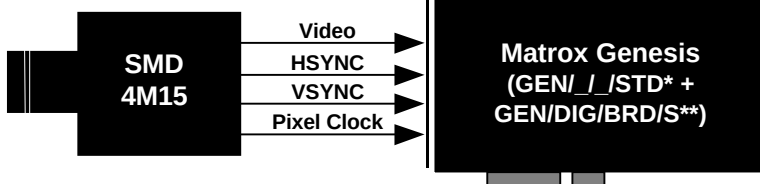
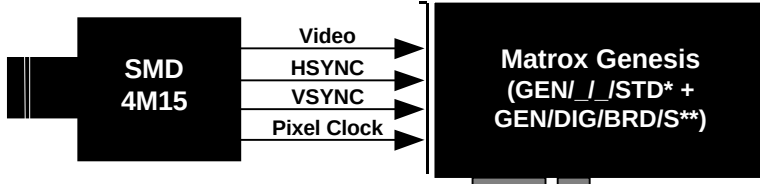


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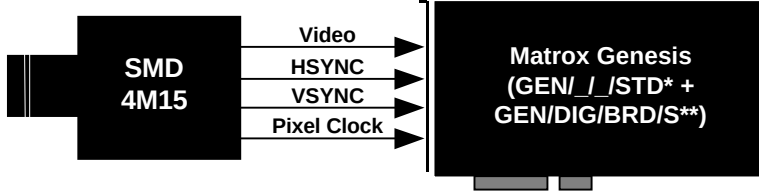
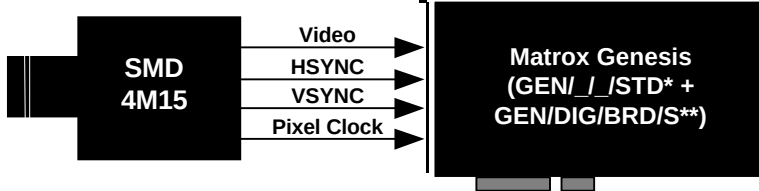
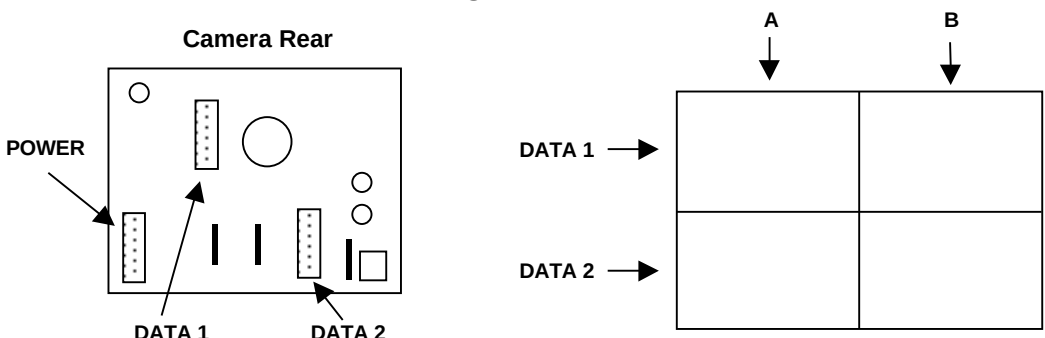
Camera Descriptions	• 2048 x 2048 x 12-bit @ 15 fps. • 4-channel digital video output (RS-422). • Non-interlaced (progressive scan). • Internal syncs. • Internal exposure control. • Maximum data rate per output: 15 MB/s N.B. This camera outputs 12-bit however only 8-bit was used for this interface
Interface mode	• Continuous (no Binning, 2x2 Binning, 4x4 Binning, AOI)
Camera Interface Briefs	Mode 1: Continuous (no Binning)  • 2048 x 2048 x 8-bit @ 15 fps. • 4-channel digital video output (RS-422). • Non-interlaced (progressive scan). • Continuous video. • Pixel clock frequency: 20 MHz • Matrox Genesis receiving RS-422 HSYNC, VSYNC and pixel clock signals from camera. • DCF used : SMDC1X1.DCF • Note: requires two additional programs for operation (see Camera Interface Details) Mode 2: Continuous (2x2 Binning)  • 1024 x 1024 x 8-bit @ 28 fps. • 4-channel digital video output (RS-422). • Non-interlaced (progressive scan). • Continuous video. • Pixel clock frequency: 10 MHz • Matrox Genesis receiving RS-422 HSYNC, VSYNC and pixel clock signals from camera. • DCF used : SMDC2X2.DCF • Note: requires two additional programs for operation (see Camera Interface Details) * Matrox Genesis Main Board with Grab Module ** Matrox Digital Data Input Board

