

Matrix Card System Troubleshooting

October 07, 2021

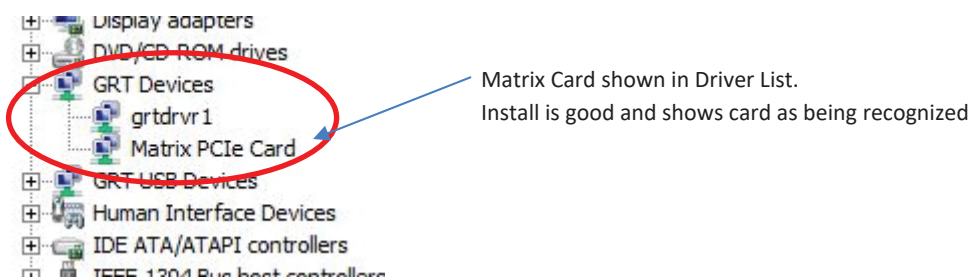
This document contains information on troubleshooting system problems for Matrix cards. The information in this guide should only be consulted after you have followed all the steps in the Quick Start and User's Guide for the card.

The following problems may be encountered when trying to use a Matrix card in your computer:

1. The card fails to work because the driver is not installed properly or card is not fully inserted into PCIe slot.
2. The driver is installed but Windows fails to recognize the card.
3. The card works initially, but stops working or hangs the system.
4. The card works but the Windows enumeration is not what is needed by the user.

1. Driver not installed properly

If the card fails to work at all, first verify the card is fully seated into the PCIe slot. If the card is correctly inserted into the slot, you should then check the Windows Device Manager to see if the driver is installed properly. In Device Manager, you should see "GRT Devices, with "grtdrvr1" listed below that. For each card installed, there will be an additional "Matrix PCIe Card" item listed below that. The picture below shows what Device Manager looks like with one Matrix card installed.

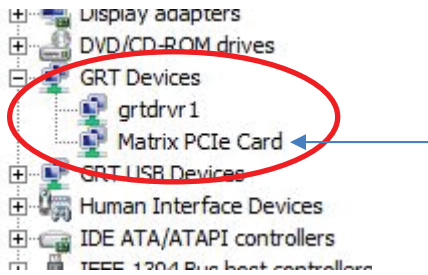


If you do not see the first two items circled above, the driver is not installed properly and you need to resolve that before continuing. Typically, removing and reinstalling the driver can remedy this.

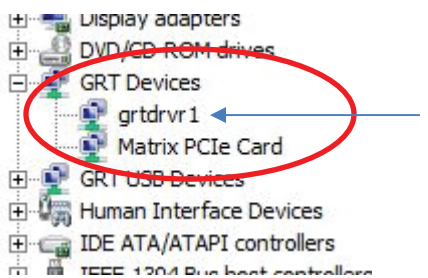
Note that if there are no cards installed, you will not see any "Matrix PCIe Card" items listed. If you have a card installed and you see the first item "grtdrvr1", but there is no "Matrix PCIe Card" listing below that, the card is not being recognized. If this case, go to section 2 below.

Perform the following steps to properly uninstall the device driver. Windows may try to reinstall old device drivers it has saved from past installations, so you may need to repeat steps 1 through 8 multiple times. Note that your card(s) must be installed for this to be completely successful.

1. Open the Windows Device Manager.
2. Under GRT Devices, right-click on “Matrix PCIe Card” and select Uninstall.



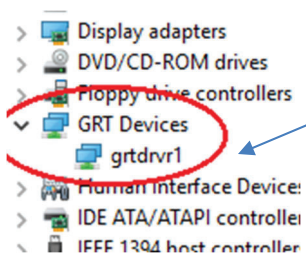
3. When prompted to confirm the uninstallation, check the “Delete the driver software for this device” checkbox and press the OK button.
4. Repeat this for any other “Matrix PCIe Card” items shown in GRT Devices.
5. Right-click on “grtdrvr1” and select Uninstall.



