Vision Point API and Firmware
Release Notes

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KAYA INSTRUMENTS

www.kayainstruments.com

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6.2	09/2022	Vision Point API release 6.2
6.2.1	11/2022	Vision Point API release 6.2 (Service pack 1)
6.3.0	01/2023	Vision Point API release 6.3.0

Table 1 – Revision History

3 Introduction

3.1 Safety precautions

With your KAYA's board in hand, please take the time to read through the precautions listed below to prevent preventable and unnecessary injuries and damage to you, other personnel, or property. Read these safety instructions carefully before your first use of the product, as these precautions contain safety instructions that must be observed. Be sure to follow this manual to prevent misuse of the product.

⚠ **Caution! Read Carefully and do not disregard these instructions.**
In case of a failure, disconnect the power supply Disconnect the power supply immediately and contact our sales personnel for repair. Continuing to use the product in this state may result in a fire or electric shock.
If an unpleasant smell or smoking occurs, disconnect the power supply. Disconnect the power supply immediately! Continuing to use the product in this state may result in a fire or electric shock. After verifying that no smoking is observed, contact our sales personnel for repair.
Do not disassemble, repair or modify the product. It might result in a fire or electric shock due to a circuit shortage or heat generation. Contact our sales personnel before inspection, modification, or repair.
Do not place the product on unstable surfaces. Otherwise, it may drop or fall, resulting in injury to persons or the camera.
Do not use the product if dropped or damaged. Otherwise, a fire or electric shock may occur.
Do not touch the product with metallic objects. Otherwise, a fire or electric shock may occur.
Do not place the product in dusty or humid environments, nor where water may splash. Otherwise, a fire or electric shock may occur.
Do not wet the product or touch it with wet hands. Otherwise, the product may fail or cause a fire, smoking, or electric shock.
Do not touch the gold-plated sections of the connectors on the product. Otherwise, the surface of the connector may be contaminated by sweat or skin oil, resulting in contact failure of a connector, malfunction, fire, or electric shock due to static electricity discharge.
Do not use or place the product in the following locations. ▪ Unventilated areas such as closets or bookshelves. ▪ Near oils, smoke, or steam. ▪ Next to heat sources. ▪ A closed (and not running) car where the temperature becomes high. ▪ Static electricity replete locations ▪ Near water or chemicals. Otherwise, a fire, electric shock, accident, or deformation may occur due to a short circuit or heat generation.
Do not place heavy objects on the product. Otherwise, the product may be damaged.
Be sure to discharge static electricity from the body before touching any sensitive electronic components. The electronic circuits in your computer and the circuits on the *Iron* camera and the *Predator II* board are sensitive to static electricity and surges. Improper handling may seriously damage the circuits. In addition, do not let your clothing come in contact with the circuit boards or components. Otherwise, the product may be damaged.

3.2 Disclaimer

KAYA Instruments assumes no responsibility for any damage that may ensue by using this product for any purpose other than intended, as previously stated. Without detracting from what was previously written, please be advised that the company will take no responsibility for any damages caused by:

- Earthquake, thunder strike, natural disasters, a fire caused by use beyond our control, willful and/or accidental misuse and/or use under other abnormal and/or unreasonable conditions.
- Secondary damages caused by the use of this product or its unusable state (business interruption or others).
- Use of this product in any manner that contradicts this manual or malfunctions due to connection to other devices. Damage to this product that is out of our control or failure due to modification
- Accidents and/or third parties that may be involved.

Additionally, **KAYA Instruments** assumes no responsibility or liability for:

- Erasure or corruption of data caused by the use of this product.
- Any consequences or other abnormalities following the use of this product

4 Release notes

The purpose of this document is to describe the changes, enhancements, and bug fix report for the new version release of Vision Point software API and Firmware versions.

4.1 Release notes Vision Point 2023.1/API 6.3.0/Firmware 6.x

4.1.1 New features

1. Frame Grabber multi-process sharing (require supporting Grabber firmware):
    a. Access the same grabber from multiple processes for better control and monitoring.
    b. Access different cameras from different processes to achieve better compartmentalization of camera and stream control.
2. Merging (stitching) or re-ordering of image data, from a single or multiple camera source, to construct differnt image layout.
3. CoaXPressII: Support CoaXPress over fiber (CoF) bridge Frame Grabber

4.1.2 Fixes and improvements

1. CoaXPressII: Fix communication with some CoaXpress 2.0 cameras
2. Improve Python and C# bindings
3. Improved and extended API samples
4. Documentation clarifications and improvement

4.1.3 Important API Notes and Limitations

1. Tested with the following Linux kernels:
    - Ubuntu 18: 4.15.0-194
    - Ubuntu 20: 5.15.0-56
2. Administrator privileges must be met during installation and driver/service registration

> ❗ **This version supports Chameleon Simulator device updated to firmware version 5.x or higher**

> ❗ **This Nvidia JetPack 4 for Xavier is no longer supported, customers should update to Jetpack 5.0.2**

4.2   Release notes Vision Point 2022.2/API 6.2/Firmware 5.x (Service pack 1)

4.2.1   Fixes and improvements

1. Replaced modal message box about incompatible firmware version with modal less system message
2. Fixed bug in CLHS camera detection
3. Documentation fixes and improvements

4.2.2   Important API Notes and Limitations

1. KYFG_Get/Set Grabber/Camera parameters functions are inherently slow because they utilize the GenICam reference implementation. Therefore, we do not suggest using them in performance-critical parts of the code, such as the stream callback function, etc. Instead, we highly recommend using KYFG_BufferGetInfo() with a relevant command to retrieve the required information. You can still use those functions in non performance-critical parts for example at the system initialization, before or after acquisition sessions etc.

