

Product Datasheet - Technical Specifications



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2500A PCI Express Protocol Analyzer

Pocket-sized PCI Express 1.1 Protocol Analyzer Model 2500A. Supports 2.5 Gbps with x1, x2 and x4 lane widths. FPGA-based, fully upgradeable design. Real-time data capture and display. PC software included.

Unique Advanced Features

- The Hierarchical Protocol Tree View organizes the captured PCI Express protocol data into a format that exactly reflects the nesting of the actual protocol items on the bus. This greatly eases understanding of the PCI Express protocol. Other PCI Express Protocol Analyzers use a primitive block-type display which makes it very hard to see the overall hierarchy of the complex data being communicated.
- FPGA hardware acceleration (indexing) of protocol items allows instantaneous Protocol View display after custom filtering, even for a full 2 gigabyte capture. Other Protocol Analyzers use the computer's CPU to parse the captured data which is orders of magnitude slower.
- Dynamic on-demand data upload from the hardware allows effortless access to and browsing of gigabyte sized trace data without a need to first upload the complete data to the PC. Only the part of the Protocol View that is actually visible will result in data fragments being uploaded from the 2500A unit.
- Extremely deep Trigger Sequence Detectors allow detection of eight trigger levels of up to 2,048 bytes per level or in total 16 kilobytes. Other Protocol Analyzers normally only allow you to trigger on a few DWords of packet payload data.
- Multiple time-correlated views of the data are simultaneously available, allowing you to easily see transaction, packet and lane details from the highest to lowest abstraction levels at a glance. Some other PCI Express Protocol Analyzers require you to change the protocol view to view the data at a different abstraction level,

resulting in lengthy reparsing of the data as well as loss of situational awareness of your location within the overall trace.

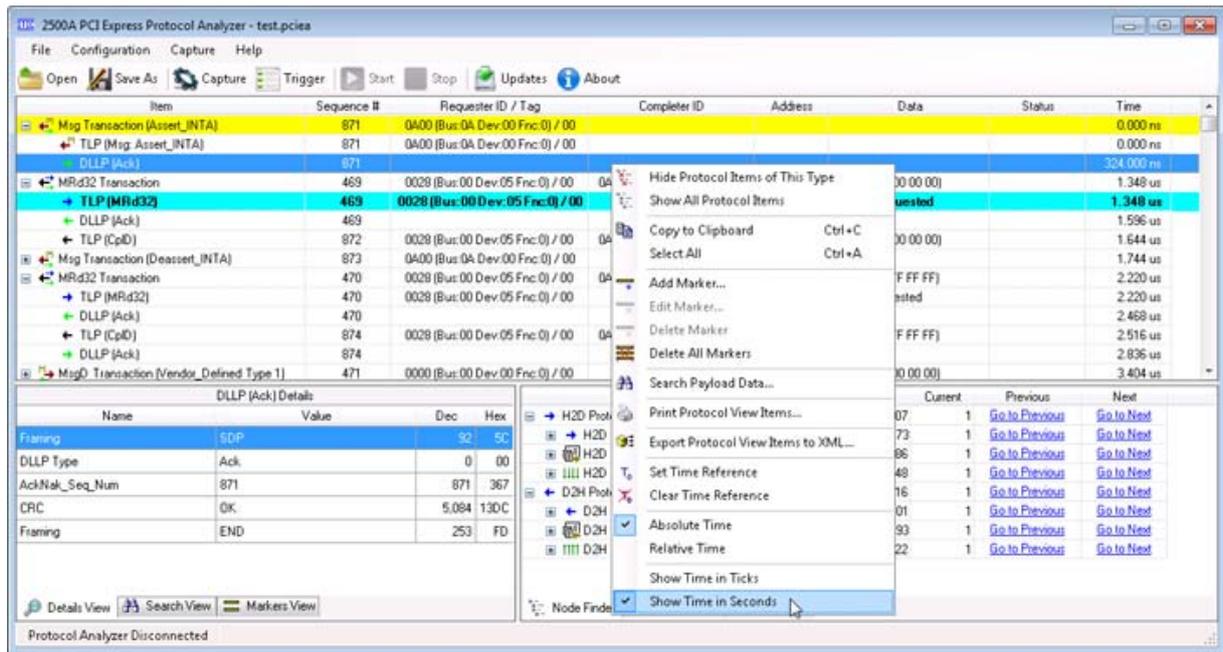
- Hardware acceleration of Protocol Item detection allows immediate display of the number of each type of protocol item in the trace as well as immediate jump to or filtering of any protocol item type.
- The 2500A unit is significantly smaller than competing PCI Express Protocol Analyzers, allowing it to be easily transported in your pocket or laptop bag (dimensions/weight is only 4.90" x 4.10" x 1.4" / 16oz or 125 x 105 x 35 mm / 450g).

