Allied Vision
a **TKH Vision** brand

eGrabber

eGrabber 26.02 Release Notes

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Contents

1. Release Benefits

*Benefits of added or improved features of **eGrabber 26.02***

Allied Vision Frame Grabbers

Extended support for 1X_2YE TapGeometry

This release of **eGrabber** adds the support for 1X_2YE TapGeometry to the "1-camera" firmware variant of **PC3622-T Coaxlink Duo CXP-12** frame grabber.

The 1X_2YE tap geometry is a configuration used in CoaXPress for area-scan cameras that feature two zones across the vertical direction.

> ⊘ **WARNING**
> **Allied Vision Frame Grabbers** are only compatible with cameras manufactured by a company of **TKH vision group**!

eGrabber Studio

Opening multiple sources at the same time

This release of **eGrabber** adds the possibility to open multiple sources at the same time from the `Welcome Tab`.

Multi-part display for GenDC

Added multi-part display support for buffers with GenDC payload type. Each GenDC part can now be enabled or disabled for display from the `Buffer pane`.

Improvements in the Features Pane

This release of **eGrabber** brings the following improvements to the `GenApi tree` of the `Features Pane`:

- Added multi-bank support, which enables the tree view to adapt to the number of sub-grabbers and display all feature values in a merged tree.

- For string-based selectors, the tree view can show the selected features as selector children; the option can be enabled/disabled individually per selector from the context menu option `Show All Selector Values`.

- The GenApi feature values indicate the status of the pending operations (i.e. whether a feature value is currently being updated, read or written).

- The tooltip of GenApi features now also include the access mode or the current operation status when applicable.

- Added `Copy/Paste` of tree item content (using the standard key sequences); this simplifies the configuration process of sub-grabbers by replicating values in multi-bank cases.

2. Release Specification

2.1. Supported Products

This topic shows, for each product series and sub-series, the list of officially[1] supported products by **eGrabber 26.02**.

- The **Product code and name** column shows the order code and the official name of the product.
- The **Class** column shows the functional class of the product (e.g.: Frame Grabber, I/O Extension ...).
- The **Icon** column shows the product icon used in this documentation package.

CoaXPress CXP-6 products

Product code and name	Class	Icon	First release
PC1633-T Coaxlink Quad G3	Frame Grabber	QuadG3	eGrabber 25.10
PC3602-T Coaxlink Octo	Frame Grabber	Octo	eGrabber 25.10

CoaXPress CXP-12 products

Product code and name	Class	Icon	First release
PC3621-LH-T Coaxlink Mono CXP-12-LH	Frame Grabber	Mono12LH	eGrabber 25.10
PC3622-T Coaxlink Duo CXP-12	Frame Grabber	Duo12	eGrabber 25.10
PC3623-T Coaxlink Quad CXP-12 Value	Frame Grabber	Value12	eGrabber 25.10

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[1] Excluding preliminary products

2.2. Firmware Variants

This topic shows, for each officially supported product (group), the list of officially available[1] firmware variants provided with **eGrabber 26.02**.

- The **Firmware variant** column shows the name of the firmware variant.

- The **HCMAP** column shows the **Host Connection Map**[2] .

- The **Features** column shows the main features of the firmware variant.

- The **Description** column shows a one-phrase description of the connection scheme.

- The **Rev.** column shows the revision number of the firmware delivered with this release.

PC1633-T Coaxlink Quad G3

Firmware Variant	HCMAP	Features	Description	Rev.
1-camera	1D4	FFC LUT CFA-12	One 1- or 2- or 4-connection area-scan camera	506
1-camera, 4-data-stream	1D4S4		One 1- or 2- or 4-connection area-scan camera, up to 4 data streams	506
1-camera, line-scan	1D4	FFC LUT FLIPX	One 1- or 2- or 4-connection line-scan camera	506
2-camera	2D22	LUT CFA-35-D0	One or two 1- or 2-connection area-scan cameras	506
2-camera, bayer	2D22	CFA-35	One or two 1- or 2-connection area-scan cameras	506
2-camera, line-scan	2D22	LUT FLIPX	One or two 1- or 2-connection line-scan cameras	506
3-camera	3D211	LUT	One 1- or 2-connection and one or two 1-connection area-scan cameras	506
4-camera	4D1111	LUT	One or two or three or four 1-connection area-scan cameras	506
4-camera, line-scan	4D1111	LUT	One or two or three or four 1-connection line-scan cameras	506

[1] Excluding custom firmware variants

[2] Specific assignment of the Device connections to the Host connectors

PC3602-T Coaxlink Octo

Firmware Variant	HCMAP	Features	Description	Rev.
1-camera	1D8	LUT CFA-123	One 1- or 2- or 4- or 8-connection area-scan camera	506
1-camera, line-scan	1D8	LUT MI	One 1- or 2- or 4- or 8-connection line-scan camera	506
2-camera	2D44	FFC LUT CFA-125	One or two 1- or 2- or 4-connection area-scan cameras	506
2-camera, line-scan	2D44	LUT FLIPX MI PLANAR	One or two 1- or 2- or 4-connection line-scan cameras	506
3-camera	3D422	LUT	One 1- or 2- or 4-connection and one or two 1- or 2-connection area-scan cameras	506
4-camera	4D2222	LUT	One or two or three or four 1- or 2-connection area-scan cameras	506
4-camera, line-scan	4D2222	LUT MI	One or two or three or four 1- or 2-connection line-scan cameras	506
5-camera	5D41111	LUT	One 1- or 2- or 4-connection and one or two or three or four 1-connection area-scan cameras	506
5-camera, 5D22211	5D22211	LUT	One or two or three 1- or 2-connection and one or two 1-connection area-scan cameras	506
8-camera	8D11111111	LUT	Up to eight 1-connection area-scan cameras	506
8-camera, line-scan	8D11111111	LUT MI	Up to eight 1-connection line-scan cameras	506

