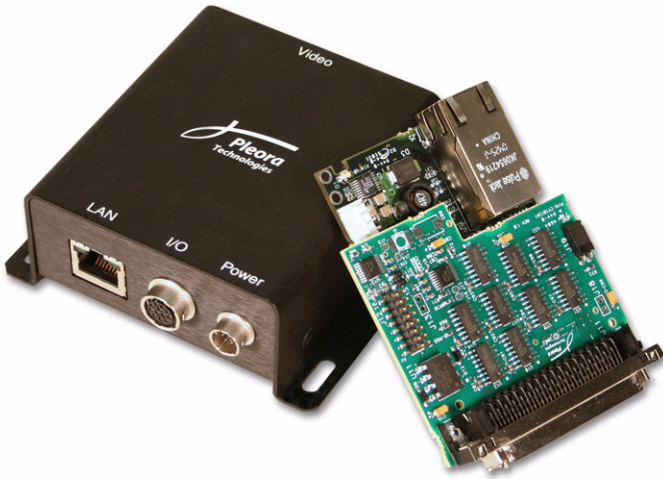




iPORT

Quick Start Guide





...high-performance imaging data and video over Ethernet

Ver 2.4

Item number: 222A00000002

Product code: PT1000DOC-QSG

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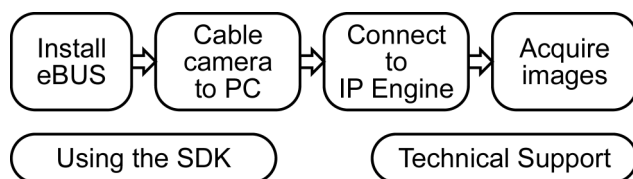
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Setting up your iPORT IP Engine



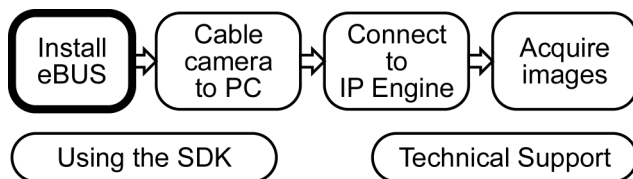
This guide explains how to set up your iPORT™ IP Engine and acquire your first images. It gives you a solid understanding of the introductory concepts, but also lets you set up your system right away, if you prefer. It is intended as a supplement to the documentation included on your iPORT Software CD.

To acquire your first images using your iPORT IP Engine:

1. Follow the directions in the *eBUS Quick Start Guide* to install your eBUS Driver Suite and iPORT Vision Suite. You will also choose and install the NIC driver that best meets your needs.
2. Cable your camera, IP Engine, and PC together. See “Cabling your camera to your PC” on page 5.
3. Connect to your IP Engine. See “Connecting to your iPORT IP Engine” on page 9.
4. Acquire images using your camera. See “Acquiring images with your camera” on page 17.

2 Setting up your iPORT IP Engine

Installing eBUS



To interface with your camera, your PC requires iPORT software.

Your iPORT Software CD contains both the eBUS Driver Suite and the iPORT Vision Suite.

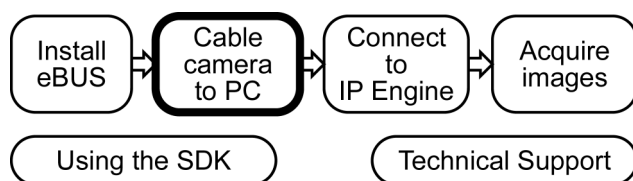
To install eBUS:

- Follow the directions in the *eBUS Quick Start Guide*. The procedure will also install the iPORT Vision Suite.

NOTE! To learn about the documentation, get software upgrades, and more, see “Technical support” on page 29.

4 Installing eBUS

Cabling your camera to your 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. For the best performance, connect to an Intel PRO/1000 NIC.

To cable your camera to your PC:

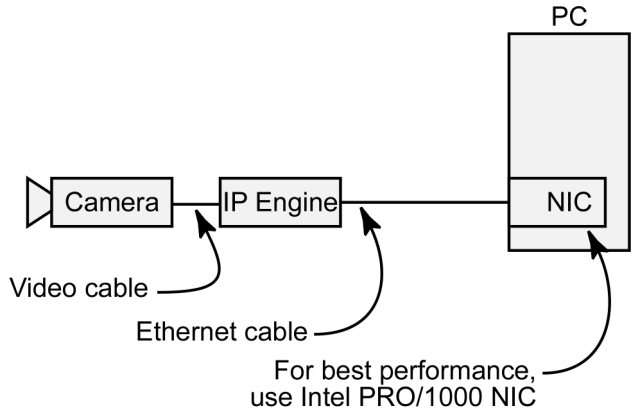
- Cable your system as described in either “Dedicated connection” on page 6, or “Dedicated connection with a second regular NIC” on page 6. Power cables aren't shown.

