Installation Guide

SKU: OSS-PCIe-HIB25-X8

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Preface

Advisories

Five types of advisories are used throughout this manual to provide helpful information, or to alert you to the potential for hardware damage or personal injury.

NOTE
Used to amplify or explain a comment related to procedural steps or text.

IMPORTANT
Used to indicate an important piece of information or special "tip" to help you

CAUTION

Used to indicate and prevent the following procedure or step from causing damage to the equipment.

WARNING

Used to indicate and prevent the following step from causing injury.

DANGER or STOP

Used to indicate and prevent the following step from causing serious injury or significant data loss

Disclaimer: We have attempted to identify most situations that may pose a danger, warning, or caution condition in this manual. However, the company does not claim to have covered all situations that might require the use of a Caution, Warning, or Danger indicator.

Safety Instructions

Always use caution when servicing any electrical component. Before handling the expansion chassis, read the following instructions and safety guidelines to prevent damage to the product and to ensure your own personal safety. Refer to the "Advisories" section for advisory conventions used in this manual, including the distinction between Danger, Warning, Caution, Important, and Note.

- Always use caution when handling/operating the computer. Only qualified, experienced, authorized electronics personnel should access the interior of the computer and expansion chassis per UL and IEC 60950-1
- The power supplies produce high voltages and energy hazards, which can cause bodily harm.
- Use extreme caution when installing or removing components. Refer to the installation instructions in this manual for precautions and procedures. If you have any questions, please contact Technical Support.

WARNING

Never modify or remove the radio frequency interference shielding from your workstation or expansion unit. To do so may cause your installation to produce emissions that could interfere with other electronic equipment in the area of your system.

When Working Inside a Computer

1. Before taking covers off a computer, perform the following steps:
2. Turn off the computer and any peripheral devices.
3. Disconnect the computer and peripheral power cords from their AC outlets or inlets in order to prevent electric shock or system board damage.

In addition, take note of these safety guidelines when appropriate:

- To help avoid possible damage to systems boards, wait five seconds after turning off the computer before removing a component, removing a system board, or disconnecting a peripheral device from the computer.
- When you disconnect a cable, pull on its connector or on its strain-relief loop, not on the cable itself. Some cables have a connector with locking tabs. If you are disconnecting this type of cable, press in on the locking tabs before disconnecting the cable. As you pull connectors apart, keep them evenly aligned to avoid bending any connector pins. Also, before connecting a cable, make sure both connectors are correctly oriented and aligned.

CAUTION

Do not attempt to service the system yourself except as explained in this manual. Follow installation instructions closely.

Protecting Against Electrostatic Discharge

Electrostatic Discharge (ESD) Warning
Electrostatic Discharge (ESD) is the enemy of semiconductor devices. You should always take precautions to eliminate any electrostatic charge from your body and clothing before touching any semiconductor device or card by using an electrostatic wrist strap and/or rubber mat.

Static electricity can harm system boards. Perform service at an ESD workstation and follow proper ESD procedures to reduce the risk of damage to components. We strongly encourage you to follow proper ESD procedures, which can include wrist straps and smocks, when servicing equipment.

You can also take the following steps to prevent damage from electrostatic discharge (ESD):

- When unpacking a static-sensitive component from its shipping carton, do not remove the component's anti-static packaging material until you are ready to install the component in a computer. Just before unwrapping the anti-static packaging, be sure you are at an ESD workstation or are grounded.

- When transporting a sensitive component, first place it in an anti-static container or packaging.

- Handle all sensitive components at an ESD workstation. If possible, use anti-static floor pads and workbench pads.

- Handle components and boards with care. Do not touch the components or contacts on a board. Hold a board by its edges or by its metal mounting bracket.

1   Introduction

PCIe x8 Gen2 Host Cable Adapter install easily into a computer's PCIe slot. A PCIe cable can then be plugged into the adapter to extend the PCIe bus from the motherboard to an external device, like an expansion enclosure or storage device. The PCIe x8 adapter extends the PCIe bus at 40Gb/s with extremely low latency because there is no conversion software

Part numbers:

- OSS-PCIE-HIB25-x8-T (Target)
- OSS-PCIE-HIB25-x8-H (Host)

1.1   Specifications

Item	Description
Form Factor	PCIe x8 half-height, half-length
Dimensions	4.5 x 2.7 inches
Bandwidth / Backplane Interface	PCIe x8 Gen2
Power Consumption	4W
Connector	PCIe x8 Cable connector PCIe x8 Edge connector
Re-drivers	5.0 Gbps 4-lane PCIe Gen2 Re-driver Pericom, pat number P12EQX5804
Bracket	Standard and low profile brackets available No LEDs on the bracket
Operating Temperature	0˚C to +70˚C environment
Operating Humidity	10% to 90% relative humidity non-condensing
Storage Humidity	5% to 95% relative humidity non-condensing
Industry Specifications	- PCIe External Cabling Specification, Rev. 1.0 - PCI Express™ Card Electromechanical - Specification, Rev. 3.0 - PCI Express ® Base Specification, Rev. 3.0 - ATX Specification, Version 2.2
Agency Compliance	• FCC Class A • CE • RoHS
Operating System	Windows 10, Windows Server 2012 R2; Linux OS based

