

## ❖ CM-200 MCL / CB-200 MCL

Progressive Scan



- *Compact series 1/1.8" progressive scan camera*
- *Monochrome and Bayer mosaic color versions*
- *1620 (h) x 1236 (v) pixels active area*
- *4.4µm square pixels*
- *25 frames/second with full resolution in continuous operation*
- *Up to 24 frames/second with external trigger and full resolution*
- *Up to 89 frames/second with partial scan*
- *48 frames/second with vertical binning (CM-200 MCL only)*
- *Shutter speed from 32 µs to 2 sec. using Pulse Width Control*
- *Programmable exposure from 64 µs to 40 ms*
- *Pre-select and Pulse width trigger modes*
- *LVAL-synchronous/-asynchronous operation (auto-detect)*
- *Power over CL (PoCL) version available*
- *Auto-iris lens video output allows a wider range of light*
- *10 or 8-bit output*
- *Setup by Windows NT/2000/XP via serial communication*



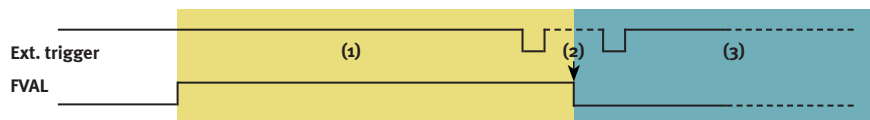
# Specifications for CM-200 MCL / CB-200 MCL

| Specifications                               | CM-200 MCL / CB-200 MCL   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
|--|---|-----------------|-------------------------------|-----------------------|---|---------------------|------------------------------|------------------|------------------------------|------------------|------------------------------|------------------|-------------------------------|
| Sensor                                       | 1/1.8" progressive scan CCD   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Pixel Clock                                  | 65 MHz  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Frame rate full frame                        | 24.98 frames/sec.<br>(1251 lines per frame)   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Active area                                  | 7.13 (h) x 5.44 (v) mm  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Cell size                                    | 4.4 (h) x 4.4 (v) $\mu$ m   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Active pixels                                | 1620 (h) x 1236 (v)   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Color (CB-200 MCL)                           | Raw Bayer output for host-based interpolation   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Read-out modes                               | <table border="0"> <tr> <td>Full</td> <td>1620 (h) x 1236 (v) 24.98 fps</td> </tr> <tr> <td>1/2 partial scan</td> <td>1620 (h) x 712(v) 43.89 fps</td> </tr> <tr> <td>1/4 partial scan</td> <td>1620 (h) x 448 (v) 69.75 fps</td> </tr> <tr> <td>1/8 partial scan</td> <td>1620 (h) x 316 (v) 98.89 fps</td> </tr> <tr> <td>2/3 partial scan</td> <td>1620 (h) x 888 (v) 35.19 fps</td> </tr> <tr> <td>Vertical binning</td> <td>1620 (h) x 627 (v) 48.87 fps*</td> </tr> </table> <p>*NOTE: CM-200MCL only</p> | Full            | 1620 (h) x 1236 (v) 24.98 fps | 1/2 partial scan      | 1620 (h) x 712(v) 43.89 fps                 | 1/4 partial scan    | 1620 (h) x 448 (v) 69.75 fps | 1/8 partial scan | 1620 (h) x 316 (v) 98.89 fps | 2/3 partial scan | 1620 (h) x 888 (v) 35.19 fps | Vertical binning | 1620 (h) x 627 (v) 48.87 fps* |
| Full   | 1620 (h) x 1236 (v) 24.98 fps   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| 1/2 partial scan                             | 1620 (h) x 712(v) 43.89 fps   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| 1/4 partial scan                             | 1620 (h) x 448 (v) 69.75 fps  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| 1/8 partial scan                             | 1620 (h) x 316 (v) 98.89 fps  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| 2/3 partial scan                             | 1620 (h) x 888 (v) 35.19 fps  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Vertical binning                             | 1620 (h) x 627 (v) 48.87 fps*   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Sensitivity (CM-200 MCL)                     | 0.25 Lux (On sensor, Max. gain, Shutter OFF, 50% video)   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Sensitivity (CB-200 MCL)                     | 0.8 Lux (On sensor, Max. gain, Shutter OFF, 50% video)  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| S/N ratio                                    | >50dB (0 dB gain)   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Video output                                 | 8 or 10 bit in Mini-CL  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Auto-iris lens video                         | 0.7 Vp-p  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Gain   | Manual, -3dB to +12dB   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Synchronization                              | Int. X-tal or ext. trigger  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Inputs                                       | Camera Link TTL<br>Ext. trigger, LVDS (CC 1)<br>Ext. trigger 4V $\pm$ 2V  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Outputs                                      | Camera Link TTL<br>Clk., FVAL, LVAL, Data, EEN<br>XEEN  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Trigger modes                                | Pre-select, Pulse Width   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Electronic shutter                           | <table border="0"> <tr> <td>Pre-set shutter</td> <td>1/24 to 1/10,000 in 10 steps</td> </tr> <tr> <td>Programmable exposure</td> <td>2L (64<math>\mu</math>s) to 1052L (40ms) in 1L steps</td> </tr> <tr> <td>Pulse Width Control</td> <td>32<math>\mu</math>s to 2 sec.</td> </tr> </table>  | Pre-set shutter | 1/24 to 1/10,000 in 10 steps  | Programmable exposure | 2L (64 $\mu$ s) to 1052L (40ms) in 1L steps | Pulse Width Control | 32 $\mu$ s to 2 sec.         |                  |                              |                  |                              |                  |                               |
| Pre-set shutter                              | 1/24 to 1/10,000 in 10 steps  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Programmable exposure                        | 2L (64 $\mu$ s) to 1052L (40ms) in 1L steps   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Pulse Width Control                          | 32 $\mu$ s to 2 sec.  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Accumulation                                 | Auto-detect LVAL-synchr. / asynchr.   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Control interface                            | Mini-CL serial communication  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Functions controlled by serial communication | Shutter, Trigger mode, Readout mode, Trigger Polarity, Black level, Gain,   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Indicators on rear panel                     | LED for power and trigger input   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Operating Temperature                        | -5°C to +45°C   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Humidity (operation)                         | 20 - 90% non-condensing   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Storage temp./humidity                       | -25°C to +60°C / 20 to 90%  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| 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 $\pm$ 10% 3 W  |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Lens mount                                   | C-mount   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Dimensions (H x W x L)                       | 29 x 44 x 66 mm   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |
| Weight                                       | 120 g   |                 |                               |                       |   |                     |                              |                  |                              |                  |                              |                  |                               |

