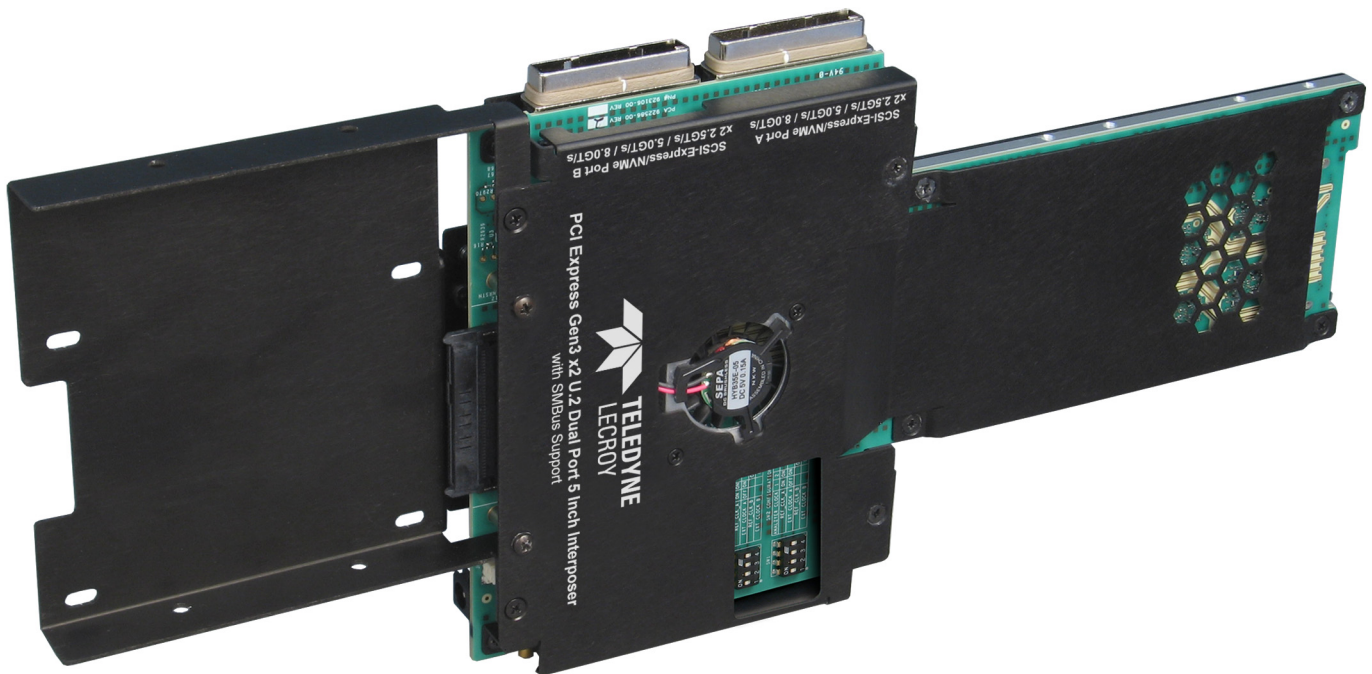


PCI Express® Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support User Manual and *Quick Start Guide*

1 Introduction

Use this document for quick installation and setup.

Teledyne LeCroy's PCI Express Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support provides a quick and simple means for protocol analysis of Solid State Drives (SSDs) based on PCI Express (PCIe®) protocols. The U.2 Interposer dual-port 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 card is compatible with the Summit T3-16, Summit T3-8, Summit T34, Summit T28 and Summit T24 Protocol Analyzers and supports data rates of 2.5 GT/s, 5.0 GT/s and 8.0 GT/s. The interposer supports side band signals such as PERST#, WAKE#, CLKREQ# and SMBus (SMBCLK, SMBDAT).



PCI Express Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support

2 Components

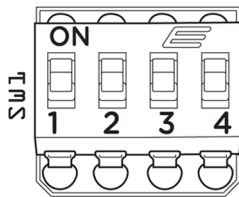
The analyzer package includes the following components:

- PCI Express Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support card
- DC Power Adapter (12 volts)
- User Manual and Quick Start Guide (this document)

Inspect the received shipping container for any damage. Unpack the container and account for each of the system components listed on the accompanying packing list. Visually inspect each component for absence of damage. In the event of damage, notify the shipper and Teledyne LeCroy. Retain all shipping materials for shipper's inspection.

