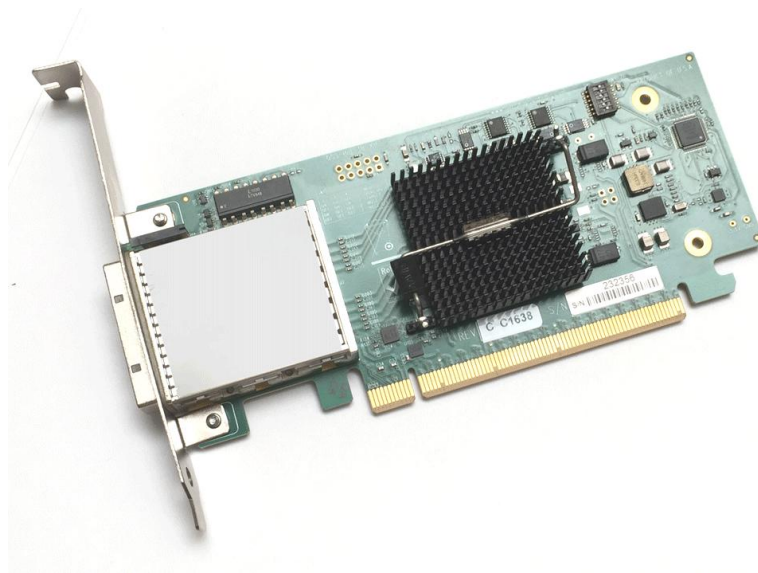




PCIe x16 Gen3 iPass Cable Adapter

Model: OSS-PCIe-HIB38-x16



PCIe x16 Gen3 iPass Cable Adapter

SKU: OSS-PCIe-HIB38-x16



OSS
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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 x16 Gen 3 switch-based 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 x16 Gen 3 adapter extends the PCIe bus at 120Gb/s with extremely low latency because there is no conversion software.

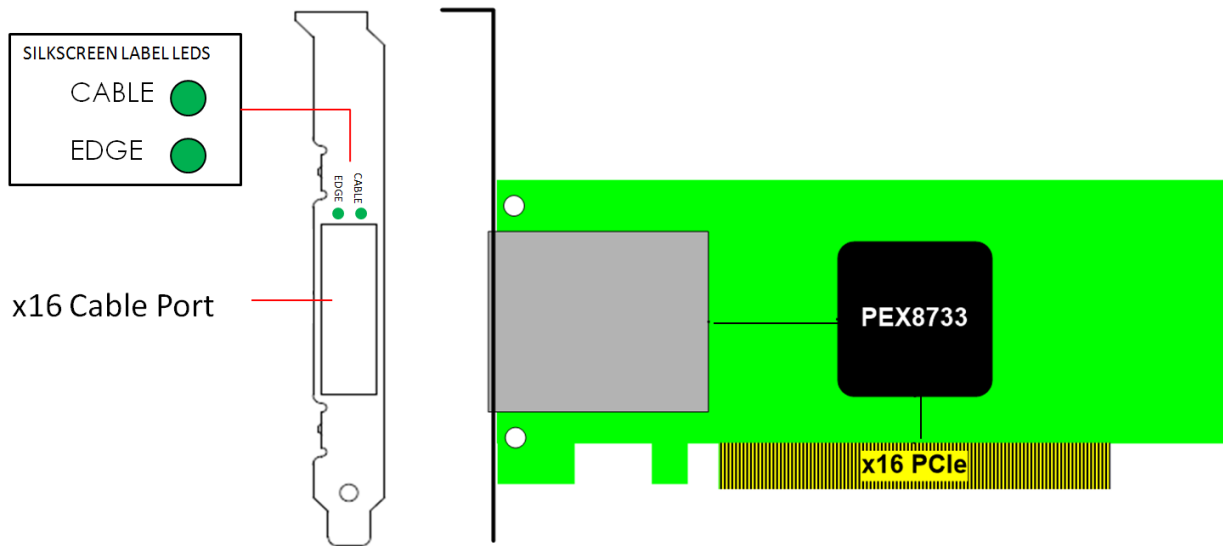
Part numbers:

- OSS-PCIe-HIB38-x16-H (Host Adapter)
 - OSS-PCIe-HIB38-x16-H-F (Host Adapter, Full Height bracket)
 - OSS-PCIe-HIB38-x16-H-H (Host Adapter, Half Height bracket)
- OSS-PCIe-HIB38-x16-T (Target Adapter)
 - OSS-PCIe-HIB38-x16-T-F (Target Adapter, Full Height)
 - OSS-PCIe-HIB38-x16-T-H (Target Adapter, Half Height)

