TELEDYNE LECROY
Everywhere**you**look™

Summit Z416™
PCI Express® 4.0 Protocol Exerciser
Quick Start Guide

1 Introduction

The Summit Z416 is Teledyne LeCroy's fifth generation protocol exerciser (traffic generator), providing support for the PCI Express 4.0 specification with up to x16 lanes and up to 16.0 GT/s data rates.

The Summit Z416 can emulate either a PCI Express Root Complex or Device Endpoint, allowing new designs to be tested against known standards.

In addition to the exerciser features, the Summit Z416 can optionally be configured to include analyzer capabilities that would make it a self-contained solution for PCI Express development. Use this document for quick installation and setup.

If you experience problems or need more information on latest software version and for host machine requirements, see the **Readme** file or the Summit Z416 User Manual on the PCIe Protocol Analysis Software installation or at the Teledyne LeCroy website:
teledynelecroy.com/sw/pciexpress

Summit Z416 Controller Board

Summit Z416 Main Board

2 Components

The package includes the following components:

- Summit Z416 Main board
- Summit Z416 Controller board
- Power Adapter (Output: 24 VDC, 9.2A, 220 Watts)
- 12 inch ribbon cable
- USB Type-C cable

- Ethernet cable
- Quick Start Guide (this document)

Please see the *Summit Z416 User Manual* for component specifications and further details.

3 Unpacking the Exerciser

Inspect the received shipping container for any damage. Unpack the container and account for each of the system components listed on the accompanying packing list. Visually inspect each component for absence of damage. In the event of damage, notify the shipper and Teledyne LeCroy. Retain all shipping materials for shipper's inspection.

⚠ **Attention: Use precautions for handling electrostatic-sensitive devices when working with the Summit Z416** ⚠

# 4 Summit Z416 PCI Express 4.0 Protocol Exerciser Components

The Summit Z416 PCI Express 4.0 Protocol Exerciser consists of a two board set: the Controller Board and the Main Board.

The Controller Board has the following interfaces and LED indicators:

- 24V DC Power Input
- USB interface
- Ethernet Interface
- Sync/Data Interface
- Power On LED Indicator
- Status LED Indicator
- Trigger LED Indicator
- Speed (GT/s) LED Indicator
- Training LED Indicator
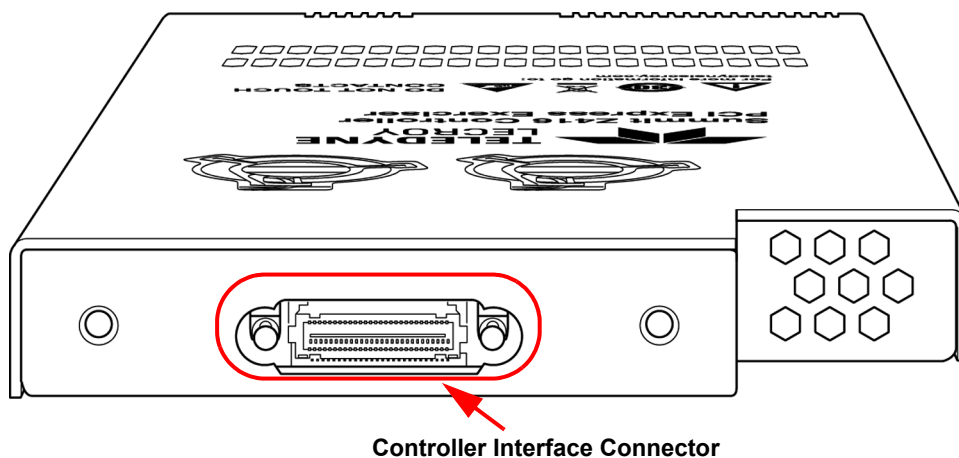- Signal Activity LED Indicators:Tx[15:0] and Rx[15:0]
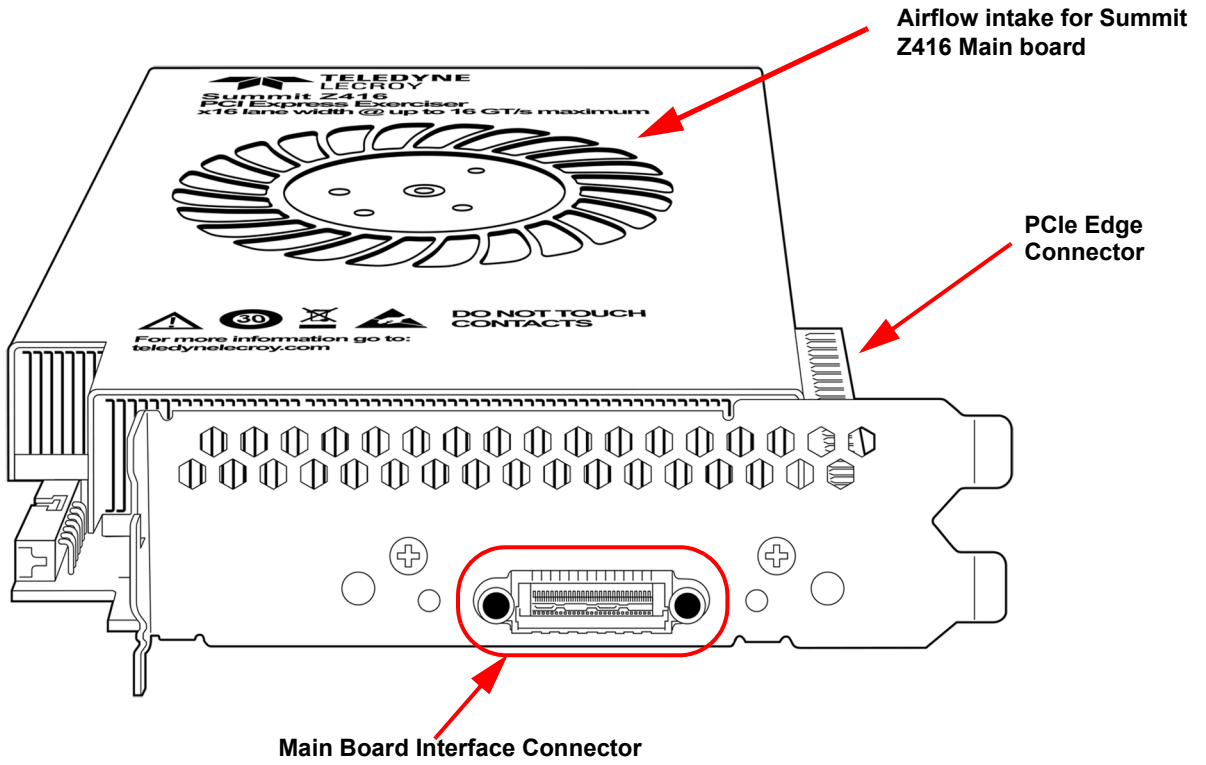- Interface with Main Board