3 Clock Selection

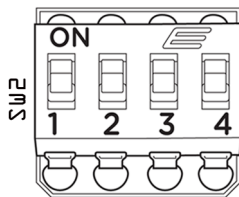
The source for the reference clock used by the analyzer to record PCI Express traffic is configurable according to below table:



SW1: Clock Select		Port A	SW1: Clock Select		Port A
1	2	Cable B	3	4	Cable A
ON	ON	Host Clk	ON	ON	Host Clk
OFF	ON	US_CLK	OFF	ON	US_CLK
ON	OFF	DS_CLK	ON	OFF	DS_CLK
OFF	OFF	No clock supplied	OFF	OFF	No clock supplied

Note: If using direct cable from Summit T24 refer only to table for Cable A for ports A and B.

Note: All switches in the ON position for SW1 is the factory default.



SW2: Clock Select		Port B	SW2: Clock Select		Port B
1	2	Cable B	3	4	Cable A
ON	ON	No clock supplied	ON	ON	No clock supplied
OFF	ON	US_CLK	OFF	ON	US_CLK
ON	OFF	DS_CLK	ON	OFF	DS_CLK
OFF	OFF	Host Clk	OFF	OFF	Host Clk

Note: If using direct cable from Summit T24 refer only to table for Cable A for ports A and B.

Note: All switches in the OFF position for SW2 is the factory default.

Host Clk: Use the reference clock from the U.2 connector.

US_CLK: Use the reference clock from the corresponding MMCX connector.

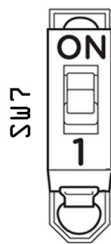
DS_CLK: Use the reference clock from the corresponding MMCX connector.

No clock: Use it only if creating an absence of clock scenario in which case the analyzer has to use Internal Clock in the Recording Options from the PCIe Protocol Suite application.

4 Switch Configuration

This switch connects the DUT power Indication LED to the bus power. It is located on the rear side of the interposer.

DUT Power LED Status on Interposer



SW7: DUT Power LED	
ON	LED Connected (Default)
OFF	LED Disconnected

Note: This switch connects the DUT power indication LEDs to the bus power. In some systems with Hot-Plug management the Power Indication LEDs on the interposer may prevent the host system from turning ON bus power to the device, if this happens disconnect the LEDs using SW7 to allow proper bus power operation.

5 Connections

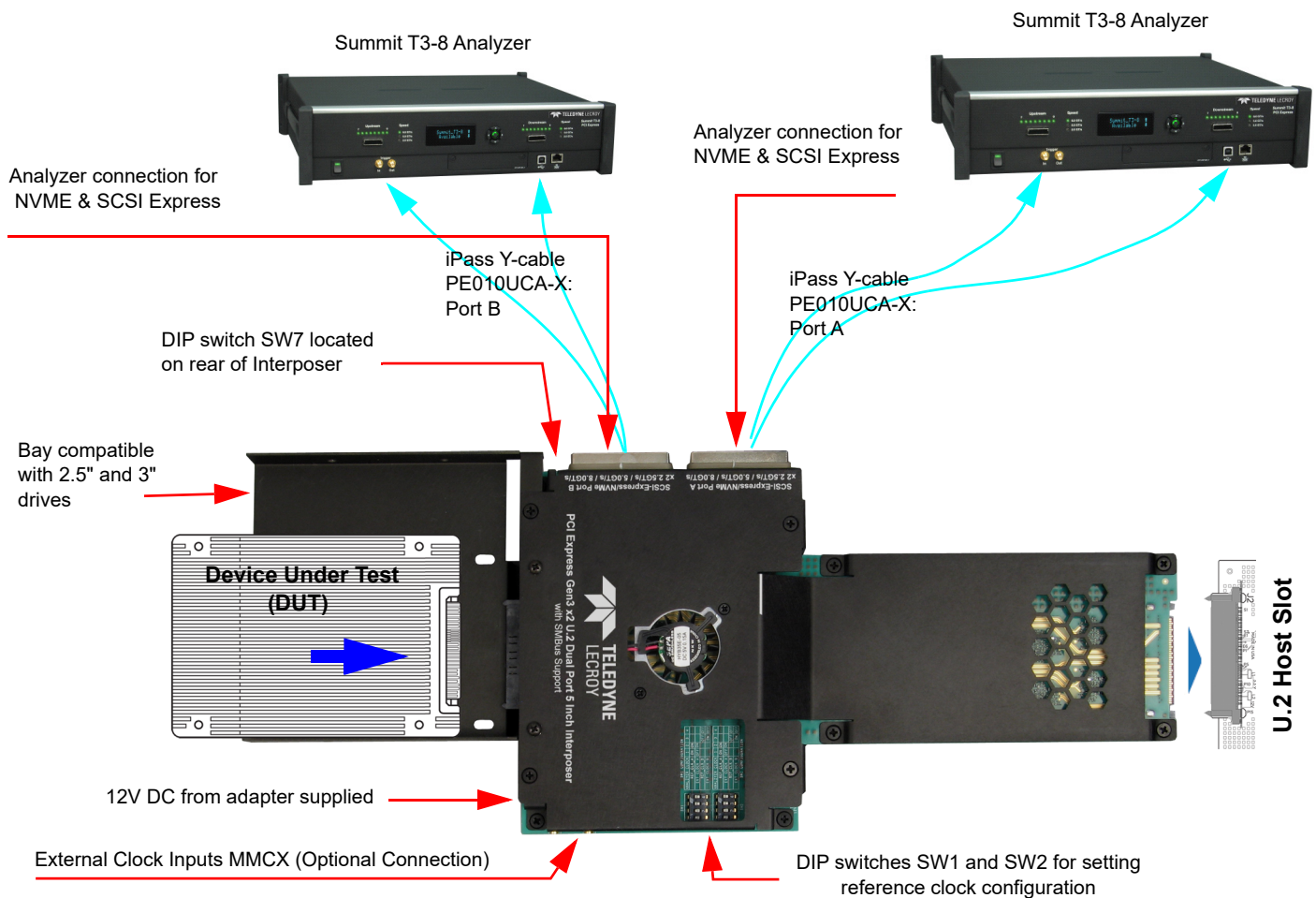
IMPORTANT: If you plan to insert the interposer into a Chassis backplane you MUST fit the rails from a donor carrier to the interposer before use to avoid serious damage to the interposer. Instructions for Modifying the HDD Carrier are in Section 5.

