

Silicon Software

Runtime Software 5.2.3.1

**For Camera Link and GigE Vision Frame Grabbers
microEnable IV Series**

Release Notes

Imprint

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1 Release Notes for Runtime Software Version 5.2.3.1 Service Release

This chapter provides the release notes for the Runtime 5.2.3.1 Software Environment for Windows. Runtime 5.2.3.1 is a runtime software service release. In the following sections, new features, changes, and compatibility information is provided.

Supported Frame Grabbers:

- microEnable IV AS1-PoCL
- microEnable IV AD1-CL / -PoCL / -mPoCL
- microEnable IV VD1-CL
- microEnable IV AD4-CL / -PoCL
- microEnable IV VD4-CL / -PoCL
- microEnable IV AQ4-GE / -GPoE
- microEnable IV VQ4-GE / -GPoE
- microEnable IV AD4-LVDS

Runtime Version 5.2.3.1 supports all Silicon Software microEnable IV frame grabbers. For use with **microEnable 5** frame grabbers, please install **Runtime Version 5.3.400** or higher.

Supported Operating Systems:

Windows® Vista (32bit/64bit), Windows® 7 (32bit/64bit), Windows® 8 (32bit/64bit), Windows Server 2008, Windows Server 2010, Windows Server 2012, Linux 32bit, Linux 64bit

Runtime Software installation RT5.2.3.1 includes:

- Advanced Acquisition Applets
- Acquisition Applets
- Software Development Kit (SDK)
- microDisplay
- GenICam Explorer
- microDiagnostics
- Silicon Software GigE network service: "SiSo Generic Service"
- clShell (terminal program) for Camera Link camera configuration.

- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005, 2008 (SP1) and 2010 Redistribution Packages (only Windows)
- Documentation
- SDK Examples

1.1 New Features

There are no new features in comparison to Runtime Version 5.2.3.

1.2 Changes and Bug Fixes

Firmware

- The following firmware versions are new in Runtime Service Release 5.2.3.1:
 - **1.0b** (hex) for frame grabber microEnable IV AS1-PoCL
 - **7.92** (hex) for microEnable IV AD1-CL, microEnable IV AD1-PoCL, and microEnable IV AD1-mPoCL
- The new firmware provides the following changes and bug fixes:
 - Enhanced stability at higher FPGA temperatures and enhanced robustness against manufacturing variations of mainboards and frame grabbers. In earlier versions, the underlying error could result in pixel errors, timeouts during image acquisition, or errors during the RAM test in microDiagnostics.
 - microDisplay: Overflow information reliable now. In earlier versions, after an image acquisition was stopped, microDisplay erroneously informed about an overflow. Fixed.
 - microDisplay: Correct information on buffer fill levels. In earlier versions, the tool displayed erroneous information on buffer fill levels on Port B. Fixed.

1.3 Compatible Firmware Versions and Frame Grabber Device Driver Versions


Compatible Firmware Versions:

- microEnable IV AS1-PoCL: 1.0b (hex)
- microEnable IV AD1-CL: 7.92 (hex)
- microEnable IV AD1-PoCL: 7.92 (hex)
- microEnable IV AD1-mPoCL: 7.92 (hex)
- microEnable IV AD4-CL: 1.0a (hex)
- microEnable IV AD4-PoCL: 1.0a (hex)
- microEnable IV AQ4-GE: 1.33 (hex)
- microEnable IV AQ4-GPoE: 1.33 (hex)
- microEnable IV VD1-CL: 1.4d (hex)
- microEnable IV VD4-CL: 1.33 (hex)
- microEnable IV VD4-PoCL: 1.33f (hex)
- microEnable IV VQ4-GE: 1.88 (hex)
- microEnable IV VQ4-GPoE: 1.88 (hex)

Compatible Frame Grabber Device Driver Versions:

- Windows 32bit: Version 4.1.0.15
- Windows 64bit: Version 4.1.0.15

All listed firmware and device driver versions are backward compatible to Runtime 5.1.

	<p>Matching Runtime, Firmware and Device Driver Versions</p> <p>Incompatibilities between a newer firmware version and an older Runtime Software version cannot be excluded. New features may require the newest firmware and device driver version. To use the newest firmware version, make sure you install the matching runtime version.</p> <p><i>We explicitly recommend to use a specific Runtime Software version only together</i></p>
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with the corresponding (frame-grabber specific) firmware version and device driver version.



Shipment

Our frame grabber products are generally shipped with the firmware version compatible to the latest Runtime Software version (major release or service release). Nevertheless, during roll-out of a new Runtime Software version it may happen that – due to production-technical reasons – frame grabbers with the former firmware version are delivered. Exceptions are communicated via the **Silicon Software Product Info email channel**. Special shipment agreements are not affected.

Detailed information about the frame grabber and firmware version regarding a certain shipment you find on the specific delivery note.

