



10GIGE CAMERAS

Speed is Everything.



ABOUT US



EMERGENT VISION TECHNOLOGIES

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EVT was founded in 2007 in Vancouver, Canada. We bring together over 40+ years of imaging experience ranging from life science, security and machine vision/industrial markets. We are the first providers of cameras based with the 10 Gigabit Ethernet (10GigE) interface. 10GigE exceeds the bandwidth of even the most advanced interfaces including USB 3.0, CoaXPRESS and Camera Link. At the same time the costs are low and the technology is fully developed since any modern IT network utilizes the 10GigE standard for broad band data transmission. The GenCam™ and GigE Vision® standards make the integration with all major software libraries as easy as can be.

In close collaboration with our global network of highly qualified partners and distributors, we offer individual consulting and support for your applications. Our online Knowledge Base provides various white papers, application notes and other resources to accelerate your system specification and development. Please contact us to find out what we can do for you!

APPLICATIONS & SOLUTIONS

Our current cameras range from 2 to 50 megapixels and 338 to 23 frames per second (fps) at full resolution (over 1000 fps at lower resolutions). We provide best-in-class and versatile solutions for a large variety of applications including display or solar panel inspection, pick-and-place machines, vision guided robots, railway inspection, highway monitoring, sport broadcast applications, and golf swing analysis.



All About 10GigE

What is 10GigE?

10GigE (a.k.a. 10 Gigabit Ethernet) is the successor to 1GigE (1 Gigabit Ethernet) which is the leading interface for machine vision applications. 10GigE, as the successor, provides all the same benefits of 1GigE but with a ten-fold increase in data-rate which leads to a ten-fold increase in frame rate. 10GigE, as with 1GigE, is an industry standard which has been around for years and is managed/produced by the IEEE 802.3 working group. The standard is used in applications such as telecom, data communications, industrial, military, etc., and now we leverage the benefits of this globally accepted cross-industry technology for machine vision applications.

What is the bandwidth of 10GigE?

The maximum bandwidth available for 10GigE is 10Gbps or 1,250 Mbytes/s. The usable bandwidth is around 9.5Gbps or 1,180 Mbytes/s.

What are the cable options & max cable lengths of 10GigE?

The two main connector options are SFP+ and RJ45. RJ45 is a good option for shorter cable lengths since the power consumption of such a solution can add an additional 2W of power for running the full 100m which becomes a bit of a problem as we attempt to make cameras more compact. SFP+ is the most flexible option and is conscious of keeping power consumption to a minimum. Using the SFP+ interface provides primarily three options which cover the cable length requirements of all applications. The first and least expensive option is Direct Attach which is a copper based passive solution and the cable lengths for these single piece cables range from 1m to 10m. The second option utilizes SFP+ multi-mode fiber modules/transceivers and LC-LC multi-mode fiber cables and the cable lengths for this three-piece cable range from 1m to 300m. The third option utilizes SFP+ single-mode fiber modules/transceivers and LC-LC single-mode fiber cables and the cable lengths for this three-piece cable range from 1m to tens of Kilometres.

Why 10GigE for my application?

- With 10 GigE you get ultra high data/frame rates.
- A large number of accessory & cabling options
- Network support & accurate multi-camera synchronization
- Low CPU overhead, low latency, low jitter using MVA.
- Industry acceptance due to IEEE and AIA standardization.

Does GigE Vision work for 10GigE?

Yes. GigE Vision (the machine vision specific interface standard) regardless of its version supports Emergent 10GigE cameras. The later versions add some additional 10GigE specific elements which are not critical for the operation of Emergent 10GigE cameras with various GigE Vision compliant software such as NI Labview, MVTec Halcon, Norpix StreamPix, etc.



10GigE NIC Cards and MVA for 10GigE.

Emergent and Myricom Inc. have partnered to provide an optimal solution for Machine Vision applications. Myricom supplies their NICs pre-programmed with MVA and are available direct from Emergent. We have 3 NIC options to choose from for our HR Series, Single NICs, Dual NIC (2 cameras per card), and Dual SYNC NICs (2 cameras per card that can be sync'd to sub 1 micro second) and 2 NIC options for our HT Series, Single NICs and Dual NICs. By using these cards in conjunction with the MVA license that comes with them, customers can expect to see:

- Extremely low CPU utilization (2% single CPU core overhead for a 9Gbps video stream)
- Extremely low latency
- Extremely low jitter

How does 10GigE compare with other interfaces?