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Camera Interface Briefs (continued)	Mode 3: Continuous (4x4 Binning)  • 512 x 512 x 8-bit @ 46 fps. • 4-channel digital video output (RS-422). • Non-interlaced (progressive scan). • Continuous video. • Pixel clock frequency: 5 MHz • Matrox Genesis receiving RS-422 HSYNC, VSYNC and pixel clock signals from camera. • DCF used : SMD4X4.DCF • Note: requires two additional programs for operation (see Camera Interface Details) Mode 4: Continuous (AOI -Area Of Interest)  • 1024 x 256 x 8-bit @ ≈ 15 fps. • 4-channel digital video output (RS-422). • Interlaced. • Continuous video. • Pixel clock frequency: 10 MHz • Matrox Genesis receiving RS-422 HSYNC, VSYNC and pixel clock signals from camera. • DCF used : SMDCAOI.DCF • Note: requires two additional programs for operation (see Camera Interface Details)
Camera Interface Details	Modes 1-4: Data connections and image viewed from front 

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Camera Interface Details (continued)	Modes 1-4: Continuous (no Binning, 2x2 Binning, 4x4 Binning, AOI) • In addition to the corresponding DCF file, two supplementary programs are required to operate the camera with the Matrox Genesis: comserial.c (to write data to the PC serial port) and grabsmc.c (to control the Matrox Genesis grabbing). • Programming the serial port requires the following usage: "comserial -x addr data" (hexadecimal values) or "comserial -d addr data" (decimal values) • Operating Modes: Address 0x81 of the camera controls the principle operating modes. - No Binning : comserial -x 81 02 2x2 Binning: comserial -x 81 06 4x4 Binning: comserial -x 81 0a - AOI mode : comserial -x 81 42 Mode 4: Continuous (AOI -Area Of Interest) • Start/End registers Addresses 0x89 and 0x8a control the START readout register. Addresses 0x8c and 0x8b control the END readout register. The commands below indicate that the readout will start at line 0x30f (783) and end at 0x410 (1040) for a total of 256 lines read out (per tap). - comserial -x 8a 0f - comserial -x 89 03 - comserial -x 8c 10 - comserial -x 8b 04 • For more information and options refer to the readme.txt file included with the DCFs and demo program or contact Matrox Imaging Applications at 514-822-6061 for assistance.
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Cabling Requirements	Modes 1-4: Continuous (no Binning, 2x2 Binning, 4x4 Binning, AOI)			
	• GEN-DIG-BRD/S required for digital data, syncs and control signals in RS-422 format. • The connections between the 15-pin quad connector (DATA1) of the camera and the 100-pin connector of the GEN-DIG-BRD/S are as follows:			
	SMD 4M15 (DATA1 15-pin quad-row connector)		GEN-DIG-BRD/S (GEN/CBL/OPEN connector)	
	<i>Pin name</i>	<i>Pin no.</i>	<i>Pin name</i>	<i>Pin no.</i>
	D1A4+	09 →	DATA, INPUT, 0+	01
	D1A4-	10 →	DATA, INPUT, 0-	02
	D1A5+	11 →	DATA, INPUT, 1+	03
	D1A5-	12 →	DATA, INPUT, 1-	04
	D1A6+	13 →	DATA, INPUT, 2+	05
	D1A6-	14 →	DATA, INPUT, 2-	06
	D1A7+	17 →	DATA, INPUT, 3+	07
	D1A7-	18 →	DATA, INPUT, 3-	08
	D1A8+	19 →	DATA, INPUT, 4+	09
	D1A8-	20 →	DATA, INPUT, 4-	10
	D1A9+	21 →	DATA, INPUT, 5+	11
	D1A9-	22 →	DATA, INPUT, 5-	12
	D1A10+	23 →	DATA, INPUT, 6+	13
	D1A10-	24 →	DATA, INPUT, 6-	14
	D1A11+	25 →	DATA, INPUT, 7+	15
	D1A11-	26 →	DATA, INPUT, 7-	16
	D1B4+	40 →	DATA, INPUT, 8+	17
	D1B4-	39 →	DATA, INPUT, 8-	18
	D1B5+	38 →	DATA, INPUT, 9+	19
	D1B5-	37 →	DATA, INPUT, 9-	20
	D1B6+	36 →	DATA, INPUT, 10+	21
	D1B6-	35 →	DATA, INPUT, 10-	22
	D1B7+	34 →	DATA, INPUT, 11+	23
	D1B7-	33 →	DATA, INPUT, 11-	24
	D1B8+	32 →	DATA, INPUT, 12+	25
	D1B8-	31 →	DATA, INPUT, 12-	26
	D1B9+	52 →	DATA, INPUT, 13+	27
	D1B9-	51 →	DATA, INPUT, 13-	28
	D1B10+	50 →	DATA, INPUT, 14+	29
	D1B10-	49 →	DATA, INPUT, 14-	30
	D1B11+	48 →	DATA, INPUT, 15+	31
	D1B11-	47 →	DATA, INPUT, 15-	32
	D1HSYNC+	58 →	HSYNC, INPUT, +	33
	D1HSYNC -	57 →	HSYNC, INPUT, -	34
	D1VSYNC+	56 →	VSYNC, INPUT, +	35
	D1VSYNC -	55 →	VSYNC, INPUT, -	36
	D1GND+	45 →	GROUND	37
	D1GND-	46 →	GROUND	38
	D1PCLK+	60 →	CLOCK, INPUT, +	39
	D1PCLK -	59 →	CLOCK, INPUT, -	40

