Ultra High-Speed Ethernet Cameras

More Detail | More Speed | Lower Costs
We are the world’s first provider of 10 Gigabit and 25 Gigabit Ethernet cameras

What makes us different

• <1% CPU utilization
  We take responsibility for the complete solution by developing technologies to keep the server-side CPU utilization and latency to incredibly low levels. For this, we leverage technologies such as Mellanox’s WMA and Rivermax and Cspi’s MVA to offload all packet processing to the Network Interface Cards (NICs). This results in less than 1% CPU utilization and approximately only 100μs added latency.

• Multi-camera accurate synchronization
  Many of our customers in the virtual reality or broadcasting fields use multiple cameras per system. This means two or more cameras will be capturing images at the same time requiring precise synchronization to ensure optimal results to analyze high-speed events. All our cameras support IEEE 1588 PTP synchronization. The PTP feature is supported through our Emergent eSDK software, which includes functional code examples to get you started.

• Cable options up to 10 kilometers
  Our cameras feature connector options such as RJ45 and SFP+ (10GigE), and SFP28 (25GigE). They offer multiple options to cover the cable length requirements of all applications. Options include direct attach copper and single and multi-mode modules transceivers for cable lengths ranging from 1 meter and up to 10 kilometers.

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Download our white paper to learn more about the benefits of 10 and 25GigE cameras for your application.
https://go.emergentvisiontec.com/10+25GigE
HR-Series cameras are equipped with a high-speed 10GigE SFP+ interface. They feature the latest CMOS sensors with global shutter technology from Sony and AMS.

Models range from 2 to 50 megapixels with frame rates up to 338 fps at full resolution. SFP+ provides three options to cover cable length requirements from one meter and up to 10 kilometers without the need for fiber converters or repeaters.

Other benefits include multi-camera synchronization at <1µs, low CPU overhead, and excellent price-performance ratio. Polarized and near-infrared options are available on selected models.

### Highlights
- High-speed 10GigE SFP+ interface
- Resolution: 2 to 50 megapixels
- Frame rates: up to 338 fps
- Latest CMOS sensors from Sony and AMS
- GigE Vision® & Genicam™ compliant

### Applications
- Production Lines
- Microscopy Imaging
- Immersive 3D Content
- Goal Line Technology
- Finish Line Vision
- Referee Assist
- Sports, Broadcast, Entertainment
- Pharmaceutical Inspection

### Options
- Visible, near-infrared and polarized options available.

### Table: HR-Series Area-Scan Cameras – 10GigE SFP+ interface

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensor</th>
<th>Resolution</th>
<th>Megapixels</th>
<th>Sensor Type</th>
<th>Max Frame Rate</th>
<th>Cell Size</th>
<th>Standard Mount</th>
<th>Dimensions (mm)</th>
<th>Variants</th>
</tr>
</thead>
<tbody>
<tr>
<td>HR-2000</td>
<td>CMV2000</td>
<td>2048 x 1088</td>
<td>2 MP</td>
<td>2/3&quot;CMOS</td>
<td>338 fps</td>
<td>5.5µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C, NIR</td>
</tr>
<tr>
<td>HR-3000-S</td>
<td>IMX252</td>
<td>2048 x 1536</td>
<td>3.2 MP</td>
<td>1/1.8&quot;CMOS</td>
<td>216 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C</td>
</tr>
<tr>
<td>HR-4000</td>
<td>CMV4000</td>
<td>2048 x 2048</td>
<td>4 MP</td>
<td>1&quot;CMOS</td>
<td>179 fps</td>
<td>5.5µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C</td>
</tr>
<tr>
<td>HR-5000-S</td>
<td>IMX255</td>
<td>2448 x 2048</td>
<td>5 MP</td>
<td>2/3&quot;CMOS</td>
<td>163 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C, NIR</td>
</tr>
<tr>
<td>HR-8000-S</td>
<td>IMX255</td>
<td>4096 x 2160</td>
<td>8.9 MP</td>
<td>1&quot;CMOS</td>
<td>110 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C</td>
</tr>
<tr>
<td>HR-12000-S</td>
<td>IMX255</td>
<td>4096 x 3000</td>
<td>12 MP</td>
<td>1.1&quot;CMOS</td>
<td>80 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>97 x 58 x 40</td>
<td>M, C, POL</td>
</tr>
<tr>
<td>HR-12000</td>
<td>CMV12000</td>
<td>4096 x 3072</td>
<td>12 MP</td>
<td>28mm-CMOS</td>
<td>84 fps</td>
<td>5.5µm</td>
<td>M42</td>
<td>97 x 58 x 50</td>
<td>M, C</td>
</tr>
<tr>
<td>HR-20000</td>
<td>CMV20000</td>
<td>5120 x 3840</td>
<td>20 MP</td>
<td>35mm-CMOS</td>
<td>64 fps</td>
<td>8µm</td>
<td>M42</td>
<td>97 x 58 x 61</td>
<td>M, C</td>
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<tr>
<td>HR-50000</td>
<td>CMV50000</td>
<td>7920 x 6004</td>
<td>50 MP</td>
<td>35mm-CMOS</td>
<td>23 fps</td>
<td>4.5µm</td>
<td>M42</td>
<td>97 x 58 x 61</td>
<td>M, C</td>
</tr>
</tbody>
</table>

