GigE Cameras
Trouble Shooting Guide

WHAT IS GigE?

GigE or Gigabit Ethernet is a member of the family of computer networking and communication standards. The Gigabit Ethernet standard supports a theoretical maximum data rate of 1 gigabits per second (1 Gbps or 1000Mbps), as defined by the IEEE 802.3-2008 standard. To ensure a high data rate, Gigabit Ethernet workS using unshielded twisted pair (1000BASE-T) copper cable (specifically, the CAT5e and CAT6 cabling standards).

What are the first things I should do to get an image?

1. Install Gigabit Ethernet network card (also called; Ethernet Adapter or Frame Grabber)
2. Configure network card (or; Jumbo Frames, Receive Descriptors, Performance Options and IP address settings). See "*Network Settings for GigE Cameras*" for detailed information.
3. Install camera manufactures SDK (Software Development Kit), from a web-download or the CD supplied. This will usually include the manufacturer's viewer software.
4. Connect the camera to your PC or laptop and power (switch on) the camera
5. Acquire your first image by using the viewer programme

If you are using an alternative software program (eg; Streampix, Labview, CVB, Matlab, Halcon, etc), it is advisable to test the camera and frame grabber with its own viewer software beforehand.

NOTE: If it doesn't work with its own software, it probably won't work with a third party software

Why is my camera not working?

Is the camera getting power? On all of our GigE cameras the RJ45 Ethernet connector on the back of the camera contains LEDs. One of these LED's will illuminate when the camera is powered. If unlit, check the power adapter. If possible, test the adapter with a working camera to verify its operation.

Is the camera powered, but not detected in Viewer? Damaged or poor quality Ethernet cabling can result in "no cameras found", dropped packets, decreased bandwidth, and other problems. Use Category 6 or better rated Ethernet cabling. If the camera still does not work with the viewer software, then it is more likely that your Ethernet adapter has not been setup properly. If this is the case please refer to "*Network Settings for GigE Cameras*".

What connection card do I use?

Does it matter what Gigabit Ethernet card is used? GigE Vision cameras can operate on 10/100, or Gigabit speed Ethernet adapters. In order to take full advantage of maximum frame rates and resolution, a Gigabit speed adapter is required. Most GigE Vision camera manufacturers recommend using the Intel Chipset for maximum performance.

NOTE: If you are still unsure, Lambda can supply Ethernet adapters for desktops and laptops.

Does my PC meet system requirements?

For high speed cameras or multiple camera setups, please check with Lambda for a complete computer configuration. The following are basic guidelines only!

System Requirements

	Single Camera		Multi Camera	
	Minimum	Recommended	Minimum	Recommended
CPU	Intel Pentium 4 or comparable		Intel Core (i3 to i5) duo comparable processor	
Clock	2.5GHz	>2.5GHz	2.5Ghz	3GHz
RAM	1GB	2GB	2GB	4GB
OS	Microsoft Windows XP/Vista/7/8 32/64bit* Linux 32/64 bit system from Kernel 2.6.xx			
Graphics	Recommended resolution: 1280 x 1024; Colour depth: at least 16 bit			
Ethernet	Gigabit Ethernet compliant NIC* (Recommended: Intel® chipset)			
CPU	Intel Pentium 4 or comparable		Intel Core (i3 to i5) duo comparable processor	
Hard Disk Speed	5400 rpm for non-recording		7200 rpm for recording with eventually RAID-0 configuration. SSD highly recommended	

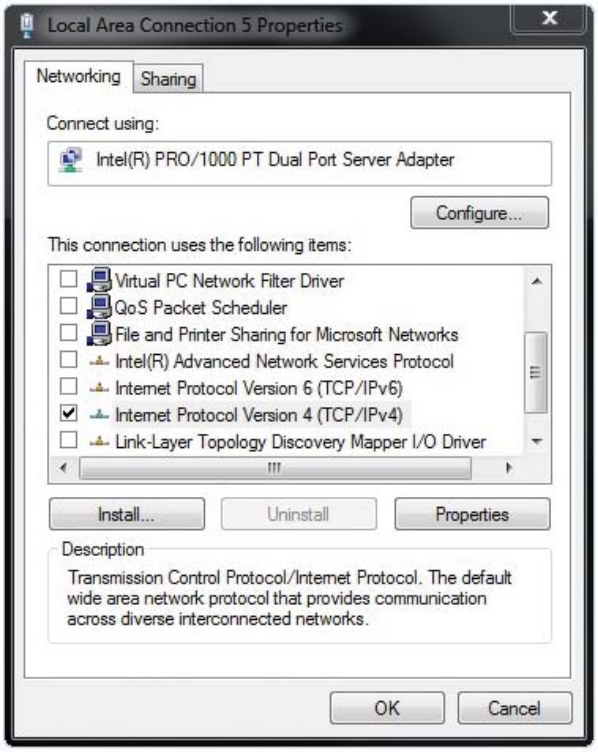
** NOTE: Norpix recording software only support Windows 7/8 32/64bit*

