



ibaCapture GigE

Video Recording with GigE Vision Cameras

Manual
Issue 5.5

Measurement Systems for Industry and Energy

www.iba-ag.com

Manufacturer

iba AG
Koenigswarterstrasse 44
90762 Fuerth
Germany

Contacts

Main office	+49 911 97282-0
Support	+49 911 97282-14
Engineering	+49 911 97282-13
E-mail	iba@iba-ag.com
Web	www.iba-ag.com

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The current version is available for download on our web site www.iba-ag.com.

Version	Date	Revision	Author	Version SW
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1 About this documentation

This documentation describes the function, the design and the application of the software product *ibaCapture* when using GigE Vision cameras.

This documentation is a supplement to the *ibaCapture* manual. Information about basic characteristics and functions of *ibaCapture* may be found in the *ibaCapture* manual.

1.1 Previous knowledge

This documentation addresses qualified professionals, who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as a professional if he/she is capable of assessing the work assigned to him/her and recognizing possible risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

This documentation in particular addresses persons, who are concerned with the configuration of video camera systems in conjunction with *ibaCapture*. As *ibaCapture* is an add-on for *ibaPDA*, the following basic knowledge is required for the configuration:

- Windows operating system
- Basic knowledge of *ibaPDA*
- Knowledge of video processing (coding, transmission) is useful but not required.

1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram – Add – New function block</i> .
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
Filenames, paths	<i>Filename, Path</i> Example: <i>Test.docx</i>

1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

Danger!



The non-observance of this safety information may result in an imminent risk of death or severe injury:

- Observe the specified measures.
-

Warning!



The non-observance of this safety information may result in a potential risk of death or severe injury!

- Observe the specified measures.
-

Caution!



The non-observance of this safety information may result in a potential risk of injury or material damage!

- Observe the specified measures
-

Note



A note specifies special requirements or actions to be observed.

Tip



Tip or example as a helpful note or insider tip to make the work a little bit easier.

Other documentation



Reference to additional documentation or further reading.

2 Video recording with GigE Vision cameras

ibaCapture is a video capture system designed for recording video from multiple cameras simultaneously. It can be connected to *ibaPDA*, which allows synchronized recording of video and measured data.

This synchronized connection of image information and measured data allows recognizing relations between process and measurement and improves the quality of data analysis.

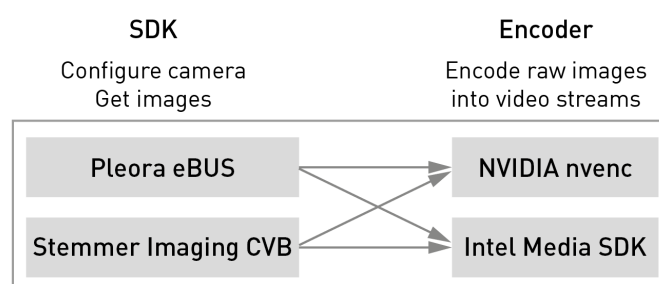
This document describes the connection and handling of cameras which support the GigE Vision® standard, so-called GigE cameras. When connecting GigE cameras to *ibaCapture* Server, some specific information has to be considered.

GigE cameras allow high-speed capturing with frame rates of up to 400 fps, depending on the used resolution. It is recommended to connect GigE cameras to an *ibaCapture* Server via a dedicated gigabit ethernet network card (e. g. Intel® Ethernet Server Adapter I350-T4V2). The mentioned card allows connecting up to 4 GigE cameras. If GigE cameras are used, further system requirements apply, see chapter [➤ Requirements](#), page 7. In addition, due to the high demands during video encoding, the requirements in terms of PCI Express bandwidth, processing power and GPU support need to be considered.

When an appropriate network interface is used (e. g. Intel(R) Ethernet-Converged-Network-Adapter X550-T2), it is also possible to connect 10GigE cameras to *ibaCapture*. With the additional bandwidth, even higher resolutions or frame rates up to 1440 fps can be captured. Be aware that utilizing the full capacity of a 10GigE camera will only allow capturing one camera per *ibaCapture* Server.

Principle of video processing with GigE cameras

In order to receive video from GigE cameras, a Software Development Kit (SDK) is required to configure the GigE camera and subsequently get the images from the GigE camera. In the next step, the raw images are encoded into a video stream by one of the supported video encoding libraries. *ibaCapture* supports several SDKs and video encoders as shown in the figure below.



NVIDIA encoding is supported for Pleora eBUS and Stemmer CVB GigE Vision cameras. Intel Quick Sync video encoding is supported by GigE cameras receiving images with Pleora eBUS or Stemmer CVBt.

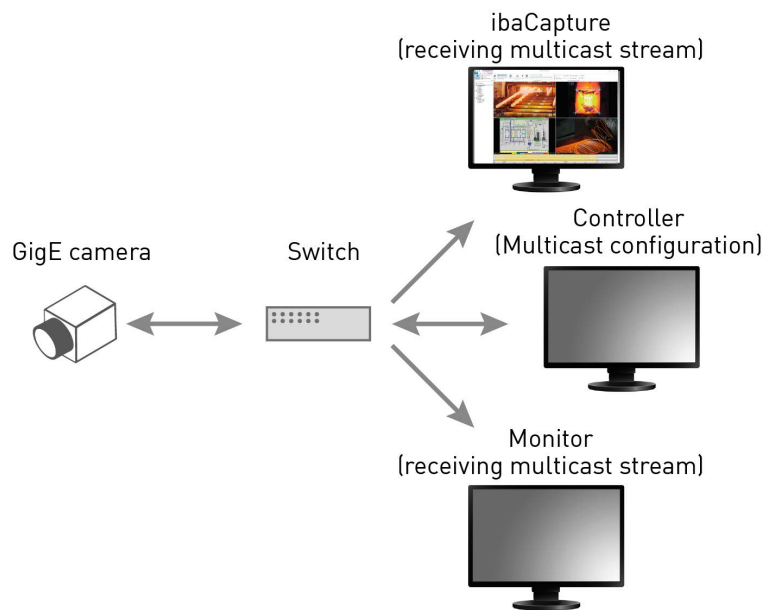
The SDK to be used has to be licensed and installed separately.

When using Stemmer Imaging CVB, TurboDrive technology by Teledyne Dalsa is supported for compatible cameras. This technology enables a more efficient usage of the interface bandwidth

allowing cameras to increase their effective throughput. Please note that this feature can only be used by cameras that support TurboDrive.

iba recommends Pleora eBUS SDK for GigE Vision grabbers.

ibaCapture also supports multicast mode with multicast capable GigE cameras. In multicast mode, raw images from GigE-Vision cameras can be streamed to multiple receivers. A specific camera type *Pleora eBUS SDK Multicast slave* enables the *ibaCapture* Encoder to subscribe to the multicast stream of the GigE Vision device. The camera type makes use of the Pleora eBUS SDK internally. Thus, an installation of the eBUS Runtime Package is required. Multicasting can be enabled/disabled using any GigE Vision compliant third party software, but not with *ibaCapture*. More information can be found in chapter ↗ *Pleora eBUS SDK Multicast slave camera configuration*, page 23



2.1 Requirements

Observe the following requirements for using *ibaCapture* with GigE cameras.

