# USB 2.0 Cameras

## small design – perfect images



**What are the advantages of USB cameras in comparison to analogue cameras?** Primary arguments: No frame grabber (video card) required. Images are transferred directly. The high number of pixels allows full utilisation of state-of-the-art graphic cards and monitors. When used in combination with the Metric measuring software, the release code for the software is integrated into the camera itself, eliminating the need for USB dongles for the software. The power is supplied to the camera automatically over the USB cable. This eliminates a additional power pack. All these points justify the additional cost for an industrial USB camera in comparison to a conventional, analogue CCD camera.

**What resolution is required?** Here it is necessary to consider the camera application carefully. Because: The higher the resolution, the fewer the number of images transferred per second. It is also necessary to consider that higher camera resolution requires better illumination. Use of CCD chips instead of CMOS chips makes the USB cameras more light sensitive, however also more expensive. When using measuring software such as Metric, where automatic measurements (image editing) are not accomplished, we recommend selecting not more than 1600 x 1200 pixels. However, if stored images are to be edited using image editing programs, it is practical to work with higher resolutions, because the more pixels available, the better the results.

**Important note:** Before ordering a megapixel camera, check the resolution realisable with your laptop or PC. Example: A laptop monitor with a maximum resolution of 1400 x 1050 pixels cannot completely display an unscaled image (full representation) from a 1600 x 1200 pixel camera . This is why the Metric measuring software offers a feature for scaling the image. However this reduces the number of pixels in the horizontal and vertical directions by one half. This applies only for display of live images. The stored images are still available with the full resolution offered by the chip. The optical system which can be used with the camera is another important criterion for selection of the resolution. Check the resolution offered by your optical system, because an incorrect combination reduces the quality of the image.



We are always available to help you find the camera which will give you the best results, i.e. the best camera for your specific application. The USB 2.0 cameras we can deliver from stock as a matter of principle are listed below. Other models such as monochrome USB cameras or cameras with other resolutions are available on request.

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## laptop of PC:

- Windows XP (or Vista and Windows 7)
- Service Pack 2 or 3 (XP)
- USB 2.0 Port
- Graphic chip or board with at least 128 MB (fully assigned in BIOS)
  for more than 3 megapixels at least 256 MB
- Excel 2003 or higher or, alternatively Open Office 3.2 or higher
  (When Metric measuring software is used)
- Minimum monitor resolution 1280 x 1024 pixels
  (for scaled mode in Metric measuring software) for over 3 megapixels at least 1600 x 1200 pixels

**Detailed information on the system requirements is given at the end of this file.**

## SE series USB 2.0 cameras

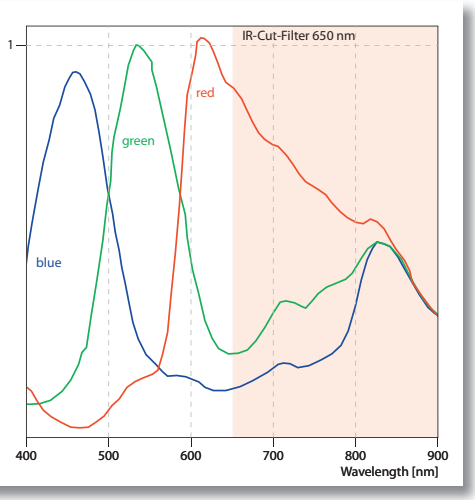
The USB SE is the all-round camera with USB 2.0 connector It is equipped with CCD and CMOS sensors from brand-name suppliers such as Sony. The digital inputs/outputs for trigger and flash control are optically decoupled and process signals with up to 30 V. The model range is completed by various types of cables with robust, screw-type plug connectors. Together with the compact metal housing and M3 mounts the USB SE series is ideal for use in automation and quality control. The device is supplied with a standard USB connection cable. Special angular screw-on cables or cables suitable for drag chains are offered as options.



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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1460-SE-C |
| Resolution (h x v) | 2048 x 1536 |
| Colour depth | 8bit (10bit ADC) |
| Resolution category/pixel class | 3.1 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 11 fps |
| Exposure time in free-run mode | 57µs-1.75s |
| Exposure time in trigger mode | 57µs-750ms |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9T001STC |
| Pixel pitch in µm | 3.2 |
| Optical area | 6.554 x 4.915 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 34.00 mm, 32.00 mm, 27.40 mm |
| Weight | 62.00 g |
| Power supply | USB |




| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1460-SE-C | USB camera with 2048 x 1536 pixels | 1,460.00 € |

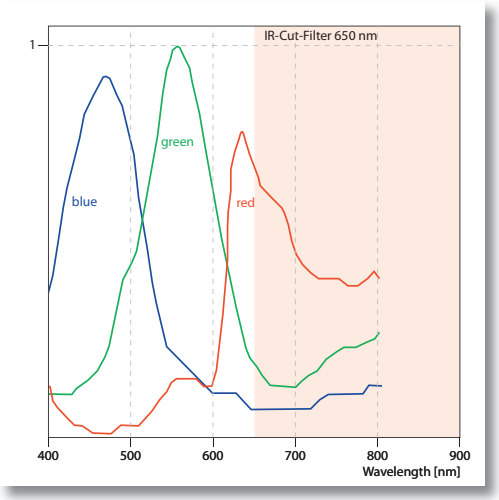
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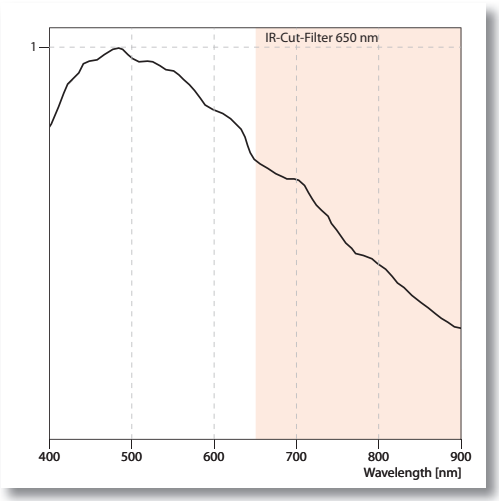
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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1480-SE-C |
| Resolution (h x v) | 2560 x 1920 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 5 Megapixesl |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 6 fps |
| Exposure time in free-run mode | 75µs-2745s |
| Exposure time in trigger mode | 75µs-2745s |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | MT9P031STM / MT9P031STC |
| Pixel pitch in µm | 2.20 |
| Optical area | 5.632 x 4.224 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 34.00 mm, 32.00 mm, 27.40 mm |
| Weight | 62.00 g |
| Power supply | USB |




| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1480-SE-C | USB camera with 2560 x 1920 pixels | 1,710.00 € |

