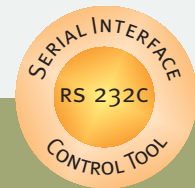




## CV-A1 / CV-A1 UV Progressive Scan



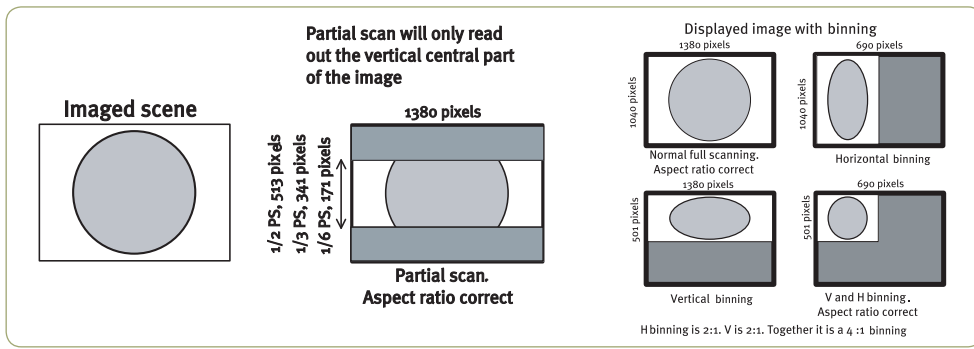
- *Compact 1/2" monochrome progressive scan camera*
- *UV version available (CV-A1 UV)*
- *1392 (h) x 1040 (v) 4.65  $\mu$ m square pixels*
- *16 frames/second with full resolution in continuous operation*
- *Increased frame rate with vertical binning and partial scan*
- *Increased sensitivity with H and V binning*
- *Exposure time from 75.9  $\mu$ s to 116 ms using Pulse Width Control mode*
- *Programmable exposure from 75.9  $\mu$ s to 59.8 ms*
- *Frame-delay readout mode for multiplexed readout of up to 3 cameras*
- *Internal, external HD/VD or random trigger synchronization*
- *Smear reduction readout mode*
- *LVAL-synchronous/-asynchronous operation (auto-detect)*
- *Exposure enable (EEN), Write enable (WEN) and Pixel Clock output*
- *Setup by Windows NT/2000/XP via serial communication*



# Specifications for CV-A1 / CV-A1-UV

| Specifications                                | CV-A1 / CV-A1 UV   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
|---|--|---------------|----------------------------|--------------------|--------------------------------|-----------------------|---------------------------|------------------|---------------------------|--------------------|---------------------------|------------------|---------------------------|---------------|--------------------------|------------|-----------------|---------------------|---------------------------|
| Sensor  | 1/2" progressive scan  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Pixel Clock                                   | 28.64 MHz  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Frame rate full frame                         | 16.037 frames/second<br>(1068 lines per frame)   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Active area                                   | 6.4 (h) x 4.8 (v) mm   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Cell size                                     | 4.65 x 4.65 pixels   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Active pixels                                 | 1380 x 1035  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Read-out modes                                | <table border="0"> <tr> <td>Full</td> <td>1380 (h) x 1035 (v) 16 fps</td> </tr> <tr> <td>1/2 partial scan</td> <td>1380 (h) x 513(v) 30 fps</td> </tr> <tr> <td>1/3 partial scan</td> <td>1380 (h) x 341 (v) 43 fps</td> </tr> <tr> <td>1/6 partial scan</td> <td>1380 (h) x 171 (v) 75 fps</td> </tr> <tr> <td>Horizontal binning</td> <td>690 (h) x 1035 (v) 16 fps</td> </tr> <tr> <td>Vertical binning</td> <td>1380 (h) x 527 (v) 32 fps</td> </tr> <tr> <td>H + V binning</td> <td>690 (h) x 527 (v) 32 fps</td> </tr> <tr> <td>Smear-less</td> <td>Smear reduction</td> </tr> <tr> <td>Frame-delay readout</td> <td>For multi-camera read-out</td> </tr> </table> | Full          | 1380 (h) x 1035 (v) 16 fps | 1/2 partial scan   | 1380 (h) x 513(v) 30 fps       | 1/3 partial scan      | 1380 (h) x 341 (v) 43 fps | 1/6 partial scan | 1380 (h) x 171 (v) 75 fps | Horizontal binning | 690 (h) x 1035 (v) 16 fps | Vertical binning | 1380 (h) x 527 (v) 32 fps | H + V binning | 690 (h) x 527 (v) 32 fps | Smear-less | Smear reduction | Frame-delay readout | For multi-camera read-out |
| Full  | 1380 (h) x 1035 (v) 16 fps   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| 1/2 partial scan                              | 1380 (h) x 513(v) 30 fps   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| 1/3 partial scan                              | 1380 (h) x 341 (v) 43 fps  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| 1/6 partial scan                              | 1380 (h) x 171 (v) 75 fps  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Horizontal binning                            | 690 (h) x 1035 (v) 16 fps  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Vertical binning                              | 1380 (h) x 527 (v) 32 fps  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| H + V binning                                 | 690 (h) x 527 (v) 32 fps   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Smear-less                                    | Smear reduction  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Frame-delay readout                           | For multi-camera read-out  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Sensitivity (CV-A1)                           | 0.3 Lux (On sensor, max. gain, shutter off, 50% video)   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| S/N ratio                                     | >50dB (0dB gain)   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Video output                                  | Composite VS signal, 1Vp-p, 75Ω<br>Video signal, 0.7Vp-p (selectable)  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Gain  | Manual, -3 to +12 dB<br>Automatic, 0 to +12dB  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Synchronization                               | Int. X-tal, Ext. HD/VD or random trigger   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Inputs  | <table border="0"> <tr> <td>Trigger</td> <td>4V, TTL</td> </tr> <tr> <td>HD/VD sync</td> <td>4V, 75Ω or High Z (switchable)</td> </tr> </table>  | Trigger       | 4V, TTL                    | HD/VD sync         | 4V, 75Ω or High Z (switchable) |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Trigger                                       | 4V, TTL  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| HD/VD sync                                    | 4V, 75Ω or High Z (switchable)   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Outputs                                       | <table border="0"> <tr> <td>HD / VD sync.</td> <td>4V, 75Ω</td> </tr> <tr> <td>WEN (Write Enable)</td> <td>4V, 75Ω</td> </tr> <tr> <td>EEN (Exposure Enable)</td> <td>4V, 75Ω</td> </tr> <tr> <td>Pixel clock</td> <td>4V, 75Ω</td> </tr> </table>   | HD / VD sync. | 4V, 75Ω                    | WEN (Write Enable) | 4V, 75Ω                        | EEN (Exposure Enable) | 4V, 75Ω                   | Pixel clock      | 4V, 75Ω                   |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| HD / VD sync.                                 | 4V, 75Ω  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| WEN (Write Enable)                            | 4V, 75Ω  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| EEN (Exposure Enable)                         | 4V, 75Ω  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Pixel clock                                   | 4V, 75Ω  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Trigger modes                                 | Continuous, EPS (Edge Pre-Select), PWC (Pulse Width Control), Long time exposure, Smear reduction and Frame-delay readout  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Electronic shutter                            | Pre-set shutter  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Programmable exposure (PE)                    | 1/16 to 1/200,000 in 16 steps  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Pulse Width                                   | 1.3H to 1000H (75.9 μs to 59.8 ms)   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Long time exposure                            | 1.3H to 2000H (75.9μs μs to 116 ms)<br>2 frames to ∞   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Accumulation                                  | HD synchronous or HD asynchronous  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Control interface                             | RS-232C, short ASCII commands  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Functions controlled by RS-232C               | Scanning format, Trigger modes, Readout modes, Programmable exposure, Shutter, Gain, Pixel clock output, Sync on/off, Black level, Manual gain, AGC, Gamma   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Functions controlled by internal DIP-switches | VD input/output, HD input/output, HD/VD 75Ω termination on/off   |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| 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 +/-10%. 1.8W  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Lens mount                                    | C-mount  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Dimensions (H x W x L)                        | 29 x 44 x 66 mm  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |
| Weight  | 150 g  |               |                            |                    |                                |                       |                           |                  |                           |                    |                           |                  |                           |               |                          |            |                 |                     |                           |

