MultiCam™

Release Notes for MultiCam 6.11
October 17, 2016

Contents

Improvements

GRABLINK series

Metadata can optionally be located in the 10th tap for the DECA_10T8 / 1X10 configuration

Affected boards: Grablink Full, Grablink Full XR

For line-scan cameras using *TapConfiguration=DECA_10T8* and *TapGeometry=1X10*, metadata can now be located in the 10th tap instead of being gathered in the first 10 bytes of each line. This can be achieved by setting the new *MetadataLocation* parameter to the *TAP10* value.

Refer to the MultiCam Boards Documentation for detailed information.

This improvement is available since MultiCam 6.11.

DirectShow

A 64-bit variant of the DirectShow filters is now available

DirectShow 64-bit filters are now available in MultiCam for all supported Picolo boards.

This improvement is available since MultiCam 6.11.

Important Notices

Renewal of the "Code Signing For Microsoft Authenticode" certificate for our drivers

Since MultiCam 6.9.8.2984 our drivers have been signed with a new SHA-256 code-signing certificate, which is required by Microsoft since January 2016 following its SHA-1 deprecation schedule. Windows 7 and Windows Server 2008 R2 now require at least SP1 as well as some specific Windows updates in order to support SHA-256 certificates. The following Windows updates are required and must be installed before using our drivers:

- KB3033929 (provides support for SHA-256 certificates which are required by Microsoft): without this update, a "Windows cannot verify the digital signature for the drivers required for this device" (code 52) error will prevent the MultiCam drivers from loading.
- KB2921916: this hotfix avoids the "Would you like to install this driver software?" dialog to pop up at each driver installation, even if the user checked the "Always trust software from "Euresys s.a." check box (see picture below) before clicking on the *Install* button. Note that the silent-mode installations will be blocked by this message until you perform this manipulation.
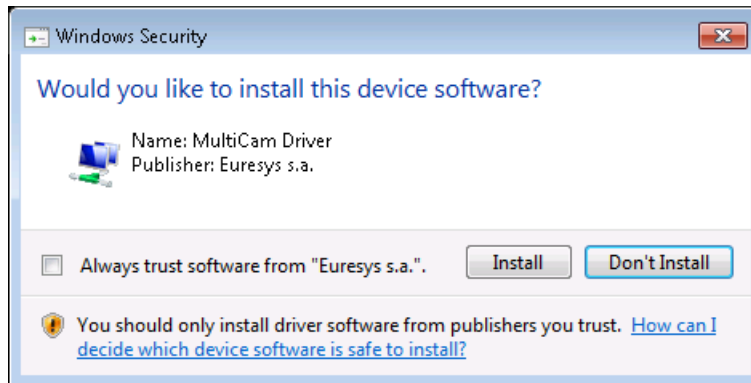
Windows Security warning at MultiCam installation when VeriSign Universal Root CA is missing

Since MultiCam 6.10 a Windows Security warning (see screenshot below) may be displayed when installing the MultiCam driver package.
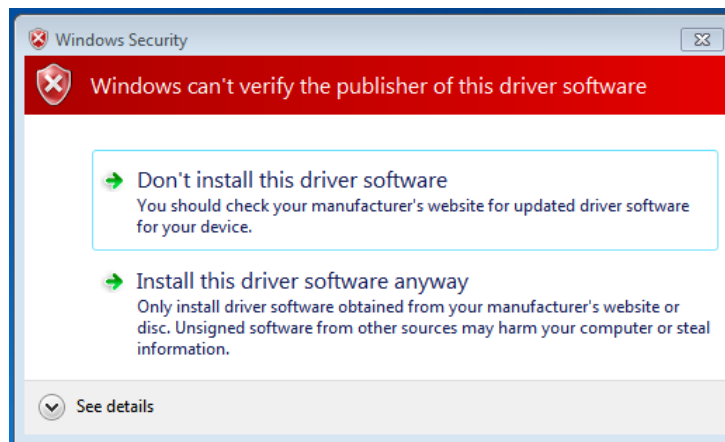
This warning occurs when the *VeriSign Universal Root CA* certificate is missing from the Windows certificate store, which can happen if the system is not connected to the Internet and thus does not receive root certificates updates.