Controller Board: Power and Data Ports
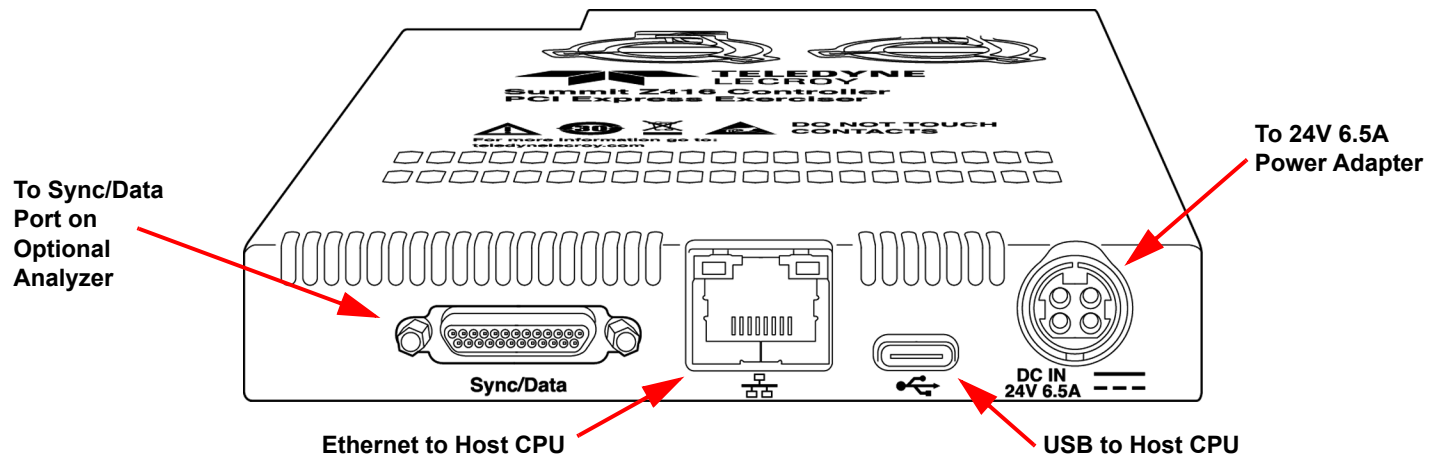
Controller Board: Display Screen and LED Indicators
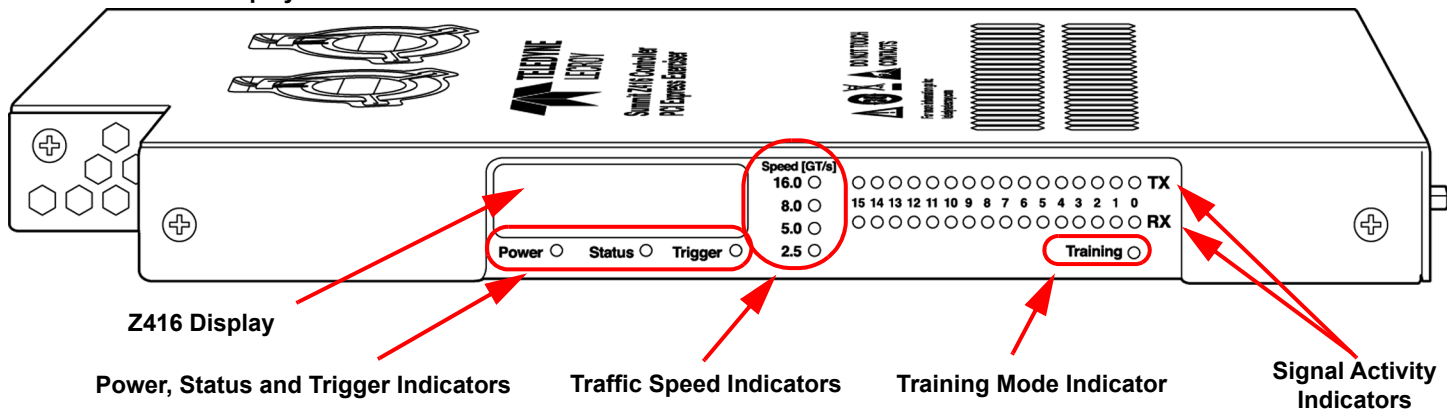
Controller Board: Interface Connector to Main Board

Main Board: Interface Connector to Controller Board

Airflow intake for Summit
Z416 Main board

PCIe Edge
Connector

TELEDYNE
LECROY
Summit Z416
PCI Express Exerciser
x16 lane width @ up to 16 GT/s maximum

DO NOT TOUCH
CONTACTS

For more information go to:
teledynelecroy.com

Main Board Interface Connector

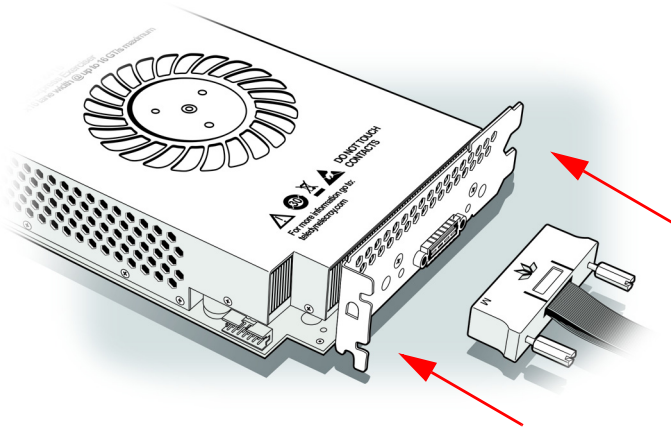**Ribbon Cable from Controller Board to Main Board**

12 Inch Ribbon Cable

5 Assembly Instructions

If the Summit Z416 is to be used to emulate a root complex it will usually be installed in the Teledyne LeCroy PXP-400™ or Teledyne LeCroy PCI Express Gen4 Test Platform. In this case please refer to the Teledyne LeCroy PXP-400 or PCI Express Gen4 Test Platform Quick Start Guide for detailed installation instructions.

