

Keysight SPT PCIe Exerciser Gen3

Installation Guide

Notices

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Installation Guide

You can find the installation guides for different components of the product on the product CD. Keysight recommends you to do not switch on the instrument before you have understood all the applicable installation instructions and have met all the installation prerequisites.

Where to find more information

You can find more information about System Protocol Tester from the following link:

<http://www.keysight.com/find/spt>

We continually improve our software. Therefore, we recommend you to check the following link to download and install the latest version:

<http://www.keysight.com/find/spt-download>

You can also look for search a local contact for assistance on the following link:

<http://www.keysight.com/find/assist>

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Safety Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed beyond a WARNING notice until the indicated conditions are fully understood and met.

Safety Summary

The following general safety precautions must be observed during all phases of operation of this instrument. Failure to comply with these precautions or with specific warnings or operating instructions in the product manuals violates safety standards of design, manufacture, and intended use of the instrument. Keysight Technologies assumes no liability for the customer's failure to comply with these requirements. Printed manuals are an option for many products. Manuals are also available on the Web. Go to www.keysight.com and type in your product number in the Search field at the top of the page.

General	Do not use this product in any manner not specified by the manufacturer. The protective features of this product may be impaired if it is used in a manner not specified in the operation instructions.
Before Applying Power	Verify that all safety precautions are taken. Make all connections to the unit before applying power. Note the instrument's external markings described in "Safety Symbols".
Ground the Instrument	If your product is provided with a grounding type power plug, the instrument chassis and cover must be connected to an electrical ground to minimize shock hazard. The ground pin must be firmly connected to an electrical ground (safety ground) terminal at the power outlet. Any interruption of the protective (grounding) conductor or disconnection of the protective earth terminal will cause a potential shock hazard that could result in personal injury.
Fuses	See the user's guide or operator's manual for information about line-fuse replacement. Some instruments contain an internal fuse, which is not user accessible.
Do Not Operate in an Explosive Atmosphere	Do not operate the instrument in the presence of flammable gases or fumes.
Do Not Remove the Instrument Cover	Only qualified, service-trained personnel who are aware of the hazards involved should remove instrument covers. Always disconnect the power cable and any external circuits before removing the instrument cover.
Cleaning	Clean the outside of the instrument with a soft, lint-free, slightly dampened cloth. Do not use detergent or chemical solvents.
Do Not Modify the Instrument	Do not install substitute parts or perform any unauthorized modification to the product. Return the product to an Keysight Sales and Service Office for service and repair to ensure that safety features are maintained.
In Case of Damage	Instruments that appear damaged or defective should be made inoperative and secured against unintended operation until they can be repaired by qualified service personnel.

CAUTION















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Safety Symbols






Table 1 Safety Symbol

Symbol	Description
	Direct current
	Alternating current
	Both direct and alternating current
	Three phase alternating current
	Three phase alternating current
	Earth ground terminal
	Protective earth ground terminal
	Frame or chassis ground terminal
	Terminal is at earth potential
	Equipotentiality
N	Neutral conductor on permanently installed equipment
L	Line conductor on permanently installed equipment
	On (mains supply)
	Off (mains supply)
	Standby (mains supply). The instrument is not completely disconnected from the mains supply when the power switch is in the standby position
	In position of a bi-stable push switch

Symbol	Description
	Out position of a bi-stable push switch
	Equipment protected throughout by DOUBLE INSULATION or REINFORCED INSULATION
	Caution, refer to accompanying documentation
	Caution, risk of electric shock
	Do not apply around or remove from HAZARDOUS LIVE conductors
	Application around and removal from HAZARDOUS LIVE conductors is permitted
	Caution, hot surface
	Ionizing radiation
CAT I	IEC Measurement Category I
CAT II	Measurement Category II
CAT III	Measurement Category III
CAT IV	Measurement Category IV

