Lumenera Cameras SDK v6.3.1

Release Notes

1.1 Update from release V6.3.0 to v6.3.1

1.1. Camera Drivers

- **Lt225/Lt425 models**
  - Improved support for use on a USB2.0 port
  - Better black level calibration
  - Enabled ability to boot from a powered off system
  - Improved external triggered frame rate
- **Lt365 model (new model)**
  - Implemented binning x2, x3, x4
  - LuCam CAPTURE modified to support tap and binning modes
  - Corrected slow response to brightness and gamma adjustments when connected to USB2.0 output
  - Improved tap balancing
  - Added new color correction matrices (CCM) for daylight and incandescent
  - Improved black-level offset correction
- **Lc170 model**
  - Corrected bug producing disconnect issue at certain resolutions
- **All USB 3.0 models**
  - Fixed range for gamma

1.2. API update from 2.1.1.27 to 2.1.1.36

- Added a new property for minimum time for a frame
- Made modifications to camera properties for Gamma, Contrast, & Brightness to support new Look Up Tables (LUT)
- Improved USB enumeration feedback and information
- Added property to indicate if external power is being provided
- Tap configuration property will return fail if camera does not support multi-tap output
- Poll additional frame format properties on camera connect
- Added the true pixel depth to the frame format structure.
- Improved post dual tap correction to support 14 bits color data.

1.3. SDK binaries update

- New Executable Sample Programs
  - BurstMode.exe (sample app to demonstrate how to capture images in burst mode).
  - CoolingAppNote.exe (sample app to demonstrate how to enable or disable cooling function with INFINITY3-1 cooled camera.

    - DemoConversionEx.exe (Sample app to demonstrate how to use conversionEX functions, mainly usage of LUCAM_CONVERSION_PARAM data structure).
    - QueryInterface.exe (Sample app to demonstrate how to query camera interface).
- Existing Samples Improved:
    - autolens.exe
    - avisample.exe
    - demosaicing.exe (add GigE cameras support)
    - Histogram.exe (support for Lt models)
    - InfinityTest.exe
    - Threshold.exe (support for Lt models)

1.2 Known Open Issues

- Demosaicing.exe application doesn't handle brightness; contrast and gamma property for GigE cameras, users should avoid using the Image Settings button.

2 Update from Release V6.2.0 to 6.3.0

2.1 API update from 2.1.1.13 to update 2.1.1.27

- Improve frame rate reports
- Add more error detection in the LucamConvertFrametoRgbXX.
- Add support for LED color correction matrix.
- Improved dual and multi tap correction mechanism.
- Improved external interface for better support with USB 3.0 product.
- Improvements on property range validation.
- Improvements on LucamAutoFocusStart() for more consistent focus control with macro lenses.
- Improvements on the LUCAM_PROP_ABS_FOCUS.
- Improvements on the LucamCameraReset.
- Added mode function in the alias list to help with direct access to dll.
- Variable frame rate support for Lt220 and Lt420 camera models.
- Add support of thresholding on Lt220 and Lt420 camera models.
- Add support of high dynamic range in dual slop mode on Lt220 and Lt420 camera models.

2.2 Sample Applications

- Add INFINITY1-2CB support in DirectX sample.
- Corrected issues that could cause autolens application crash under the following conditions:
    .1. When taking burst snapshot in 16 bit mode.
    .2. When ROI is set to 0.
    .3. With white balance when ROI is active.
- Fixed issue where the auto iris was not enabled when he continuous auto iris checkbox is activated.
- Fixed file browsing to show movie files in AVI Acquisition.exe
- Fixed crash when disconnecting camera without stopping preview in AVI Acquisition.exe
- Fixed issue of preview not showing unless Preview while capturing AVI is checked in AVI Acquisition.exe.
- Improve current time position reporting in AVI play back mode in AVI Acquisition.exe.

2.3 Known Open Issues

- CaptureVideoFrameToFile.exe sample application fail to take snapshot and returns error message "Cannot Get Color gain from monochrome camera".
- ColorMonoCapture.exe sample application fails to take snapshot.
- PictureFlipVB.exe sample application return error message when moving window location prior to connection of camera.
- VBFastFrames.exe sample application returns the same error message multiple times when Start Test is selected.
- AutoProperties.exe sample application returns error message on launch "Unable to get auto gain maximum value range. Error 21" when the auto gain maximum property is not supported.

