eBUS Player Quick Start Guide

Pleora Technologies

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9.0	Final Release with eBUS SDK 6.5.0	May 2024
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1 About this Guide

This quick start guide provides you with the information you need to start using the eBUS Player application, which lets you control the parameters of your GigE Vision or USB3 Vision compliant device and lets you view imaging video and data. For example, view streaming video from a camera.

In this guide, you can find a product overview, advice about driver selection, and the steps you can take to configure the eBUS Player to suit your requirements.

This is an introductory guide that familiarizes you with eBUS Player and provides initial setup steps. After you have read this guide, you can consult the related guides for more information.

Table 1: Related Guides

Guide	Details	Consult this guide when...
eBUS Player User Guide	Provides in-depth details about setting up and using the eBUS Player software application to control your GigE Vision and USB3 Vision compliant video transmitters (cameras) and receivers.	After you have read the *eBUS Player Quick Start Guide*, and want to learn about the additional features that are available.
iPORT™ Embedded Video Interface User Guides and *iPORT External Frame Grabber User Guides*	Provide you with the information you need to efficiently set up and start using an iPORT embedded video interface or external frame grabber to capture images from a camera.	You want to add an iPORT embedded video interface or external frame grabber to your system, or want to change the configuration settings of an embedded video interface or external frame grabber that is already part of your system.
iPORT Advanced Features User Guide	Provides you with the information you need to configure Pleora's powerful, advanced video interface features, which allow you to control and synchronize the external devices in your vision system solution.	You want to configure your system to trigger, route, time, and add data to the general purpose inputs and outputs (GPIO) signals that interface to camera heads and industrial sensors. You want to use the device's Programmable Logic Controller (PLC).

About eBUS Player

eBUS Player, part of the Pleora Technologies eBUS™ SDK, is a sample application that allows you to control the parameters of GigE Vision and USB3 Vision compliant devices by providing access to the GenICam-compliant XML files built into all GigE Vision and USB3 Vision compliant devices. The XML file provides access to the GigE Vision and USB3 Vision device features, which are controlled with the GenICam API and a GenICam node map.

eBUS Player allows you to save GenICam XML information retrieved from a device; you can also load the saved GenICam XML file information to a device.

Not just a controller, eBUS Player also receives and allows you to view streaming data. While viewing the image data, you can use eBUS Player to adjust the image color and white balance, and save images and device configuration settings.

You can use the tools in eBUS Player to determine the optimal settings for your Vision system.

As you become more familiar with GigE Vision, USB3 Vision, and GenICam, you can continue to control your GigE Vision and USB3 Vision devices using eBUS Player, or you can build your own software application using the eBUS SDK.

2 GigE Vision and USB3 Vision Support

eBUS Player provides the flexibility to communicate with both GigE Vision devices and USB3 Vision devices. As you work with eBUS Player, you will notice that the available options in the user interface vary, depending on the type of device to which eBUS Player is connected.

eBUS Player can communicate with GigE Vision devices using either a direct Ethernet connection or through a GigE switch. For USB3 Vision devices, eBUS Player uses a direct USB 3.0 connection.

3 Installing and Launching eBUS Player

3.1 System Requirements

The eBUS Player application is installed with the eBUS SDK.
Follow the installation wizard prompts to install the eBUS SDK on your computer.
Two separate installation packages are available with the Windows operating system: 32-bit and 64-bit.

Ensure the computer on which you install the eBUS Player Toolkit or eBUS SDK meets the following recommended requirements:

> ⓘ You can access installation files from the Pleora Support Center at supportcenter.pleora.com.

At least one Gigabit Ethernet NIC (if you are using GigE Vision devices) or at least one USB 3.0 port (if you are using USB3 Vision devices).

An appropriate compiler or integrated development environment (IDE):

- Visual Studio 2019, 2017, 2015, 2013, 2012, and 2010.
- Sample project files (.vcxproj) are compatible with Visual Studio 2012 (and later). When you open them with Visual Studio for the first time, you have the option of upgrading

> ⓘ For supported USB 3.0 host controller chipsets, consult the eBUS SDK Release Notes, available on the Pleora Support Center.

> 💡 Depending on the incoming and outgoing bandwidth requirements, as well as the performance of each NIC, you may require multiple NICs. For example, even though Gigabit Ethernet is full duplex (that is, it manage 1 Gbps incoming and 1 Gbps outgoing), the computer's PCIe bus may not have enough bandwidth to support this. This means that while your NIC can — in theory — accept four cameras at 200 Mbps each incoming, and output a 750 Mbps stream on a single NIC, the NIC you choose may not support this level of performance.

