol analyzer can also be synchronized with other high-speed protocol analyzers from Teledyne LeCroy using CrossSync, functionality that enables time aligned packet traffic as well as cross triggering from multiple high-speed serial busses as may be needed to design, debug and validate across bridges.



The Summit M5x PCIe 5.0 Protocol Analyzer is a high-end analyzer that offers important analysis features for new application development. While sharing application compatibility with the previous protocol analyzer platforms, the Summit M5x can record traces at speeds of 2.5, 5.0, 8.0, and 16.0 GT/s. Capturing is performed by inserting a probe into the root complex that is then routed to an external test platform. The Device Under Test (DUT) is then plugged into the test platform allowing unfettered access to the DUT. Probes are offered in link widths of x1, x4, x8 and x16. Know that your data is accurate through reliable and complete decodes of Transaction Layer Packets (TLPs), Data Link Layer Packets (DLLPs), and all primitives. Setting up and taking a trace is simple to do without the worry of extra plugin platforms or complex networking issues.

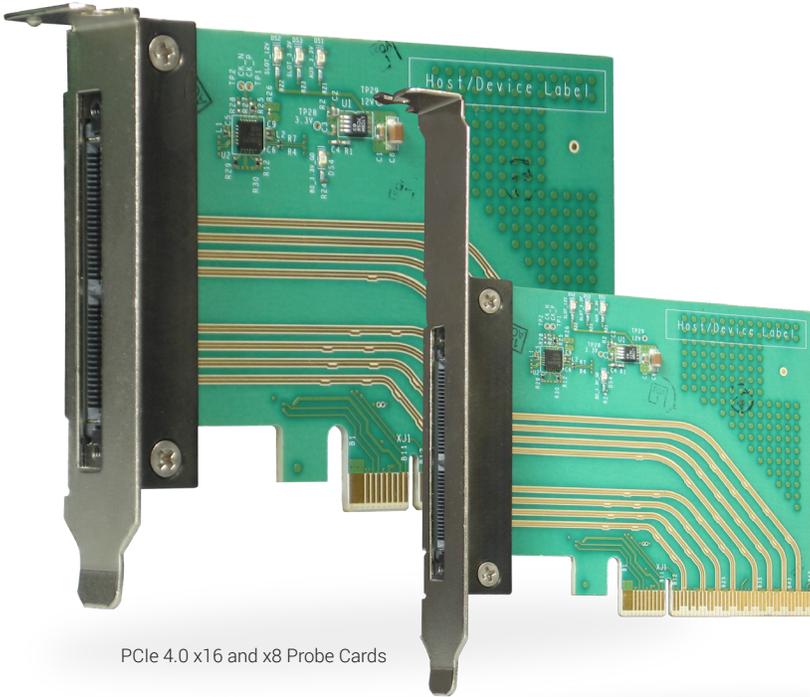


Summit M5x Jammer Actions

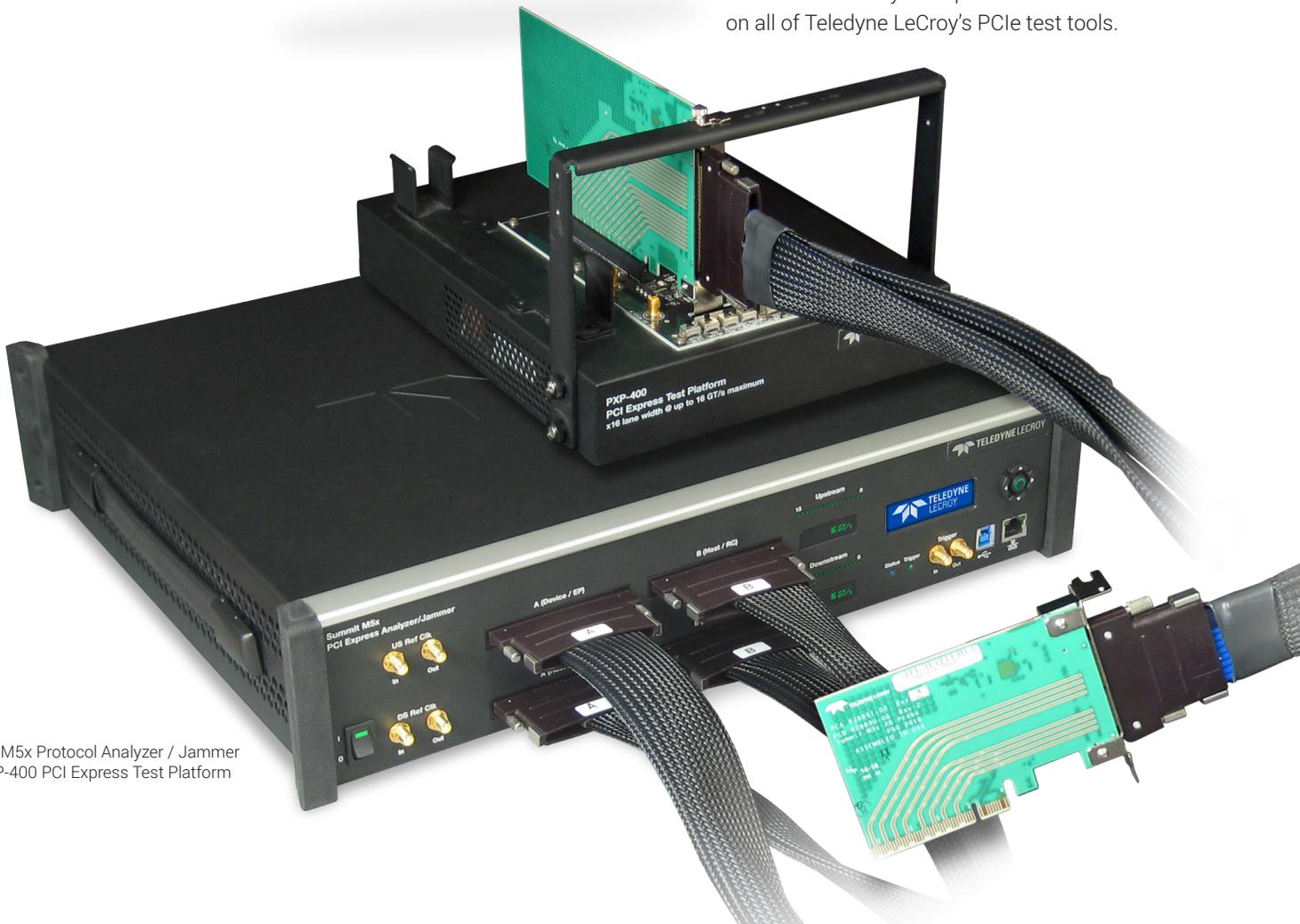
The Summit M5x utilizes the CATC Trace™, Spreadsheet View, LTSSM State View, Bit Tracer View and other focused views to assist users in analyzing how PCI Express protocol components work together in diagnosing problems. These various interfaces help find errors fast by using the powerful triggering, filtering and error reporting. View meaningful reports about performance and protocol behavior in

real time, and post captured traffic. These diverse views create a powerful and an intuitive expert software system, embedding detailed knowledge of the protocol hierarchy and intricacies as defined in the protocol specification. Graphical displays have been optimized for fast and easy navigation. Users are alerted as violations are detected at all levels of the protocol layering, and can easily drill down to areas of interest or collapse and hide fields that are not relevant. Protocol data can be viewed in several ways from logical to chronological, and by events unique to PCI Express.

All Teledyne LeCroy protocol analyzers feature a hierarchical display of protocol traffic summaries, detailed error reports, powerful scripting, and the ability to create user-defined test reports, which allow developers to troubleshoot intricate problems and finish their projects on time. Users of Teledyne LeCroy systems appreciate the rich library of decodes and analysis capabilities that are available on all of Teledyne LeCroy's PCIe test tools.