2.1.1 Software

- *ibaCapture* Server license
- Interface license GigE-Vision
 - The license for the used GigE vision SDK has to be available on the *ibaCapture* Server PC
- *ibaCapture* Encoder (is part of the *ibaCapture* Installer)
- Up-to-date graphics drivers for GPU-accelerated encoding
- Windows 10 and Windows 11 are supported. Support for server operating systems depends on the used SDK.

The following software requirements depend on the used SDK and the used video encoding. The SDKs must be licensed and installed separately.

Requirements for SDKs:

- Pleora eBUS
 - eBUS Runtime (available on the data medium "iba Software & Manuals" 01_iba_Software\ibaCapture\ibaCapture\05_Pleora_eBUS)
- Stemmer Imaging CVB
 - CVB Runtime (<https://www.commonvisionblox.com/en/software/run-time-only-setups-cvb-2017/>)

2.1.2 Hardware

- PC, Intel Core-CPU 2nd Generation or newer (from Intel Core i7-2x00K CPU)
- 4 GB RAM
- GigE network card for PCI Express (frame grabber) Intel Ethernet I350 T4 V2 SVR is recommended by iba; other GigE network cards capable of handling jumbo packets are also supported.

Please note that 4-port GigE network cards require a 4x PCI Express slot to provide enough bandwidth between the connected cameras and GPU/CPU

- GigE vision cameras supporting the GenICam protocol

Requirements for video encoding in GPU

- NVIDIA encoding
 - NVIDIA GPU: A list of supported GPUs with their features is available in the NVENC Support Matrix: <https://developer.nvidia.com/video-encode-decode-gpu-support-matrix-#Encoder> Please also see chapter ↗ *NVIDIA encoding*, page 26 for detailed information.
- Intel Quick Sync in HW-accelerated mode
 - Intel® HD Graphics 3000 or higher for H.264 encoding
 - Intel® HD Graphics 530 or higher for H.265/HEVC encoding

Note

iba recommends always using the latest graphics drivers.

2.1.3 Order information

Server licenses

Order no.	Name	Description
38.000001	ibaCapture-Server-60fps	Video recording for up to 60 fps, up to 8 client live-streams
38.000002	ibaCapture-Server-180fps	Video recording for up to 180 fps, up to 16 client live-streams
38.000003	ibaCapture-Server-480fps	Video recording for up to 480 fps, up to 48 client live-streams
38.000004	ibaCapture-Server-960fps	Video recording for up to 960 fps, up to 96 client live-streams
38.000005	ibaCapture-Server-1440fps	Video recording for up to 1440 fps, up to 144 client live-streams
38.000010	Upgrade-ibaCapture-Server-60fps to 180fps	Extension from 60 fps to 180 fps
38.000011	Upgrade-ibaCapture-Server-180fps to 480fps	Extension from 180 fps to 480 fps
38.000012	Upgrade-ibaCapture-Server-480fps to 960fps	Extension from 480 fps to 960 fps
38.000013	Upgrade-ibaCapture-Server-960fps to 1440fps	Extension from 960 fps to 14400 fps

Camera licenses

Order no.	Name	Description
38.000030	ibaCapture-1CAM-REC	1 camera license for recording
38.000031	ibaCapture-1CAM-DISP	1 camera license for displaying only
38.000032	ibaCapture-1CAM-VIRT	1 camera license for recording HMI or ibaVision images
38.000033	ibaCapture-1CAM-GigE	1 GigE camera license for recording
38.000043	License dongle for Pleora eBUS Runtime	Runtime license for GigE-Vision SDK

Hardware

Order no.	Name	Description
19.116011	INTEL GigE-Network Card 1G quad port	Quad-port Gigabit Ethernet, I350 T4 V2 SVR PCIe
19.116014	INTEL GigE-Network Card 10G dual port	Dual-port 10 GigE Ethernet, X550 PCIe

Order no.	Name	Description
43.001001	Upgrade ibaRackline-PC CAM with Quadro P2200	Graphic Card NVIDIA Quadro P2200
43.001005	Upgrade ibaRackline-PC CAM with RTX A4000	Graphic Card NVIDIA RTX A4000

An *ibaCapture* Server license always has a limit for total frames per seconds (fps) over all cameras. The highest variant offers 1440 fps.

With the purchase of GigE camera licenses, the fps count in *ibaCapture* works differently: Independent of the available *ibaCapture* Server license, GigE cameras will always be able to use up to 1440 fps on an *ibaCapture* Server. For all other camera types, the licensed fps limit is applied. Any single *ibaCapture* Server will only manage up to 1440 fps, even when using mixed camera configurations.

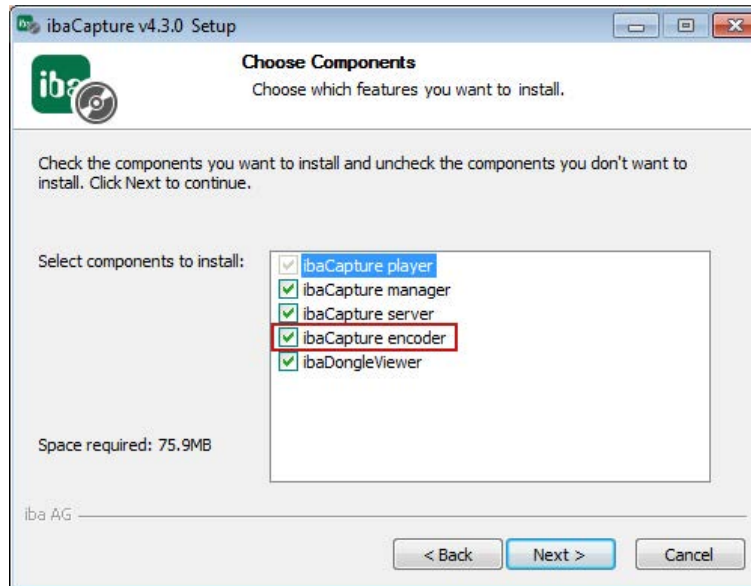
Example: An *ibaCapture-Server-60fps* license allows recording two IP cameras with 30 fps each. If GigE camera licenses are available as well, these still can utilize up to 1380 fps.

3 Additional Installations

Observe the following installations and settings for the use of GigE cameras.

3.1 ibaCapture Encoder


When using GigE cameras *ibaCapture* Encoder has to be installed with *ibaCapture*.



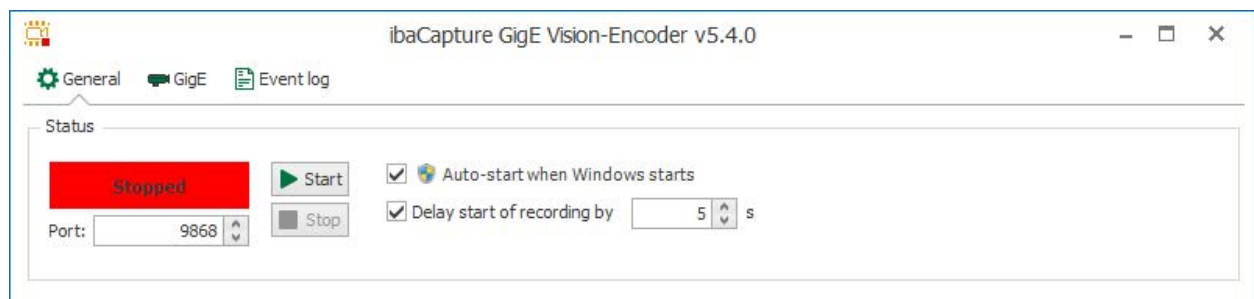
The application *ibaCapture* Encoder grabs image data from GigE cameras and provides an H.264-compliant video encoder to compress incoming video data to a video stream. This video stream can be processed and stored by *ibaCapture*.

