

## ❖ BM-141 GE / BB-141 GE

Progressive Scan

**C3** Camera Suite  
 Unlimited  
 Digital  
 Switchability



- Member of C3 Basic series, covering VGA to UXGA resolution
- 1392 (h) x 1040 (v) 6.45  $\mu\text{m}$  square pixels
- 2/3" progressive scan - Monochrome and Bayer mosaic color versions
- 30 frames/second with full resolution in continuous operation
- Increased frame rate with vertical binning (BM-141 GE) and partial scan
- Exposure time from 63  $\mu\text{s}$  to 2 sec. using Pulse Width trigger mode
- Programmable exposure from 63  $\mu\text{s}$  to 33 ms
- Several pre-processing functions for offloading host PC
- Sequencer trigger mode for on-the-fly change of gain, exposure and ROI
- LVAL-synchronous/-asynchronous operation (auto-detect)
- Auto iris lens video output allows a wider range of light
- GigE Vision interface with 12, 10 or 8-bit output
- Programmable GPIO with opto-isolated inputs and outputs
- Variable Partial Scan
- Comprehensive software tools and SDK for Windows XP/Vista

**GigE**™  
 VISION

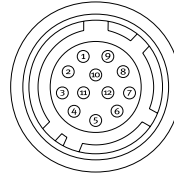


# Specifications for BM-141 GE / BB-141 GE

| Specifications                                 | BM-140 GE / BB-140 GE   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
|--|---|---------------------|--|-----------------------|---|------------------------|--|------------------|------------------------------|------------------|------------------------------|------------------|------------------------------|-------|---|------------------------|---|
| Sensor   | Sony ICX-285 2/3" progressive scan  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Pixel Clock                                    | 58 MHz  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Frame rate full frame                          | 30 frames/second  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Active area                                    | 8.98 (h) x 6.7 (v) mm 2/3" diagonal   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Cell size                                      | 6.45 x 6.45 pixels  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Active pixels                                  | 1392 x 1040   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Color (BB-141 GE)                              | Raw Bayer output, host-based interpolation  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Read-out modes                                 | <table border="0"> <tr> <td>Full</td> <td>1392 (h) x 1040 (v) 30.12 fps</td> </tr> <tr> <td>Vertical binning</td> <td>1392 (h) x 520 (v) 50.18 fps* (Note 1)</td> </tr> <tr> <td>2/3 partial scan</td> <td>1392 (h) x 694 (v) 41.05 fps</td> </tr> <tr> <td>1/2 partial scan</td> <td>1392 (h) x 520 (v) 50.06 fps</td> </tr> <tr> <td>1/4 partial scan</td> <td>1392 (h) x 260 (v) 74.57 fps</td> </tr> <tr> <td>1/8 partial scan</td> <td>1392 (h) x 130 (v) 98.73 fps</td> </tr> <tr> <td>Draft</td> <td>1392 (h) x 260 (v) 101.17 fps *(Note 2)</td> </tr> <tr> <td>Variable Partical scan</td> <td>Start line from 1 to 1025, height from 8 to 1032, vertical.</td> </tr> </table> | Full                | 1392 (h) x 1040 (v) 30.12 fps          | Vertical binning      | 1392 (h) x 520 (v) 50.18 fps* (Note 1)                | 2/3 partial scan       | 1392 (h) x 694 (v) 41.05 fps   | 1/2 partial scan | 1392 (h) x 520 (v) 50.06 fps | 1/4 partial scan | 1392 (h) x 260 (v) 74.57 fps | 1/8 partial scan | 1392 (h) x 130 (v) 98.73 fps | Draft | 1392 (h) x 260 (v) 101.17 fps *(Note 2) | Variable Partical scan | Start line from 1 to 1025, height from 8 to 1032, vertical. |
| Full   | 1392 (h) x 1040 (v) 30.12 fps   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Vertical binning                               | 1392 (h) x 520 (v) 50.18 fps* (Note 1)  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| 2/3 partial scan                               | 1392 (h) x 694 (v) 41.05 fps  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| 1/2 partial scan                               | 1392 (h) x 520 (v) 50.06 fps  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| 1/4 partial scan                               | 1392 (h) x 260 (v) 74.57 fps  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| 1/8 partial scan                               | 1392 (h) x 130 (v) 98.73 fps  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Draft  | 1392 (h) x 260 (v) 101.17 fps *(Note 2)   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Variable Partical scan                         | Start line from 1 to 1025, height from 8 to 1032, vertical.   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Region-of-interest (ROI)                       | User definable. Memory read-out<br>*Note 1: BM-141GE only<br>*Note 2: BB-141GE only   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Sensitivity (BM-141 GE)                        | 0.03 Lux (On sensor, max. gain, shutter off, 50% video)   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Sensitivity (BB-141 GE)                        | 0.2 Lux (On sensor, max. gain, shutter off, 50% video)  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| S/N ratio                                      | >58dB (odB gain)  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Video output                                   | GigE Vision, 8-bit, 10-bit or 12-bit  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Auto-iris lens video output                    | 0.7 Vp-p, enabled by internal switch  