One of the following operating systems:

- For Microsoft Windows
  - Microsoft Windows 11, 64-bit
  - Microsoft Windows 10, 32-bit or 64-bit
  - Microsoft Windows 8.1, 32-bit or 64-bit
  - Microsoft Windows 7 with Service Pack 1 (or later), 32-bit or 64-bit

- For the x86 Linux platform:
  - Ubuntu 22.04 LTS 64-bit: Qt 5.15.3
  - Ubuntu 20.04 LTS 64-bit: Qt 5.12.8
  - Ubuntu 18.04 LTS 64-bit Qt 5.9.5
  - RHEL 8.7, 64-bit: Qt 5.15.3
  - CentOS Stream 8, 64-bit: Qt 5.15.3
- For the Linux for ARM platform:
  - NVIDIA Jetson TX2, Jetson Nano, Jetson Xavier NX, Jetson AGX Xavier, Jetson TX2 NX running JetPack 4.6 (Ubuntu 18.04)
  - NVIDIA Jetson AGX Xavier, Jetson Xavier NX, Jetson AGX Orin, Jetson Orin NX running Jetpack 5.1.x which x is between 0 and 3. (Ubuntu 20.04)
  - Raspberry Pi 4 , Raspberry Pi 5 running Raspberry Pi OS (64 bits) (Debian aarch64 GNU/Linux 12 bookworm)

According to the Linux/ARM platform, we provide eBUS Python for the stock Python version of the OS:

- Ubuntu 22.04 Desktop (64-bit), eBUS Python for Python 3.10 is installed with the SDK
- Ubuntu 20.04 Desktop (64-bit), eBUS Python for Python 3.8 is installed with the SDK
- Ubuntu 20.04 for ARM (64-bit), eBUS Python for Python 3.8 is installed with the SDK
- Ubuntu 18.04 Desktop (64-bit), eBUS Python for Python 3.6 is installed with the SDK
- Ubuntu 18.04 for ARM (64-bit), eBUS Python for Python 3.6 is installed with the SDK
- RHEL 8 (64-bit), eBUS Python for Python 3.6 is installed with the SDK
- CentOS 8 Stream (64-bit), eBUS Python for Python 3.6 is installed with the SDK
- Raspberry Pi Desktop (64-bit), eBUS Python for Python 3.11 is installed with the SDK.

For non-default Python versions for different Linux ARM/x86 platforms, consult your Pleora support representative.

Ensure that you uninstall any previous versions of eBUS SDK from your machine before installing eBUS SDK 6.x.

3.2 Firewall Considerations for GigE Vision Devices

In most cases, you do not need to disable the computer's firewall.

If you are using a third-party GigE Vision device that does not support the optional features introduced in version 1.1 (and later) of the GigE Vision standard, which ensures compatibility with firewalls, see the *eBUS Player User Guide* for firewall guidelines.

3.3 Launching eBUS Player

You can launch eBUS Player from the Windows Start menu, in the **eBUS** folder.

To launch eBUS Player

- Click **Start** > **All Programs** > **eBUS** > **eBUS Player**.

4 Choosing a Driver

The eBUS SDK provides you with drivers you can install to:

- Optimize the performance of your GigE Vision system
- Connect to, control, and receive images from USB3 Vision devices

As part of the eBUS SDK installation wizard, you can choose which driver to install. Or, you can use the eBUS Driver Installation Tool to install or change drivers. The Driver Installation Tool can be launched from the eBUS folder on the Windows start menu.

Table 2: Available Drivers

Driver	Description
Manufacturer Driver	Provides functionality developed by the card's manufacturer. For GigE Vision systems, you can use the default network stack on your computer or laptop when it is not desirable or possible for you to install a driver. The network stack offers acceptable performance in most scenarios, but applications will consume greater processor resources during operation, and throughput may be limited. For USB3 Vision systems, if you are using a USB3 Vision device without installing the Universal Pro for USB3 Vision driver, eBUS Player will detect a USB3 Vision device, but you cannot connect to the device, control the device, or stream images. To perform these activities, you must install the USB3 Vision Driver.
Universal Pro for GigE Vision Driver	Provides the best performance and excellent compatibility with most network adapters. For use with GigE Vision devices.
Universal Pro for USB3 Vision Driver	Provides control and streaming capabilities. For use with USB3 Vision devices. Note: Some USB 3.0 host controllers allow you to enable or disable power management. We recommend that you disable power management.

4.1 Using the eBUS Driver Installation Tool

Included in the eBUS SDK is the eBUS Driver Installation Tool. You can use this tool to install or uninstall a Universal pro driver.

You can choose to install eBUS Universal Pro drivers as part of the eBUS SDK installation wizard, or you can use the eBUS Driver Installation Tool to install or uninstall a driver.

