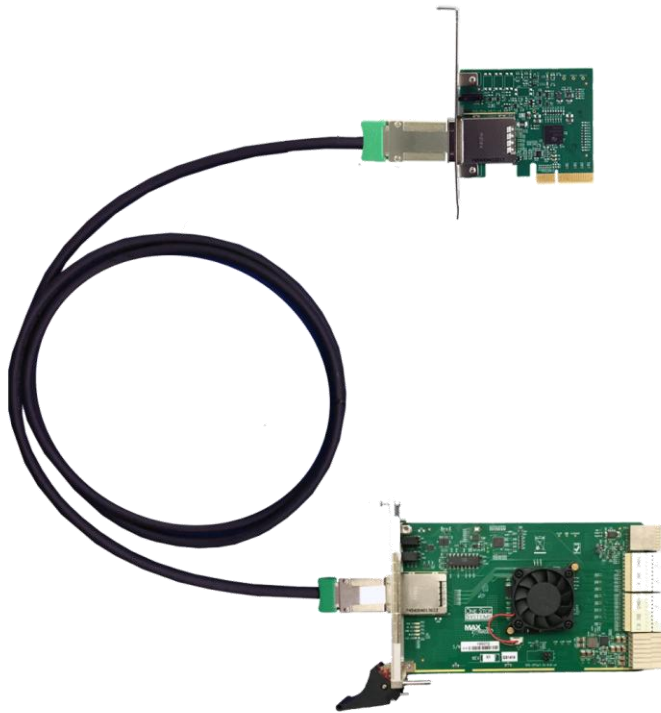




OSS-KIT-EXP-6002



## Host Server to Expansion System Kit User Manual

SKU: OSS-KIT-EXP-6002



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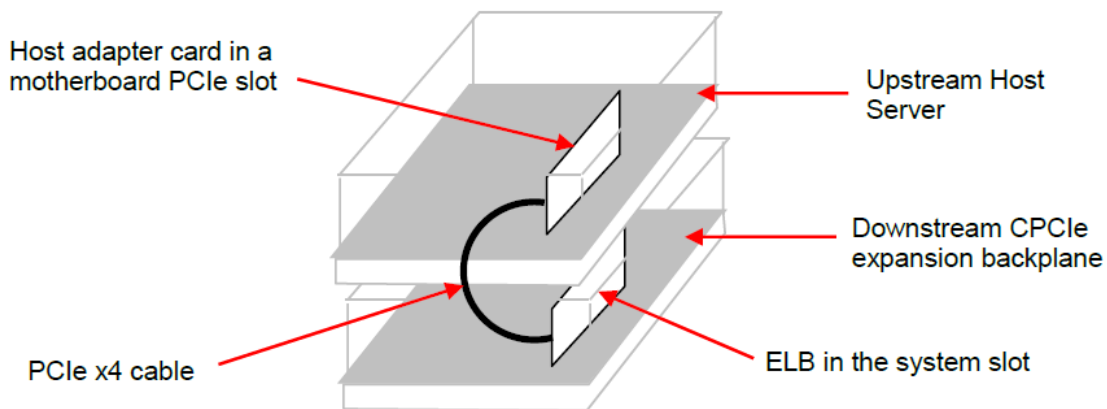
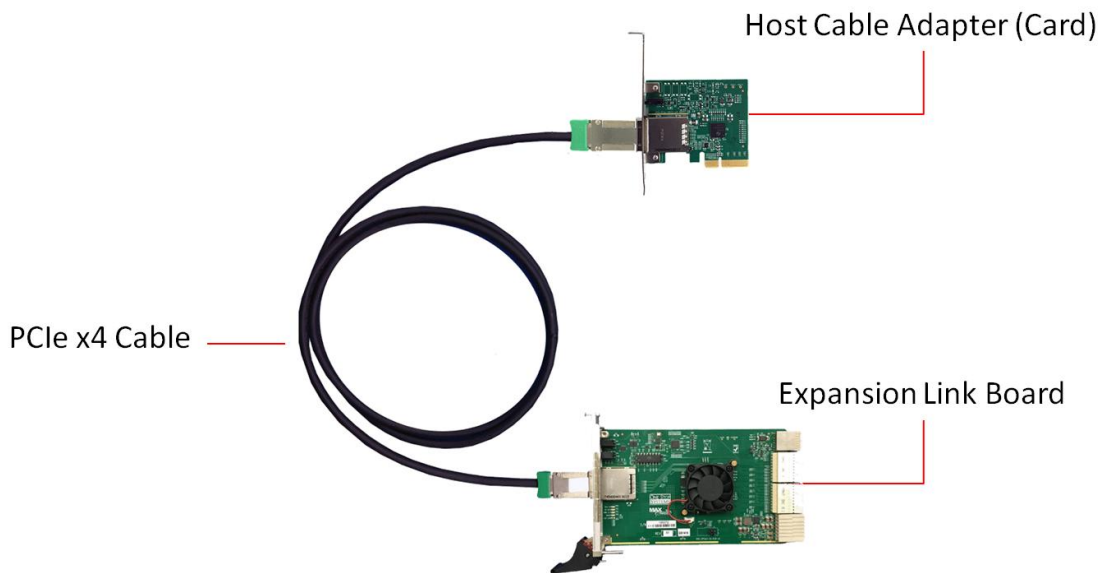
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# 1 Overview