PC3621-LH-T Coaxlink Mono CXP-12-LH

Firmware Variant	HCMAP	Features	Description	Rev.
1-camera	1D1	LUT	One 1-connection area-scan camera	506
1-camera, line-scan	1D1	LUT	One 1-connection line-scan camera	506

PC3622-T Coaxlink Duo CXP-12

Firmware Variant	HCMAP	Features	Description	Rev.
1-camera	1D2	LUT CFA-3	One 1- or 2-connection area-scan camera	506
1-camera, line-scan	1D2	LUT	One 1- or 2-connection line-scan camera	506
2-camera	2D11	LUT	One or two 1-connection area-scan cameras	506
2-camera, line-scan	2D11	LUT	One or two 1-connection line-scan cameras	506

PC3623-T Coaxlink Quad CXP-12 Value

Firmware Variant	HCMAP	Features	Description	Rev.
1-camera	1D4	FFC LUT CFA-12 BIN	One 1- or 2- or 4-connection area-scan camera	506
1-camera, line-scan	1D4	FFC LUT BIN MI LT	One 1- or 2- or 4-connection line-scan camera	506
2-camera	2D22	LUT	One or two 1- or 2-connection area-scan cameras	506
2-camera, line-scan	2D22	LUT MI LT	One or two 1- or 2-connection line-scan cameras	506
3-camera	3D211	LUT	One 1- or 2-connection and one or two 1-connection area-scan cameras	506
4-camera	4D1111	LUT	One or two or three or four 1-connection area-scan cameras	506
4-camera, line-scan	4D1111	LUT MI	One or two or three or four 1-connection line-scan cameras	506

Features abbreviations

- *BIN*: Pixel binning

- *CFA-12*: Bayer CFA decoding - Methods 1 and 2

- *CFA-123*: Bayer CFA decoding - Methods 1, 2, and 3

- *CFA-125*: Bayer CFA decoding - Methods 1, 2, and 5

- *CFA-2-S0*: Bayer CFA decoding - Method 2 on `Stream0`

- *CFA-3*: Bayer CFA decoding - Method 3

- *CFA-35*: Bayer CFA decoding - Methods 3 and Method 5

- *CFA-35-D0*: Bayer CFA decoding - Methods 3 and 5 on `Device0`

- *FLIPX*: Horizontal image flipping

- *FFC*: Flat-field correction

- *LLE*: Laser line extraction

- *LT*: Mapping of events from the I/O Toolbox to CoaXPress trigger messages `LinkTrigger0` and `LinkTrigger1`

- *LUT*: Lookup table processing

- *MI*: Metadata insertion

- *PLANAR*: RGB to PLANAR_RGB or BGR to PLANAR_BGR conversions

2.3. Camera Interfaces Standard Compliance

CoaXPress

Coaxlink frame grabbers together with **eGrabber 26.02** comply with:

- *CoaXPress Standard 1.0*
- *CoaXPress Standard 1.1*
- *CoaXPress Standard 1.1.1*
- *CoaXPress Standard 2.0*
- *CoaXPress Standard 2.1[1]*

> ⊘ **WARNING**
> **Allied Vision Frame Grabbers** are only compatible with cameras manufactured by a company of **TKH vision group**!

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[1] GenICam GenDC (Generic Data Container) support is optional in CoaXPress 2.1 and is currently not included.

2.4. Supported Operating Systems

See also: Supported Operating Systems History

Windows

eGrabber driver, eGrabber Studio, eGrabber Gigelink, eGrabber Recorder and GenICam Browser (Deprecated) are designed to support all versions of Windows 10 and Windows 11, including the Server and the IoT Enterprise versions on x86-64 (64-bit) platforms.

> ⓘ **WARNING**
> eGrabber 25.12 was the last release supporting Windows 10 versions prior to 1809. Starting with eGrabber 26.01, the minimum Windows 10 version requirements is Windows 10 version 1809 or later.

Release validation

This release has been validated with the following Windows versions:

OS Name & Version	Platform	Notes
Microsoft Windows 10	x86-64 (64-bit)	IoT Enterprise LTSC 2019 - Version 1809
		Enterprise edition - Version 1809
		Enterprise edition - Version 22H2
Microsoft Windows 11	x86-64 (64-bit)	Enterprise edition - Version 22H2
		Enterprise edition - Version 23H2
		Enterprise edition - Version 24H2
Microsoft Windows Server 2025	x86-64 (64-bit)	Standard edition - Version 24H2

> 📝 **NOTE**
> - The driver is signed by Microsoft.
> - Power saving modes of the operating systems (StandBy, Sleep, Suspend...) are not supported.
> - Kernel DMA Protection is not supported.

Linux

eGrabber driver, **eGrabber Studio**, **eGrabber Gigelink**, **eGrabber Recorder** and **GenICam Browser (Deprecated)** are designed to be distribution-independent on **x86-64 (64-bit)**, and **AArch64 (64-bit)** platforms. They are expected to work with a wide range of distributions.

