

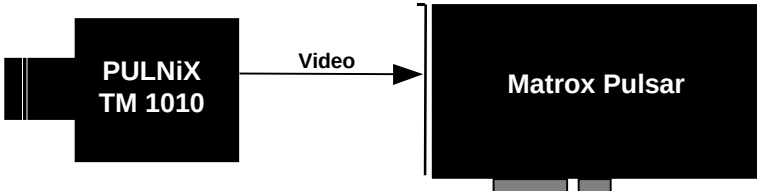
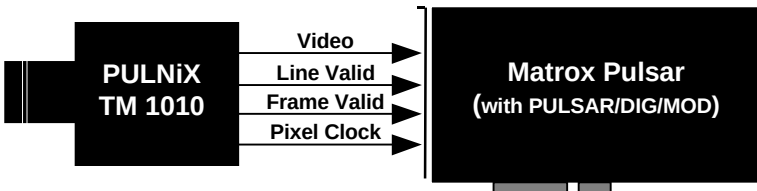
Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PULNiX TM-1010

February 10, 1998

Camera Descriptions	• 996 x 1016 x 10-bit. • Digital (RS-422) or analog video output @ 15 fps. • Non-interlaced (progressive scan). • Hsync, vsync and pixel clock signals (all RS-422) supplied by camera. • 20 MHz pixel clock rate. • Internal or external exposure control.
Interface Modes	• Continuous mode (analog and digital video output), asynchronous reset mode (pulse width control mode)
Camera Interface Briefs	Mode 1: Continuous mode (analog video output)  • 1000 x 1016 x 10-bit @ 15fps. • Analog video output. • Non-interlaced (progressive scan). • Continuous video. • DCF used: TM1010N.DCF Mode 2: Continuous mode (digital video output)  • 996 x 1016 x 10-bit @ 15fps. • Digital video output (RS-422). • Non-interlaced (progressive scan). • Continuous video. • Camera sending RS-422 hsync (Line Data Valid or LDV), RS-422 vsync (Frame Data Valid or FDV) and RS-422 pixel clock (CLK @ 20 MHz) signals to Matrox Pulsar. • DCF used: TM1010ND.DCF

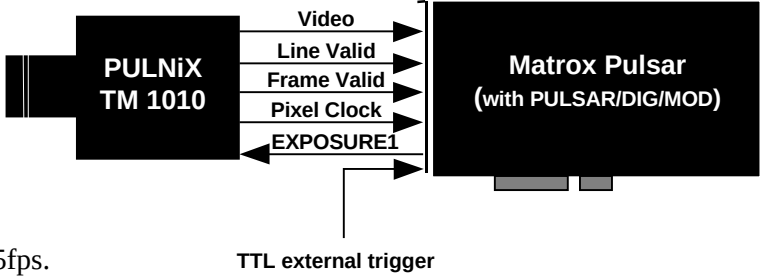
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Camera Interface Briefs (Continued)	Mode 3: Asynchronous Reset (Pulse Width Control Mode)  • 996 x 1016 x 10-bit @ 15fps. • Digital video output (RS-422). • Non-interlaced (progressive scan) • External exposure control. • Matrox Pulsar receiving TTL external trigger signal. • Matrox Pulsar sends EXPOSURE1 (VINIT) signal to camera: the EXPOSURE1 signal both initiates exposure and controls exposure time. • Camera sending RS-422 hsync (Line Data valid or LDV), RS-422 vsync (Frame Data Valid or FDV), and RS-422 pixel clock (CLK @ 20 MHz) signals to Matrox Pulsar. • DCF used: TM1010AE.DCF
Cabling Requirements	Mode 1: Continuous mode (analog video output) • IMG-7W2-TO-1BNC cable required for video output of camera (single channel). • Video input BNC of IMG-7W2-TO-1BNC cable should be connected to VIDEO OUT BNC connector of camera. • The two switches on the rear of the camera must be set respectively to NRM (normal mode) and NSP (normal speed); the Shutter Control Switch on the rear of the camera must be set to 0 (no shutter). Mode 2: Continuous mode (digital video output) • PULSAR/DIG/MOD required for digital data and syncs in RS-422 format • The two switches on the rear of the camera must be set respectively to NRM (normal mode) and NSP (normal speed); the Shutter Control Switch on the rear of the camera must be set to 0 (no shutter).

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Cabling Requirements (Continued)	• The connections between the 68-pin connector of the PULSAR/DIG/MOD and the 31-pin connector of the camera are as follows:				
	PULSAR/DIG/MOD (68-pin connector)		PULNiX TM-1010 (31-pin DC connector)		
	Pin name	Pin no.		Pin name Pin no.	
	CLKIN+	29	←	CLK+	01
	CLKIN-	63	←	CLK-	17
	HSYNC+	26	←	LDV+	02
	HSYNC-	60	←	LDV-	18
	VSYNC+	25	←	FDV+	03
	VSYNC-	59	←	FDV-	19
	GROUND	34		GND	04
	GROUND	12		GND	16
	DATA0+	20	←	D0+	06
	DATA0-	54	←	D0-	22
	DATA1+	19	←	D1+	07
	DATA1-	53	←	D1-	23
	DATA2+	16	←	D2+	08
	DATA2-	50	←	D2-	24
	DATA3+	15	←	D3+	09
	DATA3-	49	←	D3-	25
	DATA4+	14	←	D4+	10
	DATA4-	48	←	D4-	26
	DATA5+	13	←	D5+	11
	DATA5-	47	←	D5-	27
	DATA6+	11	←	D6+	12
	DATA6-	45	←	D6-	28
	DATA7+	10	←	D7+	13
	DATA7-	44	←	D7-	29
	DATA8+	09	←	D8+	14
	DATA8-	43	←	D8-	30
	DATA9+	08	←	D9+	15
	DATA9-	42	←	D9-	31
	Mode 3: Asynchronous Reset (Pulse Width Control Mode)				
	• IMG-7W2-TO-5BNC cable required for TTL external trigger; PULSAR/DIG/MOD required for digital data and syncs in RS-422 format, and for TTL control signals.				
• The two switches on the rear of the camera must be set respectively to ASY (asynchronous shutter mode) and NSP (normal speed); the Shutter Control Switch on the rear of the camera must be set to 9 (external pulse width control mode).					

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PULNiX TM-1010

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Cabling Requirements
(Continued)

- The connections between the 68-pin connector of the PULSAR/DIG/MOD and the 31-pin connector of the camera are as in continuous mode (digital video output) with the exception of the following:

PULSAR/DIG/MOD (68-pin connector)		PULNiX TM-1010 (31-pin DC connector)	
Pin name	Pin no.	Pin name	Pin no.
TTL_EXPOSURE1	66→	VINIT	20
- TTL external trigger source should be connected to the TTL Trigger Input of the IMG-7W2-TO-5BNC cable.
- An RS-422 external trigger input may also be used once the following connections between the 68-pin connector of the PULSAR/DIG/MOD and the external trigger source are made:

PULSAR/DIG/MOD (68-pin connector)		External trigger source	
Pin name	Pin no.	Pin name	
TRIGGER+	27	←	“RS-422 TRIGGER+”
TRIGGER-	61	←	“RS-422 TRIGGER-”
- Use Matrox Intellicam in order to modify the DCF for an RS-422 external trigger input. Consult the Matrox Intellicam User Guide for more information

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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