TKH VISION

Allied Vision   SVS-VISTEK   MIKROTRON

Allied Vision, SVS-Vistek and Mikrotron are part of TKH Vision, a global group of machine vision technology leaders providing complementing 2D and 3D vision components and solutions. With a distinct customer-centric approach, the machine vision experts prioritize tailoring solutions to various customer needs, fostering enduring relationships built on trust and excellence.

Advanced camera technology for defense applications: Reliability and Security

In no other industry the reliability and security of machine vision systems do play a more pivotal role than in the sensitive landscape of defense technology. Operational capabilities and mission success highly depend on the quality and stability of the technologies used. Each application has its specific requirements and demands different technical solutions. Depending on the task, various technologies are suitable for the following applications:

- ⟩ Drone Navigation
- ⟩ Disaster Response with Drones
- ⟩ Aircraft Collision Avoidance
- ⟩ Long Distance Detection on board of military vehicles
- ⟩ Runway Condition Assessment for Airports

- ⟩ Unmanned Surface Vehicle (USV) for offshore mission
- ⟩ Counterattack against aerial assault
- ⟩ Border Control
- ⟩ System Performance
- ⟩ Quality Inspection of ammunition

⟩ Drone Navigation

In GPS/GNSS-denied environments, AI-based navigating plays a crucial role in ensuring precise and reliable drone operation. Low-latency cameras, integrated into multi-sensor fusion systems, support navigation by complementing Inertial Measurement Units (IMU) and Inertial Navigation Systems (INS). By leveraging low-latency, high-resolution image processing, AI-driven systems can detect and respond to obstacles in real time, enabling safe and efficient navigation in complex environments.

Customers with similar projects and requirements purchased this: **Compact Alvium cameras with MIPI CSI-2 interface**

- ☑ Available with FPD-Link III and GMSL2 interface for highspeed data transmission (up to 6,0 Gbit/s)
- ☑ Acquisition of high-resolution (up to 20 MP) images with low latency
- ☑ Robust, shock and vibration resistant with rugged Coax cables + FAKRA connector or HSD connector + STP (Shielded Twisted Pair) cables
- ☑ Small size and low weight, bareboard variants available, ideal for embedded systems e.g. drones

Allied Vision
a **TKH Vision** brand

› Unmanned Surface Vehicle (USV) for offshore mission

360° view for offshore maneuvering, generated by an advanced software, which stitches together the video feeds from multiple cameras to create a seamless and panoramic view of the surroundings. secure navigation even in challenging conditions

Customers with similar projects and requirements purchased this: **Compact Alvium cameras with MIPI CSI-2 interface**

☑ Various features for synchronization and triggering of multiple cameras

☑ Image processing and optimization features for high-quality images and easy stitching

☑ Robust, shock and vibration resistant with rugged Coax cables + FAKRA connector or HSD connector + STP (Shielded Twisted Pair) cables

› Aircraft Collision Avoidance

Low-latency cameras featuring a multi-camera setup on board of vehicles and aircraft. By providing high-resolution camera streams, the system enables real-time surround view for situational awareness. This is particularly critical for aviation, where helicopters and airplanes operate in complex environments with potential obstacles. Advanced collision avoidance technology enhances safety by detecting and mitigating risks in low-altitude flights, ensuring secure navigation even in challenging conditions.

Customers with similar projects and requirements purchased this: **Compact Alvium cameras with MIPI CSI-2 interface**

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☑ Small size and low weight, bareboard variants available, ideal for embedded systems e.g. drones

ALVIUM C - Advanced embedded vision
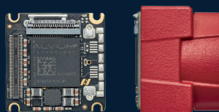
Key facts Alvium C

