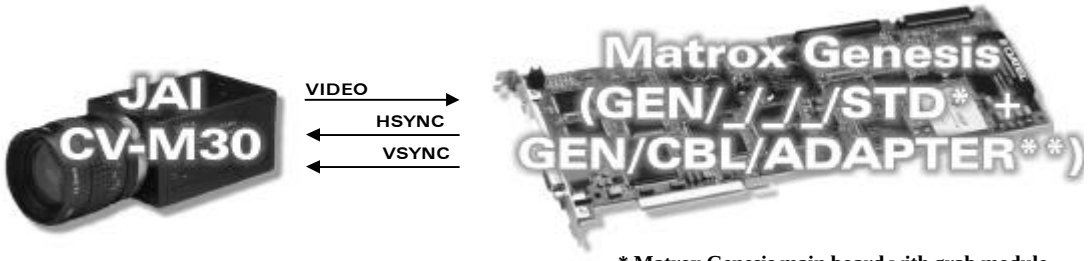
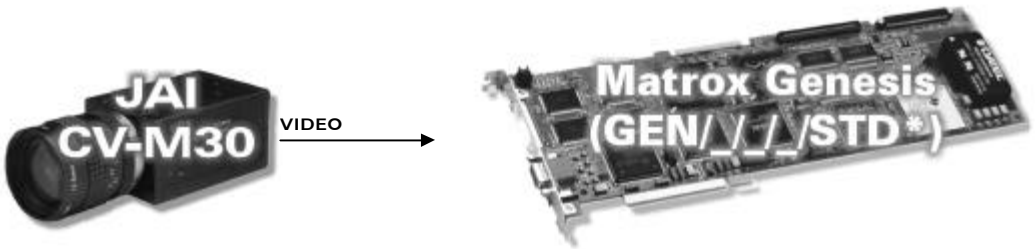
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

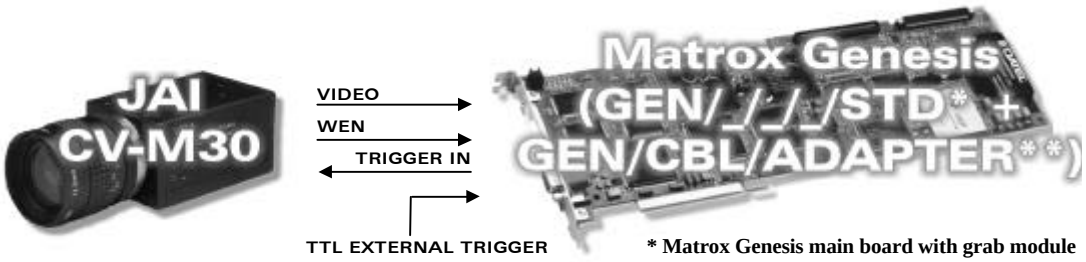
JAI CV-M30

September 25, 2000

Camera Descriptions	• 768 × 494 × 8-bit. • Single channel analog video output. • Interlaced or progressive scan. • Internal (composite) or external sync. • Internal exposure control. • Pixel clock: 28.7/14.3 MHz
Interface Modes	• Continuous, asynchronous reset
Camera Interface Briefs	**Mode 1: Continuous (double speed)**  *** Matrox Genesis main board with grab module** **** Matrox digital cable adapter module** • 756 × 242 × 8-bit @ 120 fps. • Single channel analog video. • Progressive scan. • Matrox Genesis sending HSYNC and VSYNC signals to camera. • Matrox Genesis receiving video signals from camera. • DCF used: GCVM30NS.DCF • DCF can support up to four cameras simultaneously. **Mode 2: Continuous (partial scanning)**  *** Matrox Genesis main board with grab module** • 756 × 242 × 8-bit @ 120 fps (100% scanning). • 756 × 111 × 8-bit @ 240 fps (50% scanning). • 756 × 67 × 8-bit @ 360 fps (33% scanning). • Single channel analog video. • Progressive scan. • Matrox Genesis receiving video signals from camera. • DCF used: GCVM30C1.DCF (756 × 242 × 8-bit @ 120 fps) • DCF used: GCVM30C2.DCF (756 × 111 × 8-bit @ 240 fps) • DCF used: GCVM30C3.DCF (756 × 67 × 8-bit @ 360 fps)

Camera Interface Briefs (continued)

Mode 3: Asynchronous Reset (partial scanning)



*** Matrox Genesis main board with grab module**
**** Matrox digital cable adapter module**

- 756 × 242 × 8-bit (100% scanning).
- 756 × 111 × 8-bit (50% scanning).
- 756 × 67 × 8-bit (33% scanning).
- Single channel analog video.
- Progressive scan.
- Matrox Genesis receiving external trigger signal.
- Matrox Genesis sending EXPOSURE1 (TRIGGER INPUT) signal to camera.
- Matrox Genesis receiving valid (WEN) and video signals from camera.
- DCF used: GCVM30T1.DCF (756 × 242 × 8-bit)
- DCF used: GCVM30T2.DCF (756 × 111 × 8-bit)
- DCF used: GCVM30T3.DCF (756 × 67 × 8-bit)

