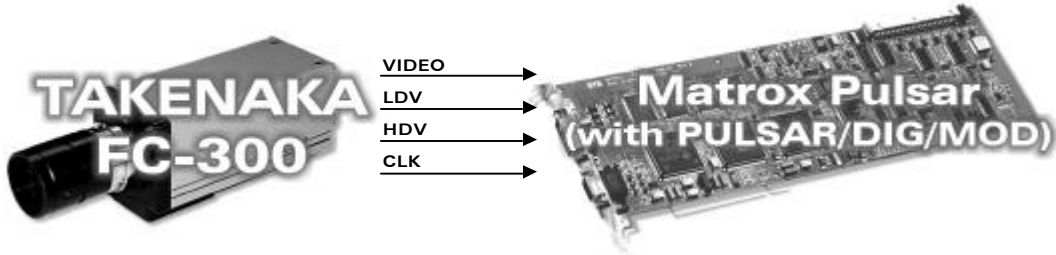
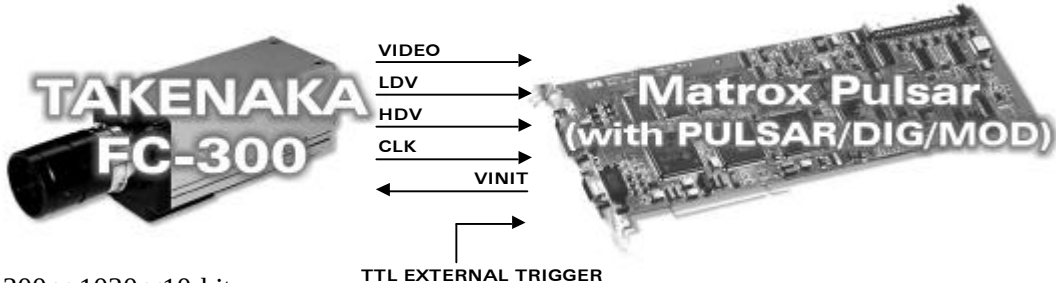


Application Note:

Interfacing non-standard cameras to Matrox Pulsar

TAKENAKA FC-300

March 28, 2000

Camera Descriptions	• 659 × 494 × 10-bit @ 12 fps • Single tap analog or RS-422 digital video output. • Progressive scan • External sync. • Internal or external exposure control. • Pixel clock: 12.27 MHz
Interface modes	• Continuous, asynchronous reset
Camera Interface Briefs	Mode 1: Continuous  • 1300 × 1030 × 10-bit @ 12 fps • Single tap RS-422 digital video output. • Progressive scan • Continuous video. • Matrox Pulsar receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 12.27 MHz) and video signal from camera. • DCF used: PFC300C.DCF Mode 2: Asynchronous reset  • 1300 × 1030 × 10-bit • Single tap RS-422 digital video output. • Progressive scan • Matrox Pulsar receiving TTL external trigger. • Matrox Pulsar sending EXPOSURE1 (VINIT) signal to camera; the EXPOSURE1 (VINIT) signal initiate exposure. • Matrox Pulsar receiving HSYNC (LDV), VSYNC (FDV), PIXEL CLOCK (CLK @ 12.27 MHz) and video signal from camera. • DCF used: PFC300A.DCF