Additionally, *ibaCapture* Encoder provides diagnostic information for the operation of GigE cameras.

Unlike *ibaCapture* Server, *ibaCapture* Encoder does not run as service but as application and hence needs a logged-on user account, see chapter ↗ *Preparatory Windows settings for GigE cameras*, page 14.

ibaCapture Encoder is opened by clicking on the  symbol in the Windows taskbar.

General tab



On the *General* tab, the status of the program is displayed. The encoder can be started and stopped with the <Start> and <Stop> button. If the option *Auto-start at Windows start* is enabled, the Encoder starts automatically when logging in to Windows.

ibaCapture Encoder can be set to start with a delay after a system startup. Enter a time in seconds in the field *Delay start of recording by*

This can be useful when cameras need more time for startup and initialization. If GigE cameras start recording without issues, delaying startup is not necessary.

GigE tab

On the *GigE* tab, the loaded GigE SDK and its version are shown, as well as the versions of Intel Quick Sync Library and NVIDIA Codec. If the libraries have been installed correctly, the display fields are green, red fields indicate an error.

The tab offers sub-tabs for each connected GigE camera. These sub-tabs show camera information and statistics for video acquisition. The information is constantly updated during acquisition.

Camera

The total number of frames, captured by the GigE camera, sent to the computer and received by *ibaCapture* Server (service). When frames are received from the camera, there could be cor-

rupted frames, and when the encoder is too busy, frames can be dropped. Of course, the number of corrupted and dropped frames should be as low as possible, ideally 0.

Encoder

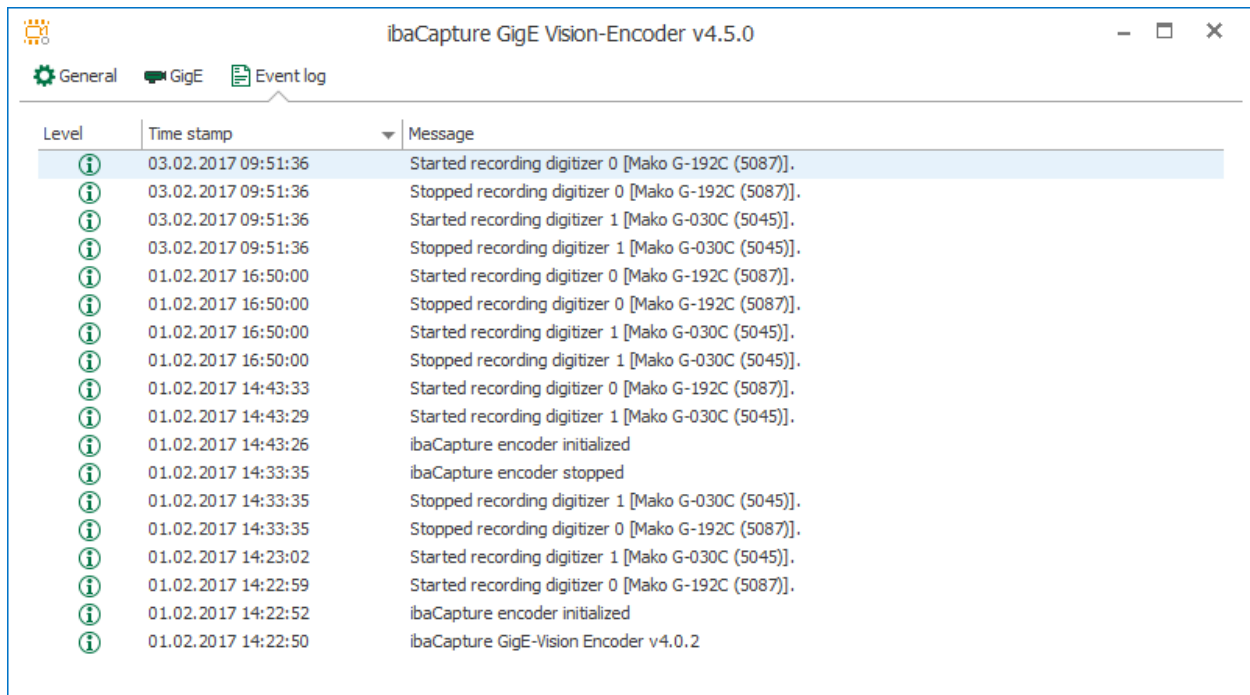
The encoder selected for this camera is displayed. The following group of values shows how many frames are used for encoding, after corrupted and dropped frames are lost (encoded frames). In addition, the number of frames that were rejected by the encoder is shown.

In case the percentage value of rejected frames is constantly in a critical range ($> 5\%$), you should consider taking measures such as reduction of frame rate or resolution.

Use hardware acceleration

This checkbox shows whether hardware acceleration is enabled in the camera's configuration (recommended).

Event log tab



Level	Time stamp	Message
i	03.02.2017 09:51:36	Started recording digitizer 0 [Mako G-192C (5087)].
i	03.02.2017 09:51:36	Stopped recording digitizer 0 [Mako G-192C (5087)].
i	03.02.2017 09:51:36	Started recording digitizer 1 [Mako G-030C (5045)].
i	03.02.2017 09:51:36	Stopped recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 16:50:00	Started recording digitizer 0 [Mako G-192C (5087)].
i	01.02.2017 16:50:00	Stopped recording digitizer 0 [Mako G-192C (5087)].
i	01.02.2017 16:50:00	Started recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 16:50:00	Stopped recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 14:43:33	Started recording digitizer 0 [Mako G-192C (5087)].
i	01.02.2017 14:43:29	Started recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 14:43:26	ibaCapture encoder initialized
i	01.02.2017 14:33:35	ibaCapture encoder stopped
i	01.02.2017 14:33:35	Stopped recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 14:33:35	Stopped recording digitizer 0 [Mako G-192C (5087)].
i	01.02.2017 14:23:02	Started recording digitizer 1 [Mako G-030C (5045)].
i	01.02.2017 14:22:59	Started recording digitizer 0 [Mako G-192C (5087)].
i	01.02.2017 14:22:52	ibaCapture encoder initialized
i	01.02.2017 14:22:50	ibaCapture GigE-Vision Encoder v4.0.2

On the *Event log* tab, events, especially error and warning messages are displayed. All events are stored in a text file, which is stored in the installation directory of *ibaCapture Encoder*.

3.2 Preparatory Windows settings for GigE cameras

User account for Auto-logon

Unlike *ibaCapture* Server, the iba video encoder program that is needed for hardware acceleration on video encoding, runs as a program and not as a service and thus requires a logged on user account.

