# Basler ace

## AREA SCAN CAMERAS

- Broadest selection in the industry
- Best price/performance ratio
- Latest sensor technology
- High value-add features

BASLER
the power of sight

# OVERVIEW

## All You Need Is ace

The Basler ace camera series offers the broadest selection ever, covering the entire spectrum of advantages, including cost-effectiveness, ultra-fast speeds and superior image quality in a very small housing. Since its introduction in 2009, the ace series has grown to more than 120 models, making it the largest series in the market.

This ace of cameras is available with sensors from all leading manufacturers, so you can easily find the right ace camera model for your application. With this variety of sensors and interfaces, combined with the extensive features offered, the ace – in all its variants - is a fit for a wide range of Vision applications. Basler ace is all you need.

Choose the camera model that best suits your requirements from our three ace product lines: ace classic, ace U and ace L.

### PGI Feature Set

All cameras within the ace U and ace L product line come with Basler's powerful in-camera image optimization PGI that improves your images at the full speed of your camera. It is a unique combination of 5x5 debayering, color-anti-aliasing, denoising and improved sharpness. This gives you the opportunity to get the best pictures directly from your camera without any additional processor load. Use the options of the Basler pylon Camera Software Suite to enable PGI, or change settings for selected PGI components for optimal results. Learn more about PGI at *www.baslerweb.com/PGI*

### ace classic

The ace classic is the starting point of our ace series and offers a very cost-effective and reliable camera selection, with a standard feature set for a wide range of applications. The ace classic includes camera models with CMOS sensors from CMOSIS, e2V and ON Semiconductor (MT line) as well as CCD sensors from Sony. It offers a broad selection of interfaces (USB 3.0, GigE, Camera Link) and covers resolutions from VGA to 14 MP.

#### Highlights of the ace classic

- First of its kind and the most successful camera series in the Machine Vision market
- CMOS and CCD sensors, including NIR-enhanced versions with an extensive variety of pixel sizes
- Wide interface selection: USB 3.0, GigE, Camera Link
- Standard Feature Set

### ace U

With speeds of up to 751 fps and the latest CMOS sensors of the Sony Pregius and Sony STARVIS lines as well as PYTHON sensors from ON Semiconductor, the ace U represents the next evolution of the ace in the areas of sensor technology and firmware features. It offers state-of-the-art CMOS technology and interface standards combined with advanced firmware features such as PGI.

#### Highlights of the ace U

- State-of-the-art sensors of the Sony Pregius and STARVIS lines as well as ON Semiconductor's PYTHON series
- Fast speeds of up to 751 fps
- USB3 Vision, GigE Vision 2.0 (IEEE1588, PTP)
- Advanced Feature Set

### ace L

The ace L profits from the same evolutionary steps in firmware features as the ace U. Furthermore, it is capable of carrying high resolution 9 and 12 MP Sony Pregius CMOS sensors with optical formats above 1".

To accommodate these larger sensors, the camera housing is slightly larger than other ace models and has a footprint of 40 mm x 30 mm.

#### Highlights of the ace L

- 1.1" sensors
- Brilliant image quality at speeds of up to 40 fps
- USB3 Vision, GigE Vision 2.0 (IEEE1588, PTP)
- Advanced Feature Set

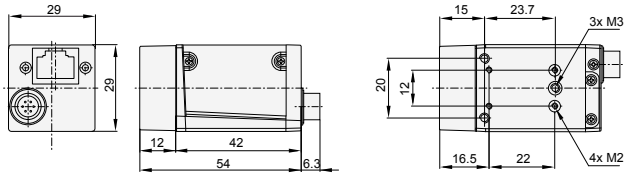
All specifications in this brochure are subject to change without notice.
Latest specifications and availability can be found on our website *www.baslerweb.com/ace*. Please visit *www.baslerweb.com/manuals* for the detailed camera User's Manual and *www.baslerweb.com/thirdparty* for information on third party software.

