



4U Value Gen4 5-Slot

5 PCIe (4.0 x16) Slot Expansion System



4U Value 5-Slot Chassis Gen4 User Manual

SKU: OSS-PCIE-4UV-5-1



OSS
ONE STOP SYSTEMS

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Table of Contents

Preface	6
Advisories	6
Safety Instructions.....	7
Protecting Against Electrostatic Discharge	8
1 Introduction	9
1.1 General Specifications	9
1.2 Features.....	10
1.3 Block Diagram.....	10
1.3.1 Enclosure.....	10
1.3.2 Backplane.....	10
1.3.3 Host and backplane.....	11
1.4 Supported Configuration	11
1.4.1 Model 1	11
1.4.2 Model 2	12
1.5 PCIe Card / GPU Configuration.....	13
1.6 Main Components	15
1.7 Parts Overview.....	15
1.8 Pre-Installation Information	17
1.9 Tools Required for Installation.....	17
1.10 Items List	17
2 Hardware Set-up / Installation	18
2.1 Installation-Procedures Overview.....	18
2.2 Before you Begin	19
2.3 Remove Top Cover.....	19
2.4 Install Target Card.....	20
2.5 Install Host Card.....	20
2.5.1 Host Card Configuration	20
2.5.2 Target Card Configuration	21
2.6 Connect Link Cables	23
2.6.1 x16 Configuration: FOUR cables	23
2.6.2 x8 Configuration: TWO cables	24
2.6.3 x4 Configuration: ONE cable.....	25
2.6.4 Disconnecting the cable	26
3 Applying Power Correctly	27
3.1 Connect Power Cord.....	27
3.2 Connecting to electrical outlet.....	28
3.3 Power ON the Host Computer	28

3.4	Power ON the Expansion Unit	29
4	Hardware Check.....	30
4.1	Verify LINK	30
4.2	LED Indicators per Configuration	30
4.2.1	x16 Configuration LEDs.....	30
4.2.2	x8 Configuration LEDs (Two Cables)	31
4.2.3	x4 Configuration LEDs (One Cable).....	33
4.3	Re-install Top Cover	35
4.4	Front LEDs Status Indicator.....	35
4.5	Power Supply LED Indicator	35
5	Software Installation.....	36
6	Verify HIB Device	37
6.1	Linux OS	37
6.2	Windows 10 / Server	41
7	Verify Expansion Backplane	43
7.1	Linux	43
7.1.1	Check and Verify PCIe cards	45
7.2	Windows.....	47
7.2.1	Check PCIe cards on Windows.....	49
8	PCIe card Installation	52
8.1	Power Down System.....	52
8.2	Open PCIe Expansion Chassis.....	52
8.3	Installation of GPU.....	53
8.3.1	Before you begin	53
8.3.2	Install GPU cards	54
8.3.3	Connect Aux Power Cable	56
8.3.4	Auxiliary Cable Management	56
8.4	Re-install top cover	57
8.5	System Power UP.....	57
9	PCIe HW Verification	58
9.1	Verify PCIe Hardware.....	58
9.1.1	Target SLOT LINK LED	58
9.1.2	Slot LINK LEDs and AUX LED	58
9.1.3	Slot LED Status indicators	58
9.2	Check PCIe cards on Windows OS (i.e. Server)	59
9.3	Check PCIe cards on Linux OS	59
9.4	Check PCIe cards on Mac OS.....	59
10	General & Other Technical Information.....	60
10.1	Board LEDs	60

10.2	PCIe Slot Type.....	61
10.3	Force Power ON	61
10.4	Power Cords	62
10.4.1	Specifications	62
10.4.2	Power cord socket and voltage tables world standards	62
10.5	Power Supply.....	63
10.5.1	Removing a hot-swap ac power supply	63
10.5.2	Specifications	64
10.5.3	LED Indicator	65
10.6	Fan.....	66
10.6.1	Fan Specifications.....	66
10.7	Auxiliary power cables.....	67
10.7.1	Aux power cable installation	68
10.7.2	Pin Outs	69
10.7.3	Using the Auxiliary Power Cable.....	71
10.8	Expansion System Power Consumption	73
10.8.1	Power consumption breakdown per hardware.....	73
11	Fan Controller	74
11.1	Specifications	75
12	Troubleshooting.....	76
12.1	Locating the Problem	76
12.2	My Computer Cannot Find the PCIe Expansion System.....	76
12.3	My Computer Hangs During Power Up	76
12.4	My PCIe Card Doesn't Work	77
12.5	Support for 3PrdP Party PCIe Cards.....	77
12.6	System board fails to power UP	79
12.7	PCIe Upstream and Downstream Ports are not detected.....	79
12.8	Expansion System fails to turn ON	80
13	Rackslide Installation	81
14	Enclosure Dimensions	83
15	Rackslide Mounting Position	84
16	Frequently Asked Questions (FAQ).....	85
17	Contacting Technical Support	87
18	Third Party Hardware and Software Support Policy.....	87
19	Returning Merchandise to One Stop Systems	88
20	Shipping / transporting the unit	88
21	APPENDIX A Compliance.....	89
	FCC	89
	CE	89

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, One Stop Systems 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 One Stop Systems 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.



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

Before taking covers off a computer, perform the following steps:

Turn off the computer and any peripheral devices.

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. One Stop Systems strongly encourages 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

1.1 General Specifications

This 5-slot rackmount expansion platform provides PCIe expansion at a value price. The 4UV supports ONE PCIe 4.0 x16 host connection to 5 PCIe 4.0 x16 slots from 1m to 2m away from the host server. The system supports 5 full-length PCIe add-in cards (AICs) such as GPU card, NVME flash and industrial I/O. Two fan choices allow for high-power add-in card cooling up to 100W per AIC or a set-and-forget manual speed control using PWM fans when lower power AICs operation are required. Two 2000W power supplies provide redundant hot-swap system power.

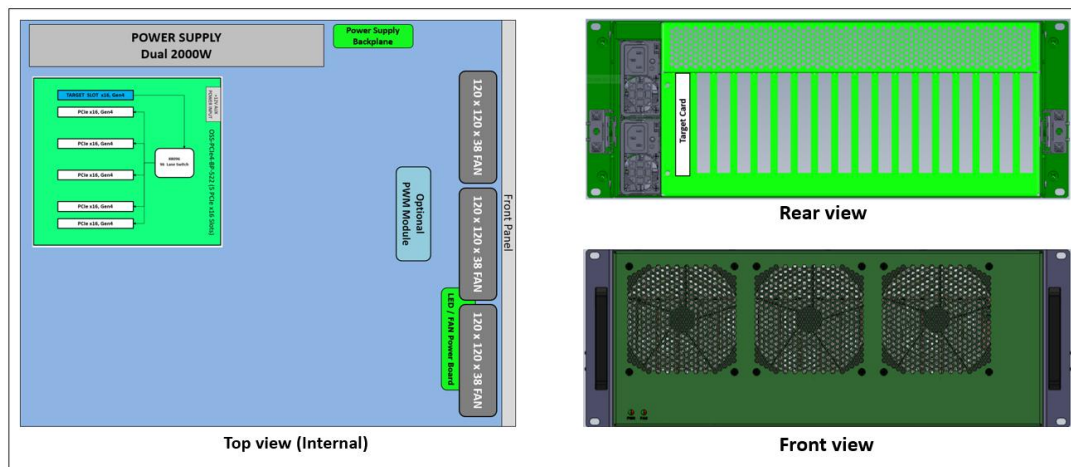
Item	Description
Host Card:	The system includes two PCIe 4.0x16 adapter cards: One host card & target card for connecting the accelerator to any server. HIB616-x16 Host/Target Interface cards PCIe Switch 88032 Half Height, half length, single slot x16 PCIe add-in card form factor PCIe4 x16 physical card edge connector (256Gb/s)
Backplane:	Two OSS-PCIe4-BP-5X16 (522 board) - PCIe switch 88096 - PCIe 3 5-slot expansion backplane The 5-slot integrated system includes: - One HIB616x16 PCIe card - Four (4) PCIe4 x16 double-width slots and One x16 single-width slot
Enclosure:	-Supports up to 5 full-height, full-length PCIe slots plus 1 cable interface - Supports extended height cards and top GPU power cables. - Black medium texture liquid paint finish with optional OEM logo area. - Power and Fan status bi-color LED panel - Tool-less rack slides included
Dimensions:	19" W x 7" H x 17.7" D
Weight:	30.0 lbs without the baseboards (522) or add-in cards
PCI Express Bus Spec.	Revision 4.0
Interconnect Bandwidth:	256Gb/s
Cooling:	Three 120mm x 38mm fans mounted to the front bezel of the chassis Two standard fan options available: High-Capacity Fans: - 250CFM fixed-speed fans - Fan monitoring via front panel LED Variable Speed PWM Fans (optional): - 250CFM PWM controlled fans - Set and forget PWM speed control module internal to the enclosure
Power Supply:	Dual load-sharing power supplies pluggable from the rear of the chassis: - Two 2000W 80Plus Titanium efficiency power supplies - Two integrated 90-264VAC, AC inputs (one in each supply) 100-140VAC at 1000W 200-240VAC at 2000W - Power supplies can provide up to 4000W non-redundant total power to the system - Supplies are redundant hot-swap when system power requirements are under 2000W total Aux Power: - An array of 8 EPS12V AUX power connectors available for high-power cards
MTBF:	53,000 hours
Operating Environment:	0-35°C 10-90% relative humidity 0-10,000 feet above sea level
Storage Environment:	-40 to 85°C 5-96% relative humidity 0-50,000 feet above sea level
Operating Systems:	Microsoft Windows Operating Systems and Linux base OS
Agency Compliance	Agency Certifications (testing pending) FCC Class A CE Safety & Emissions UL, cUL RoHS2
Warranty:	1 Year Return to Factory. Extended Warranty is available and sold separately. Upon purchased of a new unit you can buy an extended warranty.

1.2 Features

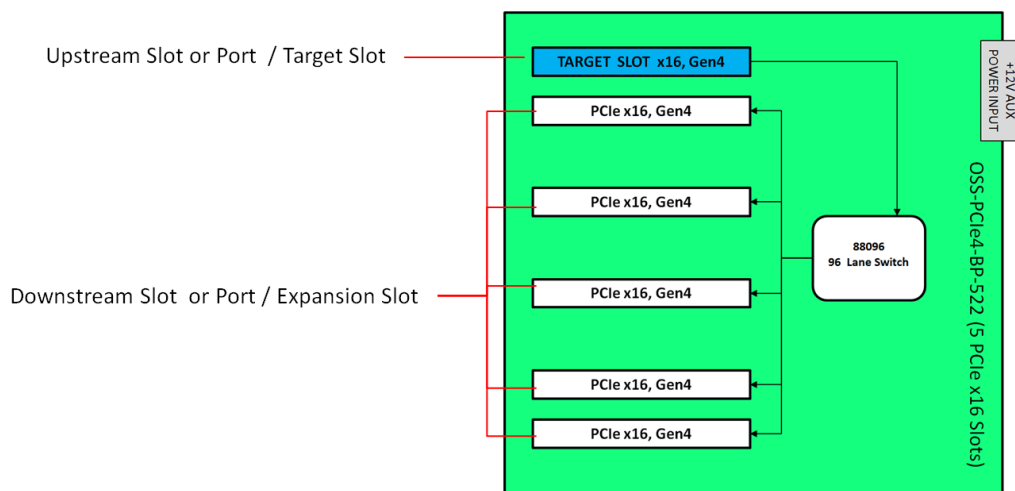
- 4U rackmount design
- 5 PCIe 4.0 x16 expansion slots
- One PCIe 4.0 x16 host connections
- Four x16 mini-SAS HD PCIe cables
- PWM fan options
- Two 2000W load-sharing power supplies
- AUX power connectors for high power AICs

1.3 Block Diagram

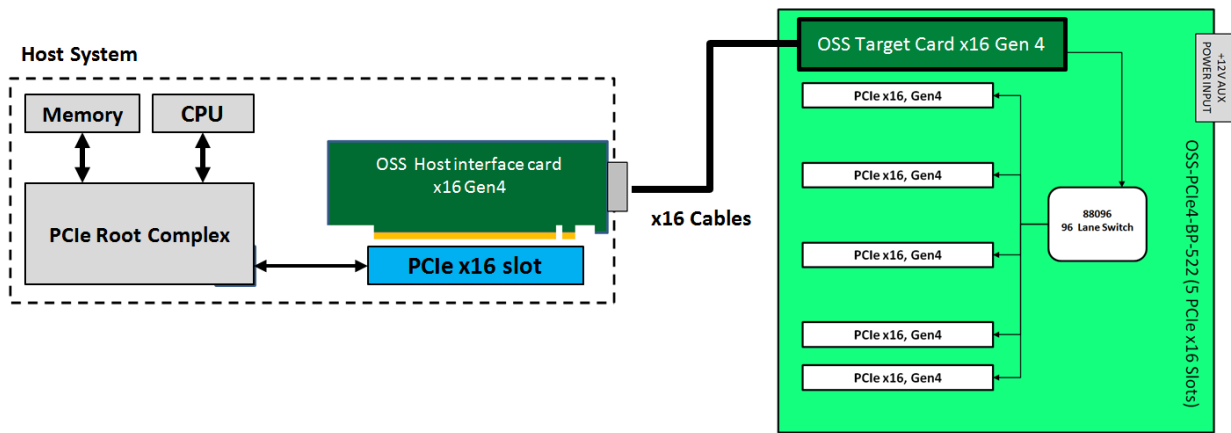
1.3.1 Enclosure



1.3.2 Backplane



1.3.3 Host and backplane



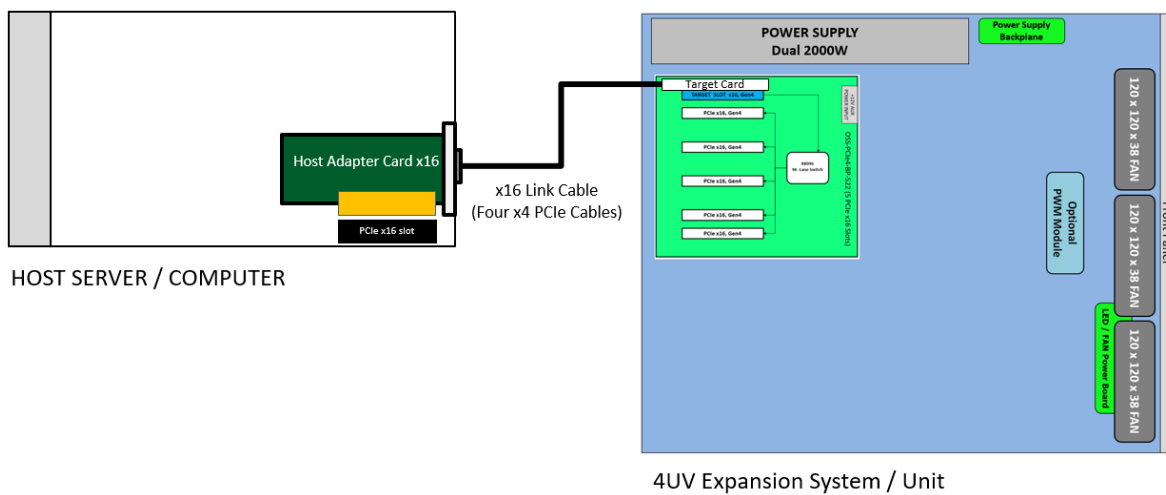
1.4 Supported Configuration

1.4.1 Model 1

By default, the expansion unit is shipped out from the manufacturer with the expansion backplane mounted closest to the power supply.

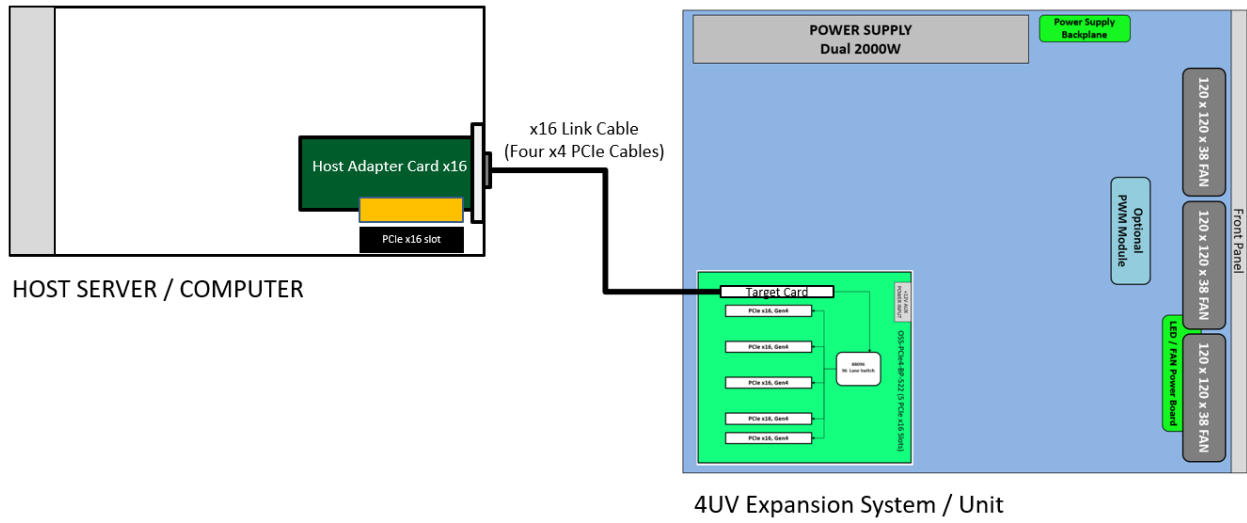
The expansion unit is attached to one host server / computer.

- A single Host Cable adapter card is installed in the host computer.
- One Target card in the expansion backplane..



1.4.2 Model 2

The location of the expansion backplane is mounted on the far right-end side in the enclosure.

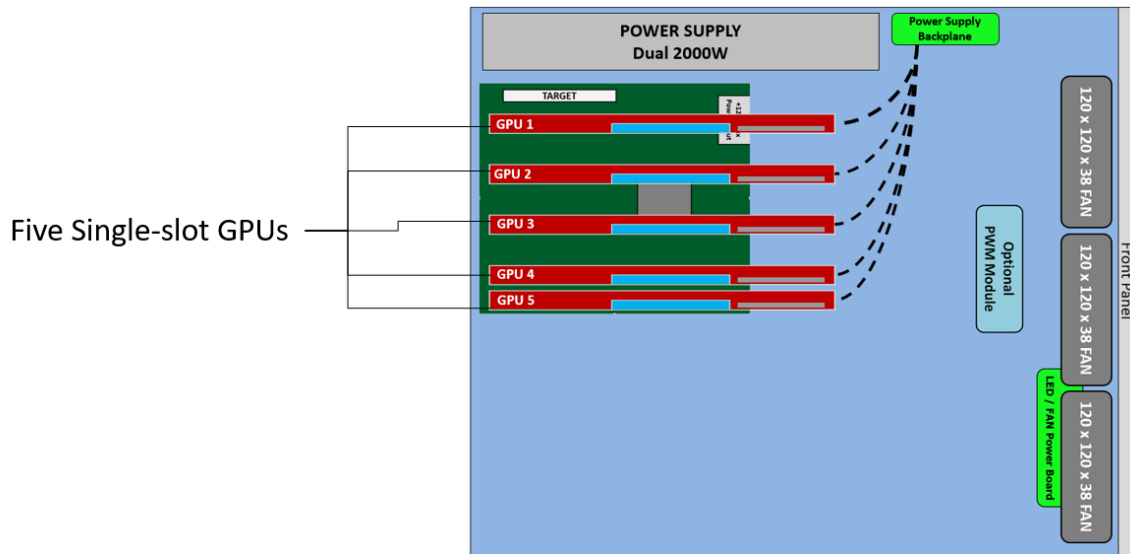


1.5 PCIe Card / GPU Configuration

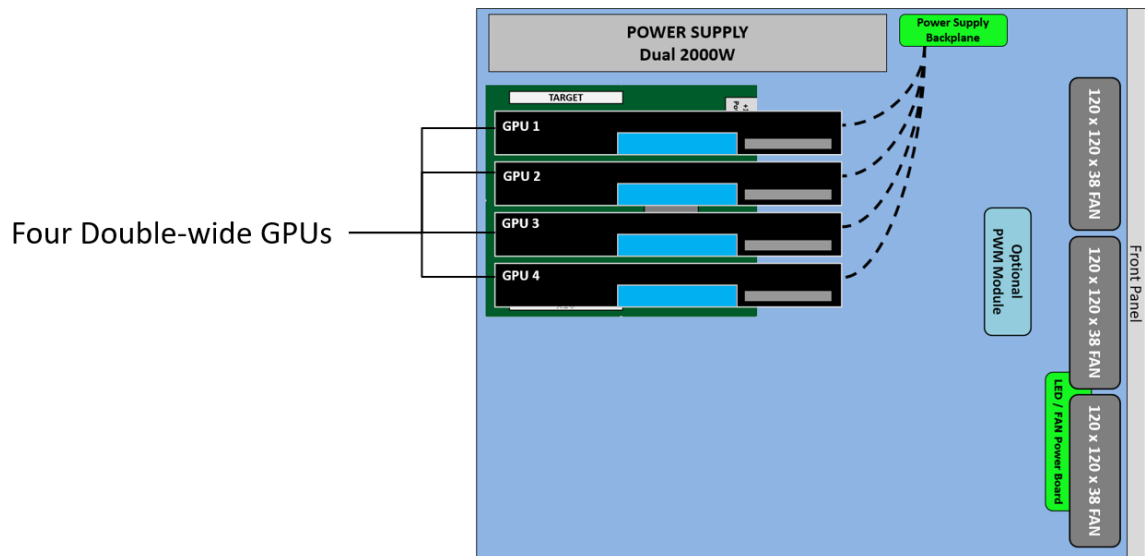
The 4UV Gen4 5-slot expansion backplane will support up to five full-length single-wide GPUs or four full-length double-wide GPUs.

- The GPUs are installed on the PCIe x16 Gen4 PCIe slot.

Single-wide GPU configuration: You can fit 5 single-wide GPUs on the expansion backplane

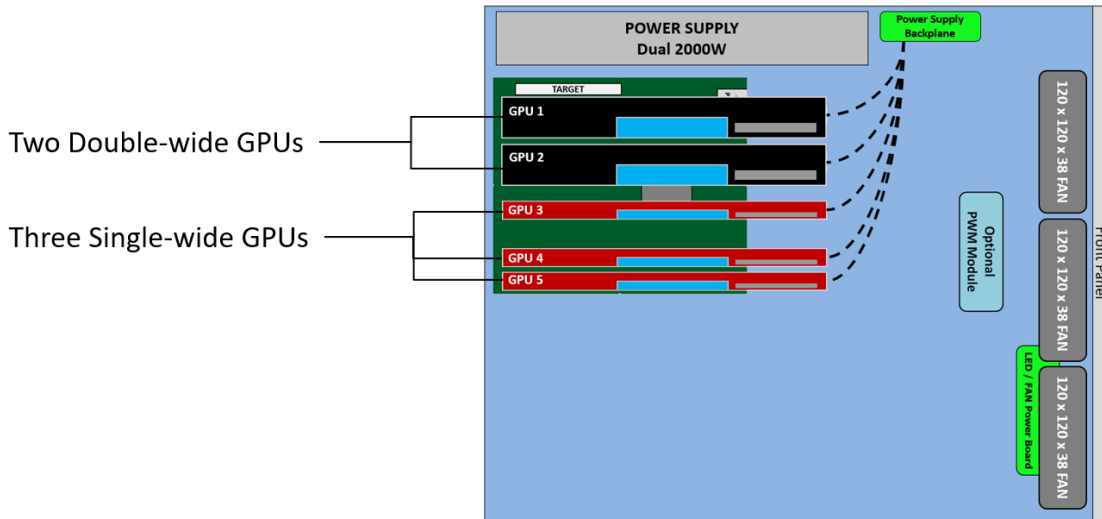


Double-wide GPU Configuration: The Gen4 expansion backplane can only accommodate four double-wide GPUs.

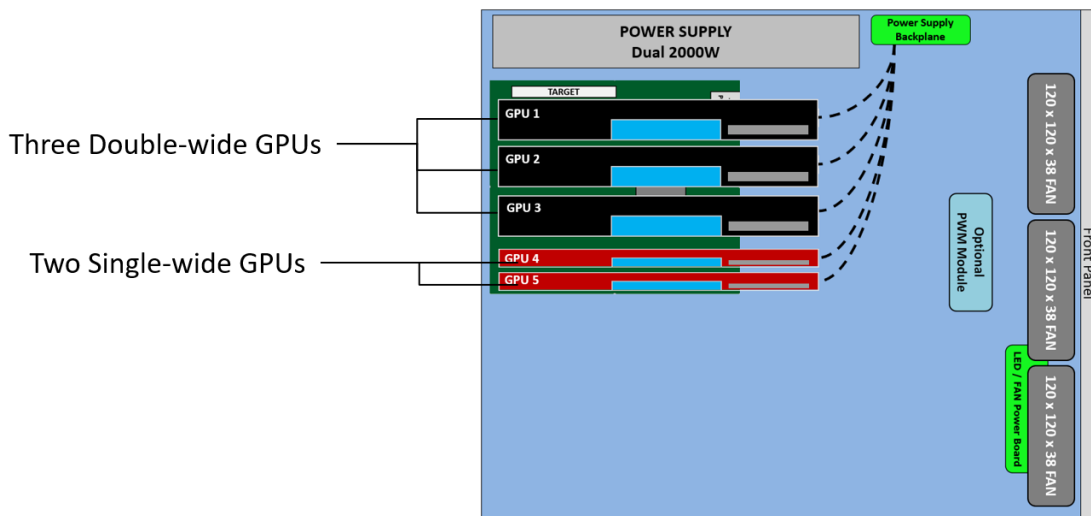


Combo GPU Configuration: You can install a combination of double-wide GPUs and single-wide GPUs.

Combo GPU Config1



Combo GPU Config2



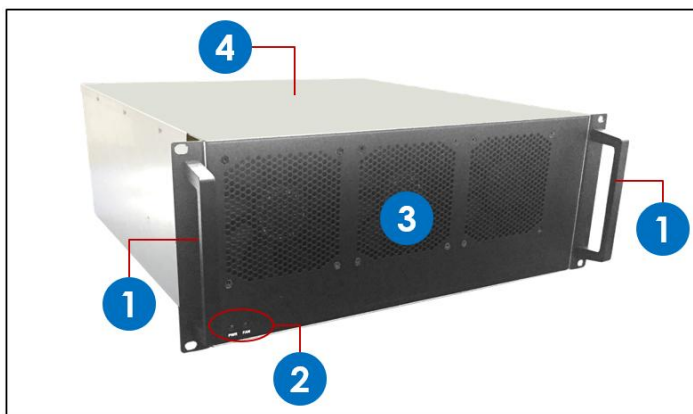
It is strictly recommended to install the same brand / maker of GPUs.

