SILICONSOFTWARE

microEnable IV

GigE Vision Product Family

Runtime Version 5.2.2

Getting Started

Imprint

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Content

1 Installation and Setup

1.1 Getting the Frame Grabber Ready

1.1.1 System Requirements

Operating System: You can use your microEnable IV frame grabber with one of the following operating systems:

- Windows® Vista 32bit/64bit
- Windows® 7 32bit/64bit
- Windows® 8 32bit/64bit
- Linux 32bit/64bit (distribution independent; tested with Ubuntu 12.04 LTS)

PCIe Interface: You need one of the following PCIe interfaces on your motherboard:

microEnable IV-AQ4-GE / -GpoE,
microEnable IV-VQ4-GE / -GpoE:

- PCIe (PCI Express) x4 or
- PCIe x8 or
- PCIe x16

1.1.2 Installing the Hardware

⚠	**Power Off** Before installing hardware, ensure that ▪ the system power is OFF and unplugged from the power outlet, ▪ proper electrical grounding procedures have been followed.

To install the Frame Grabber Hardware:

1. Shut down your computer.
2. Unplug your computer from the power outlet.
3. Plug the frame grabber into a free, appropriate PCIe slot (see above) of your PC.

⚠	**Prevent Overheating** Make sure you use an adequate ventilation system within your computer. This is of special importance if ▪ there is little space between boards in a multi board installation, ▪ an installation is close to a graphics card. We also recommend leaving enough free space between boards.

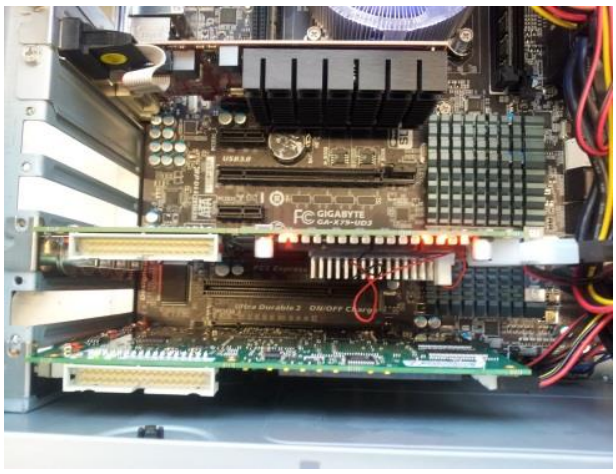


Figure 1: Plugged frame grabber board within a PC

	Using the GigE Vision Power Over Feature If you are using the Power Over Feature of GigE Vision (GpoE, supported by frame grabbers microEnable IV AQ4-GpoE and microEnable IV VQ4-GpoE), refer to section A4: Installing the Power Supply Module for information on how to install the power supply module.

4. Boot the system.
   - Windows: After booting, the frame grabber is recognized in the Windows *Device Manager* under M*ultifunction adapters*.
   - Linux: If you use Linux, skip the following steps and the next section (*Installing the Runtime Software under Windows*) and refer to the Linux Installation Guide instead.

5. There are two ways the frame grabber may be displayed under *Multifunction adapters*. If the frame grabber is displayed
   - as *Unknown device*: Proceed with the following section (1.1.3 Installing the Runtime Software). The relevant driver will be installed together with the runtime.
   - with the full name of the frame grabber (microEnable IV …): Make sure the frame grabber's driver is the same as the one available in the installation folder of the runtime (see section A1: Checking for Installed Firmware and Device Driver Versions). If this is not the case, update the frame grabber's driver with the driver you find in the installation folder of the Silicon Software runtime (see section A3: Updating the Driver).

1.1.3 Installing the Runtime Software

	**Runtime Installation under Linux** If you use a Linux system, please refer to the Linux Installation Guide for installation under Linux.

Runtime installation 5 includes:

- Advanced AcquisitionApplets
- AcquisitionApplets
- microDisplay
- microDiagnostics
- ClSerCOMWrapper for set-up of virtual COM Ports ***(new)***
- Third Party Interfaces:
  - Cognex Adaper ***(new)***
  - LabView Interface ***(new)***
- FirmwareFlasher (command line version)
- GenIcam Explorer
- Software Development Kit (SDK)
- Silicon Software Generic Service
- CLShell
- Driver
- Microsoft Visual Studio 2005, 2008 (SP1) and 2010 Redistributional Packages (Windows only)
- Documentation
- SDK Examples

	**Silent Installation under Windows** The Runtime installer supports silent installation, see section A6: Silent Installation Under Windows).

Downloading the Installer

You are provided with the installer file / an installation DVD by Silicon Software or your local distributor. Alternatively, you can download the runtime installer for your specific frame grabber type from the download area at www.silicon-software.de.

Make sure you download the version that matches your frame grabber type and operating system.

To install the runtime software under Windows:

1. Boot the system.

2. Uninstall any Silicon Software runtimes prior to version 5.1.4 that might be installed on your system. From version version 5.1.4 onwards, you can keep installations of earlier Silicon Software runtime versions on your system when installing new versions.

3. Decide if you need to install the 64 bit version or the 32 bit version of the Silicon Software runtime.

Full Access Rights to Installation Directory

During the installation process, you will have to specify the target directory for your installation. Make sure you define an installation directory where you have full access rights to (i.e., your personal user directory). This is of special importance if you work with the VisualApplets programming environment, or if you use VA applets.

4. Start installing runtime 5.x:

   - Run the installer for runtime 5.x (64 bit / 32 bit).
   - Alternatively, insert the installation DVD. Setup should start automatically. If this is not the case, start the setup file within the windows folder of the installation DVD.

5. Install the runtime software by following the installation dialogs.
   Take special care of two aspects:

   a. Minimize Disk Space Consumption

      To use minimum disk space for your installation, select only the applets you really need and that comply with the frame grabber model you are using. (For example, if you use a microEnable IV GigE frame grabber, uncheck all applets for Camera Link frame grabbers.)

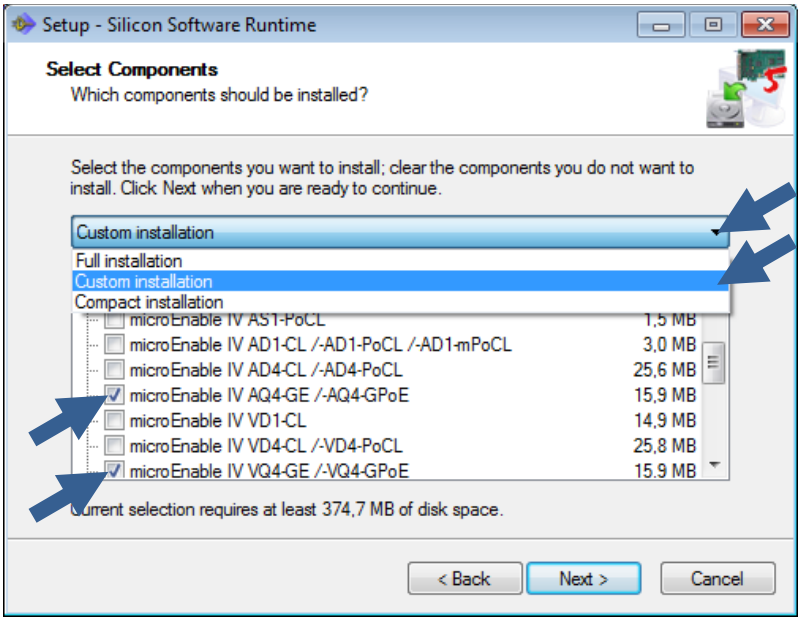


Figure 2: Selecting applets for a specific frame grabber model

   b. Specify Shortcuts in Start Menu

      Make sure you control and (if necessary) manually adapt the menu entry for the shortcuts in the Start Menu of your system (see figure below).