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Gain   | Manual/Automatic -6 to +24 dB   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Synchronization                                | External hardware trigger via GPIO<br>Software trigger via GigE Vision  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| GPIO Module                                    | <table border="0"> <tr> <td>Input/output switch</td> <td>Configurable 16-in/12-out switch (LUT)</td> </tr> <tr> <td>Clock generator (one)</td> <td>12-bit counter based on Pixel Clock</td> </tr> <tr> <td>Pulse generators (two)</td> <td>19-bit counters programmable for length, start point, stop point, repeat</td> </tr> </table>   | Input/output switch | Configurable 16-in/12-out switch (LUT) | Clock generator (one) | 12-bit counter based on Pixel Clock                   | Pulse generators (two) | 19-bit counters programmable for length, start point, stop point, repeat |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Input/output switch                            | Configurable 16-in/12-out switch (LUT)  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Clock generator (one)                          | 12-bit counter based on Pixel Clock   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Pulse generators (two)                         | 19-bit counters programmable for length, start point, stop point, repeat  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Hardware trigger modes                         | Continuous, Pre-Select, Pulse Width, Sequence (Gain, Shutter, ROI)<br>Reset-continuous trigger, Delay Readout   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Electronic shutter                             | <table border="0"> <tr> <td>Pre-set shutter</td> <td>1/30 to 1/10,000 in 10 steps</td> </tr> <tr> <td>Programmable exposure</td> <td>2L (1/16,000 sec.) to 1052L (1/30 sec.) in 63µs step.</td> </tr> <tr> <td>Exposure Time (Abs)</td> <td>µsec - user definable. Same range as PE</td> </tr> <tr> <td>Pulse Width</td> <td>63µs to 2 sec.</td> </tr> <tr> <td>Auto shutter</td> <td>64L to 1052L</td> </tr> </table>  | Pre-set shutter     | 1/30 to 1/10,000 in 10 steps           | Programmable exposure | 2L (1/16,000 sec.) to 1052L (1/30 sec.) in 63µs step. | Exposure Time (Abs)    | µsec - user definable. Same range as PE                                  | Pulse Width      | 63µs to 2 sec.               | Auto shutter     | 64L to 1052L                 |                  |                              |       |   |                        |   |
| Pre-set shutter                                | 1/30 to 1/10,000 in 10 steps  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Programmable exposure                          | 2L (1/16,000 sec.) to 1052L (1/30 sec.) in 63µs step.   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Exposure Time (Abs)                            | µsec - user definable. Same range as PE   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Pulse Width                                    | 63µs to 2 sec.  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Auto shutter                                   | 64L to 1052L  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Pre-processing funtions                        | In camera Bayer white balance, look-up-table (LUT), In-camera blemish compensation.   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Control interface                              | Register based.<br>GigE Vision/GenlCam compliant  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Functions controlled via GigE Vision interface | Shutter, Gain, Black level, Trigger mode, Readout mode, GPIO setup, ROI (GenlCam mandatory functions)   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| GigE Vision streaming control                  | Packet size (1428 to 16384 bytes), Delayed (frame) Readout, Inter-packet delay  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Indicators on rear panel                       | Power / Hardware trigger, GigE link, GigE activity  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Operating Temperature                          | -5°C to +50°C   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Humidity (operation)                           | 20 - 90% non-condensing   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Storage temp./humidity                         | -25°C to +60°C / 20 to 90% non-condensing   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Vibration                                      | 10G (20Hz to 200 Hz XYZ)  |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Shock  | 70G   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Regulations                                    | CE (EN 61000-6-2, EN-61000-6-3), FCC part 15 class B, RoHS/WEEE   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Power  | 12V DC +/-10%. 5.1W   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Lens mount                                     | C-mount   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Dimensions (H x W x L)                         | 55 x 55 x 55 mm   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |
| Weight   | 230 g   |                     |  |                       |   |                        |  |                  |                              |                  |                              |                  |                              |       |   |                        |   |

