Pleora Technologies

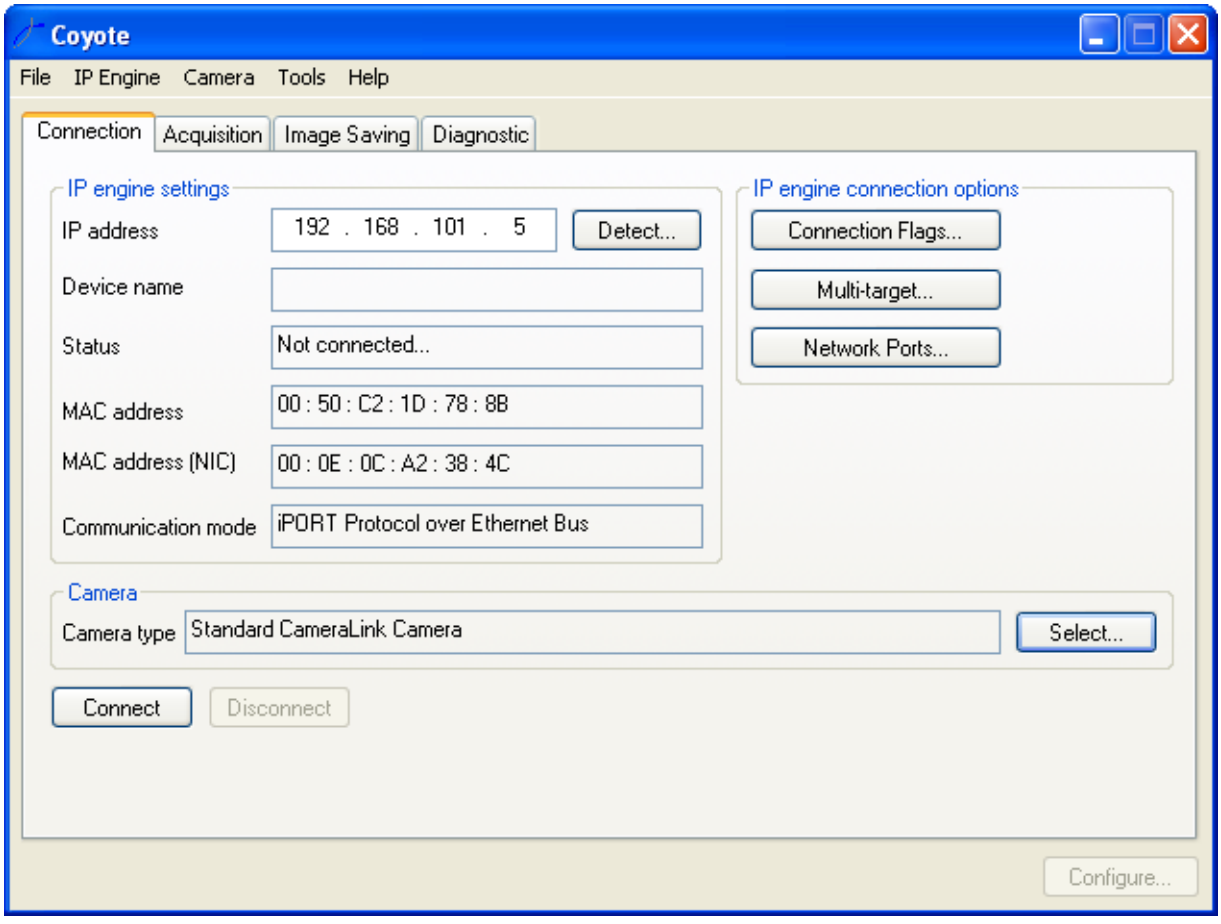
iPORT

Coyote

Software Guide

SIMPLY | CONNECT™

Pleora Technologies



Simply connect

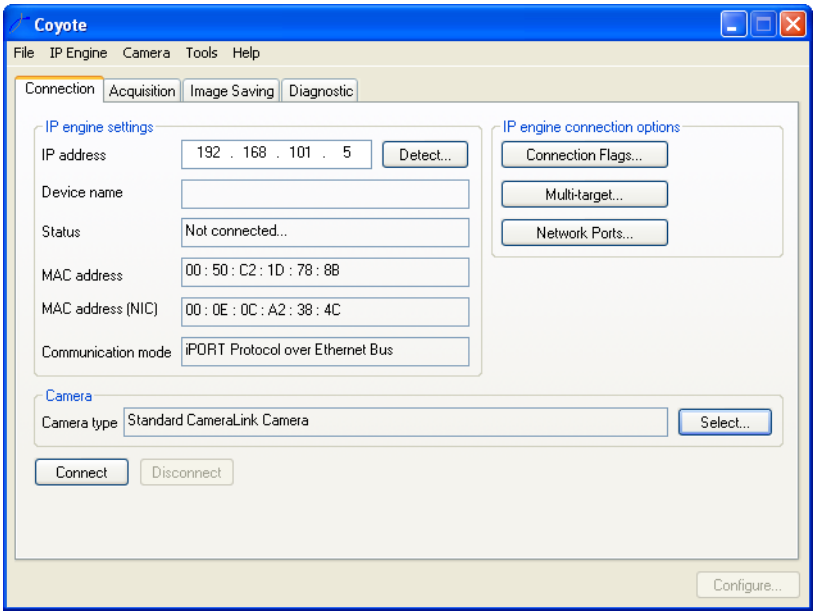
Version 2.4

2/26/08

Contents

About Coyote

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



This software guide describes Coyote's functionality in intricate detail. However, it isn't a goal-oriented guide. To learn how to use Coyote to connect to your iPORT IP Engine, connect to your camera, and acquire images, see the *iPORT Quick Start Guide*. To learn how to use the powerful PLC to create a sophisticated machine vision system, see the *iPORT Programmable Logic Controller Reference Guide*. To learn about important concepts related to your IP Engine, see the *iPORT Concepts Guide*.

Overview of Coyote

Generally, you use Coyote as follows:

1. Use the **Connection** tab to connect to your iPORT IP Engine and camera. See "Connection tab" on page 12.
2. Use the **File** > **Save** command to save your IP Engine's settings as a Coyote configuration file. See "Main menu" on page 9.
3. Use the **Acquisition** tab to display camera images on your PC. See "Acquisition tab" on page 13.
4. Optionally, use the **Image Saving** tab to save acquired images. See "Image Saving tab" on page 15.
5. Optionally, use the **Diagnostic** tab to find the cause of any acquisition problems you might have. See "Diagnostic tab" on page 17.
6. Optionally, use the **Configuration** dialog to configure image width, binning, and pixel type; define how the IP Engine and host PC communicate; and program the PLC. See "Configuration dialog" on page 19.

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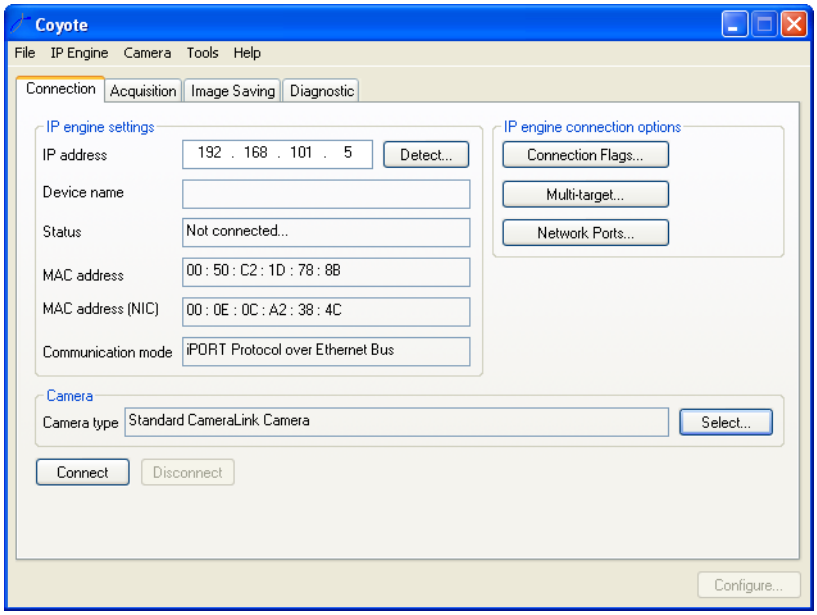
Menus and tabs

This section describes Coyote's menu options, tabs, and other functionality in intricate detail.



For a description of Coyote's dialogs, see "Coyote dialogs" on page 19.

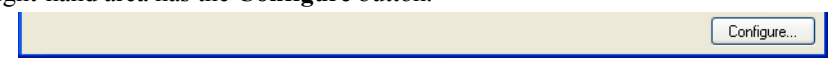
NOTE! Coyote dynamically changes options and available configurations. Thus, screen shots may vary depending on your model of iPORT IP Engine.

In this section:

Main menu

Coyote has menus for **File**, **IP Engine**, **Camera**, **Tools**, and **Help**.

The lower right-hand area has the **Configure** button.



Configure

Display the **Configuration** dialog. See "Configuration dialog" on page 19.

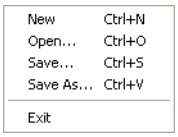
In this section:

File menu

To access:

- From the main menu, select **File**.

The **File** menu lets you create and save commands for XML configuration files for your iPORT IP Engine and camera.



The **File** menu contains:

New
Clear configurations and cached file names from the **Connection** tab (if any previous open or save has been performed).

Open
Open a dialog for selecting an XML configuration file. Check **Ignore connectivity information** to use your IP Engine's current IP address. In the Coyote configuration file, you can identify the complete connectivity information by the `<connectivity>` tag.

Save
Save As
Save the current configuration to an XML configuration file.

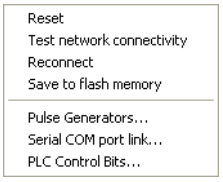
Exit
Close Coyote.

IP Engine menu

To access:

- From the main menu, select **IP Engine**.

The **IP Engine** menu lets you send commands related to controlling the iPORT IP Engine.



The **IP Engine** menu contains:

Reset
Reset the iPORT IP Engine (equivalent to powering the unit off and on).

Test network connectivity
Test that the network connection between the PC and IP Engine works.

Reconnect
Reconnect to the currently selected IP Engine.

Save to flash memory
Opens the **Save to IP Engine's Flash Memory** dialog. When an IP Engine supports this feature, this command saves the current configuration to flash memory and makes it the default boot-up configuration. See "Save to IP Engine's Flash Memory dialog" on page 45.

Pulse Generators
Opens the **Pulse Generators** dialog for modifying the PLC's pulse generator outputs on the fly. See "Pulse Generators dialog" on page 45.

Serial COM Port Link
Opens the **Serial Port Configuration** dialog. See "Serial Port Configuration dialog" on page 46.

PLC Control Bits
Opens the **PLC Control Bits** dialog. See "PLC Control Bits dialog" on page 44.

Camera menu

To access:

- From the main menu, select **Camera**.

The **Camera** menu lets you send commands related to controlling the camera.

The **Camera** menu contains:

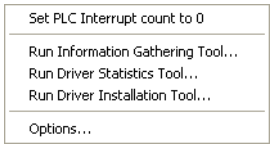
Reset
Reset the camera (or other video source), if applicable. The video source is reset, but you may have to update the iPORT IP Engine.

Tools menu

To access:

- From the main menu, select **Tools**.

The **Tools** menu lets you change Coyote options and access other programs.



The **Tools** menu contains:

Set PLC Interrupt count to 0
Set the **Count** value in **PLC Interrupts** in the **Acquisition** tab to zero. To learn more, see the Interrupt FIFO section in the *iPORT Programmable Logic Controller Reference Guide*.

Run Information Gathering Tool
Run the Information Gathering Tool. This tool gathers information about your system into a single text file. The tool gathers driver information, network information, SDK versions information, available IP Engines, and your XML configuration file. To use the Information Gathering Tool, see the Technical Support section in the *iPORT Quick Start Guide*.

Run Driver Statistics Tool
Run the Driver Statistics Tool. This tool can be used to troubleshoot network problems when using the iPORT High-Performance IP Device Driver.

Run Driver Installation Tool
Run the eBUS Driver Installation Tool. This tool lets you update and install all of Pleora's iPORT IP Device drivers, as well as the driver supplied by Intel for the PRO/1000 Adapter. See the *eBUS Quick Start Guide*.

Options
Open the **Options** dialog. This dialog lets you control the settings and behavior of Coyote. See “Options dialog” on page 39.

Help menu

To access:

- From the main menu, select **Help**.

The **Help** menu lets you see helpful information about Coyote.