In order to grant automatic restart of the system, create a user account, which automatically logs on at system start. The installation of ibaCapture Server registers the video encoder program for automatic startup.

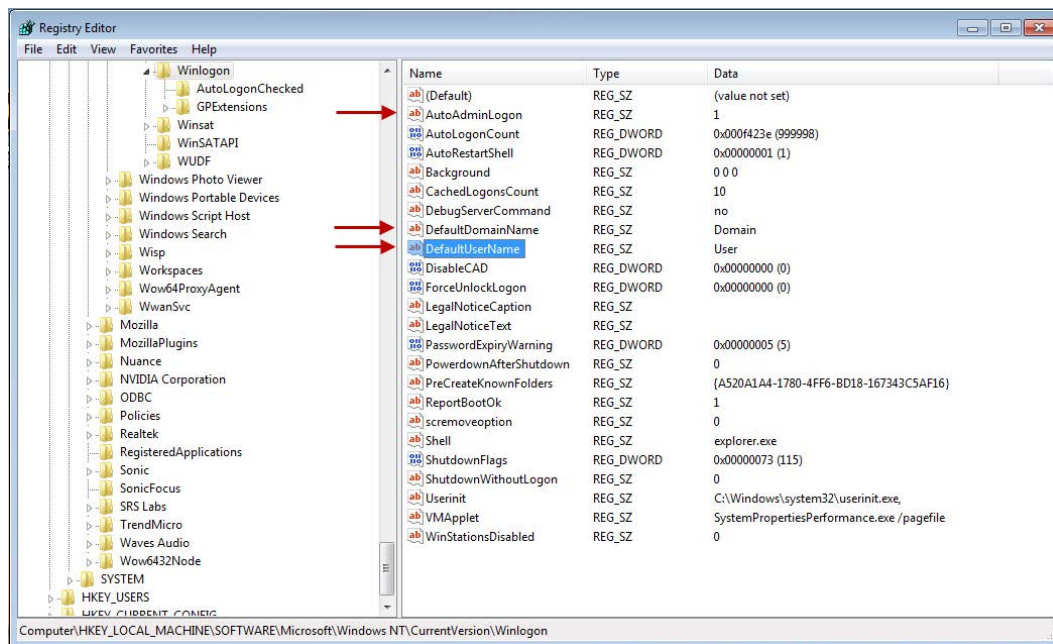
How to create a user account (local user) for Auto-logon under Windows

1. Click on the <Start> button, enter the command **netplwiz** in the search box and press <ENTER>. The dialog for the user account configuration opens.
2. In the *User* tab, uncheck the option "Users must enter user name and password".
3. Click on <Accept>.
4. When the dialog "Automatic login" opens, enter the user name for automatic login under Windows. Enter also the corresponding password.
5. Click <OK> and close the dialog "User accounts" by clicking <OK>.

How to create a user account for domain users

If the user is logged-in as domain user, the selection field "Users must enter user name and password" is not shown as default in the "User account" dialog and thus cannot be deactivated for individual users. If the appropriate setting has been done in the Windows Registry, the selection field is shown.

1. Click on the <Start> button, enter the command **regedit** in the search field and press <Enter>. The Registry Editor is opened.
2. Navigate in the Registry Editor to the path "HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon"



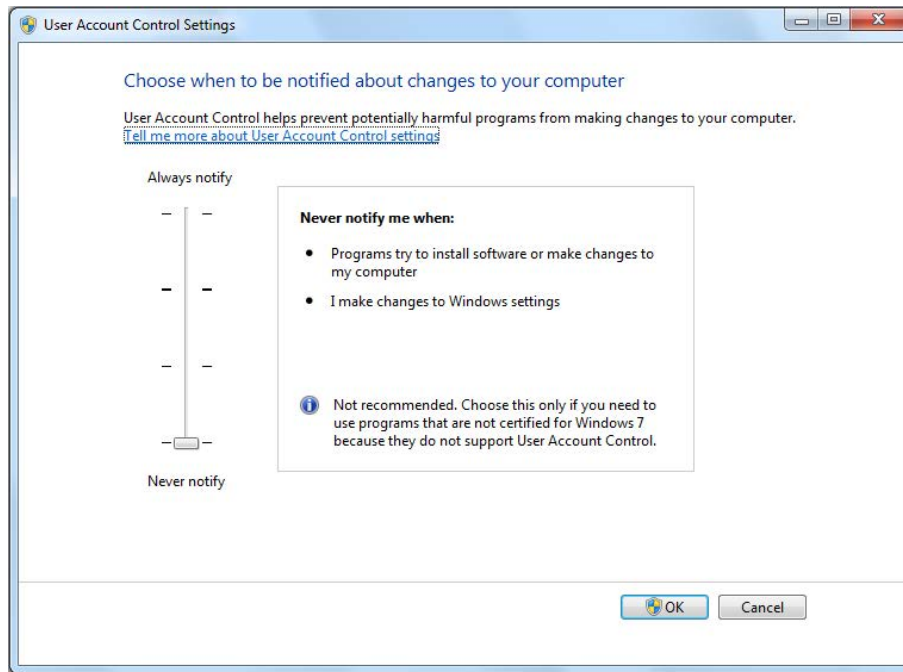
3. Change the value for "AutoAdminLogon" to 1.
4. Click again on the <Start> button, enter the **netplwiz** command in the search field and press <Enter>.

The dialog for configuring the user accounts is opened.
5. Select the user you want to log in automatically and deactivate the checkbox "Users must enter user name and password".
6. In the following dialog, you will be asked to enter the user password. Enter the password and confirm with <OK>.
7. Call once again the Registry Editor.
8. Change the setting for "DefaultDomainName" to the domain the user belongs to.
9. Enter under "DefaultUserName" the user that is to be logged in automatically.
10. Close the Registry Editor and reboot the computer. Now, the user should be logged in automatically.

User account control settings (UAC):

Set notification level to "Never notify". You can open these settings by clicking on the <Start> button and entering "UAC" in the search box.

Adjustments are only necessary here if the automatic start is blocked by the user account control.



3.3 Settings for network cards

For the best experience when using GigE cameras, it is recommended to perform several settings for the used network adapters. These recommendations only apply to network adapters which are connected to GigE cameras.

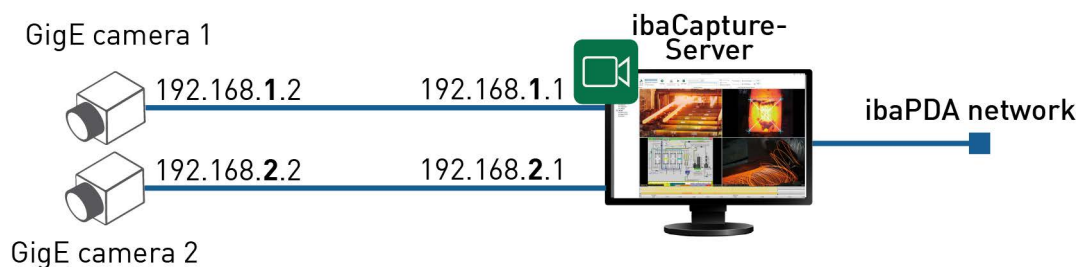
3.3.1 IP and subnet settings

Using unmodified settings of the network interface and a GigE camera, a connection will most likely succeed. In case no IP address has been assigned, both the network interface and the camera will automatically use link-local addresses from the range 169.254.0.0/255.255.0.0.