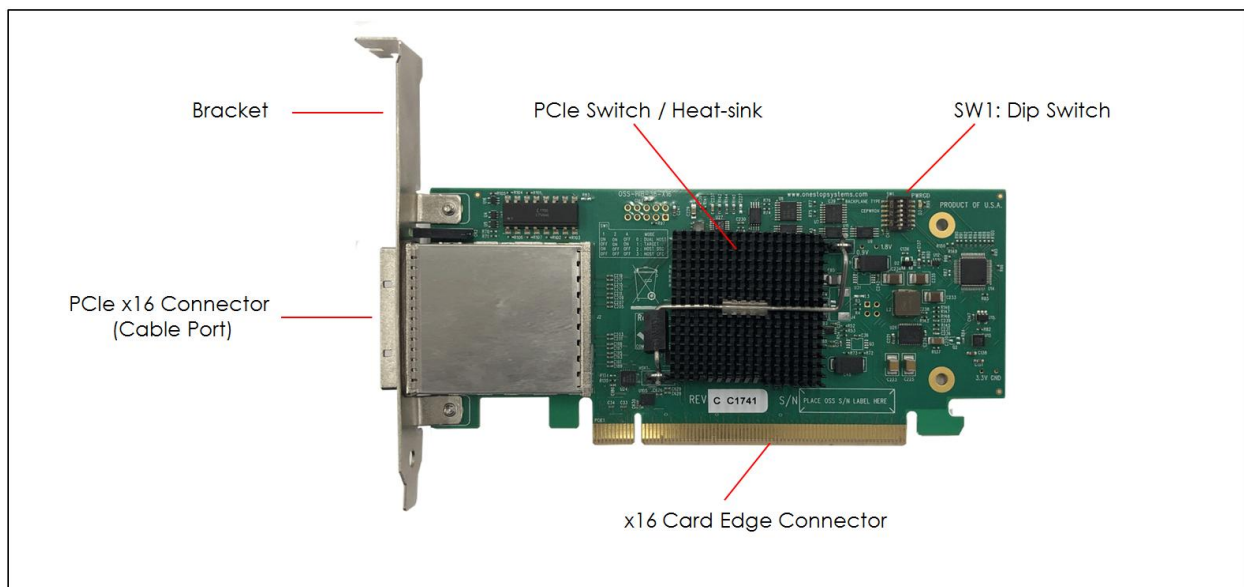
1.1 Specifications

Item	Description
Form Factor	PCIe x16 half-height, half-length
Dimensions	5.85 x 2.34" (14.85 x 5.94 cm) Weight: 2 lb
Bandwidth / Backplane Interface	PCIe x16 Gen3
Power Consumption	15 W
Connector	PCIe x16 Cable connector PCIe x16 Edge connector
PCIe Switch	PLX PEX8733 8.0 GTs 32-Lane PCIe Gen 3 Switch DMA Controller SSC Isolation
Bracket	Standard and low profile brackets available Two LEDs on bracket: Upstream link status and Downstream link status
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
PCB	<ul style="list-style-type: none"> • PCI Express add-in card standard • PCIe x16 cable • PCB thickness .063 +/-0.008 inch (1.6 +/- 0.2mm) • Mounting holes for face plate
Industry Specifications	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • FCC Class A • CE • RoHS
Operating System	Windows 10, Windows Server 2012 R2; Linux OS based

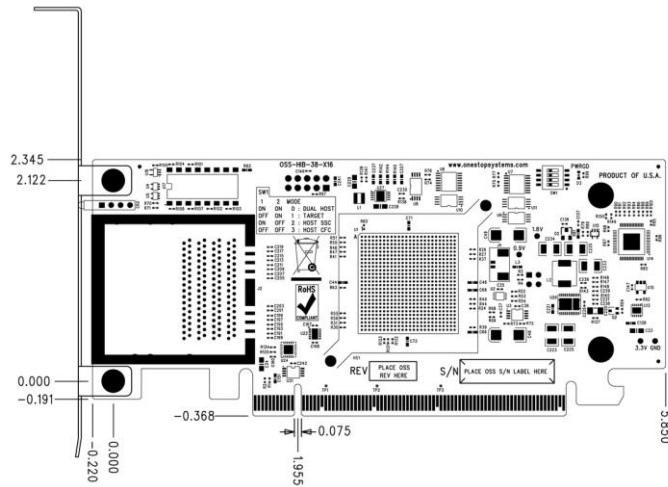
1.2 Block Diagram



1.3 Overview



1.4 Dimension



1.5 LEDs

- Green is power on and CPLD programmed. If either power LED is off, a power supply has failed or the CPLD has not been programmed.
- One green link status LED per PCIe interface (Lane_good 0 and 8 from PEX8733)
- Link status indicators located at the bracket show the basic status of the two possible links. It does not indicate the width of the link (eg: x16, x8, x4, etc), but the link speed and status is shown as follows:

PCIe Link Status	LED Pattern
No Link	Off
Link is up at Gen1	Slow blink
Link is up at Gen2	Fast blink
Link is up at Gen 3 speed	On (solid)

1.6 PCIe PLX PEX8733 Switch

32-Lane PCIe Gen 3 Multi-Root switch with DMA and downward compatibility

1.7 Power

- Power is provided by the PCI-e card slot.
- Power required by internal components of **OSS-PCIe-HIB-38-x16** is estimated to be 15 watts when both ports are fully linked and operating in Gen3 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 supplied to the PCIe cable interface is limited to 0.75A @ 3.3V per the PCIe cable specification