Perform the following steps to connect the Interposer (see the image below):

1. Set the SW1 and SW2 DIP switches to the desired clock selection according to the table shown below.
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 T3-8 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 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 Analysis on the host machine. This application is used to control the protocol analyzer.
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 Analysis) before powering on the U.2 host slot.

Connecting the PCI Express Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support to two Summit T3-8 Analyzers



6 Modification of HDD Carrier for Use with Teledyne LeCroy U.2 Interposers

In applications where a U.2 HDD is inserted into a custom carrier before being installed in a server system, the Teledyne LeCroy U.2 interposers are designed to allow the interposer to take the position of the HDD within the carrier (and then the HDD under test is inserted in the back of the interposer for testing). Depending on the depth of the server bay, either a 5" interposer or a 12" interposer can be used, but in general a custom HDD carrier must be modified to remove and possibly alter the side rails of the carrier to the interposer. Making these alterations allows the interposer to fit securely into the server bay designed for the HDD carrier.

In this Quick Start Guide, an example is given of how these alterations might be performed, using a custom carrier and a Teledyne LeCroy U.2 Interposer. However these instructions are intended to provide a guide for modifications of other custom HDD carriers when used with any of the following Teledyne LeCroy products:

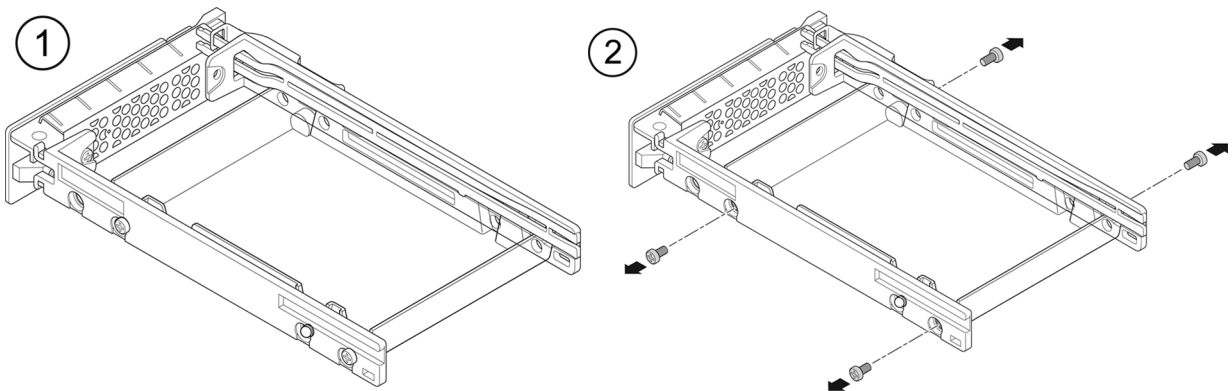
- PE154UIA-X PCI Express Gen3 U.2 Standard 5 Inch Interposer with SMBus Support
- PE156UIA-X PCI Express Gen3 U.2 Standard 12 Inch Interposer with SMBus Support
- PE155UIA-X PCI Express Gen3 x2 U.2 Dual Port 5 Inch Interposer with SMBus Support
- PE157UIA-X PCI Express Gen3 x2 U.2 Dual Port 12 Inch Interposer with SMBus Support