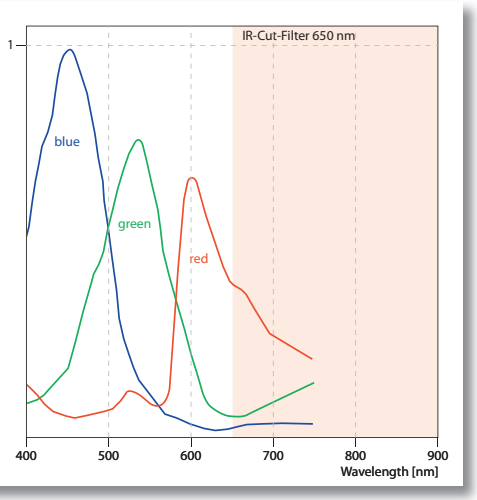
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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1490-SE-C |
| Resolution (h x v) | 3840 x 2748 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 10 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 3 fps |
| Exposure time in free-run mode | |
| Exposure time in trigger mode | |
| AOI Modes | horizontal + vertical |
| Binning Modes | - |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9J003STC |
| Pixel pitch in µm | 1.67 |
| Optical area | 6.413 x 4.589 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 34.00 mm, 32.00 mm, 27.40 mm |
| Weight | 62.00 g |
| Power supply | USB |




| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1490-SE-C | USB camera with 3840 x 2748 pixels | 2,200.00 € |

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The LE series offers extremely robust cameras with state of-the-art Aptina CMOS sensors with resolution of 2 megapixels and higher. Use of the wide spread USB 2.0 technology ensures easy connection to highly differing systems. The light-weight plastic housing on the LE series has a C/CS mount lens flange with adjustable support dimensions.

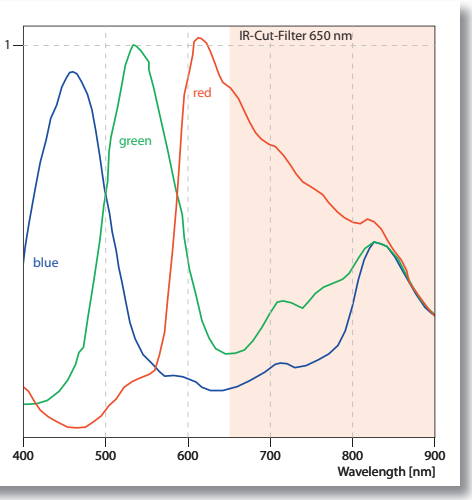


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## a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount CS-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1460-LE-C |
| Resolution (h x v) | 2048 x 1536 |
| Colour depth | 8bit (10bit ADC) |
| Resolution category/pixel class | 3.1 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 11 fps |
| Exposure time in free-run mode | 57µs-1.75s |
| Exposure time in trigger mode | 57µs-750ms |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 0 |
| I/O - Trigger | 0 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9T001STC |
| Pixel pitch in µm | 3.2 |
| Optical area | 6.554 x 4.915 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 44.00 mm, 44.00 mm, 25.40 mm |
| Weight | 32.00 g |
| Power supply | USB |




| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1460-LE-C | USB camera with 2048 x 1536 pixels | 1,100.00 € |

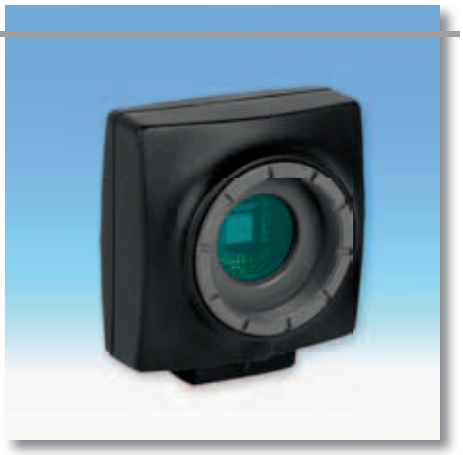
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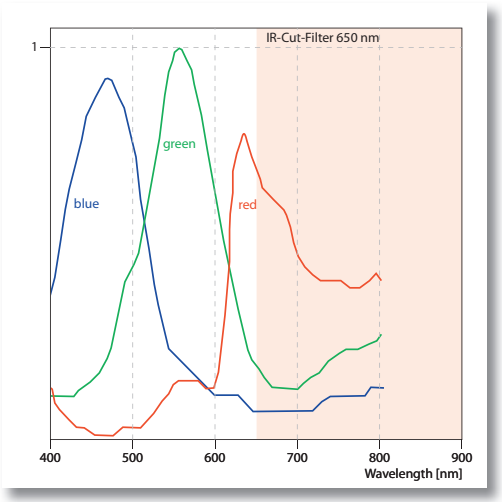
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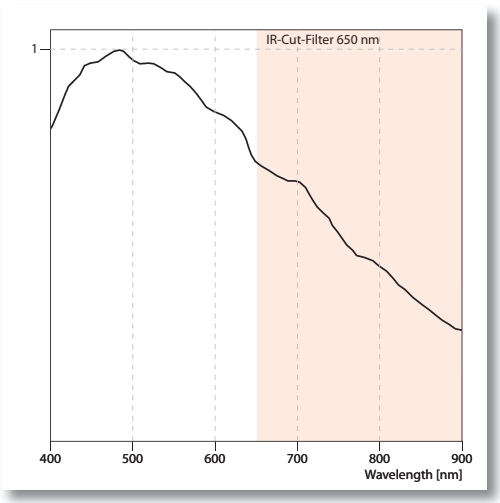
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## a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount CS-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1485-LE-C |
| Resolution (h x v) | 2560 x 1920 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 5 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 6 fps |
| Exposure time in free-run mode | 75µs-2745s |
| Exposure time in trigger mode | 75µs-2745s |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 0 |
| I/O - Trigger | 0 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | MT9P031STM / MT9P031STC |
| Pixel pitch in µm | 2.20 |
| Optical area | 5.632 x 4.224 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 44.00 mm, 44.00 mm, 25.40 mm |
| Weight | 32.00 g |
| Power supply | USB |






| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1485-LE-C | USB camera with 2560 x 1920 pixels | 1,225.00 € |

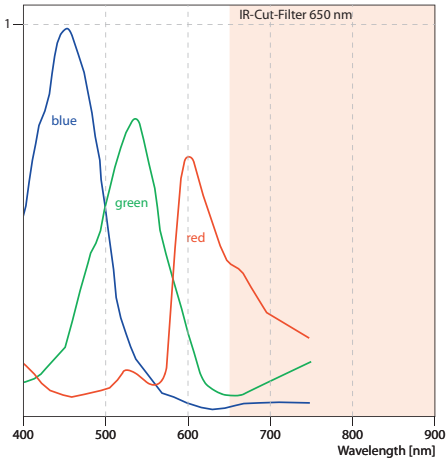


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## a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount CS-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1495-LE-C |
| Resolution (h x v) | 3840 x 2748 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 10 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 3 fps |
| Exposure time in free-run mode | |
| Exposure time in trigger mode | |
| AOI Modes | horizontal + vertical |
| Binning Modes | - |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 0 |
| I/O - Trigger | 0 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9J003STC |
| Pixel pitch in µm | 1.67 |
| Optical area | 6.413 x 4.589 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 44.00 mm, 44.00 mm, 25.40 mm |
| Weight | 32.00 g |
| Power supply | USB |




| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1495-LE-C | USB camera with 3840 x 2748 pixels | 1,725.00 € |

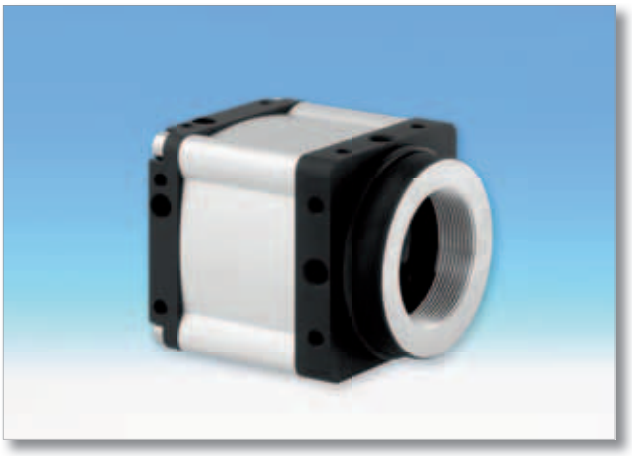


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USB uEye RE cameras are distinguished by their extreme sturdiness allowing a wide range of applications. In combination with the optional lens tubes the housing has a protection rating of IP 65/IP 67. These cameras are impervious to fine dust and water spray. The USB 2.0 port and the digital inputs/outputs are connected using plugs with the same protection rating.. The RE series USB cameras are therefore particularly suited for rough ambient conditions. The scope of features and performance data are identical to the USB SE series. The camera is supplied with a five meter long connection cable (IP67).