When a single camera is used, this configuration can be used without limitations. As soon as one or more additional cameras are used, it is recommended to manually set up the IP address configurations.

For each used network adapter, a configuration with a different subnet should be used. As an example, the address of the first adapter could be set to 192.168.1.1, for the second adapter 192.168.2.1 could be used, and so on. In this case it is important to use 255.255.255.0 as a subnet for all adapters.

After changing the addresses of the network adapters, the camera configurations need to be adapted accordingly. So, the camera connected to the first network interface could be configured to use 192.168.1.2, the second camera 192.168.2.2 and so on.



The way to set persistent IP addresses varies with the used GigE SDK and also depending on the camera manufacturer. Please refer to documentation for your installed SDK or for the camera manufacturer. If in doubt, contact iba support to get assistance.

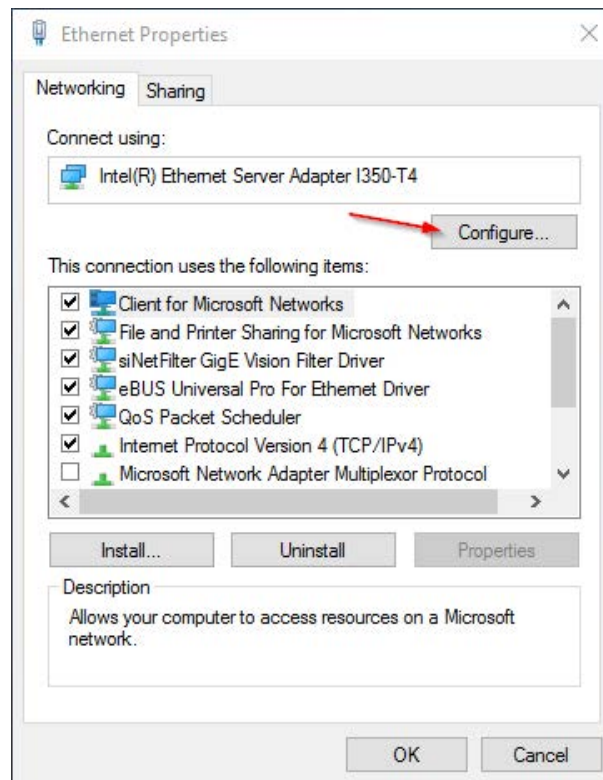
A helpful guide to set IP addresses when using eBUS can be found online:

<https://supportcenter.pleora.com/s/article/configuring-the-network-settings-for-a-gige-vision-device-kbase>.

3.3.2 Driver settings for network adapters

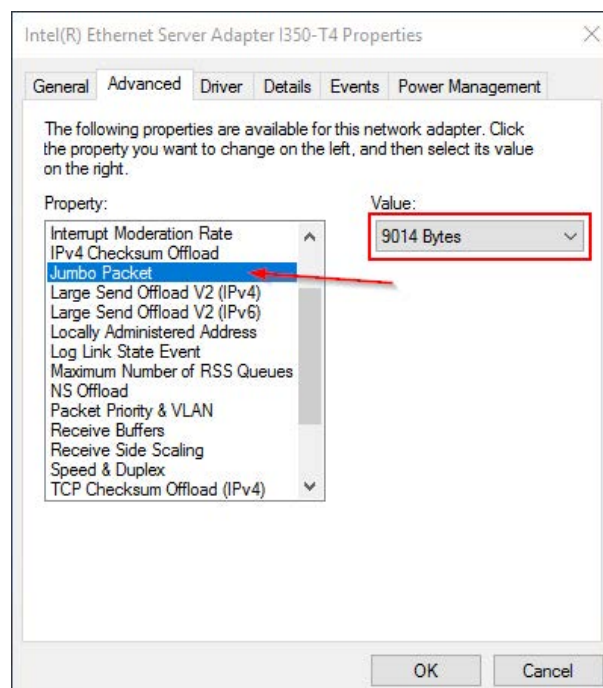
For optimal performance, the following settings should be made in the driver settings for the used network adapters. Please consider that the screenshots shown here were made for Intel adapters. When using different hardware, the same settings might be named differently.

You can access the driver settings from the Ethernet properties dialog:



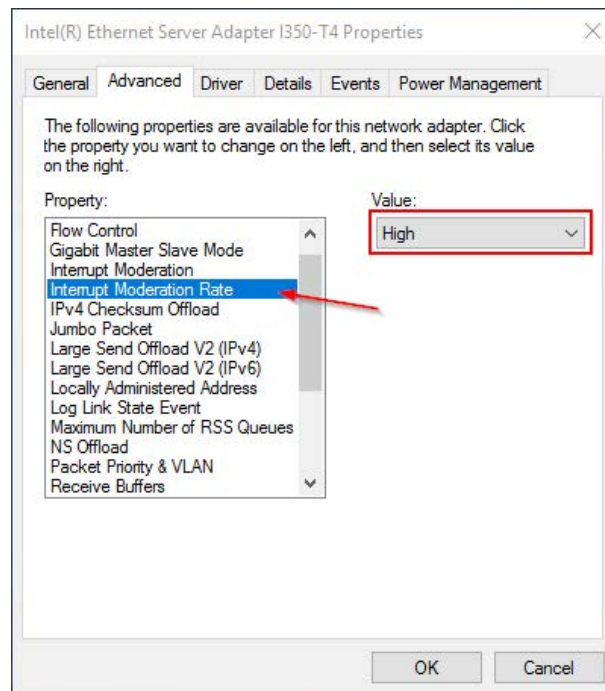
Jumbo packets

To minimize overhead for the network transmission, the packet size should be maximized. This property should be set to the highest possible value.



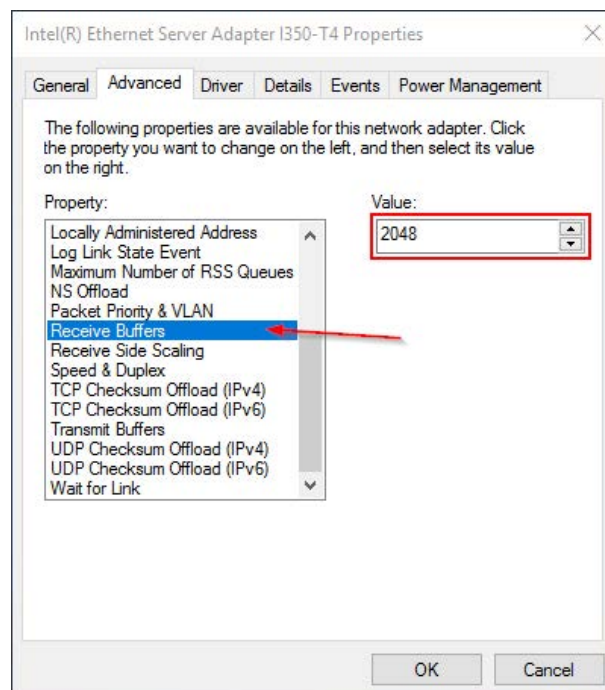
Interrupt moderation

To reduce the number of interrupts and thus the CPU load, the interrupt moderation feature should be adjusted. Interrupt moderation is enabled by default. The value for interrupt moderation rate should be set to "High".