Minimum kernel version requirements

All tools and libraries require kernel version 4.4 or higher

GNU C library (glibc) requirements

All tools and libraries require `glibc` library version 2.23 (or higher)

> ⊘ **WARNING**
> **eGrabber 25.12** was the last release supporting Linux kernel versions prior to version 4.4 and GNU C library version prior to 2.23. Starting with **eGrabber 26.01**, the Minimum kernel version requirements is *Linux kernel version 4.4 or higher* and the GNU C library (glibc) requirements is *GLIBC 2.23 or higher.*

Release validation

This release has been validated with the following distribution(s):

OS Name & Version	Platform	Notes
Linux CachyOS 25.11	x86-64 (64-bit)	Kernel version 6.18.5-2
Linux Fedora 33	x86-64 (64-bit)	Kernel version 5.8.15
Linux OpenSUSE Leap 15.4	x86-64 (64-bit)	Kernel version 5.14
Linux Ubuntu 17.04	x86-64 (64-bit)	Kernel version 4.10
Linux Ubuntu 18.04	AArch64 (64-bit)	Kernel version 5.4.0-42
Linux Ubuntu 20.04 LTS	x86-64 (64-bit)	Kernel version 5.15
Linux Ubuntu 22.04 LTS	AArch64 (64-bit)	Kernel version 5.15
Linux Ubuntu 23.10	x86-64 (64-bit)	Kernel version 6.5
Linux Ubuntu 24.10	x86-64 (64-bit)	Kernel version 6.12.1-realtime

> 🗒 **NOTE**
> Power saving modes of the operating systems (StandBy, Sleep, Suspend...) are not supported.

> **See also:** Installing eGrabber on Linux in the Getting Started section of the Coaxlink series or Grablink Duo Handbooks

macOS

eGrabber driver, **eGrabber Studio** and **GenICam Browser (Deprecated)** are designed to support **all macOS versions from version 10.14** on **x86-64 (64-bit)** platforms and **all macOS versions from version 12.3** on **AArch64 (64-bit)** platforms.

Minimum version requirements

macOS 12.6.3 or higher

Release validation

This release has been validated with the following version(s):

OS Name & Version	Platform	Notes
macOS 12.6.3	AArch64 (64-bit)	A.k.a. Monterey
macOS 12.7.4	x86-64 (64-bit)	A.k.a. Monterey

> **NOTE**
> - The driver for macOS is signed by Euresys using a certificate that has been signed by Apple.
> - Power saving modes of the operating systems (StandBy, Sleep, Suspend...) are not supported.

> **WARNING**
> **eGrabber 25.12** was the last release providing `macos-aarch64-kext` and `macos-x86_64-kext` drivers for macOS.

2.5. Memento

Memento version 4.0 or later is required when using **Coaxlink driver** version 4.0 or later and any version of **eGrabber driver**.

Memento version 9.5 is required to use the **Memento Analyzer**.

2.6. Development Tools

eGrabber driver should be usable with any development tool that supports at least one of these interfaces:

C/C++

eGrabber driver provides four GenICam GenTL producers: `coaxlink.cti`, `grablink.cti`, `gigelink.cti` and `playlink.cti`.

coaxlink.cti

`coaxlink.cti` supports **Coaxlink frame grabbers**, it includes following libraries:

- An x86_64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of x86-64 (64-bit) applications.
- An AArch64 dynamic library designed to be used with ISO-compliant C/C++ compilers for the development of AArch64 (64-bit) applications.

eGrabber

eGrabber driver also provides the `eGrabber` library, a library of C++ classes that provide a high-level interface.

- On Linux, the `eGrabber` library requires `GLIBCXX_3.4.21`/`CXXABI_1.3.9` → `libstdc++.so.6.0.21` or higher.

.NET

- `EGrabber.NET` assembly for Windows, Linux and macOS (Any CPU) targeting .NET 6.0 (previously called .NET Core)
- `EGrabber.NETFramework.dll`: a .NET assembly designed to be used with development environments compatible with .NET Framework 4.6 or higher.

NOTE: Updating an application to use `EGrabber.NETFramework.dll` or `EGrabber.NET.dll` instead of `Coaxlink_NetApi.dll` is easy and recommended.

Python

Python bindings for **eGrabber** allow users to call eGrabber functions and operate **eGrabber-driven frame grabbers** from Python scripts. They are compatible with Python 3.8 or higher under Windows, Linux and macOS.

On Windows, the eGrabber installer adds a shortcut in the Windows Start Menu to install the eGrabber Python bindings.

2.7. Software Tools

*Software tools delivered together with **eGrabber 26.02***

Name	Description
eGrabber Studio	GUI tool for testing the image acquisition with **eGrabber** from Camera Link, CoaXPress and GigE Vision cameras and upgrading the firmware of **eGrabber-driven frame grabbers**. **StudioLink** enables the **new Open eVision Studio** application to connect to an opened **eGrabber Studio** EGrabber source, control the acquisition and get images to process within **Open eVision Studio**.
Firmware Manager Console	Command-line tool for installing or upgrading the firmware embedded in **eGrabber-driven frame grabbers**.
GenTL Console	Command-line tool giving access to all the functions and commands exposed by the Euresys GenTL Producer.

> **NOTE**
> - The **eGrabber driver**, **eGrabber Studio**, **eGrabber Gigelink**, the **Firmware Manager Console**, the **GenICam Browser (Deprecated)** and the **GenTL Console** can be used free of charge with other Euresys products.
>
> - Starting from release 23.04, **eGrabber Studio** includes a **Firmware Manager**.

3. Important Notices

Important notifications to be read before installing and/or using the product on your PC!

3.1. Firmware Revisions

> ⊗ **WARNING**
> **eGrabber driver** checks the compatibility of the firmware installed on every frame grabber. For those having an incompatible firmware, the GenTL driver exposes 0 (zero) Device.
>
> If the requirement is not satisfied for all the **eGrabber-driven frame grabbers** in your system, it is *mandatory* to apply the Firmware Upgrade procedure prior to using this version of the driver.

