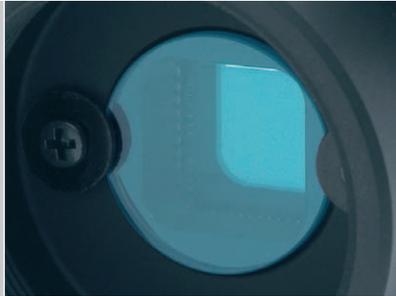




iDS



uEye[®]

uEye[®] RE

Your imagination is our challenge

uEye® – It's so easy



The uEye® family

uEye® stands for a family of extremely compact, cost efficient cameras for professional use in industrial, non industrial and security technology. Through the use of the widespread USB technology, the cameras can be interfaced with a vast variety of systems without problems.

Modern sensorics

uEye® cameras are equipped with a range of high-quality CCD and CMOS sensors. The wide range of products includes several models with VGA or Wide VGA resolution and a maximum of 87 full frames per second, as well as high-resolution megapixel cameras. Most models are available with color or monochrome sensors.



Features at a glance

- Universal use with PC, notebook, IPC and embedded systems with USB 2.0
- Monochrome and color models
- Resolutions from VGA (640 x 480) to 5 megapixels (2560 x 1920)
- High-quality CCD and CMOS sensors
- Memory models with 4 MB memory and USB 1.1 compatibility
- Up to 87 full frames/sec., over 1000 frames/sec. with AOI
- One universal driver and one SDK for the entire camera family
- Camera control and power supply via the USB bus
- Universal input, optically separated, suitable for triggering
- Digital output, optically separated, suitable for flash control
- Ultra compact housing with C-mount lens connector
- Powerful SDK for Windows 2000/XP/Vista and Linux
- DirectDraw support, ActiveX, TWAIN and Direct Show (WDM) drivers
- Interfaces for popular image processing software available: e.g. Common Vision Blox, HALCON, LabView, Neurocheck, etc.





Automation and quality assurance

uEye® Solutions for...

Industry

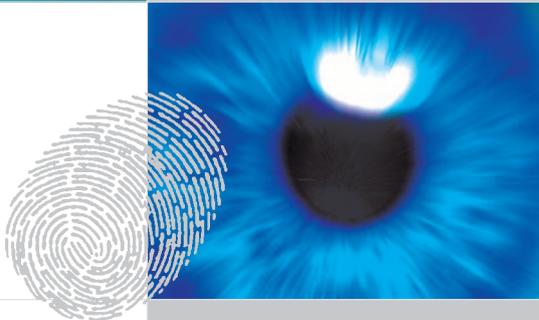
Implement quick and simple solutions in automation and quality assurance. The changeover from analog to digital technology is facilitated by an SDK which has been modeled on our frame grabbers. The demo programs included with the cameras make them fast and easy to integrate into your own applications.



Analysis and documentation

Diagnostics

Our uEye® offers cutting edge sensors for visualization, non industrial imaging and microscopy. Its USB interface allows optimum connection to notebooks and embedded PCs. The power supply via the USB bus supports compliance with applicable rules and regulations.



Comparing and archiving

Security technology

Size and versatile possibilities of application are prerequisite for use in compact mobile and stationary systems. High-resolution sensors ensure accuracy in detail. Image acquisition in the near-infrared area is possible, as is the intermediate storage of individual images in the camera.

For possible applications of our products please visit:
www.ids-imaging.com/casestudies

uEye® Housing Variants



Standard uEye® camera with C-mount
32 x 34 x 27.4 - 41.5 mm
(W x H x D)



uEye® OEM 1 board level camera with C-mount
30 x 30 x 27.4 - 41.5 mm
(W x H x D)



uEye® OEM 2 board level camera without lens mount
30 x 30 x 11 - 24 mm
(W x H x D)

The right outfit for any occasion

The uEye® series offers different sturdy housing variants. The uEye® models come with a standard mini-B type USB port. In addition connection is possible via a screw-mounted micro sub-D connector which also carries the optically decoupled I/O signals.

The uEye® cameras are available in a metal housing or as OEM variants with a C-mount front flange. For special applications the unit can be supplied as a board-level camera and, in addition, special project-related designs are also possible. Contact us!