1 M = Monochrome, C = Color, NIR = Near-infrared, POL = Polarized
HT-Series cameras are equipped with a 10GBaseT-RJ45 connection. With their sleek smaller case and CAT6A connection, these cameras have the familiarity of GigE but with 10 times the speed.

Using CAT6A cabling, you can get cable lengths up to 100 meters. They feature the latest CMOS sensors with global shutter technology from Sony and AMS. Models range from 2 to 50 Megapixels.

Other benefits include multi-camera synchronization at <1µs, low CPU overhead, excellent price-performance ratio. Polarized and near-infrared options are available on selected models.

### Applications
- Virtual Reality
- Production Lines
- Microscopy Imaging
- Metrology
- Aerial Surveillance
- Pharmaceutical Pill Sorting
- PCB Solder Inspection Machines
- Amusement Attraction
- Photography

### Options
- Visible, near-infrared and polarized options available.

### Highlights
- High-speed 10GBaseT-RJ45 Interface
- Resolution: 2 to 50 Megapixel
- Frame rates: up to 338 fps
- Latest CMOS sensors from Sony and AMS
- GigE Vision® & Genicam™ compliant

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<table>
<thead>
<tr>
<th>Model</th>
<th>Sensor</th>
<th>Resolution</th>
<th>Megapixel</th>
<th>Sensor Type</th>
<th>Max Frame Rate</th>
<th>Cell Size</th>
<th>Standard Mount</th>
<th>Dimensions (mm)</th>
<th>Variants</th>
</tr>
</thead>
<tbody>
<tr>
<td>HT-2000</td>
<td>CMV2000</td>
<td>2048 x 1088</td>
<td>2 MP</td>
<td>1/3”CMOS</td>
<td>338 fps</td>
<td>5.5µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C, NIR</td>
</tr>
<tr>
<td>HT-3000-S</td>
<td>IMX252</td>
<td>2048 x 1536</td>
<td>3 MP</td>
<td>1/1.8”CMOS</td>
<td>216 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C</td>
</tr>
<tr>
<td>HT-4000</td>
<td>CMV4000</td>
<td>2048 x 2048</td>
<td>4 MP</td>
<td>1”CMOS</td>
<td>179 fps</td>
<td>5.5µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C, NIR</td>
</tr>
<tr>
<td>HT-5000-S</td>
<td>IMX290</td>
<td>2448 x 2048</td>
<td>5 MP</td>
<td>1/2.8”CMOS</td>
<td>163 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C, POL</td>
</tr>
<tr>
<td>HT-8000-S</td>
<td>IMX255</td>
<td>4096 x 2160</td>
<td>8 MP</td>
<td>1”CMOS</td>
<td>110 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C</td>
</tr>
<tr>
<td>HT-12000-S</td>
<td>IMX355</td>
<td>4096 x 3000</td>
<td>12 MP</td>
<td>1.1”CMOS</td>
<td>80 fps</td>
<td>3.45µm</td>
<td>C-Mount</td>
<td>88 x 58 x 39</td>
<td>M, C, POL</td>
</tr>
<tr>
<td>HT-12000</td>
<td>CMV12000</td>
<td>4096 x 3072</td>
<td>12 MP</td>
<td>28mm-CMOS</td>
<td>94 fps</td>
<td>5.5µm</td>
<td>M42</td>
<td>88 x 58 x 50</td>
<td>M, C</td>
</tr>
<tr>
<td>HT-20000</td>
<td>CMV20000</td>
<td>5120 x 3840</td>
<td>20 MP</td>
<td>35mm-CMOS</td>
<td>52 fps</td>
<td>5.6µm</td>
<td>M12</td>
<td>88 x 58 x 90</td>
<td>M, C</td>
</tr>
<tr>
<td>HT-50000</td>
<td>CMV50000</td>
<td>7920 x 6004</td>
<td>50 MP</td>
<td>35mm-CMOS</td>
<td>23 fps</td>
<td>4.8µm</td>
<td>M12</td>
<td>88 x 58 x 90</td>
<td>M, C</td>
</tr>
</tbody>
</table>

