

### Before Starting

Use this document for quick installation and setup. If you experience problems or need more information, contact LeCroy customer support or check the LeCroy web site. For details about the latest software version, see the **Readme** file on the Installation CD.

## 1 Introduction

The LeCroy PCI Express<sup>®</sup> Gen 2 Protocol Test Card (PTC2) is a plug-in card that can be used for PCI Express compliance tests as defined by PCI-SIG<sup>®</sup>. It works with the software provided by PCI-SIG and performs the tests to verify and ensure compliance with the PCI Express specification.

The LeCroy PTC2 supports 2.5 GT/s and 5 GT/s transfer speeds and runs in x1 mode.

You can upgrade the PTC via the USB interface.

The PTC has three possible modes:

- Add-In-Card test mode
- Known Endpoint test mode [not yet implemented]
- Topology test mode [not yet implemented]

## 2 Host Machine PC Requirements

The PCI Express Gen 2 Protocol Test Card is controlled and operated through a third-party software application that you must install and run on a Windows<sup>®</sup>-based PC (the host machine). It also can use a small updating program. The requirements for the host machine are:

**Operating System:** Microsoft<sup>®</sup> Windows<sup>®</sup> XP

**Processor:** Intel<sup>®</sup> Pentium<sup>®</sup> 4, AMD Athlon<sup>™</sup>/AMD Duron<sup>™</sup>, or newer compatible processors with clock speed of at least 2 GHz.

**Memory:** Minimum is 256 MB of RAM.

### Connectivity:

- PCI Express interface (x1 is minimum) for compliance test execution
- USB interface for field upgrades of PTC functionality

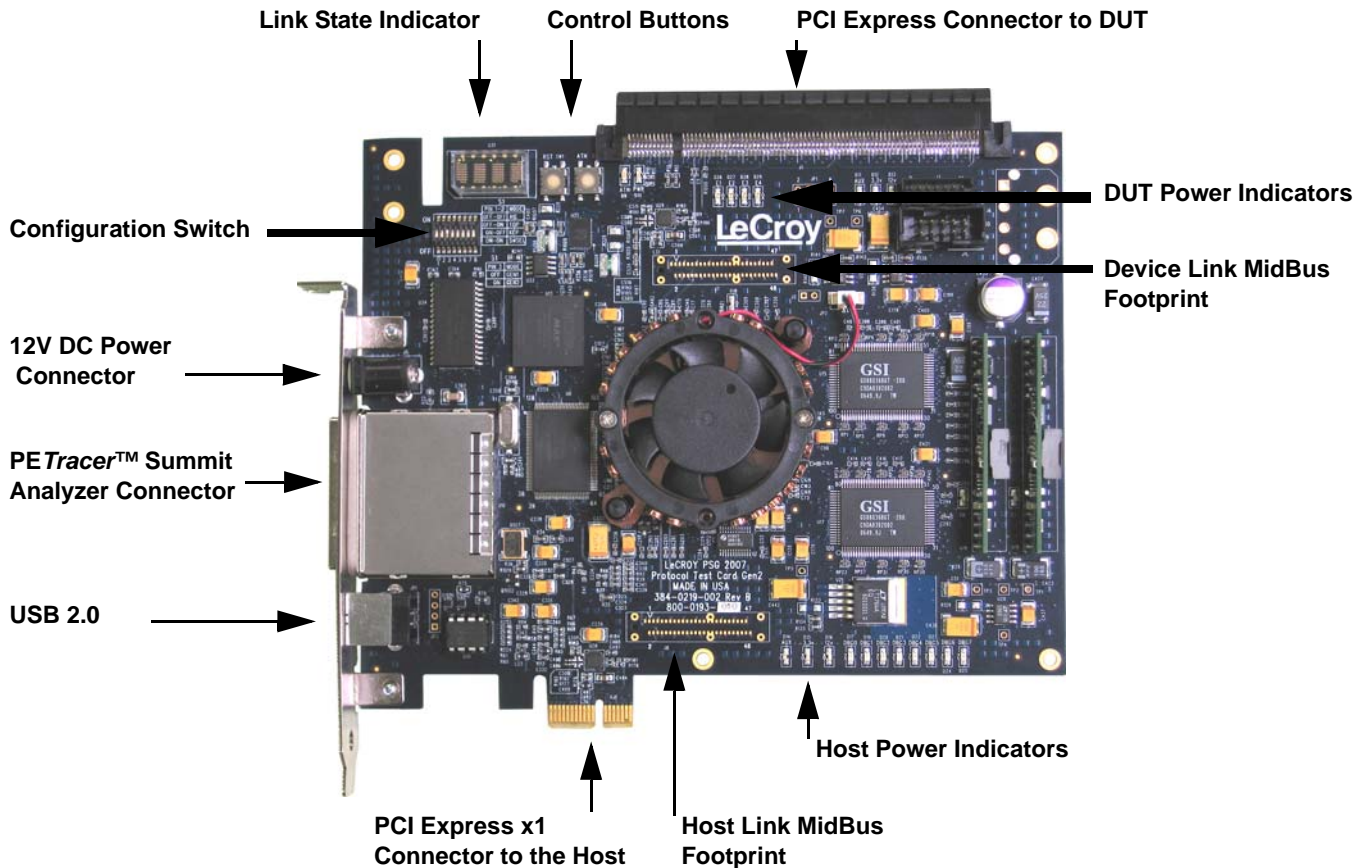
Please see the **Readme** file on the installation CD for the latest information on PC requirements.