## 1.1 Description

The PCIe x4 expansion kit is used to extend the PCI express bus from a host server to an external expansion chassis. The host adapter card inserts into a PCIe slot of the server. It then cables to a downstream expansion link board (ELB). The ELB acts as a downstream cable link board and the primary fan-out switch to support multiple configurations of PCI express expansion slots. The host adapter installs into a PCIe x4, x8 or x16 slot on the host motherboard. It then cables to the expansion link board and installs in the SHB or system slot of a CPCiE backplane.



## 1.2 Features

### 1.1.1 Adapter Cards

- The Host adapter card inserts into any PCI Express x4, x8, 16 slot on the host motherboard.
- The Target adapter card fits into SHN slot of PICMG 1.3 backplane..
- Support half-height bracket.
- The Host and Target cable adapter cards require no software / drivers

### 1.1.2 x4 Link Cable

- Available in 1m, 2m, 3m, 5m, 7m lengths.
- PCI-SIG Express Cable Specification Compliant.
- Includes x4 PCIe lane and side-band signals for:
  - Power ON
  - Reset
  - PCIe clock
  - Cable Present
  - Wake
- Positive latching mechanism per PCI-SIG specification
- Support 10 Gbps full-duplex transfer rates.

## 1.3 Specifications

### 1.3.1 Host Adapter

PCIe x4 Host Cable Adapter Card (SKU : OSS-PCIe-HIB25-X4-H)	
Form Factor	PCIe x4 add-in card
Dimension (H x L)	2.7" x 3.1" (68 x 78mm)
Front Panel Connectors	One PCIe x4 cable connectors
Front Panel Indicators	Power ON / Cable Present LED
Red-drivers	Pericom P12EQX5804
Temperature Range	0° to 50°C (32° to 122°F)
Relative Humidity	10 to 90% non-condensing
Shock	30g Acceleration peak (11 ms pulse)
Vibration	5-17 Hz 0.5" double amplitude displacement; 7-2000Hz, 1.5g acceleration
Power Consumption	3.75W typical, <a href="#">3.3@1.3A</a>
Agency Compliance	UL60950, FCC Class B, CE safety and emissions, ROHS
Redriver	Pericom P12EQX5804