Tools needed for the carrier bay modification shown here:

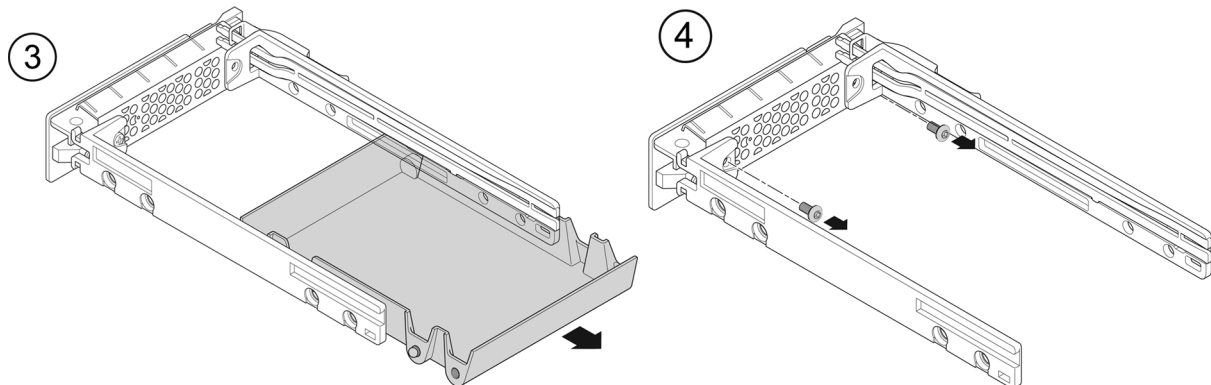
- Small Phillips screwdriver
- Torx T8 Screwdriver
- Small flat-bladed screwdriver
- Small metal-cutting hacksaw or similar metal-cutting tool

To prepare the interposer for insertion into the server bay, follow the following steps (modified as necessary for the specific custom HDD carrier in use):

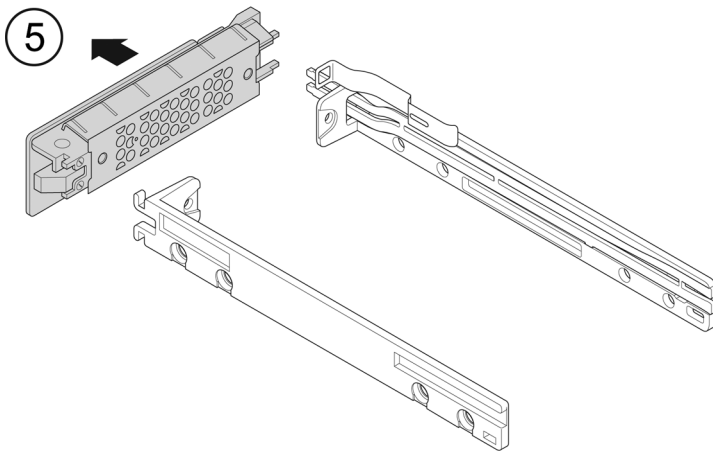
1. Acquire an empty HDD carrier as shown in Figure 1 below. The carrier contains a plastic insert which is removed and replaced by the HDD in actual use
2. Remove the four Phillips screws that hold the plastic insert in place. Save these screws as they will be used later in Step 10 to attach the side rails to the interposer.