Compliance and Environmental Information

Table 2 Compliance and Environmental Information

Safety Symbol	Description
	CSA is the Canadian certification mark to demonstrate compliance with the Safety requirements.
	The C-tick mark is a registered trademark of the Spectrum Management Agency of Australia. This signifies compliance with the Australia EMC Framework regulations under the terms of the Radio Communication Act of 1992.
	CE compliance marking to the EU Safety and EMC Directives. ISM GRP-1A classification according to the international EMC standard. ICES/NMB-001 compliance marking to the Canadian EMC standard.
	The crossed out wheeled bin symbol indicates that separate collection for waste electric and electronic equipment (WEEE) is required, as obligated by DIRECTIVE 2012/19/EU and other National legislation. Please refer to about.keysight.com/en/companyinfo/environment/takeback.shtml to understand your Trade in options with Keysight in addition to product takeback instructions.
	This mark denotes compliance with the essential requirements of the following applicable UK regulations: <ul style="list-style-type: none"> • Electromagnetic Compatibility Regulations 2016 No. 1091 (as amended) • Electrical Equipment (Safety) Regulations 2016 No. 1101 (as amended) • The Restriction of the Use of Certain Hazardous Substances in Electrical & Electronic Equipment Regulations 2012 No. 3032 (as amended)

Printing History

Keysight Technologies can issue revisions between the product releases to reflect the latest and correct information in the guide. Keysight Technologies also reserves its right to not issue a new edition of the guide for every system release.

Manual Name: Keysight Protocol Exerciser for PCI Express- Installation Guide

The edition number of the guide, publishing time of the guide, and applicable release number of the product are given in the following table.

Edition	Published	Applicable Release
1.5	August, 2015	8.78

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1 Planning the PCIe Exerciser Gen3 Installation

Planning Considerations / 12

Hardware and Software Requirements for Installation / 13

This chapter provides information to help you plan the hardware setup and software installation for PCIe Exerciser. It lists the system requirements that should be met before you start installing Protocol Exerciser on Controller PC and client PC. The chapter also provides information on the requirements that should be met for setting up the U4305A/U4305B Exerciser card.

Planning Considerations

This topic describes some planning considerations before starting with setting up the hardware and software for PCIe Exerciser.

- **Emulation mode of the Exerciser card:** The U4305A/U4305B exerciser card can emulate a root complex or a PCIe endpoint with or without SRIOV / MRIOV capabilities based on the license obtained. The hardware setup is based on whether you want to use it to stimulate and load a System Under Test for system level testing or to stimulate a DUT into various test scenarios. If you want to load and stress a server system under test, you can use multiple exerciser cards.

- **Identifying the Controller system and client PCs:**

A controller system hosts the full PCIe Exerciser functionality including all software components and hardware support services of Exerciser. This system is connected to the PCIe Exerciser card(s) and communicates with the exerciser card(s) through protocol exerciser sessions that you create using the Protocol Exerciser software. You can connect upto four exerciser cards to a controller system through USB.

A client PC hosts only the software applications (Protocol Exerciser GUI). No hardware support services are available on a client PC and consequently, it cannot create a session with the Exerciser card. A client PC communicates with the Controller system and acts as a remote client accessing existing Protocol Exerciser sessions on the Controller system.

Based on your specific needs, identify the PCs that you want to configure as clients and the server system that will act as the controller system.

Ensure that the [Hardware and Software Requirements for Installation](#) are met on the Controller system and client PCs before starting installation.

- **Protocol Exerciser software setup type**

You can install Protocol Exerciser in Client and Full setup types. On a remote client, you should install the Client only setup type. The system connected to the Exerciser card becomes the Controller system with remote clients communicating with it. This system should have the Protocol Exerciser software installed in the Full setup type.

Hardware and Software Requirements for Installation

Prior to starting the installation process, ensure that all the system requirements to install the PCIE Exerciser software are in place.

In the following sections, you will learn about:

- “Controller PC Requirements
- “Client PC Requirements
- “Requirements for the U4305A/U4305B Exerciser Card

Controller PC Requirements

On the Controller PC, following are the system requirements:

- USB 2.0 interface for each exerciser card
- Pentium® processor 1 GHz or equivalent
- Windows 7 (Enterprise or Professional 32-bit / 64-bit), Windows 8.0, or Windows 8.1 operating system
- At least 256 MB RAM. For better performance, Keysight recommends you to install 512 MB RAM or higher.
- At least 500 MB free disk space on the C drive

Client PC Requirements

On the Client PC, following are the system requirements:

- Pentium® processor 1 GHz or equivalent.
- Windows 7 (Enterprise or Professional 32-bit / 64-bit), Windows 8.0, or Windows 8.1 operating system
- At least 256 MB RAM. For better performance, Keysight recommends you to install 512 MB RAM or higher.
- At least 500 MB free disk space on the C drive.
- Microsoft .NET Framework 4.0

Requirements for the U4305A/U4305B Exerciser Card

Following are the power, memory, and environmental specifications for the U4305A/U4305B Exerciser card:

Power requirements

AC Power requirements: 100V-240V at 3.5A max 50-60Hz

Exerciser Power dissipation: 70W (max)

Memory requirements

There is no external memory module required for the Exerciser card.