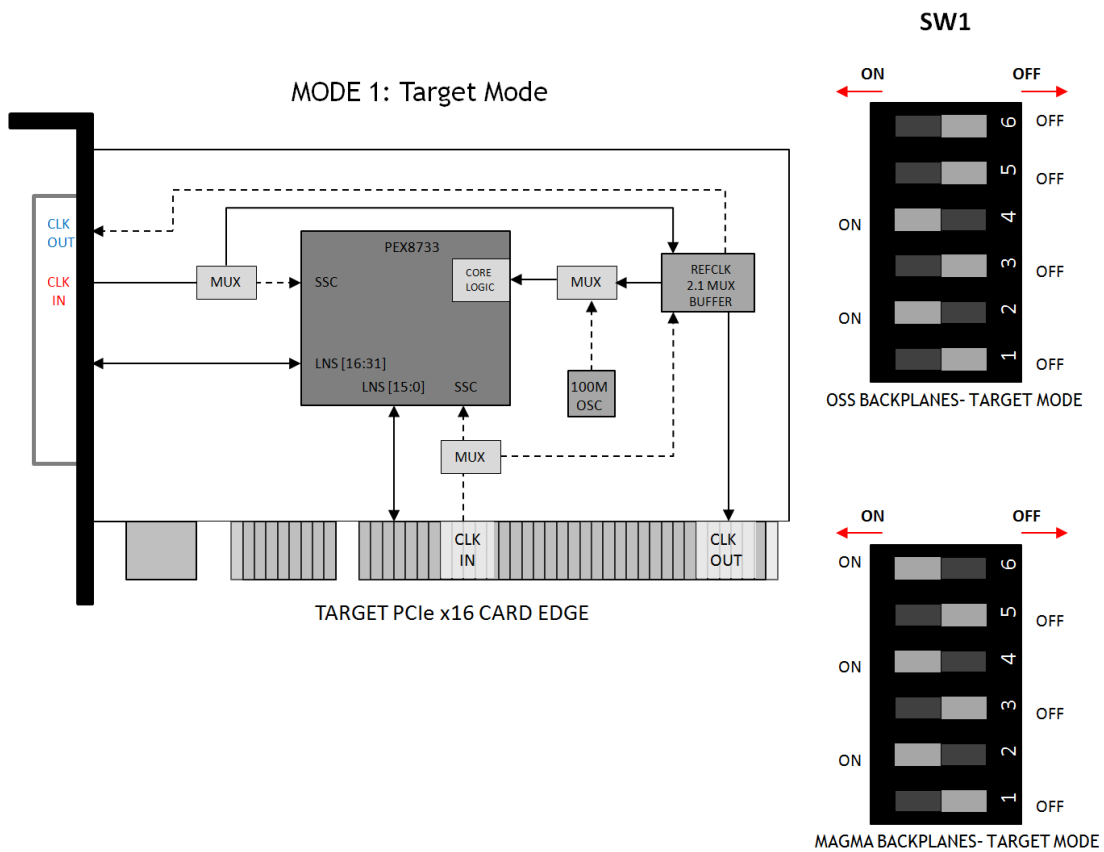
1.8 PCIe Cable Sideband signals

- 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.

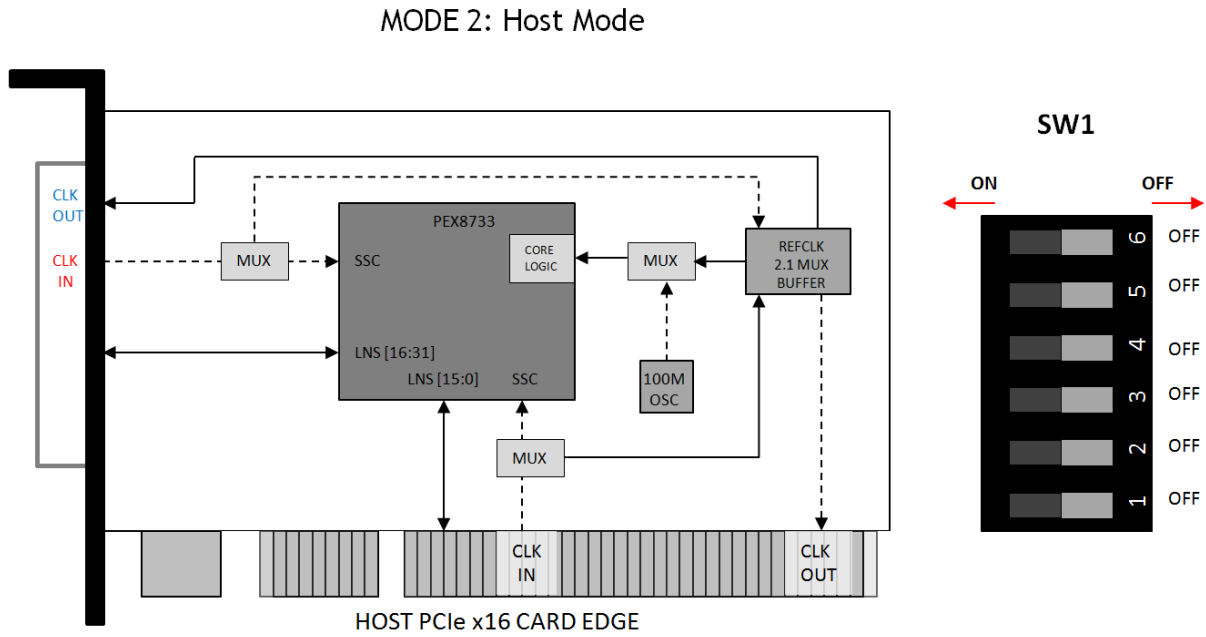
1.9 Block Diagrams (Use Cases)

Block diagrams for all operating modes.

