pylon Release Notes

Version 3.2.2

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http://www.baslerweb.com

Installation Information

You can find detailed information about installing Basler pylon software in the Installation and Setup Guide for Cameras Used with Basler's pylon API (AW000611xx000).

You can download the guide free of charge from the Basler website at

http://www.baslerweb.com

Restricted Compatibility of the API

The programming interface for pylon 3.x is in some respects not backwards compatible with pylon 2.x or earlier. The pylon Programmer's Guide and API Reference describes the modifications needed to rebuild an application that was developed using previous versions of pylon.

When updating an application from a pylon version older than pylon 3.0, the application's Visual Studio project settings may need to be adjusted with respect to the compiler include search path, linker library search path, and the linker's "Additional Dependencies" settings. References to the GENICAM_ROOT, GENICAM_ROOT_V1_1 or GENICAM_ROOT_V2_0 environment variable must be replaced by the PYLON_GENICAM_ROOT variable introduced with the pylon 2.2 release. If the import libraries for pylon or GenICam are explicitly listed in the linker configuration settings of your project, these references should be removed since some of the libraries have been renamed. Your application should include the PylonIncludes.h header file rather than explicitely specify the import libraries. By including the PylonIncludes.h header file, the required import libraries will be linked to your application automatically. Refer to the "Building Applications with pylon" and "Migrating from Previous pylon Versions" sections of the pylon for Windows Programmer's Guide and API Reference document for detailed information about the required project settings.

The Microsoft Windows 2000 operating system is no longer supported since pylon 2.2.

Version 3.2.2

Fixed Bugs

Runtime

- PylonGigE: Fixed an issue where a camera provides more than one camera description file.
- PylonGUI: The image display window doesn't work after calling `PylonTerminate()` followed by a `PylonInitialize()` call.

Known Restrictions

The same known restrictions apply to the 3.2.2 release as to the 3.0 release (see below).

Known Bugs

The same known bugs apply to the 3.2.2 release as to the 3.0 release (see below).

Version 3.2.1

Fixed Bugs

IP Configuration Tool

- After assigning a new IP address, a camera may have been unreachable for a few minutes.

Known Restrictions

The same known restrictions apply to the 3.2.1 release as to the 3.0 release (see below).

Known Bugs

The same known bugs apply to the 3.2.1 release as to the 3.0 release (see below).

Version 3.2.0

New Features / Changes

C++ SDK

- The `EOwnership` enumeration has been deprecated. Instead, the `ECleanup` enumeration has been introduced to control whether the application or pylon deletes registered event handlers.
- Added support for debugging the registration of event handlers: In debug builds an assertion is triggered when deleting an event handler that is still registered.
- Extended the interface of event handlers: Added methods that are called on registration and deregistration of event handlers.
- Added parameters to `CInstantCamera` class for getting the number of empty buffers, the number of queued buffers and the number of buffers that are ready for retrieval.
- Added the grab strategy “Latest Images”. This strategy allows setting the size of the output queue dynamically. Therefore, it allows switching between strategy “One By One” and strategy “Latest Image Only”.
- The `CTlFactory::IsDeviceAccessible()` method now offers the option of returning detailed information why a device isn't accessible.
  Note: Some transport layers (1394, CameraLink) only provide limited information. This is a technical restriction, not a restriction of pylon.
- Most properties of a `CGrabResultPtr` can be now inspected with a debugger, e.g., width, height and pixel type of a grabbed image.

Pylon Viewer

- Enabled copy-to-clipboard for the **Features**, **Feature Properties**, **Feature Documentation**, and **Devices** windows. The shortcut for “copy camera settings to clipboard” has been changed to CTRL+SHIFT+C.

IP Configuration Tool

- The IP Configuration Tool has been redesigned focusing on ease of use.
  Cameras are now shown in an easy-to-read list. You can see the network adapter a camera is connected to. This makes it easy to find the correct camera. In case a camera is misconfigured, the IP Configuration Tool will indicate this and make suggestions how to fix this. You can change the configuration with only a few mouse clicks. All user-entered data will be checked for validity, thus reducing the chance of misconfiguration.

You can also access the IP configuration of your network adapters directly from within the IP Configuration Tool.

- The IP Configuration Tool now supports broadcasting the IP configuration. This means that for newer firmware versions it is no longer necessary to manually assign a temporary IP address in case the camera's current IP configuration doesn't match the PC's configuration.
  If the camera doesn't support broadcasting the IP configuration, you will be prompted to assign a temporary IP address.

Fixed Bugs

Runtime

- On Windows 7, grabbing images from a 1394 camera failed after a 1394 bus reset occurred.

C++ SDK

- Allocation and deletion of device specific grab results were not done in the same module.
- Allocation and deletion of event handlers were not done in the same module.
- A misleading exception message was provided when an invalid `IImage` object triggered an exception, e.g. when saving an invalid image.
- While being destructed, the `CInstantCamera` classes didn't prevent a user-provided event handler from attaching a pylon device or from registering event handlers.

Pylon C / .NET / VB SDK

- Comparing handle objects did not always work correctly.
- C# Live View sample program did not dispose Bitmap objects correctly which could result in high resource usage.

Pylon Viewer

- Fixed crash if the actual payload size is smaller than indicated by the current width, height, and pixel type settings.
- On some Windows systems (typically systems with non-Latin fonts) the pylon Viewer may have become non-responsive while grabbing.

Known Restrictions

The same known restrictions apply to the 3.2 release as to the 3.0 release (see below).

Known Bugs

The same known bugs apply to the 3.2 release as to the 3.0 release (see below).

Version 3.1

New Features / Changes

Runtime

- Updated to the latest GenICam 2.3.1 version.
- PylonGigE: Added `StatisticReadWriteTimeoutCount` parameter to the transport layer parameters. The parameter counts the number of timeouts in read and write operations when waiting for the response from the device.
- PylonGigE: The number of retries for accessing camera registers is configurable.
- PylonGigE: When using the Basler filter driver, the `AutoPacketSize` parameter can be used to let pylon determine the optimum packet size automatically. For automated packet size optimization, enable the `AutoPacketSize` feature before starting grabbing.
- Pylon1394: Updated camera XML file for supporting camera features of latest firmware versions.

C++ SDK

- Introduced `CTlFactory::IsDeviceAccessible()` method to quickly probe if a GigE or Firewire camera device is already opened by another application.
- Added `CImagePersistence::LoadFromMemory()` for loading a BMP, JPEG or PNG image from memory.
- When saving JPEG images, the encoder quality for compression can be set.
- Updated camera classes for supporting latest firmware versions.
- Added the `Grab_UsingExposureEndEvent` sample illustrating the usage of the end-of-exposure event.
- The feature persistence API saves and restores the state of the sequence sets if the camera's sequencer feature is enabled.
  The ParametrizeCamera_LoadAndSaveSequenceSets sample is no longer required and has been removed.

Pylon C/VB/.Net API

- Introduced the `PylonIsDeviceAccessible()` function to quickly probe if a GigE or Firewire camera device is already opened by another application.
- The image persistence and new image format converter APIs introduced with pylon 3.0 are available for C and .Net.

- The image window and AVI file creation APIs introduced with pylon 3.0 are available for C and .Net.
- PylonC: Visual Studio 2005 solution for pylonC samples including 64 bit solution configurations.
- If a grab fails, an error message can be retrieved by calling `GenApiGetLastErrorMessage()`.

Pylon Viewer

- The current zoom factor is displayed in the status bar.
- In addition to the pixel value of the converted RGB image, the pylon viewer displays the raw values of the pixel data (e.g., Bayer, YUV, or Mono16).
- The feature documentation window displays code snippets illustrating the usage of the feature currently selected in the feature tree window.
- Enabled copy&paste for feature tree, feature documentation, and feature properties windows.
- Image and devices windows are synchronized: When selecting a device, the corresponding image window is brought to front and vice versa.

Fixed Bugs

Runtime

- Opening a pylon device was time-consuming.
- Pylon Camera Link: Accessing cameras from multiple threads had the potential to fail.

C++ SDK

- Error messages of exceptions thrown by `CImagePersistence::Load()`were not properly formatted.
- `CPylonImage::AttachUserBuffer()` didn't take user buffer size into account.
- Loading/saving camera features from/to file had the potential to fail depending on the device's current state.
- Creating/destroying pylon devices was not thread safe.
- Accessing members of device specific grab results inside an image event handler's `OnImageGrabbed()` method was only possible after copying the grab result smart pointer.
- Wrong signature of `OnImageGrabbed()` methods caused the image event handler not to be called in some sample programs.

- Extended the CAviWriter class by functions for calculating the amount of image data written to an AVI file.
- When using the device specific camera classes, the `GenApi::INode::IsFeature()` function didn't work correctly.

Pylon C / .NET / VB SDK

- `NullReferenceExeption` was thrown when the PYLONC_ROOT environment variable was not set.
- Loading/saving camera features from/to file had the potential to fail depending on the device's current state.
- Creating/destroying pylon devices was not thread safe.
- PylonC: Fixed 64 bit issues in sample code.

TWAIN

- Opening the Twain driver was time-consuming when a Firewire camera device was attached.

Setup

- 64 bit C# runtime feature was incomplete.

Known Restrictions

The same known restrictions apply to the 3.1 release as to the 3.0 release (see below).

Known Bugs

The same known bugs apply to the 3.1 release as to the 3.0 release (see below).

Version 3.0

New Features / Changes

Runtime

- Updated to the latest GenICam 2.3 implementation.
- Location and naming of clserxxx.dlls for 64-bit pylon has been changed. If you are using 32-bit pylon nothing has been changed.
  Since the Camera Link standard doesn't yet specify a location for 64-bit DLLs pylon uses an additional directory to look for clserxxx.dlls. Starting with pylon 3.0 64-bit clsexxx.dlls should be placed in the directory:
  `c:\Program Files\Basler\pylon 3.0\genicam\bin\Win64_x64\CL_Protocol`. The DLLs must be named clserxxx.dll where xxx is a vendor specific code. There is no `_w64` filename suffix as in previous 2.3.x releases.
  If you are upgrading from a pylon 2.3 release and use 64-bit clserxxx.dlls please make sure move and rename the dlls.