NOTE! If your iPORT IP Engine is a PT2000 series unit (two LAN connections), consult your hardware guide before proceeding.

6 Cabling your camera to your PC

Dedicated connection

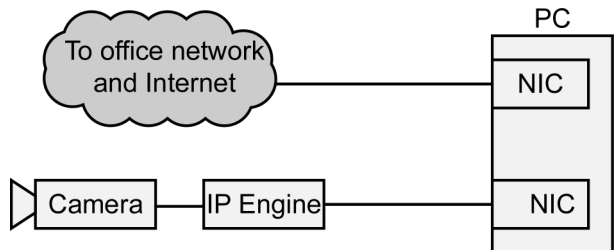
If you require a very high bandwidth connection to your iPORT IP Engine but don't require corporate network connectivity, use the configuration below.



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 is reliable and lets you use the efficient eBUS Optimal Driver.

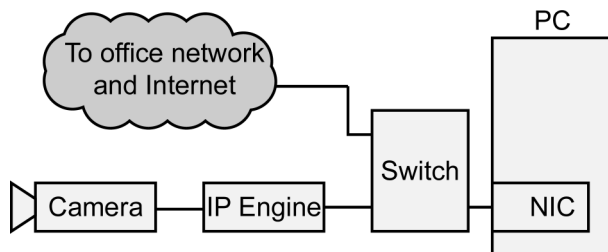
Dedicated connection with a second regular NIC

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.



Switched connection (not recommended)

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

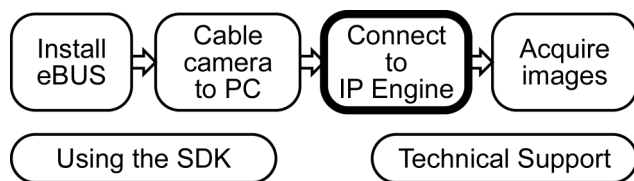


If you're setting up your iPORT IP Engine for the first time, we advise against using this configuration. Such an arrangement may cause the following problems:

- You may experience data loss, delay, or network slowdowns if the switch employs blocking architecture or insufficient packet forwarding capability.
- You may 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 the PC and the IP Engine. We recommend that you turn off spanning tree implementations on the switch.

8 Cabling your camera to your PC

Connecting to your iPORT IP Engine



Coyote is a powerful and versatile camera interface application that lets you quickly configure your iPORT IP Engine and begin capturing camera images with your PC.

To connect to your iPORT IP Engine:

1. Start Coyote. See “Starting Coyote” on page 9.
2. Click **Detect** to find your iPORT IP Engine on your network. See “Detecting your iPORT IP Engine on your network” on page 11.
3. Click **Select** to select a camera. See “Selecting your camera” on page 14.
4. Click **Connect** to connect your PC to your IP Engine and camera.

Starting Coyote

Before launching Coyote, ensure that your camera and iPORT IP Engine are properly connected and powered. Ensure that your NIC has the appropriate driver. To learn more, see “Setting up your iPORT IP Engine” on page 1.

To launch Coyote for the first time, see “Configuring the Windows XP Firewall” on page 10. Otherwise, see “Launching Coyote” on page 11.

Configuring the Windows XP Firewall

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

Follow the directions to ensure Windows XP Firewall works with Coyote (or modify the directions for your own program). Finally, and only if you prefer, you can use the directions to disable the firewall completely.

To configure the Windows XP Firewall:

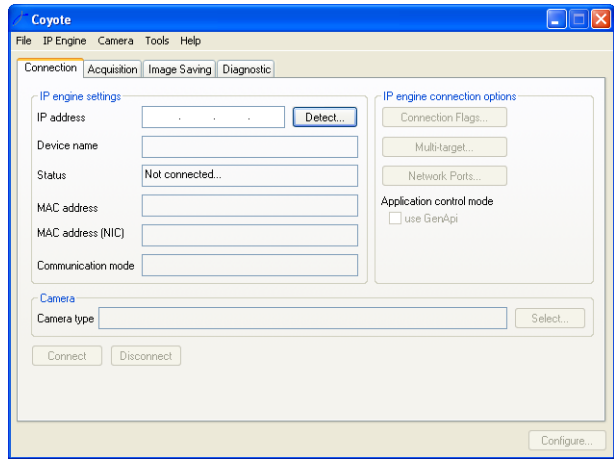
1. From the Windows Start menu, select **Start > Control Panel**.
The Control Panel appears.
2. Open the **Windows Firewall**.
If the firewall is set to **Off** (such as for closed systems), no further changes are required.
3. On the **General** tab, allow exceptions by *unchecking Don't allow exceptions*.
4. Select the **Exceptions** tab.
5. Click **Add Program**.
The **Add a Program** dialog appears.
6. Select **Coyote Application** and click **OK** (if it doesn't appear, the default location is: C:\Program Files\Pleora Technologies Inc.\iPORT Software\Binaries\Coyote.exe).
The **Add a Program** dialog closes and **Coyote Application** appears in the **Programs and Services** field.
7. Click **OK** to close the **Windows Firewall** dialog.
The Windows XP Firewall now allows Coyote to send and receive network packets.
You can now launch Coyote. See "Launching Coyote" on page 11.