4.3   Release notes Vision Point 2022.2/API 6.2/Firmware 5.x

> **❗ First generation Chameleon Simulator and Predator Frame Grabber devices are no longer supported**

4.3.1 New features

1. New "KYFG_BufferRevoke" function allows to revoke individual allocate buffer, without deleting the complete stream.
2. Linux: Added "Silent" mode to installation script.
3. Linux: Added complete un-installation script.
4. GUI: Added option to close and re-open camera after detection.
5. GUI: TIFF files are now saved uncompressed.
6. GUI: Optimized refreshing of camera/Grabber parameters.
7. Python and C# bindings: New function "KYFG_BufferRevoke" was added.

4.3.2   Fixes and improvements

1. Fixed buffer allocation larger than 512MB.
2. Fixed camera xml extraction using KYFG_CameraGetXML function: the buffer is filled with data returned by the camera as-is without additional NULL termination.**
3. Python binding: Fixed functionality of "KYFG_DeviceDirectHardwareRead" and "KYFG_DeviceDirectHardwareWrite".
4. GenTL: Fixed dynamic stream geometry changes queried using 'DSGetInfo(iInfoCmd = STREAM_INFO_PAYLOAD_SIZE)'.
5. GenTL: Fixed support for frame id, provided by underline protocol, queried using 'DSGetBufferInfo(iInfoCmd = BUFFER_INFO_FRAMEID)'; supported firmware required.

4.3.3   Important API Notes and Limitations

3. ** Function KYFG_CameraGetXML() returns data from the camera as-is, therefore, client software should not rely on terminating 0 in returned value, such code will now fail and must be changed, i.e. the function KYFG_CameraGetXML() fills output buffer WITHOUT terminating 0 char, even if the result is not zipped.
4. Tested with the following Linux kernel:
   - Ubuntu 18: 4.15.0-194
   - Ubuntu 20: 5.15.0-50

4.4   Release notes Vision Point 2022.1/API 6.1/Firmware 5.x

4.4.1   New features

1. GenICam 3.2 support was introduced in this software release
2. "Search" option was added to cameras' properties browser
3. "Code Sample" option was added to cameras' properties browser
4. GenTL support for "Common Vision Blox(CVB)" SDK
5. CoaXPress2 Frame Grabber: Added Automatically switch to CXP 2 after detection of a compatible camera
6. C# binding new functions were added to the API
7. Python examples were added to support multiple camera flow

4.4.2   Fixes and improvements

1. Driver installation method has been changed, allowing to add KAYA's driver to DKMS
2. CLHS Frame Grabber: Modified detection process to support additonal cameras
3. Chameleon: Fixed issue with loading initial parameters value from a project file
4. Chameleon and Frame Grabber: Fixed issues with buffer allocation for few YUV, YCbCr and Planar formats
5. Fixed image display for few YUV, YCbCr and Planar formats in Vision Point GUI
6. Python binding: Fixed stream callback function registration when using multiple cameras
7. Vision Point API data book was rearranged, combining native API, C# and Python bindings

4.5   Release notes Vision Point 2021.1/API 6.0/Firmware 5.x

4.5.1 New features

1. CoaXPress 2 support was introduced in this software release, including CXP2 tagged command packets, generate and receive CXP2 HeartBeats and Events. Supported devices are described in section 3.1.5.
2. New events added to the enumeration "KYDEVICE_EVENT_ID":

   - KYDEVICE_EVENT_CXP2_HEARTBEAT_ID
   - KYDEVICE_EVENT_CXP2_EVENT_ID
   - KYDEVICE_EVENT_GENCP_EVENT_ID
   - KYDEVICE_EVENT_GIGE_EVENTDATA_ID

   Corresponding structures added:

   - KYDEVICE_EVENT_CXP2_HEARTBEAT
   - KYDEVICE_EVENT_CXP2_EVENT
   - KYDEVICE_EVENT_GENCP_EVENT
   - KYDEVICE_EVENT_GIGE_EVENTDATA

   The usage is demonstrated in:
   <Public Documents>/KAYA Instruments/Vision Point/API Samples/Vision Point API/KYFGLibExampleQueuedBuffers.c
   Shows how user can allocate buffers in their software and submit them to KAYA library.
3. New function KYCS_GenerateCxpEvent() allows the user to generate CXP2 Heartbeats and Events using the Chameleon camera simulator.
4. New function "KYFG_CameraScanEx()" allowing the user to decide whether to perform full camera scan or partial detection, in which case open cameras will retain at the same places of array.
5. New function "KYFG_DevicePortSendEventMessage()"sends event message via the specified port of the device
6. New function "KYFG_CameraSendEventMessage()"sends events messages via the Master channel of the camera.
7. The cyclic buffers API sample, "KYFGLib_Example.c", now shows how a user can allocate their own acquisition buffers and submit them to the KYFGLib library. Usage sample can be found in:
   "<Public Documents>/KAYA Instruments/Vision Point/API Samples/Vision Point API/KYFGLib_Example.c".
8. GenTL example code was added to the installation package and can be found in "<Public Documents>/KAYA Instruments/Vision Point/API Samples/Vision Point API/GenTL_Example/GenTL_simple_test.c".
9. Added new Flat-field and Dark-field correction GUI features to improve the quality of the image.
10. Added new Grid Lines GUI feature to help with image centering.

4.5.2 Fixes and improvements

1. Python API binding was updated with new functionality.
2. Starting with version 6.0, the KYFG_AUX_DATA structure definition has been modified. A description is found in "<Installation folder>/KAYA Instruments/Vision Point/include.

3. Improved API usage C examples.
4. Improved installation procedure.

4.5.3 New devices

Device display name	Device ID
Komodo II CXP 104 Frame Grabber	0x1410
Komodo II CLHS-X Frame Grabber	0x421

Table 2 – Firmware release notes 2020.3

4.5.4 Important API Notes and Limitations

1. The Iron IMX camera's firmware **must** be upgraded to version 4.0 (or higher) **before** installing Vision Point 2021.1 software. The latest firmware can be found here.