Receive buffers


As the amount of streamed data from GigE cameras is immense, for best stability of the stream it is recommended to increase the size of the receive buffers. The value should be increased to the highest possible setting.

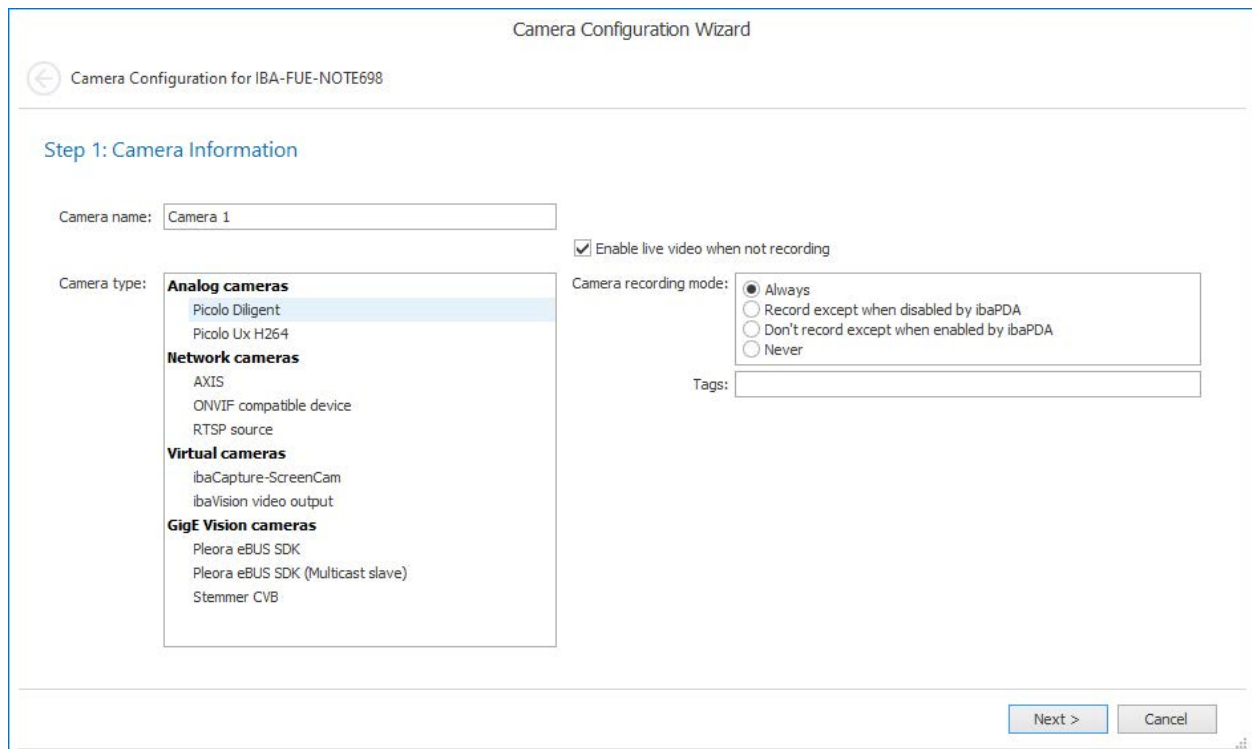


4 Camera configuration

Provided ibaCapture Server is properly installed and running, you can add and configure GigE cameras. Switch to server configuration mode and select the ibaCapture Server the GigE camera is connected to.

4.1 Adding a camera

In order to add a new camera click *Add new camera*  in the ribbon. A configuration wizard guides you through the configuration process.



1. Depending on the used SDK select the corresponding GigE camera type and select the camera recording mode. On a single *ibaCapture* Server, you can only use GigE cameras with the same SDK. It is not possible to configure additional GigE cameras with a different SDK.

You can also enable live video when *ibaCapture* is not recording.

2. Configure the camera settings.
 - For Pleora eBUS SDK cameras see chapter [Pleora eBUS SDK camera configuration](#), page 21
 - For Pleora eBUS SDK Multicast slave cameras see chapter [Pleora eBUS SDK Multicast slave camera configuration](#), page 23
 - For Stemmer CVB cameras see chapter [Stemmer CVB camera configuration](#), page 24
3. Set the streaming ports. For detailed information about streaming ports please refer to the *ibaCapture* manual.

- Configure the storage settings. For detailed information about storage settings please refer to the *ibaCapture* manual.

4.2 Pleora eBUS SDK camera configuration

In the *Camera settings (Pleora eBUS SDK)* dialog, you can make settings for the camera and video encoder configuration.

Camera Configuration Wizard

Camera Configuration for IBA-FUE-WKS519

Step 2: Camera settings (Pleora eBUS SDK)

Configuration

Camera

MAC address: 00-0F-31-5B-9E-5C

☒ Video lost timeout: 1,0 s

[Open settings](#)

Configuration file:

Browse for PVCFG file on this computer:

[Search cameras](#)

Connected GigE cameras at ibaCapture server:

Model	Vendor	MAC Addr...	IP Address
Mako G-03...	Allied Vision T...	00:0f:31:...	169.25...

Video encoder configuration

Encoder type: Intel Quick Sync

Encoder implementation: ☒ Auto ☐ Software ☐ Hardware

Bitrate control: Variable (VBR)

Bitrate: 500 kbit/s

GOP size: 30

[Next >](#) [Cancel](#)

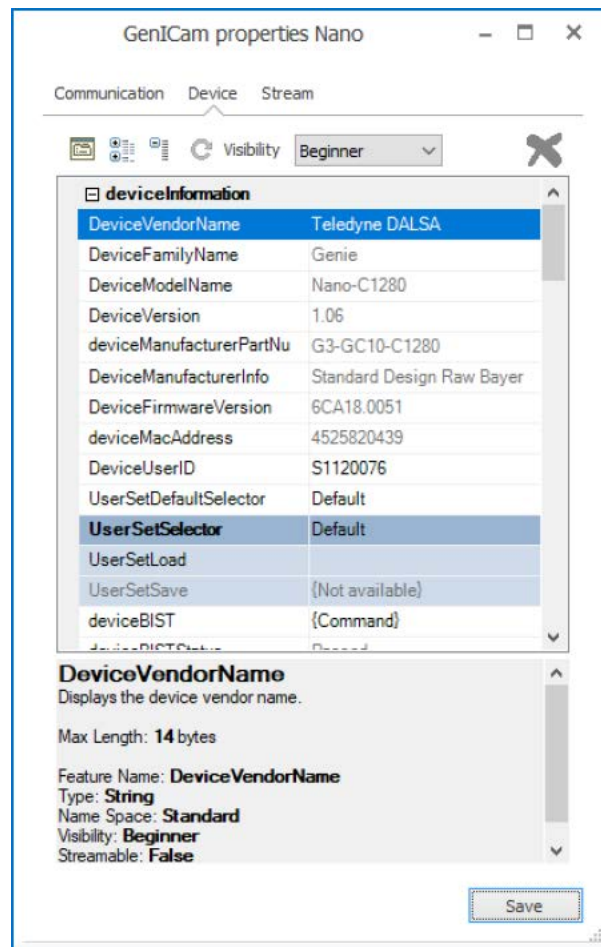
MAC address of the camera

Each camera is uniquely identified by a MAC address. Enter the MAC address of the camera or select it from the list of connected cameras.

