Digital industrial cameras
Capture the essential

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Inspired by nature – our technology as evolution.

The human eye can discern about 100 shades of gray. Our cameras can distinguish more than 4,000.

We can see no more than 16 individual images per second, but our cameras can capture more than 1,000.

Our cameras never get tired.
Simply focused on the essentials.

Baumer is a global leader in sensor solutions for factory and process automation. More than 2,300 employees in 37 subsidiaries in 19 countries are at your service across the globe.

Industrial image processing is an important business for us. Leading in innovation, we have been providing high-performance digital cameras for PC-based image processing systems and intuitive vision sensors for over 15 years.

Merging cutting-edge technologies with customer-focused consultancy has made us a premier global provider of high-quality industrial cameras. Our customers benefit from a diverse portfolio of sophisticated products for many different applications across varied industries. We are committed to long-term availability of our cameras to make sure our customers will obtain a high return on their investments in vision systems.

We develop customer-focused products, anticipate trends and shape the market by pointing the way with technology innovations. We put a particular emphasis on high performance, outstanding quality and durability as well as easy system integration.

Where standard products are too limited, we work together with our customers to develop customized components that are specific to the application. The result: Your significant competitive edge.
High-performance industrial cameras.

High frame rates, exceptional image quality and ease of integration – that’s what our industrial cameras stand for. Their robust, industrial design is the basis for long-term stability and precise image analysis in your application.

The portfolio includes CCD- and CMOS-based matrix cameras in color and monochrome versions with resolutions ranging from VGA to 8 megapixels. Our many years of expertise make us understand your requirements to provide the optimum product for your application.
Find the best matching camera series.

Maximum resolution

<table>
<thead>
<tr>
<th>Camera series</th>
<th>2 MP</th>
<th>4 MP</th>
<th>5 MP</th>
<th>8 MP</th>
</tr>
</thead>
<tbody>
<tr>
<td>TX</td>
<td>20</td>
<td>200</td>
<td>20</td>
<td>200</td>
</tr>
<tr>
<td>HX</td>
<td>40</td>
<td>200</td>
<td>40</td>
<td>400</td>
</tr>
<tr>
<td>SX</td>
<td>40</td>
<td>200</td>
<td>40</td>
<td>400</td>
</tr>
<tr>
<td>MX (VisiLine)</td>
<td>20</td>
<td>200</td>
<td>20</td>
<td>200</td>
</tr>
</tbody>
</table>

Interfaces:

- GigE Vision®
- USB3 Vision™
- Camera Link®
- FireWire®
Proven products made even better.

With the new VisiLine® camera series you are relying on innovative technologies and the proven quality of our successful TX series. Consistent further enhancement has upgraded the cameras in every aspect: higher frame rates with even better image quality and more functionality.

The new camera models incorporate everything that makes it easier to solve your image processing tasks. Color comparison as well as FPN correction and integrated HDR with the CMOS models facilitate efficient image analysis. Multi I/O, PoE and replicable user sets will ease system integration even further.

**VisiLine®**
- Up to 4 megapixels and 373 fps
- CCD and CMOS sensors
- Light and robust industrial housing with M8 connector
- Housing design compliant to IP 40 or IP 65 / IP 67

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Model Variants</th>
<th>Sensor Type</th>
<th>Sensor</th>
<th>Resolution [px]</th>
<th>Pixel Size [µm]</th>
<th>Full Frames [fps]</th>
</tr>
</thead>
<tbody>
<tr>
<td>VLG-02</td>
<td>● ●</td>
<td>1/4&quot;</td>
<td>CCD</td>
<td>SONY ICX618</td>
<td>656 x 490</td>
<td>5.6 x 5.6</td>
</tr>
<tr>
<td>VLG-03(1)</td>
<td>● ●</td>
<td>1/3&quot;</td>
<td>CMOS</td>
<td>CMOSIS CMV300</td>
<td>640 x 480</td>
<td>7.4 x 7.4</td>
</tr>
<tr>
<td>VLG-12</td>
<td>● ●</td>
<td>1/3&quot;</td>
<td>CCD</td>
<td>SONY ICX445</td>
<td>1288 x 960</td>
<td>3.75 x 3.75</td>
</tr>
<tr>
<td>VLG-20</td>
<td>● ●</td>
<td>1/1.8&quot;</td>
<td>CCD</td>
<td>SONY ICX274</td>
<td>1624 x 1228</td>
<td>4.4 x 4.4</td>
</tr>
<tr>
<td>VLG-22</td>
<td>● ●</td>
<td>2/3&quot;</td>
<td>CMOS</td>
<td>CMOSIS CMV2000</td>
<td>2044 x 1084</td>
<td>5.5 x 5.5</td>
</tr>
<tr>
<td>VLG-40</td>
<td>● ●</td>
<td>1&quot;</td>
<td>CMOS</td>
<td>CMOSIS CMV4000</td>
<td>2044 x 2044</td>
<td>5.5 x 5.5</td>
</tr>
</tbody>
</table>

