	Subject:	Basler A102k and K-BIC with pcIMAGE-SDIG	Created	Last change
			02.12.03	02.12.03
Application Note	Project:	Camera adaption	Version 1.0	

Overview

Camera Basler A102k with K-BIC

Running modes

Freerunning [X]
Restart/Reset []
Ext. Synchronized [X]

Resolution

Horizontal 1392 pixel
Vertical 1040 pixel
Bits per Pixel 8,10 bpp
Binning []
Partial Scan []

Timings

Pixel clock 28 MHz
Horizontal 15.392 kHz
Vertical 14.8 fps

MATRIX VISION GmbH Frame Grabber

Typ pcIMAGE-SDIG
Line Enable by camera [X] Frame Grabber [] external []
Frame Enable by camera [X] Frame Grabber [] external []
Trigger by external [] Frame Grabber []
Flash by camera [] Frame Grabber [] external []

Software

MVacquireControl [X]
mvIMPACT Go! [X]
Other [X] [e.g. LabView™, Halcon, etc.]

Imprint

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This document requires the general knowledge of the usage and the technical data of the used frame grabber, camera and application.

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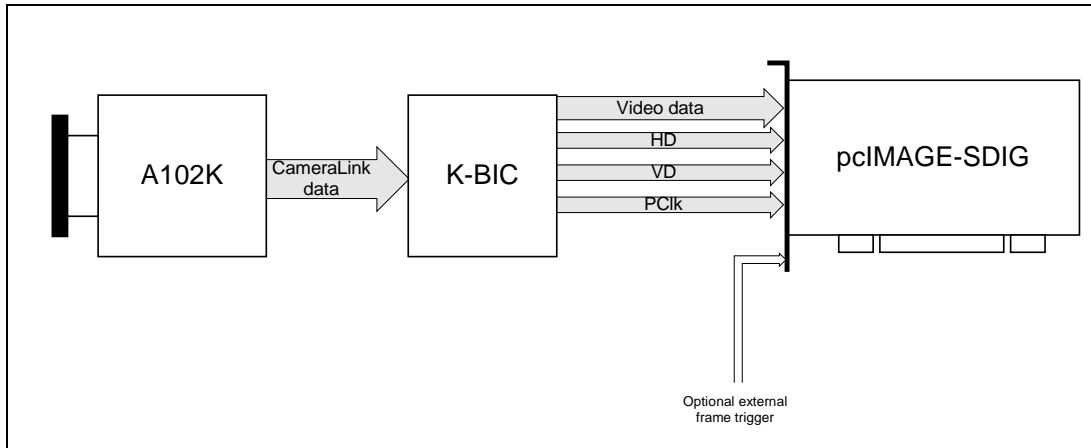
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Freerunning Mode

Camera runs in its own timing and sends video data as well as horizontal and vertical synchronization signals in CameraLink™ standard to converter K-BIC. The converted video data and synchronization signals are sent to pcIMAGE-SDIG.

Camera uses shutter and integration times set in the camera.

Signal map



Camera settings set by software

For setting up the camera the Camera Configuration Tool (CCT+) is needed. You can download the latest version of this tool from the homepage of Basler AG (www.baslerweb.de).

Connect the Converter K-BIC with a standard RS232 cable to a free COM port of the host PC.

Be sure camera is correctly supplied with power and start CCT+.

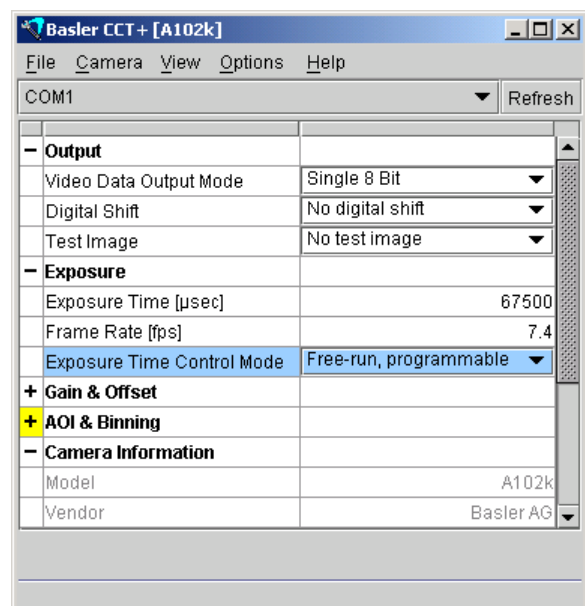
Choose the corresponding COM port in the upper list. After a successful connection you will see the camera's data in the part *Camera Information*.


