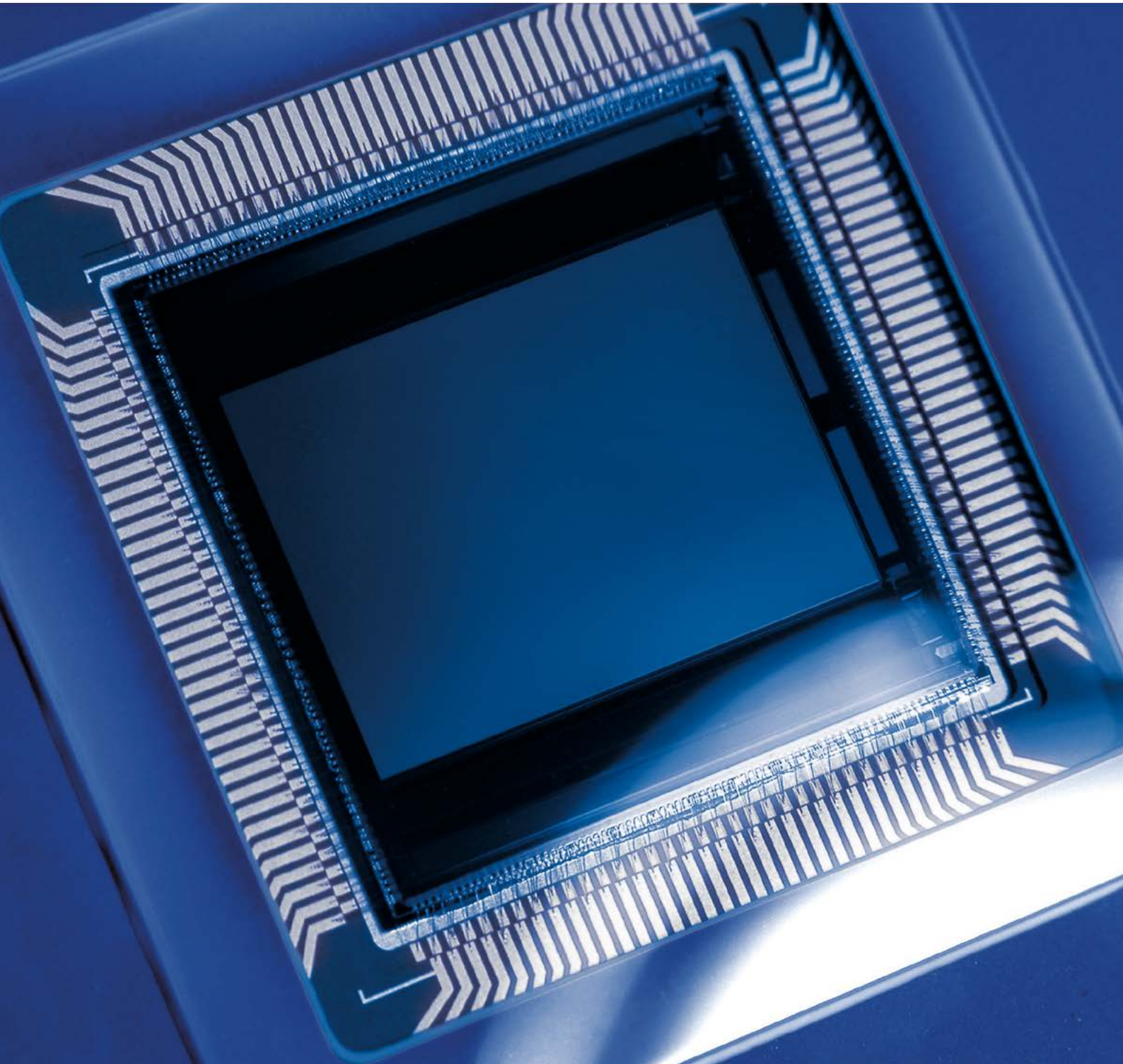


# EMVA DATA OVERVIEW

MONOCHROME AREA SCAN CAMERAS



1288   
EMVA Standard Compliant

**BASLER**   
the power of sight

The EMVA 1288 Standard has been developed by the European Machine Vision Association with the goal of standardizing image quality and sensitivity measurements for machine vision cameras and sensors. Based on this standard our cameras are tested and their EMVA data is generated. This document will give you an overview of the EMVA data of our cameras. Detailed measurement reports for each camera model can be downloaded from our website: [baslerweb.com/emva-downloads](http://baslerweb.com/emva-downloads)

