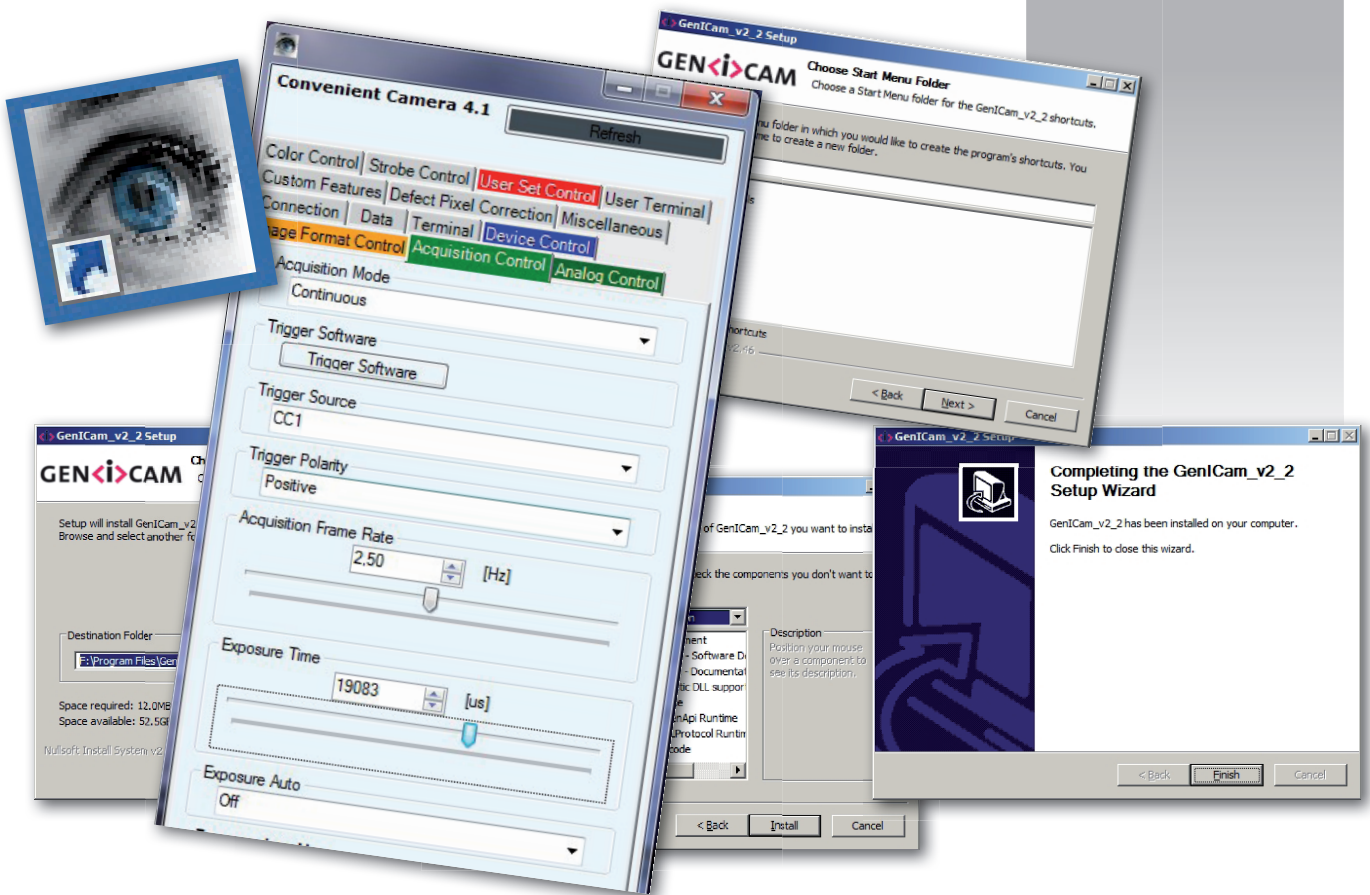




SVS-VISTEK



Operation Manual

ConvCam4.1

Software to set-up and control SVCam Camera Link Cameras

Version 2.0 / last update: 16.01.2014



ConvCam4.1

Installation of ConvCam

The installation files for 64 bit applications are in the zipped folder "ConvCam4Setup64Vx.x", the files for 32 bit applications are in "ConvCam4Setup32Vx.x"

The 64 bit version runs only on 64 bit Windows. The 32 bit version is installable on 32 and 64 bit Windows. Which version is suitable depends on your application which makes use of the ConvCam installation.

64 bit applications (grabber etc.) need the 64 bit ConvCam version,
32 bit applications (grabber etc.) need the 32 bit ConvCam version.

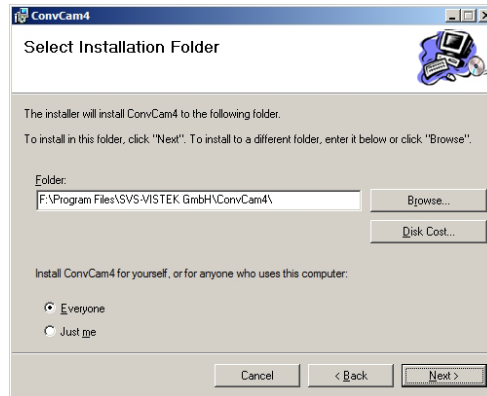
Both versions of "ConvCam4.exe" depend on .NET framework 4.0 which is included in the installation files and has to be installed.

