

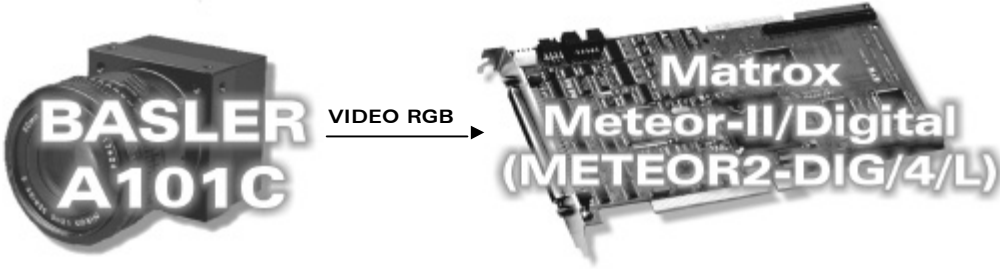
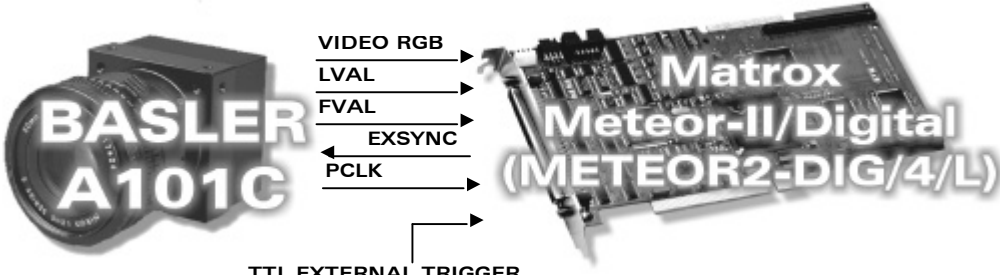
# Application Note:

## Interfacing non-standard cameras to Matrox Meteor-II



**BASLER-MVC A101C**

**February 29, 2000**

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
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| <b>Camera Descriptions</b>     | <ul style="list-style-type: none"> <li>• 1300 x 1030 x 8-bit @ 12 fps.</li> <li>• Single channel LVDS digital video output.</li> <li>• Color image generated through software-based conversion.</li> <li>• Progressive scan.</li> <li>• External sync.</li> <li>• Internal exposure control.</li> <li>• Pixel clock: 18 MHz</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| <b>Interface modes</b>         | <ul style="list-style-type: none"> <li>• Pseudo-continuous, asynchronous reset (binning, non-binning)</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <b>Camera Interface Briefs</b> | <p><b>Mode 1: Pseudo-continuous</b></p>  <p style="text-align: right;">*Matrox Meteor-II/Digital LVDS Board</p> <ul style="list-style-type: none"> <li>• 1300 x 1030 x 8-bit @ 10 fps.</li> <li>• Single channel LVDS digital video.</li> <li>• Progressive scan.</li> <li>• Matrox Meteor-II receiving video signals from camera.</li> <li>• DCF used: <a href="#">A113CC.DCF</a> (non-binning)</li> <li>• DCF used: <a href="#">A113BCC.DCF</a> (binning)</li> </ul> <p><b>Mode 2: Asynchronous Reset</b></p>  <p style="text-align: right;">*Matrox Meteor-II/Digital LVDS Board</p> <ul style="list-style-type: none"> <li>• 1300 x 1030 x 8-bit.</li> <li>• Single channel LVDS digital video.</li> <li>• Progressive scan.</li> <li>• Matrox Meteor-II receiving external trigger.</li> <li>• Matrox Meteor-II sending EXPOSURE1 (EXSYNC) signal to camera.</li> <li>• Matrox Meteor-II receiving HSYNC (LVAL), VSYNC (FVAL), PIXEL CLOCK (PCLK), and video signals from camera.</li> <li>• DCF used: <a href="#">A113CAR.DCF</a> (non-binning)</li> <li>• DCF used: <a href="#">A113BCAR.DCF</a> (binning)</li> </ul> |

