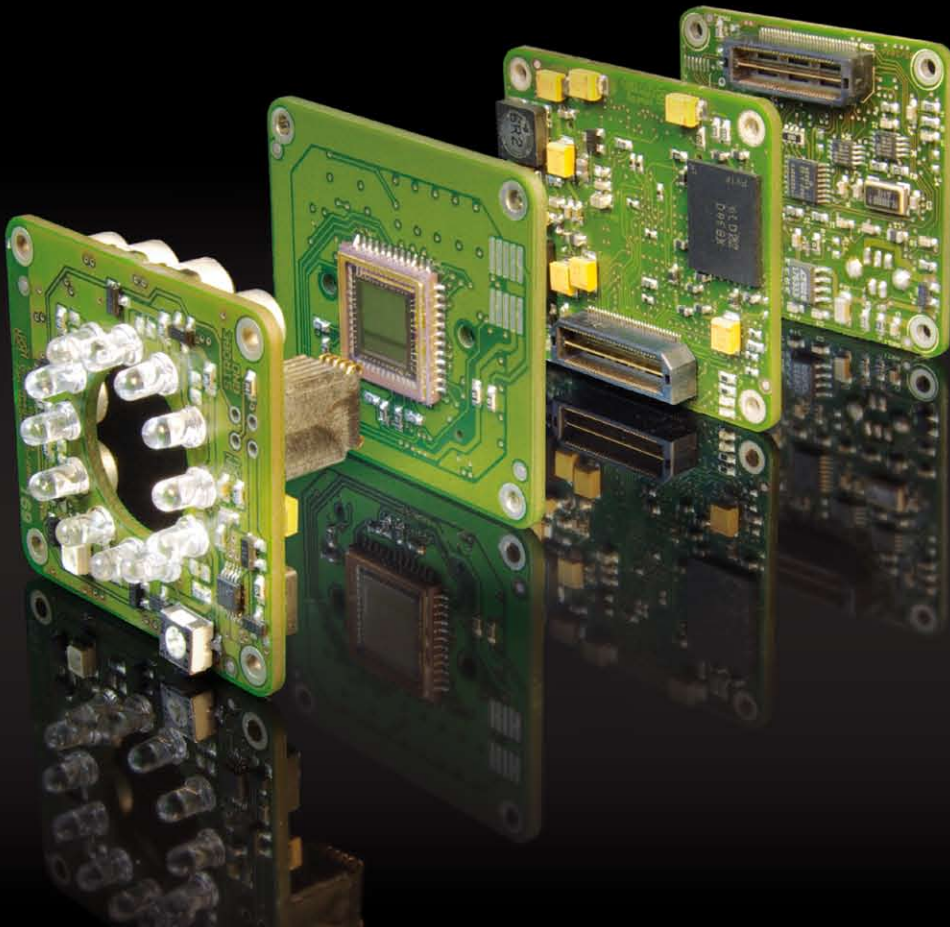




streaming, smart, intelligent imaging components



streaming, smart, intelligent components!



Design:

With streaming, smart, and intelligent components the German camera manufacturer VRmagic offers a wide range of components for industrial and scientific image processing.

Streaming Components: USB cameras and external frame grabbers for analog cameras

Smart Components: USB components with integrated preprocessing of image data on the FPGA-chip

Intelligent Components: programmable cameras running with a Linux operating system.

The product range of VRmagic includes monochrome and color cameras with rolling or global shutter and resolutions from VGA (640x480) to three megapixels (2048x1536).

User-friendly Features

All components are extremely user-friendly and offer numerous options – such as access to uncom-

pressed raw sensor data and stepless adjustment of all camera parameters. Features of all models are the storage of user data on the camera, trigger and strobe, timestamps and framecounter for synchronization, adjustable auto controls and the free definition of Region of Interest.

Software Development Kit

The product range is complemented by development software for convenient component integration and programming. The free Software Development Kit contains a single API that works with all models from VRmagic.

OEM

VRmagic offers cameras in housing and OEM variants – from sensor boards through to special designs such as multi-sensor cameras. The modules can be individually configured as required – and series-ready products can therefore be realized in a very short time.