3 Update from Release V6.1.0 to 6.2.0

3.1 .NET wrapper

- Improvements made to LucamReadRegister and LucamWriteRegister in the .NET wrapper to support multiple register read/write operation in one function call.

3.2 API update from 2.1.0.254 to 2.1.1.13

- Added support for USB 3.0 products.
- Improvements made in image quality for large format camera models.
- Improvements made to the JPEG quality property.
- Improvements made in all auto functions.
- Improvements made to the ContinousAutoExposure functions.
- Added the LUCAM_PROP_VIDEO_CLOCK_SPEED property.
- Added the LUCAM_PROP_TRIGGER_PIN property.
- Added the LUCAM_PROP_STROBE_PIN property.
- Added the LUCAM_PROP_GEV_SCPD property.
- Changed the LUCAM_VERSION structure to report the device id number.
- Added the new definition for the LUCAM_EXTERN_INTERFACE_USB3. This is used to determine the connection type with the camera.
- Added LucamPerformMultiTapCorrection functions. To perform multi tap sensor correction. At this point only the11Mega pixel and some 5 Mega pixel CCD camera models support this function.

3.3 Sample Applications

- Added a file logging capability to the C# VideoFormatTest sample.
- Added support for the INFINITY 3-1 to the C++ InfinityTest sample.
- Modified all C++ projects to use shared DLLs MFC libraries.
- Removed all pre-built and post built commands in all sample projects.
- Added hardware triggers, timeout and shutter selection to the C++ histogram sample.
- Added an exposure text field in the C# TakeMultipleCamFastFrame sample.
- Added GPIO programming support to the C# Snapshot sample.
- Removed multiple error messages that pop-up when a property is not supported in the C++ autolens sample application.
- Added support for the GigE products in the C++ GPIOtest sample.
- Added a DirectShow window to stream snapshots in the DirectXSnap sample application.
- Changed the white balance algorithm in the C++ BlankCamera sample.
- Created a new sample application called ConfigGigE C++. This sample demonstrates how to setup the Ethernet parameters for GigE products.
- Changed Autolens C++ sample to show MAC address with GigE Product.

- Added 64-bit platform support to all C++ project.
- All sample projects have been updated to Visual Studio 2008
- Added USB 3.0 products support to all DirectX sample applications.
- Resized video preview to fit the screen and keep the sensor ratio in the C++ Snapshot sample.
- Added USB 3.0 products support to C# AviAcquisition sample.
- Added playback frame rate selection in the C# AviAcquisition sample.
- Changed the white balance algorithm in the C++ AutoProperty sample.
- Added support for the cooling property in the C++ DirectX sample.
- Added area white balance in the C++ ClickCrop sample.
- Added area white balance in the C++ autolens application.
- Added the option to highlight saturated pixels in the C++ autolens application.
- Added ROI & mouse control support in the C++ autolens application.
- Changed the white balance algorithm in the C++ histogram application.
- Added a graphic performance indicator bar in C++ frameRate sample.

3.4 Documentation

- Add disclamer.txt and readme.txt file in all projects.
- Included an explanation of the API functions used to control the high dynamic range options for cameras that support this capability.
- Included new screen capture images showing the sample application interfaces.

3.5 Installation note

- Dropped support for Microsoft Visual Studio 2005. So new minimum requirements are Microsoft Visual Studio 2008.
- A new system environment variable called LUMENERA_SDK has been added into each project, and is used to point to the SDK installation directory. This enables compiling of the 32-bit and 64-bit sample applications without having to change projects settings.

4 Update from Release V6.0.0 to 6.1.0

4.1 Documentation

- Added the LucamGpioConfigure function definition.
- Added the LucamOneShotAutoExposureEx function definition.
- Added the LucamOneshotAutoGain function definition.
- Added the LucamOneshotAutoIris function definition.
- Added the LucamPerformMonoGridCorrection function definition.
- Added Language Supported header in function definition.

4.2 API update from 2.1.0.238 to 2.1.0.254

- Added LucamGetHardwareRevision() function.
- Fixed Iris property for Windows 7.
- Fixed cases where the last error was not reported correctly.
- Improvement on the algorithms for the one-shot auto functions.
- Improvement on the streaming video related functions.
- Improvement with high resolution image captures.
- Improvement on the rounding of floating point numbers to integer.

- Added the ability to query the current enum extern interface.
- Fixed a camera enumeration issue when different cameras are present.
- Improved LucamOneShotAutoWhiteBalance()
- Improved handling of gamma, contrast and brightness properties for compatibility the GigE cameras.
- Fixed the LUCAM_PROP_JPEG_QUALITY property change in reading.
- Added support for 64 bit .NET.