Standard USB and screw-mounted micro sub-D with USB and I/O





uEye® Accessories

uEye® RE – Made for Rough Environments



The RE variants feature an extremely rugged design. 41 x 41 x 40.5 - 70.5 mm (W x H x D)

The RE variants of the uEye® cameras are extremely rugged and offer an extended area of application. In conjunction with the optional lens tubes they meet the requirements of protection classes IP 65 and IP 67. The USB and the I/O signals are connected via two connectors of the same protection class. The uEye® RE is thus particularly suited for “harsh environments.” The uEye® RE accessories are also consistently designed to suit the application possibilities of these cameras.



uEye® RE connectors for USB and I/O: Consistently robust

Complementary accessories

A wide choice of cables in various lengths and designs, industrial strength USB hubs, active extension cables and USB interfaces round off your uEye® camera equipment. The range of accessories is completed by cables of the conventional, screw-connection and drag-chain compatible type. For the uEye® RE models, drag-chain cables are available even beyond the USB standard – in lengths up to 10 m.



Angled cables reduce overall design depth



Industrial strength accessories



With the lens tubes, the uEye® RE cameras meet the requirements of protection classes IP 65 and IP 67

The Second Half of the Camera



The two parts of a uEye® camera:
Hardware and a comprehensive
software package

Individual integration

The decision on how your uEye® camera is to be integrated into your system is up to you alone. Our prices include a comprehensive software package with drivers for Windows and Linux. Interfaces for various image processing packages, standard drivers such as Direct Show (WDM) as well as our Software Development Kit (SDK) allow individual integration within a very short time.

Future proof

The modular uEye® concept is also continued into our software: All necessary drivers are only loaded into the camera after it has been connected. With regularly released updates the functionality can thus be enhanced even for already installed cameras.

To ensure that our cameras are not larger than necessary, data is further processed, or post-processed, in the PC.