- How to install ConvCam (make sure "DotNet" is installed or install it)
- ▶ Insert the Installation CD in PC's drive.
 - ▶ Copy the correct bit-version (32 or 64) to the harddrive.
 - ▶ Unzip the file.
 - ▶ In the created folder will be the folder "DotNetFX40" and inside this folder the file "DotNetFX40_Full_x86_x64.exe". Double click to install "DotNet"
 - ▶ After "DotNet" is installed then the installation of ConvCam can be started by double clicking on the file "ConvCam4Setup.msi".

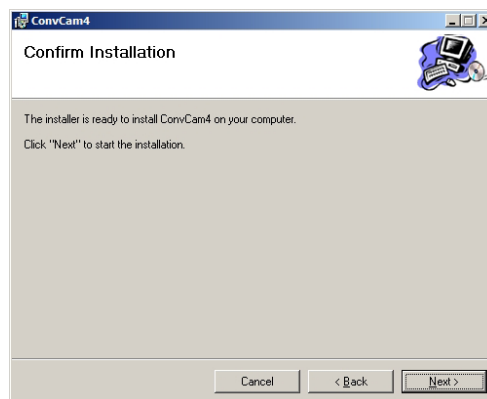
click on "Next"



Select a folder, then click on "Next"



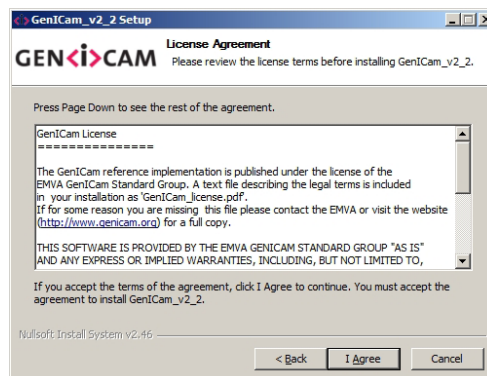
Click "Next" to start the installation



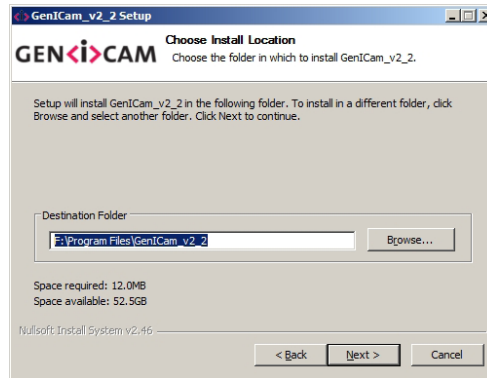
Confirm the installation of GenICam by clicking on "NEXT"



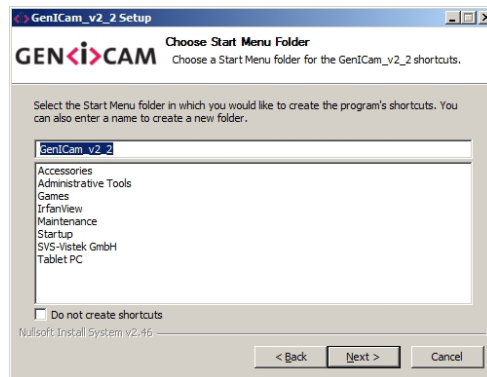
Confirm the GenICam License by clicking on "I Agree"



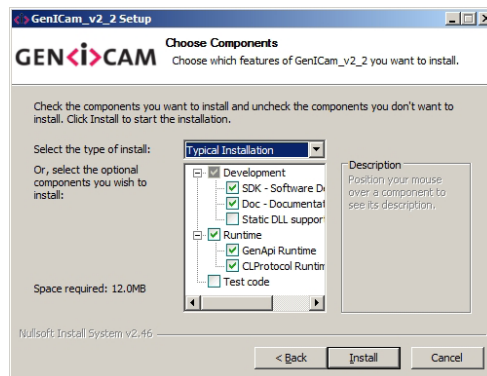
Select a folder, then click on "Next"



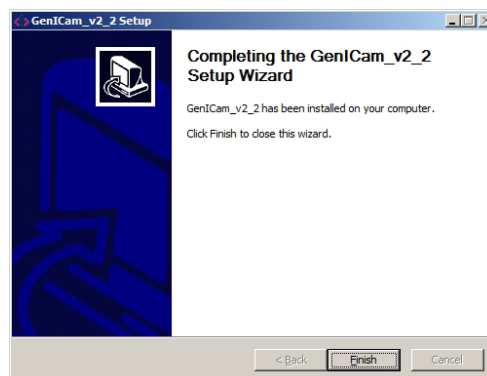
Select a folder, then click on "Next"



