

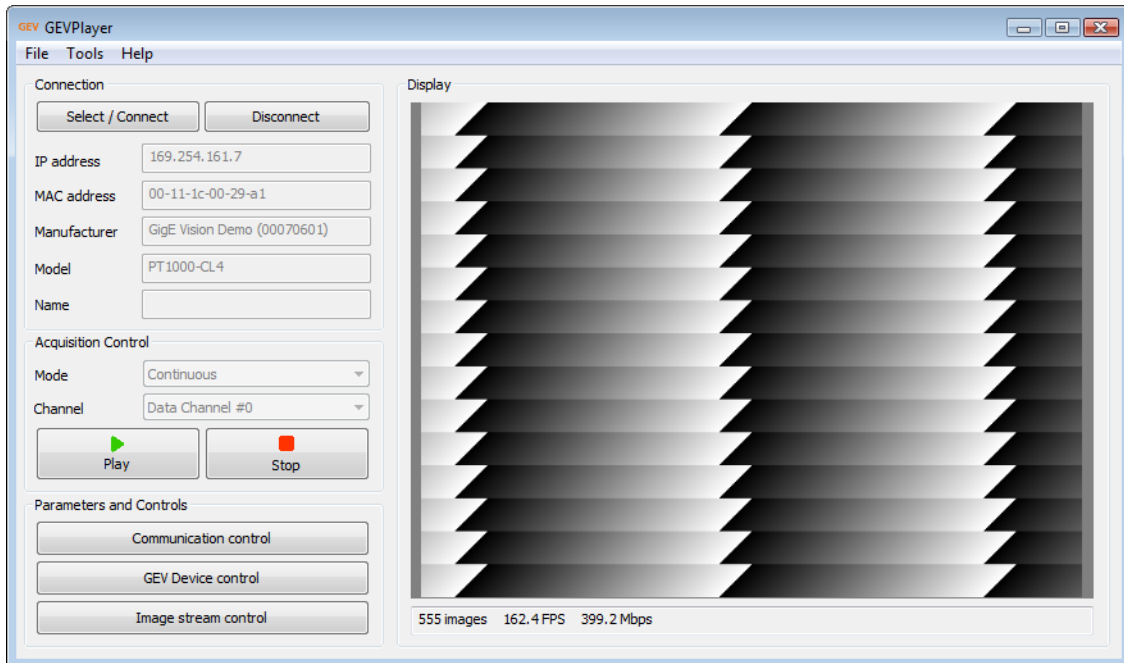


# **iPORT** *Pure* **GEV**

## **Quick Start Guide**







GigE Vision made easy

Version 1.1

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# Getting Started with the eBUS-PureGEV Package

The eBUS-PureGEV Package is a complete set of tools for configuring and controlling your GigE Vision enabled camera. GEVPlayer is a simple and powerful program that allows you to capture your first images with your IP Engine quickly. Then, as you familiarize yourself with GigE Vision, you can create your own application with the optional SDKs.

The eBUS-PureGEV Package lets you quickly take your GigE Vision device from concept to prototype to finished product.

In this section:

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## Getting started

### To acquire your first images using the eBUS-PureGEV Package:

1. Insert your software CD in your PC and install the eBUS-PureGEV Package. During this step, you will install the NIC driver that best meets your needs. (The iPORT PureGEV Suite requires an eBUS driver.)
2. Cable your camera, IP Engine, and PC together. See “Cabling Your Camera to the PC” on page 7.
3. If you’re using Windows XP, configure the firewall. See “Configuring the Windows XP Firewall” on page 13.
4. Launch GEVPlayer. See “Launching GEVPlayer” on page 19.
5. Connect to your IP Engine. See “Connecting to your IP Engine” on page 21.
6. Acquire your first images. See “Acquiring images” on page 23.

## Going further...

Once you’ve acquired your first images, you can:

- Configure and control your IP Engine further. See “Controlling your IP Engine” on page 25.
- Track the performance of your camera, IP Engine, and PC. See “Tracking performance” on page 29.
- Write your own program! See “Creating your own GigE Vision system” on page 31.

## 2 Getting Started with the eBUS-PureGEV Package

# Understanding the iPORT PureGEV Suite

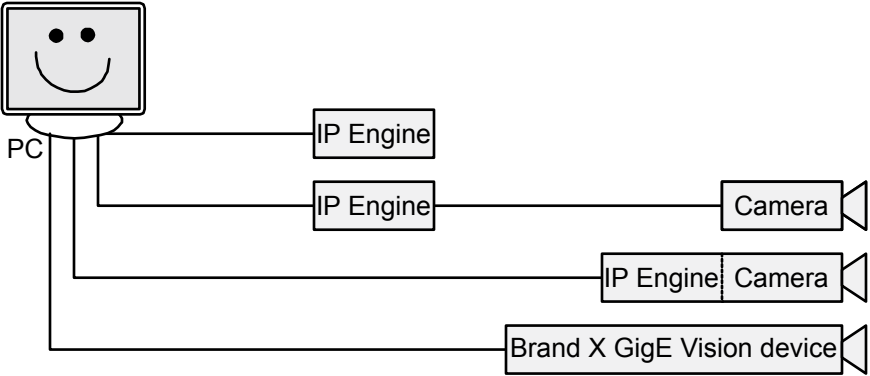
In this section:

- About IP Engines, cameras, and GEV devices ..... 3
- The birth of GigE Vision ..... 4

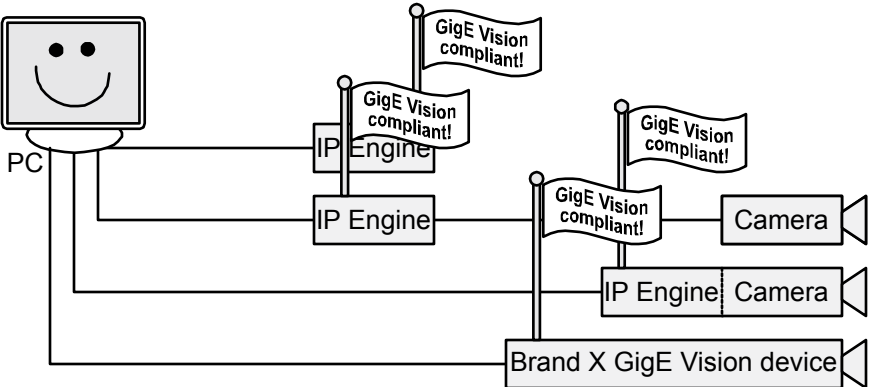
## About IP Engines, cameras, and GEV devices

Though the iPORT PureGEV Suite is principally designed to support iPORT IP Engines (with GEV firmware), you can also use it to connect to and control third-party GEV devices. By necessity, the documentation distinguishes the IP Engine and the camera you're (typically) integrating.

However, the form factor of your IP Engine can vary. The form of your IP Engine could be a standalone IP Engine, a standalone IP Engine with a separate cable-connected camera, an IP Engine and camera integrated into a single physical unit, or a third-party GigE Vision compliant camera.



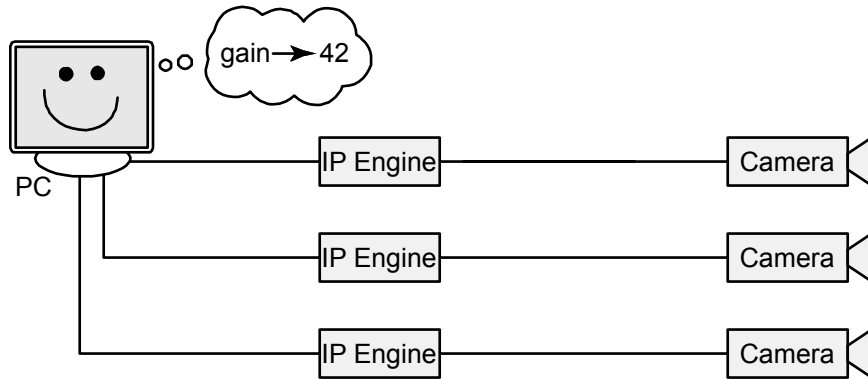
The iPORT PureGEV Suite lets you connect to *any* GigE Vision compliant device, regardless of its form!



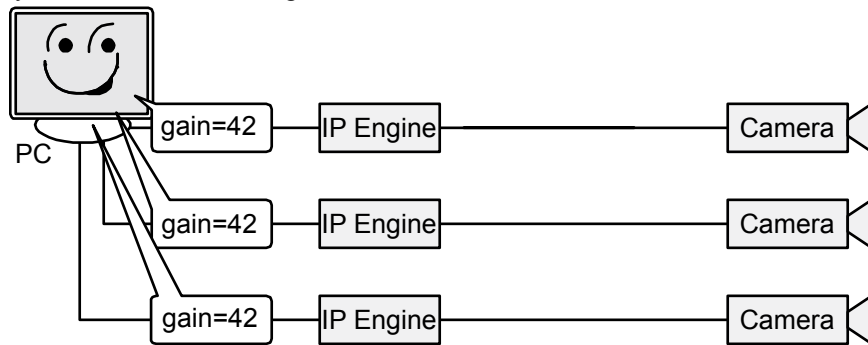
## 4 Understanding the iPORT PureGEV Suite

### The birth of GigE Vision

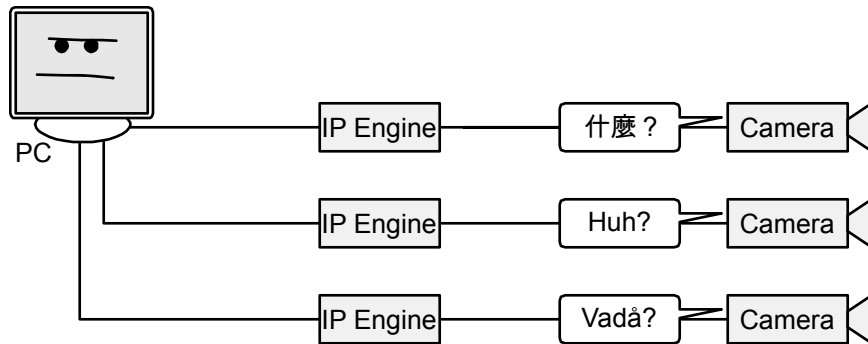
Ideally, knowing how to set a parameter on one camera...



