

PCI Express Card

Hardware Installation Guide

About This Document

This document describes the PCI Express card hardware installation guide.

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Revisions

Revision	Date	Description of Changes
R2012-8.1	12 DEC 2012	Release R2012-8.1 - Updated Figure 6
R2012-8.0	23 NOV 2012	Release R2012-8.0 - Added Celoxica 4x10G-240 board
2.9	19 APR 2012	Updated available Celoxica PCIe accelerator cards
2.8	02 MAR 2012	- Added Hardware Recommendations section - Interfaces ac0 and ac1 can now be identified, see section related to Celoxica 10G cards
2.7	21 FEB 2012	New template
<= 2.7		Older versions

1. Celoxica Accelerator Card Overview

Celoxica Accelerator cards are half-size, Gen-1, x8 width PCIe cards. They are available in normal height (111mmx145mm) or Low-Profile (69mmx145mm) form factors. The power consumption of the card is 15W (approx).

Five Celoxica PCIe (PCI Express) Accelerator Cards are available:

- Celoxica 2x10G-155
- Celoxica 4x10G-240
- Celoxica 4x1G-155
- Celoxica 4x1G-110
- Celoxica 2x1G-LP-110

Celoxica supplies these cards with the necessary drivers, and offers developers a range of APIs that expose communications routines to applications without requiring them to manage low-level details.

This section describes the different accelerator card form factors. You should familiarize yourself with these card descriptions before installing the cards. Pay careful attention to the port names and locations on the different types of card.

Note #1:

Information in this document may be affected by your firmware version. Please ensure you have the most up to date firmware.

Note #2:

The board physical interfaces can be bound to acX names. The interfaces acX names depicted in this document are therefore only provided for reading convenience.

See *PCI Express Card Software Installation Guide* for detailed instruction.

1.1 Celoxica 2x10G-155 Accelerator Cards

The Celoxica 2x10G-155 Accelerator Cards accept 10 Gigabit Ethernet SFP+ (Small Form-Factor Pluggable Plus) Transceiver modules (❶).

The SFP+ modules provide data to a Xilinx Virtex-5 FPGA (❷).

The FPGA is in turn connected to an 8-lane PCIe connector (❸).

The jumper header (❹) is located on the board to select the backup-slot when the image on the primary slot becomes corrupted and the board becomes unrecognisable by the host computer. This is a rare occurrence, but can happen if there is a problem during the user flashing process. A jumper should be used to shunt the header to select the backup slot to restore the board to normal operation.

Note:

Interfaces **ac0** and **ac1** can be identified using ethtool.

See *PCI Express Card Software Installation Guide* for detailed instruction.

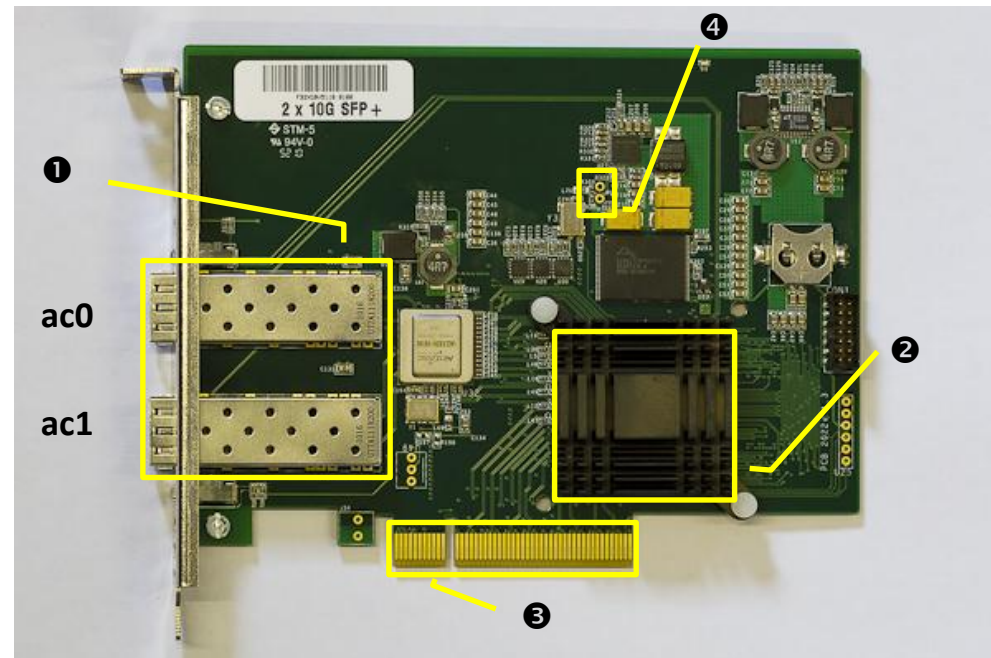


Figure 1 - Celoxica 2x10G-155 Accelerator Card

The link and activity monitoring LEDs are located next to each SFP+ connector.

