microEnable 5 ironman

CoaXPress & Camera Link

Camera Support and Applets Selection

User Guide
Imprint

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1 Targets of this Document

Determine your Applet

This document supports you in selecting the optimal firmware and applet to get the maximum performance out of your individual image acquisition system.

You get the applet and the firmware together in one *.dll file. Therefore, you always get the matching firmware and applet together:

- The firmware you install on your frame grabber (how to to that, please refer to our Getting Started).
- The applet is a function library which you configure and use for image acquisition and image pre-processing tasks on the frame grabber.

Which firmware/applet you need depends on your individual image acquisition system. In detail, it depends on the following factors:

- Camera interface standard you are using: Camera Link or CoaXPress
- Camera type: line scan or area scan
- Color mode: grayscale, RGB, or Bayer
- Topology (number of connections between camera and frame grabber)
- Bit width of image data provided by the camera

This document helps you selecting the right firmware/applet for your image acquisition system.

A system of questions referring to your camera leads you directly to the optimal applet.

Firmware and Applet

The firmware and the applet come together in one *.dll file. Therefore, you use the same *.dll file for

- flashing your frame grabber with a specific firmware,
- loading the applet for access to the applet features.
Target Hardware microEnable 5 ironman
This document is about image acquisition with microEnable 5 ironman frame grabbers. For image acquisition with microEnable IV, please refer to the according documentation, e.g., on our Website: [http://www.siliconsoftware.de/download/live_do

Prerequisites
- You have installed the frame grabber physically (hardware).
- You have installed the Silicon Software Runtime (software).

Get the Image Acquisition Running
You have to take the following steps:

1. Select the appropriate applet/firmware (see section 2 How to Get the Right Firmware/Applet).
2. Flash the frame grabber you are going to use with the selected firmware (see our Getting Started for details).
3. Load the applet onto the frame grabber (see our Getting Started for details) and start acquisition.
2  How to Get the Right Firmware/Applet

From this section onwards, you will be led by questions regarding your camera. Just follow the links provided together with your answer to find the applet that fits you best.

Question 1: What Camera Interface provides your camera?

- If you use a CoaXPress camera, go to section 3 CoaXPress Cameras.
- If you use a Camera Link camera, go to section 4 Camera Link.
3  CoaXPress Cameras

Question 2: Do you use a Line Scan Camera or an Area Scan Camera?

If you use a CXP Line scan camera, go to section 3.1 Line Scan (CoaXPress).

If you use a CXP Area scan camera, go to section 3.2 Area Scan (CoaXPress).

3.1  Line Scan (CoaXPress)

Question 3: Do you use a Gray, an RGB, or a Bayer Camera?

- If you use a Gray camera (monochrome), go to section 3.1.1 Gray-Scale (CXP Line).
- If you use an RGB camera, go to section 3.1.2 RGB (CXP Line).
- If you use a Bayer camera (Color interpolation), go to section 3.1.3 Bayer (CXP Line).

Topology – only CXP 6x4 with CXP Line Scan Cameras

At present, for CXP line scan cameras Silicon Software supports only the CXP6x4 topology (i.e., one camera with four CXP connectors).

Additional applets supporting other topologies are in preparation. Please contact Silicon Software for details.
3.1.1 Gray-Scale (CXP Line)

**Question 4: Which Topology do you use?**

If you use cameras with 4 connections, go to section 3.1.1.1 **Cameras with 4 Connections**.

If you use cameras with 2 connections, go to section 3.1.1.2 **Cameras with 2 Connections**.

If you use cameras with 1 connection, go to section 3.1.1.3 **Cameras with 1 Connection**.

### 3.1.1.1 Cameras with 4 Connections

**Cameras:**

- e2v Eliixa+ Mono
  - C4M 16k/EV71YC4MCP1605-BA0 (Gray)
- NED
  - XCM16K4GT4CXP (Gray)

**Optimal Firmware/Applet:**

- Acq_SingleCXP6x4LineGray8.dll
  - Supported Bit Width: 8
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B
    - mE5 VQ8-CXP6D
    - mE5 VQ8-CXP6B
3.1.1.2 Cameras with 2 Connections

Cameras:

- JAI Sweep Series
- All CXP line scan gray-scale cameras with only 2 CXP connections
- All CXP line scan gray-scale cameras which are operated only via 2 CXP connections (after configuration)

Optimal Firmware/Applet:

- **Acq_DualCXP6x2LineGray12.dll**
  - Supported Bit Width: 8, 10, 12
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B
3.1.1.3 Cameras with 1 Connection

Cameras:

- JAI Sweep Series
- All CXP line scan gray-scale cameras with only 1 CXP connection
- All CXP line scan gray-scale cameras which are operated only via 1 CXP connection (after configuration)

Optimal Firmware/Applet:

- **Acq_DualCXP6x1LineGray12.dll**
  
  Supported Bit Width: 8, 10, 12
  
  Running on:
  
  - me5 AQ8-CXP6D
  - me5 AQ8-CXP6B
3.1.2 RGB (CXP Line)

Question 4: Which Topology do you use?