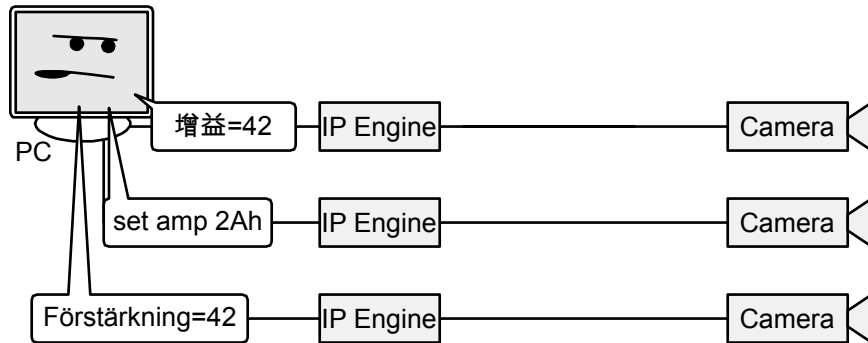
...would let you make the same setting for all cameras.



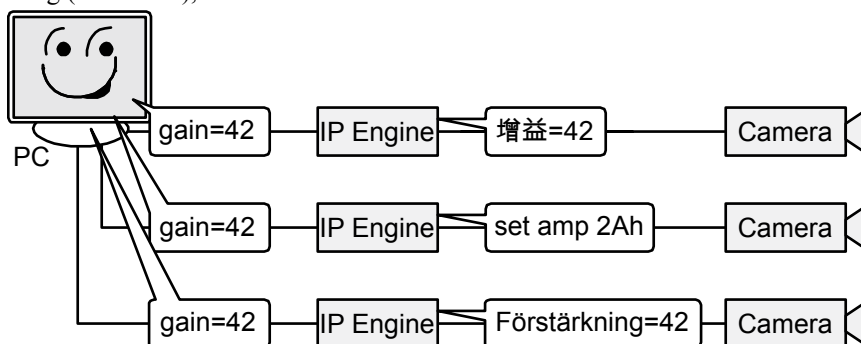
However, cameras have manufacturer-specific or model-specific instruction sets.



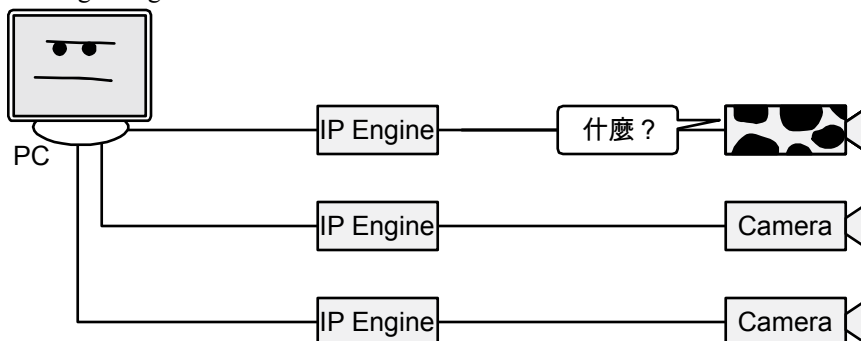
As a result, end users, programmers, or *someone* had to adapt for every camera they used.



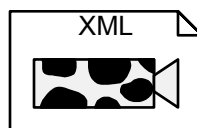
To reduce frustration, Pleora created camera-specific DLLs for as many models as they could (in the iPORT Vision Suite). These DLLs helped provide a more standard interface. Though the process was time-consuming (for Pleora), the DLLs worked well...



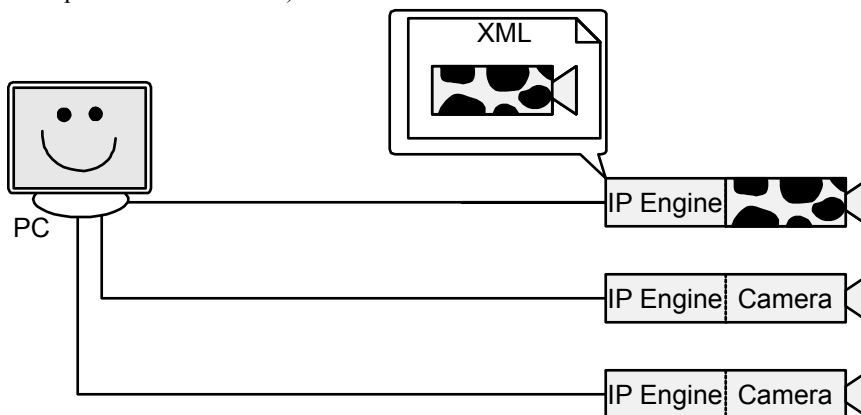
...unless something changed.



Recognizing that the increasing complexity of modern cameras would exacerbate end-user frustration (and that keeping all DLLs up-to-date was impossible), Pleora and a group of companies created the GigE Vision Standard. To be compliant, a GigE Vision device has to provide an XML file that defines its features and how to use them.



Using an iPORT IP Engine and a camera together, you can create a system that behaves as a single, GEV-compliant device. The IP Engine stores the XML file and provides it on request (as well as providing the required GEV interface).



## 6 Understanding the iPORT PureGEV Suite

# Cabling Your Camera to the PC

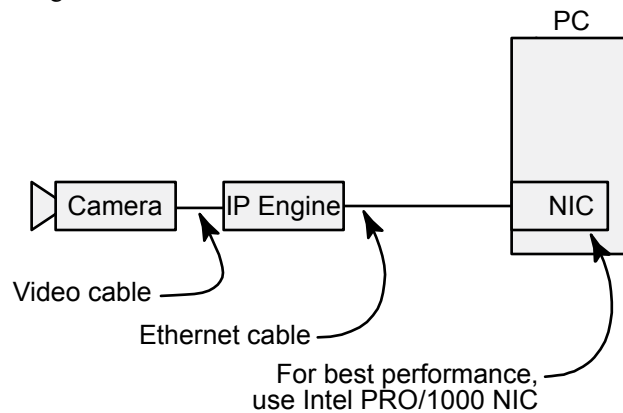
When it comes to cabling, your iPORT IP Engine gives you a lot of flexibility. However, if you're cabling it for the first time, we recommend that you make a dedicated connection between your IP Engine and PC.

## To cable your camera to your PC:

- Cable your system as described in either "Dedicated connection" on page 7 or "Dedicated connection with a second regular NIC" on page 7. Power cables aren't shown.

## Dedicated connection

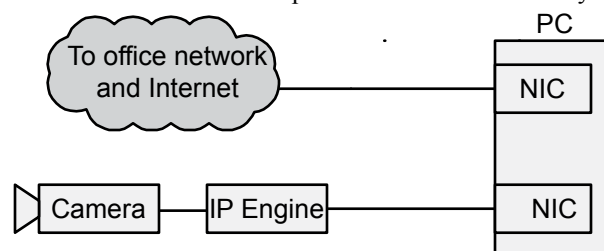
If you require a very high bandwidth connection to your IP Engine but don't require corporate network connectivity, use the configuration below.



This configuration might be used for a standalone machine vision system. For best performance, cable your IP Engine to an Intel PRO/1000 NIC. The Intel PRO/1000 NIC is reliable and lets you use the efficient eBUS Optimal Driver.

## Dedicated connection with a second regular NIC

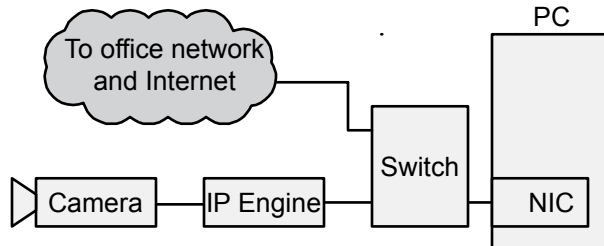
If you intend to use your NIC as a dedicated connection to your camera, use the configuration below. In this configuration, you have a second NIC for corporate network connectivity.



## 8 Cabling Your Camera to the PC

### Switched connection (not recommended for first-time use)

If you intend to use a single NIC for both the connection to your camera and corporate network connectivity, use the configuration below.