C++ SDK

- Added an easy to use high level C++ API extension on top of the previous pylon C++ API (now called the Low Level API). The new high level API adds support classes for Camera and Buffer management. It allows you to set up your camera and grab images with only a few lines of code.
  It also allows you to convert, save, and load images in various formats (BMP, PNG, TIFF, and JPG). You can also create AVI files. See the pylon Programmer's Guide for all the new features to help you create vision applications.
  The Low Level API is still present.
- The ImageFormat converter has been rewritten to improve performance and consistency. The old converters have been deprecated.
  See the "Migrating from Previous Versions" section in the Programmer's Guide and API Reference, for information on how to migrate your existing code or use the deprecated old converters.
- Added a PylonImageWindow to display an image on the screen easily with as little as one line of code. See the documentation or the samples on how to use the Pylon Image Window in your code.
- Added new samples to show how to use the new API functionality.
- The new samples use the PylonImageWindow to display grabbed images on the screen.
- The "Migrating from Previous Versions" section in the Programmer's Guide and API Reference helps you port your existing pylon 2.x code to the new High-Level pylon 3.0

API if you want to leverage the new features in pylon 3.0. Porting is optional. Your current code still works with pylon 3.0.

- The uchar8_t, char8_t pcchar8_t, and pchar8_t data types have been deprecated. Please use int8_t and uint8_t instead.
- The debug versions of the pylon libraries have been removed from the setup. You can build and develop your applications using the installed release versions of the libraries.
- The GigE transport layer will detect whether it is running in a debugger session and increase the heartbeat timeout to 5 minutes when debugging is initialized. This allows you to single step through your code without getting disconnected from the camera. You can still override this by setting the PYLON_GIGE_HEARTBEAT environment variable. For more information, see the documentation that is included with the pylon software.
- The naming scheme for DLL and import libraries has been changed. DLL names are now built using the following scheme: "<*module*>`_MD_VC100.dll`". (i.e. `PylonBase_MD_VC100.dll`).
  If you have explicitly specified the import libraries or delay loaded DLLs in your project file, you must update your project settings accordingly.
- Updated the camera description file for Basler 1394, GigE and CameraLink cameras. Camera features introduced with the latest firmware versions are supported.

Pylon C/VB/.Net API

- Fixed typo in all file persistence function names. Functions having the mistyped word "persistant" in their name were renamed to the correct spelling "persistent". The following functions were renamed:
  PylonFeaturePersistanceSave → PylonFeaturePersistenceSave,
  PylonFeaturePersistanceLoad → PylonFeaturePersistenceLoad
  PylonFeaturePersistanceSaveToString → PylonFeaturePersistenceSaveToString,
  PylonFeaturePersistanceLoadFromString → PylonFeaturePersistenceLoadFromString

Pylon Viewer

- Added a 100% Zoom command to display the image in its original size.
- The viewer can now display and save images in 1, 2 and 4 bit pixel formats.
- The pylon Viewer will restore the baud rate setting of a CameraLink camera when the application is closed.
- The Registry key when the viewer stores its settings has changed from "HKCU\Software\Basler Vision Components" to "HKCU\Software\Basler"

Setup

- The start menu entry "pylon Viewer (GigE monitor mode)" has been renamed to "pylon Viewer (Multicast Monitor)" for better clarity.
- The Speed-O-Meter application has been removed from the setup.
- On 64-bit platforms setup creates shortcuts to the 64-bit version pylon viewer on the desktop.
  You can find the shortcuts for the 32-bit version in the start menu.

Fixed Bugs

Runtime

- Depending on the network configuration, the same camera may have been enumerated twice on the same interface.
  Note: If a NIC has multiple IP addresses assigned the same device will be enumerated for each IP address. This is intended.
- CameraLink cameras using a high baud rate were not enumerated / probed correctly when multiple serial ports were available on the system.
- Improved CRC calculation / checking implementation to increase execution speed.
- Pylon::IChunkParser::CheckCRC / Pylon::IChunkParser::HasCRC may have falsely thrown an exception even if the chunk data was correct.
- C1394Device::Close() could have resulted in a deadlock when called while the device was grabbing.

C++ SDK

- The bootstrapper failed to set up the environment correctly when pylon was installed in a directory containing Unicode characters.
- Reduced compile/link times for optimized release mode builds.
- Some samples caused an exception when setting the Exposure-Feature on newer camera models as they did non honor the increment correctly.

Pylon C / .NET / VB SDK

- GenApiEnumerationGetEntryByName() returned an error when the entry was not found.
- PylonDestroyDevice() could crash when PylonGigEEnumerateAllDevices() was called after the device had been opened.
- The ImageProvider class used in the C# samples did not handle grab results correctly. This resulted in exiting the grab loop and thus stopping the image acquisition when using the samples. This has been corrected.

Known Restrictions

Installation of .NET Features Fails When .NET Framework Is Not Already Installed

Synopsis: Installing the pylon .NET runtime and SDK features fails if there is no Microsoft.NET Framework 2.0 installed.

Solution: Install the .NET 2.0 Framework. The installer can be downloaded from http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5.

Note: Windows Vista or later have .NET 2.0 Framework preinstalled.

"missing driver" Error Message After Uninstalling pylon

Synopsis: When you uninstall a previous pylon version (pylon 2.2 or earlier) you may get an error message stating that drivers for IEEE 1394 Camera/Generic Desktop Camera could not be found or installed. Windows may sometimes even ask for a driver disk.

Solution: The error message is displayed because after the pylon setup has uninstalled its drivers for IEEE 1394 cameras, windows tries to restore the previous drivers for these cameras. You can safely ignore this message or click "Cancel" if Windows asks for a driver disk during uninstall.

Missing pylon/GenICam DLLs when Starting pylon Viewer or Any Other Application Using pylon

Synopsis: When the pylon installation is performed under the Administrator's account, under some circumstances the changes of the environment variables don't take effect immediately. This leads to error messages that pylon DLLs cannot be found when starting a pylon based application (e.g., the pylon Viewer complains about a missing dll).

Workaround: When installing pylon as Administrator, log off and on again after the pylon installation is finished. After logging on again the environment changes become effective.

Restrictions on 64-Bit Operating Systems

Synopsis: In general, due to limited hardware or operating system resources, it is not possible to enqueue an arbitrary number of image buffers at a time. For the IEEE 1394 camera driver, there are limitations due to restricted DMA resources provided by the OHCI chip sets. The actual amount of memory that can be fed into the driver's input queues depends on the currently available amount of free physical memory below 4 GByte. For the GigE drivers there are similar restrictions.

Feeding in too much memory will result in exceptions and can cause a high CPU load and an extremely reduced system performance.

Solution: You can use an arbitrary amount of memory for grabbing, but you must not register and feed in all buffers into the driver's input queue simultaneously (by using the `RegisterBuffer()`and `QueueBuffer()` methods). We recommend to register and enqueue sufficient memory buffers for receiving images for a certain period (e.g. 250 ms). Each time a filled buffer is retrieved from the driver's output queue (by using the `RetrieveResult()` method), it can be deregistered (by using the `DeregisterBuffer()` method). Then, a new buffer can be registered and fed into the driver's input queue. See the pylon Programmer's Guide and API Reference for an explanation of the concepts of the queues for the drivers.

Applications Using a Previous Version of pylon (pylon 2.3 or earlier) May Not Compile

Synopsis: Applications using a previous pylon version (pylon 2.3 or earlier), may not compile when pylon 3.0 is used.

Solution: For information on how to adjust the code, see the pylon Programmer's Guide and API Reference.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks.

Workaround: The pylon runtime libraries free the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks.
Use the `PylonTerminate()` method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly, call `PylonTerminate()` in the `ExitInstance()` method of your application object. Due to a design problem of the MFC memory tracking feature the memory leaks are dumped before DLLs like the pylon runtime libraries are unloaded/freed. This in turn frees global static data allocated by these DLLs. As a result, even after calling `PylonTerminate()`, the MFC memory tracking features reports false memory leaks. As a workaround, the memory tracking feature can be disabled in the application's `InitInstance()` method:

```
BOOL CWinMyApp::InitInstance()
{
#ifdef _DEBUG
    // Disable tracking of memory for the scope of the InitInstance()
    AfxEnableMemoryTracking(FALSE);
#endif  // _DEBUG
}
```

Unable to See Multiple GigE Cameras in the pylon IP Configuration Tool

Synopsis: When using multiple GigE cameras connected to more than one network adapter in your PC, not all cameras are listed in the pylon IP Configuration tool.

Solution: When using multiple network adapters or multiport network adapters, ensure that for each adapter (network interface) a different subnet is configured. When two or more adapters are configured for the same subnet, GigE cameras cannot be found. Be aware that configuring more than one network adapter for automatic IP addressing, causes all these adapters to share the same subnet (169.245.255.255), and this will lead to non-discoverable GigE cameras.

Unable to Establish a Connection to a GigE Camera Using a 100 MBit Network Adapter

Synopsis: When using a 100 MBit network adapter with a GigE camera, a connection can only be established if the speed and duplex mode settings of the network adapter are set to Auto.

Workaround: The Installation and Setup Guide for Cameras Used with Basler's pylon API describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed and duplex mode settings of the network adapter are set to Auto.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (I)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (II)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft's **route** utility to detect and remove the incorrect route. The `route print` command shows all entries. Remove the entry to your camera using the `route delete <camera ip>` command.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and IEEE 1394 cameras are not installed, pylon based applications fail to grab images. A **Failed to open stream grabber** error message is issued.

Workaround: Depending on whether you use GigE and/or IEEE 1394 cameras, install the appropriate pylon drivers as described in the Installation and Setup Guide for Cameras Used with Basler's pylon API.