1. Mode 1: Target Mode: In this mode, the PCI-e cable is attached to an upstream host system, and the card edge supports a downstream target device. Note that the PEX8733's upstream port is set to 8 by the mode 1 eeprom. The upstream system provides a copy of its SSC, and the on-board buffer provides a copy to the downstream target as well as the PEX8733's core logic.



- Mode 2: Host Mode. In this mode, the PCI-e cable is connected to a downstream (target) or the cable port of a Mode 0 OSS-PCIe-HIB-38-x16, while the card edge interface is installed in an upstream host system. The host system's SSC is used to provide the PEX8733 core logic clock as well as the cable's reference clock.



This document employs the following abbreviations:

- HIB - Host Interface Board
- PCIe - PCI Express
- SSC - Spread Spectrum Clock
- CFC – Constant Frequency Clock
- n/c - not connected
- NT – Non-Transparent

1.10 Pin Assignments

Connectors Gen3 PCIe x16 Card Edge Connector

- The pins are numbered as shown with side A on the top of the centerline on the solder side of the board and side B on the bottom of the centerline on the component side of the board.
- The PCIe interface pins PETpx, PETnx, PERpx, and PERnx are named with the following convention: “PE” stands for PCIe high speed, “T” for Transmitter, “R” for Receiver, “p” for positive (+), and “n” for negative (-).
- Note that adjacent differential pairs are separated by two ground pins to manage the connector crosstalk

1.11 Pin-out for the Gen3 PCIe x16 Card Edge Connector

PIN#	SIDE B		SIDE A	
	Name	Description	Name	Description
1	N/C	Not Connected	PRSNT1#	Hot-Plug presence detect
2	N/C	Not Connected	N/C	Not Connected
3	N/C	Not Connected	N/C	Not Connected
4	GND	Ground	GND	Ground
5	N/C	Not Connected	N/C	Not Connected
6	N/C	Not Connected	JTAG3	TDI (Test Data Input)
7	GND	Ground	JTAG4	TDO (Test Data Output)
8	+3.3V	3.3V power	N/C	Not Connected
9	N/C	Not Connected	N/C	Not Connected
10	3.3Vaux	3.3V auxiliary power	+3.3V	3.3V power
11	N/C	Not Connected	PERST#	Fundamental Reset
MECHANICAL KEY				
12	RSVD	Reserved	GND	Ground
13	GND	Ground	REFCLK+	Reference Clock (Differential Pair)
14	PETp0	Transmitter differential pair, Lane 0	REFCLK	
15	PETn0		GND	Ground
16	GND	Ground	PERp0	Receiver Differential Pair, Lane 0
17	PRSNT2#	Hot-Plug presence detect	PERn0	
18	GND	Ground	GND	Ground
19	PETp1	Transmitter differential pair, Lane 1	RSVD	Reserved
20	PETn1		GND	Ground
21	GND	Ground	PERp1	Receiver Differential Pair, Lane 1
22	GND	Ground	PERn1	
23	PETp2	Transmitter differential pair, Lane 2	GND	Ground
24	PETn2		GND	Ground
25	GND	Ground	PERp2	Receiver Differential Pair, Lane 2
26	GND	Ground	PERn2	
27	PETp3	Transmitter differential pair, Lane 3	GND	Ground
28	PETn3		GND	Ground
29	GND	Ground	PERp3	Receiver Differential Pair, Lane 3
30	RSVD	Reserved	PERn3	
31	PRSNT2#	Hot-Plug presence detect	GND	Ground
32	GND	Ground	RSVD	Reserved

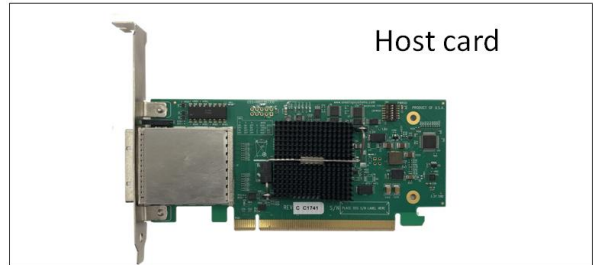
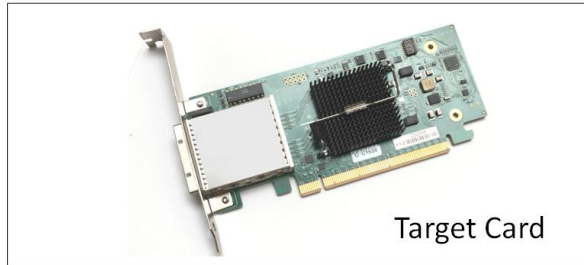
Signal Descriptions