1.1   Overview
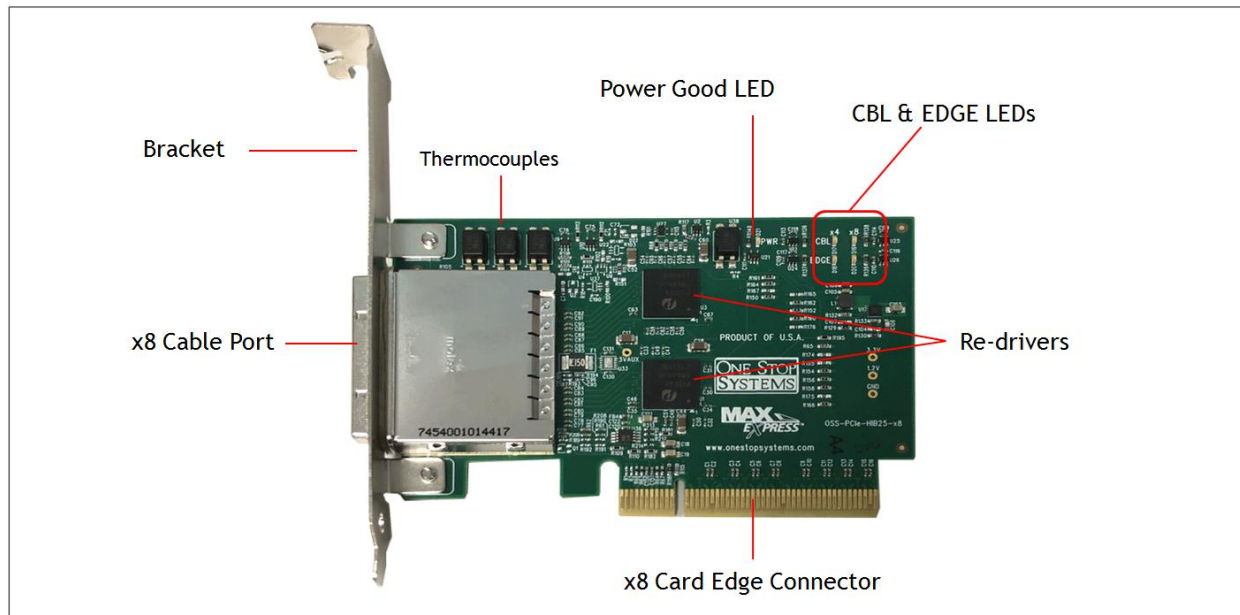
1.2   PCIe Card Edge x8

- The PCIe Card edge will be directly routed x8 interface to the Pericom Chip
- In host mode, the add-in card will accept a clock as an input.
- In target mode, the add-in card will drive a clock. It will also provide a reset output and a PS_ON# signal.

1.3   Power

- Power is provided by the PCI-e card slot.
- Power required by internal components of **OSS-PCIe-HIB-25-x16** is estimated to be 4 watts when both ports are fully linked and operating in Gen2 mode.
- Cable power is to be provided per PCIe cable specification. When an active cable (powered transceiver) is used, additional power is required from the PCI-e card slot.
- Power will be supplied +3.3V, +3.3Vaux through Card Edge.
- Some power rails will be derived from the onboard circuitry.

1.4   PCIe Cable Sideband signals

- All Cable sideband signals CPERST#, CPWRON, CPRSNT#, CWAKE# to be connected per the PCIe Cable specification.
- Additional isolation of signal CE_PWRON# (card edge power control) shall be provided by a physical switch.
- This switch allows user to electrically isolate this signal from the card edge connector.

1.5   Re-driver

- The board uses the Pericom chip to link from Card Edge to Cable Connector.
- The HIB card interface includes the following features
  - One x8 PCIe bus routed to PCIe Card Edge
  - One x8 PCIe bus routed to the PCIe Cable Connector
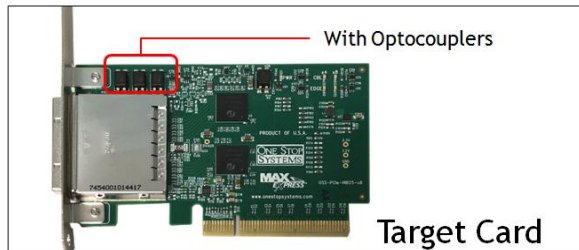 - PCIe Clock route from Card Edge to Cable Connector via a Clock Buffer.