The **Help** menu contains:

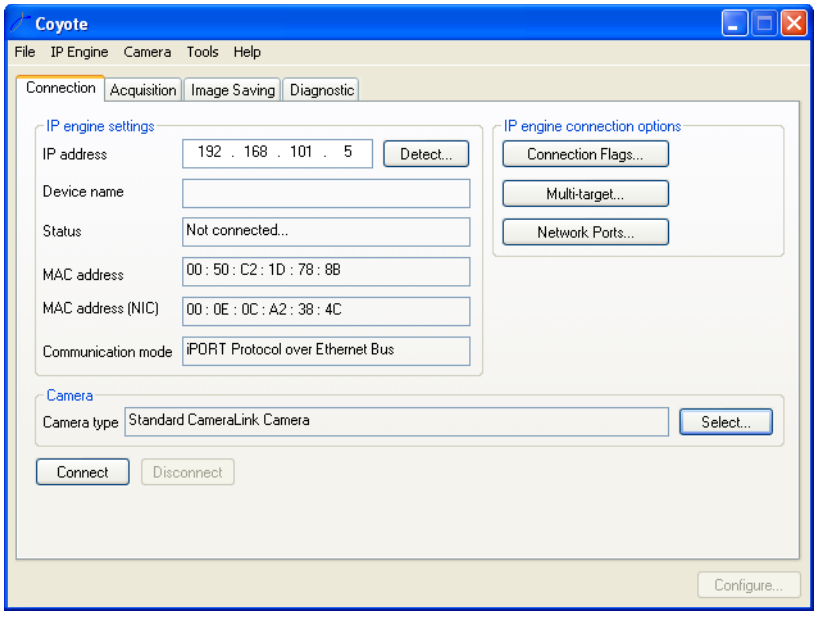
About Coyote
Display the **About Coyote** dialog containing information about the version of Coyote.

Connection tab

To access:

- Select the **Connection** tab.

The **Connection** tab lets you edit the configuration of the IP Engine and camera.



Connect
Communicate with your camera after you have detected an IP Engine and selected a camera.

Disconnect
Stop communicating with your camera and IP Engine; and clear the configurations in the **IP Engine settings** pane and **Camera** pane.

IP Engine settings pane

IP address
The IP address of the currently selected IP Engine.

Detect
Open the **IP Engine Selection** dialog which searches the network for available iPORT IP Engines. When you select an IP Engine, the information appears in the **IP Engine settings** pane. See “IP Engine Selection dialog” on page 37.

Device name
The name of the currently selected IP Engine. To set this value, see “IP Engine tab” on page 27.

Status
The connection state of the currently selected IP Engine.

MAC address
The MAC address of the currently selected IP Engine.

MAC address (NIC)
The MAC address used by the network interface card (NIC)

Communication mode
Specifies which driver is used to make the connection to the video source or camera.

IP Engine connection options pane

Connection Flags
Open the **Connection Flags** dialog. See “Connection Flags dialog” on page 36.

Multi-target
Open the **Multi-Target Configuration** dialog. See “Multi-Target Configuration dialog” on page 38.

Network Ports
Open the **Network Stack Port Selection** dialog. See “Network Stack Port Selection dialog” on page 38.

Camera pane

Camera type
The type of camera attached to the currently selected IP Engine.

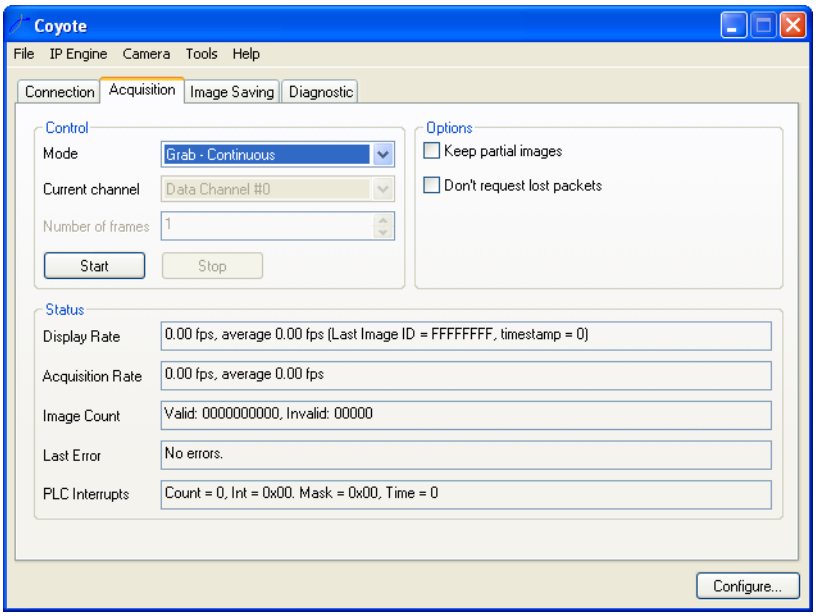
Select
Open the **Select Camera** dialog which lets you choose a camera configuration. See “Select Camera dialog” on page 46.

Acquisition tab

To access:

- Select the **Acquisition** tab.

The **Acquisition** tab lets you acquire images from the currently selected and connected IP Engine. Images appear in a separate window.



Control pane

Mode

This drop-down menu specifies the acquisition mode. Settings include:

Grab – Single

Acquire a single image from the IP Engine.

Grab – Continuous

Acquire images continuously until you click **Stop**.

Recording

Record the next frames into the IP Engine's onboard internal memory until either the memory fills up or you click **Stop**. Images can be transmitted using one of the "playback" acquisition modes.

Playback – Single

Acquire a single image from the IP Engine's onboard memory. If no frames are available, a timeout occurs.

Playback – Continuous

Acquire images continuously from the IP Engine's onboard memory. When no more frames are available, timeouts occur.

Current channel

The video input channel the IP Engine uses for the **Acquisition** tab. Most IP Engines support a single channel (single camera) but DLV-series IP Engines and some ANL-series IP Engines support two channels. If the IP Engine supports a single channel, this field is disabled; for multi-channel IP Engines, use channels 0 and 1.

Number of frames

Specify the number of images to grab when using **Grab – Single** or **Playback – Single** mode.

Start

Start acquiring images based on the **Mode**. The image display depends on Coyote's settings. See "Display Options tab" on page 43.

Stop

Halt any current acquisition.

Options pane

Keep partial images
Accept images that are missing pixels or lines. Use this option when the image size is unknown or variable.

Don't request lost packets
By default, missing packets are requested until they're successfully delivered. By enabling this option, lost packets are ignored and never retransmitted. Images that are missing packets will appear incomplete, but you minimize bandwidth use.

Status pane

Display rate
The current and average rates of display in frames per second and the image ID for the last displayed image. The rate is a cumulative value from the time the **Start** button was last pressed, not an instantaneous rate. The image ID is assigned by the iPORT IP Engine.

Acquisition rate
The current and average rates of acquisition of the iPORT IP Engine, in frames per second. The acquisition rate is a cumulative value from the time the **Start** button was last pressed.

Image count
The total number of images and the number of incomplete images. A large number of incomplete images may indicate a set-up or cable problem.

Last error
The last error that occurred when acquiring images from the iPORT IP Engine.

PLC interrupts
The Host PC Interrupt count; last input mask, and timestamp at the time the IP Engine generated the last interrupt. To learn more about PLC interrupts, see the *iPORT Programmable Logic Controller Reference Guide*.

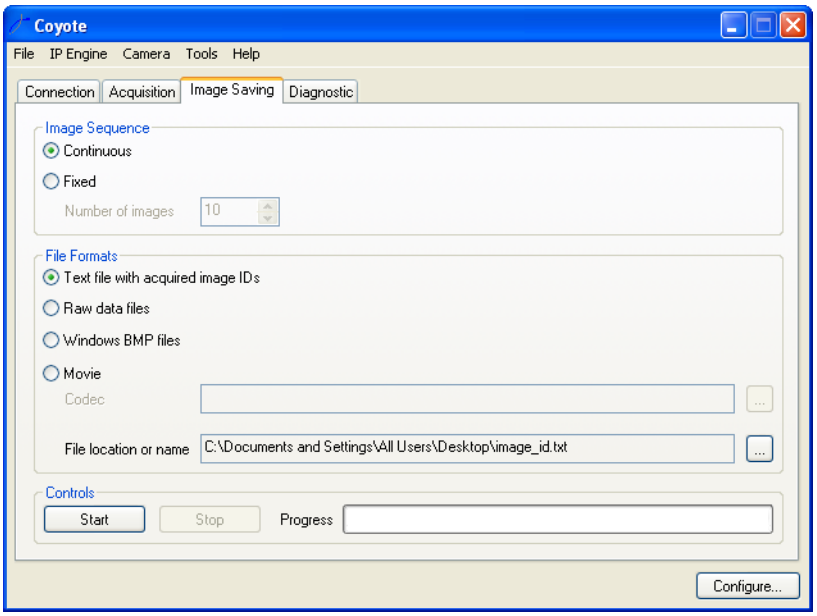
Image Saving tab

To access:

- Select the **Image Saving** tab.

The **Image Saving** tab lets you save images in a variety of formats, including bitmapped images and movies. If you save the images as a movie, you must specify the filename and Codec (coder decoder). If

you save the images individually, Coyote automatically names each file by individual frame ID; you need specify only the directory.



To save images, you must be currently acquiring images using the **Acquisition** tab. (See “Acquisition tab” on page 13.) However, you can configure the **Image Saving** tab and click **Start**, *then* configure the **Acquisition** tab. Coyote won’t save images until you click **Start** in the **Acquisition** tab.

Image sequence pane

Continuous
Save images indefinitely until you click **Stop**.

Fixed
Save a finite number of images.

Number of images
The number of **Fixed** images to save.

File format pane

Text file with acquired image IDs
Save only the image IDs into a single text file.

Raw data files
Save each acquired frame into a raw, unformatted data file (.RAW). The format depends on the grabber’s image and pixel settings output. See “Image tab” on page 26 and “Pixel tab” on page 28.

Windows BMP files
Save each acquired frame as a Windows bitmap.

Movie
Save the acquired frames into a single AVI movie file using the Codec you specify.

Codec
The coder/decoder for the **Movie**.

File location or name
The directory for sequential images (files are named by image ID) or the directory and filename for a text file or movie.

Controls pane

Start
Begin saving images.

Stop
Interrupt the process of saving images.

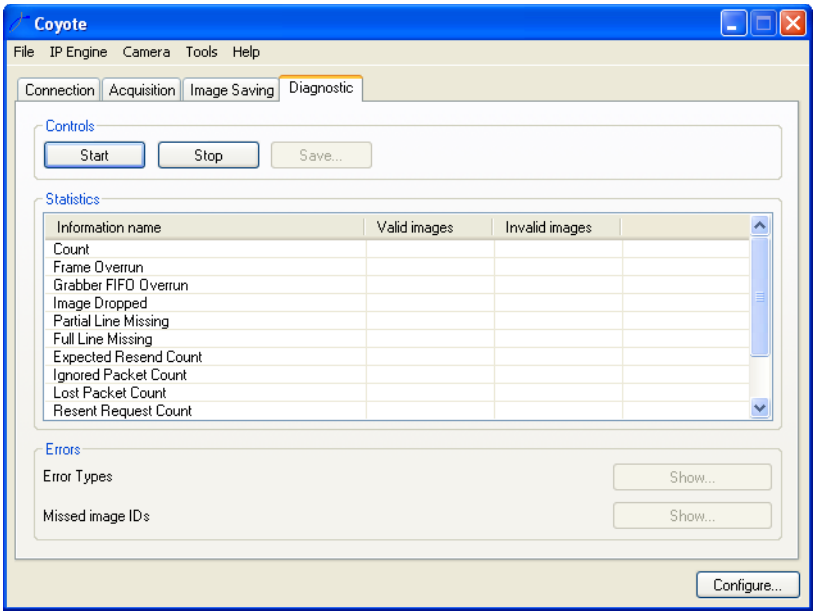
Progress
A bar that visually indicates the level of completion when saving a fixed number of images. When continuously saving images, the bar isn't used.

Diagnostic tab

To access:

- Select the **Diagnostic** tab.

The **Diagnostic** tab provides basic information about the success of the image acquisition.



Controls pane

Start
Begin diagnosing the IP Engine connection.

Stop
Interrupt the diagnostic process.

Save
Save the results as a text file.

Statistics pane

The **Statistics** pane provides a running count of the images and image-related errors for both valid and invalid images. Valid images may have errors if **Keep partial images** is checked. See "Options pane" on page 15.

Count
The total number of images.

Frame overrun
The IP Engine needs a few clock cycles to finish a frame. This error occurs if a new frame starts before the IP Engine has finished the previous frame.