6. When prompted to confirm the uninstallation, check the “Delete the driver software for this device” checkbox and press the OK button.
7. Close the Device Manager.
8. Reboot the computer.
9. Open the Windows Device Manager and look under “GRT Devices” for any remaining “grtdrvr1” or “Matrix PCIe Card” items. If you see either of those, repeat steps 1 through 8. If you don’t see “grtdrvr1” or “Matrix PCIe Card”, you are done.

2. Card not recognized by system

Before proceeding with the troubleshooting in this section, you should first verify that the Windows Device Manager shows the Matrix Drivers installed properly (see section above). If the Matrix driver has been installed, but the Windows Device Manager shows “GRT Devices” and “grtdrvr1”, but there are no “Matrix PCIe Card” items listed below that (as shown below), then the card is not being recognized.



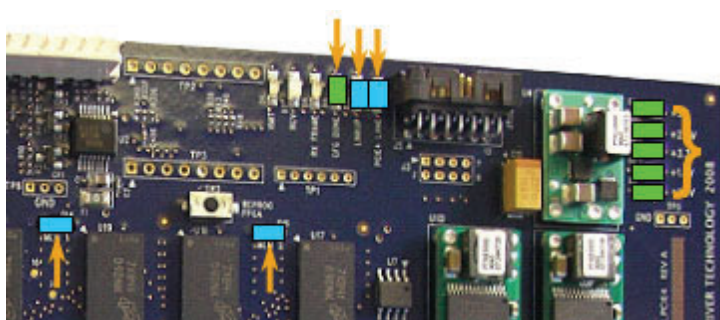
No Matrix Card is shown in this List!

The card is not being recognized

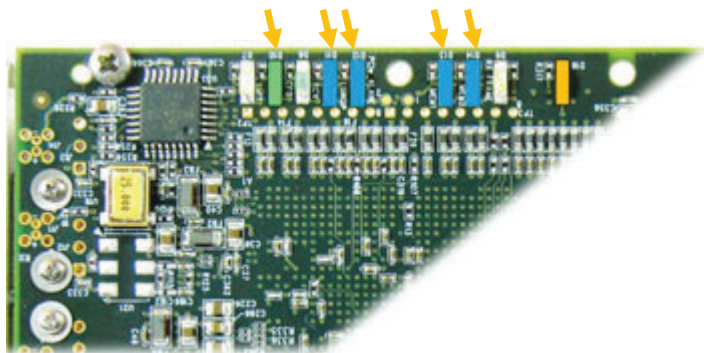
Checking the card LEDs

There are several Blue LED indicators that must be ON for your device to work properly: Refer to the pictures below:

LEDs ON PCIe Cards: CFG DONE D9, D11, D13, D14, D15



LEDs ON XMC Cards: CFG DONE D8, D11, D12, D13, D14



If your card's LEDs are OFF, then refer to the next section for changing BIOS settings.

If your system starts with your Matrix card LEDs ON, but the Windows Device Manager still does not recognizing the cards, you will need to contact the manufacture and see if there is a BIOS update available that can support Gen1 (electrically x4). If there is no BIOS update, then your system cannot be supported.