## 1.6   Block Diagram & Signal Direction
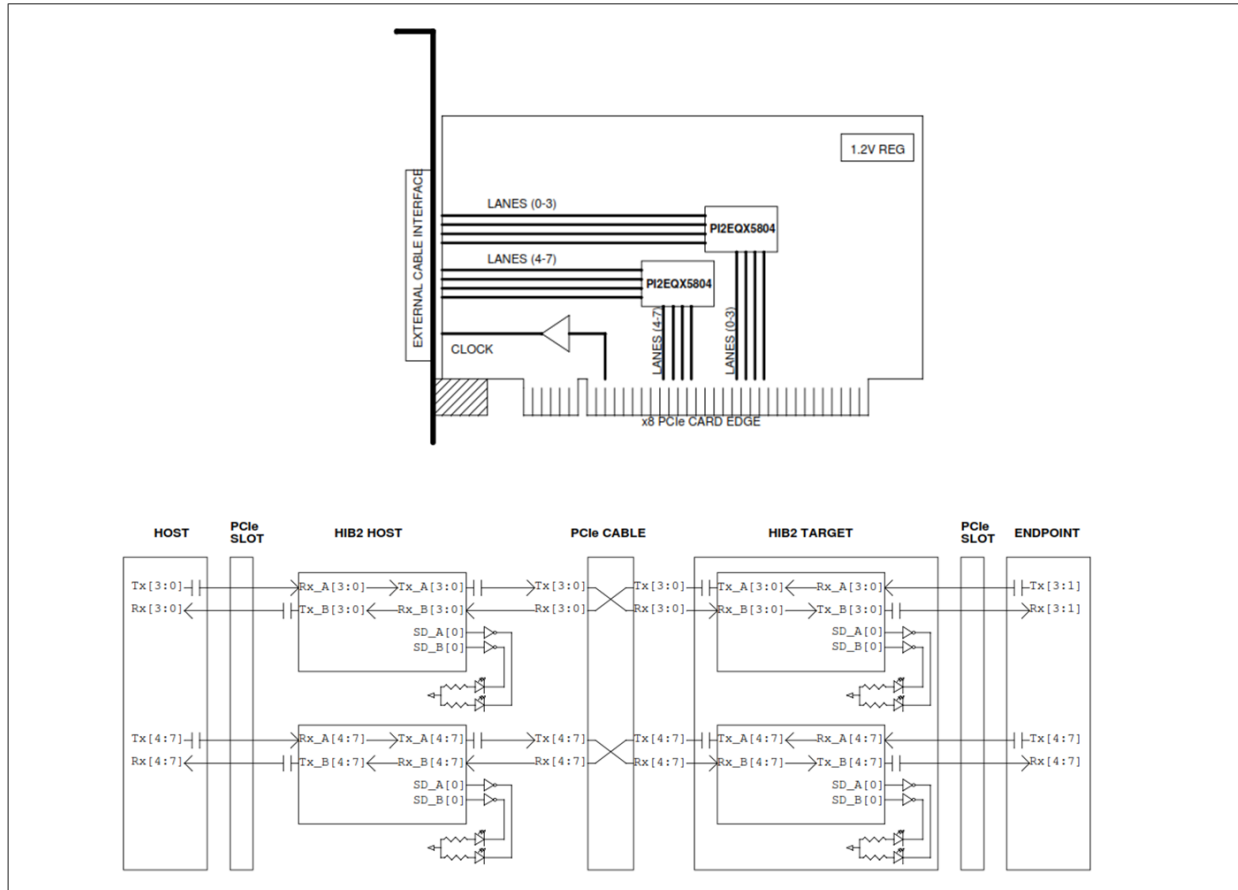
1.7   HIB card Operating Mode

Use cases for all operating modes.

1. Mode 1: Target Mode: In this mode, the card is populated with three thermocouples. The card is set to operate in Target mode and it is plugged into expansion backplane Upstream slot.

2. Mode 2: Host Mode. In this mode, the card is not populated with thermocouples. The card is set to operate in Host mode and it is plugged into computer's motherboard PCIe slot.
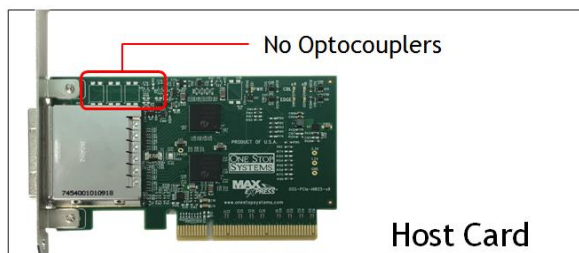
1.8 Connector Pin outs