Launching Coyote

To launch Coyote:

- From the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > iPORT Vision Suite > Coyote Application**.

The main page of the Coyote application appears.



Detecting your iPORT IP Engine on your network

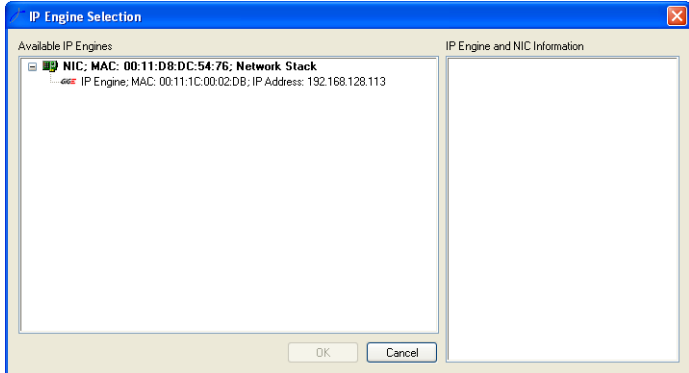
When you detect IP Engines, Coyote finds all the IP Engines it can, using all the NICs on your PC as well as any that are indirectly connected through switches.

To detect your iPORT IP Engine:

- Start Coyote. See “Starting Coyote” on page 9.
- In the **IP Engine settings** pane, click **Detect**. The **IP Engine selection** dialog appears, listing the iPORT IP Engines that each NIC found. NICs

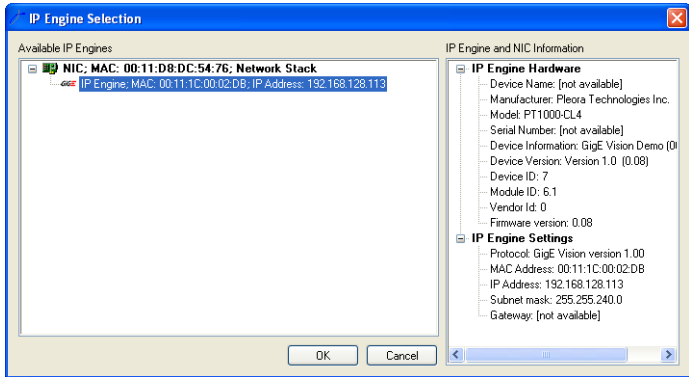
12 Connecting to your iPORT IP Engine

connected to a switched network may find multiple IP Engines.

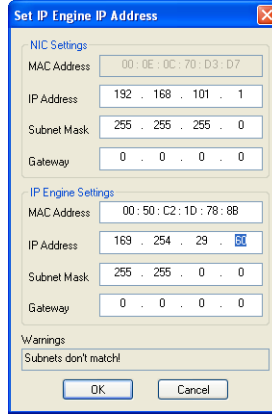


3. In the **Available IP Engines** pane, select your IP Engine.

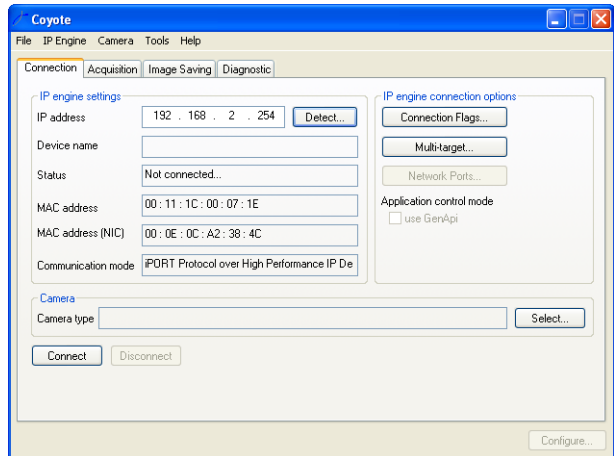
Information about your selection appears in the **IP Engine and NIC information** pane.