## 3 Components

The PCI Express Gen 2 Protocol Test Card has the components:

- Installation CD-ROM
- PCI Express Gen 2 Protocol Test Card [shown on next page]
- Power Supply [not shown]
- USB Cable [not shown]

## Card Description



### 12V DC Power Connector

Provides power to the PTC using the external power supply provided in the package.

### PETracer Summit Analyzer Connector

Attaches directly to a LeCroy Summit™ analyzer to allow you to monitor Upstream and Downstream links of the PTC.

### USB 2.0 Port

Allows you to update the PTC with the latest functionality using the PTC Upgrader utility program on the installation CD.

### Host Link MidBus Footprint

Connects to test equipment to monitor the PTC Upstream link.

### Device Link MidBus Footprint

Connects to test equipment to monitor the PTC Downstream link.

### PCI Express x1 connector to the Host

### PCI Express x1 connector to the Device

The device-side connector is a physical x16 connector, but only the x1 link is wired.

### Host Power Indicators

Indicates the host has a power voltage.

### DUT Power Indicators

Indicates that the device has a power voltage.

### Control Buttons

- **RST** is for PTC reset.
- **ATN** is the Hot Plug™ Attention button (not supported in this release).

### Link State Indicator

Displays four digits that encode the link states of Upstream and Downstream links of the PTC. The first pair (the two digits on the left) represents the Downstream (DUT) link, and the second pair (the two digits on the right) represents the Upstream (Host) link.

**Link Rate:** The first digit of each pair is for the Link Rate. The Downstream (DUT) and Upstream (RC) Link Rate values are:

- **1:** 2.5 Gbps
- **2:** 5.0 Gbps

**Link Status:** The second digit of each pair is for the Link Status. The Downstream (DUT) Link Status and Upstream (RC) Link Status values are:

- **0:** Detect
- **1:** Poling
- **2:** Configuration
- **3:** Recovery
- **4:** L0
- **5:** L0s
- **6:** L1
- **7:** L2
- **8:** Disabled
- **9:** Loop back
- **A:** Hot Reset

### Configuration Switches

Controls the PTC configuration.

- **1 and 2:** PTC mode. Both off = Add In card mode. (the other two modes are for future use)
- **3:** off = Gen 1. on = Gen2
- **4, 5, 6, 7, 8:** [reserved for future use]

## 5 Installing the Software

The LeCroy PCI Express Gen 2 Protocol Test Card (PTC2) is designed to work with the compliance test software provided by PCI-SIG®. Please follow the installation instructions for that software.

## 6 Setting Up the PTC

**Note:** You must install the software before connecting the Protocol Test Card (PTC) to the host machine for the first time.

In the Add-In-Card test mode, the PTC acts as a switch device between the target platform and another PCI Express add-in card (DUT). You plug the DUT into the PCI Express slot on top of the PTC.

**Note:** Though the upper slot of the PTC can accept up to x16 cards, only x1 links are supported.

Tests in this mode check for correct behavior of the add-in card. The test software communicates with the PTC using PCI Express commands and performs various tests with the DUT.

In the Add-In-Card test mode, you must power the PTC through the external power connector.