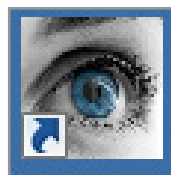
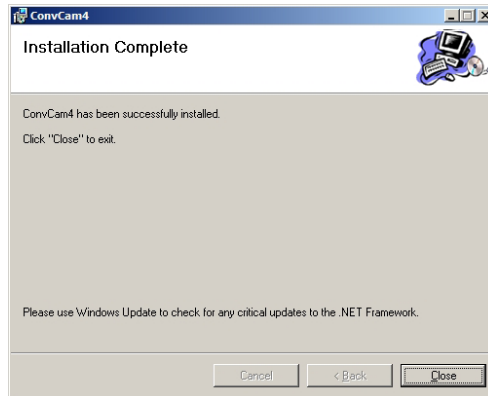
Select the components,
then start the installation by clicking on "Install"



GeniCam has been installed, click on "Finish" to close the Installation Assistant



Installation is now complete, click on "Close"



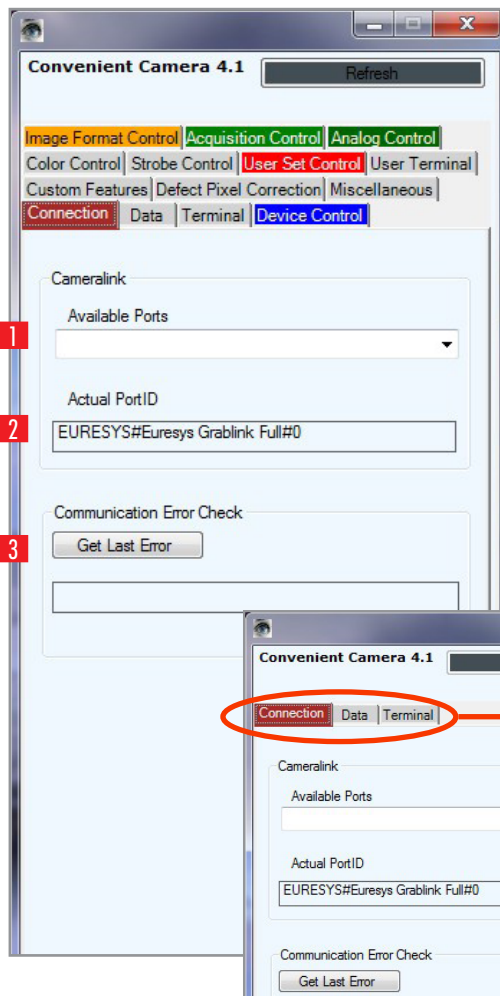
After the ConvCam installation, you now will find the ConvCam Icon on your desktop:
Double-click on Icon to start the program.

The "Connection" Folder
Here you can establish the communication between the camera and the ConvCam4.exe application

1 "Available Ports":
With this combo box you can select camera link ports of your installed frame grabber or serial ports like "COM1", "COM2" (COM-Ports for testing purposes only)

2 "Actual PortID":
Shows the actual selected framegrabber port. (Manufacturer#GrabberID#PortNumber)

3 "Communication Error Check":
A Click on the button "Get Last Error" shows the last occurred communication error



If ConvCam does not detect any camera, only three tabs will be shown

The "Device Control" Folder

1 "Device Model Name": Camera type name

2 "Device ID": Serial No.

3 "Device Manufacturer Info": SVS-VISTEK GmbH

4 "Device Version": Version no. of camera firmware

5 "Camera Type": Enumeration of different configurable camera types.

6 "Pixel Frequency":

Different pixel frequencies are selectable

Changing the pixel frequency affects the maximum frame rate, power consumption and signal to noise ratio of the camera:
Higher frequency -> higher max. frame rate -> lower S/N ratio. Lower frequency -> lower max. frame rate -> higher S/N ratio.

7 "Tap Configuration":

Different output tap configurations are selectable

QUAD: all 4 taps are active

The frame is divided in 4 quarters, highest max. frame rate.

DUAL_X: 2 taps (one at the left and one at the right side of the sensor) are active. The frame is divided in a left and right part.

(max. frame rate is reduced to less than a half of QUAD-type frame rate)

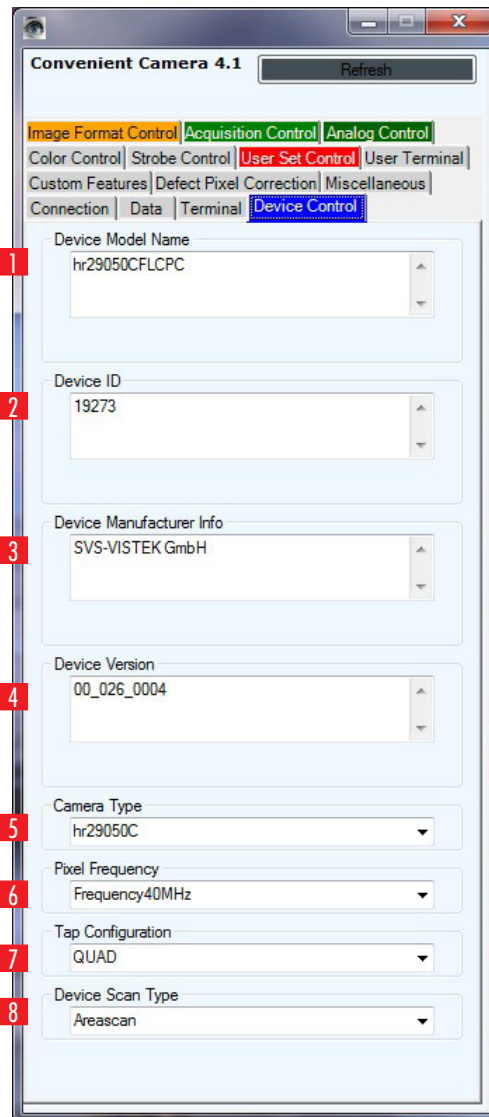
DUAL_Y: 2 taps (one at the top and one at the bottom side of the sensor) are active. The frame is divided in an upper and lower part.

