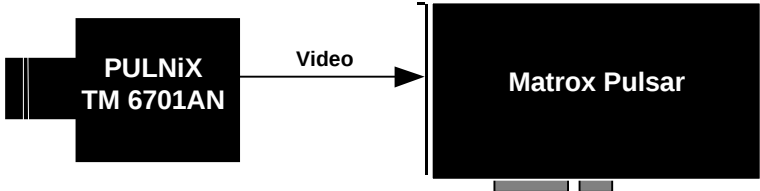
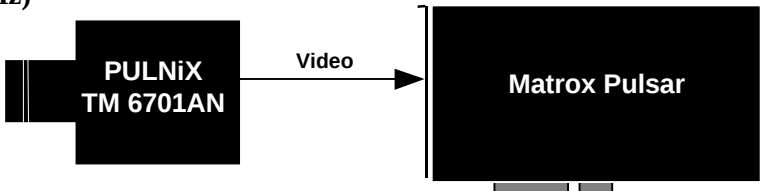
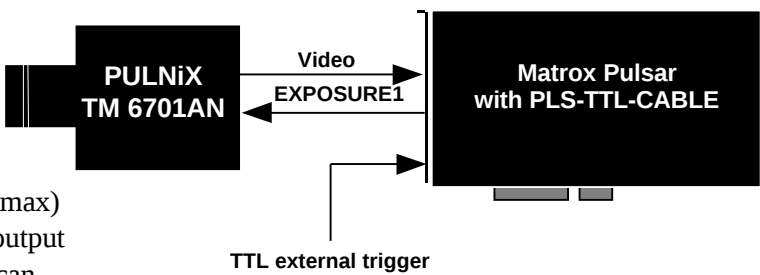


Application Note:

Interfacing non-standard cameras to Matrox Pulsar

PULNIX TM-6701AN

February 4, 1998

Camera Descriptions	• 640 x 480 x 8-bit @ 60fps or 640 x 240 x 8-bit @ 120fps • Analog video output. • Non-interlaced. • Internal sync. • 25.49 MHz pixel clock rate. • Internal exposure control.
Interface Modes	Continuous (60 MHz, 120 MHz), internal reset (fast, slow)
Camera Interface Briefs	Mode 1 : Continuous (60 Hz)  • 640 x 480 x 8-bit @ 60fps • Analog (composite) video output. • Continuous video. • Double-speed progressive scan. • DCF used : T6701N1.DCF Mode 2 : Continuous (120 Hz)  • 640 x 240 x 8-bit @ 120fps • Analog (composite) video output. • Continuous video. • Two-row progressive scan. • DCF used: T6701N2.DCF Mode 3: Internal fast reset  • 640 x 480 x 8-bit @ 60fps (max) • Analog (composite) video output • Double speed progressive scan • Internal exposure control: exposure time • Matrox Pulsar receiving TTL external trigger • Matrox Pulsar sends TTL_EXPOSURE1 (VINIT in) signal to camera to initiate exposure • DCF used: T6701NS0.DCF

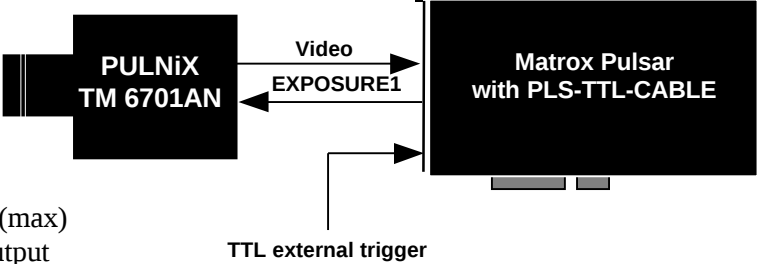
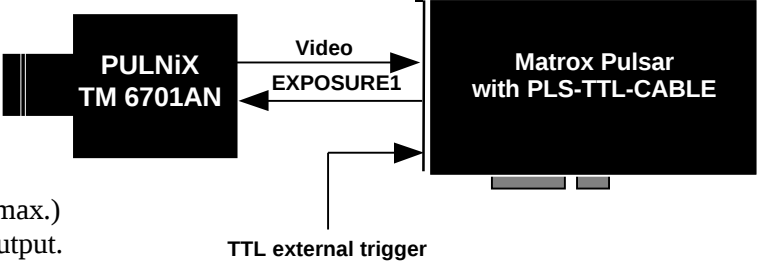
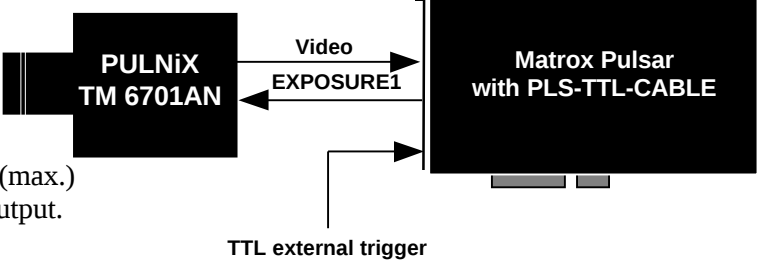
Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PULNIX TM-6701AN