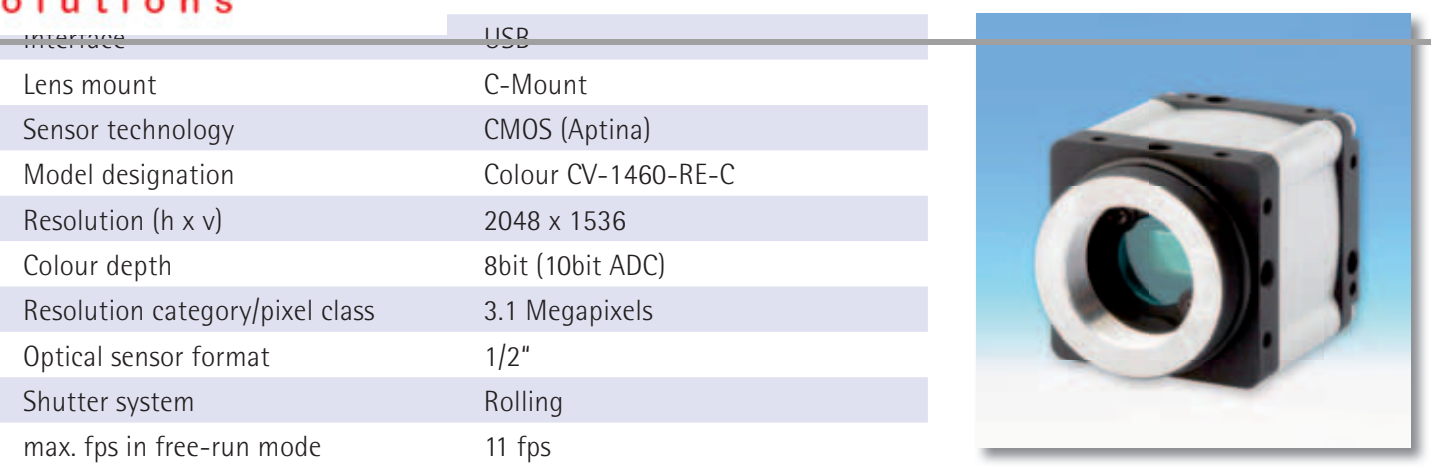


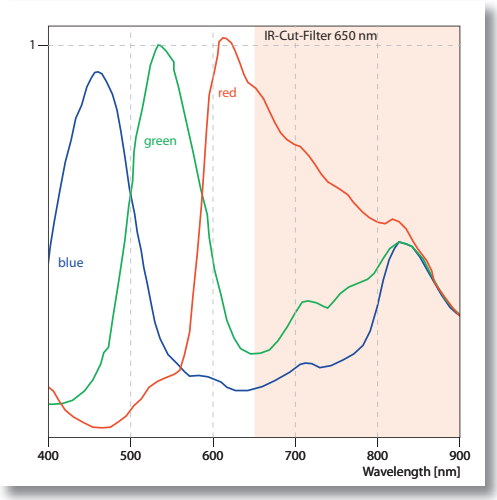


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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1460-RE-C |
| Resolution (h x v) | 2048 x 1536 |
| Colour depth | 8bit (10bit ADC) |
| Resolution category/pixel class | 3.1 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 11 fps |
| Exposure time in free-run mode | 57µs-1.75s |
| Exposure time in trigger mode | 57µs-750ms |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9T001STC |
| Pixel pitch in µm | 3.2 |
| Optical area | 6.554 x 4.915 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 41.00 mm, 41.00 mm, 40.50 mm |
| Weight | 145.00 g |
| Power supply | USB |






| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1460-RE-C | USB camera with 2048 x 1536 pixels | 1,650.00 € |

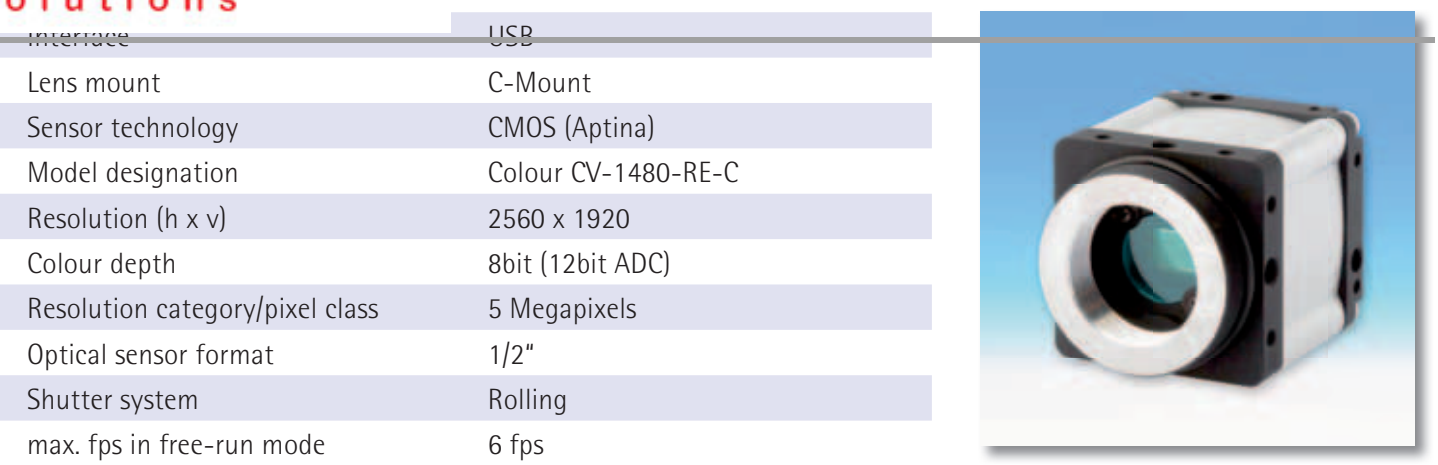
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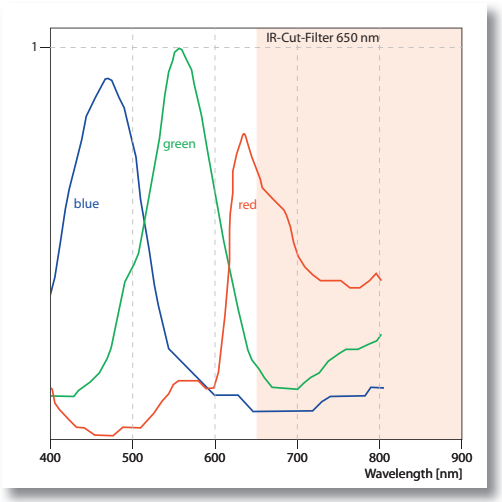
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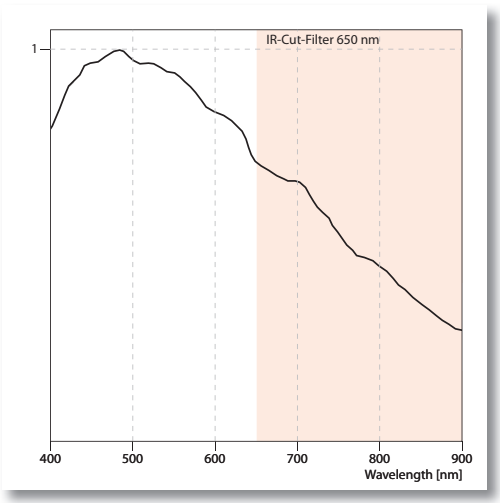
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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1480-RE-C |
| Resolution (h x v) | 2560 x 1920 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 5 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 6 fps |
| Exposure time in free-run mode | 75µs-2745s |
| Exposure time in trigger mode | 75µs-2745s |
| AOI Modes | horizontal + vertical |
| Binning Modes | horizontal + vertical |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | MT9P031STM / MT9P031STC |
| Pixel pitch in µm | 2.20 |
| Optical area | 5.632 x 4.224 mm |
| Protection rating | IP30 |
| Dimensions H/W/D | 41.00 mm, 41.00 mm, 40.50 mm |
| Weight | 145.00 g |
| Power supply | USB |






| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1480-RE-C | USB camera with 2560 x 1920 pixels | 1,890.00 € |