Environment specifications

Environment Specifications		
Temperature	Operating: 0 °C to + 45 °C	Storage: -40 °C to +70 °C
Humidity	Operating: 15% to 95% (non-condensing)	
Altitude	2000m max	

2 Setting Up the Hardware for Protocol Exerciser

Setting Up the U4305A/U4305B Exerciser Card / 16

Once all the system requirements are in place, you need to start setting up the hardware for Protocol Exerciser.

Setting Up the U4305A/U4305B Exerciser Card

You can set up hardware for Protocol Exerciser by plugging one or multiple exerciser cards into the motherboard, or by mounting them on the backplane board.

Figure 1 displays the U4305A exerciser card.

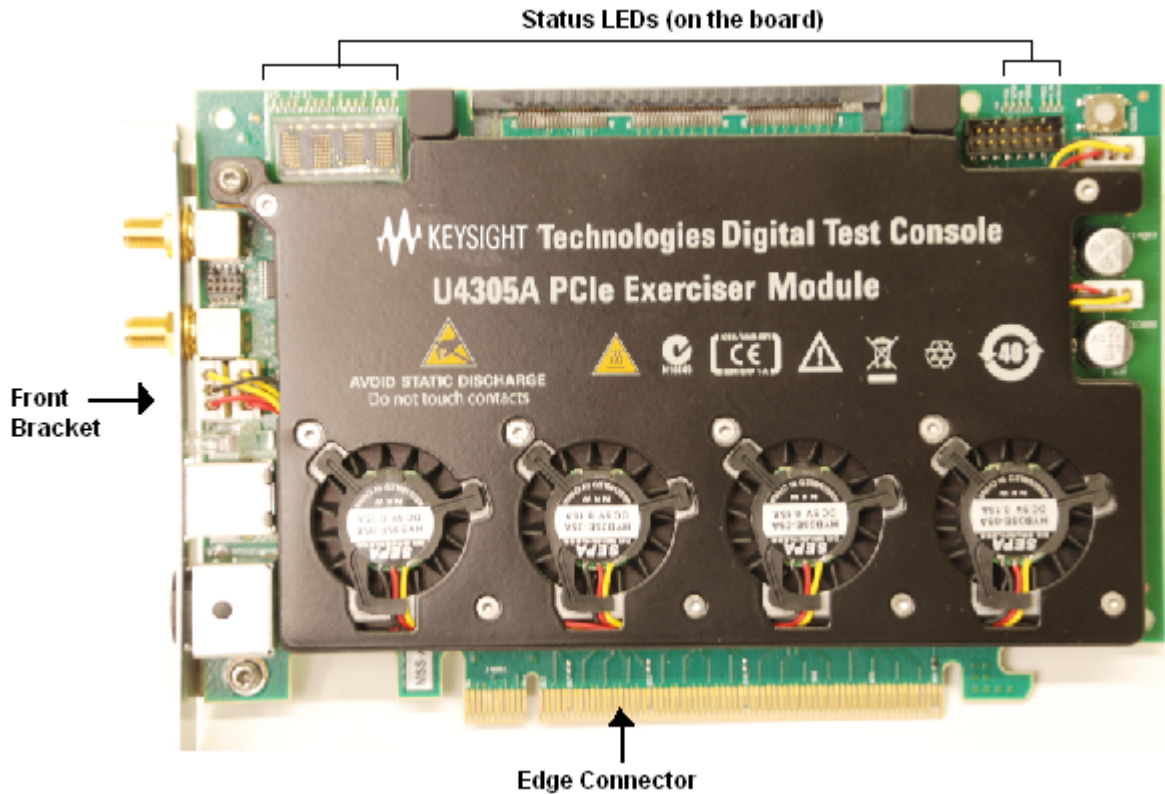


Figure 1 U4305A Exerciser card

NOTE

For more information on U4305A/U4305B exerciser card and its components, refer to *Keysight Protocol Exerciser for PCI Express, Hardware Guide* and *Keysight Protocol Exerciser for PCI Express, User's Guide*.

