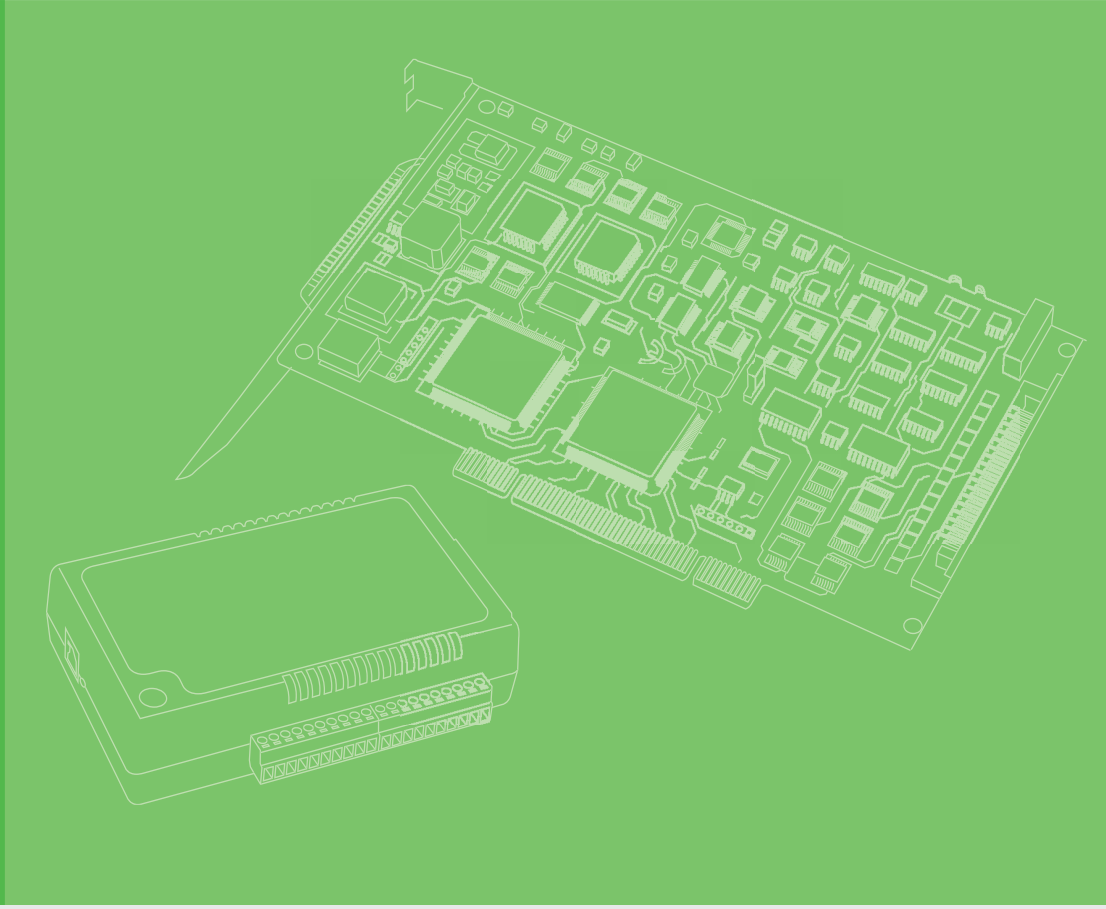

User Manual

PCIe Programmable Power ON/OFF Frame Grabber Card

Industrial GbE PoE Network Card

ADVANTECH

Enabling an Intelligent Planet

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Product Warranty (5 years)

Advantech warrants to you, the original purchaser, that this product will be free from defects in materials and workmanship for five years from the date of purchase.

This warranty does not apply to products that have been repaired or altered by persons other than repair personnel authorized by Advantech, nor does it apply to products that have been subject to misuse, abuse, accident, or improper installation. Under the terms of this warranty, Advantech assumes no liability for consequences arising from such events.

Because of Advantech's high quality-control standards and rigorous testing, most of our customers never need to use our repair service. If an Advantech product is defective, it will be repaired or replaced at no charge during the warranty period. For out-of-warranty repairs, you will be billed according to the cost of replacement materials, service time, and freight. Please consult your dealer for more details.