> 🗒 **NOTE**
> Starting with eGrabber 25.03, the firmware revision numbers are listed, for each firmware-variant in the Firmware Variants table

3.2. CPU Requirements

The image converter requires a CPU that has the Supplemental Streaming SIMD Extension 3 (SSSE3) instruction set.

3.3. Image Buffer Limits

<u>Maximum buffer size</u>

`0xfffffff0` bytes (4 GiB - 16 B) for all operating systems

<u>Number of buffers</u>

The number of buffers is only limited by available system resources.

NOTE: when using very large numbers of buffers, `DSAnnounceBuffer` calls can take longer and longer to complete (or even fail with error code `GC_ERR_CUSTOM_IOCTL_BUFFER_ANNOUNCE_FAILED`). If this happens, the user should set DmaEngineOptimization=LowMemoryUsage in the data stream module.

3.4. Notice for Linux

Important notification to be read before installing and/or using the product on your Linux PC

- **Memento** must be installed prior to **eGrabber**.
- If the **eGrabber** package is already installed, proceed as follows:
  - ☐ Uninstall **eGrabber**.
  - ☐ Install **Memento**.
  - ☐ Re-install **eGrabber**.
- If NVIDIA RDMA is required, read "Notice for NVIDIA RDMA" on page 18

3.5. Notice for NVIDIA RDMA

NVIDIA RDMA is only suppported on Linux.

NVIDIA RDMA samples require a NVIDIA GPU that suppports RDMA.

The NVIDIA RDMA samples allocate memory on the GPU and announce this memory using `NvidiaRdmaMemory`.

See the following files in the eGrabber sample programs:

- `cpp/egrabber/samples/503-grabn-cuda-rdma-process.*`
- `cpp/nvidia/egrabber-cuda` with the command line argument `cudaRDMA`

<u>Installation instructions:</u>

- NVIDIA CUDA drivers:

- Follow the installation instructions from: https://developer.nvidia.com/cuda-downloads?target_os=Linux&target_arch=x86_64&Distribution=Ubuntu&target_version=20.04&target_type=deb_network

- NVIDIA driver sources:

  - These are needed to produce the `Module.symvers` file associated with the installed nvidia driver. This file will be required to install the `eGrabber` package

  - Select the appropriate driver from https://www.nvidia.com/download/index.aspx?lang=en-us

  - Make sure to download the version that matches the `nvidia-<version>` already installed in `/usr/src/`

  - Extract the archive with `-x` option

  - Change to directory kernel in the extracted archive

  - Run `make module`

  - The file `Module.symvers` should have been generated

- eGrabber package

  - Extract the `egrabber-linux-x86_64` archive

  - Install the package with the following command:
    `sudo NVIDIA_KERNEL_PATH=<dir path containing Module.symvers> ./install.sh`

The line `Enabling NVIDIA RDMA build` should appear during the installation of the `eGrabber` package.

A successful build can be confirmed if the command `lsmod | grep coaxlink` (or `lsmod | grep grablink`) indicates that `coaxlink` (or `grablink`) module depends on `nvidia`.

3.6. Notices for macOS

Important notifications to be read before installing the driver on your Mac

Driver types

Install the **Memento** package corresponding to the **eGrabber** driver type:

eGrabber driver package	Memento package
egrabber-macos-aarch64-dext-<MA.MI.RE.BU>.pkg	memento-macos-aarch64-dext-<MA.MI.RE.BU>.pkg
egrabber-macos-x86_64-dext-<MA.MI.RE.BU>.pkg	memento-macos-x86_64-dext-<MA.MI.RE.BU>.pkg

> ✅ **TIP**
> `dext` drivers operate in user-mode using the default `Full Security` policy level.

> ⊗ **WARNING**
>
> **eGrabber 25.12** was the last release providing `macos-aarch64-kext` and `macos-x86_64-kext` drivers for macOS.

4. Release Details

4.1. Products Update

*Modification(s) to the list of supported products and or accessories in **eGrabber 26.02***

See also: "Coaxlink series Handbook" PDF document

4.2. Firmware Variants Update

Added (or removed) firmware variants in **eGrabber 26.02**

Added firmware variants

PC3625 Coaxlink QSFP+

Firmware variant	HCMAP	Processing	Description
4-camera, line-scan	4D1111	LUT MI	One or two or three or four 1-connection line-scan cameras

4.3. Features Updates

*Added and improved features in **eGrabber 26.02***

eGrabber

- Added support for Linux kernels built with `Clang` and `LLVM` utilities

- `cti` Added `DEVICE_INFO_CUSTOM_IS_REMOTE_READY` to indicate that the remote device is accessible or not (e.g. disconnected or no longer reachable)

- Added DmaEngineMaxQueueSize[LowMemoryUsage]

  - DmaEngineMaxQueueSize defines the maximum number of pending buffers (i.e., buffers queued for DMA operations)

  - Previously, DmaEngineMaxQueueSize was ignored when DmaEngineOptimization was set to LowMemoryUsage

  - The default value of DmaEngineMaxQueueSize[Default] is 100 (as before)

  - The default value of the new DmaEngineMaxQueueSize[LowMemoryUsage] is 1 (same behavior as before); higher values will use more system resources but will lead to lower latency and higher PCIe throughput

