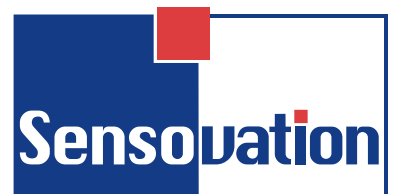




PRODUCT OVERVIEW



www.sensovation.com

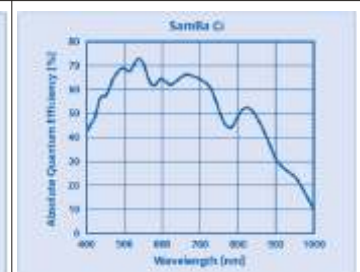
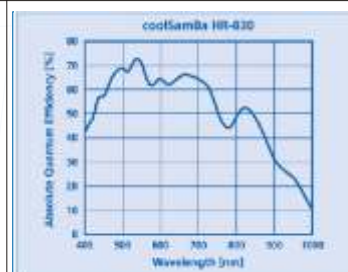


Product Overview



	coolSamBa HR-830	coolSamBa HR-400	SamBa Ci
Features	8.3 MPixel, extra-high resolution camera for detail-rich scientific and industrial imaging. Cooling for reduced dark current and increased sensitivity.	4 MPixel high resolution camera for detail-rich scientific and industrial imaging. Cooling for reduced dark current and increased sensitivity.	8.3 MPixel high resolution camera designed for solar cell and module inspection in scientific or rugged industrial environment. Available with USB 2.0 or Gigabit Ethernet interface.
Image Sensor Type	Full Frame CCD with on-chip microlenses, ITO transparent gate, low dark current.	Full Frame CCD with on-chip microlenses, ITO transparent gate, low dark current.	Full Frame CCD with on-chip microlenses optimized for increased quantum efficiency.
Number of Pixels	3326 x 2504	2048 x 2048	3326 x 2504
Pixel-Size	5.4 μm x 5.4 μm	5.4 μm x 5.4 μm	5.4 μm x 5.4 μm square
Active Area	18 mm x 13.5 mm	11 mm x 11 mm	17,9 mm horiz. x 13.5 mm vert.
Full Well Capacity	25 000 e ⁻ / Pixel (unbinned) 40 000 e ⁻ / Pixel (2x2 binned)	25 000 e ⁻ / Pixel (unbinned) 40 000 e ⁻ / Pixel (2x2 binned)	25 000 e ⁻ / Pixel (unbinned)
Read Noise	8 e ⁻ rms in HQ Mode	8 e ⁻ rms in HQ Mode	20 e ⁻ rms
Sensor Cooling	TE cooling to 50 °C below ambient, SensHermetic™ technology.	TE cooling to 50 °C below ambient, SensHermetic™ technology.	efficient passive cooling
Dark Current	< 0.03 e ⁻ /Pixel/s	< 0.03 e ⁻ /Pixel/s	25 e ⁻ /Pixel/s
Anti-Blooming	Yes	Yes	Yes
Peak Quantum Efficiency	72 %	72 %	72 %
Pixel Binning	2x2, 3x3...10x10 / subsampling	2x2, 3x3...10x10 / subsampling	2x2, 3x3 ... 10x10
Readout Modes	High Quality / High Speed	High Quality / High Speed	High Quality
Readout Rate	5 MHz (High Quality Mode) 25 MHz (High Speed Mode)	5 MHz (High Quality Mode) 25 MHz (High Speed Mode)	24 MHz
Frame Rate (HQ Mode)	2.7s / full frame	2.7s / full frame	400ms/full frame, 222ms/binned
Frame Rate (HS Mode, focussing)	Up to 1.5 fps	Up to 2.5 fps	2.5 fps unbinned, 4.5fps binned
Digital Resolution	16 bit / 12 bit	16 bit / 12 bit	12 bit
PC Interface	USB 2.0, Camera Link	USB 2.0, Camera Link	USB 2.0 or Gigabit Ethernet Data Interface
Optical Interface	F - Mount	C - Mount	C - Mount
Software	SDK-Software Development Kit (Active-X, MFC Library, .net) and SDK-viewer for image acquisition, display and storage.	SDK-Software Development Kit (Active-X, MFC Library, .net) and SDK-viewer for image acquisition, display and storage.	SDK-Software Development Kit (Active-X, MFC Library, .net) and SDK-viewer for image acquisition, display and storage.
Dimensions	100 mm x 130 mm x 170 mm	100 mm x 130 mm x 170 mm	117 mm x 117 mm x 64 mm
Order Number	SV-SB14-MB-1001	SV-SB15-MB-1001	SVSB31-MB-1001 USB-2 SVSB32-MB-1001 Gig Ethernet