### 1.3.2 Expansion Link Board

PCIe x4/x8 Gen2 Expansion Link Board (SKU : OSS-SHB-G2-x8-x4)	
Form Factor	PCIMG EXP.system slot compliant. Single Slot
Slot Type	System slot for the expansion chassis
Dimension (H x L)	3.937 x 6.299 in (100 x 160 mm), 1 slot wide
Switch	PLX PEX8733 32 lane switch
Upstream Interface	x4 PCI Express over cable PCI-SIG PCI Express Cable Rev 2.0 Compliant
Downstream Interface	16 lanes of PCI Express on the backplane connectors. The lanes form two or four links to the backplane through the XP2 and XP3 connectors per the PICMG EXP.0 specification. The following link modes are automatically selected by the backplane as follows: <ul style="list-style-type: none"> <li>• Two link mode: 2 x8 links (per backplane capabilities)</li> <li>• Four link mode: Four x4 PCIe links</li> </ul>
Front Panel Connectors	1 PCIe x4 Cable (Molex : 75586-0010)
Front Panel Indicators	4 backplane link-active indicators (green) 2 or 4 link mode + cable link (green)
Power Consumption	10W typical +12V @ .5, 3.3V @ 1.25A, 5Vaux @ 2.5mA
Temperature Range	0° to 50°C (32° to 122°F)
Relative Humidity	10 to 90% non-condensing
Storage Temperature	-40° to 85°C (-40°-185°F)
Shock	30g acceleration peak (11ms pulse)
Vibration	5-17 Hz 0.5" double amplitude displacement; 7-2000Hz, 1.5g acceleration
Agency Compliance	UL60950, FCC Class B, CE safety and emissions, ROHS

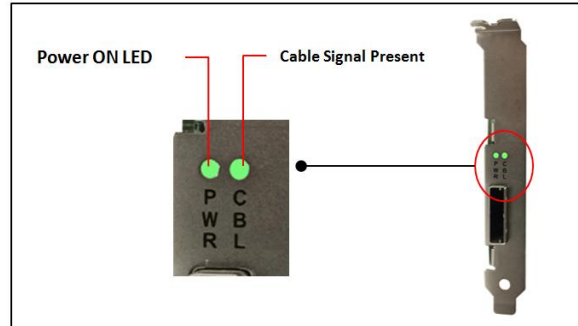
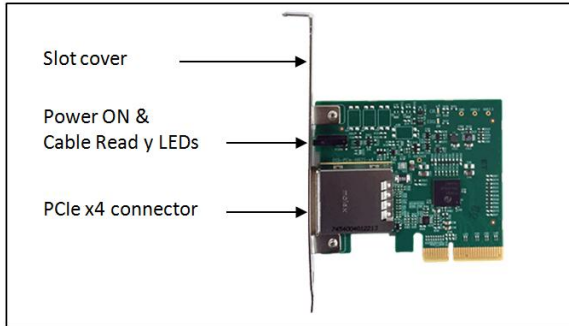
**1.3.3 PCIe x4 Cable**

PCIe x4 Cable (SKU : OSS-PCIe-CBL-x4.1M) 1 meter long cable	
Cable Length	1m, 2m, 3m, 5m, 7m
Circuits loaded	38
Gender	Male-to-Male
Lock to Mating Part	Yes
Material-Metal	Zinc Alloy
Pitch-Mating Interface	0.80mm (0.31)
Single Ended	No
Water proof / Dust proof	Yes
Wire Insulator Diameter	N/A
Wire Size AWG	28
Wire / Cable Type	Round
Electrical Current	1A Max per contact
Shielded	Yes
Voltage-Maximum	30V DC

## 2 Component Identification

### 2.1 Host cable adapter card

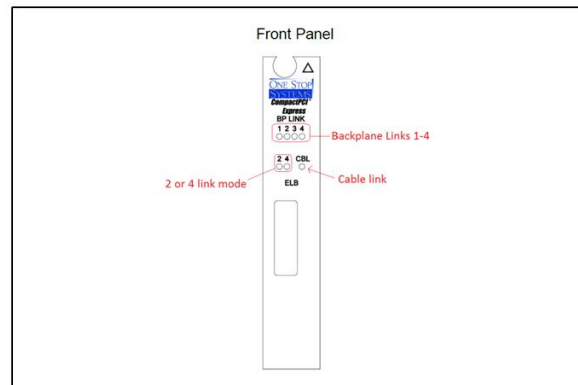
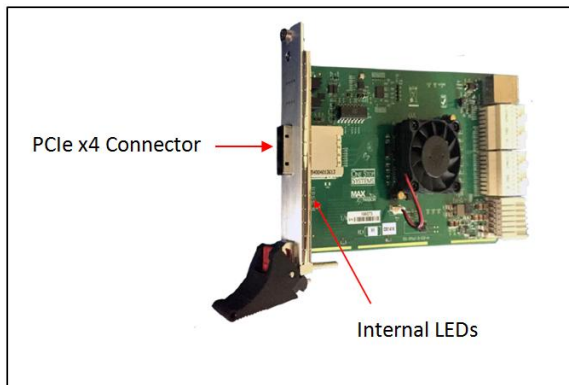
The PCIe x4 expansion kit contains two cable adapter boards, the host cable adapter and the target cable adapter. The host adapter inserts into the host computer's PCIe x4, x8 or x16 slot.