If you believe that you have a defective product, follow these steps:

1. Collect all the information about the problem encountered (e.g., CPU speed, Advantech products used, other hardware and software used, etc.). Note anything abnormal and list any on-screen messages you get when the problem occurs.
2. Call your dealer and describe the problem. Please have your manual, product, and any helpful information readily available.
3. If your product is diagnosed as defective, obtain a return merchandise authorization (RMA) number from your dealer. This allows us to process your return more quickly.
4. Carefully pack the defective product, a fully completed Repair and Replacement Order Card, and photocopy proof of the purchase date (e.g., your sales receipt) in a shippable container. A product returned without proof of the purchase date will not be eligible for warranty service.
5. Write the RMA number visibly on the outside of the package and ship it prepaid to your dealer.

Declaration of Conformity

CE

This product has passed the CE test for environmental specifications when shielded cables are used for external wiring. We recommend using shielded cables. This type of cable is available from Advantech. Please contact your local supplier for ordering information.

FCC Class A

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio-frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.

Safety Precaution - Static Electricity

Follow these simple precautions to protect yourself from harm and the products from damage.

- To avoid electrical shock, always disconnect the power from your PC chassis before you work on it. Do not touch any components on the CPU card or other cards while the PC is on.
- Disconnect the power before making any configuration changes. The sudden rush of power as you connect a jumper or install a card may damage sensitive electronic components.

Technical Support and Assistance

1. Visit the Advantech website at www.advantech.com/support for the latest information about the product.
2. Contact your distributor, sales representative, or Advantech's customer service center for technical support should you require additional assistance. Please have the following information ready before you call:
   - Product name and serial number
   - Description of your peripheral attachments
   - Description of your software (OS, version, application software, etc.)
   - A complete description of the problem
   - The exact wording of any error messages

Contents

Chapter 1

Introduction

1.1 Description

Advantech's PCIE-1672 and PCIE-1674 cards are PCI Express x4 cards with Power over Ethernet (PoE) and jumbo frame support for independent Gigabit Ethernet ports. Advantech GbE PoE cards leverage the Plug and Play capability defined in the PCI Express bus specification. The board requires one PCI Express x4 slot in the personal computer it is to be installed in. The card provides independent Gigabit Ethernet Ports via Intel i350 series Gigabit Ethernet controllers. Multiple Gigabit Ethernet Vision device connections are supported for standard Gigabit Ethernet Vision data transfer rates of up to 1000 Mbps.

The PCIE-1672 and PCIE-1674 feature the 802.3af PoE standard, combining a power supply, jumbo frame package, power isolation, and IEEE 1588 (precise time protocol) to enable synchronization with multi-camera or powered device (PD) acquisition capabilities.

Each port of the PCIE-1672 and PCIE-1674 can deliver a maximum of 15.4 W of power per port (external 12 V_{DC} is required) and 1000-Mbps bandwidth over a Cat-5/Cat-6/Cat-7 cable up to 100 m in length. It features 9-kB jumbo frame and link aggregation, which perform exceptionally for continuously receiving large amounts of image data.

PoE technology significantly reduces installation and maintenance costs by eliminating the need for power wiring. Combining PoE and the Gigabit bandwidth, the PCIE-1672 and PCIE-1674 are the perfect fit for your vision applications.

1.2 Features

- IEEE802.3af-compliant, supporting Classes 0,1,2,3,4
- Support for four independent GbE ports
- PD auto-detection and classification
- Built-in ESD 8 kV and EFT 2 kV
- IEEE 1588-compliant
- PCI Express x4-compliant
- Supports link aggregation
- Supports jumbo frames (9014 bytes)
- Inrush current, current limit, and short-circuit protection

1.3 Specifications

- **Power Over Ethernet Port**
  - 2 or 4 Gigabit Ethernet MAC and physical layer ports
  - 48 VDC PoE power output, total max. 18 W (total max. 60 W with AT/ATX system power input)
  - Standard IEEE 802.3 Ethernet interface provided for 1000BASE-T, 100BASE-TX, and 10BASE-T applications (802.3, 802.3u, and 802.3ab, 802.3x)
  - 9014-byte jumbo frame support
- **Bus Interface**
  - PCIe x4
- **Power Requirements**
  - Input voltage: 12 V_{DC} direct from PCIe slot or AT/ATX system power input
- **ESD/EFT**
  - 8 kV ESD and 2 kV EFT
- **Physical**
  - Dimensions (W x D): 174 x 106.65 mm
  - Operating temperature: 0~50°C
  - Safety compliance: CE/FCC

1.4 Ordering Information

- PCIE-1672V: 2-port PCIe programmable power on/off frame grabber
- PCIE-1674V: 4-port PCIe programmable power on/off frame grabber

1.5 Unpacking Checklist

Ensure that the following items are included in the package.