To install an eBUS Universal pro driver

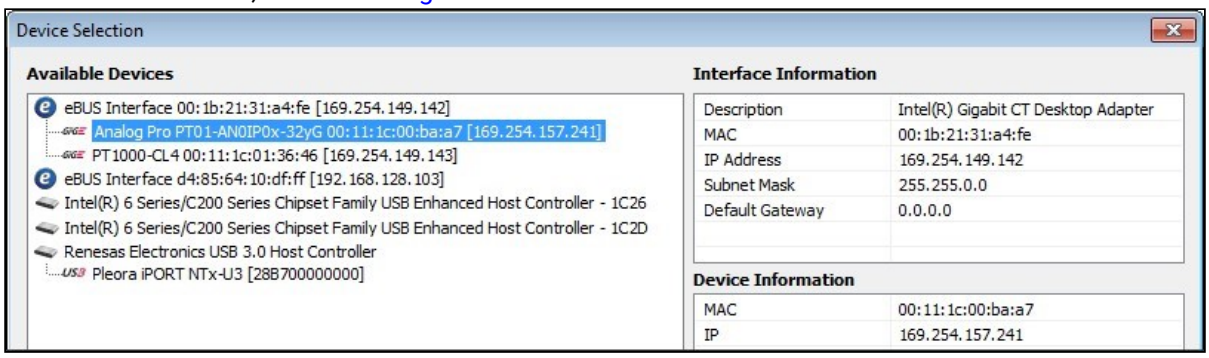
1. Click **Start** > **All Programs** > **Pleora Technologies Inc** > **eBUS SDK** > **Tools** > **eBUS Driver Installation Tool**.
2. Under the driver that matches the types of devices you will connect to, click **Install**.
   The USB3 Vision driver is installed across all USB3 Vision devices on your computer. The GigE Vision driver is installed across all network adapters on your computer.
3. Close the eBUS Driver - Installation
   You may be required to restart your computer.

To see the versions of the installed drivers, click **Help** > **About**.

5 Connecting to a Device

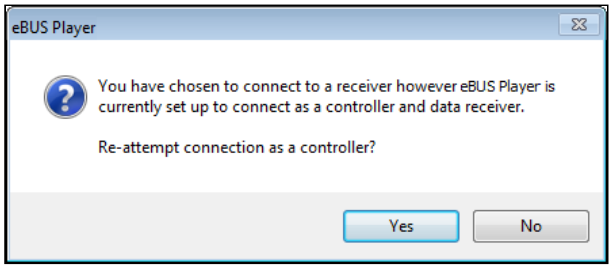
To connect to a device

1. Click Start > **All Programs > eBUS > eBUS Player.**
2. Under **Connection**, click **Select/Connect**.
   

3. Click the GigE Vision or USB3 Vision device in the **Available Devices** list.
   If you are using the manufacturer driver, a message may appear, indicating that you are not using an eBUS driver. Keep in mind the following information about drivers:
   For more information, see “Choosing a Driver”.
   

   If your GigE Vision device does not appear in the **Available Devices** list, (possibly because eBUS Player and the GigE Vision device are not on the same subnet) you can locate the device by clicking **Show unreachable Network Devices** found at the bottom of the Device Selection window.

   ⚠ Warnings and errors related to the USB3 Vision device and host controller may appear in the right-hand panel of the Device Selection dialog box. For example, a warning may appear if you have connected your USB3 Vision device to a USB 2.0 port.

4. Click **OK**.
5. If you are using the vDisplay HDI-Pro External Frame Grabber with your GigE Vision device, the first time you start eBUS Player and connect to a vDisplay HDI-Pro External Frame Grabber, the following message may appear. Click **Yes**. Roles are discussed later in this guide, in “Configuring eBUS Player as a Controller or Data Receiver”.
   

5.1 Configuring a Valid IP Address for a GigE Vision Device (If Required)

If the GigE Vision device does not have a valid IP address, an error message appears, as shown in the following image.

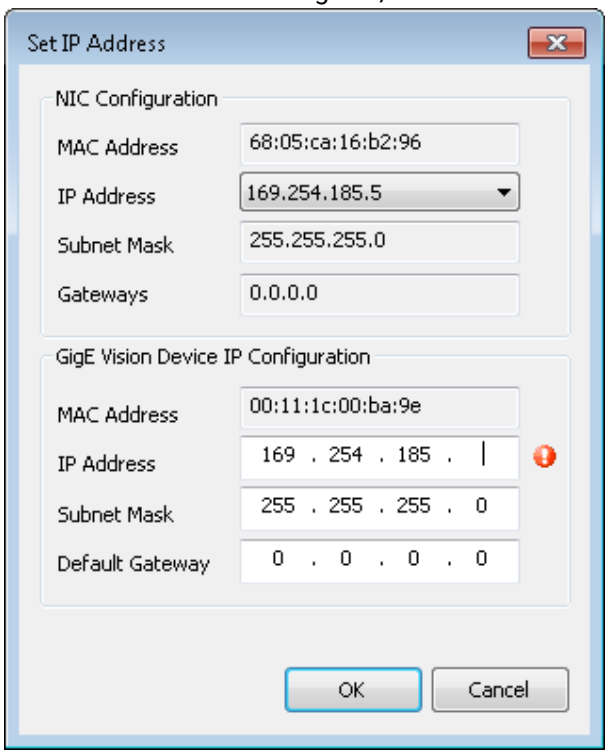
To configure a valid IP address for a GigE Vision device

This procedure allows you to set a valid IP address for initial access, but not a persistent IP address for the GigE Vision device. After you power down the device, the IP address is reset. Configuring a persistent IP address that is permanently used on the GigE Vision device is discussed later in this guide, in "Configuring a Persistent IP Address for a GigE Vision Device (If Required)"

1. Start **eBUS Player** and click **Select/Connect**.
   

2. Click the GigE Vision device in the **Available Devices** list.
3. Click **Set IP Address** in the bottom left corner.