Spectral Response Curves





coolSamBa HR-320

Very sensitive 3.2 MPixel, high resolution scientific camera with deep cooling. Very low dark current for long exposure times and low light applications.

Full Frame CCD with on-chip microlenses, ITO transparent gate, low dark current.

2184 x 1471

6.8 μm x 6.8 μm

14.9 mm x 10.3 mm

55 000 e⁻ / Pixel (unbinned)
110 000 e⁻ / Pixel (binned)

8 e⁻ rms

TE deep cooling to 60 °C below ambient, SensHermetic™ technology.

< 0.1 e⁻ / pix·s at -35 °C

No

90 %

Unlimited

High Quality / High Speed

500 KHz (High Quality Mode),
Fastbin (High Speed Mode)

6 s / full frame

Up to 5 fps

16 bit

Ethernet, LVDS framegrabber

C-Mount

SDK - Software Development Kit(Active-X, MFC Library, .net) and " *SVCameracontrol*" program for image acquisition

100 mm x 130 mm x 170 mm

SVSB08-MB-1001



coolSamBa HR-200

Sensitive 2 MPixel resolution scientific camera with large pixels for high dynamic range. Cooling for reduced dark current, longer exposures and increased sensitivity.

Full Frame CCD with on-chip microlenses, ITO transparent gate, low dark current.

1660 x 1250

10.8 μm x 10.8 μm

18 mm x 13.5 mm

80 000 e⁻ / Pixel (unbinned)

8 e⁻ rms in HQ Mode

TE cooling to 50 °C below ambient, SensHermetic™ technology.

< 0.3 e⁻ / pix·s at -20 °C

Yes

72 %

2x2, 3x3, ..., 10x10/subsampling

High Quality / High Speed

5 MHz (High Quality Mode),
25 MHz (High Speed Mode)

1.4 s / full frame

Up to 4.3 fps

16 bit / 12 bit

USB 2.0, Ethernet, camera-link

F-Mount

SDK - Software Development Kit(Active-X, MFC Library, .net) and " *SVCameracontrol*" program for image acquisition

100 mm x 130 mm x 170 mm

SVSB16-MB-1001



coolSamBa HR-Series



SamBaCi

Features and Benefits

High quantum efficiency,
100% fill factor, low noise

For sensitive detection of
low light levels

SensHermetic™ deep cooling,
low dark current

For extended exposure
time and higher sensitivity

Very high resolution

For detection of finest
details at a wide field of
view

Powerful SDK

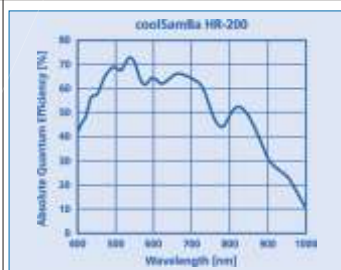
Ease of operation and
flexible software
integration

USB or ethernet interface

Standard and easy
connectivity with any PC

Gig-Ethernet, Camera-Link
interface

Robust connectivity in
industrial environment



coolSamBa Series

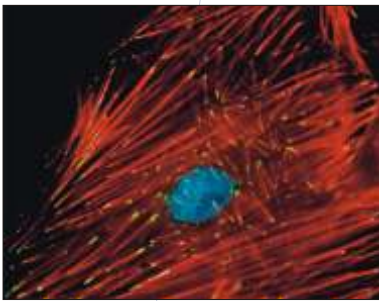
Sensovation's *coolSamBa* family of cooled scientific CCD cameras includes 5 distinct models. They are used for demanding applications, where light is often limited and an analytical grade image is required. The *coolSamBa* cameras are all designed for high sensitivity, high resolution, high flexibility and ultimate image quality. Each camera model reflects distinct sensor characteristics, pixel resolution or cooling performance, so that it will be always possible to find the right camera for a specific application.