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| Camera Interface Details                       | <p><b>Mode 1: Pseudo-continuous</b></p> <ul style="list-style-type: none"><li>• <b>Frame rate:</b> Matrox Meteor-II receives the pseudo-continuous video from the camera at a frame rate equal to 10 frames per second.</li><li>• <b>Exposure time:</b> Exposure time is inversely proportionate to the frame rate (no shutter) or determined by the shutter setting. Refer to the camera manual for more information.</li></ul> <p><b>Mode 2: Asynchronous Reset (Pulse Width Control Mode)</b></p> <ul style="list-style-type: none"><li>• Once it has received the external trigger signal, Matrox Meteor-II sends the EXPOSURE1 (EXSYNC) signal to the camera with a width equal to the desired exposure.</li><li>• <b>Frame rate:</b> The frame rate is determined by the frequency of the external trigger signal.</li><li>• <b>Exposure time:</b> The active and inactive periods of the EXPOSURE1 (EXSYNC) signal is the exposure time. The default exposure time for this DCF is equal to <b>3.82 ms</b>. In order to change the width and deployment time of the EXPOSURE1 (EXSYNC) use the Exposure Settings menu tab in Matrox Intellicam. Consult the Matrox Intellicam User Guide for more information.</li></ul> <p><b>Modes 1 and 2</b></p> <ul style="list-style-type: none"><li>• <b>Camera configuration:</b> Camera configuration tool and drivers for this camera are available from the BASLER web site (<a href="http://www.baslerweb.com/">http://www.baslerweb.com/</a>).</li><li>• <b>Capturing color information:</b> Color information is generated (by this camera) using a Bayer color mosaic filter mounted on the sensor. RGB information can only be obtained through software-based conversion. <b>Important:</b> Following each frame capture it will be necessary to make a call to the BASLER library from your MIL/MIL-Lite program in order to reconstruct the proper color image.</li></ul> |                                                |                                            |                |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|--------------------------------------------|----------------|--------------------------------------------|--|-----------------|----------------|--|-----------------|----------------|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|-----------------|----|---|--------|----|
| Cabling Requirements                           | <p><b>Mode 1: Pseudo-continuous</b></p> <ul style="list-style-type: none"><li>• DBHD100-TO-OPEN cable required for digital data, synchronization, and control signals.</li><li>• Connections between the 44-pin connector of the camera of the camera and the 100-pin connector of the Matrox Meteor-II/Digital are as follows:</li></ul> <table><tr><th colspan="2"><b>METEOR2-DIG/4/L<br/>(100-pin connector)</b></th><th></th><th colspan="2"><b>BASLER A101C<br/>(44-pin connector)</b></th></tr><tr><th><i>Pin name</i></th><th><i>Pin no.</i></th><th></th><th><i>Pin name</i></th><th><i>Pin no.</i></th></tr><tr><td>DATA, INPUT, 0+</td><td>01</td><td>←</td><td>DOUT0+</td><td>01</td></tr><tr><td>DATA, INPUT, 0-</td><td>02</td><td>←</td><td>DOUT0-</td><td>16</td></tr><tr><td>DATA, INPUT, 1+</td><td>03</td><td>←</td><td>DOUT1+</td><td>02</td></tr><tr><td>DATA, INPUT, 1-</td><td>04</td><td>←</td><td>DOUT1-</td><td>17</td></tr><tr><td>DATA, INPUT, 2+</td><td>05</td><td>←</td><td>DOUT2+</td><td>03</td></tr><tr><td>DATA, INPUT, 2-</td><td>06</td><td>←</td><td>DOUT2-</td><td>18</td></tr><tr><td>DATA, INPUT, 3+</td><td>07</td><td>←</td><td>DOUT3+</td><td>04</td></tr><tr><td>DATA, INPUT, 3-</td><td>08</td><td>←</td><td>DOUT3-</td><td>19</td></tr></table> <p>continued</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | <b>METEOR2-DIG/4/L<br/>(100-pin connector)</b> |                                            |                | <b>BASLER A101C<br/>(44-pin connector)</b> |  | <i>Pin name</i> | <i>Pin no.</i> |  | <i>Pin name</i> | <i>Pin no.</i> | DATA, INPUT, 0+ | 01 | ← | DOUT0+ | 01 | DATA, INPUT, 0- | 02 | ← | DOUT0- | 16 | DATA, INPUT, 1+ | 03 | ← | DOUT1+ | 02 | DATA, INPUT, 1- | 04 | ← | DOUT1- | 17 | DATA, INPUT, 2+ | 05 | ← | DOUT2+ | 03 | DATA, INPUT, 2- | 06 | ← | DOUT2- | 18 | DATA, INPUT, 3+ | 07 | ← | DOUT3+ | 04 | DATA, INPUT, 3- | 08 | ← | DOUT3- | 19 |
| <b>METEOR2-DIG/4/L<br/>(100-pin connector)</b> |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                | <b>BASLER A101C<br/>(44-pin connector)</b> |                |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| <i>Pin name</i>                                | <i>Pin no.</i>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                | <i>Pin name</i>                            | <i>Pin no.</i> |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 0+                                | 01                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT0+                                     | 01             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 0-                                | 02                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT0-                                     | 16             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 1+                                | 03                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT1+                                     | 02             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 1-                                | 04                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT1-                                     | 17             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 2+                                | 05                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT2+                                     | 03             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 2-                                | 06                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT2-                                     | 18             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 3+                                | 07                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT3+                                     | 04             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |
| DATA, INPUT, 3-                                | 08                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | ←                                              | DOUT3-                                     | 19             |                                            |  |                 |                |  |                 |                |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |                 |    |   |        |    |