OEM: sensor boards

> Board dimensions: 32 x 32 x 7 mm

>> 42 x 38 x 25 mm

COB „Camera On Board“: board camera with lens, illumination optional (white, red, IR LEDs)

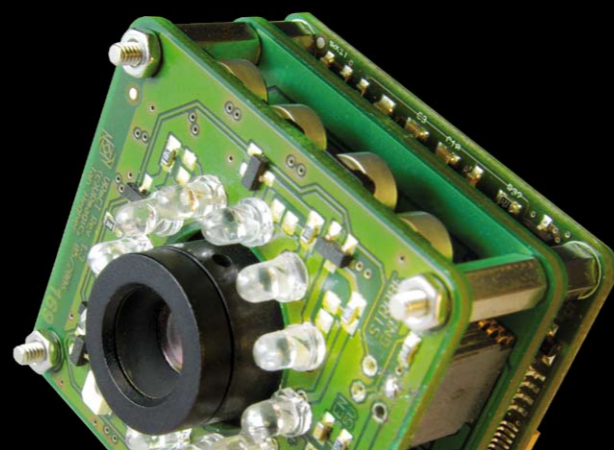
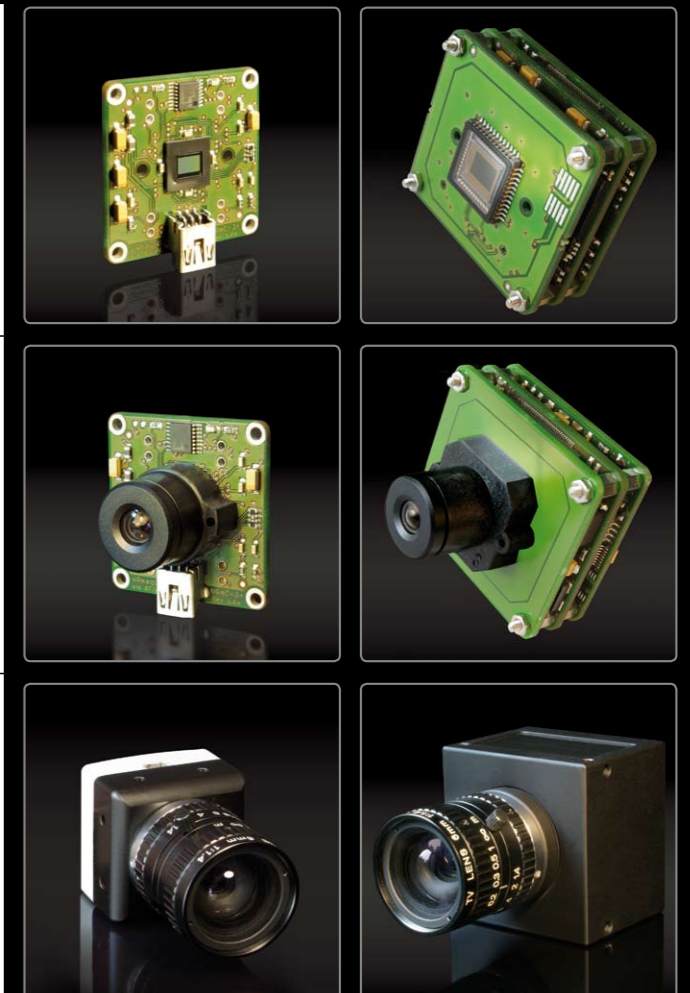
> Board dimensions: 32 x 32 x 7 mm

>> 42 x 38 x 25 mm

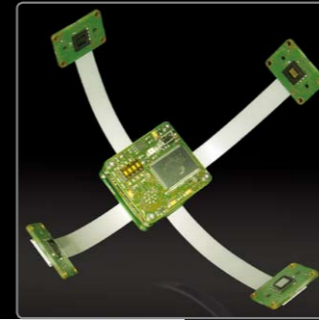
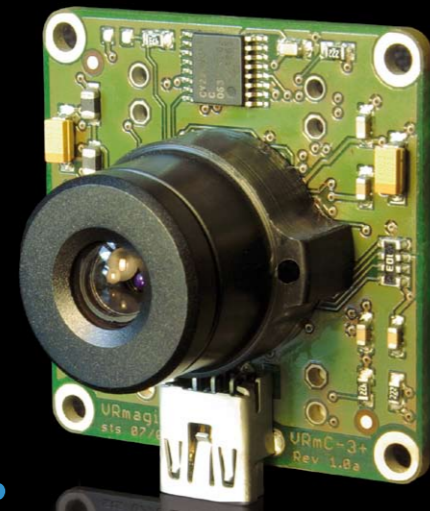
PRO: camera in housing of high quality anodized aluminum with C-Mount