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Cabling Requirements (continued)	The connections between the 15-pin quad-row connector (DATA2) of the camera and the 100-pin connector of the GEN-DIG-BRD/S are as follows:			
	SMD 4M15 (DATA2 15-pin quad-row connector)		GEN-DIG-BRD/S (GEN/CBL/OPEN connector)	
	<i>Pin name</i>	<i>Pin no.</i>	<i>Pin name</i>	<i>Pin no.</i>
	D2A4+	09 →	DATA, INPUT, 16+	51
	D2A4-	10 →	DATA, INPUT, 16-	52
	D2A5+	11 →	DATA, INPUT, 17+	53
	D2A5-	12 →	DATA, INPUT, 17-	54
	D2A6+	13 →	DATA, INPUT, 18+	55
	D2A6-	14 →	DATA, INPUT, 18-	56
	D2A7+	17 →	DATA, INPUT, 19+	57
	D2A7-	18 →	DATA, INPUT, 19-	58
	D2A8+	19 →	DATA, INPUT, 20+	59
	D2A8-	20 →	DATA, INPUT, 20-	60
	D2A9+	21 →	DATA, INPUT, 21+	61
	D2A9-	22 →	DATA, INPUT, 21-	62
	D2A10+	23 →	DATA, INPUT, 22+	63
	D2A10-	24 →	DATA, INPUT, 22-	64
	D2A11+	25 →	DATA, INPUT, 23+	65
	D2A11-	26 →	DATA, INPUT, 23-	66
	D2B4+	40 →	DATA, INPUT, 24+	67
	D2B4-	39 →	DATA, INPUT, 24-	68
	D2B5+	38 →	DATA, INPUT, 25+	69
	D2B5-	37 →	DATA, INPUT, 25-	70
	D2B6+	36 →	DATA, INPUT, 26+	71
	D2B6-	35 →	DATA, INPUT, 26-	72
	D2B7+	34 →	DATA, INPUT, 27+	73
	D2B7-	33 →	DATA, INPUT, 27-	74
	D2B8+	32 →	DATA, INPUT, 28+	75
	D2B8-	31 →	DATA, INPUT, 29-	76
	D2B9+	52 →	DATA, INPUT, 29+	77
	D2B9-	51 →	DATA, INPUT, 30-	78
	D2B10+	50 →	DATA, INPUT, 31+	79
	D2B10-	49 →	DATA, INPUT, 31-	80
	D2B11+	48 →	DATA, INPUT, 32+	81
	D2B11-	47 →	DATA, INPUT, 32-	82

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 Matrox for more information, if necessary.

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