**Functioning of a Sensor**

The sensor is the heart of a camera and therefore its most important component. A sensor consists of pixels with photodiodes that convert energy of the incoming photons to an electrical charge which is then converted and processed to generate an image.

Sensor or camera properties are measured with different parameters. For the following explanation of the most common parameters we use an example from bottle inspection.

**Quantum Efficiency QE [%]**

The incident photon to converted electron ratio is called quantum efficiency. The QE depends on the wavelength of the light. The bigger the number of electrons produced by a given number of photons, the higher the QE and the more information is available in an image. A high quantum efficiency is especially important in low light conditions.

**Temporal Dark Noise [e-]**

Even if no light hits the sensor, some electrons are captured by pixels and create a signal that is called dark noise. Those electrons result from the electronics that surround the sensor. The less dark noise, the clearer the image and the better the signals can be detected.

**Saturation Capacity [ke-]**

The number of electrons a pixel can hold is limited and given by the saturation capacity. In a saturated pixel no more photons can be converted into electrons and thus image information is lost.

In the example, the fill level of the bottle in fig. 4 is invisible as the saturation capacity of the camera is reached. At a shorter exposure time (fig. 3) the fill level is detectable but at the expense of the barcode visibility.

**Dynamic Range [dB]**

The ratio between maximum and minimum measurable light intensities is described as dynamic range. A high dynamic range is especially important when there are both, dark and bright details in an image, or when light conditions are changing.

A camera with a higher dynamic range is able to deliver more levels of grey in the images (fig.2). Details as barcodes, labels or the bottle cap can be inspected more accurately.

**Signal to Noise Ratio SNR [dB]**

The SNR compares the level of a desired signal to the level of background noise. In the overview on the following pages the best possible SNR is given.

The barcode example shows the image of a camera with high SNR (fig.2) and one with lower SNR (fig.3). For a better result, this camera needs a longer exposure time (fig. 4) or a more efficient illumination.



Fig. 1 Test Setup

**How Does Basler Measure and Define Image Quality?**

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.



