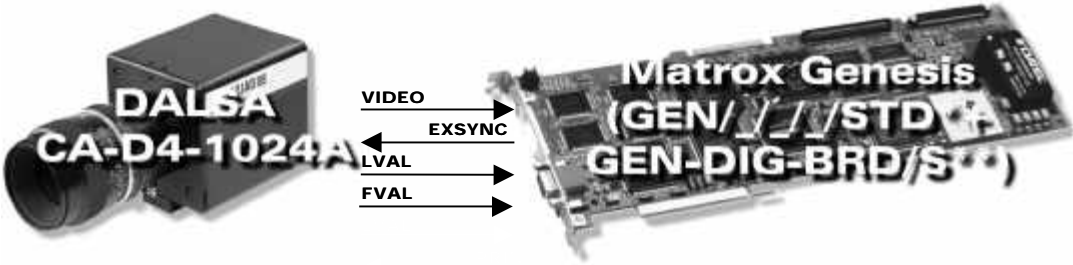
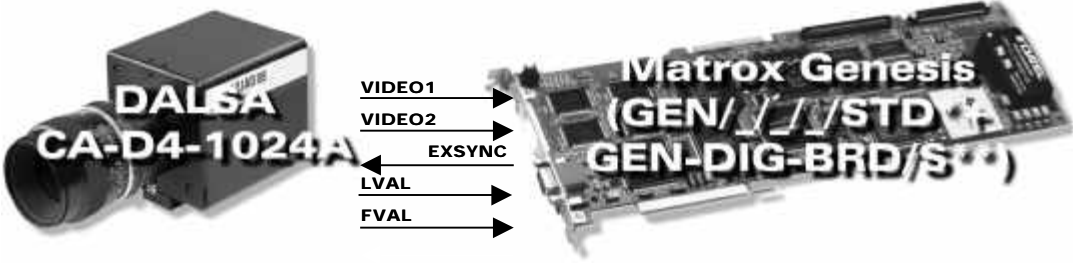


# Application Note: Interfacing non-standard cameras to Matrox Genesis

DALSA CA-D4-1024A/B

June 12, 1998

<p><b>Camera Descriptions</b></p>	<ul style="list-style-type: none"> <li>• 1024 x 1024 x 8-bit.</li> <li>• Single or dual channel RS-422 digital video output.</li> <li>• Exposure control.</li> <li>• Maximum data rate per output: 25 MHz.</li> </ul>
<p><b>Interface modes</b></p>	<ul style="list-style-type: none"> <li>• Continuous (single, dual-tap)</li> </ul>
<p><b>Camera Interface Briefs</b></p>	<p><b>Mode 1: Continuous (single tap)</b></p>  <ul style="list-style-type: none"> <li>• 1024 x 1024 x 8-bit @20fps.</li> <li>• RS-422 digital video output.</li> <li>• Progressive scan.</li> <li>• Continuous video.</li> <li>• Matrox Genesis sending periodic RS-422 EXPOSURE 1 (EXSYNC) signals to camera. The frequency of EXPOSURE1 signal determines the exposure time and the frame rate; the EXPOSURE1 signal initiates frame readout.</li> <li>• Matrox Genesis receiving RS-422 HSYNC (LVAL) and RS-422 VSYNC (FVAL) signals from camera.</li> <li>• DCF used: <a href="#">CAD41K1T.DCF</a></li> </ul> <p><b>Mode 2: Continuous (two-tap)</b></p>  <ul style="list-style-type: none"> <li>• 1024 x 8-bit @40fps (two-tap).</li> <li>• RS-422 digital video output.</li> <li>• Progressive scan.</li> <li>• Continuous video.</li> <li>• Matrox Genesis sending periodic RS-422 EXPOSURE 1 (EXSYNC) signals to camera. The frequency of EXPOSURE1 signal determines the exposure time and the frame rate; the EXPOSURE1 signal initiates frame readout.</li> <li>• Matrox Genesis receiving RS-422 HSYNC (LVAL) and RS-422 VSYNC (FVAL) signals from camera.</li> <li>• DCF used: <a href="#">CAD41K2T.DCF</a></li> </ul> <p style="text-align: right;">*Matrox Genesis Main Board with Grab Module **Matrox Digital Data Input Board</p>