4. In the **Set IP Address** dialog box, enter a valid IP address, subnet mask, and default gateway.



   The red exclamation mark disappears if the IP address is valid, taking into consideration the subnet mask, as well as the IP address and subnet mask of the computer.

5. Click **OK**.

6 Acquiring Images

Because the GigE Vision standard and USB3 Vision standard require that compliant transmitters start up in a state that is ready to send images, you can start acquiring images as soon as you apply power and connect the transmitter to the network (for GigE Vision devices) or USB 3.0 port on your computer (for USB3 Vision devices with the USB3 Vision Driver installed). Pleora GigE Vision and USB3 Vision devices can transmit a test pattern (most devices transmit a test pattern by default). You can turn the test pattern on or off as required.

If you are using eBUS Player to connect to a vDisplay HDI-Pro External Frame Grabber, this section does not apply. A vDisplay HDI-Pro External Frame Grabber acts as a controller and/or receiver, which means that it does not transmit video over the network. Instead, skip this section and go to "Configuring eBUS Player as a Controller or Data Receiver"

To turn the test pattern on or off

1. Start eBUS Player and click **Select/Connect**.
2. Click the device in the **Available Devices** list.
3. Click **OK** in the bottom right corner.
4. Under **Parameters and Controls**, click **Device control**.
5. Under **ImageFormatControl**, click a test pattern option in the **TestImageSelector** list.
6. Close the **Device Control** dialog box.

To acquire images

1. Start eBUS Player and click **Select/Connect**.
2. Click the device in the **Available Devices** list.
3. Click **OK** in the bottom right corner.
4. For multi-source GigE Vision devices, click the source to which a camera is connected under **Acquisition Control**. If you do not have a camera connected, you can use the test For more information, see "To turn the test pattern on or off" .
5. In the **Mode** list, click **Continuous**, which configures the device to send a stream of continuous images (instead of a single image).
   For other acquisitions modes, see the *eBUS Player User Guide*.
6. Click **Play**.
   The images appear in the **Display** section.

7 Reviewing the Acquisition Status

During image acquisition, information about the stream appears under the image display area, in addition to any errors or warnings that have occurred.

In most cases, errors will not appear if you are connecting to a device for the first time. If an error appears, click **Image stream control** and review the information in the **Counters** section. If anything, other than zero appears in the features within this section and you are using a GigE Vision device, consult the *Stream Control Technical Note*, available at the Pleora Support Center, to determine which feature is causing the error and for guidance on how to correct the error.

8 Configuring eBUS Player as a Controller or Data Receiver

Depending on your system, you may need to configure the eBUS Player role, which lets you specify whether you want to use eBUS Player to control a GigE Vision or USB3 Vision compliant device or receive images. The following roles are available:

Table 3: eBUS Player Roles

Role	Description
Controller and data receiver	Select this role if you are using eBUS Player to connect to and control a GigE Vision or USB3 Vision compliant transmitter AND if you want eBUS Player to receive streaming video from the transmitter. This setting is ideal when you want to control an iPORT device and see streaming video with eBUS Player. This is the default setting.
Controller	Select this role if you are using eBUS Player to connect to and control a GigE Vision or USB3 Vision compliant device. eBUS Player does not receive streaming video from the device if this option is selected. This setting is often used to connect eBUS Player to a receiver, such as the Pleora vDisplay HDI-Pro External Frame Grabber (for use with GigE Vision devices).
Data Receiver	Select this role if you are using eBUS Player to connect to and receive streaming video from a GigE Vision or USB3 Vision compliant device. You cannot control the device if this option is selected.

The vDisplay External Frame Grabber receives video from the GigE Vision network and makes it available for display on an attached monitor.

To configure eBUS Player as a controller or data receiver

1. Select **Tools** > **Setup**.
2. Select a role.
3. In most cases, you do not need to change the **Default channel**. If you have a multi-channel device and are creating a pure receiver, see the *eBUS Player User Guide* for more information about this setting.
4. Click **OK**.

If eBUS Player is already connected to a device, you must close the Setup dialog box and disconnect from the device before you can select an eBUS Player role.

9 Configuring the Stream Destination for GigE Vision Devices: Unicast or Multicast

You can configure a GigE Vision stream destination to send images to a single location or to multiple locations.

