

BCv1300 CMOS Camera

PRELIMINARY

BCv1300 CMOS Camera

- 1280 x 1024 pixels (SXGA)
- Global or Rolling Shutter
- 125 full-frames / sec.
- Monochrome or Colour
- 8 bit or 10 bit digital output
- Area-scan and sub-sampled operation
- Multi-slope exposure for extended dynamic range
- USB 2.0 or Camera Link interface
- Opto-isolated trigger input/output



The BCv1300 camera is a very compact, high-resolution CMOS camera. The camera is equipped with the VITA 1300 image sensor with 4.8 μm square pixels producing up to 125 full frames per second.

Higher frame-rates can be achieved by defining up to 8 Windows-Of-Interest within the 1280 x 1024 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 and also a rolling shutter mode. 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 150 fps can be achieved, or much higher using the programmable Window-of-Interest and sub-sampling modes.

In rolling shutter mode a 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 55dB up to 90dB. The camera can be switched between normal and Multi-Slope mode.

Automatic exposure control allows the user to program a desired exposure, the correct integration time being calculated internally.

The in-camera memory is used as image FIFO for the USB2.0 interface and can also be used with custom camera logic for other purposes, such as reference image, camera calibration data, etc.

C-Cam Technologies supply two standard interfaces: USB 2.0 and Camera Link (Base). All cameras have an isolated trigger input and output. The Camera Link interface also allows for remote triggering via the interface cable.

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.

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Sensor Specifications

Imager type	CMOS integrating active pixel sensor (APS) VITA 1300 manufactured by Cypress Semiconductor Corp. with on-chip FPN correction
Sensor types	Monochrome or Bayer colour
Total light-sensitive pixels	1,310,720 (1280H x 1024V)
Window Of Interest (WOI)	Rectangle or line image format specified by the user
Multiple WOI	Up to 8 windows-of-interest
Active image area	6.1mm (H) x 4.9mm (V)
Pixel pitch	4.8 x 4.8 μ m
Optical Format	1/2 inch
Fill factor	80%
Spectral response	52% (QE * FF)
Spectral Response Range	approx. 400-1000nm (t.b.d.)
Temporal noise	Rolling shutter: 0.72 DN Synchronous shutter: 1.88 DN
Well capacity	17000 e ⁻
Enhanced Full Well	t.b.d.
Dark current signal	133 e ⁻ /sec. @ 25°C
Avg. auto-saturation time	120 seconds @ 25°C
Parasitic Light Sensitivity	<1/500
Standard dynamic range	55dB linear
High dynamic range	90dB in multi-slope mode
Multislope Exposure	Up to 3 slopes, external reset voltages, fully programmable
Grey level	resolution 8 or 10 bits
MTF	t.b.d.
PRNU	2 % of signal
Pixel rate	4 channel x 620 Mbps
Frame speed full resolution	125 frames/second
Shutter	On-chip electronic shutter Global (pipelined) and Rolling curtain type.
Shutter synchronisation	Remote via software or cable Local via I/O interface
Minimum exposure time	Global shutter: t.b.d. Rolling shutter: 1 line read time

Ordering Information

BCv1300-CL-M	Camera Link Monochrome
BCv1300-CL-B	Camera Link Bayer colour
BCv1300-U-M	USB Monochrome
BCv1300-U-B	USB Bayer colour

The BCv1300 camera is also available without housing for OEM, and in Scheimpflug version. See our website for further details.



a division of **vector international**, Research Park, B-3001 Leuven, Belgium
Tel : +32 16 402016 Fax: +32 16 400323 www.c-cam.be info@c-cam.be

In-camera Resources

Memory	256Mb DDR2 RAM 64Mb Flash
FPGA Logic	15,000 elements

Interface Specifications

Interface types	max. 23 fps USB 2.0 max. 125 fps Base Camera Link
Interface connector	USB 2.0 Binder 712 series 4-pole Mini Camera Link SDR26p Hardware Trigger I/O Binder 712 series 5-pole

Cable lengths

USB 2.0	0.5m, 1m, 2m, 3m, 5m
Camera Link	3m, 5m, 7m, 10 m

Remote Trigger via Camera Link interface

Local Trigger Isolated, 1 input, 1 output

Mechanical Specifications

Dimensions	50 x 50 x 50 mm ^(*)
Weight	< 200 grams ^(*)
Housing	Aluminium, black anodised
Lens adapter	C-mount (standard)
Tripod mount	1/4 inch mount (1 off)
Machine mount	M6 x 1 (2 x 2 off)

^(*) Not including lens

Environmental Requirements

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

Power Requirements

USB	Power supply through interface cable
Camera Link	8 - 12 Volts via separate Binder 712 series 2-pole
Power consumption	<2 Watt



Software Development Kit
(Also available on our website)