**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.

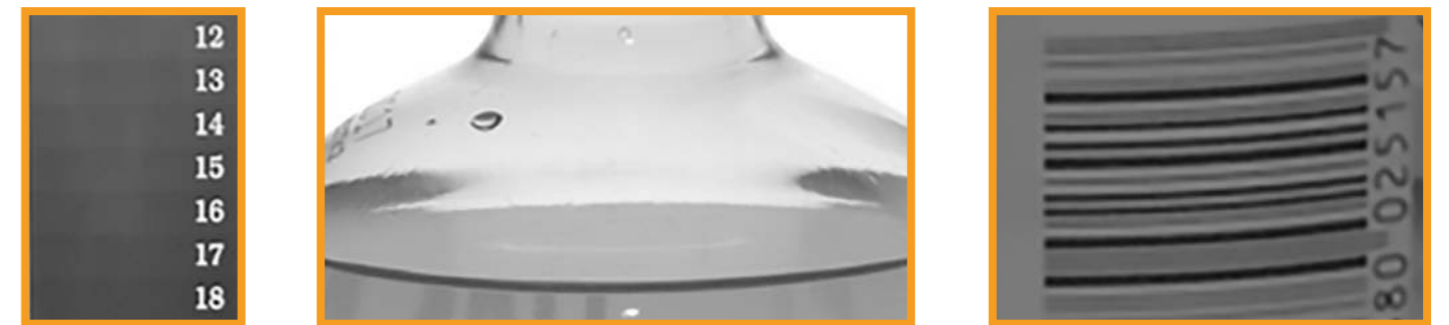


Fig. 2 Camera A with good EMVA properties

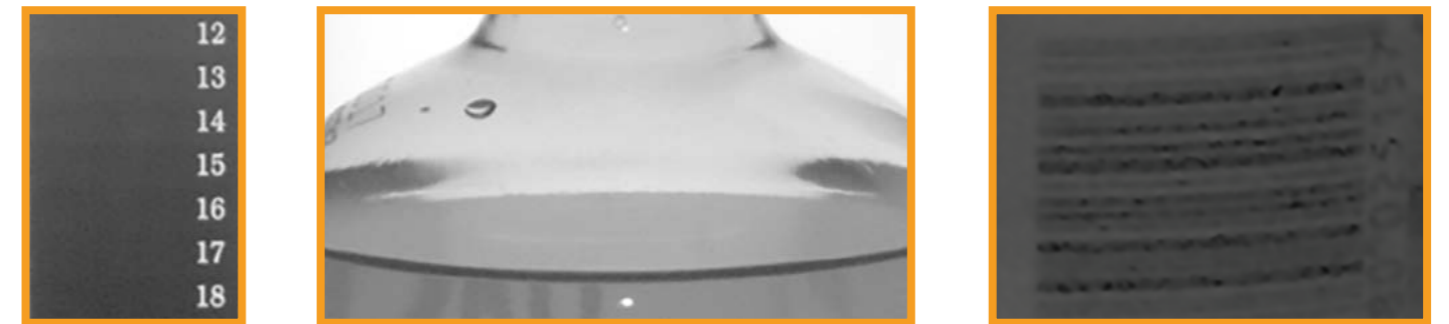


Fig. 3 Camera B with inferior EMVA properties



Fig. 4 Camera B with longer exposure time

## SENSOR OVERVIEW & EMVA DATA OF BASLER CAMERAS

| SENSOR             | TYPE | SHUTTER | RESOLUTION | PIXEL [H×V] | PIXEL SIZE [μm] | OPTICAL SIZE ["] | SERIES    | FRAME RATE<br>USB / GIGE / 5GIGE / CXP-12 |     |     |     | QE [%] | DARK NOISE [E-] | SAT. CAPACITY [KE-] | DYNAMIC RANGE [DB] | MAX. SNR [DB] |
|--------------------|------|---------|------------|-------------|-----------------|------------------|-----------|---|-----|-----|-----|--------|-----------------|---------------------|--------------------|---------------|
| <b>Sony</b>        |      |         |            |             |                 |                  |           |   |     |     |     |        |                 |                     |                    |               |
| ICX618 Replacement | CMOS | global  | VGA        | 659×494     | 5.6             | 1/4              | ace       | -   | 134 | -   | -   | 63     | 5               | 28.0                | 75                 | 45            |
| IMX174             | CMOS | global  | 2.3 MP     | 1920×1200   | 5.86            | 1/1.2            | ace       | 164                                       | 50  | -   | -   | 70     | 7               | 31.8                | 74                 | 45            |
| IMX178             | CMOS | rolling | 6 MP       | 3088×2064   | 2.4             | 1/1.8            | ace       | 59  | 16  | -   | -   | 81     | 3               | 14.3                | 73                 | 42            |
| IMX183             | CMOS | rolling | 20 MP      | 5472×3648   | 2.4             | 1                | ace       | 17  | 5   | -   | -   | 75     | 3               | 13.8                | 71                 | 41            |
| IMX226             | CMOS | rolling | 12 MP      | 4024×3036   | 1.85            | 1/1.7            | ace       | 31  | 8   | -   | -   | 83     | 3               | 11.0                | 70                 | 40            |
| IMX249             | CMOS | global  | 2.3 MP     | 1920×1200   | 5.86            | 1/1.2            | ace       | 41  | 42  | -   | -   | 70     | 7               | 31.9                | 74                 | 45            |
| IMX250             | CMOS | global  | 5 MP       | 2448×2048   | 3.45            | 2/3              | ace       | 75  | -   | -   | -   | 68     | 2               | 10.7                | 73                 | 40            |
| IMX252             | CMOS | global  | 3 MP       | 2048×1536   | 3.45            | 1/1.8            | ace       | 120                                       | -   | -   | -   | 69     | 2               | 10.5                | 73                 | 40            |
