

Matrox Genesis

Camera Interface Application Note

DALSTAR DS-11-06M03

November 26, 2002

Basics about the camera

Camera Descriptions

- $3072 \times 2048 \times 12\text{-bit}$ @ 12 fps.
- Single channel LVDS digital video output.
- Progressive scan.
- Internal (composite) or external sync.
- Internal or external exposure control.
- 20 MHz pixel clock rate.

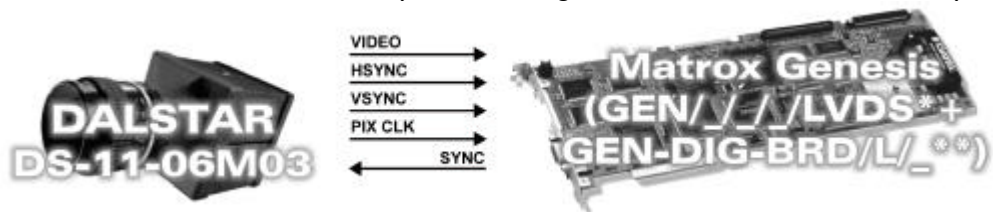
Interface Modes

- Continuous, Asynchronous reset (Binning)

Camera Interface Briefs

Mode 1: Continuous (Binning)

- Up to $3072 \times 2048 \times 12\text{-bit}$ @ 1 fps.
- Single channel LVDS digital video output.
- Progressive scan.
- Matrox Genesis sending periodic EXPOSURE1 (SYNC) signal to camera to initiate and control exposure.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (PCLK @ up to 20 MHz) and video signals from camera.
- DCF used: [G6M3PC1.DCF](#) (1 × 1 binning mode: 3072×2048 @ 20 MHz)
- DCF used: [G6M3PC2.DCF](#) (2 × 2 binning mode: 1535×1024 @ 10 MHz)
- DCF used: [G6M3PC4.DCF](#) (4 × 4 binning mode: 766×511 @ 5 MHz)
- DCF used: [G6M3PC8.DCF](#) (8 × 8 binning mode: 383×255 @ 2.5 MHz)



Mode 2: Asynchronous reset (Binning)

- Up to $3072 \times 2048 \times 12\text{-bit}$ @ 1 fps.
- Single channel LVDS digital video output.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.

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*Matrox Genesis main board with grab module
**Matrox LVDS digital data input board

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

Basics about the interface modes

Matrox Genesis

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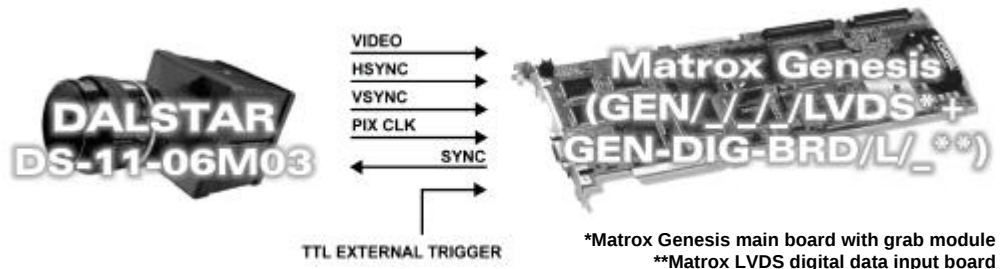
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Basics about the
interface modes

Camera Interface Briefs (continued)

Mode 2: Asynchronous reset (Binning)

- Matrox Genesis sending periodic EXPOSURE1 (SYNC) signal to camera to initiate and control exposure.
- Matrox Genesis receiving HSYNC, VSYNC, PIXEL CLOCK (PCLK @ up to 20 MHz) and video signals from camera.
- DCF used: [G6M3PA1.DCF](#) (1 × 1 binning mode: 3072 × 2048 @ 20 MHz)
- DCF used: [G6M3PA2.DCF](#) (2 × 2 binning mode: 1535 × 1024 @ 10 MHz)
- DCF used: [G6M3PA4.DCF](#) (4 × 4 binning mode: 766 × 511 @ 5 MHz)
- DCF used: [G6M3PA8.DCF](#) (8 × 8 binning mode: 383 × 255 @ 2.5 MHz)



Specifics about the
interface modes

Camera Interface Details

Mode: Continuous (Binning)

- **Frame Rate:** The frame rate is determined by the frequency of the external trigger signal. Default rate is **1** frame per second. To change the frame rate, adjust the total exposure period (active and inactive portions) in Matrox Intellicam. For a list of maximum possible frame rates per binning mode, refer to the camera specifications.
- **Exposure time:** The active period of the EXPOSURE1 (SYNC) signal is the exposure time. The default exposure time is equal to **300 ms**. The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Camera Control:** Camera control is made accessible through the control software offered by DALSA. Contact DALSA for more information.