> Housing dimensions: 36 x 36 x 27 mm

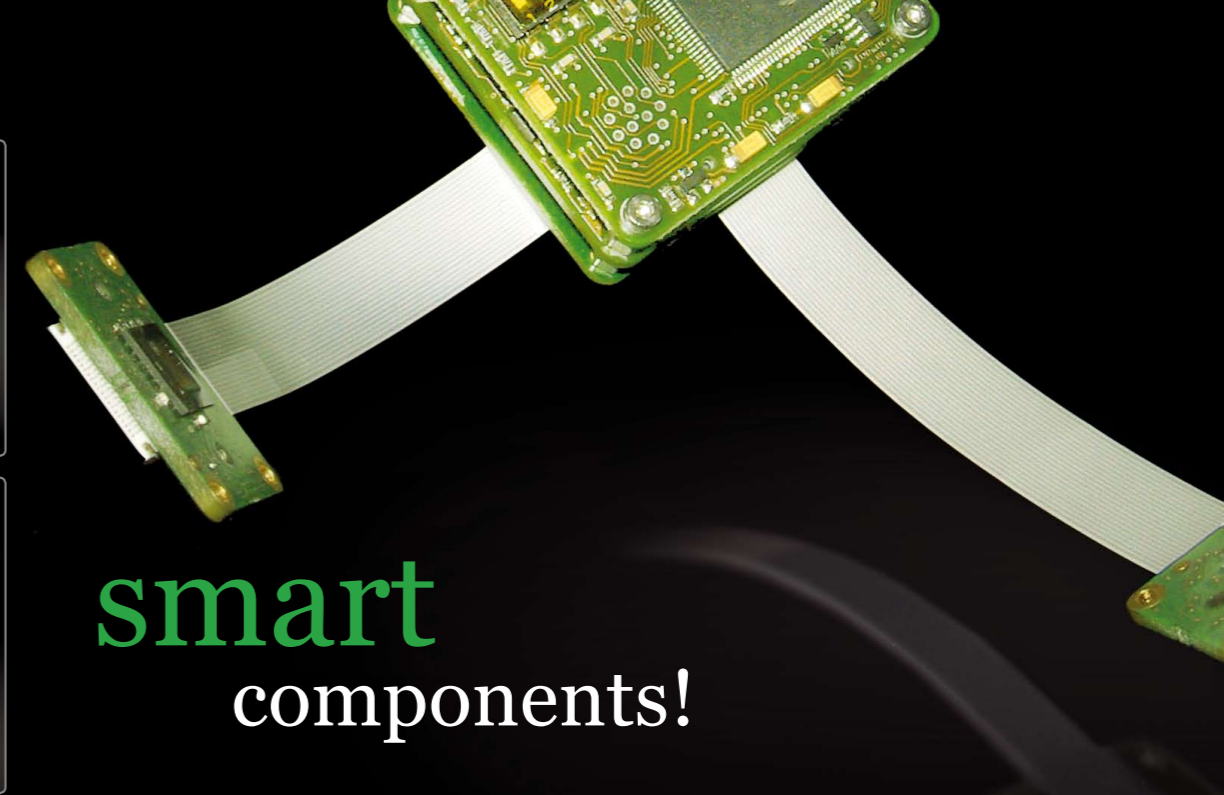
>> 46 x 46 x 46 mm



streaming components!



smart components!



Streaming Components

VRmagic offers various CMOS cameras that transfer image data to a host system via the Highspeed USB 2.0 interface. This permits no-fuss integration in existing applications. Handy frame grabbers also make it easy to connect analog cameras to a PC or laptop.

Streaming Components are available with different CMOS sensors, in monochrome and color, with rolling or global shutter and resolutions from VGA (640x480) to three megapixels (2048x1536).