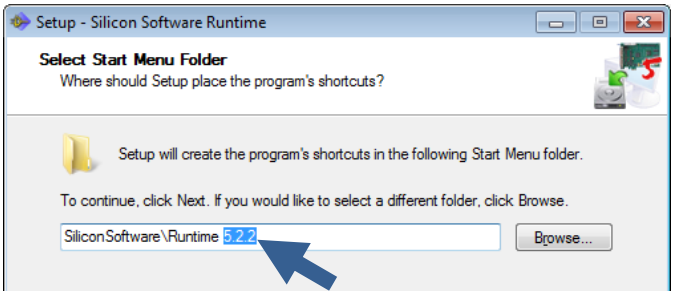


Figure 3: Adapting the menu entry in the Start Menu of your system

1.1.4 Hardware Diagnostics (microDiagnostics)

To perform a full hardware test on your frame grabber, you have the *microDiagnostics* tool available that comes as part of the delivery package.

Firmware and Driver Versions

Before you run tests in microDiagnostics, use microDisplay, any other tool, or set up an SDK project: Make sure that for the specific runtime version you are using,

- the required firmware is loaded onto the frame grabber, and
- the required device driver is installed on your system.

See section A1: Checking for Installed Firmware and Device Driver Versions.

To perform a full hardware test:

1. Open microDiagnostics.
2. Select the frame grabber you want to test first.

Frame Grabber not listed?

If the frame grabber you want to test is not listed, install the latest driver version (see section A3: Updating the Driver under Windows).

3. Use the options at the bottom of the program start window to perform your tests:

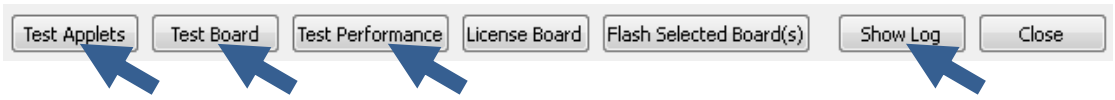


Figure 4: Test Options in microDiagnostics

While a test is running, the buttons are not available. A test is finished as soon as all buttons are available again.

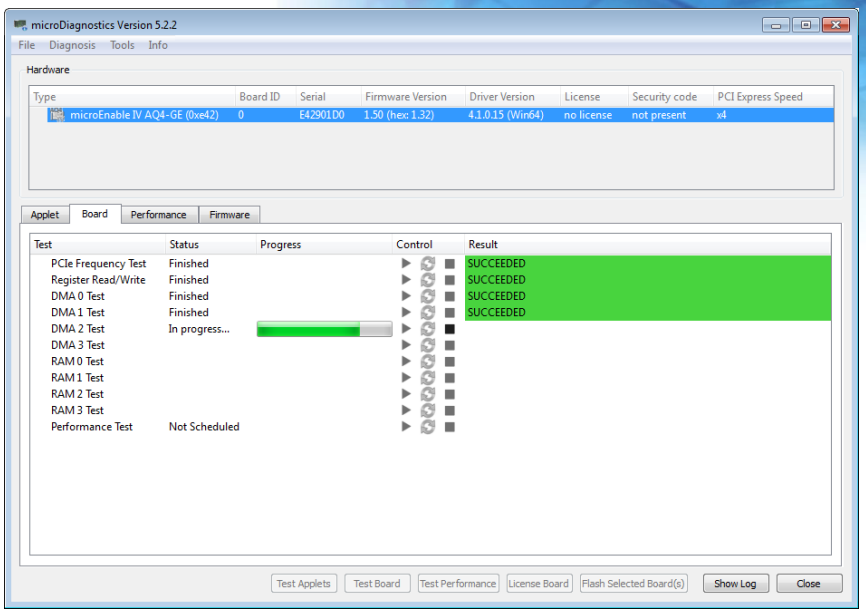


Figure 5: Running Board Test

Tip

You can check the log file containing the data of all your tests by clicking on the **Show Log** button at the bottom of the program start window.

1.2 Getting the Camera Ready

1.2.1 Connecting the Camera Physically

To connect the camera to your frame grabber:

1. Plug the cable(s) of your camera(s) to the connector(s) of the frame grabber (ports A, B, C, and D).
2. If the camera doesn't use the GigE Vision Power Over feature (GPoE), plug the camera to a power supply.

1.2.2 Autodiscovery (GenICam Explorer)

The *GenICam Explorer*

The tool *GenICam Explorer* comes as part of the runtime installation. The *GenICam Explorer* discovers connected cameras automatically and provides direct access to the GenICam interface of the camera.

Using the *GenICam Explorer*, you can

- configure and control the camera connection.
- configure the camera.

To connect the camera to the frame grabber:

1. Open the *GenICam Explorer* (Start -> All Programs -> Silicon Software -> Runtime x.x.x -> *GenICam Explorer*).

   On program start:

   - The start window of the *GenICam Explorer* opens.
   - The *GenICam Explorer* starts the automatic camera discovery.

As soon as a camera on a GigE port is discovered, camera details are displayed in the *GenICam Explorer:*

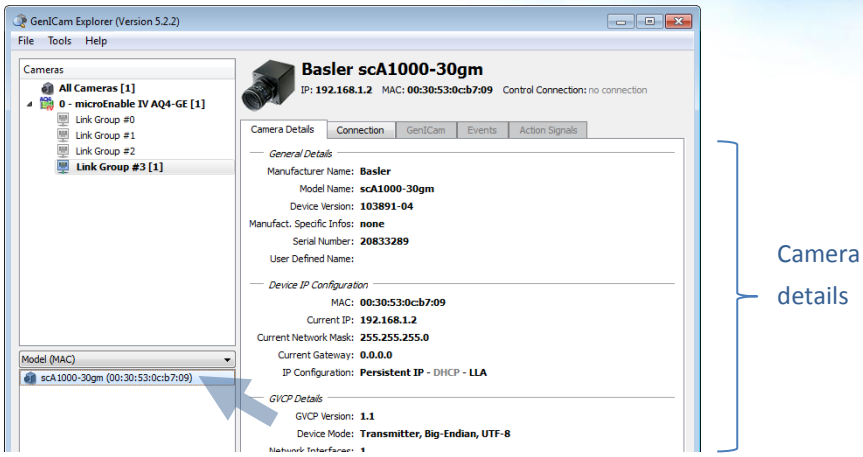


Figure 6: Display of camera details

If more than one camera is discovered, you can change between the different cameras in the left bottom corner.