2. KAYA's API should **NOT** be used from the DllMain function on Windows OS. There are significant limits on what you can safely do at a DLL entry point. See General Best Practices for specific Windows APIs that are unsafe to call in DllMain. If you need anything but the simplest initialization, then do that in an initialization function for the DLL. You can require applications to call the initialization function after DllMain has run and before they call any other functions in the DLL.

3. In Linux, KAYA's API functions are **NOT** *async-signal-safe*, i.e., they can NOT be safely called from within a signal handler. Read more about "signal-safety".

4. Inserting and/or removing KAYA PCI devices requires a reboot of the computer or restart of the "KAYA Instruments" service. After that, one may use Vision Point Application or open API examples with KAYA devices.

> **!** **Windows 10 32 bit operating system is no longer supported by both SDK and Vision Point application**

4.5.5 Firmware updates

The following firmware versions are required for CoaXPress 2 support.

Hardware device	Firmware version	Details
Predator II CoaXPress	5.x.x	CXP2 support
Komodo II CoaXPress	5.0.7	CXP2 support
Chameleon II CoaXPress	5.x.x	CXP2 support

Table 3 – Firmware release notes 2021.1

4.6 Release notes Vision Point 2020.3/API 5.4/Firmware 4.x (Service pack 1)

4.6.1 Fixes and improvements

1. Fix functionality of KYFG_GetCameraValueFloatMaxMin()and KYFG_GetCameraValueIntMaxMin().
2. Fix buffer allocation problem for certain unaligned resolutions used with "SegmentsPerBuffer" grabber configuration parameter.
3. Fix temperature indication for Komodo II CXP.
4. Improved stability of serial port enumeration and communication used with external clserkyi.dll.

4.7 Release notes Vision Point 2020.3/API 5.4/Firmware 4.x

4.7.1 New features

1. Ubuntu 20.04 is now supported.
2. Xavier JetPack 4.4.1 SDK support.
3. Added configurable log retaining policy.
4. Automatic Power over CoaXPress management for Predator.
5. Initial support for Chameleon camera Simulator.

4.7.2 Fixes and improvements

5. Add "DevicePhysicalLinksMax" Frame Grabber parameter indicating maximum available physical links.
6. Fix "KYFG Get Camera Value String.vi" and "KYFG Get Grabber Value String.vi" in the LabView adaptor.
7. Corrected behavior of BUFFER_INFO_PIXELFORMAT_NAMESPACE and BUFFER_INFO_DELIVERED_IMAGEHEIGHT commands used in GenTL's DSGetBufferInfo API function.
8. Limit the number of PoCXP monitoring channels for Predator II.

4.7.3 Firmware updates

Hardware device	Firmware version	Details
Predator CoaXPress	4.7.1	Added Automatic Power over CoaXPress management NOTE: Latest firmware for the Predator card requires the latest version of Vision Point (**2020.3** or later)

Table 4 – Firmware release notes 2020.3

4.7.4 Important API Notes and Limitations

⚠ **Windows 10 32 bit operating system is no longer supported by both SDK and Vision Point application**

4.8   Release notes Vision Point 2020.2/API 5.3/Firmware 4.x

4.8.1   New features

1.   Support for 2nd generation of KAYA's Frame Grabbers (Linux).
2.   Initial support for 2nd generation of KAYA's Frame Grabbers (Xavier).
3.   Add maximum value for "FifoThreshold" Grabber parameter, calculated using available device memory.

4.8.2   Fixes and improvements

1.   Fix camera communication command Futex error in Ubuntu 18.04 for 10GigE Frame Grabber (Linux).
2.   Fix camera communication command Futex error in Ubuntu 18.04 for CLHS Frame Grabber (Linux).
3.   The silent/Very Silent installation process was improved (Windows).
4.   Fixed driver removal in uninstall (Windows).
5.   Specific stream unaligned resolution allocation for CoaXPress Frame Grabber minor fix.
6.   Documentation improvements and minor corrections from the 2020.1 release.
7.   "DeviceMemorySize" Grabber parameter is deprecated.
8.   Corrected reflection of fan control hysteresis on/off parameters for 2nd generation KAYA Frame Grabbers.

4.9   Release notes Vision Point 2020.1/API 5.2/Firmware 4.x

4.9.1   General release note

> ⚠ **Windows 7 is no longer supported by both SDK and Vision Point application**

4.9.2   New and fixed features in API

1.   VS2012 runtime is no longer supported, KYFGLib.dll/lib are identical copies of KYFGLib_vc141.dll/lib for projects that link with "KYFGLib.lib".
2.   Chameleon: "Simulation example" project and source file are renamed to "Chameleon example" to avoid confusion with software simulated grabber.
3.   KY_DEVICE_INFO support value 2 of "version" filed: added field "m_Flags".
     a.   Device description strings are changed to determine device protocol API provides field "protocol".
4.   Function 'KYFG_Scan()' is deprecated, please use function 'KY_DeviceScan()'.
5.   Parameters enumeration entries are updated dynamically to reflect changes of the "isAvailable" state.
6.   Temperature events.

4.9.3   New and fixed features in GUI

1.   Recording AVI from buffer now saves rendered images rather than originally captured data (i.e. processed for showing in VP). For analyzing original data user needs to record RAW or TIFF format.
2.   Bandwidth test for supported devices.
3.   New AutoPoCXP management settings.

4.10 Release notes Vision Point 2019.2/API 5.1/Firmware 4.x (Service pack 9)

4.10.1 New and fixed features in API

1. Support for NVIDIA Xavier.
2. Ubuntu 16.04 and CentOS 7.3 are no longer supported.
3. Unified structure for customization builds.
4. Software version macros were added to KYFGLibVesrion.h file.
5. CoaXPress devices: Improved behavior during speed change.
6. LabVIEW support for demo Frame Grabber.