Easy Integration Thanks to Comprehensive Software



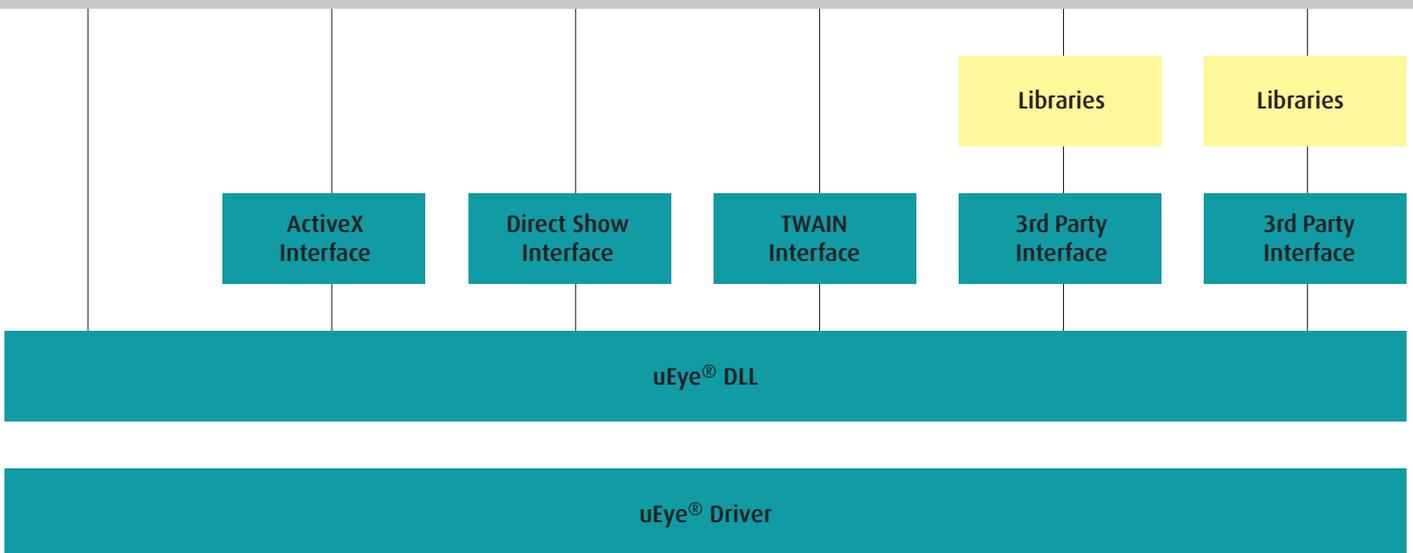
The uEye® SDK offers over 100 functions

Over 20 demos provided in source code facilitate integration



Interface variety gives you good cards for quick integration

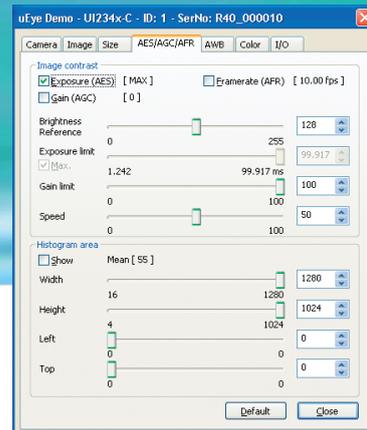
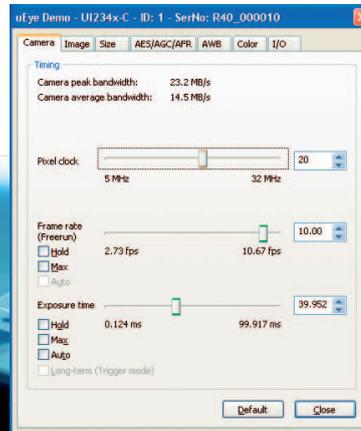
Application level



Windows, Linux, Windows CE on request

■ Components of the uEye® software package

Software in Detail



Sample programs and the uEye® demo program in source code serve as a programming model and allow quick integration

Bandwidth Management

The USB bus allows dynamic bandwidth assignment to each connected device. This means that one camera alone can use the entire bus. With additional cameras connected, the bandwidth can be divided up as required. For this purpose the uEye® USB cameras offer a freely selectable pixel clock. Long-term exposure as well as the acquisition of up to 1,000 frames per second are also possible.

Color Rendering

The color sensors provide a mosaic of color filters (Bayer filters), which serve as the basis for calculating the color information for each pixel. The color variants of the uEye® cameras transmit the same amounts of data to the PC as the monochrome models. If desired, the uEye® driver processes such raw data into RGB, Y8 or YUV images by various interpolation methods.

Binning/Subsampling

These two processes are used for reducing the resolution and increasing the frame rate. In the case of binning, several pixels are combined and transmitted to the PC; in subsampling, individual pixels are skipped during read-out. With both methods, the field of view remains identical.

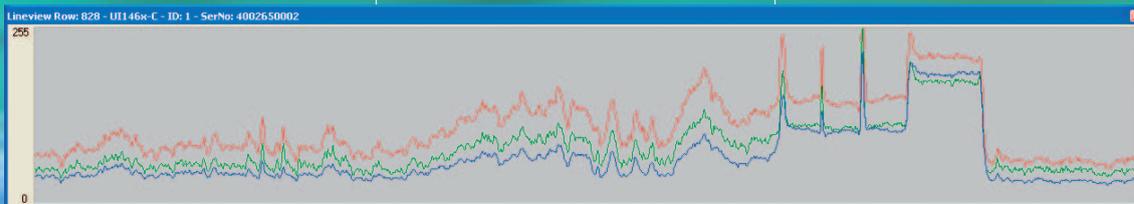
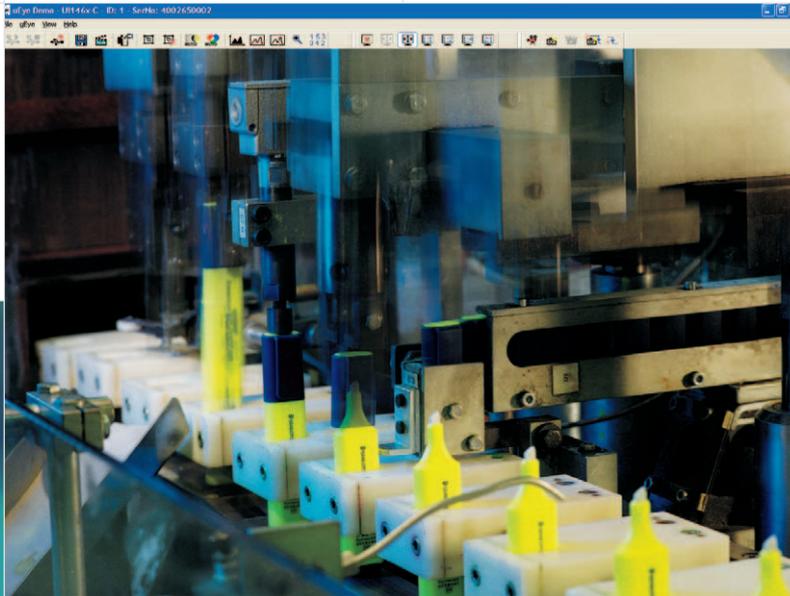
Area of Interest (AOI)

With this function, the uEye® reads out only a selected part of the sensor area. This increases the possible frame rate of the camera: At half the frame height, e.g., uEye® CCD cameras are 60–80% faster and uEye® CMOS cameras almost 100% faster!