Cable LED indicators are the same for both Host and Target configurations.

### 2.2 Expansion Link Board

The Expansion Link Board (ELB) OSS-CPCle3-3U/6U-ELB-x4 is a downstream link board that installs into a CPCle chassis. The ELB fits into the system slot of a CPCle backplane. The ELB is the downstream link board and the primary fan-out switch to support multiple configurations of PCI or CPCle expansion slots.



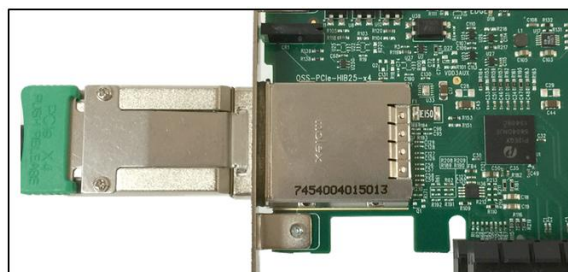
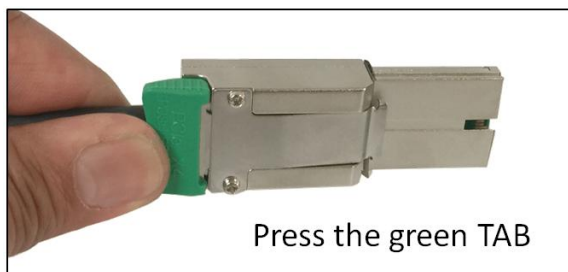
## 3 Installation Instructions

### 3.1 Installing the Adapter Kit

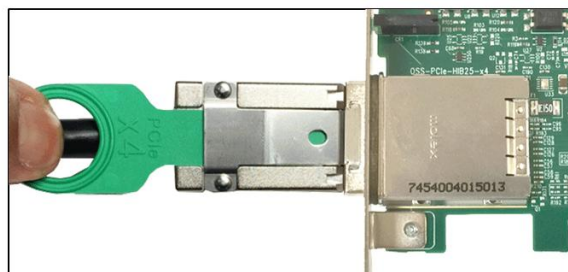
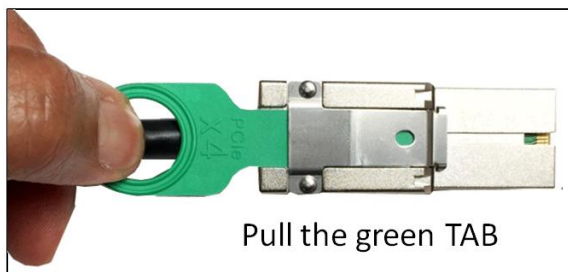
1. Insert the host cable adapter into an appropriate PCIe slot of the host computer. For example, a PCIe x4 host board can be inserted into a PCIe x16, x8, or x4 slot. It will still operate at x4 speeds. Secure the cable adapter card

### 3.2 Expansion link board

1. Insert the expansion link board into the SHB slot on the chosen backplane.
2. Connect the x4 PCIe cable to both cables adapter cards. Press or pull the green TAB while slowly inserting the cable, then release it to lock the cable. See photos below.



OR



3. Test by pulling back on the connector.

### 3.3 Removing PCIe Cable

1. To remove the cable, press or pull the green tab and slowly pull the cable out.

### 3.4 Operation

1. Plug in expansion system and turn the power supply on.
2. Power up host computer.
3. The expansion system will power up.