4.3 Sample Code

- Fixed issue where error message box were always popped-up for unsupported properties in the autolens sample application. This pop-up error message will now only appear once.
- Separated sample applications into C++, C# and VB directories .
- Added CCM matrix, gain adjustments and Hue/Saturation support in the Demosaicing sample application.
- Added C# AVIacquisition sample application.
- Added C# CaptureVideoFrameToFile sample application.
- Added C# PictureFlip sample application.
- Added C# Snapshots sample application.
- Added C# takeMultipleFastFrame sample application.
- Added C# VideoFormatTest sample application.
- Added VB DualSnapshot_VBNET sample application (LgtakeSnapshot).
- Added VB PictureFlip sample application.
- Added VB VBFastFrame Sample application.

4.4 Installation Notes

- All sample code projects have been recompiled with Microsoft Visual Studio 2005.
- In order to build sample projects the installation of Windows SDK V7.0 may be required.
- DirectX sample applications have been compiled with DirectX SDK June 2010 version.
- In order to compile C++ samples application, the header files (lucamapi.h, lucamerr.h, lucamsci.h) and libraries (lucamapi.lib) need to be copied into the project directory.
- In order to compile C# and VB sample applications the Lumenera.api.dll and Lumenera.api.xml should be copied into the project directory or reference in the project needs to be rebuilt to the other location.

4.5 DirectX Sample Projects Special Requirements

- Microsoft Visual Studio 2005 or newer.
- Window SDK V7 and V6.
- DirectX SDK (June 2010).

First you need to build the strmbase.lib by building the <.\Microsoft SDKs\ Windows\ V7.0\Samples\Multimedia\Directshow\baseclasses> project in release mode. If you are planning to also work in debug mode (strmbasd.lib) you need to rebuild the project in debug mode but the files V7.0\lib\strmiids.lib and uuid.lib need to be overwritten with previous SDK version (V6.0). We have read that this can be ignored if working under VS 2008 and newer - but this has not been tested.

Now that strbase.lib and strmbasd.lib have been created - just compile our project.

4.6 Known Open Issues

- The sample application FastSyncSnaps does not currently support output resolutions other than 1280x1040.
- .NET wrapper library not installed in the .NET framework global cache. This is plan to be register in global cache in future release.

5 Update from Release V5.0.4 to 6.0.0

5.1 Installation Packages

- Lumenera Camera SDK has been removed from the LuCam Software package and is now a standalone installation package. It will now support all Lumenera USB and GigE based cameras.

5.2 API

- Added support for GigE based cameras.
- Improve the auto iris function for the Lw1105X and Lw1605x cameras.
- Added support to query the iris latency.
- Added Beta driver for .NET support.

5.3 Samples Code

- All sample applications have been changed to support Windows SDK V7.0
- All DirectX sample applications have been changed to support DirectX SDK (June 2010)

5.4 Installation Notes

- If you used Lumenera previous SDKs release, please ensure to updates all your projects <include> and <libraries> path directories. Here a list if you used default installation directories option:

  32 bits:

  <C:\Program Files\Lumenera Corporation\Lumenera Camera SDK\Include>

  <C:\Program Files\Lumenera Corporation\Lumenera Camera SDK\Lib\Lib32>

  64bits:

  <C:\Program Files\Lumenera Corporation\Lumenera Camera SDK\Include>

  <C:\Program Files\Lumenera Corporation\Lumenera Camera SDK\Lib\Lib64>

  .NET :

  For .NET development, had this reference <C:\Program Files\Lumenera Corporation\Lumenera Camera SDK\Lib\lumenera.api.dll> in your project and in the code using the API methods

  “using Lumenera;”

  “using Lumenera.USB;”

6 Update from Release V5.0.3 to 5.0.4

6.1 Camera Drivers

- Added Support for the Lw11059B.

6.2 API

- Improve the digital white balance function.
- Added support for the LUCAM_PROP_FOCAL_LENGTH property.
- Added LucamQueryVersionEx function.
- Improve the LcamPropertyGetRange() function to return the default value of the property.

- Added Little Endian support for the LucamSaveImageEx() for bitmap images
- Added LucamGetHardwareRevision() function.

6.3 Lucam Capture software

In the "Help→about" dialog box of LuCam Capture.exe it is states that the version is 5.0.3. The version number will be correctly updated in the next release.

