

PassMark Software

PCIe Test Card

Users Guide

(Model PM080)

Introduction

When used with the PassMark™ BurnInTest Pro or PCIeTest software, the PCIe Test Card can be used to test that PCI-Express slots function correctly and provide the expected speed. It is possible to verify that:

- The PCIe slot is powered.
- That a port is capable of Gen2.0 (5Gb/s per lane) or GEN1.0 (2.5Gb/s per lane). The maximum speed of the slot can be benchmarked. (On Windows only)
- That data can be sent and received from the PCIe host slot.
- That data can be transferred without error.
- The system remains stable under long periods of load.
- Monitor power-rails for transients using 1MHz dual-channel oscilloscope mode.
- Monitor temperature inside the case
- Concurrently check multiple PCIe slots at the same time
- Measure the voltage of the PCIe slot 12V, 3.3V and 3.3Vaux power rails.
- Measure the 12V and 5V lines directly from your PSU's 4-pin Molex or SATA power connector.
- 'Power-Fail' LEDs indicate whether the voltages are within spec without running any software.

The PCIe Test Card requires a JTAG FlashPro4 programmer to upgrade the firmware.

General Notes

Compatibility

Windows 7, 8, 10 and Linux are supported.

Windows: BurnInTest Pro v8.1.1000 (or later) or PCIeTest software is required for Windows. Both 32bit and 64bit Windows drivers are available.

Riser Cables

While the PCIe Test Card will work when connected via a riser cable, direct connection is the preferred method of connection when testing a computer system. Having a direct connection eliminates the cable extension as a point of failure.

Multiple PCIe Test Cards

Multiple PCIe Test Cards can be connected and simultaneous loopback and benchmark testing carried out.

Each PCIe Test Card is unique and has its own serial number, which is displayed by PCIeTest.exe. This can be used to distinguish between multiple cards plugged into your system.

Speed

PCIe Gen2.0 is normally quoted as 5GBps per lane. Data rates will never reach these speeds on a real device because some signalling bandwidth is used by 8b/10b bit encoding, TLP, DLLP and PLP overhead. On a correctly functioning PC with a single PCIe device connected, you should typically see measured maximum speed results in the order of approximately:

- PCIe gen 2.0 x1: 420 MBps.
- PCIe gen 2.0 x4: 1200 MBps (note: the PCIe Test Card has a maximum bandwidth of 1325 MBps, so the card cannot benchmark up to the PCIe gen 2.0 maximum x4 bandwidth of ~1850 MBps).
- PCIe gen 1.0 x1: 850 MBps.
- PCIe gen 1.0 x4: 220 MBps.

Windows Installation

Step1 – Connect the device

Make sure the computer is completely off. Insert the PCIe card into a PCIe slot (note: PCIe cards cannot be inserted into PCI slots or PCIe slots shorter than their connector edge). If your motherboard supplies 3.3Vaux, the corresponding power indicator LED on the card will light. The Molex connector is for voltage measurement only and does not need to be connected to power. Make sure the PCIe card is properly seated then switch the computer on.

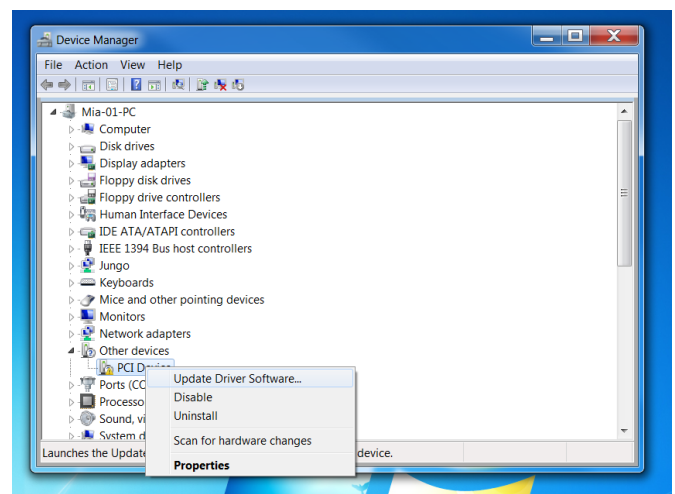
If a PassMark PCIe Test Card has been installed on the system previously, the device drivers will be automatically installed and the installation is complete.