1.6 Main Components

The 4U Value GPU Accelerator System is composed of the following major components:

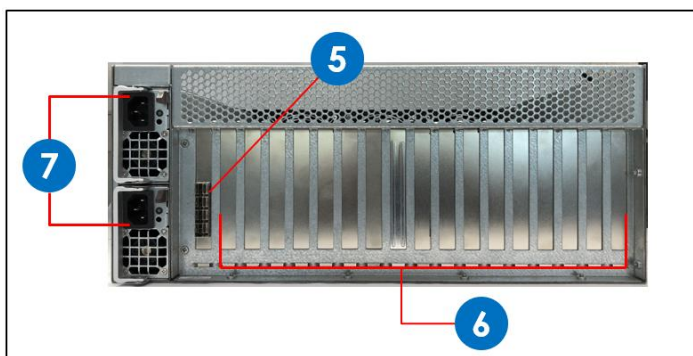
1. Single 5-slot Backplanes
2. One Target Card : PCIe 4.0 x16
3. One Host Card: PCIe 4.0 x16
4. Four SFF-8644 PCIe Gen4 PCIe Cables
5. One or Two 2000W Power Supplies
6. Three 120mm x 38mm Fans (250cfm)

1.7 Parts Overview



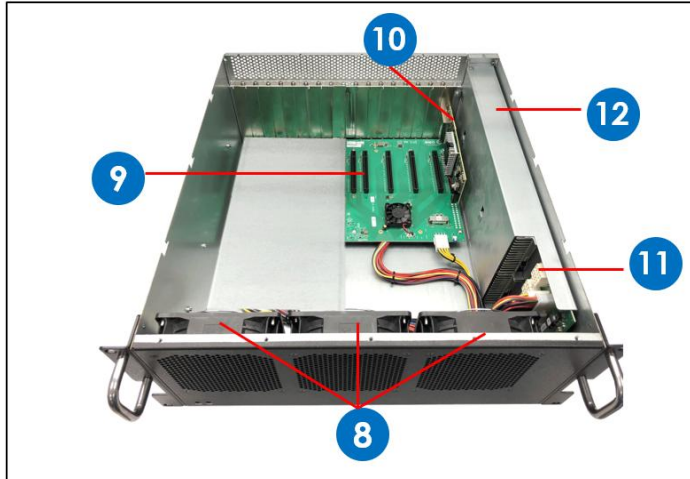
Item#	Description
1	Front Handles
2	Power and Fan LED indicators
3	Front Grill / Cover
4	Top Cover

FRONT VIEW



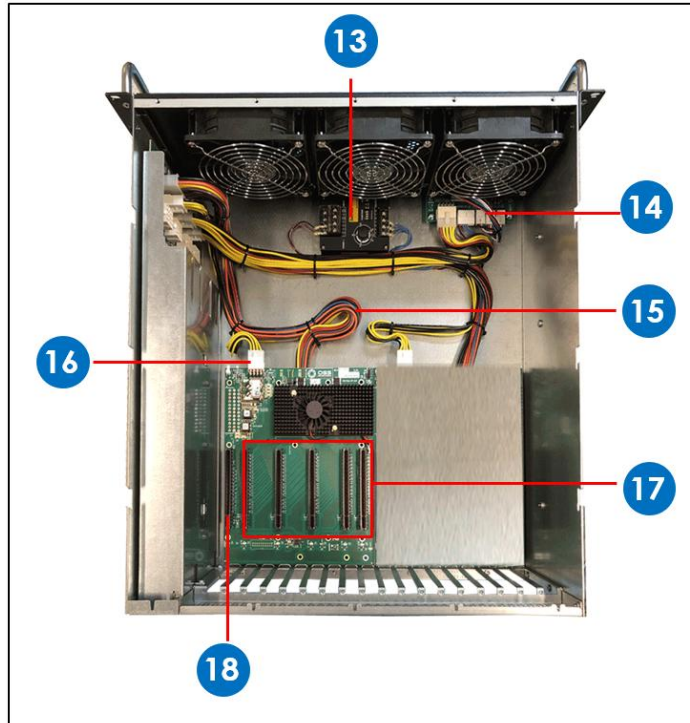
Item#	Description
5	Target Card / Cable Ports
6	Slot Opening / Slot Covers
7	Power Supply Receptacles

REAR VIEW



Item#	Description
8	Fans
9	Expansion Backplane
10	Target Card
11	Power Supply Board Module
12	Dual Power Supply

TOP VIEW



Item#	Description
13	PWM / Fan Controller
14	LED & FAN Power Board
15	ATX Power Supply Cables
16	+12V Power Input
17	Downstream PCIe Slots
18	Upstream Slot / Target Slot

1.8 Pre-Installation Information

Before using the One Stop Systems expansion unit, you should perform the following steps:

- Inventory the shipping carton contents for all of the required parts
- Gather all of the necessary tools required for installation
- Read this manual

1.9 Tools Required for Installation

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



1.10 Items List

Item	Qty	Description
1	2	Full-height PCI Express Adapter Cards
2	4	SFF – 8644 x16 PCIe Gen4 cable
3	2	U.S. Standard 125V or 250V
4	1 set	Rackslide and Kit (Optional)



2 Hardware Set-up / Installation

The following steps will guide you through the installation of your One Stop Systems expansion system



CAUTION

Hardware installation shall be performed only by qualified service personnel per UL and IEC 60950-1.



Electrostatic Discharge (ESD) Warning

All PCI cards are susceptible to electrostatic discharge. When moving PCI cards, it is best to carry the cards in anti-static packaging. If you need to set a PCIe card down, be sure to place it inside or on top of an anti-static surface. For more information, see “Protecting Against Electrostatic Discharge” in the Preface.



WARNING

High voltages are present inside the expansion chassis when the unit’s power cord is plugged into an electrical outlet. Disconnect the power cord from the AC outlet before removing the enclosure cover. Turning the system power off at the power on/off switch does not remove power to components. High voltage is still present.



CAUTION

Before touching anything inside the enclosure, move to an ESD station and follow proper ESD procedures. Failure to do so may result in electrostatic discharge, damaging the computer or its components. For more information, see “Protecting Against Electrostatic Discharge” in the Preface.

2.1 Installation-Procedures Overview

Below is the concise version on how to set up the 4U Value GPU Accelerator System.

1. Open Enclosure: [Section 2](#)
2. Target Card Installation (If not installed): [Section 2](#)
3. Host Card Installation: [Section 2](#)
4. Link Cable Installation: [Section 2](#)
5. Connecting Power: [Section 3](#)
6. Powering UP the Systems: [Section 3](#)
7. Hardware Check: [Section 4](#)
8. Re-install Top Cover: [Section 4.3](#)
9. Verify Installation (via Operating System): [Section 6](#)
10. GPU card or PCIe card Installation: [Section 8](#)
11. GPU or PCIe card Check or Verification: [Section 9](#)



NOTE

It is highly recommended to install any 3rd party PCI-E cards / High Power PCIe cards after you have verified and tested the OSS expansion unit is working OK .

When installing 3rd Party PCIe card, start with one card first to determine if there are any software and hardware issues or incompatibility problems that may occur. This will help you in troubleshooting the problem more easily and efficiently. If everything works well and no configuration issues, you can proceed with the installation of the remaining 3rd party PCIe cards.

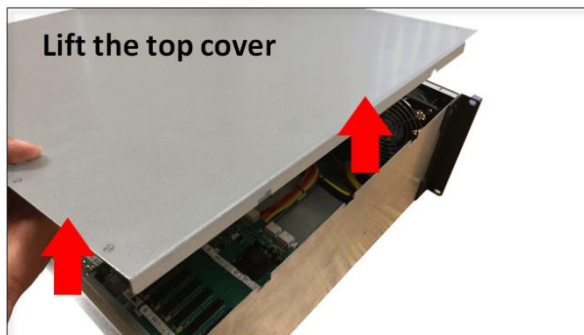
Always refer to or read “3rd party manufacturer installation guide” for further instructions.

2.2 Before you Begin

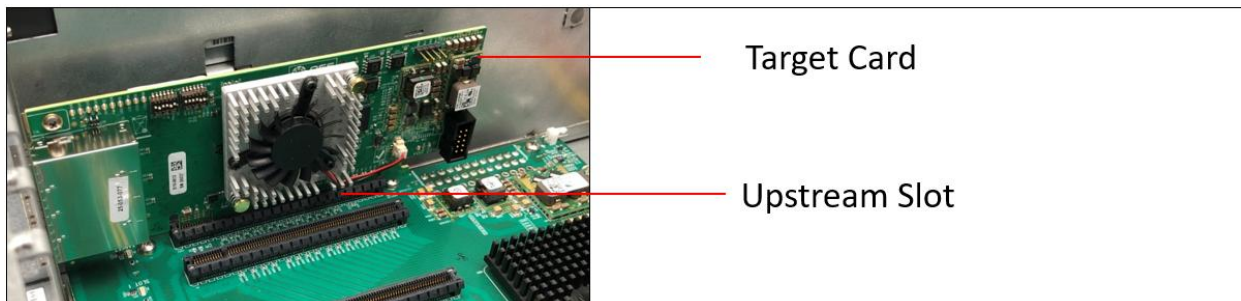
The system's power supply is auto-switching, it will automatically switch to match whatever source power you are using. The product is shipped with a US/Canadian Standard, 125V or 250V power cord.

2.3 Remove Top Cover

Remove the five (5) mounting screws on top of the chassis. Slide the enclosure cover towards the front of the unit to disengage it from the guides until it clears the back hold-down, and then lift the cover off.



Check inside the unit; make sure the "Target Adapter Card" is fully seated in the Upstream slot.

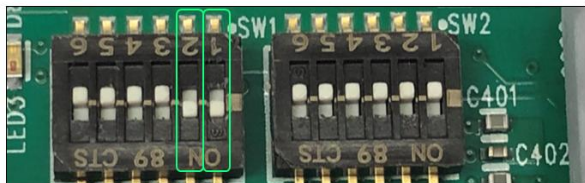


2.4 Install Target Card

By default the “Target card (OSS-PCIe-HIB616-x16)”is installed in the target slot / upstream slot of the expansion system.

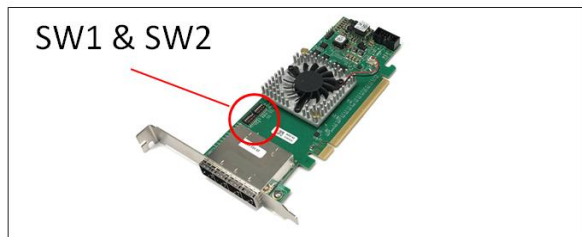
- Check the switches on the Target card, make sure it is configured to Target mode. See photo below for the Target mode switch settings.

Target Mode



2.5 Install Host Card

Before installation, you must check the switches on the Host card. By default, all the switches on the Host card are set to OFF position (“Auto-Negotiation” mode). You can leave the switches to default or manually set the switches (SW1 and SW2) on the card for the desired Host operating mode. See “Host Card Configuration” section for more details. See photos below for host mode switch settings.

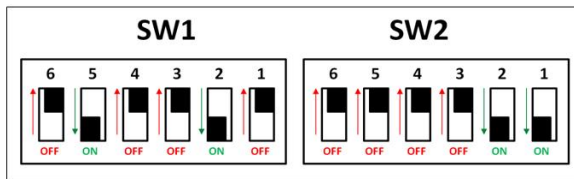
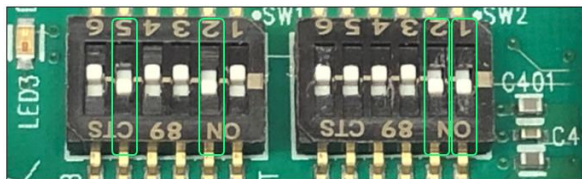


2.5.1 Host Card Configuration

By default, the Host adapter card is set to “Auto-Negotiation” mode. All switches are set to OFF position. The following are manual switch settings on the Host card.

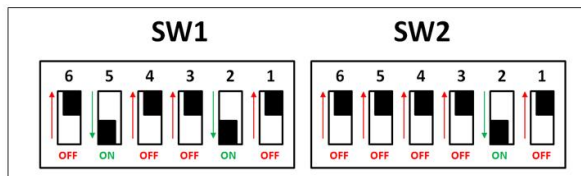
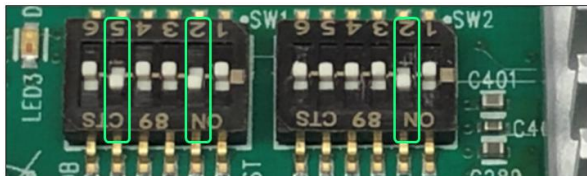
x16 Dip switch Settings:

- SW1 #2 = ON; #5 =ON.
- SW2 #1 = ON; #2 = ON



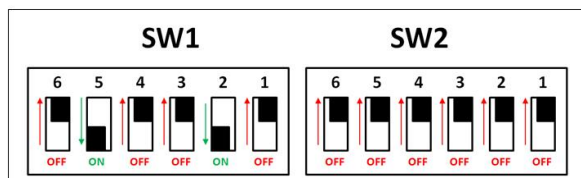
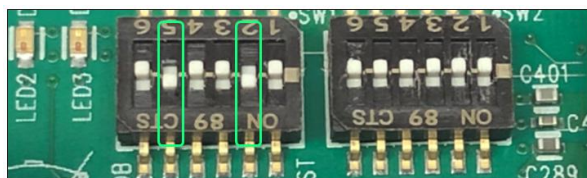
x8 Dip switch Settings:

- SW1 #2 = ON; #5 = ON
- SW2 #1 = OFF; #2 = ON or #2 = OFF and #1 = ON



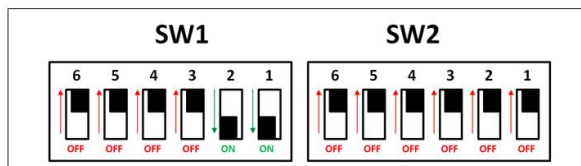
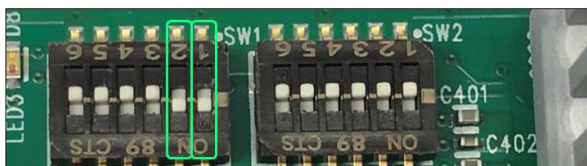
x4 Dip switch Settings:

- SW1 #2 = ON; #5 = ON
- SW2 = All OFF



2.5.2 Target Card Configuration

- SW1 #1 = ON; #2= ON
- SW2 = All OFF

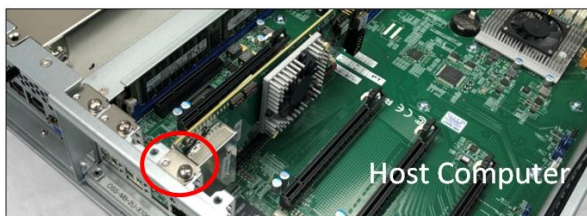


Install a Host-configured card in a x16 Gen4 PCIe slot of a motherboard.

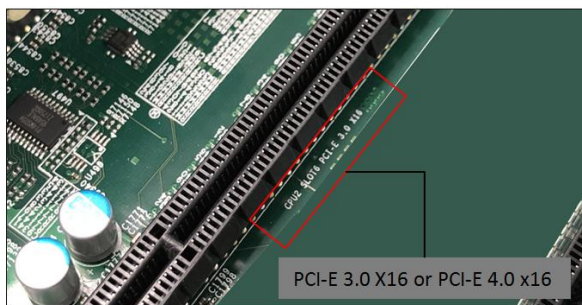
- Check the PCIe slot for any foreign debris as this can damage the card during installation.
- Align the host card PCIe connector on top of the PCIe slot and carefully push the card down until it is firmly seated.



Secure the card with the screw.



The photos below are reference of a x16 PCIe slot connectors. The photo on the right is a PCI-E 3.0 x16 slot. The specification of the PCIe slot is printed on the board next to connector for easy identification.



STOP

YOU MUST ONLY INSTALL THE PCIe HOST CARD INTO A **PCI EXPRESS SLOT**.

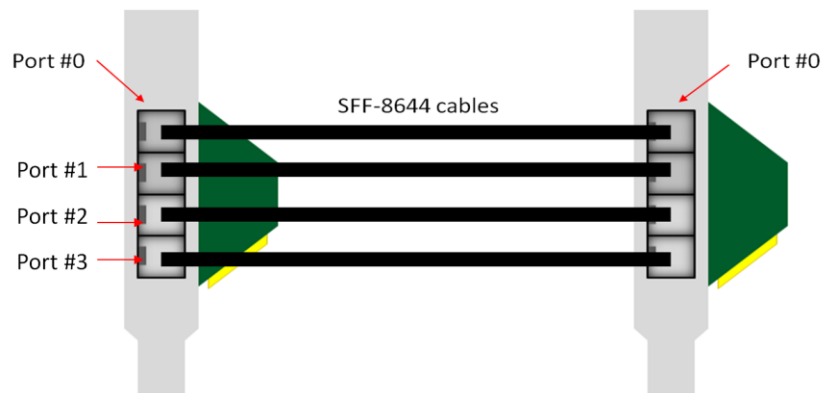
Only use cards WITH brackets. This will ensure that your PCIe host card can only be inserted into a PCIe slot. Although PCI Express cards without brackets may fit into conventional PCI slots, you run the risk of damaging the PCI Express host card if you insert it into a PCI slot. Please ensure that your host computer has PCI Express slots and install the host card **only** into a PCI Express slot.

2.6 Connect Link Cables

2.6.1 x16 Configuration: FOUR cables

- Plug-in the 1st cable to Port#0 (Top port) on both Target and Host cards
- Plug-in the 2nd cable to Port#1 on both Target and Host cards
- Plug-in the 3rd cable to Port#2 on both Target and Host cards
- Plug-in the 4th cable to Port#3 (Bottom port) on both Target and Host cards

Note: It is easier to plug in the cables starting from bottom to top.



2.6.2 x8 Configuration: TWO cables

Note: Make sure the HIB616-x16 host card is manually set to x8 configuration, see the x8 switch setting section for more details

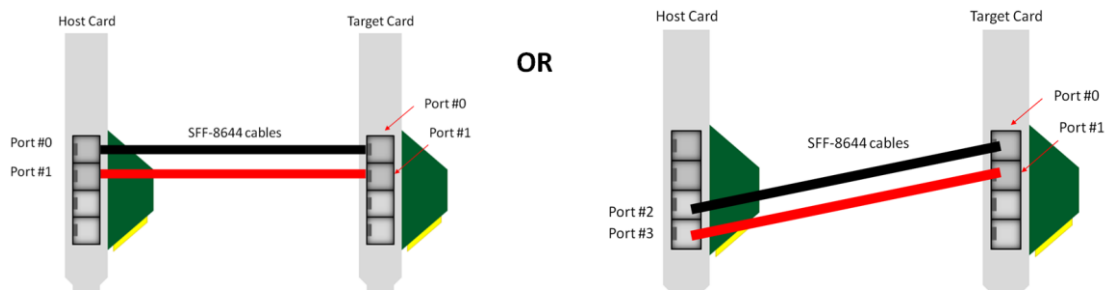
- Plug-in the 1st cable to Port#0 (Top port) on both Target and Host cards
- Plug-in the 2nd cable to Port#1 on both Target and Host cards.



On the host card, you can move the two PCIe cables to the bottom ports. 1st Cable to PORT #2 and the 2nd cable to PORT #3

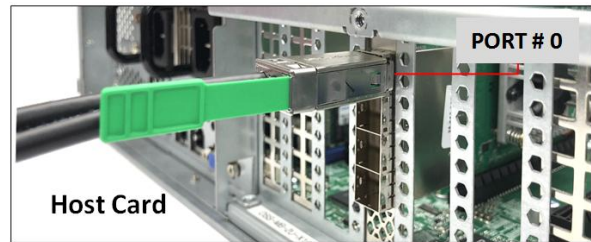


Note: The two cables on the TARGET card should not be removed from PORT #0 and PORT #1. See diagrams below as an example.



2.6.3 x4 Configuration: ONE cable

- Plug-in the single cable to Port#0 (Top port) on both Target and Host cards



You can move the x4 cable on the HOST card to another port. However, the other end of the cable stays connected to PORT#0 on the Target card.

Photo A1: Cable on the Target card is connected to PORT #0. The other end of the cable is connected to PORT #1 on the Host card.

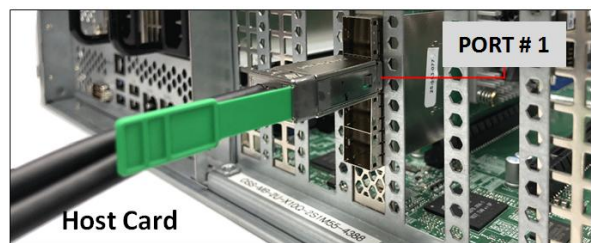


Photo B1: Cable on the Target card is connected to PORT #0. The other end of the cable is connected to PORT #2 on the Host card.

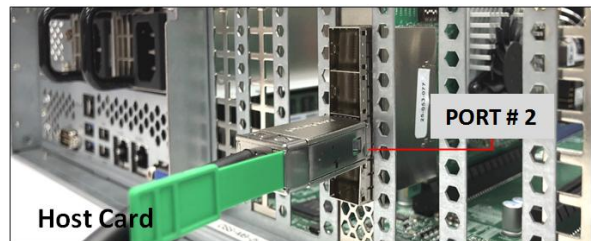
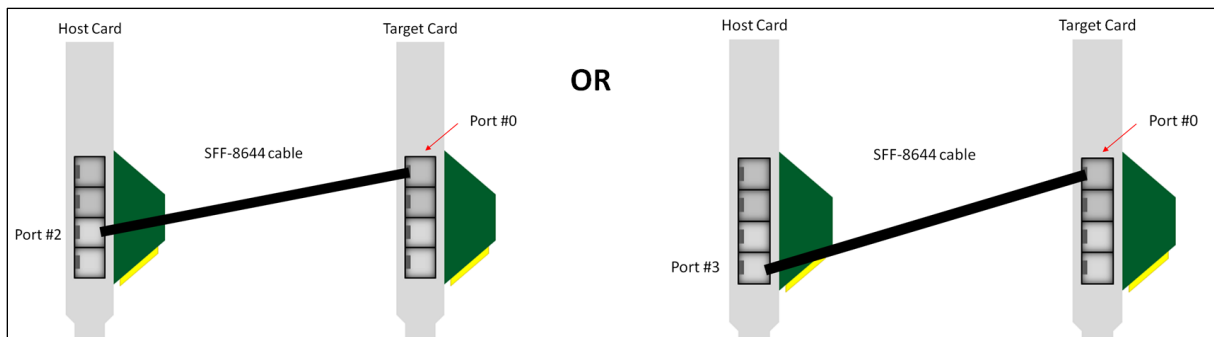
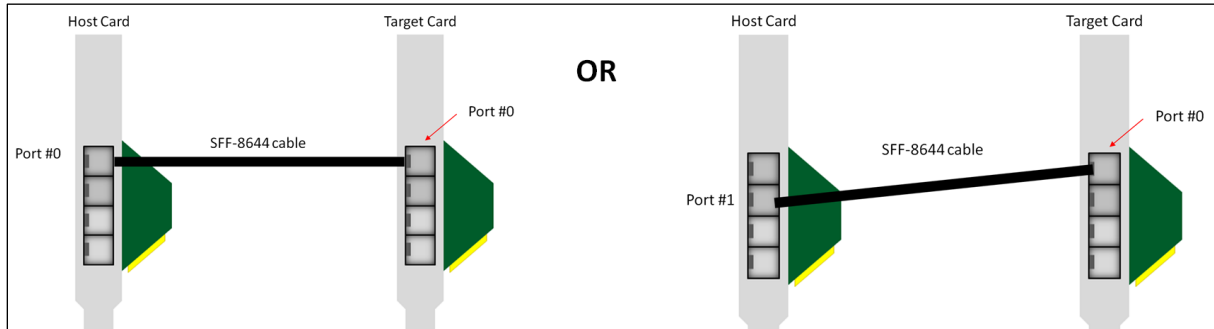


Photo C1: Cable on the Target card is connected PORT #0. The other end of the cable is connected to PORT #3 on the Host card.

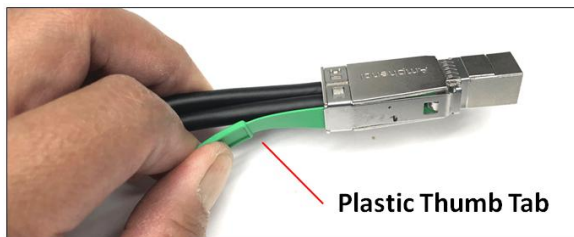


Diagrams below are different x4 cable configurations.



2.6.4 Disconnecting the cable

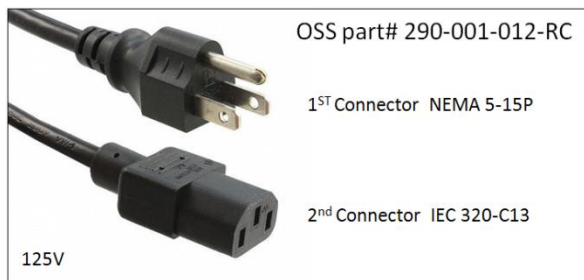
To disconnect the link cable, pull back the PLASTIC thumb tab to release metal pins while slowly pulling the cable out.



3 Applying Power Correctly

3.1 Connect Power Cord

Use the power cord supplied with the unit, connect the power cord to the back of the power supply. Ensure that the system’s power supply unit is fully secured before connecting the power cord. You should have either the 125v or the 250v power cord. If you only have the 125V power cord and you require the 250V please contact our Sales Team (sales@onestopsystems.com) to place an order.



Power Cord Voltage Table

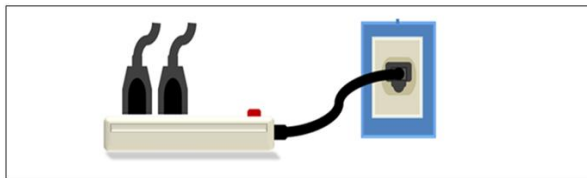
Power Cord	PSU Watt	Voltage	AMPS	Hz
125V	1000W	100-127V	12-9.5A	50-60Hz
250V	1800W	200-220V	10-9.5A	50-60Hz
250V	1980W	220-230v	10-9.8A	50-60Hz
250V	2000W	230-240V	10-9.8A	50-60Hz

NOTE: When using 115-125V power cord you are limited to 1000W of power.



3.2 Connecting to electrical outlet

It is highly recommended using a power surge to protect your gear against random power spike damage. This product is provided with a power supply that **automatically adjusts to input voltages between 100 to 240 Vac**. A U.S. and Canadian 125V or 250V power supply cord is provided with this product. If you are using a 250V power cord, you would need to connect that to a PDU (power distribution unit). You can buy the PDU on any online electronic stores. OSS does not sell the PDU.



3.3 Power ON the Host Computer

Before powering ON the Host computer, make sure the Host adapter cards are seated correctly in the PCIe slot and the cables are firmly connected. Upon powering up the Host computer, the expansion system will turn ON automatically. The power supply LEDs will come up as solid green, see photos below.

Green LED: PSU Good



Amber LED: PSU fault or power issue

If Power LED indicator is showing "Amber" in color, it indicates a fault or power issue.



3.4 Power ON the Expansion Unit

The expansion system is switched ON by the Host system. A **"Power On / Sideband" signal is sent** to the cable indicating to the expansion system to power ON or OFF. The expansion unit will turn ON automatically upon powering up the Host computer. The two front LEDs (PWR and FAN) will come ON as "solid-green". The green LED indicates that the chassis is powered.



Powering down the Host computer turns OFF the expansion system.

4 Hardware Check

4.1 Verify LINK

After powering ON the host computer, the LINK LED on the host and target card should come ON.

x16 configuration (Four x4 Cables connected)

The following LEDs on the Target card will be illuminated.

