Matrox Genesis

Camera Interface Application Note

DALSTAR DS-11-06M03 November 26, 2002

Basics about the camera

Camera Descriptions

- 3072 × 2048 × 12-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.

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

Interface Modes

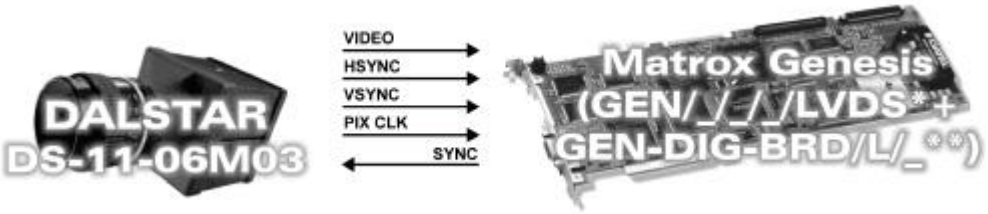
- Continuous, Asynchronous reset (Binning)

Basics about the interface modes

Camera Interface Briefs

Mode 1: Continuous (Binning)

- Up to 3072 × 2048 × 12-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 × 2048 × 12-bit @ 1 fps.
- Single channel LVDS digital video output.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.

Continued….

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

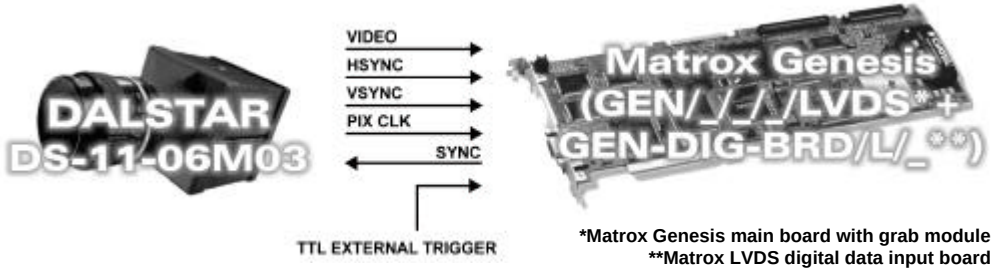
Matrox Genesis
Camera Interface Application Note
DALSTAR DS-11-06M03 November 26, 2002

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)



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

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.

Continued…

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

continued….

Matrox Genesis

Camera Interface Application Note

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.*

Corporate headquarters:

Canada and U.S.A.

Matrox Electronic Systems Ltd.
1055 St. Regis Blvd.
Dorval, Quebec H9P 2T4
Canada
Tel: (514) 685-2630
Fax: (514) 822-6273

MATROX IMAGING