Be sure parameter *Exposure Time Control Mode* is set to *Free-run, programmable*.

Using output with 8 Bit set *Video Data Output Mode* to *Single 8 Bit*. Further you have to set the videomode to *VM_DIG8* in your program or better in the used camera definition.

Using output with 10 Bit set *Video Data Output Mode* to *Single 10 Bit*. Further you have to set the videomode to *VM_DIG10* in your program or better in the used camera definition.

All settings concerning exposure and shutter time must be set as application requires.



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Pin connection

For connecting the A102K with K-BIC use an usual CameraLink™ cable.

Connecting the K-BIC with pcIMAGE-SDIG use the following pin assignment:

K-BIC HD44 male		Direction	pcIMAGE-SDIG HD37 male	
1	DOUT 0 +	→	20	D0 (+)
2	DOUT 1 +	→	21	D1 (+)
3	DOUT 2 +	→	22	D2 (+)
4	DOUT 3 +	→	23	D3 (+)
5	DOUT 4 +	→	24	D4 (+)
6	DOUT 5 +	→	25	D5 (+)
7	DOUT 6 +	→	26	D6 (+)
8	DOUT 7 +	→	27	D7 (+)
16	DOUT 0 -	→	1	D0 (-)
17	DOUT 1 -	→	2	D1 (-)
18	DOUT 2 -	→	3	D2 (-)
19	DOUT 3 -	→	4	D3 (-)
20	DOUT 4 -	→	5	D4 (-)
21	DOUT 5 -	→	6	D5 (-)
22	DOUT 6 -	→	7	D6 (-)
23	DOUT 7 -	→	8	D7 (-)
33	LVAL +	→	30	HD / LVAL (+)
34	LVAL -	→	11	HD / LVAL (-)
35	PCLK +	→	28	CLK (+)
36	PCLK -	→	9	CLK (-)
39	FVAL +	→	29	VD (+)
40	FVAL -	→	10	VD (-)
43	GND	↔	15	GND
44	GND	↔	14	GND

Recommended cable for this mode from MATRIX VISION GmbH: KSA113 (only 8 bit).

Cameradefinition

```

/* ----- Basler A102k with K-BIC ----- */
/* For use with pcIMAGE-SDIG or mvTITAN-DIG and K-BIC-2 */
/* SetInputPitch 1392L */
DefCamType "A102k-K-BIC" VM_DIG10 NONINTERLACED 15 15392 28000 PCLK_EXTERN
DefCamAcquireSetup "A102k-K-BIC" VSCAN INV_SYNC NEXT_FIELD
DefCamAnalogParam "A102k-K-BIC" AC 1 0 0 1200
DefHorizontalUnit "A102k-K-BIC" PIXEL
DefVerticalUnit "A102k-K-BIC" LINES
DefCamHorizontalAcquire "A102k-K-BIC" 0L 1392L 1
DefCamVerticalAcquire "A102k-K-BIC" 0L 1040L 1

```

Remarks to mvAcquireControl


Using the system with mvAcquireControl you have to consider the following:

- Add *SetInputPitch* command in used INI-file (in general this is ...\\windows\\matrix\\grabber.dll):

```

...
[SDIG]
...
InitBoard
...
SetInputPitch 1392
...