- D10 - blinking green
- D11 (CE- Card Edge) – blinking green (Gen 3)– depends on speed of expansion chassis switch
- D1(CHO) - solid green
- D9 (AUX) – solid green
- LED0,LED1,LED2,LED3 - all solid green

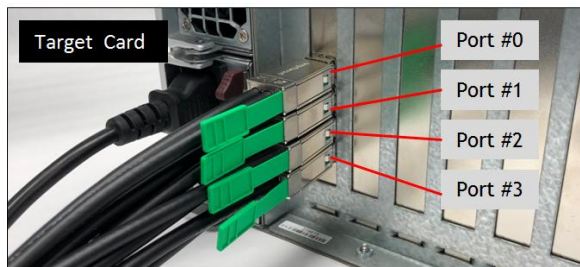
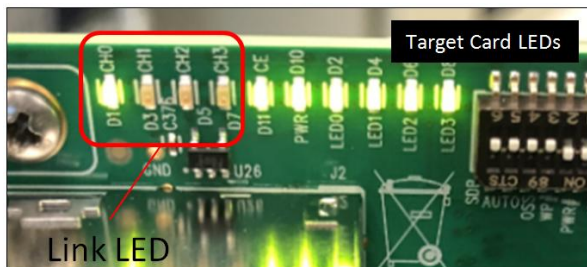
The following LEDs on the HOST card will be illuminated

- D10 - blinking green
- D11 (CE- Card Edge) - solid green (Gen 4)– assuming connection to a Gen4 server
- D1(CHO) - solid green
- D9 (AUX) – solid green
- LED0,LED1,LED2,LED3 - SOLID GREEN

4.2 LED Indicators per Configuration

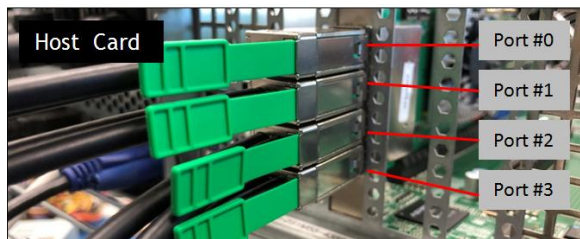
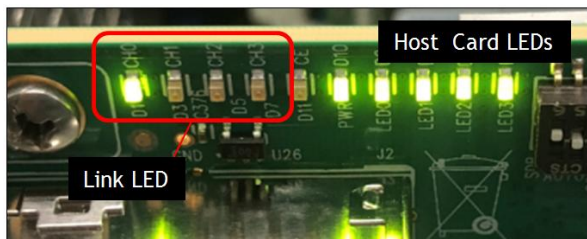
4.2.1 x16 Configuration LEDs

Target Card LED : Photo below is the link LED on the Target card (set to x16 with four cables attached).



LED	Status	Description
CH0 (D1)	ON (Solid Green)	Link LED. There is a link between Host and Target cards
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good
CE(D11)	ON (Blinking Green)	Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane. Solid Green: Gen 4 on the expansion chassis switch
D10	ON (Blinking Green)	Power Good / FPGA Healthy
D9	ON (Solid Green)	AUX Power Good

Host Card LED : Photo below is the link led on the Host card (set to x16 with four cables attached).

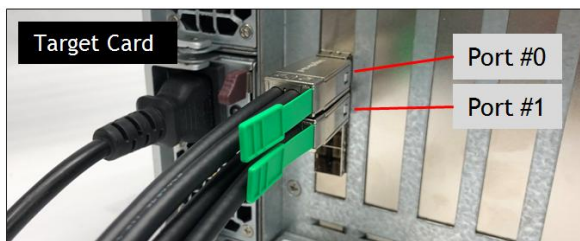
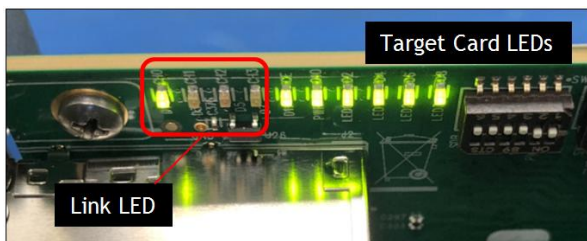


LED	Status	Description
CH0 (D1)	ON (Solid Green)	Link LED. There is a link between Host and Target cards
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good
CE(D11)	ON (Solid Green)	Solid Green: The CARD EDGE connector is communicating to Gen4 PCIe switch on the host computer motherboard. Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane
D10	ON (Blinking Green)	Power Good / FPGA Healthy
D9	ON (Solid Green)	AUX Power Good

- If there is no Link between Host and Target cards, LINK LED will be OFF on both cards.
- If the Host system is in the state of “standby mode” (waiting to be powered UP), LINK LED will be OFF on both cards.
 - Only LED0, LED1, LED2, LED3 are ON (solid green) on the Host card.

4.2.2 x8 Configuration LEDs (Two Cables)

Target Card LED : Photo below is the link LED on the Target card, which is set to x8 with and two cables attached; 1st cable to PORT #0 AND 2ND cable to PORT #1



LED	Status	Description
CH0 (D1)	ON (Solid Green)	Link LED. There is a link between Host and Target cards
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good
CE(D11)	ON (Blinking Green)	Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane. Solid Green: Gen 4 on the expansion chassis switch
D10	ON (Blinking Green)	Power Good / FPGA Healthy
D9	ON (Solid Green)	AUX Power Good

Host Card LED (When Expansion and Host systems are ON)

Photos below are the link LED on the host card, set to x8 and with two cables connected.

CH0 illuminates when connected to host port 2 and 3, CH2 illuminates when connected to ports 0 and 1. For target, always illuminates CH0

- 1st cable connected to PORT #0
- 2nd cable connected to PORT #1

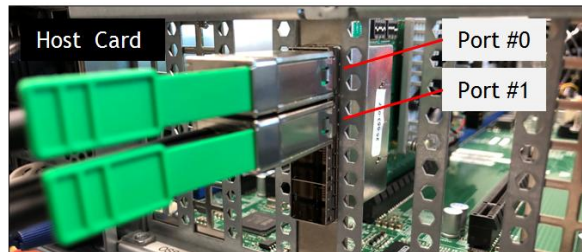
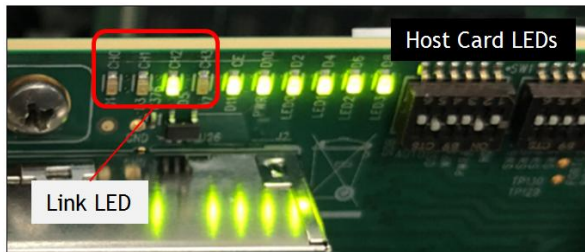
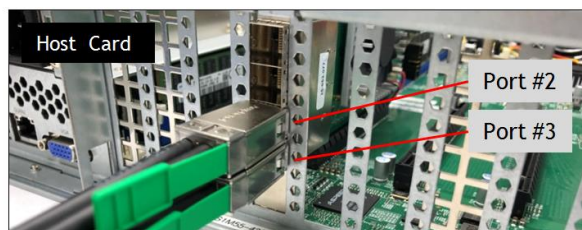
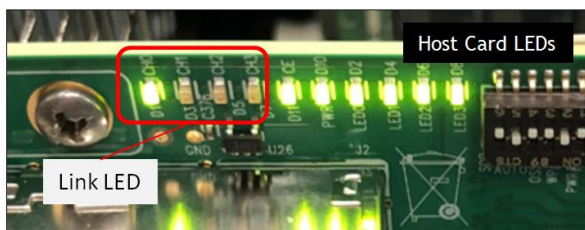


Photo below is the link led on the Host card set to x8 with two cables attached on the first bottom ports.

- 1st cable connected to PORT #2
- 2nd cable connected to PORT #3

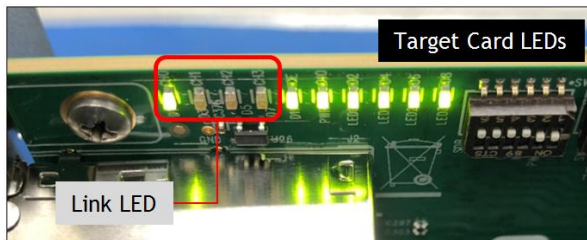


LED	Status	Description
CH0 or CH2	ON (Solid Green)	There is a link between Host and Target cards. Either CH0 or CH2 LED will be ON, depending where the two cables are connected on the ports of the HOST CARD.
		CH2 (D3) Link LED 1 st cable is connected to <u>PORT#0</u> 2 nd cable is connected to <u>PORT#1</u>
		CH0 (D1) Link LED 1 st cable is connected to <u>BOTTOM PORT#3</u> 2 nd cable is connected to <u>PORT#2</u>
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good
CE(D11)	ON (Solid Green)	Solid Green: Gen 4 on the expansion chassis switch Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane.
D10	ON (Blinking Green)	Power Good / FPGA Healthy
D9	ON (Solid Green)	AUX Power Good

4.2.3 x4 Configuration LEDs (One Cable)

Target Card LED (When Expansion and Host systems are ON)

Photo below is the link LED on the Target card, set to x4 and with a single cable connected to PORT #0.



LED	Status	Description
CH0 (D1)	ON (Solid Green)	Link LED. There is a link between Host and Target cards
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good
CE(D11)	ON (Blinking Green)	Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane. Solid Green: Gen 4 on the expansion chassis switch
D10	ON (Blinking Green)	Power Good / FPGA Healthy
D9	ON (Solid Green)	AUX Power Good

Host Card LED (When Expansion and Host systems are ON)

The Photo below is the link LED on the Host card, set to x4 and with single cable connected to top PORT #0.

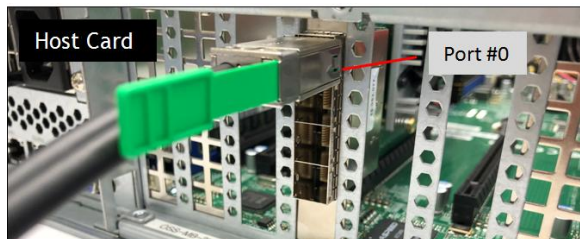
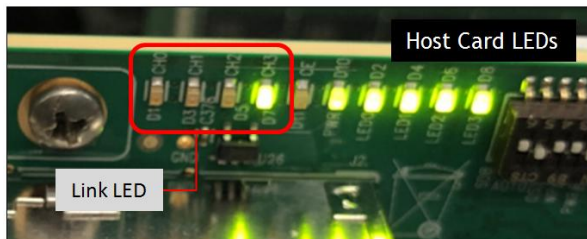


Photo below is the link LED on the Host card, set to x4 and with single cable connected to PORT #1.

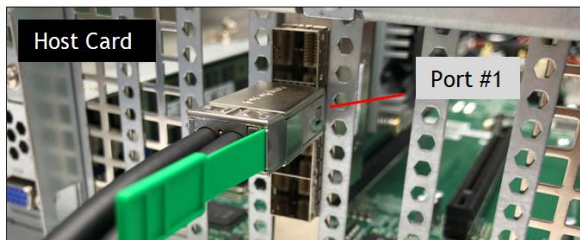
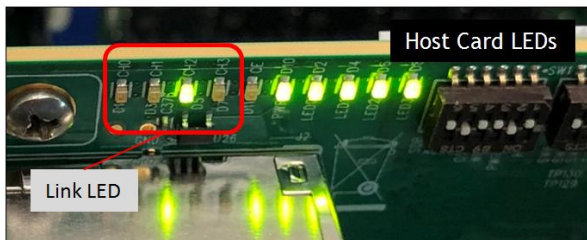


Photo below is the link LED on the Host card, set to x4 and with single cable connected to PORT #2.

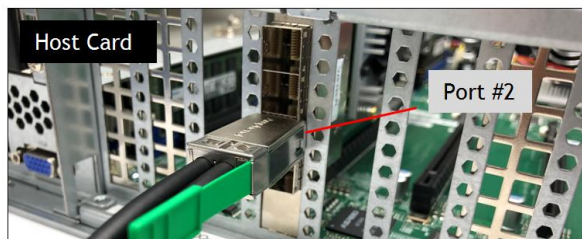
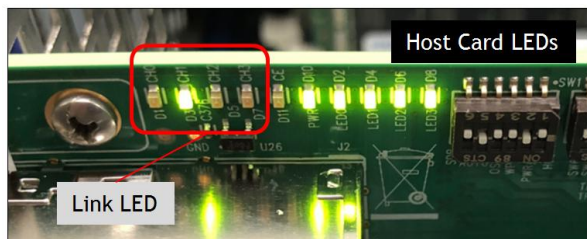
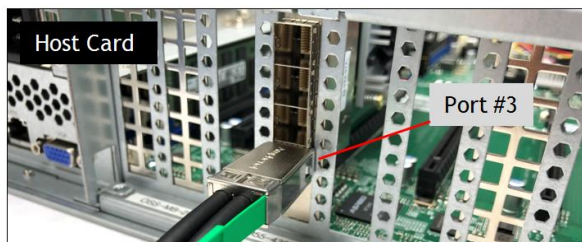
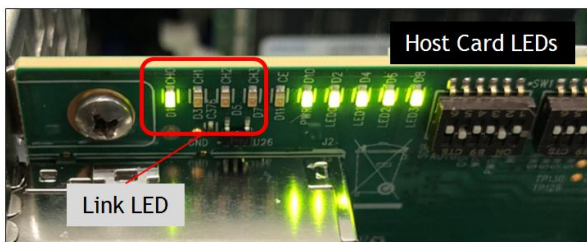


Photo below is the link LED on the Host card, set to x4 and with single cable connected to PORT #3.



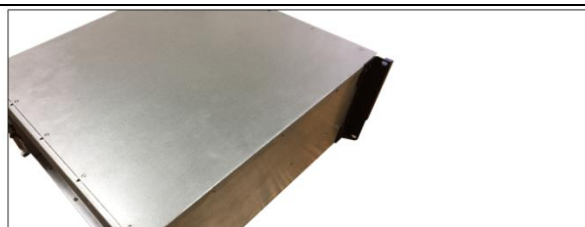
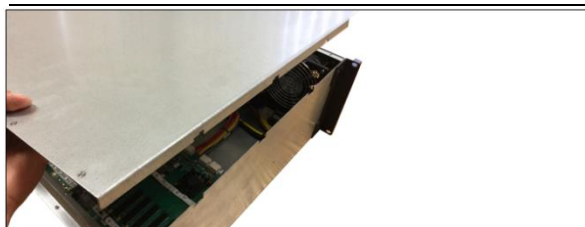
LED	Status	Description								
CH0 or CH1 or CH2 or CH3	ON (Solid Green)	There is a link between Host and Target cards. Either CHO or CH1 or CH2 or CH3 LED will be ON, depending where the cable is connected on the port of the HOST CARD.								
		<table border="1"> <tr> <td>CH3 Link LED</td> <td>Single x4 cable is connected to TOP PORT#0</td> </tr> <tr> <td>CH2 Link LED</td> <td>Single x4 cable is connected to PORT#1</td> </tr> <tr> <td>CH1 Link LED</td> <td>Single x4 cable is connected to PORT#2</td> </tr> <tr> <td>CHO Link LED</td> <td>Single x4 cable is connected to Bottom PORT#3</td> </tr> </table>	CH3 Link LED	Single x4 cable is connected to TOP PORT#0	CH2 Link LED	Single x4 cable is connected to PORT#1	CH1 Link LED	Single x4 cable is connected to PORT#2	CHO Link LED	Single x4 cable is connected to Bottom PORT#3
CH3 Link LED	Single x4 cable is connected to TOP PORT#0									
CH2 Link LED	Single x4 cable is connected to PORT#1									
CH1 Link LED	Single x4 cable is connected to PORT#2									
CHO Link LED	Single x4 cable is connected to Bottom PORT#3									
LED0 (D2), LED1(D4), LED2(D6); LED3(D8)	ON (Solid Green)	Power Good								
CE(D11)	ON (Solid Green)	The CARD EDGE connector is communicating to Gen4 PCIe switch on the host computer motherboard. Blinking Green: The CARD EDGE connector is communicating to Gen3 PCIe switch on the expansion board / backplane.								
D10	ON (Blinking Green)	Power Good / FPGA Healthy								
D9	ON (Solid Green)	AUX Power Good								

4.3 Re-install Top Cover



CAUTION

Re-install top cover when done checking internal LEDs to allow proper airflow.



4.4 Front LEDs Status Indicator

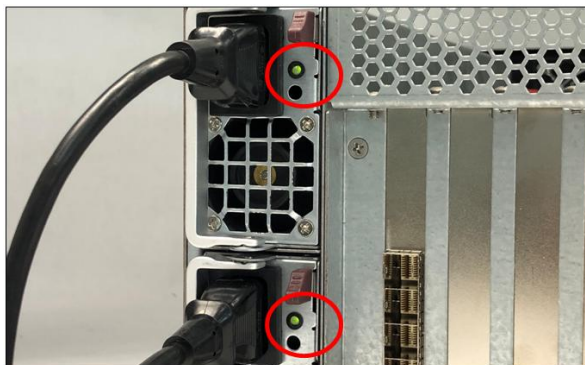
There are two LED status indicators located on the front of the unit. These two LEDs should be ON as solid green upon powering UP the expansion unit.

PWR LED	FAN LED
Solid Green: Power good	Solid Green: Operational
Amber / Orange: Faulty	Red: Fan is faulty



4.5 Power Supply LED Indicator

Both LEDs on the Power Supply should be ON as solid green, it indicates the OK status of the DC GOOD signal. The LED shall continue to glow under normal operation of the power supply. If this LED is blinking or not lit or in amber color, the power supply is not operating properly.



- During protection mode (main 12V rail), the LED should be amber.
- During protection mode (5Vsb rail), the LED should be off.
- When protection is cleared, the LED should go back to the original intended status.
- When the unit is in standby with AC is present, the LED should be amber.
- When the unit is in standby with no AC is present, the LED should be off.
- When the unit is turned on properly, the LED is green.
- During wakeup redundancy mode, the LED should be Green.
- During wakeup redundancy sleep mode, the LED should be blinking Green in 1Hz

5 Software Installation

Software Driver Installation

One Stop Systems4U Value expansion unit requires no driver on Windows 7, Windows 8, Windows 10, Windows Server, Linux, Unix, Centos and Mac OS, which means no installation of One Stop Systems driver.

Before attempting to install anything on a Windows system, you should ensure that you have set a Restore Point, that all data files are closed and that you have a current backup of your data.

6 Verify HIB Device

6.1 Linux OS

In Linux, you can check if the HIB card is detected by using the following commands on the terminal window.

NOTE: Make sure you are logged-in as “super user” when running the lspci command.

- `#lspci -tv | grep c010`

The c010 is the Device number of the card.

The output below gives you a tree-like structure of the PCI Device B/D/F numbers of b8:00.0 and bd:00.0 (B=Bus number, D=Device number, F=Function number). **The /B/D/F numbers will vary from system to system.**

```
root@oss1:~# lspci -tv | grep c010
|
| \-1c.0-[bd]----00.0 LSI Logic / Symbios Logic Device c010
|
| \-1c.0-[b8]----00.0 LSI Logic / Symbios Logic Device c010
root@oss1:~#
```

You can use the SDevice (Sub Device) of the card 00b2.

- `#lspci -m | grep 'Device 00b2'`

The output below gives you B/D/F numbers, the device Class, the Vendor name and Sub Vendor name.

```
root@oss1:~# lspci -m | grep 'Device 00b2'
b8:00.0 "Mass storage controller" "LSI Logic / Symbios Logic" "Device c010" -rb0 "LSI Logic / Symbios Logic" "Device 00b2"
bd:00.0 "Mass storage controller" "LSI Logic / Symbios Logic" "Device c010" -rb0 "LSI Logic / Symbios Logic" "Device 00b2"
root@oss1:~#
```

To check on the revision of the card, use the command below.

- `#lspci -vmms ac:00.0`
- See output below.

```
root@oss1:~# lspci -vmms ac:00.0
Slot: ac:00.0
Class: PCI bridge
Vendor: LSI Logic / Symbios Logic
Device: Device c010
Rev: b0
NUMANode: 1
```

To check on the PCIe Gen speed and Link Width

- `#lspci -nvvs b8:00.00 | grep 'LnkCap\|LnkSta'`

```
root@oss1:~# lspci -nvvs ac:00.0 | grep 'LnkCap\|LnkSta'
LnkCap: Port #224, Speed 16GT/s, Width x16, ASPM L0s L1, Exit Latency L0s <4us, L1 <32us
LnkSta: Speed 16GT/s, Width x16, TrErr- Train- SlotClk- DLActive- BWMgmt- ABWMgmt-
LnkSta2: Current De-emphasis Level: -6dB, EqualizationComplete-, EqualizationPhase1-
root@oss1:~#
```

To display more details or information

lspci -nvvs ac:00.00

```

root@oss1:~# lspci -s ac:00.0 -vvv
ac:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
Control: I/O+ Mem+ BusMaster+ SpecCycle- MemWINV- VGASnoop- ParErr+ Stepping- SERR+ FastB2B- DisINTx-
Status: Cap+ 66MHz- UDF- FastB2B- ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort- >SERR- <PERR- INTx-
Latency: 0, Cache Line Size: 32 bytes
NUMA node: 1
Bus: primary=ac, secondary=ad, subordinate=af, sec-latency=0
I/O behind bridge: 0000f000-00000fff
Memory behind bridge: fff00000-000fffff
Prefetchable memory behind bridge: 00000000fff00000-000000000000fffff
Secondary status: 66MHz- FastB2B- ParErr- DEVSEL=fast >TAbort- <TAbort- <MAbort- <SERR- <PERR-
BridgeCtl: Parity+ SERR+ NoISA- VGA- MAbort- >Reset- FastB2B-
PriDiscTmr- SecDiscTmr- DiscTmrStat- DiscTmrSRREn-
Capabilities: [40] Power Management version 3
Flags: PMEClk- DSI- D1- D2- AuxCurrent=0mA PME (D0+,D1-,D2-,D3hot+,D3cold+)
Status: D3 NoSoftRst+ PME-Enable+ DSel=0 DScale=0 PME-
Capabilities: [68] Express (v2) Downstream Port (Slot-), MSI 00
DevCap: MaxPayload 2048 bytes, PhantFunc 0
ExtTag- RBE+
DevCtl: Report errors: Correctable- Non-Fatal- Fatal+ Unsupported-
RlxdOrd+ ExtTag- PhantFunc- AuxPwr- NoSnoop+
MaxPayload 256 bytes, MaxReadReq 128 bytes
DevSta: CorrErr+ UncorrErr- FatalErr- UnsuppReq+ AuxPwr- TransPend-
LnkCap: Port #224, Speed 16GT/s, Width x16, ASPM L0s L1, Exit Latency L0s <4us, L1 <32us
ClockPM- Surprise- LLActRep- BwNot- ASPMOptComp+
LnkCtl: ASPM Disabled; Disabled- CommClk-
ExtSynch- ClockPM- AutWidDis- BWInt- AutBWInt-
LnkSta: Speed 16GT/s, Width x16, TrErr- Train- SlotClk- DLActive- BWMgmt- ABWMgmt-
DevCap2: Completion Timeout: Not Supported, TimeoutDis-, LTR+, OBFF Via message ARIFwd-
DevCtl2: Completion Timeout: 50us to 50ms, TimeoutDis-, LTR-, OBFF Disabled ARIFwd-
LnkCtl2: Target Link Speed: 16GT/s, EnterCompliance- SpeedDis-, Selectable De-emphasis: -6dB
Transmit Margin: Normal Operating Range, EnterModifiedCompliance- ComplianceSOS-
Compliance De-emphasis: -6dB
LnkSta2: Current De-emphasis Level: -6dB, EqualizationComplete-, EqualizationPhase1-
EqualizationPhase2-, EqualizationPhase3-, LinkEqualizationRequest-
Capabilities: [a4] Subsystem: LSI Logic / Symbios Logic Device a032
Capabilities: [100 v1] Device Serial Number 00-80-5e-10-43-32-36-50
Capabilities: [fb4 v1] Advanced Error Reporting
UESta: DLP- SDES- TLP- FCP- CmpltTO- CmpltAbrt- UnxCmplt- RxOF- MalfTLP- ECRC- UnsupReq- ACSViol-
UEMsk: DLP- SDES- TLP- FCP- CmpltTO- CmpltAbrt- UnxCmplt- RxOF- MalfTLP- ECRC- UnsupReq+ ACSViol-
UESvrt: DLP+ SDES+ TLP- FCP+ CmpltTO- CmpltAbrt- UnxCmplt- RxOF+ MalfTLP+ ECRC- UnsupReq- ACSViol-
CESta: RxErr- BadTLP- BadDLLP- Rollover- Timeout- NonFatalErr-
CEMsk: RxErr- BadTLP- BadDLLP- Rollover- Timeout- NonFatalErr+
AERCap: First Error Pointer: 1f, GenCap+ CGenEn- ChkCap+ ChkEn-
Capabilities: [148 v1] Virtual Channel
Caps: LPEVC=0 RefClk=100ns PATEntryBits=1
Arb: Fixed- WRR32- WRR64- WRR128-
Ctrl: ArbSelect=Fixed
Status: InProgress-
VC0: Caps: PATOffset=00 MaxTimeSlots=1 RejSnoopTrans-
Arb: Fixed+ WRR32- WRR64- WRR128- TWRR128- WRR256-
Ctrl: Enable+ ID=0 ArbSelect=Fixed TC/VC=01
Status: NegoPending- InProgress-
Capabilities: [b70 v1] Vendor Specific Information: ID=0001 Rev=0 Len=010 <?>
Capabilities: [e00 v1] #12
Capabilities: [f24 v1] Access Control Services
ACSCap: SrcValid+ TransBlk+ ReqRedir+ CmpltRedir+ UpstreamFwd+ EgressCtrl+ DirectTrans+
ACSCtl: SrcValid+ TransBlk+ ReqRedir+ CmpltRedir+ UpstreamFwd+ EgressCtrl+ DirectTrans-
Kernel driver in use: pcieport
root@oss1:~# █

```

You can check the Host and Target cards by using the command below.

```
#lspci -vvv | grep c010
```

The output below shows a link between Host card and the Target card.

```
root@oss1:~# lspci -vvv | grep c010
ab:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:0c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:1c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ad:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ae:10.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
af:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b0:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b0:0c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b0:1c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b1:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b2:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b4:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b5:14.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b5:15.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b8:00.0 Mass storage controller: LSI Logic / Symbios Logic Device c010 (rev b0)
b9:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ba:14.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ba:15.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
bd:00.0 Mass storage controller: LSI Logic / Symbios Logic Device c010 (rev b0)
root@oss1:~#
```

The output below shows only the Host is being detected. The Host card is not connected to the Target card.

```
root@oss1:~# lspci -vvv | grep c010
ab:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:0c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ac:1c.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ad:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
ae:10.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b0:00.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b1:14.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b1:15.0 PCI bridge: LSI Logic / Symbios Logic Device c010 (rev b0) (prog-if 00 [Normal decode])
b4:00.0 Mass storage controller: LSI Logic / Symbios Logic Device c010 (rev b0)
root@oss1:~#
```

To check or to identify whether the bus XX:XX.0 is the Upstream port and Downstream port, on the terminal window type `lspci -s ac:00.0 -vvv | grep 'Capabilities\|Port\|LnkSta\|LnkCap'` or `lspci -nvvs -ac:00.0 | grep 'Capabilities\|Port\|LnkSta\|LnkCap'`

```
root@oss1:~# lspci -nvvs ac:00.0 | grep 'Capabilities\|Port\|LnkSta\|LnkCap'
Capabilities: [40] Power Management version 3
Capabilities: [68] Express (v2) Downstream Port (Slot-), MSI 00
LnkCap: Port #224, Speed 16GT/s, Width x16, ASPM L0s L1, Exit Latency L0s <4us, L1 <32us
LnkSta: Speed 16GT/s, Width x16, TrErr- Train- SlotClk- DLActive- BWMgmt- ABWMgmt-
LnkSta2: Current De-emphasis Level: -6dB, EqualizationComplete-, EqualizationPhase1-
Capabilities: [a4] Subsystem: 1000:a032
Capabilities: [100 v1] Device Serial Number 00-80-5e-10-43-32-36-50
Capabilities: [fb4 v1] Advanced Error Reporting
Capabilities: [148 v1] Virtual Channel
Capabilities: [b70 v1] Vendor Specific Information: ID=0001 Rev=0 Len=010 <??>
Capabilities: [e00 v1] #12
Capabilities: [f24 v1] Access Control Services
root@oss1:~#
```

Check Host Adapter card

The OSS Gen4 PCIe switch will show up in lspci even if it is installed alone and no cables are connected to the card. You can check or verify if the OSS Gen4 Host adapter card is detected or not by using the following commands.