1 M = Monochrome, C = Color, NIR = Near-infrared, POL = Polarized
PACE-Series Cameras

**8K line-scan camera – Choose between a 10GigE SFP+ or 10GBaseT – RJ45 interface.**

PACE series feature the Gpixel GL0816 CMOS sensor. Both models come with a horizontal image resolution of 8192 effective pixels and a line rate of:
- Single Line – 137KHz, Trilinear – 45KHz. This enables high-speed and low-noise image capture at 8K vision, ensuring all your inspection, sorting and production control requirements are met.

### Applications
- Industrial Inspection
- Printing Inspection
- Label Inspection
- Film Inspection
- PCB Inspection
- Automotive Inspection
- Food Sorting and Grading
- Pharmaceutical Inspection

### Highlights
- 10GigE SFP+ or 10GBaseT – RJ45 interface
- Gpixel GL0816 CMOS sensor
- Single line – 137KHz – 8K, Trilinear – 45KHz – 8K
- GigE Vision® & Genicam™ compliant

### Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>Interface</th>
<th>Sensor</th>
<th>Resolution</th>
<th>LinScan Mode</th>
<th>Sensor Scanning Width</th>
<th>Cell Size</th>
<th>Standard Mount</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR-BRG</td>
<td>10GigE SFP+</td>
<td>GL0816 CMOS sensor</td>
<td>8192 pixels horizontal</td>
<td>Single line – 137KHz – 8K, Trilinear – 45KHz – 8K</td>
<td>40.96mm</td>
<td>5 μm (H) x 5 μm (V)</td>
<td>M52</td>
<td>97 x 58 x 60</td>
</tr>
<tr>
<td>LT-BRG</td>
<td>10GBaseT – RJ45</td>
<td>GL0816 CMOS sensor</td>
<td>8192 pixels horizontal</td>
<td>Single line – 137KHz – 8K, Trilinear – 45KHz – 8K</td>
<td>40.96mm</td>
<td>5 μm (H) x 5 μm (V)</td>
<td>M52</td>
<td>88 x 58 x 60</td>
</tr>
</tbody>
</table>
BOLT-Series’ ultra high-speed 25GigE SFP28 interface offers unmatched performance with resolutions from 0.5 to 50 Megapixels and frame rates up to 1594.7 fps.

Features:
- **Ultra high-speed 25GigE SFP28 interface**
- Resolution: 0.5 to 50 Megapixels
- Frame rates: up to 1594.7 fps
- Latest CMOS sensors from Sony, AMS, and Gpixel
- GigE Vision® & Genicam™ compliant

Applications:
- Virtual Reality
- Volumetric Capture
- Motion Capture
- Referee Assist
- Industrial Inspection
- Automation
- Intelligent Transportation Systems
- Logistics
- Metrology

### Highlights

- Ultra high-speed 25GigE SFP28 interface
- Resolution: 0.5 to 50 Megapixels
- Frame rates: up to 1594.7 fps
- Best-in-class CMOS sensors from Sony, AMS, and Gpixel
- GigE Vision® & Genicam™ compliant

### Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensor Type</th>
<th>Resolution</th>
<th>Megapixels</th>
<th>Frame Rate</th>
<th>Cell Size</th>
<th>Mount Type</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>HB-500-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>0.5 MP</td>
<td>128 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-1000-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>0.5 MP</td>
<td>256 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-1500-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>1.0 MP</td>
<td>512 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-2000-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>1.5 MP</td>
<td>1024 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-2500-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>2.0 MP</td>
<td>1536 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-3000-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>2.5 MP</td>
<td>2048 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-3500-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>3.0 MP</td>
<td>2560 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-4000-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>3.5 MP</td>
<td>3072 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-4500-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>4.0 MP</td>
<td>3584 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
<tr>
<td>HB-5000-S</td>
<td>BSI-2002</td>
<td>1280 x 960</td>
<td>4.5 MP</td>
<td>4096 fps</td>
<td>3.4µm</td>
<td>CS Mount</td>
<td>97 x 58 x 50</td>
</tr>
</tbody>
</table>
**25GigE Line Scan**

**ACCEL-Series Cameras**

**8K line-scan camera with ultra high-speed 25GigE SFP28 interface**

Our 25GigE line-scan cameras feature the SFP28 interface for cable lengths from 1 meter up to 10 kilometers without the need for costly fiber converters/repeaters. This results in lossless capture and ruthless processing efficiency. Powered by the Gpixel GL0816, the LB-8K provides multilinear scans at true 8K vision and a line rate of: Single Line – 200KHz, Trilinear – 66KHz.

### Highlights
- **Ultra high-speed 25GigE SFP28 interface**
- **Gpixel GL0816 CMOS sensor**
- **Single Line – 200KHz– 8K, Trilinear – 66KHz – 8K**
- **GigE Vision® & Genicam™ compliant**

### Applications

As the 10GigE and 25GigE specialist, we offer a wide range of area-scan and line-scan cameras for your high-speed application needs from virtual reality to sports broadcasting, inspection & automation, and ITS/traffic monitoring.

#### Virtual Reality

Wide range of options for flawless high-speed capture

Our camera models are designed to increase both the quality and the efficiency of any VR, AR or MR production. Benefits include ultra high data/frame rates, camera network support and accurate multi-camera synchronization, multicast video technology, and cabling options.

#### Sports Technology

High resolution, fast frame rates, and accurate synchronization

The proverbial photo finish in professional sports is likely the most classic imaging application a camera could be used in. The availability of high-speed cameras opens the door to new possibilities from improving the fan experience to making the correct call with goal line technology, instant replays, digital umpire/referee, or detailed motion analysis to name a few.

#### Inspection & Automation

Area-scan, line-scan cameras, and polarized sensor options

Our cameras are used in a wide range of inspection and automation applications. High-speed cameras offer new opportunities for those looking to achieve higher productivity, better quality or safety control, or to improve automation tasks.

#### ITS/Traffic

A solution to the challenges of outdoor imaging

From highway monitoring to open-road tolling or ANPR (Automatic Number Plate Recognition), machine vision and high-speed cameras offer many benefits for ITS and traffic applications to deliver reliable and high quality image data under the most challenging conditions.

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**ACCEL Line-Scan Cameras - 25GigE SFP28 interface**

<table>
<thead>
<tr>
<th>Model</th>
<th>Sensor</th>
<th>Resolution</th>
<th>Line Scan Mode</th>
<th>Sensor Scanning Width</th>
<th>Cell Size</th>
<th>Standard Mount</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACCEL LB-8KG</td>
<td>GL0816 CMOS</td>
<td>8192 pixels horizontal</td>
<td>Single Line – 200KHz – 8K, Trilinear – 66KHz – 8K</td>
<td>40.96mm</td>
<td>5 μm (H) x 5 μm (V)</td>
<td>M52</td>
<td>97 x 58 x 60</td>
</tr>
</tbody>
</table>

