

## ❖ CV-M9 CL

### 3CCD Progressive Scan RGB Color



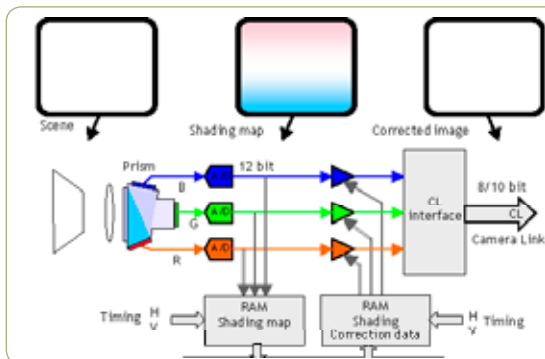
- **3 x 1/3" progressive scan RGB color CCD camera**
- **1024 (h) x 768 (v) 4.65  $\mu$ m active square pixels for each CCD**
- **Compact RGB prism for C-mount lenses**
- **Chromatic shading reduction makes lens choice wider**
- **30 frames per second with full resolution**
- **86 fps with 1/8 partial 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 smear-less 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**



# Specifications for CV-M9 CL

Specifications	CV-M9 CL
Sensor	3 x 1/3" progressive scan CCD
Pixel Clock	33.75 MHz
Frame rate full frame	30 frames/sec. (792 lines per frame)
Active area	4.8 (h) x 3.6 (v) mm
Cell size	4.65 (h) x 4.65 (v) $\mu$ m
Active pixels	1024 (h) x 768 (v)
Readout modes	Full 1024 (h) x 768 (v) 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 Vertical binning 1024 (h) x 384 (v) 50 fps
Sensitivity	2 Lux (On sensor, Max gain, 50% video)
S/N ratio	>50 dB (Green ch., 0 dB gain)
Video output	3 x 8 bit RGB: Base config. CL 3 x 10 bit RGB: Medium config. CL
Auto-iris lens video	0.7 Vp-p, 75 $\Omega$
Gain, manual	Master -3 to +12 dB R and B -6 to +6 dB
Synchronization	Int. X-tal or ext. trigger
Inputs	Camera Link TTL Ext. trigger, LVDS (CC 1) Ext. trigger, 4V $\pm$ 2V (TTL)
Outputs	Camera Link TTL Clk, LVAL, FVAL, Data, EEN XEEN
Trigger modes	Continuous, Edge Pre-Select, Pulse Width Control, Reset Continuous, Smear-less
Electronic shutter	Pre-set shutter 1/30 to 1/50,000 sec. in 12 steps Programmable exposure 0.5L to 791L in 42 $\mu$ s steps. Common and R, G, B individual Pulse Width Control 2L (84 $\mu$ s) to 23,706L (1 sec.)
White balance	Manual, R and B, -6dB to +6dB One-push automatic, 2800 to 6500K Continuous automatic, 2800 to 6500K Fixed 3200, 4600 and 5600K
Knee function	Knee point and slope for R, G and B
Control interface	Camera Link or RS 232C
Functions controlled by serial communication	Shutter, trigger mode, readout mode, trigger input and polarity, white balance, gain, knee, black level
Indicators on rear panel	LED for power and trigger input
Operating Temperature	-10°C to +45°C
Humidity (operation)	20 - 90% non-condensing
Storage temp./humidity	-25°C to +60°C / 20 to 90%
Vibration	3G (15Hz to 200 Hz XYZ)
Regulations	CE (EN 61000-6-2, EN-61000-6-3), FCC part 15 class B, RoHS/WEEE
Power	12V DC $\pm$ 10% 6 W
Lens mount	C-mount (Max 4.0 mm thread)
Dimensions (H x W x L)	50 mm x 60 mm x 99 mm
Weight	400 g

## Principle for Chromatic Shading Correction



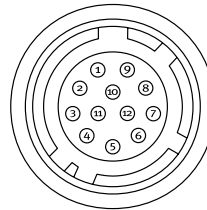
The CV-M9CL camera has a two-dimensional digital shading correction circuit. During the factory adjustment horizontal and vertical sensitivity profiles are made for R, G and B.

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.

## Connector pin-out

### DC-In / Trigger

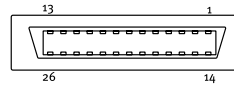


HIROSE HR10A-10R-12P

Pin	Signal
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



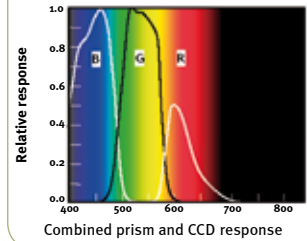
Pin	Signal	Function	
1	14	GND	
2	15	X0-/X0+	CL Data
3	16	X1-/X1+	CL Data
4	17	X2-/X2+	CL Data
5	18	Xclk-/Xclk+	CL Clk
6	19	X3-/X3+	CL Data
7	20	SerTC+/SerTC-	Serial in*
8	21	SerTFG-/SerTFG+	Serial out*
9	22	CC1-/CC1+	Trigger*
10	23	CC2-/CC2+	Not used
11	24	CC3-/CC3+	Not used
12	25	CC4-/CC4+	Not used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

\* In Camera Link or 12 pin Hirose

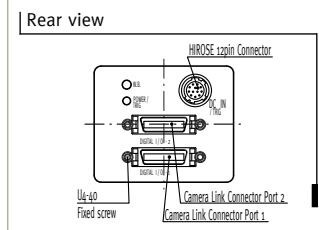
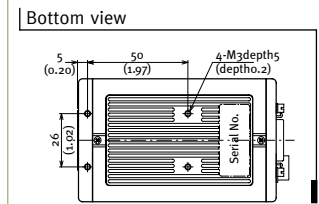
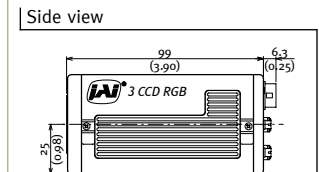
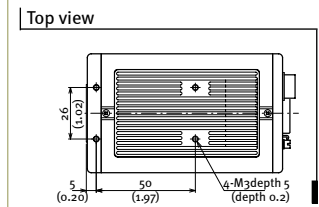
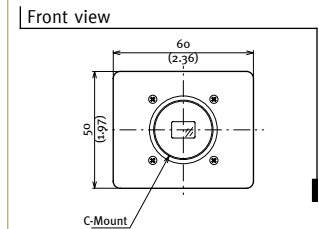
Camera Link base configuration is used for 8 bit.

Camera Link medium configuration is used for 10 bit.

## Spectral response



## Dimensions



## Ordering Information

CV-M9 CL 1/3" 3CCD Progressive Scan RGB Color

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

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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