1.4 Known Issues

1. Disabling energy safe mode for PCI Express: For safely running Silicon Software frame grabber applications it is strongly recommended to disable energy safe mode for PCI Express. Concerns Windows XP 32bit, Windows XP 64bit, Windows Vista 32bit, Windows Vista 64bit, Windows 7 32bit and Windows 7 64bit, Windows 8 32bit and Windows 8 64bit.
2. The revised implementation of the DMA900 technology requires an activation of the "Turbo DMA mode" to achieve a maximum DMA transfer performance, when running on PC setups with maximum PCIe payload size of 128 Bytes. In case of doubts run microDiagnostics performance tests in order to get the system specific performance and adjust the Turbo DMA mode setting, accordingly.
3. Frame grabber products, running Advanced AcquisitionApplets: During start-up phase spikes can occur at the trigger outputs.
4. If the grabber is configured to check for DVAL camera signal (which is the default) but the camera does not send DVAL for the whole frame one line of data is still returned. The FullArea and FullLine applets correctly return empty frames (frames of length 0).
5. When very short frames (at most 128 bytes) are transferred on an PCIe x4 frame grabber and the end of the transfer is 4, 8, or 12 bytes before any 128 byte boundary an additional



empty frame is marked as transferred. The frame data of the original frame remains intact. VA processing applets e.g. using the Blob operators are very likely to hit this behaviour. If you see such empty frames this example code might help you detect if you have hit the problem:

```
int isDmaFrameSkip(Fg_Struct *fg, dma_mem *membuf, int dmaport, int picnum)
{
    size_t len;
    Fg_getParameterEx(fg, FG_TRANSFER_LEN, &len, dmaport, membuf, picnum);
    if (len != 0) return 0;
    Fg_getParameterEx(fg, FG_TRANSFER_LEN, &len, dmaport, membuf, picnum - 1);
    if (len > 128) return 0;
    uintptr_t bufaddr = (uintptr_t)Fg_getImagePtrEx(fg, picnum - 1, dmaport, membuf);
    if (((bufaddr + len) % 128) < 116) return 0;
    return 1;
}
```

6. IMPORTANT ISSUE concerning operating systems Microsoft Windows 8 32bit/64bit, Microsoft Windows 7 32bit/64bit, Microsoft Windows Vista 32bit/64bit and Microsoft Windows XP 64bit/32bit:
 - Runtime usage stand-alone: No known issues
 - Runtime usage with VisualApplets: It is necessary and recommended to choose the user folder as destination installation folder or any other folder with full access rights.
Basically, at least the folder "hardware applets" needs to have full access rights.
7. When using the Applets for GigE Vision Link Aggregation: The DMA transfer of a certain frame terminates at the next received frame from the camera or when an adjustable timeout occurs. The effect can be seen especially, when the camera acquisition is stopped. To speed up the point of time of transfer, the timeout therefore can be adjusted.
8. When using older hardware revisions of microEnable IV VD4-CI boards (revisions < 2.1) in combination with PixelPlant200e errors might occur, even when using the newer firmware. Please contact our support team in such cases.
9. microDiagnostics: During performance test of Camera Link Dual Base applets, microDiagnostics may sporadically display wrong values especially when using 16 /48 Bit per pixel on Port B. Workaround: In case of doubts, please check the current frame rate by using microDisplay. The applet's performance is not affected by this issue.

2 Release Notes for Runtime Software Version 5.2.3 Service Release

This chapter provides the release notes for the Runtime 5.2.3 Software Environment for Windows. Runtime 5.2.3 is a runtime software service release. In the following sections, new features, changes, and compatibility information is provided.

Supported Frame Grabbers:

- microEnable IV AS1-PoCL
- microEnable IV AD1-CL / -PoCL / -mPoCL
- microEnable IV VD1-CL
- microEnable IV AD4-CL / -PoCL
- microEnable IV VD4-CL / -PoCL
- microEnable IV AQ4-GE / -GPoE
- microEnable IV VQ4-GE / -GPoE
- microEnable IV AD4-LVDS

Runtime Version 5.2.3 supports all Silicon Software microEnable IV frame grabbers. For use with **microEnable 5** frame grabbers, please install **Runtime Version 5.3.400** or higher.

Supported Operating Systems:

Windows® Vista (32bit/64bit), Windows® 7 (32bit/64bit), Windows® 8 (32bit/64bit), Windows Server 2008, Windows Server 2010, Windows Server 2012, Linux 32bit, Linux 64bit

Runtime Software installation RT5.2.3 includes:

- Advanced Acquisition Applets
- Acquisition Applets
- Software Development Kit (SDK)
- microDisplay
- GenICam Explorer
- microDiagnostics
- Silicon Software GigE network service: "SiSo Generic Service"
- clShell (terminal program) for Camera Link camera configuration.

- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005, 2008 (SP1) and 2010 Redistribution Packages (only Windows)
- Documentation
- SDK Examples

2.1 New Features

Advanced Acquisition Applets for use with Camera Link AREA cameras

Support for vertical sensor correction is introduced by 4 new Advanced Acquisition Applets:

- 2-Tap Sensor Correction for Camera Link cameras and microEnable IV AD4 & VD4:
 - Acq_DualBaseAreaBayer8_TS
 - Acq_DualBaseAreaGray12_TS

Supported Tap Geometries:

Geometry 1X-2Y

Geometry 1X-2YE

Geometry 1X-2YM

- 4-Tap Sensor Correction for Camera Link cameras and microEnable IV AD4 & VD4:
 - Acq_MediumAreaBayer12_TS
 - Acq_MediumAreaGray12_TS

Supported Tap Geometries:

Geometry 2XE-2YE

Geometry 2X-2YE

Geometry 2XM-2YE

These 4 applets replace their earlier pre-release versions and follow the GenICam SFNC in the naming of the sensor correction modes.