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**Acceler**

25GigE Line-Scan Cameras - 8192 pixels horizontal

- **Ultra high-speed 25GigE SFP28 interface**
- **Gpixel GL0816 CMOS sensor**
- **Single Line – 200KHz– 8K, Trilinear – 66KHz – 8K**
- **GigE Vision® & Genicam™ compliant**

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**Applications**

- Industrial Inspection
- Printing Inspection
- Label Inspection
- Film Inspection
- PCB Inspection
- Automotive Inspection
- Food Sorting and Grading
- Pharmaceutical Inspection
Software

Get imaging in no time with our two software packages: eCapture viewer software, and eSDK (Software Development Kit) for seamless integration of Emergent cameras into your system.

eCapture

Our free viewer software package eCapture provides control of all camera functions for preview, capture and save. Advanced functions include Area Of Interest (AOI), integration control, and standard pre-processing such as brightness, gamma, frame rate control and many more.
eCapture also allows for remote firmware upgrades which maximizes your up-time while keeping you up-to-date on the latest features from Emergent. eCapture is GenICam compliant and designed to meet the needs for machine vision users.

Features include:
• Real Time Preview and Capture
• Full control of Emergent Vision Technologies Cameras
• IP Configuration Settings
• Remote Firmware Upgrades
• GenICam Camera Feature Controls
• Custom GenICam XML Load
• Recording
• Drawing Tools
• LUT Utility
• File Saving

eSDK

eSDK allows end-users, system integrators, or OEMs to integrate their Emergent Vision Technologies cameras into their own software and equipment. eSDK is available with concise API commands to facilitate simple integration with custom software for Windows® and Linux® Based Systems.
eSDK is GenICam compliant and includes numerous examples with source code and full documentation and support from our technical staff. The eSDK software solution also provides <1% CPU overhead for Windows and Linux when capturing a 9Gbps image stream from the cameras directly to application buffers.

Features include:
• Full Control of Emergent Vision Technologies Cameras
• Visual Studio Express Support
• GenICam Compliant
• Custom GenICam XML Load
• Code Examples

Third-party Solutions

In addition to Emergent Vision Technologies eCapture and eSDK, all our cameras can be used with third-party software from four of our partners.

Features include:
• Norpix StreamPix
• NI Vision Acquisition Toolbox
• MiTeC Halcon
• Cognex VisionPro

Accessories

A wide range of accessories are available directly from us to help you get the most out of our 10GigE and 25GigE cameras.

Interface Cards

We have partnered with renowned suppliers to bring you high quality Network Interface Cards (NICs).
We offer up to three options for 10GigE NICs: Single NICs, Dual NICs (two cameras per card), and Dual SYNC NICs (two cameras per card that can be synced to sub 1 microsecond).
All come with the MVA optimized driver for extremely low CPU utilization, low latency and jitter.

Two NIC options are available for 25GigE via our partnership with Mellanox Technologies: Single NICs and Dual NICs.
Mellanox supplies their NICs pre-programmed with VMA.
All options are fully supported by the Emergent eSDK and eCapture for seamless integration.

Interface Cables

HR-Series and PACE series: Direct attach cables are available for applications up to 10 meters, while fiber cables are available for longer distance applications (up to 10 kms).
HT-Series: CAT6A cable is available (up to 100 meters).

Three options are available for the 25GigE SFP28 BOLT and ACCEL Series: The first option utilizes SFP28 multi-mode fiber modules/transceivers and LC-LC multi-mode fiber cables for cable lengths from 1 meter to 70 meters. The second option utilizes SFP28 single-mode fiber modules/transceivers and LC-LC single-mode fiber cables for cable lengths ranging from 1 meter to 10 kms. The third option utilizes low-cost direct attach for cable lengths between 1 and 5 meters.

Power and I/O

We provide certified power supplies and GPIO accessories for easy setup and use with our cameras. The power supplies are tested to be of the highest quality and are thus very good at blocking line power transients to better protect your camera investment.

Lens Mounts

Birger Engineering, Inc. manufactures a Canon EF Lens mount that can be used with all Emergent Vision Technologies cameras. The Mount allows the user to control the iris and focus of the lenses electronically through our software with all communications happening over the main camera interface.