Configuration file

Here you can select a PVCFG configuration file. Configuration files in PVCFG format can be created using the eBUS Player application. This is part of the eBUS installation.

You can also create PVCFG configuration files in *ibaCapture*. Click <Open settings> to open a pop-up dialog with all camera settings.



After setting all properties for this specific camera configuration, click <Save> to store the camera settings in a PVCFG file.

Video encoder configuration

Description see chapter [➤ Video encoder configuration](#), page 26

Streaming settings

For detailed information about streaming ports please refer to the *ibaCapture* manual.

4.3 Pleora eBUS SDK Multicast slave camera configuration

In the *Camera settings (Pleora eBUS SDK (Multicast slave))* dialog, you can make settings for the camera and video encoder configuration for the *Pleora eBUS SDK Multicast Slave* camera type.

Camera Configuration Wizard

← Camera Configuration for **192.168.1.100**

Step 2: Camera settings (Pleora eBUS SDK (Multicast slave))

Configuration

- Streaming
- Display settings
- PTZ Configuration

Camera

MAC address:

☒ Video lost timeout:

☒ Determine address and port dynamically

Multicast IP address:

Multicast port:

Connected GigE cameras at ibaCapture server:

Model	Vendor	MAC Address	IP Address
Mako G-192C (50...	Allied Vision Technolog...	00:0f:31:5b:9c...	192.168.1.100

Video encoder configuration

Encoder type:

Device:

Encoder preset:

☒ Enable encoder preset customization

GOP size:

Bitrate control:

Average bitrate:

Maximum bitrate:

MAC address of the camera

Each camera is uniquely identified by a MAC address. Enter the MAC address of the camera or select it from the list of connected cameras.

Video lost timeout

Time span after which "No video signal" error will be shown if no frames are received from the camera.

Determine address and port dynamically

Enable this option to obtain the address and the port of the GigE device that provides the multicast stream automatically.

If it is not possible to receive the multicast address and port dynamically, enter the respective data manually.

Video encoder configuration

Description see chapter [Video encoder configuration](#), page 26.

Streaming settings

For detailed information about streaming ports please refer to the *ibaCapture* manual.

4.4 Stemmer CVB camera configuration

In the *Camera settings (Stemmer CVB)* dialog, you can make settings for the camera and video encoder configuration.

Camera Configuration Wizard

← Camera Configuration for IBA-FUE-WKS519

Step 2: Camera settings (Stemmer CVB)

Configuration

Streaming

PTZ Configuration

Camera

MAC address: 00-0F-31-5B-9E-5C

☒ Video lost timeout: 1,0 s

☐ Use TurboDrive

Open settings

Configuration file:

Browse for GCS file on this computer:

Connected GigE cameras at ibaCapture server:

Model	Vendor	MAC Address	IP Address
Mako G-030...	Allied Vision Te...	00-0F-31-5...	169.254...

Search cameras

Video encoder configuration

Encoder type: Intel Quick Sync

Encoder implementation: ☒ Auto ☐ Software ☐ Hardware

Bitrate control: Variable (VBR)

Bitrate: 500 kbit/s

GOP size: 30

Next > Cancel

Camera

MAC address of the camera

Each camera is uniquely identified by a MAC address. Enter the MAC address of the camera or select it from the list of connected cameras.

Use TurboDrive

TurboDrive is supported by Teledyne Dalsa GigE Vision cameras, but only certain models. When TurboDrive is enabled, GigE cameras compress their frames in a lossless way before sending them to the receiver. Therefore, they are able to send at an increased frame rate. Before enabling this setting, make sure the used GigE camera supports TurboDrive.

When you enable this checkbox while configuring a non-TurboDrive camera, you will experience errors in the image acquisition.

Configuration file

Here you can select a GCS configuration file. GCS files are used to store the camera's settings for this configuration.

One way to set up a GCS file is to use the application "GenICam Browser", which is part of the Common Vision Blox runtime installation.

Alternatively, you can click "Open settings" to access the "GenICam properties" form.

GenICam properties C1280

Maximum visibility:

Camera Information	
Manufacturer Name	Teledyne DALSA
Family Name	Genie
Model Name	Nano-C1280
Device Version	1.06
Manufacturer Part Number	G3-GC10-C1280
Manufacturer Info	Standard Design Raw Bayer
Firmware Version	6CA18.0051
MAC Address	00-01-0D-C2-8A-17
Device User ID	S1120076
Power-up Configuration Set	Factory Setting
User Set Selector [...]	Factory Setting
Device Built-In Self Test	
Device Built-In Self Test Status	Passed
Device Built-In Self Test Status	0
Device Reset	
Device Temperature Set	Internal
DALSA Software Compatibility	TurboDrive 8-bit requires v8.0
Sensor Control	
I/O Controls	
Advanced Processing	

... Tim... Message

After setting the camera features, click the <Save> button in the properties form to save the camera settings as GCS file.

Video encoder configuration

Description see chapter [Video encoder configuration](#), page 26

Streaming settings

For detailed information about streaming ports please refer to the *ibaCapture* manual.

4.5 Video encoder configuration

ibaCapture Encoder supports NVIDIA encoding and Intel Quick Sync video encoding. The desired encoder can be selected from a drop-down menu. The corresponding configuration options will appear accordingly.

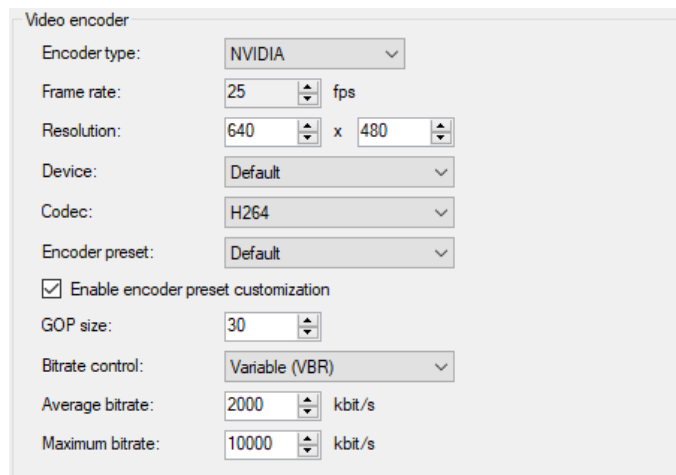
4.5.1 NVIDIA encoding

To use NVIDIA encoding, it is necessary that a supported NVIDIA GPU is installed into the ibaCapture server PC. The support matrix can be found here <https://developer.nvidia.com/video-encode-decode-gpu-support-matrix>.