PETp(x)	PCI Express Transmit Positive signal of (x) pair
PETn(x)	PCI Express Transmit Negative signal of (x) pair
PERp(x)	PCI Express Receive Positive signal of (x) pair
PERn(x)	PCI Express Receive Negative signal of (x) pair
CREFLCK+/-	Cable Reference Clock: Provides a reference clock from the host systems to the remote systems
SB_RTN	Side Band ReTurn: return path for single ended signals from remote systems
CPRSNT#	Cable PreSent: Indicates the presence of a device beyond the cable
PWR	PoWer: Provides local power for in-cable redriver circuits. Only needed on long cables. Power does not go across the cable
PWR_RTN	PoWer ReTurn: Provides local power return path for PWR pins.
CWAKE#	Cable Wake
CPERST#	Cable PCI Express Reset

2 Hardware & Software Requirements

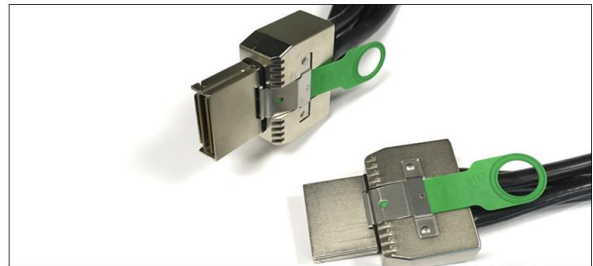
2.1 Hardware

1. **OSS-370, QTY 2:** The HIB card works in pair, one Host card and one Target card.



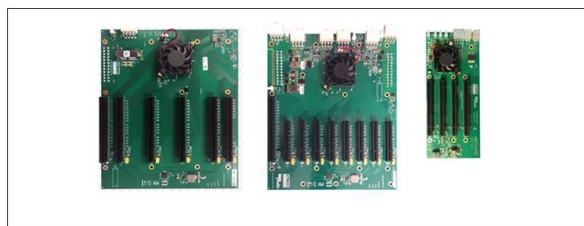
2. **One x16 iPass cable**

Use x16 iPass cable for connecting host card and target card



3. **OSS Expansion chassis or OSS expansion board / backplane x16 Gen 3**

You need an expansion chassis with Gen3 backplane . Photos below are example of Gen3 OSS backplanes and an expansion unit. The HIB card has custom pinout unique to OSS and only OSS Target adapters will work in the upstream slot of our expansion backplanes.



OR



4. **Host computer / workstation**

Use a motherboard that has a Gen3 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.

5. **ATX Power Supply and Power Cord(s)**

2.2 Software

- OSS-370 boar card requires no driver or software on Windows based OS and Linux.

2.3 Tools Required for Installation

To complete the installation of the OSS product you will need a Phillips-head screwdriver and ESD wrist strap to prevent electrostatic discharge.



3 Installation Procedures

Host adapter (aka: HIB - Host Interface Board)

The host adapter (aka: Host Interface card) is installed into the host computer’s PCIe x16 slot. The host cable adapter (Part # OSS-PCIe-HIB38-x16-H) allows communication between a processor and an I/O point.

Target adapter (aka: Target Card, Expansion Interface Card)

The target card(Part# OSS-PCIe-HIB38-x16-T) fits into an OSS custom slot backplane and extends the PCIe bus to a single add-in board via a PCIe x16 cable. The “Target Card” can only be installed in a designated “Upstream slot” on OSS expansion backplane.

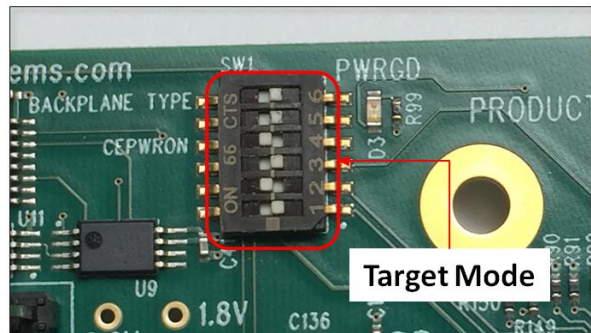
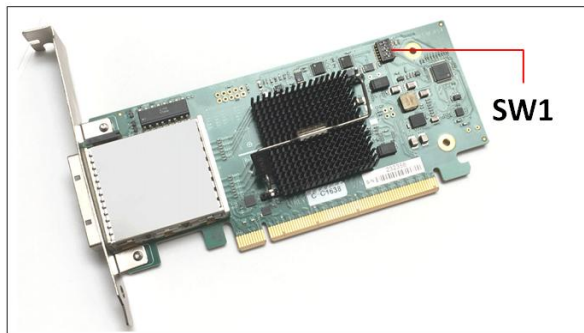
The following steps will guide you through the installation of your OSS-370 Host and Target cards

3.1 Configure Dipswitches

Prior to using the HIB card, it needs to set the Dipswitch to appropriate operating mode. There are two standard modes, Host mode and Target mode.