February 4, 1998

Camera Interface Briefs (continued)	Mode 4: Internal slow reset  • 640 x 240 x 8-bit @ 120fps (max) • analog (composite) video output • two row progressive scan • internal exposure control: exposure time set with shutter control switch on rear panel of camera (positions 5-8) • Matrox Pulsar receiving TTL external trigger • Matrox Pulsar sends TTL_EXPOSURE1 (VINIT in) signal to camera to initiate exposure. • DCF used: T6701NS1.DCF Mode 5 : Asynchronous reset (60 Hz)  • 640 x 480 x 8-bit @ 60fps (max.) • Analog (composite) video output. • Double-speed progressive scan. • Matrox Pulsar receiving TTL external trigger. • Matrox Pulsar sending EXPOSURE1 (VINIT) signal to camera to initiate exposure and control exposure time • DCF used : T6701N1E.DCF Mode 6 : Asynchronous reset (120 Hz)  • 640 x 240 x 8-bit @ 120fps (max.) • Analog (composite) video output. • Two-row progressive scan. • Matrox Pulsar receiving TTL external trigger. • Matrox Pulsar sending EXPOSURE1 (VINIT) signal to camera to initiate exposure and control exposure time • DCF used: T6701N2E.DCF
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Application Note:

Interfacing non-standard cameras to Matrox Pulsar

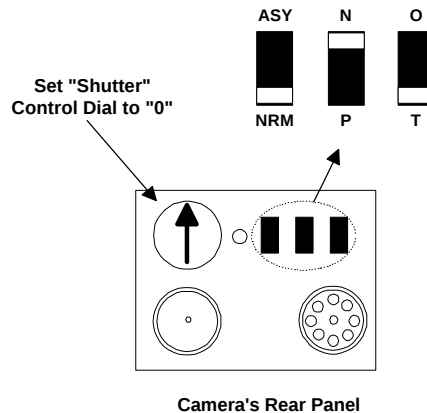


PULNIX TM-6701AN

February 4, 1998

Camera Interface Details

Mode 1 and 2: Continuous (60 and 120 Hz)



- The three switches on the rear of the camera must be set to NRM, N, and O for 60 Hz operation, and NRM, N, and T for 120 Hz operation.
- The shutter control switch on the rear of the camera must be set to position '0'.

Mode 3 and 4: Internal fast and slow reset

- Positions 1 through 8 of the shutter control switch on the rear of the camera correspond to the following exposure times:

Shutter control switch positions

Internal fast reset mode

Position	Exposure time (s)
1	1/320001H
2	1/160002H
3	1/8000 4H
4	1/4000 8H

Internal slow reset mode

Position	Exposure time (s)
5	1/200016H
6	1/100032H
7	1/500 64H
8	1/250128H

- The delay between the rising edge of the external trigger pulse and the falling edge of the TTL_EXPOSURE1 pulse is 10 μ s.
- The width of the TTL_EXPOSURE1 pulse must be greater than 63 μ s (two horizontal line times).
- The camera is reset upon the falling edge of the TTL_EXPOSURE1 (VINIT IN) pulse and will expose for the amount of time as set on the shutter control switch..