2. Click on the **Quick Connect** Button to connect to the discovered camera.

After successful camera connection, under the **GenICam** tab you find information on the current camera configuration:

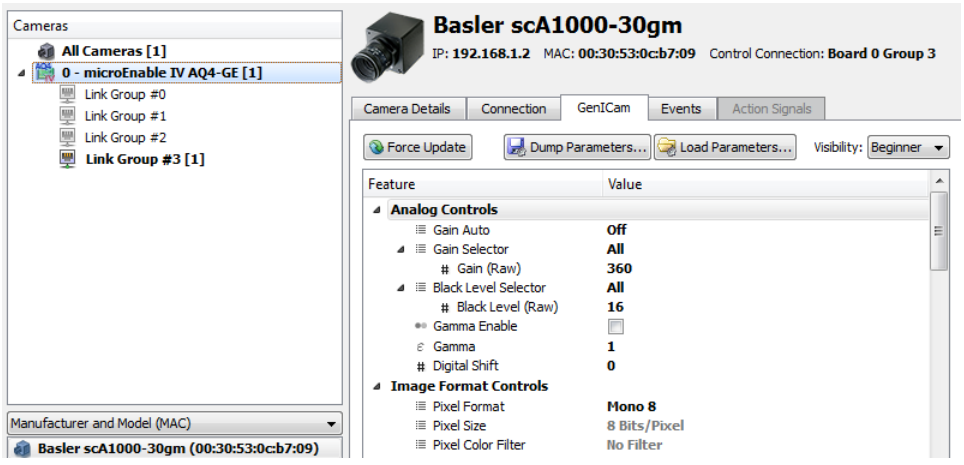


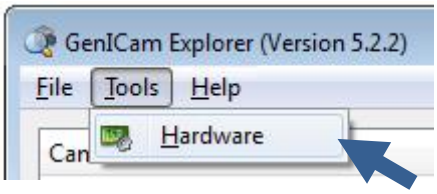
Figure 7: After connecting to the camera, the GenICam camera configuration is displayed

1.2.3 Adapting the Link Topology (GenICam Explorer)

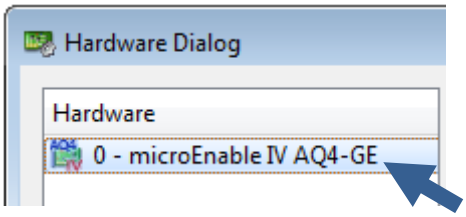
To adapt the link topology to your needs:

1. Open the *GenICam Explorer*.

2. On the **Tools** menu, select **Hardware**.

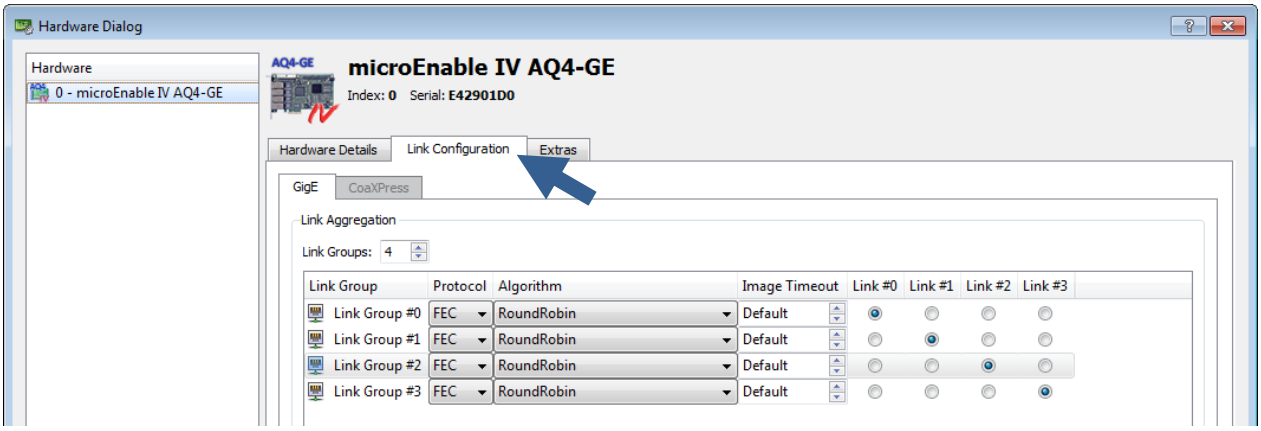


3. In the window that opens, select the frame grabber you are working with.



4. Go to the tab **Link Configuration**.

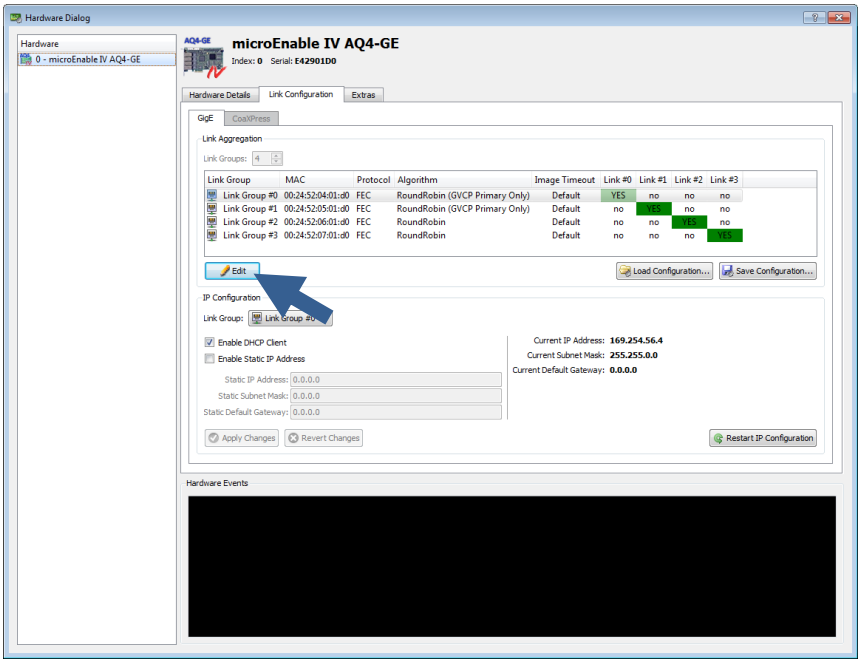
The current link topology is displayed:



If the link topology displayed meets your requirements, proceed with section 1.2.4 Configuring the Camera (GenICam Explorer).