## Ordering Information

CM-200 MCL 1/1.8" Monochrome Progressive Scan Camera  
CB-200 MCL 1/1.8" Bayer Mosaic Color Progressive Scan Camera

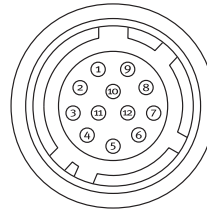
## FVAL auto-detect trigger function (next LVAL or immediate)



- (1) Within this period camera starts accumulation at next LVAL (prevents feed-through noise)
- (2) Avoid trigger at FVAL transition, as function may randomly switch between "next LVAL" and "immediate"
- (3) Within this period camera starts accumulation immediately (no delay)

## Connector pin-out

### DC In / Trigger



HIROSE HR10A-10R-12PB-01

| Pin | Signal                      |
|-----|-----------------------------|
| 1   | Ground                      |
| 2   | +12V DC                     |
| 3   | Ground                      |
| 4   | Auto Iris lens video output |
| 5   | Ground                      |
| 6   | N/C                         |
| 7   | N/C                         |
| 8   | Ground                      |
| 9   | XEEN out                    |
| 10  | Trigger in*                 |
| 11  | +12V DC                     |
| 12  | Ground                      |

### Mini-CL interface

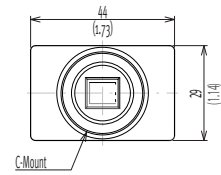


| Pin | Signal | Function        |
|-----|--------|-----------------|
| 1   | 14     | GND             |
| 2   | 15     | +/-Tx0          |
| 3   | 16     | +/-Tx1          |
| 4   | 17     | +/-Tx2          |
| 5   | 18     | +/-Txclk        |
| 6   | 19     | +/-Tx3          |
| 7   | 20     | SerTC+/SerTC-   |
| 8   | 21     | SerTFG+/SerTFG- |
| 9   | 22     | CC1-/CC1+       |
| 10  | 23     | CC2-/CC2+       |
| 11  | 24     | CC3-/CC3+       |
| 12  | 25     | CC4-/CC4+       |
| 13  | 26     | GND             |

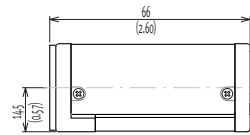
For PoCL version pins 1 and 26 are used for +12V  
\*) in Mini-CL or 12-pin Hirose

## Dimensions

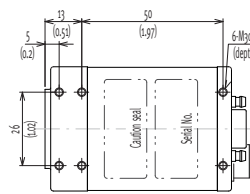
### Front view



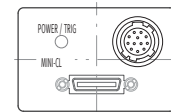
### Side view



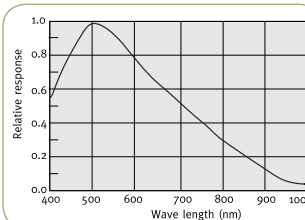
### Bottom view



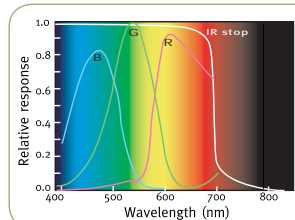
### Rear view



## Spectral Response CM-200 MCL



## Spectral Response CB-200 MCL



Europe, Middle East & Africa  
Phone +45 4457 8888  
Fax +45 4491 3252

Asia Pacific  
Phone +81 45 440 0154  
Fax +81 45 440 0166

Americas  
Phone (Toll-Free) 1 800 445 5444  
Phone +1 408 383 0300



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