Mode 5 and 6 : Asynchronous reset (Pulse Width Control - 60 and 120 Hz)

- The three switches on the rear of the camera must be set respectively to ASY (asynchronous shutter mode), N and O for 60 Hz operation, and ASY, N, and T for 120 Hz operation; the shutter control switch on the rear of the camera must be set to position 9.
- The camera is reset upon the falling edge of the EXPOSURE1 (VINIT IN) pulse. The exposure period is for the inactive (low) period of EXPOSURE1 (VINIT IN). The default exposure time in this DCF is 6.4 ms.

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PULNIX TM-6701AN

February 4, 1998

Cabling Requirements	Mode 1 and 2: Continuous (60 and 120 Hz)																														
	• IMG-7W2-TO-1BNC cable required for video input of camera (single input) • Video input of IMG-7W2-TO-1BNC cable should be connected to video out BNC connector of camera																														
	Mode 3: Internal slow reset																														
	• IMG-7W2-TO-5BNC cable and PLS-TTL-CABLE required • video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera • the three switches on the rear of the camera must be set respectively to ASY (asynchronous shutter mode), N and O; the shutter control switch on the rear of the camera must be set to a position between 1 and 4 • the connections between the DB-37 connector of the PLS-TTL-CABLE, the 12-pin connector of the camera and the power supply are as follows:																														
	<table><tr><td colspan="2">PLS-TTL-CABLE (DB-37 connector)</td><td></td><td colspan="2">PULNiX TM-6701AN (12-pin connector)</td><td>POWER SUPPLY</td></tr><tr><td>Pin name</td><td>Pin no.</td><td></td><td>Pin name</td><td>Pin no.</td><td></td></tr><tr><td>TTL_EXPOSURE1</td><td>9</td><td>→</td><td>VINIT in</td><td>6</td><td></td></tr><tr><td>GROUND</td><td>7</td><td></td><td>GND</td><td>1, 3, 5, or 8</td><td>GND</td></tr><tr><td></td><td></td><td></td><td>12V DC in</td><td>2</td><td>+12V</td></tr></table>	PLS-TTL-CABLE (DB-37 connector)			PULNiX TM-6701AN (12-pin connector)		POWER SUPPLY	Pin name	Pin no.		Pin name	Pin no.		TTL_EXPOSURE1	9	→	VINIT in	6		GROUND	7		GND	1, 3, 5, or 8	GND				12V DC in	2	+12V
	PLS-TTL-CABLE (DB-37 connector)			PULNiX TM-6701AN (12-pin connector)		POWER SUPPLY																									
	Pin name	Pin no.		Pin name	Pin no.																										
	TTL_EXPOSURE1	9	→	VINIT in	6																										
	GROUND	7		GND	1, 3, 5, or 8	GND																									
				12V DC in	2	+12V																									
• TTL external trigger source should be connected to the TTL Trigger Input of the IMG-7W2-TO-5BNC cable.																															
Mode 4: Internal slow reset																															
• IMG-7W2-TO-5BNC cable and PLS-TTL-CABLE required • video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera • the three switches on the rear of the camera must be set respectively to ASY (asynchronous shutter mode), N and T; the shutter control switch on the rear of the camera must be set to a position between 5 and 8 • the connections between the DB-37 connector of the PLS-TTL-CABLE and the 12-pin connector of the camera are as in internal fast reset mode. • TTL external trigger source should be connected to the TTL Trigger Input of the IMG-7W2-TO-5BNC cable																															

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PULNIX TM-6701AN

February 4, 1998

Cabling Requirements (continued)	Mode 5 and 6 : Asynchronous reset (Pulse Width Control - 60 and 120 Hz) • IMG-7W2-TO-5BNC cable and PLS-TTL-CABLE required • Video input BNC of IMG-7W2-TO-5BNC cable should be connected to video out BNC connector of camera • The connections between the DB-37 connector of the PLS-TTL-CABLE and the 12-pin connector of the camera are as in internal fast reset mode. • TTL external trigger source should be connected to the TTL Trigger input of the IMG-7W2-TO-5BNC cable
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The DCF(s) mentioned in this application note can be found on the MIL and MIL-Lite CD, or our FTP site ([ftp.matrox.com](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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