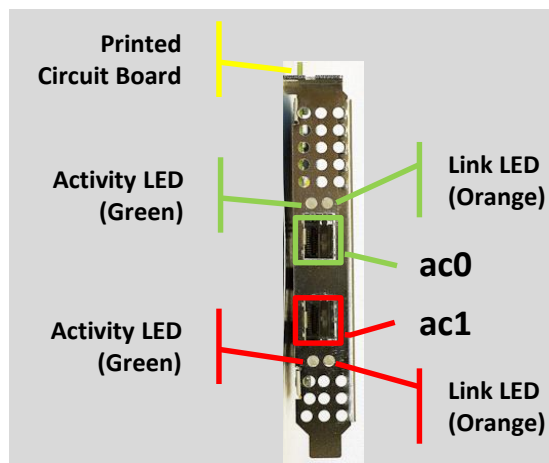


Figure 2 - Celoxica 2x10G-155 Accelerator Card Side View – SFP+ Connectors

1.2 Celoxica 4x10G-240 Accelerator Cards

The Celoxica 4x10G-240 Accelerator Cards accept 10 Gigabit Ethernet SFP+ (Small Form-Factor Pluggable Plus) Transceiver modules (❶).

The SFP+ modules provide data to a Xilinx Virtex-6 FPGA (❷).

The FPGA is in turn connected to an 8-lane PCIe connector (❸) and SATA connectors (❹).

Note:

SATA connectors are currently not used and must not be connected.

The primary firmware is automatically read when the accelerator card is installed and the host machine is powered up.

In order to force the FPGA to read the backup firmware instead of the primary firmware, the rear set recovery button (❺) must be pressed while the host machine is powered up.

See *PCI Express Card Software Installation Guide* for detailed instruction.

Note:

Interfaces **ac0**, **ac1** and **ac2** can be identified using ethtool.

The third port **ac2** is dedicated for the TCP Offload Engine TOE.

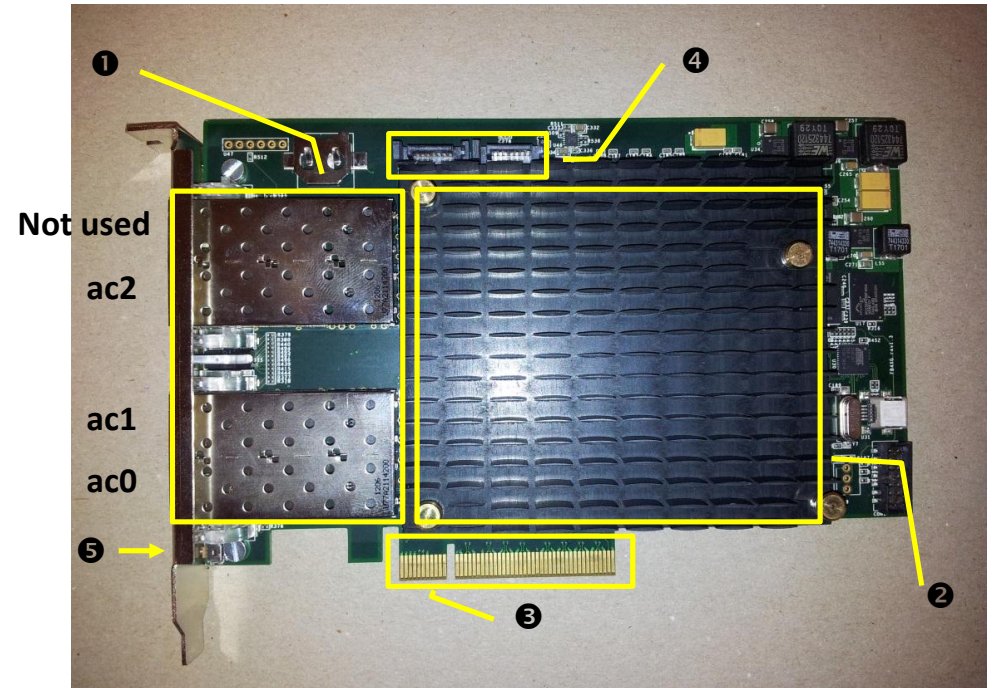


Figure 3 - Celoxica 4x10G-240 Accelerator Card

The link and activity monitoring LEDs are located next to each SFP+ connector.

