



CV-M4⁺ CL

Digital Double Speed Monochrome Megapixel Progressive Scan Camera



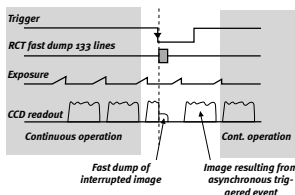
- **Digital 2/3" monochrome progressive scan CCD camera**
- **1392 (h) x 1040 (v) 6.45 μ m square pixels**
- **Extended IR sensitivity**
- **10 bit video output as Camera Link**
- **LVDS version with 8 bit video output**
- **Full 1380 (h) x 1030 (v) frame readout in 1/24 second**
- **Higher frame rates with partial scanning or binning**
- **Partial scan to 1/8 and vertical binning**
- **Edge pre-select (EPS) and pulse width control (PWC) trigger modes**
- **Restart continuous trigger (RCT) mode**
- **Analog video output for controlling auto-iris lenses**
- **Shutter speeds from 1/24 to 1/10,000 second in 10 steps**
- **Trigger and timing signals as LVDS or via Camera Link**
- **Setup by switches or serial control (short ASCII commands)**
- **Windows 98/NT/2000 setup software**

The leading manufacturer of high performance camera solutions

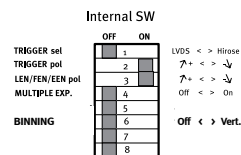
Specifications for CV-M4⁺ CL

Specifications	CV-M4 ⁺ CL
Scanning system	Progressive 1060 lines 24 frames/sec.
Pixel clock	40.49 MHz
with H binning	20.25 MHz
Line frequency	25.43 kHz (1592 pixel clock/line)
with H binning	23.11 kHz (1752 pixel clock/line)
Frame rate for full frame	24 frames/sec. (1060 lines/frame)
with V binning	44 frames/sec. (565 lines/frame)
CCD sensor	2/3" progressive scan monochrome IT CCD
Sensing area	8.9 (h) x 6.6 (v) mm
Cell size	6.45 (h) x 6.45 (v) μm
Effective pixels	1392 (h) x 1040 (v)
Pixels in video output	
Full	1380 (h) x 1030 (v) 24 frames/sec.
V binning	1380 (h) x 515 (v) 44 frames/sec.
1/2 partial	1380 (h) x 512 (v) 44 frames/sec.
1/4 partial	1380 (h) x 256 (v) 70 frames/sec.
1/8 partial	1380 (h) x 128 (v) 102 frames/sec.
Spectral sensitivity	380 - 1000 nm
Sensitivity on sensor	0.1 Lux (Max. gain, 50% video)
S/N ratio	>55 dB
Video A/D conversion	10 bit
Video output digital	8 bit LVDS (EIA 644) 10 bit in Camera Link
Iris video	0.7 Vpp, 75 Ω
Gamma	1.0
Gain	Manual - Automatic
Gain range	-3 to +12 dB
Synchronization	Int. X-tal. Ext. random trigger
Sync. output	Composite 4 Vpp from 75 Ω
Trigger input TTL	4 V±2 V
EEN output	4 Vpp from 75 Ω
Pixel clock output	LVDS or Camera Link
LEN/FEN output	LVDS or Camera Link
Trigger input LVDS	LVDS or Camera Link
Multiple exposure	LVDS or Camera Link
Trigger modes	Continuous, Edge pre-select, Pulse width control, Restart continuous trigger
Trigger in (Edge pre-select)	>2 H
Shutter speed (fixed)	1/24 through 1/10,000 second
Pulse width control	2 H to 3 frames. (80 μsec. to 72 msec.)
Frame-delay readout	Fixed shutter speeds. Delay ≤3 frames
Restart continuous trigger	Capture begins 133 lines after trigger input
Smearless readout	Edge pre-select, PWC and frame-delay
Multiple exposure	≤6 fixed exposures in frame-delay readout.
Interval	Fixed shutter time + 1H (80 μsec.)
Camera setup by switches on rear	Shutter, Trigger, Scanning, Smearless, RS 232C control
Functions controlled by RS 232C	Shutter, Trigger, Scanning, Readout, Trigger input, Select/polarity, LEN/FEN/EEN polarity, Video level, Set-up level and Gain
Operating temperature	-5°C to +45°C
Humidity	20 - 80% non-condensing
Storage temp./humidity	-25°C to 60°C / 20% - 90%
Power	12V DC ± 10%. 4.5 W
Lens mount	C-mount
Dimensions	40 x 50 x 90 mm (HxWxD)
Weight	250g