PCI Express x8 Cable Connector

	Row A	Row B		Row A	Row B
Pin #	Signal Name	Signal Name	Pin #	Signal Name	Signal Name
1	GND	GND	13	GND	GND
2	PETp0	PERp0	14	CREFCLK+	PWR (3.3V)
3	PETn0	PERn0	15	CREFCLK-	PWR (3.3V)
4	GND	GND	16	GND	PWR (3.3V)
5	PETp1	PERp1	17	RSVD	PWR RTN
6	PETn1	PERn1	18	RSVD	PWR RTN
7	GND	GND	19	SB_RTN	PWR RTN
8	PETp2	PERp2	20	CPSRNT$#	CWAKE#
9	PETn2	PERn2	21	CPWRON	CPERST#
10	GND	GND	22	GND	GND
11	PETp3	PERp3	23	PETp4	PETp4
12	PETn3	PERn3	24	PETn4	PERp4

1.9   PCI Express x16 Connector Pin out (Wired as x8)

PIN#	NAME	PIN#	NAME	
B1	+12V	A1	PRSNT1#	
B2	+12V	A2	+12V	
B3	+12V	A3	+12V	
B4	GND	A4	GND	
B5	SMCLK	A5	TCK	
B6	SMDAT	A6	TDI	
B7	GND	A7	TDO	
B8	+3.3V	A8	TMS	
B9	TRST#	A9	+3.3V	
B10	3.3Vaux	A10	+3.3V	
B11	WAKE#	A11	PERST#	Mechanical Key
B12	RSVD	A12	GND	
B13	GND	A13	REFCLK+	
B14	PETp0	A14	REFCLK-	
B15	PETn0	A15	GND	
B16	GND	A16	PERp0	
B17	PRSNT2#	A17	PERn0	
B18	GND	A18	GND	End of the x1 connector
B19	PETp1	A19	RSVD	
B20	PETn1	A20	GND	
B21	GND	A21	PERp1	
B22	GND	A22	PERn1	
B23	PETp2	A23	GND	
B24	PETn2	A24	GND	
B25	GND	A25	PERp2	
B26	GND	A26	PERn2	
B27	PETp3	A27	GND	
B28	PETn3	A28	GND	
B29	GND	A29	PERp3	
B30	RSVD	A30	PERn3	
B31	PRSNT2#	A31	GND	
B32	GND	A32	RSVD	End of the x4 connector
B33	PETp4	A33	RSVD	
B34	PETn4	A34	GND	
B35	GND	A35	PERp4	
B36	GND	A36	PERn4	
B37	PETp5	A37	GND	
B38	PETn5	A38	GND	
B39	GND	A39	PERp5	
B40	GND	A40	PERn5	
B41	PETp6	A41	GND	
B42	PETn6	A42	GND	
B43	GND	A43	PERp6	
B44	GND	A44	PERn6	
B45	PETp7	A45	GND	
B46	PETn7	A46	GND	
B47	GND	A47	PERp7	
B48	PRSNT2#	A48	PERn7	
B49	GND	A49	GND	End of x8 connector

NC = NOT CONNECTED

2 Hardware Requirements

The following steps will guide you through the installation of your HIB25-x8 Host and Target card.
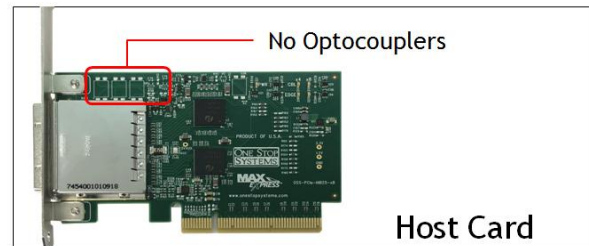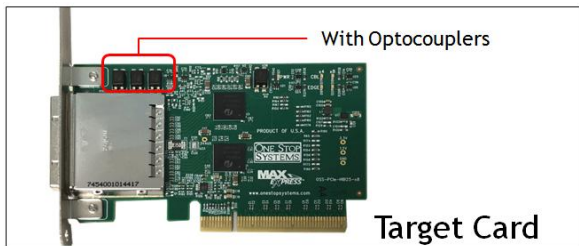
2.1 Hardware & System Requirements

1. Computer / Server motherboard with x8 Gen2 PCIe slot
2. HIB25-x8-H, qty 1: Host card
3. HIB25-X8-T, qty 1: Target card

NOTE: The HIB25-x8 card works in pair (one as host card and other as target card)

4. One x8 iPass cable
5. OSS Expansion chassis with Gen2 backplane, or OSS expansion backplane and power supply.

2.1.1 HIB25-x8 card (Host and Target)

2.1.2 PCIe Slot & Motherboard Requirement

For Host Adapter card: Use a server-computer type motherboard that has a Gen3 or Gen2 x16 PCIe slot in order for the card to operate to its max performance. The Host adapter card is recommended to be installed in a x16 connector.