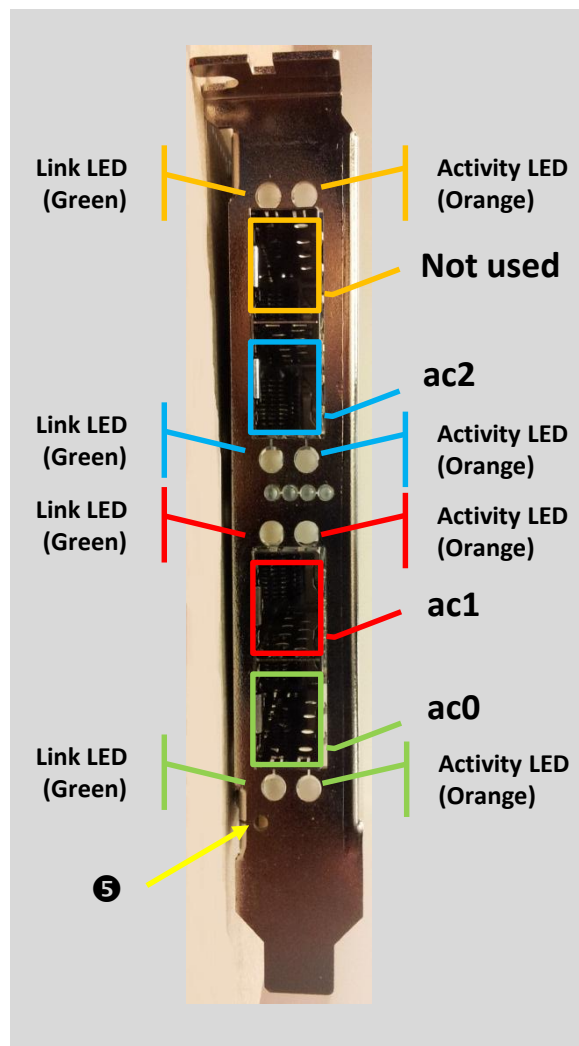


Figure 4 – Celoxica 4x10G-240 Accelerator Card Side View – SFP+ Connectors

The rear set recovery button (5) is located as shown in the following larger view of the card side.

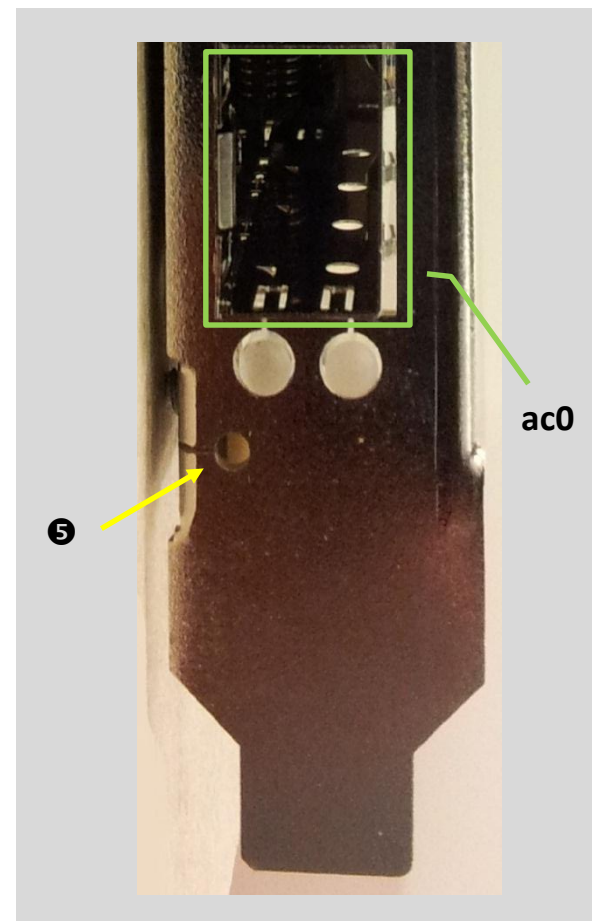


Figure 5 – Celoxica 4x10G-240 Accelerator Card Side View – Recovery Button

The board also provides 4 LEDs to monitor the card.