- PCIE-1672V or PCIE-1674V card

Chapter 2

Hardware Configuration

2.1 Initial Inspection

We carefully inspect our PCIe GbE PoE cards mechanically and electrically before shipping them. Your PCIe card should be free from marks and scratches and in perfect working order upon receipt.

As you unpack your card, check for signs of shipping damage (e.g., damaged box, scratches, or dents). If it has been damaged or if it fails to meet the specifications, notify our service department or your local sales representative immediately. Also notify the carrier and retain the shipping carton and packing material for inspection by the carrier. After inspection, we will make arrangements to repair or replace the card.

When you handle the card, remove it from its protective packaging by grasping the rear metal panel. Retain the anti-vibration package for storage should you ever need to remove the card from your PC.

Warning! *Discharge your body's static electric charge by touching the back of the grounded chassis of the system unit (metal) before handling the board. You should avoid contact with materials that hold a static charge, such as plastic, vinyl, and styrofoam. To avoid static damage to its integrated circuits, handle the board only by its edges. Avoid touching the exposed circuit connectors. We recommend that you use a grounded wrist strap and place the card on a static dissipative mat whenever handling it.*

2.2 Hardware View

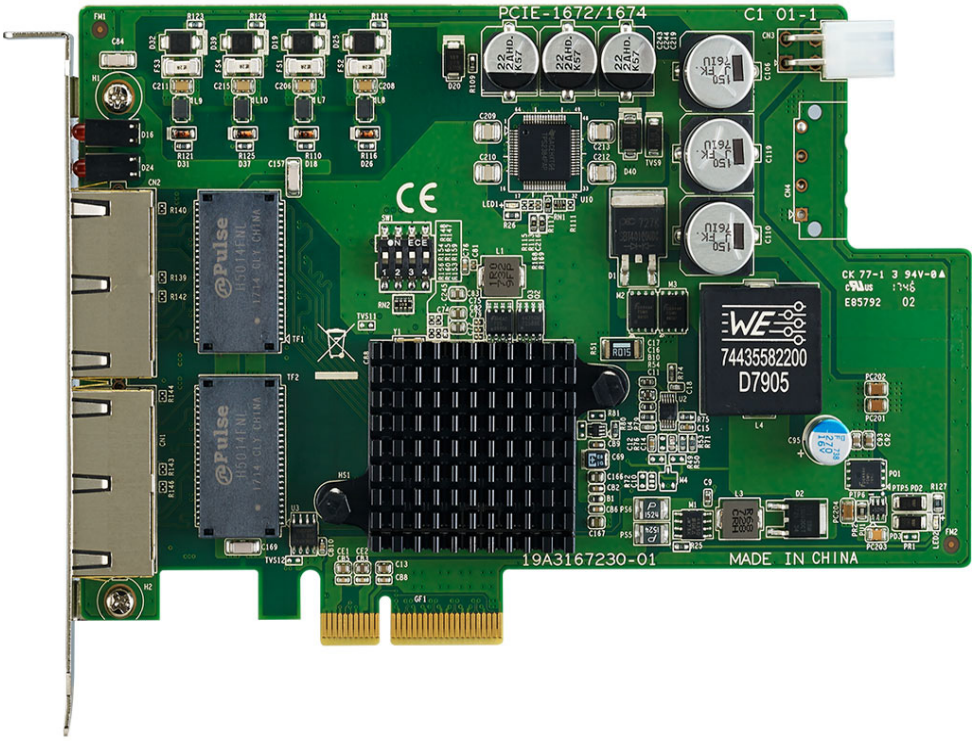


Figure 2.1 PCIE-1674 Board Layout

Figure 2.2 LED Status Indicators

2.3 Card Installation

Note! *We strongly recommend that you install the software driver before you install the hardware in your system. This will guarantee a smooth and trouble-free installation process.*

Turn off your PC's power supply whenever you install or remove the card or its cables. Static electricity can easily damage computer equipment. Ground yourself by touching the chassis of the computer (metal) before you touch any boards. See the static warning at the start of this chapter.