Advanced Acquisition Applets for use with Camera Link LINE cameras

- Raised image height with line trigger: The image height is now unlimited (in the range of sensible heights) for the following applets (all Advanced Acquisition Applets for use with Camera Link line cameras):
 - MediumLineRGB24
 - FullLineRGB24
 - FullLineGray8_10TAP
- Splitting of large images: New image trigger mode for the following applets (all Advanced Acquisition Applets for use with Camera Link line cameras) available:
 - MediumLineRGB24
 - FullLineRGB24
 - FullLineGray8_10Tap

New image trigger mode allows splitting of large images into chunks. Images (up to 16 million lines) can be split into smaller frames. The image tag at the end of each frame holds information if the frame is the last frame of the image or if other frame(s) that belong to the same image will follow. The height of the partial images is controlled by parameter. The image height of the large image is either controlled by the pulse length of an external signal or an external signal triggers a parameterized image height.

- Image selector in line applets: An image selector is now integrated in the following applets (all Advanced Acquisition Applets for use with Camera Link line cameras):
 - MediumLineRGB24
 - FullLineRGB24
 - FullLineGray8_10TAP
- All advanced Acquisition Applets for use with Camera Link line cameras offer digital input (FG_DIGIO_INPUT):
 - MediumLineRGB24
 - FullLineRGB24
 - FullLineGray8_10TAP

Acquisition Applets for use with GigE Vision cameras

- Image format Mono14 is supported now
- Expansion of supported image size:
 - QuadAreaGray8: 8192x1024 OK, 1024x65535
 - QuadAreaGray16: 8192x1024 OK, 1024x65535
 - QuadAreaBayer24: 8192x1024 OK, 1024x65535
 - QuadLineGray8: 16384x1024 OK, 1024x65535
 - QuadLineGray16: 16384x1024 OK, 1024x65535

LabView Interface

- User controlled memory management: New functions available which enable the user to allocate and free memories (frame buffers).
- Image Acquisition: Two modes of arranging the memory available, the Blocking mode (Fifo principle) and the non-blocking mode (round robin principle).
- Two ways to fetch image data out of the LabView Interface into the LabView Application: a) Image copying, including conversion into 8-bit image data, and b) Handling pointers and frame numbers of image buffer management.

Cognex Adapter

- Cognex Adapter for VisionPro: The Cognex Adapter has been extended. The new features of Adapter Version 2.1 are the following ones:
 - Support of SmartApplets
 - Support of Gigabit Ethernet frame grabbers
 - Management of image timeouts: Time-out period can be defined by user. After the time-out period is exceeded, an according error message is provided by the Silicon Software Cognex Adapter.
 - Cognex trigger models are mapped to the Silicon Software applet trigger models.
 - Support of RGB planar image format: The RGB format is converted into an RGB planar format within the Silicon Software Cognex Adapter (pixel by pixel). The data are buffered in the frame buffer separated by color channel (R,G, and B). The formats are handed over to VisionPro according to parameter FG_FORMAT of the

applet. The image data get converted since currently there is no applet directly supporting planar formats.

Firmware

- mE4 AQ4 / mE4 VQ4, Image Timeout: Default value of parameter *Image Timeout* is set to 1000 μ s now. If no EOF (end of frame) signal is received within this period, the frame gets terminated automatically after this timeout period is elapsed.

SDK

- PixelPlant detection now via SDK possible.
Usage: SDK function `Fg_getSystemInformation(..,INFO_PIXELPLANT_PRESENT,..)`

Set-Up Options

- During installation of runtime, user can select if ComWrapper is started at each system start.

Physical Layer (GigE Vision)

- Automatic reset of PHYs after loss of camera connection: After loss of camera connection the runtime now always resets the related PHYs in order to improve the subsequent camera detection success rate. (In earlier versions, after loss of camera connection and subsequent camera restart, sporadically the runtime did not detect the camera.)



2.2 Changes and Bug Fixes

Advanced Acquisition Applets for use with Camera Link cameras

- Advanced Acquisition Applets for CL line cameras with microEnable IV (*MediumLineRGB24*, *FullLineRGB24* and *FullLineGray8_10Tap*) and microEnable 5 (*Acq_FullLineBayer8_Opt1*, *Acq_FullLineGray8*) offer digital input (FG_DIGIO_INPUT).
- DIGIO output error occurring with the following applets has been fixed:
 - *MediumLineRGB24*
 - *FullLineGray8_10Tap*
 - *FullLineRGB24*
- Applet parameter **FG_USEDVAL** in Advanced Acquisition Applets for Camera Link Full Configuration, e.g. *Acq_FullAreaBayer8*, *Acq_FullAreaGray8*: Applet parameter **FG_USEDVAL** can be set when provided by the applet. (In earlier versions, setting this parameter failed in Camera Link Full applications due to a backward compatibility bug. Fixed.)

Acquisition Applets for use with Camera Link cameras

- Standard applet *DualLineGray8* with row length 16k (A Series) and 32k (V Series) on microEnable IV AS1, microEnable IV AD1, microEnable IV VD1, microEnable IV AD4, microEnable IV VD4: With earlier versions, images showed defects at the end of the image rows. Fixed.
- Image Trigger Low Active (concerns Line-Applets, Camera Link Base (dual) and Medium configurations): Pulse length of image trigger can be shorter than row period. (In earlier versions, an image trigger pulse length shorter than the row period resulted in a loss of the image trigger.)
- Standard applet *DualAreaBayer12* on microEnable IV AD4 and microEnable IV VD4: Flawless 48-bit output. (In earlier versions, the 48-bit output of this applet showed errors. Fixed.)
- Standard applet *FullAreaGray8*: New synchronization Fifo implemented which allows flawless image acquisition even when reading out phase-shifted Camera Link signals. (In

earlier versions, a phase-shift of Camera Link signals could result in corrupted images. Fixed.)