- Implement driver once, use with any Alvium CSI-2 camera
- Use our Vimba X APIs to control Alvium CSI-2 camera via Genicam4CSI-2
- Advanced triggering and image optimization for CSI-2
- Wide embedded platform support; NVIDIA® Jetson™, AMD Xilinx Zynq, NXP i.MX8M Plus

mipi

Alvium G1

Camera model	Sensor	Mega-pixels	Resolution	Sensor format	Shutter mode	Max. frame rate in fps	Pixel size in µm	Mono/color/mono NIR/color NIR
1500 C-050	ON Semi PYTHON 480 CMOS	0.5	808 × 608	Type 1/3.6	Global	117	4.8 × 4.8	• / • / - / -
1500 C-120	ON Semi AR0135CS CMOS	1.2	1280 × 960	Type 1/3	Global	52	3.75 × 3.75	• / • / - / -
1500 C-210	ON Semi AR0521SR HD CMOS	2.1	1928 × 1088	Type 1/3.6	Rolling	119	2.2 × 2.2	• / • / - / -
1500 C-501	ON Semi AR0522SR CMOS	5.0	2592 × 1944	Type 1/2.5	Rolling	68	2.2 × 2.2	- / - / • / •

Alvium C

Camera model	Sensor	Mega-pixels	Resolution	Sensor format	Shutter mode	Max. frame rate in fps	Pixel size in µm	Mono/color/ mono NIR/ color NIR
1800 C-030	Sony IMX991 InGaAs	0.3	656 × 520	Type 1/4	Global	132	5 × 5	VSWIR
1800 C-040	Sony IMX287 CMOS	0.4	728 × 544	Type 1/2.9	Global	302	6.9 × 6.9	• / • / - / -
1800 C-052	Sony IMX426 CMOS	0.5	816 x 624	Type 1/1.7	Global	499	9 x 9	• / • / - / -
1800 C-130	Sony IMX990 InGaAs	1.3	1296 × 1032	Type 1/2	Global	69	5 × 5	VSWIR
1800 C-158	Sony IMX273 CMOS	1.6	1456 × 1088	Type 1/2.9	Global	157	3.45 × 3.45	• / • / - / -
1800 C-203	Sony IMX422 CMOS	2.0	1632 × 1248	Type 1/1.7	Global	156	4.5 x 4.5	• / • / - / -
1800 C-234	Sony IMX249 CMOS	2.3	1936 × 1216	Type 1/1.2	Global	31	5.86 x 5.86	• / • / - / -
1800 C-235	Sony IMX174 CMOS	2.3	1936 × 1216	Type 1/1.2	Global	155	5.86 x 5.86	• / • / - / -
1800 C-240	Sony IMX392 CMOS	2.4	1936 × 1216	Type 1/2.3	Global	128	3.45 × 3.45	• / • / - / -
1800 C-291	Sony IMX421 CMOS	2.9	1944 x 1472	Type 2/3	Global	116	4.5 x 4.5	• / • / - / -
1800 C-319	Sony IMX265 CMOS	3.2	2064 × 1544	Type 1/1.8	Global	54	3.45 × 3.45	• / • / - / -
1800 C-500	ON Semi AR0521SR CMOS	5.0	2592 × 1944	Type 1/2.5	Rolling	68	2.2 × 2.2	• / • / - / -
1800 C-507	Sony IMX264 CMOS	5.1	2464 × 2056	Type 2/3	Global	34	3.45 × 3.45	• / • / - / -
1800 C-507 Pol	SonyMX264MZR/MYR CMOS	5.1	2464 × 2056	Type 2/3	Global	34	3.45 × 3.45	• / • / - / - / Pol
1800 C-508	Sony IMX250 CMOS	5.1	2464 × 2056	Type 2/3	Global	66	3.45 × 3.45	• / • / - / -
1800 C-508 Pol	Sony IMX250 MZR/MYR CMOS	5.1	2464 × 2056	Type 2/3	Global	66	3.45 × 3.45	• / • / - / - / Pol
1800 C-510	Sony IMX548 CMOS	5.1	2464 × 2064	Type 1/1.8	Global	81	2.74 × 2.74	• / • / - / -
1800 C-511	Sony IMX547 CMOS	5.1.	2464 × 2064	Type 1/1.8	Global	79	2.74 × 2.74	• / • / - / -
1800 C-811	Sony IMX546 CMOS	8.1	2848 × 2848	Type 2/3	Global	59	2.74 × 2.74	• / • / - / -
1800 C-812	Sony IMX487 CMOS	8.1	2848 × 2848	Type 2/3	Global	51	2.74 × 2.74	UV
1800 C-895	Sony IMX267 CMOS	8.9	4112 x 2176	Type 1	Global	31	3.45 x 3.45	• / • / - / -
1800 C-1236	Sony IMX304 CMOS	12.4	4112 × 3008	Type 1.1	Global	23	3.45 × 3.45	• / • / - / -
1800 C-1240	Sony IMX226 CMOS	12.2	4024 × 3036	Type 1/1.7	Rolling	41	1.85 × 1.85	• / • / - / -
1800 C-1242	Sony IMX545 CMOS	12.4	4128 × 3008	Type 1/1.1	Global	39	2.74 × 2.74	• / • / - / -
1800 C-1620	Sony IMX542 CMOS	16.2	5328 × 3040	Type 1.1	Global	30	2.74 × 2.74	• / • / - / -
1800 C-2040	Sony IMX541 CMOS	20.4	4512 × 4512	Type 1.1	Gobal	24	2.74 × 2.74	• / • / - / -
1800 C-2050	Sony IMX183 CMOS	19.7	5376 × 3672	Type 1	Rolling	25	2.4 × 2.4	• / • / - / -
1800 C-2460	Sony IMX540 CMOS	24.6	5328 × 4608	Type 1.2	Gobal	20	2.74 x 2.74	• / • / - / -