# Application Note: Interfacing non-standard cameras to Matrox Genesis

DALSA CA-D4-1024A/B

June 12, 1998

<p><b>Camera Interface Details</b></p>	<p><b>Mode 2: Continuous (dual-tap)</b></p> <ul style="list-style-type: none"> <li>As described in the camera manual, a user can select either single or dual tap with model 1024A, however only dual tap can be selected with model 1024B. For single tap (single-channel output), pixel data is output starting at column 0 and proceeds to 1023. With dual-tap (two-channel output) columns 0-511 are read to OS1 while simultaneously columns 1032-512 are read to OS2.</li> <li>The output mirrors the right half of the image, and requires to be inverted. Additional processing time is thereby required to invert the mirrored output. Model 1024B does not require any additional processing time since the tap's output is reformatted before output. For additional information, refer to the camera manual.</li> </ul>																																																																																												
<p><b>Cabling Requirements</b></p>	<p><b>Mode 1: Continuous (single tap)</b></p> <ul style="list-style-type: none"> <li>GEN-DIG-BRD/s required for digital data, syncs and control signals in RS-422 format.</li> <li>Connections between the two 20-pin dual-row connector (<b>OS1</b>) of the camera and the 100-pin connector of the GEN-DIG-BRD/S are as follows:</li> </ul> <table border="0"> <thead> <tr> <th colspan="2"><b>DALSA CA-D4-1024A/B</b></th> <th colspan="2"><b>GEN-DIG-BRD/S</b></th> </tr> <tr> <th colspan="2"><b>(OS1 20-pin IDC connector)</b></th> <th colspan="2"><b>(GEN/CBL/OPEN connector)</b></th> </tr> <tr> <th><b>Pin name</b></th> <th><b>Pin no.</b></th> <th><b>Pin name</b></th> <th><b>Pin no.</b></th> </tr> </thead> <tbody> <tr><td>D7</td><td>01</td><td>→ DATA, INPUT, 7+</td><td>15</td></tr> <tr><td>D7B</td><td>02</td><td>→ DATA, INPUT, 7-</td><td>16</td></tr> <tr><td>D6</td><td>03</td><td>→ DATA, INPUT, 6+</td><td>13</td></tr> <tr><td>D6B</td><td>04</td><td>→ DATA, INPUT, 6-</td><td>14</td></tr> <tr><td>D5</td><td>05</td><td>→ DATA, INPUT, 5+</td><td>11</td></tr> <tr><td>D5B</td><td>06</td><td>→ DATA, INPUT, 5-</td><td>12</td></tr> <tr><td>D4</td><td>07</td><td>→ DATA, INPUT, 4+</td><td>09</td></tr> <tr><td>D4B</td><td>08</td><td>→ DATA, INPUT, 4-</td><td>10</td></tr> <tr><td>D3</td><td>09</td><td>→ DATA, INPUT, 3+</td><td>07</td></tr> <tr><td>D3B</td><td>10</td><td>→ DATA, INPUT, 3-</td><td>08</td></tr> <tr><td>D2</td><td>11</td><td>→ DATA, INPUT, 2+</td><td>05</td></tr> <tr><td>D2B</td><td>12</td><td>→ DATA, INPUT, 2-</td><td>06</td></tr> <tr><td>D1</td><td>13</td><td>→ DATA, INPUT, 1+</td><td>03</td></tr> <tr><td>D1B</td><td>14</td><td>→ DATA, INPUT, 1-</td><td>04</td></tr> <tr><td>D0</td><td>15</td><td>→ DATA, INPUT, 0+</td><td>01</td></tr> <tr><td>D0B</td><td>16</td><td>→ DATA, INPUT, 0-</td><td>02</td></tr> <tr><td>STROBE</td><td>17</td><td>→ CLOCK, INPUT, +</td><td>39</td></tr> <tr><td>STROBEB</td><td>18</td><td>→ CLOCK, INPUT, -</td><td>40</td></tr> <tr><td>LVAL</td><td>19</td><td>→ VSYNC, INPUT, +</td><td>33</td></tr> <tr><td>LVALB</td><td>20</td><td>→ VSYNC, INPUT, -</td><td>34</td></tr> </tbody> </table>	<b>DALSA CA-D4-1024A/B</b>		<b>GEN-DIG-BRD/S</b>		<b>(OS1 20-pin IDC connector)</b>		<b>(GEN/CBL/OPEN connector)</b>		<b>Pin name</b>	<b>Pin no.</b>	<b>Pin name</b>	<b>Pin no.</b>	D7	01	→ DATA, INPUT, 7+	15	D7B	02	→ DATA, INPUT, 7-	16	D6	03	→ DATA, INPUT, 6+	13	D6B	04	→ DATA, INPUT, 6-	14	D5	05	→ DATA, INPUT, 5+	11	D5B	06	→ DATA, INPUT, 5-	12	D4	07	→ DATA, INPUT, 4+	09	D4B	08	→ DATA, INPUT, 4-	10	D3	09	→ DATA, INPUT, 3+	07	D3B	10	→ DATA, INPUT, 3-	08	D2	11	→ DATA, INPUT, 2+	05	D2B	12	→ DATA, INPUT, 2-	06	D1	13	→ DATA, INPUT, 1+	03	D1B	14	→ DATA, INPUT, 1-	04	D0	15	→ DATA, INPUT, 0+	01	D0B	16	→ DATA, INPUT, 0-	02	STROBE	17	→ CLOCK, INPUT, +	39	STROBEB	18	→ CLOCK, INPUT, -	40	LVAL	19	→ VSYNC, INPUT, +	33	LVALB	20	→ VSYNC, INPUT, -	34
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# Application Note: Interfacing non-standard cameras to Matrox Genesis