This issue can be solved by installing this missing certificate, which is available in an archive that can be downloaded here, on the Symantec website.

Grablink DualBase, Full and Full XR no longer support x1 PCIe link width from version 138

Since version 138 (0x8A) of the PCI Express endpoint interface (its version is given by the *PCIeEndpointRevisionID* board parameter) Grablink DualBase, Grablink Full and Grablink Full XR support exclusively the x4 link width.

MultiCam does not support Windows 8 Fast Startup feature

The *Fast Startup* feature which is available since Windows 8 is not supported by the MultiCam drivers. Please make sure to turn it off before using MultiCam.

To turn off the *Fast Startup* feature, perform the following few steps:

1. Go to the *Control Panel* then click on the *Power Options* icon.
2. Click on the "*Choose what the power buttons do*" link on the left side.
3. Click on the "*Change settings that are currently unavailable*" link at the top.
4. If prompted by UAC, then click on "*Yes*".
5. Under *Shutdown settings*, uncheck the "*Turn on fast startup*" checkbox if it is listed, then click on the "*Save changes*" button.
6. The *Fast Startup* feature is now disabled.

Configuration switches

Grablink Base, DualBase, Full and Full XR feature a set of configuration switches.
For normal operation of the board, both switches must be in the ON position.
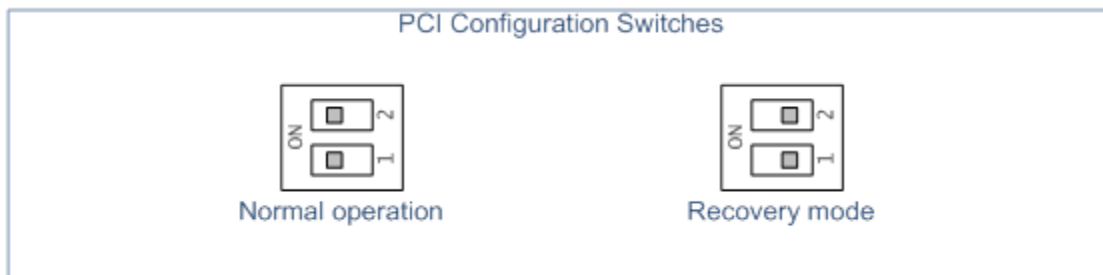
Should recovery mode be enabled by error, the Grablink board appears as
"GRABLINK Base/DualBase/Full/Full XR (Recovery)" in Windows Device Manager and is not functional.
To restore normal operation, power off the PC, change the switches to normal position and then reboot.

PCI and PCI Express bus compatibility note for Picolo, Picolo PCIe, Picolo Junior 4, Picolo Pro 2, Picolo Pro 2 PCIe, Picolo Tetra, Picolo Tymo

To ensure correct operation when using one of the Picolo cards listed above, the response time (also called latency) of the PCI or PCIe bus on the motherboard where the card is plugged must be low enough. The latency of the PCI or PCIe bus depends on the architecture of the motherboard, and may also depend on the Operating System used and the BIOS version or settings.

If the latency of the bus is not low enough, randomly distributed black lines may appear in the image acquired. They are caused by the long response time of the PCI or PCIe bus, leading to a condition known as "FIFO overrun".

The requirements for correct operation depend on the color format and the buffer pitch used. Both are set by the application using the Picolo through MultiCam parameters.

1) When the color format is RGB24 (this is default setting in MultiCam Studio), the allowed bus latency is 11 us. (*This is the least favorable case.*)

2) When the color format is RGB24 and the MultiCam buffer pitch is set to 4096, the allowed bus latency is 17 us.

3) When the color format is YUV422 (packed) or RGB16 and the MultiCam buffer pitch is set to 4096, the allowed bus latency is 29 us.

4) When the color format is YUV411 (packed) and the MultiCam buffer pitch is set to 4096, the allowed bus latency is 37 us. (*This is the most favorable case.*)

If you experience this problem, try changing the application parameters towards a more favorable case.