**Important:** Power the PTC before booting the host platform.

To set up the PTC card:

1. Remove the PTC, external power supply, and power cord from the shipping container or carrying case.
2. Insert the PTC into the Host slot (see Figure 1).
3. Insert the DUT into the PCI Express connector of the PTC (see Figure 1).
4. Connect the PTC to the power supply.  
Connect the power cord to the power supply.  
Connect the power cord to a 100V–240V, 50Hz–60Hz, power outlet to turn on the PTC.  
(Note that the power supply and the PTC have no switch.)  
**Important:** It is not recommended to connect the PTC to the power supply after connecting the power supply cord to a power outlet.

### Information about Power Controller Operation

The PTC uses a power controller to manage the supply of power to the DUT slot. After the input power is applied on the bus and has stabilized, the power controller ramps the power to the DUT slot in a predictable manner. While bus power is active, the controller constantly monitors the source to ensure that all voltages are within the limits defined in the PCIe® Card Electromechanical Specifications:

- If the source voltage drops below the limit, the power controller powers down the DUT bus.
- If the DUT card draws excessive current, the power controller shuts down power supply to the DUT slot.

**Note 1:** The power controller manages the main power rails (12 V and 3.3 V) independently of the auxiliary supply (3.3 V Aux).

**Note 2:** The PTC does not draw its power from the bus.

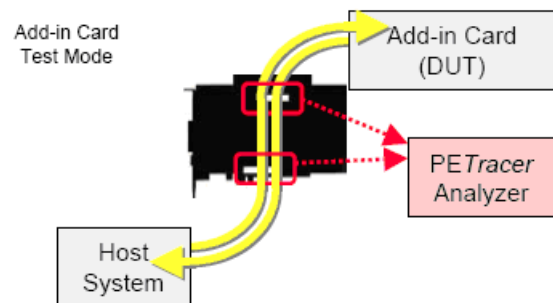


Figure 1. Host, PTC, and DUT Setup

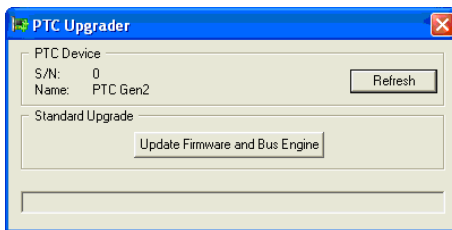
# 7 Updating the PTC Using the PTC Upgrader Utility

To update the PTC board via USB using the PTC Updater utility on the installation CD:

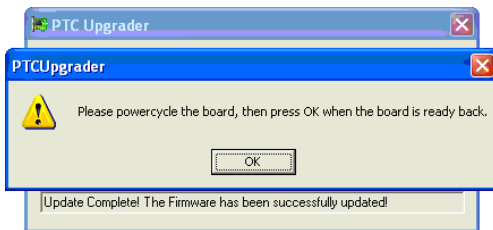
1. Power the PTC board (see Section 6 “Setting Up the PTC”).
2. Connect the PTC to the host computer using the USB cable.

**Note:** The Windows® OS may ask you to install the USB driver for the PTC. The installation CD has the USB driver.

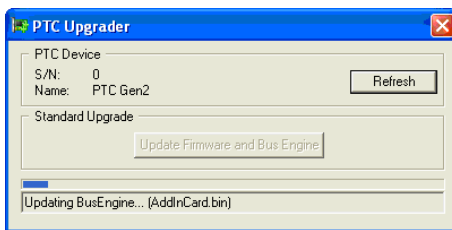
3. Start the **PTC Updater** software, provided on the installation CD, to display the PTC Upgrader window.
4. Check the PTC Device serial number (S/N) and Name.  
If the PTC Device S/N is a number and the Name is “PTC Gen2”, the PTC board is properly connected to the host computer. When the PTC device is properly connected to the host computer, the PTC Updater software enables the **Update Firmware and Bus Engine** button.



5. If the PTC device is in the device list, click the **Update Firmware and Bus Engine** button to upgrade the contents of the PTC board's flash EEPROM Firmware to the current version.
6. After updating the Firmware, the PTC Upgrader program asks you to power cycle the PTC board.



7. Turn off the PTC power, then turn it on again.
8. Click the **OK** button to start loading the Bus Engine™. Loading may take several minutes. The progress bar at the bottom of the window shows the loading status.



9. After loading finishes, power cycle the PTC board again to finish the upgrade and ready the PTC for use.

## LeCroy Customer Support

### Online Download

Periodically check the 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.

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Web: <http://www.lecroy.com/tm/Library/software/PSG>  
E-mail: [psgsupport@lecroy.com](mailto:psgsupport@lecroy.com)  
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## Changes

Product specifications are subject to change without notice.

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