

## ➤ CM-040 MCL / CB-040 MCL Progressive Scan

**C<sub>3</sub> Camera Suite**  
Unlimited  
Digital  
Switchability



- *Compact series 1/2" progressive scan camera*
- *Monochrome and Bayer mosaic color versions*
- *776 (h) x 582 (v) active pixels*
- *8.3  $\mu$ m square pixels*
- *61.15 frames/second with full resolution in continuous operation*
- *60 frames/second with external trigger and full resolution*
- *Up to 280 frames/second with partial scan*
- *111 frames/second with vertical binning (CM-040 MCL only)*
- *Shutter speed from 27.437 $\mu$ s to 2 sec. using Pulse Width Control*
- *Programmable exposure from 54.874 $\mu$ s to 16.553 ms*
- *Pre-select and Pulse width trigger modes*
- *LVAL-synchronous/-asynchronous operation (auto-detect)*
- *Auto iris lens video output to support dynamic lighting conditions*
- *10 or 8-bit output*
- *Setup by Windows NT/2000/XP via serial communication*
- *Right angle adapter (optional)*

**CAMERA  
Link**  
(Mini Camera Link)



[www.jai.com](http://www.jai.com)

See the possibilities

# Specifications for CM-040 MCL / CB-040 MCL

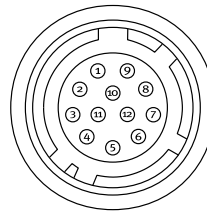
Specifications	CM-040 MCL / CB-040 MCL												
Sensor	1/2" progressive scan CCD												
Pixel Clock	33.75 MHz												
Frame rate full frame	61.15 frames/second (596 lines per frame)												
Active area	6.49 (h) x 4.83 (v) mm												
Cell size	8.3 x 8.3 μm												
Active pixels	776 (h) x 582 (v)												
Color (CB-040 MCL)	Raw Bayer output, host-based interpolation												
Read-out modes	<table border="0"> <tr> <td>Full</td> <td>776 (h) x 582 (v) 61 fps</td> </tr> <tr> <td>2/3 partial scan</td> <td>776 (h) x 390(v) 87 fps</td> </tr> <tr> <td>1/2 partial scan</td> <td>776 (h) x 294 (v) 110 fps</td> </tr> <tr> <td>1/4 partial scan</td> <td>776 (h) x 146 (v) 186 fps</td> </tr> <tr> <td>1/8 partial scan</td> <td>776 (h) x 74 (v) 280 fps</td> </tr> <tr> <td>Vertical binning</td> <td>776 (h) x 291 (v) 111 fps*</td> </tr> </table> <p>*NOTE: CM-040 MCL only</p>	Full	776 (h) x 582 (v) 61 fps	2/3 partial scan	776 (h) x 390(v) 87 fps	1/2 partial scan	776 (h) x 294 (v) 110 fps	1/4 partial scan	776 (h) x 146 (v) 186 fps	1/8 partial scan	776 (h) x 74 (v) 280 fps	Vertical binning	776 (h) x 291 (v) 111 fps*
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Vertical binning	776 (h) x 291 (v) 111 fps*												
Sensitivity (CM-040 MCL)	0.2 Lux (On sensor, Max. gain, shutter off, 50% video)												
Sensitivity (CB-040 MCL)	1.3 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 +24dB												
Synchronization	Int. X-tal or ext. trigger												
Inputs	Camera Link TTL Ext. trigger, LVDS (CC 1) Ext. trigger 4V ±2V												
Outputs	Camera Link TTL Clk., FVAL, LVAL, Data, EEN XEEN												
Trigger modes	Pre-select, Pulse Width												
Electronic shutter	Pre-set shutter 1/60 to 1/10,000 in 10 steps												
Programmable exposure	2L (54.87μs) to 596L (16.353ms) in 1L steps												
Pulse Width Control	27.437μs 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 ±10% 3 W												
Lens mount	C-mount												
Dimensions (H x W x L)	29 x 44 x 66 mm (CM/CB-040 MCL) 29 x 44 x 93.5 mm (CM/CB-040 MCL-RA)												
Weight	115 g (CM/CB-040 MCL) 155 g (CM/CB-040 MCL-RA)												

## Ordering Information

CM-040 MCL	1/2" Monochrome Progressive Scan Camera
CB-040 MCL	1/2" Bayer Mosaic Color Progressive Scan Camera
CM-040 MCL-RA	1/2" Monochrome Progressive Scan Camera with Right angle adapter
CB-040 MCL-RA	1/2" Bayer Mosaic Color Progressive Scan Camera with Right angle adapter
Option: CM-040 MCL-GL	1/2" Bayer Mosaic Color Progressive Scan Camera – Glassless

## 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

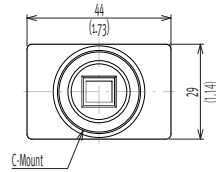


Pin	Signal	Function
1	14	GND
2	15	-/+ Tx0
3	16	-/+ Tx1
4	17	-/+ Tx2
5	18	-/+ Txclk
6	19	-/+ Tx3
7	20	+/-SerTC
8	21	-/+ SerTFG
9	22	CC1-/CC1+
10	23	CC2-/CC2+
11	24	CC3-/CC3+
12	25	CC4-/CC4+
13	26	GND

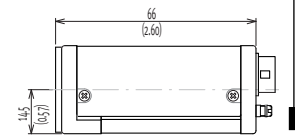
\*) in Mini-CL or 12-pin Hirose

## Dimensions

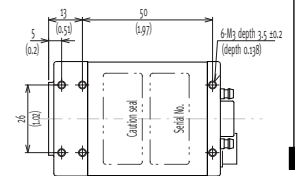
### Front view



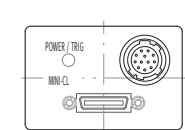
### Side view



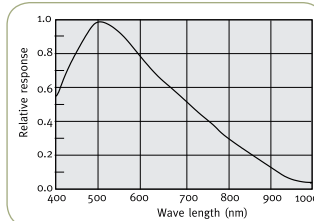
### Bottom view



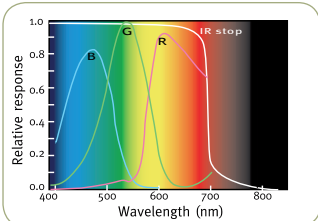
### Rear view



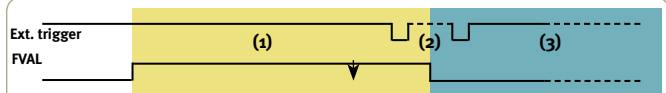
## Spectral Response CM-040 MCL



## Spectral Response CB-040 MCL



## 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)



See the possibilities

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