- Click **OK**.
The **Set IP Engine IP address** dialog appears.



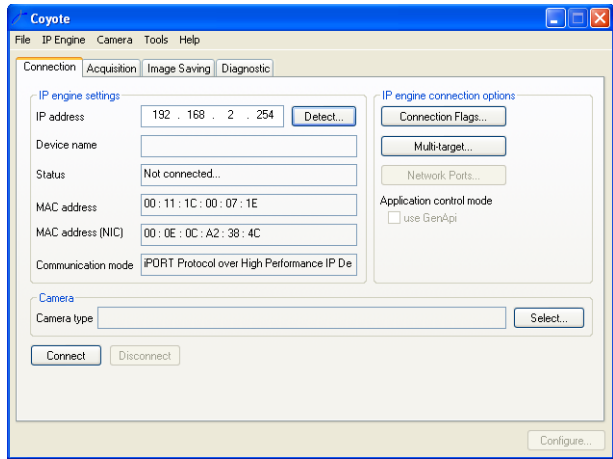
- In the IP Engine settings pane, enter the **IP address** and **Subnet mask**. If you're connecting to your iPORT IP Engine through a network switch (not recommended for an initial connection), consult with your office IT department to ensure that your chosen IP address isn't used by another machine.
The **Warnings** pane lets you know if values you enter are valid.
- Click **OK** to close the **IP Engine selection** dialog.
The updated information appears in the **IP engine settings** pane.



To speed the process of connecting to your iPORT IP Engine in the future, see “Saving your settings” on

14 Connecting to your iPORT IP Engine

page 15. Proceed to “Acquiring images with your camera” on page 17.



Selecting your camera

Coyote requires that you specify your camera when you connect to your IP Engine. However, in some cases, you may want to connect without a camera. For example, you may be trying to connect to the IP Engine for the first time or you might be following the tutorials described in the *iPORT Programmable Logic Controller* reference guide. When prompted, choose the first camera on the list (without that camera you obviously won't be able to acquire any images.)

For a better understanding of what the selections mean, see “Acquiring images with your camera” on page 17.

To select your camera:

1. From the main page of Coyote, click **Select**.
The **Select Camera** dialog appears with a list of all cameras supported by the IP Engine.



2. Select a camera and click **OK**. Only cameras supported by your IP Engine will appear. The **Select Camera** dialog closes and your selection appears on the main page of Coyote.

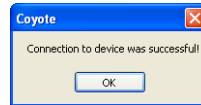
Testing your connection

When you connect to an IP Engine for the first time using an eBUS driver, Windows recognizes the IP Engine as new hardware.

To test your iPORT IP Engine:

- From Coyote's menu, select **IP Engine > Test connection**.

A dialog appears explaining the results of the test.



Saving your settings

To avoid reconfiguring every time you restart the program, Coyote lets you save your current settings as an XML file.

The XML file contains all the information for your iPORT connection, plus all the information for your camera connection (described in “Acquiring images with your camera” on page 17).

16 Connecting to your iPORT IP Engine

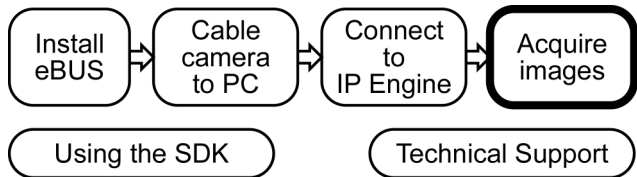
To save the settings for your iPORT IP Engine and camera:

1. From the main menu, select **File > Save**.
2. Type your file name and click **Save**.
Coyote saves your configuration.

To load the settings for your iPORT IP Engine and camera:

1. Launch Coyote. See “Launching Coyote” on page 11.
2. From the main menu, select **File > Open**.
3. Select your file and click **Open**.
Coyote loads your saved configuration. (If **File > Ignore connectivity information** is checked, you have to manually connect to your IP Engine before loading the settings. See the *iPORT Coyote* software guide.)

Acquiring images with your camera



Now that you've connected your iPORT IP Engine, you can connect to your camera and begin acquiring images.

In general, the camera manufacturer's software will let you get the most out of your camera's features. However, how you connect to your camera depends on the type of software that came with it.

To acquire images using your camera (in order of preference):

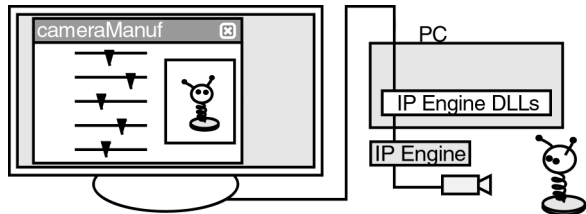
- If your camera included image acquisition software, see "Using the camera manufacturer's software only" on page 18.
- If your camera included software for controlling the camera but doesn't include image acquisition software, see "Using the camera manufacturer's software and Coyote" on page 18.
- If your camera doesn't include any controlling software, see "Using Coyote with presets" on page 19.
- If after trying option 3, you find your camera doesn't have a preset configuration, see "Using Coyote with manual configuration" on page 21.
- If you wish to configure your camera using a command prompt, see "Using command line configuration" on page 24.