Known Bugs

Pylon Viewer: Process Hangs When Closing the Viewer

Synopsis: Under some circumstances, the pylon Viewer process keeps running after closing the Viewer application. The GUI of the viewer is no longer visible, but the process is still visible in the task manager.

Workaround: Currently, there is no workaround other than killing the process using the Windows task manager.

GigE Filter Driver: Dropped Frames

Synopsis: If the first packet of an image frame (the so-called data leader packet) is missed, the complete frame will be dropped since the filter driver generates no resend requests for this data leader packet.

Workaround: Use a network adapter that is compatible with the performance driver. When the performance driver is used, a frame will be received even if its first packet was missed.

When a compatible network adapter cannot be used, optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb, set the packet size to its maximum. See also the camera User's Manual and the Installation and Setup Guide for Cameras Used with Basler's pylon API.

GigE Filter Driver: RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler filter driver.

Workaround: Unbind the Pylon GigE Vision filter driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service. How to unbind a filter driver is explained in the Installation and Setup Guide for Cameras Used with Basler's pylon API.

The pylon GigE Filter Driver May Prevent a PC from Going Into Sleep Mode

In pylon 3.0 or older, the pylon GigE filter driver may prevent a PC from going into sleep mode. The problem is only observed if the pylon GigE filter driver is used and one or several buffers were lost during image acquisition. In this case, the monitor will be turned off and the PC will not go into sleep mode but will hang. Shut off power to the PC before starting it again.

The problem is not observed when no buffers were lost while operating the pylon GigE filter driver or when using the pylon GigE performance driver.

Version 2.3.5

New Features

Pylon C++ API

- Updated CBasler1394Camera header file with latest v2.16 XML additions.
- Updated CBaslerGigECamera header file with latest v3.1 XML additions.
- Sequencer sample that shows how to use the sequencer feature.
- LoadSaveSequenceSets sample that shows how to load and save sequence sets.

Fixed Bugs

Pylon C++ API

- Pylon headers use explicit packing.

Pylon C/VB/.Net API

- PylonDestroyDevice() may have raised an access violation when PylonGigEEnumerateAllDevices() has been called after having opened a GigE device.
- Stdint.h caused type redefinitions when compiling with VS2010.

Setup

- Runtime msi file for x64 was missing CameraLink support.

Known Restrictions

The same known restrictions apply to the 2.3.5 release as to the 2.3.0 release (see below).

Known Bugs

The same known bugs apply to the 2.3.5 release as to the 2.3.0 release (see below).

Version 2.3.4

New Features

Pylon Runtime and All Transport Layers

- Support for Windows 7 SP1.

Pylon C++ API

- Extended the camera classes to support camera features introduced with latest firmware versions.

Pylon C/VB/.Net API

- Added functions for persisting camera features and for accessing files on the camera.

GigE Transport Layer

- Support for camera configuration and image acquisition across subnet boundaries.

IEEE 1394 Transport Layer

- Updated the camera description file for Basler cameras with IEEE 1394 interface. Camera features introduced with latest firmware versions are supported.

Camera Link Transport Layer

- Added support for the ace Camera Link cameras. Please refer to the known restrictions section below regarding API support of the ace Camera Link camera.

Pylon Viewer

- When image acquisition is active, the pylon Viewer prevents the system from entering sleep state.

Fixed Bugs

Runtime

- Discrepancy between color conversion matrices for YUV pixel formats used by the pylon pixel format converters and the camera devices.

GigE Transport Layer

- Device discovery failed if non-camera devices (e.g. a 3G network access module) sent unexpected responses to device discovery requests.
- The thread priority was reset to `THREAD_PRIORITY_TIME_CRITICAL` for a thread used for accessing a camera feature when the thread priority had been increased using the `Pylon::SetRTThreadPriority()` function.

IEEE 1394 Transport Layer

- The XML file for 1394 cameras included an incorrect enumeration for the PixelFormat chunk data feature.

Tools

- The pylon Viewer appeared to be frozen when opening a CL device for the first time.
- The pylon Viewer didn't handle file extensions correctly in the file selection dialog.
- The pylon Viewer didn't reflect changes of a feature's increment.
- The CL configuration tool crashed when probing for an ace CL camera.

Known Restrictions

Incomplete Support of the ace CL Camera in the Native C++ API

Synopsis: The `CBaslerCameraLinkCamera` class does not yet support all features of the ace Camera Link camera.

Workaround: Use the dynamic programming approach as explained in the pylon programmer's guide for accessing features not yet supported by the `CBaslerCameraLinkCamera` class.

Note: All features of the ace CL camera are supported by the C/VB/.NET API.

In addition, the same restrictions apply to the 2.3.4 release as to the 2.3.0 release (see below).

Known Bugs

The same known bugs apply to the 2.3.4 release as to the 2.3.0 release (see below).

Version 2.3.3

New Features

Pylon C API

- Added new GenApiPortRead/GenApiPortWrite functions to read and write data directly to a port.
- Added new PylonDevicePortRead/PylonDevicePortWrite functions to read and write data directly to a device port.

Fixed Bugs

Runtime

- Fixed a bug that caused saved Mono12packed TIFF images to contain incorrect pixel data.

IEEE 1394 Transport Layer

- Fixed a bug that resulted in not receiving any event grabber events.

Known Restrictions

The same known bugs apply to the 2.3.3 release as to the 2.3.0 release (see below).

Known Bugs

The same known bugs apply to the 2.3.3 release as to the 2.3.0 release (see below).

Version 2.3.0

New Features

Runtime

- **Support of Windows 7.**

C++ SDK

- **Improved device enumeration and device creation.**
  When enumerating cameras a filter can be applied allowing to enumerate only devices matching given criteria. Refer to the "Applying a Filter when Enumerating Cameras" section in the "pylon Programmer's Guide and API Reference" help document. The "Creating Specific Cameras" section describes how to create devices by specifying device properties like serial number or IP address.
- **Version of pylon can be retrieved at runtime.**
  Use the `GetPylonVersion()` function to query the version of the pylon installation. The `VersionInfo` class serves as a helper class for comparing version numbers.
- **Camera classes used for camera configuration have been extended to support new camera features.**
- **CPixelTypeMapper class**
  The CPixelTypeMapper class provides a mapping of camera specific pixel format values (e.g. "Mono8") to PixelType enum values (e.g. PixelType_Mono8).

IEEE 1394 Transport Layer

- **Updated the camera description file for Basler cameras with IEEE 1394 interface.**
  Camera features introduced with latest firmware versions are supported.

Camera Link Transport Layer

- **Specifying maximum baud rate.**
  Pylon will use the maximum possible baud rate reported by the Camera Link frame grabbers by default. For some frame grabbers however, the communication at higher baud rates might be unreliable. The "probe device" functionality of the CL Configurator tool will test the reliability of the serial port currently probed. In case there are any communication errors it will repeat the test at lower baud rates, shows a warning message, and suggest lowering the maximum baud rate to ensure proper communication.

In addition, the CL Configurator tool provides a dialog for manually setting the maximum baud rate.

- **64 bit support for Camera Link.**
  The 64-bit pylon installer installs both, a 32 bit and a 64 bit version of the Transport Layer. This allows operating Basler aviator cameras regardless whether the frame grabber manufacturer provides 32 bit or 64 bit versions of the DLLs required for the serial communication.

Pylon Viewer

- **A 64 bit version of the pylon Viewer is available.**
  The 64 bit version is required to access Camera Link cameras if the frame grabber manufacturer provides only 64 bit versions of the DLLs required for the serial communication.
- **Save images as .tiff files.**
  Grabbed images can be saved as .tiff files. Saving .tiff images with 16 bit per pixel is supported.
  Not all programs can read/display 16 bit per pixel images. I.E. Paint included in Windows XP cannot open 16 bit per pixel image files. Paint included in Windows 7 can read and display 16 bit per pixel image files.

Pylon NeuroCheck Driver

For NeuroCheck 6.0 a driver based on pylon is available. By installing pylon 2.3 and the pylon NeuroCheck driver Basler GigE and IEEE 1394 cameras are supported by the NeuroCheck application. The pylon NeuroCheck driver can be downloaded from the Basler website: www.baslerweb.com

pylonC.NET

When installed the pylonC.NET assembly is now visible in the *Add Reference* dialog in Visual Studio 2010.

Fixed Bugs

IEEE 1394 Transport Layer

- Frequent bus resets could have caused an IEEE 1394 camera to stop grabbing or to disappear from the IEEE 1394 bus.
- Occasionally grabbing images failed with a "Not enough storage is available to process this command" error.

SDK

- When compiling pylon applications using Microsoft Visual Studio 2010 you may have received compilation errors.
- Including Basler1394Camera.h in your project prevented the delay loading of GCBase.DLL resulting in a Missing DLL error message when starting the application.
- Fixed an issue where the installation of the Filter Driver on Windows 7 could have caused a bluescreen.
- Closing the stream grabber or calling FinishGrab() without stopping the image acquisition caused the camera to stream data although the required resources were already freed.
- The camera's trigger settings were not saved to file.

Installer

- On 64 bit Windows 7 the installer always requested a reboot after installing IEEE 1394 drivers.
- The installer occasionally hung when updating the environment.
- After uninstalling the Direct Show filter it was still visible in the list of available Direct Show filters.

Documentation

- C++ camera class documentation: grouping of class members was broken.

SpeedOMeter

- The Speedometer occasionally hung when closed while grabbing was still active..

Samples

- The VB6 and .NET viewer samples did not display Bayer images correctly.

Known Restrictions

Installation of .NET Features Fails When .NET Framework Is Not Already Installed

Synopsis: Installing the pylon .NET runtime and SDK features fails if there is no Microsoft.NET Framework 2.0 installed.

Solution: Install the .NET 2.0 Framework. The installer can be downloaded from http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5.

Note: Windows Vista or later have .NET 2.0 Framework preinstalled.