BoardTopology value change for cameras with a pixel clock below 30 MHz on Grablink Base, Grablink DualBase and Grablink Full boards

Since MultiCam 6.7.2.1677, to be able to use cameras with a pixel clock below 30 MHz on Grablink Base, Grablink DualBase and Grablink Full, an application must set the *BoardTopology* board parameter to the *MONO_SLOW* (Grablink Base and Grablink Full) or *DUO_SLOW* (Grablink DualBase) value.

Allowed values for the Camera and CamConfig parameters

On Grablink Base, Grablink DualBase and Grablink Full, the allowed value for the *Camera* parameter is *MyCameraLink* and the allowed values for the *CamConfig* parameters are *PxxSC*, *PxxRC*, *PxxRG*, *LxxxxSC*, *LxxxxSP*, *LxxxxRC*, *LxxxxRP*, *LxxxxRG* and *LxxxxRG2*. All CamFiles have been adapted accordingly and can be downloaded from the Euresys website using the following URL: http://www.euresys.com/CamFiles/CamFile.asp .

Other boards are not concerned but it is however recommended to use the latest available CamFiles in each case.

Buffer size limits for MultiCam surfaces

Under Windows, the maximum buffer size allowed per MultiCam surface is about 4GB.

If a MultiCam surface exceeds those limits, MultiCam returns *MC_IO_ERROR* at channel activation.

Memory allocation

The recommended method allocating memory to the surfaces of MultiCam is the "Automatic method" since this is the only method that is always applicable.

The usage of the "manual" memory allocation method" is restricted to the following cases:

■ On "Windows 32-bit without PAE" systems, without any further restrictions

■ On boards having 64-bit DMA addressing capability, without any further restrictions

■ On Linux operating systems, without any further restrictions: The Linux kernel provides a buffering system ensuring that the DMA operates always in the lowest 4 GB of physical addressing space.

The "manual" method is prohibited when:

■ The board has no 64-bit DMA capability and…

■ The system has physical memory beyond the 4 GB address boundary and…

■ The operating systems is "Windows x86 with PAE" or "Windows x86-64"

Since MultiCam 6.5.1, MultiCam returns the "MC_INVALID_SURFACE" error on channel activation if the manual memory allocation method is used in a prohibited case.

Environments

Supported OS

Windows

OS Version	Additional Information	
Microsoft Windows 10	x86 (32-bit) Edition	-
	x86-64 (64-bit) Edition	
Windows 8.1	x86 (32-bit) Edition	-
	x86-64 (64-bit) Edition	
Microsoft Windows Server 2012 R2	x86-64 (64-bit) Edition	-
Microsoft Windows 8	x86 (32-bit) Edition	-
	x86-64 (64-bit) Edition	
Microsoft Windows Server 2012	x86-64 (64-bit) Edition	-
Microsoft Windows 7	x86 (32-bit) Edition	Service Pack 1
	x86-64 (64-bit) Edition	
Microsoft Windows Server 2008 R2	x86-64 (64-bit) Edition	Service Pack 1

Linux

MultiCam is designed to work with a wide range of x86 and x86-64 Linux distributions, but requires at least a 2.6.32 kernel version. This release has been validated on Linux Ubuntu 14.04 LTS (kernel 3.13, x86 and x86-64).

Supported Programming Interfaces

MultiCam 6.11 is supplied as:

- A **32-bit binary library** (Windows and Linux) designed to be used with ISO-compliant C/C++ compilers for the development of 32-bit (x86) applications.
- A **64-bit binary library** (Windows and Linux) designed to be used with ISO-compliant C/C++ compilers for the development of 64-bit (x86-64) applications.
- A **.NET assembly**, based on the *MultiCam.cs* interface file provided with the C# sample programs, designed to be used with development environments compatible with .NET frameworks version 2.0 or higher. You can find more information on this API in the sample programs source code.
- **DirectShow 32-bit filters** (Windows only) designed to be used with 32-bit (x86) Microsoft Visual C++ compilers for the development of 32-bit (x86) applications.
- **DirectShow 64-bit filters** (Windows only) designed to be used with 64-bit (x86-64) Microsoft Visual C++ compilers for the development of 64-bit (x86-64) applications.