4.10.2 New and fixed features in GUI

1. Description and comment section availability fixed for saving project option.
2. Histogram visualization bug fixes.

4.10.3 Documentation & File structure

1. C examples were moved to the "Vision Point API" folder.
2. Documentation minor corrections.

4.11 Release notes Vision Point 2019.2/API 5.1/Firmware 4.x (Service pack 8)

4.11.1 New and fixed features in API

Automatic PoCXP bug fixes, mainly for devices, which do not support the Automatic PoCXP management feature.

4.11.2 Documentation

1. Documentation improvements.
2. Added PoCXP automatic management sections.

4.12 Release notes Vision Point 2019.2/API 5.1/Firmware 4.x (Service pack 7)

4.12.1 New and fixed features in API

1. Automatic PoCXP management. KAYA Software stack is now constantly monitoring an available connection state and turning PoCXP on/off automatically.
2. Chameleon simulator: Fixed Image1StreamId register update according to the provided XML file.

4.12.2 New and fixed features in GUI

Automatic PoCXP functionality monitoring activation/deactivation option is now available via Vision Point GUI (Tools-> Options).

4.13 Release notes Vision Point 2019.2/API 5.1/Firmware 4.x

4.13.1 New and fixed features in API

1. Chameleon: Fixed issue with first stream start that did not render an output image.
2. Chameleon: Fixed issue with a loaded user XML file/ parameters do not change from a remote source.
3. Chameleon: Fixed configuration of "TimerControl", "SimulationTriggerDelay" and "SimulationTriggerFilter" parameters.
4. Added support for new Frame Grabber devices (e.g., Predator II).
5. Added support for Frame Grabber devices with 12.5Gbit connection speed.
6. Extended option of customized KYFGLib library initialization. For more details, see KYFGLib_Initialize function description in Vision Point API documentation.
7. Removed KYFG_Pid2Name() function. This function is no longer implemented. User should use KY_DeviceDisplayName() function instead.

4.13.2 New and fixed features in GUI

1. Color Correction – visualization of image processing features
2. Color Histogram – image color segmentation
3. Improved representation of IP and MAC address parameter types
4. Save video buffer and individual frames in TIFF format

4.13.3 External software stack configuration

Added option to specify Gen<i>Cam library binaries path.

Remarks:

1. Vision Point 2019.2 will be the last version to support Windows 7 OS. We encourage our customers to switch to Windows 10 OS to support our latest updates and hotfixes.
2. Support and usage of Visual Studio 2012 are phasing out. Visual Studio API sample projects are converted to VS 2017 format and now linked with KYFGLib_vc141 library, i.e., VC141 version if Microsoft C/C++ compiler. We encourage our API users to change linker options of existing Visual Studio projects and link them with KYFGLib_vc141.lib instead of legacy KYFGLib.lib.

4.14 Release notes Vision Point 2019.1/API 5.0.1/Firmware 4.x

4.14.1 New and fixed features in API

1. New function KYFG_UpdateCameraList() updates the list of cameras connected to the device. Currently, open camera handles are not affected by this function.
2. Event callback when a camera lost connection.
3. GigE:

    a. Fix Issue with packed/unpacked PixelFormat.
    b. Remote device communication enhancement (similar to CLHS).
    c. Control the source port on each channel.

4. CoaXPress: Option to overwrite ALL sizes of ControlPacketDataSize via Grabber configurations.
5. Virtual Grabber: Add new versioning register to support new suppression of old device version.
6. GenTL:

    a. Reset STREAM_INFO_NUM_DELIVERED on each new stream start.
    b. Improved mechanism for EventGetData() function.
    c. Override camera's xml file using exteranl KYFGLib.json and x.fgprj file.

4.14.2 New and fixed features in GUI

1. "Grabber Links" parameter to indicate the device link and camera channel connection.
2. System message indication about camera connection loss.
3. Camera re-detection retains open cameras and updates the cameras list.

Remarks:

1. Vision Point 2019.1 will be the last version to support Windows 7 OS. We encourage our customers to switch to Windows 10 OS to support our latest updates and hotfixes.

4.15 Release notes Vision Point 2019.1/API 5.0/ Firmware 4.x

4.15.1 New features for Windows

1. KYService: Starting from API version 2019.1 Windows service, "KYService" and display name "KAYA Instruments Service", is installed during Vision Point application installation.
2. LogChannel: Starting from API version 2019.1 the registry root part has been moved to "HKEY_CURRENT_USER\Software\KAYA Instruments" and was split into 2 sub-parts: "internal" and "public". The public part contains the key "LogChannel.(Default)," allowing to suppress of the log output. The value of "LogChannel.(Default)" can be one of the following:

   a. 0 - Dummy channel, all records discarded
   b. 1 – File
   c. 2 – DbgView
   d. 3 - Internal buffer (attention - in this value, memory consumption will grow. This option is designed mainly for internal use when debugging service startup at boot time when file and DbgView options may not work properly). The software initializes all registry values in a "lazy" manner, i.e., if a key does not exist when it is being queried, it is created with a default value. This means that this key will not be seen (until Vision Point runs or other software linked with KYFGLib at least once. The default value for LogChannel.(Default) is 1, i.e., we are writing a log file, but if your installation script sets it to 0, then logs will be suppressed.

3. Visual Studio 2017 flavor support: Starting from API version 2019.1, the user will be able to use our libraries linked to Visual Studio 2017 flavor on runtime:

   a. KYFGLib_vc141.dll
   b. clserkyi_vc141.dll

   The functionality will remain unchanged, and the 2012 flavor will remain for backup compatibility until the next official software release. We encourage our customers to use the vc_141 flavor of our DLLs since starting from the next release, support of Visual Studio 2012 flavor will not be provided.
4. Genicam and OpenCV libraries: Starting from API version 2019.1, those libraries are not installed to Vision Point's "bin" folder, added to the system's PATH. Instead, it will be installed into a sub-folder for internal use only. If the user's application needs these libraries, they should be installed separately.
5. Support for 32 bit under 64 bit Windows.