- All standard applets Camera Link Line Dual or Medium Configuration, triggering: Enhanced stability of image acquisition since image trigger is recognized now even if image trigger pulse length is shorter than line trigger period.

Acquisition Applets for use with GigE Vision cameras

- Standard Applet QuadLineGray8: Image acquisition at low line rates: Default value for time-out variable that forces end of image has been set to a higher value. Result: Flawless acquisition at low line rates without the need to re-set the time-out value. (User can always change time-out value via GenICam Explorer.)

All Applets

- Setting applet parameters: If an entered value is in the correct value range, but is not a valid value within this value range, an according error message (FG_INVALID_MODULO) is displayed by microDisplay/returned in SDK environment. Example: Parameter FG_[parametername] has the value range 4 to 1024, step size is 4, and the value 5 is entered, message FG_INVALID_MODULO is returned. In earlier versions, some applets returned message FG_VALUE_OUT_OF_RANGE in such cases.

Firmware

- mE4 VD4 / mE4 VQ4, operation in combination with PixelPlant: On call Fg_Init, FPGA configuration starts as required. (In earlier versions, with some combinations of frame grabber model and PixelPlant type, FPGA configuration on call Fg_Init failed . Firmware bug causing this behaviour is fixed.)
- mE4 AD4 / mE4 VD4: Board recognition works stable now (avoidance of a 180° phase shift).
- mE4 VD4 / mE4 VQ4: Adaptation of signal strength to ensure save operation with PixelPlant

Drivers

- Installation: 32 bit runtime installer identifies if target operating system is a 32 bit or a 64 bit OS and automatically installs the matching driver. During 32 bit runtime installation:
 - the 64 bit driver is installed on a 64 bit target OS, whereas
 - the 32 bit driver is installed on a 32 bit target OS.

Tools

- Firmware flasher: Check of frame grabber type activated again.
- MicroDiagnostics and Firmware flasher Commandline: After successful flashing of firmware onto the frame grabber, write protection for SPI is active.
- MicroDiagnostics: Color-indicated results of applet tests displayed with correct message now.

SDK

- GigE Vision: Robustness of Gbe library at loss of camera connection. (In version 5.2.2., there sporadically occurred an access violation when the camera connection got lost at virtually at the same time the camera acquisition was started (via `gbe_startAcquisition`). Fixed.)
- FG_CAMSTATUS when using MediumLineRGB24 und FullLineRGB24 applets: The call for FG_CAMSTATUS returns the correct value now. In earlier versions, when working with these applets, the call for FG_CAMSTATUS always returned value 0.
- Frame grabber library (FgLib5) : returns error code in case of time-out: FG_GetImage (SEL_ACT_IMAGE) returns an error code in case of time-out (instead of returning 0).
- Frame grabber library (FgLib5) : Management of frame buffers working correctly again when using the same memory address for different DMA channels in a sequence. In version 5.2.2, the functions `Fg_AllocMem`, `Fg_Aquire` and `Fg_FreeMemex` in some combinations did not accept a correctly allocated frame buffer, resulting in an error when starting acquisition on DMA x. This happened, when the same memory address had been used twice for different DMAs, if they had been freed in between and re-allocated (via `Fg_FreeMem(fg, dmaIndex)`). Reason: Memory address was not unregistered internally

from the list of memory addresses locked because in use. Fg_AquireEx returned an error, even when memory allocation was correct in such a sequence. Fixed.

When Fg_AllocMem returned the same memory address twice, the sequence below failed, although this sequence is allowed:

```
Fg_Struct* fg = Fg_Init("AppleName.dll", 0);
for(uint32_t dmaIndex = 0; dmaIndex < 2; dmaIndex++)
{
    void* memory = Fg_AllocMem(fg, static_cast<size_t>(width * height), 1,
dmaIndex);
    int acquireResult = Fg_Acquire(fg, dmaIndex, 1);
    if(acquireResult == FG_OK)
    {
        cout << "Acquisition start worked on DMA " << dmaIndex << ": " <<
NO_BUG << endl;
    }
    else
    {
        cout << "Acquisition start failed on DMA " << dmaIndex << " with code :
" << acquireResult << endl;
    }
    Fg_stopAcquire(fg, dmaIndex);
    Fg_FreeMem(fg, dmaIndex);
}
Fg_FreeGrabber(fg);
```

2.3 Compatible Firmware Versions and Frame Grabber Device Driver Versions

Compatible Firmware Versions:


- microEnable IV AS1-PoCL: 1.0a (hex)
- microEnable IV AD1-CL: 7.90 (hex)
- microEnable IV AD1-PoCL: 7.90 (hex)
- microEnable IV AD1-mPoCL: 7.90 (hex)
- microEnable IV AD4-CL: 1.0a (hex)
- microEnable IV AD4-PoCL: 1.0a (hex)
- microEnable IV AQ4-GE: 1.33 (hex)
- microEnable IV AQ4-GPoE: 1.33 (hex)


- microEnable IV VD1-CL: 1.4d (hex)
- microEnable IV VD4-CL: 1.33 (hex)
- microEnable IV VD4-PoCL: 1.33f (hex)
- microEnable IV VQ4-GE: 1.88 (hex)
- microEnable IV VQ4-GPoE: 1.88 (hex)

Compatible Frame Grabber Device Driver Versions:

- Windows 32bit: Version 4.1.0.15
- Windows 64bit: Version 4.1.0.15

All listed firmware and device driver versions are backward compatible to Runtime 5.1.