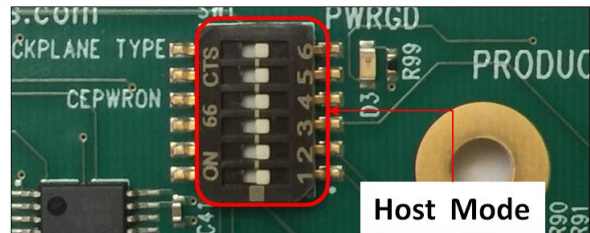
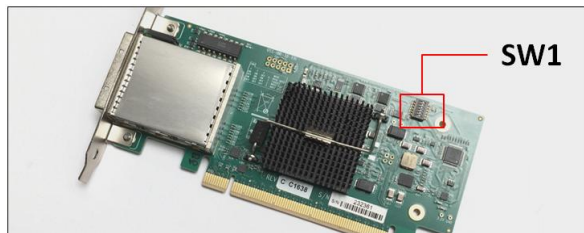
3.1.2 Set 1st HIB to Target Mode

Configure HIB to Target mode by the dipswitches to their corresponding setting, see photo below



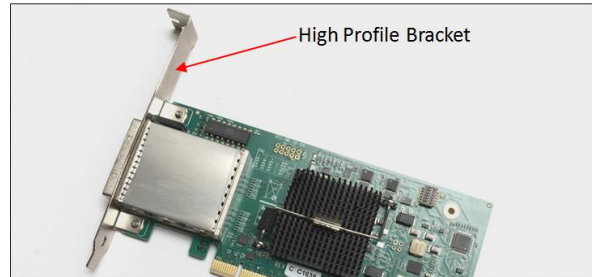
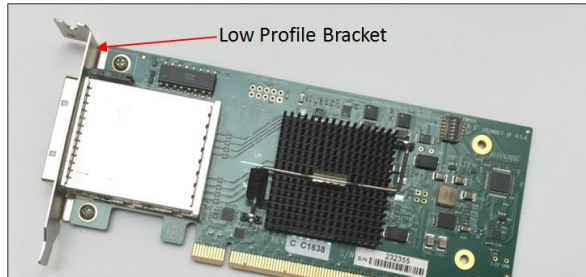
3.1.3 Set 2nd HIB to Host Mode

Configure the 2nd HIB card to Host mode, see dipswitches settings below.

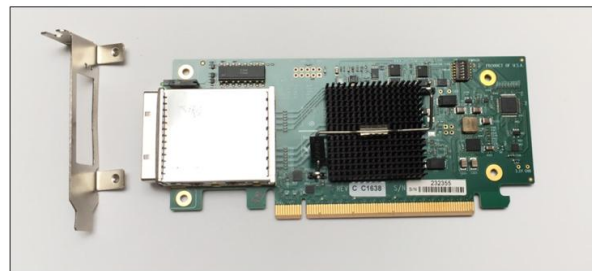


3.2 Install HIB Host card

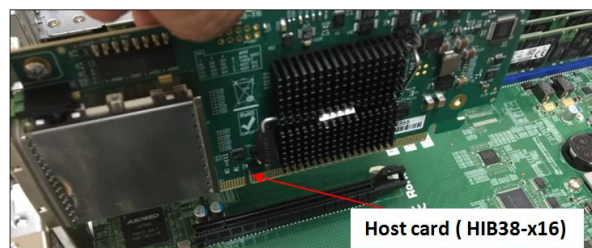
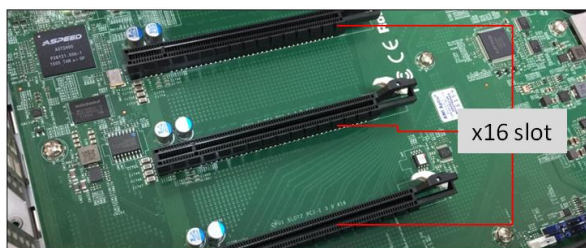
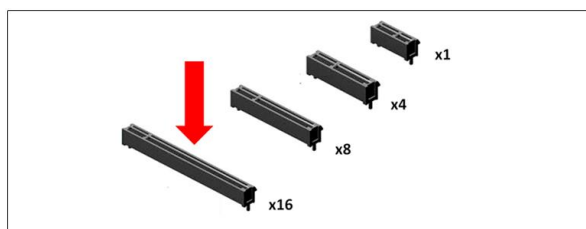
Install the Host Interface card. Begin the installation by first powering down your computer. Remove the power cord. 5VSB (5V Standby) is still available, if the power cord is still installed. Use the procedures for shutting down your operating system and shutting off power to your computer provided in your owner’s manual or system documentation. The PCIe host card is a “half-height,” x16-capable PCIe card mounted to a “full-height” bracket as shown below.

