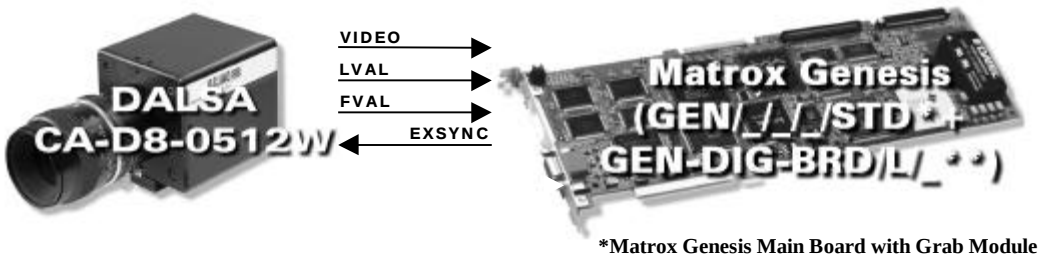
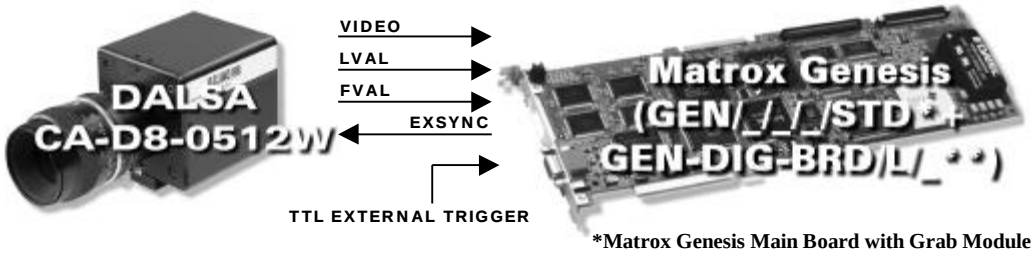
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

DALSA CA-D8-0512W (MotionVision)

February 19, 1999

Camera Descriptions	• 512 x 512 x 8-bit @ 77 fps. • Single channel LVDS digital video output. • Progressive scan. • Internal synchronization. • Exposure control. • Pixel clock rate: 25 MHz.
Interface mode	• Continuous, Trigger
Camera Interface Briefs	**Mode 1: Continuous**  ***Matrox Genesis Main Board with Grab Module** ****** **Matrox LVDS Digital Data Input Board** • 512 x 512 x 8-bit @77fps. • Single channel LVDS digital video. • Continuous video. • Matrox Genesis sending periodic EXPOSURE1 (EXSYNC) signal to camera; EXPOSURE1 (EXSYNC) signal initiates frame readout and controls exposure. • Matrox Genesis receiving PIXEL CLOCK (STROBE), HSYNC (LVAL), VSYNC (FVAL) and video signals from camera. • DCF used: GD8512WC.DCF **Mode 2: Trigger**  ***Matrox Genesis Main Board with Grab Module** ****** **Matrox LVDS Digital Data Input Board** • 512 x 512 x 8-bit. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving TTL external trigger. • Matrox Genesis sending EXPOSURE1 (EXSYNC) signal to camera; EXPOSURE1 (EXSYNC) signal initiates frame readout and controls exposure. • Matrox Genesis receiving PIXEL CLOCK (STROBE), HSYNC (LVAL), VSYNC (FVAL) and video signals from camera. • DCF used: GD8512WA.DCF

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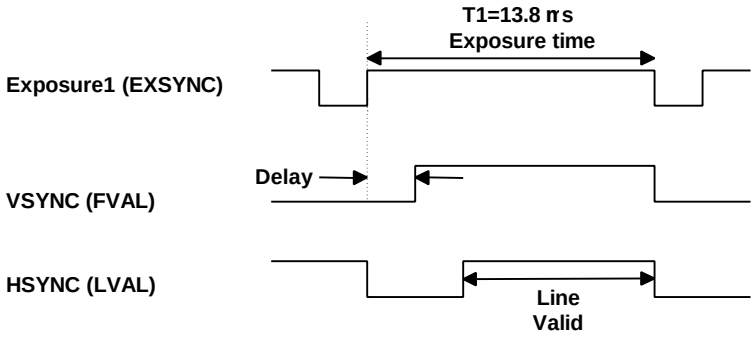
Camera Interface Details

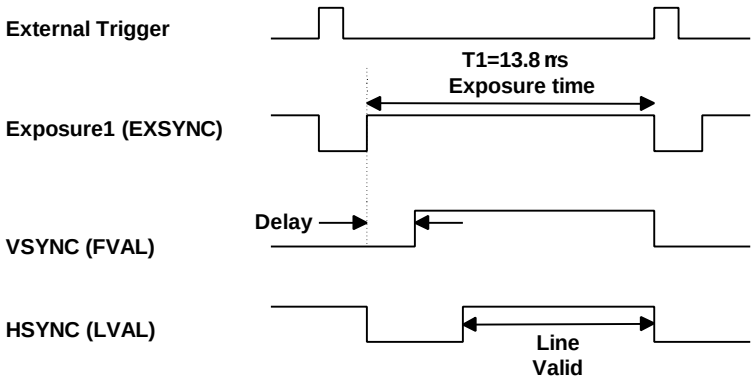
Mode 1: Continuous

- **Frame rate**: The frame rate is continuous and initiated by the periodic EXPOSURE1 (EXSYNC) signal.
- **Exposure time**: The width or duration of the EXPOSURE1 (EXSYNC) signal is equal to the exposure time. The default exposure time for this DCF is **13.8 µs**. In order to change the exposure time, the width and deployment time of EXPOSURE1 (EXSYNC) must be set in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.



