



# **CV-M9 CL**

## **3CCD Progressive Scan RGB Color Camera**



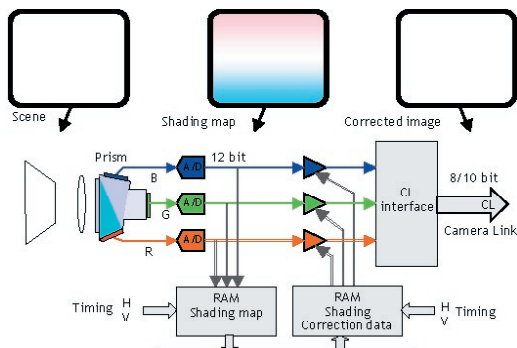
- *3 x 1/3" progressive scan RGB color CCD camera*
- *1034 (h) x 779 (v) 4.65  $\mu$ m effective square pixels for each CCD*
- *Compact RGB prism for C-mount lenses*
- *Chromatic shading reduction makes lens choice wider*
- *30 frames per second with full resolution*
- *86 fps with 1/8 partial scan*
- *Vertical binning for higher sensitivity and frame rate*
- *12 bit internal digital signal processing*
- *24 bit RGB output via Camera Link base configuration. 30 bit via CL medium configuration*
- *Edge pre-select and pulse width trigger modes*
- *Reset continuous trigger mode and smearless mode*
- *Programmable individual exposure for R, G and B*
- *Manual, continuous or one push white balance*
- *Color bar test image for set-up*
- *Setup by switches or Windows NT/2000/XP software via RS 232C or Camera Link*

***The leading manufacturer of high performance camera solutions***

# Specifications for CV-M9 CL

Specifications	CV-M9 CL
Scanning system	Progressive scan
Frame rate	30 fps
Line frequency	23.768 kHz
Pixel clock	33.75 MHz
CCD sensors	3 x 1/3" monochrome IT CCD
Sensing area	4.8 (h) x 3.6 (v) mm
Effective pixels	1034 (h) x 779 (v)
Pixels in video output	
Full	1024 (h) x 768 (v) x 30 fps
1/2 partial	1024 (h) x 384 (v) 48 fps
1/4 partial	1024 (h) x 192 (v) 68 fps
1/8 partial	1024 (h) x 96 (v) 86 fps
V binning	1024 (h) x 384 (v) 50 fps
Cell size	4.65 (h) x 4.65 (v) $\mu$ m
Sensitivity on sensor	2 Lux (Max gain, 50% video)
S/N ratio	50 dB (Green, 0 dB gain)
Digital video output	3 x 8 bit RGB via base Camera Link 3 x 10 bit RGB via medium Camera Link
Auto iris lens video output	0.7 Vpp, 75 $\Omega$
Gamma	1.0
Gain	Manual
Gain range, Master R and B	-3 to +12 dB -6 to +6 dB
Synchronization	Int. X-tal. or random trigger
Trigger input TTL	4Vpp $\pm$ 2 V. (Termination TTL or 75 $\Omega$ )
CL	cc 1
Shutter	1/30, 1/60, 1/100, 1/120, 1/250,
Continuous and EPS	1/500, 1/1000, 1/2000, 1/4000, 1/10,000, 1/16,000, 1/50,000 sec.
Programmable exposure	Common RGB or R, G, B individual 0 to 791 LVAL
Pulse width control	2 to 23706 LVAL, $\times$ 84 $\mu$ s to 1 s
White balance	Manual, One push, continuous Fixed 3200, 4600, 5600 K Manual, R and B -6 to +6 dB One push (2800 to 6500 K)
Functions controlled by RS 232C or CL serial	Trigger, Shutter, Scanning, Readout, Polarity, Gain, Set-up, White balance, Knee point
Operating temperature	-5°C to +45°C
Humidity	20 - 80% non-condensing
Storage temp./humidity	-25°C to 60°C / 20% to 90% non-condensing
Vibration	3G (15Hz - 200Hz in XYZ)
Shock	50G
Regulations	CE (EN50081-1 and EN50082-1) FCC part 15
Power	12V DC $\pm$ 10%. 6 W
Lens mount	C-mount. (Max 4.0 mm thread)
Dimensions	50 x 60 x 99 mm (HxWxD)
Weight	400g