Binning

Subsampling



Finding the right settings and acquiring the first image without a line of code – with the help of the uEye® demo program



Flexible Camera Integration

With over 100 functions the uEye® Software Development Kit (SDK) gives you all the possibilities to integrate the camera under C++, C# and VB. Basic camera functions enable you to control camera timing, frame size and image representation. More than 20 demo programs, provided in source code, facilitate your first steps in programming.

uEye® Demo

With the uEye® demo material supplied, you will have your first pictures on your uEye® camera in no time at all. The program enables you to perform comprehensive measurements even before you start your own programming, and it makes it easy for you to compare different cameras and settings. Results can be stored as individual images or as an AVI sequence.

Auto Features

To facilitate working with the uEye® camera under changing lighting conditions, the uEye® software offers three automatic image control functions: Auto Exposure, Auto Gain and Auto White Balance. Following selectable control criteria, the camera driver adjusts exposure times and signal amplification on the sensor (hardware gain) and performs the white balance for the relevant color temperature of the light.

The CPU has time for more important things

Thanks to the efficient programming of the drivers, the uEye® cameras run at a very low processor load. With high-performance PC hardware, the CPU load during image acquisition by the uEye® (monochrome) will generally remain below 10%; even color conversion through the software (RGB) will hardly ever cause loads above 20%.