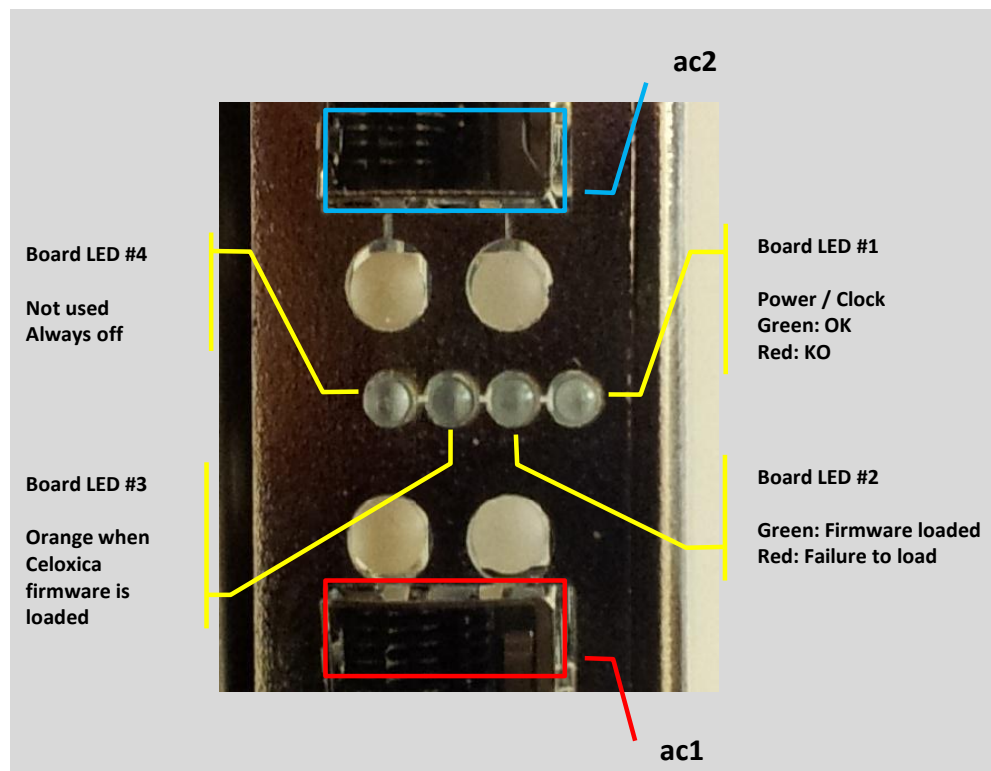


Figure 6 – Celoxica 4x10G-240 Accelerator Card Side View – Board LEDs

1.3 Celoxica 4x1G-155 and 4x1G-110 Accelerator Cards

The Celoxica 4x1G-155 and 4x1G-110 Accelerator Cards accept Gigabit Ethernet SFP (Small Form-Factor Pluggable) Transceiver modules (❶) connected to a Xilinx Virtex-5 FPGA (❷).

The FPGA is in turn connected to an 8-lane PCIe connector (❸).

The jumper header (❹) is located on the board to select the backup-slot when the image on the primary slot becomes corrupted and the board becomes unrecognisable by the host computer. This is a rare occurrence, but can happen if there is a problem during the user flashing process. A jumper should be used to shunt the header to select backup slot to restore the board to normal operation.

See *PCI Express Card Software Installation Guide* for detailed instruction.

When the card is in use, the Ethernet ports appear in order, starting from the top, as **ac0** and **ac1**, the two bottom ports are not used.