Network Settings for GigE Cameras

To configure the network settings for the transfer of data between the camera and your PC, please follow the steps listed below:

Windows 7

- **Start, Control Panel**
- **Network and Internet**
- **View network status and tasks**
- **Change adapter settings**
- Right-click Network Connection
- **Properties**
- Select **Internet Protocol Version 4** and click **Properties**
- Select **Use the following IP address for example**:
  IP address: 169.254.100.7
  Subnet mask: 255.255.0.0
  Default gateway: blank



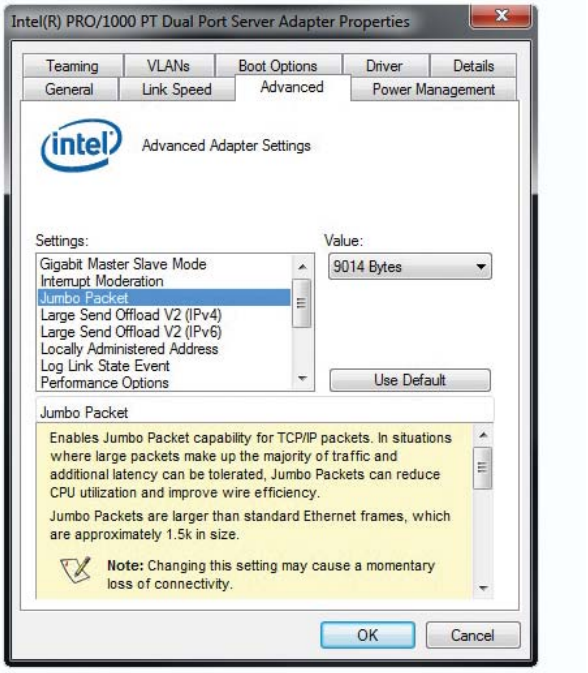
If you are doubtful what IP address to use, you can select "**Obtain an IP address automatically**" along with "**Obtain DNS server address automatically**". However this set-up process may take a little longer.

How do I ensure the best speed performance?

There are adjustments to the Ethernet Adapter that can be made to improve the system performance when using a GigE Vision camera. This performance is related to minimizing CPU usage and dropped or resent packets.

You will need to edit the Ethernet adapter driver properties of the following - *Packet Size, Adjust Moderation Rate and Receive & Transmit Buffers:*

Packet Size



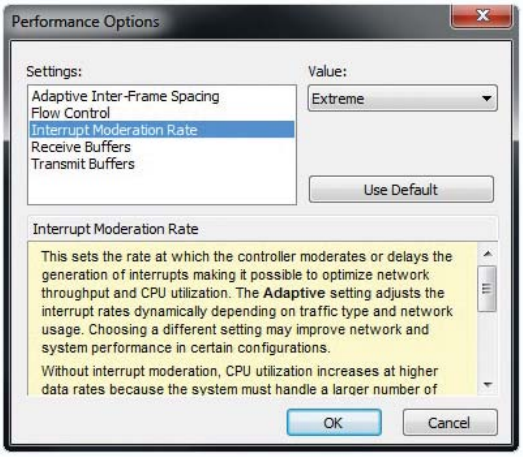
Windows 7, Intel Gigabit CT

- **Start, Control Panel**
- **Hardware and Sound**
- **Device Manager**
- **Network Adapter**
- Right-click Adapter device name
- **Properties**
- **Advanced tab**
- **Settings:** Jumbo Packet **- Value:** 9014 Bytes or to the maximum

The settings list in the advanced adapter settings may be different for different types/brands of Gigabit Ethernet network cards. Common expressions are **Jumbo Frames** or **Jumbo Packet.** If **Jumbo Frames** or **Jumbo Packet** does not appear in this list, your network card may not support it.