Gen4, use the following command

NOTE: Make sure you are logged-in as “super user”

```
#lspci -vvv | grep 00b2
```

```
#lspci -vvt | grep c010, see output below.
```

```
[root@osshost ~]# lspci -vvv | grep 00b2
      Subsystem: Broadcom / LSI Device 00b2
[root@osshost ~]# lspci -vvt | grep c010
|           |                               \-1c.0-[8b]----00.0  Broadcom / LSI Device c010
[root@osshost ~]# █
```

```
#lspci -vvt | grep LSI, see output below.
```

```
[root@osshost ~]# lspci -vvt | grep LSI
|           |                               \-1c.0-[8b]----00.0  Broadcom / LSI Device c010
[root@osshost ~]# █
```

```
#lspci -vvt | grep c010, see output below.
```

```
[root@osshost ~]# lspci -vvv | grep c010
82:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
83:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
83:0c.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
83:1c.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
84:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
85:10.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
87:00.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
88:14.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
88:15.0 PCI bridge: Broadcom / LSI Device c010 (rev b0) (prog-if 00 [Normal decode])
0b:00.0 Mass storage controller: Broadcom / LSI Device c010 (rev b0)
[root@osshost ~]# █
```


6.2 Windows 10 / Server

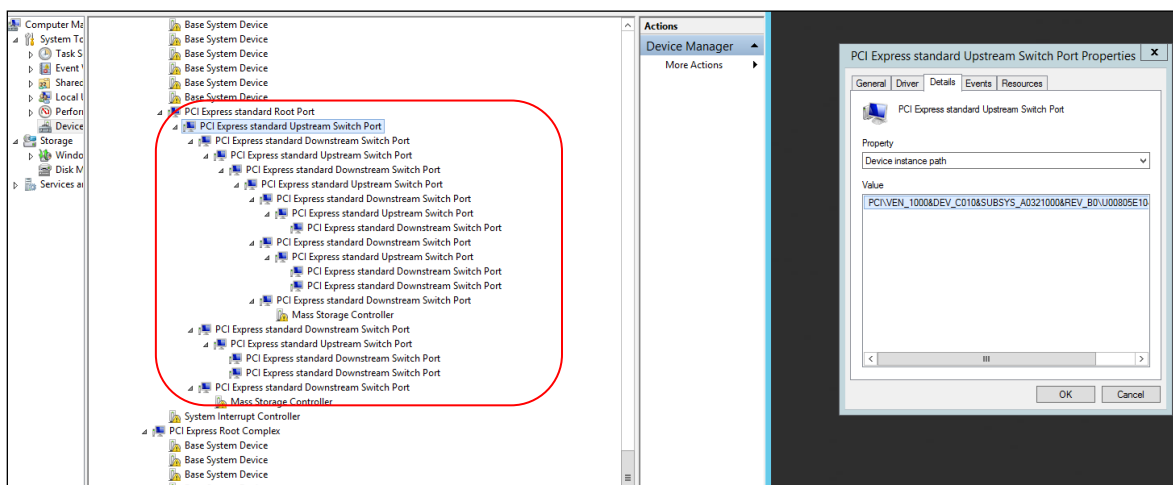
Verify hardware device in Windows Operating System. As your Windows computer starts up, you will see a small message box pop-up in the lower-right corner of the screen to alert you that Windows has found new hardware.

To verify a successful installation on Windows, find the **'My Computer'** icon and "right-click" on it. Then select **'Manage'** from the pop-up menu. Next, click on **'Device Manager'** in the leftmost Computer Management window. Finally, click on the **View Menu** and select **View Devices by Connection**.

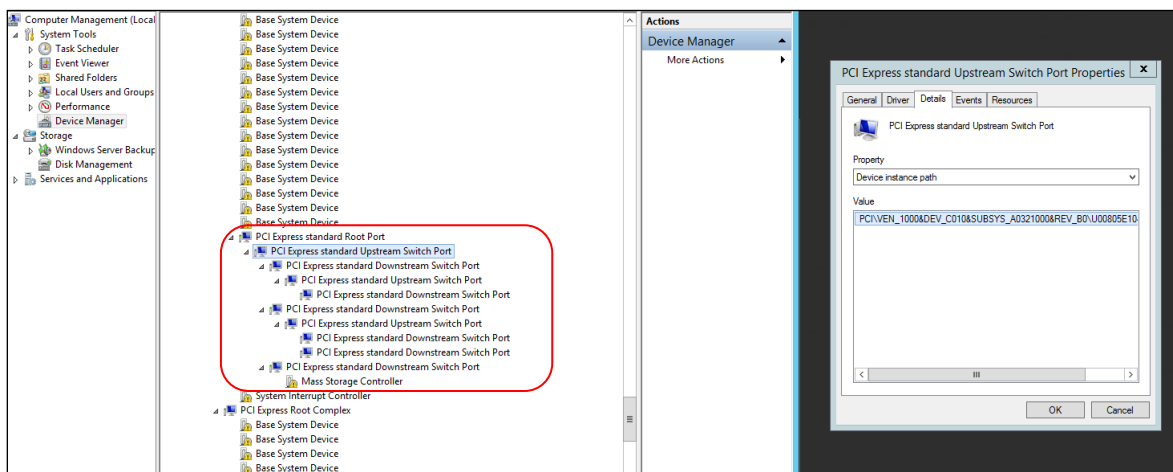
When everything is functioning correctly, your Windows Device Manager should look something like the screenshot below. You will see multiple PCI standard PCI-to PCI bridge or PCI Express standard Upstream Switch Ports and PCI Express standard Downstream Switch Ports.

These are the screenshots of Windows Device Manager running **Windows Server 2012 R2**

- The photo below is showing multiple layers of PCI Express standard Upstream Switch Port and PCI Express standard Downstream Switch Port.
- Displaying a link between Host and Target cards.

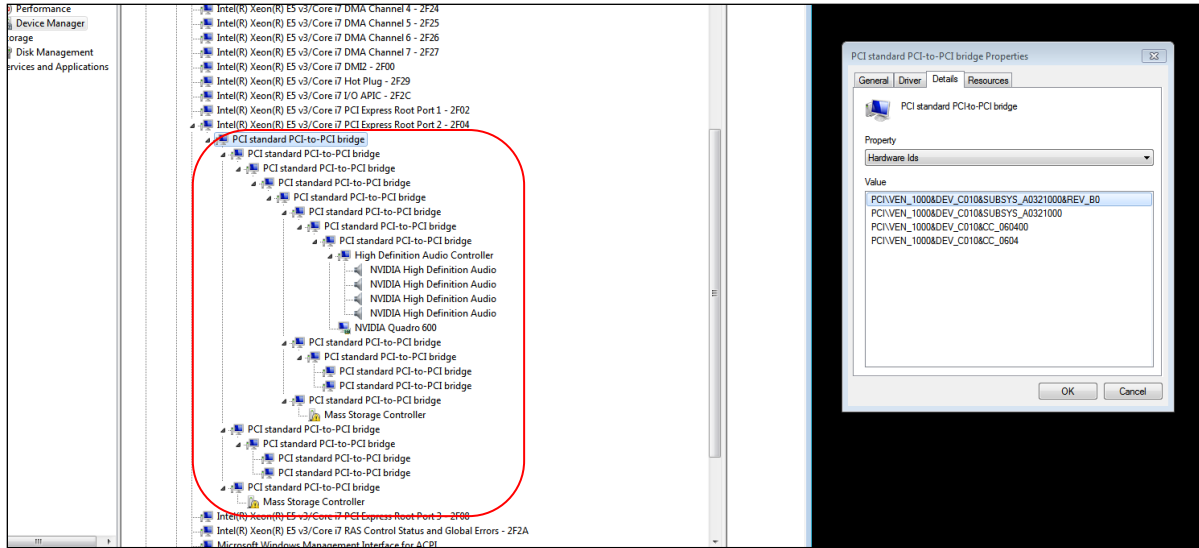


- Photo below is only showing a single Host device is detected.

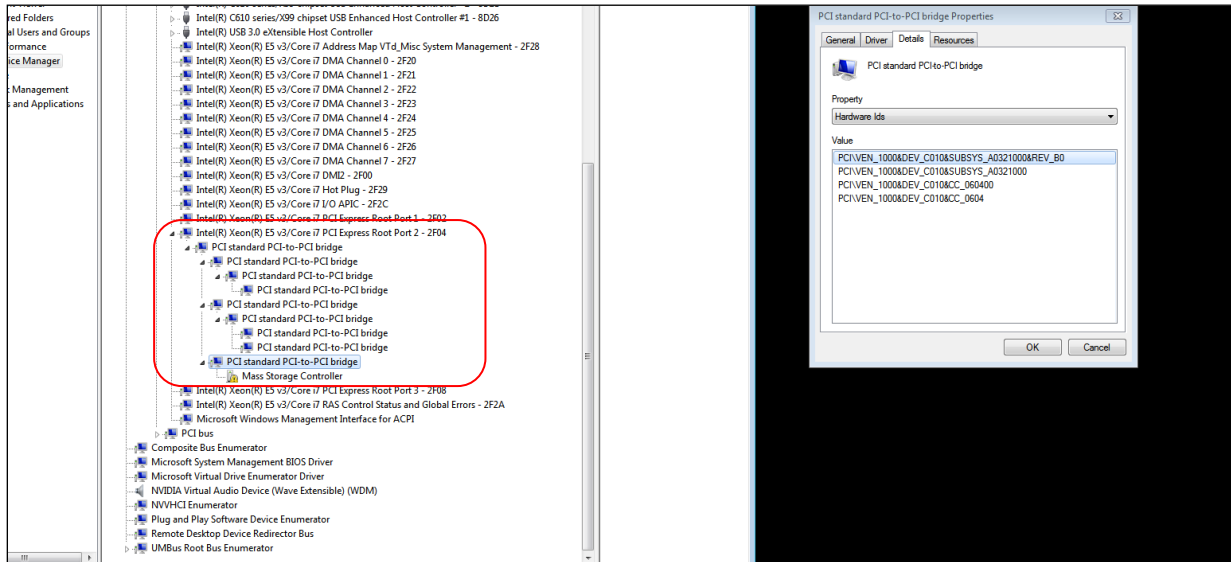


These are the screenshots of Windows Device Manager running **Windows 10**.

- Photo below is showing multiple layers of PCI standard PCI-to-PCI bridges.
- Displaying a link between Host and Target cards. Showing a PCIe device (i.e. NVIDIA card) is recognized. The PCIe device is the 3rd party PCIe card installed into the downstream slot of an expansion backplane.



- The screenshot below depicts that only the Host card is detected.



7 Verify Expansion Backplane

7.1 Linux

On Linux operating system, to verify or check if the board is detected or not, type the following commands on the terminal window.

\$lspci -vv | grep c012, see output below:

```
[root@osshost oss]# lspci -vv | grep c012
8a:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:04.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:08.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:0c.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8b:1c.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8c:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8d:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
8f:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
90:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
90:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
93:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
94:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
94:10.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
97:00.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
98:14.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
98:15.0 PCI bridge: Broadcom / LSI Device c012 (rev a0) (prog-if 00 [Normal decode])
9b:00.0 Mass storage controller: Broadcom / LSI Device c012 (rev a0)
```

\$lspci -tvvv | grep LSI, see output below

```
[root@osshost /]# lspci -tvvv | grep 'c010\|c012'
bash: lspci: command not found
[root@osshost /]# lspci -tvvv | grep 'c010\|c012'
|_-.c.0-[a5]----00.0 Broadcom / LSI Device c010
|_-.c.0-[a0]----00.0 Broadcom / LSI Device c010
|_-.c.0-[9b]----00.0 Broadcom / LSI Device c012
[root@osshost /]#
```



\$lspci -m | grep 00b2, see output below.

```
[root@osshost oss]# lspci -m | grep 00b2
9b:00.0 "Mass storage controller" "Broadcom / LSI" "Device c012" -ra0 "Broadcom / LSI" "Device 00b2"
a0:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
a5:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
[root@osshost oss]#
```

```
[root@osshost oss]# lspci -m | grep 00b2
9b:00.0 "Mass storage controller" "Broadcom / LSI" "Device c012" -ra0 "Broadcom / LSI" "Device 00b2"
a0:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
a5:00.0 "Mass storage controller" "Broadcom / LSI" "Device c010" -rb0 "Broadcom / LSI" "Device 00b2"
[root@osshost oss]#
```

OSS-522 Backplane

HIB Adapter Cards (Host & Target)

\$lspci -vvvt, this will give you the entire devices in a tree format.

Output below is a cropped screenshot of the lspci -tvvv showing the OSS-522 backplane with no PCIe cards installed.

```
+14.6 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 0 & 1
+14.7 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 0 & 1
+16.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Target Address, Thermal & RAS Registers
+16.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Target Address, Thermal & RAS Registers
+16.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel Target Address Decoder
+16.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel Target Address Decoder
+16.6 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO Channel 2/3 Broadcast
+16.7 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO Global Broadcast
+17.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel 0 Thermal Control
+17.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel 1 Thermal Control
+17.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel 0 ERROR Registers
+17.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Integrated Memory Controller 1 Channel 1 ERROR Registers
+17.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 2 & 3
+17.5 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 2 & 3
+17.6 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 2 & 3
+17.7 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DDRIO (WSE) 2 & 3
+1e.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Power Control Unit
+1e.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Power Control Unit
+1e.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Power Control Unit
+1e.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Power Control Unit
+1e.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Power Control Unit
+1f.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 VCU
+1f.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 VCU
--[0000:80]--
+00.0-[81]--+00.0 Intel Corporation I350 Gigabit Network Connection
+02.0-[82-a5]---00.0-[83-a5]--+00.0-[84-a0]---00.0-[85-a0]---10.0-[86-a0]---00.0-[87-a0]--+00.0-[88-9b]---00.0-[89-9b]---00.0-[8a-9b]---00.0-[8b-9b]--+00.0-[8c-8e]---00.0-[8d-8e]---10.0-[8e]---
+04.0-[8f-92]---00.0-[90-92]--+00.0-[91]---
+08.0-[93-96]---00.0-[94-96]---00.0-[95]---
+0c.0-[97-9a]---00.0-[98-9a]--+14.0-[99]---
+15.0-[9a]---
+1c.0-[9b]---00.0 Broadcom / LSI Device c012
+0c.0-[9c-9f]---00.0-[9d-9f]--+14.0-[9e]---
+15.0-[9f]---
+1c.0-[a0]---00.0 Broadcom / LSI Device c010
+0c.0-[a1-a4]---00.0-[a2-a4]--+14.0-[a3]---
+15.0-[a4]---
+1c.0-[a5]---00.0 Broadcom / LSI Device c010
+04.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 0
+04.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 1
+04.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 2
+04.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 3
+04.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 4
+04.5 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 5
+04.6 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 6
+04.7 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 DMA Channel 7
+05.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Address Map, Vtd Misc, System Management
+05.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Hot Plug
+05.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 RAS, Control Status and Global Errors
+05.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 I/O APIC
--[0000:7f]--
+08.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 0
+08.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 0
+08.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 0
+09.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 1
+09.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 1
+09.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 QPI Link 1
+0b.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 R3 QPI Link 0 & 1 Monitoring
+0b.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 R3 QPI Link 0 & 1 Monitoring
+0b.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 R3 QPI Link 0 & 1 Monitoring
+0c.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.5 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.6 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0c.7 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0d.0 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0d.1 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0d.2 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0d.3 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Unicast Registers
+0d.4 Intel Corporation Xeon E7 v3/Xeon E5 v3/Core 17 Buffered Ring Agent
```

OSS-522 board 5 PCIe slots.
No PCIe Cards

Output below is a cropped screenshot of the "lspci -tvvv" showing the OSS-522 backplane with a single card installed in SLOT# 2.

```

+17.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.5 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.6 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.7 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+1e.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.3 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1f.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+1f.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+0000:80---00.0:[1]---00.0 Intel Corporation 1350 Gbabit Network Connection
+02.0:[82-a5]---00.0:[83-a5]---00.0:[84-a8]---00.0:[85-a8]---10.0:[86-a8]---00.0:[87-a8]---00.0:[88-9b]---00.0:[89-9b]---00.0:[8a-9b]---00.0:[8b-9b]---00.0:[8c-8e]---00.0:[8d-8e]---10.0:[8e]---
+04.0:[8f-92]---00.0:[90-92]---00.0:[91]---
+00.0:[93-96]---00.0:[94-96]---00.0:[95]---00.0 NVIDIA Corporation GF108GL [Quadro 600]
+00.1 NVIDIA Corporation GF108 High Definition Audio Controller
+0c.0:[97-9a]---00.0:[98-9a]---14.0:[99]---
+10.0:[92]---
+10.0:[96]---
+15.0:[9a]---
+1c.0:[9b]---00.0 Broadcom / LSI Device c012
+0c.0:[a1-a4]---00.0:[a2-a4]---14.0:[a3]---
+15.0:[a4]---
+1c.0:[a5]---00.0 Broadcom / LSI Device c010
+04.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 0
+04.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 1
+04.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 2
+04.3 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 3
+04.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 4
    
```

PCIe card installed in SLOT# 2

Output below is a cropped screenshot of the "lspci -tvvv" showing the OSS-522 backplane with a single card installed in SLOT# 3.

```

+17.5 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.6 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.7 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+1e.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.3 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1f.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+1f.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+0000:80---00.0:[1]---00.0 Intel Corporation 1350 Gbabit Network Connection
+02.0:[82-a5]---00.0:[83-a5]---00.0:[84-a8]---00.0:[85-a8]---10.0:[86-a8]---00.0:[87-a8]---00.0:[88-9b]---00.0:[89-9b]---00.0:[8a-9b]---00.0:[8b-9b]---00.0:[8c-8e]---00.0:[8d-8e]---10.0:[8e]---
+04.0:[8f-92]---00.0:[90-92]---00.0:[91]---
+00.0:[93-96]---00.0:[94-96]---00.0:[95]---00.0 NVIDIA Corporation GF108GL [Quadro 600]
+00.1 NVIDIA Corporation GF108 High Definition Audio Controller
+0c.0:[97-9a]---00.0:[98-9a]---14.0:[99]---
+10.0:[96]---
+10.0:[9a]---
+15.0:[9a]---
+1c.0:[9b]---00.0 Broadcom / LSI Device c012
+0c.0:[a1-a4]---00.0:[a2-a4]---14.0:[a3]---
+15.0:[a4]---
+1c.0:[a5]---00.0 Broadcom / LSI Device c010
+04.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 0
+04.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 1
+04.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 2
    
```

PCIe card installed in SLOT# 3

Output below is a cropped screenshot of the "lspci -tvvv" showing the OSS-522 backplane with a single card installed in SLOT# 4.

```

+17.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Integrated Memory Controller Channel 0 Error Registers
+17.3 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Integrated Memory Controller Channel 1 Error Registers
+17.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.5 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.6 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+17.7 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DORIO (MSE) 2 & 3
+1e.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.3 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1e.4 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 Power Control Unit
+1f.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+1f.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 VCU
+0000:80---00.0:[1]---00.0 Intel Corporation 1350 Gbabit Network Connection
+02.0:[82-a5]---00.0:[83-a5]---00.0:[84-a8]---00.0:[85-a8]---10.0:[86-a8]---00.0:[87-a8]---00.0:[88-9b]---00.0:[89-9b]---00.0:[8a-9b]---00.0:[8b-9b]---00.0:[8c-8e]---00.0:[8d-8e]---10.0:[8e]---
+04.0:[8f-92]---00.0:[90-92]---00.0:[91]---00.0 NVIDIA Corporation GF108GL [Quadro 600]
+00.1 NVIDIA Corporation GF108 High Definition Audio Controller
+00.0:[93-96]---00.0:[94-96]---00.0:[95]---
+00.0:[92]---
+10.0:[96]---
+10.0:[9a]---
+0c.0:[97-9a]---00.0:[98-9a]---14.0:[99]---
+15.0:[9a]---
+15.0:[9a]---
+1c.0:[9b]---00.0 Broadcom / LSI Device c012
+0c.0:[9c-9f]---00.0:[9d-9f]---14.0:[9e]---
+15.0:[9f]---
+1c.0:[a0]---00.0 Broadcom / LSI Device c010
+0c.0:[a1-a4]---00.0:[a2-a4]---14.0:[a3]---
+15.0:[a4]---
+1c.0:[a5]---00.0 Broadcom / LSI Device c010
+04.0 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 0
+04.1 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 1
+04.2 Intel Corporation Xeon E7 v3/Neon ES v3/Core 17 DMA Channel 2
    
```

PCIe card installed in SLOT# 4

7.2 Windows

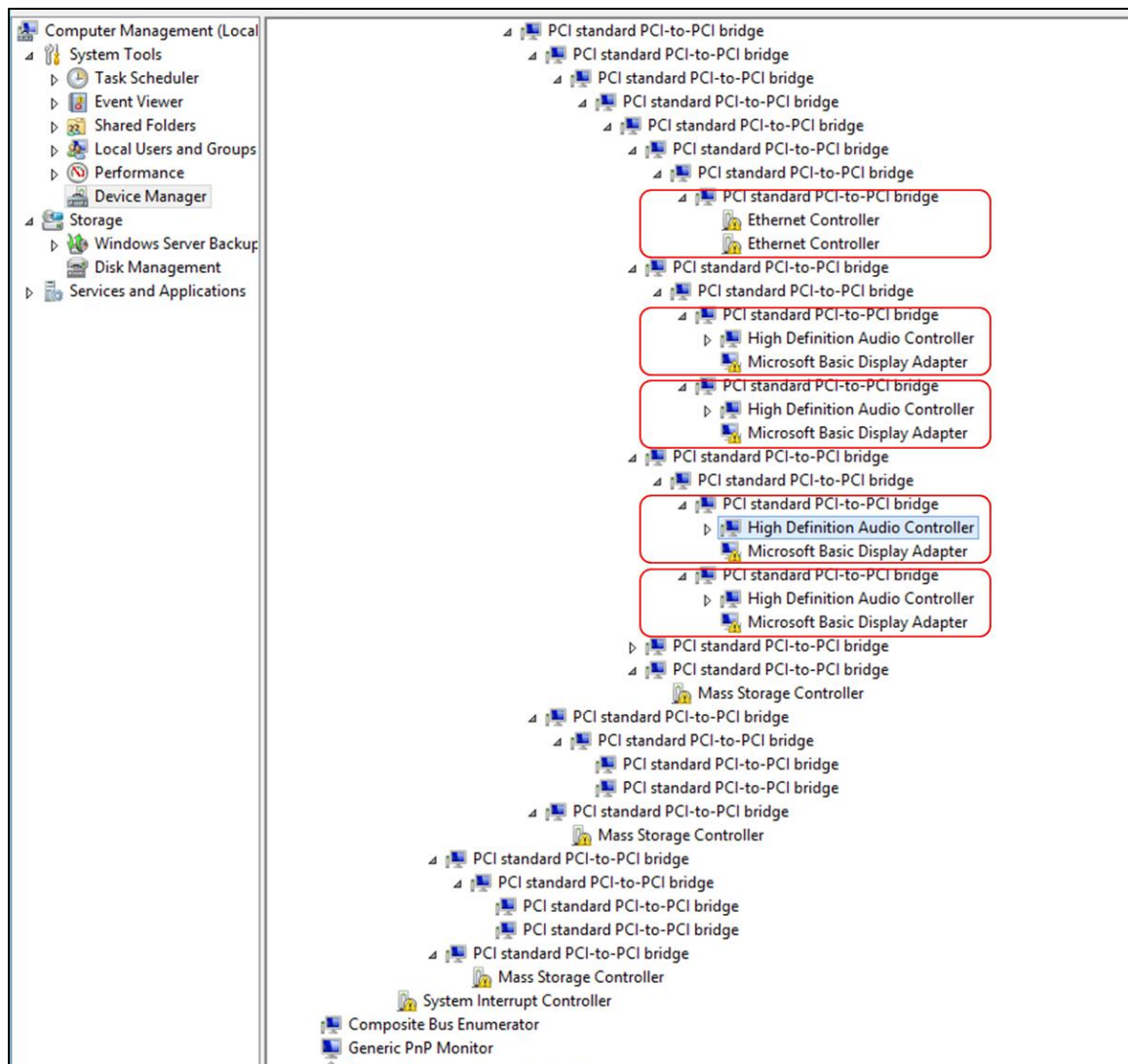
Verify hardware device in Windows Operating System. As your Windows computer starts up, you will see a small message box pop-up in the lower-right corner of the screen to alert you that Windows has found new hardware.

Find the 'My Computer' icon and "right-click" on it. Then select 'Manage' from the pop-up menu.

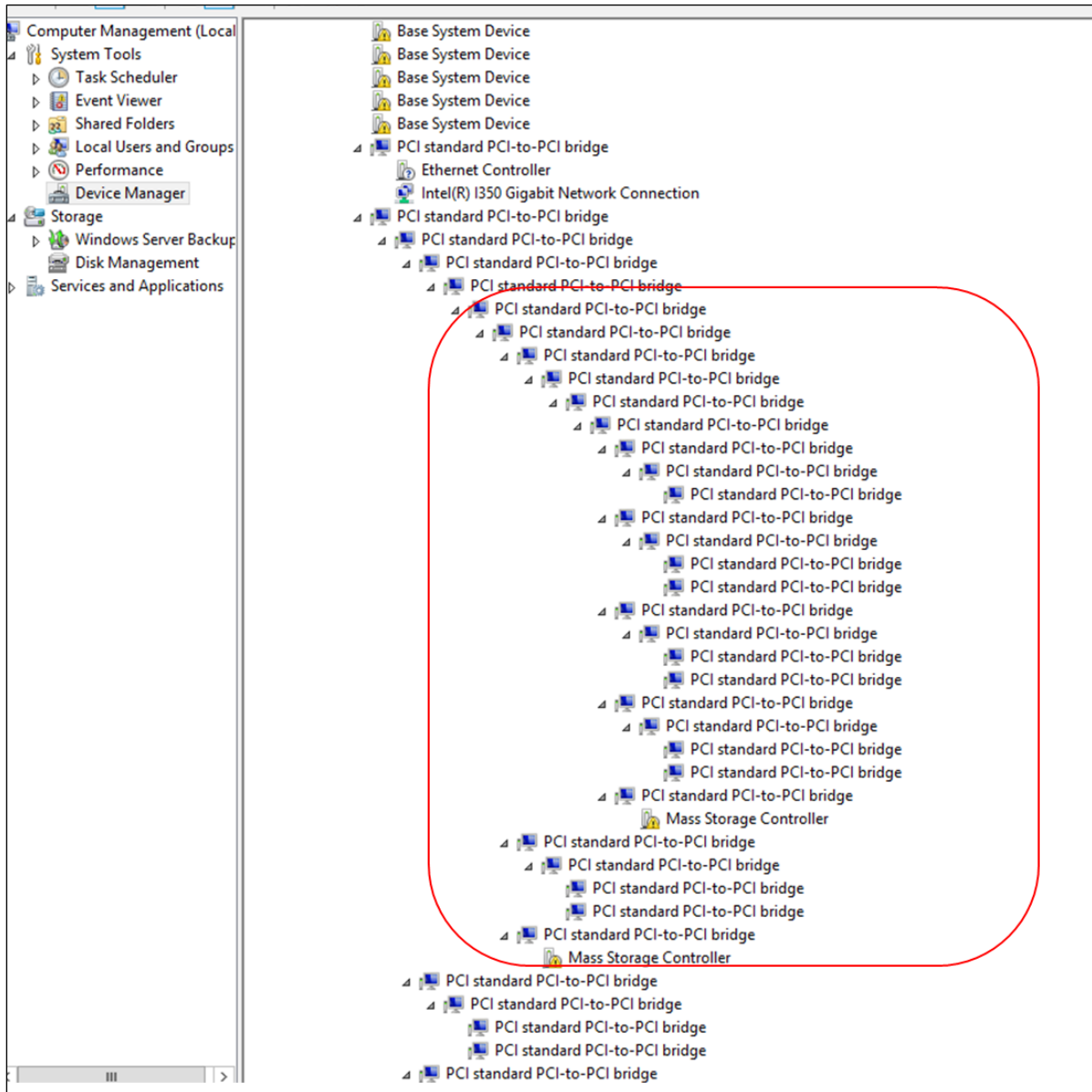
- Next, click on 'Device Manager' in the left most Computer Management window.
- Finally, click on the View Menu and select View Devices by Connection
- Open ACPI (BIOS) → Open PCI Bus → Click the '+' or '>' sign several times until you reach a PCI Express Root Port Complex.
- Then click or collapse all the '+' or '>' until you see multiple subsets of PCI standard PCI-to-PCI bridge. See screenshot below.