Step 2 – Install the device driver

Make sure that you have either the device driver CD or drivers that you have downloaded from the PassMark web site available. Insert the device driver CD.

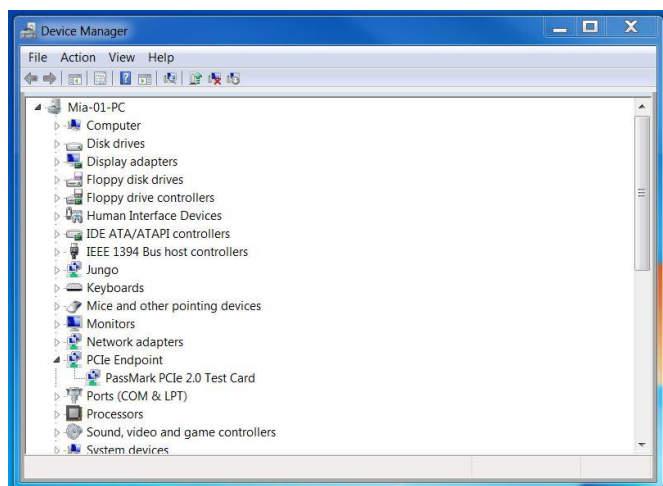
Start Device Manager by selecting Windows Start and typing "Device Manager" or through the Control Panel. If the PCIe Test Card has never been installed before, it should appear as "PCI Device" under

Device Manager>>Other devices



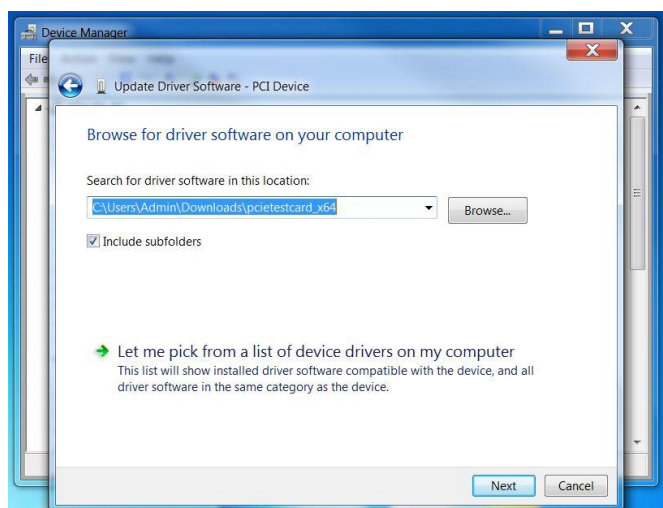
If the PCIe Test Card already has drivers installed and you wish to update the driver then it should appear as “PassMark PCIe 2.0 Test Card” under

Device Manager >> PCIe Endpoint

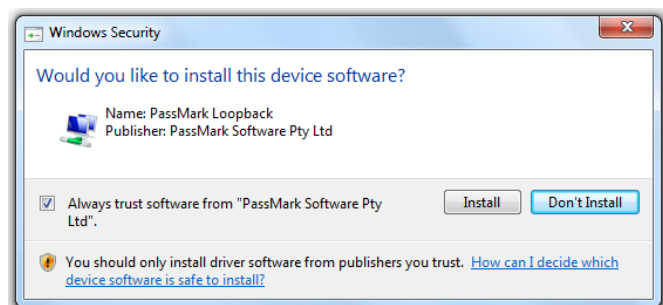


Right-click the device and select “Update Driver Software...” from the drop-down menu.