# TECHNICAL DETAILS

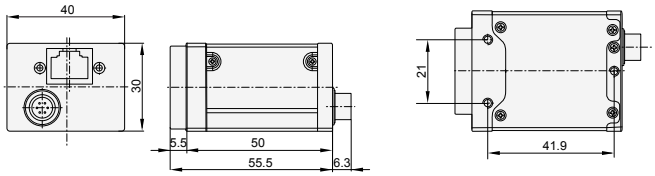
| Basler ace GigE | |
|---|---|
| **Product Group Specifications** | |
| Interface | Fast Ethernet (100 Mbit/s) or Gigabit Ethernet (1000 Mbit/s) |
| Housing Size (L x W x H) | ace classic/ace U: 42 mm x 29 mm x 29 mm, ace L: 50 mm x 40 mm x 30 mm |
| Housing Temperature | 0 °C - 50 °C |
| Typical Weight | < 90 g |
| Power Requirements | ace classic: Power over Ethernet (IEEE 802.3af) or 12 VDC (+/- 10%)<br>ace U/ace L: Power over Ethernet (IEEE 802.3af) or 12-24 VDC (+/- 10%)[1] |
| Synchronization | Via hardware trigger, via software trigger, or free-run |
| Exposure Control | Via hardware trigger[2] or programmable via the camera API |
| Conformity | CE, RoHS, GenICam, GigE Vision, IP30, UL[3], FCC, IEEE 802.3af (PoE) |
| Driver | Basler pylon Camera Software Suite or 3rd party GigE Vision Software |
| Operating System: | Windows, Linux, Mac OS X |

[1] also applies also to ace classic models acA3800-10gm/gc, acA4600-7gc
[2] not applicable for acA1280-60gm/gc, acA1300-60gm/gc, acA1600-60gm/gc, acA3800-10gm/gc, acA4600-7gc
[3] in preparation for ace L and ace U with Sony STARVIS sensors

## Dimensions (in mm): ace classic & ace U




## Dimensions (in mm): ace L




| Basler ace classic | acA640-90gm/gc | acA640-120gm/gc | acA645-100gm/gc | acA750-30gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 659 x 494 | 659 x 494 | 659 x 494 | 752 x 580 |
| Sensor | Sony ICX424 | Sony ICX618 | Sony ICX414 | Sony ICX409 |
| Sensor Size (optical) | 1/3″ | 1/4″ | 1/2″ | 1/3″ |
| Sensor Technology | CCD, global shutter | | | |
| Pixel Size [µm²] | 7.4 × 7.4 | 5.6 × 5.6 | 9.9 × 9.9 | 6.5 × 6.25 |
| Frame Rate [fps] | 90 | 120 | 100 | 30 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C, CS | C, CS | C | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output | | | |
| Power Consumption (PoE/AUX) | 3.1 W/2.7 W | 2.3 W/2.0 W | 3.6 W/3.3 W | 2.6 W/2.4 W |

# TECHNICAL DETAILS

| Basler ace classic | acA780-75gm/gc | acA1300-22gm/gc | acA1300-30gm/gc | acA1280-60gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 782 x 582 | 1296 x 966 | 1296 x 966 | 1282 x 1026 |
| Sensor | Sony ICX415 | Sony ICX445 | Sony ICX445 | E2V EV76C560 |
| Sensor Size (optical) | 1/2″ | 1/3″ | 1/3″ | 1/1.8″ |
| Sensor Technology | CCD, global shutter | CCD, global shutter | CCD, global shutter | CMOS, rolling shutter |
| Pixel Size [µm²] | 8.3 × 8.3 | 3.75 × 3.75 | 3.75 × 3.75 | 5.3 x 5.3 |
| Frame Rate [fps] | 75 | 22 | 30 | 60 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C | CS | C, CS | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output | | | |
| Power Consumption (PoE/AUX) | 3.6 W/3.3 W | 2.5 W/2.2 W | 2.5 W/2.2 W | 2.4 W/2.0 W |

| Basler ace classic | acA1300-60gm/gc | acA1300-60gmNIR | acA1600-20gm/gc | acA1600-60gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 1282 x 1026 | 1282 x 1026 | 1626 x 1236 | 1602 x 1202 |
| Sensor | E2V EV76C560 | E2V EV76C661 | Sony ICX274 | E2V EV76C570 |
| Sensor Size (optical) | 1/1.8″ | | | |
| Sensor Technology | CMOS, global and rolling shutter | CMOS, global and rolling shutter | CCD, global shutter | CMOS, global and rolling shutter |
| Pixel Size [µm²] | 5.3 x 5.3 | 5.3 x 5.3 | 4.4 x 4.4 | 4.5 x 4.5 |
| Frame Rate [fps] | 60 | 60 | 20 | 60 |
| Mono/Color | Mono/Color | Mono NIR-enhanced | Mono/Color | Mono/Color |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C, CS | C, CS | C | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output | | | |
| Power Consumption (PoE/AUX) | 2.4 W/2.0 W | 2.4 W/2.0 W | 3.4 W/2.9 W | 2.5 W/2.1 W |