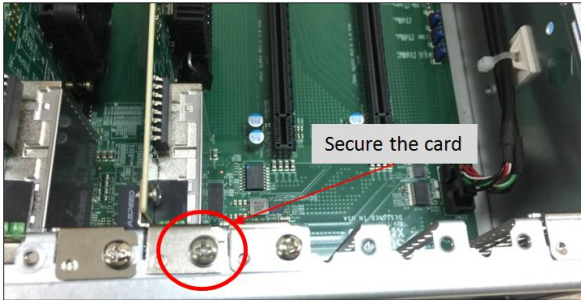


For low profile case applications, change the mounting bracket to the low profile bracket. You can order a low profile bracket by contacting our Sales Support. Replacing the “High Profile Bracket” with “Low Profile Bracket” is done by removing the screws that hold the card to the bracket. Detach the standard bracket from the card, and place the low profile bracket and secure it. Use proper ESD procedures when completing this action.



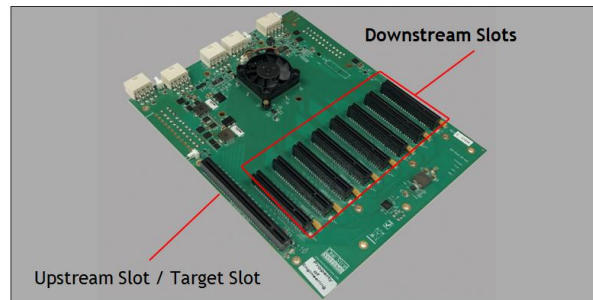
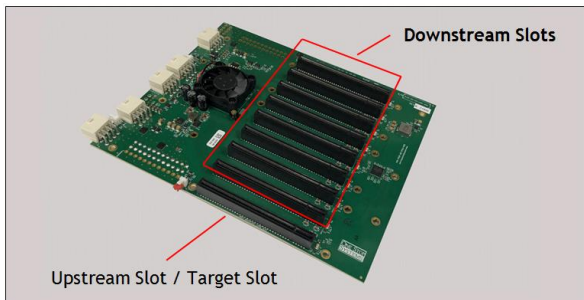
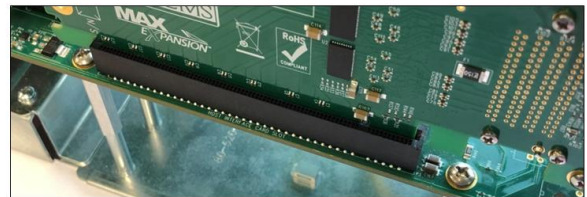
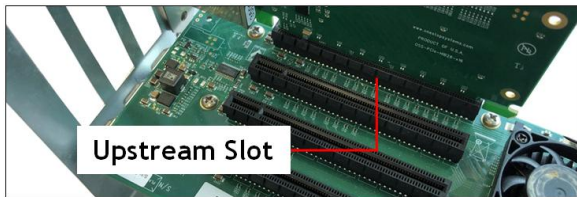
Install the host card in the computer. Plug in the host card in the x16 Gen3 PCIe slot. Secure the card.





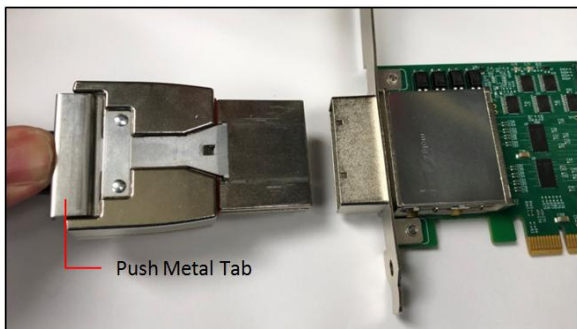
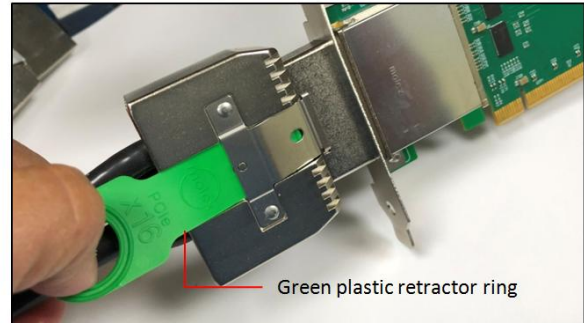
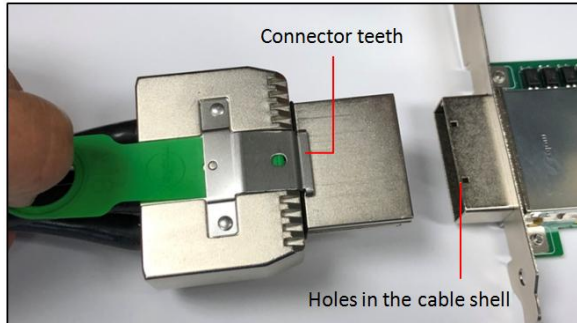
3.3 Install HIB Target card

Install the Target card in OSS expansion backplane. Plug-in the target card in the designated Upstream slot of the backplane. The HIB Target card will only work in the OSS backplane designated Upstream slot. Below photos are example of Gen3 OSS expansion backplanes showing where the location of the Upstream slot.