The pylon::CLock and pylon::AutoLock Classes Are Deprecated

Synopsis: These classes are also provided by the GenApi SDK which is part of the pylon SDK. For that reason, the pylon versions will be omitted in the next releases.

Solution: If you are using the Pylon::CLock or the Pylon::AutoLock classes in your application, include the <genapi/Synch.h> file instead of <pylon/Synch.h> and use the GenApi::CLock and GenApi::AutoLock classes instead of the Pylon::CLock and Pylon::AutoLock classes.

"missing driver" Error Message After Uninstalling pylon

Synopsis: When you uninstall a previous pylon version (pylon 2.2 or earlier) you may get an error message stating that drivers for IEEE 1394 Camera/Generic Desktop Camera could not be found or installed. Windows may sometimes even ask for a driver disk.

Solution: The error message is displayed because after the pylon setup has uninstalled its drivers for IEEE 1394 cameras, windows tries to restore the previous drivers for these cameras. You can safely ignore this message or click "Cancel" if Windows asks for a driver disk during uninstall.

Missing pylon/GenICam DLLs when Starting pylon Viewer or Any Other Application Using pylon

Synopsis: When the pylon installation is performed under the Administrator's account, under some circumstances the changes of the environment variables don't take effect immediately. This leads to error messages that pylon DLLs cannot be found when starting a pylon based application (e.g., the pylon Viewer complains about a missing **PylonUtility_MD.dll**).

Workaround: When installing pylon as Administrator, log off and on again after the pylon installation is finished. After logging on again the environment changes become effective.

Restrictions on 64 Bit Operating Systems

Synopsis: In general, due to limited hardware or operating system resources, it is not possible to enqueue an arbitrary number of image buffers at a time. For the IEEE 1394 camera driver, there are limitations due to restricted DMA resources provided by the OHCI chip sets. The actual amount of memory that can be fed into the driver's input queues depends on the currently available amount of free physical memory below 4 GByte. For the GigE drivers there are similar restrictions.

Feeding in too much memory will result in exceptions and can cause a high CPU load and an extremely reduced system performance.

Solution: You can use an arbitrary amount of memory for grabbing, but you must not register and feed in all buffers into the driver's input queue simultaneously (by using the `RegisterBuffer()`and `QueueBuffer()` methods). We recommend to register and enqueue sufficient memory buffers for receiving images for a certain period (e.g. 250 ms). Each time a filled buffer is retrieved from the driver's output queue (by using the `RetrieveResult()` method), it can be deregistered (by using the `DeregisterBuffer()` method). Then, a new buffer can be registered and fed into the driver's input queue. See the pylon Programmer's Guide and API Reference for an explanation of the concepts of the queues for the drivers.

Applications Using a Previous Version of pylon (pylon 2.2 or earlier) May Not Compile

Synopsis: Applications using a previous pylon version (pylon 2.2 or earlier), may not compile when pylon 2.3 is used.

Solution: For information on how to adjust the code, see the pylon Programmer's Guide and API Reference.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks.

Workaround: The pylon runtime libraries free the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks.
Use the `PylonTerminate()` method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly, call `PylonTerminate()` in the `ExitInstance()` method of your application object. Due to a design problem of the MFC memory tracking feature the memory leaks are dumped before DLLs like the pylon runtime libraries are unloaded/freed. This in turn frees global static data allocated by these DLLs. As a result, even after calling `PylonTerminate()`, the MFC memory tracking features reports false memory leaks. As a workaround the memory tracking feature can be disabled in the application's `InitInstance()` method:

```
BOOL CWinMyApp::InitInstance()
{
#ifdef _DEBUG
    // Disable tracking of memory for the scope of the InitInstance()
    AfxEnableMemoryTracking(FALSE);
#endif  // _DEBUG
}
```

Unable to See Multiple GigE Cameras in the pylon IP Configuration Tool

Synopsis: When using multiple GigE cameras connected to more than one network adapter in your PC, not all cameras are listed in the pylon IP Configuration tool.

Solution: When using multiple network adapters or multiport network adapters, ensure that for each adapter (network interface) a different subnet is configured. When two or more adapters are configured for the same subnet, GigE cameras cannot be found. Be aware that configuring more than one network adapter for automatic IP addressing, causes all these adapters to share the same subnet (169.245.255.255), and this will lead to non-discoverable GigE cameras.

Unable to Establish a Connection to a GigE Camera Using a 100 MBit Network Adapter

Synopsis: When using a 100 MBit network adapter with a GigE camera, a connection can only be established if the speed and duplex mode settings of the network adapter are set to Auto.

Workaround: The Installation and Setup Guide for Cameras Used with Basler's pylon API describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed and duplex mode settings of the network adapter are set to Auto.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (I)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (II)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Debug Libraries

Synopsis: Using the debug version of the Pylon GigE transport layer library sets the heartbeat timeout to 5 minutes. This allows single stepping during the debugging without loosing the connection to the camera. When restarting the program after an anomalous termination or after terminating the application in the debugger, no connection to the camera can be established. A **Device is controlled by another application** error message is issued.

Workaround: Remove the network cable to the camera temporarily. If this is not convenient, a tool is available allowing to shutdown the connection to the camera after an application aborted. Contact Basler Technical support for obtaining the tool.

GigE Camera Detection Fails If More than One Device Is Configured for AutoIP (e.g., if a Mobile Device Is Connected)

Synopsis: An attached GigE camera configured for automatic IP addressing is not detected when a further device is also configured for automatic IP addressing, for example a mobile device such as a PDA using MS Active Sync®.

Workaround: Assign fixed IP addresses to the camera and to the network adapter the camera is connected to. Make sure that the adapter and the camera are in the same subnet.

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft's **route utility** to detect and remove the incorrect route. The `route print` command shows all entries. Remove the entry to your camera using the `route delete <camera ip>` command.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and IEEE 1394 cameras are not installed, pylon based applications fail to grab images. A **Failed to open stream grabber** error message is issued.

Workaround: Depending on whether you use GigE and/or IEEE 1394 cameras, install the appropriate pylon drivers as described in the Installation and Setup Guide for Cameras Used with Basler's pylon API.

Samples may report invalid PixelFormat enumeration value when using an ace camera

Synopsis: Some samples may report an invalid PixelFormat value when using an ace camera.

Workaround: Some samples explicitly use the PixelFormat value "Mono16" which may not be supported by all ace cameras. Change all occurrences of "Mono16" to "Mono12" which is a pixel format supported by all ace cameras.

Known Bugs

Bluescreen may occur when uninstalling pylon software

Synopsis: Uninstalling pylon software while an IEEE 1394 camera is connected to the IEEE 1394 bus may cause a bluescreen.

Workaround: Make sure to unplug the plug of the IEEE 1394 cable from the camera before you start uninstalling pylon software. If you can not unplug the plug switch off camera power.

IEEE 1394 Transport Layer: A Deadlock might occur when closing an IEEE 1394 camera while the camera still acquires images.

Synopsis: If you close a 1394 camera while a acquisition is still active the `Close()` function may deadlock and not return.

Workaround: Ensure that an `AcquisitionStop` command is issued before closing the camera device.

Pylon Viewer: Process Hangs When Closing the Viewer

Synopsis: Under some circumstances, the pylon Viewer process keeps running after closing the Viewer application. The GUI of the viewer is no longer visible, but the process is still visible in the task manager.

Workaround: Currently, there is no workaround other than killing the process using the Windows task manager.

GigE Filter Driver: Dropped Frames

Synopsis: If the first packet of an image frame (the so-called data leader packet) is missed, the complete frame will be dropped since the filter driver generates no resend requests for this data leader packet.

Workaround: Use a network adapter that is compatible with the performance driver. When the performance driver is used, a frame will be received even if its first packet was missed.

When a compatible network adapter can not be used, optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb, set the packet size to its maximum. See also the camera User's Manual and the Installation and Setup Guide for Cameras Used with Basler's pylon API.

GigE Filter Driver: RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler filter driver.

Workaround: Unbind the Pylon GigE Vision filter driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service. How to unbind a filter driver is explained in the Installation and Setup Guide for Cameras Used with Basler's pylon API.

SpeedOMeter May Show Error Messages When Unplugging the Camera while Acquiring Images.

Synopsis: When you start the SpeedOMeter, select a camera, press *Start* and unplug the camera you may get several error messages.

Workaround: Press Stop to end the acquisition before unplugging the camera.

Version 2.2.1

New Features

SDK & Runtime

- **64 bit support for PylonC and PylonC.Net API.**

IEEE 1394 Transport Layer

- **The device info objects contain valid serial numbers.** In previous versions, the serial number of an IEEE1394 camera could only be retrieved after creating and opening a pylon device object. With pylon 2.2.1, the serial number is available by just enumerating camera devices. The device info objects for IEEE 1394 cameras contain now the serial numbers. A serial number can be retrieved by calling the `CDeviceInfo::GetSerialNumber()` function. **Note:** The serial number information is only valid if the camera is not opened by an application when enumerating the device.

Camera Link Transport Layer

- Support of the aviator camera's Acquisition Status feature.

Fixed Bugs

SDK

- The Pylon.Net assembly is not listed in the Visual Studio "Add Reference" dialog.
- Pylon.Net API: XML help is not available.
- Including PylonGigEIncludes.h causes compiler errors (references to non-existing files).
- PylonGigE DLL is not linked automatically (missing #pragma comment lib).
- PylonUtilities DLL is not linked automatically. (missing pragma comment lib).
- Missing #pragma comment lib for user32.dll and shell32.dll.
- VS 2008: COMPILER define redefinition when not including PylonIncludes.h first.

Installer

- The GenICam x64 bin folder is not added to the PATH environment variable.
- 64 bit runtime redistributables for IEEE 1394 and for GigE cannot be installed.

Camera Link Transport Layer

- I/O errors during XML file download are ignored causing corrupted XML files added to the XML file cache.