(max. frame rate is reduced to a half of QUAD-type frame rate)

SINGLE: only 1 tap is active. The frame is not divided (no tap balance required, max. frame rate is less than a quarter of QUAD-type frame rate.

8 "Device Scan Type:"

All SVCams are Areascan Cameras.



The "Acquisition Control" Folder

1 "Acquisition Mode":

Select one of the five acquisition modes of the camera: None, Continuous, Software Triggered, Triggered with Internal Exposure Control, Triggered with External (pulse width driven) Exposure Control

2 "Trigger Software":

Will read **one** image only if acquisition mode is set to "Trigger Software".

3 "Trigger Source":

Select the port of the hardware trigger input. "CC1", "CC2": LVDS input driven from frame grabber via camera link cable "DI1", "DI2": Single ended inputs on 12pin Hirose connector (see manual).

4 "Trigger Polarity":

Select the polarity of the hardware trigger input: "positive" or "negative"

5 "Acquisition Frame Rate":

In "continuous" mode (default ex factory) you can adjust the framerate.

6 "Exposure time":

The exposure time can be set in μsec . The min exposure time is about $20 \mu\text{sec}$ (depending on the camera type and speed). The longest is 1 sec. Due to the internal timing of the camera the program will adjust the values to the appropriate value

7 "Exposure Auto":

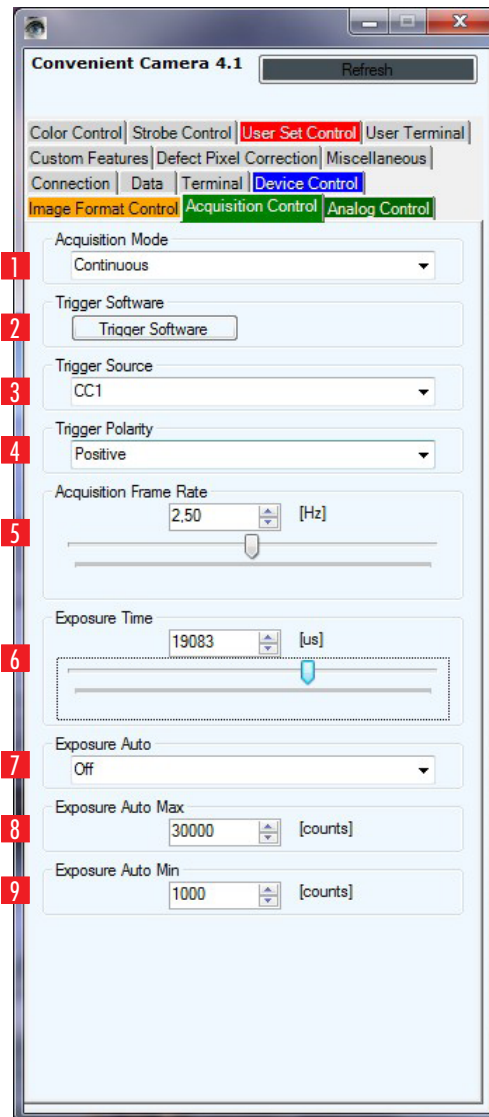
Enable automatic exposure control: "On" or "Off" see also: "Gain Auto" in "Analog Control" field

8 "Exposure Auto Max":

Maximum allowed exposure time for automatic exposure control [μs].

9 "Exposure Auto Min":

Minimum allowed exposure time for automatic exposure control [μs]



The "Strobe Control" Folder

1 "Exposure Delay"

This numeric value represents the time between the (logical) positive edge of trigger pulse and start of integration time. Unit is μs . Default is $0 \mu\text{s}$.