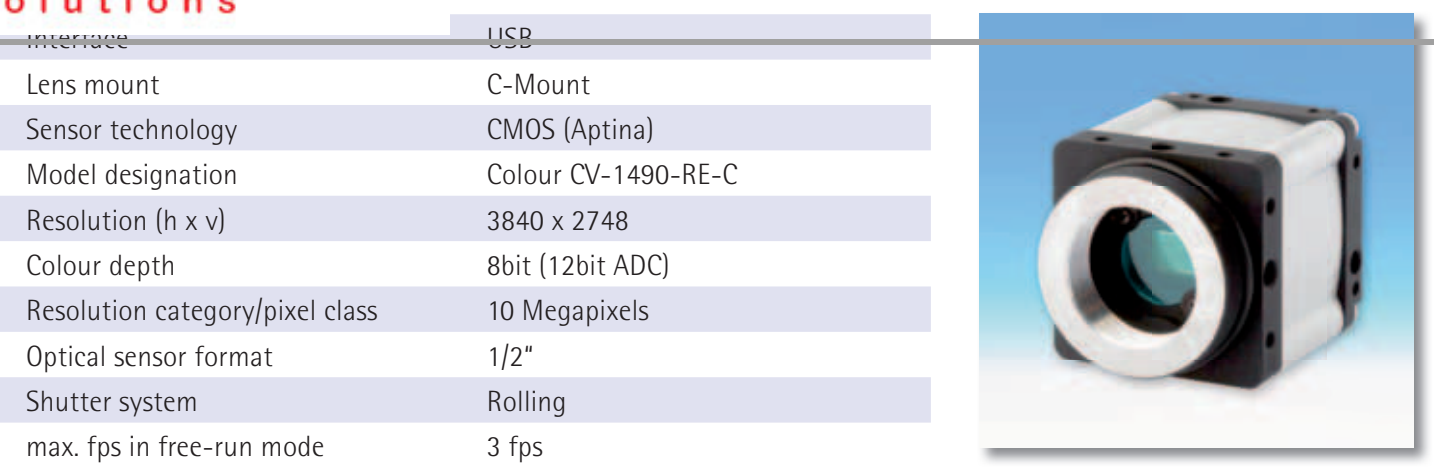
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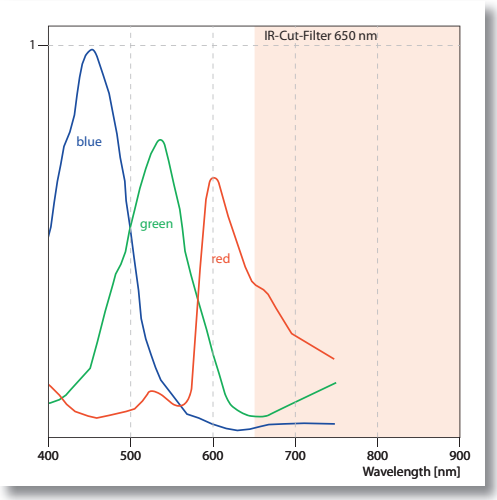
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## :a:

| | |
|---|---|
| Interface | USB |
| Lens mount | C-Mount |
| Sensor technology | CMOS (Aptina) |
| Model designation | Colour CV-1490-RE-C |
| Resolution (h x v) | 3840 x 2748 |
| Colour depth | 8bit (12bit ADC) |
| Resolution category/pixel class | 10 Megapixels |
| Optical sensor format | 1/2" |
| Shutter system | Rolling |
| max. fps in free-run mode | 3 fps |
| Exposure time in free-run mode | |
| Exposure time in trigger mode | |
| AOI Modes | horizontal + vertical |
| Binning Modes | - |
| Subsampling Modes | horizontal + vertical |
| I/O - Strobe | 1 |
| I/O - Trigger | 1 |
| I/O - RS-232 | - |
| I/O - GPIO | 0 |
| I/O - I2C | - |
| HDR (High Dynamic Range) | - |
| Sensor designation (m/c) | - / MT9J003STC |
| Pixel pitch in µm | 1.67 |
| Optical area | 6.413 x 4.589 mm |
| Protection rating | IP65/67 |
| Dimensions H/W/D | 41.00 mm, 41.00 mm, 40.50 mm |
| Weight | 145.00 g |
| Power supply | USB |





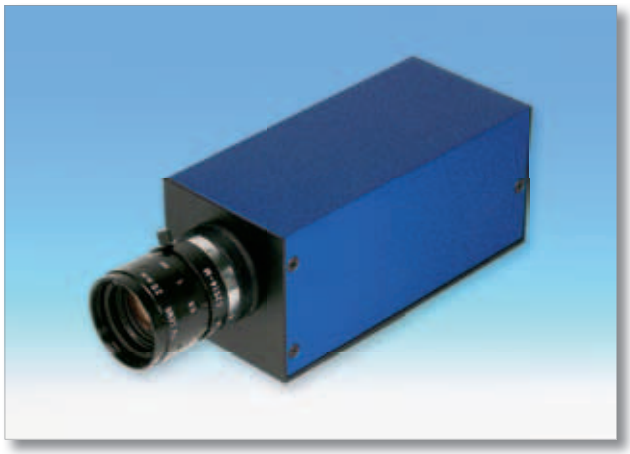

| Order no. | Description | Price excl. VAT. |
|---|---|---|
| CV-1490-RE-C | USB camera with 3840 x 2748 pixels | 2,390.00 € |

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# DVI camera

## Check and compare without PC



**Practical example:** A plant has a large number of grinding machines equipped with conventional profile projectors. These are to be replaced with state-of-the-art equipment, however without using computers. Our new DVI camera combined with the appropriate optical system is ideal for such applications. The camera can be combined with a standard computer monitor with DVI interface and 4:3 display mode (minimum resolution 1024 x 768). As a matter of principle the DVI camera sends 1024 x 768 pixels to the monitor. The image in the centre area can be zoomed to 2x.