MultiCam 6.11 should be usable with any development tool that supports at least one of these interfaces.

Please note that these programming interfaces also cover most of the available development tools used with other languages.

The previously available **ActiveX controls library** and **.NET assembly** are now deprecated and have been removed from the MultiCam package. MultiCam can still be used with Microsoft Visual Basic 6 or a .NET language provided that the C API is called directly. Sample programs are available beside the driver in the MultiCam download area of the Euresys website.

Supported Boards

All boards support 32-bit operating systems as well as 32-bit DMA. The following table lists the support of 64-bit operating systems as well as the support of 64-bit DMA for each board.

PICOLO series	64-bit	64-bit DMA	DOMINO series	64-bit	64-bit DMA	GRABLINK series	64-bit	64-bit DMA
Picolo	✓	-	Domino Alpha 2	-	-	Grablink Value	✓	-
Picolo PCIe	✓	-	Domino Melody	✓	-	Grablink Avenue	✓	-
Picolo Junior 4	✓	-	Domino Harmony	✓	-	Grablink Express	✓	-
Picolo Pro 2	✓	-	Domino Symphony PCIe	✓	-	Grablink Full	✓	✓
Picolo Pro 2 PCIe	✓	-				Grablink DualBase	✓	✓
Picolo Tetra	✓	-				Grablink Base	✓	✓
Picolo Tymo	✓	-				Grablink Full XR	✓	✓
Picolo Alert	✓	-						
Picolo Alert PCIe	✓	-						
Picolo Alert Compact PCIe	✓	-						
Picolo Alert RC	✓	-						

Known Issues

GRABLINK series

Invalid images for RedBlueSwap=DISABLE and ImageFlipX=ON with ColorFormat=RGB24 or RGB32

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

When using an RGB color camera with *RedBlueSwap=DISABLE* and *ImageFlipX=ON*, images acquired with *ColorFormat=RGB24* or *ColorFormat=RGB32* are invalid for most image widths.

As a workaround, if the problem occurs, setting Hactive_Px to a multiple of 16 pixels will solve the issue.

Infrequent device start failure after cold boot

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

Some cards may infrequently fail to start properly after power up (PC cold boot) and are not detected by the PC. The card operates properly again, after a power down / power up cycle of the PC.

The cards with the following version numbers may exhibit this issue: v128 (0x80), v129 (0x81), v130 (0x82), v131 (0x83), v132 (0x84), v133 (0x85), v134 (0x86), v135 (0x87), v136 (0x88), v160 (0xA0), v161 (0xA1). Cards with other version numbers do not present this issue.