| IMX253             | CMOS | global  | 12 MP      | 4096×3000   | 3.45            | 1.1              | ace boost | 30  | -   | -   | -   | 70     | 2               | 10.5                | 73                 | 40            |
|                    |      |         |            |             |                 |                  |           | -   | -   | -   | 68  |        |                 |                     |                    |               |
| IMX255             | CMOS | global  | 9 MP       | 4096×2160   | 3.45            | 1                | ace boost | 40  | -   | -   | -   | 70     | 2               | 10.5                | 73                 | 40            |
|                    |      |         |            |             |                 |                  |           | -   | -   | -   | 93  |        |                 |                     |                    |               |
| IMX264             | CMOS | global  | 5 MP       | 2448×2048   | 3.45            | 2/3              | ace       | 35  | 20  | -   | -   | 68     | 2               | 10.4                | 73                 | 40            |
| IMX265             | CMOS | global  | 3 MP       | 2048×1536   | 3.45            | 1/1.8            | ace       | 55  | 35  | -   | -   | 68     | 2               | 10.4                | 73                 | 40            |
| IMX267             | CMOS | global  | 9 MP       | 4096×2160   | 3.45            | 1                | ace       | 30  | 12  | -   | -   | 68     | 2               | 10.2                | 73                 | 40            |
| IMX273             | CMOS | global  | 1.6 MP     | 1440×1080   | 3.45            | 1/2.9            | ace       | 227                                       | 73  | -   | -   | 63     | 3               | 10.5                | 71                 | 40            |
| IMX287             | CMOS | global  | VGA        | 720×540     | 6.9             | 1/2.9            | ace       | 525                                       | 291 | -   | -   | 63     | 7               | 21.0                | 74                 | 43            |
| IMX304             | CMOS | global  | 12 MP      | 4096×3000   | 3.45            | 1.1              | ace       | 20  | 8   | -   | -   | 68     | 2               | 10.2                | 73                 | 40            |
| IMX334             | CMOS | rolling | 5 MP       | 2592×1944   | 2.0             | 1/2.8            | ace 2     | 60  | 22  | -   | -   | 73     | 2               | 7.2                 | 69                 | 39            |
|                    |      |         | 8.3 MP     | 3840×2160   | 2.0             | 1/1.8            | ace 2     | 45  | 13  | -   | -   | 72     | 2               | 7.2                 | 69                 | 39            |
| IMX392             | CMOS | global  | 2.3 MP     | 1920×1200   | 3.45            | 1/2.3            | ace 2     | 160                                       | 51  | 168 | -   | 62     | 3               | 10.4                | 72                 | 40            |