If the link topology displayed does not meet your requirements, proceed the following steps to adapt it:

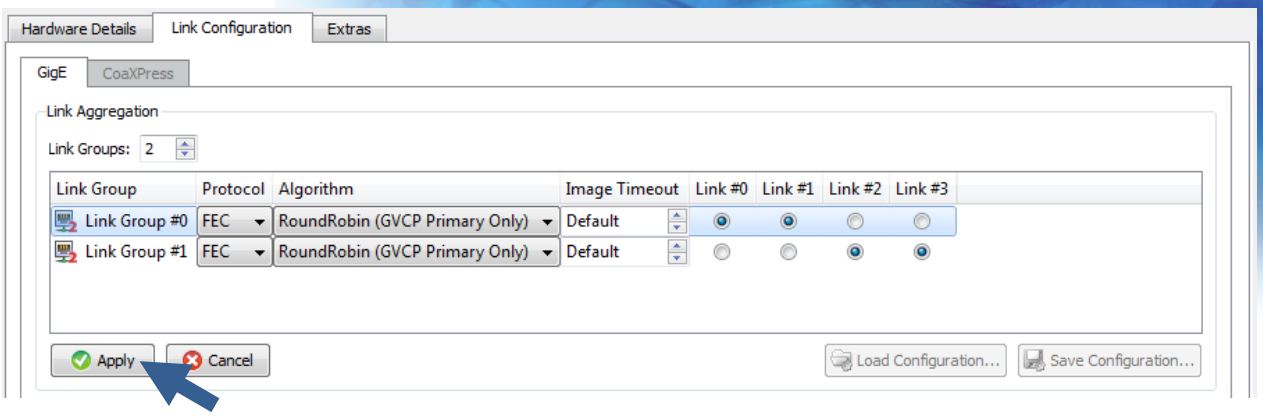
5. Click on the **Edit** button.



Now, the parameters are editable.

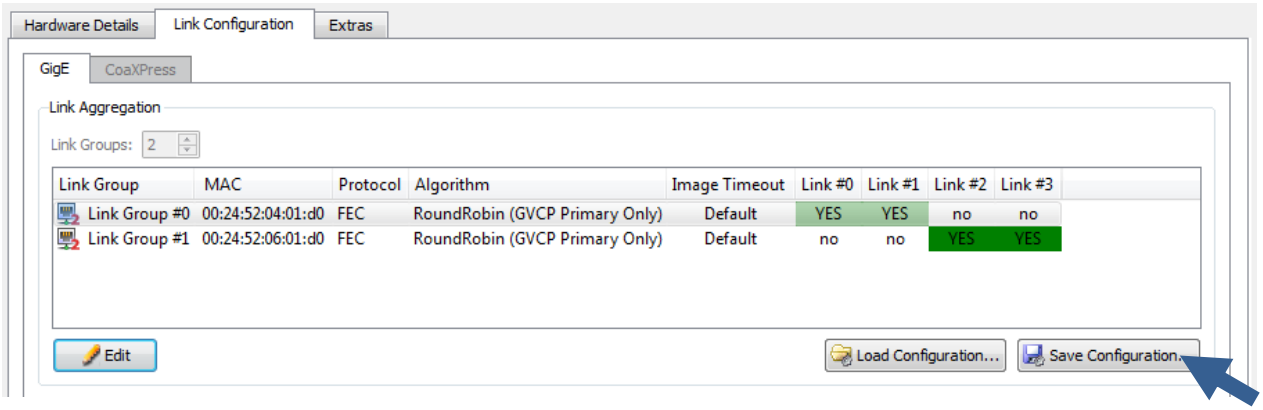
6. Adapt the Parameter settings to your needs.

   If you are using link aggregation (LAG) applets, set the number of link groups to two and use the *RoundRobin (GVCO Primary Only)* algorithm, and assign the physical ports to their link groups (see also the Getting Started with LAG documentation).



7. Confirm by clicking the **Apply** button.

	Important Each configuration can be saved to a file. You can also load configurations available as file by clicking on the **Load Configuration…** button.



8. Save your configuration by clicking the **Save Configuration…** button.
9. Close the *Hardware Dialog* window.

1.2.4 Configuring the Camera (GenICam Explorer)

1. Start the GenICam Explorer.
2. Connect the camera by clicking the **Quick Connect** button.

The parameters of the GenICam interface with current settings are displayed in the *GenICam Explorer* directly after connecting to the camera. You are ready to start the actual camera configuration.

3. Go to the **GenICam** tab.
4. Adapt the settings of the GenICam parameters to your needs.
   In the column *Value*, type in or select the new value.
5. Scroll down to access all parameters.

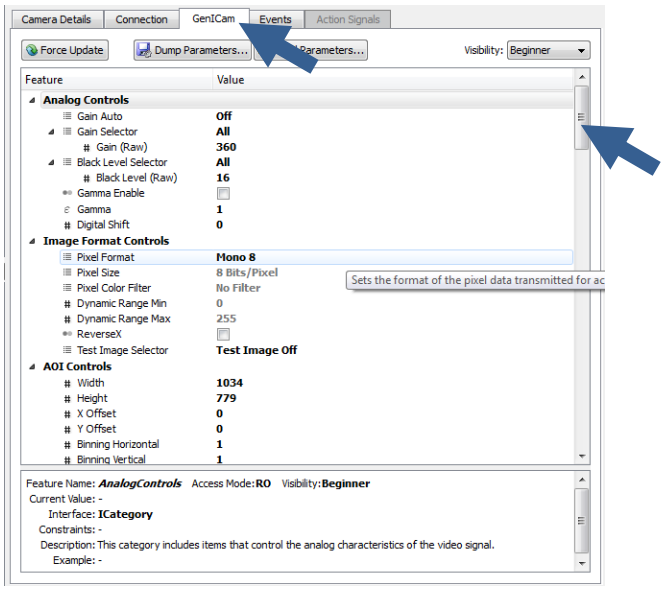


Figure 8: Changing parameter values under *Value*

To see your changes after modifying parameter values:

6. Click on the **Force Update** button. The display will be updated immediately.

	Writing Data Directly into the Camera During image acquisition, the camera will use the settings you define here, since you are writing the data directly into the camera. There is no need to load the XML file onto the camera.

2 Image Acquisition with the Tool microDisplay

Depending on the link topology and the camera type you use, as well as on the image data pre-processing you need, you have to load a specific applet onto the frame grabber.

To load an applet:

1. Start the tool microDisplay (START -> All programs -> SiliconSoftware -> RT 5.x -> microDisplay)
2. In the dialog *I want to…*, select **Load Applet**.
3. In the *Load Hardware Applet* dialog, select the frame grabber you want to use (left upper corner).
4. The available applets are displayed.