  - Increasing DmaEngineMaxQueueSize[LowMemoryUsage] after one or more buffers have been announced can take a long time when system resources are limited; similarly, announcing a buffer after DmaEngineMaxQueueSize[LowMemoryUsage] was set to a value larger than 1 can take a long time when system resources are limited; DmaEngineQueueSetupTimeout can be used to apply a time limit to these operations

Frame grabbers

- `Coaxlink` Further improved `ecamera` scripts to lower the amount of descriptors per buffer under specific conditions by adjusting the buffer allocation alignment (initially introduced in 26.01

eGrabber Studio

- Added the possibility to open multiple sources at the same time from the `Welcome Tab` by holding down the `Ctrl` (`Cmd` on macOS) or `Shift` key when selecting entries, or by holding down the left mouse button and dragging

- Added multi-part display for buffers with **GenDC** payload type; the display of each **GenDC** part can be enabled or disabled from the `Buffer pane`

- Improved GenApi tree of the `Features Pane`

    - Added multi-bank support; the number of columns of the tree view adapts to the number of sub-grabbers, the feature values of all sub-grabbers are now displayed in a merged feature tree

    - For string-based selectors, the tree view can show the selected features as selector children; the option can be enabled/disabled individually per selector from the context menu option `Show All Selector Values`

    - The GenApi feature values indicate the status of the pending operations (i.e. whether a feature value is currently being updated, read or written)

    - The tooltips of GenApi feature values were improved (they also include the access mode or the current operation status when applicable)

    - Added `Copy/Paste` of tree item content (using the standard key sequences); this can help sub-grabber configurations by replicating values in multi-bank cases

- Improved handling of the remote device when it's no longer detected.
  eGrabber Studio queries `DEVICE_INFO_CUSTOM_IS_REMOTE_READY` on a regular basis (or when an error occurs) when accessing a feature from the `Features Pane`. If the remote device is no longer detected, the user interface adapts accordingly and the remote device cannot be further used unless the remote device is again detected. When the device is again detected (e.g. the CoaXPress device rebooted), the interface is refreshed to show "up to date" remote device feature/register values as well as selected feature values (if the view is enabled)

- The `Dump Selected features` view now keeps the previous selectors in a list for quicker access

- Improved consistency and behavior of toggle buttons icons in the `Features Pane`; they now behave like the sources and modules tabs

4.4. Solved Issues

*Solved issues in **eGrabber 26.02***

eGrabber

- `GenApi` Improved selector syntax when the current selector value is not available; in this case, the selector value cannot be rolled back afterward

- `GenApi`: fixed parsing of `xs:float` elements starting with a ., for example `.25`

- Fixed handling of GenDC descriptors with components containing 0 parts

eGrabber Studio

- Fixed issues in the XML pane where the text could not be selected or was incorrectly highlighted in some situations

- Scrolling on the right side of the GenApi feature tree is now possible without interacting with the feature values

eGrabber Studio

4.5. Breaking Changes

Changes in the API that are not backward compatible

Since eGrabber 26.01

Moved built-in scripts `egrabber://save-state.js` and `egrabber://restore-state.js` into `egrabber://deprecated/`

Since eGrabber 25.09

- On Windows, `coaxlink.cti`, `grablink.cti`, `gigelink.cti`, and `playlink.cti` now look for their configuration files (`coaxlink.ini`, `grablink.ini`, `gigelink.ini`, and `playlink.cfg` respectively) in `%PUBLIC%\Documents\Euresys\eGrabber\` instead of `%PUBLIC%\Documents\eGrabber\`

- Removed 2 member variables from `NewBufferData`; these member variables are for internal use only and should not be used:
  - `Python` `NewBufferData.dsh` and `NewBufferData.bh`
  - `.NET` `NewBufferData::DataStreamHandle` and `NewBufferData::BufferHandle`

Since eGrabber 25.07

Removed `BUFFER_INFO_CUSTOM_STREAM_LINE_WIDTH`, `BUFFER_INFO_CUSTOM_STREAM_LINE_PITCH`, `BUFFER_INFO_CUSTOM_STREAM_STRIPE_HEIGHT`, `BUFFER_INFO_CUSTOM_STREAM_STRIPE_PITCH`, `BUFFER_INFO_CUSTOM_STREAM_STRIPE_OFFSET`, and `BUFFER_INFO_CUSTOM_STREAM_BLOCK_HEIGHT`, which were deprecated since eGrabber 24.09

> ⊘ **WARNING**
> - `BUFFER_INFO_CUSTOM_STREAM_STRIPE_ARRANGEMENT` is deprecated and will be removed in a future release
> - `StripeArrangement=Geometry_1X_1YE` is deprecated and will be removed in a future release; `StripeArrangement=Geometry_1X_1Y` with `ReverseY=True` should be used instead

Since eGrabber 25.04

- `.NET` Fixed a typo in `EGrabberDiscovery`; the property `GentTL` has been renamed to `GenTL`; an application using `EGrabberDiscovery.GentTL` will no longer work starting from this release of eGrabber unless it's updated to use `EGrabberDiscovery.GenTL` instead

- Deprecation of `EGrabbers.h` is now enforced; `EGrabbers.h` was deprecated in **eGrabber 22.03**; two options to fix user code:
  - `recommended change` use `EGrabberDiscovery` instead of `EGrabbers`
  - add `#define EURESYS_USE_EGRABBERS_DEPRECATED_API` before `#include <EGrabbers.h>`

Since eGrabber 24.09

`.NET` Improved `EGrabber.NET` API to support buffers larger than 2GiB

Since eGrabber 24.06

cti configuration files locations

- `coaxlink.cti`, `grablink.cti`, and `gigelink.cti` now look for their configuration file (`coaxlink.ini`, `grablink.ini`, and `gigelink.ini`, respectively) in the eGrabber configuration directory:

  - □ on Windows: `%PUBLIC%\Documents\Euresys\eGrabber\`

  - □ on Linux: `/etc/opt/euresys/egrabber/`

  - □ on macOS: `/usr/local/etc/opt/euresys/egrabber/`

Since eGrabber 22.08

eGrabber Recorder : Removed asynchronous writes

- The eGrabber Recorder binary interface has not changed, however the arguments related to async handles are no longer functional; applications using this API need to be adapted (depending on the application architecture, a dedicated thread will be required to perform the writes in the background).