	<h3>Matching Runtime, Firmware and Device Driver Versions</h3> <p>Incompatibilities between a newer firmware version and an older Runtime Software version cannot be excluded. New features may require the newest firmware and device driver version. To use the newest firmware version, make sure you install the matching runtime version.</p> <p><i>We explicitly recommend to use a specific Runtime Software version only together with the corresponding (frame-grabber specific) firmware version and device driver version.</i></p>
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	<h3>Shipment</h3> <p>Our frame grabber products are generally shipped with the firmware version compatible to the latest Runtime Software version (major release or service release). Nevertheless, during roll-out of a new Runtime Software version it may happen that – due to production-technical reasons – frame grabbers with the former firmware version are delivered. Exceptions are communicated via the Silicon Software Product Info email channel. Special shipment agreements are not affected.</p> <p>Detailed information about the frame grabber and firmware version regarding a certain shipment you find on the specific delivery note.</p>
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3 Release Notes for Runtime Software Version 5.2.2 Service Release

This chapter provides the release notes for the Runtime 5.2.2 Software Environment for Windows. Runtime 5.2.2 is a runtime software service release. In the following sections, new features, changes, and compatibility information is provided.

Supported Frame Grabbers:

- microEnable IV AS1-PoCL
- microEnable IV AD1-CL / -PoCL / -mPoCL
- microEnable IV VD1-CL
- microEnable IV AD4-CL / -PoCL
- microEnable IV VD4-CL / -PoCL
- microEnable IV AQ4-GE / -GPoE
- microEnable IV VQ4-GE / -GPoE
- microEnable IV AD4-LVDS

Runtime Version 5.2.2 does not support the Silicon Software CoaXPress Frame Grabber Series. For use with our CoaXPress Frame Grabber Series, please install Runtime Version 5.3.300 or higher. However, please note that, due to production-technical reasons, this documentation also contains the documentation for Silicon Software CoaXPress frame grabbers.

Supported Operating Systems:

Windows® Vista (32bit/64bit), Windows® 7 (32bit/64bit), Windows® 8 (32bit/64bit), Windows Server 2008, Windows Server 2010, Windows Server 2012, Linux 32bit, Linux 64bit

Runtime Software installation RT5.2 includes:

- Advanced AcquisitionApplets
- AcquisitionApplets
- Software Development Kit (SDK)
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- Silicon Software GigE network service: "SiSo Generic Service"
- clShell (terminal program) for Camera Link camera configuration.
- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005, 2008 (SP1) and 2010 Redistributal Packages (only Win)
- Documentation
- SDK Examples

3.1 New Features

- microEnable IV Camera Link: COM interface for communication with Camera Link cameras (in addition to the standard CLSer interface of the frame grabber) – implementation of new frame grabber module *CLSerCOM Wrapper* which provides virtual COM ports.
- microEnable IV AD4-CL/-PoCL and microEnable IV VD4-CL/-PoCL: Three new advanced acquisition applets for line cameras, supporting new high speed RGB line cameras (applets "FullLineRGB24" and "MediumLineRGB24") and gray line cameras that need 10-tap sensor correction (applet "FullLineGray8_10Tap"); all three acquisition applets support DMA 900. These applets replace their earlier pre-release versions.
- microEnable IV AQ4-GE/GPoE and microEnable IV VQ4-GE/GPoE: Two new advanced acquisition applets supporting link aggregation (LAG) according to GigE Vision standard 2.0: applets "Acq_DualGEx2AreaBayer8" and "Acq_DualGEx2AreaGray12". LAG enables double transfer bandwidth. At present, Silicon Software supports a specific protocol implementation for the packet distribution over two physical links. With Silicon Software frame grabbers, you can use all GigE Vision cameras that offer two links for streaming and work with the same GigE Vision LAG protocol implementation as the frame grabbers. Please contact the Silicon Software Sales or Silicon Software Support departments to get to know which cameras are compatible.
- microEnable IV AS1, microEnable IV AD1, microEnable IV AD4, microEnable IV VD4: Acquisition applets for line cameras now support full 16k row length.
- GenICam support now based on GenICam Reference Implementation 2.3



- Communication with GigE cameras: Time span, after which timeout occurs, and number of retries now configurable (in GenICam Explorer and SDK)
- Linux installation: Silicon Software Runtime now also available for LINUX

3.2 Changes and Bug Fixes

- Runtime does not stop acquisition when a fixed number of frames is specified: Fixed. When a maximal number of frames is specified for function FG_Acquire, the grabbing process is stopped on all levels after the specified number of frames is acquired (and/or a time out occurs). There is no need to call Fg_stopAcquire to stop the acquisition process.
- microDisplay: Column width of parameter table fixed. User can adjust column width to his/her preferences. These settings are saved and reloaded at program start. Automatic adaptation of column width is disabled.
- Corrupted images when using four GigE cameras at maximum speed on microEnable IV AQ4-GE and microEnable IV VQ4-GE: Fixed. Solution: Band width per channel has been set to a higher value than the maximum GigE speed so that it is impossible to run into a bandwidth restriction.
- microDisplay: Display of parameter properties (panel in the right bottom corner) always displays properties for selected parameter, no matter if the mouse is used to select a parameter or if the parameters are navigated through using the cursor keys.
- Extended SDK documentation: All frame grabber and camera parameters that are configurable via SDK are now listed and described in the SDK documentation (like, e.g., configuration of MTU size via SDK)
- Camera stays connected during load of user sets the in GenICam Explorer. Solution: Time span, after which timeout occurs, and number of retries have been set to higher default values. In addition, both parameters are configurable now in GenICam Explorer and SDK.
- Signal processing (microEnable IV AD1 und microEnable IV AS1): Image Trigger mode "Gated Multibuffer" now fully functional, i.e., status information for the last frame of an image (status bit 31 of image tag) contains correct value.
- Improved board detection at system start (microEnable IV AQ4 and microEnable IV VQ4)
- Timeout occurrences on microEnable IV AQ4 and microEnable VQ4 during continuous acquisition with 4 GigE cameras: Fixed. Solution: Refined discovery options; Camera discovery can be disabled now for active ports. (Default setting: disabled.)