Camera Link Transport Layer and GigE Transport Layer

- If the XML file download fails, an XML file stored in the file system is used.

Direct Show / Twain

- The tree view control does not respect increment constraints of certain camera features.

Known Restrictions

For the 2.2.1 release there are the same restrictions as for the 2.2.0 release (see below).

Known Bugs

For the 2.2.1 release there are the same known bugs as for the 2.2.0 release (see below).

Version 2.2.0

New Features

Pylon

- **Support for the aviator Camera Link cameras**. The pylon Viewer tool can be used to configure aviator cameras. In order to use aviator cameras, you must run the CLConfiguration tool to select the serial ports to be probed for aviator cameras. The CLConfiguration tool will be automatically started when running the pylon Viewer for the first time.
- **Update to GenICam 2.0.** With the newer GenICam version, the creation of pylon device objects is much faster than for previous pylon versions.
- **Facility to avoid conflicts with non-Basler software based on GenICam 2.0.** The pylon installer no longer sets a system-wide GENICAM_ROOT_VX_Y and other GenICam related environment variables. Setting these environment variables globally could have influenced the installation of non-Basler software based on GenICam. For backward compatibility reasons, the pylon installer by default extends the PATH environment variable so that the GenICam DLLs shipped with pylon can be found at runtime. If that causes conflicts with non-Basler software, deselect or uninstall the *Extend PATH Environment Variable* feature. Refer to the "Delay Loading of DLLs and Bootstrapping" section of the pylon for Windows API Reference and Programmer's Guide document for more information about how pylon based applications set up the environment at runtime.

SDK

- **Support for Camera Link**. This release provides a new transport layer for aviator Camera Link cameras. This transport layer supports camera configuration only. Grabbing images with the Camera Link transport layer is not supported. To grab images use the API provided by your frame grabber manufacturer.
- **Pylon C API**. Libraries and header files of the pylon C API are provided as an alternative to the pylon C++ API. As part of the installation procedure, a set of sample C programs is installed at <Program Files Folder>\Basler\Pylon 2.2\Samples\C. Project files for Microsoft Visual Studio 6.0 and make files for the Borland C++ command-line compiler are provided.
- **Pylon C.Net API**. The pylon 2.2.0 installer installs a .NET assembly allowing to build pylon based applications using .NET languages. A set of C# sample programs is installed at <Program Files Folder>\Basler\Pylon 2.2\Samples\C#.

- **Pylon VB6 API**. A type library for building pylon based applications with Visual Basic 6 is provided. A set of VB 6 sample programs is installed at <Program Files Folder>\Basler\Pylon 2.2\Samples\VB.
-

IEEE 1394 Transport Layer

- **New camera configuration XML files for Basler FireWire cameras.** New features introduced with the latest firmware updates are supported. The new XML files are optimized to reduce delays when starting image acquisition.

GigE Transport Layer

- **Support for ace cameras**
- **Heartbeat timeout adjustable per environment variable.** Refer to the "The pylon Programmer's Guide and API Reference" document for more details.

Fixed Bugs

Pylon Viewer

- The viewer crashes when collapsing the feature tree.
- The viewer crashes when changing the user level.
- Under some circumstances drop down boxes in the feature tree are not updated.

Installer

- Failed to detect older pylon installations.
- Failed to uninstall network drivers.
- Failed to install due to remaining network drivers from previous pylon installations. The pylon 2.2 installer now detects and removes remaining network drivers from previous installations.

SDK

- No delay loading possible due to exported string constants.

GigE

- Dead locks when closing a GigE device.
- Failed to reopen a GigE event grabber.
- Device discovery failed if there were no network interfaces enabled.

- Device discovery failed if non-camera devices sent unexpected responses to device discovery requests.

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- Fixed handle leak in 1394 transport layer.
- Memory leak when using chunk parser or event grabber.
- Failed to set ExposureTimeBase feature for A102f, A31xf and A60xf cameras.

Direct Show

- Broken support of Bayer and YUV pixel formats.
- AOI settings were reset when starting image acquisition.

Known Restrictions

The pylon Installer Requires the Microsoft .NET Framework 2.0

Synopsis: Installing the pylon .NET runtime and SDK features fails if there is no Microsoft.NET Framework 2.0 installed.

Solution: Install the .NET 2.0 Framework. The installer can be downloaded from http://www.microsoft.com/downloads/details.aspx?displaylang=en&FamilyID=0856eacb-4362-4b0d-8edd-aab15c5e04f5.

Windows Vista or higher have .NET 2.0 Framework preinstalled.

The pylon::CLock and pylon::AutoLock Classes Are Deprecated

Synopsis: These classes are also provided by the GenApi SDK which is part of the pylon SDK. For that reason, the pylon versions will be omitted in the next releases.

Solution: If you are using the Pylon::CLock or the Pylon::AutoLock classes in your application, include the *<genapi/Synch.h>* file instead of *<pylon/Synch.h>* and use the *GenApi::CLock* and *GenApi::AutoLock* classes instead of the *Pylon::CLock* and *Pylon::AutoLock* classes.

"missing driver" Error Message After Uninstalling pylon 2.2

Synopsis: When you uninstall pylon 2.2 you may get a message stating that drivers for 1394 Camera/Generic Desktop Camera could not be found or installed.
Sometime Windows may even ask for a driver disk.

Solution: This error message is displayed because after the plyon setup has uninstalled its drivers for 1394 cameras windows tries to restore the previous drivers for these cameras. You can safely ignore these messages or click "Cancel" if Windows asks for a driver disk during uninstall.

When Installing as Administrator, Changes to the Environment Are not Effective Immediately

Synopsis: When the pylon installation is performed under the Administrator's account, under some circumstances the changes of the environment variables don't take effect immediately. This leads to error messages that pylon DLLs cannot be found when starting a pylon based application (e.g., the pylon Viewer complains about a missing **PylonUtility_MD.dll**).

Workaround: When installing pylon as Administrator, log off and on again after the pylon installation has been finished. After logging on again the environment changes become effective.

Restrictions on 64 Bit Operating Systems

Synopsis: In general, due to limited hardware or operating system resources, it is not possible to enqueue an arbitrary number of image buffers at a time. For the IEEE 1394 camera driver, there are limitations due to restricted DMA resources provided by the OHCI chip sets. The actual amount of memory that can be fed into the driver's input queues depends on the currently available amount of free physical memory below 4 GByte. For the GigE drivers there are similar restrictions.

Feeding in too much memory will result in exceptions and can cause a high CPU load and an extremely reduced system performance.

Solution: You can use an arbitrary amount of memory for grabbing, but you must not register and feed in all buffers into the driver's input queue simultaneously (by using the `RegisterBuffer()`and `QueueBuffer()` methods). We recommend to register and enqueue sufficient memory buffers for receiving images for a certain period (e.g. 250 ms). Each time a filled buffer is retrieved from the driver's output queue (by using the `RetrieveResult()` method), it can be deregistered (by using the `DeregisterBuffer()` method). Then a new buffer can be registered and fed into the driver's input queue. See the Programmer's Guide and API Reference for an explanation of the concepts of the queues for the drivers.

Applications Using an Old pylon Version May Not Compile

Synopsis: Current applications using a pylon version older than pylon 2.0, may not compile when pylon 2.2 is used.

Solution: For information on how to adjust the code, see the Programmer's Guide and API Reference.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks.

Workaround: The pylon runtime libraries free the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks.

Use the `PylonTerminate()` method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly, call `PylonTerminate()` in the `ExitInstance()` method of your application object. Due to a design problem of the MFC memory tracking feature the memory leaks are dumped before DLLs like the pylon runtime libraries are unloaded resulting in freeing global static data allocated by these DLLs. As a result, even after calling `PylonTerminate()`, the MFC memory tracking features reports false memory leaks. As a workaround the memory tracking feature can be disabled in the application's `InitInstance()` method:

```
BOOL CWinMyApp::InitInstance()
{
#ifdef _DEBUG
    // Disable tracking of memory for the scope of the InitInstance()
    AfxEnableMemoryTracking(FALSE);
#endif  // _DEBUG
}
```

Unable to See Multiple GigE Cameras in the pylon IP Configuration Tool

Synopsis: When using multiple GigE cameras connected to more than one network adapter in your PC, not all cameras are listed in the pylon IP configuration tool.

Solution: When using multiple network adapters or multiport network adapters, ensure that for each adapter (network interface) a different subnet is configured. When two or more adapters are configured for the same subnet, GigE cameras cannot be found. Be aware that configuring more than one network adapter for automatic IP address assignment, all of these adapters will share the same subnet (169.245.255.255), and this will lead to non-discoverable GigE cameras.

Unable to Establish a Connection to a GigE Camera Using a 100 MBit Network Adapter

Synopsis: When using a 100 MBit network adapter with a GigE camera, a connection can only be established if the speed and duplex mode settings are set to Auto.

Workaround: The Installation and Setup Guide for Cameras Used with Basler's pylon API describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed and duplex mode settings of the network adapter are set to Auto.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (I)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (II)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Debug Libraries

Synopsis: Using the debug version of the Pylon GigE transport layer library sets the heartbeat timeout to 5 minutes. This allows single stepping during the debugging without loosing the connection to the camera. When restarting the program after an anomalous termination or after terminating the application in the debugger, no connection to the camera can be established. A **Device is controlled by another application** error message is issued.

Workaround: Remove the network cable to the camera temporarily. If this is not convenient, a tool is available allowing to shutdown the connection to the camera after an application aborted. Contact Basler Technical support for obtaining the tool.

GigE Camera Detection Fails If More than 1 Devices are Configured for AutoIP (e.g., if a Mobile Device Is Connected

Synopsis: An attached GigE camera configured for automatic IP addressing is not detected when a further device is also configured for automatic IP addressing, for example a mobile device such as a PDA using MS Active Sync®.

Workaround: Assign fixed IP addresses to the camera and to the network adapter the camera is connected to. Make sure that the adapter and the camera are in the same subnet.