## Readout formats



## Connector pin-out

**DC-IN/SYNC.**

**HIROSE HR10A-10R-12PB-01**

Pin 1 GND  
 Pin 2 +12 V DC input  
 Pin 3 Ground  
 Pin 4 Video output  
 Pin 5 Ground  
 Pin 6 HD input/output\*  
 Pin 7 VD input/output\*  
 Pin 8 Ground  
 Pin 9 Pixel clock output\*  
 Pin 10 WEN output\*  
 Pin 11 Trigger input\*  
 Pin 12 GND

(Pin configuration compatible with EIAJ standard)

**RS 232C/TRIGGER**

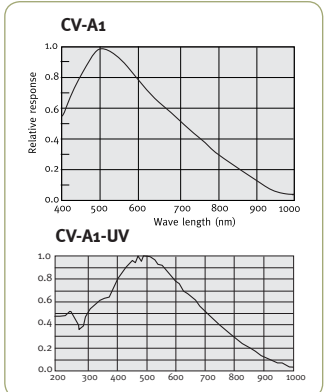
**HIROSE HR10A-7R-6PB**

Pin 1 TXD  
 Pin 2 RXD  
 Pin 3 Ground  
 Pin 4 Ground  
 Pin 5 Trigger input  
 Pin 6 EEN/WEN output

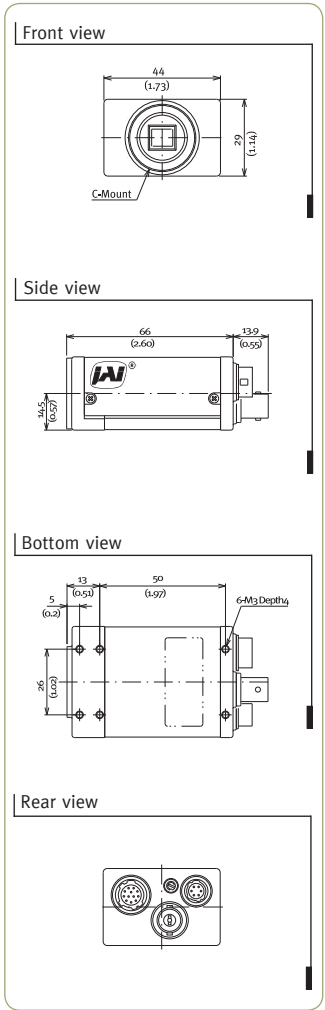
\*) Configurable

HIROSE Plugs for cable:  
 12 pin: HIROSE HR10A-10P-12S  
 6 pin: HIROSE HR10A-7P-6S

## Spectral Response



## Dimensions



## Ordering Information

CV-A1 1/2" Monochrome Progressive Scan Camera  
 CV-A1 UV 1/2" UV-enhanced Progressive Scan Camera  
 MP40 Tripod Adapter  
 (must be ordered separately)

Europe, Middle East & Africa  
 Phone +45 4457 8888  
 Fax +45 4491 8880

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

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