Camera Features

- Standard Mini USB-B connector
- USB powered
- Freely programmable timings
- Unlimited access to uncompressed sensor data
- Optimized for parallel operation of multiple cameras
- Soft-trigger
- Timestamps
- Framecounter
- Storage of user configurations in the device
- Multiple standard formats plus one free definable ROI (Region of Interest)
- No frame grabbing hardware necessary

^ PRO Camera small

^ Framegrabber AVC

^ PRO Camera large

^ *Smart Multi-Sensor Camera:* up to four pixel-synchronous CMOS sensors with global shutter are connected to the camera by an LVDS data cable and can be freely positioned. An FPGA and 256MB storage take over the preprocessing of the image data.

Smart Components

In addition to image acquisition, *Smart Components* from VRmagic also make it possible to preprocess data directly in the camera. Image data can be compressed on the FPGA of the camera to reduce the load of the host system.

Smart Components are available with different CMOS sensors, in monochrome and color, with rolling or global shutter and resolutions from VGA (640x480) to three megapixels (2048x1536).

Features

Internal 64MB DDR-memory (ring buffer); Lossless bandwidth sharing; Lossless realtime compression (RLE-encoding); Bayer and HQ Bayer filter with RGB24; RGB565 or optimized grey picture; Highspeed USB 2.0; Fullspeed USB 1.x.

Camera Features

- Standard Mini USB-B connector
- USB powered
- Freely programmable timings
- Unlimited access to uncompressed sensor data
- Hirose connector for trigger/strobe signals
- DIP switches for configuration of trigger/strobe to active/passive
- Optimized for parallel operation of multiple cameras
- Soft-trigger; Timestamps; Framecounter
- Storage of user configurations in the device
- Multiple standard formats plus one free definable ROI (Region of Interest)
- No frame grabbing hardware necessary

	VRmAVC-1	VRmC-3+	VRmC-4	VRmC-6	VRmC-8+	VRmC-8	VRmC-9+	VRmC-9	VRmC-12	VRmFVC-1	VRmFC-4	VRmFC-6	VRmFC-8	VRmFC-9	VRmFC-12	Multi-Sensor Cameras		
CMOS Sensor		1/3"	1/2"	1/2"	1/2"	1/2"	1/2"	1/2"	1/3"		1/2"	1/2"	1/2"	1/2"	1/3"	2x 1/3"	3x 1/3"	4x 1/3"
Color	x	x	x	x	x	x			x	x	x	x	x	x	x	x	x	x
Monochrome	x	x	x	x			x	x	x	x				x	x	x	x	x
Resolution	PAL/NTSC	752x480	800x600	640x480	2048x1536	2048x1536	1280x1024	1280x1024	752x480	PAL/NTSC	800x600	640x480	2048x1536	1280x1024	752x480	752x480	752x480	752x480
Pixelsize		6x6 µm	8x8 µm	9.9x9.9 µm	3.2x3.2 µm	3.2x3.2 µm	5.2x5.2 µm	5.2x5.2 µm	6x6 µm		8x8 µm	9.9x9.9 µm	3.2x3.2 µm	5.2x5.2 µm	6x6 µm	6x6 µm	6x6 µm	6x6 µm
FPS		69	30	132	13	13	30	30	69		30	132	13	30	69	69	69	69
Pixelclock		5-26.6 MHz	5-15 MHz	5-42 MHz	5-48 MHz	5-48 MHz	5-48 MHz	5-48 MHz	5-26.6 MHz		5-15 MHz	5-42 MHz	5-48 MHz	5-48 MHz	5-26.6 MHz	5-26.6 MHz	5-26.6 MHz	5-26.6 MHz
Shutter		global	rolling	global	rolling	rolling	rolling	rolling	global		rolling	global	rolling	rolling	global	global	global	global
Board size (mm)	42x38x33	32x32x7	42x38x18	42x38x18	32x32x7	42x38x18	32x32x7	42x38x18	42x38x18	42x38x40	42x38x25	42x38x25	42x38x25	42x38x25	42x38x25	42x38x25	42x38x25	42x38x25
Housing size (mm)	55x45x33	36x36x27	46x46x40	46x46x40	36x36x27	46x46x40	36x36x27	46x46x40	46x46x40	55x45x40	46x46x46	46x46x46	46x46x46	46x46x46	46x46x46			
Software-Trigger		x	x	x	x	x	x	x	x									
Hardware-Trigger			x	x		x		x	x									
Hardware-Strobe			x	x		x		x	x									
Illumination (Cob)		x	x	x		x		x	x		x	x	x	x	x			
Internal (RAM)										64MB	64MB	64MB	64MB	64MB	64MB	256MB	256MB	256MB
Illumination (Cob)																		