Hardware options	Mounts	Dimensions L × W × H in mm
Bare Board / Open Housing	C / CS / S	13 × 26 × 26 (Bare Board)

❯ Long Distance Detection on board of military vehicles

Multi-camera setup on board of military vehicle providing a comprehensive view of the surroundings, allowing military personnel to monitor and respond to potential threats from multiple angles.

Customers with similar projects and requirements purchased this: **Customized board level Alvium camera with MIPI CSI-2 interface**

☑ Compact industrial-grade hardware with rugged connectors

☑ On-board ISP functionality: Advanced image corrections and optimization features for optimal light exposure

☑ Image acquisition with low latency

❯ Disaster Response with Drones

An automated reconnaissance system delivers real-time aerial data and images to a ground-based platform. This enables disaster response teams to quickly and accurately assess the situation, identify affected areas, and prioritize their actions. Additionally, the system can support long-term environmental monitoring, providing valuable insights into the impact of disasters and the effectiveness of response efforts.
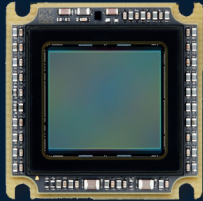
Customers with similar projects and requirements purchased this: **Flexible Alvium G1 cameras with GigE Vision interface**

☑ Up to 20 MP resolution

☑ Industrial-grade hardware in a compact format (41 mm × 29 mm × 29 mm, closed housing)

☑ On-board ISP functionality: Advanced image corrections and optimization features onboard

Alvium Modular Concept -
Flexible design for maximum versatility

With the Alvium platform, we have created a flexible and modular platform to ensure that your camera adapts to your requirements and not the other way around. Alvium cameras are available with 6 different interfaces for diverse requirements. Together with the large choice of high-quality image sensors, various lens mount and housing options, and a wide range of spectral sensitivities, the Alvium platform offers a broad variety of cameras to choose from.

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To meet individual needs and to enable the greatest possible flexibility, Allied Vision offers a wide range of additional modular options for Alvium cameras.

Removed Cover Glass (RCG) for cameras with Sony IMX sensors

Alvium cameras with Sony IMX, including VSWIR sensors, are available without sensor cover glass. Particularly for reflection-sensitive applications, the RCG option can help achieve the best possible imaging results. Image artefacts are eliminated.

- No image artefacts caused by particles on the sensor cover glass
- No disturbing reflections
- Increase of overall quantum efficiency
- Fiber optic arrays can directly be mounted to the sensor
- Disturbing reflections or interferences caused by the sensor cover glass are avoided
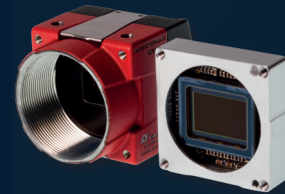
Alvium Frame for USB3 and CSI-2 cameras

Vision applications sometimes require a very precise sensor alignment than the standard bare board camera allows. Alvium Frame cameras are actively aligned during production. The image sensor is perfectly aligned towards the small precision frame. There are two options of alignement:

- Precision milled areas on the bottom, side, and front of the frame
- Precision milled front face, alignment pin, and oblong hole

Every available camera model / image sensor in the Alvium CSI-2 and USB3 series is available as an Alvium Frame camera.