## 4 Technical Information

The transmit and receive signals on the OSS-HIB-25x4 are driven and conditioned by Pericom redriver chips. Adjustments can be made to equalization, de-emphasis and output swing. These controls are factory set by the use of zero Ohm resistors.

In the following tables, a 0 indicates that a zero Ohm resistor has been installed and a 1 indicates no resistor. In rare cases, mostly where non-OSS equipment is used with the HIB-25x4, these adjustments may need to be changed. The following tables are made available for this purpose. It is highly recommended to contact OSS customer support before making changes to these settings. Having the customer solder to the board should void the warranty.

### 4.1 Signal Adjustment

Equalizer Selection					
SEL_2[A:D]	SEL_1[A:D]	SEL_0[A:D]	@1.25 GHZ	@2.5G HZ	
0	0	0	0.5dB	1.2dB	Edge Default
0	0	1	0.6dB	1.5dB	
0	1	0	1.0dB	2.6dB	
0	1	1	1.9dB	4.3dB	Cable Default
1	0	0	2.8dB	5.8dB	
1	0	1	3.6dB	7.1dB	
1	1	0	5.0dB	9.0dB	
1	1	1	7.7dB	12.3dB	

De-emphasis Adjustment				
D2[A:D]	D1[A:D]	D0[A:D]	De-emphasis	
0	0	0	0dB	SW=ON Default
0	0	1	-2.5dB	
0	1	0	-3.5dB	
0	1	1	-4.5dB	SW=OFF Default
1	0	0	-5.5dB	
1	0	1	-6.5dB	
1	1	0	-7.5dB	
1	1	1	-8.5dB	

Output Swing Control			
S_1[A:D]	S_0[A:D]	Swing (Diff. VPP)	
0	0	1V	Cable Default
0	1	05V	
1	0	0.7V	Edge Default
1	1	0.9V	

### 4.2 Pin Assignments

Host and Target card connectors (x4 Card Edge Connector)

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

### 4.3 Pin-out for the PCIe x4 Card Edge Connector on the “Host Cable Adapter”

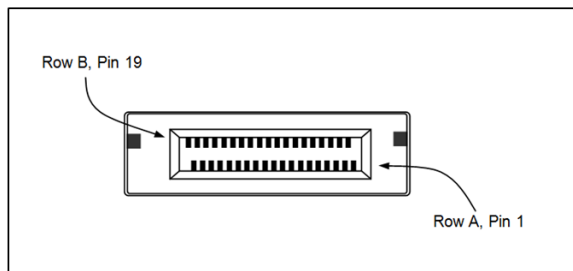
Pin #	Side B		Side A	
	Name	Description	Name	Description
1	N/C	N/C	PRSNT1#	Hot-Plug presence detect
2	N/C	N/C	N/C	N/C
3	N/C	N/C	N/C	N/C
4	GND	Ground	GND	Ground
5	NC	N/C	N/C	Not connected
6	N/C	N/C	JTAG3	TDI (Test Data Input)
7	GND	Ground	JTAG4	TDO (Test Data Output)
8	+3.3V	3.3 V power	N/C	Not connected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

## Notes:

- Optional signals that are not implemented are left as no connects on the board side connector.
- Reserved signals are no connects on the board side connector.
- Although support of CWAKE# is optional from the board side connector perspective, an allocated wire is mandated for the cable assembly.

- Board side pin-outs on both sides of the Link are identical. The cable assembly incorporates a null modem for the PCIe transmit and receive pairs.

#### 4.4 PCI Express x4 Connector PIN Assignment



#### 4.5 Pin-out for the PCIe x4 Cable

Pin #	Cable Side 1		Cable Side 2	Pin #
A1 A4 A7 A10 A13 A16 B1 B4 B7 B10 B13	GND	Drain Wires	GND	A1 A4 A7 A10 A13 A16 B1 B4 B7 B10 B13
A2	PETp0	Differential Pair	PERp0	B2
A3	PETn0		PERn0	B3
A5	PETp1	Differential Pair	PERp1	B5
A6	PETn1		PERn1	B6