DALSA CA-D4-1024A/B

June 12, 1998

<b>Cabling Requirements (continued)</b>	<ul style="list-style-type: none"> <li>The connections between the two 20-pin dual-row connector (<b>0S2</b>) of the camera and the 100-pin connector of the GEN-DIG-BRD/S are as follows:</li> </ul>																																																																																			
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# Application Note: Interfacing non-standard cameras to Matrox Genesis

DALSA CA-D4-1024A/B

June 12, 1998

<p><b>Cabling Requirements (continued)</b></p>	<ul style="list-style-type: none"> <li>The connections between the DB-25 connector on the rear panel of the camera and the power supply are as follows:</li> </ul> <div style="text-align: center; margin: 10px 0;"> <table style="margin: auto;"> <thead> <tr> <th colspan="2" style="text-align: left;">DALSA CA-D4-1024A (DB-25 male connector)</th> <th style="text-align: center;">POWER SUPPLY</th> </tr> <tr> <th style="text-align: left;">Pin no.</th> <th style="text-align: left;">Pin name</th> <th></th> </tr> </thead> <tbody> <tr> <td>8</td> <td>+5V</td> <td>→ +5V</td> </tr> <tr> <td>9</td> <td>+28V</td> <td>→ +28V</td> </tr> <tr> <td>12</td> <td>-5V</td> <td>→ -5V</td> </tr> <tr> <td>13</td> <td>+5V</td> <td>→ +5V</td> </tr> <tr> <td>21</td> <td>+28V</td> <td>→ +28V</td> </tr> <tr> <td>22</td> <td>-5V</td> <td>→ -5V</td> </tr> <tr> <td>25</td> <td>-15V</td> <td>→ -15V</td> </tr> <tr> <td>7</td> <td>GROUND</td> <td>→ GROUND</td> </tr> <tr> <td>11, 20, 24</td> <td>GROUND</td> <td>→ GROUND</td> </tr> </tbody> </table> </div> <p><b>NOTE:</b> it is very important that all the GROUNDs of the camera be connected together to the POWER SUPPLY GROUND, and to the GROUND of the Matrox Genesis. Do not use the cable shield as a ground, instead always use the ground pin of the power supply.</p> <p><b>Mode 2: Continuous (dual-tap)</b></p> <ul style="list-style-type: none"> <li>All connections are as in <i>Mode 1: Continuous (single tap)</i></li> </ul>	DALSA CA-D4-1024A (DB-25 male connector)		POWER SUPPLY	Pin no.	Pin name		8	+5V	→ +5V	9	+28V	→ +28V	12	-5V	→ -5V	13	+5V	→ +5V	21	+28V	→ +28V	22	-5V	→ -5V	25	-15V	→ -15V	7	GROUND	→ GROUND	11, 20, 24	GROUND	→ GROUND
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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.

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