If you're setting up your IP Engine for the first time, we advise against using this configuration. Such an arrangement can cause the following problems:

- You can experience data loss, delay, or network slowdowns if the switch employs blocking architecture or insufficient packet forwarding capability.
- You can experience connectivity problems due to a switch that is nonstandard or improperly configured (jumbo frames not enabled).
- Switches that use a spanning tree algorithm often incur a significant delay (several minutes) when establishing a connection between a PC and the IP Engine. We recommend that you turn off spanning tree implementations on the switch (check with your network administrator).

# Understanding Drivers

In this section:

- Quick pick ..... 9
- Understanding drivers ..... 9
- Choosing your driver ..... 10

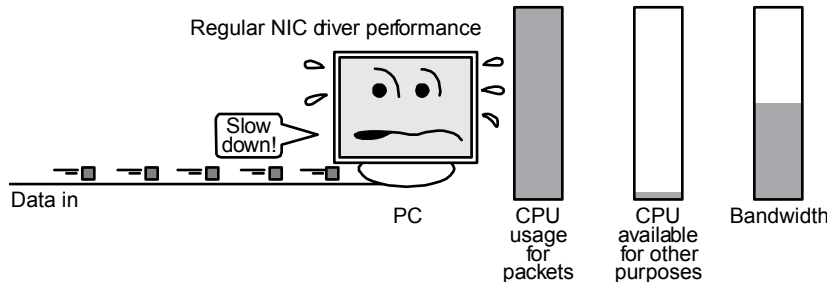
## Quick pick

In general, the eBUS Universal Driver is a good, all-round choice.

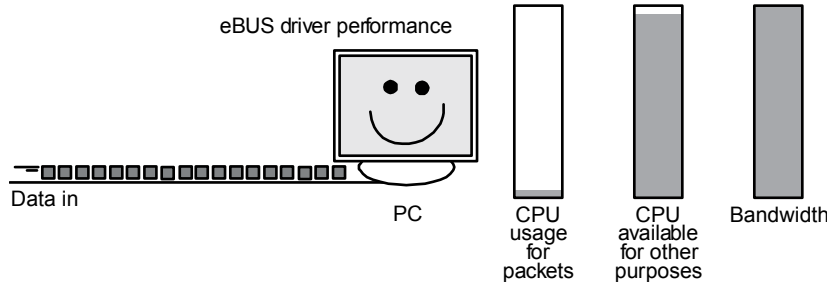
## Understanding drivers

A regular manufacturer’s NIC driver receives Ethernet packets and passes them on to the Windows network stack. The network stack analyzes the headers from each layer.

However, for each packet, the network stack can have to perform hundreds of tests before routing the packet. The many decisions incur a heavy CPU usage penalty. The job of analyzing incoming packets overwhelms the CPU long before data throughput reaches the NIC’s potential.



A Pleora driver tests only for data destined for your application. If so, the data bypasses the network stack to efficiently route data to your application. If not, the packet is sent to the Windows network stack. Since the great majority of the data will be for your high-bandwidth application, Pleora drivers dramatically reduce CPU usage. By eliminating the CPU usage bottleneck, data throughput is maximized and your CPU is free to perform other duties.



## Choosing your driver

Pleora offers two eBUS drivers. If you're using an Intel PRO/1000 network card, we recommend the eBUS Optimal Driver. Otherwise, use the eBUS Universal Driver. If you've already got a project in development, you can use continue to use the iPORT High-Performance IP Device Driver.

### Comparison of Pleora NIC Drivers

Category	eBUS Optimal Driver	eBUS Universal Driver	iPORT High-Performance IP Device Driver <sup>a</sup>	
Efficiency	★★★★★	★★★★★	★★★★★	★★★★★
	High bandwidth, CPU-intensive applications	High bandwidth applications that can tolerate some sharing of CPU capacity	Existing projects requiring high-bandwidth	Temporary
Works with eBUS-PureGEV Package	Yes	Yes	No	No
Works with eBUS-Vision Package	Yes	Yes	Yes	Yes
Limitations	Requires Intel PRO/1000 NIC and 825xx chips		Requires Intel PRO/1000 NIC and 825xx chips No support for corporate office connectivity (Internet)	
	Good choice – no change required	Good choice – no change required	Replace with eBUS Optimal Driver	Replace with eBUS Universal Driver

a. The iPORT High-Performance IP Device Driver isn't available with the eBUS-PureGEV Package. If you're migrating to the eBUS-PureGEV Package or wish to use the same driver for all your products, use an eBUS driver.

### eBUS Optimal Driver

The eBUS Optimal Driver is our recommended driver for demanding applications. The driver is a purpose-built replacement for the regular driver that comes with your Intel PRO/1000 card or 825xx chip. Designed to maximize throughput and minimize CPU usage, it's ideal for high-bandwidth applications that need virtually all the CPU for other tasks. It also supports corporate network connectivity.

### eBUS Universal Driver

The eBUS Universal Driver replaces the CPU-intensive Windows network stack. It works with almost any NIC because it works in conjunction with your NIC manufacturer's driver. The eBUS Universal Driver supports corporate network connectivity.

### iPORT High-Performance IP Device Driver

If you're upgrading your iPORT SDK, already have an existing project under development, and you don't require a GigE Vision compliant connection, we recommend that you continue using the iPORT High-Performance IP Device Driver – it has a solid track record of field-proven reliability. In short, if your current system is working well, there's no need to change.

The iPORT High-Performance IP Device Driver is extremely efficient but disregards regular Internet traffic. As a result, it doesn't support corporate network connectivity.

If you wish to upgrade, consider the eBUS Optimal Driver.

## Manufacturer's NIC driver

The manufacturer's NIC driver is the default driver that comes with your NIC.

Your manufacturer's NIC driver routes data through the Windows network stack. Though suitable for bandwidths of 100 Mb/s or less, higher bandwidths incur a significant CPU usage penalty. Bandwidth is limited when CPU usage reaches 100%. By devoting all its resources to packet routing, the PC is left with insufficient CPU resources for other tasks (such as processing or displaying images).

## 12 Understanding Drivers

# Configuring the Windows XP Firewall

In its default configuration, the Windows XP Firewall can block certain network packets between your IP Engine and your image-acquisition program (e.g. Coyote, GEVPlayer, or your own program).

Follow the directions to ensure Windows XP Firewall lets your programs work as you expect. Finally, and only if you prefer, you can use the directions to disable the firewall completely.

If you're using Windows Vista, you don't need to make any changes.

## To configure the Windows XP Firewall:

1. From the Windows Start menu, select **Start > Control Panel**.  
The Control Panel appears.
2. Open the **Windows Firewall**.  
If the firewall is set to **Off** (such as for closed systems), no further changes are required.
3. On the **General** tab, allow exceptions (*Uncheck Don't allow exceptions*).
4. Select the **Exceptions** tab.
5. Click **Add Program**.  
The **Add a Program** dialog appears.
6. Select your program (e.g. Coyote, GEVPlayer, or your own program) and click **OK**.  
The **Add a Program** dialog closes and your program appears in the **Programs and Services** field.
7. Click **OK** to close the **Windows Firewall** dialog.  
The Windows XP Firewall now allows your program to send and receive network packets.

## 14 Configuring the Windows XP Firewall

# Configuring your NIC

If you're in a typical networked office environment, your NIC will get its IP address from a DHCP server. However, if you're setting up for the first time, we recommend that you make a direct connection to your iPORT IP Engine. Without a DHCP server, Windows uses Zeroconf (also known as Autoconf or LLA fallback), but the fallback takes up to a minute every time you disconnect.

To connect faster, you can configure a static IP address. See “Dedicated connection (static IP address)” on page 15.

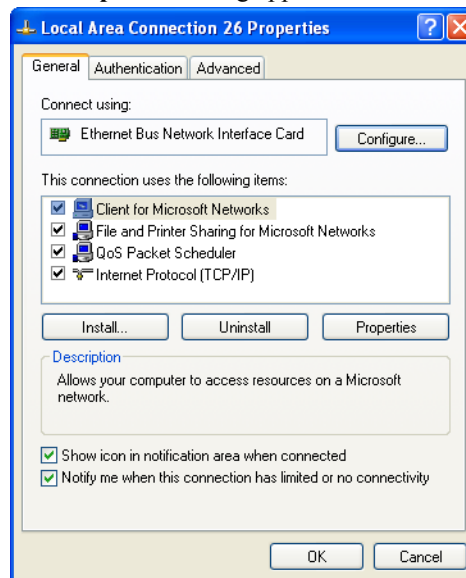
If you want to configure your NIC to get its IP address from a DHCP server, see “Multi-use connection (DHCP server)” on page 16.

## Dedicated connection (static IP address)

This configuration assigns your NIC a static IP address.

### To configure your NIC for a dedicated connection:

- Make the following selections:  
 In Windows XP: From the Windows Start menu, select **Start > Control Panel > Network Connections**.  
 In Windows Vista: From the Windows Start menu, select **Start > Control Panel > Network and Sharing Center > Manage Network Connections**.
- Right-click your **Local Area Connection** and select **Properties**.  
 The **Local Area Connection Properties** dialog appears.