2 "Strobe Polarity"

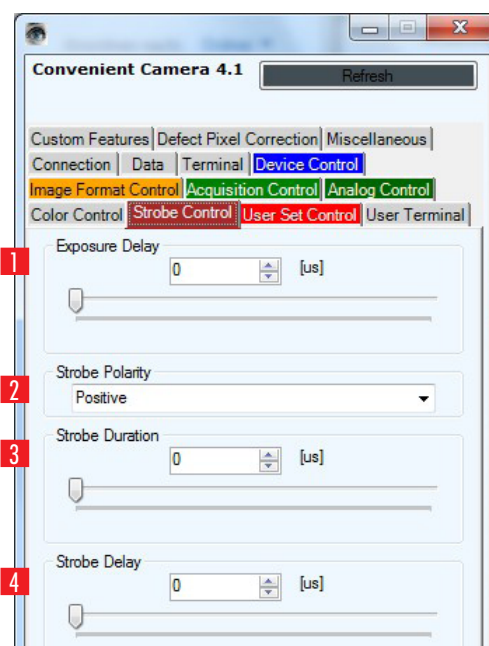
Select the polarity of the hardware strobe output DO1: "positive" or "negative". Please check the timing diagram in the manual of your Camera.

3 "Strobe Duration"

Exposure time: the exposure time can be set in μsec . The min duration is $1 \mu\text{sec}$. The longest time is 1 second.

4 "Strobe Delay"

The delay between the (logical) positive edge of trigger pulse and strobe pulse output can be set in μsec . Unit is μs . Default is $0 \mu\text{s}$.



The “Analog Control” Folder

1 “Tap Selector”:

Select the tap for the “Gain” and “Black Level” configuration:
 “TapAll”: gain and black level can be configured for all taps simultaneously.
 “Tap0”, “Tap1”, “Tap2”, “Tap3”: gain and black level can be adjusted for only one tap, useful for manual tap balancing.

2 “Gain”:

Gain can be configured for the selected tap (see above).
 The default gain setting is 0.0 dB (factor 1.0). You may change the gain up to 18.0 dB (factor 8.0) in steps of 1/10th dB. Note that the dynamic range will not be improved! For good image quality do not set gain to more than 6.0dB (factor 2.0), because the noise is also amplified.

3 “Black Level Raw”:

Black level offset adjustment is possible for the selected tap (see above).
 Please note that factory adjustment is optimized for S/N ratio and sensitivity at gain 0 dB. You may lose dynamic range if the black level has been set to high or to low.

4 “Tap Balance”:

Select the tap balance operation:
 “TapBalance_Off”: no tap balance operation
 “TapBalance_Once”: taps are balanced until they match, then operation stops. The configuration is kept until camera is switched off
 “TapBalance_Continuous”: taps are balanced permanently during image acquisition.
 “TapBalance_Reset”: balancing of the taps is reset to factory default values.

5 “Gain Auto”:

Enable automatic gain control: “On” or “Off”

6 “Gain Auto Level”:

Configure the average gray level of the image during auto gain control and automatic exposure control.

7 “Gain Auto Max”:

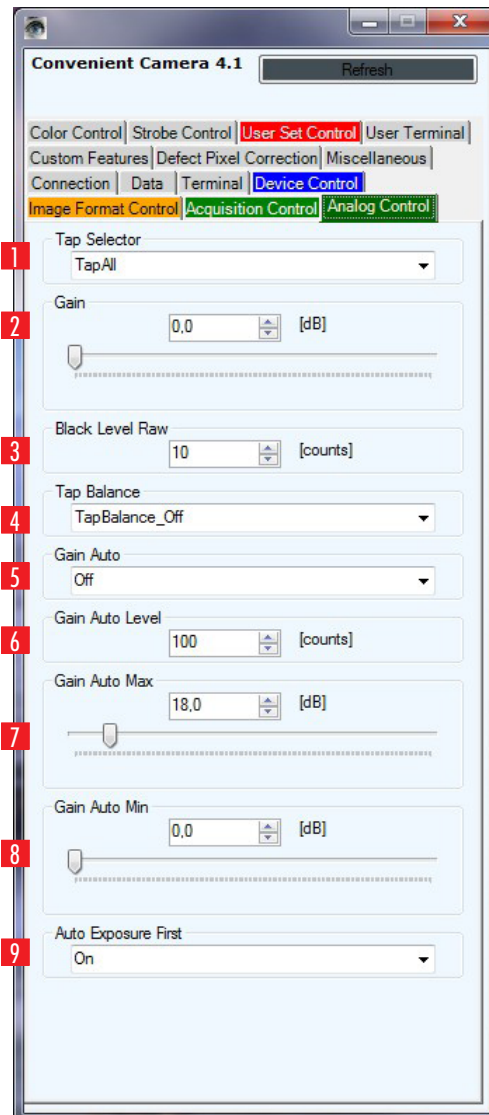
Configure the maximum allowed gain for automatic gain control (max. 18dB)

8 “Gain Auto Min”:

Configure the minimum allowed gain for automatic gain control (min. 0dB)

9 “Auto Exposure First”:

Enables the prioritization of automatic exposure control over automatic gain control when automatic exposure control is selected. This effects the optimum S/N level during automatic gray level control. Gain is only increased when exposure time is at maximum allowed level



The “Image Format Control” Folder

1 “Size X”:

This is a read only value. It represents the amount of valid pixels in one line

2 “AOI Size Y”:

The AOI Size Y can be set to values divisible by 4

The AOI is always centered to the optical axis.

Note that you have to change your grabber configuration after changing the resolution!

