MATROX GENESIS
CAMERA INTERFACE APPLICATION NOTE
REDLAKE MASD (KODAK) ES310T SEPTEMBER 5, 2001

Basics about the camera

Camera Descriptions

- 648 × 484 × 8-bit @ up to 125 fps.
- Single channel analog or RS-422 digital video output.
- Progressive scan.
- Internal sync.
- External exposure control.
- 25 MHz pixel clock rate.

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

Interface Modes

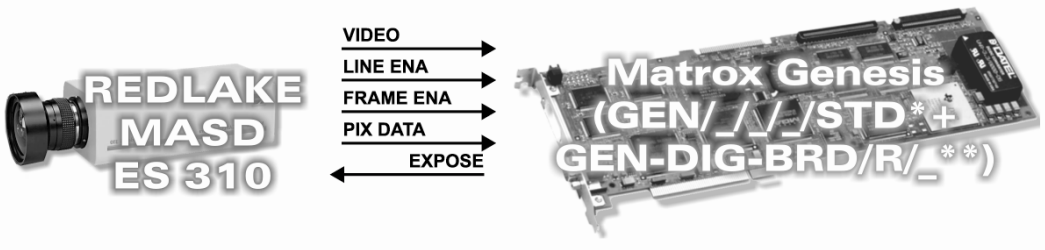
- Continuous
- Asynchronous reset (Trigger)

Basics about the interface modes

Camera Interface Briefs

Mode 1: Continuous

- 648 × 484 × 8-bit @ 30 fps.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving HSYNC (LINE ENA), VSYNC (FRAME ENA), PIXEL CLOCK (PIX DATA @ 25 MHz) and video signals from camera.
- DCF used: ES310TC.DCF



Mode 2: Asynchronous Reset (Trigger)

- 648 × 484 × 8-bit.
- Dual channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis receiving TTL external trigger signal.
- Matrox Genesis sending EXPOSURE1 (EXPOSE) signal to camera to initiate and control exposure time.
- Matrox Genesis receiving HSYNC (LINE ENA), VSYNC (FRAME ENA), PIXEL CLOCK (PIX DATA @ 25 MHz) and video signals from camera.

Continued…

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

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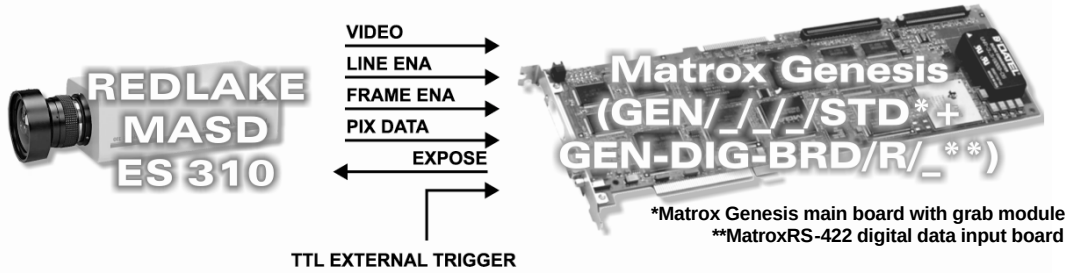
Basics about the interface modes

Camera Interface Briefs (Continued)

Mode 2: Asynchronous Reset (Trigger)

- DCF used: ES310TA.DCF



Specifics about the interface modes

Camera Interface Details

Mode 1: Continuous

- **Frame Rate:** Matrox Genesis receives the continuous video from the camera at 30 frames per second.
- **Exposure time:** Exposure time is controlled by the Remote Panel software setting. Exposure time can be set between 66 microsecond and 1/frame rate in milliseconds.
- **Remote Panel software settings:** Refer to the camera manual for additional information. Settings for this mode should be set as follows:

ES310TC.DCF			
MDE	**EXE**	**TRS**	**FRS**
CS	xx*	AIA	30

* as desired

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. For frequencies <= 30Hz, set EXE as desired. Otherwise EXE 100 = 04.700 (maximum 60Hz trigger, if EXE > 0.4700 then frame rate drops by 1/2) or EXE 2 =00.094 for 85Hz. Maximum exposure time equals **96** ms. Refer to the camera manual for more information.
- **Remote Panel software settings:** Refer to the camera manual for additional information. Settings for this mode should be set as follows:

ES310TA.DCF			
MDE	**EXE**	**TRS**	**FRS**
TR	*	AIA	**

* see explanation above
** any setting since external trigger frequency determines frame rate

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Cabling details for this interface mode

Cabling Requirements

Mode 1: 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 ES310T (68-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DATA, INPUT, 7+	15	←	BMSB +	10
DATA, INPUT, 7-	16	←	BMSB -	44
DATA, INPUT, 6+	13	←	BMSB1 +	11
DATA, INPUT, 6-	14	←	BMSB1 -	45
DATA, INPUT, 5+	11	←	BMSB2 +	13
DATA, INPUT, 5-	12	←	BMSB2 -	47
DATA, INPUT, 4+	09	←	BMSB3 +	14
DATA, INPUT, 4-	10	←	BMSB3 -	48
DATA, INPUT, 3+	07	←	BMSB4 +	15
DATA, INPUT, 3-	08	←	BMSB4 -	49
DATA, INPUT, 2+	05	←	BMSB5 +	16
DATA, INPUT, 2-	06	←	BMSB5 -	50
DATA, INPUT, 1+	03	←	BMSB6 +	19
DATA, INPUT, 1-	04	←	BMSB6 -	53
DATA, INPUT, 0+	01	←	BMSB7 +	20
DATA, INPUT, 0-	02	←	BMSB7 -	54
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	←	FRAME ENA +	25
VSYNC, INPUT, -	36	←	FRAME ENA -	59
EXPOSURE1, OUTPUT, +	95*	→	EXPOSE +	30*
EXPOSURE1, OUTPUT, -	96*	→	EXPOSE -	64*
GROUND	50	--	GROUND	01
DATA, INPUT, 15+	31	←	AMSB +	02
DATA, INPUT, 15-	32	←	AMSB -	36
DATA, INPUT, 14+	29	←	AMSB1 +	03
DATA, INPUT, 14-	30	←	AMSB1 -	37
DATA, INPUT, 13+	27	←	AMSB2 +	04
DATA, INPUT, 13-	28	←	AMSB2 -	38
DATA, INPUT, 12+	25	←	AMSB3 +	05
DATA, INPUT, 12-	26	←	AMSB3 -	39
DATA, INPUT, 11+	23	←	AMSB 4+	06
DATA, INPUT, 11-	24	←	AMSB 4-	40

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

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Cabling details for this interface mode

Cabling Requirements (Continued)

Mode 1: Continuous

- **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 ES310T (68-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
DATA, INPUT, 10+	21	←	AMSB 5+	07
DATA, INPUT, 10-	22	←	AMSB 5-	41
DATA, INPUT, 9+	19	←	AMSB 6+	08
DATA, INPUT, 9-	20	←	AMSB 6-	42
DATA, INPUT, 8+	17	←	AMSB 7+	09
DATA, INPUT, 8-	18	←	AMSB 7-	43

Mode 2: Asynchronous Reset (Trigger)

- **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 other connections are as in Mode 1: *Continuous*

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