	Information on Applet Features The speaking file names provide information on the most relevant applet features. To get further information, use the applet documentation you find under http://www.siliconsoftware.de/download/live_docu/RT5/en/ind_acquisition.html

5. Select the applet you want to use.

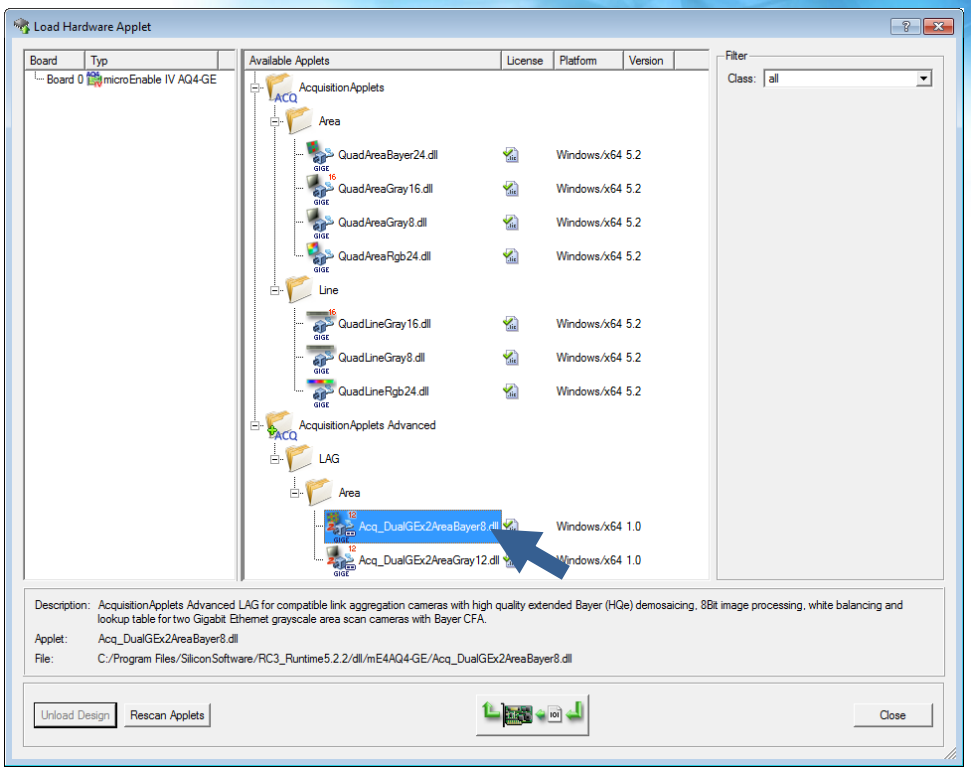


Figure 9: Selecting an applet in microDisplay

6. Click on the Load button  to load the selected applet onto the frame grabber.

As soon as the applet is loaded (and the camera plugged to the frame grabber), the camera is detected by the system and the connection is displayed in microDisplay:

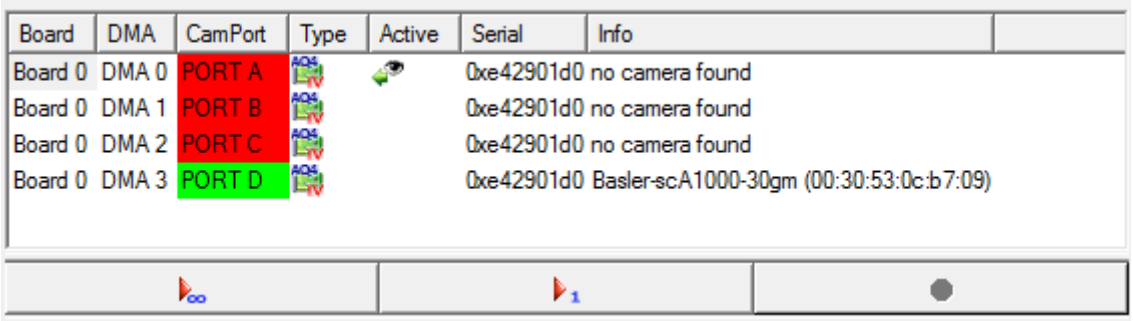


Figure 10: Port D with connected camera, Port A,B,C without connected camera as displayed in microDisplay

You can configure now the frame grabber using the parameter panel of the microDisplay program window.

7. When working with more than one camera: Select the port you are going to configure.

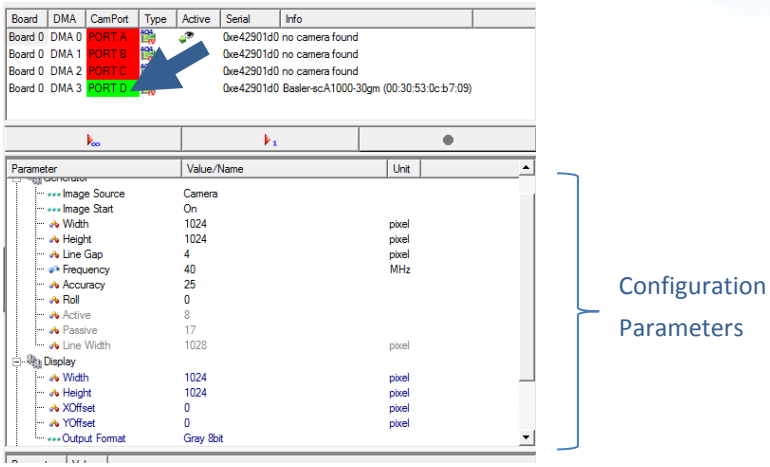


Figure 11: Configuration Parameters for Frame Grabber Parameterization

8. Set the parameters to your needs, e.g., image height and image width.

    a. Right-click directly on the value and select **Edit**.

    b. Enter the value.

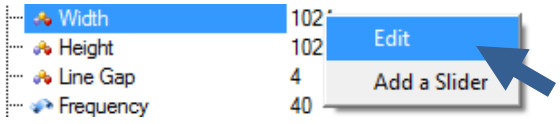


Figure 12: Entering Parameters

9. Optional: Configure specific operation modes you want to use (e.g., trigger settings).
10. Start image acquisition on the frame grabber by clicking on the button *Grab and display an infinite number of frames*  .