# TECHNICAL DETAILS

| Basler ace classic | acA1920-25gm/gc | acA2000-50gm/gc | acA2000-50gmNIR | acA1300-22gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 1920 x 1080 | 2048 x 1088 | 2048 x 1088 | 2048 x 2048 |
| Sensor | ON Semiconductor MT9P031 | CMOSIS CMV2000 | CMOSIS CMV2000 NIR-enhanced | CMOSIS CMV4000 |
| Sensor Size (optical) | 1/3.7″ | 2/3″ | 2/3″ | 1″ |
| Sensor Technology | CMOS, rolling shutter | CMOS, global shutter | CMOS, global shutter | CMOS, global shutter |
| Pixel Size [µm²] | 2.2 x 2.2 | 5.5 x 5.5 | 5.5 x 5.5 | 5.5 x 5.5 |
| Frame Rate [fps] | 25 | 50 | 50 | 25 |
| Mono/Color | Mono/Color | Mono/Color | Mono NIR-enhanced | Mono/Color |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer GR (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer GR (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output | | | |
| Power Consumption (PoE/AUX) | 2.5 W/2.2 W | 2.8 W/2.5 W | 2.8 W/2.5 W | 2.8 W/2.5 W |

| Basler ace classic | acA2040-25gmNIR | acA2500-14gm/gc | acA3800-10gm/gc | acA4600-7gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 2048 x 2048 | 2592 x 1944 | 3840 x 2748 | 4608 x 3288 |
| Sensor | CMOSIS CMV4000 NIR-enhanced | ON Semiconductor MT9P031 | ON Semiconductor MT9J003 | ON Semiconductor MT9F002 |
| Sensor Size (optical) | 1″ | 1/2.5″ | 1/2.3″ | 1/2.3″ |
| Sensor Technology | CMOS, global shutter | CMOS, rolling shutter | CMOS, rolling shutter | CMOS, rolling shutter |
| Pixel Size [µm²] | 5.5 x 5.5 | 2.2 x 2.2 | 1.67 x 1.67 | 1.4 x 1.4 |
| Frame Rate [fps] | 25 | 14 | 10 | 7 |
| Mono/Color | Mono NIR-enhanced | Mono/Color | Mono/Color | Color |
| Video Output Format | Mono (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer GB (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono 8, Bayer BG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C | C, CS | C | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output | | | |
| Power Consumption (PoE/AUX) | 2.9 W/2.6 W | 2.5 W/2.2 W | 3.5 W/3.3 W | 3.5 W/3.3 W |

# TECHNICAL DETAILS

| Basler ace U | acA640-300gm/gc | acA800-200gm/gc | acA1300-75gm/gc | acA1920-48gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 640 x 480 | 800 x 600 | 1280 x 1024 | 1920 x 1200 |
| Sensor | ON Semiconductor PYTHON 300 | ON Semiconductor PYTHON 500 | ON Semiconductor PYTHON 1300 | ON Semiconductor PYTHON 2000 |
| Sensor Size (optical) | 1/4″ | 1/3.6″ | 1/2″ | 2/3″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 4.8 x 4.8 | | | |
| Frame Rate [fps] | 376 | 240 | 88 | 50 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 10, 10 Packed), Bayer BG (8, 10, 10 Packed), YUV 4:2:2 (Packed, YUYV Packed) | | | |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 1 GPIO | | | |
| Power Consumption (PoE/AUX) | 3.5 W/3.1 W | 3.5 W/3.1 W | 3.5 W/3.1 W | 3.7 W/3.3 W |

| Basler ace U | acA1920-40gm/gc | acA1920-50gm/gc | acA2040-35gm/gc | acA2440-20gm/gc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 1920 x 1200 | 1920 x 1200 | 2048 x 1536 | 2448 x 2048 |
| Sensor | Sony IMX249 | Sony IMX174 | Sony IMX265 | Sony IMX264 |
| Sensor Size (optical) | 1/1.2″ | 1/1.2″ | 1/1.8″ | 2/3″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 5.86 x 5.86 | 5.86 x 5.86 | 3.45 x 3.45 | 3.45 x 3.45 |
| Frame Rate [fps] | 42 | 50 | 36 | 23 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | | | |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 1 GPIO | | | |
| Power Consumption (PoE/AUX) | 3.4 W/3.1 W | 3.6 W/3.2 W | 3.2 W/2.7 W | 3.3 W/2.7 W |