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft's **route utility** to detect and remove the incorrect route. The `route print` command shows all entries. Remove the entry to your camera using the `route delete <camera ip>` command.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and 1394 cameras are not installed, pylon based applications fail to grab images. A **Failed to open stream grabber** error message is issued.

Workaround: Depending on whether you use GigE and/or 1394 cameras, install the appropriate pylon drivers as described in the Installation and Setup Guide for Cameras Used with Basler's pylon API.

Known Bugs

Pylon Viewer: Process Hangs Up When Closing the Viewer

Synopsis: Under some circumstances, the pylon Viewer process keeps running when closing the viewer application. The GUI of the viewer is no longer visible, but the process is still visible in the task manager.

Workaround: Currently, there is no other workaround than killing the process using the Windows task manager.

GigE Filter Driver: Dropped Frames

Synopsis: If the first packet of an image frame (the so-called data leader packet) is missed, the complete frame will be dropped since the filter driver generates no resend requests for this data leader packet.

Workaround: Use a network adapter that is compatible with the performance driver. When the performance driver is used, a frame will be received even if its first packet was missed.

When a compatible network adapter can not be used, optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb, set the packet size to its maximum. See also the camera User's Manual and the Setup Guide for Cameras Used with Basler's pylon API.

GigE Filter Driver: RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler Filter Driver.

Workaround: Unbind the Pylon GigE Vision Streaming Filter Driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service. How to unbind a filter driver is explained in the Setup Guide for Cameras Used with Basler's pylon API.

Version 2.1.1

New Features

SDK

New camera features such as Reverse X, Trigger Delay, and combined Auto Gain & Auto Shutter are supported.

Known Restrictions

For the 2.1.1 release there are the same restrictions as for the 2.1.0 release (see below).

Known Bugs

For the 2.1.1 release there are the same known bugs as for the 2.1.0 release (see below).

Version 2.1.0

New Features

Pylon

- Windows Vista (32 & 64 bit) is supported.
- pylon TWAIN driver providing all applications able to acquire images from TWAIN sources access to Basler cameras. The TWAIN driver supports the complete feature set of Basler cameras.
- A 64 bit version of the pylon DirectShow driver to be used by DirectShow-based 64 bit applications.

- Camera settings can be saved to a file or loaded from a file. This feature can be useful for “cloning” cameras.
- Support of the file access feature of Basler cameras. For Basler runner cameras gain shading data can be uploaded using this file access feature.

GigE

- Full support of Windows XP 64 bit & Vista 64 bit operating systems.
- Multicasting & Broadcasting the image data stream is supported: Multiple PCs can receive the data stream of one camera simultaneously.
- Improved timing when grabbing images. Previous versions of the pylon GigE library used an internal thread for receiving image data. This thread was a potential source for delays when waiting for images. With pylon 2.1 the helper thread has been removed. The stream grabber implementation in the pylon GigE library does not use threads anymore.
- The parameter set of the GigE stream grabber now reflects the type of the used GigE Vision streaming driver (filter driver versus performance driver). This new type of stream grabber parameter can be used to explicitly select a certain driver when multiple drivers are available. When the application does not explicitly select a driver, the performance driver is used when it is available for the network interface. See the documentation of the `CBaslerGigEStreamGrabber` for more details.
- Statistic information: The parameter set of the GigE stream grabber contains new read-only parameters reflecting information about the number of successfully acquired images, incompletely acquired images, and information about the number of GigE Vision resend requests. See the documentation of the `CBaslerGigEStreamGrabber` class for more details.
- The GigE performance driver supports new Intel network adapters. See the FAQ http://www.baslerweb.com/beitraege/faq_en_74662.html for a list of supported network adapters.

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- Improved timing when grabbing images. The default priority of a helper thread needed for grabbing images has been raised significantly in order to reduce delays and jitter that might have been induced by the helper thread in previous pylon versions. Raising the thread priority requires either administrative privileges or the `SE_INC_BASE_PRIORITY_NAME` privilege. This privilege can be granted using the Windows policy editor (User Rights Assignment / Increase scheduling policy).

Viewer

- User interface for saving/loading camera features to/from a file (**Camera** menu, **Load Features** and **Save Features** entries)

- User interface for camera file access, e.g., for up- and downloading runner shading data. (**Camera** menu, **File Access** menu entry)
- Support of GigE multicast & broadcast streaming. In the Pylon 2.1 program group there is the additional shortcut 'Pylon Viewer (GigE monitor mode)' used for starting the pylon Viewer in a read-only mode. In this read-only mode the viewer can receive the data stream of a GigE camera that is controlled by a "normal" instance of the pylon Viewer running on a different PC. For more information about configuring the pylon Viewer for broad- and multicasting, see the description of the parameters in the **Stream Parameters** -> **IP Configuration** group. These parameters are accessible when the user level is set to 'Expert' or 'Guru'.

SDK

- VS 2008 is supported.
- Save/load camera features to/from a file (`Pylon::CFeaturePersistence` class). See the new LoadSaveCameraFeatures sample program as part of the SDK installation.
- Access to packet statistics of GigE streaming drivers `Pylon::CBaslerGigEStreamGrabber` class)
- Access of files in the cameras. Especially up- and download of shading data for Basler runner cameras (`GenICam::ODevFileStream & GenICam::IDevFileStream` classes). See the new RunnerShadingSample sample program as part of the SDK installation.
- API to raise the priority of a single thread to real-time priorities without the need of putting the whole process into the real-time process priority class. Setting a thread acquiring images to a priority value >= 16 can significantly reduce delays and jitter when waiting for grabbed images. For more details, see the documentation of the `Pylon::SetRTThreadPriority()` function.
- New sample program demonstrating multicast & broadcast streaming (`AcquireContinuous_Multicast`).
- New sample program demonstrating how to create and upload shading data for a Basler runner camera (`RunnerShadingSample`).

Fixed Bugs

Viewer

- Width of drop-down boxes and sliders exceed the width of the value column of the viewer's 'Features' pane.
- Edit controls and drop-down boxes loose focus when the viewer automatically polls the feature values.
- A changed value in an edit control is not written to the device when one of the grab buttons is pressed while editing the value.
- Under some circumstances the viewer freezes when removing a device.

IP Configuration Tool

- The tool allows assigning an IP address reserved for IP multicast to a camera. This causes the camera not being discoverable anymore.

IEEE 1394 bus driver

- Problems with large networks of 1394 devices
- Crash when the driver is used by Windows video capture sources in DirectShow based applications.
- Problems when removing 1394 devices.
- Initialization problems of PHY registers when the Basler 1394 bus driver is installed when some 3rd party OHCI bus drivers are installed.
- Compatibility problems with non-Basler cameras. Some non-Basler cameras cannot be used with Basler cameras simultaneously.

IEEE 1394 Camera Driver

- Memory leak in the pylon 1394 transport layer library.
- Exceptions of `CBcamException` type are thrown when unplugging a 1394 device.

GigE Performance Driver

- Grab timeouts when using multiple buffers and subsequently cancelling and restarting image grabbing.

SDK

- Creating a device using the full device name fails.

Known Restrictions

When Installing as Administrator, Changes to the Environment are not Effective Immediately

Synopsis: When the pylon installation is performed under the Administrator's account, under some circumstances the changes of the environment variables don't take effect immediately. This leads to error messages that pylon DLLs cannot be found when starting a pylon based application (e.g., the pylon Viewer complains about a missing **PylonUtility_MD.dll**).

Workaround: When installing pylon as Administrator, log off and on again after the pylon installation has been finished. After logging on again the environment changes become eventually effective.

Restrictions on 64 Bit Operating Systems

Synopsis: In general, due to limited hardware or operating system resources, it is not possible to enqueue an arbitrary number of image buffers at a time. For the IEEE 1394 camera driver, there are limitations due to restricted DMA resources provided by the OHCI chip sets. The actual amount of memory that can be fed into the driver's input queues depends on the currently available amount of free physical memory below 4 GByte. For the GigE drivers there are similar restrictions.

Feeding in too much memory will result in exceptions and can cause a high CPU load and an extremely reduced system performance.

Solution: You can use an arbitrary amount of memory for grabbing, but you must not register and feed in all buffers into the driver's input queue simultaneously (by using the `RegisterBuffer()`and `QueueBuffer()` methods). We recommend to register and enqueue sufficient memory buffers for receiving images for a certain period (e.g. 250 ms). Each time a filled buffer is retrieved from the driver's output queue (by using the `RetrieveResult()` method), it can be deregistered (by using the `DeregisterBuffer()` method). Then a new buffer can be registered and fed into the driver's input queue. See the Programmer's Guide and API Reference for an explanation of the concepts of the queues for the drivers.

Applications Using an Old pylon Version May Not Compile

Synopsis: Current applications using an older pylon version than pylon 2.0, may not compile when pylon 2.1 is used.

Solution: For information on how to adjust the code, see the Programmer's Guide and API Reference.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks.

Workaround: The pylon runtime libraries free the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks.

Use the `PylonTerminate()` method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly, call `PylonTerminate()` in the `ExitInstance()` method of your application object. Due to a design problem of the MFC memory tracking feature the memory leaks are dumped before DLLs like the pylon runtime libraries are unloaded resulting in freeing global static data allocated by these DLLs. As a result, even after calling `PylonTerminate()`, the MFC memory tracking features reports false memory leaks. As a workaround the memory tracking feature can be disabled in the application's `InitInstance()` method:

```
BOOL CWinMyApp::InitInstance()
{
#ifdef _DEBUG
    // Disable tracking of memory for the scope of the InitInstance()
    AfxEnableMemoryTracking(FALSE);
#endif  // _DEBUG
}
```

Unable to See Multiple GigE Cameras in the pylon IP Configuration Tool

Synopsis: When using multiple GigE cameras connected to more than one network adapter in your PC, not all cameras are listed in the pylon IP configuration tool.