## Connector pin-out

### DC In / GPIO



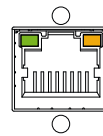
HIROSE HR10A-10R-12PB-01

#### Connector Pin-out

- |       |                             |
|-------|-----------------------------|
| Pin 1 | GND                         |
| 2     | +12 VDC input               |
| 3     | Opto in 2(-)/GND            |
| 4     | Opto in 2(+)/Auto iris lens |
| 5     | Opto in 1(-)                |
| 6     | Opto in 1(+)                |
| 7     | Opto out 1(-)               |
| 8     | Opto out 1(+)               |
| 9     | Opto out 2(-)               |
| 10    | Opto out 2(+)               |
| 11    | +12V DC input               |
| 12    | GND                         |

\* Pins 3 and 4 can be configured by internal switch selection

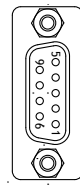
### GigE Vision interface Accepts RJ-45 with thumbscrews



- |       |         |   |         |
|-------|---------|---|---------|
| Pin 1 | TRD+(0) | 5 | TRD-(2) |
| 2     | TRD-(0) | 6 | TRD-(1) |
| 3     | TRD+(1) | 7 | TRD+(3) |
| 4     | TRD+(2) | 8 | TRD-(3) |

### D-sub 9 pin connector for GPIO (Auxiliary)

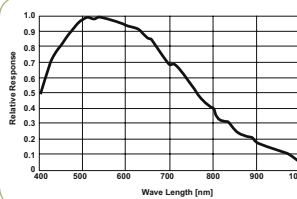
Type: DD-09SSG



| No. | I/O | Name      |
|-----|-----|-----------|
| 1   | I   | LVDS IN1- |
| 2   | I   | LVDS IN1+ |
| 3   | I   | TTL IN 1* |
| 4   | O   | TTL OUT 1 |
| 5   |     | GND       |
| 6   |     | NC        |
| 7   |     | NC        |
| 8   | O   | TTL OUT 2 |
| 9   |     | GND       |

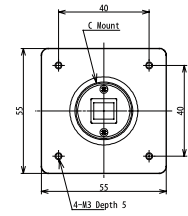
\*Can be set to 75Ω terminator via internal switches

## Spectral Response BM-141 GE

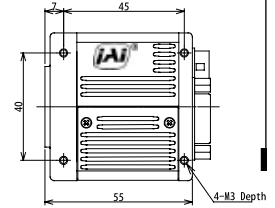


## Dimensions

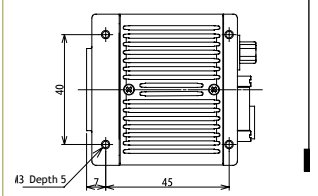
### Front view



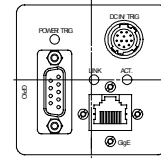
### Side view



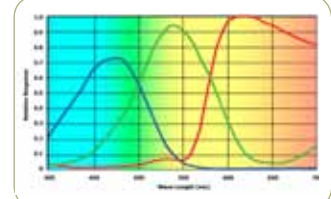
### Bottom view



### Rear view



## Spectral Response BB-141 GE



## Ordering Information

- |           |   |
|-----------|---|
| BM-141 GE | 2/3" Monochrome Progressive Scan Camera         |
| BB-141 GE | 2/3" Bayer Mosaic Color Progressive Scan Camera |

## C3 Camera Suite Unlimited Digital Switchability

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