(1) available in the first quarter of 2014
Flexible board level cameras.

Based on the VisiLine® platform, cameras of the MX series are particularly developed for use in embedded systems. The remote sensor circuit board is connected to the system circuit board via flexprint to make the board level cameras fit in almost any installation space.

USB 3.0 camera models provide you with simple Plug & Play functionality and a single cable solution. GigE cameras master a transmission distance up to 100 meter cable length and support PoE. With CCD or CMOS sensors, cameras of the MX series ensure maximum benefit by functional flexibility.

### MX series
- Up to 4 megapixels and 373 fps
- CCD and CMOS sensors
- Multi I/O for increased flexibility
- CMOS models with FPN correction and HDR

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**Camera Type** | **Model Variants** | **Sensor Type** | **Sensor** | **Resolution [px]** | **Pixel Size [µm]** | **Full Frames [fps]**
---|---|---|---|---|---|---
Mono | Color | **Mono Color** | | | | |
MXG02 / MXU02[2]| 1/4” | CCD | SONY ICX618 | 656 x 490 | 5.6 x 5.6 | 160 | 160 |
MXGC03[2]| 1/3” | CMOS | CMOSIS CMV300 | 640 x 480 | 7.4 x 7.4 | 373 | – |
MXG12 / MXU12[2]| 1/3” | CCD | SONY ICX445 | 1288 x 960 | 3.75 x 3.75 | 42 | 42 |
MXG20 / MXU20[2]| 1/1.8” | CCD | SONY ICX274 | 1624 x 1228 | 4.4 x 4.4 | 27 | 27 |
MXGC20 / MXUC20[2]| 2/3” | CMOS | CMOSIS CMV2000 | 2044 x 1084 | 5.5 x 5.5 | 55 | 55 |
MXGC40 / MXUC40[2]| 1” | CMOS | CMOSIS CMV4000 | 2044 x 2044 | 5.5 x 5.5 | 29 | 29 |


Perfect image quality ensures your competitive advantage in automated production.
Photometric precision.

The SX series stands for CCD cameras with excellent image quality and resolutions from 1 to 8 megapixels. With their Truesense sensors and accordingly aligned processing electronics, the series is characterized by excellent image homogeneity, outstanding linearity and photometric stability. The SX series is thus the ideal choice for demanding measurement tasks.

Thanks to double bandwidth, Dual GigE cameras provide the full frame rate even with a 12 bit resolution. Camera Link® Base models excel by minimum CPU load. Dynamic alignment of the quad tap sensors ensures an exceptional image quality.

SX series
- Up to 8 megapixels and 120 fps
- CCD sensors
- Dynamic tap alignment technique
- Robust, industrial design

Truesense CCD sensors up to 8 megapixel high resolution with excellent image quality

Multi I/O and PoE for more flexibility in system design

Because every detail matters: high resolution and low noise.

