

- **2048 x 2048 pixels**
- **Global Pipelined Shutter**
- **17 full-frames / sec.**
- **Monochrome or Color**
- **8, 10 -bit digital output**
- **USB 2.0 interface**
- **Opto-isolated trigger input/output**
- **Area-scan, line-scan and sub-sampled operation**
- **Multi-slope exposure for extended dynamic range**



The BCcmv4000 camera is a very compact, high-resolution CMOS camera. The camera is equipped with the CMOSIS CMV4000 image sensor with 5.5 μ m square pixels producing up to 17 full frames per second.

Higher frame-rates can be achieved by defining up to 8 row-based Windows-Of-Interest within the 2048 x 2048 pixel area, and/or specify sub-sampling.

The camera has an excellent signal-to-noise ratio in combination with superior contrast performance.

The sensor has a pipelined global shutter. The digital camera can operate in single shot mode, which makes it ideal for machine vision applications. In this mode, the user has the freedom to decide when the camera has to capture an image, not the other way around as is the case with most analogue camera systems. Continuous capture mode is also supported. Frame-rates up to 35 fps can be achieved, or much higher using the programmable Window-of-Interest and sub-sampling modes.

The Correlated Double Sampling (CDS) technique is used to reduce Fixed Pattern Noise (FPN) and increase dynamic range.

The image sensor has a Multi-Slope Exposure mode that prevents over-exposure of brighter parts of an image while preserving contrast in the darker areas. In this way the dynamic range is extended from the normal 60dB up to 90dB. The camera can be switched between normal and Multi-Slope mode.

The in-camera memory is used as image FIFO and can also be used with custom camera logic for other purposes, such as reference image, camera calibration data, etc.

C-Cam Technologies currently supply the USB 2.0 interfaces only. All cameras have an isolated trigger input and output.

The BC family of cameras come with a complete Software Development Kit (SDK) including drivers, DLL files and sample code in high-level languages. Software engineers can easily adapt this code to integrate into their own applications. Application libraries are available for Windows and Linux.

BCCMV4000 CMOS CAMERA

Ordering Codes

Sensor Specifications

Imager type	CMOS sensor CMV-4000 manufactured by CMOSIS with Global Pipelined shutter
Sensor types	Monochrome or Bayer colour
Total light-sensitive pixels	4.2 megapix (2048H x 2048V)
Window Of Interest (WOI)	Full row rectangle or line image format specified by the user.
Multiple WOI interest	Up to 8 windows-of-interest
Active image area	11.26mm (H) x 5.98mm (V)
Pixel pitch	5.5 x 5.5 μm
Optical Format	2/3 inch
Fill factor	42% (without microlenses)
QE * FF	>50% (with microlenses)
Sensitivity	4.64 V / lux.s (0.22 A / W)
Spectral Response Range	approx. 400-1000nm (t.b.d.)
Temporal noise	13e ⁻ (RMS)
Well capacity	13500 e ⁻
Dark current signal	125e ⁻ /s @25°C
Parasitic Light Sensitivity	1/50,000
Standard dynamic range	60dB linear
High dynamic range	90dB in multi-slope mode
Multi-slope Exposure	Up to 3 slopes, fully programmable resolution 8 or 10 bits
Grey level	t.b.d.
MTF	t.b.d.
Fixed Pattern Noise (FPN)	<1 LSB (<0.1% of full-swing)
PRNU	<1% of signal
Pixel rate	16 channel x 480 Mbps
Frame speed full resolution	148 fps (10-bit mode) 70 fps (12-bit mode)
Shutter	On-chip electronic shutter
Shutter synchronisation	Global pipelined Remote via software or cable Local via I/O interface
Minimum exposure time	2.7 μs

In-camera Resources

Memory	32MB DDR2
FPGA Logic	15k Lut

Interface Specifications

Interface types	max. 11 fps	USB 2.0
Interface connector	USB 2.0	Mini-USB with screwlocks
Cable lengths	USB 2.0	5m ⁽²⁾
Local Trigger output	Isolated, 1 input, 1 output	
Local Trigger Connector	Binder 712 series 5-pole	⁽¹⁾

Mechanical Specifications

Dimensions	50 x 50 x 53 mm ^(not incl lens)
Weight	< 200 grams ^(not incl lens)
Housing	Aluminium, black
Lens adapter	C-mount (standard)
Tripod mount	1/4 inch mount (1 off)
Machine mount	M6 x 1 (4 x 2 off)
anodised	

Environmental Requirements

Operating temperature	0°C to +50°C
Storage temperature	-30°C to +80°C ^(non-condensing)

Power Requirements

USB	via interface cable
Power consumption	<2 Watt

¹ Trigger-cable 5m included in package

² USB-cable 5m included in package. Other lengths on request.

³ Power-adaptor with changeable input plugs for Europe , UK , USA and Australia.

BCcmv4000-U-x	USB2.0
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X = M for Monochrome and B for Bayer Color

The BCcmv4000 camera is also available with customized housing or without housing for OEM. Please contact C-Cam for more info