Grabber FIFO overrun
The grabber ran out of RAM while acquiring an image. At least one section of the image is missing.

Image dropped
The total number of images dropped by the IP Engine. When a camera transmits images faster than the IP Engine can relay them to the PC, the IP Engine drops the image. The next image has an image-status bit set to indicate that the previous image was dropped.

Partial line missing
The number of times a part of a line was missing in the IP Engine (i.e. not sent by the camera). The value is incremented only once per image, even if all lines in the image are partial.

Full line missing
A complete line is missing from a frame. This error may occur with images of variable length.

Expected resend count
The number of packets (image pieces) that were re-requested and received.

Ignored packet count
The number of packets received by the PC were ignored due to the lack of an available buffer. Packets unrelated to IP Engine data aren't counted.

Lost packet count
The number of packets that were expected, but weren't received within a certain time limit or in the expected order.

Resent request count
The number of packets re-requested by the PC.

Start packet count
The number of packets the PC received (and ignored) while waiting for the first image packet.

Unexpected resent count
The host PC re-requests packets that haven't arrived within its time limit. If both packets ultimately arrive, the second is counted as unexpected and discarded.

Errors pane

Error Types
The total number of errors. Click **Show** to see a detailed list in the **Error Type** dialog.

Missed Image IDs
The image ID of the last missed image. Click **Show** to see a full list in the **Missed Image** dialog.

Coyote dialogs

This section describes most of the dialogs available in Coyote. The dialogs are arranged alphabetically by name. For a description of the menus, tabs, and buttons used to call the dialogs, see “Menus and tabs” on page 9.

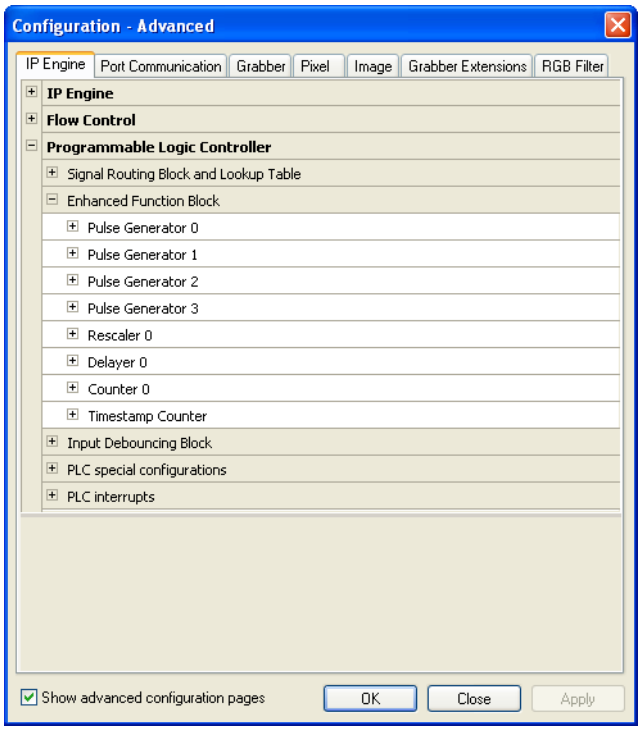
This section describes the followings dialogs:

Configuration dialog

To access:

- Click **Configure**.

The **Configuration** dialog lets you configure the iPORT IP Engine and the camera to which it is attached. As with the rest of Coyote, the options and tabs that appear depend on your model of IP Engine.



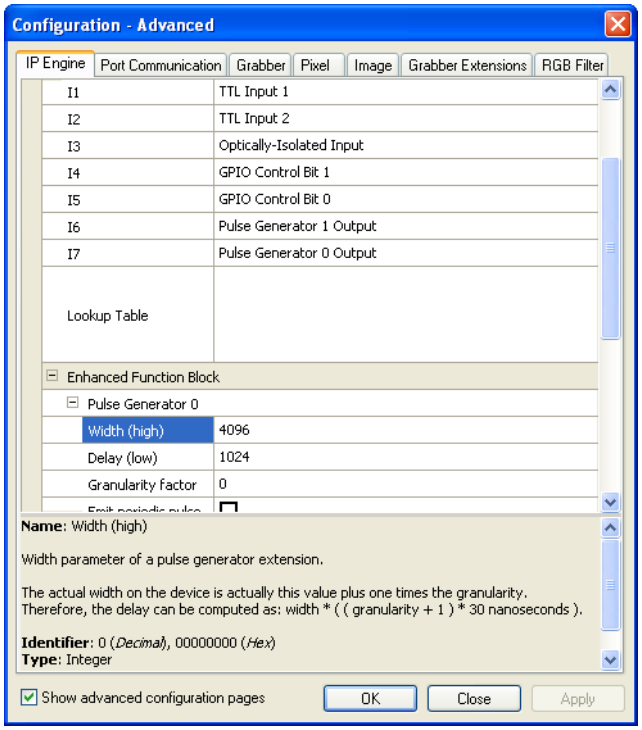
The **Configuration** dialog includes the following tabs:

Configuration details

Although this manual describes many features and parameters, some aren't included. To prevent error-prone duplication, features that are documented in the SDK are omitted, but included in the Coyote dialogs. Most of these features are in the **IP Engine** tab. To read about these settings, see the CyDeviceExtensionConstants.h file in the *iPORT C++ SDK Reference Guide*.

To see documentation for some features within Coyote:

- Click on the item.
  The description appears in the window below.



Advanced and basic configuration pages

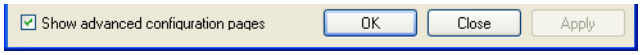
The **Configuration** dialog lets you hide some parameters for easier understanding. If all parameters on a tab are hidden, Coyote hides the entire tab.

The basic version gives you easy access to the most commonly used camera parameters, such as image width, image height, or test pattern.

The advanced version gives you access to extra features such as tap reconstruction, pulse generators, and the rescaler.

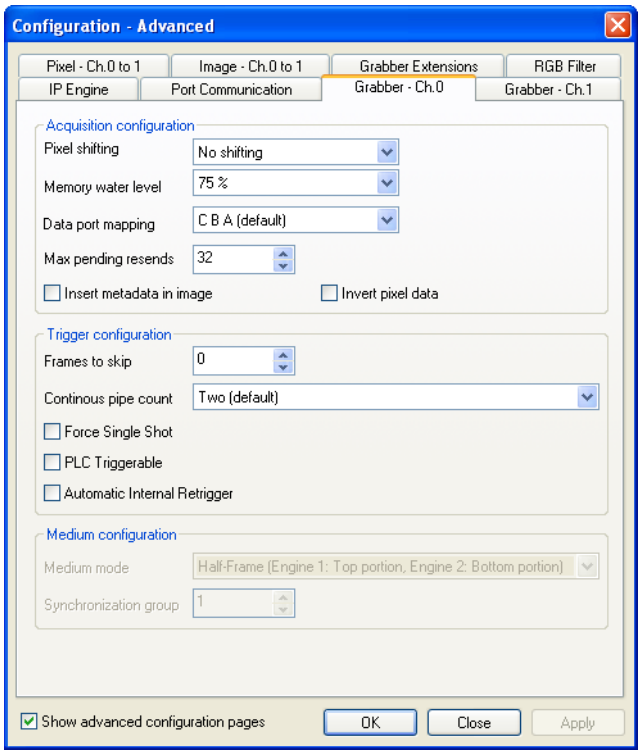
To toggle between the advanced and basic configurations:

- Check or uncheck the **Show advanced configuration pages** check box at the bottom of the **Configuration** dialog.



Multi-channel IP Engines and the Configuration dialog

If your IP Engine supports multiple channels and per-channel configurations, the Configuration dialog displays a tab for each channel. Tabs that affect both channels remain unchanged.

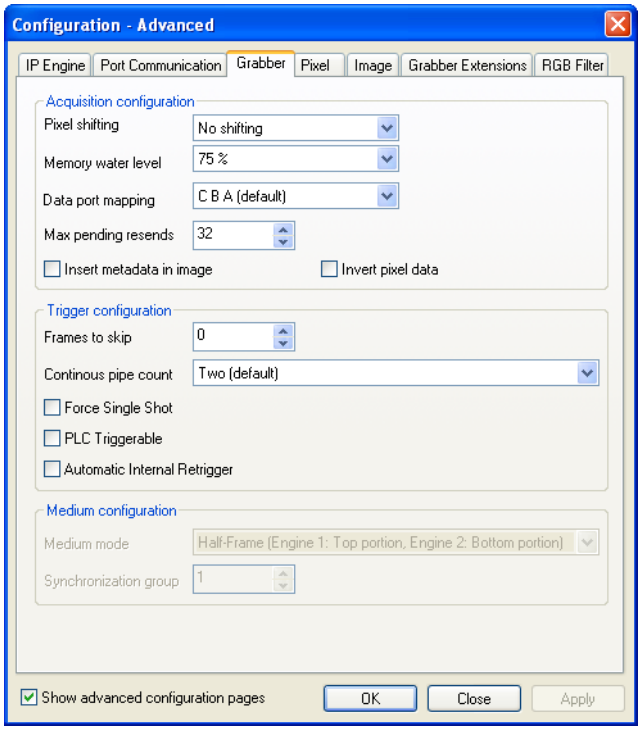


Grabber tab

To access:

- Click **Configure**. Select the **Grabber** tab.

The **Grabber** tab lets you configure how the grabber acquires images from the camera.



Acquisition configuration pane

Pixel shifting

The type of pixel shifting to use when acquiring pixels from the camera. When pixel shifting is used, the grabber will grab pixels according to its pixel depth configuration, and then shift them by the number of bits required. Depending on the source pixel and the pixel configuration, it may yield a smaller frame size, in bytes. For example, if the attached camera is sending 10-bit pixels and the pixel shifter is set to 2, the resulting depth is 8 bits. In this case, the resulting buffer would shrink from 2 bytes per pixel to 1 byte per pixel. (Available on IP Engines with firmware Version 3.16 or higher.)

Memory water level

The amount of the onboard memory that can be used before the IP Engine sees that it is "full." (Available on IP Engines with firmware Version 3.14 or higher.) The possible values include:

50%
75% (default)
87.5%
100% (not recommended)

Data port mapping

The mapping of data ports from the camera. This feature comes from the Camera Link specification, but also applies to LVDS models as well. Refer to both the Camera Link specifications and your camera's documentation for more details on the port mapping. (Available on IP Engines with firmware Version 3.16 or higher.) The possible values include:

C B A (default)
C A B
B C A
B A C
A C B
A B C

Max pending resends

If many packets are missing (likely due to a bad connection), the PC might endlessly try to request the retransmission of the same packets. This setting limits the number of packets the PC tries to acquire and keeps the PC from generating an endless list of packets. Once the limit is reached, Coyote drops the oldest packet from the list.

Insert metadata in image

When enabled, the IP Engine replaces the first 4 bytes of every image with the image ID (in little-endian format).

The image ID can also be determined using the CyBuffer::GetReadImageID function, but only after all the data packets for the image have been transferred. Enabling this feature lets software programs get the image ID after receiving the first packet (at the expense of losing a 4-byte section of the image).

Instead of the image ID, you can insert the PLC's counter value in the image. To control the type of information in the 4 bytes, use the **Grabber Extension** tab. See "Grabber Extensions tab" on page 24. (Available on IP Engines with firmware Version 3.53 or higher.)

Invert pixel data

When enabled, the grabber inverts the bits of each acquired pixel. Black pixels become white; white pixels become black. (Available on IP Engines with firmware Version 3.16 or higher.)

Trigger configuration pane

Frames to skip

The number of frames that the iPORT IP Engine will skip between successively transmitted frames. A value of 0 sends all frames.

Continuous pipe count

The number of frames that can be in the transmission-and-acquisition pipe. A frame is considered to be in the pipe from the moment it starts until its last packet is transmitted to the Ethernet link. When the specified number of frames is reached, the IP Engine will ignore any new frames from the camera until the number of frames in the pipe decreases.
In Continuous mode, the limit is set by the amount of onboard memory available in the IP Engine, rather than the number of frames in the pipe. The IP Engine acquires frames from the camera until the memory is filled up to the water-level setting. See “Memory water level” on page 23.

Force single shot

When enabled, Coyote continuously requests single images from the iPORT IP Engine. Otherwise, Coyote asks the iPORT IP Engine to send images continuously until stopped.

PLC triggerable

Use the PLC to trigger the grabber to acquire an image. The grabber uses output Q14 in the PLC Lookup Table. Note that the IP Engine is triggered, not the camera. This feature is useful for cameras that don’t support triggered acquisition. (Available on IP Engines with firmware Version 1.7 or higher.)