```

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- Select camera definition *A102k-K-BIC* in register *Camera*
- Activate *Greyscale* in register *Acquire* with either 8 or 10 bit

Remarks to programming

Using the system in your own program you have to consider the following:


- Select camera definition *A102k-K-BIC* in used INI file
- Set colormode to either *COL_GREY* for 8 bit or *COL_GREY16* for 10bit
- Insert *SetInputPitch* command in used INI file

Sample for used INI file:

```

...
[SDIG]
...
InitBoard
...
InterpretIni "camdefs.ini" 0L "[CameraDefs]"
SelCamera "A102k-K-BIC"
SetInputPitch 1392
...

```

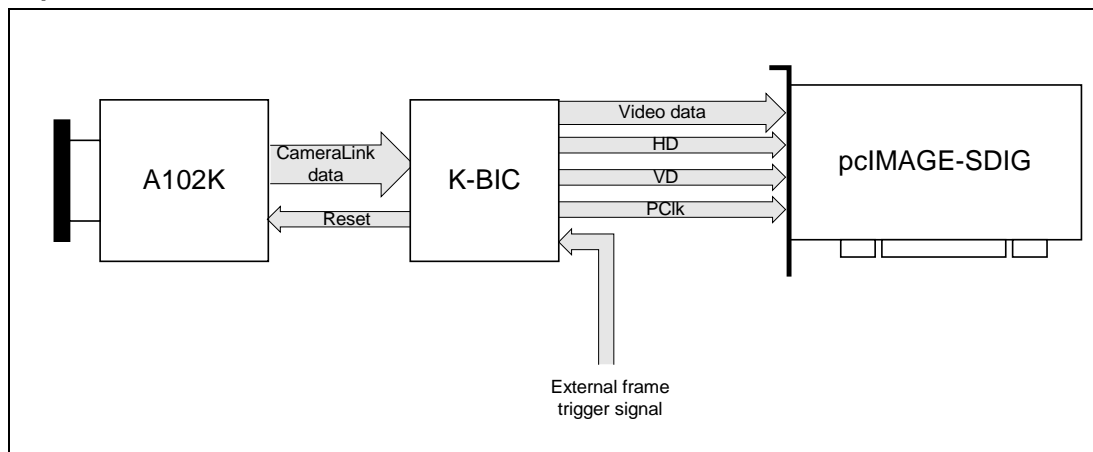
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Restart-Reset mode (ExSync mode)

Camera is reset by an external frame trigger signal. After an image was acquired the video data is sent in CameraLink™ standard to converter K-BIC. The converted video data and synchronization signals are sent to pcIMAGE-SDIG afterwards.

Camera uses either a predefined shutter and integration time or it can be controlled by the pulse width of the external frame trigger signal.

Signal map



Camera settings set by software

For setting up the camera the Camera Configuration Tool (CCT+) is needed. You can download the latest version of this tool from the homepage of Basler AG (www.baslerweb.de).

Connect the Converter K-BIC with a standard RS232 cable to a free COM port of the host PC.

Be sure camera is correctly supplied with power and start CCT+.

Choose the corresponding COM port in the upper list. After a successful connection you will see the camera's data in the part *Camera Information*.

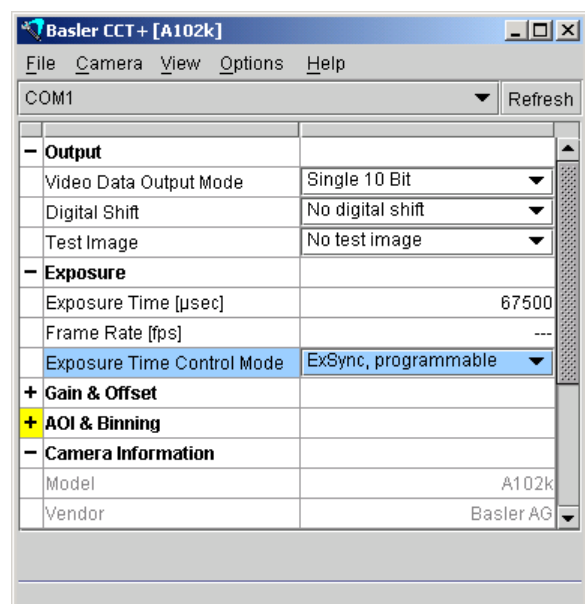
Be sure parameter *Exposure Time Control Mode* is set to either *ExSync, programmable* or *ExSync, level-controlled*.