Remarks:

1. Vision Point 2019.1 will be the last version to support Windows 7 OS.
2. For Windows OS to support the latest version of Vision Point, please make sure your Windows is up to date and all the latest updates and hotfixes are installed. If your computer hardware does not support Windows 7 latest updates, please consider using the Vision Point 4.4 software version.

4.15.2 New features in API and GUI

1. KY Service improves the automatic monitoring and management of PoCXP for CoaXPress cameras by monitoring the connection state and turning PoCXP on/off automatically.

   NOTE: *The software stack requires "KYService" to be running; otherwise, KYFG_Scan() will return 0, and KYFG_Open()/KYFG_OpenEx() will return INVALID_FGHANDLE.*

2. KYFGLib_Initialize() - optional call before "KYFGScan" and reserved for future usage.
3. Adjust image level in the range of specified minimum and maximum threshold pixel values (Accessible only via Vision Point GUI).
4. Zooming Picture window with the mouse wheel.
5. The software detects outdated firmware and disables all sets of operations, except firmware updates.

4.15.3 Fixes and improvements in API and GUI

1. GenTL producer minor fixes for computability with different GenTL consumers.
2. Resetting device upon application exit (cleanup commands) to prevent BSOD.
3. Pixel value display for RGB image format (mouse cursor's location) in x:y[R G B].
4. Optimized camera discovery process to reduce detection time.

   NOTE: *Detection time may vary according to the number of physical links, number of connected cameras, camera response time, connection speed, etc.*

5. Private Global software configurations should be used for debugging purposes only (reset each software installation and assigned with default value)
6. Public Global software configurations can be modified and will remain after new software installation.

Vision Point version 2019.1 contains numerous bug fixes, documentation, and diagnostic improvements, including improved library stability in debugging mode.

4.15.4 New Frame Grabber parameters

The following new parameters are added in this version:

Category	Parameter name	Gen<i>Cam name	Values
Acquisition Burst Frame Count	Specifies the number of frames to acquire for each stream acquisition trigger. Subject to supported firmware.	AcquisitionBurstFrameCount	Integer
PoCXP Auto	Indicates whether PoCXP is controlled automatically	PoCXPAuto	Enumeration: ▪ PoCXPAutoOff ▪ PoCXPAutOn
Device Reset	Resets the device	DeviceReset	Command: 1- Active

Table 5 – New Frame Grabber parameters

4.15.5   New firmware features

Hardware device	Firmware version	Details
Komodo CoaXPress 4ch and 8ch	4.11	Voltage monitoring support Note: Starting from hardware revision no. 3
Predator CoaXPress	4.5	Voltage monitoring support Note: Starting from hardware revision no. 3

Table 6 – Firmware release notes 2019.1

4.16 Release notes version 4.4/ Firmware 4.x

4.16.1 New device kernel driver for Windows

Installation of this version will replace the previous kernel driver in Windows with the new one.

> **!** **Previous software versions will NOT work with the new kernel driver**

4.16.2 New features in Vision Point application

1. Improved support of the hexadecimal view of a video frame.
2. A video buffer can also be saved as a single RAW file with all allocated frames. There is also an option to save this file as a series of RAW files, one per frame.
3. Support for Gen<i>Cam IRegister type in GUI.

Vision Point version 4.4 contains numerous bug fixes, documentation, and diagnostic improvements, including improved library stability in debugging mode.

4.16.3 New firmware features

Hardware device	Firmware version	Details
Komodo Fiber CXP	4.6	DDR memory size was changed
Komodo CXP	4.9	Support for CXP packet payload bigger than 8 Kbyte
Komodo Fiber	4.14(QSFP), 4.15(SFP)	DDR memory size was changed
Komodo 10G	4.3	DDR memory size was changed
Chameleon Simulator	4.30	1. Improved triggering mechanism with trigger delay and filtering 2. Added option to control video readout timing 3. Added support for GPIO pins configuration Note: Supported with Vision Point application only starting from version 4.0
Predator CXP	4.4	Queued buffer mechanism was added

Table 7 – Firmware release notes 4.x

4.17 Release notes version 4.3/ Firmware 4.x

4.17.1 New OS support

Ubuntu 16, CentOS 7.3 are now supported.

NOTE: *CentOS 6.x is no longer supported.*

4.17.2 New protocols

Chameleon CXP 1.1 protocol support.

4.17.3   New features in Vision Point

1. Python & .NET binding.
2. Triggering control new parameters for Chameleon Simulator.
3. Signed drivers for the latest Windows 7 and 10 builds.
4. Support of "IRegister" GenICam type. (e.g. "LUTValueAll").
5. Image view as a HEX value in GUI.
6. Improved 10GigE cameras compatibility.
7. Added support for serial communication interface via an external .dll (clserkyi.dll) using Komodo Fiber devices.
8. Improved GenTL producer functionality and input parameters validation.

4.17.4   New and changed parameters

1. Additional API was added, allowing the usage of Python and .NET binding
2. Chameleon API
3. Definition changes in API:

   a. Public #define "MAX_CAMERAS" changed to "KY_MAX_CAMERAS"
   b. Public #define "MAX_CAMERA_INFO_STRING_SIZE" changed to "KY_MAX_CAMERA_INFO_STRING_SIZE"

Vision Point version 4.3 also contains bug fixes, documentation, and diagnostic improvements, including improved library stability in debugging mode.