7 Update from Release v5.0.2 to 5.0.3

This section describes the changes made since release 5.0.2.

7.1 Camera Drivers

Lw115

- New camera support (Beta drivers).

Lu135, Lw135

- New interface board support.

Lw575

- Corrected issue where the snapshot strobe signal was not outputted correctly.

Lw11059

- Corrected issue where some Canon lenses were not calibrating correctly.
- Corrected issue where HW trigger pulses did not always start a snapshot capture.

Lw16059

- New camera support (Beta drivers).

7.2 API

- Improved Canon auto-lens initialization for Lw11059, Lw16059.

8 Update from Release v5.0.1 to 5.0.2

This section describes the changes made since release 5.0.1.

8.1 Camera Drivers

Lm075, Lm135, Lm165, Lu070, Lu130, Lu160, Lw070, Lw130, Lw160, Lw230

- Improved reliability of GPO features.
- Corrected issue with strobe timing.
- Improved snapshot frame rate.

Lw11057, Lw11058

- Improved snapshot frame rate.
- Corrected issue with snapshot exposure jitter.

Lw11059

- Improved snapshot frame rate.
- Corrected issue with snapshot exposure jitter.
- Corrected issue with powered lens, snapshot iris control.

9 Update from Release v5.0.0 to 5.0.1

This section describes the changes made since release 5.0.0.

9.1 Camera Drivers

Lw230

- Support Sub-Component EOL Migration (Release drivers).

10 Update from Release v4.6 to 5.0

This section describes the changes made since release 4.6.

10.1 API

- Added 64 bit support for the LuCam API.
- Preview windows created by API now are scalable, have slider bars and zoom control.
- Added functions to cancel requests for video frames and snapshots. The new functions are LucamCancelTakeVideo() and LucamCancelTakeFastFrame() respectively.
- LucamPropertyRange() function now returns true range of property.
- New camera property to control the JPEG compression ratio.
- Added new event, LUCAM_EVENT_START_OF_READOUT, that can be used to notify an application that the camera has started the readout of the sensor.
- Increased permanent buffer storage to 2048 bytes.

10.2 COM Object

- Added 64 bit support for the LuCam API COM object.
- Now supports callback functions.

10.3 Camera Drivers

All

- Added 64 bit support to all camera drivers.
- In Windows Vista, camera drivers will be installed with little user interaction required. Users should expect to see no “New Hardware Wizard” dialog boxes when installing new cameras on their computers with this release.

Lc080

- Added support for LUCAM_PROP_AUTO_EXP_MAXIMUM property.

Lu100

- Corrected issue where some invalid frame formats were selectable.

Lu120

- Corrected issue where the strobe delay value was not being applied to the strobe pulse.

Lu170CB

- New camera support (Release drivers)

Lw130

- Corrected issue where the Contrast, Gamma and Brightness controls were disabled when opening the DirectX Video Properties dialog box.
- Corrected issue where last two pixels in video frames could be incorrect.

Lw160

- Corrected issue where the video stream may not start correctly every time.

Lu200

- Corrected issue where snapshots could be very noisy.

Lw290

- Added resolutions within the DirectX interface.

Lw570

- Corrected issue where not all camera settings were saved in registry.
- Implemented the half-global shutter for snapshot mode.

Lw11050

- Improved performance when controlling Canon based lenses.
- Corrected issue where snapshot strobe pulse was not being outputted from camera when selected.
- Corrected issue where last four bits of a 16 bit snapshot image were not 0.
- Corrected issue where camera could stop streaming video data unexpectedly.

10.4 Known Issues

- Range value for LUCAM_PROP_STILL_STROBE_DURATION is not available for most camera models
- The CreateDisplayWindow() COM API function does not properly handle the dialog title correctly in a C# development environment
- The SOF pulse is not outputted on GPO4 on the Lw1105x cameras.

11 Update from Release v4.5 to 4.6

This section describes the changes made since release 4.5.

11.1 API

- Added support for preview callbacks for monochrome cameras.

11.2 Camera Drivers

Lm080

- New camera support (Release drivers)

Lu200CB

- Corrected issue when taking snapshots with 0 exposure

Lu270

- Corrected issue where exposure was unresponsive on DirectX Property Pages

11.3 Known Issues

- Incandescent color correction matrix is not ideal for Lm080 and Lu200CB cameras
- Subsampling 2x2 mode not implemented on Lw290 cameras
- Snapshots may fail when changing resolutions on Lw570 cameras
- Access to contrast, brightness and gamma on DirectX Property Pages may be disabled when first accessed or after manually changing snapshot exposure with some camera models. Hitting Initialize/Reset button may correct this issue.
- Default color balance is not ideal on Lm080 cameras

12 Update from Release v4.2 to 4.5

This section describes the changes made since release 4.2.