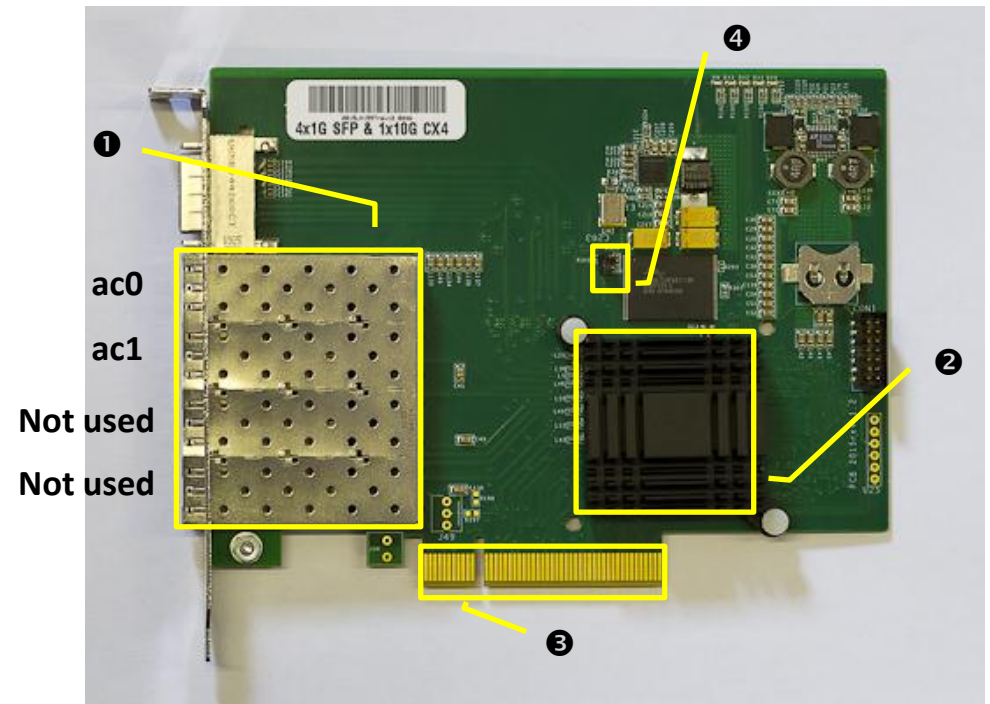


Figure 7 - Celoxica 4x1G-155 Accelerator Card (4x1G-110 is similar)

1.4 Celoxica 2x1G-LP-110 Accelerator Cards

The Celoxica 2x1G-LP-110 Accelerator Cards accept Gigabit Ethernet SFP (Small Form-Factor Pluggable) Transceiver modules (❶) connected to a Xilinx Virtex-5 FPGA (❷).

The FPGA is in turn connected to an 8-lane PCIe connector (❸) and a SATA connector (❹).

The jumper header (❺) is located on the board to select the backup-slot when the image on the primary slot becomes corrupted and the board becomes unrecognisable by the host computer. This is a rare occurrence, but can happen if there is a problem during the user flashing process. A jumper should be used to shunt the header to select backup slot to restore the board to normal operation.

See *PCI Express Card Software Installation Guide* for detailed instruction.

When the card is in use, the top-most Ethernet port appears as **ac0**, the lower as **ac1**.