Model VRmC-3+ and VRmC-4 transfer 8 bit sensor data via USB, all other Streaming Components alternatively 8 bit or 10 bit.

10 bit sensor data are being processed and alternatively 8 bit or 10 bit transferred via USB. Model VRmFC-4 transfers 8 bit.

intelligent components!

Software Development Kit!

Intelligent Components

With a combination of a Linux-based ARM processor and a DSP, VRmagic offers fully autonomous *Intelligent Components*. Image processing tasks – such as decisions on position, completeness or quality – are performed directly in the camera. Developers can transfer their own algorithms to the camera conveniently by means of a cross-compiler.

The component is equipped with 128 MB RAM and a 512 MB flash module. An FPGA-Chip for preprocessing of image data can optionally be integrated.

Intelligent Components are available with several CMOS sensors, in monochrome and color, with rolling or global shutter and resolutions from VGA (640x480) to three megapixels (2048x1536).

Supported Interfaces:

- 10/100 Mbit Ethernet
- USB 2.0 Host
- Analog Video Output
- General Purpose I/O (2 Input/ 3 Output)
- RS232
- CAN-Bus (optional)
- PROFIBUS (optional)



^ Backview board-camera



The free Software Development Kit contains a single API that works with all models from VRmagic. The Self Describing Interface allows for generic code development - an exchange of the camera model later on is thus possible without additional programming. The provided user interface allows access to all camera parameters. Demo applications and free source code for several developing platforms are included.

Special features of the Software Development Kit:

Free control of exposure time, pixelclock and blanking interval; Individual adjustment of auto exposure, gains or white balance; Optimized image conversion (1-pass) to RGB32, RGB24, RGB565, Gray and YUYV; Optional horizontal or vertical image inversion; Correction of gamma, luminance and contrast via Look-Up-Tables.

Supported System Software

- Microsoft Windows 2000 (x86) SP3 or later
- Microsoft Windows XP (x86) with Q312370 Hotfix or SP1 or later
- Microsoft Windows XP (x64) SP2 or later
- Microsoft Windows Vista (x86)
- Microsoft Windows Vista (x64)
- Linux Kernel 2.6.xx with usbfs support

Programming platforms including demos and free source code

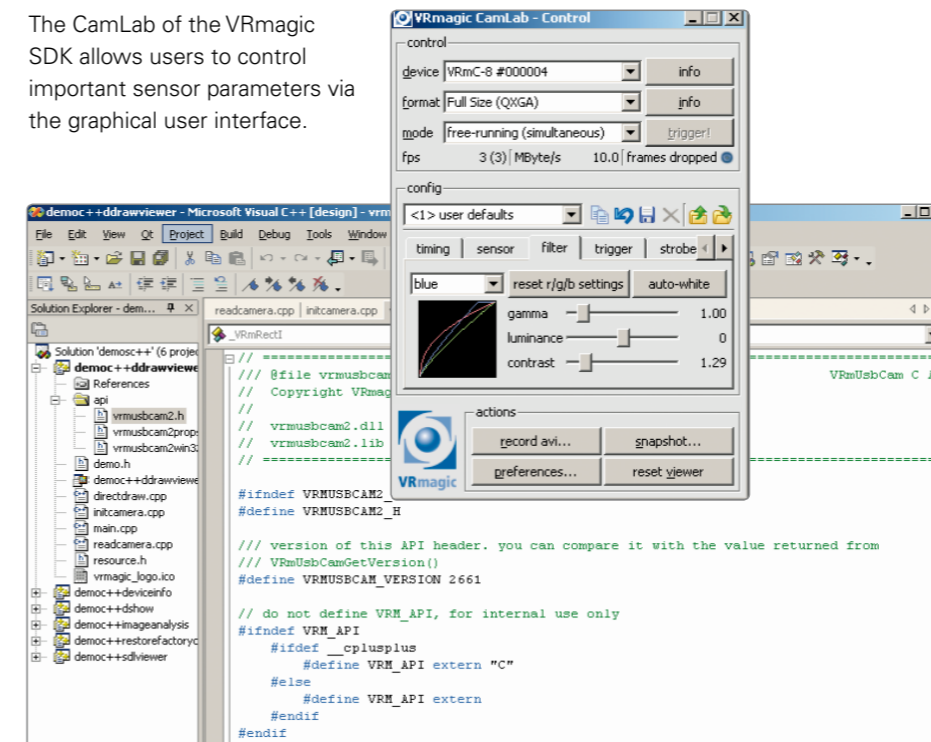
- Microsoft Visual C++ 6.0 or later
- Microsoft Visual Basic 6.0
- Microsoft Visual Basic 2005 or later
- Microsoft Visual C# 2005 or later
- Microsoft DirectShow