Emergent 10GigE cameras, coupled with Myricom's MVA, equals or out-performs other interfaces in every technical category and its price performance is in line with the best. With MVA, all the shortcomings associated with 1GigE w.r.t. CPU utilization, latency and jitter are obliterated. Industry acceptance is very good and will only get better.

What software can be used with 10GigE cameras?

Generally, any GigE Vision compatible software should work with Emergent cameras by virtue of Emergent cameras being certified as GigE Vision compliant by the AIA. We have tested with a few such 3rd party software such as NI Vision Acquisition Toolbox, MVTec Halcon, Norpix StreamPix 6. Emergent also offers free software with a camera purchase: eCapture is our free viewer software, and eSDK is our C++ SDK for easy application development.

HR SERIES



The HR Series cameras are our 10GigE SFP+ product line with camera options between 2MP-20MP. These cameras come equipped with SFP+ Connections that can be used with our short length direct attached copper cables or long range fiber with transceivers. What makes this line so attractive, is if a customer needs to run those long cable lengths, there is no need for a Fiber Converter. With fiber, the cable lengths can go up to 10KM.

The HT Series cameras are our 10GBaseT RJ45 product line with camera options between 2MP-20MP. These cameras are smaller in physical size and come equipped with CAT6A 10GBaseT Connections. They have the more familiar ethernet connection used in GigE but 10x the speed. Cable lengths can go up to 100M.

HT SERIES



SONY

Pregius

Exmor R
CMOS Sensor

EVT is excited to announce the addition of Sony Pregius Global Shutter CMOS Sensors to our SFP+ and 10GBaseT cameras lines. As the first 10GigE industrial digital camera series in the world, our HR and HT cameras obtain their high performance from these industrial CMOS sensors with Global Shutter technology in combination with the cross-industry standard 10 Gigabit Ethernet (10GigE) interface.

The Sony Pregius CMOS Global Shutter Sensors are superior than other CMOS Sensors on the market today including:

- Better Dynamic Range
- Higher QE% at 525nm
- Lower Temporal Dark Noise
- High Saturation Capacity

NEW 50 MP CAMERA

The brand new 50MP cameras HR-50000 & HT50000, are setting a new standard in advanced imaging technologies for applications ranging from broadcast sports to high speed inspection. At full resolution (7920x6004), you get 23 frames per second at full resolution. Like all Emergent Vision cameras, the HR-50000 & HT-50000 series offers various triggering modes for the precise synchronization at <math><1\mu s</math>. This combination is ideal for any application needing to see the details at real time imaging speeds. Overall, the HR-50000 & HT-50000 deliver the resolution you need at unmatched speeds.

CMOSIS



SOFTWARE

eCapture and eSDK

eCapture provides control of all camera functions for preview, capture and save. Advanced functions such as Area Of Interest (AOI), integration control, standard pre-processing such as brightness, gamma, frame rate control and many more. eCapture also provides <3% CPU overhead for Windows and Linux when capturing a 9Gbps image stream from the cameras directly to application buffers.

eSDK is available with concise API commands to facilitate simple integration with custom software for Windows® and Linux® based Systems. Access to eSDK is available at no charge with the purchase of an Emergent camera system. The eSDK software solution also provides <3% CPU overhead for Windows and Linux when capturing a 9Gbps image stream from the cameras directly to application buffers.

ACCESSORIES

10GIGE NIC CARDS

10G NICs are available direct from Emergent Vision Technologies and come with the MVA optimized driver for extremely low CPU utilization. We have 3 NIC options to choose from for our HR Series, Single NICs, Dual NICs (2 cameras per card), and Dual SYNC NICs (2 cameras per card that can be sync'd to sub 1 micro second). We have 2 NIC options for our HT Series, Single NICs and Dual NICs (2 cameras per card). All are fully supported by the Emergent eSDK and eCapture for seamless integration.



CABLES, POWER SUPPLIES, AND GPIO

SFP+ fiber, direct attach, and Cat6A cables are available direct from Emergent Vision Technologies. For the HR line, direct attach cables are available for applications up to 10M, while fiber cables are available for longer distance applications (up to 10KM). Cat6A Cable is available up to 100M for the HT line. Power supplies and GPIO accessories are also available to our customers for easy setup and use with our cameras.



Emergent cameras can use Birger Engineering Canon EF adapters for electronic iris and focus control. The benefits of such a solution are to be able to bring the lens under software control with all communications happening over the main camera interface - in this case, the enormously fast 10GigE interface. As we have noted in the past, the 10GigE SFP+ interface has ultimate flexibility for cable lengths with direct attach (<=10m) and fiber options to over a kilometer.