Table 4: GigE Vision Stream Destination Options

Option	Description
Unicast, automatic	Select this option to configure the camera to stream video directly to the eBUS Player computer using an automatically-selected port.
Unicast, specific local port	Select this option to configure the camera to stream video directly to a user-defined port on the eBUS Player computer.
Unicast, other destination	Select this option to configure the camera to stream video directly to a computer or a vDisplay External Frame Grabber (a destination other than the eBUS Player computer).
Multicast	Select this option to configure the camera to join a multicast group (specified by the IP address and port), and to begin streaming to that group. The vDisplay External Frame Grabber or any other receiver (such as a computer), must be configured to receive streaming video at the same multicast address. If eBUS Player is configured as a multicast receiver, it allows you to view video from the camera streaming video to the same multicast address.

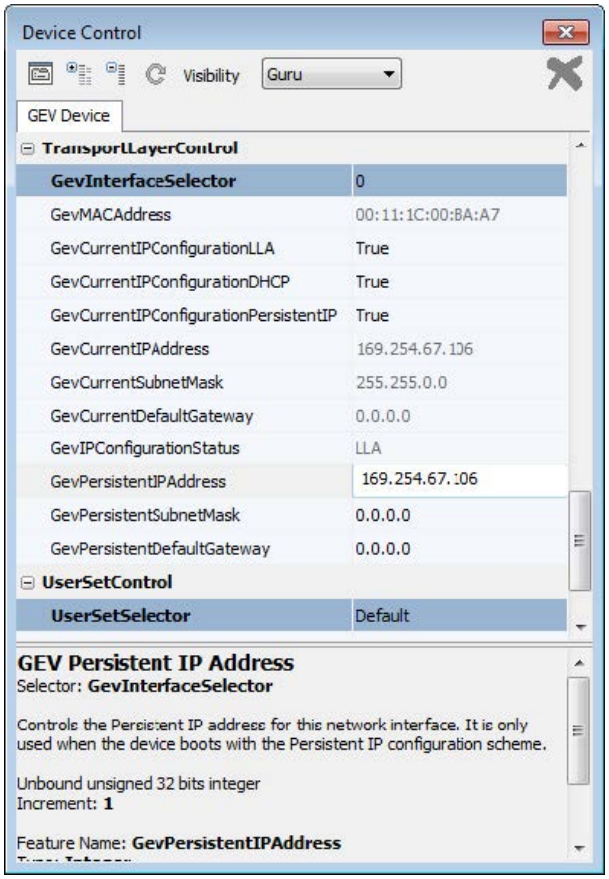
10 Configuring a Persistent IP Address for a GigE Vision Device (If Required)

By default, Pleora devices are configured to automatically acquire an IP address using Dynamic Host Configuration Protocol (DHCP) and Link Local Addresses (LLA), provided no persistent IP address has been assigned. This allows you to immediately connect to the device at first-time deployment, and then, if you choose to, provide it with a persistent IP address. If you provide the device with a persistent IP address, it will use this persistent IP address each time it is powered up and connected to the network.

> The device can use the persistent IP address each time it is powered up as long as the IP address is valid and there were no IP address conflicts at the time the IP address was configured.

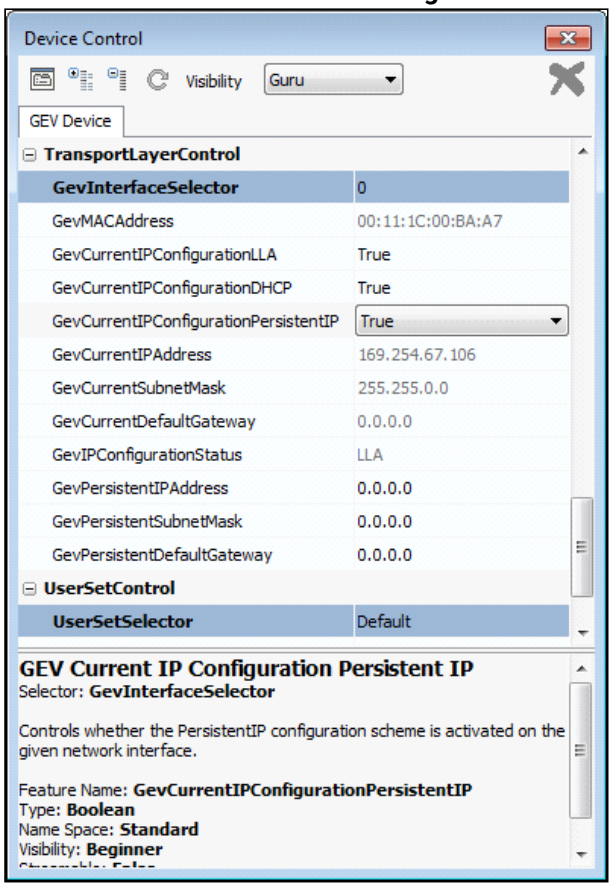
To configure a persistent IP address for a GigE Vision device

1. Start eBUS Player and click **Select/Connect**.
2. Click the device in the **Available Devices** list.
3. Click **OK** in the bottom right corner.
4. Under **Parameters and Controls** click **Device control**.
5. In the **TransportLayerControl** section of the **Device Control** dialog box, enter the expected persistent IP address and a subnet mask in the **GevPersistentSubnetMask** box respectively..