1. Turn off the computer and all peripheral devices (such as printers and monitors)
2. Disconnect the power cord and any other cables from the back of the computer
3. Remove the PC's cover (refer to your user guide if necessary)
4. Install the card in your PCIe bus
5. Replace the PC's cover and reconnect any cables you removed at Step 3 and then connect the power connector and power supply with the power cable in the package
6. Turn on the computer
7. Test your Ethernet port and verify that it works normally (see Chapter 4)

Chapter 3

Driver Setup and Installation

3.1 Introduction

This chapter describes the driver installation, configuration and removal procedures for Windows XP/Vista/7 (32/64-bit).

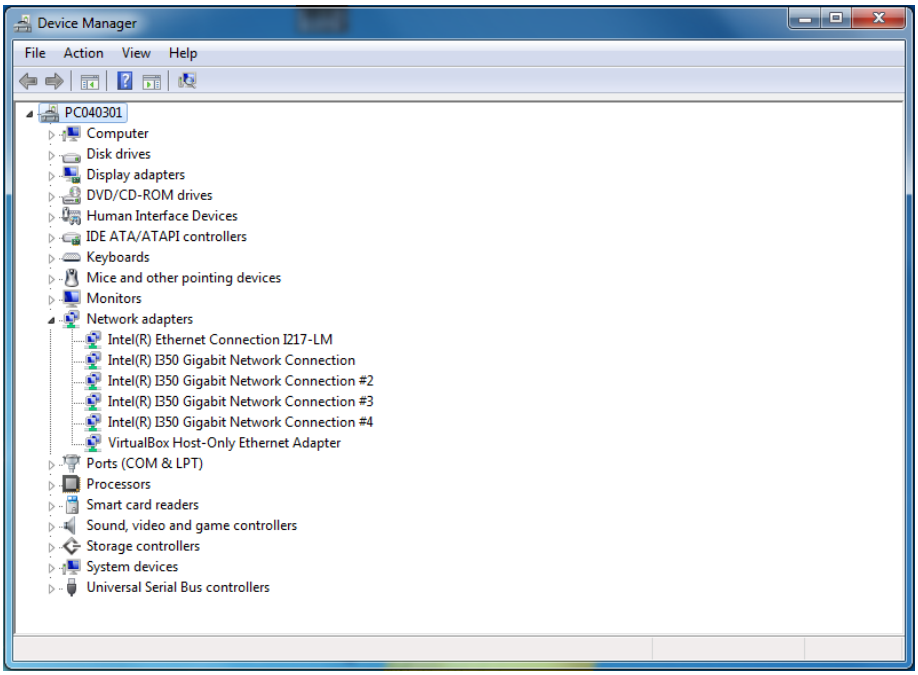
3.2 Driver Setup

To fully utilize the advanced features of Windows XP/Vista/7 (e.g., multiprocessing and multithreading), pure 32-bit and 64-bit Windows XP/Vista/7 device drivers are provided for your PCIe card.

3.2.1 Driver Installation (Windows XP/Vista/7)

Please follow these steps for driver installation:

1. Visit the Advantech website, search for “PCIE-1674,”click the **Manual/ Driver/ BIOS/ FAQ** icon, and download the Driver.
2. Unzip the driver and execute **autorun.exe**.
3. After installation, the network device will appear in Device Manager.



3.3 Configuring Devices for Win XP/Vista/7

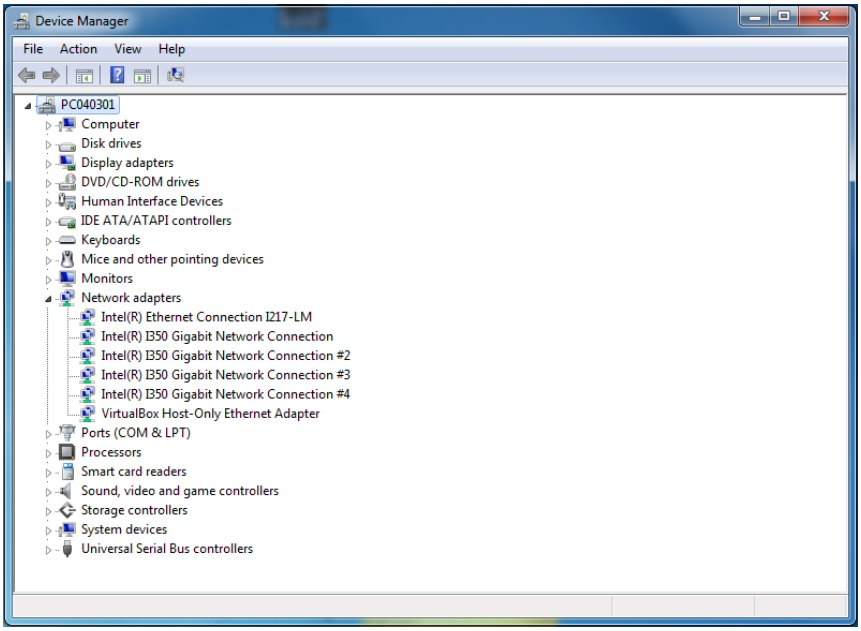
The PCIE-1672 and PCIE-1672 offer Gigabit Ethernet connectivity via the Intel® i350 GbE controller. When connecting to a high-speed PoE device, such as a GigE camera, you can adjust some driver settings to improve the transmission throughput and connection stability. These settings are discussed in this section.