# TECHNICAL DETAILS

| Basler ace U | acA2500-20gm/gc | NEW acA3088-16gm/gc | NEW acA4024-8gm/gc |
|---|---|---|---|
| **Model Specifications** | | | |
| Resolution (H×V pixels) | 2592 x 2048 | 3088 x 2064 | 4024 x 3036 |
| Sensor | ON Semiconductor PYTHON 5000 | Sony IMX178 | Sony IMX226 |
| Sensor Size (optical) | 1″ | 1/1.8″ | 1/1.7″ |
| Sensor Technology | CMOS, global shutter | CMOS, rolling shutter | CMOS, rolling shutter |
| Pixel Size [µm²] | 4.8 x 4.8 | 2.4 x 2.4 | 1.85 x 1.85 |
| Frame Rate [fps] | 21 | 16 | 8 |
| Mono/Color | Mono/Color | | |
| Video Output Format | Mono (8, 10, 10 Packed), Bayer BG (8, 10, 10 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) |
| Lens Mount | C | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 1 GPIO | | |
| Power Consumption (PoE/AUX) | 4.1 W/3.6 W | 2.9 W/2.5 W | 2.9 W/2.5 W |

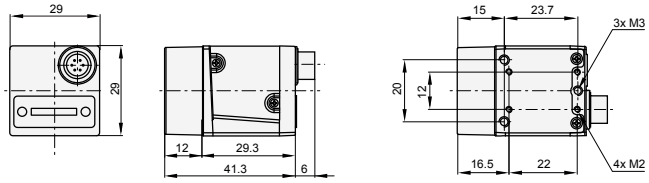
| Basler ace L | NEW acA4096-11gm/gc | NEW acA4112-8gm/gc |
|---|---|---|
| **Model Specifications** | | |
| Resolution (H×V pixels) | 4096 x 2160 | 4096 x 3000 |
| Sensor | Sony IMX267 | Sony IMX304 |
| Sensor Size (optical) | 1″ | 1.1″ |
| Sensor Technology | CMOS, global shutter | |
| Pixel Size [µm²] | 3.45 x 3.45 | |
| Frame Rate [fps] | 12 | 8 |
| Mono/Color | Mono/Color | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YUV 4:2:2 (Packed, YUYV Packed) | |
| Lens Mount | C | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 1 GPIO | |
| Power Consumption (PoE/AUX) | 3.2 W / 2.7 W | |

# TECHNICAL DETAILS

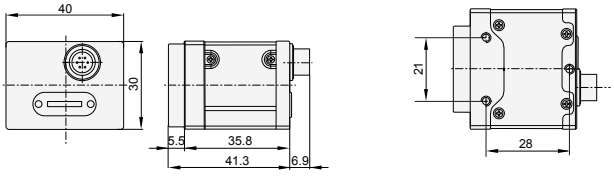
| Basler ace USB | |
|---|---|
| **Product Group Specifications** | |
| Interface | USB 3.0 |
| Housing Size (L x W x H) | ace classic/ace U: 29.3 mm x 29 mm x 29 mm, ace L: 35.8 mm x 40 mm x 30 mm |
| Housing Temperature | 0 °C - 50 °C[1] |
| Typical Weight | < 80 g |
| Power Requirements | Via USB 3.0 interface |
| Power Suspend Mode | Yes, less than 0.02 W, configurable |
| Synchronization | Via hardware trigger, via software trigger or free-run |
| Exposure Control | Via hardware trigger[2] or programmable via the camera API |
| Conformity | CE, RoHS, GenICam, USB3 Vision, IP30, UL[3], FCC |
| Driver | Basler pylon Camera Software Suite or 3rd party USB3 Vision Software |
| Operating System | Windows, Linux, Mac OS X |

[1] 0 °C - 60 °C for acA2040-90um/uc, acA2040-90umNIR
[2] not applicable for ace models with sensors of the MT line from ON Semiconductor
[3] in preparation for ace L and ace U with Sony STARVIS sensors

## **Dimensions** (in mm): **ace classic & ace U**




## **Dimensions** (in mm): **ace L**




| Basler ace classic | acA640-90um/uc | acA640-120um/uc | acA1300-30um/uc | acA1600-20um/uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 659 x 494 | 659 x 494 | 1296 x 966 | 1626 x 1236 |
| Sensor | Sony ICX424 | Sony ICX618 | Sony ICX445 | Sony ICX274 |
| Sensor Size (optical) | 1/3″ | 1/4″ | 1/3″ | 1/1.8″ |
| Sensor Technology | CCD, global shutter | | | |
| Pixel Size [µm²] | 7.4 × 7.4 | 5.6 × 5.6 | 3.75 × 3.75 | 4.4 x 4.4 |
| Frame Rate [fps] | 90 | 120 | 30 | 20 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8, Mono (8, 12, 12 Packed), Bayer BG | | | |
| Lens Mount | C, CS | C, CS | C, CS | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 3 W | 3 W | 2.5 W | 3.5 W |

