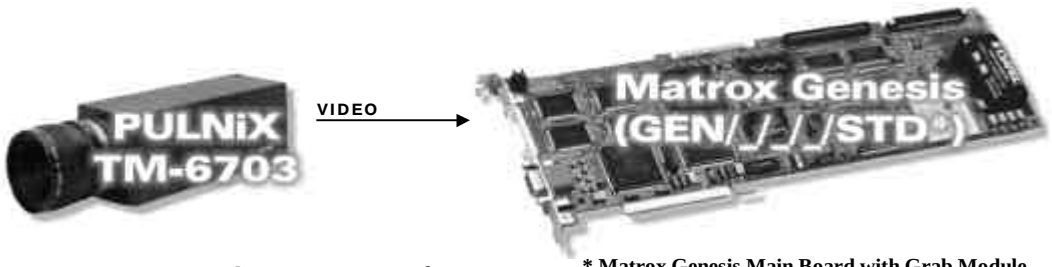
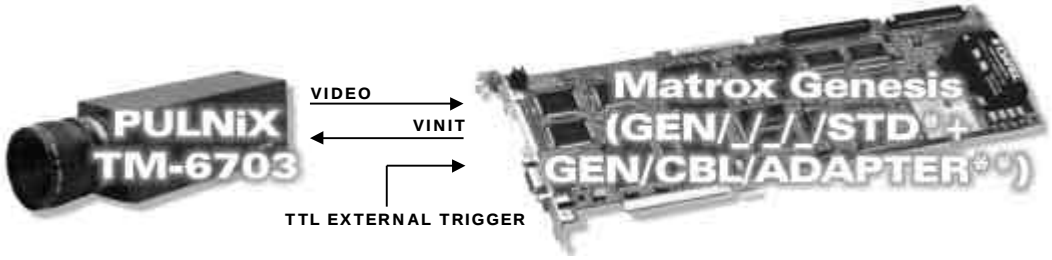
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

PULNiX TM-6703

September 24, 1999

Camera Descriptions	• 648 x 484 x 8-bit @ at up to 220fps. • Single channel analog video output. • Progressive scan. • External or internal exposure control. • Internal or external sync. • 25.49 MHz pixel clock rate.
Interface modes	• Continuous, Asynchronous reset (External pulse width control)
Camera Interface Briefs	**Mode 1 : Continuous**  *** Matrox Genesis Main Board with Grab Module** • Up to 640 x 484 x 8-bit @ up to 220fps. • Single channel analog video. • Progressive scan. • Matrox Genesis receiving continuous video signals from camera. • DCF used: G703C60.DCF (640 x 484 @ 60fps) • DCF used: G703C120.DCF (640 x 242 @ 120fps) • DCF used: G703C125.DCF (640 x 200 @ 130fps) • DCF used: G703C220.DCF (640 x 100 @ 220fps) **Mode 2 : Asynchronous reset (External pulse width control)**  ***Matrox Genesis Main Board with Grab Module** **** Matrox Digital Cable Adapter Board** • Up to 640 x 484 x 8-bit. • Single channel analog video. • Progressive scan. • Matrox Genesis receiving TTL external trigger. • Matrox Genesis sending EXPOSURE2 (VINIT) signal to camera to initiate exposure and control exposure time. • Matrox Genesis receiving video signals from camera. • DCF used: G703A60.DCF (640 x 484) • DCF used: G703A120.DCF (640 x 242) • DCF used: G703A125.DCF (640 x 200) • DCF used: G703A220.DCF (640 x 100)

Camera Interface Details

Mode 1 : Continuous

- **Frame rate:** Matrox Genesis receives the continuous video from the camera. The frame rate is listed below for each mode.
- **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.
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows

Mode 1: Continuous

Modes	Normal	Double scan	200 line scan	100 line scan
Hz / Frame rate	60 / 60fps	120 / 120fps	125 / 130fps	220 / 220fps

Switches	***Settings***	***Settings***	***Settings***	***Settings***
Shutter (Speed)	As desired	As desired	As desired	As desired
ASY / MAN	MAN	MAN	MAN	MAN
N / P	N	N	P	P
O / T	O	T	T	O

Mode 2 : Asynchronous reset (External pulse width control)

- Once it has received the external trigger signal, Matrox Genesis sends the EXPOSURE2 (VINIT) signal to the camera with a width equal to the desired exposure time (following a **delay** of **286.2 ms (9H)** from the leading edge of the EXPOSURE2 (VINIT) signal).
- **Frame rate**: The frame rate is determined by the frequency of the external trigger signal.
- **Exposure time**: The active and inactive periods of the EXPOSURE2 (VINIT) signal is the exposure time. The default exposure time is listed below for each dcf. In order to change the width and deployment time of EXPOSURE2 (VINIT) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.
- **Minimum / maximum exposure width**: minimum EXPOSURE2 (VINIT) pulse width is equal to **63.6ms (2H),** while the maximum is equal to **15.9ms (500H).**
- **Camera switch settings:** Refer to the camera manual for additional information. Switches for this mode should be set as follows

Mode 2: Asynchronous reset (External pulse width control)

Modes	Normal	Double scan	200 line scan	100 line scan
Hz	60	120	125	220
Default Exposure Time	1.79 ms	2.16 ms	1.73 ms	1.83 ms

Switches	***Settings***	***Settings***	***Settings***	***Settings***
Shutter (Speed)	9	9	9	9
ASY / MAN	ASY	ASY	ASY	ASY
N / P	N	N	P	P
O / T	O	T	T	O

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Cabling Requirements

Mode 1 : Continuous

- IMG-7W2-TO-5BNC cable required for video output of camera.
- Video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera.

Mode 2 : Asynchronous reset (External pulse width control)

- IMG-7W2-TO-5BNC and DBHD68-TO-OPEN cables, and GEN/CBL/ADAPTER board required for TTL external trigger and video output of camera.
- Video input of IMG-7W2-TO-5BNC cable should be connected to video out BNC connector of camera.
- TTL external trigger source should be connected to Gray BNC of IMG-7W2-TO-5BNC cable.
- The following additional connection should be made between the 12-pin connector of the camera and the 68-pin connector of the Digital Cable Adapter board:

GEN/CBL/ADAPTER (68-pin connector)			**PULNiX TM-6703 (12-pin connector)**	
Pin name	***Pin no.***		***Pin name***	***Pin no.***
EXPOSURE2, OUTPUT, TTL	58	→	VINIT IN	06

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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