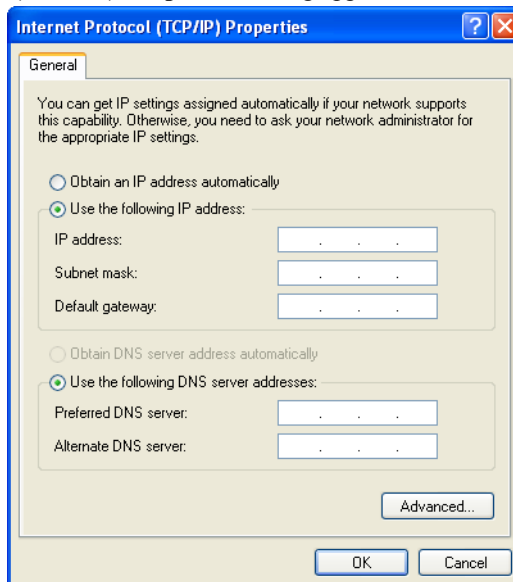


- Make the following settings:
  - Client for Microsoft Networks**
  - File and Printer Sharing for Microsoft Networks**
  - QoS Packet Scheduler**

## 16 Configuring your NIC

- Internet Protocol (TCP/IP)**
- Show icon in notification area when connected**
- Notify me when this connection has limited or no connectivity**

4. Select **Internet Protocol (TCP/IP)** and click **Properties**.  
The **Internet Protocol (TCP/IP) Properties** dialog appears.



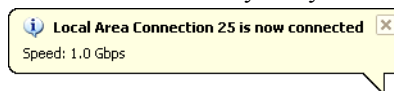
5. Enable **Use the following IP address** and make the following settings:

<b>IP address</b>	192.168.101.001
<b>Subnet mask</b>	255.255.255.0
<b>Default gateway</b>	leave blank

Ensure you're not conflicting with an existing IP address on another NIC. For multiple dedicated connections on the same host PC, increment the third IP address by one for each NIC (i.e. 101, 102, 103, etc.).

6. Click **OK** to close the **Internet Protocol (TCP/IP) Properties** dialog.
7. Click **Close** to close the **Local Area Connection Properties** dialog.

Your NIC is now configured for a dedicated connection. When you cable your NIC to another NIC, Windows will recognize the connection without any delay.



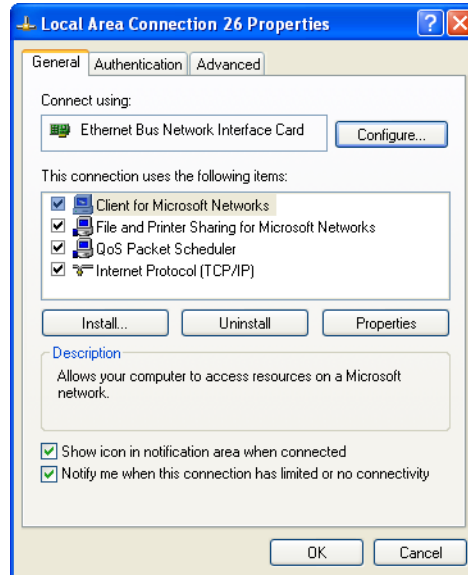
## Multi-use connection (DHCP server)

If you're using your NIC for both your eBUS data and your regular office network connectivity, configure it as a multi-use connection. This configuration is generic and presumes your office network uses a DHCP server. For the exact settings for your network, consult with your company's IT department.

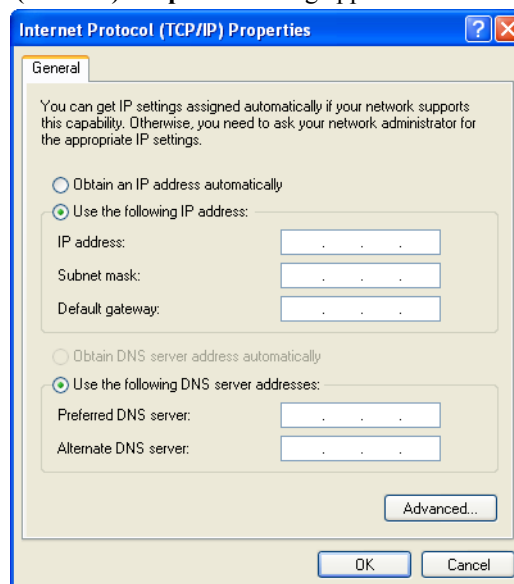
### To configure your NIC for a multi-use connection:

1. From the Windows **Start** menu, select **Start > Control Panel**.  
The **Control Panel** dialog appears.
2. Double-click **Network Connections**.  
The **Network Connections** dialog appears.

- Right-click your **Local Area Connection** and select **Properties**.  
The **Local Area Connection Properties** dialog appears.



- Make the following settings:
  - Client for Microsoft Networks**
  - File and Printer Sharing for Microsoft Networks**
  - QoS Packet Scheduler**
  - Internet Protocol (TCP/IP)**
  - Show icon in notification area when connected**
  - Notify me when this connection has limited or no connectivity**
- Select **Internet Protocol (TCP/IP)** and click **Properties**.  
The **Internet Protocol (TCP/IP) Properties** dialog appears.



- Enable **Obtain an IP address automatically**.
- Enable **Obtain DNS server address automatically**.
- Click **OK** to close the **Internet Protocol (TCP/IP) Properties** dialog.
- Click **Close** to close the **Local Area Connection Properties** dialog.  
Your NIC will now get its IP address from a DHCP server.

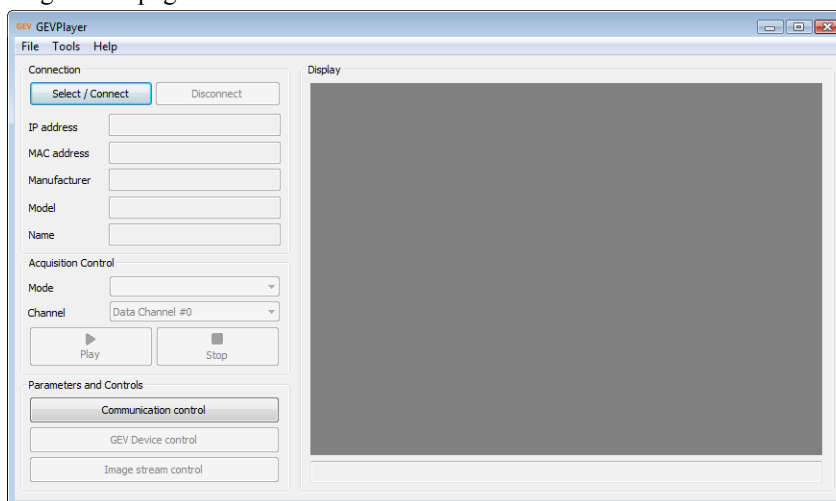
## 18 Configuring your NIC

# Launching GEVPlayer

## To launch GEVPlayer:

- From the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > eBUS-PureGEV Package > GEVPlayer**.

The main page of GEVPlayer appears. You can now connect to your IP Engine. See “Connecting to your IP Engine” on page 21.

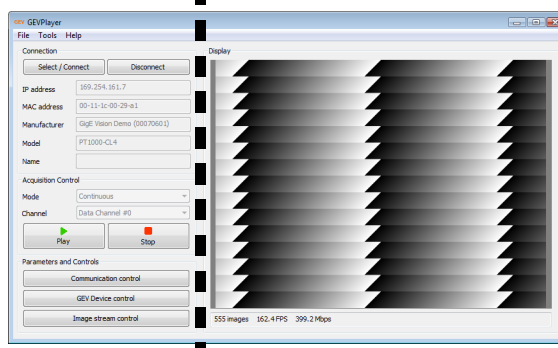


## Understanding GEVPlayer

GEVPlayer consists of two parts — the control side and the display side.

The control side (on the left) lets you select and connect to an IP Engine, configure it, and acquire images. The display side (on the right) passively displays images from your IP Engine.

left side - control



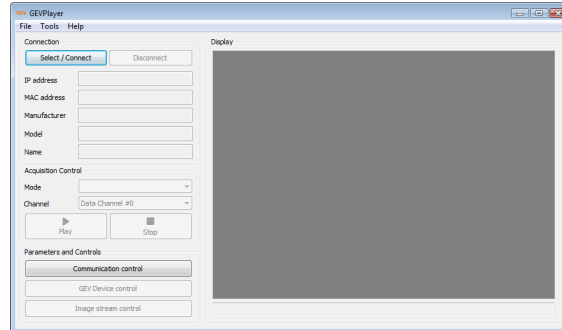
right side - display



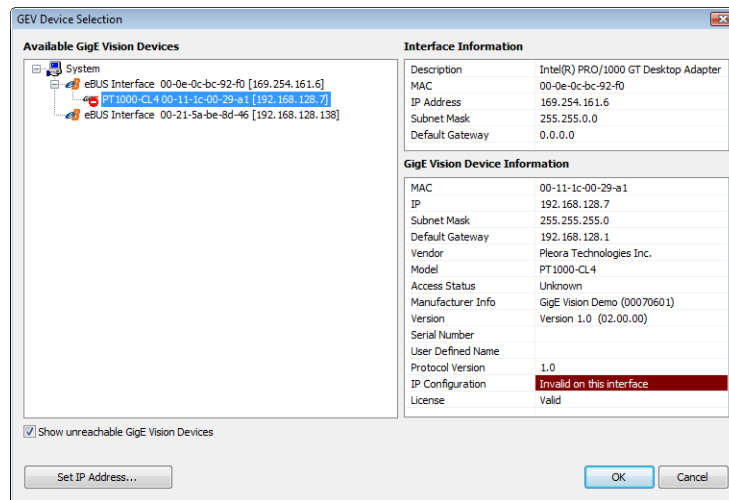
# Connecting to your IP Engine

## To select and connect to your IP Engine:

1. Launch GEVPlayer. See “Launching GEVPlayer” on page 19.



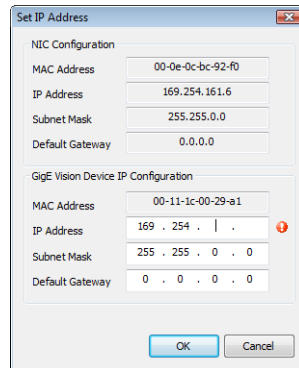
2. In the **Connection** pane, click **Select / Connect**.  
The **GEV Device Selection** dialog appears, listing the IP Engines that each NIC found. NICs connected to a switched network may find multiple IP Engines.
3. Check **Show unreachable GigE Vision Devices**.
4. In the **Available IP Engines** pane, select your IP Engine.  
GEVPlayer displays information about your selection in the **IP Engine and NIC information** pane.