- When using Advanced AcquisitionApplets, in very rare cases and only on certain server mainboards, the call FG_GetParameter(FG_TRANSFERLEN) returned a too small value for transfer length. In these cases, the image was defective. This error has been fixed.
- Board detection problems occurring on very rare occasions with microEnable IV AS1 and microEnable IV AD1: Fixed.

3.3 Compatible Firmware Versions and Frame Grabber Device Driver Versions

Compatible Firmware Versions:

- microEnable IV AS1-PoCL: 1.0a (hex) *new*
- microEnable IV AD1-CL: 7.90 (hex) *new*
- microEnable IV AD1-PoCL: 7.90 (hex) *new*
- microEnable IV AD1-mPoCL: 7.90 (hex) *new*
- microEnable IV AD4-CL: 1.09 (hex)
- microEnable IV AD4-PoCL: 1.09 (hex)
- microEnable IV AQ4-GE: 1.32 (hex) *new*
- microEnable IV AQ4-GPoE: 1.32 (hex) *new*
- microEnable IV VD1-CL: 1.4d (hex)
- microEnable IV VD4-CL: 1.2f (hex)
- microEnable IV VD4-PoCL: 1.2f (hex)
- microEnable IV VQ4-GE: 1.85 (hex) *new*
- microEnable IV VQ4-GPoE: 1.85 (hex) *new*

Compatible Frame Grabber Device Driver Versions:

- Windows 32bit: Version 4.1.0.15
- Windows 64bit: Version 4.1.0.15

All listed firmware and device driver versions are backward compatible to Runtime 5.1.



Matching Runtime, Firmware and Device Driver Versions

Incompatibilities between a newer firmware version and an older Runtime Software version cannot be excluded. On the other hand, new features require occasionally the newest firmware version and device driver version.

We explicitly recommend to use the corresponding firmware (frame-grabber specific) and device driver version with a specific Runtime Software version.



Shipment

Our frame grabber products are generally shipped with the firmware version compatible to the latest Runtime Software version (major release or service release). Nevertheless, during roll-out of a new Runtime Software version it may happen that – due to production-technical reasons – frame grabbers with the former firmware version are delivered. Exceptions are communicated via the **Silicon Software Product Info email channel**. Special shipment agreements are not affected.

Detailed information about the frame grabber and firmware version regarding a certain shipment you find on the specific delivery note.

4 Release Notes Runtime Software Version 5.2.1 Service Release for Windows

This chapter provides the release notes for the Runtime 5.2.1 software environment for Windows. Runtime 5.2.1 is a Runtime Software service release. In the following sections new features, changes and compatibility information is provided.

Supported Frame Grabber:

- microEnable IV AS1-PoCL
- microEnable IV AD1-CL / -PoCL / -mPoCL
- microEnable IV VD1-CL
 - PCIe (PCI Express) x1 or
 - PCIe x4 or
 - PCIe x8 or
 - PCIe x16
- microEnable IV AD4-CL / -PoCL
- microEnable IV VD4-CL / -PoCL
- microEnable IV AQ4-GE / -GPoE
- microEnable IV VQ4-GE / -GPoE
 - PCIe (PCI Express) x4 or
 - PCIe x8 or
 - PCIe x16

Supported Operating Systems:

Windows® XP (32bit/64bit), Windows® Vista (32bit/64bit), Windows® 7 (32bit/64bit), Windows® 8 (32bit/64bit)

Runtime Software installation RT5.2 includes:

- Advanced AcquisitionApplets
- AcquisitionApplets
- Software Development Kit (SDK) 5
- microDisplay
- GenICam Explorer
- microDiagnostics
- Silicon Software GigE network service: "SiSo Generic Service"
- clShell (terminal program) for Camera Link camera configuration.
- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005 Redistributonal Package (only Windows)
- Microsoft Visual Studio 2008 SP1 Redistributonal Package (only Windows)
- Documentation
- SDK Examples

4.1 New Features

- Runtime 5.2.1 supports the operating system Windows 8 (32bit/64bit)
- microEnable IV AD4-CL/-PoCL and VD4-CL/-PoCL: A new Applet "Acq_FullAreaGray10" is available supporting Camera Link Deca/80bit 8 tap 10bit mode.
- microEnable IV AD4-CL/-PoCL and VD4-CL/-PoCL: 10 new Advanced Acquisition Applets supporting Camera Link Base, Medium, Full and Deca/80bit configuration are available: The so called "XL" Applets now support image sizes of up to 16k x 64k pixel. For detailed information please refer to section "Advanced AcquisitionApplets" of the Runtime documentation