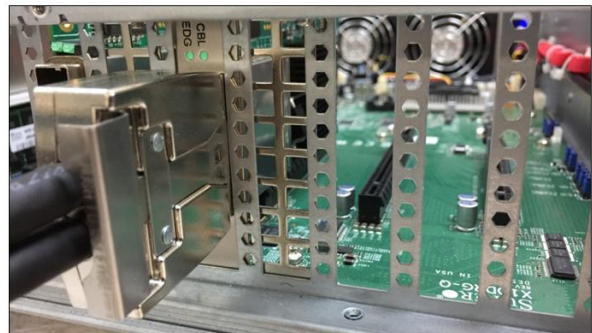
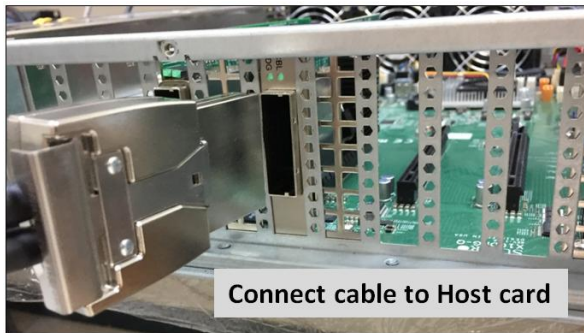


3.4 Connect the x16 iPass Cable

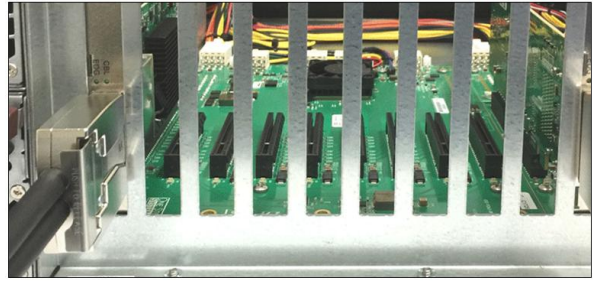
Use a x16-to-x16 iPass cable. Attach the cable by pulling back on the retractor ring or by pressing / pushing the metal tab. Make sure to align the keyed slot with the connector key ridge on the slot cover. Insert the cable connector into the connector shell on the board until the connector teeth snap securely into the holes in the cable shell. See photos below.



Connect cable to Host adapter card, which is installed in the computer.



Connect the other end of the cable to the Target card, which is installed in the OSS expansion chassis, see photos below



3.4.1 Disconnecting the cable

To remove the cable, pull down the green plastic tab or push the metal tab and slowly pull the cable out

4 Software Installation

Install the appropriate software / driver for the M.2 device. OSS does not provide the driver / software for the M.2 device. This can be obtained or downloaded from the manufacturer's website.

When done installing the driver, reboot the host computer.

5 Verify Hardware

After the system is powered up, check the LINK LEDs on both Host and Target cards. Make sure you have a solid green LEDs on CBL and EDG. If only one LED is lit, this is an indication that you are not getting a good link between host and expansion unit. If this occurs, the host computer will not be detecting or recognizing your PCIe cards in the expansion unit.

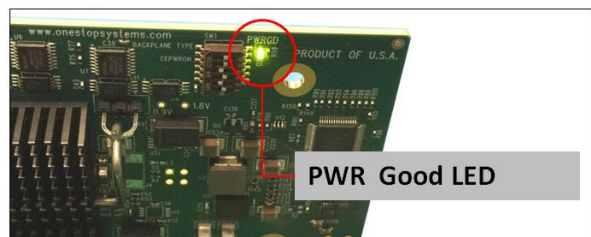


5.1 Bracket LED Status indicators

- Off - Link is down; no PCIe card installed
- Slow blink - Link is up at Gen1 (1Hz)
- Fast blink - Link is up at Gen2 (2Hz)
- On (solid) - Link is up at Gen 3 speed

Multiple LEDs and Dip switches make debugging and troubleshooting easy. Visible CBL and EDG LEDs show PCIe link STATUS that each PCIe Interface card is operating properly. Other LED for "Power Good -PWRGD" is useful visual indicator for troubleshooting and verifying the connections. A Gen3 LINK between host and targets card will show two Solid Green LEDs on the back of the card (CBL and EDG).

1. **CBL LED** shows the link status between the host card in the host computer and the target card in the expansion chassis.
2. **EDGE LED shows:**
 - a. HOST card – connection between host card and host system.
 - b. TARGET card – connection between the switch on the target card and the switch in the expansion chassis
2. **PWRGD LED** shows electrical power is present



6 Troubleshooting

Computer fails to boot or the bracket LEDs are not coming ON do the following

1. Check the Dipswitch settings on each card. Make sure the Target card is set to target mode and Host card is set to host mode.
2. Reseat the Host card and Target card
3. Reseat x16 iPass cable

If you are still having problem, do the following

1. Try another expansion chassis or backplane
2. Replace the cable
3. Replace the Host card
4. Replace the target card
5. Contact OSS Customer / Technical Support. You may need to send the boards or expansion chassis for service.

7 How to Get More Help

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

7.1 Contacting Technical Support

Our support department can be reached by phone at [1 \(760\) 745-9883](tel:17607459883). 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.

7.2 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.

7.3 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