How to read the version number

1 - Using Windows Device Manager - Properties Dialog (values are displayed in <u>hexadecimal</u> form)
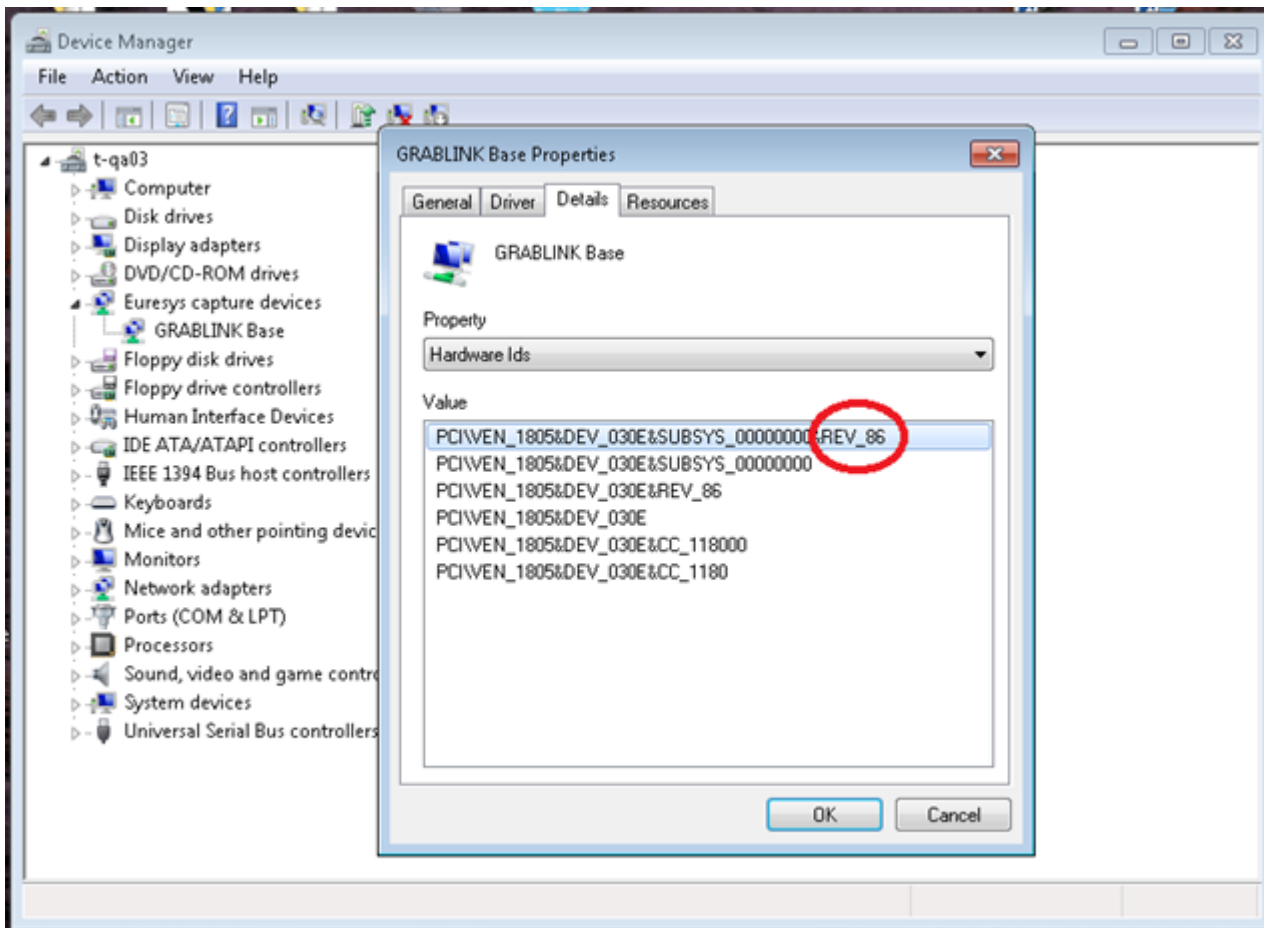
2 - Using MultiCam Studio - Board Information Dialog (values are displayed in <u>decimal</u> form)