Automatic internal retrigger

When this mode is disabled, the IP Engine waits for the rising-edge of the FVAL signal to start acquiring, and stops acquiring when either the preset number of lines has been reached, or the FVAL signal falls. The engine then waits until the next rising-edge of FVAL to acquire the next frame.
When this mode is enabled, the IP Engine waits for the rising edge of the FVAL signal to start acquiring frames. If the signal is still high when the preset number of lines has been reached, the IP Engine will start a new frame with the next lines inside the FVAL signal. This goes on until FVAL finally falls. The SDK buffer functions can tell the application if a buffer is full based on either a line count or the falling edge of FVAL.

Medium configuration pane

The **Medium configuration** pane lets you configure settings for the second IP Engine when Coyote is configured for Camera Link Medium Mode (see “Application Options tab” on page 40).

Medium mode

The readout format. For example, **Half-Line (Engine 1: Left portion, Engine 2: Right portion)** outputs the first half (left) of each line on Camera Link 1 and the right half on Camera Link 2.

Synchronization group

Setting used for systems that have multiple PT2000 series IP Engines connected to the host PC. Each PT20000 series IP Engine must have a unique number, so subsequent units would be numbered 2, 3, and so on.

Data port mapping

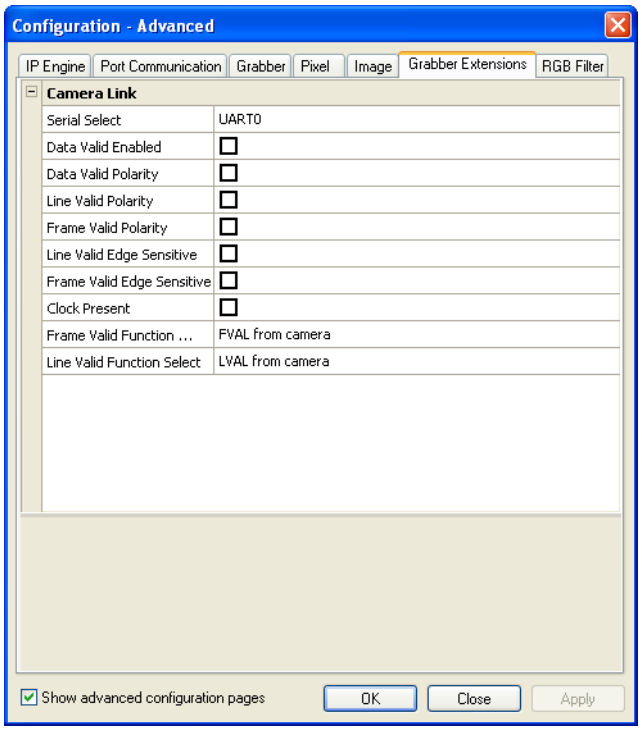
The mapping ports for the second IP Engine. See “Data port mapping” on page 23.

Grabber Extensions tab

To access:

- Click **Configure**. Select the **Grabber Extensions** tab.

The **Grabber Extensions** tab lets you configure how the grabber interprets the DVAL, LVAL, and FVAL signals from the camera.



Serial Select

The UART used for serial communications with the camera. Only UART0 is currently supported.

Data Valid Enabled

When checked, the DVAL signal determines whether or not the pixel is kept. When unchecked, all pixels are kept.

Data Valid Polarity
Line Valid Polarity
Frame Valid Edge Polarity

When checked, the DVAL/LVAL/FVAL signal is valid when low, rather than high (for level sensitive). When checked for edge sensitive values, the signal is valid for a falling edges, rather than rising.

Line Valid Edge Sensitive
Frame Valid Edge Sensitive

When checked, the IP Engine is sensitive to the edges of the LVAL/FVAL signal rather than the level of the signal.

Clock Present

A read-only value that is enabled when the IP Engine is receiving a clock signal from the camera. This entry is useful for determining if the IP Engine and camera are properly connected.

Frame Valid Function
Line Valid Function

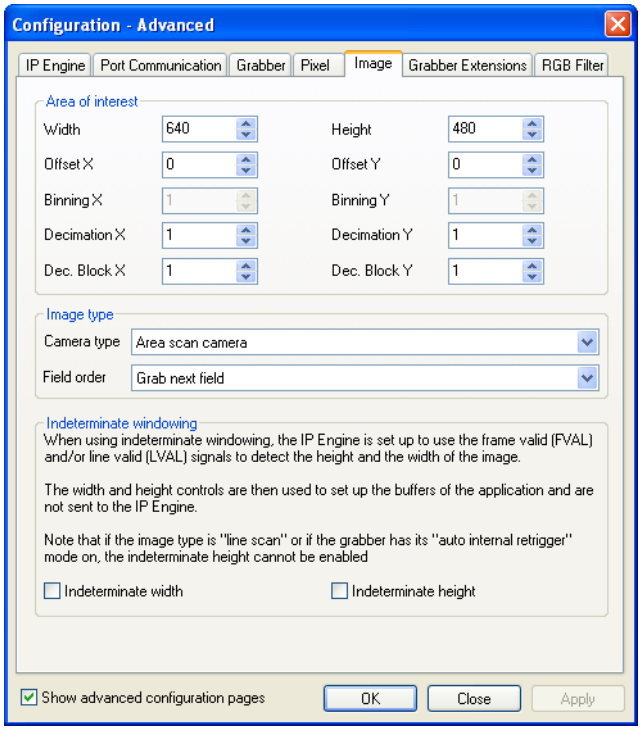
The functions used inside the IP Engine. You can use combinations of the original signal and signals from the PLC to create your own signal (particularly useful for line scan cameras).

Image tab

To access:

- Click **Configure**. Select the **Image** tab.

The **Image** tab lets you configure parameters related to image composition, such as windowing and image type definition. Settings applied in this panel may control both the camera and iPORT IP Engine.



Area of interest pane

To learn more about binning, decimation, and area of interest, see the *iPORT Concepts Guide*.

Width
Height
The width and height of a single image frame from the camera. These settings also determine the size of the image buffer.

Offset X
The starting column of a single image frame from the camera. The **Width** plus the **Offset X** must be within the range allowed by the camera.

Offset Y
The starting row of a single image frame from the camera. The **Height** plus the **Offset Y** must be within the range allowed by the camera.

Binning X
Binning Y
The horizontal and vertical binning values on the camera. Binning combines several pixels into a single pixel to improve the signal to noise ratio in the image (reduce the resolution, increase the dynamic range). For example, a **Binning X** value of 4 and a **Binning Y** value of 3 combines 12 pixels into one “superpixel.”

Decimation X
Decimation Y
The horizontal and vertical decimation of the iPORT IP Engine. A value of one indicates that the IP Engine won’t perform decimation. Any other value causes the IP Engine to eliminate all

but the (*n* - 1)th horizontal/vertical block of pixels from the image. For example, a **Decimation X** value of 4 and a **Decimation Block X** value of 1 removes 3 pixels and keeps 1.

Decimation Block X
Decimation Block Y
The size of the horizontal and vertical block of pixels that are kept or removed. For example, a **Decimation X** value of 3 and a **Decimation Block X** value of 2 removes 4 pixels and keeps 2.

Image type pane

Camera Type
Sets the camera in line-scan or area-scan mode.

Field order
When the pixel type isn't interlaced, the IP Engine returns frames containing fields from the interlaced sources. The field mode setting will dictate which field to acquire. The possible settings are:

Grab the next field
The IP Engine acquires the next field, regardless of whether it is field 0 or 1.

Grab the next field 0
The IP Engine acquires field 0 next, ignoring field 1.

Grab the next field 1
The IP Engine acquires field 1, ignoring field 0.

Indeterminate windowing pane

Indeterminate width
When checked, the IP Engine uses the Line Valid Signal to determine the end of a line. When unchecked, it ends the line when the pixel count matches **Width**.

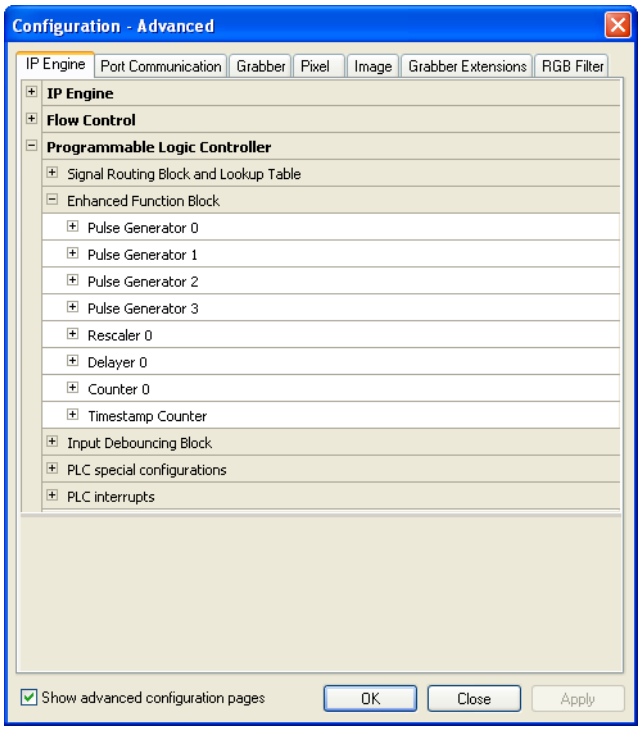
Indeterminate height
When checked, the IP Engine uses the Frame Valid Signal to determine the end of an image. When unchecked, it ends the image when the line count matches **Height**.

IP Engine tab

To access:

- Click **Configure**. Select the **IP Engine** tab.

The **IP Engine** tab lets you configure many parameters, including the Programmable Logic Controller. To see the descriptions of the parameters, see “Configuration details” on page 20. For a full description of the PLC, see *iPORT Programmable Logic Controller Reference Guide*.

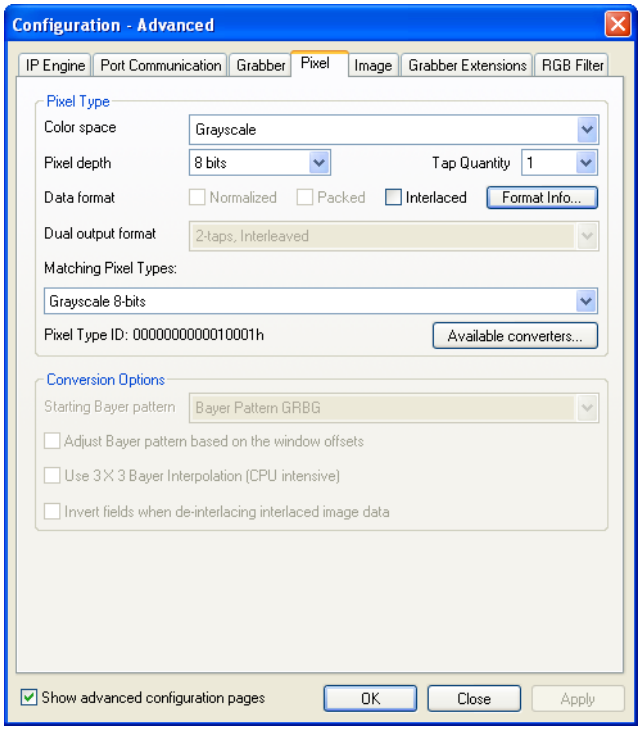


Pixel tab

To access:

- Click **Configure**. Select the **Pixel** tab.

The **Pixel** tab lets you select the pixel type for the current camera configuration. The selected pixel type is used to configure the grabber and the buffers.



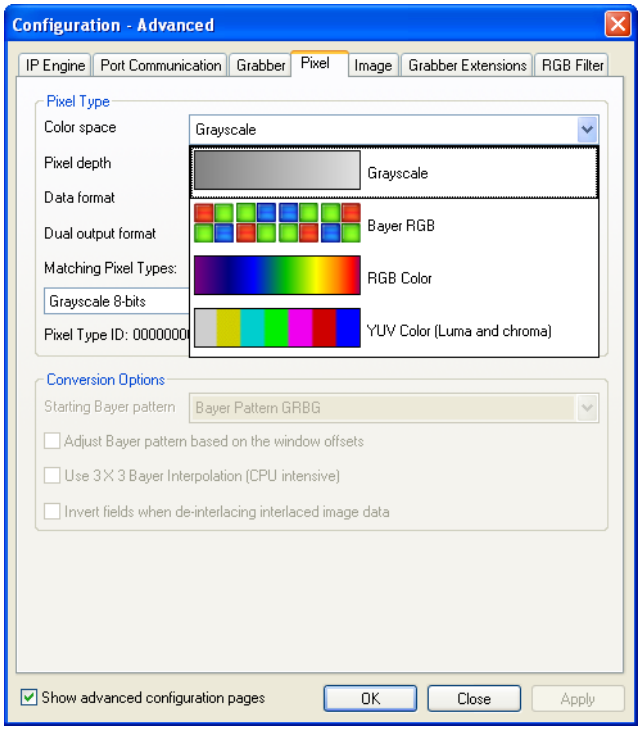
The **Pixel** tab takes camera DLL information and brings forward only the color spaces, pixel depths, and tap quantities supported by that camera, as well as the flags and options that apply to the selected color/depth/tap combination. You can also select the different conversion flags associated with the camera. These flags will be saved to the camera's XML configuration file (see "File menu" on page 10).

