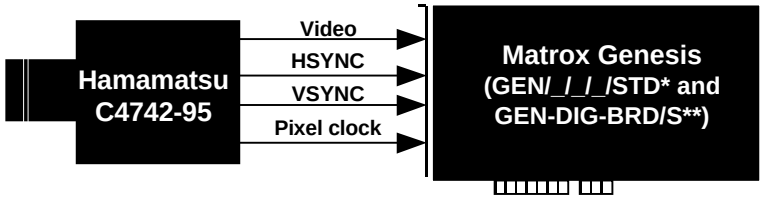
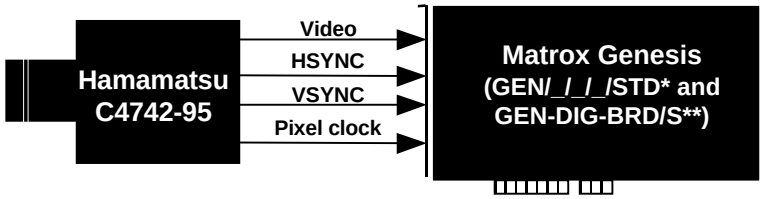
Application Note:
Interfacing non-standard cameras to Matrox Genesis

MATROX GENESIS

Hamamatsu C4742-95

March 21, 1997

Camera Descriptions	• 1280 (H) x 1024 (V). • Digital video output (10-bit, RS-422). • Non-interlaced. • Internal or external exposure control.
Interface Modes	• Continuous mode (Full resolution, binning)
Camera Interface Briefs	**Mode 1: Continuous mode (Full resolution)**  * Matrox Genesis Main Board with Grab Module ** Matrox Digital Module Board • 1280 (H) x 1024 (V). • Digital video output (10-bit, RS-422). • Non-interlaced. • Matrox Genesis receiving RS-422 HSYNC, RS-422 VSYNC, RS-422 Pixel clock, RS-422 Video output. • Pixel clock: 14.75 MHz. • DCF used: 4742DN.DCF **Mode 2: Continuous mode (Binning)**  * Matrox Genesis Main Board with Grab Module ** Matrox Digital Module Board • 640 (H) x 512 (V). • Digital video output (10-bit, RS-422). • Non-interlaced. • Matrox Genesis receiving RS-422 HSYNC, RS-422 VSYNC, RS-422 Pixel clock, RS-422 Video output. • Pixel clock: 7.35 MHz. • DCF used: 4742DNBN.DCF

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Camera Interface Details

Mode 1: Continuous mode (Full resolution)

- The Genesis is SLAVE in this mode, in other words the camera sends the RS-422 (10-bit) Video, RS-422 HSYNC, RS-422 VSYNC and RS-422 Pixel clock in continuous mode to the Genesis.
- The frame scan rate equals 9 fps.
- The camera's parameters are set using the C4742-95 controller software. The correct commands for this mode should be set to:
  - AMD N (Free run)
  - SHA F (1280 x 1024 mode)
  - SMD N (Normal read)
  - NMD N (Normal exposure)

Mode 2: Continuous mode (Binning)

- The Genesis is SLAVE in this mode, in other words the camera sends the RS-422 (10-bit) Video, RS-422 HSYNC, RS-422 VSYNC and RS-422 Pixel clock in continuous mode to the Genesis.
- The frame scan rate equals 18 fps.
- The camera's parameters are set using the C4742-95 controller software. The correct commands for this mode should be set to:
  - AMD N (Free run)
  - SHA F (1280 x 1024 mode)
  - SMD S (Binning read)
  - NMD N (Normal exposure)

Cabling Requirements

Mode 1: Continuous mode (Full resolution)

- GEN-DIG-BRD/S board required for digital data, syncs and control signals in RS-422 format.
- The connections between the GEN-DIG-BRD/S and the 68-pin connector of the camera are as follows:

GEN-DIG-BRD/S (GEN/CBL/OPEN connector)			**Hamamatsu C4742-95 (68-pin connector)**	
Pin name	***Pin no***		***Pin name***	***Pin no.***
CLOCK, INPUT, -	40	←	PIXCLK -	1
CLOCK, INPUT, +	39	←	PIXCLK +	35
HSYNC, INPUT, -	34	←	HVALID -	2
HSYNC, INPUT, +	33	←	HVALID +	36
VSYNC, INPUT, -	36	←	VVALID -	3
VSYNC, INPUT, +	35	←	VVALID +	37
DATA, INPUT, 0 -	2	←	DB0 -	4
DATA, INPUT, 0 +	1	←	DB0 +	38

(Pin-out continued)

Cabling Requirements (continued)

DATA, INPUT, 1 -	4	←	DB1 -	5
DATA, INPUT, 1 +	3	←	DB1 +	39
DATA, INPUT, 2 -	6	←	DB2 -	6
DATA, INPUT, 2 +	5	←	DB2 +	40
DATA, INPUT, 3-	8	←	DB3 -	7
DATA, INPUT, 3 +	7	←	DB3 +	41
DATA, INPUT, 4	10	←	DB4 -	8
DATA, INPUT, 4 +	9	←	DB4 +	42
DATA, INPUT, 5-	12	←	DB5 -	9
DATA, INPUT, 5 +	11	←	DB5 +	43
DATA, INPUT, 6-	14	←	DB6 -	10
DATA, INPUT, 6 +	13	←	DB6 +	44
DATA, INPUT, 7-	16	←	DB7 -	11
DATA, INPUT, 7 +	15	←	DB7 +	45
DATA, INPUT, 8-	18	←	DB8 -	12
DATA, INPUT, 8 +	17	←	DB8 +	46
DATA, INPUT, 9-	20	←	DB9 -	13
DATA, INPUT, 9 +	19	←	DB9 +	47
USER, INPUT, 0 -	42	←	A/D OVF -	20
USER, INPUT, 0 +	41	←	A/D OVF +	54

Mode 2: Continuous mode (Binning)

All connections are the same as in Mode 1 : *Continuous mode (Full resolution)*

Contact your local sales representative or Matrox Sales Office, or contact Matrox Imaging Applications at 514-822-6061 for assistance.

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). 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. C*ontact Matrox for more information, if necessary.*

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