BIRGER
engineering



		HR-2000	HR-3000-S	HR-4000	HR-5000-S
HR SERIES	Variation	Mono/Color/Near IR	Mono / Color	Mono/Color/Near IR	Mono/Color
	Sensor	CMV2000	IMX252	CMV4000	IMX250
	Resolution	2048 x 1088	2048 x 1536	2048 x 2048	2448 x 2048
	Megapixels	2MP	3MP	4MP	5MP
	Sensor Type	2/3" CMOS	1/1.8" CMOS	1" CMOS	2/3" CMOS
	Max Frame Rate	338 fps	216 fps	179 fps	163 fps
	Cell Size	5.5 µm	3.45 µm	5.5 µm	3.45 µm
	Standard Mount	C Mount	C Mount	C Mount	C Mount
	Dimensions (mm)	97 x 58 x 39	97 x 58 x 39	97 x 58 x 39	97 x 58 x 39

		HT-2000	HT-3000-S	HT-4000	HT-5000-S
HT SERIES	Variation	Mono/Color/Near IR	Mono/Color	Mono/Color/Near IR	Mono/Color
	Sensor	CMV2000	IMX252	CMV4000	IMX250
	Resolution	2048 x 1088	2048 x 1536	2048 x 2048	2448 x 2048
	Megapixels	2MP	3MP	4MP	5MP
	Sensor Type	2/3" CMOS	1/1.8" CMOS	1" CMOS	2/3" CMOS
	Max Frame Rate	338 fps	216 fps	179 fps	163 fps
	Cell Size	5.5 µm	3.45 µm	5.5 µm	3.45 µm
	Standard Mount	C Mount	C Mount	C Mount	C Mount
	Dimensions (mm)	88 x 58 x 39	88 x 58 x 39	88 x 58 x 39	88 x 58 x 39

HR FAMILY SPECIFIC

Shutter	Global
Bit Depth	8 or 10 Bit*
GPIO	2 in, 4 out
Interface	SFP+ 10GigE

HT FAMILY SPECIFIC

Shutter	Global
Bit Depth	8 or 10 Bit*
GPIO	2 in, 4 out
Interface	CAT6A 10GBaseT

12 Bit Available for Sony models



HR-8000-S	HR-12000-S	HR-12000	HR-20000	HR-50000	
Mono/Color	Mono/Color	Mono/Color/Near IR	Mono/Color	Mono/Color	
IMX255	IMX253	CMV12000	CMV20000	CMV50000	
4096 x 2160	4096 x 3000	4096 x 3072	5120 x 3840	7920 x 6004	
8MP	12MP	12MP	20MP	50MP	
1" CMOS	1.1" CMOS	28mm CMOS	35mm CMOS	35mm CMOS	
110 fps	80 fps	84 fps	32 fps	23 fps	
3.45 μm	3.45 μm	5.5 μm	6.4 μm	4.6 μm	
C Mount	C Mount	F, M42	F, M52	F, M52	
97 x 58 x 39	97 x 58 x 39	97 x 58 x 50	97 x 58 x 60	97 x 58 x 60	

HT-8000-S	HT-12000-S	HT-12000	HT-20000	HT-50000	
Mono/Color	Mono/Color	Mono/Color/Near IR	Mono/Color	Mono/Color	
IMX255	IMX253	CMV12000	CMV20000	CMV50000	
4096 x 2160	4096 x 3000	4096 x 3072	5120 x 3840	7920 x 6004	
8MP	12MP	12MP	20MP	50MP	
1" CMOS	1.1" CMOS	28mm CMOS	35mm CMOS	35mm CMOS	
110 fps	80 fps	84 fps	32 fps	23 fps	
3.45 μm	3.45 μm	5.5 μm	6.4 μm	4.6 μm	
C Mount	C Mount	F, M42	F, M52	F, M52	
88 x 58 x 39	88 x 58 x 39	88 x 58 x 50	88 x 58 x 60	88 x 58 x 60	



- **1ST MFG OF 10 GIGE CAMERAS**
- **SHIPPING 10 GIGE 5+ YEARS**
- **SMALLEST FORM FACTOR**
- **1-10K CABLE LENGTH WITH HR SERIES (FIBER)**
- **1-100M CABLE LENGTH WITH HT SERIES (CAT6A)**
- **GIGE VISION AND GENICAM COMPLIANT**
- **MULTI CAMERA SYSTEM OPTIONS FOR SINGLE PC**