## 22 Connecting to your IP Engine

5. Click **Set IP Address**.

The **Set IP Engine IP Address** dialog appears.



The **Set IP Address** dialog box contains two sections for configuration:

NIC Configuration	
MAC Address	00-0e-0c-bc-92-f0
IP Address	169.254.161.6
Subnet Mask	255.255.0.0
Default Gateway	0.0.0.0

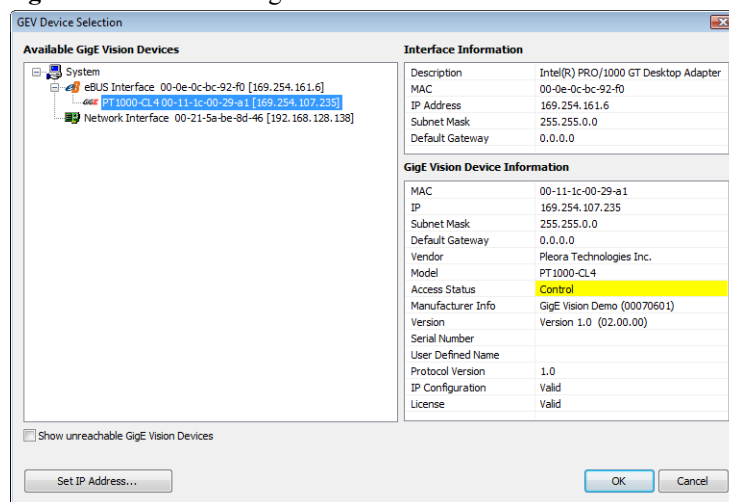
GigE Vision Device IP Configuration	
MAC Address	00-11-1c-00-29-a1
IP Address	169 . 254 .   .
Subnet Mask	255 . 255 . 0 . 0
Default Gateway	0 . 0 . 0 . 0

Buttons: **OK**, **Cancel**

6. In the **IP Engine Settings** pane, enter the **IP Address**, **Subnet Mask**, **Gateway**.

7. Click **OK**.

The **Set IP Engine IP Address** dialog closes.



The **GEV Device Selection** dialog box shows available devices and their details:

Available GigE Vision Devices	
System	
eBUS Interface 00-0e-0c-bc-92-f0 [169.254.161.6]	
PT1000-CL4 00-11-1c-00-29-a1 [169.254.107.235]	
Network Interface 00-21-5a-be-8d-46 [192.168.128.138]	

Interface Information	
Description	Intel(R) PRO/1000 GT Desktop Adapter
MAC	00-0e-0c-bc-92-f0
IP Address	169.254.161.6
Subnet Mask	255.255.0.0
Default Gateway	0.0.0.0

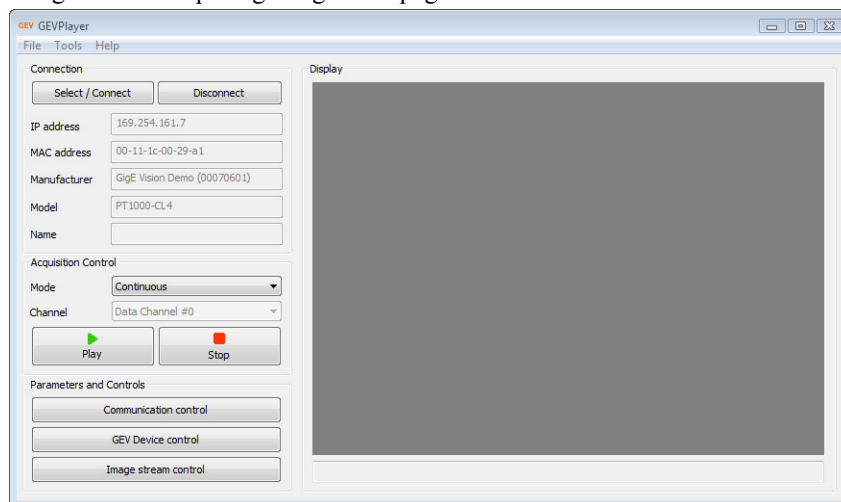
  

GigE Vision Device Information	
MAC	00-11-1c-00-29-a1
IP	169.254.107.235
Subnet Mask	255.255.0.0
Default Gateway	0.0.0.0
Vendor	Pleora Technologies Inc.
Model	PT1000-CL4
Access Status	Control
Manufacturer Info	GigE Vision Demo (00070601)
Version	Version 1.0 (02.00.00)
Serial Number	
User Defined Name	
Protocol Version	1.0
IP Configuration	Valid
License	Valid

Buttons: **Set IP Address...**, **OK**, **Cancel**

8. Click **OK**.

The **GEV Device Selection** dialog closes and GEVPlayer connects to your IP Engine. You can now acquire images. See “Acquiring images” on page 23.



The **GEVPlayer** application window includes the following sections:

- Connection:** **Select / Connect**, **Disconnect** buttons.
- IP address:** 169.254.161.7
- MAC address:** 00-11-1c-00-29-a1
- Manufacturer:** GigE Vision Demo (00070601)
- Model:** PT1000-CL4
- Name:** (empty)
- Acquisition Control:** **Mode:** Continuous; **Channel:** Data Channel #0; **Play** (green play button), **Stop** (red stop button) buttons.
- Parameters and Controls:** **Communication control**, **GEV Device control**, **Image stream control** buttons.
- Display:** A large gray area for image acquisition.

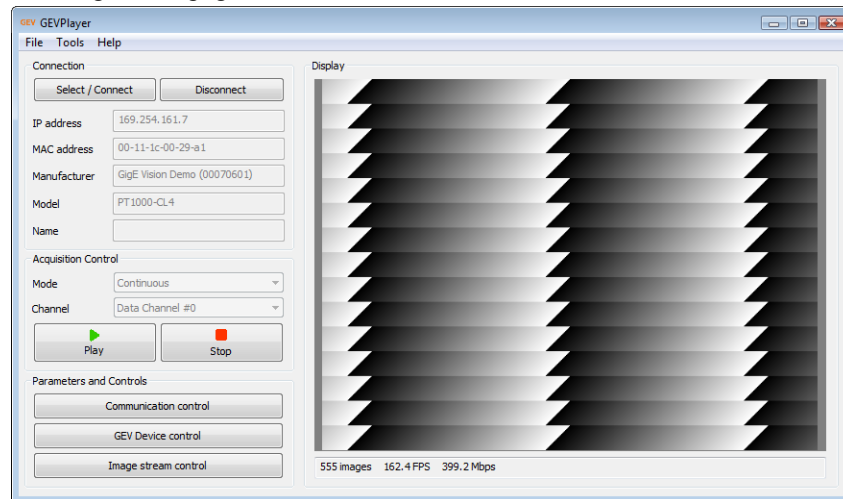
# Acquiring images

The **Acquisition Control** pane lets you easily access the features that control how you acquire images.

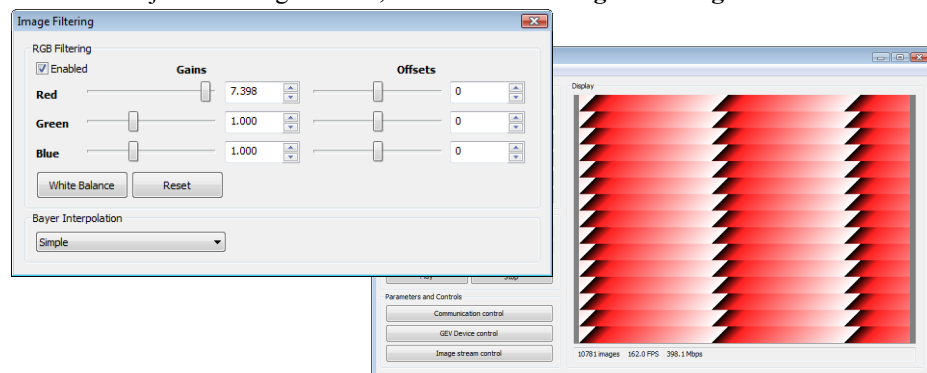
The GigE Vision Standard requires that your IP Engine start up in a state ready to send images. In fact, you can still acquire images even if you don't have a camera — iPORT IP Engines send a sawtooth-shaped test pattern by default.