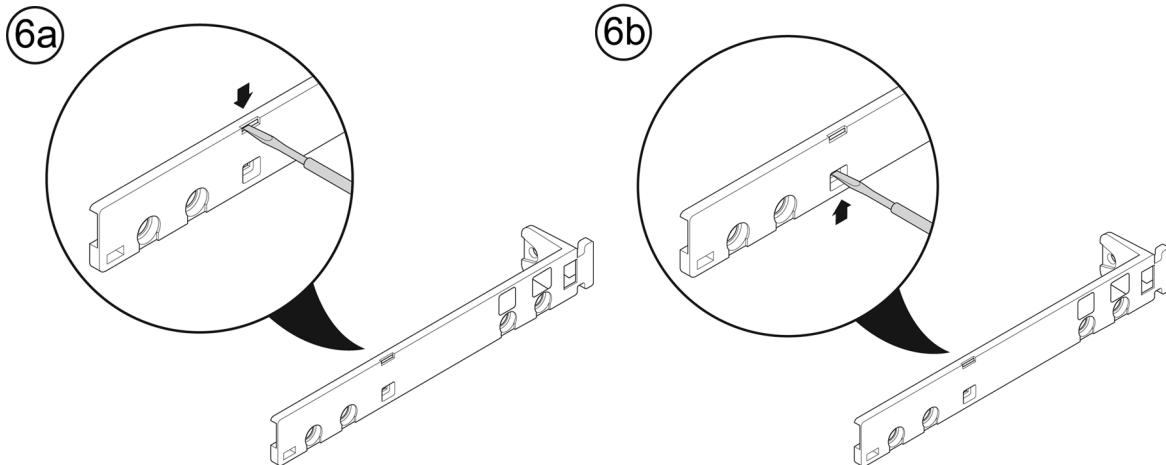
3. Remove the plastic insert from the carrier.
4. Remove the two Torx T8 screws which attach the side rails of the carrier to the front cover.



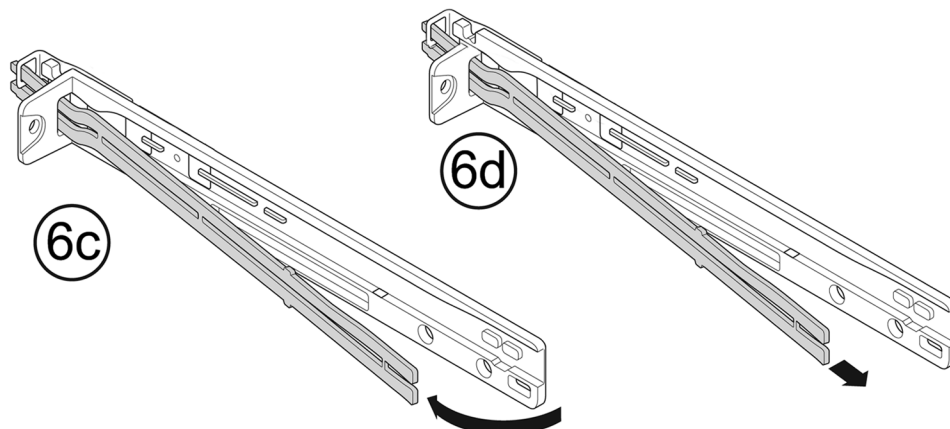
5. Remove the front cover of the HDD carrier.



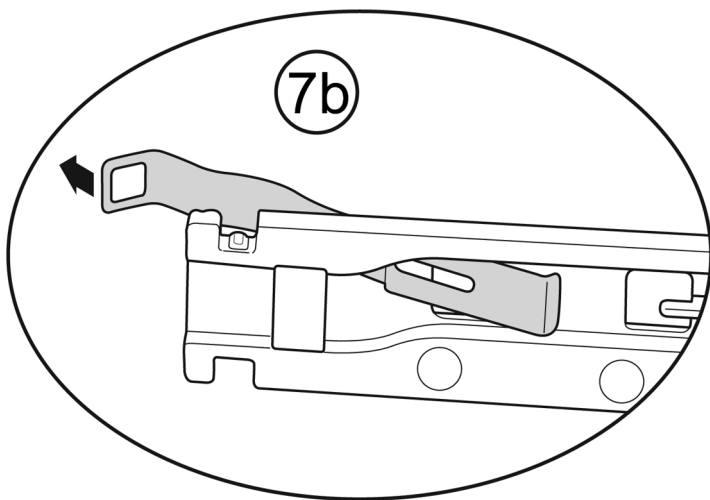
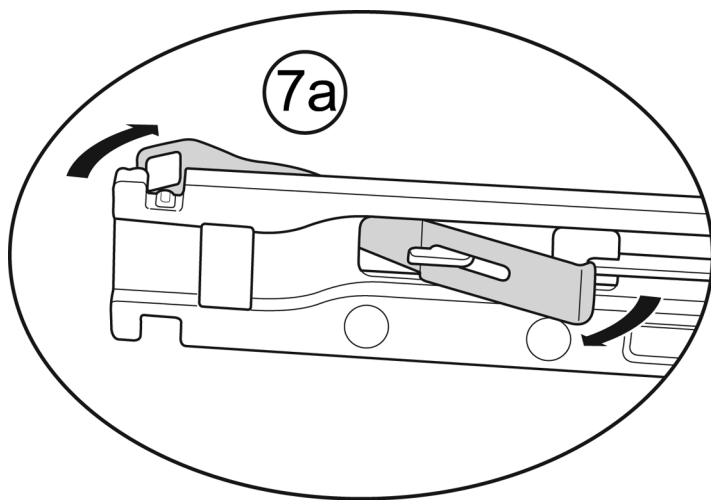
6. This carrier includes a dual light pipe that is intended to allow power and status LEDs located on the server backplane to be displayed on the front cover of the carrier. This light pipe is held in place with a metal clip (at the front) and tabs on the light pipe itself that fit slots in the side rail of the carrier towards the rear. Remove the light pipe as follows:
- Using a small flat-bladed screwdriver, push down on the upper slot to release the top of the light pipe.
 - Repeat the process, pushing up on the lower slot to release the bottom of the light pipe.