| IMX421             | CMOS | global  | 3 MP       | 1936×1464   | 4.5             | 2/3              | boost     | -   | -   | -   | 400 | 69     | 5               | 24.6                | 72                 | 44            |
| IMX530             | CMOS | global  | 24.4 MP    | 5328×4608   | 2.74            | 1.2              | boost     | -   | -   | -   | 100 | 66     | 2               | 9.6                 | 71                 | 40            |
| IMX531             | CMOS | global  | 20 MP      | 4504×4504   | 2.74            | 1.1              | boost     | -   | -   | -   | 100 | 67     | 2               | 9.7                 | 71                 | 40            |
| IMX532             | CMOS | global  | 16.1 MP    | 5320×3032   | 2.74            | 1.1              | boost     | -   | -   | -   | 150 | 65     | 2               | 9.6                 | 71                 | 40            |
| IMX535             | CMOS | global  | 12 MP      | 4096×3000   | 2.74            | 1/1.1            | boost     | -   | -   | -   | 180 | 66     | 3               | 10                  | 70                 | 40            |
| IMX536             | CMOS | global  | 8 MP       | 2832×2840   | 2.74            | 2/3              | boost     | -   | -   | -   | 190 | 65     | 2               | 10                  | 71                 | 40            |
| IMX537             | CMOS | global  | 5 MP       | 2448×2048   | 2.74            | 1/1.8            | boost     | -   | -   | -   | 250 | 66     | 2               | 10                  | 72                 | 40            |
| IMX540             | CMOS | global  | 24.4 MP    | 5328×4608   | 2.74            | 1.2              | ace 2     | 15  | 4   | 22  | -   | 66     | 2               | 9.6                 | 71                 | 40            |
| IMX541             | CMOS | global  | 20.2 MP    | 4504×4504   | 2.74            | 1.1              | ace 2     | 18  | 5   | 27  | -   | 66     | 2               | 9.7                 | 71                 | 40            |
| IMX542             | CMOS | global  | 16.1 MP    | 5320×3032   | 2.74            | 1.1              | ace 2     | 23  | 7   | 34  | -   | 66     | 2               | 9.7                 | 71                 | 40            |
| IMX545             | CMOS | global  | 12.3 MP    | 4096×3000   | 2.74            | 1/1.1            | ace 2     | 30  | 9   | 44  | -   | 65     | 3               | 9.9                 | 70                 | 40            |
| IMX546             | CMOS | global  | 8 MP       | 2840×2840   | 2.74            | 2/3              | ace 2     | 48  | 14  | 67  | -   | 66     | 2               | 9.8                 | 70                 | 40            |
| IMX547             | CMOS | global  | 5 MP       | 2448×2048   | 2.74            | 1/1.8            | ace 2     | 75  | 23  | 106 | -   | 66     | 3               | 9.9                 | 70                 | 40            |