The grabbed images are now displayed in *microDisplay*:

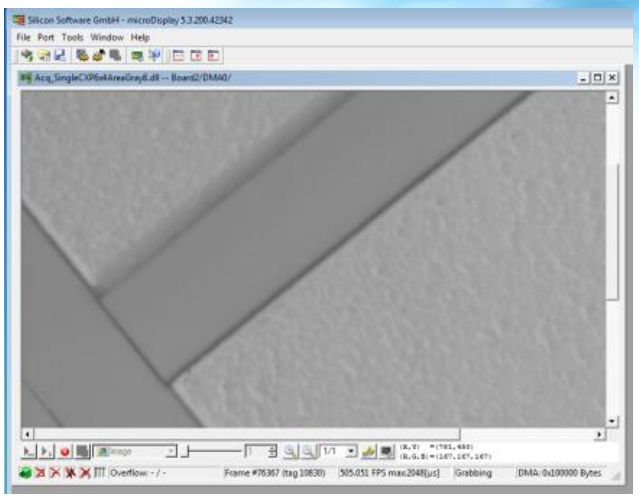


Figure 13: Display of grabbed images in the tool *microDisplay*

11. To stop the acquisition, click on the stop button in *microDisplay*:

Figure 14: Stopping acquisition on the frame grabber via microDisplay

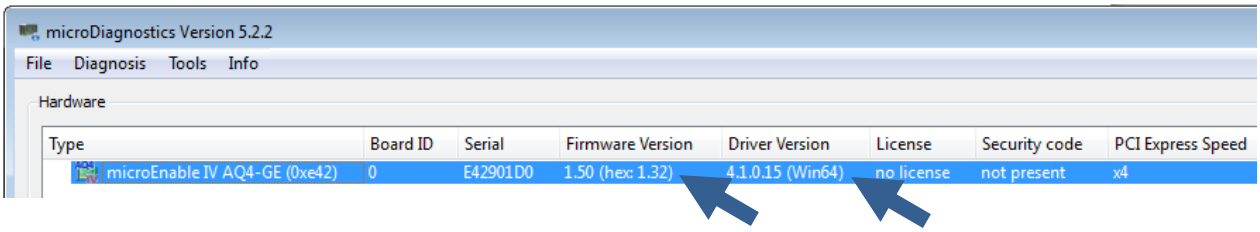
Appendix

A1: Checking for Installed Firmware and Device Driver Versions

To compare installed and required firmware and device driver versions:

1. Open *microDiagnostics* (START -> All programs -> SiliconSoftware -> RT 5.x -> microDiagnostics)

In the first window that opens, all frame grabbers installed on your PC are listed. Here, you find information on the currently installed firmware and device driver versions:



2. Compare the displayed versions with the required versions as stated in the Release Notes.

   - If the installed firmware and driver versions match the versions specified in the release notes of your runtime version, proceed as described in section 1.1.4 Hardware Diagnostics (microDiagnostics).
   - If you need another firmware version on your frame grabber, proceed as described in section A2: Installing Firmware (microDiagnostics).
   - If you need another driver version for your frame grabber, proceed as described in section A3: Updating the Driver.

A2: Installing Firmware (microDiagnostics)

To install another firmware on the frame grabber:

1. Start the tool microDiagnostics (START -> All programs -> SiliconSoftware -> RT 5.x -> microDiagnostics).
2. Select the frame grabber you want to use.

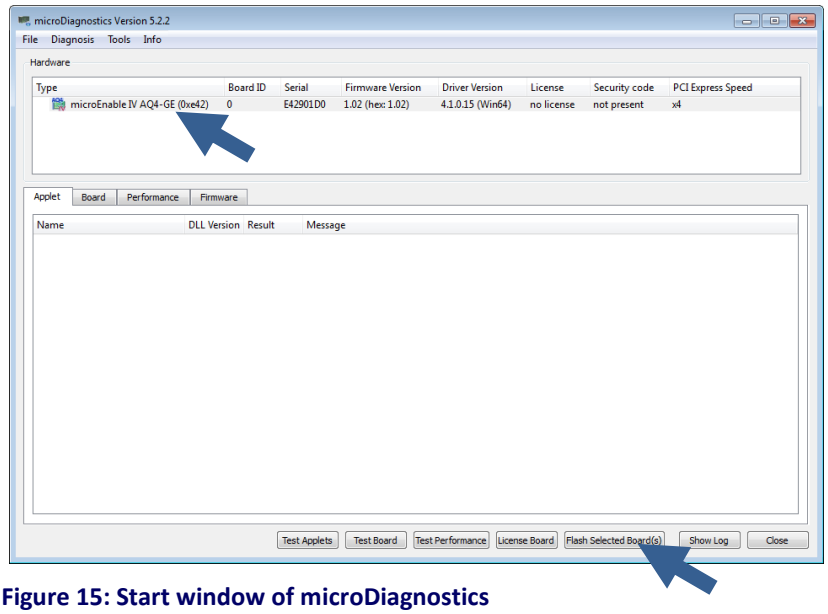


Figure 15: Start window of microDiagnostics

3. Click the button **Flash Selected Board(s)**. A new window opens.
4. Open the folder which has the name of your frame grabber.
   Here, you find the firmware files available for this frame grabber.

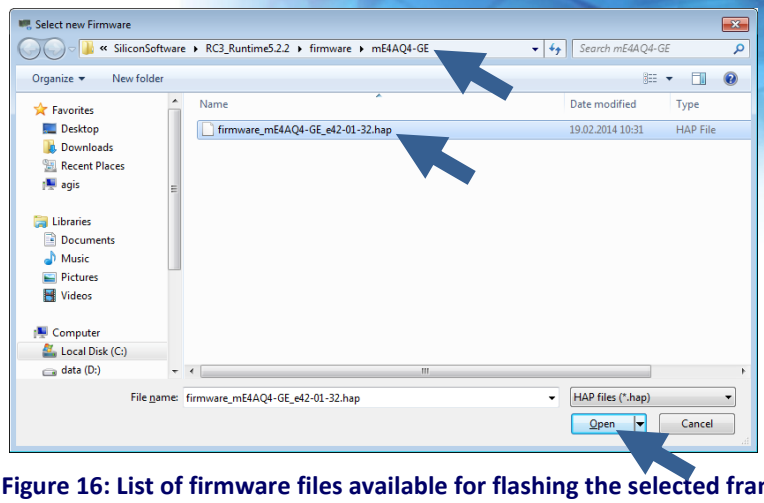


Figure 16: List of firmware files available for flashing the selected frame grabber board

5. Select the firmware you need.
6. Click on **Open** and confirm by clicking on **Yes**.

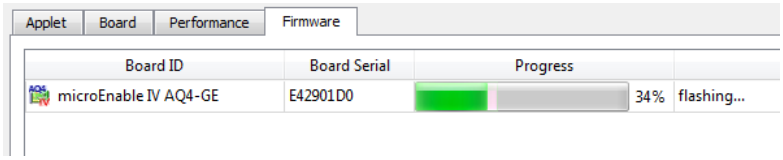


Figure 17: Flashing in progress – as displayed in microDiagnostics

7. Wait until the new firmware is completely installed. You get an according message in microDiagnostics.

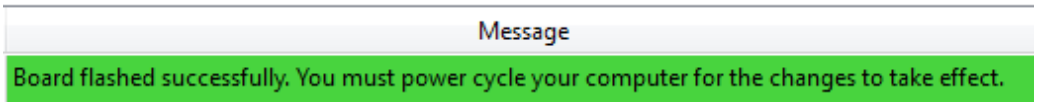


Figure 18: Message after successful flashing

8. Power cycle your computer:
    a. Shut down your computer.
    b. After the computer is completely off, wait for some seconds.
    c. Start the computer again.

	Complete Shut Down Essential For power cycling, it is not enough use the *Restart* option of Windows. Complete shut down and following new start are essential when you need to power cycle your computer.