PCIe 4.0 x16 and x8 Probe Cards



Summit M5x Protocol Analyzer / Jammer with PXP-400 PCI Express Test Platform

Jammer

The M5x protocol analyzer features the PCIe industry's first PCIe 4.0 jamming test capability. The Summit M5x sits between a root complex and endpoint and can accurately change traffic between the two ends in order to test a variety of traffic scenarios for behavioural results. Unlike previous PCIe jammers, jamming the transmission between the root complex and endpoint is done within normal operation of the PCIe specification instead of breaking the spec with undue latencies and retransmissions. This feature supports jamming NVMe and NVMe-MI protocol as well. The analyzer and jammer combination make this a powerful testing tool for any lab.

Powerful Features

The Summit M5x is up to the challenge by offering decoding for the high performance NVM Express storage protocol. DataCenter monitoring technology such as NVMe-MI and out-of-band SMBus signaling which is decoded and synchronized with PCI Express can be analyzed for protocol traffic issues. Want to get down to the byte level and see traffic just before lane alignment? BitTracer™ software option records the bytes exactly as they come across the link, allowing debugging of PHY layer problems and combining the features of a logic analyzer format with a decoded protocol analyzer format.

Specifications

Host Machine Minimum Requirements	Microsoft Windows® 10, Windows 8, Windows Server, Windows 7, Windows Server 2008R2; 2 GB of RAM; Storage with at least 1 GB of free space for the installation of the software and additional space for recorded data; display with resolution of at least 1024x768 with at least 16-bit color depth; USB 2.0 port and/or 100/1000baseT Ethernet; For optimal performance, please refer to our recommended configuration in the product documentation.
Recording Memory Size	Summit M5x Protocol Analyzer: Up to 128 GB
Data Rates Supported	2.5 GT/s, 5.0 GT/s, 8.0 GT/s, 16.0 GT/s
Ports	Summit M5x Protocol Analyzer: Downstream and Upstream reference clock inputs, USB 3.0 Type B connector, Trigger in and out, 1 GB/s ethernet port, Sync in/out port
Display Panel	Summit M5x Protocol Analyzer: 122x32 Pixel Graphic displays plus two 8 character SPEED indication Displays for (2.5 GT/s, 5.0 GT/s, 8.0 GT/s, 16.0 GT/s)
LEDs	Power LED, Status LED, Trigger LED, 32 Activity LEDs (2 per lane for 16 lanes)
Dimensions and Weight	Summit M5x Protocol Analyzer: 432 x 88 x 365 mm (16.99" x 3.45" x 14.35"), 5.4 Kg (12 lb) M5x Slot Probes: 100 x 198 x 170 mm (3.9" x 7.8" x 6.7"), 1.4 Kg (3 lb)
Power Requirements	100-240 VAC, 50-60 Hz, 450W
Environmental	Operating: 0 to 40°C (32 to 104°F) Non-operating: -20 to 80°C (-4 to 176°F) Humidity: 10 to 90% non-condensing

Additional Features

- ✓ Protocol Hierarchical Display
- ✓ Spreadsheet View
- ✓ Queue Utilization
- ✓ NVMe
- ✓ SATA Express
- ✓ NVMe-MI
- ✓ SMBus
- ✓ ZeroTime™ Search
- ✓ Dword View
- ✓ LTSSM View
- ✓ Header Field Viewer
- ✓ Config Spec Viewer
- ✓ TLP Packet Script Decoding
- ✓ Timing Calculator
- ✓ Trigger/Filter Control
- ✓ Performance Metrics
- ✓ Expert Triggering
- ✓ Trace Expert
- ✓ Expert Graphical Bus Utilization View
- ✓ Verification Script Engine
- ✓ 1 GB/s Ethernet & USB 3.0

Ordering Information

Product Description

Summit M5x System (licensed as a Gen4 x4, 8GB memory)

Product Code

PE184AAA-X



Local sales offices are located throughout the world.
Visit our website to find the most convenient location.

1-800-5-LeCroy • teledynelecroy.com



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