If the Summit Z416 is going to be installed into a motherboard or backplane, follow the steps below:
1. Make sure host system if powered Off.
2. Plug Z416 main board in to PCIe Slot.
3. Secure Z416 main board bracket to host chassis with screw.
4. Attach 12" cable to the Z416 main board. The connectors are keyed so only one end can be connected.
5. Gently tighten the cable screws with your fingers make sure the connector is properly attached. **Do not use tools or Overtighten**.
6. Attach the other end of the 12" cable to the Z416 Controller board making sure the connector is properly attached and the screws gently tightened. **Do not use tools or Overtighten**.

Align Ribbon Cable with Main Board
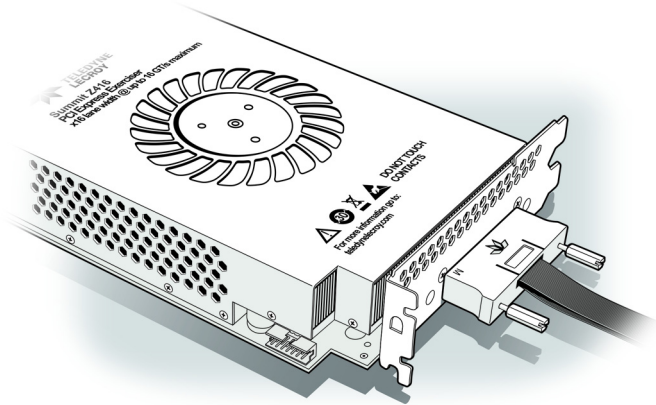
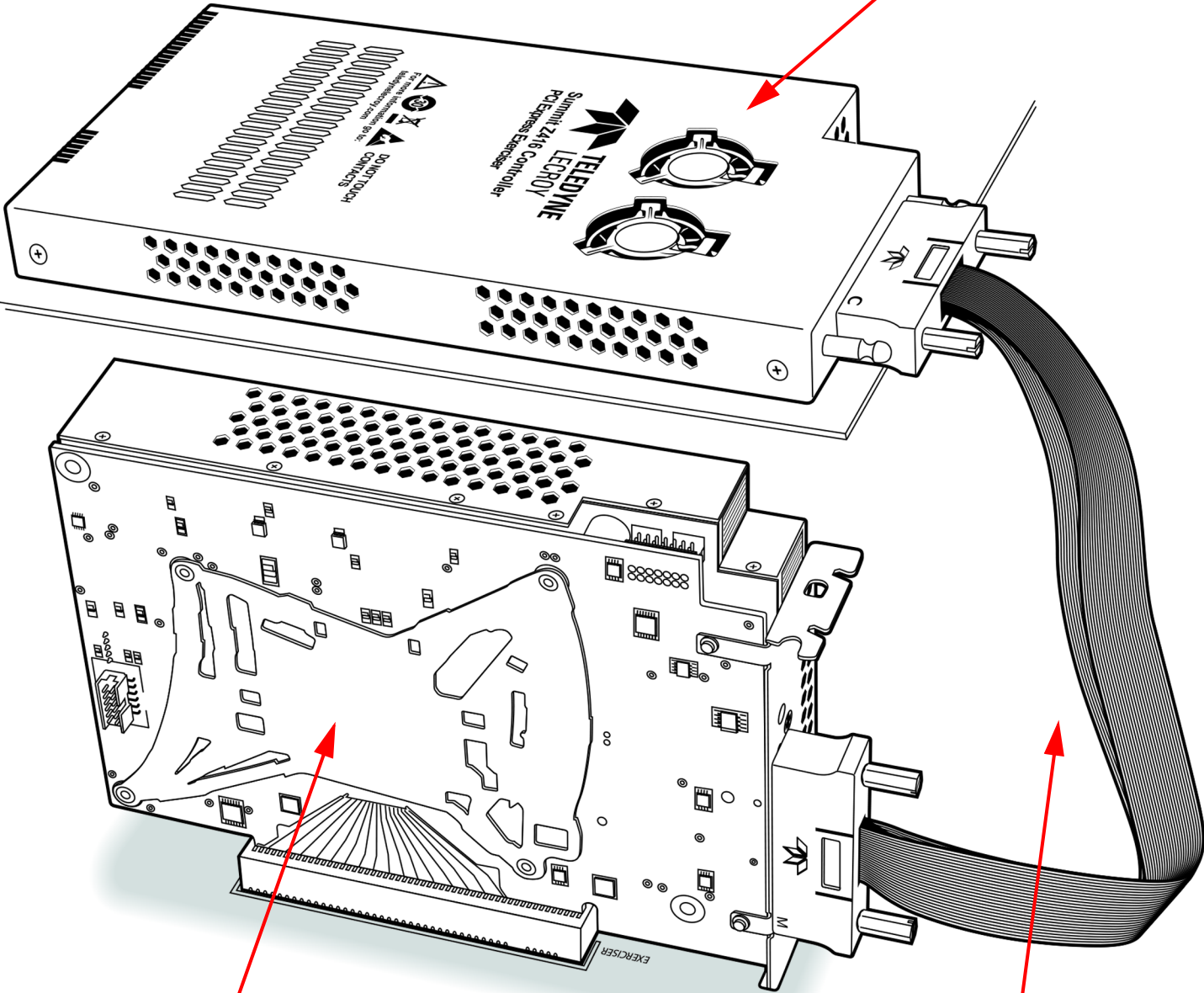**Attach Ribbon Cable to Exerciser Card and Gently Tighten Screws**
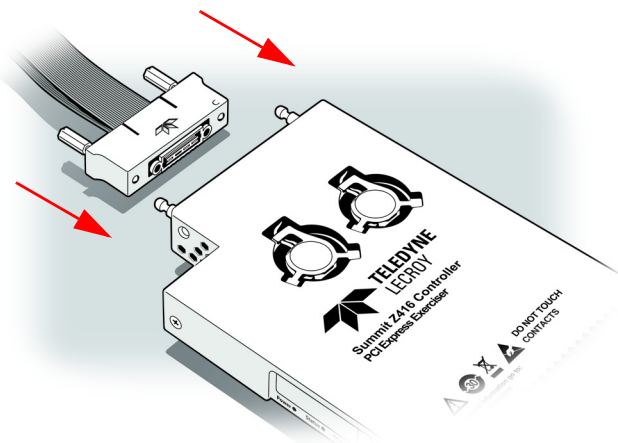
Align Ribbon Cable with Controller Board
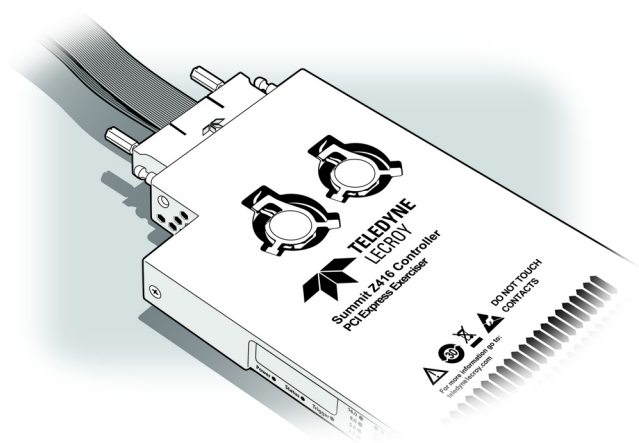
Attach Ribbon Cable to Controller Board and Gently Tighten Screws
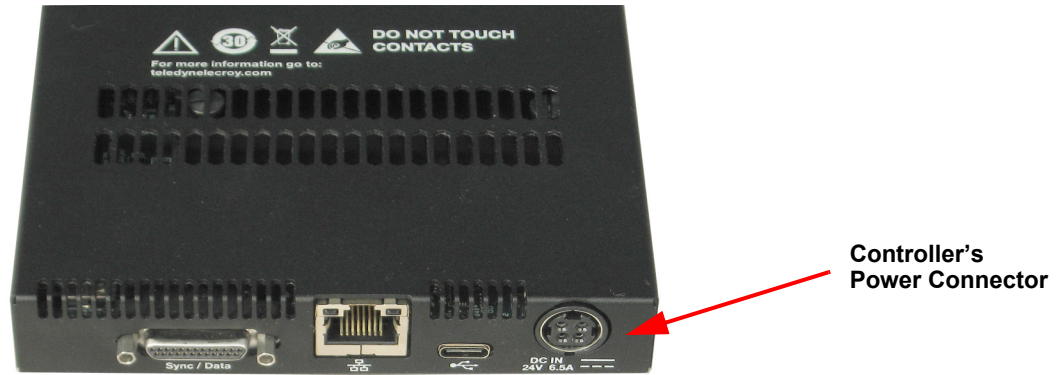
Summit Z416 Controller Board