3.3.1 Jumbo Frame

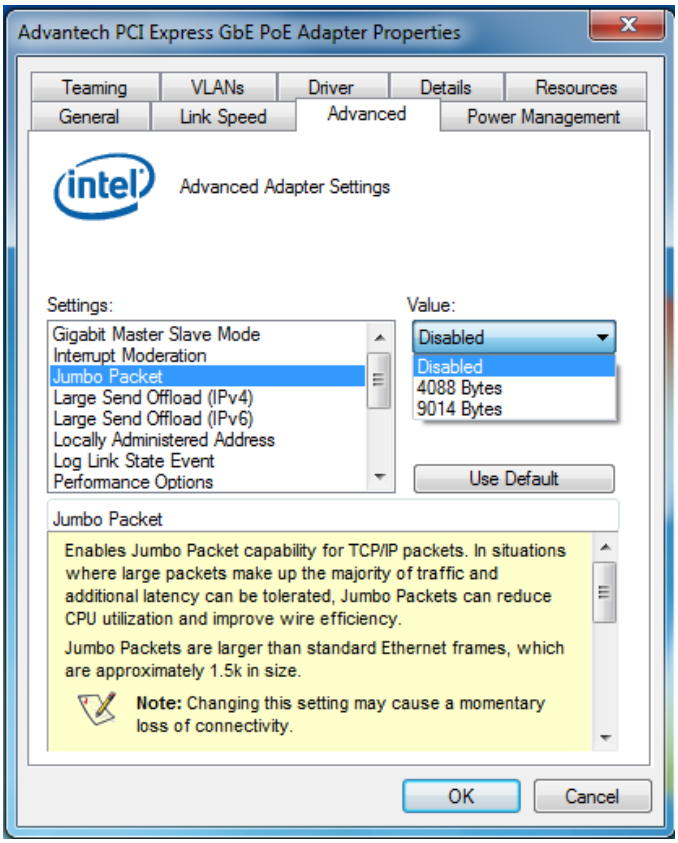
Jumbo frames are Ethernet frames with more than 1500 bytes of payload. By increasing the payload size, a large amount of data can be transferred with fewer interrupts generated, which reduces CPU utilization and increases the overall data throughput. The Intel® i350 GbE controller supports jumbo frame sizes of up to 9 KB. When you connect an Ethernet device with high data rate (e.g., a Gigabit Ethernet camera), enabling the jumbo frame feature is highly recommended.

After installing the driver for Intel® i350 GbE controller, you can change the jumbo frame settings by following these steps:

1. Open **Computer Management** and select **Device Manager**



2. Right-click on **Advantech PCI Express GbE PoE Adapter** and select **Properties**
3. Click **Configure** and a dialog box will appear; click the **Advanced** tab
4. Select **Jumbo Packet** under **Settings** and select the expected jumbo frame size under **Value**

