

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

**C3** 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)



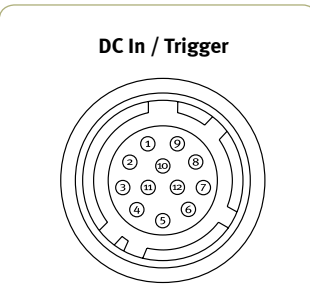
# Specifications for CM-040 MCL / CB-040 MCL

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	
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*
	*NOTE: CM-040 MCL only
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

## Connector pin-out



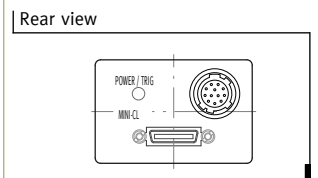
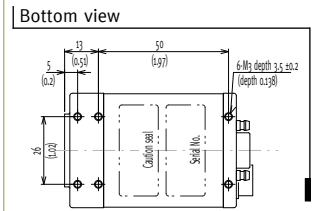
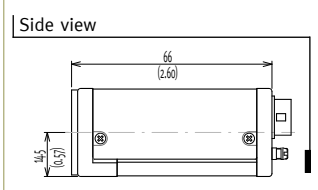
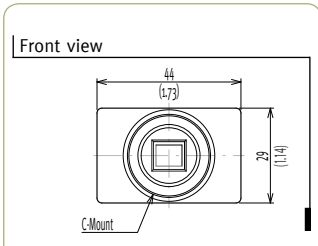
Pin	Signal
1	Ground
2	+12V DC
3	Ground
4	Auto Iris lens video output
5	Ground
6	N/C
7	N/C
8	Ground
9	XEEN out
10	Trigger in*
11	+12V DC
12	Ground



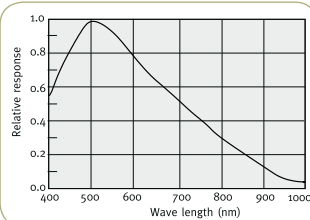
Pin	Signal	Function
1	14	GND
2	15	+/-Tx0
3	16	+/-Tx1
4	17	+/-Tx2
5	18	+/-Txclk
6	19	+/-Tx3
7	20	SerTC+/SerTC-
8	21	SerTFG+/SerTFG-
9	22	CC1-/CC1+
10	23	CC2+/CC2-
11	24	CC3-/CC3+
12	25	CC4+/CC4-
13	26	GND

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

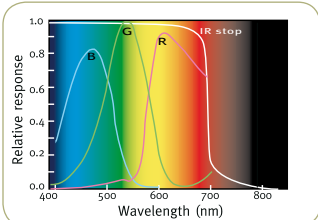
## Dimensions



## 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)

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