Please note that only monochrome area scan cameras are listed in this overview. Specifications are subject to change without notice.  
For further information on the EMVA measurements and the EMVA 1288 standard (release 3.1), please visit: [baslerweb.com/emva-1288-standard](https://www.baslerweb.com/emva-1288-standard)

## SENSOR OVERVIEW & EMVA DATA OF BASLER CAMERAS

| SENSOR               | TYPE | SHUTTER            | RESOLUTION | PIXEL [H×V] | PIXEL SIZE [µm] | OPTICAL SIZE ["] | SERIES | FRAME RATE                  |     |     | QE [%] | DARK NOISE [E-] | SAT. CAPACITY [KE-] | DYNAMIC RANGE [DB] | MAX. SNR [DB] |
|----------------------|------|--------------------|------------|-------------|-----------------|------------------|--------|-----------------------------|-----|-----|--------|-----------------|---------------------|--------------------|---------------|
|                      |      |                    |            |             |                 |                  |        | USB / GIGE / 5GIGE / CXP-12 |     |     |        |                 |                     |                    |               |
| <b>ams</b>           |      |                    |            |             |                 |                  |        |                             |     |     |        |                 |                     |                    |               |
| CMV2000              | CMOS | global             | 2 MP       | 2048×1088   | 5.50            | 2/3              | ace    | 165                         | 50  | 340 | 63     | 14              | 9.4                 | 57                 | 40            |
| CMV4000              | CMOS | global             | 4 MP       | 2048×2048   | 5.50            | 1                | ace    | 90                          | 25  | 180 | 62     | 14              | 12.4                | 59                 | 41            |
| CMV4000 NIR-enhanced | CMOS | global             | 4 MP       | 2048×2048   | 5.50            | 1                | ace    | 90                          | 25  | 180 | 62     | 14              | 11.9                | 59                 | 41            |
| CMV12000             | CMOS | global             | 12 MP      | 4096×3072   | 5.50            | 1.75             | beat   | -                           | -   | 62  | 45     | 14              | 11.6                | 59                 | 41            |
| <b>e2V</b>           |      |                    |            |             |                 |                  |        |                             |     |     |        |                 |                     |                    |               |
| EV76C560             | CMOS | rolling switchable | 1.3 MP     | 1282×1026   | 5.30            | 1/1.8            | ace    | -                           | 60  | -   | 55     | 10              | 9.5                 | 60                 | 40            |
|                      |      |                    | 1.3 MP     | 1282×1026   | 5.30            | 1/1.8            | ace    | -                           | 60  | -   | 54     | 24              | 9.2                 | 52                 | 40            |
| EV76C570             | CMOS | switchable         | 2 MP       | 1602×1202   | 4.50            | 1/1.8            | ace    | -                           | 60  | -   | 47     | 22              | 6.8                 | 50                 | 38            |
| EV76C661             | CMOS | switchable         | 1.3 MP     | 1280×1024   | 5.30            | 1/1.8            | ace    | -                           | 60  | -   | 59     | 23              | 7.4                 | 50                 | 39            |
| <b>onsemi</b>        |      |                    |            |             |                 |                  |        |                             |     |     |        |                 |                     |                    |               |
| MT9J003              | CMOS | rolling            | 10 MP      | 3840×2748   | 1.67            | 1/2.3            | ace    | 14                          | 10  | -   | 46     | 6               | 2.8                 | 54                 | 34            |
| MT9P031              | CMOS | rolling            | 2 MP       | 1920×1080   | 2.20            | 1/3.7            | ace    | 25                          | 25  | -   | 57     | 6               | 6.7                 | 60                 | 38            |
|                      |      |                    | 5 MP       | 2592×1944   | 2.20            | 1/2.5            | ace    | 14                          | 14  | -   | 57     | 6               | 6.7                 | 60                 | 38            |
| PYTHON 300           | CMOS | global             | VGA        | 640×480     | 4.80            | 1/4              | ace    | 751                         | 376 | -   | 54     | 11              | 7.7                 | 57                 | 39            |
| PYTHON 500           | CMOS | global             | CCIR       | 800×600     | 4.80            | 1/3.6            | ace    | 511                         | 240 | -   | 54     | 11              | 7.8                 | 57                 | 39            |
| PYTHON 1300          | CMOS | global             | 1.3 MP     | 1280×1024   | 4.80            | 1/2              | ace    | 203                         | 88  | -   | 55     | 11              | 7.8                 | 57                 | 39            |
| PYTHON 2000          | CMOS | global             | 2.3 MP     | 1920×1200   | 4.80            | 2/3              | ace    | 150                         | 50  | -   | 54     | 11              | 7.8                 | 57                 | 39            |
| PYTHON 5000          | CMOS | global             | 5 MP       | 2590×2048   | 4.80            | 1                | ace    | 60                          | 21  | -   | 55     | 12              | 8.2                 | 57                 | 39            |
| XGS 20000            | CMOS | global             | 20 MP      | 4500×4500   | 3.2             | 1.3              | boost  | -                           | -   | 45  | 55     | 4               | 9.2                 | 66                 | 40            |
| XGS 32000            | CMOS | global             | 32.4 MP    | 6580×4935   | 3.2             | APS-C            | boost  | -                           | -   | 35  | 56     | 4               | 9.3                 | 65                 | 40            |
| XGS 45000            | CMOS | global             | 44.7 MP    | 8192×5460   | 3.2             | 35 mm            | boost  | -                           | -   | 15  | 55     | 4               | 9.0                 | 65                 | 39            |
| <b>Gpixel</b>        |      |                    |            |             |                 |                  |        |                             |     |     |        |                 |                     |                    |               |
| GMAX2505             | CMOS | global             | 5.6 MP     | 2600×2160   | 2.5             | 1/2              | ace 2  | 64                          | 20  | -   | 51     | 1               | 5.6                 | 72                 | 37            |
| GMAX2509             | CMOS | global             | 9.1 MP     | 4200×2160   | 2.5             | 2/3              | ace 2  | 12                          | 40  | -   | 50     | 1               | 4.5                 | 69                 | 37            |
| GMAX2518             | CMOS | global             | 18 MP      | 4508×4096   | 2.5             | 1                | ace 2  | 20                          | 6   | -   | 50     | 1               | 4.5                 | 69                 | 37            |