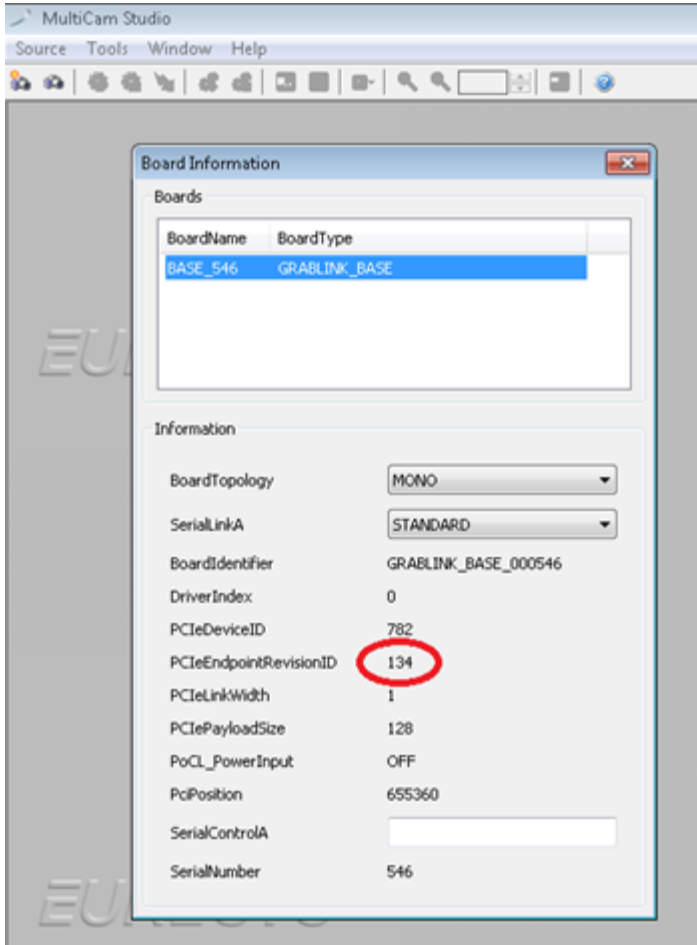### *MC_SIG_END_ACQUISITION_SEQUENCE sometimes occurs before last MC_SIG_SURFACE_PROCESSING*

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

When using *AcquisitionMode=LONGPAGE*, the MC_SIG_END_ACQUISITION_SEQUENCE signal is sometimes issued before the last *MC_SIG_SURFACE_PROCESSING* signal of a sequence.

Invalid image borders when using Cropping with a Bayer CFA camera

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

When using a cropped window with a Bayer CFA camera, the 4 borders of acquired images (i.e. the first and last lines as well as the first and last columns) contain invalid data.

Line-scan acquisitions with PageLength_Ln=1 may lead to segmentation fault or kernel panic under Linux

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

When performing line-scan acquisitions with *PageLength_Ln* set to *1*, some segmentation fault or kernel panic issues have been observed in rare cases, depending on the Linux distribution used.

As a workaround, if the problem occurs, setting PageLength_Ln to a value greater than 1 will make it disappear.

MC_SIG_END_ACQUISITION_SEQUENCE signal is generated twice when EndTrigEffect=FOLLOWINGLINE

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

When using the *LONGPAGE* acquisition mode with *EndTrigMode=HARD* and *EndTrigEffect=FOLLOWINGLINE*, the *MC_SIG_END_ACQUISITION_SEQUENCE* signal is generated twice when enabled.

As a workaround, you can either use EndTrigEffect=PRECEDINGLINE or handle the MC_SIG_END_ACQUISITION_SEQUENCE signal twice.

Misbehaviour of the trigger decimation unit when using both software and hardware triggers together

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

The trigger decimation unit does not take the occurrence of software triggers into account for the decimation counter. This may lead to misbehaviour especially when the first acquisition phase has been software triggered. In this case the trigger decimation unit is still continuing to consider the value of *TrigDelay_Pls* parameter instead of *NextTrigDelay_Pls* parameter. The *NextTrigDelay_Pls* parameter is only taken into account from the second hardware initiated trigger event.

As a workaround you can either avoid using software triggers with this feature or use the same value for both TrigDelay_Pls and NextTrigDelay_Pls parameters.

Synchronized acquisition broken on slave channels for AcquisitionMode=LONGPAGE, BreakEffect=FINISH and EndTrigMode=HARD when master channel is stopped before hardware end trigger

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

Synchronized acquisition using two or more line-scan cameras connected on several boards is broken on slaves when channels are restarted in the following conditions:

- *AcquisitionMode = LONGPAGE;*
- *BreakEffect = FINISH;*
- *EndTrigMode = HARD;*
- *The master channel is set to the IDLE state before receiving the hardware end trigger and before setting the slave channels to the IDLE state.*

As a workaround, this problem can be avoided by setting all slave channels to IDLE before setting the master channel to IDLE.