NOTE: Without this capability, you may not be able to achieve the full performance of the camera - CALL LAMBDA

Adjust Moderation Rate and Receive & Transmit Buffers



Windows 7, Intel Gigabit CT

- **Start, Control Panel**
- **Hardware and Sound**
- **Device Manager**
- **Network Adapter**
- Right-click Adapter device name
- **Properties**
- **Advanced** tab
- **Performance Options**
- **Settings**: Interrupt Moderation Rate **Value**: Extreme
- **Settings**: Transmit Buffers **Value**: 256 bytes
- **Settings**: Receive Buffers **Value**: Max allowable

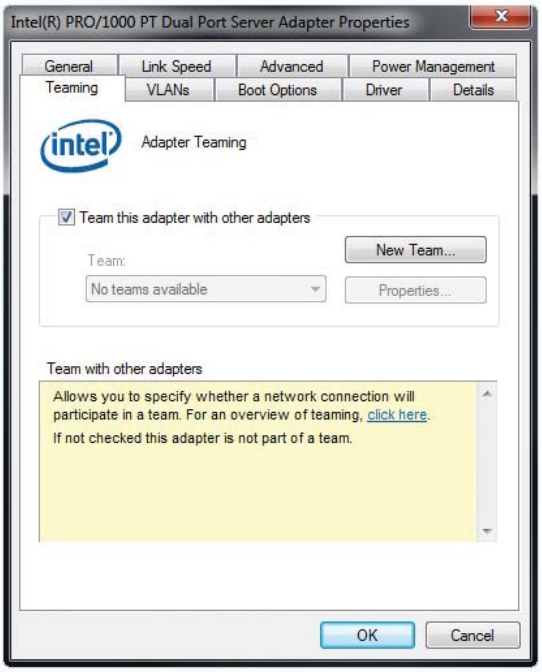
Installing a Dual GigE Camera

Designed to take full advantage of Quad Tap readouts, the Dual GigE cameras incorporate state-of-the-art sensors that provide an unrivalled combination of image quality, resolution and high frame rates. In order to provide the high data rate to support image transfer, two Gigabit Ethernet ports are combined to a dynamic Link Aggregation Group, (LAG). Connecting both ports increases the available bandwidth to 240 MB/sec.

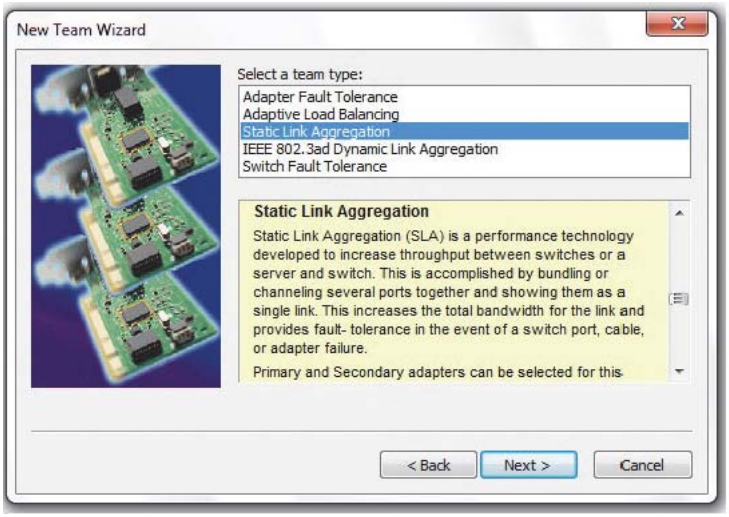
Configure and optimise each Ethernet adapter port using steps outlined in the "*Network Settings for GigE Cameras*". The following steps describe the setup of a Link Aggregate Group, (LAG).

Windows 7, Intel PT

- **Start, Control Panel**
- **Hardware and Sound**
- **Device Manager**
- **Network Adapter**
- Right-click Adapter device name
- **Properties**
- **Teaming tab**
- Select **Team the adapter with otheradapters**
- Click **New Team**
- The New Team Wizard window opens, choose a team name and click **Next**



- Select the desired adapters corresponding to the ports to be used by the camera, click **Next**



- Select team type: **Static Link Aggregation**
- Click **Next**

This configures the team and a new adapter appears in the Network Connections window.

Now return to your viewer program on your PC or Laptop to view your images.

You have now:

1. **Connected your camera to your PC/Laptop - using high quality cabling**
2. **Applied power to your camera**
3. **Created the correct Network Settings - in your Laptop or PC**
4. **Created a Team if using Dual GigE - if you have Dual GigE adapters installed**
5. **Seen your sample - in your viewer software**

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