- The Recorder Python bindings have been adapted to remove the asynchronous writes as well as the Record flags (e.g. `recorder.read()` now returns a tuple with 2 elements instead of 3).

Since eGrabber 22.05

- Previously, enableEvent<NewBufferData> was implicitly performed in the constructor of `EGrabber`.

- Now, enableEvent<NewBufferData> is performed in `start` unless `NewBufferData` event has been disabled beforehand; any attempt to pop a `NewBufferData` structure before `start` and without explicitly enabling `NewBufferData` event will lead to an error.

Since eGrabber 19.0

The minimal GLIBC version required for x86-64 (64-bit) Linux binaries is now 2.14.

Since eGrabber 14.0

- `BUFFER_INFO_SIZE_FILLED` now reports the number of bytes transferred, excluding padding (if any)

- `BUFFER_INFO_DATA_SIZE` reports the value that was previously reported by `BUFFER_INFO_SIZE_FILLED`

Since Coaxlink 12.2

`NeverWrite` is the new default value of `CxpLinkConfigurationOption`.

NOTE: The recommended way to set the CoaXPress link configuration is by using the equivalent feature in the remote device module; this can be named `ConnectionConfig`, `LinkConfig`, or `CxpLinkConfiguration` depending on the camera.

NOTE: Alternatively, the previous behavior can be restored by setting `CxpLinkConfigurationOption` to `AlwaysWrite`. However, the GenApi cache for this register might become invalid!

Since Coaxlink 12.0

- **PC1637 Coaxlink Quad 3D-LLE**: `STREAM_INFO_CUSTOM_WIDTH` and `BUFFER_INFO_WIDTH` are now multiplied by two if two laser-lines are extracted

- The Coaxlink .NET assembly targets:

  □   the .NET framework 2.0 in Coaxlink versions up to 11.x

  □   the .NET framework 4.0 in Coaxlink versions 12.0 and higher

Since Coaxlink 11.1

Behavior of PC1637 Coaxlink Quad 3D-LLE from firmware revision 285:

- The line pitch alignment has been changed to 16 bytes (before firmware revision 285, the line pitch alignment of the card was 8 bytes); this means the `Width` of the camera must be a multiple of 16 (`Mono8`).

- When the extraction is disabled, the card behaves like an area-scan variant (and the data stream feature BufferHeight is not available); when the extraction is enabled, BufferHeight is available and determines the number of profiles to extract; when the extraction is disabled, applications no longer require extra care to make sure acquisitions always start with the first line of the acquired images.

CoaXPress

Ignore any remote device whose master connection is not connected to the first connector of a Coaxlink Device; the driver now requires a master connection to be connected to the first connector whereas the extension connections can be connected to the remaining Coaxlink Device connectors in any order.

> See also: "Firmware Variants" on page 8 for the applicable connection schemes.

Image converter

Updated `ImageConvertInput` and `ImageConvertOutput` structures.
Subsequent potential build issues can be fixed by either:

- using `IMAGE_CONVERT_INPUT` and `IMAGE_CONVERT_OUTPUT` initialization macros (recommended approach) or

- adding the suffix `Version0` to `ImageConvertInput` and `ImageConvertOutput` types.

NOTE: Users of EGrabber are not affected by this breaking change

Since Coaxlink 10.3

PayLoadSize behavior: The feature `PayloadSize` is not available anymore when the remote device `Width` is not in line with the data stream `Width.Inc`

Since Coaxlink 10.2

Additional constructor parameter required: The grabber classes (based on `EGrabber`) instanciated by `EGrabbers` require the additional constructor parameter (`bool remoteRequired`).

> See also: sample "*213-egrabbers*" for details

Since Coaxlink 10

Deprecated the functions `Features, RegexFeatures, GlobFeatures, EnumEntries, RegexEnumEntries, GlobEnumEntries` from namespace Euresys, which are still available by `#defining EURESYS_USE_NS_ EURESYS_DEPRECATED_API`. Two options to fix user code:

1. *Recommended change* Replace all occurrences of:

   □ `Euresys::Features()` by `Euresys::query::features()`

   □ `Euresys::RegexFeatures(re)` by `Euresys::query::features().regex(re)`

   □ `Euresys::GlobFeatures(g)` by `Euresys::query::features().glob(g)`

   □ `Euresys::EnumEntries(f)` by `Euresys::query::enumEntries(f)`

   □ `Euresys::RegexEnumEntries(f,re)` by `Euresys::query::enumEntries(f).regex(re)`

   □ `Euresys::GlobEnumEntries(f,g)` by `Euresys::query::enumEntries(f).glob(g)`

2. Or add `#define EURESYS_USE_NS_EURESYS_DEPRECATED_API` before `#include <EGrabber.h>` (or `#include <EGenTL.h>`), a quick fix that doesn't require changing source code.