Pixel pane

Color Space

The color space of the output signal. The possible values include: **Grayscale**, **Bayer RGB**, **RGB Color**, and **YUV Color**. The availability of the color spaces depend on what the selected camera supports. Coyote automatically includes **Bayer RGB** if the camera supports grayscale and has a Bayer filter on its sensor.

The dropdown includes an intuitive graphic representation of the color space options.



Pixel depth

The pixel depth for the selected **Color Space**.

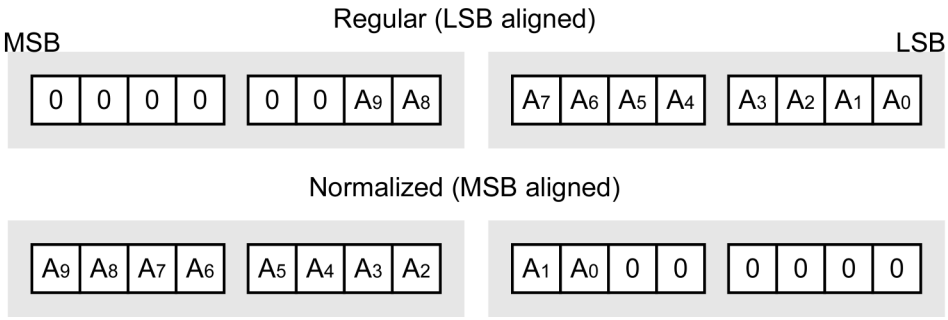
Tap quantity

The number of taps on your camera.

Normalized

For 10, 12, and 14-bit pixel depths (i.e. those that aren't multiples of 8), this check box indicates whether or not the IP Engine will normalize the data. When normalizing data, the IP Engine aligns the most significant bit (MSB) of the data with the MSB of a 16-bit word, and sets the least significant bit (LSB) to zero. When not normalized, each pixel data is stored on

the LSB of a 16-bit word. The example below shows a regular 10-bit pixel and a normalized one.



Packed

For 10-, 12-, and 24-bit pixel depths, this check box indicates if the data will be "packed" or not. For 10 and 12-bit depths, every two pixels of data are packed on 3 bytes (24 bits), instead of on two 16-bit words (32 bits). For 24-bit pixel depth, the data is actually packed on 24 bits. When this option isn't selected for 24-bit RGB pixels, each pixel is stored on a double word (32 bits).

Interlaced

Indicates whether or not the data from the camera is interlaced. When a source is interlaced, this option will grab the two fields from the source to generate a single frame. The application is then responsible for de-interlacing the data.

Format info

Open the **Pixel Organization** dialog containing a graphical representation of the pixel data in the buffer, as well as a text description. This information is useful for application developers.

Dual output format

This dropdown, which is available only with two-tap data, indicates how the data is expected to be generated from the camera. If the output format isn't in the format assumed by the IP Engine, some software reconstruction will be required.
The possible output formats include:

2 taps, interleaved

The data of tap 1 is the even numbered pixels (0, 2, 4, etc.). The data of tap 2 is the odd numbered pixels. This is the default handling of tap data by the iPORT IP Engine and requires no reconstruction.

2 taps, segmented

The data of tap 1 is the left part of a line and the data of tap 2 is the right part.

2 taps, segmented, right inverted

Same as **2 taps, segmented**, but the pixels of tap 2 arrive from right to left.

2 taps, segmented, left inverted

Same as **2 taps, segmented**, but the pixels of tap 1 arrive from right to left.

2 taps, segmented, left & right inverted

Same as **2 taps, segmented**, but the pixels of both taps arrive from right to left.

2 taps, dual lines

The data of tap 1 contains the pixels of one line and the data of tap 2 contains the pixels of the next line.

NOTE! If your IP Engine supports tap reconstruction, you should use it. Tap reconstruction reconfigures data before it is transmitted by the IP Engine. Thus, Coyote doesn't have to reconstruct the data image, reducing CPU usage. To learn more about tap reconstruction, see "Tap Reconstruction tab" on page 34.

Matching pixel types
The available pixel types that match the selection criteria. Though most selections yield a single item, there are some odd cases where it is possible to have two or more.

Pixel ID
The pixel type identifier of the currently selected pixel type.

Available converters
Open the **Pixel Type Converters** dialog showing all the converters that are available from and to the currently selected **Pixel Type**. This information is useful if you're developing an application.

Conversion options pane

Starting Bayer pattern
The available Bayer patterns that can be used. Options include:

GRBG
GBRG
RGGB
BGGR

Note that when the selected item is changed, it affects the display if it is running, within about 500 ms. Therefore, you can easily select the right pattern for the camera in use.

Adjust Bayer pattern based on the window offsets
Leave unchecked if your camera adjusts odd-numbered offsets (see **Offset X** and **Offset Y** in "Pixel tab" on page 28) to make them even. Thus, the **Starting Bayer pattern** accurately reflects the actual pattern sent by the camera.
Check this option if your camera allows odd-numbered offsets. Coyote adjusts the Bayer pattern to accurately reflect the pixel being sent. For example, a camera that sends a GRBG pixel with an **Offset X** of 1 is effectively sending a RGGB pixel.

Use 3 X 3 Bayer interpolation
When checked, use 3 x 3 interpolation instead of the faster 2 x 2 interpolation. The 2 x 2 interpolation is more CPU efficient, but is less detailed.

Invert fields when de-interlacing interlaced image data
When using interlaced images, this option indicates if the de-interlacer will use field 1 or field 0 for even numbered lines.

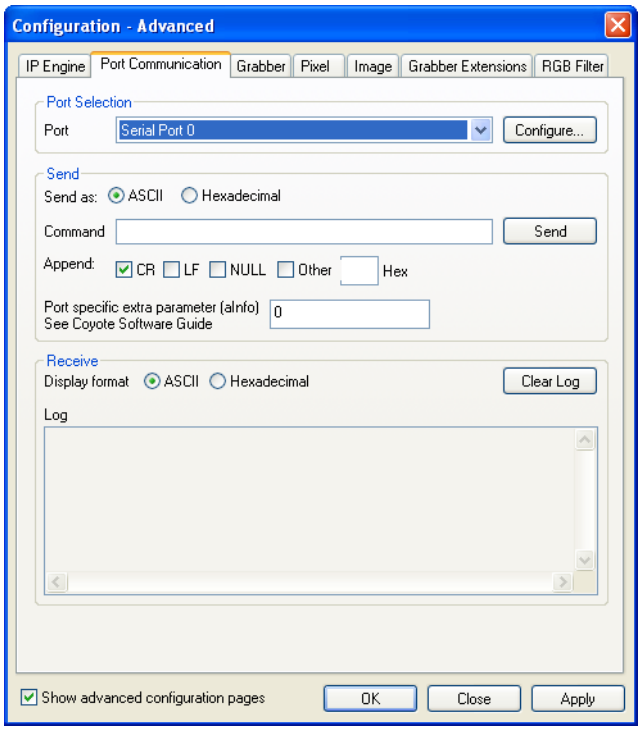
Port Communication tab

To access:

- Click **Configure**. Select the **Port Communication** tab.

The **Port Communication** tab lets you communicate through the available ports of the IP Engine.

The **Port Communication** tab lets you send and receive commands from a camera. You can use the tab to configure and access any camera without a camera-specific interface.



Port selection pane

Port
The serial port to be used. The dialog supports two types of ports: serial interfaces and bulk interfaces.

Configure
Opens the **Port Configuration** dialog. See “Port Configuration dialog” on page 45.

Send pane

The **Send** pane lets you communicate directly with the camera using the camera’s native command set.

Send as
The format of the strings to be sent. Available options include:

ASCII
Transmit strings as typed.

Hexadecimal
Transmit in hexadecimal. The data must be formatted as two-character hexadecimal digits separated by a space. For example, “58 59 5A” actually sends “XYZ”.

Command
The serial string to send.

Append
The character or characters used to terminate a string. Can include:

CR
Add a carriage return to the ASCII string before sending it to the camera.

LF
Add a line feed to the ASCII string before sending it to the camera.

NULL
Add a NULL character to the ASCII string before sending it to the camera.

Other
Add a user-defined character to the ASCII string before sending it to the camera. Specify the hexadecimal value in the **Hex** window.

Port specific parameter
This integer parameter is used as the "aInfo" parameter when sending commands. See the CyDevice::SendCommand section in the *iPORT C++ SDK Reference Guide*.

Receive pane

Display Format
The appropriate format for the **Log**. Can be **ASCII** or **Hexadecimal**.

Clear Log
Clears the **Log**.

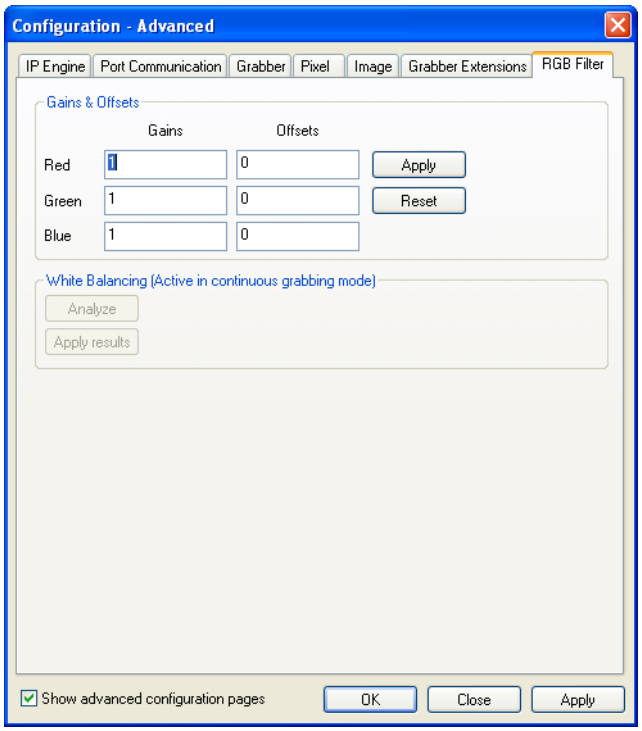
Log
Displays data sent via the serial port to the camera.

RGB Filter tab

To access:

- Click **Configure**. Select the **RGB Filter** tab.

The **RGB Filter** tab provides the basic RGB gain and offset values available when using a color camera (RGB, Bayer, or YUV). The panel also provides mechanisms for white balancing images from the camera. You must be acquiring images to analyze them.



Coyote applies the gains and offsets; they aren't applied in the IP Engine. The conversions may increase CPU usage.

*newColorValue = oldColorValue * gain + offset*

Gains & offsets pane

Red Gain
Green Gain
Blue Gain
The multiplier used for each color value. The resulting value is the red/green/blue value multiplied by this value.

Red Offset
Green Offset
Blue Offset
The offset for each color value. The offset is added to each color value.

White balancing pane

Analyze
Capture one image from a continuous stream of images, analyze the color values, and recommend gain values to best balance the image.

Apply results
Automatically set the gain values that Coyote recommended with the **Analyze** button.

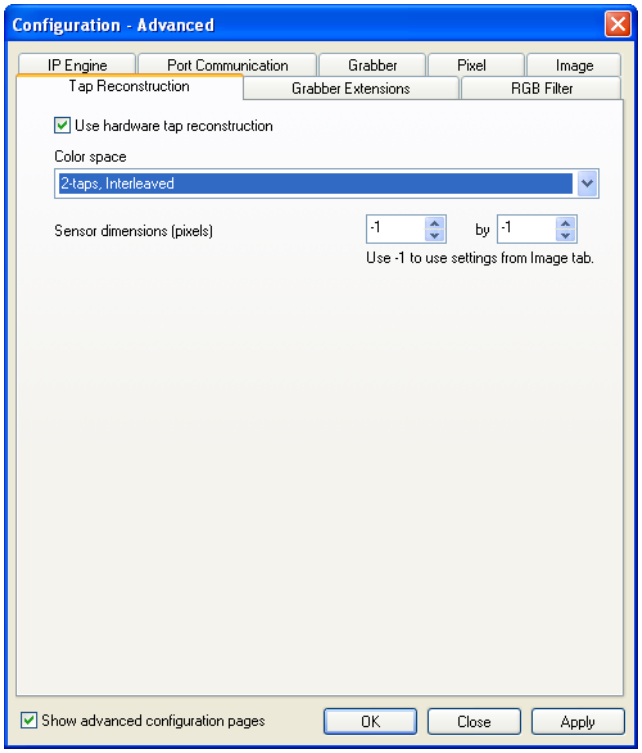
Tap Reconstruction tab

To access:

- Click **Configure**. Select the **Tap Reconstruction** tab.