4.17.5   New firmware features

Hardware device	Firmware version	Details
Komodo Fiber CXP	4.6	DDR memory size was changed
Komodo CXP	4.9	Support for CXP packet payload bigger than 8 Kbyte
Komodo Fiber	4.14(QSFP), 4.15(SFP)	DDR memory size was changed
Komodo 10G	4.3	DDR memory size was changed
Chameleon Simulator	4.30	1. Improved triggering mechanism with trigger delay and filtering 2. Added option to control video readout timing 3. Added support for GPIO pins configuration Note : Supported with Vision Point application only starting from version 4.0
Predator CXP	4.4	Queued buffer mechanism was added

Table 8 – Firmware release notes 4.x

4.18 Release notes version 4.2/ Firmware 4.x

4.18.1 New feature

The new software version 4.2 is now capable of supporting all KAYA Instruments JetCam HS Cameras. Additional API functions were added as well. Vision Point version 4.2 also contains bug fixes, documentation, and diagnostic improvements, including improved library stability in debugging mode.

4.18.2 Windows 7 support

KAYA Instruments uses a SHA256 algorithm to sign its drivers digitally. Windows 7 must support the SHA256 to be compatible with KAYA's Digital Signature. Please make sure your Windows 7 is up to date and all the latest updates and hotfixes are installed.

4.18.3 New software update

Please note, this key feature means that there is no longer support for devices that do not use device ID 0x1000, including all devices with any firmware below 4.0. It is necessary to update the device firmware to 4.0 version or higher before installing new Vision Point software.

4.19 Release notes version 4.1/ Firmware 4.x

4.19.1 New feature

The new software version 4.1 is now capable of supporting both Camera Simulator and Frame Grabber. Additional API was added, allowing connection of camera Simulator and generation of a video stream. Vision Point version 4.1 also contains numerous bug fixes, improved documentation, and diagnostic improvements.

Please note, this key feature means that the Chameleon software is no longer supported. It is advised to uninstall previous versions of Chameleon and Vision Point software before installing the new Vision Point software.

4.20 Release notes version 4.0/ Firmware 4.1

4.20.1   Windows 10 support

New SDK will now support Windows 10. It is subject to a firmware update to at least the 4th firmware version. A firmware update should be performed on Windows 7, and then the Frame Grabber driver and SDK will be supported on Windows 10.

4.20.2   New protocols

4.20.2.1 CLHS support

Support for CLHS cameras implementing 10G X protocol. GenCP1.1 communication interface.

4.20.2.2 GigE support

Support for 10G GigE Vision cameras. GVCP (GigE Vision Control Protocol) and GVSP (GigE Vision Streaming Protocol) communication protocol).

4.20.3   Vision Point Additions

4.20.3.1 Multiple Camera support

Vision Point will now have full support for controlling multiple cameras simultaneously, changing their parameters, streaming, and playing back saved data.

4.20.3.2 Save Video and Replay Mode

In addition to the "Single Frame Data Save" feature, we added" Video Save" and "Replay Mode" features to allow a review of multiple stream frames. Saved video data will contain up to the amount of allocated frames.

4.20.3.3 Firmware update via GUI

The firmware update option is now available using the Vision Point application. The "Firmware update..." option can be found under the "Grabber Control" category.

4.20.4 New and changed grabber parameters

4.20.4.1 Renamed parameters

Some parameters that existed in previous versions have been renamed according to Gen<i>Cam Standard Features Naming Convention (SFNC):

- "FrameGrabberControl" category name has been renamed to "DeviceControl"
- "Show output image as RGB," found under the "Image Format Control" category, was renamed to "Transformation Pixel Format."

4.20.4.2 New Frame Grabber parameters

The following new parameters are added in this version:

Category	Parameter name	Gen<i>Cam name	Values	Description
Transport Layer Control	ControlPacketDataSize	ControlPacketDataSize	Integer	Override camera bootstrap register value for Control commands packets max size
Transport Layer Control	StreamPacketDataSize	StreamPacketDataSize	Integer	Override camera bootstrap register value for Stream packets max size
Transport Layer Control	Image1StreamID	Image1StreamID	Integer	Override camera bootstrap register value for Id of the first stream
Image Format Control	Debayer Mode	DebayerMode	Enum: ■ Demosaic 3x3 ■ Demosaic 3x2 ■ DemosaicSoftware	Selects debayer de-mosaicing algorithm. Added software debayer option
Image Format Control	Frames Per Stream	FramesPerStream	Integer	Number of Frames to be created for stream

Table 9 – New Frame Grabber parameters

4.20.5 API Additional Functions and Features

4.20.5.1 A Packed data output stream mode

Data packing modification options were added to the interface, allowing users to increase transfer rates without data loss.

4.20.5.2 Queued buffer mechanism

Stream handling mechanism and function interface parameters were modified. "Buffer Interface" was deprecated and substituted with a new "Stream Interface". Old API functions remain exported for backward compatibility. "Stream Interface" provides additional functionality to support user allocated buffers, management over buffer fill sequence and order, the individual information of each frame, and compatibility for old buffer management.

The new mechanism solves the issue of the previously provided cyclic frame buffer fill mechanism. This method prevents the frame memory from being modified until the user resubmits the frame. While cyclic frame buffer organization is internally and automatically managed, the queued frame scheduling should be managed by a user.

A new set of functions was added to support this mechanism:

KYFG_StreamCreateAndAlloc(), KYFG_StreamGetPtr(), KYFG_StreamGetSize(), KYFG_StreamGetFrameIndex(), KYFG_StreamCreate(), KYFG_BufferAllocAndAnnounce(), KYFG_BufferAnnounce(), KYFG_StreamGetInfo(), KYFG_BufferGetInfo(), KYFG_BufferToQueue(), KYFG_BufferQueueAll(), KYFG_StreamDelete(), KYFG_StreamGetAux().

4.21 Release notes version 3.0.0/ Firmware 3.2

4.21.1   Product line renamed

Starting from major version 3, firmware and software, the product line "Predator" has been renamed "Vision Point". The directory structure has been changed, while API remains backward compatible. It is advised to uninstall previous versions of Predator software before installing the new Vision Point.

4.21.2   Timestamp counter added

A timestamp counter feature was added according to Gen<i>Cam SNFC (See section 2.3.5.2). The timestamp counter generates precise and synchronized timestamp to video frames and I/O controller with 8ns resolution.