## To acquire images:

1. Select and connect to your IP Engine. See “Connecting to your IP Engine” on page 21.
2. In the **Acquisition Control** pane, select your preferred **Mode** and **Channel**. For continuous images, select **Continuous** and **Data Channel #0**. For other acquisition modes, see “Understanding acquisition modes” on page 24.
3. In the **Acquisition Control** pane, click **Play**.  
The images appear in the **Display** pane. If you want to control the IP Engine further see “Controlling your IP Engine” on page 25.



4. If you want to zoom the image in or out, right-click the image and select a zoom setting from the context menu.
5. If you want to adjust the image's color, select **Tools > Image Filtering**.



6. If you want to save one image (or many), select **Tools > Save images**.
7. If you want to save the settings for GEVPlayer and your IP Engine to disk, select **File > Save**.

### Understanding acquisition modes

Your IP Engine lets you acquire images continuously, or frame-by-frame. You can also save images to the IP Engine's onboard memory and retrieve them later. The IP Engine's acquisition modes include:

**Continuous**

Acquire images continuously.

**ContinuousReadout**

Acquire images continuously from the IP Engine's onboard memory (until all images in memory have been retrieved).

**ContinuousRecording**

Save images to the IP Engine's onboard memory until its memory is full.

**Multiframe**

Acquire a fixed number of images. To configure the number of images, set the IP Engine's **AcquisitionFrameCount** feature.

**SingleFrame**

Acquire a single image.

**SingleFrameReadout**

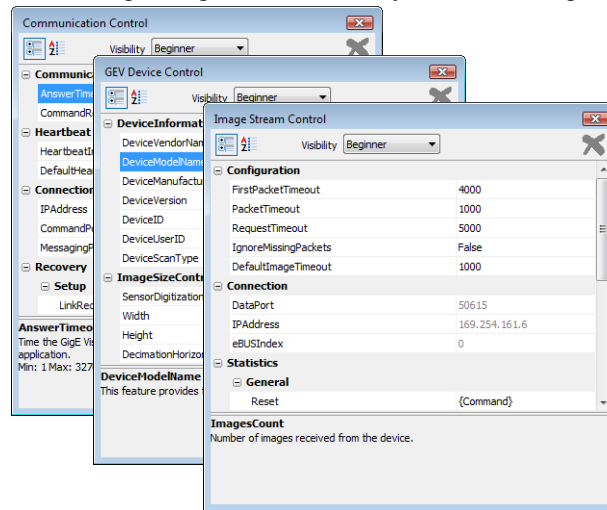
Acquire a single image from the IP Engine's onboard memory.

**SingleFrameRecording**




Save a single image to the IP Engine's onboard memory.

# Controlling your IP Engine

GEVPlayer lets you control settings using three functionally identical dialogs.



## Control dialogs


Dialog name	Button	Purpose
<b>Communication Control</b> dialog		Controls network transport layer settings
<b>GEV Device Control</b> dialog		
<b>Image Stream Control</b> dialog		Controls image stream settings and provides performance statistics

### To access the control dialogs:

- In the **Parameters and Controls** pane, click one of: **GEV Device control**, **Communication control**, or **Image stream control**.  
A control dialog appears.

## Understanding the control dialogs

### To control the list of features in the left-hand pane:

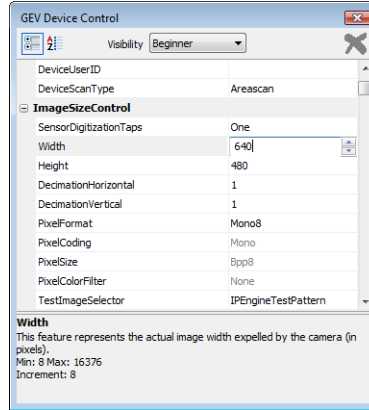
- Expand and collapse the tree by clicking the + and - icons.
- Find features alphabetically by using the alphabetization button .
- To show all features, set **Visibility** to **Guru**; to hide complex features, set **Visibility** to **Beginner**.

### To control features:

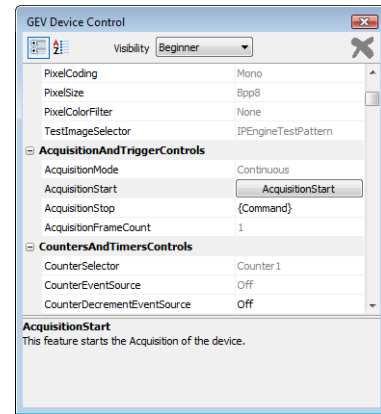
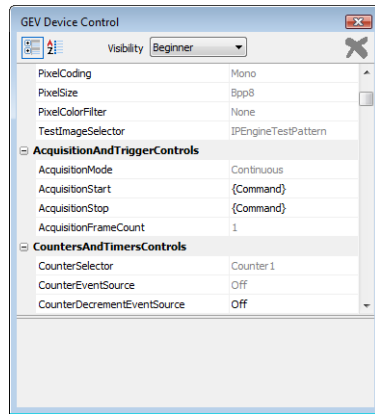
- Select a feature in the left-hand column.  
Information about the feature appears in the bottom pane.

## 26 Controlling your IP Engine

2. If the feature has an editable value, change the value in the edit window. The value is applied when you click somewhere else.



3. If the feature is a command, click it to make the button appear. Click the button to activate the command.



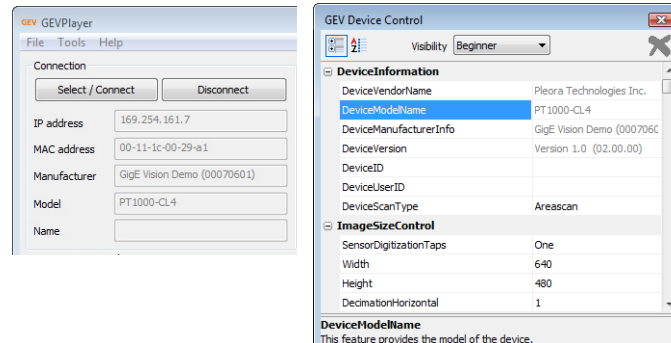
## Understanding the controls

All the IP Engine's features are parameter based. By changing the value of a feature, you can directly control how the IP Engine works. In fact, most of the information in GEVPlayer directly correlates to a parameter-based feature in the IP Engine.

## Connection pane

### Features in the Connection pane

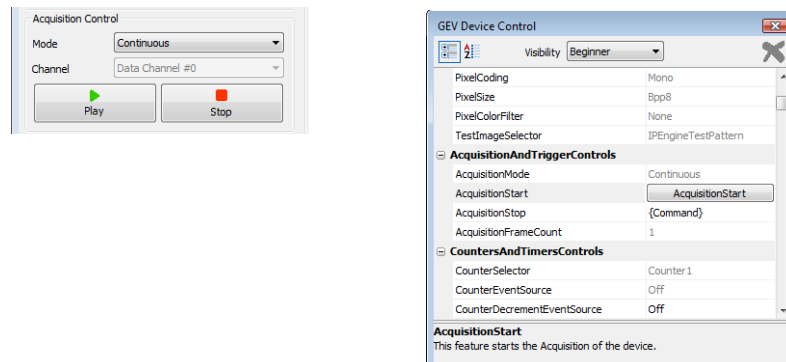
Connection pane shortcut	IP Engine feature
IP address field	<code>GigEVisionTransportLayer &gt; GevCurrentIPAddress</code>
MAC address field	<code>GigEVisionTransportLayer &gt; GevMACAddress</code>
Manufacturer field	<code>DeviceInformation &gt; DeviceVendorName</code>
Model field	<code>DeviceInformation &gt; DeviceModelName</code>



## Acquisition Control pane

### Features in the Acquisition Control pane

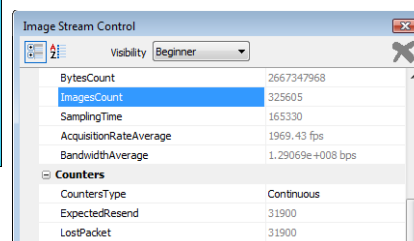
Acquisition Control pane shortcut	IP Engine feature
Mode dropdown	<code>AcquisitionAndTriggerControls &gt; AcquisitionMode</code>
Channel dropdown	<code>GigEVisionTransportLayer &gt; GevStreamChannelSelector</code>
Play button	<code>AcquisitionAndTriggerControls &gt; AcquisitionStart</code>
Stop button	<code>AcquisitionAndTriggerControls &gt; AcquisitionStop</code>



## Display pane

### Features in the Display pane

Display pane short-cut	Image stream feature
Image count (e.g. <i>nnn</i> images)	<b>Statistics &gt; General &gt; ImagesCount</b>
Frame rate (e.g. <i>xxx</i> FPS)	<b>Statistics &gt; General &gt; AcquisitionRateAverage</b>
Data rate (e.g. <i>yyy</i> Mbps)	<b>Statistics &gt; General &gt; BandwidthAverage</b>

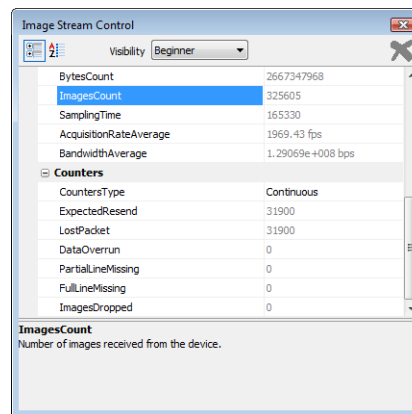


# Tracking performance

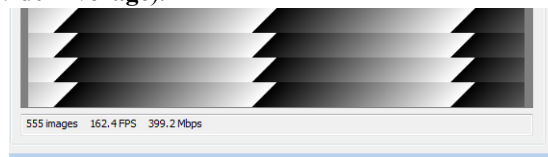
As your IP Engine receives images from your camera and sends them to your PC, it keeps track of image errors (missing lines, etc.), network errors (lost packets, etc.), and other performance-related statistics.