2.1.3 x16 iPass Cable

Use x16 iPass cable for connecting host card and target card

2.1.4   Gen3 Expansion Chassis / backplane

You need an expansion chassis with Gen2 or Gen3 backplane . Photos below are example of Gen3 OSS backplanes and an expansion unit.

The HIB card has custom pin out that unique to OSS and only OSS Target adapters will work in the upstream slot of our expansion backplanes.
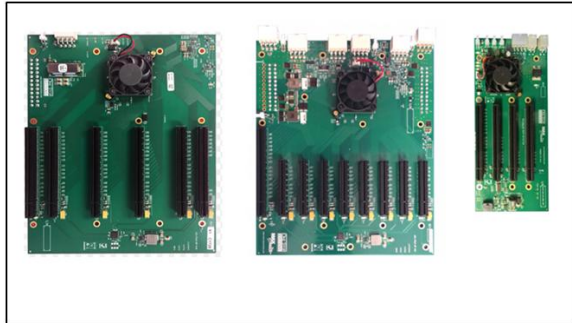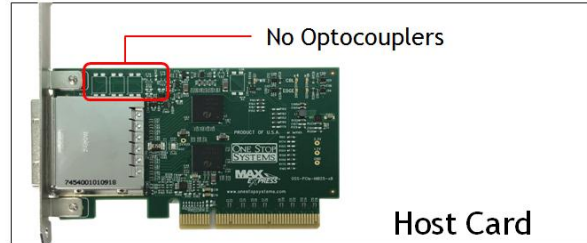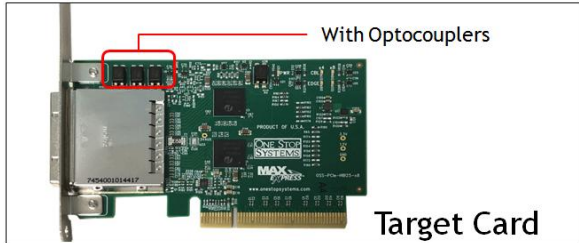

OR

2.2   Software Requirement

1. Computer running Windows 7, 8, 10 and or Server
2. No driver is needed for the OSS-HIB25-x8

2   Installation Procedures

2.1   Select Host and Target Card

Select the appropriate card to use, makes sure you have the correct host and target cards. Below are photos to help you identify between Target and Host card.
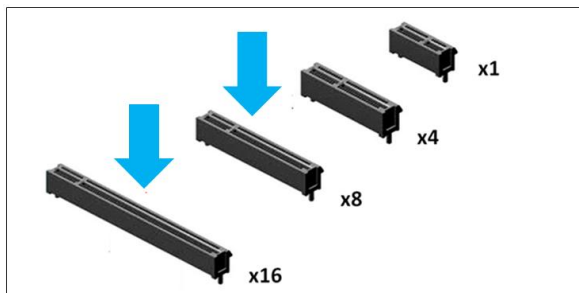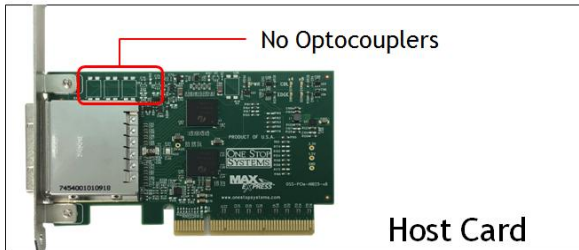

2.2   Install HIB Host card

Power down the host computer first before installing the host card. Do not install the host card while the computer is ON.

- Install the HIB25-X8 host card into the available PCIe slot in the computer motherboard. Use a x8 or x16 Gen2/Gen3 PCIe slot.
- Secure the card

2.3   Install HIB Target card

Do not plug in the target card while expansion unit or the expansion backplane is ON as this can damage the board. Turn OFF the unit first before installing the card.

The HIB Target card will only work in the OSS backplane designated "Upstream" slot. It will not function in the downstream slot or the end-point slot of the backplane.

Install the Target card in the OSS expansion backplane. Plug-in the target card in the designated Upstream slot of the backplane.

The "optocouplers" are mounted on the Target card

Target Card

Target Slot / Upstream Slot
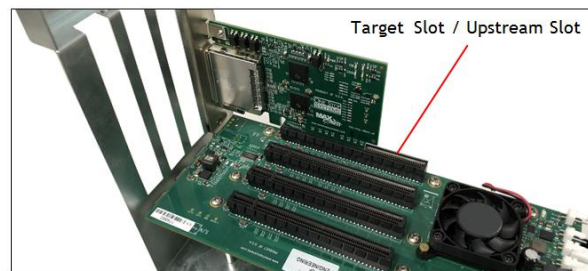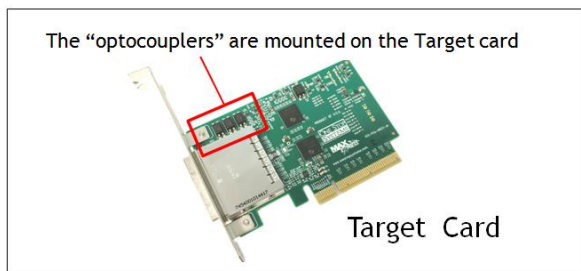
Photos below are different backplanes showing where the location of the Upstream slot.