NOTE! Tap reconstruction isn't a standard feature of iPORT IP Engines, but a semi-custom feature added to engines by customer request. An engineering charge may apply. The **Tap Reconstruction** tab doesn't appear for IP Engines without this feature.

The **Tap Reconstruction** tab lets you enable and configure the IP Engine's hardware tap reconstruction feature.



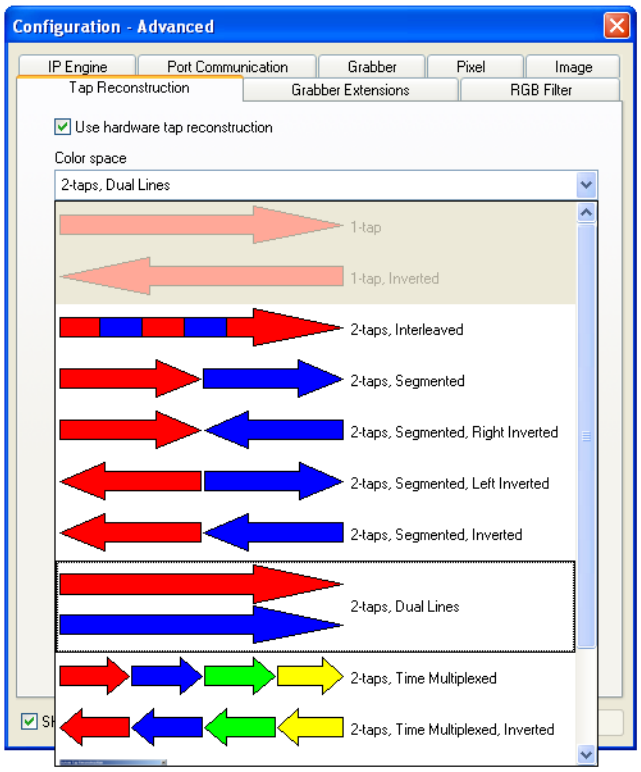
Enable hardware tap reconstruction

When checked, the IP Engine enables its tap reconstruction feature.

Reconstruction mode

This dropdown lets you select either a predefined reconstruction mode or a custom mode. The dropdown includes images that let you see the data arrangement for each selection.

By default, most of the options are disabled. To enable this dropdown: From the **Configuration** dialog, select the **Pixel** tab. Set **Tap Quantity** to 2. Click **Apply**.



Your options depend on the **Tap Quantity** you select in the **Pixel** tab. See “Pixel tab” on page 28.

The possible values include:

1-tap

Data from the camera is from left to right.

1-tap, inverted

Data from the camera is from right to left.

2-tap, interleaved

Data from tap 1 contains even-numbered pixels and the data from tap 2 contains odd-numbered pixels.

2-tap, segmented

Data from tap 1 contains the left portion of a line and the data from tap 2 contains the right portion.

2-tap, segmented, right inverted

Same as **2-tap, segmented**, but pixels from the right portion arrive from right to left.

2-tap, segmented, left inverted

Same as **2-tap, segmented**, but pixels from the left portion arrive from right to left.

2-tap, segmented, inverted

Same as **2-tap, segmented**, but pixels from the both portions arrive from right to left.

2-tap, dual lines
Data from tap 1 contains even-numbered lines and the data from tap 2 contains odd-numbered lines.

4-taps, segmented
Tap 1 contains the left-most portion of a line, tap 2 contains the middle-left portion, tap 3 contains the middle-right portion, and tap 4 the right-most portion.

4-taps, segmented, inverted
Same as **4-taps, segmented**, but the pixels of each segment arrive from right to left.

Custom
The tap output of the camera isn't one of the predefined modes. The **Custom Tap Reconstruction** dialog appears. See "Custom Tap Reconstruction dialog" on page 36.

Sensor dimension
When using a camera where the taps are segments of a sensor (segmented), this parameter indicates the complete size of the sensor. A value of **-1** indicates that the size of the windows (from the **Image** tab), will be used. This parameter is important when windowing is required. Coyote needs to know the size of each segment to properly adjust the range to grab from each tap.

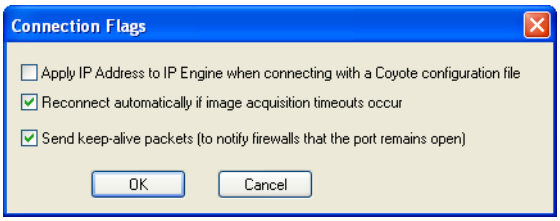
Time multiplexed mode
When checked, taps arrive in two groups on two different pixel clock cycles. The first group arrives on the first clock cycle ($n + 0$), and the second group arrives on the subsequent clock cycle ($n + 1$).

Connection Flags dialog

To access:

- Select the **Connection** tab. Click **Connection Flags**.

The **Connection Flags** dialog lets you configure how your iPORT IP Engine acquires and maintains a connection.



Apply IP Address to IP Engine when connecting with a Coyote configuration file
Force the specified IP address onto the IP Engine. When enabled and loading a Coyote configuration file, the IP Engine takes the IP address specified in the file.

Reconnect automatically if image acquisition timeouts occur
When enabled, Coyote automatically attempts to reconnect if it loses its connection with an IP Engine. When disabled, Coyote reports a timeout and waits for the connection to return. Disabling this flag may help with wireless networks, where connectivity isn't always stable.

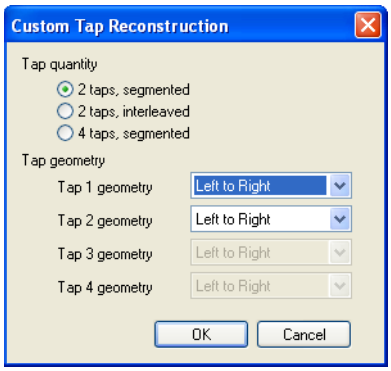
Send keep-alive packets (to notify firewalls that the port remains open)
When enabled, Coyote sends regular dummy packets to the IP Engine. The packets keep your firewall from automatically closing an idle connection after it times out.

Custom Tap Reconstruction dialog

To access:

- Click **Configure**. Select the **Tap Reconstruction** tab. In the dropdown, select **Advanced**.

The **Custom Tap Reconstruction** dialog lets you set the tap geometry and segmentation for your custom configuration.



Tap quantity

Indicates how many taps the camera outputs. Options include:

2 taps, segmented
2 taps, interleaved
4 taps, segmented

These settings are the same as those in the **Tap Reconstruction** tab, however, you can customize the **Tap Geometry** for each tap (rather than using presets). For the definitions, see “Tap Reconstruction tab” on page 34.

Tap 1 geometry
Tap 2 geometry
Tap 3 geometry
Tap 4 geometry

The direction of the tap output from the camera/sensor. The **Tap quantity** setting determines how many are enabled. Options include:

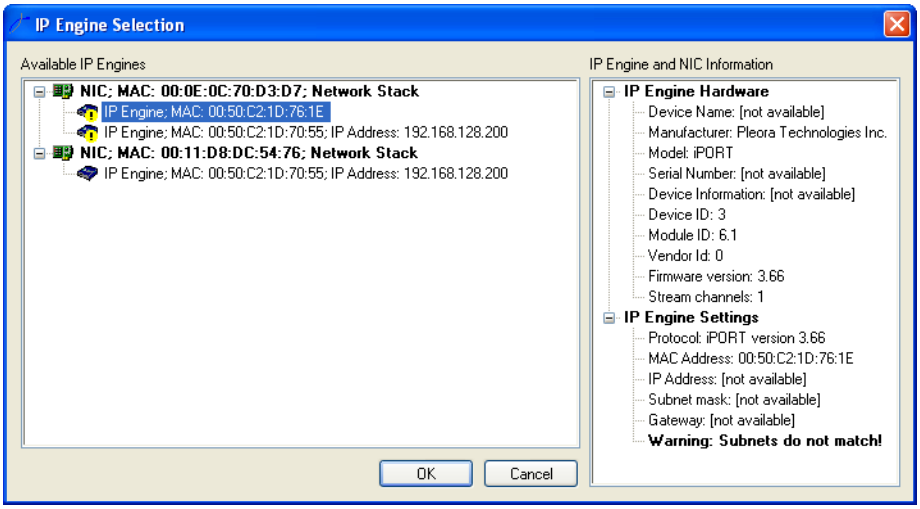
Left to right
Right to left

IP Engine Selection dialog

To access:

- Select the **Connection** tab. Click **Detect**.

The **IP Engine Selection** dialog lets you locate iPORT IP Engines that are connected to a host PC either directly or through a network switch.



The **Available IP Engines** pane displays the IP Engines that each NIC found.

The **IP Engine and NIC Information** pane provides detailed information about any device you select in the **Available IP Engines** pane.

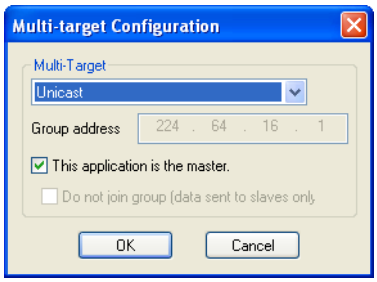
To select, click an IP Engine in the **Available IP Engines** pane, then click **OK**.

Multi-Target Configuration dialog

To access:

- Select the **Connection** tab. Click **Multi-target**.

The **Multi-Target Configuration** dialog lets you configure the IP Engine to send images to multiple PCs. You might use this option for machine vision applications where many PCs process images from a single IP Engine. To learn more about multicast, unicast, and multi-unicast modes work, see the *iPORT Concepts Guide*.



Multi-Target
The sending mode used when connecting to IP Engine. Note that this list box shows all the possible modes, since Coyote can't determine the modes that are supported by the IP Engine until the connection is made. If you select a mode that isn't supported, an error will occur during the connection sequence. See the *iPORT Concepts Guide*.

Group address
The multicasting group IP address, used only in multicasting mode. The usable IP addresses are restricted; see the *iPORT Concepts Guide*.

This application is the master
When enabled, the current PC will be the master client of the IP Engine. This applies to all modes, including unicast. When connecting a unicast client as a slave, Coyote won't be able to configure or trigger the IP Engine. This is useful when connecting to an IP Engine that boots up in a streaming state.

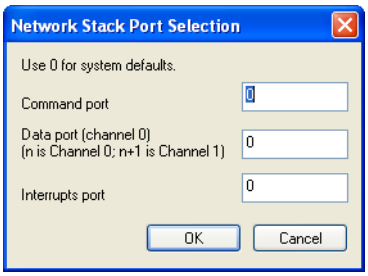
Do not join group
Whether or not the multicasting master will join the group. When the master doesn't join the group, it won't receive any image data from the IP Engine. This mode is useful when a master PC controls several multicasting IP Engines, and the combined bandwidth exceeds the capacity of the PC's Ethernet link and/or PCI bus. The master simply configures the IP Engines and camera(s), and then triggers the engines to stream their data.

Network Stack Port Selection dialog

To access:

- Select the **Connection** tab. Click **Network Ports**.

The **Network Stack Port Selection** dialog lets you configure the UDP ports.



When using the network stack to bring data into the PC, you can specify which UDP ports will be used to connect to the IP Engine. The default port value of 0 causes the network stack to choose any available port. These values aren't used when using the iPORT High-Performance IP Device Driver.

In some cases, you may want to force a port number to one or all of the three ports. For example, you can save IP Engine's configuration to flash while it is streaming (see "Save to IP Engine's Flash Memory dialog" on page 45). When the IP Engine boots up the next time, it starts sending frames right away. To ensure that the same ports are used, specify each port rather than letting the IP Engine choose available ports.

Command Port
The port over which commands from the host PC to the IP Engine (and acknowledgements from the IP Engine) are sent.

Data Port
The port over which images are sent from the IP Engine to the PC. For IP Engines with multiple channels, channel #0 uses *dataPort*; channel #1, *dataPort* + 1.

