Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX
GENESIS

BASLER-MVC A101C   February 29, 2000

Camera Descriptions	• 1300 x 1030 x 8-bit @ 12 fps. • Single channel LVDS digital video output. • Color image generated through software-based conversion. • Progressive scan. • External sync. • Internal exposure control. • Pixel clock: 18 MHz
Interface modes	• Pseudo-continuous, asynchronous reset (binning, non-binning)
Camera Interface Briefs	**Mode 1: Pseudo-continuous** *Matrox Genesis main board with grab module ** Matrox LVDS digital data input board • 1300 x 1030 x 8-bit @ 10 fps. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving video signals from camera. • DCF used: A113CC.DCF (non-binning) • DCF used: A113BCC.DCF (binning) **Mode 2: Asynchronous Reset** *Matrox Genesis main board with grab module ** Matrox LVDS digital data input board • 1300 x 1030 x 8-bit. • Single channel LVDS digital video. • Progressive scan. • Matrox Genesis receiving external trigger. • Matrox Genesis sending EXPOSURE1 (EXSYNC) signal to camera. • Matrox Genesis receiving HSYNC (LVAL), VSYNC (FVAL), PIXEL CLOCK (PCLK), and video signals from camera. • DCF used: A113CAR.DCF (non-binning) • DCF used: A113CBAR.DCF (binning)

Camera Interface Details	**Modes 1: Pseudo-continuous** • **Frame rate:** Matrox Genesis receives the pseudo-continuous video from the camera at a frame rate equal to 10 frames per second. • **Exposure time:** Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting. Refer to the camera manual for more information. **Mode 2: Asynchronous Reset (Pulse Width Control Mode)** • Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE1 (EXSYNC) signal to the camera with a width equal to the desired exposure. • **Frame rate**: The frame rate is determined by the frequency of the external trigger signal. • **Exposure time:** The active and inactive periods of the EXPOSURE1 (EXSYNC) signal is the exposure time. The default exposure time for this DCF is equal to **3.82 ms**. In order to change the width and deployment time of the EXPOSURE1 (EXSYNC) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information. **Modes 1 and 2** • **Camera configuration:** Camera configuration tool and drivers for this camera are available from the BASLER web site (http://www.baslerweb.com/). • **Capturing color information:** Color information is generated (by this camera) using a Bayer color mosaic filter mounted on the sensor. RGB information can only be obtained through software-based conversion. **Important:** Following each frame capture it will be necessary to make a call to the BASLER library from your MIL/MIL-Lite program in order to reconstruct the proper color image.

Cabling Requirements

Mode 1: Pseudo-continuous

• DBHD100-TO-OPEN cable and GEN/DIG/BRD/L/_ board required for digital data, synchronization and control signals.
• Connections between the 44-pin connector of the camera and the 100-pin connector of the GEN-DIG-BRD/L/_ are as follows:

GEN-DIG-BRD/L/_ (100-pin connector)			BASLER A101C (44-pin connector)	
Pin name	*Pin no.*		*Pin name*	*Pin no.*
DATA, INPUT, 0+	01	←	DOUT0+	01
DATA, INPUT, 0-	02	←	DOUT0-	16
DATA, INPUT, 1+	03	←	DOUT1+	02
DATA, INPUT, 1-	04	←	DOUT1-	17
DATA, INPUT, 2+	05	←	DOUT2+	03
DATA, INPUT, 2-	06	←	DOUT2-	18
DATA, INPUT, 3+	07	←	DOUT3+	04
DATA, INPUT, 3-	08	←	DOUT3-	19
continued				

Cabling Requirements (continued)

GEN-DIG-BRD/L/_ (100-pin connector)			BASLER A101C (44-pin connector)	
Pin name	*Pin no.*		*Pin name*	*Pin no.*
DATA, INPUT, 4+	09	←	DOUT4+	05
DATA, INPUT, 4-	10	←	DOUT4-	20
DATA, INPUT, 5+	11	←	DOUT5+	06
DATA, INPUT, 5-	12	←	DOUT5-	21
DATA, INPUT, 6+	13	←	DOUT6+	07
DATA, INPUT, 6-	14	←	DOUT6-	22
DATA, INPUT, 7+	15	←	DOUT7+	08
DATA, INPUT, 7-	16	←	DOUT7-	23
HSYNC, INPUT, +	33	←	LVAL+	33
HSYNC, INPUT, -	34	←	LVAL-	34
VSYNC, INPUT, +	35	←	FVAL+	39
VSYNC, INPUT, -	36	←	FVAL-	40
GROUND	37		GND	43
GROUND	38		GND	44
CLOCK, INPUT, +	39	←	PCLK+	35
CLOCK, INPUT, -	40	←	PCLK-	36
EXPOSURE1, OUTPUT, +	95*	→	EXSYNC+	37*
EXPOSURE1, OUTPUT, -	96*	→	EXSYNC-	38*

* These connections are not required for this mode, however allows this cable to be used with all modes.

Mode 2: Asynchronous Reset

- DBHD100-TO-OPEN and IMG-7W2-TO-5BNC cables, and GEN/DIG/BRD/L/_ board required for digital data, synchronization and control signals.
- External trigger source should be connected to the trigger input (GRAY BNC) of the IMG-7W2-TO-5BNC cable.
- All other connections are as in Mode 1: *Pseudo-continuous*

Modes 1-2

- Connections between the 2-pin subminiature round connector on the rear panel of the camera and the power supply are as follows:

Power Supply		BASLER A101C (2-pin connector)	
Pin name	*Pin no.*	*Pin name*	*Pin no.*
+24V	03	GND	01
+24V	04	GND	02

Cabling Requirements (continued)	• Connections between the DB-9 connector on the rear panel of the camera and the system (RS-232 interface) are as follows:

Pin	Signal
2	RxD
3	TxD
5	GND
1, 4, 6, 7, 8, 9	NOT CONNECTED

M A T R O X
IMAGING

GEN-CID-078