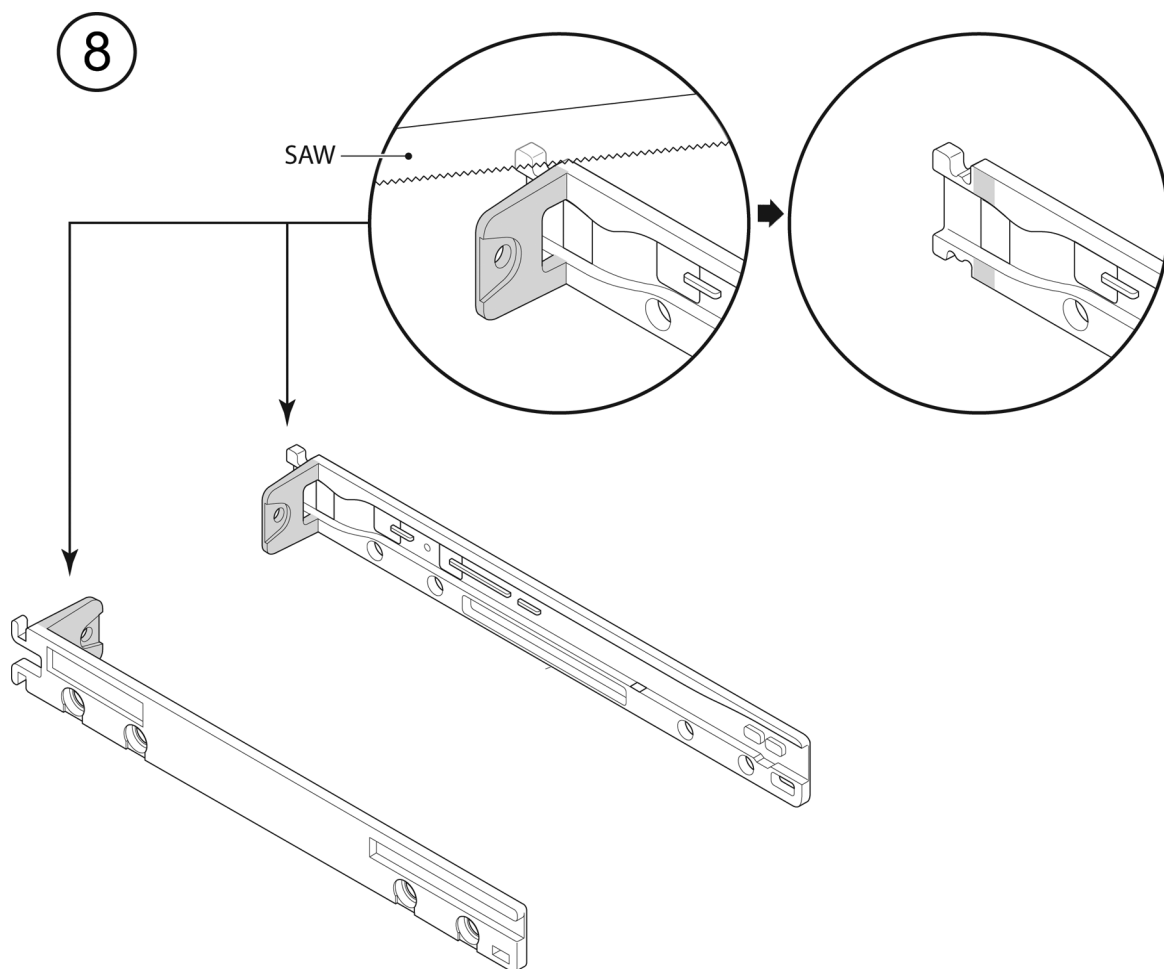
- Swing the rear end of the light pipe away from the side rail.
- Pull back on the light pipe to remove it from the side rail.