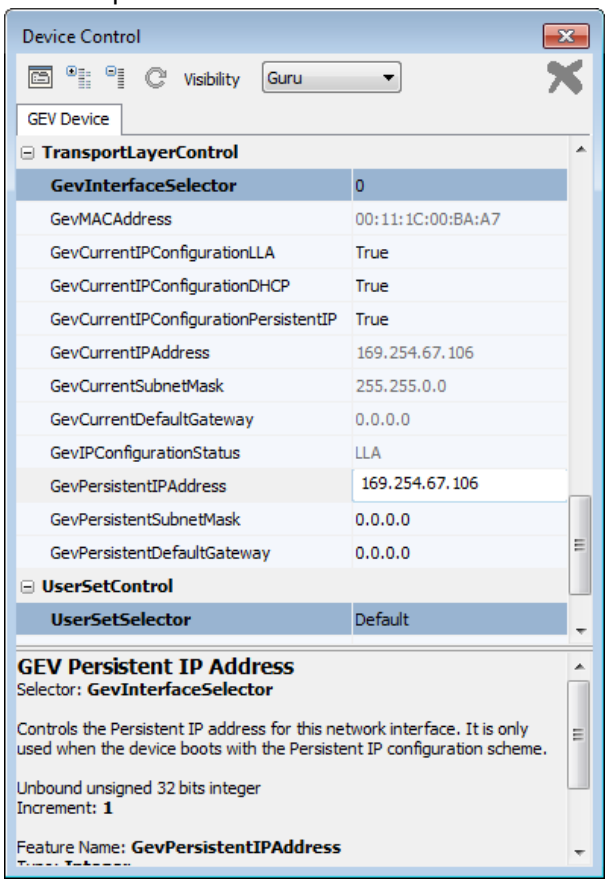


The subnet gateway value can remain at 0.0.0.0.

6. Click **True** in the **GevCurrentIPConfigurationPersistentIP** list.



7. Enter the persistent IP address in the **GevPersistentIPAddress** box.



8. Close the **Device Control** dialog box.

If **GevCurrentIPCconfigurationPersistentIP** device is set to **False**, it uses the IP address provided by DHCP next, and if this fails, uses LLA to find an available IP address. LLA cannot be disabled and is **True** by default.