3 “AOI Offset Y”:

This is a read only value which changes automatically when “AOI Size Y” is altered.

4 “Resolution Mode”:

You can choose different resolutions.

Max_Resolution:

- No Binning (default setting), horizontal x 1, vertical x 1
- Binning 2x2: Vertical 2x and Horizontal 2x at the same time: Resolution: horizontal x 1/2, vertical x 1/2, Sensitivity is 4x, pixel frequency is halved, max. frame rate is almost doubled.

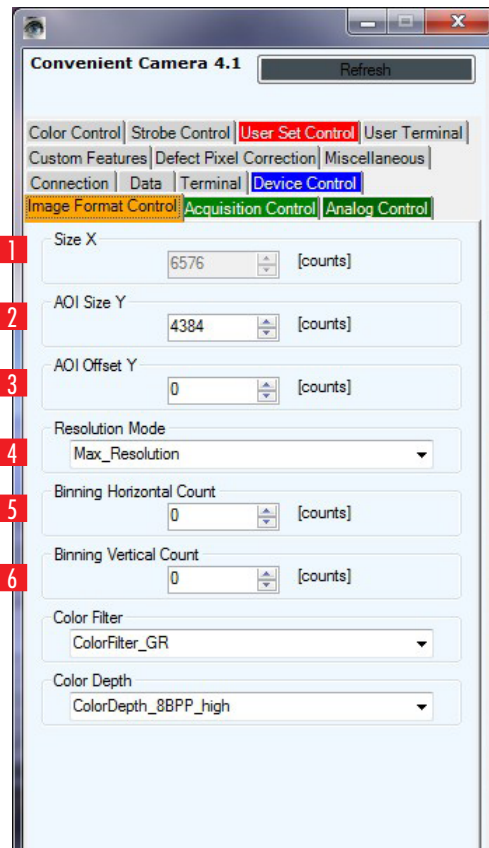
If you need other binning mode configurations consult factory or your nearest distributor. Using binning with a color version of the camera **5** will cause incorrect colors and strange effects! However, for fast focusing it might be useful.

“Color Filter”:

This is a read only entity. It shows the color sequence of the Bayer RGB pattern at the first two pixels in the first valid line **6** “GR”, “RG”, “BG”, “BG”). It is “none” for B/W cameras

“Color Depth”:

The data output format of the camera is configurable: “12BPP”: 12-bit per pixel. Bit 13..2 of the ADC 14bit output “8BPP_high”: 8-bit per pixel. Bit 13..6 of the ADC output (default) “8BPP_low”: 8-bit per pixel. Bit 9..2 of the ADC output data



NOTICE

You have to change the configuration of your Frame Grabber after changing the data output format from 8 to 12 bit or vice versa.

The "UserSet Control" Folder

1 "User Set Load"

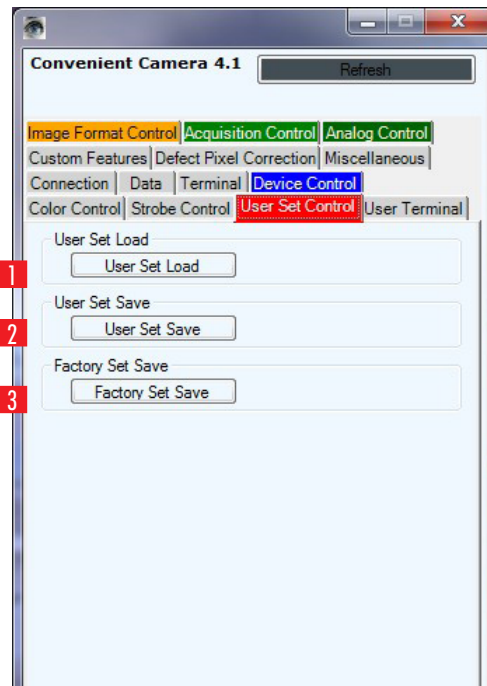
If you have troubles during configuration, you can reset the camera to the last saved configuration by clicking this button. Click on "Refresh" button afterwards to update the user interface (you could also switch camera power off and on and then click on "Refresh" button).

2 "User Set Save"

If you have configured your camera successfully you can save the actual configuration in the EEPROM of the camera. Every time the camera is connected to power it will start with this configuration. Ensure that your camera is running correctly before you click this button!

3 "Factory Set Save"

This saves the factory default values to EEPROM. The button is only used during first run after production of the camera. Ensure that your camera is running correctly before you click this button!



The "Data" Folder

1 "Save configuration to file"

allows to "Save" different camera configurations and upload them

2 with "Load" (Load Camera configuration from file)

3 "Create Log file"

Creates a logfile in a directory (e.g. program files/SVS-Vistek GmbH/convcam4). It stores all changes made to the camera during operation period.

4 "Close Logfile"

Stops the command protocol.