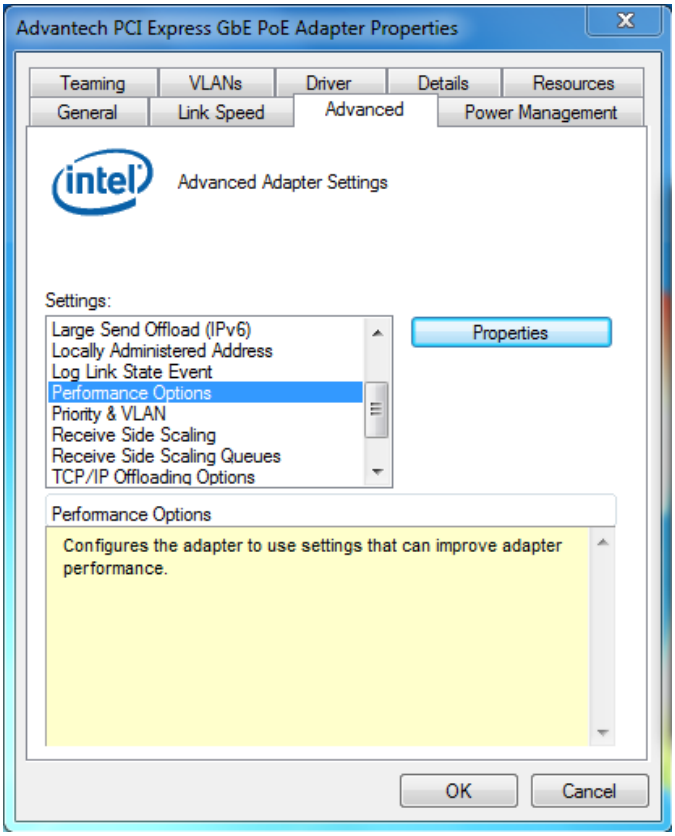


3.3.2 Receive Buffer

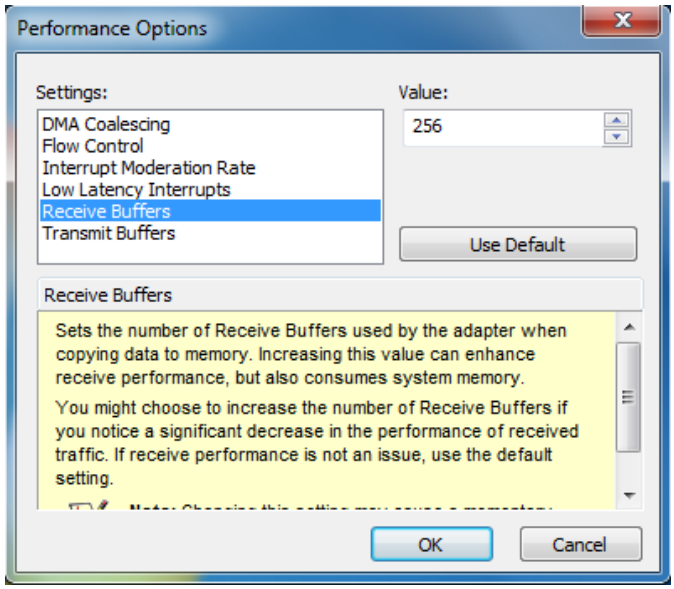
The receive buffer is another option that can affect the data throughput. This determines the size of the allocated memory buffer for receiving data. Increasing its size can improve the performance of receiving data. The default setting is 256 bytes. When connecting to an Ethernet device that generates a large amount of data, you can set this option to a larger value to improve the performance (max. 2048 bytes).

You can change the settings of the receive buffer by following these steps:

1. Select **Performance Options** under **Settings** and click **Properties**



2. Select **Receive Buffers** under **Settings** and adjust the value as required. The default value is 256 bytes (for Ethernet devices with a high data rate, we recommend selecting 2048 bytes)