**Operation of the camera?** All DVI camera settings can be made with a computer mouse (included). When the left mouse key is pressed, an on-screen display appears with the required access. The right mouse key can be assigned the following functions: Switch-over between standard and high image quality (30 images/second or 12 images/second) or switch-over between full image and zoom.



**View only or also test?** Of course purely optical testing is not the purpose of a profile projector. However with these instruments the contours of parts can be compared with built-in templates. The DVI camera therefore offers the additional capability of saving 24 drawings in DXF format and displaying them on the monitor. This allows parts to be compared directly during production in the same manner as with a profile projector.

**Advantages in summary:** The overall size is significantly smaller than a profile projector and comparison of the parts with a DXF, displayed on the computer monitor, is fast, reliable and easy on the operators eyes. Moreover the camera requires no maintenance.

**How do the drawings get into the camera?** The DXF files can be transferred to the camera over the RS-232 interface or USB adapter using the Metric DVI installed on a laptop or PC. Naturally the combination of DVI camera and optical system must be calibrated so that the drawings are displayed using the right scale. A special calibration disc (incl. test certificate) with a ring structure is included for this purpose.

**Checking without comparing:** Since it is not possible to use DXF files for all applications, i.e. the camera cannot be used optimally for purely visual checking without a PC, the DVI cameras are also available without Metric DVI dongle and calibration disc.

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era offers the capability of controlling other components such as illumi-
ls or relays. For such requirements please send us our technical specifica-
tions, so that we can work out an appropriate offer for you.

**Viewing from a distance:** A special DVI cable makes it possible to overcome distances of up to 30 metres between the camera and monitor. When state-of-the-art fibre-optic cable is used, the camera can also be operated at distances of up to 500 metres with remote control

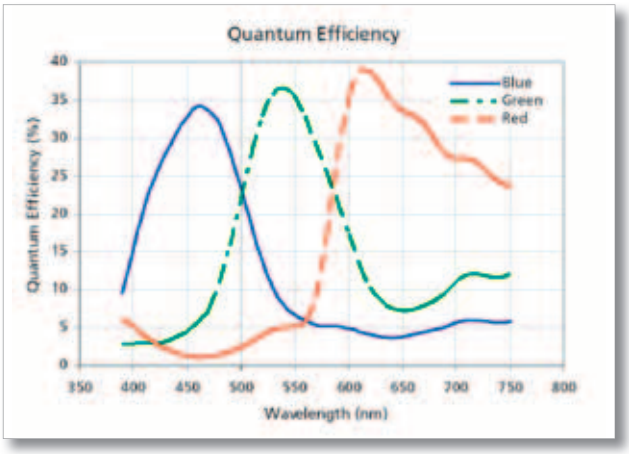


**Special version:** For special applications we offer a modified camera with offset camera head in an IP 67 rated housing. The distance between the camera head and control unit can be up to 15 metres with the standard IP67 version. Cables with lengths of up to 50 metres are available on request.

## Technical Data on DVI Camera



| | |
|---|---|
| Pixel size | 3.2 µm x 3.2 µm |
| Shutter | Rolling Shutter |
| Exposure time | 100 µs - 1.4 s |
| Image rate | 60 fps |
| Image resolution | 2048 x 1536 (QXGA) |
| Sensor size | 1/2" |
| Number of pixels | 2048 x 1024 |
| Type of sensor | CMOS, progressive scan, colour, Bayern-Pattern |
| Output format | 1024 x 768 - Sensor complete (1:2) oder 1:1 |
| A/D resolution | 10bit |
| Gain | 1 - 64 |
| Image dynamics | 60 dB |
| White balance | automatic |
| ROI-Zoom | 2x (loss free) |
| Video out | DVI-D |
| Interfaces | RS 232 and PS/2 mouse port |
| Power supply | 8 V to 24 V |
| Power consumption | 5 W |
| Dimensions | 51 x 51 x 110 mm |
| Lens mount | C-Mount, adjustable |
| Weight | ca. 270 Grams (not including lens) |
| Operating temperature | 0 °C - + 55 °C |




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question frequently asked is: What final enlargement do I get on the ISB camera?

It is difficult to calculate the "enlargement on the monitor" from the magnification factors (in relation to the monitor). "Earlier" this was comparatively easy, because all monitors used the PAL format (768 x 567 pixels). All these monitors had a 4:3 image format and displayed the full image from the camera. With a 15" monitor (measured diagonally) it was clear that it was 12" wide and 9" high, corresponding to a 15" diagonal according to the Pythagorean theorem.

The 12" was subdivided into 768 pixels corresponding to approx. 0.4 mm per pixel. The height (9") was divided up on the same manner, also corresponding to 0.4 mm. An image field of 8 x 6 mm on the monitor became 304.8 x 228.6 mm (12" x 9") and the magnification factor was approx. 38x. If the monitor was larger (e.g. 20") the magnification increased proportionally (38 x 20 / 15 = approx. 51x).

This is no longer true today: A 1/2'' camera may have 1.3 MPix or 2 MPix, 3 MPix, 5 MPix or even 10 MPix. The image (8 x 6 mm in the example above) is divided up into a larger or smaller number of pixels. At 1.3 MPix one pixel from the camera then represents approx 8 mm / 1024 pixels = 7.8 µm, at 10 MPix, however, only 8 mm / 3840 pixels = 2.1µm.