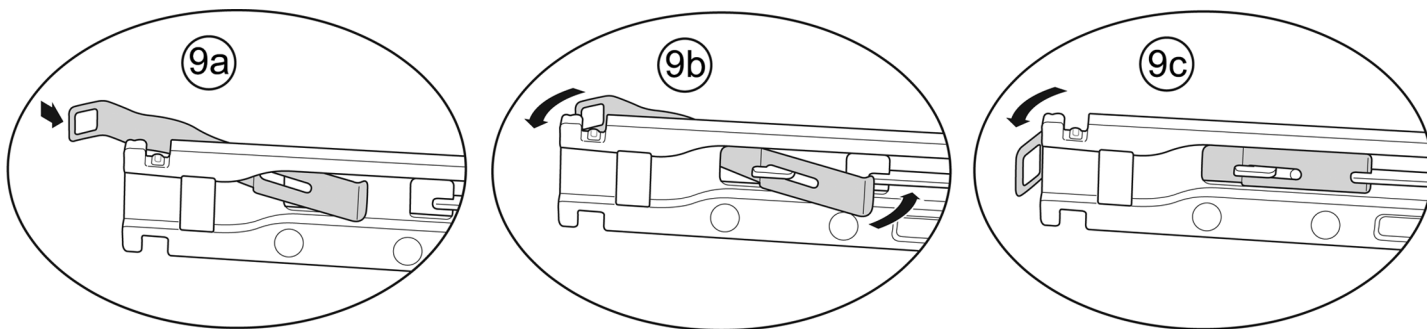
7. With the light pipe removed, it is now possible to remove the metal clip from the front of the side rail, as follows:
- Using a small flat-bladed screwdriver, push down on the upper slot to release the top of the light pipe.
 - Push the metal clip forward to remove it from the side rail.



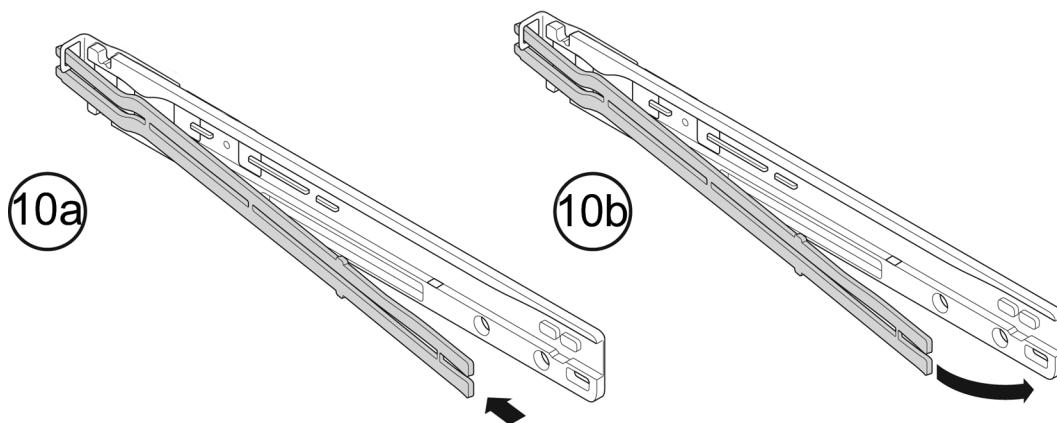
8. On this HDD carrier, the side rails contain flanges designed to attach the front cover of the carrier. These flanges interfere with the space needed for the interposer and need to be removed. To remove the flanges, use a small metal-cutting hacksaw (or similar tool) and cut the flanges from the side rail, ensuring that no residual portion of the flange extends out from the side rail. Do this for both side rails.