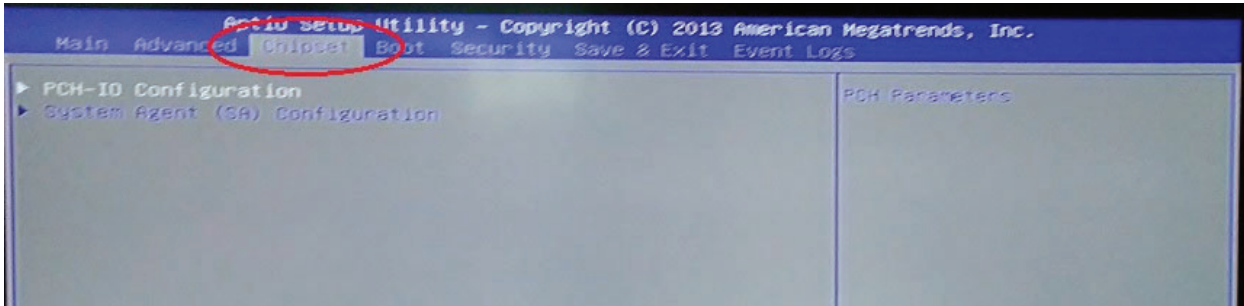
Changing BIOS settings

Some systems have PCIe slots that are reserved for graphics cards. If that cannot be changed in the BIOS settings, you will not be able to use the Matrix card in that slot.

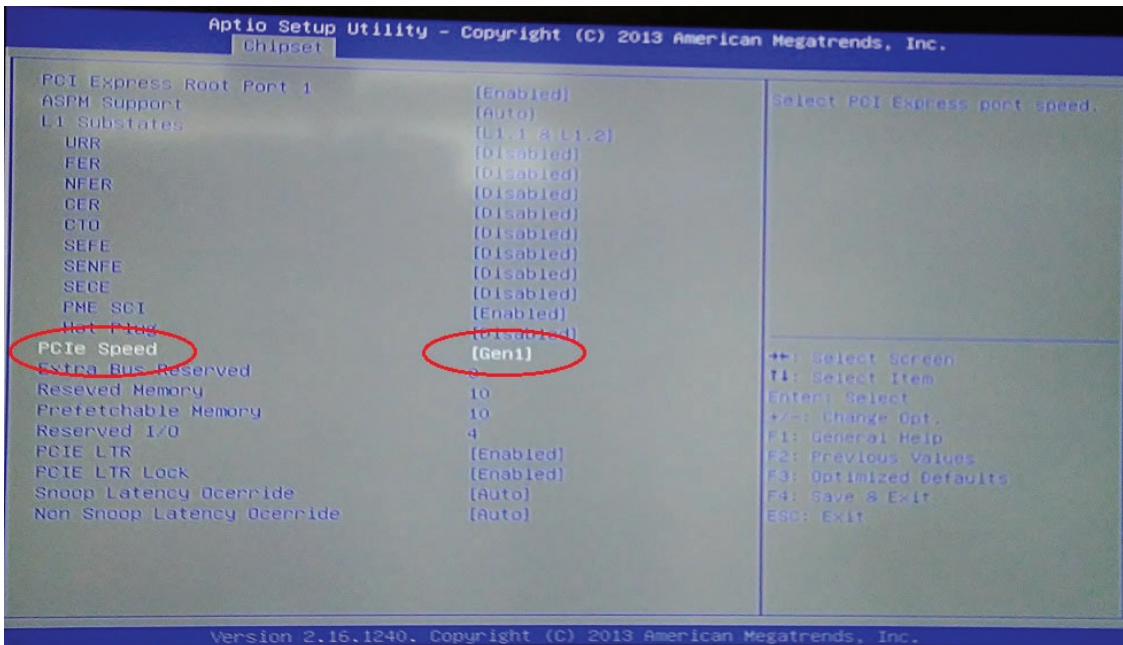
Most systems allow the changing of PCIe settings in BIOS. You must ensure that the PCIe slot that you have your Matrix card installed in is set to Gen1, and that the PCIe slot supports a physical x4 electrical connection or greater.

If your system's BIOS does not allow for changing these settings then you will not be able to resolve this problem.

Below is an example of an American Megatrends BIOS setting for Gen1 on PCI Express Root Port 1 where a Matrix card is installed. Your Gen1 setting is often found under your PCI Chipset setting. Look for a PCI configuration option under this setting. Try changing from AUTO to GEN1



In the example below we have a Matrix card installed on PCI Express Root Port 1. The setting has been changed to Gen1 under PCIe speed.