# TECHNICAL DETAILS

| Basler ace classic | acA1920-25um/uc | acA2000-165um/uc | acA2000-165umNIR | acA2040-90um/uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 1920 x 1080 | 2048 x 1088 | 2048 x 1088 | 2048 x 2048 |
| Sensor | ON Semiconductor MT9P031 | CMOSIS CMV2000 | CMOSIS CMV2000 NIR-enhanced | CMOSIS CMV4000 |
| Sensor Size (optical) | 1/3.7″ | 2/3″ | 2/3″ | 1″ |
| Sensor Technology | CMOS, rolling shutter | CMOS, global shutter | CMOS, global shutter | CMOS, global shutter |
| Pixel Size [µm²] | 2.2 x 2.2 | 5.5 x 5.5 | 5.5 x 5.5 | 5.5 x 5.5 |
| Frame Rate [fps] | 26 | 165 | 165 | 90 |
| Mono/Color | Mono/Color | Mono/Color | Mono NIR-enhanced | Mono/Color |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer GB (8, 12, 12 Packed), YCbCr422_8 | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed) | Mono (8, 12, 12 Packed) | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed) |
| Lens Mount | C, CS | C | C | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 2.2 W | 3.2 W | 3.2 W | 3.2 W |

| Basler ace classic | acA2040-90umNIR | acA2500-14um/uc | acA3800-14um/uc | acA4600-10uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 2048 x 2048 | 2592 x 1944 | 3840 x 2748 | 4608 x 3288 |
| Sensor | CMOSIS CMV4000 NIR-enhanced | ON Semiconductor MT9P031 | ON Semiconductor MT9J003 | ON Semiconductor MT9F002 |
| Sensor Size (optical) | 1″ | 1/2.5″ | 1/2.3″ | 1/2.3″ |
| Sensor Technology | CMOS, global shutter | CMOS, rolling shutter | CMOS, rolling shutter | CMOS, rolling shutter |
| Pixel Size [µm²] | 5.5 x 5.5 | 2.2 x 2.2 | 1.67 x 1.67 | 1.4 x 1.4 |
| Frame Rate [fps] | 90 | 14 | 14 | 10 |
| Mono/Color | Mono NIR-enhanced | Mono/Color | Mono/Color | Color |
| Video Output Format | Mono (8, 12, 12 Packed) | Mono (8, 12, 12 Packed), Bayer GB (8, 12, 12 Packed), YCbCr422_8 | Mono (8, 12, 12 Packed), Bayer BG (8, 12, 12 Packed), YCbCr422_8 | Mono 8, Bayer BG (8, 12, 12 Packed), YCbCr422_8 |
| Lens Mount | C | C, CS | C | C |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 3.2 W | 2.2 W | 2.8 W | 2.8 W |

# TECHNICAL DETAILS

| Basler ace U | acA640-750um/uc | acA800-510um/uc | acA1300-200um/uc | acA1920-150um/uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 640 x 480 | 800 x 600 | 1280 x 1024 | 1920 x 1200 |
| Sensor | ON Semiconductor PYTHON 300 | ON Semiconductor PYTHON 500 | ON Semiconductor PYTHON 1300 | ON Semiconductor PYTHON 2000 |
| Sensor Size (optical) | 1/4″ | 1/3.6″ | 1/2″ | 2/3″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 4.8 x 4.8 | | | |
| Frame Rate [fps] | 751 | 511 | 203 | 150 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 10, 10 Packed), Bayer BG (8, 10, 10 Packed), YCbCr422_8, RGB8, BGR8 | | | |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 3.3 W | 3.3 W | 3.3 W | 4.2 W |

| Basler ace U | acA1920-40um/uc | acA1920-155um/uc | acA2040-55um/uc | acA2040-120um/uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 1920 x 1200 | 1920 x 1200 | 2048 x 1536 | 2048 x 1536 |
| Sensor | Sony IMX249 | Sony IMX174 | Sony IMX265 | Sony IMX252 |
| Sensor Size (optical) | 1/1.2″ | 1/1.2″ | 1/1.8″ | 1/1.8″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 5.86 x 5.86 | 5.86 x 5.86 | 3.45 x 3.45 | 3.45 x 3.45 |
| Frame Rate [fps] | 41 | 164 | 55 | 120 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 | | | |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 2.9 W | 3.7 W | 2.6 W | 3.5 W |