Restart Continuous Trigger

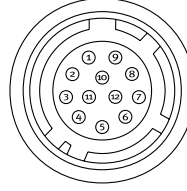


Internal Switch



Connection Description

DC-IN/TRIG.



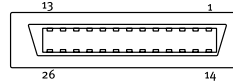
HIROSE HR10A-10R12P

- Pin 1 Ground
- 2 +12V DC
- 3 Ground
- 4 Iris video
- 5 Ground
- 6 RXD RS 232C
- 7 TXD RS 232C
- 8 Ground
- 9 Sync. output/EEN output*
- 10 Trigger input (TTL)*
- 11 +12V DC/Multiple exposure*
- 12 Ground

* Signals can be changed by internal switches and jumpers or via RS 232C.

Camera Link interface

26 pin MDR connector
3M 10226-1A10JL



Digital I/O

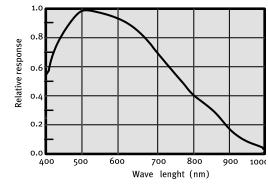
- | Pin | Signal | Function |
|-------|-----------------|-------------|
| 1 14 | GND | |
| 2 15 | X0-/X0+ | CL Data |
| 3 16 | X1-/X1+ | CL Data |
| 4 17 | X2-/X2+ | CL Data |
| 5 18 | Xclk-/Xclk+ | CL Clk |
| 6 19 | X3-/X3+ | CL Data |
| 7 20 | SerTC+/SerTC- | Serial in* |
| 8 21 | SerTFG-/SerTFG+ | 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 | |

Camera Link base configuration.

(for LVDS pinout, see operation manual)

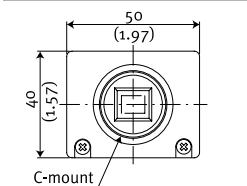
* In CL or Hirose 12-pin connector

Spectral Sensitivity

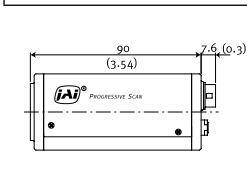


Dimensions

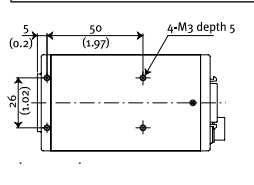
Front view



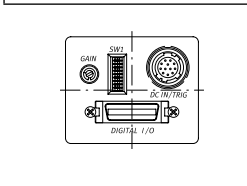
Side view



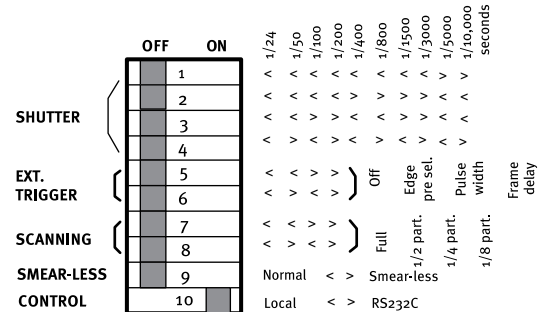
Bottom view



Rear view



Switch Setting



Ordering Information

CV-M4⁺ CL 2/3" Digital Double Speed Megapixel Progressive Scan Camera. Camera Link
CV-M4⁺ 2/3" Digital Double Speed Megapixel Progressive Scan Camera. LVDS

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