Mode 2: Trigger

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (EXSYNC) signals to the camera, with a duration equal to the desired exposure time. A short delay follows the EXPOSURE1 (EXSYNC), whereby the camera sends the VSYNC (FVAL) and HSYNC (LVAL) signals to the Matrox Genesis to initiate frame and line readout.
- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time**: The active period of EXPOSURE1 (EXSYNC) signals is the exposure time. The default exposure time for this DCF is equal to **13.8 µs**. In order to change the exposure time, the width and deployment time of EXPOSURE1 (EXSYNC) must be set in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.



DALSA CA-D8-0512W (MotionVision) February 19, 1999

Cabling Requirements

Mode 1: Continuous mode

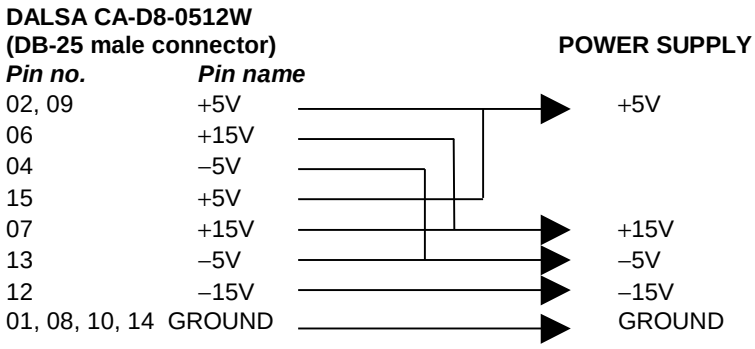
- DBHD100-TO-OPEN cable and GEN/DIG/BRD/L board required for digital data, synchronization, and control signals in LVDS format.
- Connections between the DB-25 dual-row 25-pin connector (**OS1**) of the camera and the 100-pin connector of the GEN-DIG-BRD/L are as follows:

GEN-DIG-BRD/L (100-pin digital interface connector)			**DALSA CA-D8-0512W (25-pin connector)**	
Pin name	**Pin no.**		**Pin name**	**Pin no.**
DATA, INPUT, 0+	01	←	D0 (LSB)	08
DATA, INPUT, 0-	02	←	D0B	21
DATA, INPUT, 1+	03	←	D1	07
DATA, INPUT, 1-	04	←	D1B	20
DATA, INPUT, 2+	05	←	D2	06
DATA, INPUT, 2-	06	←	D2B	19
DATA, INPUT, 3+	07	←	D3	05
DATA, INPUT, 3-	08	←	D3B	18
DATA, INPUT, 4+	09	←	D4	04
DATA, INPUT, 4-	10	←	D4B	17
DATA, INPUT, 5+	11	←	D5	03
DATA, INPUT, 5-	12	←	D5B	16
DATA, INPUT, 6+	13	←	D6	02
DATA, INPUT, 6-	14	←	D6B	15
DATA, INPUT, 7+	15	←	D7	01
DATA, INPUT, 7-	16	←	D7B	14
HSYNC, INPUT, +	33	←	LVAL	10
HSYNC, INPUT, -	34	←	LVALB	23
VSYNC, INPUT, +	35	←	FVAL	11
VSYNC, INPUT, -	36	←	FVALB	24
CLOCK, INPUT, +	39	←	STROBE	09
CLOCK, INPUT, -	40	←	STROBEB	22

- Connections between the dual-row 15-pin connector (**DB15F**) of the camera and the 100-pin connector of the GEN-DIG-BRD/L are as follows:

GEN-DIG-BRD/L (100-pin digital interface connector)			**DALSA CA-D8-0512W (15-pin connector-DB15F)**	
Pin name	**Pin no.**		**Pin name**	**Pin no.**
EXPOSURE1, OUTPUT, +	95	→	EXSYNC	12
EXPOSURE1, OUTPUT, -	96	→	EXSYNCB	04
EXPOSURE2, OUTPUT, +	97	→	PRIN	05
EXPOSURE2, OUTPUT, -	98	→	PRINB	13

- Connections between the DB-25 connector on the rear panel of the camera and the power supply are as follows:



NOTE: it is very important that all the GROUNDs of the camera be connected together to the POWER SUPPLY GROUND, and to the GROUND of the Matrox Genesis. Do not use the cable shield as a ground, instead always use the ground pin of the power supply.

Mode 2: Trigger

- IMG-7W2-TO-5BNC and DBHD100-TO-OPEN cables, and GEN/DIG/BRD/L board required for external trigger, digital data, synchronization, and control signals in LVDS format.
- TTL external trigger source should be connected to the TTL trigger input of IMG-7W2-TO-5BNC cable.
- All other connections are as in Mode 1: *Continuous*

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