## Principle for Chromatic Shading Correction



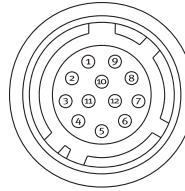
The CV-M9CL camera has a two-dimensional digital shading correction circuit. During the factory adjustment horizontal and vertical sensitivity profiles are made for R, G and B.

This profile table is stored in the camera memory. With the shading corrector enabled, the table values are used to correct the R, G and B gain depending on the H and V positions.

The resulting image has been corrected for shading originating from the lens, the prism and the CCD combination.

## Connection Description

### DC-IN/SYNC.

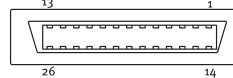


HIROSE HR10A-10R-12P

- | Pin | Signal                      | Function |
|-----|-----------------------------|----------|
| 1   | Ground                      |          |
| 2   | +12V DC                     |          |
| 3   | N/C                         |          |
| 4   | Auto iris lens video output |          |
| 5   | Ground                      |          |
| 6   | RXD                         |          |
| 7   | TXD                         |          |
| 8   | Ground                      |          |
| 9   | XEEN out                    |          |
| 10  | Trigger input               |          |
| 11  | +12V DC                     |          |
| 12  | Ground                      |          |

### Camera Link interface

26 pin MDR connector  
3M 10226-1A10JL



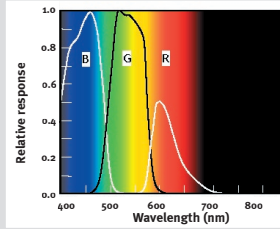
- | Pin | Signal | Function        |             |
|-----|--------|-----------------|-------------|
| 1   | 14     | GND             |             |
| 2   | 15     | X0-/X0+         | CL Data     |
| 3   | 16     | X1-/X1+         | CL Data     |
| 4   | 17     | X2-/X2+         | CL Data     |
| 5   | 18     | Xclk-/Xclk+     | CL Clk      |
| 6   | 19     | X3-/X3+         | CL Data     |
| 7   | 20     | SerTC+/SerTC-   | Serial in*  |
| 8   | 21     | SerTFG+/SerTFG- | Serial out* |
| 9   | 22     | CC1-/CC1+       | Trigger*    |
| 10  | 23     | CC2-/CC2+       | Not used    |
| 11  | 24     | CC3-/CC3+       | Not used    |
| 12  | 25     | CC4-/CC4+       | Not used    |
| 13  | 26     | GND             |             |

\* In Camera Link or 12 pin Hirose

Camera Link base configuration is used for 8 bit.

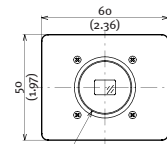
Camera Link medium configuration is used for 10 bit.

## Relative Prism and CCD Response

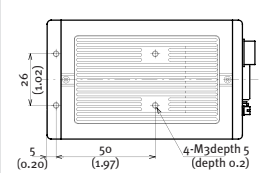


## Dimensions

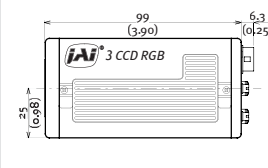
### Front view



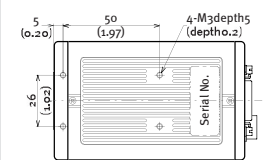
### Top view



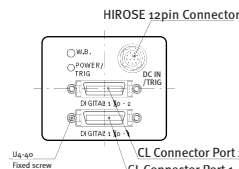
### Side view



### Bottom view



### Rear view



## Ordering Information

CV-M9 CL 3CCD Progressive Scan RGB Color Camera

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