Description

The 2500A PCI Express Protocol Analyzer supports the following features:

- PCI Express 1.1 (2.5 GBit/second) compliant
- User-selectable x4, x2 and x1 link width configurations.
- User-selectable 2 Gigabyte to 64 Kilobyte capture buffer. A selectable capture buffer size allows for smaller data files when saved to hard disk.
- A powerful 48 MHz Cypress FX2LP microprocessor implements on-demand upload of data via USB 2.0 after a completed capture. This allows you to immediately view data after the capture without having to wait for lengthy uploads of the full trace data.
- An Altera Arria II GX FPGA contains PCI Express x4 transceivers, a DDR2 Memory Controller and data upload interface to the microprocessor.
- Programmable Sequence Detectors allows the FPGA to detect the location of pre-defined as well as custom data sequences. This facilitates hardware-acceleration of PCI Express Protocol Item detection after capture. This, in turn, enables the software to display the data very quickly after a completed capture without a need for the software to locate the PCI Express Packets and Ordered Sets captured.
- An 8-level trigger with up to 2048 byte deep data detection per trigger level allows triggering on very long data sequences. In total, data sequences up to 16 Kbytes in length can be triggered upon.
- A TTL-compatible Trigger in / out port allows synchronization with external test instruments.
- A x4 slot probe with a 1 m (3.3ft) cable is included. 3rd party, custom probes can also be designed and connected to the 2500A unit.
- Microprocessor firmware and FPGA configuration are automatically updated with the PC application software. No separate and complex hardware re-programming is needed.

Overall, the 2500A hardware and software has been designed for maximum efficiency and simplicity of use. The hardware is small enough to fit in your pocket, the software is very easy to use but yet the complete package is very flexible and powerful.



Software Overview

The 2500A software runs on Microsoft Windows XP and newer operating systems. Both x86 and x64 systems are supported. The .NET Framework 2.0 is required.

The 2500A software supports the following features:

- The trigger position can be adjusted within the capture buffer (i.e. pre or post trigger).
- Lane Polarity, Lane Mapping and Descrambling can be adjusted / disabled as needed.
- The software dynamically acquires the data required to display the visible part of the trace as the data is browsed. This results in very quick and effortless browsing of the captured data regardless of the capture buffer size used.
- Multiple Views of the data are time-correlated; the Protocol View displays a hierarchical view of all Transactions as well as the Packets included within the transactions; the Lane View displays the raw data and control characters as they were received on the link under test; finally, the Detail View decodes details of the packet selected in the Protocol View. Together, these views give you a quick and easy way to browse the captured data from the highest to lowest information level.
- All Protocol Items in the trace are displayed in the 'Node Finder' View. This view allows direct jump to any protocol item in the trace. The Node Finder can also be used to hide / show packets of a particular type.
- The 'Search View' allows you to search for binary or string data in packet payload. Multiple searches can be started and run in the background as you continue working with the software. The Search View allows direct jumps to the search result locations.
- The 'Markers View' displays the trigger position as well as any markers you have added to the capture. Markers are saved with the project and allow you to quickly locate interesting areas in the trace at a later time.

- Protocol Item Filtering allows you to instantly hide any given Protocol Item Type from the Protocol View. Due to the dynamic data access of the Protocol View, filtering is very quick, even for a full 2 Giga-byte capture.
- The Protocol View and Lane View data can be exported to file in XML format and to the clipboard in CSV format. This allows easy post-processing of the captured data via your own or 3rd party software.
- Time can be shown in absolute (measured from capture start) or relative (measured from prior protocol item) mode.
- Protocol View and Lane View data can be print previewed as well as printed.

For best performance we recommend a newer Core i5 or Core i7 PC to be used. The minimum recommended PC requirements are a P4 / 2 GHz machine. The data upload speed as well as the Protocol View Filtering speed will be improved with the faster machines.