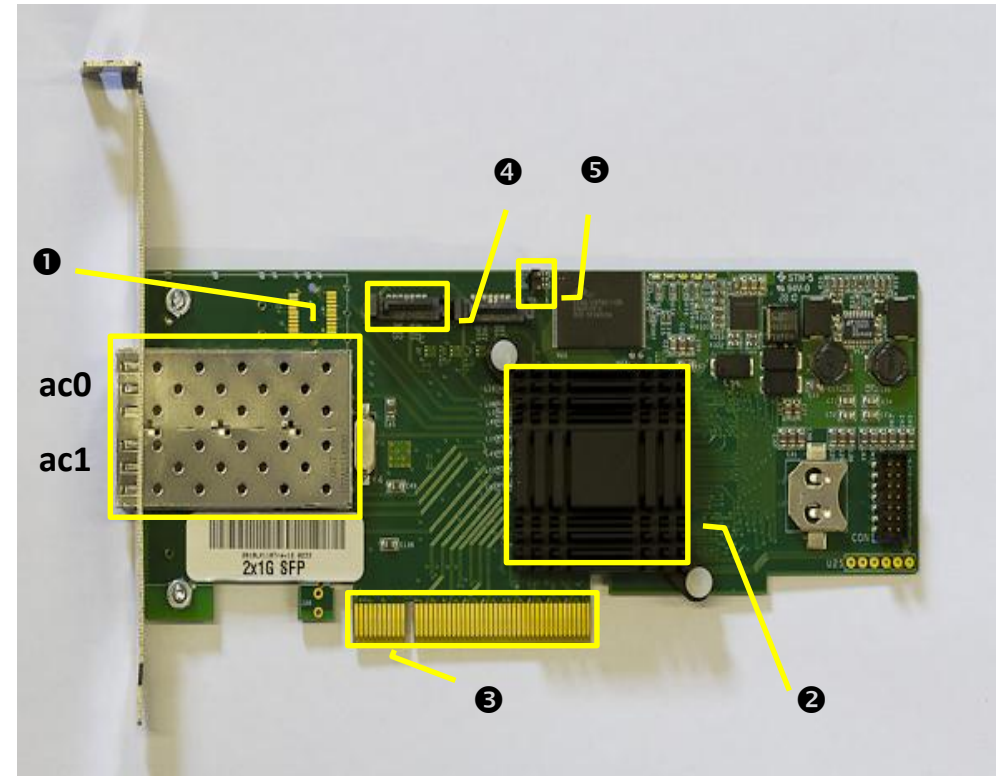


Figure 8 - Celoxica 2x1G-LP-110 Accelerator Card

2. Installing the Accelerator Card

This section describes the physical installation of the card. The installation steps are:

- Physically mount the card in a free 8-lane PCIe slot
- Install the SFP modules (SFP+ for 10G cards) into the SFP cages
- Connect a SATA drive (optional)
- Install the driver software and support libraries for your OS (Red Hat or SuSE Linux).

You can install accelerator cards on hosts running Red Hat or SuSE Linux operating systems. For information on system requirements, see the *PCI Express Card Software Installation Guide*.

Be sure to read all the physical installation steps before you begin installing your cards.

Note:

Take care to avoid static discharge when handling your Accelerator Card, as this may damage it. Use an earth strap or ensure that you make contact with an earth before and during handling of the board.

Only handle the board by its edges. To avoid damaging the Accelerator Card or host computer, handle the Accelerator Card with care when installing or removing it.

2.1 Pre-Installation Requirements

For operating system requirements, see the *PCI Express Card Software Installation Guide*.

Before installing the Accelerator Card, ensure that your host server has at least one free 8-lane PCIe slot.

2.2 Installing the Card

Warning:

Ensure that the power to the host server is removed before installing the card.

1. Insert the card into a free 8-lane PCIe slot.

Note:

Some motherboards have 8-lane mechanical slots that are electrically wired as 4-lane. If possible, use a full 8-lane electrically wired slot to get the best performance from the card.

2. Insert the SFP modules into the cages on the rear of the card. Ensure that the SFP/SFP+ modules are firmly inserted. You should hear and feel a slight click as the SFP/SFP+ modules slide into position.