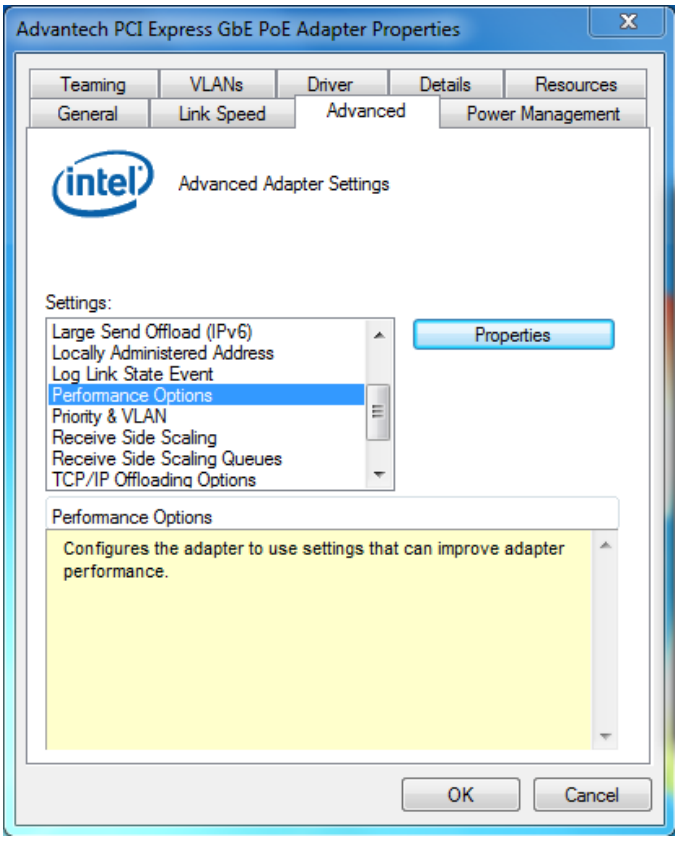


3.3.3 Transmit Buffers

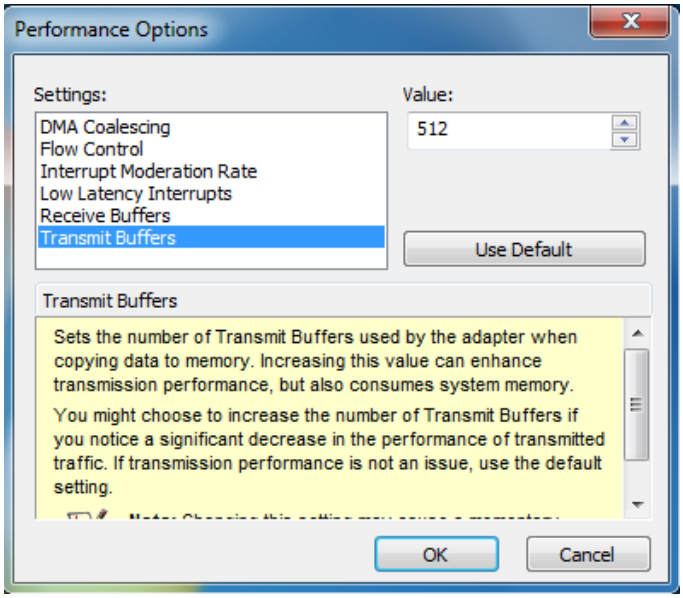
Like receive buffer, transmit buffer can affect the performance of transmitting data. The default settings of receive buffer is 256 bytes. If you encounter a performance issue while transmitting data, you can increase the size of transmit buffer (max. 2048 bytes) to improve the performance.

You can change the settings of transmit buffer by following these steps:

1. Select **Performance Options** under **Settings** and click **Properties**

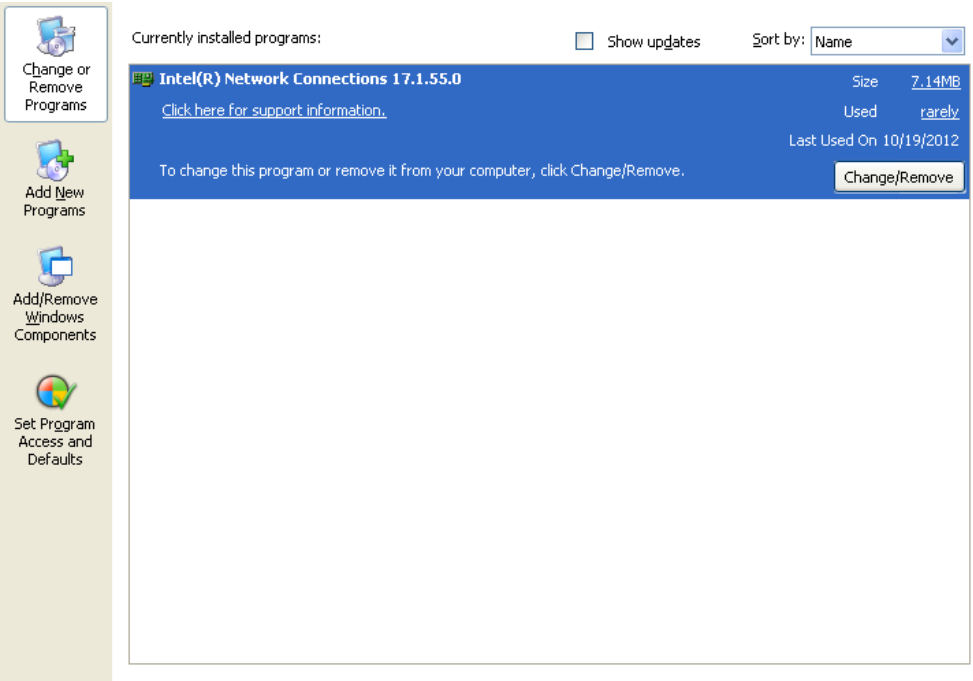


2. Select **Transmit Buffers** under **Settings** and adjust the value as required

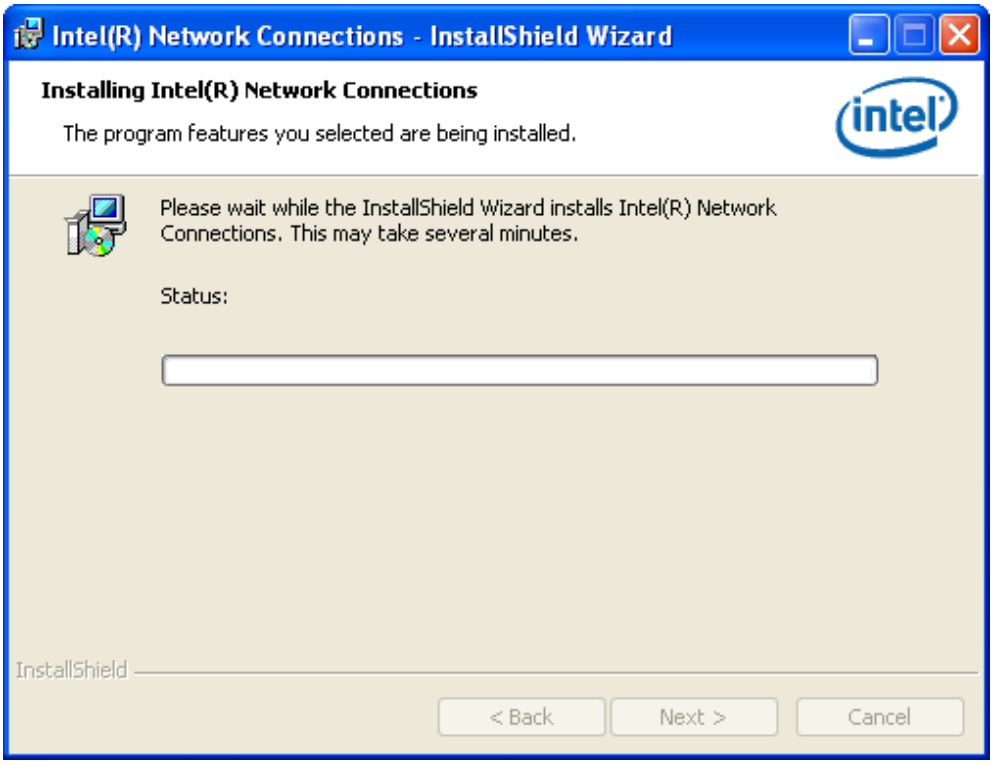


3.4 Removing the PCI Express GbE PoE Device Driver

1. Open **Add/Remove Programs** from the Control Panel



2. Select the **Intel® Network Connections 17.1.55.0** and click **Change/Remove** to remove the driver, and then follow the prompts to complete the uninstallation



3.5 PoEPowerControl_Installer

The PCIE-1672V/PCIE1674V supports a unique feature of per-port power on/off control for each PoE port. With the provided function APIs, you can turn the power of each PoE port on or off manually for fault recovery or device power reset purposes.

3.5.1 Driver Installation

Download “PoEControl Sample Code for PCIE-1672V/1674V” from the Advantech support portal and run the installer: http://support.advantech.com.tw/support/DownloadSRDetail_New.aspx?SR_ID=1-1JAZ8JN&Doc_Source=Download

Once installed, the sample code can be found at “C:\Advantech\PoEPowerControl\Example\”

3.5.2 Per-Port On/Off Control Function

Compile and run the sample program. The PoE feature will be turned off and then back on sequentially for each port on the PCIE-1672V/1674V card.

```
// function for setting the PoE mode to off: "fpPPCSetPowerState(i, PPC_POWER_OFF)"
if (fpPPCSetPowerState(i, PPC_POWER_OFF))
{
printf("Set Port %d to Power Off: Success\r\n", i);
}

// function for setting the PoE mode to auto: "fpPPCSetPowerState(i, PPC_POWER_AUTO)"
if (fpPPCSetPowerState(i, PPC_POWER_AUTO))
{
printf("Set Port %d to Power Auto: Success\r\n", i);
}

// i = the specified port on the card. For the PCIE-1672V, i = 0~1; for the PCIE-1674V, i = 0~3
```

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