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Silicon Software

Runtime Software 5.2.2

For Camera Link and GigE Vision Frame Grabbers

Release Notes

Imprint

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Content

1 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), Linux 32bit, Linux 64bit

Runtime Software installation RT5.2 includes:

- Advanced AcquisitionApplets
- AcquisitionApplets
- 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 Redistributional Packages (only Win)
- Documentation
- SDK Examples

1.1 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

1.2 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 band-width 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 occurences 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 mainbords, 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.

1.3 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 occassionally 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. Execptions 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.

2 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 Redistributional Package (only Windows)
- Microsoft Visual Studio 2008 SP1 Redistributional Package (only Windows)
- Documentation
- SDK Examples

2.1 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 documention
- **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

2.2 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-fuctional 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

2.3 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 occassionally 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.

3 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"
- clShell (terminal program) for Camera Link camera configuration.
- FirmwareFlasher (command line version)
- Frame grabber device driver
- Microsoft Visual Studio 2005 Redistributional Package (only Win)
- Microsoft Visual Studio 2008 SP1 Redistributional Package (only Win)
- Documentation
- SDK Examples

3.1 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 defintion 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

3.2 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-Cl 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_registerApcHandler(), 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 stabability 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

4 Known Issues

- 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.
- 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.
- Frame grabber products, runnning Advanced AcquisitionApplets: During start-up phase spikes can occur at the trigger outputs.
- 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).
- 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;
}

- 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.
- 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.

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