Select “Browse my computer for driver software” and enter the location of the device drivers, e.g. the directory on the installation CD. Select Next.



Click ‘Install’ if the Windows Security displays the following message.



After successful installation, a Window will be displayed indicating that “Windows has successfully updated your driver software”.

Step 3 – Starting the Test Software

The PCIe Test Card can be used to test PCIe slots with PCIeTest or BurnInTest software. To run PCIeTest, copy the utility from the CD to your hard disk and double click on “PCIeTest.exe”. See the software help files for details of using PCIeTest or BurnInTest.

Uninstalling in Windows

From the Windows "Start" option, select "Control Panel", "System", "Hardware", "Device Manger", from the "PCIe Endpoint" branch of the device tree, select the "PassMark PCIe 2.0 Test Card" device and from the menu select "Action", "Uninstall".

Trouble shooting

Symptom: Power, but no appearance of a PCI Device under Device Manager

The basic PCIe device enumeration process could not be completed. This could be a fault in the Windows O/S installation or with the PCIe hardware in the computer.

Molex/SATA Connector

The PCIeTest Card has a Molex connector for direct connection to 12V and 5V ATX Power Supply rails. The PCIeTest Card is shipped with a removable Molex-to-SATA adapter for easy mating with any ATX power supply.



PCIe Test Card with Molex to SATA Adapter



PCIe Test Card with Molex to SATA Adapter Attached

The PCIeTest Card does not draw additional power from this connector so unless measuring the 12V and 5V rails, it can be left disconnected. When the Molex connector is not connected to power, it can be expected that the red ‘fail’ LEDs corresponding to the 12V and 5V Molex will be on.

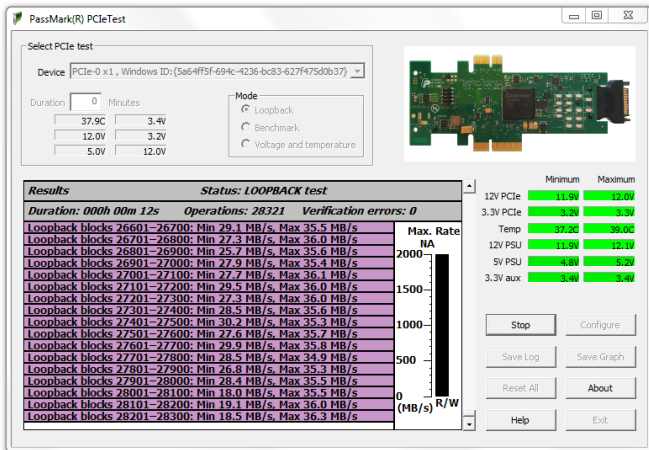
Voltage Measurement

Power rails can be measured using the PCIeTest Card in four different ways:

- The red 'voltage fail' LEDs located top-side of the PCIe Test Card light up automatically if the 12V PCIe, 3.3V PCIe, 12V Molex or 5V Molex voltage rails are found to fall out of the specified range (see table below). No communication with the driver or PCIeTest.exe application is needed in this usage scenario.



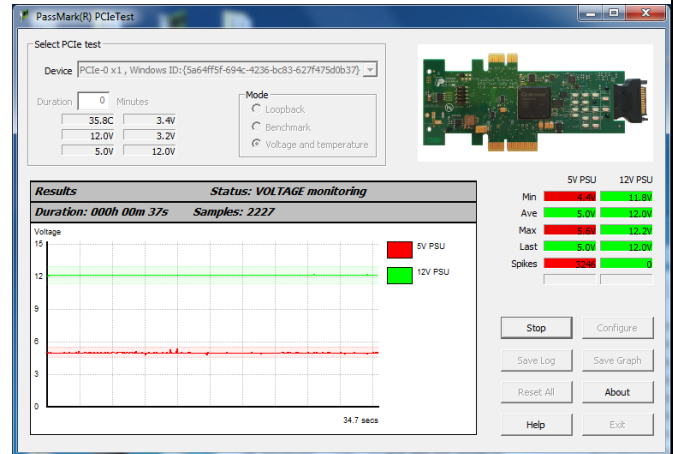
- For more detailed voltage data, the PCIeTest.exe application can track the measured minimum and maximum voltages of all inputs, including 3.3Vaux and temperature, even during benchmark and loopback tests.