# TECHNICAL DETAILS

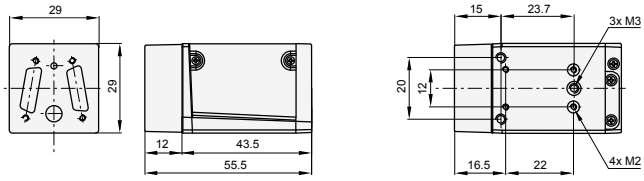
| Basler ace U | acA2440-35um/uc | acA2440-75um/uc | acA2500-60um/uc | NEW acA3088-57um/uc | NEW acA4024-29um/uc |
|---|---|---|---|---|---|
| **Model Specifications** | | | | | |
| Resolution (H×V pixels) | 2448 x 2048 | 2448 x 2048 | 2592 x 2048 | 3088 x 2064 | 4024 x 3036 |
| Sensor | Sony IMX264 | Sony IMX250 | ON Semiconductor PYTHON 5000 | Sony IMX178 | Sony IMX226 |
| Sensor Size (optical) | 2/3″ | 2/3″ | 1″ | 1/1.8″ | 1/1.7″ |
| Sensor Technology | CMOS, global shutter | CMOS, global shutter | CMOS, global shutter | CMOS, rolling shutter | CMOS, rolling shutter |
| Pixel Size [µm²] | 3.45 x 3.45 | 3.45 x 3.45 | 4.8 x 4.8 | 2.4 x 2.4 | 1.85 x 1.85 |
| Frame Rate [fps] | 35 | 75 | 60 | 59 | 31 |
| Mono/Color | Mono/Color | | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 | Mono (8, 10, 10 Packed), Bayer BG (8, 10, 10 Packed), YCbCr422_8, RGB8, BGR8 | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 |
| Lens Mount | C | | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | | |
| Power Consumption | 2.7 W | 3.4 W | 4.2 W | 3.0 W | 3.0 W |

| Basler ace L | NEW acA4096-30um/uc | NEW acA4096-40um/uc | NEW acA4112-20um/uc | NEW acA4112-30um/uc |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 4096 x 2168 | 4096 x 2168 | 4096 x 3000 | 4096 x 3000 |
| Sensor | Sony IMX267 | Sony IMX255 | Sony IMX304 | Sony IMX253 |
| Sensor Size (optical) | 1″ | 1″ | 1.1″ | 1.1″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 3.45 x 3.45 | | | |
| Frame Rate [fps] | 32 | 42 | 23 | 30 |
| Mono/Color | Mono/Color | | | |
| Video Output Format | Mono (8, 12, 12 Packed), Bayer RG (8, 12, 12 Packed), YCbCr422_8, RGB8, BGR8 | | | |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input + 1 opto-isolated output + 2 Fast-GPIO (configurable as In/Out) | | | |
| Power Consumption | 3.0 W | 3.6 W | 3.0 W | 3.6 W |

# TECHNICAL DETAILS

| Basler ace Camera Link | |
|---|---|
| **Product Group Specifications** | |
| Interface | Camera Link (base, medium or full) |
| Housing Size (L x W x H) | 43.5 mm x 29 mm x 29 mm |
| Housing Temperature | 0 °C - 50 °C |
| Typical Weight | ≈ 100 g |
| Power Requirements | Power over Camera Link (PoCL) or 12VDC (+/- 10%) |
| Synchronization | Via hardware trigger, via software trigger or free-run |
| Exposure Control | Trigger width or timed |
| Conformity | CE, RoHS, GenICam, Camera Link, IP30, FCC |
| Driver | Basler pylon Camera Software Suite or 3rd party Camera Link Software |
| Operating System | Windows, Linux, Mac OS X |

**Dimensions** (in mm):




| Basler ace classic | acA2000-340km/kc | acA2000-340kmNIR | acA2040-180km/kc | acA2040-180kmNIR |
|---|---|---|---|---|
| **Model Specifications** | | | | |
| Resolution (H×V pixels) | 2048 x 1088 | 2048 x 1088 | 2048 x 2048 | 2048 x 2048 |
| Sensor | CMOSIS CMV2000 | CMOSIS CMV2000 NIR-enhanced | CMOSIS CMV4000 | CMOSIS CMV4000 NIR-enhanced |
| Sensor Size (optical) | 2/3″ | 2/3″ | 1″ | 1″ |
| Sensor Technology | CMOS, global shutter | | | |
| Pixel Size [µm²] | 5.5 x 5.5 | | | |
| Frame Rate [fps] | 340 | 340 | 180 | 180 |
| Mono/Color | Mono/Color | Mono NIR-enhanced | Mono/Color | Mono NIR-enhanced |
| Lens Mount | C | | | |
| Digital I/O | 1 opto-isolated input or output (GPIO) | | | |
| Power Consumption | 3.0 W | | | |

# BASLER´S COMPONENTS

## Basler´s Components Enhance Your Vision

**Basler offers you extensively tested cables and lenses, which are optimized for use with our Basler cameras. Our cooperation with certified suppliers facilitates the operation of a high-performance image processing system.**

An image processing system needs more than just a camera, lens and light source. A stable vision system also requires accessories for handling data transfer.