18 Acquiring images with your camera

If you encounter difficulties, see “Common image capture troubles” on page 25. Alternately, see “Technical support” on page 29.

Using the camera manufacturer’s software only

Image acquisition software created by your camera manufacturer will let you get the most out of your camera. Generally, this software works directly with the iPORT IP Engine and doesn’t require additional setup from you.



The camera manufacturer’s software is designed to work with the full library of iPORT DLLs. (Knowing how the software connects to the camera isn’t critical now, but will be useful as you move toward developing your own applications.)

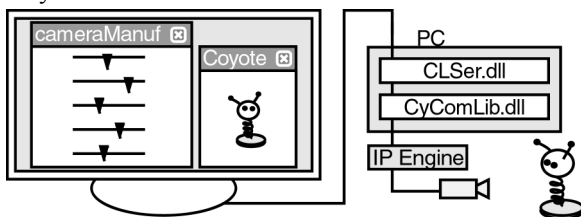
To control your camera and acquire images with the camera manufacturer’s software:

- Launch the manufacturer’s software. Consult your camera manufacturer’s documentation for complete directions. If your camera manufacturer requires that you perform any additional setup, see “Using Coyote with manual configuration” on page 21.

Using the camera manufacturer’s software and Coyote

If your camera manufacturer included software for controlling your camera that *doesn’t* include integrated image acquisition software, you can control the camera using the manufacturer’s software and acquire images

with Coyote. Typically, the manufacturer uses the CLSer family of DLLs.



NOTE! Although ANL and LV cameras will work with the Camera Link Serial DLLs, most manufacturers don't offer software that lets you exercise this option.

To function properly, you must ensure that the settings in Coyote match those in your manufacturer's software. The image may not display correctly (or at all) if Coyote receives an image with an unexpected image width/height/depth or an incorrect number of taps.

Although Coyote uses the full library of iPORT DLLs, the camera manufacturer's software communicates only with the Camera Link Serial family of DLLs (`clser*.dll`). These DLLs, which conform to the Camera Link Serial Communication standard, interface with `CyComLib.dll`, which communicates with the iPORT IP Engine.

To control your camera with the camera manufacturer's software and acquire images with Coyote:

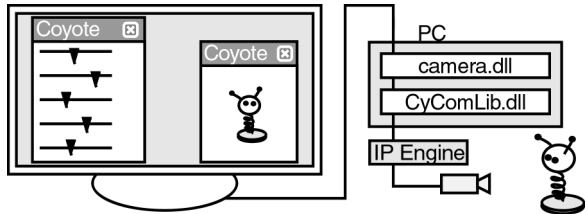
1. Configure Coyote by following the procedure described in "Using Coyote with manual configuration" on page 21.
2. Launch your manufacturer's software. Consult your camera manufacturer's documentation for complete directions.

Using Coyote with presets

To reduce the effort needed to configure your camera for the first time, Pleora offers ready-made configurations. For many cameras, Pleora created a DLL that lets you access the camera-specific features and commands. While the DLLs were fully tested and worked well when they

20 Acquiring images with your camera

were first created, camera manufacturers gradually change their hardware specifications and firmware over time. Thus, the once-valid configurations may no longer be up-to-date or may not work at all. Pleora includes these settings in the SDK as a bonus, but takes no responsibility for updating or maintaining outdated configurations.



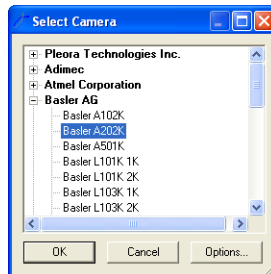
If the ready-made configuration doesn't work, you have the following options.

- Modify the ready-made configuration as needed.
- Configure your camera manually. See “Using Coyote with manual configuration” on page 21.

Coyote communicates with a camera-specific DLL (`CyCam<manuf>.dll`). That DLL communicates with `CyComLib.dll`.

To connect to your camera:

1. Launch Coyote. See “Launching Coyote” on page 11.
2. In the **Camera** pane, click **Select**. The **Select Camera** dialog appears.
3. Select the appropriate make and model of your camera.