Collapse or click the '+' or '>' sign next to PCI standard PCI-to-PCI bridge and you will find all the PCIe devices that are detected.

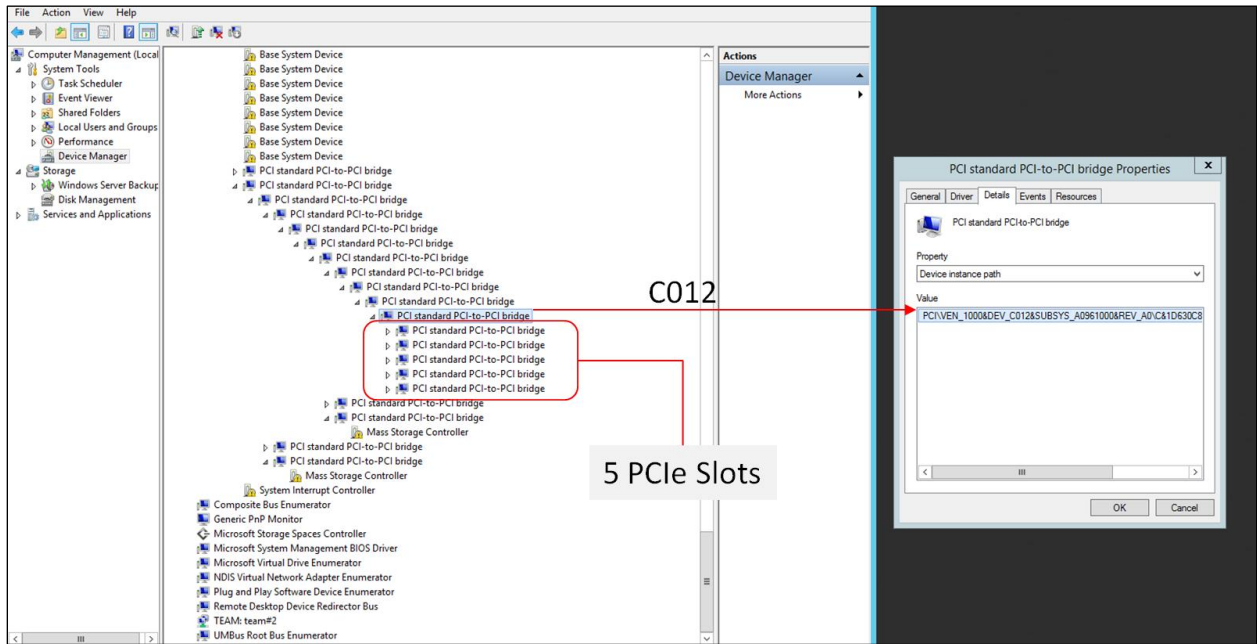
The screenshot below shows five PCIe cards that are detected but showing a yellow exclamation mark next to it, which means the driver is not loaded. You can obtain the driver from the card manufacturer or you can download it from the vendor's website. OSS does not provide 3rd party driver / software.



The screenshot below shows NO PCIe cards are installed on the OSS-522 backplane.

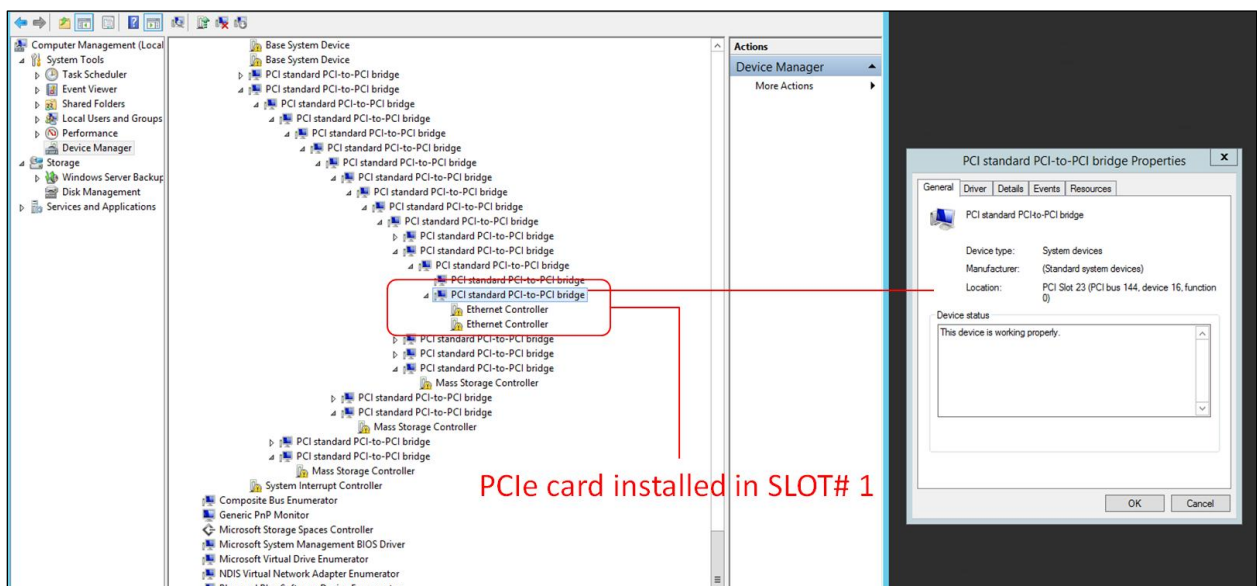


The screenshot below shows the 5 PCIe slots on OSS-522 backplane (Gen4 PCIe expansion board).

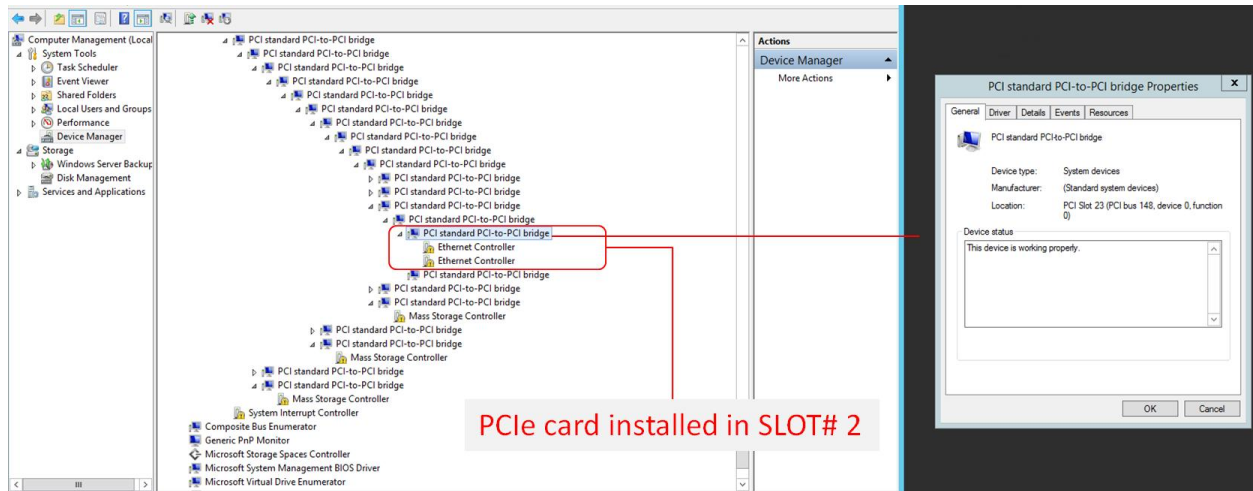


7.2.1 Check PCIe cards on Windows

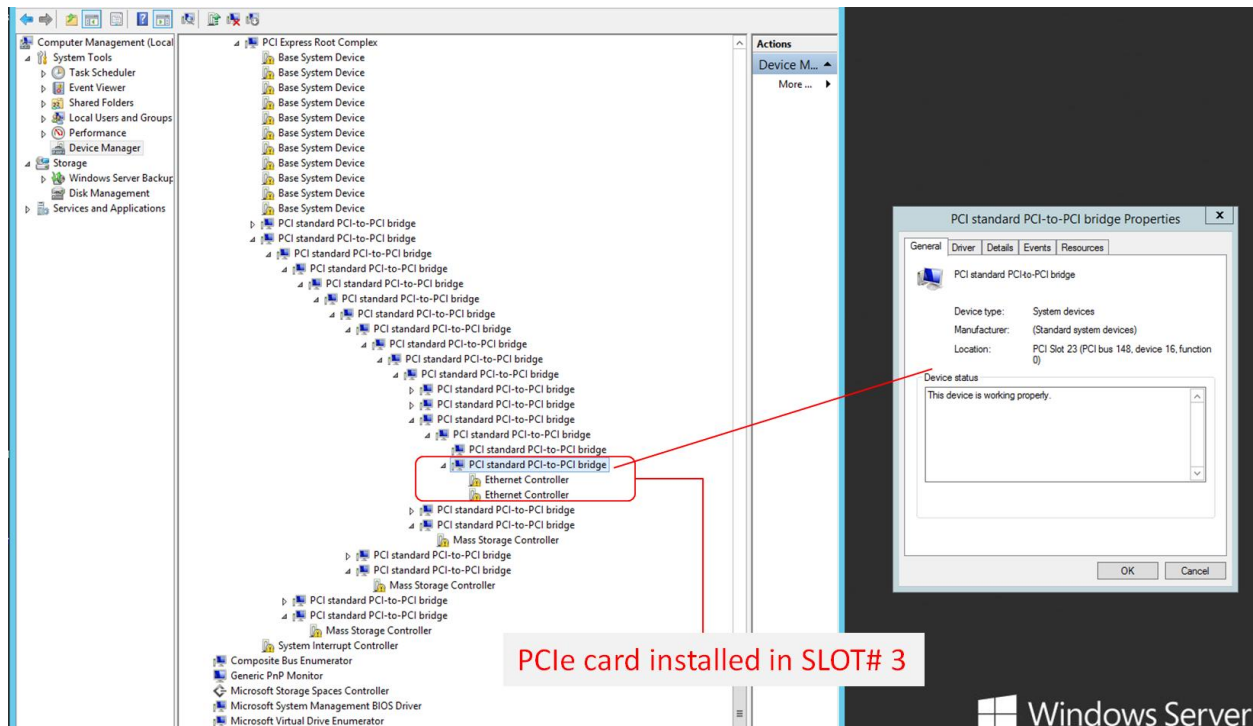
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 1



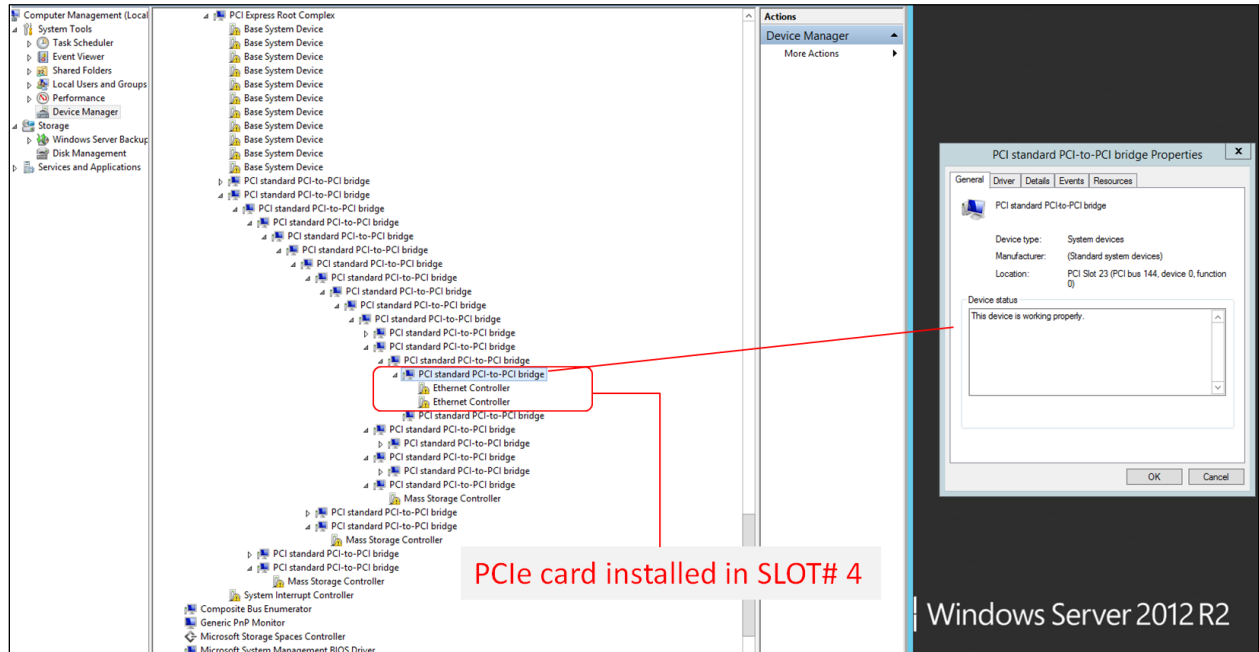
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 2



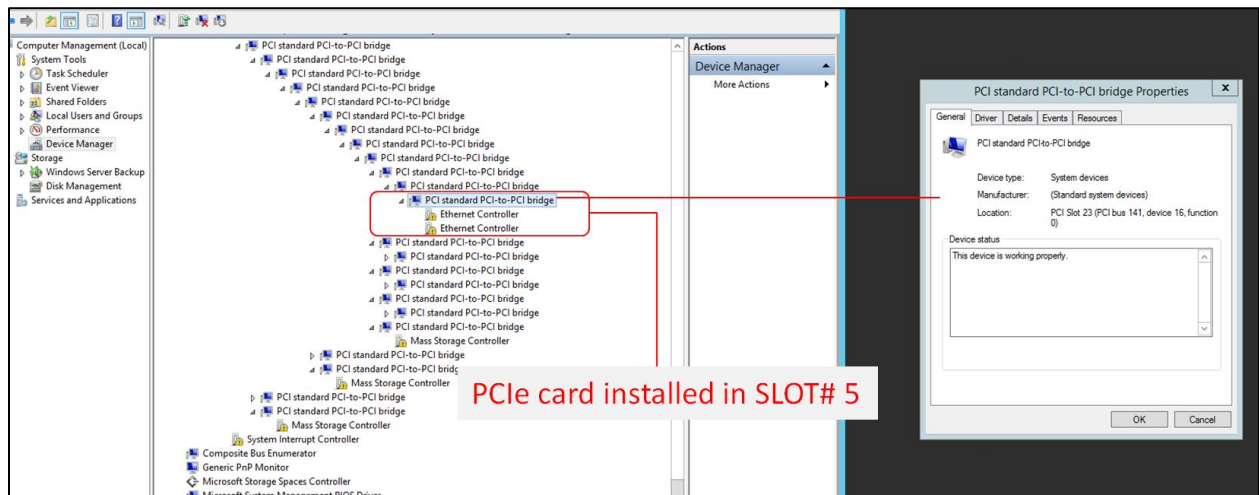
Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 3



Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 4



Below screenshot is showing the OSS-522 backplane with a single PCIe card installed in SLOT# 5



8 PCIe card Installation

This chapter provides information on how to install GPU cards or PCIe cards into your One Stop Systems expansion chassis. More details on the installation of individual cards are provided by the card's manufacturer. For the purpose of installation, the One Stop Systems expansion chassis functions exactly as a standard desktop computer chassis. Always follow the manufacturer's instructions for installing their card or hard drive on a desktop computer.



CAUTION

Hardware installation shall be performed only by qualified service personnel per UL and IEC 60950-1.



IMPORTANT

We will provide reasonable technical support with GPU cards or PCIe cards. However, if you have verified a successful installation of the One Stop Systems expansion system, but experience difficulty installing your GPU cards, please contact the card manufacturer for support.

8.1 Power Down System

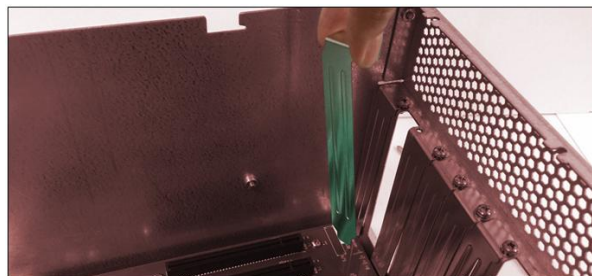
You must turn OFF or power down the system before you start installing PCIe cards. After you have completely power down the system, disconnect or remove the power cords and cables from the back of the expansion chassis.

8.2 Open PCIe Expansion Chassis

Unscrew the four screws on the front of the unit and slide the lid towards the front as shown below:



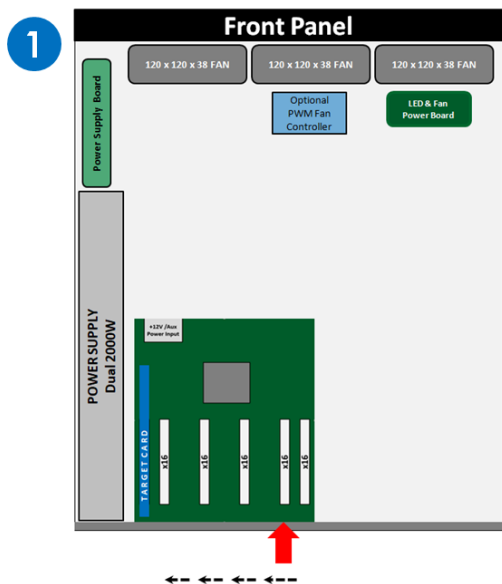
Remove slot covers



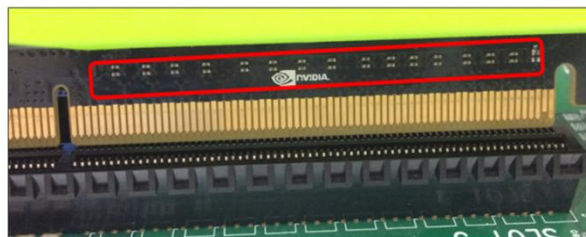
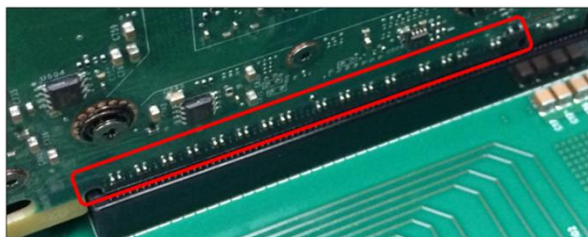
8.3 Installation of GPU

8.3.1 Before you begin

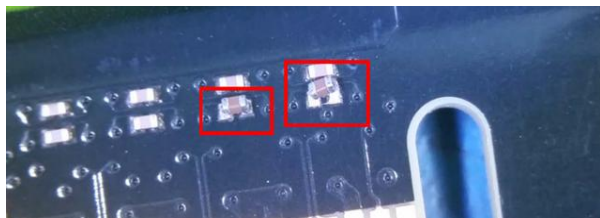
A double-wide GPU cover two slots. When installing a double-wide or dual-width GPUs you must begin placing the GPU in the far right end of the backplane (looking from the rear). This will allow you to see the slot location and align the GPU connector easily on top of the slot.



There are tiny components that are mounted above the gold-finger connector of the K80 and some GPUs, see pictures below. When these components are broken off or become detached from the GPU board, your K80 or GPU will be inoperable.



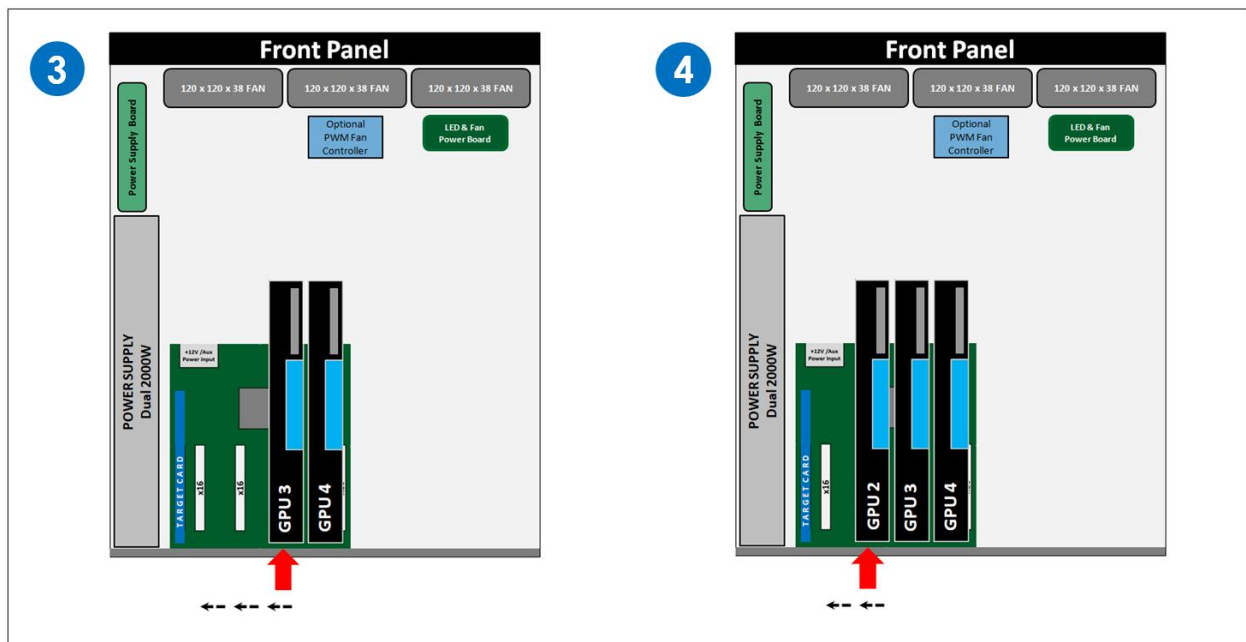
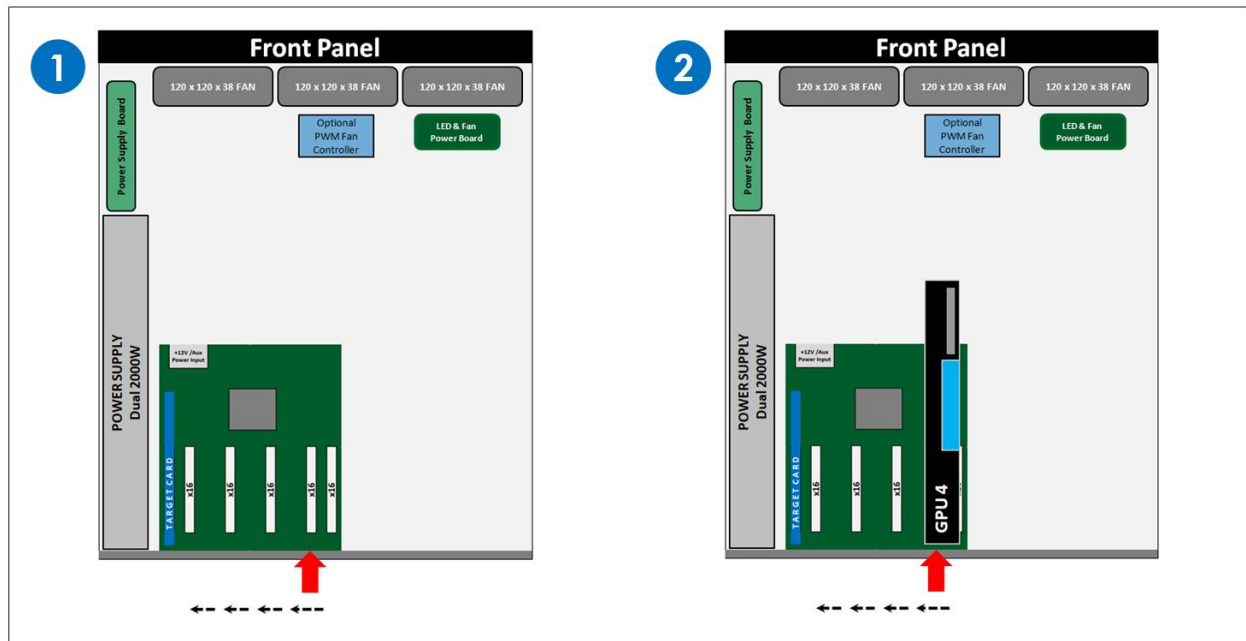
Be very careful and cautious when plugging in a GPU into a PCIe slot. Failure to align the GPU on the slot can damage one of the components. See picture below as an example of a detached / damaged components.

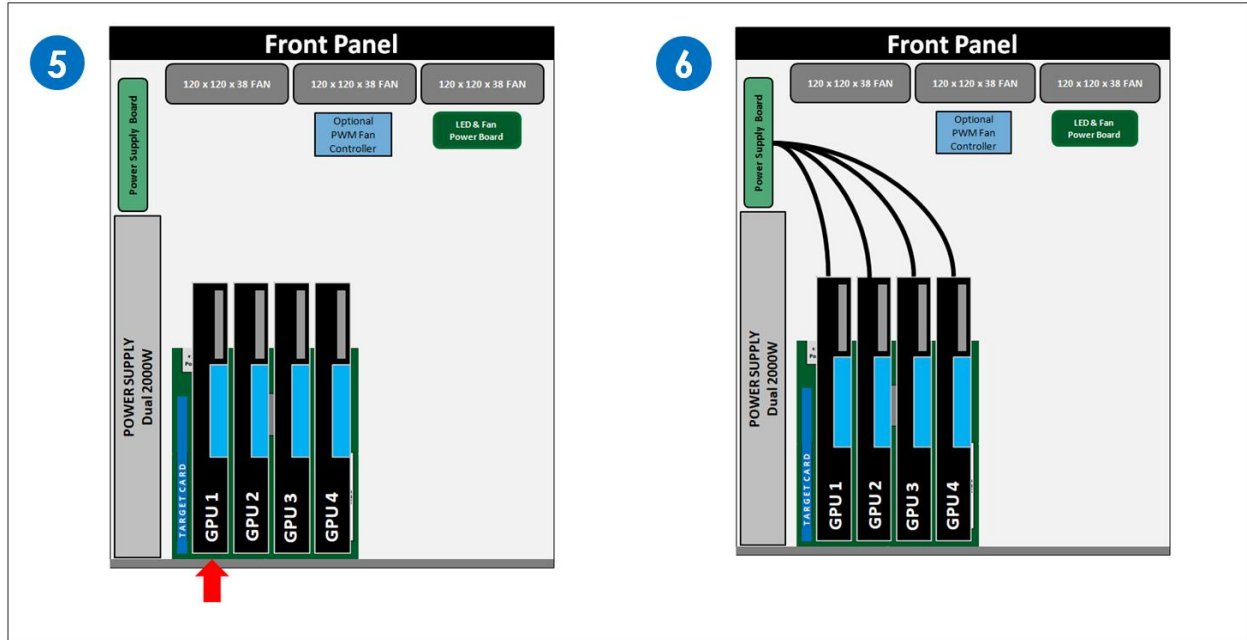


8.3.2 Install GPU cards

NOTE: Be sure to install the GPU cards following the card manufacturer’s recommendations. Some GPU card manufacturers recommend that you install their software driver(s) prior to installing the hardware. If this is the case, you should install their driver or software before you connect and power up the expansion chassis.