Alvium Flex for USB3 and CSI-2 cameras

The Alvium Flex models enable the use of various connectors and cables by replacing the standard interface with a board-to-board connector for all signals.

- Very compact footprint of 26 mm × 26 mm for bare board
  and 29 mm × 29 mm for housed cameras
- Slim 8 mm bare board version
- Support for more than 20 image sensors
- Support for Sony SWIR and UV sensors
- Board-to-board connector to enable individual connections
- Various interface boards, add-on boards, and cables accessories available
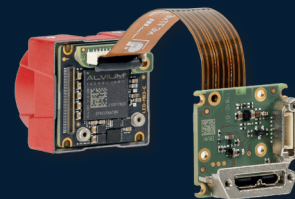
Active Lens Alignment for cameras with S-mount lenses

Deviations along the optical axis between lens and sensor affect image quality. Allied Vision offers Active Lens Alignment for its Alvium cameras. Each single S-Mount lens is aligned with the corresponding Alvium camera in an automated production process, resulting in:

- Consistent high image quality and optimal optical alignment
- Higher precision and shorter production times compared to manual alignment
- No effects such as blurring, tilt, rotation, focus drift and excessive variances

Runway Condition Assessment for Airports

Cameras sensitive in the short-wave infrared spectrum support ice detection. Multiple cameras on board of a service car allow airport personnel to quickly and accurately assess the condition of the runway and take necessary action to ensure safe takeoff and landing operations.

Customers with similar projects and requirements purchased this: **Flexible Alvium G1 cameras sensitive from visible to short-wave infrared light**

☑ Detecting ice, water and other liquids

☑ Single camera to capture images in both the visible and SWIR spectra

☑ Small size for easy integration into service vehicles and robot arms

☑ Industrial-grade housing made for extended temperature range from -20°C to +65°C

ALVIUM G1 - The GigE Vision refresh
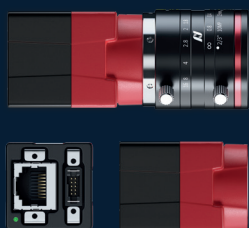
Key facts GigE Vision

- Small feature-rich GigE camera with PoE
- Future-proof design with latest technology for long-availability
- Comprehensive feature set including sequencer and multi-ROI