Downstream Slots

Upstream Slot / Target Slot

Target card

Downstream Slots

Upstream Slot / Target Slot
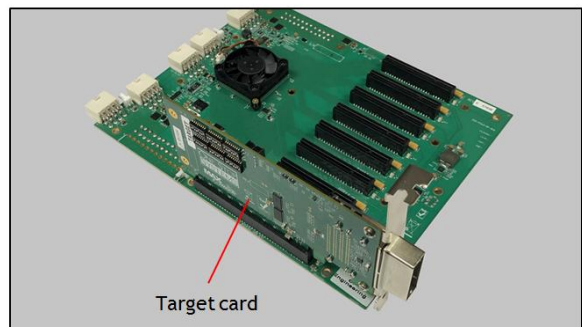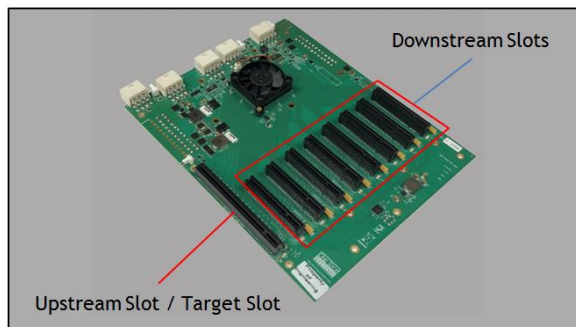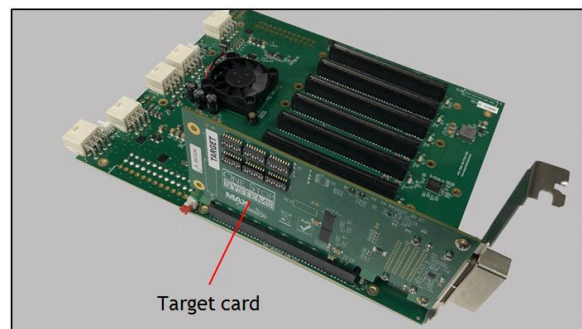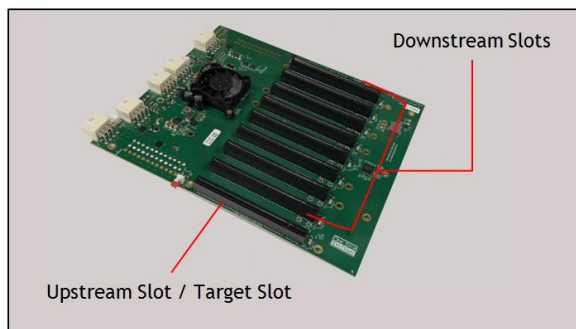
Target card

2.5   Install PCIe card

Plug-in your 3rd party PCIe card in the expansion backplane. Use the downstream slot of the OSS backplane. See photos below.
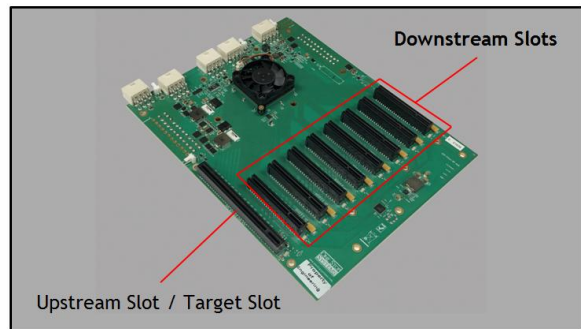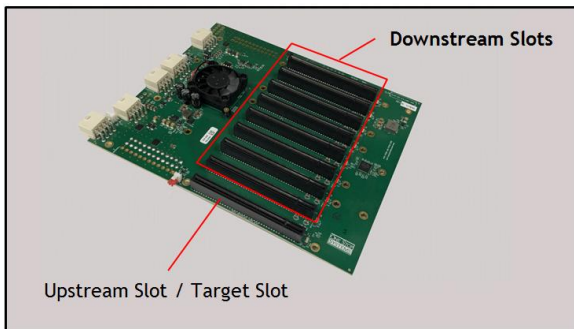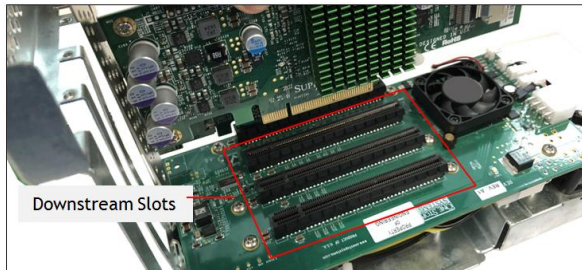
2.6   Install link cable