5 "Generate CS API"

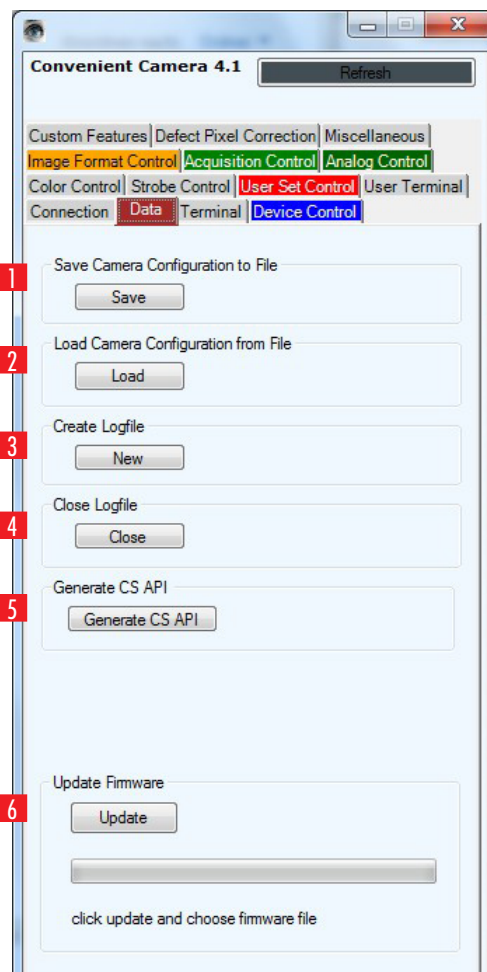
This generates a text file with "C#" source code useful for integrating the "Convcam4ODLL.dll" into a customer's application.

A click on this button opens a file dialog where you can select a previous saved configuration file. This file provides as a (camera type specific) basis for the source code. For further information please contact SVS-VISTEK Support.

6 "Update Firmware"

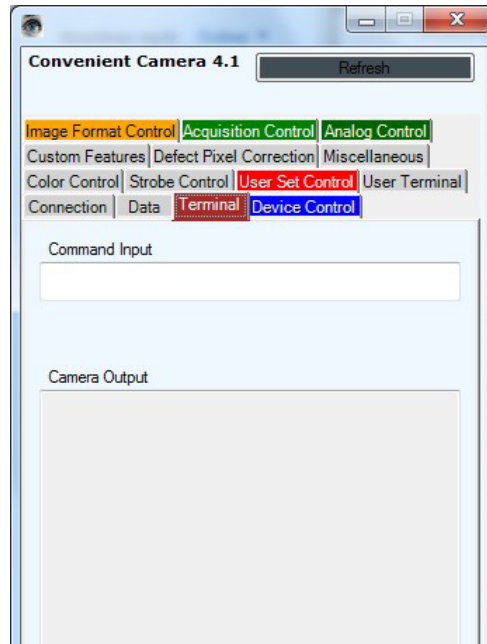
Don't use without contacting SVS-Vistek support before! Updating with an improper file might damage your camera!

A click on the "Update" button opens a file dialog where you can select a firmware file which will be send to the camera as firmware update.



The "Terminal" Folder

In case you want to communicate alpha numeric with the camera via Camera Link.
For further Information contact SVS-Vistek support.



The "Color Control" Folder

1 "White Balance Mode":

Selects the speed of the automatic white balance algorithm: "Approximative" or "Immediate". "Approximative" means a slower Adjustment than "Immediate". Immediate could possibly lead to an overshoot depending on application.

2 "Balance White Auto":

Enables the automatic white balance algorithm: "On" or "Off".

3 "Balance White Red":

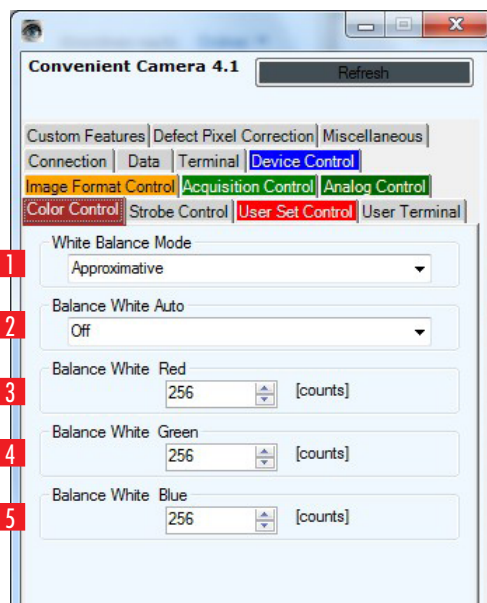
This is read only when automatic white balance is enabled. Click on "Refresh" to get the actual value. Range 128..1023. When "Balance White Auto" is set to "Off" you can change the digital gain values of the red pixels. 256 : gain factor = 1.0, 512: gain factor = 2.0, 128: gain factor = 0.5.

4 "Balance White Green":

This is read only when automatic white balance is enabled. Click on "Refresh" to get the actual value. Range 128..1023. When automatic white balance is "Off" you can change the digital gain values of the green pixels. 256 : gain factor = 1.0, 512: gain factor = 2.0, 128: gain factor = 0.5.

5 "Balance White Blue":

This is read only when automatic white balance is enabled. Click on "Refresh" to get the actual value. Range 128..1023. When automatic white balance is "Off" you can change the digital gain values of the blue pixels. 256 : gain factor = 1.0, 512: gain factor = 2.0, 128: gain factor = 0.5.