No acquisition failure event when LineCaptureMode is PICK or ADR

Affected boards: Grablink Avenue, Grablink Express, Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

No acquisition failure event is issued when needed if *LineCaptureMode* is *PICK*. Moreover, on Grablink Avenue and Grablink Express, no acquisition failure event is issued when needed if *LineCaptureMode* is *ADR*.

LineTriggerViolation wrongly incremented at channel (de)activation when using the rate converter

Affected boards: Grablink Avenue, Grablink Express, Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

The *LineTriggerViolation* parameter is wrongly incremented when a channel is activated or deactivated if *LineRateMode* is set to *CONVERT*.

The upper limit of Hactive_Px is 65504 instead of 65535

Affected boards: Grablink Base, Grablink DualBase, Grablink Full, Grablink Full XR

The upper limit for the *Hactive_Px* parameter is currently *65504* instead of *65535* (this value depends on the *TapConfiguration* parameter value). When setting a value greater than *65504*, MultiCam returns *MC_RANGE_ERROR*.

Cannot change connector for a camera without creating the channel again

Affected board: Grablink DualBase

If a channel is first created on the A connector, no acquisition will be performed by just setting the *Connector* parameter to the *B* value when changing the camera from the A connector to the B connector. In that case, the channel must be created again using the B connector.

Inoperative timeout for clSerialRead and clSerialWrite functions of the Camera Link® serial linux library

Affected boards: all Grablink boards

Under linux, the *clSerialRead* and *clSerialWrite* functions of the *libclseremc.so* library do not take the timeout passed as fourth argument into account. These functions simply return *CL_ERR_NO_ERR* immediately instead of *CL_ERR_TIMEOUT* when no data could be read or written within the specified timeout.

Inoperative VIDEO acquisition mode when ActivityLength is not equal to 1

Affected boards: Grablink Avenue, Grablink Express

If *ActivityLength* is not equal to 1 when *AcquisitionMode=VIDEO*, the frame grabber only acquires the first sequence of images (i.e. the number of images defined by the *SeqLength_Fr* parameter) then remains in the *ACTIVE* state without acquiring any additional image.

Bad behaviour of WindowX_Px

Affected boards: Grablink Avenue, Grablink Express

When changing the *WindowX_Px* parameter more than once, the system has to be rebooted to be able to activate the channel.

As a workaround, don't change the WindowX_Px parameter more than once.

Wrong serial port ID returned by Camera Link® serial library

Affected board: Grablink Express

The "Grablink Avenue" port ID is returned instead of "Grablink Express" when calling the *clGetSerialPortIdentifier* function of the Camera Link® serial library with a Grablink Express.

There is no workaround.

Inoperative StartExposure signal for subsequent images in a sequence

Affected boards: all Grablink boards

When acquiring a sequence of 2 or more images, the *MC_SIG_START_EXPOSURE* signal is only issued for the first acquired image.

There is no workaround.

DOMINO series

Invalid strobe pulse when using PreStrobe_us parameter

Affected boards: Domino Melody, Domino Harmony, Domino Symphony PCIe

The pre-strobe function is not functional.

There is no workaround.

PICOLO series

MULTIPLE_IRP_COMPLETE_REQUESTS Blue Screen occasionally occurs on some systems

Affected boards: Picolo, Picolo Pro 2, Picolo Junior 4, Picolo Tetra, Picolo Tymo

On some systems a MULTIPLE_IRP_COMPLETE_REQUESTS Blue Screen might occasionally occur.

ImageSizeX is 702 instead of 704 when Standard=PAL and PixelTiming=BROADCAST

Affected boards: Picolo, Picolo Pro 2, Picolo Junior 4, Picolo Tetra, Picolo Tymo

When *Standard=PAL* and *PixelTiming=BROADCAST*, *ImageSizeX* is wrongly set to 702 pixels instead of 704.

As a workaround, manually set ImageSizeX to the correct value.

MultiCam

Left-over binaries after uninstalling MultiCam from Windows 7

Since Windows 7, some MultiCam driver binaries located in *C:\Windows\system\euresys\multicam* are left on the system after uninstalling MultiCam. Deleting them manually is allowed once MultiCam has been uninstalled.