Alvium G1

Camera model	Sensor	Mega-pixels	Resolution	Sensor format	Shutter mode	Max. frame rate in fps	Pixel size in µm	Mono/color/ mono NIR/ color NIR
G1-030	Sony IMX991 InGaAs	0.3	656 × 520	Type 1/4	Global	249	5 x 5	VSWIR
G1-040	Sony IMX287 CMOS	0.4	728 × 544	Type 1/2.9	Global	276	6.9 × 6.9	• / • / - / -
G1-130	Sony IMX990 InGaAs	1.3	1296 × 1032	Type 1/2	Global	86	5 x 5	VSWIR
G1-131	E2V EV76C560 CMOS	1.3	1280 × 1024	Type 1/1.8	Global	59	5.3 x 5.3	• / • / - / -
G1-158	Sony IMX273 CMOS	1.6	1456 × 1088	Type 1/2.9	Global	72	3.45 × 3.45	• / • / - / -
G1-192	E2V EV76C570 CMOS	1.9	1600 × 1200	Type 1/1.8	Global	59	4.5 × 4.5	• / • / - / -
G1-234	Sony IMX249 CMOS	2.4	1936 x 1216	Type 1/1.2	Global	40	5.86 × 5.86	• / • / - / -
G1-240	Sony IMX392 CMOS	2.4	1936 × 1216	Type 1/2.3	Global	49	3.45 × 3.45	• / • / - / -
G1-319	Sony IMX265 CMOS	3.2	2064 × 1544	Type 1/1.8	Global	36	3.45 × 3.45	• / • / - / -
G1-500	ON Semi AR0521SR CMOS	5.0	2592 × 1944	Type 1/2.5	Rolling	23	2.2 × 2.2	• / • / - / -
G1-507	Sony IMX264 CMOS	5.1	2464 × 2056	Type 2/3	Global	23	3.45 × 3.45	• / • / - / -
G1-507 Pol	Sony IMX264MZR/MYR CMOS	5.1	2464 × 2056	Type 2/3	Global	23	3.45 × 3.45	• / • / - / Pol
G1-510	Sony IMX548 CMOS	5.1	2464 × 2064	Type 1/1.8	Global	23	2.74 × 2.74	• / • / - / -
G1-811	Sony IMX546 CMOS	8.1	2848 × 2848	Type 2/3	Global	14	2.74 × 2.74	• / • / - / -
G1-812	Sony IMX487 CMOS	8.1	2848 × 2848	Type 2/3	Global	14	2.74 × 2.74	UV
G1-895	Sony IMX267 CMOS	8.9	4112 x 2176	Type 1	Global	13	3.45 × 3.45	• / • / - / -
G1-1236	Sony IMX304 CMOS	12.4	4112 × 3008	Type 1.1	Global	9	3.45 × 3.45	• / • / - / -
G1-1240	Sony IMX226 CMOS	12.2	4024 x 3036	Type 1/1.7	Rolling, Global	9	1.85 × 1.85	• / • / - / -
G1-1242	Sony IMX545 CMOS	12.4	4128 × 3008	Type 1/1.1	Global	9	2.74 × 2.74	• / • / - / -
G1-1620	Sony IMX542 CMOS	16.2	5328 × 3040	Type 1.1	Global	7	2.74 × 2.74	• / • / - / -
G1-2040	Sony IMX541 CMOS	20.4	4512 × 4512	Type 1.1	Global	5	2.74 × 2.74	• / • / - / -
G1-2050	Sony IMX183 CMOS	20.2	5496 × 3672	Type 1	Rolling	5	2.4 × 2.4	• / • / - / -
G1-2460	Sony IMX540 CMOS	24.6	5328 × 4608	Type 1.2	Global	4	2.74 x 2.74	• / • / - / -

Hardware options	Mounts	Dimensions L × W × H in mm
Closed Housing	C / CS / S	41 × 29 × 29 (Closed Housing)

Infrared Imaging

In everyday life, we are constantly exposed to electromagnetic radiation differing in wavelengths such as visible light, ultraviolet light, radio and microwaves, or X-rays. Within the electromagnetic spectrum, infrared radiation is in the range between visible light and microwaves.

It covers a wavelength range from 0.75 µm – 14 µm and is separated into near-infrared (NIR), short-wave infrared (SWIR), mid-wave infrared (MWIR), and long-wave infrared (LWIR).

Although infrared radiation in the SWIR region is not visible to the human eye, it interacts with objects in a similar manner as visible light. Thereby, SWIR cameras have the advantage to "see" even at night and under challenging conditions such as fog, haze, or smoke. Another major benefit of SWIR cameras, is their ability to image through glass, making special and often expensive lenses unnecessary as they are required for MWIR or LWIR imaging.

Border Control

SWIR cameras can penetrate fog, haze, and other atmospheric obscurants, allowing it to maintain situational awareness and detect potential threats even in adverse weather conditions. This makes it an invaluable asset for border security personnel, who rely on accurate and timely information to make critical decisions and respond to emerging situations.

Customers with similar projects and requirements purchased this: **High-performance Goldeye SWIR cameras**

☑ Reliable, high-quality SWIR imaging

☑ High quantum efficiency due to strong sensor cooling (TEC1, TEC2,)

☑ Ideal for low-light conditions, fog, haze, dust etc.

GOLDEYE - Imaging beyond the Visible

Goldeye short-wave infrared (SWIR) cameras offer a high grade of versatility whether resolution, interface, lens-mount, spectral range or thermo-electric sensor cooling wise (TEC1, TEC2, TECless). They can be operated at high frame rates and their multiple on-board image processing features provide superior imaging results with low-noise, high linearity, and high dynamic range. Standardized GigE Vision or Camera Link interface and GenICam-like feature control provide a plug & play feeling when utilizing these robust, high-quality SWIR cameras.