## To track performance:

- See a complete list of error counts in the **Image Stream Control** dialog. Performance metrics are grouped in the **Statistics** folder.



- See a summarized list at the bottom of the **Display** pane. The pane shows the total number of images displayed (**ImagesCount**), the instantaneous frame rate (**AcquisitionRateAverage**), and the data rate (**BandwidthAverage**).



## 30 Tracking performance

# Creating your own GigE Vision system

Now that you've successfully connected to your IP Engine and acquired your first images, you're ready to begin developing your own system!

In this section:

Customizing your software ..... 31

## Customizing your software

For customizing your software, GEVPlayer is a good place to start — not only is it a complete application, it was designed specifically to be a sample that you can use as a template for your own application!

### To customize your software:

1. Configure your IDE (integrated development environment). See the “Creating a new C/C++ project” section in the *iPORT PureGEV C++ SDK Reference Guide*.
2. Copy the PVSimpleUI code as a new project. To browse the PVSimpleUI code (and all other samples), from the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > eBUS-PureGEV Package > Code Samples**.
3. Use the PVSimpleUI code as a template for your own program. You can also use the goal-oriented procedures in the *iPORT PureGEV C++ SDK Reference Guide*.

## 32 Creating your own GigE Vision system

# Modifying Camera Parameters

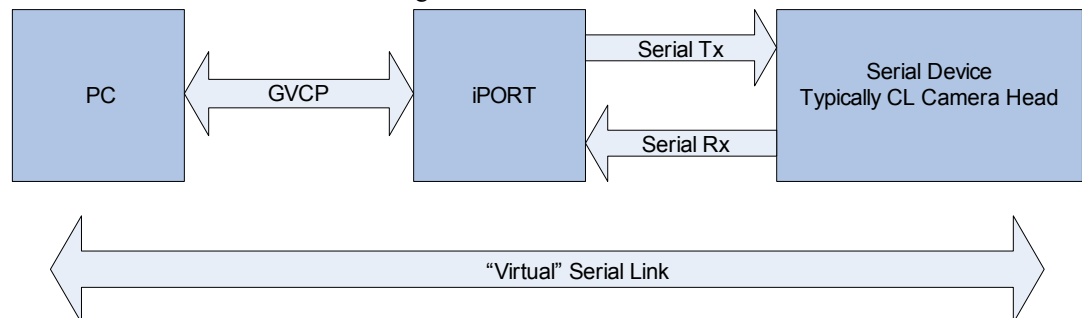
## Serial Communication

### Introduction

You might want to bypass the standard GigE Vision configuration of your camera with a Pleora IP Engine, and modify camera parameters through the serial ports, UART0 and UART1 for your specific vision application.

PureGEV allows you to control Serial Port 0 and Serial Port 1 (UART0 and UART1, respectively) of a GigE Vision Device that is integrated with a Pleora IP Engine. Typically, Serial Port 0 is mapped to the camera head of the device and Serial Port 1 can control or monitor lighting systems and motion control systems.

These serial ports are physically implemented on the device and can be accessed through the GVCP link managed by a PvDevice, that allows you to connect to and control your GigE Vision device. The Serial Communication Link is shown in the figure below.



Consult the Pleora IP Engine hardware guide specific to your application for more information on serial ports.

### Assumptions

Before attempting to modify camera parameters through the serial ports, you must be familiar with these topics:

- [“Launching GEVPlayer” on page 19](#) in this quick start guide
- [“Connecting to your IP Engine” on page 21](#) in this quick start guide
- [“Acquiring images” on page 23](#) in this quick start guide
- [“Controlling your IP Engine” on page 25](#) in this quick start guide
- The hardware guide specific to your IP Engine

## Accessing the Serial Ports

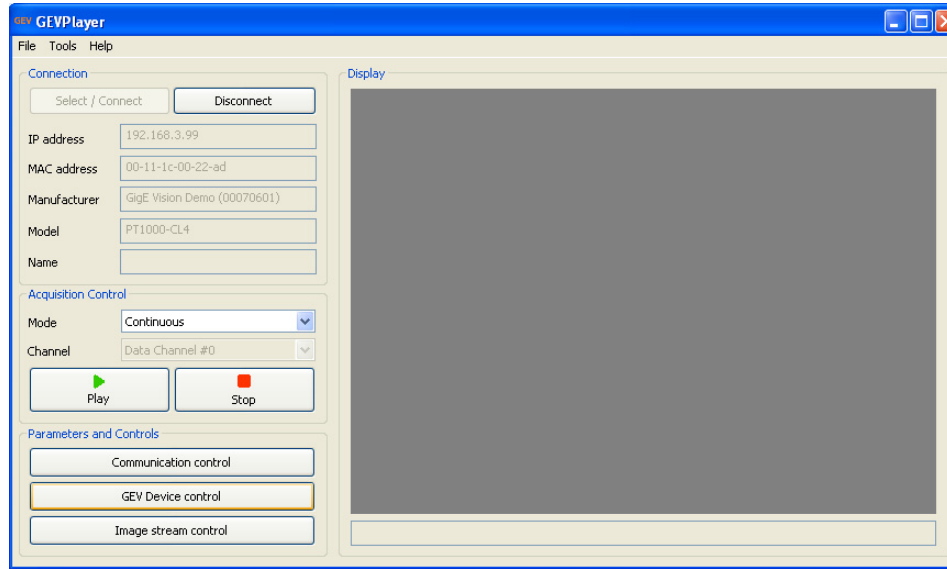
You must successfully connect to the camera integrated with the IP Engine core with GEV Player to write (Tx) to a serial port, or control and monitor incoming data (Rx) of various formats.

Before selecting the serial ports for data transmit and receive, you must set the baud rate for the serial ports, if the default value is not acceptable.

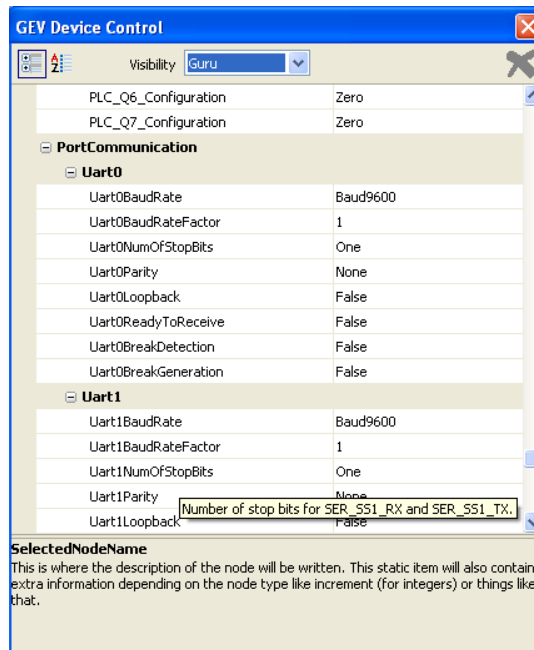
*NOTE!* You must determine the baud rate values for both Serial Port 0 and Serial Port 1 for successful data transmit and receive. These values are set by the `Uart0BaudRate` and `Uart1BaudRate` parameters through the GEV Device Control button in the GEVPlayer application.

To set the baud rate for the serial ports.

1. Click the **GEV Device Control** button in the GEV Player main Window.



The Device Control Window appears.



2. Set the baud rate parameter, `Uart0BaudRate` for Serial Port 0 (UART0).
3. Set the baud rate parameter, `Uart1BaudRate` for Serial Port 1 (UART1), if enabled.

## Selecting the Serial Ports

To access the serial ports with the GEV Player application.