Summit Z416 Main Board

**Ribbon Cable Connecting
Main Board to Controller Board**

Note: Alignment posts shown attached to the Controller Board are not needed and may not be installed.
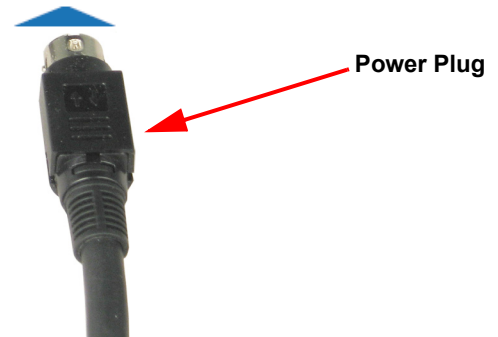
7.   Plug in the output cable of the Power Adapter to the power connector on the Summit Z416 Controller Board (see figure below):
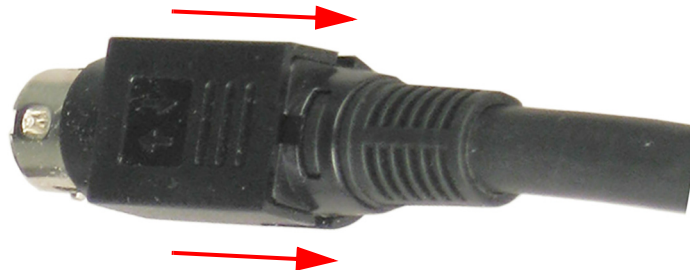

Controller's
Power Connector

Power Plug About to be
Attached to Controller

Power Plug

Note: Push the power plug into the controller's power connector until you hear a "click" noise.

Note: To disconnect the power cable from the Controller Board, the outer sleeve of the end of the connector must be pulled back to free the locking mechanism. With the sleeve pulled back, the connector can be disconnected from the Controller Board.

8.   Install the PCIe Protocol Analysis Software following the steps below (See section "6").

9.   Power ON the Summit Z416 system.

⚠   **Make sure airflow is not blocked to the intake for the Summit Z416. This may happen when installing a large DUT card on the slot next to the Summit Z416 Main board.**   ⚠

10.   Use PCIe Protocol Analysis Software to configure it and start the exerciser/analyzer (See section "8").

11.   You can setup and connect the Summit Z416 to your host machine though either a USB or Ethernet connection. (See section "7").

12.   After the Summit Z416 is setup and connected, the next step is to connect your DUT to the system and start recording traffic (See section "8").

13.   Power ON the host DUT.

⚠   **Warning: Do not disconnect the 12" cable while the Summit Z416 system is powered ON.**   ⚠

Note: If the Summit Z416 will be installed in a PCI Express Gen4 Test Platform follow the installation steps in the *Summit Z416 User Manual*.

6 Installing the Software

To install the software download the latest software by going to teledynelecroy.com/sw/pciexpress.
First-time user registration is required.