4. Click **OK**. The **Select Camera** dialog closes.
5. Click **Connect**. You have now connected to your camera. To avoid reproducing these steps, save your settings (see “Saving your settings” on page 15). To begin

acquiring images, proceed to “Acquiring images with Coyote”, below.

Acquiring images with Coyote

Once you’ve connected to your camera using Coyote, you can begin acquiring images. Due to the many possible camera settings, acquiring images for the first time can require significant setup and repeated attempts. Work carefully and patiently.

To acquire images:

1. Load the configurations for your iPORT IP Engine and camera. See “Saving your settings” on page 15.
2. Select the **Acquisition** tab.
3. In the **Control** pane, select **Grab - Continuous** from the **Mode** menu.
4. In the **Options** pane, enable **Keep partial images**. (This setting isn’t necessary, but it helps you see an image even if Coyote is slightly misconfigured. Once you’re sure that Coyote is properly configured, you can uncheck this option.)
5. In the **Control** pane, click **Start**.
Your camera image appears in a new window.

To make image adjustments:

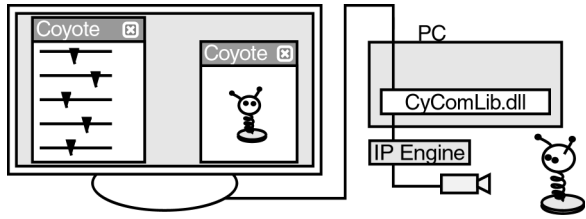
1. Select the **Acquisition** tab.
2. Click **Configure**.
3. The **Configuration - Advanced** dialog appears.
4. Make changes as you require. (Consult your camera manual for advice.)
5. Click **OK**.

Using Coyote with manual configuration

If you wish to configure your camera manually, follow this procedure. You could also use this procedure to make a

22 Acquiring images with your camera

few initial settings before controlling your camera using the manufacturer's software.



Before manually configuring your camera, consult your camera's documentation for the following:

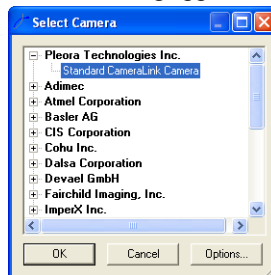
- Camera type (i.e. area scan or line scan)
- Camera sensor size (i.e. image width and height)
- Camera read out mode (i.e. single tap, dual tap right-side inverted)
- Number of taps (i.e. 1, 2)
- Pixel depth (i.e. 8, 12, 14, 16, 24 bits)
- Color space (i.e. gray, RGB, YUV, Bayer)

Some cameras have unusual features or requirements. For example, some cameras won't begin transmitting images without first receiving an external trigger input. Even properly configured, such cameras will appear to not work. Thus, having a full understanding of your camera is essential.

Coyote communicates directly with `CyComLib.dll` to tell the iPORT IP Engine the parameters it should expect from the camera.

To manually configure your camera:

1. Ensure you have properly connected to your iPORT IP Engine. See "Connecting to your iPORT IP Engine" on page 9.
2. From the main page of Coyote, click **Select Camera**. The **Select Camera** dialog appears.

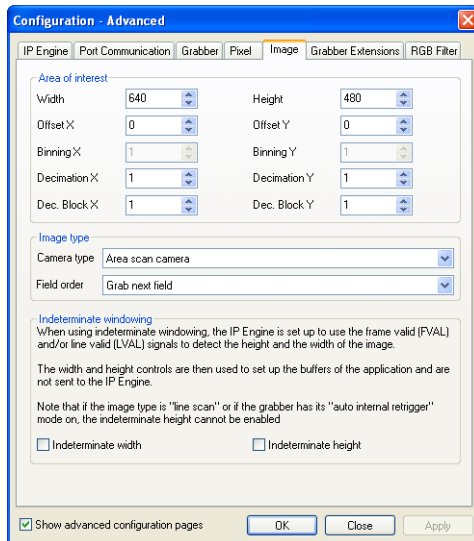


- Expand the **Pleora Technologies Inc.** entry.

NOTE! Don't select your specific camera from the list (i.e. don't select your camera manufacturer's name). Doing so activates a camera-specific DLL that will conflict with the camera manufacturer's software. To use the camera-specific configurations, see "Using Coyote with presets" on page 19.

- If your IP Engine model number contains the letters "ANL", select **Video Decoder**. For "LV" models, select **LVDS Camera**. Otherwise, select **Standard CameraLink Camera**. Only options that are supported by your model of IP Engine will appear.
- Click **OK**.
- From the main page of Coyote, click **Apply**.
- Click **Configure**.

The **Configuration - Advanced** dialog appears. If the **Configuration - Basic** dialog appears, check **Show advanced configuration pages**. You can now manually configure your camera. Camera setup is complicated, with many options, so work carefully and thoroughly. Be sure to have a good working understanding of your camera's documentation and functionality.



