

# MATROX GENESIS

## CAMERA INTERFACE APPLICATION NOTE

### QIMAGING PMI 4200

MAY 11, 2001

Basics about the  
camera

#### Camera Descriptions

- 2048 × 2048 × 12-bit @ up to 6 fps.
- Single channel RS-422 digital video output.
- Progressive scan.
- External exposure control.
- 8 MHz pixel clock rate (maximum).

#### Interface Mode

- Control (high resolution)

Mode of operations as  
per Matrox Imaging (in  
parentheses as per  
camera manufacturer)

Basics about the  
interface modes

#### Camera Interface Briefs

##### Mode: Control (high resolution)

- 1964 × 1978 × 12-bit @ 1.7 fps.
- Single channel RS-422 digital video.
- Progressive scan.
- Matrox Genesis sending EXPOSURE1 (EXPOSE) signal to camera.
- Matrox Genesis receiving HSYNC (LINE ENABLE), VSYNC (FRAME ENABLE), PIXEL CLOCK (PIXEL STROBE) and video signals from camera.
- DCF used: [PMI4200.DCF](#) (Created for XILLIX PMI 4200)



\*Matrox Genesis main board with grab module

\*\*Matrox RS-422 digital data input board

Specifics about the  
interface modes

#### Camera Interface Details

##### Mode: Control (high resolution)

- **Frame rate:** The frame rate is determined by the frequency of the periodic EXPOSURE1 (EXPOSE) signal. For this DCF the maximum rate equals **1.7 fps**.
- **Exposure time:** The width (rising edge to falling edge) of the EXPOSURE1 (EXPOSE) signal is the exposure time. The default exposure time is equal to **0.51 seconds**. The exposure time can be modified in the DCF using Matrox Intellicam, Genesis Native Library (GNL) imCamControl() or with the MIL MdigControl() function. Consult the respective manual for more information.

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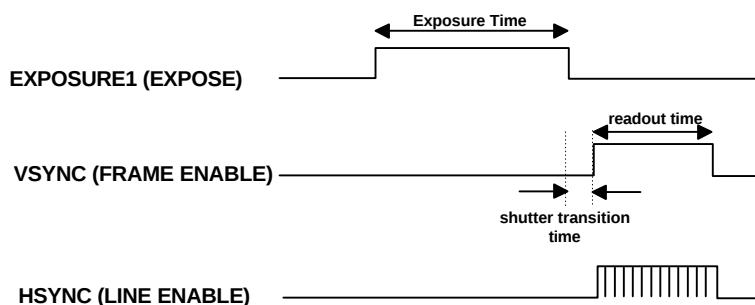
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Specifics about the  
interface modes

#### Camera Interface Details (continued)

##### ▪ Timing diagram:



Cabling details for this  
interface mode

#### Cabling Requirements

##### **Mode: Control (high resolution)**

- **Cable:** DBHD100-TO-OPEN (open ended) cable required for digital data, synchronization and control signals.
- **Connection:** Connections between the 50-pin connector of the camera and the 100-pin connector of the Matrox Genesis are as follows:

##### QIMAGING PMI 4200 (50-pin connector)

| Pin name         | Pin no. |
|------------------|---------|
| EXPOSE +         | 02      |
| EXPOSE -         | 27      |
| PIXEL STROBE +   | 04      |
| PIXEL STROBE -   | 29      |
| FRAME ENABLE +   | 06      |
| FRAME ENABLE -   | 31      |
| LINE ENABLE +    | 07      |
| LINE ENABLE -    | 32      |
| GND              | 08      |
| GND              | 33      |
| MODE CONTROL 3 + | 09      |
| MODE CONTROL 3 - | 34      |
| MODE CONTROL 1 + | 11      |
| MODE CONTROL 1 - | 36      |
| DATA 12 (MSB) +  | 13      |
| DATA 12 -        | 38      |
| DATA 11 +        | 14      |
| DATA 11 -        | 39      |
| DATA 10 +        | 15      |
| DATA 10 -        | 40      |
| CONTINUED...     |         |

##### Matrox Genesis (100-pin connector)

| Pin name             | Pin no. |
|----------------------|---------|
| EXPOSURE1, OUTPUT, + | 95      |
| EXPOSURE1, OUTPUT, - | 96      |
| CLOCK, INPUT, +      | 39      |
| CLOCK, INPUT, -      | 40      |
| VSYNC, INPUT, +      | 35      |
| VSYNC, INPUT, -      | 36      |
| HSYNC, INPUT, +      | 33      |
| HSYNC, INPUT, -      | 34      |
| GROUND               | 37      |
| GROUND               | 38      |
| USER, OUTPUT, 0 +    | 91      |
| USER, OUTPUT, 0 -    | 92      |
| USER, OUTPUT, 1 +    | 93      |
| USER, OUTPUT, 1 -    | 94      |
| DATA, INPUT, 11+     | 23      |
| DATA, INPUT, 11-     | 24      |
| DATA, INPUT, 10+     | 21      |
| DATA, INPUT, 10-     | 22      |
| DATA, INPUT, 9+      | 19      |
| DATA, INPUT, 9-      | 20      |

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*Cabling details for this  
interface mode*

### Cabling Requirements (continued)

#### QIMAGING PMI 4200 (50-pin connector)

| <i>Pin name</i> | <i>Pin no.</i> |
|-----------------|----------------|
| DATA 9 +        | 16             |
| DATA 9 -        | 41             |
| DATA 8 +        | 17             |
| DATA 8 -        | 42             |
| DATA 7 +        | 18             |
| DATA 7 -        | 43             |
| DATA 6 +        | 19             |
| DATA 6 -        | 44             |
| DATA 5 +        | 20             |
| DATA 5 -        | 45             |
| DATA 4 +        | 21             |
| DATA 4 -        | 46             |
| DATA 3 +        | 22             |
| DATA 3 -        | 47             |
| DATA 2 +        | 23             |
| DATA 2 -        | 48             |
| DATA 1 (LSB) +  | 24             |
| DATA 1 (LSB) -  | 49             |
| GND             | 25             |

#### Matrox Genesis (100-pin connector)

| <i>Pin name</i> | <i>Pin no.</i> |
|-----------------|----------------|
| DATA, INPUT, 8+ | 17             |
| DATA, INPUT, 8- | 18             |
| DATA, INPUT, 7+ | 15             |
| DATA, INPUT, 7- | 16             |
| DATA, INPUT, 6+ | 13             |
| DATA, INPUT, 6- | 14             |
| DATA, INPUT, 5+ | 11             |
| DATA, INPUT, 5- | 12             |
| DATA, INPUT, 4+ | 09             |
| DATA, INPUT, 4- | 10             |
| DATA, INPUT, 3+ | 07             |
| DATA, INPUT, 3- | 08             |
| DATA, INPUT, 2+ | 05             |
| DATA, INPUT, 2- | 06             |
| DATA, INPUT, 1+ | 03             |
| DATA, INPUT, 1- | 04             |
| DATA, INPUT, 0+ | 01             |
| DATA, INPUT, 0- | 02             |
| GROUND          | 37             |

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 H9P 2T4  
Canada  
Tel: (514) 685-2630  
Fax: (514) 822-6273