To make things even more difficult, some cameras no longer use a 4:3 image format and the information on the 1/2" is also only "approximate". On the camera side 1/2" is therefore not necessarily 1/2"; pixels of various sizes are possible depending on the camera used.

On the monitor side we have the same problem. Most 24" monitors have at least 1920 x 1200 pixels. However some have 1920 x 1080 pixels (these are panels built for full HD). Accordingly the monitor diagonal is then 61 cm, but sometimes 16:10 and sometimes 16:9; but no longer 4:3 in any case. The monitor width changes proportionally to approx. 20.3" (at 16:10) or approx. 20.9" (at 16:9).

Thus the enlargement can differ enormously depending on the megapixels supplied by the camera. In addition monitors can deviate up to 3%. Moreover the Metric software also has a "Scaling" feature to reduce the resolution by one half. Besides this some users switch their monitor over from its native resolution (1920 x 1200) to 1536 x 1024, for example. This results in an additional enlargement of approx. 25% and, as if that was not already enough, circles can also be changed to ellipses.

Therefore the enlargement on the monitor has now become more of an adjustment factor, rather than simply a question of converting from a 1/2" chip to a 24" monitor.
(Source: Dr. Frank Lechtenberg, Itzehoe)

- Windows XP all versions ServicePack 2 *)
- Windows VISTA all versions ServicePack 1 *) **)
- Windows 7 all Versions *) **) ***)

## Supported PC-Hardware

- Pentium III 1 GHz or higher
- AMD K7 „Athlon" or higher
- 256 MByte RAM (Observe minimum requirements for operating system!)
- 200 MByte free space on hard disc
- USB 2.0 for digital cameras (fully supported = 500 mA power supply) ****)
- PCI port for framegrabber (on older systems as close as possible to graphic board)
- Separate graphic board (or Intel 945G or newer graphics chip set) DirectX 9.0c compatible, min. 512 MByte RAM for digital cameras, min. 128 MByte RAM for framegrabber (Observe BIOS settings for graphics chip set)
- Graphic board min. AGP 2x (special CAD graphic boards can cause problems)
- Please do not use ATI graphic boards if possible, because „overlay mode" of Metric measuring software may not work properly

## Monitors

- Minimum resolution 1600 x 1200 pixels (native resolution)
- When 16:9 monitors are used it is necessary to either increase the resolution to display the software mask at a ratio of 4:3 or to set it to 4:3 to prevent circles being displayed as ovals.

- When HDMI interfaces are used it is necessary to ensure that all drivers are installed correctly to prevent the image from "freezing up".

- Monitors with a frequency of 200 Hz or with tweening (interframe calculation) are not recommended, because otherwise the picture "lags behind" which can be very disturbing especially at high magnification factors. Moreover the graphic board installed must support HDMI.

- Single channel DVI interfaces only support resolutions up to 1900 x 1200 pixels. For this reason it must be dual channel.

- The monitor must always be operated at its native resolution.

## Image sources

- Digital cameras ****)
  - IDS uEye all versions
    (drivers up to 2.40 for older board versions, 64bit drivers only as of version 3.50)
  - ABS UK all versions
    (drivers provided exclusively by us, 64bit drivers included automatically)

cePack 3 or higher
nin. 2GHz for digital cameras, Image processing features
and high speed DXF overlays for MT versions)

- Graphic board PCIe 16x (moderate performance, not HighEnd)

- Spreadsheet programs (Microsoft Excel™ or OpenOffice as of Version 3.0) are required for special evaluation features and protocol layouts with the PLUS and MT versions.

*) 64 bit operating systems sometimes require special hardware drivers, which are not available for the image sources listed.

**) A side effect of the special security systems used by Window VISTA and Windows 7 is that it is not possible for all users to change the program default settings. Administrator rights are required for storage in any case.

***) In some cases it may be necessary to use the XP mode. This requires special hardware with virtualization features and installation of the (free) XP mode.

****) Speeds can be checked with CheckUSB.exe on the CD.

# Camera CV-UI-1008-XS-C

## Extremely small camera form, but perfect images

The CV-1008-XS USB 2.0 camera, which has a size of less than 1 cubic size, is packed with smart features. The ultra-small casing includes a modern CMOS sensor with an integrated autofocus lens as well as a DSP slot. This slot offers a wide range of functions, of which some are also known from the consumer sector. With the USB CV-1008-XS many of these features are now also available in a professional USB camera and can be integrated in your own applications via the corresponding SDK.

**The main technical data of the CV-UI-1008XS-C**

USB 2.0
8 Megapixel CMOS sensor
3280 x 2464 in snapshot mode
1280 x 720 with 15 images/sec.
Integrated lens with autofocus
Electronic image stabilisation
Automatic picture control
EMC conformity: CE Class B, FCC Class B



In the field of measuring and inspection technology these extremely small but excellent USB cameras are used in combination with measuring magnifiers, microscopes as well as pen microscopes. In areas where until now photo digital cameras where used on mobile microscopes, for example from the PEAK series, the use, transport and saving of images have been substantially simplified. The representation of the scales in the oculars is as clear and sharp as the actual image.




Owing to the integrated lens in the USB camera no ocular adapter is required when used on stereo microscopes. In this way loss of time caused by the removal of the ocular and the risk of polluting the tube and the lenses can be avoided.

The scope of delivery of the USB camera includes the original driver software (in English). Alternatively, the Metric BE software can be used with this camera. Metric BE software is more comfortable for rapid use.



An extensive range of adapters is available for the various combination cases. To some extent the various diameters of the microscopes or magnifiers are combined with intermediate adapters.