Install GPU card one at a time starting from RIGHT to LEFT (see reference photos below). Align the card on top of the slot. Gently push the card down until it is firmly seated. Make sure that all GPU cards are secured.





Make sure all the GPUs are firmly secured before connecting the aux power cables!

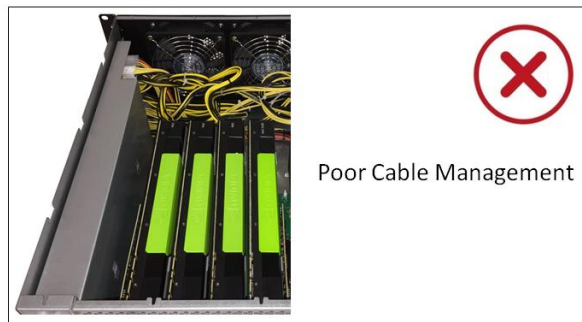
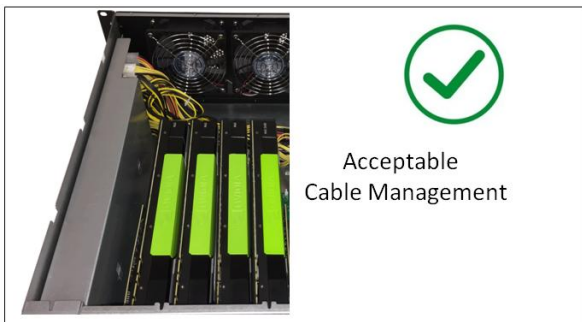
8.3.3 Connect Aux Power Cable

Connect the auxiliary power cables. Plug in the appropriate auxiliary power cable to each GPU. For details on Aux power cables go to section 8.8.



8.3.4 Auxiliary Cable Management

Route the cables away from the fan. Make sure the cables are not blocking the air flow. Use a zip-ties or tie-wraps to tuck the cables in; Or a Velcro to hold or tie down the cables. For acceptable cable management versus poor cable management, see photos below.



NOTE: Do not operate or run the unit with the cables blocking the fan as this can impede the airflow and can lead the GPU cards to overheat.

8.4 Re-install top cover

Re-install top cover when done installing all your PCIe cards to allow proper airflow.

8.5 System Power UP

Reconnect the power cords to the back of the expansion unit. Reconnect the link cables, make sure both are firmly attached to the interface cards (Host and Target cards), then power up the Host computer.

The Host computer with the Host interface card installed controls the power-up for the entire system.

The PCIe link cable must be attached between the host and target cards. When the Host PC is powered ON, a signal is sent over the PCIe link cable to turn ON the 4U Value expansion system.

If the expansion system fails to power up, check the cable(s) make sure it is / are firmly attached and both interface cards are seated in the slot properly.

If you have two Host computer attached to the expansion system, the first Host computer to power UP turns ON the expansion system. The last Host computer to power down turns OFF the expansion system.

The system should be up and running, the next step is to check and verify whether the PCIe cards are detected or not. Use the procedures detailed in **Chapter 6** to confirm the card installation(s) in the Windows Device Manager, Linux and Mac OS.

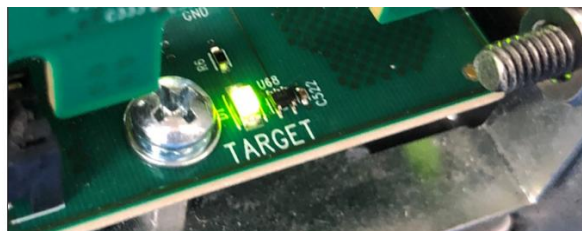
9 PCIe HW Verification

9.1 Verify PCIe Hardware

After the system is powered up, check inside the unit and pay attention on the slot LEDs. You should see all LEDs are illuminated (see pictures below). This is an indication that a card in the slot is recognized and detected. Depending on the type of PCIe card that is present in the slot will dictate the LED behavior. If there is no card present in the slot, the slot LED will be OFF.

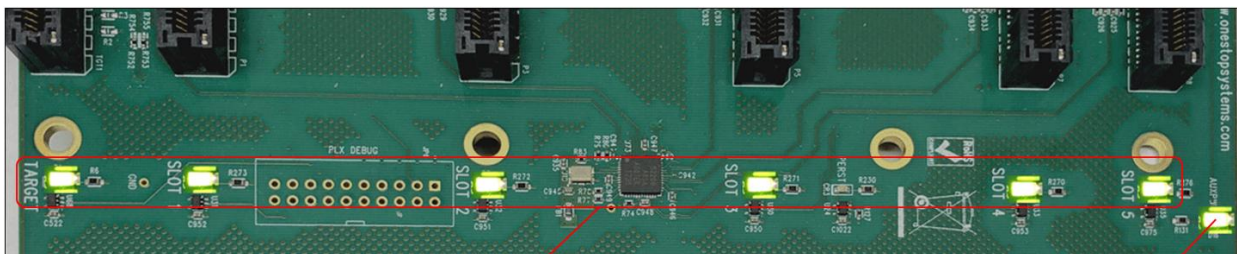
- After the host computer is powered UP, the Target LED on the backplane will come up as solid green.

9.1.1 Target SLOT LINK LED



9.1.2 Slot LINK LEDs and AUX LED

- The SLOT Link LED will come ON if a PCIe card is occupying the slot.
- The AUX LED will be lit as solid green



Slot Link LEDs

AUX LED

9.1.3 Slot LED Status indicators

Solid = Gen4 Link
Blink 2Hz = Gen3 Link
Blink 1Hz = Gen2 Link
Blink 0.5Hz = Gen1 Link (Slow Blinking)
OFF = No card installed

Check the LINK LEDs on both Host and Target cards, go to Chapter 4 for more information.

9.2 Check PCIe cards on Windows OS (i.e. Server)

Go to section 6.2.1 Windows for more details

9.3 Check PCIe cards on Linux OS

To check on PCIe cards or GPU cards on Linux OS, type `lspci -vtt` or `lspci-tv` command on the terminal window.

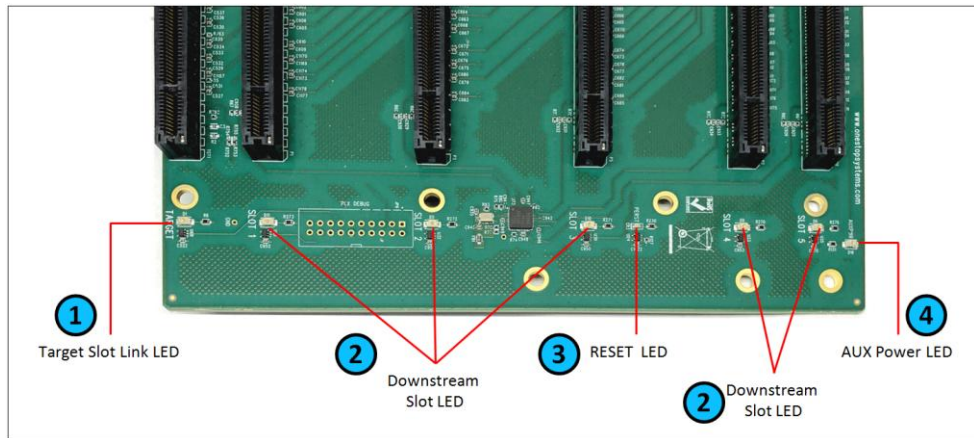
Go to section 6.1.1 for more details

9.4 Check PCIe cards on Mac OS

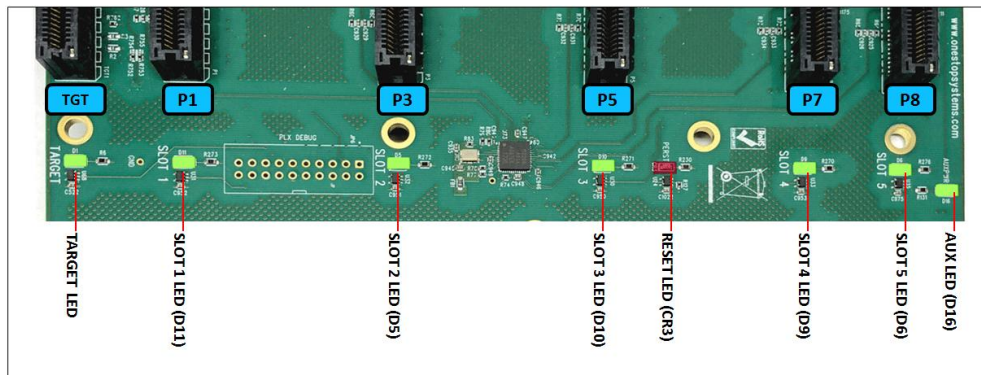
Not tested.

10 General & Other Technical Information

10.1 Board LEDs



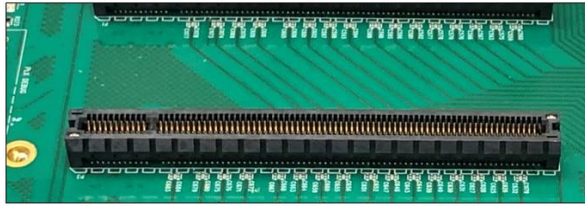
Item	Name	Description	When Lit (Solid Green or Blinking)	When Off
1	Target Slot Link LED	Upstream Slot LINK LED	Solid = Gen4 Link Blink 2Hz = Gen3 Link Blink 1Hz = Gen2 Link Blink 0.5Hz = Gen1 Link (Slow Blinking)	OFF - Not Linked / No Card present in the slot
2	Downstream Link LED	PCIe slot LINK LEDs	Solid = Gen4 Link Blink 2Hz = Gen3 Link Blink 1Hz = Gen2 Link Blink 0.5Hz = Gen1 Link (Slow Blinking)	OFF - Not Linked / No Card present in the slot
3	Reset LED	Board Reset LED	This is RED, when this LED is lit, the PE_RST from the target card is low.	The target card signal is good
4	Aux Power LED	Auxiliary Board power LED	This is GREEN, denotes existence of auxiliary power +5VAUX	Board is at fault / error



LED Name	Target LED	SLOT 1	SLOT 2	SLOT 3	Reset	Slot 4	Slot 5	Aux
LED Component	D1	D11	D5	D10	CR3	D9	D6	D16
PCIe Connector	TGT	P1	P3	P5	-	P7	P8	

10.2 PCIe Slot Type

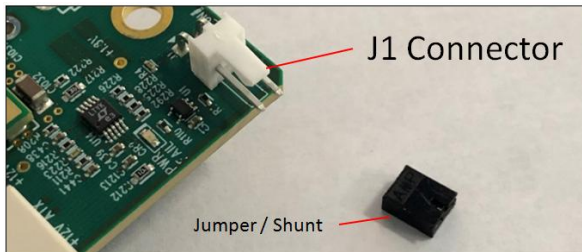
Slot Type: Closed-ended PCIe slot / connector, x16 mechanical and x16 electrical Gen 4.



- Closed-ended PCIe slot / connector
- x16 Mechanical , x16 Electrical

10.3 Force Power ON

The board has a connector for a shunt / jumper, which allows the backplane to force the ATX supply to power ON. See photos below for the location of the J1 connector on the backplane.



10.4 Power Cords

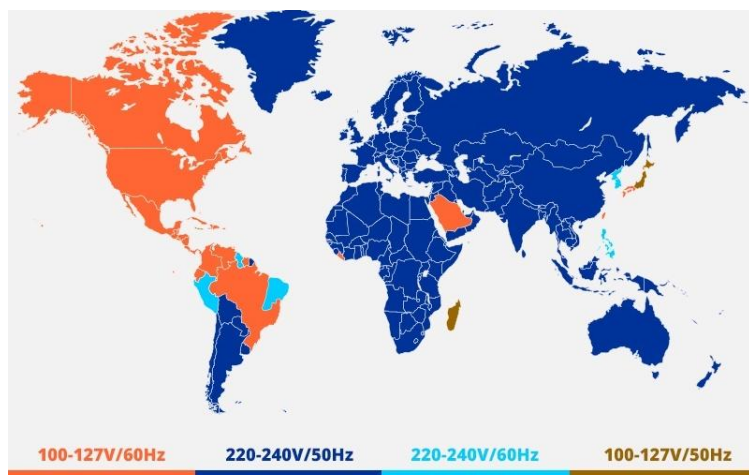
Two types of power cords can be used with this expansion unit, 125V and 250V.



10.4.1 Specifications

OSS PART#: 290-001-012-RC (125V)		OSS PART#: 290-001-032-RC (250V)	
Description: CORD NEMA5-15P C-13SJT		Description: CORD PWR MALE-FEMALE SJT	
Part Status	Active	Part Status	Active
Style	Male pins (Blades) to Female Sockets (slots)	Style	Male pins (Blades) to Female Sockets (slots)
1 ST Connector	NEMA 5-15P	1 ST Connector	IEC 320-C14
2 ND Connector	IEC 320-C13	2 ND Connector	IEC 320-C13
Number of Conductors	3	Number of Conductors	3
Cord Type	SJT	Cord Type	SJT
Wire Gauge	14 AWG	Wire Gauge	14 AWG
Shielding	Unshielded	Shielding	
Approval Marks	CSA, UL	Approval Marks	CSA, UL
Approved Countries	Canada, USA	Approved Countries	
Voltage Rating	125V	Voltage Rating	250V
Current Rating	15A	Current Rating	15A
Operating Temperature	60°C	Operating Temperature	105°C
Digi-Key Part#	Q944-ND	Digi-Key Part#	1175-1312-ND

10.4.2 Power cord socket and voltage tables world standards



10.5 Power Supply

The 4U Value expansion chassis has an 80 Plus Titanium power supply capable of supplying 2000W output power at 91% efficiency. This power supply is designed not only to provide you with reliable power but also protects it from over voltage, over current and short circuiting via protective circuitry embedded into the unit. It has a mean-time between failure (MTBF) of **greater than 200,000** hours and an LED indicator to keep you informed on normal/abnormal conditions for your PSU.

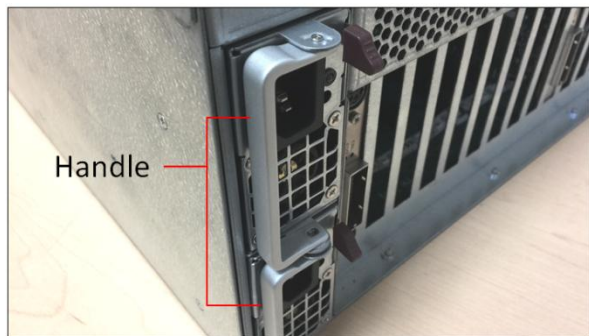
The power supply is redundant to safe-guard your system from power failure and allows for hot-swap replacement to eliminate system downtime. It includes two replaceable modules (ea 2000 W) that share the power load requirements during normal operations. All materials contained comply with RoHS requirements

- Should one module fail for any reason, the power load will be shifted to the other module.
- An indicator for the failure would be the LEDs on the back panel of the power supply behind the chassis.
- For non-functioning equipment, these indicators would not show.



10.5.1 Removing a hot-swap ac power supply

1. Disconnect the power cord from the power supply you are removing.
2. Grasp the power-supply handle.
3. Press the brown release latch to the right and hold it pressed down.
4. Pull the power supply part of the way out of the bay.
5. Release the release latch; then, support the power supply with your left hand and pull it the rest of the way out of the bay.
6. If you are instructed to return the power supply, follow all packaging instructions, and use any packaging materials for shipping that are supplied to you.



The power supply is an 80 Plus Titanium power supply capable of supplying 2000W output power at 91% efficiency. Enjoy the simplicity of active power factor correction (PFC) and automatically correct AC input for a full range of voltages. Features a card edge connector for connection with the backplane of compatible 1U systems. This power supply is designed to not only provide you reliable power to your server but also protects it from over voltage, over current and short circuiting via protective circuitry embedded into the unit. Rest easy knowing your hardware will be up and running with a mean-time between failure (MTBF) of greater than 200,000 hours and an LED indicator to keep you informed on normal/abnormal conditions for your PSU. This power supply is redundant to safe-guard your system from power failure and allows for hot-swap replacement to eliminate system downtime. All materials contained comply with RoHS requirements.

10.5.2 Specifications

General Specifications	
Dimension	346 x 76 x 40 mm (D x W X H)
Total Max Power / Power Output	1000 W @ 100-127Vac 1800 W @ 200-220Vac 1900 W @ 220-230Vac 2000 W @ 230-240Vac
Hold-up Time	11ms @ 75% load
Efficiency	at least 96% Peak @ 50% load
MTBF	200,000 hours @ 25 degree C
PFC	Yes
PMBUS	Support PMBus 1.2
Internal Oring	Yes
N+1 Redundant	Yes
Cold Redundancy	Yes
Full Digital Power Supply	Yes
High Power Density	39.7 W/in ³
Application	HPC, Cloud Computing
80 Plus Certification	80 Plus Titanium

Input Specifications	
Input Voltage	90-264
Input Frequency	50-60Hz
AC Input Rating (Voltage Range / Current Range/Frequency)	2000 W (UL/CUL) 200-240V / 11.8-9.8A /50-60Hz 1000W: 100-127V / 12-9.5A / 50-60Hz 1800W: 200-220V / 10-9.5A / 50-60Hz 1980W: 220-230V / 10-9.8A / 50-60Hz 2000W: 230-240V / 10-9.8A / 50-60Hz

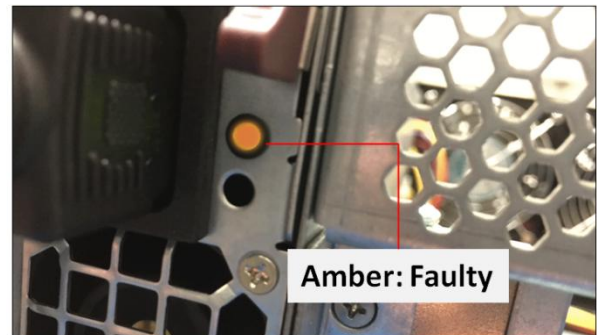
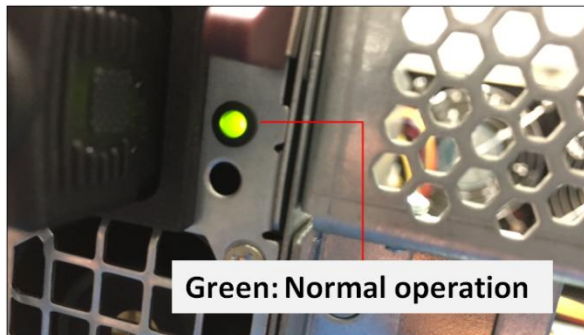
Output Specifications	
DC Output Specifications (Voltage /Max Load)	2000 W (UL/CUL) +12V / 166.7A ; +5Vsb /1A 1000W: +12V / 83.3A ; +5Vsb / 1.0A 1800W: +12V / 150 A ; +5Vsb / 1.0A 1980W: +12V / 165 A ; +5Vsb / 1.0A 2000W: +12V /166.7A ; +5Vsb / 1.0A +5V: N/A +3.3V : N/A

Environmental Specifications	
Temperature	0 to 50 degree C Operating
Altitude	16,5000 feet Operating
Relative Humidity	20% to 90% RH Operating

Safety Regulations	
	UL, cUL, BMSI, CQC, CB, CE, FCC Class A, CISPR Class A, ROHS

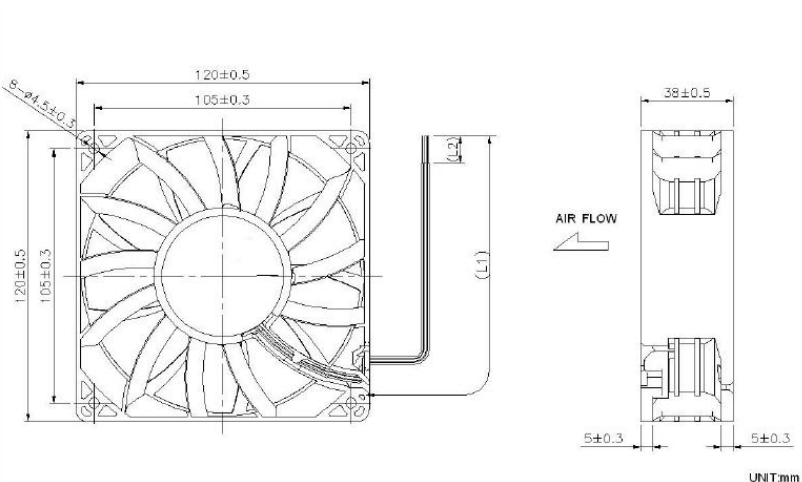
10.5.3 LED Indicator

- A green/amber double color Light Emitting Diode (LED) shall be mounted as indicated in mechanical drawing and shall indicate the status of the DC GOOD signal with green color.
- The LED shall continue to glow under normal operation of the power supply. If this LED is blinking or not lit or in amber color, the power supply is not operating properly.
- During protection mode (main 12V rail), the LED should be amber.
- During protection mode (5Vsb rail), the LED should be off.
- When protection is cleared, the LED should go back to the original intended status.
- When the unit is in standby with AC is present, the LED should be amber.
- When the unit is in standby with no AC is present, the LED should be off.
- When the unit is turned on properly, the LED is green.
- During wakeup redundancy mode, the LED should be Green.



10.6 Fan

The expansion unit has three fans installed enough to provide cooling to the extreme-high-heat-generating GPUs. These are high CFM / RPM and replaceable fans. The standard or default fans have a fixed fan speed (3x lead wires). There is an optional fan that would allow you to control the speed. You can get the PWM controller and 4 wire fans.



10.6.1 Fan Specifications

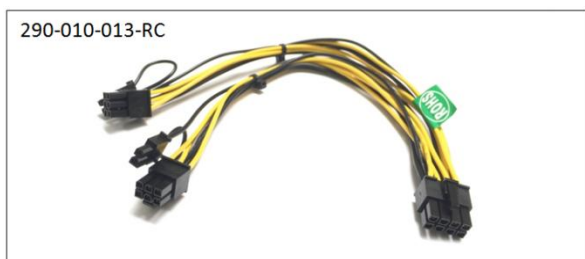
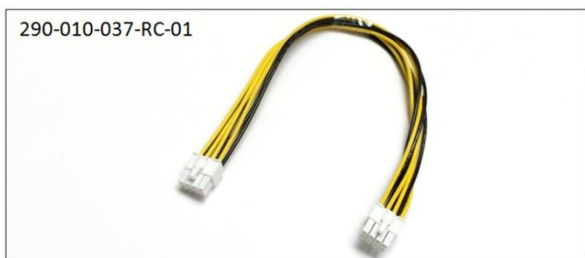
4x Lead wires – PWM / Fan control (Controls Fan Speed)				3x Lead wires – Standard Fan (Fixed Fan Speed)			
Frame& Impeller		PBT, UL94V-O plastic		Frame& Impeller		PBT, UL94V-O plastic	
Dimension		120x38mm (4.7”X1.5)		Dimension		120x38mm (4.7”X1.5)	
Connection		4x Lead wires		Connection		3x Lead wires	
Motor		Brushes DC, auto restart, polarity protected.		Motor		Brushes DC, auto restart, polarity protected.	
Bearing System		Dual ball bearing		Bearing System		Dual ball bearing	
Insulation Resistance		Min. 10M at 500VDC		Insulation Resistance		Min. 10M at 500VDC	
Dielectric Strength		1 minute at 500 VAC, max leakage< 500 MicroAmp		Dielectric Strength		1 minute at 500 VAC, max leakage< 500 MicroAmp	
Temperature Range		-10C~+70C		Temperature Range		-10C~+70C	
Storage Temperature		-40C~+80C		Storage Temperature		-40C~+80C	
Life (L10)		70,000 Hours (40C)		Life (L10)		70,000 Hours (40C)	
Part Number		OD1238-12HBXJ10A		Part Number		OD1238-12HBXJ10A	
Nominal Voltage		12V DC		Nominal Voltage		12V DC	
Voltage Range		7~13.2V DC		Voltage Range		7~13.2V DC	
Rated Current		3.70 A		Rated Current		3.70 A	
Rated Power		44.4 Watt		Rated Power		44.4 Watt	
Rated Speed (RPM)		6000		Rated Speed (RPM)		6000	
Airflow (CFM)		250		Airflow (CFM)		250	
Noise Level (db)		69		Noise Level (db)		69	
Max. Static Pressure		1.48” H ² O		Max. Static Pressure		1.48” H ² O	
Weight		~375 g		Weight		~375 g	
Tachometer – Open Collector PWM				Tachometer – Open Collector			
*Connection UL1007, 24AWG, ~320mm				*Connection UL1007, 24AWG, ~320mm			
Red (+)	Black(-)	White: Tachometer	Blue: PWM	Red (+)	Black(-)	White Tachometer	




10.7 Auxiliary power cables

The aux power cable is available for the unit but it is not a standard item. It is optional and sold separately. If your card requires an extra power, please contact our Sales team.

There are two different sets of aux power cables, see table below.

Aux Power Cable	Part Number	Description	Connector	#of Connector
8 pin	290-010-037-RC-01	Cable Assy, Aux Pwr, 8 Pin, NVIDIA 2.0, 12", Expansion System, M176 (OSS)	8-pin male to 8-pin male	One 8-pin connector
	290-010-037-RC-02	Cable Assy, Aux Pwr, 8 Pin, NVIDIA 2.0, 24" Expansion System, M176 (OSS)	8-pin male to 8-pin male	One 8-pin connector
6+2 pin	290-010-013-RC	Cable Assy, Canister, External Pwr, Dual 6+2 PCIe Graphics Only	8-pin male to 2 6+2-pin male	Two 6+2 pin connectors
	290-010-036-RC	Cable Assy, Aux Pwr, 6+2 Pin, 24", Expansion System, M176 (OSS)	8-pin male to 2 6+2-pin male	Two 6+2 pin connectors

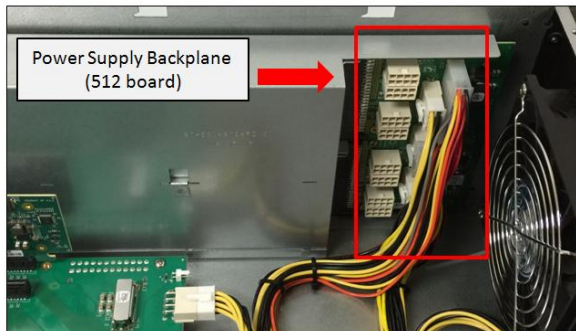
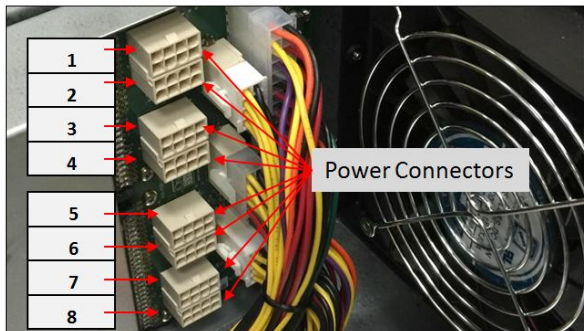


	Connectors	Can provide power of
	8 pin	150 Watts
	Two 6+2 pin	300 Watts
	6 pin	75 Watts

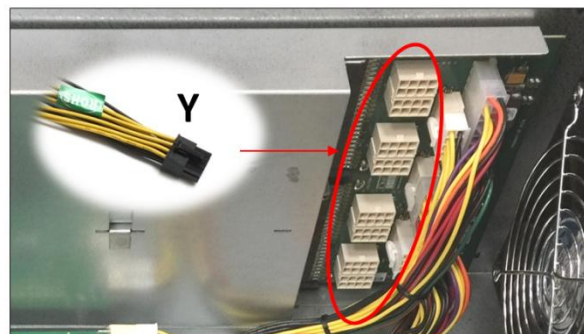
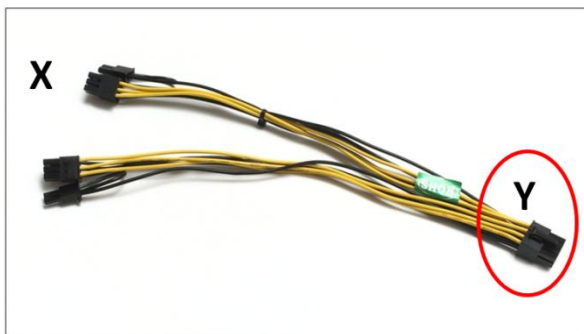
10.7.1 Aux power cable installation

Eight is the maximum number of aux power cables that can be plugged in or used with this model.

