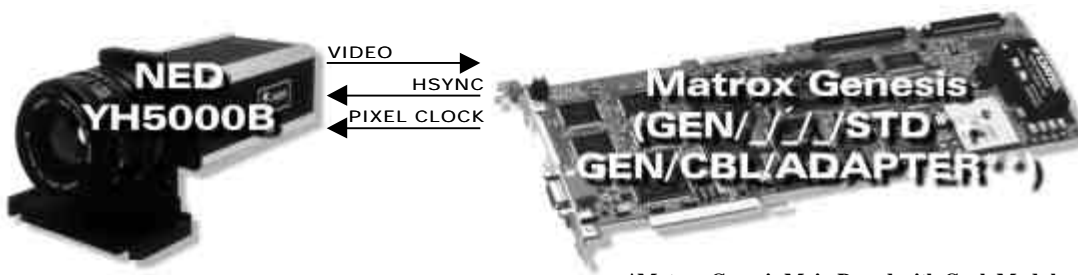
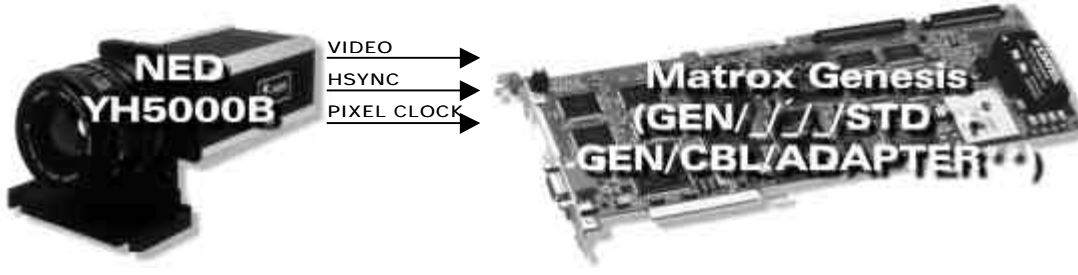


Application Note:

Interfacing non-standard cameras to Matrox Genesis

NED YH5000B

August 10, 1998

Camera Descriptions	<ul style="list-style-type: none"> • 5000 × 8-bit. • Single channel analog video output. • Internal exposure control. • Pixel Clock rate of 10 MHz.
Interface modes	<ul style="list-style-type: none"> • Fixed line scan rate mode (Genesis master or slave)
Camera Interface Briefs	<p>Mode 1: Fixed line scan rate (Genesis master)</p>  <p>*Matrox Genesis Main Board with Grab Module ** Matrox Digital Cable Adapter Board</p> <ul style="list-style-type: none"> • 5000 × 8-bit. • Single channel analog video output. • DCF configured for 512 lines per virtual frame. • Line scan rate is fixed and determined by the frequency of the HSYNC signal. • Exposure time is software controlled in Matrox Intellicam. • Matrox Genesis sending RS-422 HSYNC and RS-422 PIXEL CLOCK (CMCLK) signals to camera. • Matrox Genesis receiving video signal from camera. • DCF used: NED5GM.DCF <p>Mode 2: Fixed line scan rate (Genesis slave)</p>  <p>*Matrox Genesis Main Board with Grab Module ** Matrox Digital Cable Adapter Board</p> <ul style="list-style-type: none"> • 5000 × 8-bit. • Single channel analog video output. • DCF configured for 512 lines per virtual frame. • Line scan rate is fixed and determined by the frequency of the HSYNC signal. • Exposure time is inversely proportional to the line scan rate. • Matrox Genesis receiving RS-422 HSYNC, RS-422 PIXEL CLOCK (CMCLK), and video signals from camera. • DCF used: NED5CM.DCF

Application Note:

Interfacing non-standard cameras to Matrox Genesis

NED YH5000B

August 10, 1998

Camera Interface Details	<p>Mode 1: Fixed line scan rate mode (Genesis master)</p> <ul style="list-style-type: none">• Matrox Genesis sending HSYNC and PIXEL CLOCK (CMCLK) signals to the camera; the camera awaits the rising edge of the HSYNC signal and after a short (constant) delay initiates line readout.• Line rate: The HSYNC frequency specifies the line rate of the camera. The HSYNC frequency is currently set to 1.9802 kHz. With a 10 MHz pixel clock this translate to a 1.9802 kHz line rate.• Exposure time: Exposure time is controlled by the HSYNC which in turn is reset by the EXPOSURE1 (EXSYNC) setting in Matrox Intellicam. The default exposure time for this DCF is 6000 pixel clocks or 0.6 ms. The exposure time of the camera can be modified in the DCF using Matrox Intellicam EXPOSURE1 setting, Genesis Native Library function imCamControl() or with the MIL digitizer control function MdigControl(). Refer to the appropriate manual or user guide for additional information. <p>Mode 2: Fixed line scan rate (Genesis slave)</p> <ul style="list-style-type: none">• Matrox Genesis is receiving the HSYNC and PIXEL CLOCK (CMCLK) signals from the camera; Matrox Genesis awaits the rising edge of the RS-422 HSYNC signal and after a short (constant) delay initiates line readout.• Line rate: The line rate of the camera is fixed and controlled by the HSYNC frequency of the camera. The HSYNC of the camera is 1.9802 kHz With a 10 MHz pixel clock this translate to a 1.9802 kHz line rate. The line rate can be modified using the internal NED Camera Control Box switch settings. Refer to the Camera manual for further information.• Exposure time: Exposure time is fixed and inversely proportional to the line scan rate.• Minimum exposure time: The minimum exposure time is 505 ms.																													
	<p>Mode 1: Fixed line scan rate (Genesis master)</p> <ul style="list-style-type: none">• IMG-7W2-TO-5BNC cable and GEN/CBL/ADAPTER required for video output of camera.• Video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera.• Connections between the 68-pin connector of the GEN/CBL/ADAPTER and the 15-pin connector of the camera are as follows: <table><tr><th colspan="2">NED YH5000B (15-pin connector)</th><th></th><th colspan="2">GEN/CBL/ADAPTER (PLS/CBL/OPEN 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>HSYNC +</td><td>04</td><td>←</td><td>HSYNC, OUTPUT, 422+</td><td>08</td></tr><tr><td>HSYNC-</td><td>11</td><td>←</td><td>HSYNC, OUTPUT, 422-</td><td>42</td></tr><tr><td>CLOCK+</td><td>03</td><td>←</td><td>CLOCK, OUTPUT, 422+</td><td>06</td></tr><tr><td>CLOCK-</td><td>10</td><td>←</td><td>CLOCK, OUTPUT, 422-</td><td>40</td></tr></table>	NED YH5000B (15-pin connector)			GEN/CBL/ADAPTER (PLS/CBL/OPEN connector)		Pin name	Pin no.		Pin name	Pin no.	HSYNC +	04	←	HSYNC, OUTPUT, 422+	08	HSYNC-	11	←	HSYNC, OUTPUT, 422-	42	CLOCK+	03	←	CLOCK, OUTPUT, 422+	06	CLOCK-	10	←	CLOCK, OUTPUT, 422-
NED YH5000B (15-pin connector)			GEN/CBL/ADAPTER (PLS/CBL/OPEN connector)																											
Pin name	Pin no.		Pin name	Pin no.																										
HSYNC +	04	←	HSYNC, OUTPUT, 422+	08																										
HSYNC-	11	←	HSYNC, OUTPUT, 422-	42																										
CLOCK+	03	←	CLOCK, OUTPUT, 422+	06																										
CLOCK-	10	←	CLOCK, OUTPUT, 422-	40																										
Cabling Requirements																														

Application Note:

Interfacing non-standard cameras to Matrox Genesis

NED YH5000B

August 10, 1998

Cabling Requirements (continued)	Mode 2: Fixed line scan rate (Genesis slave)				
	<ul style="list-style-type: none">• IMG-7W2-TO-5BNC cable and GEN/CBL/ADAPTER required for video output of camera.• Video input BNC of IMG-7W2-TO-5BNC cable should be connected to VIDEO OUT BNC connector of camera.• Connections between the 68-pin connector of the GEN/CBL/ADAPTER and the 15-pin connector of the camera are as follows:				
	NED YH5000B (15-pin connector)		GEN/CBL/ADAPTER (PLS/CBL/OPEN connector)		
	<i>Pin name</i>	<i>Pin no.</i>	<i>Pin name</i>	<i>Pin no.</i>	
	HSYNC +	04	→	HSYNC, INPUT, 422+	16
	HSYNC-	11	→	HSYNC, INPUT, 422-	50
	CLOCK+	03	→	CLOCK, INPUT, 422+	13
	CLOCK-	10	→	CLOCK, INPUT, 422-	47

The DCF(s) mentioned in this application note can be found on the MIL and Native Library 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.

Corporate
Headquarters:
Canada and U.S.A.
Matrox Electronic
Systems Ltd.
1055 St.Regis Blvd.
Dorval, Quebec, Canada
H9P 2T4
Tel: (514) 685-7230
Fax: (514) 822-6273