Pin #	Cable Side 1		Cable Side 2	Pin #
A8	PETp2	Differential Pair	PERp2	B8
A9	PETn2		PERn2	B9
A11	PETp3	Differential Pair	PERp3	B11
A12	PETn3		PERn3	B12
A14	CREFCLK+	Differential Pair	CREFCLK+	A14
A15	CREFCLK-		CREFCLK-	A15
A17	SB_RTN	Hook-up Wire	SB_RTN	A17
A18	CPRSNT#	Hook-up Wire	CPRSNT#	A18
A19	CPWRON	Hook-up Wire	CPWRON	A19
B2	PERp0	Differential Pair	PETp0	A2
B3	PERn0		PETn0	A3
B5	PERp1	Differential Pair	PETp1	A5
B6	PERn1		PETn1	A6
B8	PERp2	Differential Pair	PETp2	A8
B9	PERn2		PETn2	A9
B11	PERp3	Differential Pair	PETp3	A11
B12	PERn3		PETn3	A12
B14	PWR	NC	PWR	B14
B15	PWR	NC	PWR	B15
B16	PWR_RTN	NC	PWR_RTN	B16
B17	PWR_RTN	NC	PWR_RTN	B17
B18	CWAKE#	Hook-up Wire	CWAKE#	B18
B19	CPERST#	Hook-up Wire	CPERST#	B19
Back shell	Chassis Ground	Overall Cable Braid	Chassis Ground	Back shell

## 4.6 Signal Descriptions

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

## 4.7 Connector Pin-outs for the PCIe x4 Cable Connector

PIN#	SIGNAL	DESCRIPTION
A1	GND	Ground reference
A2	PETp0	Differential PCI Express Transmitter Lane 0
A3	PETn0	
A4	GND	Ground reference
A5	PETp1	Differential PCI Express Transmitter Lane 1
A6	PETn1	
A7	GND	Ground reference
A8	PETp2	Differential PCI Express Transmitter Lane 2
A9	PETn2	
A10	GND	Ground reference
A11	PETp3	Differential PCI Express Transmitter Lane 3
A12	PETn3	
A13	GND	Ground reference
A14	CREFLK+	Differential 100MHz cable reference clock
A15	CREFLK-	
A16	GND	Ground reference
A17	SB_RTN	Side Band Return
A18	CPRSNT#	Used for detection of external cable and if downstream system is powered
A19	CPWRON	Turns power on / off to slave type downstream subsystems
B1	GND	Ground reference
B2	PERp0	Differential PCI Express Receiver Lane 0
B3	PERn0	
B4	GND	Ground reference
B5	PERp1	Differential PCI Express Receiver Lane 1
B6	PERn1	
B7	GND	Ground reference
B8	PERp2	Differential PCI Express Receiver Lane 2
B9	PERn2	
B10	GND	Ground reference
B11	PERp3	Differential PCI Express Receiver Lane 3
B12	PERn3	
B13	GND	Ground reference
B14	PWR	+3.3V Cable Power
B15	PWR	
B16	PWR_RTN	Cable Power Return

B17	PWR_RTN	
B18	CWAKE#	Power management signal for wakeup events (optional)
B18	CPERST#	Cable Reset#

#### 4.8 PCI Express x4 Connector PIN Assignment

CFG(0:2)			BP PORT CFG				
0	1	2	A0	A1	A2	A3	B0
0	0	0	X4	X4	X4	X4	X4
0	1	0	X8	0	X4	X4	X4
0	1	1	X8	0	X8	0	X4
1	X	X	X16	0	0	0	X4

## 5 Contacting Technical Support

Our support department can be by phone at [1 \(760\) 745-9883](tel:17607459883). Support is available Monday through Friday, 8:00 AM to 5:00 PM PT. When contacting 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: [www.onestopsystems/support/](http://www.onestopsystems/support/)

For a quick response, use the Technical Support and RMA Request Form available in the Support Section of the website. Simply complete the form with all required information. Please make sure that your problem description is sufficiently detailed to help us understand your problem.

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.

## 6 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#110 92029

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.



**2235 Enterprise Street, Suite#110, Escondido CA 92029**

Toll-Free (800) 285-8990 US • Main (858) 530-2511 • Fax (858) 530-2733

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