Important: Pay attention to the column "Max # of concurrent sessions" in the support matrix. If the value is 2, only 2 streams per system will be supported. This is also true if multiple NVIDIA GPUs are installed. Only GPUs from the Quadro series (value "Unrestricted") will allow more concurrent streams. For recording from GigE cameras in *ibaCapture*, one camera requires one stream.

So if you plan to record from more than 2 GigE cameras, it is necessary to install an appropriate GPU. Running *ibaVision* with video outputs via NVIDIA also counts into the number of sessions. In case you are not sure about your application, contact your local iba support for clarification.

Please note that when using an NVIDIA GPU, hardware accelerated Intel® Quick Sync Video encoding will be disabled. If a camera is configured to use Intel Quick Sync, *ibaCapture* Encoder will automatically switch to software-based Intel® Quick Sync Video encoding.



Video encoder

Encoder type: NVIDIA

Frame rate: 25 fps

Resolution: 640 x 480

Device: Default

Codec: H264

Encoder preset: Default

☒ Enable encoder preset customization

GOP size: 30

Bitrate control: Variable (VBR)

Average bitrate: 2000 kbit/s

Maximum bitrate: 10000 kbit/s

Device

GPU on which the encoding will be performed (in case multiple GPUs are installed)

Encoder preset

The NVIDIA encoder API provides different presets. Their names indicate their intended use. If a preset is not supported by the GPU, it reverts to the default preset.

Codec

ibaCapture supports H.264 and H.265 (or HEVC) encoding. The main benefit of H.265 encoding is a reduction of the required storage space compared to H.264 encoding. However, this comes at the cost of an increased demand for processing power (both during encoding and decoding). Select the encoding type in the dropdown menu:

- H.264
- HEVC (H.265)
Device compatibility for HEVC can also be checked in the support matrix. (link at the top of this chapter).

GOP size

GOP (Group Of Pictures) defines the number of pictures after which a full picture, a so called keyframe will be stored. The pictures between the keyframes are derived from the previous keyframe, in between, only changes of the pictures are stored. With a high GOP, possible encoding errors exist longer, with a low GOP, the bitrate and hence the memory requirements of the video stream tend to grow. The default setting 30 is suitable for most of the cameras.

Bitrate control

- VBR (Variable Bit Rate)
With VBR, the bitrate is always set according to the complexity of the taken image. That means, that a high bandwidth is required for a high activity and a low bandwidth for low activity in the video.
- CBR (Constant Bit Rate)
If you select CBR, you can configure a fixed maximum bitrate and hence make sure that the demand for the bandwidth remains calculable. Thus, the maximum value will not be exceeded, no matter how much activity is in the video.

Bitrate

If VBR is configured for the bitrate control, you can configure here the average bitrate. If CBR is selected, you can configure the maximum bitrate here.

Note



Demosaicing of 8-bit Bayer pixel formats is executed on the GPU with the use of the NVIDIA Performance Primitives (NPP) library v9.2. Therefore, make sure your GPU driver supports CUDA 9.2.

4.5.2 Intel Quick Sync video encoding

If you have selected *Intel Quick Sync video* encoding, you can make the following settings.

Video encoder

Encoder type: Intel Quick Sync

☐ Use hardware acceleration

Codec: H264

Bitrate control: Variable (VBR)

Bitrate: 500 Kbps

GOP size: 30 frames

Frame rate: 25 fps

Resolution: 640 x 480

Performance: Compression Speed

Encoder implementation

- **Auto**
Attempts to use hardware acceleration. If no acceleration device was found, software implementation is used.
- **Software**
Use software implementation
- **Hardware**
Use hardware acceleration. Currently, only Intel HD Graphics GPUs are supported.

Codec

ibaCapture supports H.264 encoding as well as H.265 (or HEVC). Select the encoding type in the dropdown menu:

- **H.264**
- **HEVC (H.265)**
When using a hardware encoder, make sure that the device supports this codec. Software-encoding is only possible on 64 bit systems.

Bitrate control

- **VBR (Variable Bit Rate)**
With VBR, the bitrate is always set according to the complexity of the taken image. That means, that a high bandwidth is required for a high activity and a low bandwidth for low activity in the video.
- **CBR (Constant Bit Rate)**
If you select CBR, you can configure a fixed maximum bitrate and hence make sure that the demand for the bandwidth remains calculable. Thus, the maximum value will not be exceeded, no matter how much activity is in the video.

Bitrate

If VBR is configured for the bitrate control, you can configure here the average bitrate. If CBR is selected, you can configure here the maximum permitted bitrate.

GOP size

GOP (Group Of Pictures) defines the number of pictures after which a full picture, a so called keyframe will be stored. The pictures between the keyframes are derived from the previous keyframe, in between, only changes of the pictures are stored. With a high GOP, possible encoding errors exist longer, with a low GOP, the bitrate and hence the memory requirements of the video stream tend to grow. The default setting 30 is suitable for most of the cameras.

Optional settings

Number of asynchronous tasks

The number of asynchronous tasks can be tuned in certain scenarios. The default setting should be okay for most cases.

Use Direct3D memory

Enable this option to use the Direct3D memory of the GPU.

Performance slider

The performance can be adjusted with the slider to prioritize either compression or speed. Please note that a high speed causes low compression and requires large memory space. High compression requires high computing capacity and lowers the speed.

4.6 Camera info

For each camera, there is an "info" branch, where you can enable/disable the camera, find status information, diagnostics and a camera preview.

For detailed information about camera info please refer to the *ibaCapture* manual.

5 Supported GigE cameras

Generally, *ibaCapture* supports all types of GigE Vision compatible cameras which provide the GenICam protocol.

The following web page lists compatible cameras from a few manufacturers:

<https://www.automate.org/products/gige-cameras#results>

iba has tested the following models:

Manufacturer	Model	Resolution	Remark
Dalsa	Genie HM640/HC640	640 x 480	300 fps, monochrome
JAI	RM-6740GE	640 x 480	200 fps, monochrome
Baumer	TXG13c	1392 x 1036	20 fps, color
Basler	acA640-90gc	658 x 492	90 fps, color
Basler	piA2400-17gc	2454 x 2056	17 fps, color
Allied Vision	Mako G-030C	644 x 484	312 fps, color
Allied Vision	Mako G-192C	1600 x 1200	60 fps, color

Notes on the compatibility of GigE cameras

Color resolution

When using GigE Vision compatible cameras, the resolution is limited to 8 Bit. Other formats like e.g. Mono16 cannot be used.

Trigger mode

If the trigger mode is activated in the camera settings, external signals are required for triggering the images. If these external signals are not available, the camera does not provide video. If the trigger mode is not used explicitly, it should be deactivated.

6 Support and contact

Support

Phone: +49 911 97282-14
Email: support@iba-ag.com

Note



If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

Contact

Headquarters

iba AG
Koenigswarterstrasse 44
90762 Fuerth
Germany

Phone: +49 911 97282-0
Email: iba@iba-ag.com

Mailing address

iba AG
Postbox 1828
D-90708 Fuerth, Germany

Delivery address

iba AG
Gebhardtstrasse 10
90762 Fuerth, Germany

Regional and Worldwide

For contact data of your regional iba office or representative please refer to our web site:

www.iba-ag.com