Please note that only monochrome area scan cameras are listed in this overview. Specifications are subject to change without notice.  
For further information on the EMVA measurements and the EMVA 1288 standard (release 3.1), please visit: [baslerweb.com/emva-1288-standard](https://www.baslerweb.com/emva-1288-standard)

**SONY CMOS**

|  |
|--|
| <b>ICX618 Replacement</b><br>acA640-121gm      |
| <b>IMX174</b><br>acA1920-50gm<br>acA1920-155um |
| <b>IMX178</b><br>acA3088-16gm<br>acA3088-57um  |
| <b>IMX183</b><br>acA5472-5gm<br>acA5472-17um   |
| <b>IMX226</b><br>acA4024-8gm<br>acA4024-29um   |
| <b>IMX249</b><br>acA1920-40gm<br>acA1920-40um  |
| <b>IMX250</b><br>acA2440-75um                  |
| <b>IMX252</b><br>acA2040-120um                 |
| <b>IMX253</b><br>acA4112-30um<br>boA4112-68cm  |
| <b>IMX255</b><br>acA4096-40um<br>boA4096-93cm  |
| <b>IMX264</b><br>acA2440-20gm<br>acA2440-35um  |
| <b>IMX265</b><br>acA2040-35gm<br>acA2040-55um  |
| <b>IMX267</b><br>acA4096-11gm<br>acA4096-30um  |
| <b>IMX273</b><br>acA1440-73gm<br>acA1440-220um |
| <b>IMX287</b><br>acA720-290gm<br>acA720-520um  |
| <b>IMX304</b><br>acA4112-8gm<br>acA4112-20um   |

**SONY CMOS**

|   |
|---|
| <b>IMX334</b><br>a2A2590-22gmBAS/PRO<br>a2A2590-60umBAS/PRO<br>a2A3840-13gmBAS/PRO<br>a2A3840-45umBAS/PRO |
| <b>IMX392</b><br>a2A1920-51gmBAS/PRO<br>a2A1920-160umBAS/PRO<br>a2A1920-165g5mBAS                         |
| <b>IMX421</b><br>boA1936-400cm  |
| <b>IMX530</b><br>boA5328-100cm  |
| <b>IMX531</b><br>boA4504-100cm  |
| <b>IMX532</b><br>boA5320-150cm  |
| <b>IMX535</b><br>boA4096-180cm  |
| <b>IMX536</b><br>boA2832-190cm  |
| <b>IMX537</b><br>boA2448-250cm  |
| <b>IMX540</b><br>a2A5328-4gmBAS/PRO<br>a2A5328-15umBAS/PRO<br>a2A5328-22g5mBAS                            |
| <b>IMX541</b><br>a2A4504-5gmBAS/PRO<br>a2A4504-18umBAS/PRO<br>a2A4504-27g5mBAS                            |
| <b>IMX542</b><br>a2A5320-7gmBAS/PRO<br>a2A5320-23umBAS/PRO<br>a2A5320-34g5mBAS                            |
| <b>IMX545</b><br>a2A4096-9gmBAS/PRO<br>a2A4096-30umBAS/PRO<br>a2A4096-44g5mBAS                            |
| <b>IMX546</b><br>a2A2840-14gmBAS/PRO<br>a2A2840-48umBAS/PRO<br>a2A2840-67g5mBAS                           |
| <b>IMX547</b><br>a2A2448-23gmBAS/PRO<br>a2A2448-75umBAS/PRO<br>a2A2448-105g5mBAS                          |

