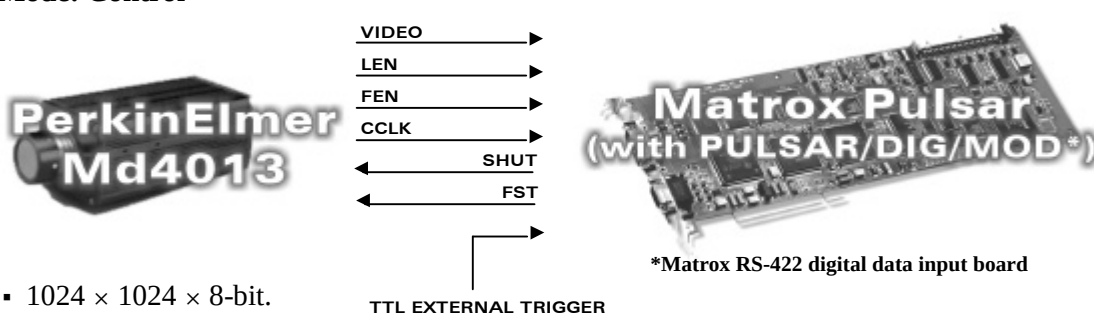


Application Note:

Interfacing non-standard cameras to Matrox Pulsar

PerkinElmer (EG&G RETICON) MD4013

June 16, 2000

Camera Description	▪ 1024 × 1024 × 8-bit @ 30 fps (maximum). ▪ RS-422 digital video output. ▪ Progressive scan. ▪ External sync. ▪ External exposure control. ▪ Pixel clock: 20 MHz
Interface Mode	▪ Control
Camera Interface Briefs	Mode: Control  *Matrox RS-422 digital data input board ▪ 1024 × 1024 × 8-bit. ▪ RS-422 digital video. ▪ Progressive scan. ▪ Matrox Pulsar receiving TTL external trigger. ▪ Matrox Pulsar sends EXPOSURE1 (FST) and EXPOSURE2 (SHUT) signals to camera to initiate and control exposure. ▪ Matrox Pulsar receiving HSYNC (LINE ENBLE), VSYNC (FEN), PIXEL CLOCK (CCLK @ 20 MHz), and video signals. ▪ DCF used: MD4013.DCF
Camera Interface Details	Mode: Control ▪ Once it has received the external signal to trigger, the Matrox Pulsar sends an EXPOSURE2 (SHUT) signal to the camera. The camera awaits the rising edge of the signal, at which point it initiates exposure. Matrox Pulsar sets the exposure time; the camera will expose for as long as the EXPOSURE2 (SHUT) signal is high. The camera initiates frame readout upon arrival of the falling edge of the EXPOSURE1 (FST) signal. ▪ The image captured by Matrox Pulsar resides scrambled in the host buffer and must be reconstructed. The original image is stretched and folded over; in the host buffer, the pixel columns from the second half of the original image are interleaved in a “folded paper” fashion with the pixel columns from the first half of the original image. ▪ The 30 ms immediately following the falling edge of the Frame Start signal cover the shift and readout of the entire array; therefore, in order to avoid smearing, the camera must not be triggered for a minimum of 30 ms after a Frame Start signal is received.

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PerkinElmer (EG&G RETICON) MD4013

June 16, 2000

Cabling Requirements	Mode: Control			
	- DBHD68-TO-OPEN (open end) cable and PULSAR/DIG/MOD board required for digital data, synchronization and control signals. - TTL external trigger source should be connected to the TTL Trigger Input of the DBHD68-TO-OPEN (open end) cable. - Connections between the 68-pin connector of the camera and the 68-pin connector of the PULSAR/DIG/MOD are as follows:			
	PULSAR/DIG/MOD (68-pin connector)		ROPER SCIENTIFIC (EG&G) MD4013 (TOP DB-37 connector)	
	Pin name	Pin no.	Pin name	Pin no.
	CLKIN+	29	CCLK+	01
	CLKIN-	63	CCLK-	20
	HSYNC+	26	LEN+	02
	HSYNC-	60	LEN-	21
	VSNC+	25	FEN+	03
	VSNC-	59	FEN-	22
	EXPOSURE1+	30	FST+	24
	EXPOSURE1-	64	FST-	05
	EXPOSURE2+	28	SHUT+	06
	EXPOSURE2-	62	SHUT-	25
	DATA0+	20	ADATA0	08
	DATA1+	19	ADATA1	09
	DATA2+	16	ADATA2	10
	DATA3+	15	ADATA3	11
	DATA4+	14	ADATA4	12
	DATA5+	13	ADATA5	13
	DATA6+	11	ADATA6	14
	DATA7+	10	ADATA7	15
	DATA0-	54	BDATA0	27
	DATA1-	53	BDATA1	28
	DATA2-	50	BDATA2	29
	DATA3-	49	BDATA3	30
	DATA4-	48	BDATA4	31
	DATA5-	47	BDATA5	32
	DATA6-	45	BDATA6	33
	DATA7-	44	BDATA7	34
	PULSAR/DIG/MOD (68-pin connector)		ROPER SCIENTIFIC (EG&G) MD4013 (BOTTOM DB-37 connector)	
	Pin name	Pin no.	Pin name	Pin no.
	DATA8+	09	ADATA0	08
	DATA9+	08	ADATA1	09
	continued			

Application Note:

Interfacing non-standard cameras to Matrox Pulsar



PerkinElmer (EG&G RETICON) MD4013

June 16, 2000

Cabling Requirements (continued)	PULSAR/DIG/MOD (68-pin connector)			ROPER SCIENTIFIC (EG&G) MD4013 (TOP DB-37 connector)		
	Pin name	Pin no.		Pin name	Pin no.	
	DATA10+	07	←	ADATA2	10	
	DATA11+	06	←	ADATA3	11	
	DATA12+	05	←	ADATA4	12	
	DATA13+	04	←	ADATA5	13	
	DATA14+	03	←	ADATA6	14	
	DATA15+	02	←	ADATA7	15	
	DATA8-	43	←	BDATA0	27	
	DATA9-	42	←	BDATA1	28	
	DATA10-	41	←	BDATA2	29	
	DATA11-	40	←	BDATA3	30	
	DATA12-	39	←	BDATA4	31	
	DATA13-	38	←	BDATA5	32	
	DATA14-	37	←	BDATA6	33	
	DATA15-	36	←	BDATA7	34	
	• A RS-422 external trigger input may also be used once the following connections between the 68-pin SCSI-2 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-"		

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 Imaging Applications at 514-822-6061 for assistance.

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