- Closely examine the **Image** tab and the **Pixel** tab. Set your configuration values as required.

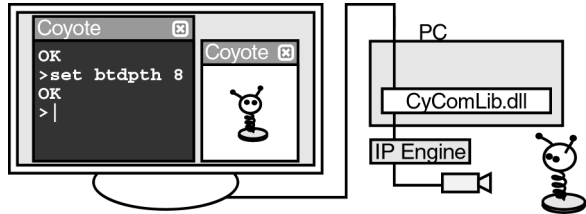
24 Acquiring images with your camera

- When you have made the necessary changes, click **OK**.

Your changes take effect. To permanently save your changes, see “Saving your settings”. Proceed to “Acquiring images with Coyote” on page 21.

Using command line configuration

Some cameras can receive “command line” instructions. In some cases, the instruction set is powerful enough to let you easily configure the camera using this method. Some cameras also have instructions for saving the configuration to the camera’s flash memory, for triggering the camera to begin acquiring images, or for performing low-level diagnosis and setup.



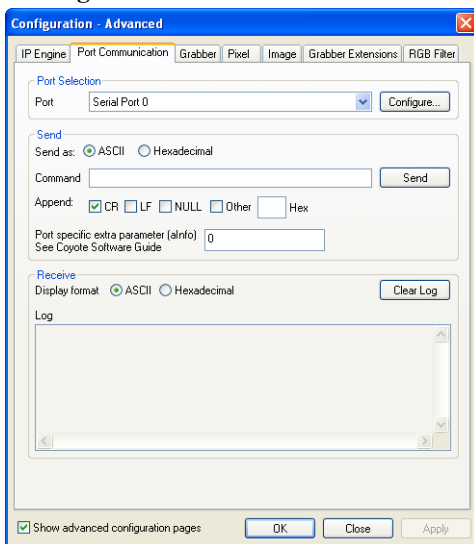
If your camera supports it, you can use Coyote’s built-in prompt to send commands to the camera.

To control your camera with command line instructions:

- From the main page of Coyote, click **Configure**. The **Configuration - Advanced** dialog appears. If the **Configuration - Basic** dialog appears, check **Show advanced configuration pages**.
- Select the **Port Communication** tab.
- In the **Port Selection** pane, select **Serial Port 0**.
- Consult your camera’s documentation then configure the **Send** pane as required. Include the configurations accessible through the **Configure** button in the **Port** pane.

- In the **Command** field, type your command line camera instruction and click **Send**.

The command appears in the **Log** field. If your camera replies (and not all do), the results also appear in the **Log** field.



Common image capture troubles

In some cases, a working camera seems to not work due to a small issue.

Low light and bright light cameras

Some cameras are designed to work with very low light or very bright light. When exposed to the light levels typical of an office, the image may be completely white/black, giving the impression that no signal is being received.

To test for low/bright light cameras:

- If the image is white, cover the camera lens. If the image is dark, shine a bright light into the lens. If the camera required more or less light, the image will brighten or darken.

26 Acquiring images with your camera

Incorrect image size

If Coyote expects to receive a larger image than your camera sends, Coyote may discard the image as bad.

To test for incorrect image size settings:

- Set the width and height settings to a value equal to or lower than your camera image size. In Coyote, click **Configure**, then select the **Image** tab.
- In the **Acquisition** tab, enable **Keep partial images**. If the expected image size was too large, partial or distorted images will appear.

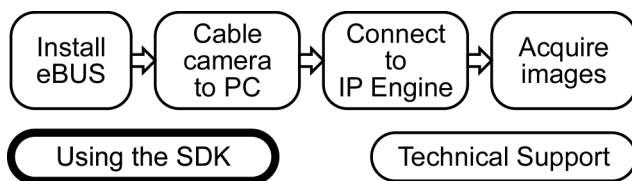
Awaiting trigger

Some cameras won't send an image without receiving a trigger input.

To determine if your camera is awaiting a trigger signal:

- Consult your camera's documentation. Common terms include free-running, auto retrigger, continuous trigger, continuous acquisition, and rolling shutter. If your camera can be set in free-running mode, images will appear. Some cameras require a continuous enable signal to remain in free-running mode.

Using the iPORT SDK



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

Included in your iPORT Software CD are sample applications, the *iPORT Run-Time Library Distribution* reference guide, and the *iPORT C++ SDK* reference guide (which contains an architecture overview, directions for setting up your compiler, and many example programs).