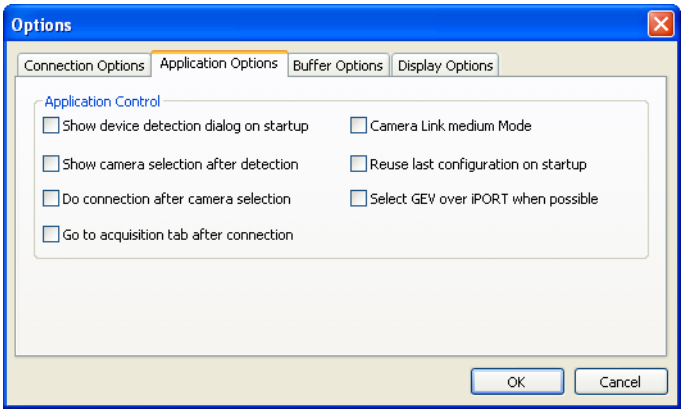
Interrupts Port
The port over which the IP Engine sends interrupts to the host PC. To configure interrupts, see the *iPORT Programmable Logic Controller Reference Guide*.

Options dialog

To access:

- From the main menu, select **Tools** > **Options**.

The **Options** dialog lets you set a large number of preferences and settings in Coyote.



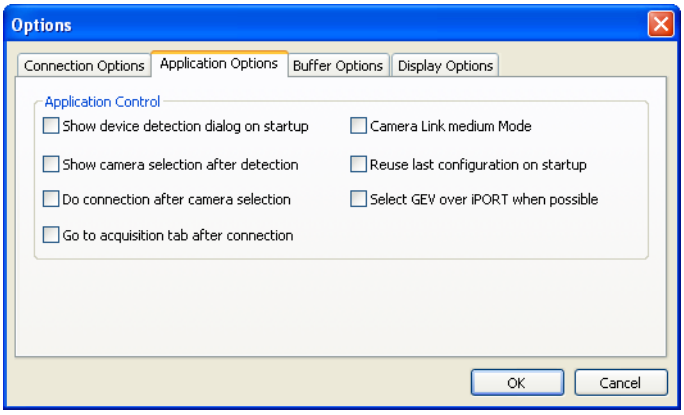
The **Options** dialog includes the following tabs:

Application Options tab

To access:

- From the main menu, select **Tools** > **Options**. Select the **Application Options** tab.

The **Application Options** tab lets you configure the flow of dialogs until you have successfully connected to your IP Engine.



Show device detection dialog on startup
Open the **IP Engine Selection** dialog upon startup. See “IP Engine Selection dialog” on page 37.

Show camera selection after detection
Automatically open the **Select Camera** dialog after selecting an IP Engine. See “Select Camera dialog” on page 46.

Do connection after camera selection
Automatically connect after choosing a camera. Equivalent to clicking **Connect**. See “Connection tab” on page 12.

Go to acquisition tab after connection
Cycle to the **Acquisition** tab successfully connecting to an IP Engine. See “Acquisition tab” on page 13.

Camera Link Medium Mode
Set Coyote in Camera Link Medium mode. See “Configuring your PT2000 series IP Engine (Medium mode)” on page 49.

Reuse last configuration on startup
Save the last used configuration to a temporary file and reload it when starting the application.

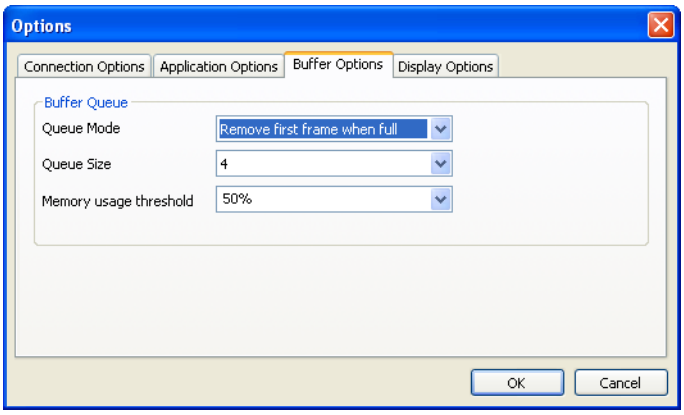
Select GEV over iPORT when possible
If your IP Engine supports the GigE Vision protocol, this option lets you automatically use that protocol over the iPORT protocol.

Buffer Options tab

To access:

- From the main menu, select **Tools** > **Options**. Select the **Buffer Options** tab.

The **Buffer Options** tab lets you configure how the buffer queue behaves when acquiring images.



Buffer Queue Mode

Set the buffer queue mode. The queue mode indicates the behavior of the buffer when the queue is full and new images are acquired. Available modes include:

Remove first frame when full

When the buffer is full, discard the oldest images to make room for new ones.

Drop new frames when full

When the buffer is full, discard new images.

Queue Size

The maximum number of buffers in Coyote's buffer queue. When the buffer queue is full and a new image arrives from the IP Engine, Coyote handles the new image according to the **Buffer Queue Mode** setting.

Memory usage threshold

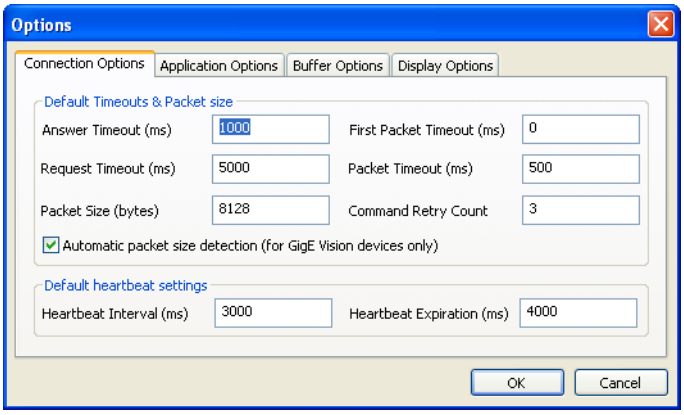
The percentage of the PC's total RAM memory available for holding images from the IP Engine. Once exceeded, an error prompt appears. Typically, a level of 50% or 75% works for most systems.

Connection Options tab

To access:

- From the main menu, select **Tools** > **Options**. Select the **Connection Options** tab.

The **Connection Options** tab lets you configure how the IP Engine connects with the PC, the duration of timeouts, and so on.



Default timeouts & packet size pane

Answer Timeout
The maximum time, in milliseconds, the IP Engine can take to respond to a command from the application.

Request Timeout
The maximum time, in milliseconds, the host PC waits to receive all the packets for a single image.

Packet Size
The maximum packet size, in bytes, that the IP Engine can use to send image data to the application. When connected point-to-point with the iPORT High-Performance IP Device Driver, the maximum value is 8128 bytes. In networked applications, the value depends on the maximum packet size that can be accepted by the switches between the IP Engine and the host PC. If the switches can be configured to support jumbo packets, you can use the jumbo packet configuration to reduce packet overhead in the host PC. A packet size of 1440 bytes should work with all networking equipment.

First Packet Timeout
The maximum time, in milliseconds, the IP Engine can take to send the first packet of image data to the application. When zero, the timeout is calculated automatically from the request timeout.

Packet Timeout
The maximum time, in milliseconds, the IP Engine can take to send subsequent packets of image data to the application. When zero, the timeout is calculated automatically from the request timeout.

Command Retry Count
The maximum number of times Coyote retransmits an unacknowledged command to the IP Engine.
When Coyote sends a command to the IP Engine, the IP Engine transmits an acknowledge packet back to the PC (Coyote). If Coyote doesn't receive the acknowledge packet within the time specified by **Packet Timeout**, it retransmits the command. The retry count doesn't include the original command.

Automatic packet size detection
When enabled, the Coyote disregards the **Packet Size** configuration and negotiates the optimal packet size with the IP Engine.

Default heartbeat settings pane

The heartbeat function lets the IP Engine send data only when the host PC is properly connected to the network. Using the heartbeat function keeps the IP Engine from endlessly transmitting data to a PC that has long since disconnected from the network (due to power outage, network failure, etc.).

If the IP Engine doesn't receive a heartbeat signal before the configured maximum time, it stops transmitting (as if it received a stop request). To restart transmission, the PC must reconnect to the IP Engine and explicitly start transmission.

To learn more about the heartbeat function, see the *iPORT Concepts Guide*.

Normally, the IP Engine accepts heartbeat signals only from the PC to which it is connected. However in Multicast mode, the IP Engine accepts heartbeats from any PC because it can't tell which PCs are part of the multicasting group (see "Multi-Target Configuration dialog" on page 38).

Heartbeat Expiration
The maximum time that the IP Engine waits for a heartbeat signal before stopping transmission. An expiration of 0 disables heartbeating.

Heartbeat Interval

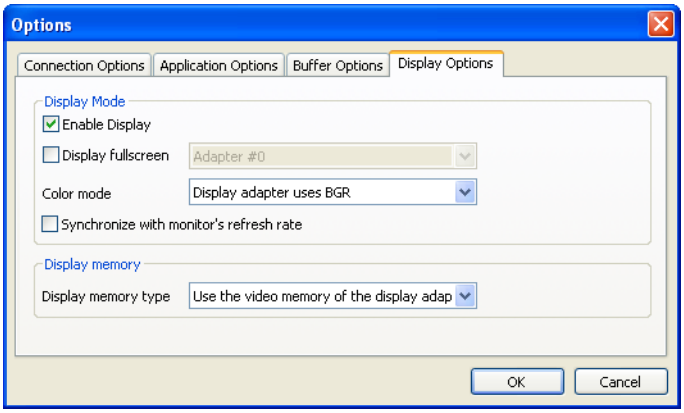
The interval between the transmission of each heartbeat packet from the PC to the IP Engine. For proper operation, this value must be lower than the **Heartbeat Expiration**.

Display Options tab

To access:

- From the main menu, select **Tools** > **Options**. Select the **Display Options** tab.

The **Display Options** tab lets you configure how Coyote displays the image window when you begin acquiring images.



Display mode pane

Enable display

When enabled, each successful grab operation displays its image data in a display window. If the window is closed, it will be opened on the first grab operation. When disabled, grab operations are performed without displaying the image data.

Display fullscreen

When enabled, and the display window isn't already opened, the display window will be opened as full screen. Use the `Escape` key to get out of the full screen mode. On a system with multiple monitors, you can select on which monitor the full screen window appears.

Color mode

The color order for the display. Available options include:

Display adapter uses BGR

Coyote adjusts its output to use Blue, Green, and Red ordering. Most adapters use this format.

Display adapter uses RGB

Coyote adjusts its output to use Red, Green, and Blue ordering.

Synchronize with monitor's refresh rate

When enabled, Coyote tries to match the image acquisition rate with your monitor's refresh rate (such as not exceeding your monitor's rate, etc.).

Display memory pane

Display memory type

The type of memory used by the display adapter. Available options include:

Use video memory of the display adapter

Display uses the video memory of the display adapter.

Use system memory

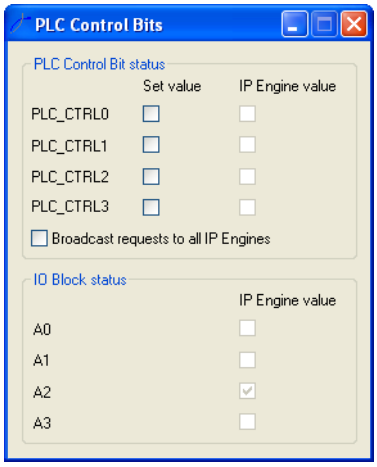
Display uses the system memory of the PC. Use this mode if you encounter display problems when using the adapter's video memory, particularly when big images are being displayed on smaller display sizes (for example, a 4K x 4K image is being displayed on a 1280 x 1024 display). Note that this mode might impact CPU and resource usage.

PLC Control Bits dialog

To access:

- From the main menu, select **IP Engine** > **PLC Control Bits**.

The **PLC Control Bits** dialog lets you read and change the values of the PLC control bits of the IP Engine. To learn more, see the *iPORT Programmable Logic Controller Reference Guide*.



PLC Control Bit status pane

The **PLC Control Bit** status pane lets you set the values of PLC_CTRL0 through PLC_CTRL3. To learn how to use these bits, see the *iPORT Programmable Logic Controller Reference Guide*.

Set value

The value you request. Enabled is equivalent to a value of 1. Changes are sent immediately.

IP Engine value

The value polled from the IP Engine. These values let you confirm that the **Set value** was actually implemented on the IP Engine. Though **Set value** request packets are instantaneously applied in the IP Engine (allowing for network propagation times), the polling for confirming the values is slower.

Broadcast requests to all IP Engines

When enabled, commands to set or clear a PLC control bit are sent to all IP Engines on the network. Only the changed value is sent and IP Engines with PLC control bits already set at the new value aren't toggled.