To Set Up Exerciser Card as a Root Complex

You generally mount an exerciser card on backplane when you want to test a PCIe endpoint. The main application of this board is in testing an add-in card, such as a LAN or graphic card. In this scenario, exerciser card acts as a root complex (USC) to test a PCI Express end point. When you use the backplane, Exerciser card communicates to the DUT through the bottom connectors.

To set up exerciser card to act as a root complex:

- 1 Connect the exerciser card with external power supply using the power supply connector on the front bracket of the card.
- 2 Connect the exerciser card with the Controller PC using the USB cable.

- 3 Plug the exerciser card's *Edge Connector* into one PCIe connector of backplane and the DUT into the other PCIe connector.

This completes the hardware setup for Protocol Exerciser card acting as a root complex.

Figure 2 displays a sample setup of exerciser card mounted on the backplane board. The card is connected to a controller system through USB.

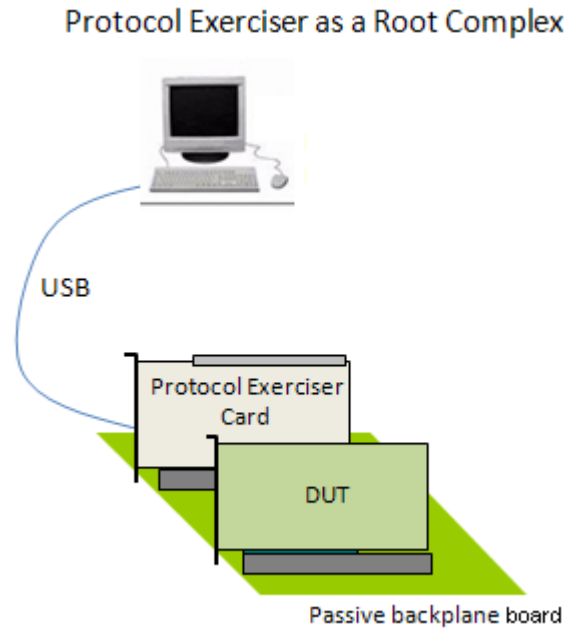


Figure 2 Exerciser Card mounted on a backplane

To Set Up Exerciser Card as a PCIe Endpoint

You plug the exerciser card into a motherboard under test when you want to exercise the System Under Test (SUT) with various test scenarios. In this case, the exerciser card acts as a normal PCIe device (DSC) to test a PCI Express root complex.

To set up exerciser card to act as a PCIe endpoint:

- 1 Connect the exerciser card with external power supply using the power supply connector on the front bracket of the card.
- 2 Connect the exerciser card with the Controller PC using the USB cable.
- 3 Plug the exerciser card's *Edge Connector* into the system under test's motherboard.

Figure 3 displays a sample setup of exerciser card plugged into a system motherboard. The card is connected to a controller system through USB.

Protocol Exerciser as an Endpoint

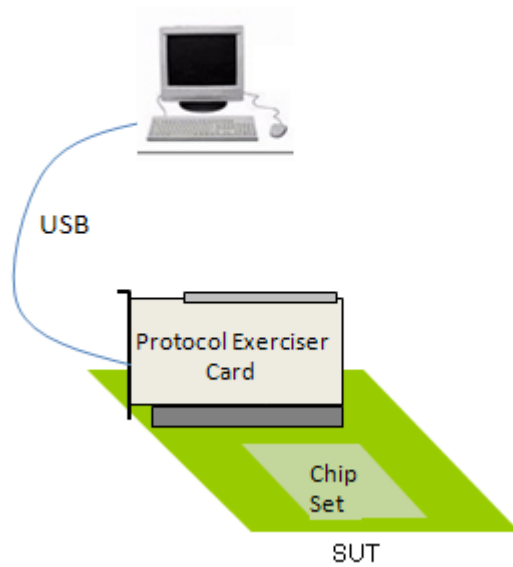


Figure 3 Exerciser Card plugged into a motherboard

CAUTION

Components on the I/O module are sensitive to the static electricity. Therefore, take necessary anti-static precautions, such as wear a grounded wrist strap, to minimize the possibility of electrostatic damage. Also, you should not operate a chassis with empty slots. Fill empty slots with blanking plates to ensure correct operation of the chassis.