- Connect the PCIe iPass x8 cable between the host and target cards. Plug in the cable to the host card.
- Plug in the other end of the cable to the target card. Make sure the cable is firmly latched in to the cable connectors of the card.
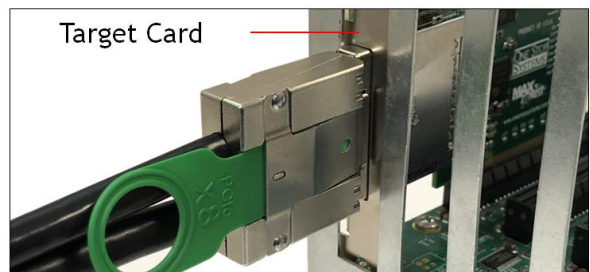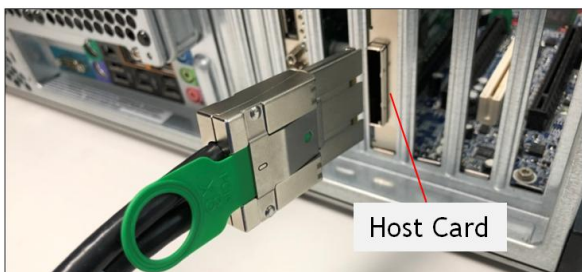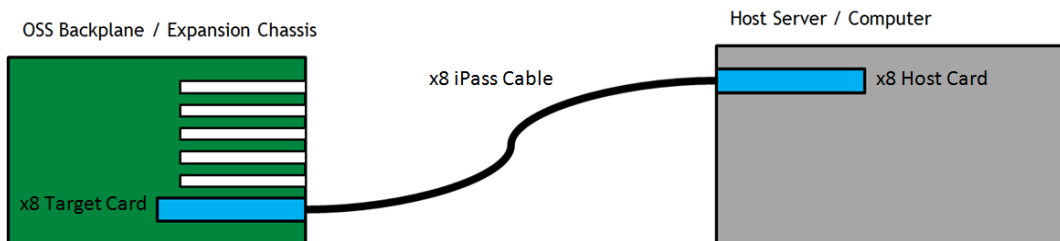

Photo below is a block diagram of an OSS expansion unit linked to a host server / computer.

2.7   Connect ATX Power Supply

Note   If you are using an expansion chassis, the power supply is already part of the unit. You can skip this step.

If you are using an expansion backplane, plug-in the ATX power supply cable into the 24pin ATX power connector on the OSS board
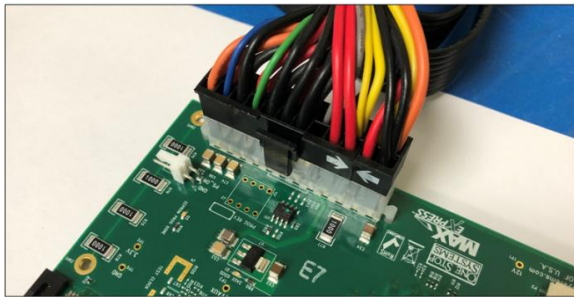
Connect power to the PSU and turn the switch to ON position.

2.8   Power ON the system

- Turn On the main power of the host computer.
- Start the computer by pushing the power button.
- Upon powering ON the Host system, it will send a sideband signal to the Target card triggering the target expansion system to turn ON.

Note   If the expansion unit or the HIB card are not powering ON, check the link cable make sure it is firmly connected. The target and host card must be fully seated in the PCIe slot in order to work correctly.

3   Verify Hardware

A operational host and target cards will have the following LEDs on the board illuminated.

1. PWR LED
2. x4 CBL and EDGE LEDs
3. x8 CBL and EDGE LEDs
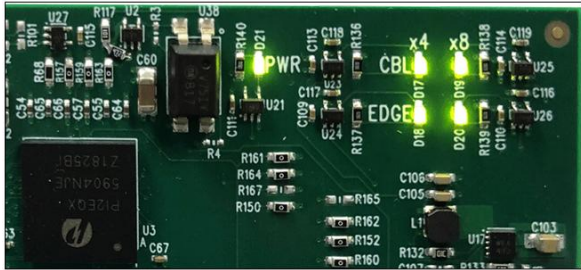
3.1   LED Definition

PWR – Board has power
CBL – Signal detect on cable*
EDGE – Signal detect on card edge*

*Signal detect does not mean it has a link, but rather it identifies there is a signal on the card edge. If the link does not appear to be stable, it could mean that there is a compliance pattern being generated by the PCIe device interfacing with this card.