Basler offers a wide variety of accessories such as lenses, I/O cables, power supplies, data cables, host adapter cards, hubs or switches designed to help you get the most out of your camera. To ensure full compatibility, all accessories are tested with our cameras. Cables and power supplies are all EMC tested for industrial conditions by our support team.

### Basler Original Equipment

The accessories market for machine vision cameras is broad and deep. Therefore, Basler offers products specially developed for our cameras, meaning camera and lens or cables harmonize perfectly with one another. The products are produced exclusively for us and are available only from Basler. All products with the Basler Original Equipment seal allow top performance when combined with Basler cameras.

### Why Components from Basler?

- Perfect match with our Basler cameras
- Extensive and qualified portfolio
- One-stop-shopping for your image processing system
- Performance stability through premium quality standards
- Qualified selection of components avoids changes in existing systems
- Professional consultancy during preselection

### USB 3.0 Accessories from Basler

Especially with a USB 3.0 interface, it is important to think about the right accessories to achieve stability in a system with one or more cameras. In particular USB 3.0 accessories from the consumer sector may lead to major disadvantages for the user, as they are not designed to handle the higher demands of machine vision applications.

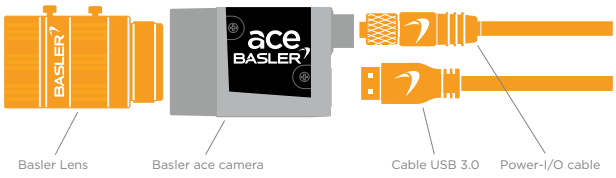
Our portfolio of USB 3.0 accessories covers a broad selection of cables, host adapter cards and a USB 3.0 hub.

### Your Benefits Through USB 3.0 Accessories:

- High stability of your USB 3.0 set up
- Simple integration into all image processing applications
- Tested USB 3.0 accessories with reliable premium quality for industrial applications
- Carefully selected accessories for a perfect match
- Plug and play functionality

**Have a look at the matching components for your camera model at [www.baslerweb.com/accessories](www.baslerweb.com/accessories)**

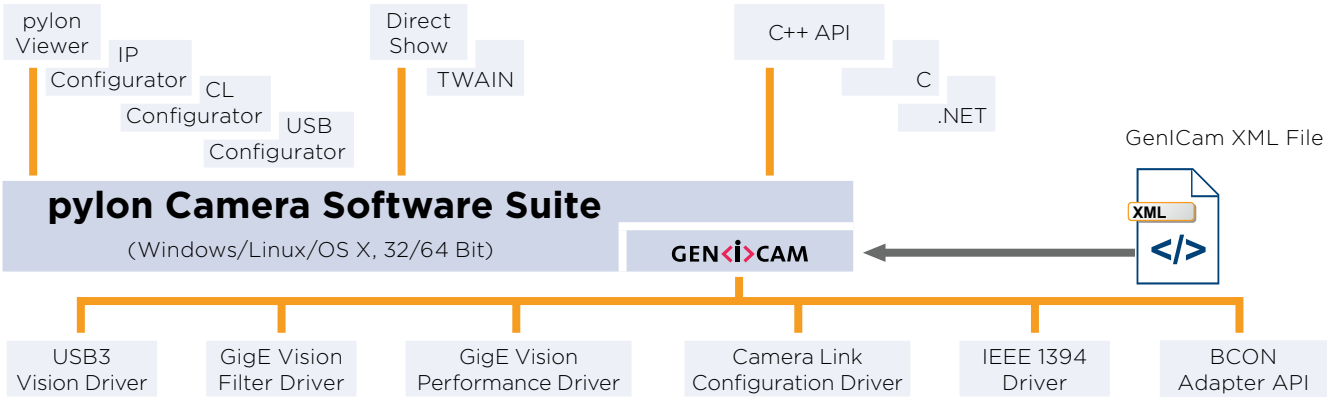
### Typcial set-up of a camera system:



**Get your free version: www.baslerweb.com/pylon**

## Basler pylon Camera Software Suite

**The pylon Camera Software Suite operates with all Basler line scan and area scan cameras - no matter what interface they use. It offers stable, reliable and flexible data exchange between Basler cameras and PCs, for Windows and Linux on x86 and ARM based systems – at a very low CPU load.**




The architecture of the pylon Camera Software Suite is based on GenICam Technology, which offers you easy access to the newest camera models and the latest features. Changes to an existing camera device in your application essentially become a plug-and-play process.