All uEye®-Models at a Glance



| | | | | | | | |
|---|--|---|---|---|---|--|---|
| Sensor Technology | CMOS | CMOS | CMOS | CMOS | CMOS | CMOS | CMOS |
| Model (Color) | UI-1220-C | - | UI-1640-C | UI-1450-C | UI-1550-C | UI-1460-C | UI-1480-C |
| Model (Mono) | UI-1220-M | UI-1540-M | - | - | - | - | - |
| Resolution (h x v) | 752 x 480 | 1280 x 1024 | 1280 x 1024 | 1600 x 1200 | 1600 x 1200 | 2048 x 1536 | 2560 x 1920 |
| Resolution Category/Pixel Class | WVGA | SXGA/1.3 MP | SXGA/1.3 MP | UXGA/2 MP | UXGA/2 MP | SUXGA/3.3 MP | QSXGA/5 MP |
| Sensor Size | 1/3" | 1/2" | 1/3" | 1/2" | 1/3" | 1/2" | 1/2" |
| Shutter | Global | Rolling | Rolling | Rolling | Rolling | Rolling | Rolling/Global Start |
| Max. fps in Freerun Mode at full resolution | 87 fps | 25 fps | 25 fps | 18 fps | 17 fps | 11 fps | 6 fps |
| Max. fps in SW Trigger Mode at 1 ms exposure | 78 fps | 23 fps | 23 fps | 16 fps | 14 fps | 10 fps | 5 fps |
| Exposure Time in Freerun Mode | 80 µs - 5,5 s | 35 µs - 980 ms | 37 µs - 10 s | 45 µs - 1,25 s | 41 µs - 13,4 s | 57 µs - 1,75 s | 71 µs - 2745 ms |
| Exposure Time in Trigger Mode | 80 µs - 5,5 s | 35 µs - 980 ms | 37 µs - 10 s | 45 µs - 1,25 s | 41 µs - 13,4 s | 57 µs - 750 ms | 71 µs - 2745 ms |
| AOI Modes | H ² + V ² | H ² + V ² | H ² + V ² | H ² + V ² | H ² + V ² | H ² + V ² | H ² + V ² |
| AOI with 320 x 240 Pixels (CIF) | 200 fps | 232 fps | 265 fps | 242 fps | 230 fps | 220 fps | 126 fps |
| Subsampling Modes | - | H ² + V ² (Color) | H ² + V ² | H ² + V ² |
| Subsampling Factors | - | x2, x4 | x2, x4 |
| Resolution, fps | - | 640 x 512, 79 fps 320 x 256, 219 fps | 640 x 512, 85 fps 320 x 256, 254 fps | 800 x 600, 60 fps 400 x 300, 177 fps | 800 x 600, 58 fps 400 x 300, 173 fps | 1024 x 768, 37 fps 512 x 384, 113 fps | 1280 x 960, 19 fps 640 x 480, 53 fps |
| Binning Modess | H + V ² (Mono) | - | - | - | H ² + V ² | H ² + V ² | H ² + V ² |
| Binning Method | H + V: Average | - | - | - | H: Average V: Average | H: Sum V: Average | H: Sum V: Average |
| Binning Factors | x2, x4 | - | - | - | x2 | x2, x4 | x2, x4 |
| Resolution, fps | 368 x 240, 162 fps 176 x 120, 286 fps | - | - | - | 800 x 600, 52 fps | 1024 x 768, 30 fps 512 x 384, 79 fps | 1280 x 960, 15 fps 640 x 480, 23 fps |
| Mono: Maximum Gain | 4x | 12x | - | - | - | - | - |
| Color: Maximum Gain RGB/Master | 5x (SW)/4x | - | 3,3x/7,5x | 12x/- | */* | 7,25x/12x | 6,5x/12x |
| Additional Gain Boost with Factor | 1,6x | 1,5x | - | 1,4x | - | 2x | 1,6x |
| Sensor Model | MT9V032 | MT9M001 | MT9M131 | MT9D001 | MT9D131 | MT9T001 | MT9P031 |
| Pixel Clock | 5 - 40 MHz | 5 - 43 MHz | 5 - 40 MHz | 5 - 43 MHz | 5 - 40 MHz | 5 - 43 MHz | 5 - 43 MHz |
| Pixel Pitch in µm | 6,0 | 5,2 | 3,6 | 4,2 | 2,8 | 3,2 | 2,2 |
| Full Well Capacity | 30.000 e- | 40.000 e- | * | 30.000 e- | * | 20.000 e- | 15.000 e- |
| Optical Size | 4,51 x 2,88 mm | 6,66 x 5,32 mm | 4,61 x 3,69 mm | 6,72 x 5,04 mm | 4,48 x 3,36 mm | 6,55 x 4,92 mm | 5,63 x 4,22 mm |
| Aspect Ratio | 14:9 | 5:4 | 5:4 | 4:3 | 4:3 | 4:3 | 4:3 |
| Exact Real Diagonal | 5,4 mm, 1/3,0" | 8,5 mm, 1/1,9" | 5,9 mm, 1/2,7" | 8,4 mm, 1/1,9" | 5,6mm, 1/2,9" | 8,2 mm, 1/2,0" | 7,0 mm, 1/2,3" |
| Current Consumption at 5 V | 100 - 130 mA | 130 - 170 mA | 90 - 160 mA | 100 - 140 mA | 140 - 240 mA | 90 - 130 mA | 90 - 130 mA |
| Regulations | CE class A, CE class B, FCC (depending on model) | | | | | | |

² = Use increases frame rate
* = planned





Delivery includes

uEye® camera installation CD for Windows 2000, XP, VISTA and Linux, complete with drivers, demo programs, program examples, tools and documentation

System requirements

PC system with 1.5 GHz, 256 MB RAM; operating system: Windows 2000 with SP4 / Windows XP with SP2 / Windows VISTA, Linux Kernel 2.6; USB 2.0 interface