The new Goldeye Pro camera series is equipped with a GigE Vision compliant 5 Gbps interface, for highest throughput, quality, and imaging performance. It supports optimally the higher bandwidth requirements of the latest SWIR sensor solutions while enabling simultaneously an efficient sensor temperature stabilization via thermoelectric coolers (TEC).

Key facts Goldeye G/CL
- Resolution up to 1.3 megapixels (QVGA, VGA, and SXGA)
- Various InGaAs sensor technologies supported, including visible SWIR and eXtended SWIR
- Extended operating temperature range: -20° C to +55° C (housing)

Key facts Goldeye PRO
- High resolutions up to 5.3 MP and fast framerates
- Thermo-electric cooled IMX99x sensors for optimal imaging results
- Best-in-class imaging performance

Goldeye G/CL

Camera model	Sensor	Shutter mode	Mega-pixels	Resolution	Max. frame rate in fps	Pixel size in µm	Spectral range in nm	Standard mount	Power over Ethernet
G/CL-008 TEC1	InGaAs FPA with TEC1 cooling (Min. ΔT = 20 K)	Global	0.1	320 × 256	344	30 × 30	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-030 T1	Sony IMX991 with TEC1 cooling (Min. ΔT = 25 K)	Global	0.3	656 x 520	234	5 × 5	400 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-032 TEC1	InGaAs FPA with TEC1 cooling (Min. ΔT = 30 K)	Global	0.3	636 × 508	100	25 × 25	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-033 TEC1	InGaAs FPA with TEC1 cooling (Min. ΔT = 25 K)	Global	0.3	640 × 512	301	15 × 15	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-033 TECless	InGaAs FPA without TEC cooling	Global	0.3	640 × 512	301	15 × 15	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-034 TEC1	InGaAS FPA with TEC1 cooling (Min. ΔT= 25 K)	Global	0.3	636 × 508	303	15 × 15	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-130 T1	Sony IMX990 with TEC1 cooling (Min. ΔT = 25 K)	Global	1.3	1280 x 1024	94	5 × 5	400 to 1700	C-Mount	IEEE 802.3af (PoE)

Goldeye G/CL Cool/XSWIR

Camera model	Sensor	Shutter mode	Mega-pixels	Resolution	Max. frame rate in fps	Pixel size in µm	Spectral range in nm	Standard mount	Power over Ethernet
G/CL-008 Cool TEC1	InGaAs FPA with TEC1 cooling (Min. ΔT = 30 K)	Global	0.1	320 × 256	344	30 × 30	900 to 1700	C-Mount	IEEE 802.3af (PoE)
G/CL-008 XSWIR 1.9 TEC2	InGaAs FPA with TEC2 cooling (Min. ΔT = 60 K)	Global	0.1	320 × 256	344	30 × 30	1100 to 1900	C-Mount	IEEE 802.3at (PoE+)
G-008 XSWIR 2.2 TEC2	InGaAs FPA with TEC2 cooling (Min. ΔT = 60 K)	Global	0.1	320 × 256	344	30 × 30	1200 to 2200	C-Mount	IEEE 802.3at (PoE+)
G/CL-032 Cool TEC2	InGaAs FPA with TEC2 cooling (Min. ΔT = 60 K)	Global	0.3	636 × 508	100	25 × 25	900 to 1700	C-Mount	IEEE 802.3at (PoE+)
G/CL-034 TEC2	InGaAs FPA with TEC2 (Min. ΔT = 60 K)	Global	0.3	636 × 508	303	15 × 15	900 to 1700	C-Mount	IEEE 802.3at (PoE+)
G/CL-034 XSWIR 1.9 TEC2	Extended InGaAs FPA with TEC2 (Min. ΔT = 60 K)	Global	0.3	636 × 508	303	15 × 15	1100 to 1900	C-Mount	IEEE 802.3at (PoE+)
G/CL-034 XSWIR 2.2 TEC2	Extended InGaAs FPA with TEC2 (Min. ΔT = 60 K)	Global	0.3	636 × 508	303	15 × 15	1200 to 2200	C-Mount	IEEE 802.3at (PoE+)