Try other PCIe slots in the system

If the changes to BIOS have not helped, make sure the card is fully inserted into the PCIe slot and try all available PCIe slots in the system. Some motherboards have a reserved slot for graphics cards only (This is typically a x16 slot). Check with your mother board user manual to understand the usage and setup for each PCIe slot, sometimes there are jumper settings to enable PCIe slots. Every system and Motherboard can be different.

3. Card stops working or hangs system

If the card stops working or hangs the system, this could be due to Windows Power Management settings. Apply Tech Note 012M (<http://greatrivertech.com/pdfs/Matrix-PCIePowerMgmt-TN012M.pdf>) before continuing.

4. Card enumeration is not as expected

How PCIe enumeration works

The process of detecting PCIe devices on a host does not guarantee those devices will be listed in the order they are plugged into the motherboard or backplane of your system. When a host sends configuration packets to assign a unique bus, device, and function number to a device, the root complex driver steps through the hierarchy to find all the connected downstream devices by looping the bus number. The first device to respond with a valid vendor ID will be assigned 0; the next to respond will be assigned 1; and so on.

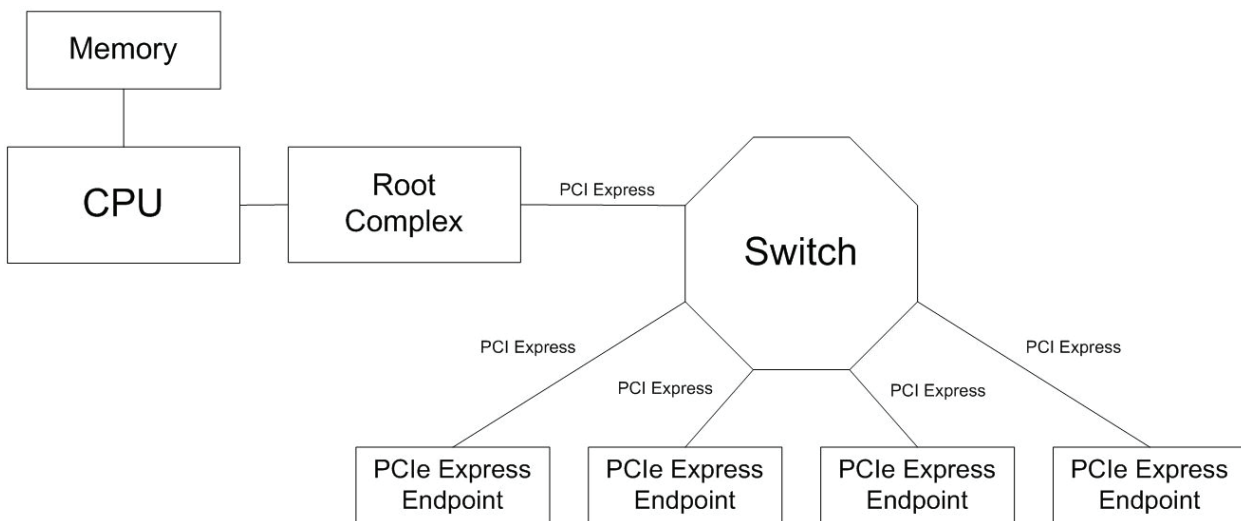


Figure 4.1. PCIe cards will not necessarily be listed in their physical order in the motherboard or backplane.

Once all cards are installed in a system, the PCIe enumeration will be repeatable after power cycle or reboot. The enumeration will change only when cards are moved to different slots or when the number of installed cards changes.

5. Updates

Updates are very important for Windows10/11 operating system. If the system uses this OS, make sure to run updates to the OS.

Make sure all Great River Technology device drivers and S/W are up to date. If the latest revision is not used, this can be the source of many errors. Check with Great River if there is any doubt on the latest version.