- You can measure the 12V and 3.3V PCIe power rails directly using an external voltage measuring tool such as a multimeter or an oscilloscope. The power rails can be probed by connecting the tool's measurement terminals to the labeled jumper headers (+12V, +3.3V, and GND) on the PCIe Test Card.



- And finally, the user can monitor up to two voltage rails or temperature in real-time using PCIeTest.exe in 'voltage mode'. A green band is imposed over the output graph to indicate whether the measured voltage falls within the acceptable range.

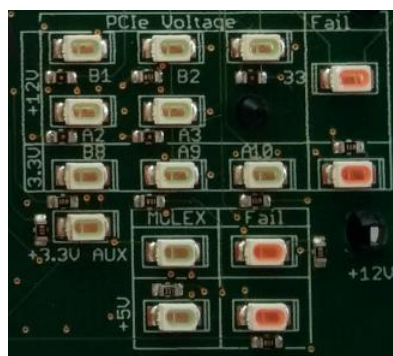


Technical Specifications

| | |
|-----------------------------|---|
| Plug and play: | Compliant |
| Physical connector: | x1 or x4 PCIe Edge |
| Voltage: | 4.75V – 18V (No external power req'd) |
| Current: | 650 mA (when all LEDs are on) |
| Current: | |
| Clock speed: | 166 MHz |
| Size: | 140mm x 69mm x 20mm (5.5 x 2.7 x 0.8 inches) |
| Weight: | 41g (1.4oz) |
| EMC standards: | AS/NZS 3548:1995, EC |
| Storage Temperature: | -30 °C to + 80 °C |
| Usage Temperature: | 0 °C to + 70 °C |
| Model number: | PM080 |
| RoHS (Lead free): | Yes |

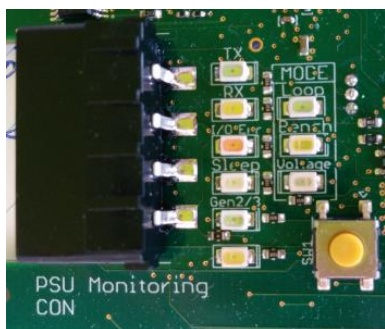
LED Assignments

| Group | Labels | Colour | Description |
|-----------|--------------------|--------|--------------------------|
| 12V PCIe | B1, B2, B3, A2, A3 | Green | Labeled pins powered |
| 12V Fail | - | Red | 12V out of spec'd range |
| 3.3V PCIe | B8, A9, A10 | Green | Labeled pins powered |
| 3.3V Fail | - | Red | 3.3V out of spec'd range |
| 12V Molex | - | Green | 12V Molex connected |
| 12V Fail | - | Red | 12V out of spec'd range |
| 5V Molex | - | Green | 5V Molex connected |
| 5V Fail | - | Red | 5V out of spec'd range |
| 3.3V Aux | 3.3V Aux | Green | 3.3Vaux pin powered |



(Left-Figure: Top side LEDs for power rail indication and automatic monitoring)

| Label | Colour | Description |
|---------|--------|-----------------------|
| TX | Yellow | TX Activity |
| RX | Green | RX Activity |
| I/O Err | Red | I/O Error |
| Sleep | Orange | Sleep |
| Gen2/3 | Green | PCIe Gen2/3 |
| Misc | Yellow | Application Dependent |
| Loop | Green | Loopback Mode |
| Bench | Yellow | Benchmark Mode |
| Voltage | Orange | Oscilloscope Mode |



(Left-Figure: Bottom side LEDs for activity, error and mode indication)

Disclaimer

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