If you use cameras with 4 connections, go to section 3.1.2.1 Cameras with 4 Connections.

If you use cameras with 2 connections, go to section 3.1.2.2 Cameras with 2 Connections.

3.1.2.1 Cameras with 4 Connections

Cameras:

- e2v Eliixa+ Color (RGB)
  - C4C 8k/EV71YC4CCP1605-BA0 (RGB)

Optimal Firmware/Applet:

- **Acq_SingleCXP6x4LineRGB24.dll**
  Supported Bit Width: 8 per color component
  Running on:
  - mE5 AQ8-CXP6D
  - mE5 AQ8-CXP6B
3.1.2.2 Cameras with 2 Connections

Cameras:

- JAI Sweep Series
- All CXP line scan RGB cameras with only 2 CXP connections
- All CXP line scan RGB cameras which are operated only via 2 CXP connections (after configuration)

Optimal Firmware/Applet:

- **Acq_DualCXP6x2LineRGB24.dll**
  Supported Bit Width: 8 per color component
  Running on:
  - mE5 AQ8-CXP6D
  - mE5 AQ8-CXP6B
3.1.3 Bayer (CXP Line)

Cameras:

- e2v Eliixa+ Color (Bayer)
  - C4C 16k/EV71YC4CCP1605-BA0 (Bayer)

Optimal Firmware/Applet:

- under development: Acq_SingleCXP6x4LineBayer_Opt1.dll
  Contact Silicon Software for details.
3.2 Area Scan (CoaXPress)

Question 3: Do you use a Gray or a Bayer Camera?

- If you use a **Gray** camera (monochrome), go to section 3.2.1 Gray-Scale (CXP Area).
- If you use a **Bayer** camera (Color interpolation), go to section 3.2.2 Bayer (CXP Area).

3.2.1 Gray-Scale (CXP Area)

Question 4: Which Topology do you use?

If you use cameras with 4 connections, go to section 3.2.1.1 Cameras with 4 connections.

If you use cameras with 2 connections, go to section 3.2.1.2 Cameras with 2 Connections.

If you use cameras with 1 connection, go to section 3.2.1.3 Cameras with 1 Connection.

3.2.1.1 Cameras with 4 connections

Cameras:

- Optronis, all models
  - CP80-3-M-540 (Mono)
  - CP80-4-M-500 (Mono)
  - CP70-12-M-167 (Mono)
  - CP80-25-M-72 (Mono)
- Mikrotron, all models
  - EoSens® 3CXP (Mono)
  - EoSens® 4CXP (Mono)
  - EoSens® 25CXP (Mono)
- ISVI, all models
  - IC-X25CXP (Mono)
Figure 1: Camera with four connections (1* CXP 4-lanes)

Optimal Firmware/Applet:

- **Acq_SingleCXP6x4AreaGray8.dll** (default)
  Supported Bit Width: 8
  Running on:
  - mE5 AQ8-CXP6D
  - mE5 AQ8-CXP6B
  - mE5 VQ8-CXP6D
  - mE5 VQ8-CXP6B

- **Acq_SingleCXP6x4AreaGray10.dll** (optional, all mentioned camera models except Microtron EoSens® 3CXP Mono)
  Supported Bit Width: 10
  Running on:
  - mE5 AQ8-CXP6D
  - mE5 AQ8-CXP6B
3.2.1.2 Cameras with 2 Connections

Cameras:

- JAI 5MPixel, 20Mpixel
  - SP-5000M -cx2 (Mono)
  - SP-20000M -cx2 (Mono)
- IOIndustries, all models (only default applet Acq_SingleCXP6x2AreaGray12.dll)
  - Flare 2M280-CX (Mono)
  - Flare 4M140-CX (Mono)
- Adimec, Quartz Series
  - Qs Series (Mono)
- Vieworks, VA Series (only default applet Acq_SingleCXP6x2AreaGray12.dll)
  - VCX-12MX-M180 (Mono)

One camera with 2 connections:

Optimal Firmware/Applet (default):
- Acq_SingleCXP6x2AreaGray12.dll
  - Supported Bit Width: 8, 10, 12
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B

Two cameras with 2 connections:

Optimal Firmware/Applet (option):
- Acq_DualCXP6x2AreaGray8.dll
  - Supported Bit Width: 8
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B
3.2.1.3 Cameras with 1 Connection

Cameras:

- Imperx, all models (only default applet Acq_QuadCXP6x1AreaGray8.dll)
  - Bobcat Series (Mono)
- Toshiba Teli, 25Mpixel (only default applet Acq_QuadCXP6x1AreaGray8.dll)
  - CSX12M25CMP19 (Mono)
- JAI 2.8 MP
  - Elite EL-2800-CXP
- Adimec
  - Opal Series (Mono)

**One** camera with 1 connection:

- Acq_QuadCXP6x1AreaGray8.dll
  - Supported Bit Width: 8
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B

**Four** cameras with 1 connection:

- Acq_QuadCXP6x1AreaGray8.dll
  - Supported Bit Width: 8
  - Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B
3.2.2 Bayer (CXP Area)

Question 4: Which Topology do you use?

