MATROX GENESIS
CAMERA INTERFACE APPLICATION NOTE
REDLAKE MASD (KODAK) 1.4i JUNE 19, 2001

Basics about the camera

Camera Descriptions

- 1317 × 1035 × 8-bit @ up to 6.9 fps.
- Single channel RS-422 digital video output.
- Progressive scan.
- External sync.
- Internal or external exposure control.
- 10 MHz pixel clock rate.

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

Interface Modes

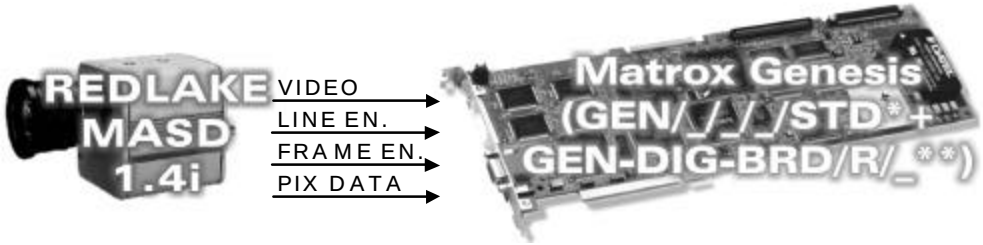
- Pseudo-continuous
- Asynchronous reset (Trigger, Control)

Basics about the interface modes

Camera Interface Briefs

Mode 1: Pseudo-continuous

- 1317 × 1035 × 8-bit @ up to 6.9 fps.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC (LINE ENABLE), VSYNC (FRAME ENABLE), PIXEL CLOCK (PIX DATA STRB @ 10 MHz) and video signals from camera.
- DCF used: KOD14ID.DCF



Mode 2: Asynchronous Reset (Trigger, Control)

- 1317 × 1035 × 8-bit.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving external trigger signal.
- Matrox Genesis sending EXPOSURE1 (EXPOSE) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC (LINE ENABLE), VSYNC (FRAME ENABLE), PIXEL CLOCK (PIX DATA STRB @ 10 MHz) and video signals from camera.

Continued…

***Matrox Genesis main board with grab module**
****MatroxRS-422 digital data input board**

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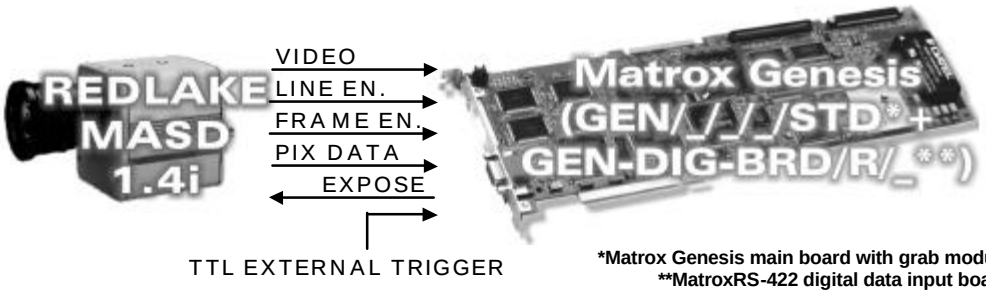
Basics about the interface modes

Camera Interface Briefs (Continued)

Mode 2: Asynchronous Reset (Trigger, Control)

- DCF used: KOD14IDA.DCF (Trigger)
- DCF used: KOD14IAE.DCF (Control)



***Matrox Genesis main board with grab module**
****MatroxRS-422 digital data input board**

Specifics about the interface modes

Camera Interface Details

Mode 1: Pseudo-continuous

- **Frame Rate:** Matrox Genesis receives the continuous video from the camera at 6.9 frames per second.
- **Exposure time:** Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting (remote panel software). Refer to the camera manual for more information.
- **Remote Panel software settings:** Operating mode set to **Continuous.** Refer to the camera manual for additional information.

Mode 2: Asynchronous Reset (Trigger)

- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** The rising edge of the EXPOSURE1 (EXPOSE) signal initiates the exposure; exposure period is controlled through the Remote Panel software. Refer to the camera manual for more information.
- **Remote Panel software settings:** Operating mode set to **Trigger.** Refer to the camera manual for additional information.

Mode 2: Asynchronous Reset (Control)

- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** The width (rising to falling edge) of the EXPOSURE1 (EXPOSE) signal initiates and controls the exposure. 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.
- **Remote Panel software settings:** Operating mode set to **Control.** Refer to the camera manual for additional information.

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Cabling details for this interface mode

Cabling Requirements

Mode 1: Pseudo-continuous

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for video, synchronization and control signals.
- **Connection:** Connections between the 68-pin connector of the camera and the 100-pin connectors of the Matrox Genesis are as follows:

GEN-DIG-BRD/R/_ (100-pin connector)			**REDLAKE MASD 1.4i (68-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DATA, INPUT, 7+	15	←	MSB+	02
DATA, INPUT, 7-	16	←	MSB-	36
DATA, INPUT, 6+	13	←	MSB-1+	03
DATA, INPUT, 6-	14	←	MSB-1-	37
DATA, INPUT, 5+	11	←	MSB-2+	04
DATA, INPUT, 5-	12	←	MSB-2-	38
DATA, INPUT, 4+	09	←	MSB-3+	05
DATA, INPUT, 4-	10	←	MSB-3-	39
DATA, INPUT, 3+	07	←	MSB-4+	06
DATA, INPUT, 3-	08	←	MSB-4-	40
DATA, INPUT, 2+	05	←	MSB-5+	07
DATA, INPUT, 2-	06	←	MSB-5-	41
DATA, INPUT, 1+	03	←	MSB-6+	08
DATA, INPUT, 1-	04	←	MSB-6-	42
DATA, INPUT, 0+	01	←	MSB-7+	09
DATA, INPUT, 0-	02	←	MSB-7-	43
CLOCK, INPUT, +	39	←	PIX DATA STRB +	29
CLOCK, INPUT, -	40	←	PIX DATA STRB -	63
HSYNC, INPUT, +	33	←	LINE ENA +	26
HSYNC, INPUT, -	34	←	LINE ENA -	60
VSYNC, INPUT, +	35	←	FRME ENA +	25
VSYNC, INPUT, -	36	←	FRME ENA -	59
EXPOSURE1, OUTPUT, +	95*	→	EXPOSE +	30*
EXPOSURE1, OUTPUT, -	96*	→	EXPOSE -	64*
GROUND	50	--	GROUND	01

* Connection not necessary for this mode however allows this cable to be used for both modes.

Mode 2: Asynchronous Reset (Trigger, Control)

- **Cable:** IMG-7W2-TO-5BNC and DBHD100-TO-OPEN (open ended) cables required for video, synchronization and control signals.
- **External Trigger:** TTL external trigger source should be connected to the TTL trigger input of IMG-7W2-TO-5BNC cable.
- **Connection:** All connections are as in Mode 1: *Pseudo-continuous.*

Continued…

Cabling details for the interface modes

Cabling Requirements (Continued)

Mode 2: Asynchronous Reset (Trigger, Control)

- An RS-422 external trigger input may also be used once the following connections between the 100-pin connector of the GEN-DIG-BRD/R/_ and the external trigger source are made:

GEN-DIG-BRD/R/_ (100-pin connector)			**EXTERNAL TRIGGER SOURCE**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
TRIGGER, +	47	←	RS-422 TRIGGER +	--
TRIGGER, -	48	←	RS-422 TRIGGER -	--

The DCF(s) mentioned in this application note can be found on the MIL and Native Library CD, or our FTP site (ftp.matrox.com). 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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