If the board is operating on x4 mode, x4 CBL and EDGE are illuminated. This is indicative of a x4 slot PCIe slot (electrical) where the host or target card is installed.
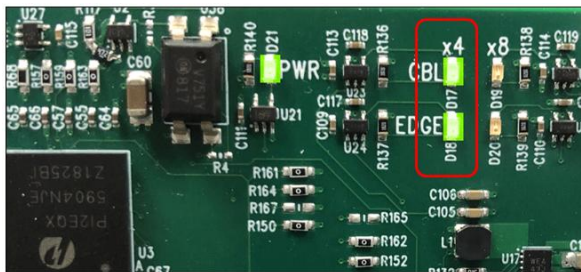
3.2 LED Configuration Explanation

D17	D19	D18	D20	Indication
0	0	0	0	No valid signal from root or endpoint
0	0	0	1	NA
0	0	1	0	Root is sending valid training signals on either lane 0 only (x1) or lanes 0-3 (x4) to the target; no valid signal coming from endpoint.
0	0	1	1	Root is x8 and is sending valid training signals on lanes 0-7 to the root; no valid signal coming from endpoint.
0	1	0	0	NA
0	1	0	1	NA
0	1	1	0	NA
0	1	1	1	NA
1	0	0	0	Endpoint is sending valid training signals on either lane 0 only (x1) or lanes 0-3 (x4) to the root; no valid signal coming from root.
1	0	0	1	NA
1	0	1	0	Valid signal levels from both root and endpoint on either lane 0 only (x1) or lanes 0-3 (x4)
1	0	1	1	Endpoint is sending valid signals on either lane 0 only (x1) or lanes 0-3 (x4) to the root, but root is sending valid signals on lanes 0-7 (x8) (root and endpoint can't agree on lane width)
1	1	0	0	NA
1	1	0	1	NA
1	1	1	0	Root is sending valid signals on either lane 0 only (x1) or lanes 0-3 (x4) to the endpoint, but endpoint is sending valid signals on lanes 0-7 (x8) (root and endpoint can't agree on lane width)
1	1	1	1	Valid signal levels from both root and endpoint on lanes 0-7 (x8)

4   Software Installation

No software or driver is required for the Host Adapter card.

5   How to Get More Help

You can visit the Technical Support FAQ pages on the Internet at https://www.onestopsystems.com/support

5.1   Contacting Technical Support

Our support department can be reached by phone at 1 (760) 745-9883. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting Technical Support make sure to include the following information:

1. Exact and correct serial #
2. Service Ticket or Case # (if you already submitted an online request)
3. Computer Type & Model: Operating System
4. Make & Model of PCI/PCIe cards: Application
5. Problem description

When submitting an online technical support request always provide a valid working e-mail address, phone number, shipping address and proper contact name. Check your e-mail for an automated response containing the case # and updates. You can also visit our web site at: https://www.onestopsystems.com/support for a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

Shipping or Transporting of Expansion Unit with PCI / PCIe cards
Any PCIe cards in **should be removed** (or not to be installed) prior to shipment to avoid or prevent possible damage. Note: Expansion board and PCIe / PCI cards that arrive damaged in shipment will not be covered under warranty.

5.2   Returning Merchandise

If factory service is required, a Service Representative will give you a Return Merchandise Authorization (RMA) number. Put this number and your return address on the shipping label when you return the item(s) for service. Please note that One Stop Systems WILL NOT accept COD packages, so be sure to return the product freight and duties-paid. Ship the well-packaged product to the address below:

> Attention:RMA # _____, One Stop Systems
> 2235 Enterprise Street, #110
> Escondido, CA 92029
> USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your product. However, if you return a product for warranty repair/ replacement or take advantage of the 30-day money back guarantee, you will need to package the product in a manner similar to the manner in which it was received from our plant. We cannot be responsible for any physical damage to the product or component pieces of the product (such as the host or expansion interfaces for the expansion chassis) that are damaged due to inadequate packing. Physical damage sustained in such a situation will be repaired at the owner's expense in accordance with Out of Warranty Procedures. Please, protect your investment, a bit more padding in a good box will go a long way to insuring the device is returned to use in the same condition you shipped it in. Please call for an RMA number first.

5.3   Online Support Resources

As a product user and customer, listed below are our Online Support Resources

https://www.onestopsystems.com/support provides Knowledgebase Articles such as troubleshooting methods, compatibility, FAQ, documentation, and product technical information.

If you need technical support, product assistance or have a technical inquiry we encourage you to submit it on-line using our Technical Support Form. If you need to send a unit for repair or diagnostic evaluation, fill out our RMA (Return Material Authorization) online request form.
- https://www.onestopsystems.com/support

2235 Enterprise Street, Suite#110, Escondido CA 92029

Toll-Free : +1(800)285-8900 US • Main: +1 (760) 745-9883 • Fax: +1 (760) 745-9824

www.onestopsystems.com