IO Block status pane

The **IO Block status** lets you see the values of A0 through A3 on the IO Block. These values are inputs; though the actual input type (TTL, etc.) depends on your model of IP Engine. The values are polled at a rate of roughly 4 Hz. Thus, fast signals and short pulses may not appear to change (though the changes occur properly on the IP Engine).

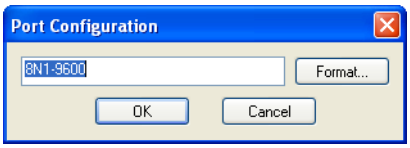
To learn how to use these input signals in the PLC, see the *iPORT Programmable Logic Controller Reference Guide*; to see the pinouts for your IP Engine, see your hardware guide.

Port Configuration dialog

To access:

- Click **Configure**. Select the **Port Communication** tab. Click **Configure**.

The **Port Configuration** dialog lets you configure the port characteristics for serial port communication.



Configuration Edit box
Edit box in which the port configuration string is to be typed. The format of the string depends on the port type being used.

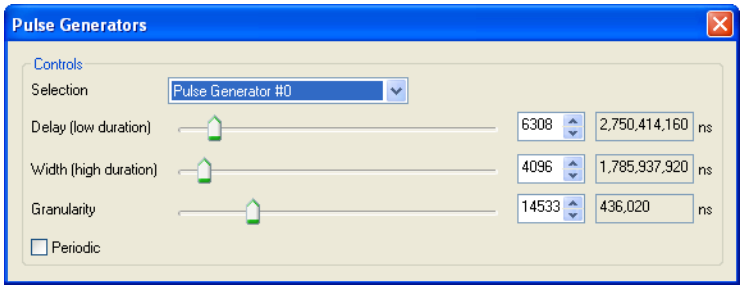
Format
Open a dialog that provides a quick reference for the configuration string format. This information is also available in the *iPORT C++ SDK Reference Guide*.

Pulse Generators dialog

To access:

- From the main menu, select **IP Engine** > **Pulse Generators**.

The **Pulse Generators** dialog lets you set the PLC's pulse generators on the fly. To learn more about the pulse generators, see the *iPORT Programmable Logic Controller Reference Guide*.

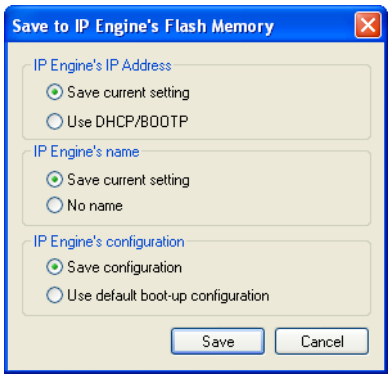


Save to IP Engine's Flash Memory dialog

To access:

- From the main menu, select **IP Engine > Save to flash memory**.

The **Save to IP Engine's Flash Memory** dialog lets you select which information is to be saved in the flash memory of the unit.



IP Engine's IP Address pane

Save current setting
The IP Engine saves its current IP address, the mask, and the default gateway to flash.

Use DHCP/BOOTP
The IP Engine automatically retrieves an IP address when it boots up. Depending on the type of IP Engine, it can get its address from a DHCP/BOOTP server or use LLA (Link-local address) from a directly connected host.

IP Engine's name

Save current setting
The IP Engine saves its current name (the name is only informational).

No name
The IP Engine saves no name (even if it currently has one).

IP Engine's configuration

Save configuration
The IP Engine saves information such as the PLC's settings, the camera's settings, and settings you find in the **Configuration** dialog.

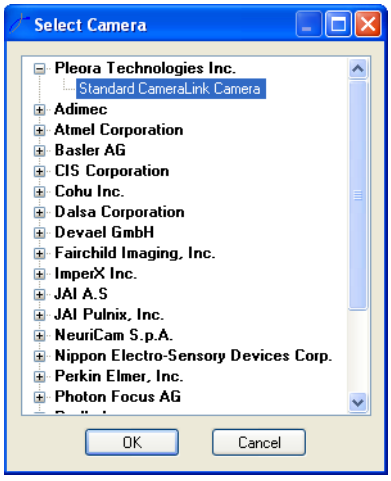
Use default boot-up configuration
The IP Engines saves no configuration information. When the IP Engine boots up, its default values are unchanged.

Select Camera dialog

To access:

- Select the **Connection** tab. Click **Select**.

The **Select Camera** dialog lets you choose a camera implementation. The dialog displays the cameras that match the module and sub-module ID of the currently selected IP Engine.

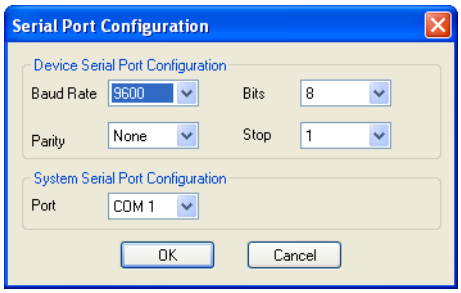


Serial Port Configuration dialog

To access:

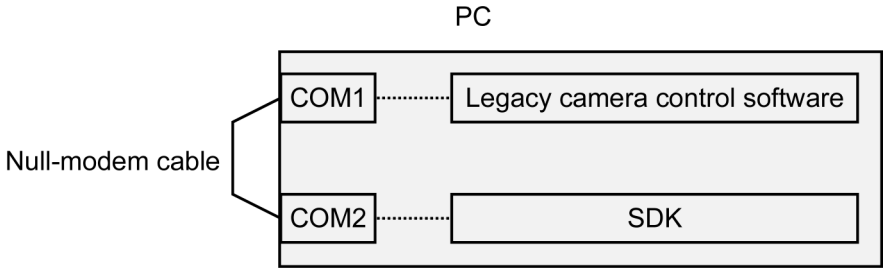
- From the main menu, select **IP Engine** > **Serial COM port link**.

The **Serial Port Configuration** dialog lets you communicate with the IP Engine through a serial port on your PC.



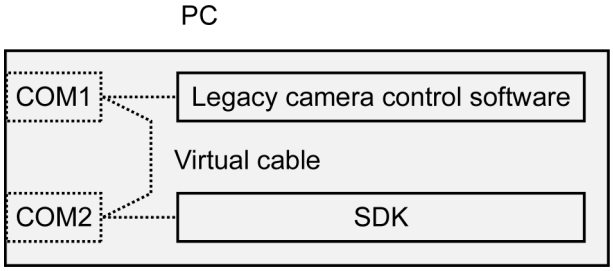
Some older camera configuration programs can only communicate with the camera through a PC COM port. To let you use these legacy programs, you can connect your IP Engine to a second COM port and cable the two COM ports together. Windows supports virtual COM ports, so the COM port need not be an actual physical port on your PC.

If you're controlling the camera through a physical COM port, cable the two ports together using a null-modem cable.



If you're controlling the camera through a virtual COM port, use a virtual serial port driver and connect the two COM ports together. You can find good virtual serial port drivers at:

- http://www.softinfinity.com/
- http://www.virtual-serial-port.com/.



Device serial port configuration pane

Baud Rate
The speed of the serial communication for the COM port and the IP Engine.

Bits
The data size for the COM port. At present, IP Engines support only 8 bits.

Parity
The parity of the serial communication for the COM port and the IP Engine. Can be set to **None**, **Odd**, or **Even**.

Stop
The number of serial stop bits for the COM port.

System serial port configuration pane

Port
The serial COM port to which the SDK is attached.

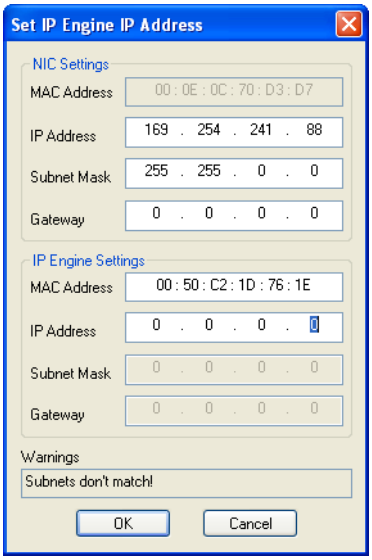
Set IP Engine IP Address dialog

To access:

- Select the **Connection** tab. Click **Detect**. In the right window, right-click an IP Engine and click **OK**.

The **Set IP Engine IP Address** dialog lets you configure or change the IP address of an IP Engine.

If there is a BOOTP or DHCP server on the network, iPORT IP Engines may already have been given an IP address. It is your responsibility to ensure each IP Engine has a unique IP address.



IP Engine Settings

MAC address
The MAC address of the device. This address is unique and can be used for IP Engine identification.

IP address
The current IP address of the IP Engine. It can be modified to change the IP address of the IP Engine.

Subnet mask
A mask used to determine which subnet the **IP address** belongs to. To obtain the subnet address, Coyote performs a bitwise AND operation on the **Subnet mask** and the **IP address**.

Gateway
The IP address of the device on the network that sends local traffic to other networks.

Configuring your PT2000 series IP Engine (Medium mode)

The Base Configuration of the Camera Link standard uses a single Camera Link cable to transmit data; the Medium Configuration uses two. All iPORT IP Engines support the Camera Link Base Configuration.

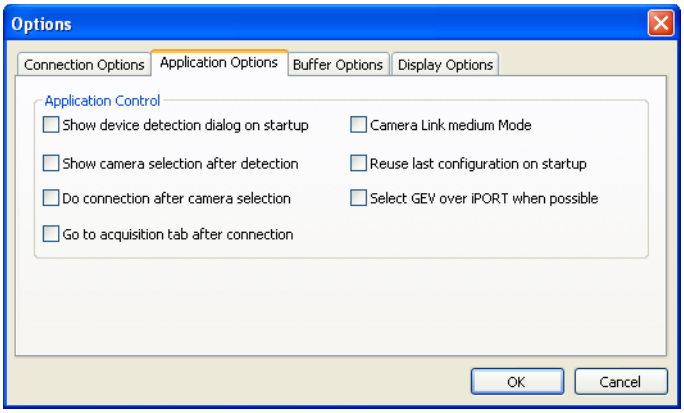
The PT2000 series of iPORT IP Engines supports the Camera Link Medium Configuration. In most respects, the PT2000 works as two individual IP Engines, however you must configure the two IP Engines to synchronize the data between each other.

Configuring Coyote for an IP Engine (PT2000 series)

Before connecting to your PT2000 series IP Engine, you must enable Coyote to connect to IP Engines in Camera Link Medium Configuration.

To configure Coyote for Camera Link Medium Configuration:

1. From the main menu, select **Tools** > **Options**.
   The **Options** dialog appears.
2. Select the **Application Options** tab.



3. Check **Camera Link medium mode**.
4. Click **OK**.
   Coyote is now ready to connect to a PT2000 series IP Engine using the Camera Link Medium Configuration.

Connecting to your iPORT IP Engine (PT2000 series)

Generally, the connection procedure for a PT2000 series IP Engine is the same as that for a Base Configuration IP Engine. However, when you connect to your IP Engine, you must connect to *two* IP Engines rather than one.

Coyote assumes that the first device is the one that performs the following tasks:

- Serial port communication with the camera;
- Acquisition triggering; and
- PLC signal handling.

The two IP Engines inside your PT2000 series unit have consecutive MAC addresses. When prompted for the two IP Engines, you must choose the IP Engine with the *lower* MAC address first. The IP Engine with the lower MAC address is physically located closer to the power and PLC connectors.

To connect to your IP Engine:

1. Follow the usual procedure for connecting to an IP Engine. (See the *iPORT Quick Start Guide*.)
   Where the **IP Engine Selection** dialog usually appears, the **IP Engine Selection - Medium mode - 1 of 2** dialog appears instead. Except for the dialog name, it is visually identical.
2. Select the IP Engine with the *lower* MAC address and click **OK**.
   Once your first IP Engine is selected and configured, the **IP Engine Selection - Medium mode - 2 of 2** dialog appears.
3. Select the IP Engine with the *higher* MAC address and click **OK**.
4. Continue with the usual procedure for connecting to an IP Engine.
   Except for minor exceptions, Coyote treats a Camera Link Medium Configuration camera in exactly the same way as a Camera Link Base Configuration camera.

Configuring your iPORT IP Engine (PT2000 series)

Most Coyote configurations apply to both IP Engines within the PT2000 series IP Engine. However, some tabs within the **Configuration** dialog will have two sections, one for each IP Engine. Ensure you properly configure all the extra sections. See “Configuration dialog” on page 19.

Tabs of particular interest include:

- **IP Engine** tab (See “IP Engine tab” on page 27.)
- **Grabber Extensions** tab (See “Grabber Extensions tab” on page 24.)
- **Grabber** tab (See “Grabber tab” on page 22.)

Technical Support

For additional help, see the Technical Support section in the *iPORT Quick Start Guide.*