- **Event Notification** (synchronous&asynchronous) newly implemented supporting microEnable IV AQ4-GE / AQ4-GPoE / VQ4-GE / VQ4-GPoE;
A new set of SDK functions for event handling (camera events and camera/frame grabber events) is available. Additionally GigE Vision events are supported by the tool GenICam Explorer.
- New Callback interfaces for GigE Vision camera events and events for GigE Vision camera detection and loss.
- All GigE products: GigE Vision action commands are supported by the SDK and GenICam Explorer
- Regarding GigE Vision products:
 - Direct sending and receiving of UDP packets is supported.
 - Access to GenICam node map via SDK
 - Extended support for GigE Vision LAG support (Firmware+GenICam Explorer)
 - Extended set of SDK examples including camera discovery, callback/events and node map access and usage and force IP
- microDisplay now supports new image formats: FG_GRAY32, FG_GRAY10
- microDisplay: Display of SmartApplets "Segmentation and Object Classification" results improved - new switch "Visualize Blob's" to enable/disable the results view.
- microDiagnostics: Improved control for running test procedures - tests can be aborted

4.2 Changes and Bug Fixes

- Improved support for high-speed DMA transfers: For maximum DMA performance some mainboards requires a specific setup of the DMA900 configuration. Therefore a "DMA Turbo Mode" switch has been implemented. to support most efficiently this specific class of mainboards. For further mainboard information

please contact Silicon Software technical support:
support@silicon-software.de

- microDisplay: Improved access to VisualApplets field and string parameter
- mE4 AS1-PoCL, AD1-CL/-PoCL: Trigger outputs on CL port B non-functional. This has been fixed.
- mE4 AS1-PoCL, AD1-CL/-PoCL: A shortened control signal duration has led to a non-functional Flash signal. This has been fixed. Furthermore Flash signal duration is now programmable. This bug fix and change requires mandatorily the newest firmware version, see section "Firmware Versions"
- All frame grabber products, running "classical"
AcquisitionApplets: During start-up phase spikes can occur at the trigger outputs. The implementation has been changed to eliminate spikes at the outputs.
- Camera Link Serial Interface: Adaption of error codes and availability of a new SDK example
- SDK function "Fg_stopAcquireEx" using parameter nFlag "STOP_SYNC" returns "not implemented": Support for frame synchronous acquisition stop has been fixed.
- Correction of Auto Shading function within Advanced AcquisitionApplets with RGB output: Reference value for Color Applets is now calculated to be a common value for all color components. This enables correct auto-white balancing.
- Extension of Auto Shading function within Advanced AcquisitionApplets: Input of custom gain normalization values and read-out of computed correction coefficients.
- Advanced AcquisitionApplets - Trigger function: Plausibility check of trigger setup does not check for illegal configuration of the combination of trigger frequency and pulse width. This has been fixed.
- Some minor improvements in the Applets documentation

4.3 Compatible Firmware Versions and Frame Grabber Device Driver Versions

Compatible Firmware Versions:

- microEnable IV AS1-PoCL: 1.07 (hex)
- microEnable IV AD1-CL: 7.8d (hex)
- microEnable IV AD1-PoCL: 7.8d (hex)
- microEnable IV AD1-mPoCL: 7.8d (hex)
- microEnable IV AD4-CL: 1.09 (hex)
- microEnable IV AD4-PoCL: 1.09 (hex)
- microEnable IV AQ4-GE: 1.30 (hex)
- microEnable IV AQ4-GPoE: 1.30 (hex)
- microEnable IV VD1-CL: 1.4d (hex)
- microEnable IV VD4-CL: 1.2f (hex)
- microEnable IV VD4-PoCL: 1.2f (hex)
- microEnable IV VQ4-GE: 1.82 (hex)
- microEnable IV VQ4-GPoE: 1.82 (hex)

Compatible Frame Grabber Device Driver Versions:

- Windows 32bit: Version 4.1.0.15
- Windows 64bit: Version 4.1.0.15

Please note that incompatibilities between a newer firmware version and an older Runtime Software Version cannot be excluded. On the other hand new features requires occasionally the newestet firmware version and device driver version. Therefore we explicitly recommend to use in a certain Runtime Software environment the corresponding firmware version and device driver version for a certain frame grabber.

5 Release Notes Runtime Software Version 5.2 Major Release for Windows

This chapter provides the release notes for the Runtime 5.2 Software Environment for Windows. Runtime 5.2.0 is a Major Runtime Software release. In the following sections new features, changes and compatibility information is provided.

Supported Frame Grabber:

- microEnable IV AS1-PoCL
- microEnable IV AD1-CL / -PoCL / -mPoCL
- microEnable IV VD1-CL
 - PCIe (PCI Express) x1 or
 - PCIe x4 or
 - PCIe x8 or
 - PCIe x16
- microEnable IV AD4-CL / -PoCL
- microEnable IV VD4-CL / -PoCL
- microEnable IV AQ4-GE / -GPoE
- microEnable IV VQ4-GE / -GPoE
 - PCIe (PCI Express) x4 or
 - PCIe x8 or
 - PCIe x16

Supported Operating Systems:

Windows® XP (32bit/64bit), Windows® Vista (32bit/64bit), Windows® 7 (32bit/64bit)

Runtime Software installation RT5.2 includes:

- Advanced AcquisitionApplets
- AcquisitionApplets
- Software Development Kit (SDK) 5
- microDisplay
- GenICam Explorer



- microDiagnostics
- Silicon Software GigE network service: "SiSo Generic Service"
- cShell (terminal program) for Camera Link camera configuration.
- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005 Redistributonal Package (only Win)
- Microsoft Visual Studio 2008 SP1 Redistributonal Package (only Win)
- Documentation
- SDK Examples