Since Coaxlink 9.3.1

Removed data stream event counts from the list of possible contexts of device event notifications: StartOfCameraReadoutEventCount, EndOfCameraReadoutEventCount, StartOfScanEventCount, EndOfScanEventCount, RejectedFrameEventCount, and RejectedScanEventCount are no longer valid values for EventNotificationContext1, EventNotificationContext2, and EventNotificationContext3 in the device module.

Since Coaxlink 9.3

Data stream features StartOfScanTriggerSource, EndOfScanTriggerSource and ScanLength are now reset by the data stream feature StreamReset. Previously, they were reset by the device feature DeviceReset.

Since Coaxlink 9.2

GenApi Features Range Checking

Range checking will prevent applications from setting forbidden values to camera features. A meaningful error will be reported if such an event should happen.

Since Coaxlink 9.1.1

Camera Model - Exposure Time Range Boundaries

When ExposureTimeMin and/or ExposureTimeMax are/is set, the order in which the features ExposureTimeMin, ExposureTimeMax and ExposureTime are set is imposed by the constraints.

Since Coaxlink 7.1.1

GenTL 1.5 header file

Moved to standard GenTL 1.5 header file (was previously GenTL 1.4):

- GenTL 1.5 changed namespace from `GenICam::Client` to `GenTL`,

- Coaxlink custom GenTL definitions have been moved accordingly from the namespace `GenICam::Client::Euresys` to namespace `GenTL::EuresysCustomGenTL`,

- replaced header file `GenTL_v1_4.h` by `GenTL_v1_5.h`,

- replaced header file `GenTL_v1_4_EuresysCustom.h` by `GenTL_v1_5_EuresysCustom.h`.

Euresys::GenTL class renaming

Renamed the class `Euresys::GenTL` into `Euresys::EGenTL` to avoid name conflicts with the new standard GenTL 1.5 namespace `GenTL`. This will impact any code using the class `Euresys::GenTL`:

- renamed header file `EuresysGenTL.h` into `EGenTL.h`,

- renamed header file `EuresysGenTLErrors.h` into `EGenTLErrors.h`,

- `Euresys::EGenTL` is now declared in header file `EGenTL.h`.

Deprecated Euresys::SharedGenTL Class

Deprecated the class `Euresys::SharedGenTL`, which is still available by defining `EURESYS_USE_SHAREDGENTL_DEPRECATED_API`.

Two options to fix user code:

1. *Recommended change* Replace all occurrences of `Euresys::SharedGenTL` by `Euresys::EGenTL`,

2. Or add `#define EURESYS_USE_SHAREDGENTL_DEPRECATED_API` before `#include <EGrabber.h>`, a quick fix that doesn't require changing source code.

GenTL 1.5 Changes

Announcing or revoking buffers while acquiring returns the error code `GC_ERR_BUSY` (was `GC_ERR_RESOURCE_IN_USE` for GenTL 1.4)

Revoking a queued buffer returns the error code `GC_ERR_BUSY` (was `GC_ERR_RESOURCE_IN_USE` for GenTL 1.4)

New device access status values (defined by GenTL 1.5) returned by the GenTL functions `IFGetDeviceInfo` and `DevGetInfo` for the command `DEVICE_INFO_ACCESS_STATUS`:

- `DEVICE_ACCESS_STATUS_OPEN_READWRITE`: when the device is opened by the current producer with read/write access

- `DEVICE_ACCESS_STATUS_OPEN_READONLY`: when the device is opened by the current producer with read-only access

Since Coaxlink 7.0.0

Product Rename

Renamed **Coaxlink Duo PCIe/104** into **Coaxlink Duo PCIe/104-MIL**; this will impact the names of GenTL interfaces (i.e., `INTERFACE_INFO_ID`)

OemSafetyKey Length

The length of ProgramOemSafetyKey and CheckOemSafetyKey is now limited by a user-configurable MaximumOemKeyLength (4096 characters by default)

LUT Configuration Locking

 LUT configuration features (datastream) are locked while grabbing.

CIC Features Availability

Features related to the CIC (device) are not available when CameraControlMethod is NC or EXTERNAL.

Since Coaxlink 4.6.1

EGrabber API

Deprecated EGrabber method announceBuffer (superseded by announceAndQueue).

Two options to fix user code:

1. *Recommended change* Replace all occurrences of announceBuffer by announceAndQueue
   (GenTLMemory(...)) or announceAndQueue(UserMemory(...)),

2. Or add #define EURESYS_USE_EGRABBER_DEPRECATED_API before #include <EGrabber.h>.

Since Coaxlink 4.5.1

Euresys Name Space for EGrabber Classes

EGrabber C++ classes now belong to Euresys namespace.

Two options to fix user code:

1. *Recommended change* Replace each occurrence of EGrabber by Euresys::EGrabber,

2. Or add using namespace Euresys; after #include <EGrabber.h>.

Since Coaxlink 4.4.1

EGrabber API

The API of EGrabber .NET classes have changed since Coaxlink 4.4.0 beta. GenTL class now behaves like SharedGenTL, which is what most users need

NOTE: The GenTL constructor accepts a new argument, named shared, which can be used to revert to the old behavior.

RGBConverter.h

Added inplace1x2yeReordering methods instead of Inplace1x2yeReordering class

NOTE: User code needs to be adapted to call inplace1x2yeReordering instead of creating an Inplace1x2yeReordering instance, please see include/RGBConverter.h for a code sample.

Since Coaxlink 4.4.0

.NET Assembly

Added new assembly exposing EGrabber classes, previous CoaxlinkGrabber classes are removed from the assembly.

EGrabber

Deprecated getInfoString methods (replaced by getInfo).