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Model Variants</th>
<th>Sensor Type</th>
<th>Sensor</th>
<th>Resolution [px]</th>
<th>Pixel Size [µm]</th>
<th>Full Frames [fps]</th>
<th>Dual GigE</th>
<th>Camera Link®</th>
</tr>
</thead>
<tbody>
<tr>
<td>SXG10 / SXC10</td>
<td>•</td>
<td>1/2” CCD</td>
<td>Truesense KAI-01050</td>
<td>1024 × 1024</td>
<td>5.5 × 5.5</td>
<td>120</td>
<td>120</td>
<td></td>
</tr>
<tr>
<td>SXG20 / SXC20 / SXC20 v2</td>
<td>•</td>
<td>2/3” CCD</td>
<td>Truesense KAI-02050</td>
<td>1600 × 1200</td>
<td>5.5 × 5.5</td>
<td>68</td>
<td>68</td>
<td></td>
</tr>
<tr>
<td>SXG21 / SXC21</td>
<td>•</td>
<td>2/3” CCD</td>
<td>Truesense KAI-02150</td>
<td>1920 × 1080</td>
<td>5.5 × 5.5</td>
<td>64</td>
<td>64</td>
<td></td>
</tr>
<tr>
<td>SXG40 / SXC40</td>
<td>•</td>
<td>1” CCD</td>
<td>Truesense KAI-04050</td>
<td>2336 × 1752</td>
<td>5.5 × 5.5</td>
<td>32</td>
<td>32</td>
<td></td>
</tr>
<tr>
<td>SXG80 / SXC80 / SXC80 v2</td>
<td>•</td>
<td>4/3” CCD</td>
<td>Truesense KAI-08050</td>
<td>3296 × 2472</td>
<td>5.5 × 5.5</td>
<td>16</td>
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<td></td>
</tr>
</tbody>
</table>
High Speed CMOS cameras.

Based on top-of-the-line CMOS sensors, we developed the HX series cameras especially for applications that put high demands on frame rate, resolution and sensitivity. All cameras feature FPN correction, HDR and a global shutter to ensure top image quality.

Dual GigE cameras will tackle any inspection task with all the benefits of GigE Vision® technology – with a frame rate that is even twice as high. For applications with even higher speed requirements you can rely on the Camera Link® Full models.

**HX series**
- Up to 4 megapixels and 500 fps
- CMOS sensors
- Excellent sensitivity
- HDR for a higher dynamic range

<table>
<thead>
<tr>
<th>Camera Type</th>
<th>Model Variants</th>
<th>Sensor Type</th>
<th>Sensor</th>
<th>Resolution [px]</th>
<th>Pixel Size [µm]</th>
<th>Full Frames [fps]</th>
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</thead>
<tbody>
<tr>
<td>Mono</td>
<td>Color NIR</td>
<td>CMOS Cypress Lupa-1300-2</td>
<td>1280 × 1024</td>
<td>14 × 14</td>
<td>–</td>
<td>500</td>
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<tr>
<td>HXC13</td>
<td></td>
<td>1.4”</td>
<td>CMOSIS CMV2000</td>
<td>2048 × 1088</td>
<td>5.5 × 5.5</td>
<td>105</td>
</tr>
<tr>
<td>HXG20 / HXC20</td>
<td>* *</td>
<td>2/3”</td>
<td>CMOSIS CMV4000</td>
<td>2048 × 2048</td>
<td>5.5 × 5.5</td>
<td>56</td>
</tr>
<tr>
<td>HXG40 / HXC40</td>
<td>* *</td>
<td>1”</td>
<td>CMOSIS CMV4000</td>
<td>2048 × 2048</td>
<td>5.5 × 5.5</td>
<td>180</td>
</tr>
</tbody>
</table>

**Multi ROI (Region of Interest)** maximum frame rate with reduced amount of data

**Fixed Pattern Noise (FPN) Correction** for homogenous images

**Burst Mode** to capture image sequences with full sensor speed
Proven versatility.

TX cameras were among the first compact GigE camera series and they are still a benchmark for market standards today. Tens of thousands have been successfully utilized in most varied applications.

More than 100 camera models with CCD sensors offer what it takes to meet virtually every requirement: PoE models for reduced installation and maintenance, Multi I/O cameras for simplified process synchronization as well as water and dust proof IP 67 models.

**TX series**

- Up to 5 megapixels and 210 fps
- CCD sensors
- Multi-voltage supply ranging from 8 to 30 volt
- Matured electronics design for superior image quality

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**Sensor Dust Protection System**