5.1 Runtime Software Version 5.2.0 Major Release - New Features

- New AcquisitionApplets set for microEnable IV AD4-CL / AD4-PoCL / VD4-CL / VD4-PoCL:
Advanced AcquisitionApplets
- covering Area Scan Applets for Camera Link Base / Dual Base / Medium and Full Configuration
Features overview (for detailed information please refer to the Advanced AcquisitionApplets documentation):
 - Auto Shading Correction including Dead Pixel Interpolation (DPI)
 - Image Selector:
 - Noise Filter
 - Improved and extended Area Scan Trigger functionality including compatibility mode
 - ROI Selection
 - High Quality Extended Bayer Pattern de-mosaicing and White Balancing
 - Look-Up Table
 - DMA900 technology
 - Camera Simulator
- New Silicon Software .NET Interface; programming example in C# available
- **Event Notification** (synchronous&asynchronous) revised and extended supporting microEnable IV AD4-CL / AD4-PoCL / VD4-CL / VD4-PoCL;
New set of SDK functions for event handling, taken over from RT5.1.x Technical Releases.
- New SDK examples for event handling



- Adjustment of board indices especially for use in multi-board systems
- Visibility of **Applet protection** integrated: microDisplay and microDiagnostics
- microDiagnostics: GUI entirely revised, parallel flashing of multiple boards, explicit definition of board ordering
- microDisplay: Improved access to VisualApplets field parameter (e.g. LUT), see file formats section within SDK manual
- Camera Link camera configuration interface CLSer: New component CLSerCOMWrapper enables CL camera config tools access via a system COM port
- New SDK function: Fg_getSystemInformation(): information retrieval of frame grabber system, e.g. nr. and type of boards, etc.
- New SDK function: Fg_getParameterProperty(): information retrieval of applet parameters
- Support of **Camera Link PoCL Lite** Interface: microEnable IV AS1-PoCL and microEnable IV AD1 all flavors
- Support of **Camera Link Base configuration 3TAP** extended: Advanced AcquisitionApplets
- Exclusive frame grabber access (frame grabber locking), prevents improper board access
- Preparation for support of future **microEnable 5 series**
- Introduction of new, **extended GigE Service for GigE Vision frame grabber**
 - Parallel use of GenICam Explorer and microDisplay / SDK
 - Automatic Camera Detection
 - Adjustable MTU
 - Preparation for LAG support (Link Aggregation Group support, as specified in GigE Vision 2.0)
- Device driver: Support of 32bit applications running in 64bit environments
- Parallel installation of multiple Runtime Software versions, e.g. 32bit / 64bit, etc.
- Introduction of **GenICam Explorer, replacing GigE Explorer** - with extended functions
 - Revised Graphical User Interface
 - Save/load GenICam XML file
 - Adjustment of MTU size
 - Automatic Camera Detection
 - Parallel use of GenICam Explorer and microDisplay / SDK
 - Extended information view
- New Installer options: Enhanced possibility of customizing the Runtime installer

5.2 Runtime Version 5.2.0 Major Release - Changes / Improvements / Bug Fixes

- XML Applet parameter interface based on GenICam revised, related to Camera Link and GigE Vision Applets
- Camera Link Serial Interface for camera configuration - added support as specified in Camera Link 2.0 specification
- microEnable III support discontinued and microEnable III documentation removed
- Bayer HQ Applets for microEnable IV AD4-CL / VD1-CL abd VD4-CI removed;
new Bayer HQe Applets with improved quality added -> see **Advanced AcquisitionApplets**
- GigE Applets: Revised parameter interface
- Legacy frame grabber support discontinued and legacy frame grabber documentation removed
- New/Removed/Changed SDK Functions: Compatibility of SDK 5.1.x maintained
 - New set of SDK functions for event handling, taken over from RT5.1.x Technical Releases
 - SDK function extended: Fg_registerApHandler(), see documentation
 - New function Fg_sendSoftwareTriggerEx(), taken over from RT5.1.x Technical Releases
 - New SDK function: Fg_getSystemInformation(): information retrieval of frame grabber system, e.g. nr. and type of boards, etc.
 - New SDK function: Fg_getParameterProperty(): information retrieval of applet parameters
- Trigger / GPI/O documentation new structured and extended
- Opto trigger boards documentation extended and new boards added
- Applets documentation new structured and extended
- Overall documentation partially new structured, extended and revised
- New Firmware versions -> see section "**Current Firmware versions**"
- New Device Driver versions -> see section "**Current Device driver versions**"
- Tool microDiagnosis renamed to microDiagnostics
- clserMe4.dll renamed to clSersis.dll
- Applet FullLineGray8 supports now full 16k (16384 Pixel) line widths
- Firmware updates of the products microEnable IV AD1 series resolves microDiagnostics hardware test failures



- microDisplay camera status CamPort indicator bug fixed, concerning Camera Link Medium configuration and Full configuration applets. Connected or disconnected cameras are now indicated correctly
- Bug in sensor readout correction modes SMODE_TAB4_2 and SMODE_TAB4_5 in the applet MediumLineGray for all platforms fixed
- Bug in sensor readout correction modes SMODE_TAB2_1 in the applets DualAreaGray and DualAreaBayer for the frame grabbers microEnable IV VD1-CL, VD4-CL/-PoCL, AD4-CL/-PoCL fixed
- With the introduction of the new tool GenICam Explorer and the new GigE service several minor bugs in the GigE components are solved
- Furthermore the stability and reliability of the handling of GigE Vision cameras has significantly been improved
- All improvements and bug fixes from the Technical Releases 5.1.1 to 5.1.4 have been taken over
- Several minor bug fixes are available as well

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