An easy-to-use set of tools lets you configure the camera's interface. Use the **pylon Viewer** to set camera parameters, to capture and display images, and to evaluate the camera.

The pylon **USB3 Vision Driver** fully supports the USB3 Vision standard. It allows Basler USB 3.0 cameras to use the full speed and bandwidth of USB 3.0 for image transmission while reducing resource load and using off-the-shelf hardware components.

The **pylon GigE Vision Drivers** quickly separate incoming packets carrying image data from other traffic on the network and make the data available for use by your vision application while requiring the lowest CPU resources.

The pylon **IEEE 1394b Driver** gives you access to a well-established interface technology, and the pylon **Camera Link Configuration Driver** offers comfortable access to all camera parameters of Basler's latest Camera Link families ace, aviator, and racer.

The **BCON Adapter API** allows easy implementation of an adapter to communicate with the systems $I^2C$ interface. A ready to use sample adapter implementation is also provided.

The pylon Camera Software Suite also contains a powerful SDK that supports any type of application development. The pylon package contains the following main modules. Each one can be individually selected/unselected during the installation process, preventing the installation of unneeded modules on your system:

- USB3 Vision Driver
- GigE Vision Filter Driver
- GigE Vision Performance Driver
- IEEE 1394 Driver
- BCON Adapter API
- Camera Link Serial Communication Driver
- pylon Viewer
- SDK for all cameras; C, C++, .NET (C#, VB.NET, ...); the 'pylon for Linux' version only supports the GigE and USB 3.0 interface via a C++ API

The pylon Camera Software Suite can be downloaded for free at *www.baslerweb.com/pylon*. For more information on the installation process, refer to the pylon Installation Guide. The helpful pylon Release Notes contain all improvements and bug fixes since the first pylon version.

# OTHER INFORMATION

## How Does Basler Measure and Define Image Quality?

1288 EMVA Standard Compliant

Basler is leading the effort to standardize image quality and sensitivity measurement for cameras and sensors. We are giving the EMVA 1288 standard our strongest support because it describes a unified method to measure, compute, and present the specification parameters for cameras and image sensors. Our cameras are characterized and measured in 100% compliance with the EMVA 1288 standard. Measurement reports can be downloaded from our website.

## How Does Basler Ensure Superior Quality and Reliable High Performance?

Our approach to quality assurance is rigorous: we continually audit all facets of our business to ensure powerful performance, increase efficiency and reduce costs for our customers. We are compliant with all major quality standards including ISO 9001, CE, RoHS, and more. To ensure consistently high product quality, we employ several quality inspection procedures during manufacturing.

Every Basler camera is subjected to exhaustive optical and mechanical tests before leaving the factory. We have developed a unique combination of optics, hardware, and software tools that can quickly and efficiently calibrate a camera and measure its performance against a set of standard performance criteria. Regardless of what technology or camera model you choose you can be assured of consistent performance.

## 3-Year Warranty

Basler offers a 3-year warranty for their cameras and the Basler Lenses 1/2.5″. We make this unprecedented promise because we have unparalleled confidence in our products. We continually reinvest in research, development and superior manufacturing capabilities so that our customers can fully rely on the products we manufacture.

## About Basler

Basler is a leading manufacturer of high-quality digital cameras and accessories for industry, medicine, traffic and a variety of other markets. The company's product portfolio encompasses area scan and line scan cameras in compact housing dimensions, camera modules in board level variants for embedded solutions, and 3D cameras. The catalog is rounded off by our user-friendly pylon SDK and a broad spectrum of accessories, including a number developed specially for Basler and optimally harmonized for our cameras.

Basler has 30 years of experience in computer vision. The company is home to approximately 500 employees at its headquarters in Ahrensburg, Germany, and its subsidiaries and sales offices in Europe, Asia, and North America.

©Basler AG, No. 30, 08/2017
ID 2000030025

**Basler AG**
**Germany, Headquarters**
Tel. +49 4102 463 500
sales.europe@baslerweb.com

**Basler, Inc.**
**USA**
Tel. +1 610 280 0171
sales.usa@baslerweb.com

**Basler Asia Pte Ltd.**
**Singapore**
Tel. +65 6367 1355
sales.asia@baslerweb.com

Please visit our website to find further Basler offices and representatives close to you:
**www.baslerweb.com/sales**

BASLER
the power of sight