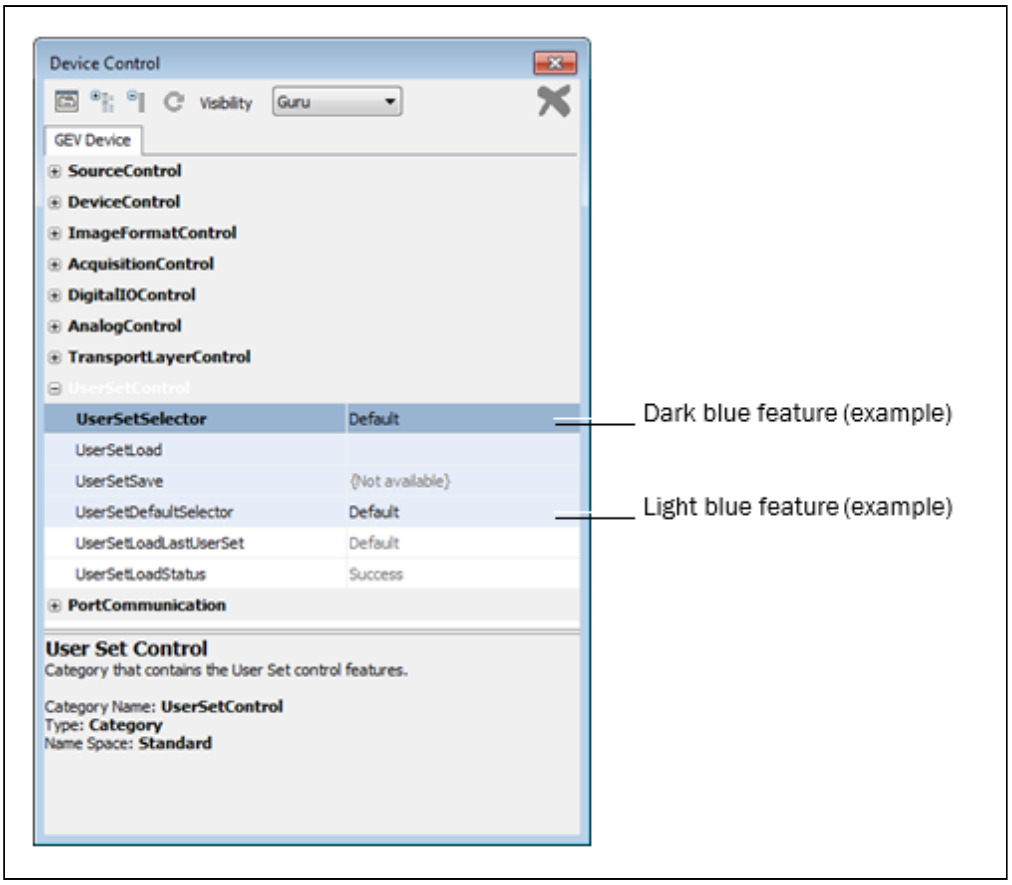
11 Accessing the Device Settings

To change the device settings, you can access the eBUS Player Device Control dialog box. This dialog box lets you specify all of the settings related to your device, including transport layer settings, image processing settings, image mode and formatting settings, display timing settings, channel settings, autonomous control settings, and messaging settings.

To change the device settings

1. Start eBUS Player and click **Select/Connect**.
2. Click a GigE Vision or USB3 Vision device in the **Available Devices** list.
3. Click **OK** in the bottom right corner.
4. Under **Parameters and Controls**, click **Device control.**
   The **Device Control** dialog box appears. Customize the settings as required by adjusting the features in the dialog box.

> Features that are light blue are dependent on features that are dark blue in eBUS Player. For example, the **UserSetLoad** feature depends on the option that is selected in the **UserSetSelector**. If **Default** is selected, the default User Set is loaded when this command is executed. If **UserSet1** is selected, User Set 1 is loaded.


Device Control
Visibility
Guru
GEV Device
SourceControl
DeviceControl
ImageFormatControl
AcquisitionControl
DigitalIOControl
AnalogControl
TransportLayerControl
UserSetControl
UserSetSelector
Default
UserSetLoad
UserSetSave
{Not available}
UserSetDefaultSelector
Default
UserSetLoadLastUserSet
Default
UserSetLoadStatus
Success
PortCommunication
User Set Control
Category that contains the User Set control features.
Category Name: UserSetControl
Type: Category
Name Space: Standard
Dark blue feature (example)
Light blue feature (example)

12 Adjusting the Display of Features

You can adjust the display of features in the Device Control dialog box, such as the way the features are filtered and the features that appear.

To adjust the display of features

Perform any of the tasks listed in the following table to adjust the display of features..

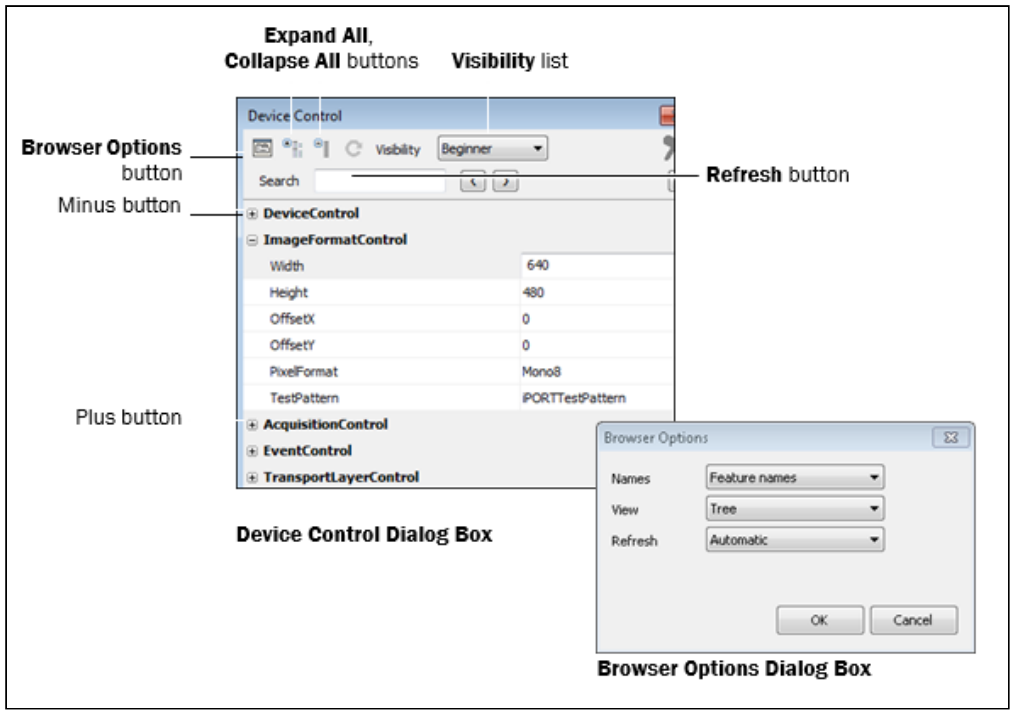


Table 5: Adjusting the Display of Features

Adjustment tool	Description
Expand All button	Expands the headings (when the **Tree** view is selected in the **Browser Options** dialog box).
Collapse All button	Collapses the headings (when the **Tree** view is selected in the **Browser Options** dialog box).
Visibility list	Filters the list of features to suit your level of video network responsibility and understanding. There are more controls available for the **Guru** level than the **Beginner** level; some controls are not available in the **Beginner** level.