4.21.3   Auxiliary data callback from IO controller

A new type of callback function can now be registered using API KYFG_AuxDataCallbackRegister(). The callback will be called when various auxiliary data is generated. The supplied "KYFGLib_Example.c" code demonstrates how to configure IO controller to generate this callback and how to interpret its auxiliary data passed as a parameter to user's callback function: Auxiliary data is passed to user callback as a pointer to KYFG_AUX_DATA structure parameter. In the case of callback originated by IO controller, the data portion of this structure is interpreted as KYFG_IO_AUX_DATA:

```
typedef struct _KYFG_IO_AUX_DATA
{
        uint64_t masked_data;
        uint64_t timestamp;
} KYFG_IO_AUX_DATA;
```

Where:
1. 'timestamp' - the event timestamp in units of nanoseconds (nsec)
2.   'masked_data' - indicates the state of the I/O controller feature that can generate an event according to the table below.

Bit	Function
0	OptoCoupled Input 0
1	OptoCoupled Input 1
2	OptoCoupled Input 2
3	OptoCoupled Input 3
4	OptoCoupled Input 4
5	OptoCoupled Input 5
6	OptoCoupled Input 6
7	OptoCoupled Input 7
8	LVDS Input 0
9	LVDS Input 1
10	LVDS Input 2
11	LVDS Input 3
12	TTL 0
13	TTL 1
14	TTL 2
15	TTL 3
16	TTL 4
17	TTL 5
18	TTL 6
19	TTL 7
20	LVTTL 0
21	LVTTL 1
22	LVTTL 2
23	LVTTL 3
24	LVTTL 4
25	LVTTL 5
26	LVTTL 6
27	LVTTL 7
28	OptoCoupled Output 0
29	OptoCoupled Output 1
30	OptoCoupled Output 2
31	OptoCoupled Output 3
32	OptoCoupled Output 4

Bit	Function
32	OptoCoupled Output 4
33	OptoCoupled Output 5
34	OptoCoupled Output 6
35	OptoCoupled Output 7
36	LVDS Output 0
37	LVDS Output 1
38	LVDS Output 2
39	LVDS Output 3
40	Encoder 0
41	Encoder 1
42	Encoder 2
43	Encoder 3
44	Timer 0
45	Timer 1
46	Timer 2
47	Timer 3
48	Timer 4
49	Timer 5
50	Timer 6
51	Timer 7
52	Camera Trigger 0
53	Camera Trigger 1
54	Camera Trigger 2
55	Camera Trigger 3
56	Camera Trigger 4
57	Camera Trigger 5
58	Camera Trigger 6
59	Camera Trigger 7
60	Acquisition Trigger 0
61	Acquisition Trigger 1
62	Acquisition Trigger 2
63	Acquisition Trigger 3

Table 10 – I/O controller feature

4.21.4 Frame timestamping (Auxiliary data in stream callback)

In addition to the information available in the stream callback function, it is now possible to retrieve auxiliary data associated with each arrived frame. KYFG_BufferGetAux() retrieves this data in the form of KYFG_AUX_DATA structure. The data portion of this structure, in this case, should be interpreted as KYFG_FRAME_AUX_DATA. The supplied "KYFGLib_Example.c" code demonstrates how to retrieve this data within the stream callback function and read frame timestamp from it.

```
typedef struct _KYFG_FRAME_AUX_DATA
{
        uint32_t sequence_number;
        uint64_t timestamp;
        uint32_t reserved;
}KYFG_FRAME_AUX_DATA;
```

Where:
1. 'sequence_number' – sequential index of the frame within the allocated frame buffer
2. 'timestamp' – frame arrival timestamp in units of nanoseconds (nsec)
3. 'reserved' – reserved for future use.

4.21.5 New and changed grabber parameters

4.21.5.1 Renamed parameters

Some parameters that existed in previous versions have been renamed according to Gen<i>Cam Standard Features Naming Convention (SFNC):

▪   "Video Control" category display name has been renamed to "Image Format Control."
▪   "LineDecimation," found under the "Image Format Control" category, was renamed to "DecimationVertical"

4.21.5.2 New Frame Grabber parameters

The following new parameters are added in this version:

Category	Parameter name	Gen<i>Cam name	Values	Description
Device Control	Timestamp	Timestamp	Integer (in ns)	Reports the current value of the device timestamp counter. The same timestamp counter is used for tagging images and I/O events
Device Control	Timestamp Reset	TimestampReset	Command	Resets the current value of the device timestamp counter
Device Control	Timestamp Latch	TimestampLatch	Command	Latches the current timestamp counter into TimestampLatchValue
Device Control	Timestamp latched value	TimestampLatchValue	Integer (in ns)	Returns the latched value of the timestamp counter

Digital I/O Control	Line Event Mode	LineEventMode	Enum: ▪ Disabled ▪ RisingEdge ▪ FallingEdge ▪ AnyEdge	Selects condition when an event for selected IO line is generated by software
Trigger Control	Trigger Event Mode	TriggerEventMode	Enum: ▪ Disabled ▪ RisingEdge ▪ FallingEdge ▪ AnyEdge	Selects the condition when to generate software event for acquisition trigger
Timer Control	Timer Event Mode	TimerEventMode	Enum: ▪ Disabled ▪ RisingEdge ▪ FallingEdge ▪ AnyEdge	Select the condition when the software event is generated for the selected timer
Encoder Control	Encoder Event Enable	EncoderEventEnable	Enum: ▪ Enable ▪ Disable	Enables event generation for encoder
Image Format Control	Debayer Mode	DebayerMode	Enum: ▪ Demosaic 3x3 ▪ Demosaic 3x2	Selects debayer demosaicing algorithm
Camera Trigger Control	Camera Trigger Event Enable	CameraTriggerEventEnable	Enum: ▪ Enable ▪ Disable	Enables event generation for camera trigger