Goldeye Pro

Camera model	Sensor	Shutter mode	Mega-pixels	Resolution	Max. frame rate in fps	Pixel size in µm	Spectral range in nm	Standard mount	Power over Ethernet
Goldeye Pro G5-530	IMX992 SenSWIR Type 1/1.4 (Max. ΔT = 30 K)	Global	5.3	2592 × 2056	115	3.45 × 3.45	400 to 1,700	C-Mount	IEEE 802.3af (PoE)
Goldeye Pro G5-320	IMX993 SenSWIR Type 1/1.8 (Max. ΔT = 30 K)	Global	3.2	2080 x 1544	157	3.45 × 3.45	400 to 1,700	C-Mount	IEEE 802.3af (PoE)

Allied Vision
a **TKH Vision** brand

Allied Vision Technologies GmbH

Stadtroda, Germany

www.alliedvision.com

Allied Vision supplies camera technology and image capture solutions for factory automation, medical and scientific imaging, drones and many more application areas. With a deep understanding of customers' needs, Allied Vision finds individual solutions for every application, a practice which has made Allied Vision **one of the leading manufacturers of 2D and SWIR cameras** worldwide in the machine vision market.

Quality Inspection of ammunition

High Speed cameras enable a fast and reliable inspection of ammunition during production process. High-speed images of ammunition components, such as projectiles, casings, and propellants, allowing to detect even the smallest defects or irregularities. This level of detail is critical in ensuring that ammunition functions properly and safely, and that it meets the required specifications and standards.

Customers with similar projects and requirements purchased this: **High-speed camera FXO**

- ☑ 671 frames per second at 1.8 MP resolution
- ☑ Reliable fast CoaXPress-12 interface
- ☑ Outstanding properties in terms of trigger latency and constant data rate

FXO - High image quality in a comapct housing

The FXO offers an extremely flexible, powerful and at the same time costefficient camera concept that impresses with excellent image quality, fast interfaces, versatile inputs and an integrated, multi-channel GenICam Strobe Controller. The Pregius S sensor from Sony with Global Shutter shines with outstanding image quality and is the heart of the FXO series. The 2.74 µm pixels enable high light sensitivity combined with very low noise characteristics. The excellent homogeneity and high dynamic range of the image set standards. In addition, the compact design allows the use of economical lenses and is easier to integrate in applications where space is limited.

Key facts FXO

- Resolutions up to 24.6 megapixels (up to 1.2") in a small C mount housing
- State-of-the-art interfaces 10GigE, 25GigE and CoaXPress-12 with PoE or PoCXP
- Smallest camera with CXP12-2C (2 Connections) interface
- Also available with 25GigE Interface
- Thermally highly optimized milled housing

FXO

Model	[MP]	Resolution [Pixel]	Format	Sensor	Pixel [µm]	Shutter	Mount	max. Frame Rate [fps]		
fxo425	1.8	1,600 × 1,104	17.6 mm	Sony IMX425	9	GS	C	662*	–	671
fxo421	2.8	1,936 × 1,472	11 mm	Sony IMX421	4.5	GS	C	413.5*	–	–
fxo537	5	2,448 × 2,048	8.8	Sony IMX537	2.74	GS	C	262*	–	262
fxo547	5	2,448 × 2,048	1/1.8	Sony IMX547	2.74	GS	C	124.3	124	–
fxo420	7.1	3,216 × 2,208	17.6 mm	Sony IMX420	4.5	GS	C	207*	–	–
fxo546	8	2,840 × 2,840	11.1 mm	Sony IMX546	2.74	GS	C	88	88	–
fxo536	8.1	2,848 × 2,848	11.1	Sony IMX536	2.74	GS	C	195*	–	195
fxo535	12.3	4,096 × 3,008	14	Sony IMX535	2.74	GS	C	182.5*	–	182.5
fxo545	12.3	4,096 × 3,000	1/1.1	Sony IMX545	2.74	GS	C	61	61	–
fxo542	16.1	5,320 × 3,032	16.8 mm	Sony IMX542	2.74	GS	C	45.6	45.6	–
fxo532	16.2	5,328 × 3,040	16.8 mm	Sony IMX532	2.74	GS	C	144*	–	144
fxo901	16.4	8,016 × 2,048	22.7mm	Sony IMX901	2.74	GS	C	135.4*	73.6	–
fxo541	20.2	4,480 × 4,504	17.5 mm	Sony IMX541	2.74	GS	C	33.1	35.7	–
fxo531	20.4	4,512 × 4,512	17.5 mm	Sony IMX531	2.74	GS	C	109.5*	–	109.5
fxo540	24.4	5,312 × 4,600	19.3 mm	Sony IMX540	2.74	GS	C	30.4	30.4	–
fxo530	24.6	5,328 × 4,608	19.3 mm	Sony IMX530	2.74	GS	C	97.6*	–	97.6