12.1 API

- Added new function to retrieve the error code for a specific camera, LucamGetLastErrorForCamera()
- Improved the performance of the LucamOneShotAutoExposure() and LucamOneShotWhiteBalance() functions
- Added new functions to define the region of interest (ROI) that will be used for AEC and AWB
- Corrected issue where unsupported frame formats did not return an error
- Added new function to get the image intensity, LucamGetImageIntensity()

12.2 COM Object

- Corrected issue with EnableSyncrhonousSnapshot() function not setting up the cameras correctly
- Corrected issue with EnumCameras() function not work correctly when multiple cameras were connected

12.3 Camera Drivers

Lw080

- New camera support (alpha drivers)

Lm080

- New camera support (alpha drivers)

Lu120

- Updated color correction matrices for Lu120C based cameras

Lu130

- Corrected issue where exposure delay was not being applied correctly

Lm130

- By default, cameras will run at its fastest frame rate
- Added support for timestamps on video frames

Lw130

- By default, cameras will run at its fastest frame rate
- Added support for timestamps on video frames

Lu160

- Corrected issue with where the API would allow unsupported subsampling modes

Lw250

- New camera support (alpha drivers)

Lw290

- Increased snapshot exposure range to allow exposures less than 60ms

Lu330

- Still camera properties are now supported in Fast Frames mode

Lw330

- Corrected issue with camera's GPO ports

Lu370

- Corrected issue with previewing in 16 bit mode

Lw450

- New camera support (alpha drivers)

Lw11050

- Improved image quality in low light when running at fastest frame rate

12.4 Sample Code

- Ported all sample code to Visual Studio 2005
- Added new sample applications:
    - AutoProperties: Demonstrates how to setup the camera's auto features such as AEC and AWB in Visual C++.Net
    - VbFastFrames: Demonstrates how to enable fast frames mode in Visual Basic.Net

12.5 Known Issues

- The LuCam API COM object may not return all the correct information when calling EnumCameras with multiple cameras connected
- The LuCam API COM object may not be fully multi-thread compliant
- The Lw570 currently does not allow the setting of the strobe pulse length

13 Update from Release v4.0 to 4.2

This section describes the changes made since release 4.0.

13.1 API

- Added new AVI control functions: LucamPreviewAVIGetDuration(), LucamPreviewAVIGetFrameCount(), LucamPreviewAVIGetFrameRate(), LucamPreviewAVIGetPositionTime(), LucamPreviewAVIGetPositionFrame(), LucamPreviewAVISetPositionTime(), LucamPreviewAVISetPositionFrame(), LucamPreviewAVIGetFormat()
- Added feature to provide event notification of changes in the GPIO values.
- Added feature to provide event notification of camera removal

13.2 COM Object

- Added missing LuCam API functions
- Corrected issue with EnumAvailableFrameRate() function parameters
- Corrected issue with Setup8bitsColorLUT() and Setup8bitsLUT() function parameters

13.3 Camera Drivers

All CCD based cameras

- Corrected issue where saturated data was set to 0xFFFF instead of 0xFFF0

Lm075

- New camera support

Lu080

- Corrected issue where green color gains were inverted
- Added high speed drivers that allow faster frame rates with 8 bit data

Lu120

- Added support to control the strobe pulse width

Lm135

- New camera support

Lm165

- New camera support

Lu170

- Added high speed drivers that allow faster frame rates with 8 bit data

Lu270

- Corrected issue with noisy snapshots in 16 bit mode
- Added high speed drivers that allow faster frame rates with 8 bit data

Lw230

- Corrected issue where first video frame was corrupted when starting the video stream

Lw290

- Enabled snapshot mode

Lu330

- Improved snapshot quality

Lw330

- Improved preview image quality
- Added support to report max width and height

Lu370

- Corrected issue with camera drivers crashing when stopping preview in Windows Vista
- Added high speed drivers that allow faster frame rates with 8 bit data

Lw620

- Improved image quality in preview

Lw11050

- Improved color response
- Improved dual tap calibration
- Improved lens calibration

13.4 Sample Code

New sample code provided

- BlankCamera: Generic camera sample application
- Histogram: sample application that demonstrates how to generate a histogram

13.5 Known Issues

Lw620

- Vertical oscillating lines in preview

14 Update from Release 3.8 to 4.0

This section describes the changes made since release 3.8.