9. Proceed as follows:
   - If you also need another driver version, proceed with section A3: Updating the Driver, or refer to the Linux Installation Guide for updating the driver under Linux.
   - If the according driver version is already installed on your system, proceed with section 1.1.4 Hardware Diagnostics (microDiagnostics).

A3: Updating the Driver under Windows

To update the driver:

1. Open the "Device Manager".
2. Under “Multifunction adapters”, search for the subentry listing the frame grabber you want to work with.
3. Right-click onto it and select "Update Driver Software".
4. Follow the driver update dialogs and install the driver you find in the installation folder of the runtime.
5. After driver update, reboot your system.
6. Proceed with section 1.1.4 Hardware Diagnostics (microDiagnostics).

A4: Installing the Power Supply Module

Power Off

Before installing hardware, ensure that

- the system power is OFF and unplugged from the power outlet,
- proper electrical grounding procedures have been followed.

Prevent Overheating

Make sure you use an adequate ventilation system within your computer.

This is of special importance if

- there is little space between boards in a multi board installation,
- an installation is close to a graphics card.

We also recommend leaving enough free space between boards.

Your GigE Vision frame grabber with Power over function is delivered with the following hardware parts:

- Power supply module
- slot bracket (for regular slot at the back of the PC chassis)
- 3.5'' adaptor bracket (for use in 3.5'' HDD slots)
- Screws for attaching the power supply module to the 3,5'' adaptor bracket
- Power cable adaptor (Sata 15Pin male > Molex 4Pin female)

To install the power supply module:

1. Attach the power supply module to either
   - the slot bracket, or
   - the 3,5'' adaptor bracket (in this case, use the screws that come with the adaptor bracket).

Figure 19: Power supply module, attached to slot bracket

Figure 20: Power supply module, attached to the 3.5'' adaptor bracket

2. Put the power supply module into a slot opening, either
   - at the back of the chassis (when using the slot bracket), or
   - into a free 3.5'' HDD slot (when using the 3,5'' adaptor bracket)
3. Connect the power supply cable of the power supply module to the corresponding connector at the frame grabber (microEnable IV AQ4-GpoE / microEnable IV VQ4-GpoE).

4. To connect to the PC power supply, either
   - Connect a 4pin Molex power cable of the PC with the 4pin Molex connector of the power supply module, or
   - Connect the power cable adaptor (Sata 15Pin male > Molex 4Pin female) to the 4pin Molex connector of the power supply module and a Sata connector of the PC.
5. After installing the power supply module, continue with step Boot the system in section 1.1.2 Installing the Hardware.

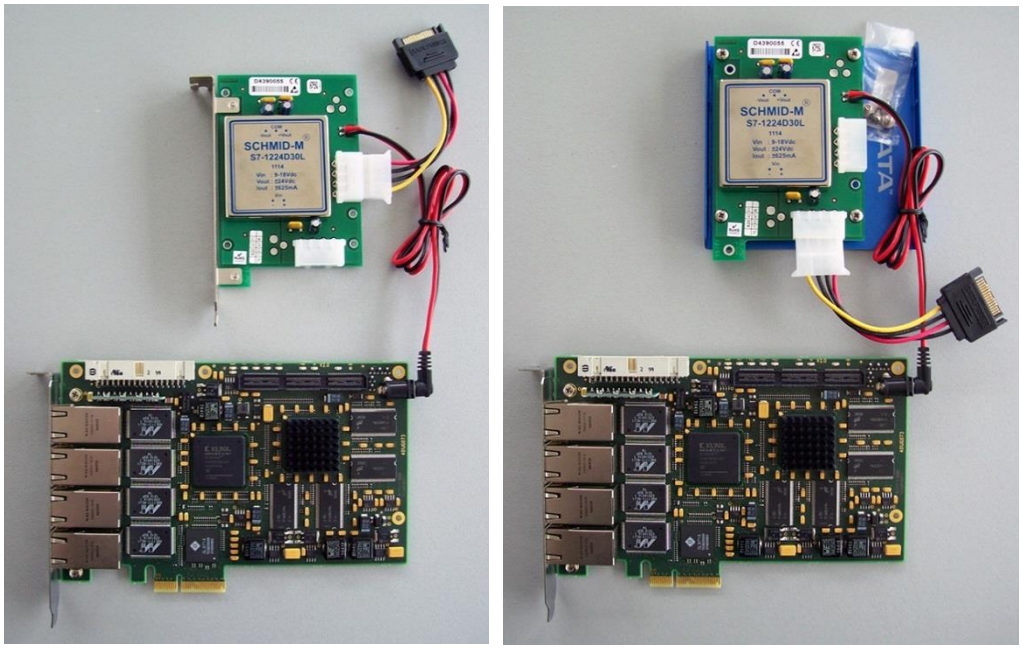


Figure 21: Power supply module, connected to frame grabber and power cable adaptor

A5: SDK

For detailed information on the Silicon Software SDK, please refer to the SDK Documentation that comes with the runtime documentation. Here, you will find all you need, including a general function reference and a GigE Vision specific function reference. Silicon Software also provides a set of SDK examples which comes together with the SDK documentation.

A6: Silent Installation Under Windows

The Runtime installer supports silent installation. The setup program accepts optional command line parameters. These can be useful for system administrators and other programs calling the setup program.

Setup Command Line Parameters

/SILENT, /VERYSILENT

Instructs the setup to be *silent* or *very silent*.

- Silent setup: The wizard and the background window are not displayed, but the installation progress window is visible on screen.
- Very silent setup: Wizard and background window are not displayed; even the installation progress window is not displayed.

Everything else is normal, e.g., error messages during installation are displayed, as well as the startup prompt (if you haven't disabled it with DisableStartupPrompt or the '/SP-' command line option).

If a restart is necessary and the '/NORESTART' command isn't used (see below):

- Silent setup: A" Reboot now?" message box is displayed.
- Very silent setup: The system reboots without asking.

/SUPPRESSMSGBOXES

Instructs the setup to suppress message boxes. This command line parameter has only an effect when combined with with '/SILENT' or '/VERYSILENT'.

The used defaults are the following:

- 'Keep newer file?' **Yes**
- 'File exists, confirm overwrite.' **No**
- Abort/Retry: **Abort**
- Retry/Cancel: **Cancel**
- DiskSpaceWarning/ DirExists/ DirDoesntExist/ /NoUninstallWarning/ ExitSetupMessage/ ConfirmUninstall: **Yes (=continue)**
- FinishedRestartMessage/ /UninstalledAndNeedsRestart: **Yes (=restart)**

5 message boxes are not suppressible:

- The “About Setup” message box,
- The “Exit Setup?” message box, and
- The “FileNotInDir2” message box which is displayed when setup requires a new disk to be inserted and the disk was not found.
- Any (error) message box displayed before Setup (or Uninstall) could read the command line parameters.
- Any message box displayed by [Code] support function **MsgBox**.