 maximum protection for the image sensor

**Square housing**

image center is maintained in each position

**Multi I/O option**

three inputs and outputs easy to configure

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**Camera Type** | **Model Variants** | **Sensor Type** | **Sensor** | **Resolution** (px) | **Pixel Size** (µm) | **Full Frames** (fps)
---|---|---|---|---|---|---
Mono | Color | NIR | IP 67 | PoE | Multi I/O | GiGE Vision
TXG02 | • | 1/4" | CCD | SONY ICX618 | 656 × 494 | 5.6 × 5.6 | 140
TXG03(1) | • • • • | 1/3" | CCD | SONY ICX424 | 656 × 494 | 7.4 × 7.4 | 90
TXG04 | • | 1/2" | CCD | SONY ICX414 | 656 × 494 | 9.9 × 9.9 | 56
TXG04 v2 | • | 1/2" | CCD | SONY ICX414 | 656 × 494 | 9.9 × 9.9 | 93
TXG04h | 1/3" | CCD | Truesense KAI-0340 | 640 × 480 | 7.4 × 7.4 | 210
TXG06 | • | 1/2" | CCD | SONY ICX415 | 776 × 582 | 8.3 × 8.3 | 64
TXG08(1) | • • • | 1/3" | CCD | SONY ICX204 | 1032 × 776 | 4.65 × 4.65 | 28
TXG12 | • | 1/3" | CCD | SONY ICX445 | 1296 × 966 | 3.75 × 3.75 | 32
TXG13(1) | • • • • | 1/2" | CCD | SONY ICX267 | 1392 × 1040 | 4.65 × 4.65 | 20
TXG14(1) | • • | 2/3" | CCD | SONY ICX285 | 1392 × 1040 | 6.45 × 6.45 | 20
TXG14f | • | 2/3" | CCD | SONY ICX285 | 1392 × 1040 | 6.45 × 6.45 | 30
TXG20(1) | • • • • | 1/1.8" | CCD | SONY ICX274 | 1624 × 1236 | 4.4 × 4.4 | 16
TXG50(1) | • • • • | 2/3" | CCD | SONY ICX625 | 2448 × 2050 | 3.45 × 3.45 | 15

* Resolution with color models can have minimal variations. (1) Model is also available with FireWire interface in monochrome and/or color (full frame rate differs).
Our in-house developed network components are optimally harmonized and particularly conceived for industrial image processing. They complete your image processing system in an ideal way. Based on PoE standard they simplify power supply of the GigE Vision® cameras and reduce cabling effort. Supporting jumbo frames will considerably cut down on processing work and CPU load. All units are conveniently DIN rail mounted.

System integration of process-relevant sensors and actuators such as encoders or light barriers becomes most easy when using our trigger device. Direct evaluation of the input signals enables real time camera trigger within the network.

### Network components

- Easy implementation of multiple camera systems
- Power supply by Power over Ethernet (PoE)
- Supporting jumbo frames
- Industrial design for easy DIN rail mount

<table>
<thead>
<tr>
<th>Components</th>
<th>Connections</th>
<th>Jumbo Frames [kByte]</th>
<th>DC supply [V]</th>
<th>PoE</th>
<th>Performance per output [W]</th>
<th>Dimensions [mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>GigE Power Injector</td>
<td>4x 8P8C (RI-45)</td>
<td>–</td>
<td>48</td>
<td>*</td>
<td>15.4</td>
<td>22.5 × 99.0 × 113.5</td>
</tr>
<tr>
<td>GigE Switch</td>
<td>4x 8P8C (RI-45)</td>
<td>up to 10</td>
<td>12 … 24</td>
<td>–</td>
<td>–</td>
<td>22.5 × 99.0 × 113.5</td>
</tr>
<tr>
<td>GigE Power Switch (4 Port)</td>
<td>4x 8P8C (RI-45)</td>
<td>up to 10</td>
<td>48</td>
<td>*</td>
<td>15.4</td>
<td>22.5 × 99.0 × 113.5</td>
</tr>
<tr>
<td>GigE Power Switch Extended (6 Port)</td>
<td>5x 8P8C (RI-45)</td>
<td>up to 10</td>
<td>48</td>
<td>*</td>
<td>15.4</td>
<td>45.0 × 99.0 × 113.5</td>
</tr>
<tr>
<td>GigE Power Switch Plus (6 Port)</td>
<td>5x 8P8C (RI-45)</td>
<td>up to 9</td>
<td>12 … 36</td>
<td>*</td>
<td>30.0</td>
<td>41.0 × 94.9 × 144.3</td>
</tr>
<tr>
<td>GigE Trigger Device</td>
<td>2x 8P8C (RI-45)</td>
<td>up to 10</td>
<td>48</td>
<td>*</td>
<td>15.4</td>
<td>22.5 × 99.0 × 113.5</td>
</tr>
</tbody>
</table>
Software integration made easy.

Besides the right camera, another prerequisite in high-performance image processing is the appropriate software for evaluation and implementation. Our cameras can either be used in conjunction with the Baumer GAPI Software Development Kit (SDK) or, where preferred, any other compatible third party software.