14.1 API

- Corrected issues with 16 bit images on color cameras
- Added function to better support AVI file preview and provide access to AVI file information

14.2 COM Object

- Provided additional LuCam API functions
- Corrected issues with Permanent Buffer accesses
- Corrected issue with enabling Fast Frames mode

14.3 Camera Drivers

All

- Corrected issues with unresponsive cameras when starting and stopping repeatedly

Lu120

- Updated color correction matrices

Lu170

- Corrected issue with not being able to manually toggle GPO2 when taking snapshots

Lw230

- Improved white balance algorithm to target proper white balance more quickly

Lw290

- Low exposures or high gains may produce images with horizontal banding. This is an issue with the current sensor revision used in the camera and will be corrected in a future revision.

Lw570

- New camera support

Lw11050

- Updated drivers (Beta drivers)

14.4 Sample Code

New sample code provided

- AVISample: Example on how to use the AVI capture and playback functions included in the SDK
- CaptureToFile Net: Example on how to capture the pixel data to a text file
- EnumFrameRates: Console based sample application that enumerates the available frame rates of the camera
- Get16BitInfo: Console based application that demonstrates how to get 16 bit information from the camera
- ResetAndFF: Console based application that demonstrates how to reset the camera and set it up for Fast Frames captures

15 Updates from Release 3.7 to 3.8

This section describes the changes made since release 3.7.

15.1 API

Functions added

- Added functions and properties to support focus and iris control on cameras that support these properties.
- Added support for individual color LUTs for color gamma and other functions.
- Added support for saving 16-bit images in both Little Endian and Big Endian images.
- Added LucamForceFastFrames() function.

15.2 COM Object

- Added more LuCam API based functions and properties.

15.3 Camera Drivers

All:

- DirectShow drivers were modified to add support for new larger window resolutions.
- Added support to control snapshot exposure and gain while in Fast Frames mode.
- Added driver only installation packages

Lw070

- New camera driver support
- At high frame rates with a low AEC target, the camera may oscillate in brightness.

Lu080

- Added support to control the output strobe duration (length).

Lu120

- Updated drivers to support new hardware.
- Corrected issues with newer cameras having snowy images.
- Improved snapshot image quality

Lw130

- New camera support

Lw160

- New camera support

Lu170

- Minimized green noise in snapshots
- Added support for reading snapshot exposure and gain properties and querying their ranges.

Lu200

- Improved snapshot quality
- In LuCam application, the adjustment of target value for AEC may not have any effect on the camera settings.

Lw230

- Improved image quality and reduced noise
- With 0ms exposures, the video image is very bright.

Lu270

- Added support for reading snapshot exposure and gain properties and querying their ranges.

Lw290

- New camera support (Alpha drivers)
- Missing snapshot support
- The video stream requires a few frames to readjust itself after a gain increase.

Lu370

- Added support for reading snapshot exposure and gain properties and querying their ranges.

Lw620

- Implemented faster transitions between video and snapshot modes
- First snapshot captured when entering Fast Frames mode may be noiser that subsequent snapshots.

Lw11050

- New camera support (Alpha drivers)

15.4 Sample Code

New sample code provided.

- CaptureToFile: Simple example of how to capture pixel data to a text or Excel spreadsheet file.
- CSharp Sample: Simple example that demonstrates how to use our LuCam API COM object in a C# application.
- Direct X Net: Our Direct X VC 6.0 recompiled using VC.Net.
- DX Control: a console based Direct X sample application.
- VBlucamCOMSample: VB.Net example application using the LuCam API COM object.
- VBNet Sample: Our VB Sample application recompiled using VB.Net.

16 Updates From Release 3.5.3 to 3.7

This section describes the changes made since release 3.5.3.