If you use cameras with 4 connections, go to section 3.2.1.1 Cameras with 4 connections.

If you use cameras with 2 connections, go to section 3.2.1.2 Cameras with 2 Connections.

If you use Cameras with 1 connection, go to section 3.2.1.3 Cameras with 1 Connection.

3.2.2.1 Cameras with 4 connections

Cameras:

- Optronis, all models
  - CP80-3-C-540 (Bayer)
  - CP80-4-C-500 (Bayer)
  - CP70-12-C-167 (Bayer)
  - CP80-25-C-72 (Bayer)
- ISVI, all models
  - IC-X25CXP (Bayer)

Figure 2: Camera with four connections (1* CXP 4-lanes)

Optimal Firmware/Applet:

- Acq_SingleCXP6x4AreaBayer10.dll
  Supported Bit Width: 8, 10
  Running on:
  - mE5 AQ8-CXP6D
  - mE5 AQ8-CXP6B
3.2.2.2 Cameras with 2 Connections

Cameras:

- JAI 5MPixel, 20Mpixel
  - SP-5000C -cx2 (Bayer)
  - SP-20000C -cx2 (Bayer)
- IOIndustries, all models, no test
  - Flare 2M280-CX (Color/Bayer)
  - Flare 4M140-CX (Color/Bayer)
- Adimec, no Bayer model known
- Vieworks, no Bayer model known

One camera with 2 connections:

Optimal Firmware/Applet:

- Acq_SingleCXP6x2AreaBayer12.dll
  (default)
  Supported Bit Width: 8, 10, 12
  Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B

Two cameras with 2 connections:

Optimal Firmware/Applet:

- Acq_DualCXP6x2AreaBayer8.dll
  (optional)
  Supported Bit Width: 8
  Running on:
    - mE5 AQ8-CXP6D
    - mE5 AQ8-CXP6B
3.2.2.3 Cameras with 1 Connection

Cameras:

- Imperx, no Bayer model known
- Toshiba Teli, no Bayer model known
- JAI 2.8 MPixel

Currently no color interpolation/Bayer Applet support.

4 Camera Link

Question 2: Do you use a Line Scan Camera or an Area Scan Camera?

- If you use a line scan camera, go to section 4.1 Line Scan.
- If you use an area scan camera, go to section 4.2 Area Scan.

4.1 Line Scan (Camera Link)

- If you use a Bayer (color interpolation) camera, go to section 4.1.1 Bayer (Camera Link Line)
- If you use transfer Gray (monochrome) or Raw data, go to section 4.1.2 Gray Full/Deca (Camera Link Line).

For microEnable 5 frame grabbers, Silicon Software supports only Camera Link Full configurations.
### 4.1.1 Bayer (Camera Link Line)

**Cameras:**

- e2v Eliixa+ Color 8k
- Dalsa Piranha4 bilinear Color 8k

**Optimal Firmware/Applet (for using Color interpolation):**

- **Acq_FullLineBayer8_Opt1.dll (AD8)**

**Supported Bit Width:**

- 8 Tap 8bit
- 10 Tap 8bit

**Running on**

- microEnable 5 AD8-PoCL
- microEnable 5 VD8-PoCL
4.1.2 Gray Full/Deca (Camera Link Line)

Transfer of Raw/Gray Data:

- **Acq_FullLineGray8.dll**
  
  Supported Bit Width:
  - 8 Tap 8bit
  - 10 Tap 8bit

Running on
- microEnable 5 AD8-PoCL

4.2 Area Scan (Camera Link)

- If you use a **Bayer** camera (Color interpolation), go to section 4.2.1 Bayer Full/Deca (Camera Link Area).
- If you use transfer **Gray** (monochrome) or **Raw** data, go to section 4.2.2 Gray Full/Deca (Camera Link Area).

For microEnable 5 frame grabbers, Silicon Software supports only **Camera Link Full** configurations.

4.2.1 Bayer Full/Deca (Camera Link Area)

Optimal Firmware/Applet (for using Color interpolation):

- **Acq_FullAreaBayer8.dll**
  
  Supported Bit Width:
  - 8 Tap 8bit
  - 10 Tap 8bit

Running on
- microEnable 5 AD8-PoCL
- microEnable 5 VD8-PoCL
4.2.2 Gray Full/Deca (Camera Link Area)

Transfer of Raw/Gray Data:

- **Acq_FullAreaGray8.dll**

  Supported Bit Width:
  - 8 Tap 8bit
  - 10 Tap 8bit

Running on
- microEnable 5 AD8-PoCL

5 How to go on with Your Image Acquisition

For all further information, e.g., how to actually flash your frame grabber with the selected firmware, how to configure your applet and how to get the system running, please refer to our *Quick Start Guide*, which you find in your runtime installation or online on:

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