| | | | | | | | |
|---|---|---|---|--|--|--|--|
| CCD UI-2210-C UI-2210-M | CCD UI-2310-C UI-2310-M | CCD UI-2410-C UI-2410-M | CCD UI-2220-C UI-2220-M | CCD UI-2230-C UI-2230-M | CCD UI-2240-C UI-2240-M | CCD UI-2340-C UI-2340-M | CCD UI-2250-C UI-2250-M |
| 640 x 480 VGA | 640 x 480 VGA | 640 x 480 VGA | 768 x 576 CCIR | 1024 x 768 XGA | 1280 x 1024 SXGA/1.3 MP | 1360 x 1024 XGA-2/1.4 MP | 1600 x 1200 UXGA/2MP |
| 1/2" Global | 1/4" Global | 1/3" Global | 1/2" Global | 1/3" Global | 1/2" Global | 1/2" Global | 1/1.8" Global |
| 75 fps | 75 fps | 75 fps | 52 fps | 30 fps | 15 fps | 17 fps | 12 fps |
| 66 fps | 65 fps | 66 fps | 47 fps | 27 fps | 14 fps | 16 fps | 12 fps |
| 40 µs - 630 ms 40 µs - 10 min. | 40 µs - 640 ms 40 µs - 10 min. | 40 µs - 640 ms 40 µs - 10 min. | 50 µs - 770 ms 50 µs - 10 min. | 66 µs - 1 s 66 µs - 10 min. | 83 µs - 1,46 s 83 µs - 10 min. | 78 µs - 1,46 s 78 µs - 10 min. | 94 µs - 1,57 s 94 µs - 5 s |
| H + V ² 122 fps | H + V ² 140 fps | H + V ² 111 fps | H + V ² 97 fps | H + V ² 78 fps | H + V ² 38 fps | H + V ² 44 fps | H + V ² 47 fps |
| - | V ² (Color) x2 640 x 240, 131 fps | - | - | - | - | V ² (Color) x2 1360 x 512: 28 fps | V ² (Color) x2, x4 1600 x 600: 24 fps 1600 x 300, 43 fps |
| V ² (Mono) V: Sum | V ² (Mono) V: Sum | V ² V: Sum | V ² (Mono) V: Sum |
| x2, x4 | x2, x4 | x2 (Color+Mono), x4 (Mono) | x2, x4 |
| 640 x 240, 133 fps 640 x 120, 220 fps | 640 x 240, 131 fps 640 x 120, 206 fps | 640 x 240, 133 fps 640 x 120, 215 fps | 768 x 288, 90 fps 768 x 144, 143 fps | 1024 x 384, 53 fps 1024 x 192, 85 fps | 1280 x 512, 23 fps 1280 x 256, 31 fps | 1360 x 512, 28 fps 1360 x 256, 42 fps | 1600 x 600, 24 fps 1600 x 300, 43 fps |
| 20,7x 4x/12x 2x (Mono) | 12,2x 4x/7,3x 2x (Mono) | 18x 4x/12x 2x (Mono) | 14x 4x/8,9x 2x (Mono) | 10,4x 4x/7,5x 2x (Mono) | 13,6x 4x/8,9x 2x (Mono) | 15,6x 4x/9,6x 2x (Mono) | 13,7x 4x/8,9x 2x (Mono) |
| ICX414 5 - 30 MHz | ICX098 5 - 30 MHz | ICX424 5 - 30 MHz | ICX415 5 - 30 MHz | ICX204 5 - 30 MHz | ICX205 5 - 30 MHz | ICX267 5 - 32 MHz | ICX274 5 - 30 MHz |
| 9,9 32.000 e- 6,34 x 4,75 mm 4:3 7,9 mm, 1/2,0" | 5,6 20.000 e- 3,58 x 2,69 mm 4:3 4,5 mm, 1/3,6" | 7,4 24.000 e- 4,74 x 3,55 mm 4:3 5,9 mm, 1/2,7" | 8,3 25.000 e- 6,37 x 4,78 mm 4:3 8,0 mm, 1/2,0" | 4,65 12.000 e- 4,76 x 3,57 mm 4:3 6,0 mm, 1/2,7" | 4,65 12.000 e- 5,95 x 4,76 mm 5:4 7,6 mm, 1/2,1" | 4,65 12.000 e- 6,32 x 4,76 mm 4:3 7,9 mm, 1/2,0" | 4,4 9.000 e- 7,04 x 5,28 mm 4:3 8,8 mm, 1/1,8" |
| 170 - 260 mA | 160 - 230 mA | 170 - 230 mA | 170 - 250 mA | 150 - 230 mA | 190 - 290 mA | 190 - 290 mA | 230 - 340 mA |



**uEye® and uEye® RE
cameras with
CCD/CMOS sensors
and USB port**

- Universal use with PC, notebook, IPC and embedded systems with USB 2.0
- Resolutions from VGA (640 x 480) to 5 megapixels (2560 x 1920)
- High-quality CCD and CMOS sensors
- Memory models with 4 MB memory and USB 1.1 compatibility



Other IDS products

- Camera accessories
- Lenses
- Frame grabbers
- Software



Your imagination is our challenge

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