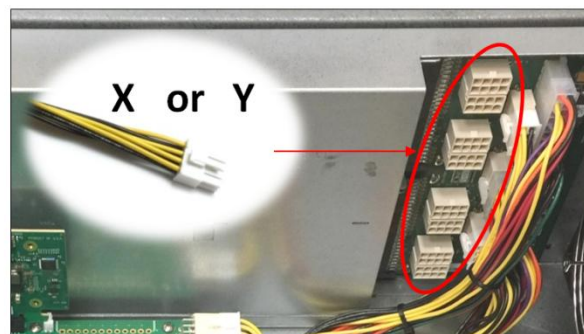
The extra power is supplied directly from the power supply backplane (512 board) and there are 8 available power connections / ports in which the auxiliary power cables are plugged in, see photo below.



To plug in or connect the 6+2 pin cable to the power supply backplane, use the “Y” end of the cable, see photos below.



To plug in or connect the 8-pin cable, you can use either X or Y end of the cable, see photos below.



Ensure the cable is fully seated and secured.

There are eight available 8 ports / connections on the power supply backplane in which you can plug in the aux power cables. You can only use the OSS supplied 8-pin and 6+2 pin aux power cables (290-010-037-RC-01/02, 290-010-013-RC and 290-010-036-RC).

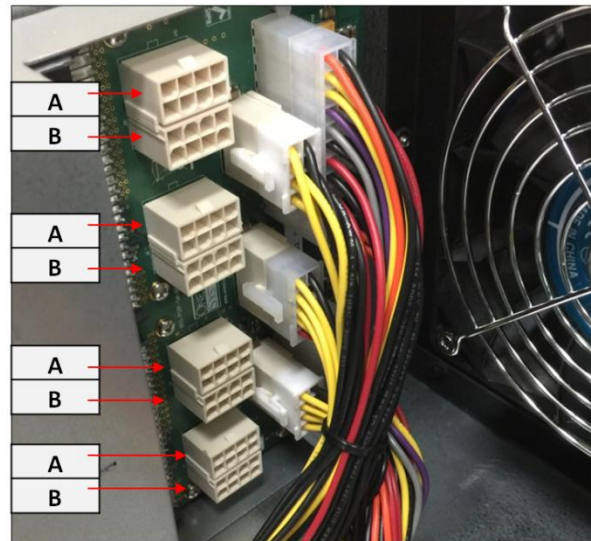
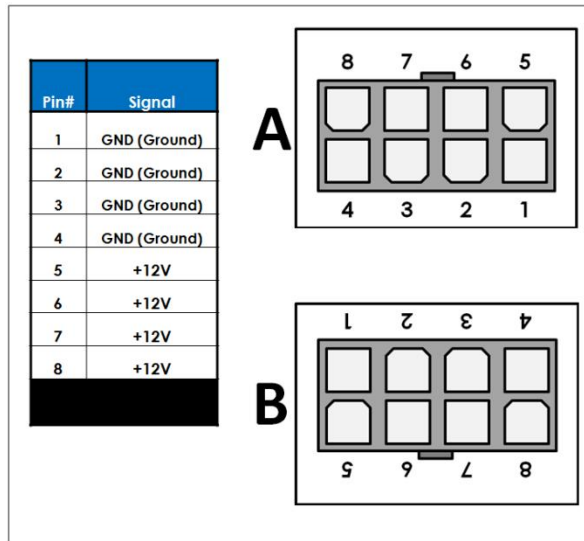


NOTE

Route cables away from FANs. For safety and proper airflow avoid blocking the fans.

10.7.2 Pin Outs

PSU board aux port pin outs



8-pin aux power cable and pin outs

Figure A1

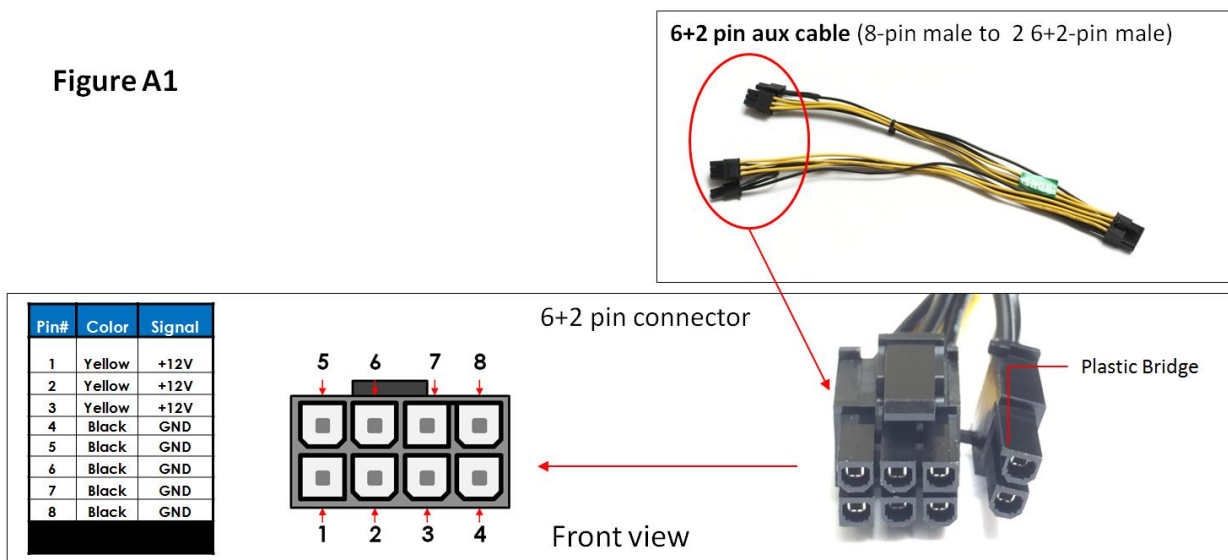
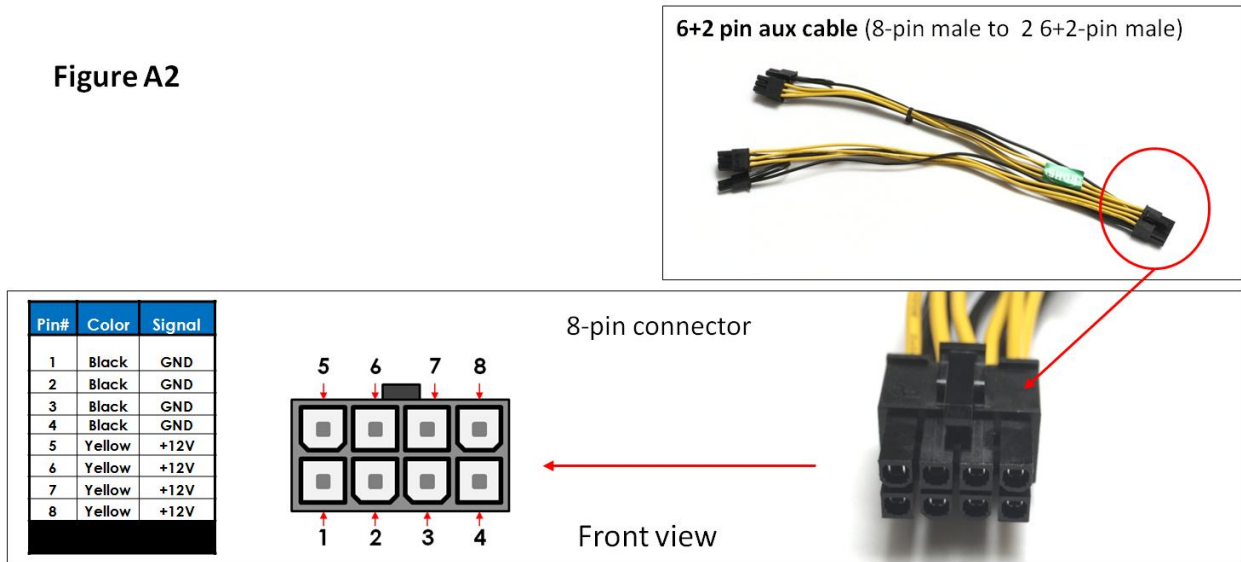


Figure A2



6+2-pin aux power cable and pin outs

Figure B1

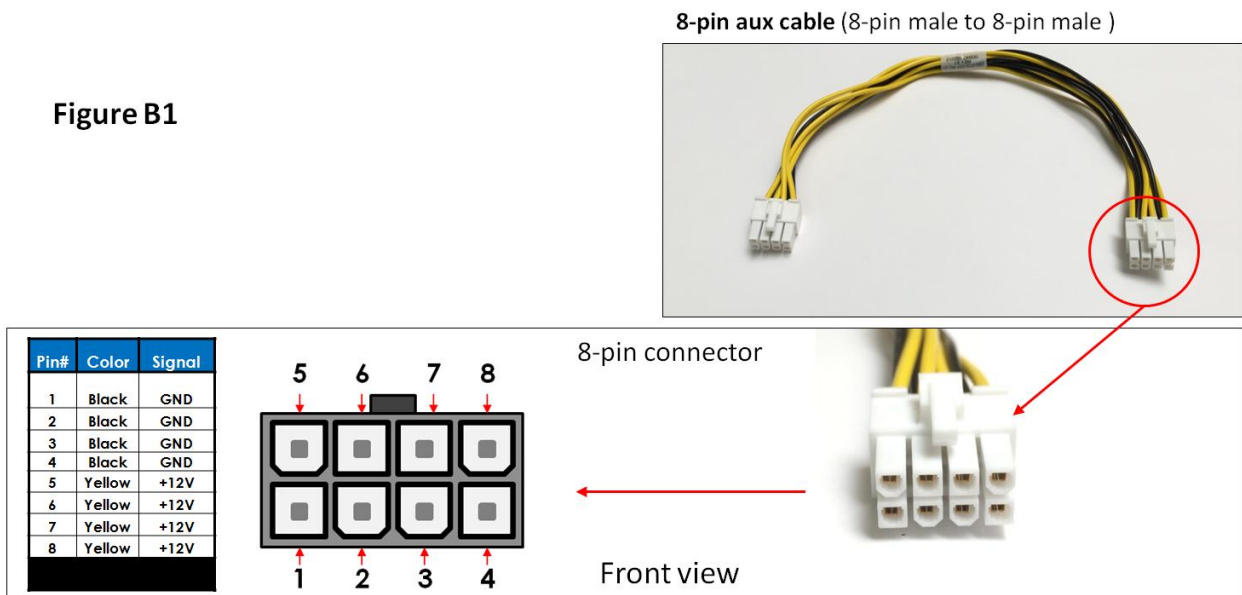
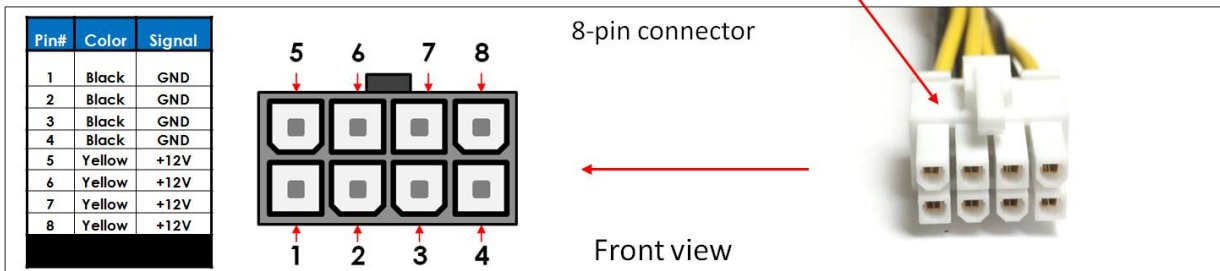
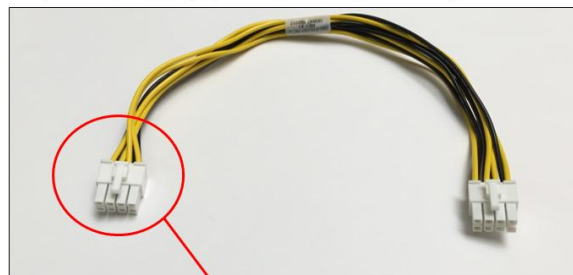


Figure B2

8-pin aux cable (8-pin male to 8-pin male)



10.7.3 Using the Auxiliary Power Cable

When using a PCIe card such as an FPGA card or GPU card that requires additional power you would need the aux power cables. Depending on the power requirement of your PCIe card, it will have a different built-in aux power port in which you attach the aux power cable.

A PCIe slot only provides 75 watts of power, there is not enough to meet the power requirement for a high-end with power consumption of over 125Watts or more for example. A direct connection to the power supply is needed to obtain additional power. This can be done by using the 6+ 2 pin or 8 pin auxiliary power cable. The below photos represent how the 6+2 pin connector and 8 pin aux power cables are attached to the PCIe card or GPU card.

The photo below is an example of a PCIe card or GPU card that has two 6-pin power connectors. You need two 6+2-pin aux cables to provide extra power.



The photos below are example of a PCIe card or GPU card that has a 6pin power connector. You need one 6+2pin aux cable to provide extra power.





The photo below is an example of a PCIe card that has an 8pin power connector. You need one 8-pin aux cable to provide extra power.



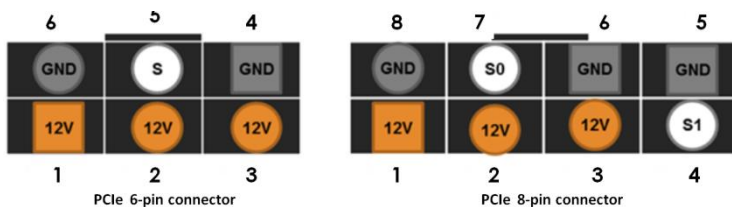
Each PCIe x16 slot on the 522 OSS board provides 75 Watts of power which is adequate for most video cards. But a high-end GPU cards usually need more power. To accommodate graphics cards needing more than 75 watts, the **PCI-SIG (Special Interest Group)** introduced two standards for supplying additional power to a video card via additional graphics power connectors:

- **PCI Express x16 Graphics 150 W-ATX Specification**—Published in October 2004, this standard defines a six-pin (2x3) auxiliary power connector capable of delivering an additional 75 W to a graphics card directly from the power supply, for a total of 150 W to the card.
- **PCI Express 225 W/300 W High Power Card Electromechanical Specification**—Published in March 2008, this standard defines an eight-pin (2x4) auxiliary power connector capable of supplying an additional 150 W of power, for a total of either 225 watts (75+150) or 300 watts (75+150+75) of available power.

Graphics Card Auxiliary Power Connector Configurations	
Maximum Power Draw	Auxiliary Power Connector Configuration
75 Watts	None
150 Watts	One six-pin connector
225 Watts	Two six-pin connectors*
300 Watts	One eight-pin connector + one six-pin connector
375 Watts	Two eight-pin connectors
450 Watts	Two eight-pin connectors + one six-pin connector

*May optionally use one eight-pin connector instead

GPU Card Power Connectors



Pin	PEX 6-pin	PCe 8-pin
1	12V	12V
2	12V	12V
3	12V	12V
4	GND	SENSE1
5	SENSE	GND
6	GND	SENSE0
7	--	GND
8	--	GND

Example below, when using a GPU card that has a maximum power consumption of 300 Watt. It has an 8-pin and 6-pin power connectors.

Number of Pins	Watt
6 pin connector	provides 75 Watts
8 pin connector	provides 150 Watts

To provide additional power, you need two 6+2pin cable connectors, see Figure A.

Note:300 Watt power needed = 75 Watt from PCIe slot + 75 Watt from 6-pin + 150 Watt from 8-pin.



Figure B shows the wrong power cable to use due to special keying on the eight-pin connector. The GPU power connector has a different keying to prevent interchanging with the +12 V power connectors.

NOTE: We do not provide different aux power cables (i.e. 8pin to 4pin Molex) other than what we offer. If your PCIe card requires a different power adapter or aux power cable, you would have to buy it from other electronic stores.

10.8 Expansion System Power Consumption

The 4U Value expansion unit draws a maximum of 262 Watts (3 Fans + 2 Backplanes + 2 Interface boards) of power without any boards / cards installed.

10.8.1 Power consumption breakdown per hardware

Item	Hardware	Power Consumption
1	Target Cards	15 Watt per card
2	Fans	44.4 Watt per fan
3	Backplane	Typical is 40 Watt min, Worst Case is 50 Watt max (per backplane)

- Three Fans: 132 Watts
- Two Target cards: 30 Watt
- Two boards: 100 Watts (max)

11 Fan Controller

An optional fan PWM controller is available. Customer can purchase the configuration with the fan controller installed.



If you require the fan controller upgrade you need to contact our Sales Team (sales@onestopsystems.com).

- The upgrade can only be done in house (at OSS manufacturing plant).
- You have to send the unit back to One Stop Systems.

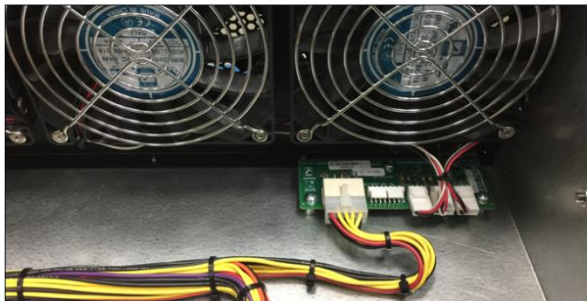
The upgrade involves the following:

1. Changing the three fans
2. Connecting new wires
3. Setting up the Dip switches on the fan controller.
4. Drilling holes beneath the enclosure for mounting the PWM controller device.

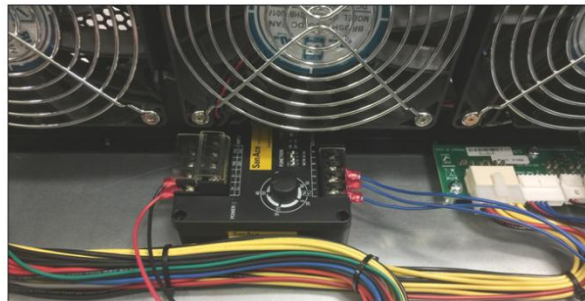
Parts required: You need to order a set of fan (qty 3) and 1 PWM controller. Contact our Sales team for details.

The photos below are an example of two units: one unit with fan controller installed and one without the fan controller.

Without fan controller

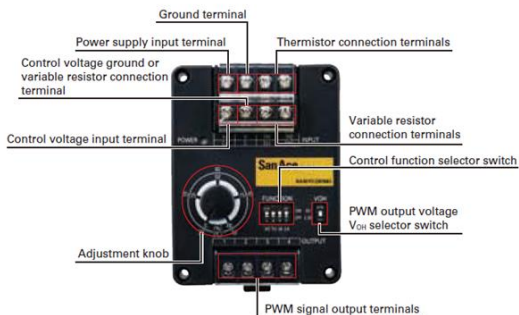


With fan controller



The 4U 10-slot Value Expansion chassis is designed to work with all types of PCI Express cards. Some PCI Express cards produce substantial heat and must be cooled properly to eliminate over heating problem. There are three fans located at the front of the enclosure to provide cooling required for the hottest PCI Express cards. As safety measure, by default the OSS provides 4U 10-slot Value expansion chassis with the fans functioning at full speed to prevent high-heat generating PCIe cards from over-heating

If noise is a concern, we provide an optional fan PWM Controller to help alleviate fan noise in situations when a low heat producing card is installed in the expansion unit. You can manage the velocity or speed of the fan by adjusting the "Adjustment Knob" to the desired percentage. When the PWM percentage is at 100%, the fan spins at maximum speed. When the PWM cycle is at 0%, the fans are stopped.



Adjustment knob:

- Primary function: Adjusting the speed of the fan. 100%= max speed; 0%= fan is stopped.
- Turn the knob counter-clockwise, reduces the fan speed. Turn the knob clockwise, increases the fan speed.

Control Function Selector Switch:

- Correct settings to operate the PWM Controller: 1(VO)=OFF , 2(TH)=OFF, 3(IA)=ON, 4(EA)=OFF

The PWM Controller in this setup can be operated in internal adjustment function (IA) only. This is why the IA is ON and the others are OFF. In the IA mode the adjustment shows the percentage duty cycle of the PWM (0%-to-100%). The 30-50 scale is only for TH and EA modes and is not being utilized in this configuration.

VO: Voltage control	TH: Thermistor control	IA: Internal adjustment control	EA: External adjustment control
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PWM output voltage V_{OH} selector switch:

- The default setting for V_{OH} is 5v. The 5V level needs to be set for the fan to have the correct maximum voltage.

Power LED Green:

- When PWM Controller is ON, the LED will be illuminated as solid GREEN.

11.1 Specifications

Item	Specifications	Remarks
Model no.	9PC8666X-S001	
Size [mm]	86 (H) × 66 (W) × 38 (D)	
Rated voltage [VDC]	12, 24, and 48	
Power consumption [W]	0.2 W	
Operating voltage range [VDC]	7 to 60 VDC	
PWM signal output	High-level voltage (VOH)	3.3 V or 5 V
	Low-level voltage (VOL)	0.4 V or lower
	PWM frequency	25 kHz
Operating temperature [°C]	-20 to +70°C,	Non-condensing
Storage temperature range	-30 to 70°C	Non-condensing
Humidity (Operating and Storage)	20 to 85% RH	Non-condensing
Output PWM signal	VOH (high level voltage): 3.3 or 5 VDC (selectable). Frequency: 25 kHz	
Material	Case: Plastics	
Mass	Approx 110 g	
Insulation resistance	10 MΩ or higher using a 500 VDC insulation resistance tester.	Between the power supply input terminal and case
Dielectric strength	500 VAC (50/60 Hz) for 1 minute	Between power supply input terminal and case

12 Troubleshooting

12.1 Locating the Problem

If you are having trouble with the One Stop Systems expansion system, first verify that all cards and cables are seated properly. Be sure you followed the instructions in earlier sections of this Service Manual. Always remember to power **On** and **Off** correctly when rechecking your installation. If you are still having problems, try these troubleshooting steps:

- My Computer Can't Find the PCIe Expansion System
- My PCIe Card Doesn't Work
- My system hangs beyond a certain number of add-in cards

12.2 My Computer Cannot Find the PCIe Expansion System

If the 4U Value expansion system is not being detected or recognized by the computer operating system (via Windows Device Manager, Linux –vtt output, or Apple System Profiler) do the following

1. You will need to turn off your computer (and the expansion unit) and then reseal all link cables to ensure you have everything connected correctly
2. Verify that the required LEDs on the back of the Target and Host carfare lit as explained in Chapter 4.
3. Verify the Target card in the correct designated slot and the Host card are properly inserted into the host computer x 16 slot. Make sure the switches settings on both cards are set correctly.
 - Try moving the Host card to a different PCIe slot (if a slot is available).
 - Try another host computer.
 - If the expansion system is still not visible after trying all of the above steps, try replacing the Link cables, and both interface cards.
 - If you are still having problem, you may need to send your unit for service.

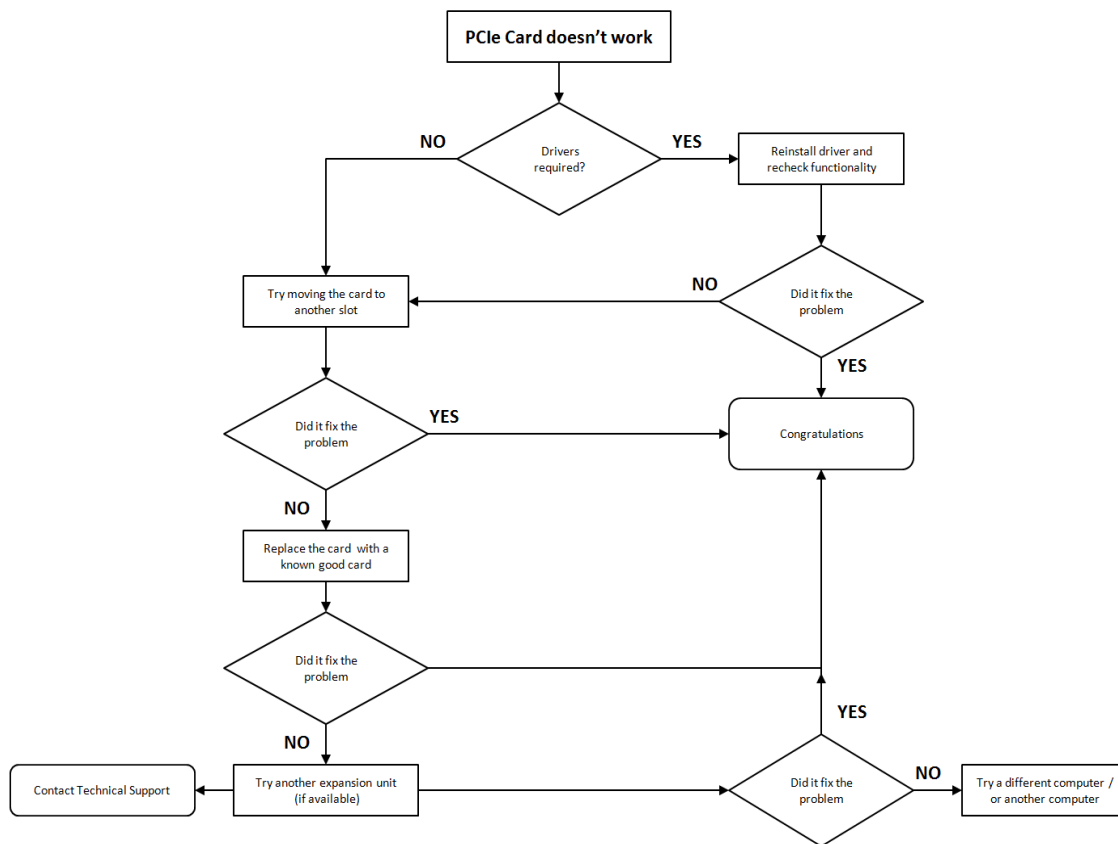
12.3 My Computer Hangs During Power Up

If your computer “hangs” while being turned on and you cannot even start, follow the following steps to try to fix this problem:

1. Shut off the computer (first) and then the One Stop Systems expansion system and verify that all cards and cables are connected and seated correctly.
2. If it still hangs and you have added one or more cards in addition to several PCIe cards, ensure that you have not exceeded the power capabilities of the expansion system’s power supply. You can verify the capacity of your power supply by checking the label on the power supply. If you are not certain about the power consumption of your peripherals, it is best to remove them one by one (starting with those you suspect of being most “power hungry”) until the system powers up.
3. If you have removed all 3rd Party PCIe cards from the One Stop Systems chassis and it still hangs, try the following:
 - a. Remove the One Stop Systems PCIe host card from the computer and try booting up without the One Stop Systems expansion system attached.
 - b. If it boots up OK withoutthOne Stop Systems expansion system attached, call One Stop Systems Technical Support.
 - c. If it still hangs, the problem is in the computer and not with the One Stop Systems expansion system or the 3rd Party PCIe cards.
 - d. If it booted up OK without any 3rd Party PCIe cards installed, try adding only one card and see if it boots up
 - e. If it boots up OK wth one card, shut it down and swap the card. Repeat this until all cards have been tested.
 - f. If they all test OK, then add the card one at a time until you find the combination that does not work.
 - g. If you find that one of your card is bad card, replace it, you fixed it!