Camera Interface Details

Mode 1: Continuous (double speed)

- **Frame rate:** Matrox Genesis receives continuous video from the camera at 120 frames per second.
- **Exposure time:** Exposure time is determined by user desired shutter speed setting. Refer to the camera manual for more information.
- **Camera switch settings:** Switches (**SW1**) for this mode should be set as follows:

SW1 switches	*GCVM30NS.DCF*
1: Shutter Speed	*
2: Shutter Speed	*
3: Shutter Speed	*
4: Scanning Area	OFF
5: Scanning Speed	OFF
6: Scanning Area	OFF
7: External Trigger	OFF
8: Gain	OFF

* Switches 1-3 can be set to user desired shutter speed setting, refer to camera manual for details.

Camera Interface Details (continued)

Mode 2: Continuous (partial scanning)

- **Frame rate:** Matrox Genesis receives continuous video from the camera at up to 360 frames per second.
- **Exposure time:** Exposure time is determined by user desired shutter speed setting. Refer to the camera manual for more information.
- **Camera switch settings:** Switches (**SW1**) for this mode should be set as follows:

SW1 switches	GCVM30C1.DCF	GCVM30C1.DCF	GCVM30C1.DCF
1: Shutter Speed	*	*	*
2: Shutter Speed	*	*	*
3: Shutter Speed	*	*	*
4: Scanning Area	OFF	**ON**	**ON**
5: Scanning Speed	OFF	OFF	**ON**
6: Scanning Area	OFF	**ON**	**ON**
7: External Trigger	OFF	OFF	OFF
8: Gain	OFF	OFF	OFF

* Switches 1-3 can be set to user desired shutter speed setting, refer to camera manual for details.

Mode 3: Asynchronous Reset (partial scanning)

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE2 (TRIGGER INPUT) signal to the camera to imitate exposure.
- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time:** Exposure time is initiated by the rising edge of the EXPOSURE2 (TRIGGER INPUT) signal and determined by user desired shutter speed setting. Refer to the camera manual for more information.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows:

SW1 switches	GCVM30T1.DCF	GCVM30T1.DCF	GCVM30T1.DCF
1: Shutter Speed	*	*	*
2: Shutter Speed	*	*	*
3: Shutter Speed	*	*	*
4: Scanning Area	OFF	**ON**	**ON**
5: Scanning Speed	OFF	OFF	OFF
6: Scanning Area	OFF	OFF	**ON**
7: External Trigger	**ON**	**ON**	**ON**
8: Gain	OFF	OFF	OFF

* Switches 1-3 can be set to user desired shutter speed setting, refer to camera manual for details.

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Cabling Requirements

Mode 1: Continuous (double speed)

- IMG-7W2-TO-5BNC and DBHD68-TO-OPEN cables required for synchronization and video output of camera.
- Video input (RED BNC) of IMG-7W2-TO-5BNC cable should be connected to video out BNC connector of camera.
- Connections between the 12-pin (**DC/SYNC IN**) connector of the camera and the 44-pin connector of the Matrox Genesis are as follows:

GEN/CBL/ADAPTER (68-pin connector)			**JAI CV-M30 (12-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
HSYNC, OUTPUT, TTL	62	→	HD INPUT (TTL)	06
GROUND	60	--	GROUND	05
VSYNC, OUTPUT, TTL	26	→	VD INPUT (TTL)	07
GROUND	28	--	GROUND	08

Mode 2: Continuous (partial scanning)

- IMG-7W2-TO-5BNC and DBHD68-TO-OPEN cables required for video output of camera.
- Video input (RED BNC) of IMG-7W2-TO-5BNC cable should be connected to video out BNC connector of camera.

Mode 3: Asynchronous Reset (partial scanning)

- IMG-7W2-TO-5BNC and DBHD68-TO-OPEN cables required for control (WEN) and video output of camera.
- Video input (RED BNC) of IMG-7W2-TO-5BNC cable should be connected to video out BNC connector of camera.
- TTL external trigger source should be connected to the TTL external trigger input of the IMG-7W2-TO-5BNC cable (Gray BNC wire).
- Connections between the 6-pin (**TRIGGER**) connector of the camera and the 44-pin connector of the Matrox Genesis are as follows:

GEN/CBL/ADAPTER (68-pin connector)			**JAI CV-M30 (6-pin HIROSE connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
EXPOSURE2, OUTPUT, TTL	58	→	TRIGGER INPUT	05
TRIGGER, INPUT, TTL	67	←	WEN PULSE	06
GROUND	68	--	GROUND	03

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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