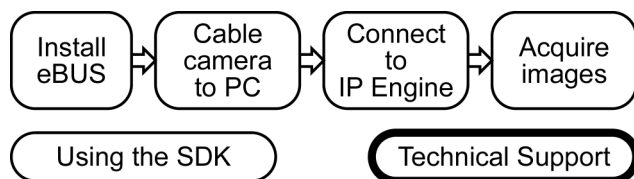
We encourage you to use the samples as a framework for creating your own application. As you become familiar with the SDK, we're confident that you'll find it a flexible tool for harnessing the power of your iPORT IP Engine.

To access the samples:

- From the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > iPORT Vision Suite > Code Samples**.

28 Using the iPORT SDK

Technical support



If you're having any problems using the iPORT Development Kit, the first place to look is in the documentation that came with your iPORT Development Kit and your camera. You can also find additional information on the Pleora website.

If you need help beyond that, email and phone support is available. For best results, please read this entire section before deciding how to proceed.

Documentation

iPORT Development Kit

The iPORT Development Kit documentation includes user's manuals, specifications, and step-by-step directions. The documentation also includes a troubleshooting guide that addresses many of the common problems.

To view the iPORT Development Kit documentation:

- From the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > iPORT Vision Suite > Documentation**.

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NOTE! By default, the documentation files are located in **C:\Program Files\Pleora Technologies Inc\iPORT Software\Documentation.**

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 some of the more common camera-related acquisition issues, see “Common image capture troubles” on page 25. For additional information, consult the documentation that accompanied your camera.

Website

To get software updates, view online documentation, and more, visit the **Resource Center** at www.pleora.com and register for partner access.

Email support

If the above options don't solve your issue, contact Pleora.

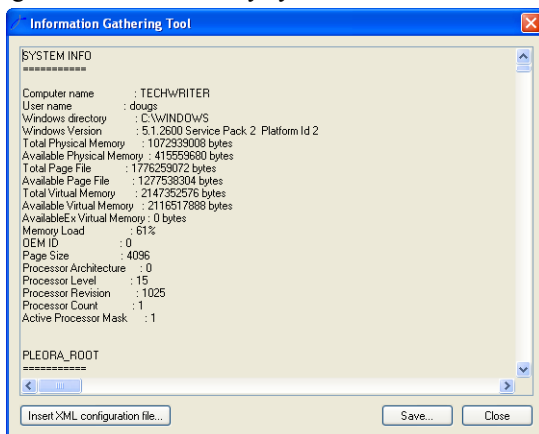
To better help you, your iPORT Development Kit includes the Information Gathering Tool which automatically summarizes your system configuration and saves it as a text file. Including this file with your first email will speed problem resolution.

To gather system information required by Pleora's support staff:

1. Ensure your iPORT IP Engine is powered and properly connected to your PC.

- From the Windows Start menu, select **Start > All Programs > Pleora Technologies Inc > iPORT Vision Suite > Information Gathering Tool**.

The main page of the Information Gathering Tool appears. It may take a few moments for the tool to gather all the necessary system information.



- If your setup includes an XML configuration file, click **Insert XML configuration file** and select the file. (The XML configuration file is the file you normally load in Coyote.) If you have a standard configuration but haven't saved it as an XML file, please do so before running this tool. See "Saving your settings" on page 15.

Your XML file is appended to the list.

- Click **Save**.
The **Save As** dialog appears.
- Name your file and click **Save**.
Your system information is now summarized in a text file.

To contact Pleora by email:

- Send an email to your iPORT reseller or distributor. Include your camera make and model; the physical connection arrangement; and a detailed description of your issue. Attach the file you created with the Information Gathering Tool. If you bought your iPORT IP Engine directly from Pleora, send an email to support@pleora.com.

Phone support

To best resolve your problem, we require detailed information about your system. When you call, you will need to know the following:

- Operating system and version. (To see the version in Windows, select **Start > Control Panel**. Click **System**. The version information is in the **General** pane.)
- Firmware version. (To see the firmware version using Coyote, select the **Device** pane, and click **Detect**. Hover your pointer over the relevant entry. The firmware version appears at the bottom of the dialog box.)
- Software version. (To see the software version using Coyote, select **Help > About**.)
- If your issue is image or frame related, include the image size, pixel type, frame rate, and synchronization type.
- If your issue is network related, include the driver type, connection type, packet size, network topology, and networking equipment
- A brief description of your application and how you're using your iPORT IP Engine.

To obtain phone support:

- Ensure you have the information described above, then call your iPORT reseller or distributor. If you bought your IP Engine directly from Pleora, call +1-613-270-0625, x303.

NOTE! The Information Gathering Tool automatically gathers almost all the information you need into a text file that can be easily sent by email. Thus, email support is likely to be faster and easier for you. To learn more, see “Email support” on page 30.