Browser Options button	Opens the **Browser Options** dialog box, which allows you to show the features using either the feature name (as per the GenICam standard) or the display name, and allows you to choose whether the features are displayed as an alphabetical list or a feature tree. Also allows you to specify whether the device features are automatically, based on polling time, or manually refreshed.
Refresh button	Refreshes the features of a GigE Vision or USB3 Vision device (such as a transmitter or receiver) that are displayed in the **Device Control** dialog box. The following refresh options are available in the **Browser Options** dialog box: • **Polling**. Features that are defined for polling are automatically refreshed (if the polling time configured for the feature has elapsed). • **Automatic**. The features are automatically refreshed every few seconds). This is the default setting. • **Manual**. You can manually refresh the features in the **Device Control** dialog box.
Minus button	Collapses a heading (when the **Tree** view is selected in the **Browser Options** dialog box).
Plus button	Expands a heading (when the **Tree** view is selected in the **Browser Options** dialog box).

13 Saving Your Device Configuration Settings to the Device's Flash Memory

You can use the options available in the **UserSetControl** section of the **Device Control** dialog box to save the changes you make to your GigE Vision or USB3 Vision device settings. Once saved, the changes (saved as "User Sets") can persist across power cycles.

Most iPORT devices support two User Sets: **UserSet1**, which consists of the user-configured settings, and **Default**, which consists of the pre-configured settings, to which you can always revert. Settings identified as **Default** in the **Device Control** dialog box cannot be changed.

The following table describes the options available in **UserSetControl**.

Table 6: Saving Configuration Settings to a GigE Vision or USB3 Vision Device

Setting	Description
UserSetSelector	Selects the User Set to load or save.
UserSetLoad	Loads the User Set specified by **UserSetSelector** to the device and makes it active.
UserSetSave	Saves configuration data to the User Set specified by **UserSetSelector**, which is part of the non-volatile memory of the device.
UserSetDefaultSelector	Selects the User Set to load and make active when the device is reset.
UserSetLoadLastUserSet	Shows the last User Set executed by the device from a **UserSetLoad** command, or as a result of a reset of the device.
UserSetLoadStatus	Indicates the success or failure of the last User Set applied. The User Set can be applied through a power cycle or through user selection.

To save a configuration change to UserSet1

1. In the **Device Control** dialog box, make the required configuration changes.
2. Scroll to the **UserSetControl** section and change the **UserSetSelector** setting to **UserSet1**.
3. Click **UserSetSave**.

To load the default configuration settings (one-time)

1. In the **UserSetControl** section of the **Device Control** dialog box, select **Default** in the **UserSetSelector** box.
2. Click the **UserSetLoad** setting and then click the **UserSetLoad** button that appears to the right.
   The default settings are applied to the GigE Vision or USB3 Vision device.

To specify the persistent settings that are loaded every time the device is reset

- In the **UserSetControl** section of the **Device Control** dialog box, select a user set in the **UserSetDefaultSelector** box and then close the **Device Control** dialog box.
  The next time the GigE Vision or USB3 Vision device is reset, the user set that you selected is loaded.

14 Performing Additional Tasks

After you have familiarized yourself with the eBUS Player application and started an image stream, you can start to learn about the other functionality that is available. You can consult the *eBUS Player User Guide* for additional information, such as:

- A detailed user interface overview
- Firewall configuration guidelines
- Adjusting the image display by zooming in, for example
- Saving images to your computer
- Choosing an acquisition mode
- Configuring chunk data
- Saving eBUS Player application preferences
- Monitoring performance by reviewing image and network errors, and performance-related statistics
- Using the event monitor to determine causes of issues that may occur during the use of your device
- Modifying camera parameters through serial ports connected to your Pleora device The user guide is available at the Pleora Support Center at supportcenter.pleora.com.

Technical Support

On the Pleora Support Center, you can:

- Download the latest software and firmware.
- Log a support issue.
- View documentation for current and past releases.
- Browse for solutions to problems other customers have encountered.
- Read knowledge base articles for information about common tasks.

To visit the Pleora Support Center:

- Go to supportcenter.pleora.com.
- Most material is available without logging in to a Support Center account.
- To access software and firmware downloads, in addition to other content, log in to the Support Center.
- If you do not have an account, click Request Account.
- Accounts are usually validated within one business day.

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