	VRmDAVC-1	VRmDC-4	VRmDC-6	VRmDC-8	VRmDC-9	VRmDC-12
CMOS Sensor		1/2"	1/2"	1/2"	1/2"	1/3"
Color	x	x	x	x		x
Monochrome	x	x	x		x	x
Resolution	PAL/NTSC	800x600	640x480	2048x1536	1280x1024	752x480
Pixelsize		8x8 µm	9.9x9.9 µm	3.2x3.2 µm	5.2x5.2 µm	6x6 µm
FPS		30	132	13	30	69
Pixelclock		5-15 MHz	5-42 MHz	5-48 MHz	5-48 MHz	5-26.6 MHz
Shutter		rolling	global	rolling	rolling	global
Board size (mm)	42x38x48	42x38x33	42x38x33	42x38x33	42x38x33	42x38x33
Housing size (mm)	55x45x48	46x46x54	46x46x54	46x46x54	46x46x54	46x46x54

Camera Features

- Freely programmable timings
- Unlimited access to uncompressed sensor data
- Trigger/strobe signals
- Optimized for parallel operation of multiple cameras
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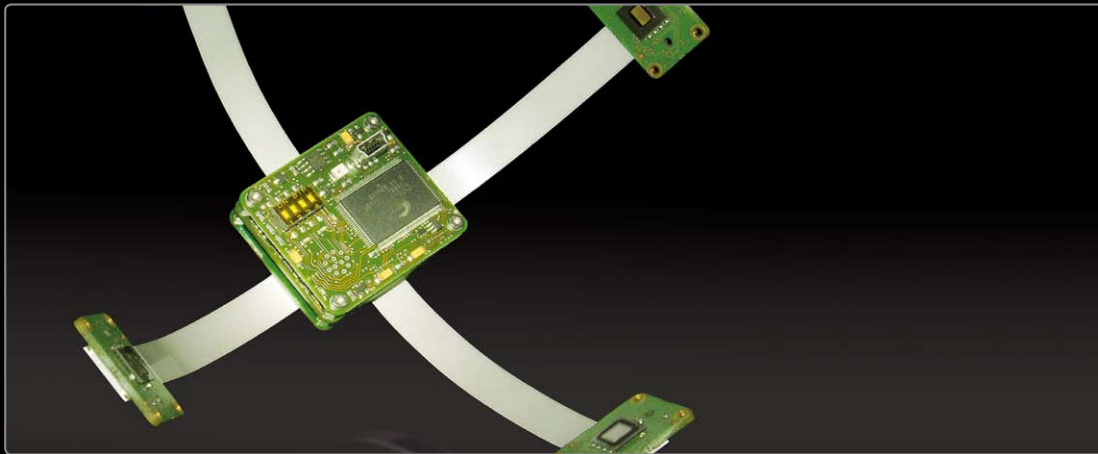
The CamLab of the VRmagic SDK allows users to control important sensor parameters via the graphical user interface.



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Supports:



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Design: GreenwoodFinch, Elmstein, Germany

