

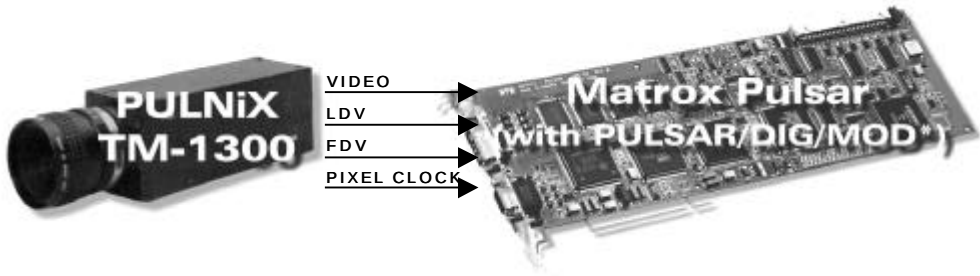
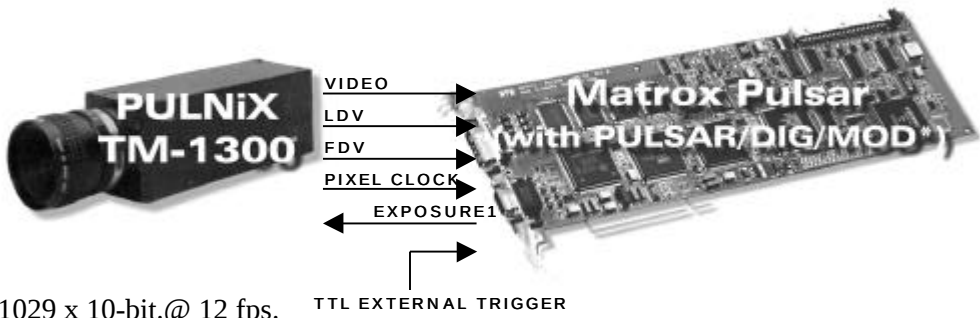
Application Note:

Interfacing non-standard cameras to Matrox Pulsar

MATROX
PULSAR

PULNiX TM-1300

March 30, 1998

Camera Descriptions	• 1284 x 1029 x 10-bit. • Digital (RS-422) video output @ 12 fps. • Non-interlaced (progressive scan). • Hsync, vsync and pixel clock signals (all RS-422) supplied by camera. • 20 MHz pixel clock rate • Internal exposure control
Interface mode	• Continuous mode, asynchronous reset mode
Camera Interface Briefs	Mode 1: Continuous mode  • 1284 x 1029 x 10-bit @ 12 fps. • Digital (RS-422) video output. • Non-interlaced (progressive scan). • Continuous video. • DCF used: TM1300ND.DCF Mode 2: Asynchronous Reset mode  • 1284 x 1029 x 10-bit.@ 12 fps. • Digital video output (RS-422). • Non-interlaced (progressive scan) • Internal exposure control. • Matrox Pulsar receiving TTL external trigger signal. • Matrox Pulsar sends EXPOSURE1 (VINIT) signal to camera; the EXPOSURE1 signal initiates exposure; exposure time determined by internal camera settings. • 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: TM1300A.DCF

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Camera Interface Details	Mode 1 and 2: Continuous and Asynchronous Reset mode The mode control switch on the camera’s rear must be set to “0” (Normal Mode) for Mode 1: Continuous and set to “2” for Mode 2: Asynchronous Reset mode. Shutter Control Switch can be set to the desired shutter speed for both interface modes. Refer to the camera manual for more information.																																																																																																																																																										
Cabling Requirements	Mode 1: Continuous mode - PULSAR/DIG/MOD required for digital data and syncs in RS-422 format. - The connections between the 68-pin connector of the PULSAR/DIG/MOD and the 31-pin connector of the camera are as follows: <table><thead><tr><th colspan="2">PULSAR/DIG/MOD (68-pin connector)</th><th></th><th colspan="2">PULNiX TM-1300 (31-pin DC connector)</th></tr><tr><th>Pin name</th><th>Pin no.</th><th></th><th>Pin name</th><th>Pin no.</th></tr></thead><tbody><tr><td>CLKIN+</td><td>29</td><td>←</td><td>CLK+</td><td>01</td></tr><tr><td>CLKIN–</td><td>63</td><td>←</td><td>CLK–</td><td>17</td></tr><tr><td>HSYNC+</td><td>26</td><td>←</td><td>LDV+</td><td>02</td></tr><tr><td>HSYNC–</td><td>60</td><td>←</td><td>LDV–</td><td>18</td></tr><tr><td>VSYNC+</td><td>25</td><td>←</td><td>FDV+</td><td>03</td></tr><tr><td>VSYNC–</td><td>59</td><td>←</td><td>FDV–</td><td>19</td></tr><tr><td>GROUND</td><td>34</td><td></td><td>GND</td><td>04</td></tr><tr><td>GROUND</td><td>12</td><td></td><td>GND</td><td>16</td></tr><tr><td>DATA0+</td><td>20</td><td>←</td><td>D0+</td><td>06</td></tr><tr><td>DATA0–</td><td>54</td><td>←</td><td>D0–</td><td>22</td></tr><tr><td>DATA1+</td><td>19</td><td>←</td><td>D1+</td><td>07</td></tr><tr><td>DATA1–</td><td>53</td><td>←</td><td>D1–</td><td>23</td></tr><tr><td>DATA2+</td><td>16</td><td>←</td><td>D2+</td><td>08</td></tr><tr><td>DATA2–</td><td>50</td><td>←</td><td>D2–</td><td>24</td></tr><tr><td>DATA3+</td><td>15</td><td>←</td><td>D3+</td><td>09</td></tr><tr><td>DATA3–</td><td>49</td><td>←</td><td>D3–</td><td>25</td></tr><tr><td>DATA4+</td><td>14</td><td>←</td><td>D4+</td><td>10</td></tr><tr><td>DATA4–</td><td>48</td><td>←</td><td>D4–</td><td>26</td></tr><tr><td>DATA5+</td><td>13</td><td>←</td><td>D5+</td><td>11</td></tr><tr><td>DATA5–</td><td>47</td><td>←</td><td>D5–</td><td>27</td></tr><tr><td>DATA6+</td><td>11</td><td>←</td><td>D6+</td><td>12</td></tr><tr><td>DATA6–</td><td>45</td><td>←</td><td>D6–</td><td>28</td></tr><tr><td>DATA7+</td><td>10</td><td>←</td><td>D7+</td><td>13</td></tr><tr><td>DATA7–</td><td>44</td><td>←</td><td>D7–</td><td>29</td></tr><tr><td>DATA8+</td><td>09</td><td>←</td><td>D8+</td><td>14</td></tr><tr><td>DATA8–</td><td>43</td><td>←</td><td>D8–</td><td>30</td></tr><tr><td>DATA9+</td><td>08</td><td>←</td><td>D9+</td><td>15</td></tr><tr><td>DATA9–</td><td>42</td><td>←</td><td>D9–</td><td>31</td></tr></tbody></table>					PULSAR/DIG/MOD (68-pin connector)			PULNiX TM-1300 (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
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Cabling Requirements	Mode 2: Asynchronous Reset 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 signal. • 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) plus the following extra connections:				
	PULSAR/DIG/MOD (68-pin connector)			PULNiX TM-1300 (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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