Solution: When using multiple network adapters or multiport network adapters, ensure that for each adapter (network interface) a different subnet is configured. When two or more adapters are configured for the same subnet, GigE cameras cannot be found. Be aware that configuring more than one network adapter for automatic IP address assignment, all of these adapters will sharing the same subnet (169.245.255.255), that will lead to non-discoverable GigE cameras.

Unable to Establish a Connection to a GigE Camera Using a 100 MBit Network Adapter

Synopsis: When using a 100 MBit network adapter with a GigE camera, a connection can only be established if the speed and duplex mode settings are set to Auto.

Workaround: The Installation and Setup Guide for Cameras Used with Basler's pylon API describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed and duplex mode settings of the network adapter are set to Auto.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (I)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Multiple Network Adapters (II)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera When Using Debug Libraries

Synopsis: Using the debug version of the Pylon GigE transport layer library sets the heartbeat timeout to 5 minutes. This allows single stepping during the debugging without loosing the connection to the camera. When restarting the program after an abort no connection to the camera can be established. A **Device is controlled by another application** error message is issued.

Workaround: Interrupt the power supply to the camera and restart the camera. If this is not convenient, a tool is available allowing to shutdown the connection to the camera after an application aborted. Contact Basler Technical support for obtaining the tool.

GigE Camera Detection Fails If Mobile Device Is Connected

Synopsis: An attached GigE camera configured for automatic IP addressing is not detected when a mobile device such as a PDA is connected to the host PC using MS Active Sync®.

Workaround: Assign fixed IP addresses to the camera and to the network adapter the camera is connected to. Make sure that the adapter and the camera are in the same subnet.

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft's **route utility** to detect and remove the incorrect route. The `route print` command shows all entries. Remove the entry to your camera using the `route delete <camera ip>` command.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and 1394 cameras are not installed, pylon-based applications fail to grab images. A **Failed to open stream grabber** error message is issued.

Workaround: Depending on whether you use GigE and/or 1394 cameras, install the appropriate pylon drivers as described in the Installation and Setup Guide for Cameras Used with Basler's pylon API..

Known Bugs

GigE Filter Driver: Dropped Frames

Synopsis: If the first packet of an image frame (the so-called data leader packet) is missed, the complete frame will be dropped since the filter driver generates no resend requests for this data leader packet.

Workaround: Optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb set the packet size to its maximum. See also the Camera User's Manual and the Setup Guide for Cameras Used with Basler's pylon API.

GigE Filter Driver: RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler Filter Driver.

Workaround: Unbind the Pylon GigE Vision Streaming Filter Driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service. How to unbind a filter driver is explained in the Setup Guide for Cameras Used with Basler's pylon API.

Version 2.0.2

New Features

SDK

New camera features such as Gain Auto, Exposure Auto, and White Balance Auto are supported.

Fixed Bugs

Viewer

- Images acquired using the single grab feature are not displayed in some cases.

GigE Vision (SDK)

- Creation of a camera device from an IP address fails.

IEEE 1394

- BcamError.dll is constantly loaded and unloaded.
- Resource leak in the 64 bit version of the driver.

AcquireSingleFrame_ChunkImage Sample

- Wrong argument for the IChunkParser::AttachBuffer() method is used.
  (The payload size returned by the grab result object must be used instead of the payload size value reported by the camera object).

Known Restrictions

For the 2.0.2 release there are the same restrictions as for the 2.0.0 release (see below).

Known Bugs

For the 2.0.2 release there are the same known bugs as for the 2.0.0 release (see below).

Version 2.0.0

New Features

Pylon

- Pylon runs natively under the Windows 64 bit operating system.
- Update from GenICam 1.0 to GenICam 1.1.
- Basler runner GigE Vision cameras are supported.
- The handling of GenICam camera description XML files has been improved. For GigE Vision cameras, the description files are downloaded from the cameras by default. The user can control the assignment of a camera description file to a camera by a priority rule file, specifying the location of the XML file to be used. For more information, see the pylon Programmer's Guide and API Reference or the **StandardRules.xml** file in your pylon installation (<**PYLON_ROOT**>/**Config File Registry**).

IEEE 1394

- A Basler IEEE 1394 bus driver is provided. The alternative IEEE 1394 protocol stack implementation replaces the original Windows driver stack to work around limitations and bugs in the Windows default stack. In particular, the speed limitations of the original Windows driver are no longer present with the Basler 1394 bus driver.

Viewer

- Color images at bit depths of more than 8 BPP can be displayed.
- Some minor GUI improvements.

SDK

- VS2005 SP1 is supported.
- **PylonIncludes.h** includes all common headers and their required import libraries. For increased ease of use, include **PylonIncludes.h** in your project and compile. Libraries need no longer be specified in the Project settings.
- The `PylonAutoInit` class is added. `PylonInitialize` and `PylonTerminate` are automatically called in the constructor and destructor.
- Color Converter functions are included.
- Pylon can be used with alternative STL implementations, e.g. with STL Port.

Fixed Bugs

Setup

- Workarounds for the limitations of the Windows 1394 bus driver are no longer necessary due to the new Basler IEEE 1394 bus driver.
- The GigE performance driver is now installed as part of a silent installation.
- For Windows 2000, the GDI+ runtime is included and needs not be installed separately. GDI+ is used by the Basler DirectShow driver only.
- When selecting only IEEE 1394 software components for custom installation, no GigE software components are installed.
- The Basler drivers being certified, warning messages are not generated during installation.
- DirectShow components are installed as part of a silent installation.

Pylon

GigE Vision

- The gxAPI provides a more robust ACK message handling and discards invalid acks instead of generating errors.
- Device user IDs of 16 characters are handled correctly.
- Calling `Close()` on an already closed GigE Pylon Device does not cause an error on the second call.
- Fixed: Resource leak when grabbing.
- Receive buffers of the cameras no longer fill up when enumerating the cameras while multiple network adapters are present.

SDK

Common

- Multiple calls to `PylonInitialize()` and `PylonTerminate()` do no longer cause a crash. We recommend using the `PylonAutoInit` class.

Samples

- SetValueAll is removed as the method for writing the LUT.

Viewer

- The viewer does not crash when a transport layer fails to provide a streamgrabber object.
- The viewer does not crash when feature values are copied to the clipboard.
- The viewer does not crash upon disconnecting the camera.

Known Restrictions

Restrictions on 64 Bit Operating Systems with More Than 4 GByte RAM

Synopsis: For the IEEE 1394 driver, there are limitations due to restricted DMA resources. It is not possible to enqueue an arbitrary amount of image buffers at a time. The actual amount of memory that can be fed into the driver's input queues depends on the currently available amount of free physical memory below 4 GByte.

Feeding in too much memory can cause a high CPU load and an extremely reduced system performance.

Solution: You can use an arbitrary amount of memory for grabbing, but you must not feed in all buffers (by using the `QueueBuffer()` method) into the driver's input queue simultaneously. We recommend enqueueing sufficient memory buffers for receiving images for a certain period (e.g. 250 ms). Each time a filled buffer is retrieved from the driver's output queue (by using the `RetrieveResult()` method), a new buffer can be fed into the driver's input queue. See the Programmer's Guide and API Reference for an explanation of the concepts of the queues for the drivers.

Broken DirectShow After Uninstalling pylon

Synopsis: When uninstalling pylon 1.0 , the **quartz.dll** may be unregistered. The **quartz.dll** is a DirectShow runtime component and therefore, all applications using DirectShow may fail.

Solution: Reregister the **quartz.dll** manually:

1. Click **Start** and click **Run**
2. Enter **regsvr32 quartz.dll**
3. Click **OK**

Applications Using an Old pylon Version May Not Compile

Synopsis: Current applications using an old pylon version, may not compile when pylon 2.0 is used.

Solution: For information of how to adjust the code, see the Programmer's Guide and API Reference.

Installation Requires Administrator Privileges

Synopsis: It is not possible to install the pylon packages with restricted privileges.

Workaround: Ask your local system administration to install the pylon packages.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks.

Workaround: The runtime system frees the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks. Use the `PylonTerminate()` method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly, call `PylonTerminate()` in the `ExitInstance()` method of your application object.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and 1394 cameras are not installed, pylon-based applications fail to grab images. A "Failed to open stream grabber" error message is issued.

Workaround: Depending on whether you use GigE and/or 1394 cameras, install the appropriate pylon drivers as described in the camera User's Manual.

Unable to Establish a Connection to a GigE Camera (I)

Synopsis: When using a 100 MBit network adapter with a GigE camera, a connection can only be established if the speed & duplex mode settings are set to "auto".

Workaround: The Installation and Setup Guide for Cameras Used with Basler's pylon API describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed & duplex mode settings of the network adapter are set to "auto".

Unable to Establish a Connection to a GigE Camera (II)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera (III)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera (IV)

Synopsis: Using the debug version of the Pylon GigE User-mode Driver sets the heartbeat timeout to 5 minutes. This allows single stepping when debugging. When restarting the program after an abort no connection to the camera can be established. A “Device is controlled by another application” error message is issued.

Workaround: Interrupt the power supply to the camera and restart the camera.

Camera Detection Fails If Mobile Device Is Connected

Synopsis: An attached GigE camera configured for automatic IP addressing is not detected when a mobile device such as a PDA is connected to the host PC using MS Active Sync®.

Workaround: Assign fixed IP addresses to the camera and the network adapter the camera is connected to. Ensure that the adapter and the camera are in the same subnet.

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft’s **route** utility to detect and remove the incorrect route. The command **route print** shows all entries. Remove the entry to your camera using the command **route delete** <**camera ip**>

Only msi Files Are Provided for Redistributing the pylon Runtime Environment with Your Own Applications

Synopsis: Pylon 2.0 does no longer provide Windows installer merge modules (.msm files) for redistributing the pylon runtime environment and drivers. This is due to the fact, that installing drivers from merge modules causes problems.