Note: You must install the software before connecting the Summit Z416 to the host machine for the first time and Administrator privileges are **required** during the installation process.
Note: If you get an error message during installation of the drivers, consult your system administrator.

To start the PCIe Protocol Analysis after installation, click on the executable icon in:

Start > All Programs > LeCroy > PCIe Protocol Suite

In general, the higher the performance of the host machine, the better user experience you get. The Summit Z416 is supported starting from version 8.00 of the PCIe Protocol Analysis and later. Please refer to the **Readme** notes and *Summit Z416 User Manual* for recommended configurations and additional information. User manuals for your Teledyne LeCroy PCI Express products can be found in: **Start > All Programs > LeCroy > PCIe Protocol Suite Documents**.

Refer to the System Requirements in the readme file for information about the exact Windows operating systems supported.

7 Setting Up and Connecting the Summit Z416 Protocol Exerciser

You can connect the Summit Z416 Protocol Exerciser to the host machine using USB or Ethernet.

Using an Ethernet Connection

To set up the Summit Z416 using an Ethernet connection:

1. Install PCIe Protocol Analysis on the host machine.
2. Connect the Power Adapter to a 100-volt to 240-volt, 50 Hz to 60 Hz, 160 W power outlet using the provided power cord.
3. Connect the Ethernet cable between the Ethernet port on the Summit Z416 and an Ethernet port in the local network.
4. Power on the Summit Z416 by plugging the 24-V DC power cable into the Controller Card.

Note 1: No driver installation is needed for Summit Z416 to operate over a network.

Note 2: At power-on, the Summit Z416 Protocol Exerciser initializes and performs a self-diagnostic.

Note 3: Summit Z416 is configured at the factory to use dynamic IP setting and will get all required network parameters from the DHCP server on your network. If the DHCP server is not available, or to connect Summit Z416 directly to the host machine, you can reconfigure the network settings through the PCIe Protocol Analysis (see *Summit Z416 User Manual*).

Connecting to Summit Z416 in the software

(Assuming the host PC and the Summit Z416 are on the same subnet, Start the PCI Protocol Suite software, otherwise please refer to the Summit Z416 User Manual.)

Start the PCIe Protocol Analysis and perform the following procedure to connect to a Summit Z416 over the network.

1. Select the **Setup > All connected devices…** menu in the PCIe Protocol Analysis application to display the Analyzer Devices dialog.
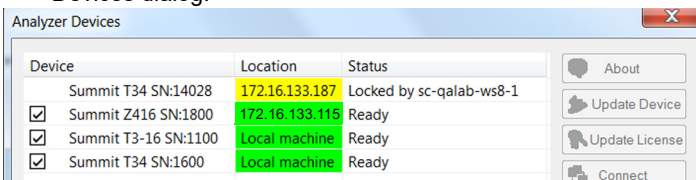

The Summit devices in the list are marked:

- **Locked**: Some other client on the network is already connected to that device
- **Ready to connect**: Available for connection

2. Select your Summit Z416 device in the list and press the **Connect** button to execute the connection procedure. After the connection is established, the application displays the Connection Properties dialog.

3. Select an option:
   - **Automatically connect to the device**: When the application is started or when the named device appears on the network while the PCIe Protocol Analysis application is running on this computer, the PCIe Protocol Analysis application will try to connect to the named device.
   - **Ask if I want to connect to the device**: When the application is started or when the named device appears on the network while the PCIe Protocol Analysis application is running on this computer, the PCIe Protocol Analysis application will display a message box allowing you to connect to the named device.
   - **Take no action**: When you start the application or when the named device appears on the network while the PCIe Protocol Analysis application is running on this computer, you must connect manually to use the named device.

Note: When you close the application on this computer (or you perform manual disconnect), the application disconnects from the device.

4. Press **OK** in the Connection Properties dialog. After you finish the connect procedure, the Summit Z416 to which you have connected is marked as **Connected** and you can use it for recording.
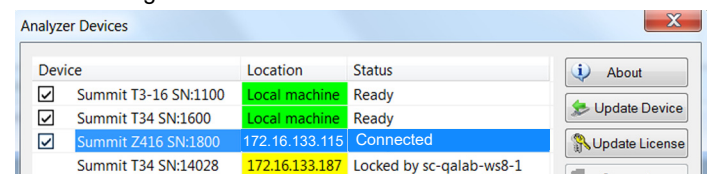
Note 1: To disconnect from a device, display this dialog, select the device, and click the **Disconnect** button.