Mode 2: Asynchronous reset (Binning)

- **Frame rate:** The frame rate is determined by the frequency of the external trigger signal.

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Matrox Genesis

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DALSTAR DS-11-06M03

November 26, 2002

Specifics about the
interface modes

Camera Interface Details (continued)

Mode 2: Asynchronous reset (Binning)

- **Exposure time:** The active period of the EXPOSURE1 (SYNC) signal is the exposure time. The default exposure time is equal to **300 ms**. The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Consult the respective manual for more information.
- **Camera Control:** As outlined in the camera specifications, camera configurations may be modified through the manipulation of control registers. All registers are accessed via an RS-232 serial interface. For this camera interface, Integrate Mode and Binning Mode control registers must be set as follows:

Binning Mode	Setting
1 × 1	00
2 × 2	01
4 × 4	10
8 × 8	11
Integrate Mode	Setting
External	1

Cabling details for this
interface mode

Cabling Requirements

Mode: Continuous (Binning)

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for video, synchronization and control signals.
- **Connection:** Connections between the 60-pin connector of the camera and the 100-pin connector of the Matrox Genesis are as follows:

DALSTAR DS-11-06M03 (60-pin connector)			Matrox Genesis (100-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
DA0	01	→	DATA, INPUT, 0+	01
DA0*	02	→	DATA, INPUT, 0-	02
DA1	03	→	DATA, INPUT, 1+	03
DA1*	04	→	DATA, INPUT, 1-	04
DA2	05	→	DATA, INPUT, 2+	05
DA2*	06	→	DATA, INPUT, 2-	06
DA3	07	→	DATA, INPUT, 3+	07
DA3*	08	→	DATA, INPUT, 3-	08
DA4	09	→	DATA, INPUT, 4+	09
DA4*	10	→	DATA, INPUT, 4-	10
DA5	11	→	DATA, INPUT, 5+	11
DA5*	12	→	DATA, INPUT, 5-	12
DA6	13	→	DATA, INPUT, 6+	13
DA6*	14	→	DATA, INPUT, 6-	14

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Matrox Genesis

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DALSTAR DS-11-06M03

November 26, 2002

*Cabling details for this
interface mode*

Cabling Requirements

Mode: Continuous (Binning)

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for video,

DALSTAR DS-11-06M03 (60-pin connector)			Matrox Genesis (100-pin connector)	
Pin name	Pin no.		Pin name	Pin no.
DA7	17	→	DATA, INPUT, 7+	15
DA7*	18	→	DATA, INPUT, 7-	16
DA8	19	→	DATA, INPUT, 8+	17
DA8*	20	→	DATA, INPUT, 8-	18
DA9	21	→	DATA, INPUT, 9+	19
DA9*	22	→	DATA, INPUT, 9-	20
DA10	23	→	DATA, INPUT, 10+	21
DA10*	24	→	DATA, INPUT, 10-	22
DA11	25	→	DATA, INPUT, 11+	23
DA11*	26	→	DATA, INPUT, 11-	24
GND	45	--	GROUND	37
GND	46	--	GROUND	50
VSYNC	56	→	VSYNC, INPUT, +	35
VSYNC*	55	→	VSYNC, INPUT, -	36
HSYNC	58	→	HSYNC, INPUT, +	33
HSYNC*	57	→	HSYNC, INPUT, -	34
PCLK	60	←	CLOCK, INPUT, +	39
PCLK*	59	←	CLOCK, INPUT, -	40
SYNC	CAMERA REAR	®	EXPOSURE1, OUTPUT, TTL	87

Note: This last connection is not necessary for this mode however allows a single cable to be used for both modes.

Mode 2: Asynchronous reset (Binning)

- **Cable:** DBHD100-TO-OPEN (open ended) and IMG-7W2-TO-5BNC cables required for video, synchronization and control signals.
- **External Trigger:** TTL external trigger source should be connected to the TTL trigger input of the IMG-7W2-TO-5BNC cable.
- **Connection:** Connections between the 60-pin connector of the camera and the 100-pin connector of the Matrox Genesis are as in *Mode 1: Continuous*.

The DCF(s) mentioned in this application note can be found on the MIL, Native Library CD or our FTP site ([ftp.matrox.com](ftp:ftp.matrox.com)). The information furnished by Matrox Electronic Systems, 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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