Table 11 – New Frame Grabber parameters

4.22 Release notes version 2.0.1.484 / Firmware 2.4

4.22.1 API function additions

1. New functions KYFG_CameraGetXML() and KYFG_GetCameraValueStringCopy() were added to overcome development environment allocation issues. KYFG_CameraGetXML() will substitute existing function KYFG_GetXML(). While KYFG_GetXML() allocates the needed buffer and user is responsible to free it; the KYFG_CameraGetXML() function receives a user pre-allocated buffer and fills it with requested data.
KYFG_GetCameraValueStringCopy() will substitute existing function KYFG_GetCameraValueString().While KYFG_GetCameraValueString() allocates the needed buffer and user is responsible to free it; the KYFG_GetCameraValueStringCopy() function receives a user pre-allocated buffer and fills it with requested data.

   There could be a runtime library conflict issue if the existing function is used in an environment other than Visual Studio 2012 or equivalent. The pointer might become corrupted, and the free() function might cause a crash. To avoid this issue, please use the substitute functions.

2. FGSTATUS_BUFFER_TOO_SMALL enumeration value was added to FGSTATUS error code bank. This error code will indicate that the provided buffer length is too small to hold the amount of information to be filled in the provided buffer. Larger or equivalent buffer length should be introduced to KYFG_CameraGetXML() and KYFG_GetCameraValueStringCopy() functions to overcome this error.

3. FGSTATUS_EXCEEDED_MAX_CAMERA_CONNECTIONS enumeration value was added to FGSTATUS error code bank. KYFG_CameraScan() returns this error code if the number of connected and found cameras exceeds the maximum allowed connected cameras.

4. Full support for multiple camera connectivity, configuration, control, and triggers for up to 4 cameras. Different cameras on different links, speeds, and topology can be connected and run simultaneously using provided API.

4.22.2   I/O controller definition

1. Trigger selection for a camera was moved from the Digital I/O Control line selector to its camera trigger category. The camera trigger will now be located in the "CameraTriggerControl" category, subordinate to a selected camera using the Camera selector. In addition, the Camera Trigger ("KY_CAM_TRIG") enumeration option has been omitted from Line Selector ("LineSelector") Frame Grabber configuration parameters.

2. Encoder trigger control has been expended and modified. A filter ("EncoderFilter"), value at reset register ("EncoderValueAtReset"), reset command ("EncoderReset") and reset activation state ("EncoderResetActivation") was added for better encoder triggers mechanism control.

4.22.3 PoCXP control

The PoCXP (power over CoaXPress) control and monitoring mechanism were modified. The Frame Grabber card will boot up with PoCXP disabled. The PoCXP will be re-enabled during the cameras scan process.

Each camera may have different boot-up times till the cameras are warmed up and ready for operation. A discovery delay should be optimized to match the camera boot-up time, allowing Vision Point API/App to successfully detect such cameras. To do so, "CameraDiscoveryDelay" should be set to, e.g., 20000, which will delay camera detection by 20 seconds to let all connected cameras boot up for successful operation.
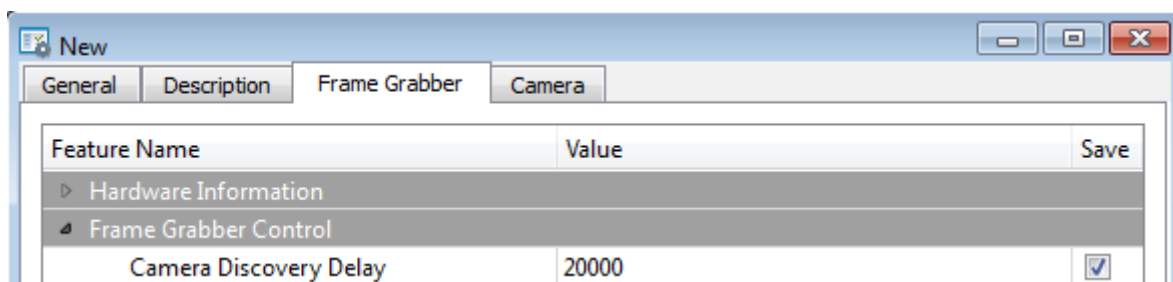

Figure 1 – Setting up the Camera Discovery Delay in Vision Point App

During the discovery process, it might look that the API/App stopped responding during camera discovery. It will last for the duration of discovery delay and discovery process. To avoid such behavior, one might first manually enable the PoCXP from Vision Point API/App, wait for the cameras to boot up, and execute the camera detection process with a short delay parameter.

1. Control the PoCXP of the Frame Grabber form API:
   "PoCXP0" – "PoCXP7" grabber parameters should be used to turn "On"/" Off" the FG PoCXP using one of the API dedicated functions. e.g., To turn on the power of Frame Grabber channel 2, the following function call may be used:

   KYFG_SetGrabberValueEnum_ByValueName(GrabberHandle, "PoCXP2", "On")

2. To control the PoCXP of the Frame Grabber from the Vision Point, please follow the section below.

4.22.4   Vision Point App enhancement

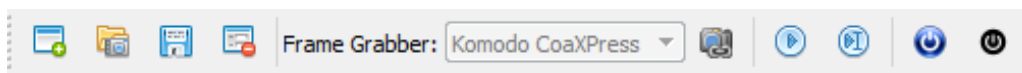Additional buttons for manual control of PoCXP were added to Toolbar Menu.

Figure 2 – New Vision Point App Toolbar Menu

To enable PoCXP, press the ⏻ button – this will enable PoCXP to all links

To disable PoCXP, press the ⏻ button – this will disable PoCXP to all links

⚠ **Caution!** Manually enabling PoCXP will drive 24V to all the Frame Grabber ports. Avoid hot-plugging the camera while the PoCXP was manually enabled to reduce the risk of camera damage