Note 2: The Summit Z416 will not appear in the Analyzer Device dialog if it is connected on a different Subnet on your local network. You can connect to it on the Subnet by specifying its IP address in the Add Device dialog.

Using a USB Connection

To set up the Summit Z416 using a USB connection:

1. Install PCIe Protocol Analysis on the host machine.
2. Connect the Power Adapter to a 100-volt to 240-volt, 50 Hz to 60 Hz, 160 W power outlet using the provided power cord.
3. Connect the USB port to a USB port on the host machine using a USB cable.
4. Power on the Summit Z416 by plugging the 24-V DC power cable into the Controller Card.

Note 1: At power-on, the Summit Z416 initializes and performs a self-diagnostic.

Note 2: Using the USB Connection will connect the host to the Summit Z416 automatically without using the Device Manager.

5. The Summit Z416 will be recognized by the host machine as a USB device.

   Follow the Microsoft® Windows® on-screen Plug-and-Play instructions for the automatic installation of the Summit Z416 as a USB device on your analyzing host machine. (The required USB drivers are included on the software installation and were installed on your system when you installed the software.) Click **Finish** when you see the message that says "Windows has finished installing the software that your new hardware requires" and the file has been installed in your host machine.
6. Start the PCIe Protocol Analysis, so you can start working with Summit Z416.

8 Connecting to the DUT and Generating Traffic

The Summit Z416 PCI Express Protocol Exerciser can test both the host and device sides as well as performing analysis of a PCI Express link as explained below:

For Motherboards and Host Controllers

1. If not already powered off, power off the Summit Z416 and the DUT.
2. Insert the Main Board portion of the Summit Z416 into a PCI Express slot in the DUT. (Skip the next set of steps and go to Power on).

For PCI Express Add-on Cards

1. If not already powered off, power off the Summit Z416 and a PCI Express Gen4 Test Platform such as the PXP-400 and the DUT. For details of the operation of the PXP-400 refer to the PXP-400 PCI Express Test Platform Quick Start Guide and User Manual.
2. Insert the Main Board portion of the Summit Z416 into the PXP-400 PCI Express Test Platform.
3. Assemble completely the Summit Z416 according to above instructions (see See section "5").
4. Insert the edge connector of the DUT into the remaining PXP-400 PCI Express Test Platform slot.

Power on the Summit Z416 and then the DUT

Important: Power on the Summit Z416 before you power on the DUT.

1. Power on the Summit Z416.
2. Open the PCIe Protocol Analysis application on the host machine. Configure the Summit Z416 to start proper traffic generation. See *Summit Z416 User Manual* for details*.
3. If testing a motherboard, power on the motherboard. If testing a DUT, power on the DUT.

Generating Traffic (see *Summit Z416 User Manual for details)*

1. Use the default settings or set options in the Generation Options dialog box.
2. Start the PCIe Protocol Analysis, if necessary, and open an existing script file or create a new script.
3. Start generation by clicking the **Start Traffic Generation** button on the Status bar. This action causes the software to download the script to the device. After the download completes, the device starts executing the script. As the script executes, the Status bar displays script progress. **Note**: Script execution can be terminated at any time by clicking the **Stop Generation** button on the toolbar.

9 Environmental Conditions

- Temperature: Operating 0° C to 35° C (32° F to 95° F)
- Temperature: Non-Operating -10° C to 80° C (14° F to 176° F)
- Humidity: Operating 10% to 90% RH (non-condensing)

Note: These conditions are for normal operation of the Summit Z416 and are not meant to be interpreted as environmental chamber testing.

Teledyne LeCroy Customer Support

Online Download

Periodically check the Teledyne LeCroy Protocol Solutions Group web site for software updates and other support related to this product. Software updates are available to users with a current Maintenance Agreement.

Web: teledynelecroy.com/tm/software/PCIe
E-mail: psgsupport@teledyne.com
Support: teledynelecroy.com/support/contact

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