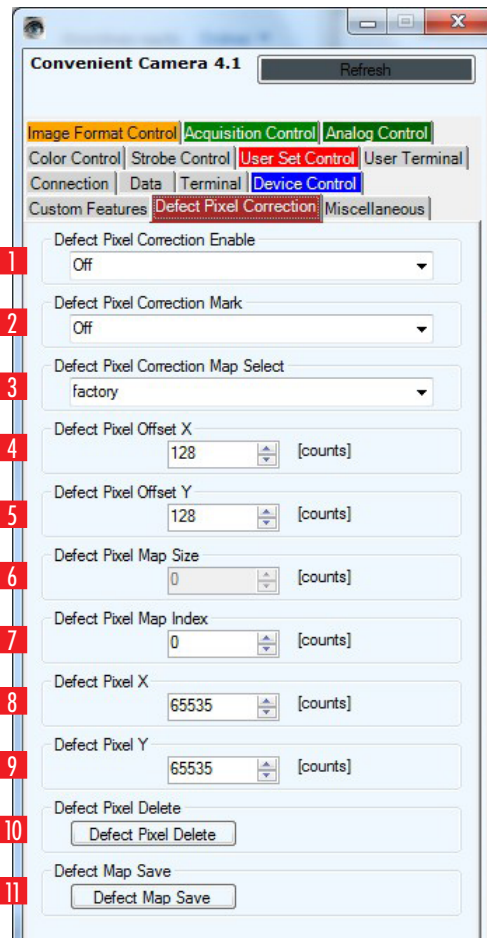


The “Defect Pixel Correction” Folder

- 1** “Defect Pixel Correction Enable”: Enables the defect pixel correction: “On” or “Off”.
- 2** “Defect Pixel Correction Mark”: Enables the high lighting of defect pixels when defect pixel correction is enabled: “On” or “Off”.
- 3** “Defect Pixel Correction Map Select”: Three defect pixel maps are selectable: “factory”, “SVS”, “custom”. “factory” defect pixel map is read only!
- 4** “Defect Pixel Offset X”: X-offset for all defect pixel entries of the selected defect pixel map. Useful for shifting the origin of the coordinate system.
Default = 128 : coordinate system is not shifted in x-axis
127 all defect pixel entries are shifted by one to the left.
129 all defect pixel entries are shifted by one to the right.
- 5** “Defect Pixel Offset Y”: Y-offset for all defect pixel entries of the selected defect pixel map
Useful for shifting the origin of the coordinate system
Default = 128 : coordinate system is not shifted in y-axis
127 all defect pixel entries are shifted by one to the top.
129 all defect pixel entries are shifted by one to the bottom.
- 6** “Defect Pixel Map Size”: This is a read only entity. It shows the amount of defect pixel entries in the selected defect pixel map. This field is not updated during inserting new defect pixel entries, click on “Refresh” to get the actual amount.
- 7** “Defect Pixel Map Index”: Selects the index of an entry in the selected defect pixel map for editing.

On the last index the “Defect Pixel X” and “Defect Pixel Y” values are 32767 or 65535. At this index new values can be edited and after both values are entered a new entry is added to the defect pixel map. Then “Defect Pixel Map Index” can be increased and another new entry can be made.

- 8** “Defect Pixel X”: X-Coordinate of the selected defect pixel entry.
- 9** “Defect Pixel Y”: Y-Coordinate of the selected defect pixel entry .
- 10** “Defect Pixel Delete”: Deletes the selected defect pixel entry.
- 11** “Defect Map Save”: Saves the selected defect pixel map to flash-memory.



The “Custom Features” Folder

1 “Digital Gain”:

The value of the digital gain:
 Range 128..4095
 256 = gain factor 1.0
 512 = gain factor 2.0
 1024 = gain factor 4.0.

2 “Digital Offset”:

Gray value of the digital offset added to the output gray values.

3 “Crosshair Pixel Width”:

Pixel width of the Crosshair 0: no Crosshair is displayed.

4 “Crosshair Position X”:

X-position of the crosshair.

5 “Crosshair Position Y”:

Y-position of the crosshair.

6 “Test Pattern”:

Select output of a test pattern:
 “Off”, “Gray scale”, “Color scale”.

7 “ADC Test Enable”:

Enables ADC Test Output: “On” or “Off”.

8 “ADC Test Value”:

Gray value of the ADC test output (14bit depth)
 When you switch off “ADC Test Enable” set this value to 0 also.

9 “LUT enable”:

Enables the look up table: “On” or “Off”.

10 “LUT Index”:

Index of a value in the look up table (range 0..4095).

11 “LUT Value”:

Output value of the look up table at selected index (range 0..255)
 (only 8bit range: lower 4 bits of 12 bit gray scale values are set to 0).

12 “PIVMode Enable”:

Switches the PIV Mode “on” or “off”.

13 “Temperatur Sensor”:

This is a read only value of the temperature inside the camera in degree Celsius. To get the actual value click on “Refresh”.