/LOG="filename"

Same as /LOG, except that this parameter allows you to specify a fixed path/filename to use for the log file. If a file with the specified name already exists, it will be overwritten. If the file cannot be created, setup will abort with an error message.

/NORESTART

Instructs setup not to reboot even if ia reboot is necessary.

/DIR="x:\dirname"

Overrides the default directory name displayed on the *Select Destination Location* wizard page. A fully qualified pathname must be specified.

/GROUP="folder name"

Overrides the default folder name displayed on the *Select Start Menu Folder* wizard page. If the [Setup] section directive DisableProgramGroupPage was set to **yes**, this command line parameter is ignored.

/NOICONS

Instructs setup to initially check the *Don't create a Start Menu Folder* check box on the *Select Start Menu Folder* wizard page.

/COMPONENTS="comma separated list of component names"

Overrides the default component settings. Using this command line parameter causes the setup to automatically select a custom type. If no custom type is defined, this parameter is ignored.

Only the specified components will be selected; the rest will be deselected. If a component name is prefixed with a "*" character, any child components will be selected as well (except for those that include the dontinheritcheck flag). If a component name is prefixed with a "!" character, the component will be deselected.

This parameter does not change the state of components that include the fixed flag.

Usage:

<SISO_INSTALLER_EXE.exe> /Components = "<component1>,<component2>"

Available components:

Component	Description
core	Installation of core components (required)
tools_cli	Installation of command line tools
tools_gui	Installation of GUI tools
doc	Installation of documentation
gige	Support for GigE Vision frame grabber
dev\core	Installation of libs and header files
dev\examples	Installation of SDK examples
dev\examples_source	Installation of the source code of the examples
dev\examples_bin	Installation of example binaries
dev\cmake	Installation of cmake files
acq_applets	Installation of AcquisitionApplets
acq_applets\me4as1cl	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4ad1cl	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4ad4cl	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4aq4ge	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4vd1cl	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4vd4cl	Installation of frame grabber specific AcquisitionApplets
acq_applets\me4vq4ge	Installation of frame grabber specific AcquisitionApplets
advanced_acq_applets	Installation of Advanced AcquisitionApplets
advanced_acq_applets\me4ad4cl	Installation of frame grabber specific AcquisitionApplets

advanced_acq_applets\me4 vd4cl	Installation of frame grabber specific AcquisitionApplets
UpdateEnvironment	Update of the environment variables
CompCLStandardVersion_2	Installation of CLser as defined in Camera Link 2.0
Com_0_Com	Installation of virtual null modem
bin_libs	Installation of libs into the system directory
redist_package	Installation of redistributable packages

Notes:

- Multiple components are applied by a commata separated list.
- The list may not contain any blanks.

/TASKS="comma separated list of task names"

Specifies a list of tasks that should be initially selected.

Only the specified tasks will be selected; the rest will be deselected. Use the /MERGETASKS parameter instead if you want to keep the default set of tasks and only select/deselect some of them.

If a task name is prefixed with a "*" character, any child tasks will be selected as well (except for those that include the dontinheritcheck flag). If a task name is prefixed with a "!" character, the task will be deselected.

Usage:

<SISO_INSTALLER_EXE.exe> /Tasks = "<task1>,<task2>"

Available tasks:

Task	Description
taskDesktopicon	installs a desktop icon
taskDrvInstall64	update of the device drivers

Example for a silent installation:

RuntimeSetup_v5.2.2_Win64.exe
/components=core,tools_cli,acq_applets\me4ad1cl,acq_applets\me4vd1
cl /silent

A7: Where to Find Further Documentation

Silicon Software provides deep and comprehensive documentation for its frame grabber series.

The documentation is part of the installation package. After installation of the runtime software package, you find the documentation in the Windows start menu:

START -> All Programs -> SiliconSoftware -> Runtime 5.x -> Documentation

	Live Documentation You always find the last update of our documentation on our website: http://www.siliconsoftware.de/download/live_docu/RT5/en/start.html

The most relevant information for running your frame grabber for the first time is:

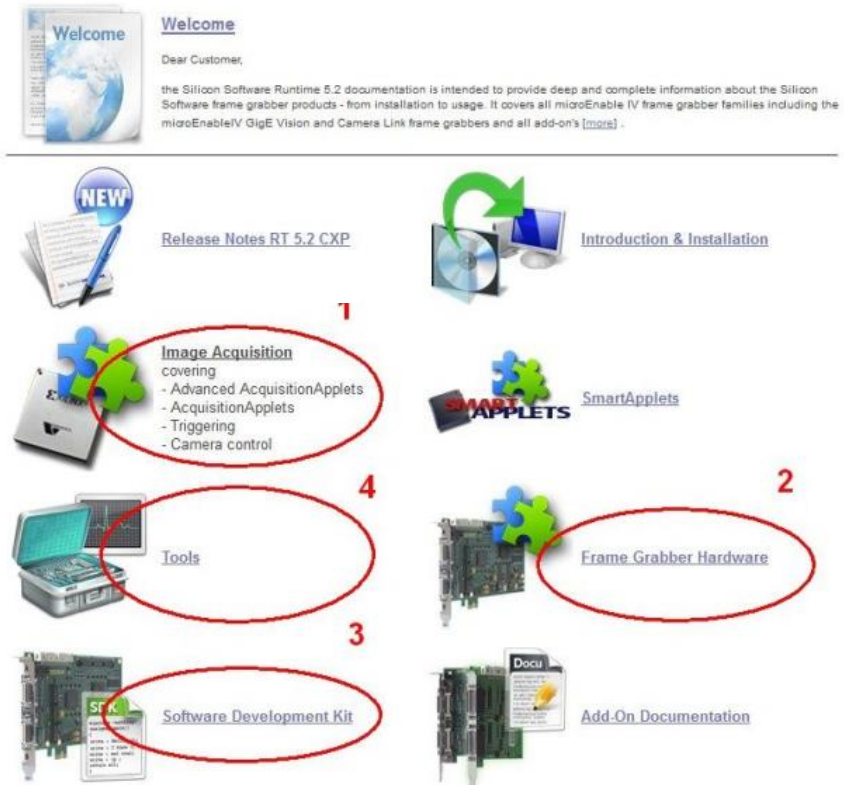


Figure 22: Documentation set for the microEnable Frame Grabbers & Runtime

You get the following information:

1. Image Acquisition

   Information on

   - How frame grabber applets work
   - Applets for individual frame grabber models
   - How to set up an image acquisition
   - Trigger boards and how to use them

2. Frame Grabber Hardware

   Information on

   - Individual frame grabber boards and accessories

3. Software Development Kit (API)
   - Introduction to this powerful image acquisition library
   - SDK Manual
   - SDK Reference
   - SDK examples as a quick and simple starting point for your own C/C++ projects

4. Tools

   Information on

   - Camera configuration with GenICam Explorer
   - Image acquisition with microDisplay

A8: Support

Feel free to contact our support team for any technical support you may need:

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