In mode *ExSync, programmable* you define the used integration time in CCT+ by *Exposure Time [µsec]*.

If you want to control the integration time by the pulse length of your frame start signal you have to choose *ExSync, level-controlled*.

Using output with 8 Bit set *Video Data Output Mode* to *Single 8 Bit*. Further you have to set the videomode to *VM_DIG8* in your program or better in the used camera definition.

Using output with 10 Bit set *Video Data Output Mode* to *Single 10 Bit*. Further you have to set the videomode to *VM_DIG10* in your program or better in the used camera definition.



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3	DOUT 2 +	→	22	D2 (+)
4	DOUT 3 +	→	23	D3 (+)
5	DOUT 4 +	→	24	D4 (+)
6	DOUT 5 +	→	25	D5 (+)
7	DOUT 6 +	→	26	D6 (+)
8	DOUT 7 +	→	27	D7 (+)
16	DOUT 0 -	→	1	D0 (-)
17	DOUT 1 -	→	2	D1 (-)
18	DOUT 2 -	→	3	D2 (-)
19	DOUT 3 -	→	4	D3 (-)
20	DOUT 4 -	→	5	D4 (-)
21	DOUT 5 -	→	6	D5 (-)
22	DOUT 6 -	→	7	D6 (-)
23	DOUT 7 -	→	8	D7 (-)
33	LVAL +	→	30	HD / LVAL (+)
34	LVAL -	→	11	HD / LVAL (-)
35	PCLK +	→	28	CLK (+)
36	PCLK -	→	9	CLK (-)
39	FVAL +	→	29	VD (+)
40	FVAL -	→	10	VD (-)
43	GND	↔	15	GND
44	GND	↔	14	GND

37	ExSync +	←	External frame trigger signal +	
38	ExSync -	←	External frame trigger signal -	

Cameradefinition

```

/* ----- Basler A102k with K-BIC ----- */
/* For use with pcIMAGE-SDIG or mvTITAN-DIG and K-BIC-2 */
/* SetInputPitch 1392L */
DefCamType "A102k-K-BIC" VM_DIG10 NONINTERLACED 15 15392 28000 PCLK_EXTERN
DefCamAcquireSetup "A102k-K-BIC" VSCAN INV_SYNC NEXT_FIELD
DefCamAnalogParam "A102k-K-BIC" AC 1 0 0 1200
DefHorizontalUnit "A102k-K-BIC" PIXEL
DefVerticalUnit "A102k-K-BIC" LINES
DefCamHorizontalAcquire "A102k-K-BIC" 0L 1392L 1
DefCamVerticalAcquire "A102k-K-BIC" 0L 1040L 1

```

Remarks to mvAcquireControl


Using the system with mvAcquireControl you have to consider the following:

- Add *SetInputPitch* command in used INI-file (in general this is ...\\windows\\matrix\\grabber.dll):

```

...
[SDIG]
...
InitBoard
...
SetInputPitch 1392
...

```

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- Select camera definition *A102k-K-BIC* in register *Camera*
- Activate *Greyscale* in register *Acquire* with either 8 or 10 bit

Remarks to programming

Using the system in your own program you have to consider the following:


- Select camera definition *A102k-K-BIC* in used INI file
- Set colormode to either *COL_GREY* for 8 bit or *COL_GREY16* for 10bit
- Insert *SetInputPitch* command in used INI file

Sample for used INI file:

```

...
[SDIG]
...
InitBoard
...
InterpretIni "camdefs.ini" 0L "[CameraDefs]"
SelCamera "A102k-K-BIC"
SetInputPitch 1392
...

```

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Glossary

Expression	Explanation
VD	Vertical drive, signal is sent to signalize next field (noninterlaced) or frame (interlaced). Also called Frame Enable, VSync or frame start signal.
HD	Horizontal drive, signal is sent to signalize next line. Also called Line Enable, HSync or line start signal.
PCLK	Pixel clock, is sent to signalize a valid pixel value on the digital inputs.