Two options to fix user code:

1. *Recommended change* Replace all occurrences of getInfoString<module> (and getBufferInfoString) by getInfo<module, std::string> (and getBufferInfo<std::string>)

2. Or add #define EURESYS_USE_EGRABBER_DEPRECATED_API before #include <EGrabber.h>.

GenTL C++ class

Deprecated bayerConvert function

Though the function bayerConvert is superseded by the image converter, it is still possible to use it, if required please add #define EURESYS_USE_BAYER_DEPRECATED_API before #include <EuresysGenTL.h> or #include <EGrabber.h>

Since Coaxlink 4.3

Data Stream Module GenApi feature

UnpackingMode: Changed default value to LSB (instead of MSB)

Since Coaxlink 4.1

Device Module features changes

- Merged CycleTriggerSource and CycleHardwareTriggerSource features.

- Renamed CycleSoftwareTrigger into StartCycle.

- Renamed CyclePeriodTarget into CycleMinimumPeriod.

- Renamed ErrorCounter into ErrorCount.

- Renamed ErrorCounterReset into ErrorCountReset.

- Removed backward compatibility for deprecated features: `TriggerSource`, `TargetFramePeriod`, `ExposureRecovery`.

5. Known Issues

*Known issues of **eGrabber 26.02***

5.1. Deviations from the GenTL Specification

EventKill

GenTL specification

The GenTL specification states that:

- In case of multiple pending wait operations EventKill causes one wait operation to return with a GC_ERR_ABORT error code.

- This means that if more than one thread waits for an event, the EventKill function terminates only one wait operation and other threads will continue execution.

- Therefore in order to cancel all pending wait operations EventKill must be called as many times as wait operations are pending.

- In case this function is called while no wait operation was pending the next call to EventGetData will return a GC_ERR_ABORT.

> **NOTE**
>
> - This implementation is prone to race conditions: calling EventKill N times in a row to kill exactly N waiting threads is not guaranteed to work as expected because signaling an event that is already in the signaled state has no effect. In other words, some of the EventKill calls could have no effect.
>
> - EventKill as specified is not easy to use: How many EventKill calls are required? How many EventGetData calls should we expect to return GC_ERR_ABORT? Note that race conditions affect these questions.

Euresys GenTL implementation

The Euresys GenTL implementation solves these issues, but differs slightly:

- EventKill aborts all pending wait operations on the event handle.
- EventKill has no impact on subsequent wait operations.

DSStopAcquisition

GenTL specification

The GenTL specification states that:

- Each call to DSStartAcquisition must be accompanied by a call to DSStopAcquisition.

- Argument iNumToAcquire passed to DSStartAcquisition sets the number of filled delivered buffers after which the acquisition engine stops automatically.

- There must be a call to DSStopAcquisition accompanying each call to DSStartAcquisition even though the stream already stopped because the number of frames to acquire was reached.

- DSStopAcquisition returns GC_ERR_RESOURCE_IN_USE when the acquisition engine has already been terminated or has not been started.

Euresys GenTL implementation

The Euresys GenTL implementation differs slightly:

- DSStopAcquisition will not return GC_ERR_RESOURCE_IN_USE if the data stream hasn't been started.

- DSStopAcquisition will not return GC_ERR_RESOURCE_IN_USE if the data stream has already been stopped by a prior call to DSStopAcquisition.

- DSStopAcquisition will not return GC_ERR_RESOURCE_IN_USE if the data stream has stopped automatically after iNumToAcquire images have been captured.

In other words, DSStopAcquisition is idempotent: it can be applied multiple times without changing the result beyond the initial application.

With the Euresys implementation, it is not necessary to treat some errors as normal, and race conditions (between DSStopAcquisition and the automatic stop of the data stream are avoided. Furthermore, if the data stream has stopped automatically after acquiring iNumToAcquire images, DSStartAcquisition can be called without first calling DSStopAcquisition.

5.2. Deviations from the PCI Express Specification

Applies to **PC1633-T Coaxlink Quad G3.**

QuadG3

PC1633-T Coaxlink Quad G3operates only at PCIe 2.0 and PCIe 3.0 link speeds.

This product cannot be used when inserted in PCIe revision 1.x slots.

5.3. GenICam Browser (Deprecated) and gentl view Limitations

Only images having a width aligned on a 4-bytes boundary can be displayed correctly.
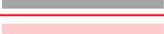
6. Appendix

6.1. About Icons

Icons are used everywhere in the eGrabber documentation to represent a specific product. They are particularly useful in "Applies to" elements to obtain a compact representation of a product list.

Applies to:

| Duo | QuadG3 | Octo | Mono12LH | Duo12 | Value12 |

Icons used in this edition of the eGrabber documentation

Icons are composed of graphical elements characterizing the product:

Background	Description
	Analog product (Domino series)
	SDTV product (Picolo series)
	HDTV product (Picolo HD and Picolo.net series)
	Camera Link product (Grablink series)
	CoaXPress product (Coaxlink series)
	CoaXPress-over-Fiber product (Coaxlink series)
	Accessory product
	Software libraries
	Free software

Text	Description
Alphanumeric	Shortened product name (e.g. "Value12", "QSFP+") - Only for main products
Number	Product code w.o. prefix (e.g. 1625) - For accessories

Top border	Description
	Low performance camera interface (e.g. CXP-6, CL-85)
	High performance camera interface (e.g.CoF 10, CXP-12)
	Highest performance camera interface (e.g. CoF-25)

Badge	Description
Prelim	Preliminary
REQ	Product on request
NRND	Not recommended for new designs
EOL	End-of-life product

Top-left corner triangle	Description
Red	Allied Vision product