TELEDYNE LECROY
Everywhereyoulook™

Summit™ T416 Analyzer
for PCI Express® 4.0

The Summit T416 is Teledyne LeCroy's highest performance PCI Express analyzer, and offers advanced features such as: support for PCI Express Spec 4.0; 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; and up to 128GB of trace memory. The product is ideal for high-performance protocol development for add-in boards, servers and workstations, and for customers currently working on PCIe 3.0 or who wish to support PCIe 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 on all link widths up to x16

Deep memory buffer
- Up to 128 GB depth

PCIe storage protocols supported
- NVM Express
- NVMe-MI
- SATA Express (ATA/AHCI-PCIe)
- SCSI Express (SOP-PQI)

Virtualization protocols
- SRIOV
- MRIOV
- ATS

Out of band signaling
- SMBus
- CLKREQ#
- WAKE#
- PERST#

BitTracer™

Flexible Hardware

The Summit T416 PCIe 4.0 Protocol Analyzer is a high-end analyzer that offers important analysis features for new Gen4 application development. While sharing application compatibility with the previous protocol analyzer platforms, the Summit T416 can record traces at speeds of 2.5, 5.0, 8.0 and 16.0 GT/s. Capturing is performed by connecting a Gen4 interposer to the Device Under Test (DUT). Interposers 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 for PCI Express for up to 16 lanes. Setting up and taking a trace is simple to do without the worry of extra plugin platforms or complex networking issues.

The Summit T416 for PCI Express 4.0 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 through a captured traffic session. 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 analysis 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.

The Summit T416 is up to the challenge by offering decoding for Storage protocols like NVM Express and SATA Express. 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. If IO virtualization is important SRIOV and MRIOV is also decoded and analyzed.

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 T416 Protocol Analyzer: Up to 128 GB
Data Rates Supported	2.5 GT/s, 5.0 GT/s, 8.0 GT/s and 16.0 GT/s (PCI Express 4.0)
Ports	Summit T416 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 T416 Protocol Analyzer: 122x32 Pixel Graphic diplay
LEDs	Power LED, Status LED, Trigger LED, Four Data Rate LEDs (2.5 GT/s, 5.0 GT/s, 8.0 GT/s, 16.0 GT/s), 32 Activity LEDs (2 per lane—Tx/Rx—for 16 lanes), Training LED
Dimensions and Weight	Summit T416 Protocol Analyzer: 114 x 19 x 207 mm (16.99 " x 3.45" x14.35"), 5.4 Kg (12 lb) Slot Interposer: 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, 230W
Environmental	Operating: 0 to 55°C (32 to 131°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	Product Code
Summit T416 (licensed as a Gen4 x16 analyzer at 8GB, no probes or cables)	PE090AAA-X
Summit T416 (licensed as a Gen4 x8 analyzer at 8GB, no probes or cables)	PE091AAA-X
Summit T416 (licensed as a Gen4 x4 analyzer at 8GB, no probes or cables)	PE092AAA-X
Gen4x1 Interposer (includes Gen4x1 Interposer Card and (2) two high speed connector cables)	PE125UIA-X
Gen4x4 Interposer (includes Gen4x4 Interposer Card and (2) two high speed connector cables)	PE124UIA-X
Gen4x8 Interposer (includes Gen4x8 Interposer Card and (4) four high speed connector cables)	PE123UIA-X
Gen4x16 Interposer (includes Gen4x16 Interposer Card and (4) four high speed connector cables)	PE122UIA-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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