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**BASLER-MVC A101C**

**February 29, 2000**

|                                                                                                                                                                           |                                        |                                   |                                    |         |     |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-----------------------------------|------------------------------------|---------|-----|
| Cabling Requirements<br>(continued)                                                                                                                                       | METEOR2-DIG/4/L<br>(100-pin connector) |                                   | BASLER A101C<br>(44-pin connector) |         |     |
|                                                                                                                                                                           | Pin name                               | Pin no.                           | Pin name                           | Pin no. |     |
|                                                                                                                                                                           | DATA, INPUT, 4+                        | 09                                | ←                                  | DOUT4+  | 05  |
|                                                                                                                                                                           | DATA, INPUT, 4-                        | 10                                | ←                                  | DOUT4-  | 20  |
|                                                                                                                                                                           | DATA, INPUT, 5+                        | 11                                | ←                                  | DOUT5+  | 06  |
|                                                                                                                                                                           | DATA, INPUT, 5-                        | 12                                | ←                                  | DOUT5-  | 21  |
|                                                                                                                                                                           | DATA, INPUT, 6+                        | 13                                | ←                                  | DOUT6+  | 07  |
|                                                                                                                                                                           | DATA, INPUT, 6-                        | 14                                | ←                                  | DOUT6-  | 22  |
|                                                                                                                                                                           | DATA, INPUT, 7+                        | 15                                | ←                                  | DOUT7+  | 08  |
|                                                                                                                                                                           | DATA, INPUT, 7-                        | 16                                | ←                                  | DOUT7-  | 23  |
|                                                                                                                                                                           | HSYNC, INPUT, +                        | 33                                | ←                                  | LVAL+   | 33  |
|                                                                                                                                                                           | HSYNC, INPUT, -                        | 34                                | ←                                  | LVAL-   | 34  |
|                                                                                                                                                                           | VSYNC, INPUT, +                        | 35                                | ←                                  | FVAL+   | 39  |
|                                                                                                                                                                           | VSYNC, INPUT, -                        | 36                                | ←                                  | FVAL-   | 40  |
|                                                                                                                                                                           | GROUND                                 | 37                                |                                    | GND     | 43  |
|                                                                                                                                                                           | GROUND                                 | 38                                |                                    | GND     | 44  |
|                                                                                                                                                                           | CLOCK, INPUT, +                        | 39                                | ←                                  | PCLK+   | 35  |
|                                                                                                                                                                           | CLOCK, INPUT, -                        | 40                                | ←                                  | PCLK-   | 36  |
|                                                                                                                                                                           | EXPOSURE1, OUTPUT, +                   | 95*                               | →                                  | EXSYNC+ | 37* |
|                                                                                                                                                                           | EXPOSURE1, OUTPUT, -                   | 96*                               | →                                  | EXSYNC- | 38* |
| * These connections are not required for this mode, however allows this cable to be used with all modes.                                                                  |                                        |                                   |                                    |         |     |
| Mode 2: Asynchronous Reset                                                                                                                                                |                                        |                                   |                                    |         |     |
| • DBHD100-TO-OPEN required for digital data, synchronization, and control signals.                                                                                        |                                        |                                   |                                    |         |     |
| • TTL external trigger source should be connected to Pin 2 and 7 (OPTO TRIG) on the Trigger Input connector (9-pin female connector on the RS-232/Trigger Input bracket). |                                        |                                   |                                    |         |     |
| • All other connections are as in Mode 1: Pseudo-continuous                                                                                                               |                                        |                                   |                                    |         |     |
| Modes 1-2                                                                                                                                                                 |                                        |                                   |                                    |         |     |
| • Connections between the 2-pin subminiature round connector on the rear panel of the camera and the power supply are as follows:                                         |                                        |                                   |                                    |         |     |
| Power Supply                                                                                                                                                              |                                        | BASLER A101C<br>(2-pin connector) |                                    |         |     |
| Pin name                                                                                                                                                                  | Pin no.                                | Pin name                          | Pin no.                            |         |     |
| +24V                                                                                                                                                                      | 03                                     | GND                               | 01                                 |         |     |
| +24V                                                                                                                                                                      | 04                                     | GND                               | 02                                 |         |     |

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**BASLER-MVC A101C**

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### Cabling Requirements (continued)

- Connections between the DB-9 connector on the rear panel of the camera and the system (RS-232 interface) are as follows:

| Pin              | Signal        |
|------------------|---------------|
| 2                | RxD           |
| 3                | TxD           |
| 5                | GND           |
| 1, 4, 6, 7, 8, 9 | NOT CONNECTED |

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:matrox.com)). The information furnished by Matrox Electronic 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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