Easy implementation: Baumer GAPI.

The generic Application Programming Interface (API) Baumer GAPI is the convenient tool to integrate our cameras in your user-specific software environment. Efficient drivers with low CPU load support all common interfaces. Varied example programs and documentation will ease integration.

For quick evaluation of the camera, the new Camera Explorer is intuitive to operate and can be used as a test tool providing the first image after just one click. Thanks to full GenICam™ compatibility the cameras can be easily integrated and exchanged within the series.

<table>
<thead>
<tr>
<th>Baumer GAPI</th>
<th>v1.7</th>
<th>v2.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interfaces</td>
<td></td>
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<tr>
<td>GigE Vision®</td>
<td>Dual GigE</td>
<td>•</td>
</tr>
<tr>
<td>USB3 Vision®</td>
<td>–</td>
<td>•</td>
</tr>
<tr>
<td>Camera Link®</td>
<td>•</td>
<td>–</td>
</tr>
<tr>
<td>FireWire</td>
<td>•</td>
<td>–</td>
</tr>
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<td>Operating systems</td>
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<td>Windows® XP</td>
<td>7</td>
<td>8 (32/64 Bit)</td>
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<td>Linux Debian</td>
<td>Ubuntu (32/64 Bit)¹</td>
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<td>Programming languages and compatibility</td>
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<tr>
<td>C</td>
<td>C++</td>
<td>C#</td>
</tr>
<tr>
<td>GenICam™</td>
<td>–</td>
<td>•</td>
</tr>
</tbody>
</table>

¹GigE Vision® support

Our compatibility is your flexibility.

Every application in image processing has individual requirements that pose a challenge to the utilized camera and software. Consistent compliance to all relevant standards leaves it up to you to use application-specific third party software with our camera models.

Among others, Baumer cameras support the following third party software:
Making it all easy.

We provide you with everything you need to integrate our cameras quickly and easily into your system: From proper accessories on to individual starter kits, you will obtain all that’s necessary.

Matching accessories for your system.

There is more to an image processing system than just a camera: cables, PCI interface cards, filters, adapters and mountings or lenses. We help you to find the accessories that match your application and provide you with a comprehensive range of cross-interface accessories that are optimally harmonized. Since the system is only as reliable as its individual components, you can be sure our components underwent comprehensive testing and inspection – for long-term longevity and reliability in the image processing application.

Starter Kits: Just unpack and go.

Our starter kits are individually compiled to match the related camera series and will support you in evaluating a camera. You can focus entirely on the solution while we provide you with everything required for set up – from cable to mountings on to software.

Your Starter Kit
Request today your individual starter kit: www.baumer.com/vision/starterkits
More than just a camera: From idea to implementation.

When conceiving a new image processing system, our customers focus on the whole. For this reason we attach great importance to continuous improvement of the entire value-added process in order to support you in cutting down on costs and improving efficiency.

Right from the beginning, we are with you every step of the way. Our experienced engineers and technicians provide on-side support when it comes to evaluating the appropriate camera and matching accessories. In close cooperation with you we elaborate on customized components where standard products meet their limits.

Our cameras enable cross-industry deployment in most varied applications. Our individual starter kits and the Camera Explorer in our Baumer GAPI software development kit allow you convenient testing of our products already in the evaluating stage. This way, you can be sure to always get the components optimally matching your system.

Easy and time-saving camera integration. Our Technical and Application Support Center will help you in implementing the camera in your application. Comprehensive compatibility tests of several system components and compliance to all relevant standards ensure perfectly reliable system integration, whereas camera integration is aided by our SDK Baumer GAPI or third party software.

The robust design of our industrial cameras is essential in long-term stable image processing. We are EN ISO 9001 certified and by compliance to EMVA 1288 our cameras achieve top results in supplier audits. Every camera is subject to strict controls and comprehensive electric and optical inspection. Development, production and support all merged in one single location – for best results.

Rely on us and on our cameras throughout the years: 37 locations in 19 countries ensure long-term availability of our products and short reaction channels. Our products are backed by first-class service throughout their entire service life – in general, the experienced experts of our international technical support will answer your questions within 48 hours.
Machine vision competence at a glance.

- High-performance digital industrial cameras
- Intuitive vision sensors
- Customer-specific hardware and software design
Worldwide presence.

For more information about our worldwide locations go to: www.baumer.com/worldwide

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