The *coolSamBa* cameras are used for scientific applications in many fields but the majority of them in the field are used in biotechnology. Cameras most used there are the *coolSamBa HR-320* (top-sensitivity, best cooling), the *coolSamBa HR-830* (high resolution, excellent sensitivity), the *coolSamBa HR-200* (large pixels, high dynamic range) and the *coolSamBa HR-400*.

Because of their outstanding sensitivity these cameras are increasingly used for electroluminescence-measurement in the photovoltaic industry. Cameras used there are the *SamBa Ci* (fast frame rate, high sensitivity) *coolSamBa HR-830* (high resolution, high sensitivity) and the *coolSamBa HR-400*. These cameras also are available with industry proven and robust data interfaces.

The *coolSamBa* cameras incorporate latest SensHermetic™ sensor cooling technology (hermetically sealed and maintenance-free) for low dark current and long exposure time, allowing the detection of even the faintest light signals from the sample. High quantum efficiencies and low readout noise contribute to their outstanding sensitivity. The *coolSamBa* family includes cooled high resolution cameras with up to 8.3 Million Pixel, enabling the detection of the finest sample details while still offering a wide field of view. All *coolSamBa*HR-cameras have in common 16 Bit digital resolution, the same form factor and the same software and PC interface. The cameras come with a powerful software development kit (SDK), and a flexible viewer. USB 2.0 or Ethernet interface to the PC allows fast streaming of data and cost efficient connectivity without the need of an expensive interface card. For industrial applications like solar cell or solar panel inspection - Gigabit-Ethernet or Camera-Link interfaces are available to provide robust connectivity, also under demanding conditions.

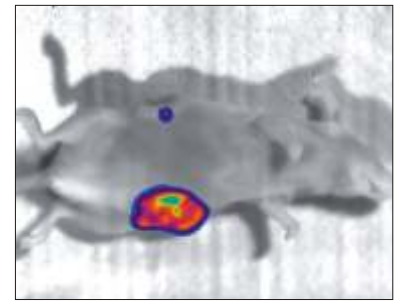
Applications for the coolSamBa Series



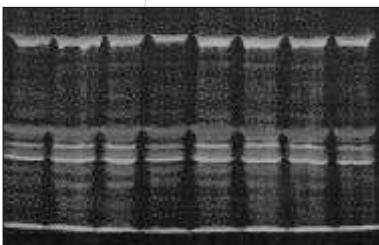
■ Fluorescence Imaging



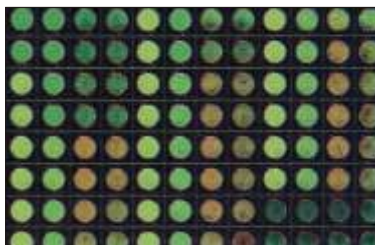
■ Chemi- and Bioluminescence



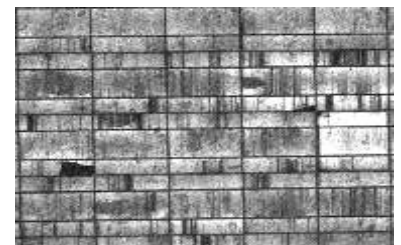
■ In-vivo Imaging



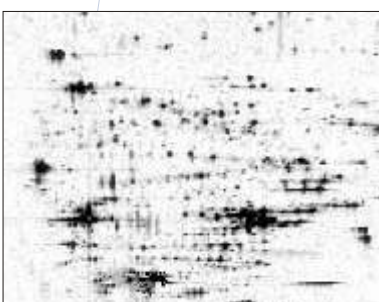
■ Gel Documentation



■ Microarray and Biochip Detection



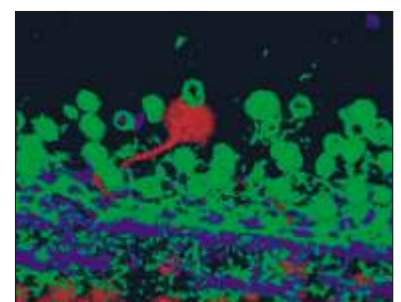
■ Electroluminescence



■ 2-D Gel Electrophoresis



■ Astronomy



■ Microscopy

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