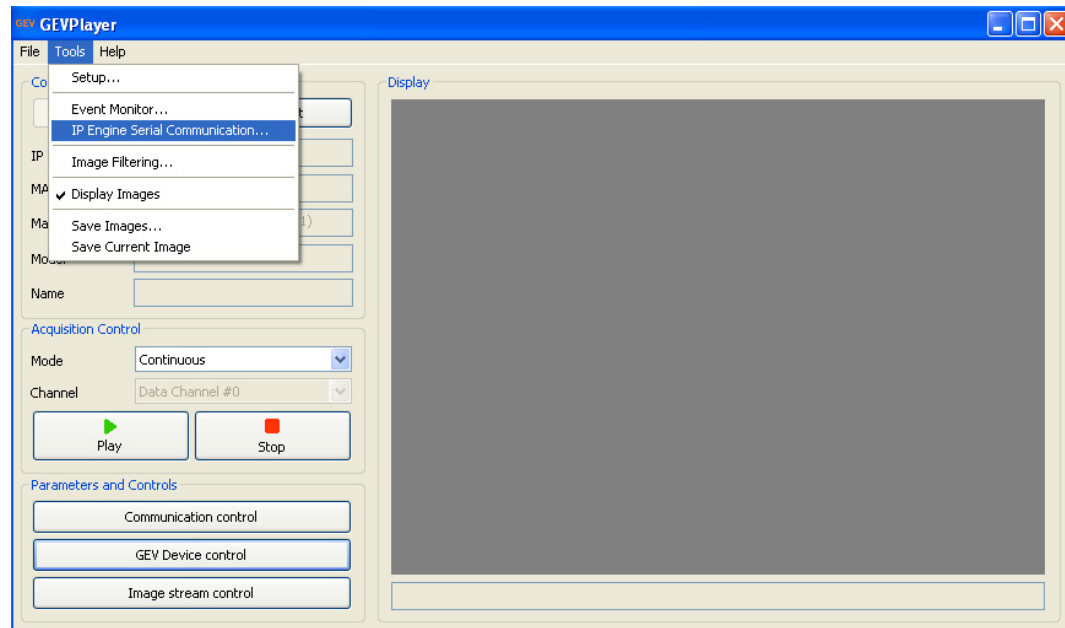
1. Launch GEV Player from the desktop, or alternately in the **Menu Bar**,

Click **Start> All Programs> Pleora Technologies Inc> eBUS-PureGEV Package> GEVPlayer**

The GeVPlayer application splash appears.

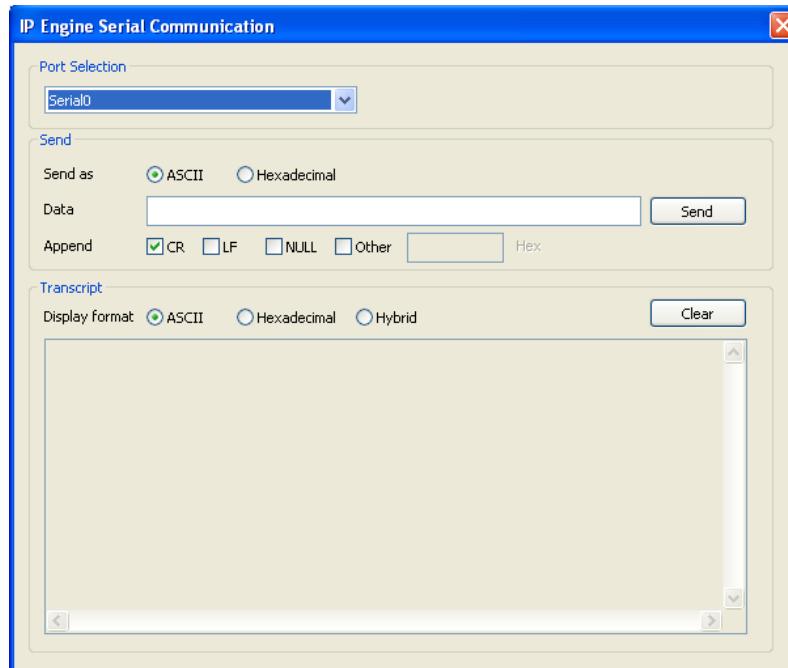


2. In the GEV Player Menu Bar, click **Tools> IP Engine Serial Communication...**

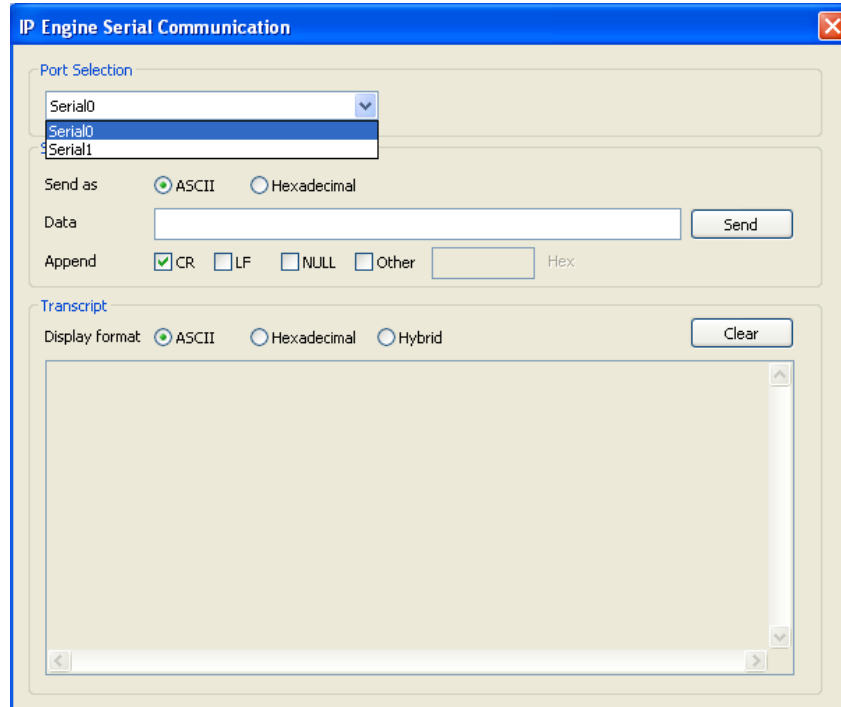


## 36 Modifying Camera Parameters

The IP Engine Serial Communication Window appears.



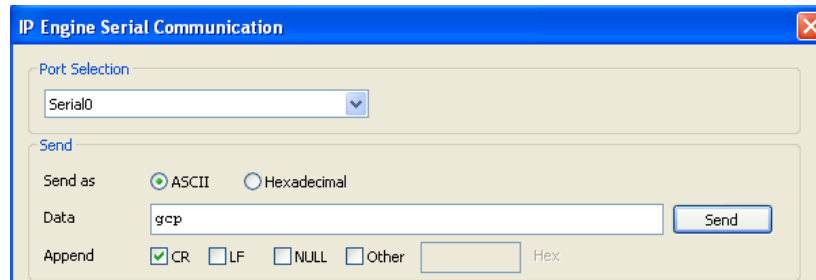
3. In the **Port Selection** group, select **Serial0** or **Serial1** from the pull-down.



## Setting the Transmit Data Sequence

You must determine the correct data sequence and format before transmitting data over the serial ports.

1. In the **Send** group, select the transmit data sequence format, **ASCII** (text only), or **Hexadecimal**. For **Hexadecimal**, enter a pair of hexadecimal digits for each byte, separated by spaces.



2. Enter the data string in the **Data** field.
3. Click any of **CR**, **LF**, **NULL**, or **Other** as trailer options (**Append**). Trailer options are not mutually exclusive; they are appended in the order shown. Select **Other** for ASCII and hexadecimal sequences in custom trailers for camera heads that do not use the trailer options in the order shown (for example, **CR** and **LF**).
4. Click **Send** to transmit the data sequence.

## Receiving Data

Data that is received over the serial port is displayed in the **Transcript** group in the **IP Engine Serial Communication** Window.



1. Select **ASCII**, **Hexadecimal**, or **Hybrid** to determine the format for the displayed data.
2. Click **Clear** to clear the Transcript data pane.

*NOTE!* The **Hybrid** option is selected for data that is comprised of both binary protocol and ASCII strings. It might be necessary to view binary terminators in an ASCII string, or ASCII string attributes in binary data. For example, in an ASCII string you cannot see the 0x07 end-of-line (EOL) binary terminator; conversely, in binary protocol you cannot see the “set width=640” attribute string. Selecting the **Hybrid** option allows you to view both formats at the same time.

### Serial Ports and the SDK

You can create your own GigE Vision application and use the `PvSerialPortIPEngine` class in the SDK to access a Pleora IP Engine serial port. Configure the Class object with the `Open` method by providing a pointer to the serial port of the `PvDevice` that is already connected. Use the `Read` and `Write` methods to write and read data, to and from the port.

Use the `PvTerminalIPEngineWnd` class to display the same serial port terminal dialog `GEVPlayer` is using in your application. Then, use the `ShowModal` method to display the dialog.

*NOTE!* Use caution to access the IP Engine camera head directly through the serial port. If the port is open, all GenICam parameters of the device linked to the camera head are not functional. In addition, it is possible for the GenICam cache for these parameters to lose synchronization with the camera head and the IP Engine.

# Technical support

If you're having problems, the first place to look is in the accompanying documentation. In particular, the *iPORT Concepts Guide* explains many topics that have been traditional trouble spots for our customers. The following are good sources of additional information and help. For best results, please read the entire section before deciding how to proceed.

## Camera Documentation

Cameras are complicated devices with many settings and features; many image-acquisition troubles are actually a misconfiguration or a working camera awaiting a trigger signal. For additional information, consult the documentation that accompanied your camera.