**AMS**

|  |
|--|
| <b>CMV2000</b><br>acA2000-165um<br>acA2000-340km<br>acA2000-50gm             |
| <b>CMV4000</b><br>acA2040-180km<br>acA2040-25gm<br>acA2040-90um              |
| <b>CMV4000 NIR</b><br>acA2040-180kmNIR<br>acA2040-25gmNIR<br>acA2040-90umNIR |
| <b>CMV12000</b><br>beA4000-62km  |

**GPIXEL**

|   |
|---|
| <b>GMAX2505</b><br>a2A2600-20gmBAS/PRO<br>a2A2600-64umBAS/PRO |
| <b>GMAX2509</b><br>a2A4200-12gmBAS/PRO<br>a2A4200-40umBAS/PRO |
| <b>GMAX2518</b><br>a2A4508-6gmBAS/PRO<br>a2A4508-20umBAS/PRO  |

**E2V**

|   |
|---|
| <b>EV76C560</b><br>acA1280-60gm<br>acA1300-60gm |
| <b>EV76C570</b><br>acA1600-60gm                 |
| <b>EV76C661</b><br>acA1300-60gmNIR              |

**ONSEMI**

|  |
|--|
| <b>MT9J003</b><br>acA3800-10gm<br>acA3800-14um                                 |
| <b>MT9P031</b><br>acA1920-25gm<br>acA1920-25um<br>acA2500-14gm<br>acA2500-14um |
| <b>PYTHON 300</b><br>acA640-750um<br>acA640-300gm                              |
| <b>PYTHON 500</b><br>acA800-510um<br>acA800-200gm                              |
| <b>PYTHON 1300</b><br>acA1300-200um<br>acA1300-75gm                            |
| <b>PYTHON 2000</b><br>acA1920-150um<br>acA1920-48gm                            |
| <b>PYTHON 5000</b><br>acA2500-60um<br>acA2500-20gm                             |
| <b>XGS 20000</b><br>boA4500-45cm   |
| <b>XGS 32000</b><br>boA6500-36cm   |
| <b>XGS 45000</b><br>boA8100-16cm   |

**About Basler**

Basler AG is an international leader and experienced expert in computer vision. The company offers a broad coordinated portfolio of vision hardware and software. In addition, it enables customers to solve their vision application issues by developing customer-specific products or solutions. Founded in 1988, the Basler Group employs more than 1,000 people at its headquarters in Ahrensburg, Germany, as well as other sales and development locations throughout Europe, Asia, and North America.



**Markets We Focus on**



**How to Read Our Camera Model Names**

| AC  | A                              | 2040              | 180   | K  | M                     | NIR   |
|---|--------------------------------|-------------------|---|--|-----------------------|---|
| <b>Model</b>  | <b>Type</b>                    | <b>Resolution</b> | <b>Frame Rate</b>                             | <b>Interface</b>   | <b>Color</b>          | <b>Spectrum</b>   |
| a2 = ace 2<br>ac = ace<br>be = Basler beat<br>bo = boost<br>da = dart<br>pu = pulse<br>ra = racer | A = Area scan<br>L = Line scan | Horizontal pixels | Number of frames per second (fps) at full AOI | k = CL<br>c = CoaXPress<br>g = GigE<br>g5= 5GigE<br>u = USB 3.0<br>m = BCON for MIPI | m = mono<br>c = color | NIR = Near Infrared<br><br><b>Product Line</b><br>BAS = Basic<br>PRO = Pro<br><br><b>ISP</b><br>i = Internal ISP for MIPI cameras |

Specifications are subject to change without notice. Latest specifications and availability can be found on our website [baslerweb.com/products](https://baslerweb.com/products). Please visit [baslerweb.com/manuals](https://baslerweb.com/manuals) for the detailed camera User's Manual and [baslerweb.com/thirdparty](https://baslerweb.com/thirdparty) for information on third party software.





**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

