

Matrox Meteor-II/Camera Link

Camera Interface Application Note

BASLER A501k

May 29, 2002

Basics about the
camera

Mode of operations as
per Matrox Imaging (in
parentheses as per
camera manufacturer)

Basics about the
interface modes

Camera Descriptions

- Effective resolution: $1280 \times 1024 \times 8\text{-bit}$ @ 74 fps¹ (maximum).
- Camera Link BASE interface (Dual channel).
- Progressive scan.
- Internal sync.
- Internal or external exposure control.
- 50 MHz pixel clock rate.

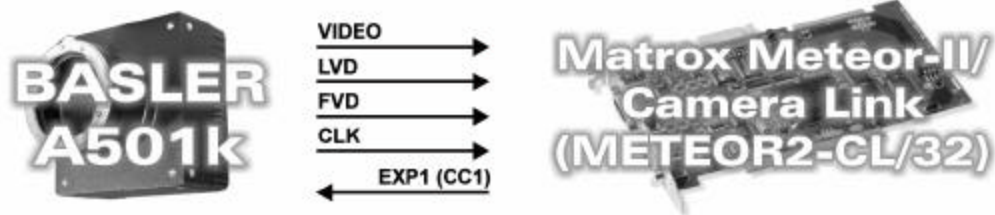
Interface Mode

- Continuous (EXSYNC programmable with external exposure)
- Asynchronous reset (EXSYNC programmable with asynchronous timings)

Camera Interface Briefs

Mode 1: Continuous

- $1280 \times 1024 \times 8\text{-bit}$ @ 35 fps (capable of up to 74 fps)¹
- $1280 \times 512 \times 8\text{-bit}$ @ 35 fps (capable of up to 142 fps)¹.
- Camera Link BASE interface (Dual channel).
- Progressive scan.
- Matrox Meteor-II/Camera Link sending periodic EXPOSURE1 (CC1) signal to camera to initiate capture.
- Matrox Meteor-II/Camera Link receiving LDV, FDV, CLK and video signal from camera.
- DCF used: [BA501KC.DCF](#) (1280×1024)
- DCF used: [BA501KCA.DCF](#) (1280×512)



Mode 2: Asynchronous reset

- $1280 \times 1024 \times 8\text{-bit}$.
- $1280 \times 512 \times 8\text{-bit}$.
- Camera Link BASE interface (Dual channel).
- Progressive scan.
- Matrox Meteor-II/Camera Link receiving external trigger signal.
- Matrox Meteor-II/Camera Link sending EXPOSURE1 (CC1) signal to camera to initiate and control exposure time.
- Matrox Meteor-II/Camera Link receiving LDV, FDV, CLK and video signal from camera.

Continued...

¹ Refer to Camera Interface Details section

Matrox Meteor-II/Camera Link

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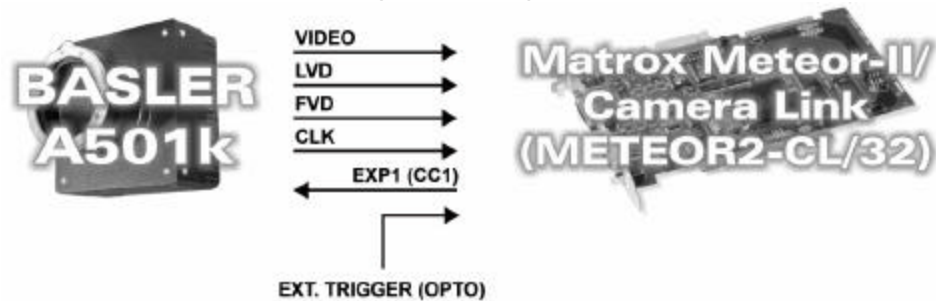
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Basics about the
interface modes

Camera Interface Briefs (cont.)

Mode 2: Asynchronous reset

- DCF used: [BA501KA.DCF](#) (1280 × 1024)
- DCF used: [BA501KAA.DCF](#) (1280 × 512)



Specifics about the
interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** The frame rate is determined by the frequency of the periodic EXPOSURE1 (CC1) signal. **NOTE:** Acquiring the frame rate designated by the camera manufacturer is PC system bandwidth dependent (typical bandwidth is 80 Mbytes/second). The DCFs were released with lower frame rates for supporting on-board double-buffered grabs (as per the standard MIL example MMET2DIG.C) with a copy to host and a copy to VGA display. Higher acquisition frame rates are possible however there will be less PCI bandwidth available should copies to the VGA be required. To increase the frame rate, reduce the EXPOSURE1 (CC1) signal inactive period in the Timer1 menu tab. Moreover, to further increase the frame rate, reduce the number of lines per frame (e.g., 260 lines for 300 fps). Consult the respective manual for more information.
- **Exposure time:** The width (falling edge to rising edge) of the EXPOSURE1 (CC1) signal is the exposure time. An internal delay (introduced by the camera) of **26.4 ms** is present between the end of exposure and the start of the frame. The exposure time can be modified in the DCF using Matrox Intellicam or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Camera settings:** Refer to the camera manual for additional information. Camera parameter settings are as follows:

Area of Interest		
	BA501KC.DCF	BA501KCA.DCF
Starting Column	0	320
Starting Row	0	256
Width	1280	1280
Height	1024	512

Continued...

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Specifics about the
interface modes

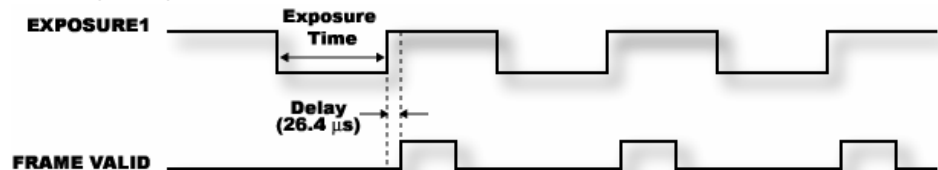
Camera Interface Details (cont.)

Mode 1: Continuous

- **Camera settings:** Refer to the camera manual for additional information. Camera parameter settings are as follows:

Exposure Time Control Mode		
	BA501KC.DCF	BA501KCA.DCF
ExSync, Level controlled	0x04	0x04

Timing diagram:



Mode 2: Asynchronous reset

- **Frame Rate:** The frame rate is determined by the frequency of the external trigger signal and the exposure time period. Please refer to Mode 1: Continuous for a note on PCI bandwidth issues.
- **Exposure time:** The width (falling edge to rising edge) of the EXPOSURE1 (CC1) signal and a fixed internal (camera) delay is the exposure time. An internal delay (introduced by the camera) of **26.4 ms** is present between the end of exposure and the start of the frame. The exposure time can be modified in the DCF using Matrox Intellicam or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Camera settings:** Refer to the camera manual for additional information. Command for setting camera parameters are as follows:

Area of Interest		
	BA501KA.DCF	BA501KAA.DCF
Starting Column	0	320
Starting Row	0	256
Width	1280	1280
Height	1024	512
Exposure Time Control Mode		
	BA501KA.DCF	BA501KAA.DCF
ExSync, Level controlled	0x04	0x04

Continued...

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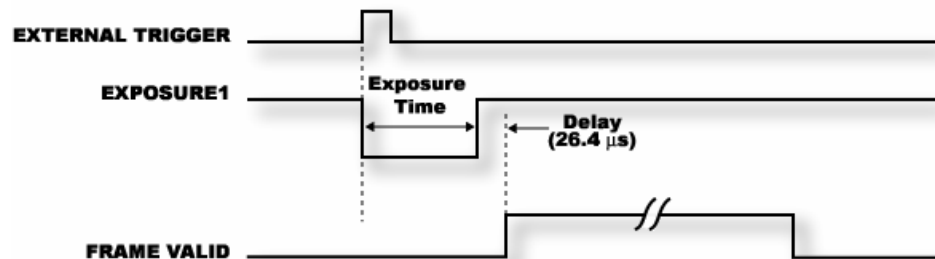
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Specifics about the
interface modes

Camera Interface Details (cont.)

Mode 2: Asynchronous reset

■ Timing diagram:



Cabling details for the
interface modes

Cabling Requirements

Mode 1: Continuous

- **Cable and Connection:** Standard Camera Link cable.

Mode 2: Asynchronous reset

- **Cable and Connection:** Standard Camera Link.
- **External trigger:** External trigger should be connected to the OPTO TRIG input of the 9-pin connector (pins 7 and 2) on the Expanded I/O adapter bracket.

EXPANDED I/O BRACKET (9-pin connector)

			External Trigger Source	
OPTOTRIG +	07	←	SIGNAL	--
OPTOTRIG -	02	←	GROUND	--

The DCF(s) mentioned in this application note can be found on our FTP site (<ftp.matrox.com/pub/imaging/>). The information furnished by Matrox Electronics System, Ltd. is believed to be accurate and reliable. Please verify all interface connections with camera documentation or manual. Contact your local sales representative or Matrox Sales office or Matrox Imaging Applications at 514-822-6061 for assistance.

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