Workaround: Use the Windows installer packages (.msi files) that are located in the **redist** folder of the pylon SDK CD. A custom installer can launch the installation of these packages as nested installations.

Known Bugs

GigE Vision Streaming Filter Driver

Dropped Frames

Synopsis: Dropped frame if a data leader packet was missed.

Workaround: Optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb set the packet size to its maximum. See also the “Recommendations” section and the Camera User’s Manual.

Clipped data lengths are not reported

Synopsis: The original frame size is reported by the grab result even if a received data frame is clipped by an insufficiently sized destination buffer.

Workaround: Provide sufficiently sized destination buffers or address the issue in your own way.

RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler Filter Driver.

Workaround: Unbind the Pylon GigE Vision Streaming Filter Driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service.

Version 1.0

New Features

SDK

Common

- **PylonInitialize()/PylonTerminate()**: These functions were added to the pylon API in order to handle resource management correctly. A pylon application uses these functions to initialize and clean up the pylon API properly. See the Basler pylon Programmers Guide and API Reference for more details.
- **Basler DirectShow Filter**: A completely new DirectShow source filter provides access to all camera functions besides the standard DirectX parameters like gain and shutter. The DirectShow Filter is now integrated in the pylon setup application.

GigE Vision

- **Fire Test Packet**: A camera can be triggered to send a dummy stream data packet of a predetermined size. Based on the success of receiving this stream data packet an application can optimize the packet size parameter of a data stream.
- **Force IP command**: Mechanism to force a static IP address into a camera by a broadcast request message. This is especially useful if the camera is inappropriately configured and can therefore not be reachaed by the regular communication mechanism.
- **Facility to enable broadcast of DISCOVERY_ACK**: A camera which is configured to reside in a different IP subnet than the requestor of the DISCOVERY_CMD is enabled to broadcast its answer and can be enumerated this way.
- **Support for register concatenation**: Concatenated register accesses and block read and write commands are now executed with their maximum possible sizes. This increases the performance of the data transmission. (Previously, these register accesses were broken down into individual register accesses partly with the rationale to overcome limitations of some initial Basler camera prototypes.)
- **Unicast/directed device discovery**: Cameras residing behind IP routers can be addressed by unicast device discovery requests. (The camera addresses must be known of course.)

Drivers

Tools

- **Basler Driver Installer**: For all pylon components a GUI based installer is now available which also provides the facility for silent installation.
- **Redistribution Installation**: For the integration in customer installation routines, new individual driver packages with small footprints are now available. Select the interface driver package serving your requirement (IEEE1394 Driver, GigE Filter Driver of GigE Performance Driver) or combinations of driver packages.
- **DirectX Redistribution**: For the Basler DirectShow source filter a redistribution package is now available.

pylon Viewer

- **Feature documentation window**: This new window in the pylon Viewer displays a short description for each feature selected.
- **Feature properties window**: For the currently selected feature all its GenICam properties like Type and Access Mode are displayed.
- **Extended support for image data formats**: The pylon Viewer converts Bayer8, Mono10, Mono12 and Mono16 images to their 8bit equivalent for display. The resulting images can be stored as 8bit bmp files. The display of packed image formats is not yet supported.
- **Polling of non-cacheable GenICam Features**: Volatile parameters on the GUI are periodically checked and updated by the viewer.

Fixed Bugs

Driver

1394

- Problem with retrieval of 1394 related error messages

GigE Vision

Common

- Fixed: report of incompletely acquired frames
- Report of actually received amount of data
- Complete stream capture driver ranking and automatic selection

- Fixed: opening a stream channel overwrites its “don’t-fragment” settings

Streaming Filter

- Fixed: incorrect source address of packet resend requests
- Enhanced packet timeout timer resolution
- Open driver as restricted user
- Certified driver for Windows XP – 32 bit and Windows 2000

Performance Driver

- Enhanced packet timeout timer precision
- Enumeration of multiple network adapters
- More detailed error status reporting
- Fixed: blue screen if no adapter is available

SDK

- Plug & Play handling improved in many respects
- Samples improved
- Diverse resource leaks eliminated

Viewer

- RGB status view is also updated if mouse isn’t moved
- Image blitting improved
- Presentation of float values improved

Recommendations

Packet Size Parameter for GigE Vision

Synopsis: Adjust the maximum possible value.

Solution: We recommend the following settings for the Packet Size (GevSCPSPacketSize) parameter:

- If you use a peer-to-peer connection with a network adapter supporting jumbo frames: 8192 bytes. Configure your network adapter to use Jumbo Frames.
- If you use a peer-to-peer connection with a network adapter not supporting jumbo frames: 1500 bytes.
- If you use a connection routed through an arbitrary network: 576 bytes or more depending on the capabilities of the routers.

Heartbeat Timeout Parameter

Synopsis: A short heartbeat timeout value causes a premature reset of the connection.

Solution: Use a timeout value appropriate for your operating conditions. Setting the heartbeat timeout parameter to its maximum value can be very useful for debugging. This will allow you to stop in a breakpoint for sufficient time. The pylon debug libraries set the heartbeat timeout to 5 minutes by default.

Known Restrictions

Installation Requires Administrator Privileges

Synopsis: It is not possible to install the pylon packages with restricted privileges.

Workaround: Ask your local system administration to install the pylon packages.

MFC Applications Report Memory Leaks

Synopsis: In debug mode, MFC applications using the pylon API report a huge number of memory leaks. It might take several minutes for the debugger to output the pretended leaks.

Workaround: The runtime system frees the reported memory blocks after the MFC memory tracking feature has dumped the assumed leaking memory leaks. Use the PylonTerminate() method to explicitly free memory resources allocated by the pylon runtime system. In order to terminate the application properly call PylonTerminate() in its exit instance method.

Unable to Grab Images

Synopsis: When pylon drivers for GigE and 1394 cameras are not installed, pylon-based applications fails to grab images. A “Failed to open stream grabber” error message is issued.

Workaround: Depending on whether you use GigE and/or 1394 cameras, install the appropriate pylon drivers as described in the camera User’s Manual.

Unable to Establish a Connection to a GigE Camera (I)

Synopsis: When using a 100 MBit network adapter with a GigE camera a connection can only be established if the speed & duplex mode settings are set to “auto”.

Workaround: The camera User’s Manual describes how to install the Basler network drivers and how to configure the network adapter. Ensure that the speed & duplex mode settings of the network adapter are set to “auto”.

Unable to Establish a Connection to a GigE Camera (II)

Synopsis: When multiple network adapters are used on one PC with multiple adapters included in the same subnet, connections to cameras cannot be established.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera (III)

Synopsis: A connection to a camera cannot be established when more than one adapter is configured for automatic IP addressing.

Workaround: Assign fixed IP addresses to your network adapters. Ensure that each adapter is in a different subnet.

Unable to Establish a Connection to a GigE Camera (IV)

Synopsis: Using the debug version of the Pylon GigE User-mode Driver sets the heartbeat timeout to 5 minutes. When restarting the program after an abort no connection to the camera can be established. A “Device is controlled by another application” error message is issued.

Workaround: Interrupt the power supply to the camera and restart the camera.

Camera Detection Fails If Mobile Device Is Connected

Synopsis: An attached camera configured for automatic IP addressing is not detected when a mobile device such as a PDA is connected to the host PC using MS Active Sync®.

Workaround: Assign fixed IP addresses to the camera and the network adapter the camera is connected to. Ensure that the adapter and the camera are in the same subnet.

GigE Vision Control Protocol Commands have no “Don’t Fragment” Bit Set

Synopsis: The current pylon GigE Vision Control Protocol implementation can not set the don’t-fragment-flag in the IP header of command messages.

Workaround: Not possible. Not necessary. The issue poses no limitation to realistic usage.

Known Bugs

GigE Vision, Common

GigE Camera Unreachable

Synopsis: Camera is temporarily not reachable because the MS Windows® operating system adds an incorrect entry in the routing table when a camera is removed while a connection to it exists.

Workaround: Use Microsoft's **route** utility to detect and remove the incorrect route. The command **route print** shows all entries. Remove the entry to your camera using the command **route delete** <**camera ip**>

Solution: none

GigE Vision Streaming Filter Driver

Dropped Frames

Synopsis: Dropped frame if a data leader packet was missed.

Workaround: Optimize the transport layer parameters of the filter driver and reduce the network traffic. As a rule of thumb set the packet size to its maximum. See also the "Recommendations" section and the Camera User's Manual.

Clipped data lengths are not reported

Synopsis: Even if a received data frame is clipped by an insufficiently sized destination buffer the original frame size is reported by the grab result.

Workaround: Provide sufficiently sized destination buffers or consider this fact on your own.

RAS, VPN Is Not Working

Synopsis: The RAS and VPN services do not work with the Basler Filter Driver.

Workaround: Unbind the Pylon GigE Vision Streaming Filter Driver from the adapter that is used for the RAS and/or VPN service. Do not share a network connection between GigE Vision devices and the RAS and/or VPN service.

GigE Vision Performance Driver

Driver is not yet WHQL certified

Synopsis: The Performance Driver is not Microsoft WHQL certified. A related warning message is displayed every time the driver is installed.

Workaround: Ignore the warning message and continue the installation.

pylon Runtime

Side-by-Side Installations of GenICam Packages Do Not Work

Synopsis: Using the pylon-based applications (e.g. the pylon Viewer) depends on the correct settings of the following environment variables: **GENICAM_ROOT**, **PYLON_ROOT**, and **PATH**. The following settings are vital:

- **GENICAM_ROOT** must point to the installation folder
- **PATH** must contain <**GENICAM_ROOT**>**\Bin\Win32_i86** and <**PYLON_ROOT**>**\bin**.

The pylon software installation procedures properly set the environment variables, but installing other GenICam-based software packages may alter the settings of **GENICAM_ROOT** and **PATH**.

Workaround: Use start scripts setting up the correct local environment for different software packages.