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



TAKENAKA FC-300

March 28, 2000

Camera Interface Details	Mode 1: Continuous • Frame rate: Matrox Pulsar receives the continuous video from the camera at 12 frames per second. • 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: External switch settings are as follows: <table><tr><th>Switch</th><th>Setting</th></tr><tr><td>Shutter</td><td>0</td></tr><tr><td>Mode</td><td>5</td></tr><tr><td>Up/Down</td><td>UP</td></tr></table> Mode 2: Asynchronous Reset • Once it has received the external trigger signal, Matrox Pulsar sends the EXPOSURE1 (VINIT) signal to the camera to initiate and control the exposure period. • Frame rate: The frame rate is determined by the frequency of the external trigger signal. • Exposure time: Exposure time is dependent on the shutter switch setting as well as the width of the EXPOSURE1 (VINIT) signal (active and inactive periods). The default exposure time for this DCF is equal to 200 ms. In order to change the width and deployment time of EXPOSURE1 (VINIT) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information. • Camera switch settings: External switch settings are as follows: <table><tr><th>Switch</th><th>Setting</th></tr><tr><td>Shutter</td><td>0</td></tr><tr><td>Mode</td><td>5</td></tr><tr><td>Up/Down</td><td>DOWN</td></tr></table>	Switch	Setting	Shutter	0	Mode	5	Up/Down	UP	Switch	Setting	Shutter	0	Mode	5	Up/Down	DOWN																																		
Switch	Setting																																																		
Shutter	0																																																		
Mode	5																																																		
Up/Down	UP																																																		
Switch	Setting																																																		
Shutter	0																																																		
Mode	5																																																		
Up/Down	DOWN																																																		
Cabling Requirements	Mode 1: Continuous • DBHD68-TO-OPEN cable and PULSAR/DIG/MOD board required for digital data, synchronization and control signals. • Connections between the 36-pin connector (D-SUB) of the camera and the 68-pin connector of the Matrox Pulsar are as follows: <table><tr><th colspan="2">TAKENAKA FC-300 (36-pin connector)</th><th></th><th colspan="2">PULSAR/DIG/MOD (68-pin connector)</th></tr><tr><th>Pin name</th><th>Pin no.</th><th></th><th>Pin name</th><th>Pin no.</th></tr><tr><td>DO 0+</td><td>15</td><td>→</td><td>DATA0+ (LSB)</td><td>20</td></tr><tr><td>DO 0-</td><td>16</td><td>→</td><td>DATA0- (LSB)</td><td>54</td></tr><tr><td>DO 1+</td><td>17</td><td>→</td><td>DATA1+</td><td>19</td></tr><tr><td>DO 1-</td><td>18</td><td>→</td><td>DATA1-</td><td>04</td></tr><tr><td>DO 2+</td><td>19</td><td>→</td><td>DATA2+</td><td>16</td></tr><tr><td>DO 2-</td><td>20</td><td>→</td><td>DATA2-</td><td>50</td></tr><tr><td>DO 3+</td><td>21</td><td>→</td><td>DATA3+</td><td>15</td></tr><tr><td>DO 3-</td><td>22</td><td>→</td><td>DATA3-</td><td>49</td></tr></table> continued	TAKENAKA FC-300 (36-pin connector)			PULSAR/DIG/MOD (68-pin connector)		Pin name	Pin no.		Pin name	Pin no.	DO 0+	15	→	DATA0+ (LSB)	20	DO 0-	16	→	DATA0- (LSB)	54	DO 1+	17	→	DATA1+	19	DO 1-	18	→	DATA1-	04	DO 2+	19	→	DATA2+	16	DO 2-	20	→	DATA2-	50	DO 3+	21	→	DATA3+	15	DO 3-	22	→	DATA3-	49
TAKENAKA FC-300 (36-pin connector)			PULSAR/DIG/MOD (68-pin connector)																																																
Pin name	Pin no.		Pin name	Pin no.																																															
DO 0+	15	→	DATA0+ (LSB)	20																																															
DO 0-	16	→	DATA0- (LSB)	54																																															
DO 1+	17	→	DATA1+	19																																															
DO 1-	18	→	DATA1-	04																																															
DO 2+	19	→	DATA2+	16																																															
DO 2-	20	→	DATA2-	50																																															
DO 3+	21	→	DATA3+	15																																															
DO 3-	22	→	DATA3-	49																																															

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



TAKENAKA FC-300

March 28, 2000

Cabling Requirements	TAKENAKA FC-300 (36-pin connector)		PULSAR/DIG/MOD (68-pin connector)	
	<i>Pin name</i>	<i>Pin no.</i>	<i>Pin name</i>	<i>Pin no.</i>
	DO 4+	23	→ DATA4+	14
	DO 4-	24	→ DATA4-	48
	DO 5+	25	→ DATA5+	13
	DO 5-	26	→ DATA5-	47
	DO 6+	27	→ DATA6+	11
	DO 6-	28	→ DATA6-	45
	DO 7+	29	→ DATA7+	10
	DO 7-	30	→ DATA7-	44
	DO 8+	31	→ DATA8+	09
	DO 8-	32	→ DATA8-	43
	DO 9+	33	→ DATA9+	08
	DO 9-	34	→ DATA9-	42
	LDV+	03	→ HSYNC+	26
	LDV-	04	→ HSYNC-	60
	FDV+	05	→ VSYNC+	25
	FDV-	06	→ VSYNC-	59
	CLK+	01	→ CLKIN+	29
	CLK-	02	→ CLKIN-	63
	GND	07	GROUND	01
	GND	08	GROUND	68
	VINIT	14	← TTL_EXPOSURE1	66*

* This connection not required for this mode, however allows this cable to be used with all modes.

Mode 2: Asynchronous Reset

- DBHD68-TO-OPEN cable and PULSAR/DIG/MOD board required for TTL external trigger, digital data, synchronization and control signals.
- TTL external trigger should be connected to the TTL Trigger Input of the DBHD68-TO-OPEN cable.
- All connections between the 36-pin connector (**D-SUB**) of the camera and the 100-pin connector of the Matrox Pulsar are as in *Mode 1: Continuous*

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: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.

Corporate headquarters:

Canada and U.S.A.

Matrox Electronic Systems Ltd.
1055 St. Regis Blvd.
Dorval, Quebec H9P 2T4
Canada
Tel: (514) 685-2630
Fax: (514) 822-6273