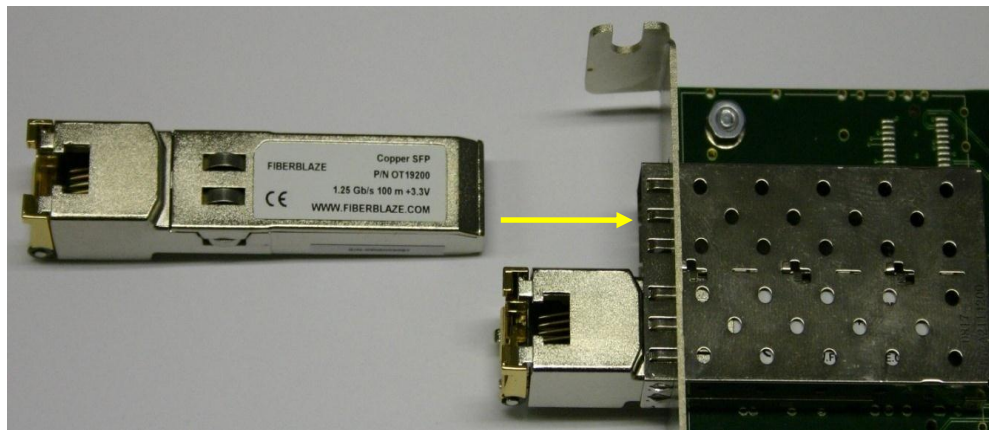


Figure 9 - Inserting SFP Modules

3. Ensure that each SFP/SFP+ module is in position and held in place by the retention clip.

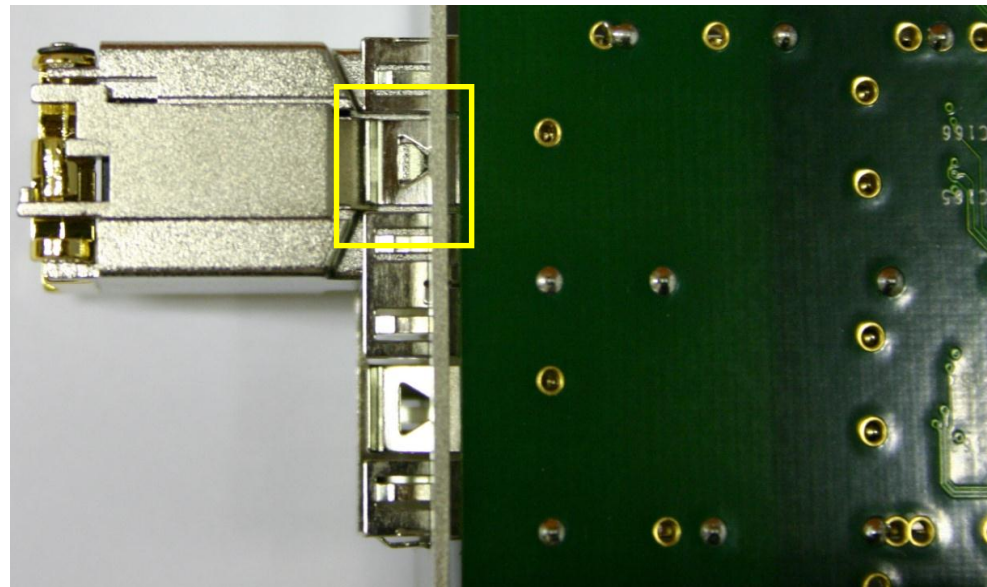


Figure 10 - SFP Module Retention Clip

2.3 Power up the Host Machine

When the accelerator card is installed and the SFP modules are in place, power up the host machine.

3. Uninstalling the Accelerator Card

If you wish to uninstall the card, for example to install it on another machine, you need to take care to follow these instructions.

Warning:

Ensure that the host server is powered off before removing the card.

3.1 Physically Removing the Accelerator Card

1. Flip down the swing latch on the front of the SFP or SFP+ module to release the SFP or SFP+ module from the cage.

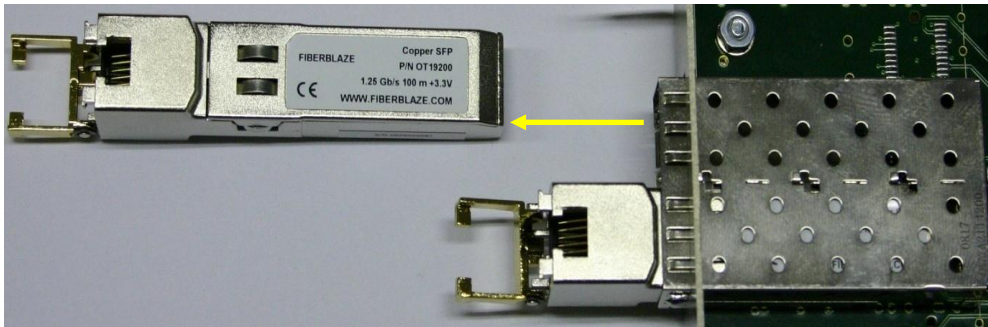


Figure 11 - SFP Module Removal

2. Remove the SFPs from the Accelerator Card.
3. Remove the Accelerator Card from the PCIe slot.

4. Installing and Uninstalling Celoxica Software

To install Celoxica software and drivers, follow the instructions in the *PCI Express Card Software Installation Guide*.

5. Hardware Recommendations

The following table provides some hardware recommendations:

Component	Recommendation
Servers	Recommended servers for new setups are Dell R710 or HP DL380 G7. Please contact the support should you want to use other servers.
SFPs	Celoxica 10G cards supports standard SFP+ optical modules with the spec SR (Short Range), 850nm, Multi-mode.
Cables	MultiMode, Aqua color coded, OM3 and OM4 cables are recommended.
Direct-attach cables	10Gbps Direct Attached SFP+ copper cables are supported.