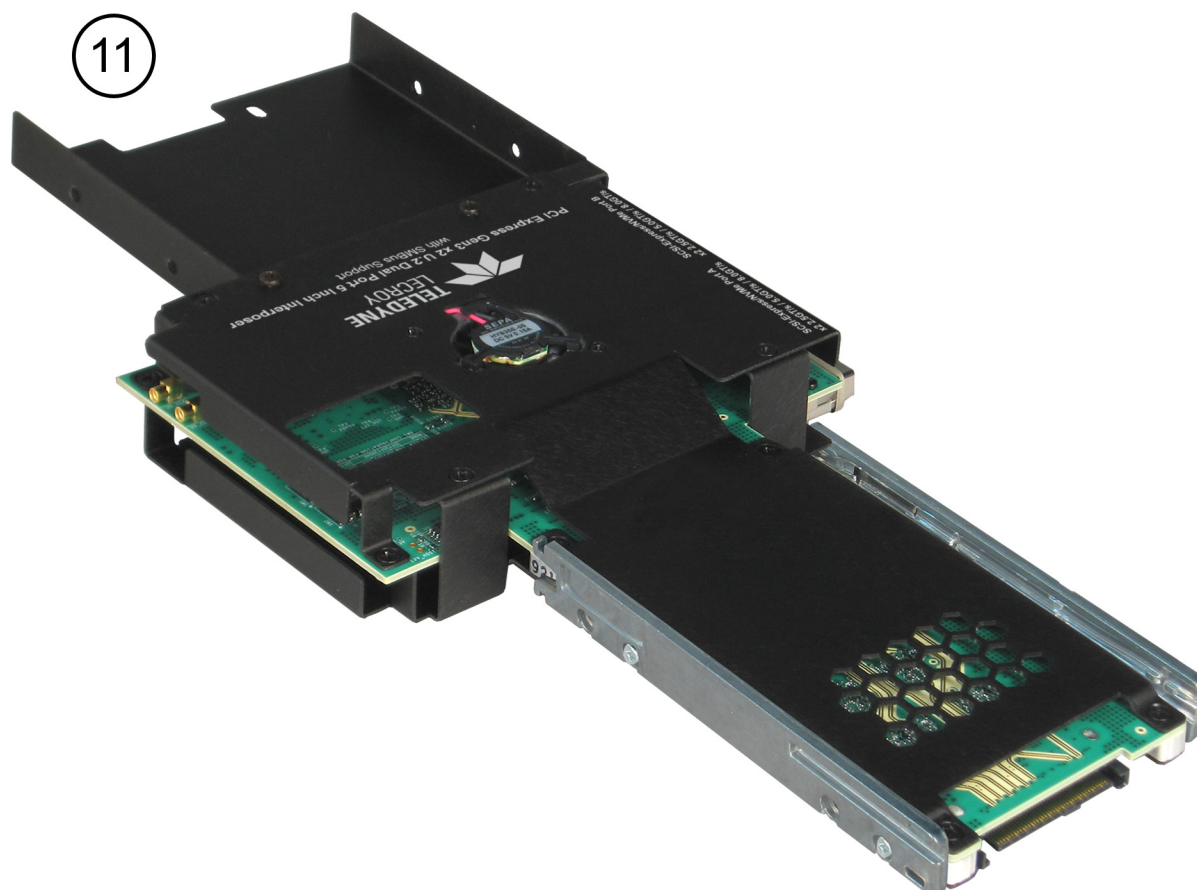
9. The light pipe can be re-installed by first re-inserting the metal clip removed in Step 7 as follows:
- Insert the metal clip through the front hole in the front of the side rail until the slot in the metal slip engages with the hook on the side rail.
 - Twist the metal clip to allow the rear portion of the clip to engage with the second (rear) retaining clip on the side rail.
 - The hole to support the light pipe should now be visible and aligned with the inside surface of the side rail.



10. Insert the light pipe as follows:
- Slide the top part of the light guide through the hole in the metal clip to hold the front portion of the light pipe in position
 - Swing the rear portion of the light pipe against the side rail and press the tabs on the light pipe into the retaining holes in the rear portion of the side rail.



11. Attach the side rails to the 5" (or 12") extension on the interposer, using the four Phillips screws removed in Step 2. Ensure that the side rails are correctly aligned, with the rear portion of the side rails aligned with the end of the extension on either side of the HDD connector.



12. If correctly assembled, the interposer/side rail assembly should slide easily into the carrier bay slot in place of the original HDD carrier. Return to Section 4 for Connection information.

7 Environmental Conditions

- Temperature: Operating 32° F to 122° F (0° C to 50° C)
- Temperature: Non-Operating 14° F to 176° F (-10° C to 80° C)
- Humidity: Operating 10% to 90% RH (non-condensing)

Teledyne LeCroy Customer Support

Online Download

Periodically check the Teledyne LeCroy Protocol Solutions Group web site for software updates and other support related to this product. Software updates are available to users with a current Maintenance Agreement.

Web: teledynelecroy.com/tm/software/PCle
E-mail: psgsupport@teledyne.com
Support: teledynelecroy.com/support/contact



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Changes

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