12.4 My PCIe Card Doesn't Work

The following flowchart describes a general approach to resolve PCIe card issues:



12.5 Support for 3PrdP Party PCIe Cards

One Stop Systems will provide reasonable technical support to with 3rd Party PCIe cards. However, if you have verified a successful installation of the One Stop Systems expansion system, but experience difficulty installing your 3rd Party PCIe cards, the card manufacturer should be able to provide the best support.



IMPORTANT

The One Stop Systems expansion unit is designed to function exactly like your desktop computer. This means that you should follow the card maker’s instructions for installation on a Windows or Mac computer as if the expansion chassis WAS the desktop computer. When correctly installed, there is no difference to the operating system, removable cards, or most software.

12.5 1 Windows Error Codes

If you are having a problem with one of your devices, and the Device status box shows a Windows Error Code, refer to the following list of error codes for guidance. These Windows error codes would help in troubleshooting and isolating the problem.

Error Code	Description/Action
10	This code indicates that there is a problem with the 3rd Party PCIe Card driver. If necessary, contact the card's manufacturer for updated software drivers. If all else fails, contact One Stop Systems Technical Support for further assistance.
28	The driver for the PCIe card is not installed on your system. Reinstall the card driver following the manufacturer's instructions. If that fails to fix the problem, call the card manufacturer for new drivers.
1	The PCIe host card or expansion chassis are not working correctly. Reinstall the PCIe host card into the computer's slot and recheck all cable connections. If the error code remains, try another PCIe slot. If the error persists, call One Stop Systems Technical Support.
12	On the Bridge: If you receive error code 12 on the first PCI to PCI Bridge, call One Stop Systems Technical Support. On the Card: This usually means the memory, I/O, or prefetch is more than has been allocated. Call One Stop Systems Technical Support

When your PCIe device or card is showing up with error, we highly recommend that you contact the vendor or manufacturer of the PCIe card for technical assistances.

Any PCI or PCI Express expansion scheme requires the cooperation of the computer system's BIOS in order to operate properly, regardless of the platform (PC/Laptop/Server) or operating system (MS Windows/MAC OS/LINUX etc.)

The BIOS hosts the first and the most fundamental code (firmware) that a computer executes upon boot-up. It is then that each PCI/PCIe add-in card (be it located on the host system or on One Stop Systems expansions chassis) is allocated Input/output memory space for proper operation.

By installing multiple add-in cards in one chassis or chaining multiple One Stop Systems chasses, we are requesting more and more resources from the BIOS and thus must make sure we pre-allocate them sufficiently.

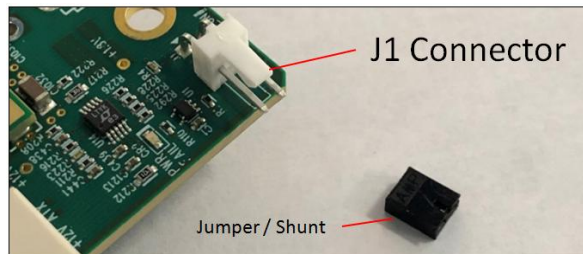
It is therefore imperative that our computing platform allocates **at least 32KB** of I/O memory space to allow multiple add in cards to operate properly. This setting may be editable or preset by your BIOS (or computer) vendor. If you are having this problem it is recommended that you first update your system to the latest firmware provided by your vendor. Instruction on how to do that (as well as making a backup of your current BIOS firmware) should be provided by your computer vendor on their web site. In case this property is editable, you computer vendor should also be able to tell you how to select at least 32KB using their BIOS interface.

12.6 System board fails to power UP

A faulty OSS board can cause the expansion system not to power UP properly. For troubleshooting, you can force power ON the OSS board by placing a jumper on J1 connector, see photos below. This will help you determine whether the board is functioning properly. You need the following items to perform this task.

- Standard ATX power supply with 24pin ATX power cable/connector .
- Jumper or shunt, not provided by One Stop Systems. You can buy this from any online electronic stores.

The board has a connector for a shunt / jumper, which allows the backplane to force the ATX supply to power ON. See photos below for the location of the J1 connector on the backplane.



12.7 PCIe Upstream and Downstream Ports are not detected

1. Shutdown the system
2. Remove all PCIe cards from the slot.
3. Reseat the Target card and host card.
4. Reseat the cables.
5. Power UP the system.
6. Check the LEDs on the back of the Target cards and Host cards. Make sure both LEDs are illuminated as solid green.

If the upstream and downstream ports are still not detected, you would need to move the host card to another PCIe slot. You can try another computer. If you are still having problem try the following.

1. Replace the target and host cards
 - See if it fixes the problem. If problem prevails go to step 2
2. Replace the link cables
 - See if it fixes the problem. If the problem prevails go to step 3
3. Replace the OSS 522 board(s).
4. Send the unit for service / repair

12.8 Expansion System fails to turn ON

Issue:

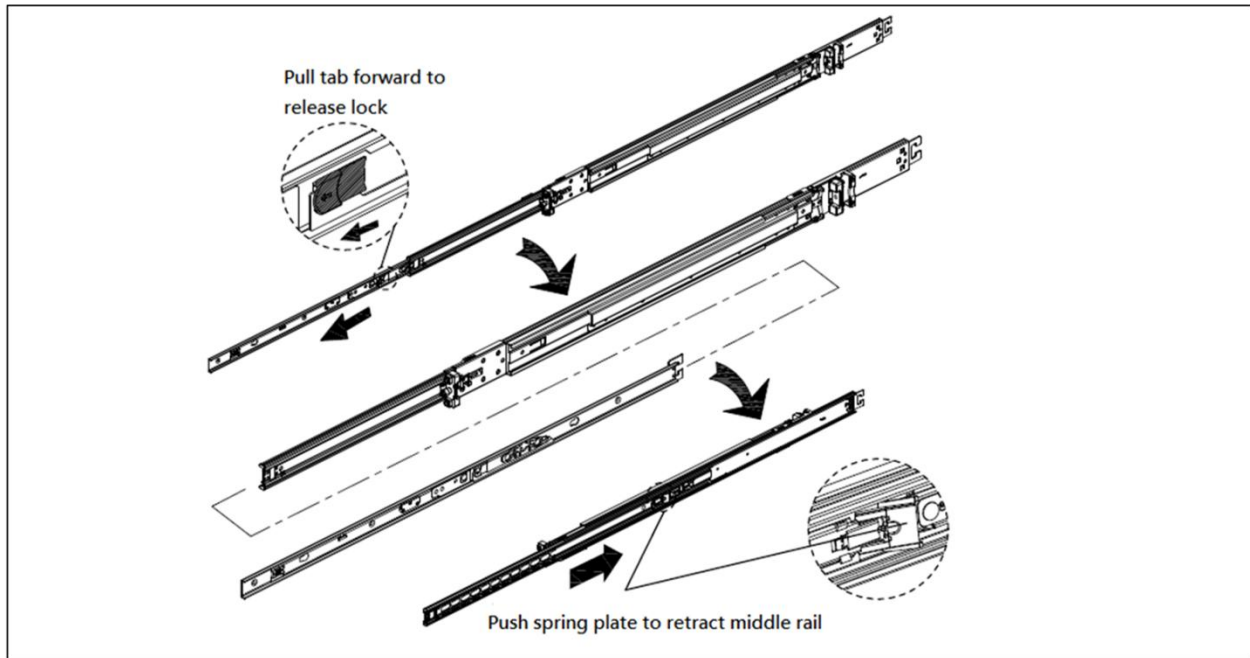
The 4U Value expansion system is not powering ON after replacing the target and host cards.

Troubleshooting steps:

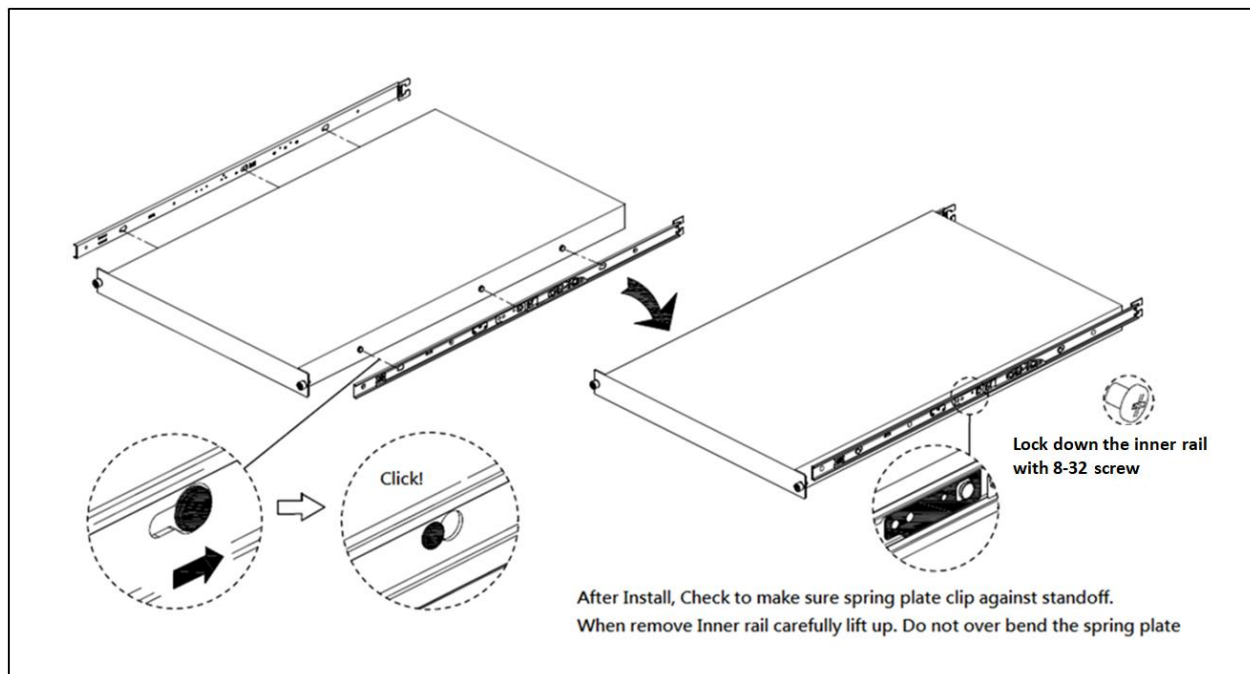
1. Shutdown the system (computer and expansion unit).
2. Disconnect the link cables.
3. Remove the Target and Host cards. Check the target and host cards, make sure you have the correct model OSS-PCIe-HIB38-x16-F.
4. Check the switch settings on the target card.
5. Check the switch settings on the host card.
6. Reinstall the target card (plug the card into target slot).
7. Reinstall the host card (plug the card into x16 Gen3 slot).
8. Make sure the target and host cards are fully seated in the slot and firmly secured.
9. Reconnect the link cables. Make sure the cables are properly connected.
10. Power UP the host computer and expansion system will turn ON.
11. If the expansion system is still not turning ON do the following:
 - a. Move the host card to another PCIe slot (in the host computer). Make sure the slot is x16 Gen3.
 - b. Try another computer.
 - c. Try another link cable (if available).
 - d. Try another set of adapter cards.
 - e. Send the unit for service / repair. You may be having a faulty boards.

13 Rackslide Installation

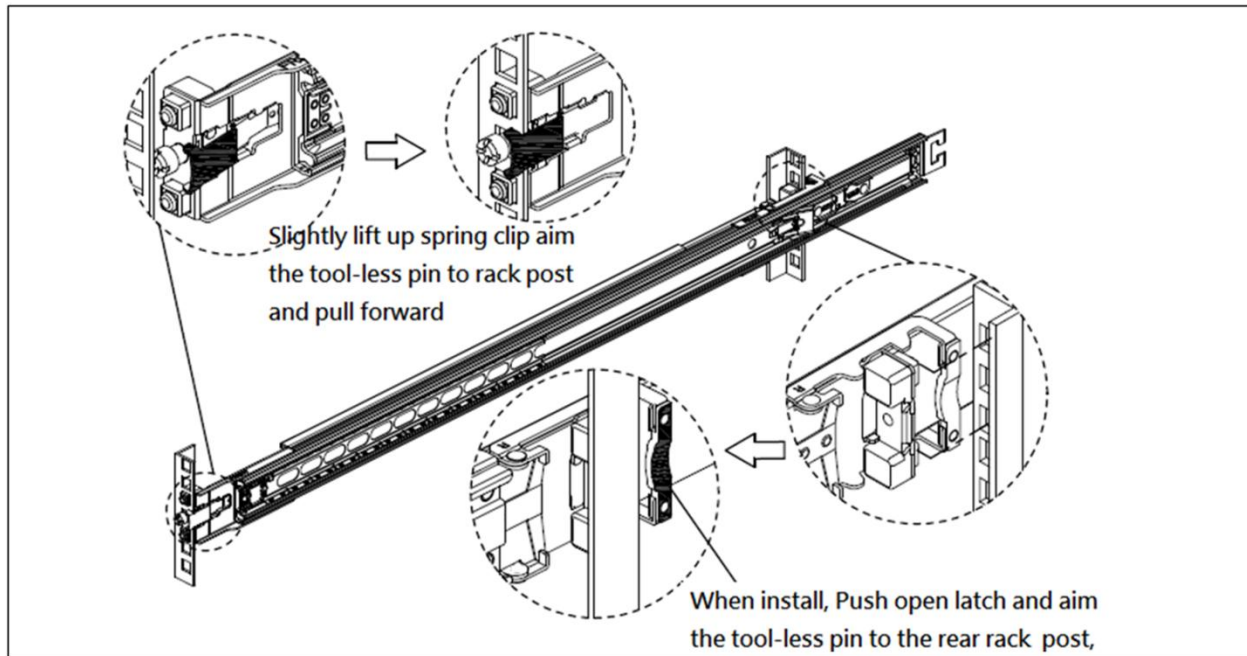
1. Remove Inner from the middle-outer rail



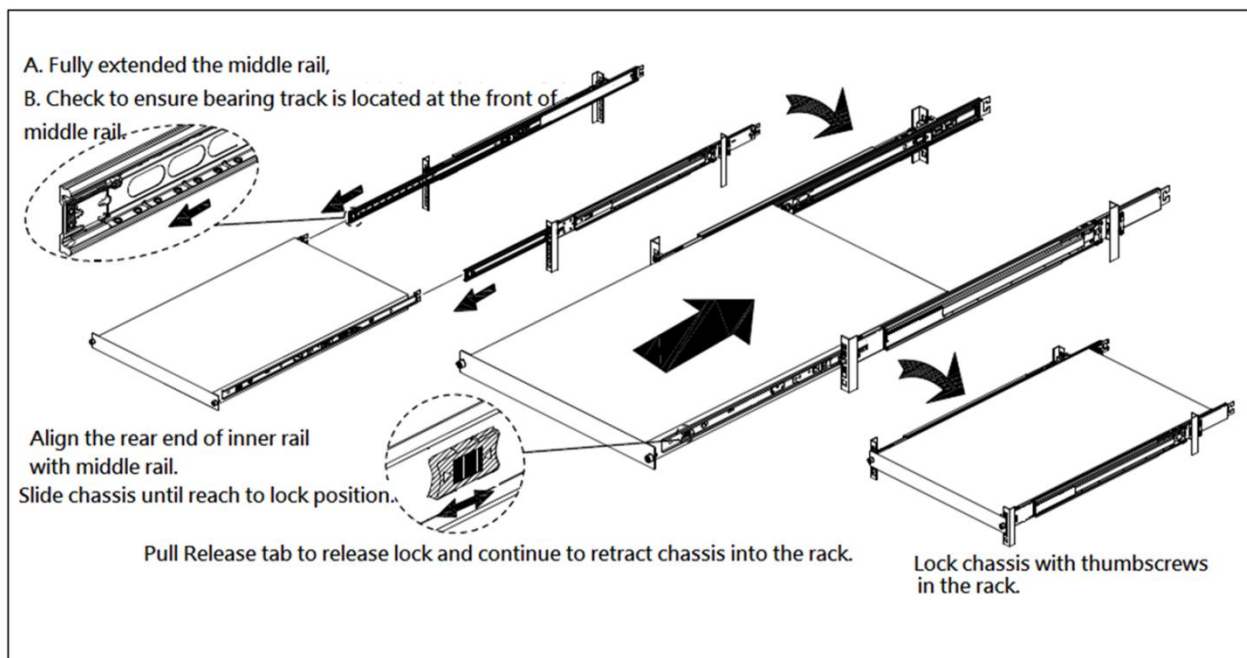
2. Install inner rail to both sides of the chassis



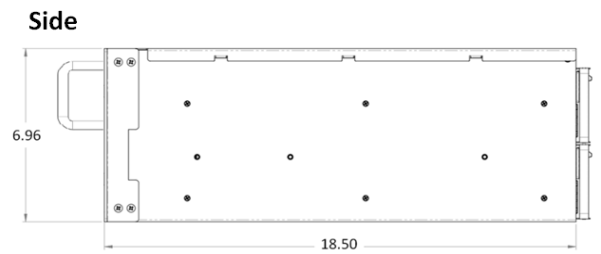
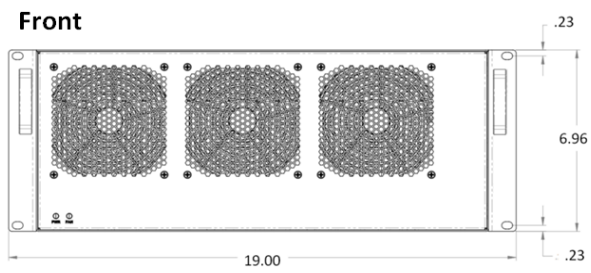
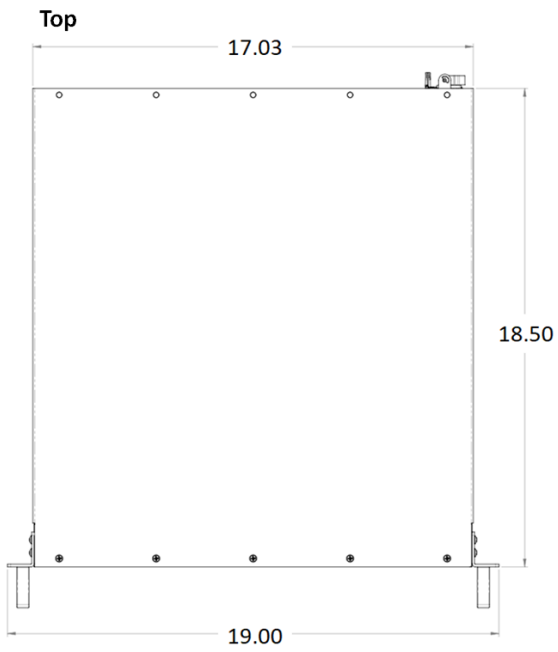
3. Install mid-outer rail onto rack post



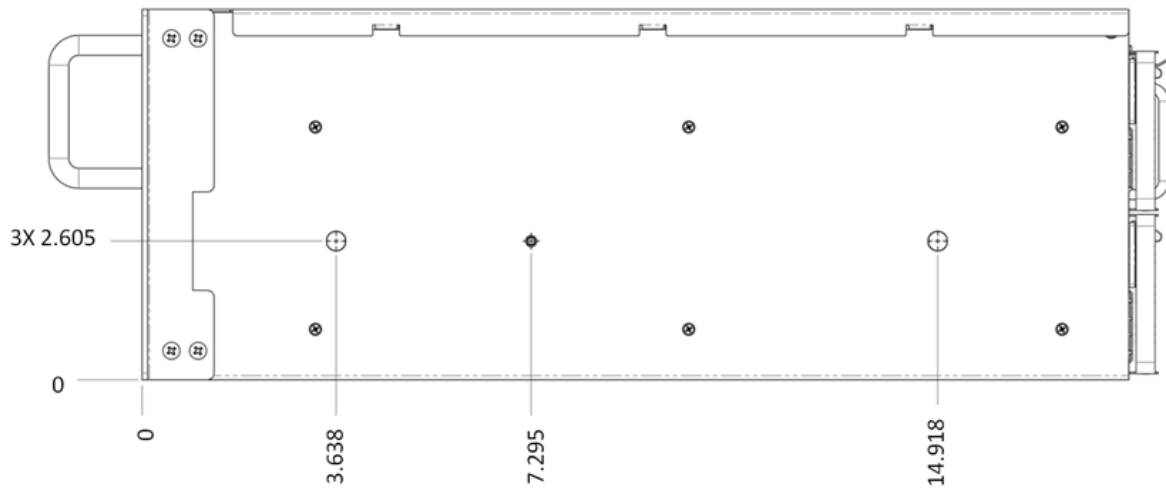
4. Insert chassis into middle-outer rail on the rack



14 Enclosure Dimensions



15 Rackslide Mounting Position



16 Frequently Asked Questions (FAQ)

1. Is there a PCIe switch on the HIB616-x16 CARD? if there is, what the vendor model and number?
Answer: The card uses a Broadcom PEX88032.
2. What does it indicate when the front PWR & FAN LEDs come up as Amber or Orange?
Answer: Is it an indication of faulty power and fan.
3. How many lanes are available on the PEX88096 switch on 522 backplane?
Answer: On the 522 backplane, there are 5x16 lanes (80 lanes), 16 for the target card, a total of 96 lanes.
4. What is the weight of the 4U Value chassis?
Answer: The 4UV weighs 30.0 lbs without the baseboard (522) or add-in cards
5. What is power consumption of HIB38-x16?
Answer: 60W max •1.5A @3.3V •3A @12V •250mA @ 3.3V aux
6. Will the Value chassis power UP automatically upon turning ON the host computer?
Answer: Yes
7. Does the 4UV chassis need to be attached to a host (cable, host/target cards) to power ON?
Answer: Yes
8. If the unit is running, can you pull one of the power supply module? Will cause a problem with the unit?
Answer: That depends on the load inside the expansion chassis. If one supply is insufficient to provide power to all the add-in cards then it will fail.
9. I am assuming that there is a PCIe card that comes with the expansion box that has to be inserted in the host server. This card will connect the server to the expansion box via the PCIe cable. Is this correct?
Answer: Yes, this is correct.
10. Is the PCIe card referred above called HIB616x-16 PCIe host target interface? (To me it looked like these are inserted in the slot on the expansion box backplanes. Without a card to be inserted in the host server - how would it connect to any server?)
Answer: Host interface card. It comes with the expansion box. It is installed in a x16 PCIe slot in a host computer motherboard. The chassis is not limited to x16, It can also support a x4 and x8 Host Interface Board.
11. Can I connect two hosts (servers) to this system(expansion box)? Or do the cards have to be connected to the same server?
Answer: Yes. You can connect the two host servers and YES you can connect to the same server.
12. Are the PCIe switches connected to each other (backplanes connected to each other) so that with one server connected to the expansion box with one cable I can access 16 PCIe card slots? Or is it one server to access all the 10 slots only with two PCIe cables?
Answer: The two backplanes are independent and there is not any connectivity between the two. You need two PCIe cables to access 10 slots.
13. If the PEX switches in each backplane are connected to each other I need a configuration where in one state one host server acts as the root hub for all the 10 PCIe cards and if that host server fails the second server connected to the second backplane takes over as the root hub for all the 10 PCIe cards? Is this possible with this product?
Answer: Not applicable since there is not any connectivity between the two PCIe switches.
14. Can I unplug the link cables while the expansion unit and the host computers are running?
Answer: It is not recommended to unplug or plug in the link cables (x16 cable) while the expansion unit and host computers are running as this can cause failure.

15. Can I update my unit to have a fan control or PWM capability:
Answer: Yes, but you have to send the entire unit (as RMA) to OSS to perform the update (PWM capability).
16. Can I buy aux power cables for my unit?
Answer: Yes, contact OSS Sales for more information.
17. How many dual-width / double-wide GPU can I install in the unit?
Answer: You can install a total of 8 double-wide / dual-width GPUs. Four dual-width / double-wide GPUs per 522 OSS board.
18. How many single-width / single-wide GPU can I install in the unit?
Answer: You can install a total of 10 single-width / single-wide GPUs in the unit. Five single-width / single-wide GPUs per 522 OSS board.
19. Can I leave my GPU cards in the expansion unit when sending it back to OSS for service?
Answer: NO, GPU cards must be removed from the slots when transporting or shipping the unit as this can break the slot or damage the card.

17 Contacting Technical Support

Our support department can be reached by fax at (858) 530-2733 or by phone at (858) 530-2511. Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting One Stop Systems Technical Support, please be sure to include the following information:

- | | |
|------------------|--|
| 1) Name | 7) Serial Number |
| 2) Company Name | 8) Computer Make |
| 3) Phone Number | 9) Computer Model |
| 4) Fax Number | 10) Operating System and Version |
| 5) Email Address | 11) Make/Model of PCI cards in expansion chassis |
| 6) Model Number | 12) Detailed description of the problem |

You can also visit our web site at: <https://www.onestopsystems.com/support-0>

To submit a support ticket or case, use our OSS Online Support portal: <https://onestopsystems.desk.com/customer/portal/emails/new>

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.

For example: Don't say "Won't boot up." Do say "Tried all the steps in the Troubleshooting Section and it still won't boot up."

For faster diagnosis of your problem, please run the two utility programs described in the following sections and include the diagnostic files they generate with your email.

18 Third Party Hardware and Software Support Policy

OSS tests, certifies and bundles many popular third party hardware and software products with OSS hardware for ease of use and guaranteed operation. OSS encourages customer innovation by combining OSS products in a new and interesting ways with third party and customer developed hardware and software. Unfortunately, with virtually infinite combinations of hardware and software, OSS cannot test and validate every possible configuration. OSS is committed to supporting its products and identifying if any technical issue may be related to third-party hardware or software. In order to isolate technical issues, OSS may request that the system be returned to the same configuration that shipped from the OSS factory and any non-OSS supplied third-party hardware or software be removed from the system during troubleshooting.

We test, certify and support many third party hardware and software products along with OSS hardware and are happy to integrate a fully supported system. Ask us about that service and we would be happy to help. If an OSS product is fully functional and a support issue is related to third-party hardware or software that did not ship from the OSS factory, the customer requesting support should reach out to the third-party vendor for assistance to fully troubleshoot the issue.

19 Returning Merchandise to One Stop Systems

If factory service is required, you must contact OSS Service Representative to obtain 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. **One Stop Systems will return any product that is not accompanied by an RMA number.** 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:

RMA # _____

One Stop Systems

2235 Enterprise Street, Suite#11092029

USA

It is not required, though highly recommended, that you keep the packaging from the original shipment of your One Stop Systems product. However, if you return a product to One Stop Systems 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. One Stop Systems 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 PCIe 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.

20 Shipping / transporting the unit

GPU cards should be removed from the slots when transporting or shipping the unit as this can break the slot and may end-up damaging the card.



IMPORTANT

PCIe cards should be removed (or not to be installed) prior to shipping to avoid or prevent possible damage, failure to do so, will void the warranty of the unit..

21 APPENDIX A Compliance

FCC

NOTE: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the service personnel will be required to correct the interference at his own expense.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the service personnel's authority to operate the equipment.

**NOTE**

The assembler of a personal computer system may be required to test the system and/or make necessary modifications if a system is found to cause harmful interferences or to be noncompliant with the appropriate standards for its intended use.

Industry Canada

This Class A digital apparatus complies with Canadian ICES-003. Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada

CE

The product(s) described in this manual complies with all applicable European Union (CE) directives. One Stop Systems will not retest or recertify systems or components that have been reconfigured by customers



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