Teledyne LeCroy's U.2 (previously known as SFF-8639) Dual Port Interposer card provides a quick and simple means for protocol analysis of dual port Solid State Drives (SSDs) such as NVMe and SCSI Express that use x2 PCI Express (PCIe®) protocols on both ports. The U.2 Interposer Card, used with a Summit Protocol Analyzer, enables PCIe bus traffic between a host backplane and SSD device to be monitored, captured, and recorded for protocol analysis. The U.2 dual port interposer supports PCIe host interfaces such as NVM Express (NVMe), SCSI Express (SOP/PQI) and native PCIe Express protocols at data rates from 2.5 GT/s up to 8 GT/s. Now it is possible to monitor and analyze multiple PCIe storage host interfaces with a single set of tools.

The U.2 interposer provides connectivity and monitoring capability for the recently announced U.2 connector targeted at enterprise storage devices. This U.2 connector provides flexible drive connectivity for NVM Express, SCSI Express, SATA Express, SAS, SATA, and native PCIe 3.0 host interface devices in a serviceable and hot-pluggable drive bay sometimes referred to as "Express Bay". The U.2 dual port interposer can be used with 2-1/2” or 3” sized drives. To use this interposer, the drive is inserted into a drive tray on the interposer that supports a mechanical and electrical connection to a U.2 connector. The interposer taps all PCIe protocol traffic between the host backplane and the storage device and records it on the PCIe protocol analyzer, where protocol issues and performance metrics can be further analyzed and debugged.

Teledyne LeCroy was the first company to introduce a PCI Express protocol analyzer with NVM Express decoding functionality. Since that time Teledyne LeCroy has added decoding for SCSI Express (SOP/PQI) and SATA Express (AHCI/PCIe). Integrating all three PCIe SSD technologies into a single protocol analyzer gives developers versatile tools that can show essential details regarding proper data transmission and bus performance. These tools have been at the center of much of the PCIe SSD interoperability testing that has occurred over the last few years.

**Key Features**

- Quick and simple set-up
- Allows capturing and decoding of all PCI Express traffic between host and device
- Decodes PCIe host interfaces such as NVM Express (NVMe) and SCSI Express (SOP/PQI) in addition to native PCI Express protocols
- Can be used with both 2.5" and 3" drives
- Supports data rates of 2.5 GT/s, 5 GT/s and 8 GT/s
- Supports dual port x2 NVM Express and x2 SCSI Express
- Supports SRIS clocking
- Supports CLKREQ# for testing low power L1 substates
- Dimensions:
  - 340 x 141 mm (13.4” x 5.6”)

**Dimensions:**

- 105 mm 4.1”
- 100 mm 3.9”
- 138 mm 5.4”
- 69 mm 2.7”
- 202 mm 7.95”
- 220 mm 8.66”

**Dimensions:**

- 340 x 141 mm (13.4” x 5.6”)

**nvm EXPRESS**

**SCSI EXPRESS**

**PCI EXPRESS**

**Performance Scalability for the Next Decade**
Connecting the U.2 Interposer (refer to Quick Start Guide for more details)

1. Set the SW1 DIP switches to the desired clock selection.
2. Install the U.2 device under test (DUT) into the connector on the interposer as shown (fits 2.5" or 3" drives).
3. Connect the Summit T34 Analyzers (or other compatible Teledyne LeCroy analyzers) to the interposer using the system iPass cables. One analyzer should be connected to the port marked “SCSI Express/NVMe Port A” and the second analyzer should be connected to the port marked “SCSI Express/NVMe Port B”. If using Summit T24 or T34 analyzers, use the x4-to-x8 straight iPass cable (PE013UCA-X). For all other Summit analyzers, use the iPass Y-Cable (PE010UCA-X).
4. Connect the analyzers to a host computer system using the USB ports on the Summit analyzers.
5. If not already done, install the PCIe Protocol Suite software on the host machine.
6. Connect 12V DC using the AC adapter supplied with the interposer. (Make sure that the AC adapter is powered on).
7. Power on the analyzers.
8. Power on the host machine.
9. Launch the Teledyne LeCroy software application to monitor, record and view PCI Express traffic passing through the U.2 Interposer.
10. Install the Interposer into the host system connector.

Note: The sequence of operations shown here is for “hot plug” operations where the host system powering the U.2 host slot remains powered on. For test applications where this is not required, assemble the components as indicated (including plugging the interposer into the host slot), then power on all components (interposer, analyzers, and host machine for PCIe Protocol Suite software) before powering on the U.2 host slot.