The small form of the camera and special LED ringlights installed in the adapter make it also possible to use the system as endoscope substitute, for example in the area of tank construction. We can also provide special adapters at

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| | | Price excl. VAT. |
|---|---|---|
| | era with driver software | 650.00 € |
| **ADP-XS-C** | Adapter for USB 2.0 camera | 100.00 € |
| **Metric BE** | Software for presentation and storing | 250.00 € |
| | | |
| Delivery: | Incl. packaging, freight charges see **www.m-service.de** | |
| Payment: | 30 days, net | |

## Technical data CV-UI-1008-XS-C:

| | |
|---|---|
| **Sensor specification** | |
| Type of sensor | CMOS |
| Shutter device | Elektronic rolling shutter |
| Characteristics | Linear |
| Read out method | Progressive Scan |
| Resolution class | HD ready |
| Resolution | Live mode: 1280 x 720 Pixels (0.92 Megapixels)<br>Software trigger: 3264 x 2448 Pixels (8 Megapixels) |
| Aspect ratio | 4 : 3 |
| Bit depth | 8 Bit |
| Optical sensor class | 1/3 inch |
| Accurate sensitive face | 4.59 mm x 3.45 mm |
| Accurate optical sensor size | 5.74 mm (1/2.79 inch) |
| Pixel size | 1.4 µm, square |
| Monochrome sensor format | - |
| Colour sensor format | Sony MCB1172 |
| Features | Integrated autofocus lens<br>Electronic image stabilisation<br>Face recognition<br>Hardware colour calculation ($YC_bC_r$ Format)<br>Internal sensor for exposure control (AES),<br>white balance (AWB) and gain (AGC). |
| | |
| **Optical characteristics** | |
| Focal length (35mm equivalent) | 4,56 mm (35 mm) |
| Picture angle horizontal/vertical | approx. 53° / 41° |
| F-number (F) | 1 : 2.8 |
| Focal point | Linear motor: Autofocus / manual software |
| Focus range | 100 mm ~ infinity |
| | |
| **Gain** | |
| Colour model (total / RGB) | 2 x / - |
| Analogue extra gain | - |
| | |
| **Camera timing** | |

| | | |
|---|---|---|
| | | 1280 x 720 (HD 720p)<br>960 x 480<br>800 x 480 (WVGA)<br>640 x 480 (VGA)<br>640 x 360<br>400 x 240<br>352 x 288 (CIF)<br>288 x 352<br>320 x 240<br>240 x 320 |
| Picture sizes (software trigger mode) | | 3264 x 2448 (8 MP)<br>3264 x 2176 (7 MP 3 : 2)<br>3264 x 1836 (6 MP 16 : 9)<br>2592 x 1944 (5 MP)<br>2048 x 1536 (3 MP)<br>1920 x 1080 (HD 1080p)<br>1632 x 1224<br>1600 x 1200 (2 MP)<br>1280 x 960 (1.2 MP)<br>1280 x 720 (HD 720p)<br>960 x 480<br>800 x 480 (WVGA)<br>640 x 480 (VGA)<br>640 x 360<br>400 x 240<br>352 x 288 (CIF)<br>288 x 352<br>320 x 420<br>240 x 320 |
| Frame rate HD 720p (1280 x 720 Pixels) | 1/s | 15 |
| Frame rate WVAG (960 x 480 Pixels) | 1/s | 30 |
| Frame rate WVGA (800 x 480 Pixels) | 1/s | 30 |
| Frame rate VGA (640 x 480 Pixels) | 1/s | 30 |
| Frame rate CIF (352 x 288 Pixels) | 1/s | 30 |
| **Hardware trigger** | | |
| Mode | | - |
| **Power consumption** | | |
| | W | approx. 1 W *3) |

*1) The pixel clock is automatically selected depending on resolution and cannot be altered. Due to transfer in $YC_bC_r$ format, two bytes of data are transmitted per pixel clock.

## Assembly and operation

- Putting the camera into standby mode is recommended for long periods without use.
- The allowed temperature region of the operating environment is lower than in other uEye models due to the sensible heat generation of the USB uEye XS.
- The mounting of the camera body on a thermally conductive mounting is recommended.
- Power consumption depends on operating mode and focus position. In the "infinity" focus position the camera's power consumption is at its lowest.
- The integrated optics are very sensitive to shocks in the direction of the optic axis, if the focus is not on minimum or infinity.

## Camera parameters

- Full sensor resolution is only available in single picture mode with software trigger.
- The pixel clock is automatically selected depending on resolution and cannot be altered. The pixel clock is 32 MHz at full resolution (1280 x 720 pixels) and 16 MHz at lower resolutions. Due to transfer in $YC_bC_r$ format, two bytes of data are transmitted per pixel clock. If there is not enough bandwidth available on the USB bus for the camera, this may lead to frequent transmission (Transfer Failed) errors. In this case the solution is to reduce the camera's resolution or select a more powerful USB connection.
- The camera transmits image data exclusively in $YC_bC_r$ format. The Bayer raw data format is therefore not supported.
- CPU utilisation is less than in bitmap (DIB) mode when displaying images in Direct3D mode.
- Shutter speed can only be altered in free-running mode (freerun). Software trigger mode: Continuous trigger mode is not supported. The function cannot be called up with the *IS_DONT_WAIT* parameter. Please use *IS_WAIT* as the parameter.
- The camera is not designed for flash operation. If the camera is operated with external flash lighting, it should be noted that the automatic brightness control is adjusted when the lighting is activated. It is recommended to wait for a short while before image acquisition until adjustment is completed.

## Other information on camera properties

- The sensor partly shows colour spots in the picture through the micro lenses. These are reddish towards the centre of the picture and greenish towards the edge.
- Image data is always resharpened within the camera, which in the case of edge-based image processing (e.g optical character recognition, OCR) can lead to inaccuracies.
- Image data is always processed within the camera with a noise filter, which can lead to fine details being lost.
- Depending on the resolution and operating mode, there is a latency via the image preprocessing within the camera of approx. 2 pictures between taking and transmission to the PC.
- When using internal image stabilisation part of the image field is used as a reserve for motion compensation. The visible image field is reduced as a result by approx. 10%.