16.1 API

Function Modifications:

- LucamEnumCameras does not return -1

16.2 COM Object

- Added COM support for the API

16.3 Driver

All:

- Corrected issue with 16 bit snapshots

Lu080

- Improved strobe stability

Lu100

- Better precision on get/set properties

Lu120

- Added support for contrast, brightness and gamma

Lu130

- Hardware trigger fix
- Improved stability

Lu160

- Hardware trigger fix
- Improved stability
- Added SOF signal

Lu170

- Added subsampling modes in DirectX interface

Lw230

- New camera support

Lw560

- New camera support

Lw620

- New camera support

17 Updates From Release 3.5.1 to 3.5.3

The LuCam Software v3.5.3 includes beta support for the Lw620 camera. The following issues have been seen and will be addressed in the final release:

- If exposure is set to 0 and AEC is turned on, the camera will not adjust exposure. To work around this issue, set the exposure to a non-zero value.
- The AWB (Automatic White Balance) tends to balance with too much red. The LucamOneShotWhiteBalance() does not have this effect and is recommended instead of AWB.
- The Lucam.exe application fails to take snapshots with subsampling by 3. The preview still works correctly.

18 Updates From Release 3.3 to 3.5.1

This section describes the changes made since release v3.3.

18.1 API

Function additions:

- Added LucamAdjustDisplayWindow()
- Added LucamConvertFrameToGreyscale8()
- Added LucamConvertFrameToGreyscale16()

Function modifications:

- Extended timeout value for captures and snapshots
- Better support for multilingual fonts in save file directories
- Multithread safe termination of Fast Frames mode
- Added support for changing gain and exposure while in Fast Frames mode

Definition additions:

- Replaced LUCAM_PROP_WHITEBAL_U with LUCAM_PROP_DIGITAL_WHITEBALANCE_U
- Replaced LUCAM_PROP_WHITEBAL_V with LUCAM_PROP_DIGITAL_WHITEBALANCE_V

- Added LUCAM_PROP_DIGITAL_GAIN
- Added LUCAM_PROP_DIGITAL_GAIN_RED
- Added LUCAM_PROP_DIGITAL_GAIN_GREEN
- Added LUCAM_PROP_DIGITAL_GAIN_BLUE
- Added LUCAM_PROP_TEMPERATURE
- Added LUCAM_PROP_TRIGGER
- Added LUCAM_PROP_FRAME_GATE
- Added LUCAM_PROP_EXPOSURE_INTERVAL
- Added LUCAM_PROP_PWM
- Added LUCAM_PROP_FLAG_POLARITY
- Added LUCAM_DM_SIMPLE
- Added LUCAM_CM_IDENTITY

Structure modifications:

- None

18.2 Driver

All:

- Corrected split images using HW triggers
- Added IAMCameraControl DirectX interface
- Improved snapshot stability

Lu050:

- Corrected issue with resetting HW triggers

Lu070:

- Implemented adjustable frame rate
- Corrected gamma implementation
- Added strobe output and HW trigger input via GPIO
- Improved snapshot acquisition
- Corrected strobe output timing

Lu080:

- New camera support

Lu100

- Improved color demosaicing

Lu120

- Improved stability when streaming with small ROI
- Improved stability when starting and stopping streams
- Correction of split video in 16 bit streaming video mode

Lu130:

- Allowed strobe access in DirectX interface
- Improved binning modes
- Snapshot image corrections

Lu160

- New camera support

Lu170

- No camera specific updates

Lu200

- No camera specific updates

Lu270

- Added extended exposure

Lu330:

- New camera support

Lu370

- Added autoexposure control
- Improved color correction matrices
- Added support for USB 1.1

Lu620

- New camera support

18.3 Sample Code

Sample Code Additions:

- ClickCrop: Streaming video overlay example
- DirectX Snapshot: Snapshot sample using DirectX
- DualSlope: Dual slope – Multi slope usage sample application
- ScrollingPreview: Demonstrates how to add scroll bars to a preview window

18.4 Documentation

- Added descriptions for added API functions described above

18.5 Application

- Added support for Lu080, Lu160, Lu330 and Lu620 based cameras

19 Updates From Release 3.1 to 3.3

This section describes the changes made since release v3.1.

19.1 API

Function additions:

- Added LucamSaveImageW()
- Added LucamPermanentBufferRead()
- Added LucamPermanentBufferWrite()

Function modifications:

- Corrected inconsistency between values received from LucamGetProperty() and those available through the Property Pages

Definition additions:

- Added LUCAM_PROP_TIMESTAMPS
- Added LUCAM_PROP_SNAPSHOT_SETTING
- Added LUCAM_PROP_AUTO_EXP_MAXIMUM
- Added LUCAM_PROP_FLAG_USE
- Added LUCAM_PROP_FLAG_STROBE_FROM_START_OF_ EXPOSURE
- Added LUCAM_PROP_STILL_EXPOSURE

Structure modifications:

- LUCAM_SNAPSHOT replaced:
    - BOOL useStrobe; now union {BOOL useStrobe; ULONG strobeFlags;};

19.2 Driver

All:

- Improved the reliability of acquiring snapshots

Lu050 based cameras:

- Added support for small subwindow sizes
- Corrected smearing effect in high dynamic range areas of images

Lu070 based cameras:

- New camera support

Lu100 based cameras:

- Corrected register access issue
- Corrected column shifting issue
- Corrected GPIO accesses
- Increased allowable maximum exposure times for rolling shutter snapshots

Lu110 based cameras:

- Added new high speed buffering for video and snapshots
- Corrected GPIO accesses

Lu120 based cameras:

- Added new high speed buffering for snapshots
- Added support for small subwindow sizes

- Redesigned drivers for new camera hardware

Lu130 based cameras:

- Corrected inconsistencies of pixel values in low lighting conditions

Lu170 based cameras:

- Added support for monochromatic based cameras

Lu200 based cameras:

- Corrected register access issue
- Increased snapshot timeout parameter

Lu270 based cameras:

- New camera support

Lu370 based cameras:

- New camera support

19.3 Sample Code

Sample Code Additions:

- CaptureToFile: Captures multiple video frames and stores frame data to a text file or MS Excel spreadsheet
- Flipping: VC++ example that demonstrates how to flip and mirror video stream
- HwTrigCount: Counts the number of hardware triggers received through the camera's GPIO port through a callback function
- MonoCheck: Checks to see if attached camera is a monochromatic or color camera
- MultiSnapshot: Same as the Snapshot sample but now allows the connection to any camera connected to the computer
- PermStorage: Example application that demonstrates how to use the new LucamPermanentBufferRead() and LucamPermanentBufferWrite() functions
- Threshold: Demonstrates how to set the camera in threshold mode
- VB Picture Flip: VB sample application that demonstrates how to flip and mirror video stream

19.4 Documentation

- Added descriptions for added API functions described above

19.5 Application

- Added support for Lu070, Lu270 and Lu370 based cameras

20 Updates From Release 2.9 to 3.1

This section describes the changes made since release v2.9.

20.1 API

Functions additions:

- Added LucamGetCameraId()

- Added LucamQueryRgbPreviewPixelFormat()
- Added LucamConvertFrameToRgb48()
- Added LucamConvertMsBmp24ToStdRgb24()
- Added LucamGetCurrentMatrix()
- Added LucamOneShotAutoWhiteBalanceEx()

Functions modifications:

- Changed LucamAddRgbPreviewCallback() return type from BOOL to ULONG

Definition additions:

- Added LUCAM_PF_48 pixel format
- Added LUCAM_FRAME_FORMAT_FLAGS_BINNING flag
- Added LUCAM_DM_HIGHER_QUALITY demosaic method

Structure modifications

- LUCAM_FRAME_FORMAT: replaced
    - ULONG subSampleX: now union {USHORT subSampleX; USHORT binningX; } and USHORT flagsX
    - ULONG subSampleY: now union {USHORT subSampleY; USHORT binningY; } and USHORT flagsY

20.2 Driver

All:

- Added synchronization of USB Control transfers

Lu050 based cameras:

- Added support for Active High (AH) strobe output
- Fixed multiple snapshots per HW trigger problem

Lu100 based cameras:

- Modified snapshot buffering to increase frame rate
- Fixed problems with GPIO accesses
- Added support for USB 1.1
- Added serial port accesses

Lu110 based cameras:

- Modified snapshot buffering to increase frame rate

Lu120 based cameras:

- Enabled video frame buffering
- Added support for new Imager sensor

Lu130 based cameras:

- New camera support

Lu170 based cameras:

- Modified snapshot buffering to increase frame rate
- Enabled video frame buffering

Lu200 based cameras:

- Added serial port accesses
- Modified snapshot buffering to increase frame rate
- Fixed problems with GPIO accesses
- Added support for USB 1.1

- Added serial port accesses

20.3 Sample Code

Sample Code additions:

- FastSyncSnaps: Demonstrates how to do fast synchronous snapshots
- GpioTest: Demonstrates how to access the GPIO port
- Snapshot: Demonstrates how to use Snapshot callbacks

20.4 Documentation

- Added descriptions for added API functions described above
- Corrected minor errors in documentation

20.5 Application

- Added support for Lu130 based cameras
- Fixed problem with multiple cameras and 5 digit serial numbers