CAUTION

This product is a plug-in printed board and has no enclosure. For the purpose of safe use when utilized outside of PCI Slots, the product may only be operated under supervision and on surfaces complying with flammability class V-1 or better acc. to IEC60695 or UL94.

3 Installing Protocol Exerciser for PCI Express

Installing Protocol Exerciser / 20

Once you have set up the hardware for Protocol Exerciser, you can start installing Protocol Exerciser on Controller and client PCs.

Installing Protocol Exerciser

The following section provides step-by-step instructions on installing Protocol Exerciser software.

Installing PCIE Exerciser Gen3 Software

- 1 Use the following URL to access the Exerciser product page on Keysight.com:
 - www.keysight.com/find/U4305A (for the U4305A model)
 - www.keysight.com/find/U4305B (for the U4305B model)
- 2 Scroll down the web-page and click the **Technical Support** link.
- 3 Click the **Drivers, Firmware, and Software** link.
- 4 Download the latest Exerciser software.
- 5 Once the download is complete, double-click the .exe file to begin installation.
 - If legacy components or a previous version of the software are installed on your computer, then a message box appears and prompts you to remove them.
 - To remove legacy components/previous version, do the following:
 - a Click **Yes**. The uninstallation process starts. Once this process ends, the Uninstall Complete screen of the wizard appears.
 - b Click **Finish**.
- 6 Repeat Step 5.
 - This time, the welcome screen of the installation wizard appears.
- 7 Click **Next**.
 - The License Agreement screen appears.
- 8 Click **Yes**.
 - The **Setup Type** screen appears. This screen prompts you to select the setup type of Protocol Exerciser that best suits your need.
- 9 Select one of the following options:
 - a **Client (GUI only)**: Select if you want to install only the Client software on your PC. The PC will then act as a client for the controller PC hosting the full Protocol Exerciser software.
 - b **Controller + Client (Full)**: Select if you want to install both the Controller and Client software on your PC. The PC will then act as the Controller PC for remote clients.
 - Refer to the topic "[Planning Considerations](#)" on page 12 to know more about clients and controller system.
- 10 Click **Next**.
 - The Start copying files screen appears.
- 11 Click **Next**.
 - If you have chosen to install the client (GUI Only) setup of Protocol Exerciser, then the installation of the exerciser software is initiated and you move to step 14. If you have chosen to install the full setup of Protocol Exerciser in step 9, the welcome screen for the Keysight SPT WAR FTP Daemon setup wizard is displayed. If an existing version of Keysight SPT WAR FTP Daemon is found, the setup wizard first uninstalls the existing version and reinstalls the required version.
- 12 Click **Next**.
 - The License Agreement page of Keysight SPT WAR FTP Daemon setup wizard is displayed.
- 13 Click **Next**.
 - This completes the installation of Keysight SPT WAR FTP Daemon and the Protocol Exerciser installation continues.
- 14 Clear the **View Readme.txt** check box if you do not want to view the `Readme.txt` file.
- 15 Click **Next**.

A dialog box displaying the below message appears.

“Link Layer test cases require Tcom Tcl package version 3.9. Please download and install this package from the following location: <http://www.vex.net/~cthuang/tcom/>. For instructions of how to install this package, please refer to the readme document.”

16 Click **OK**.

A dialog box displaying the below message appears.

“Please power cycle the exerciser card before starting a new session.”

17 Click **OK**.

The Update Complete screen appears.

18 Choose whether you want to restart the computer now or later if you have installed the Controller and client setup of Protocol Exerciser.

19 Click **Finish**.

This completes the PCIE Exerciser Gen3 software installation.

Verifying the Protocol Exerciser Installation

You can verify if the Protocol Exerciser is installed successfully by performing the following steps:

- The **Keysight SPT** folder is added in the Programs folder.
- The Protocol Exerciser GUI is accessible from the **Keysight SPT > PCIE Exerciser 8.76 Release > Exerciser GUI** option.
- On the desktop, the **SPT Control Panel** icon is added that provides access to SPT tools and utilities.

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