* CoaXPress12 with 2 connections

Counterattack against aerial assault

High-resolution cameras allow for rapid and accurate detection, even in complex and dynamic environments. The camera's onboard processing enables real-time tracking and prediction of target trajectories, providing air defense systems with the critical information needed to neutralize threats.

Customers with similar projects and requirements purchased this: **EXO GigE camera**

☑ Ensuring stable broadcast-safe transmission even under high network loads

☑ High-resolution with up to 12.3 MP resolution and up to 120 MB/s data rate

☑ Camera powered over Ethernet for single-cable setups

EXO - The Integrator's Camera

The EXO series is based on powerful CMOS sensors from Sony and CMOSIS, offering a clever and economical camera concept with excellent image quality and outstanding temperature behavior. The cameras feature multiple inputs, PLC functionality, and a multi-channel Strobe Controller, and are available with GigE Vision, Camera Link, and USB3 Vision interfaces, supporting the latest standards like GenICam 3.0 and USB 3.1.

Key facts EXO

- Resolution 1.6 to 31.4 megapixel (up to 4/3")
- Latest CMOS sensors from Sony and CMOSIS
- Monochrome and color versions (Bayer pattern)
- Logic trigger functions (PLC) and 4 × Power Output (4-channel strobe controller)

EXO

Model	[MP]	Resolution [Pixel]	Format	Sensor	Pixel [µm]	Shutter	Mount	max. Frame Rate [fps]		
exo273	1.6	1,440 × 1,080	1/2.9"	Sony IMX273	3.45	GS	C	79	–	–
exo174	2.3	1,920 × 1,200	1/1.2"	Sony IMX174	5.86	GS	C	53.6	105	160
exo249	2.3	1,920 × 1,200	1/1.2"	Sony IMX249	5.86	GS	C	41	–	41
exo252	3.1	2,048 × 1,536	1/1.8"	Sony IMX252	3.45	GS	C	–	78	115
exo265	3.1	2,048 × 1,536	1/1.8"	Sony IMX265	3.45	GS	C	39	–	55
exo4000	4	2,048 × 2,048	1"	CMOSIS CMV4000	5.5	GS	C	29.5	–	74
exo250	5	2,448 × 2,048	2/3"	Sony IMX250	3.45	GS	C	24.5	49	75
exo264	5	2,448 × 2,048	2/3"	Sony IMX264	3.45	GS	C	24.5	–	35
exo547	5	2,448 × 2,048	2/3"	Sony IMX547	2.74	GS	C	24.5	–	–
exo428	7.1	3,208 × 2,200	1.1"	Sony IMX428	4.54	GS	C	17.4	–	51.4
exo546	8.1	2,840 × 2,840	2/3"	Sony IMX546	2.74	GS	C	15	–	–
exo255	8.8	4,096 × 2,160	1"	Sony IMX255	3.45	GS	C	–	–	42
exo267	8.8	4,096 × 2,160	1"	Sony IMX267	3.45	GS	C	13.5	28	32
exo253	12.3	4,096 × 3,000	1.1"	Sony IMX253	3.45	GS	C	–	–	30
exo304	12.3	4,096 × 3,000	1.1"	Sony IMX304	3.45	GS	C	10	20	23
exo545	12.3	4,096 × 3,000	1/1.1"	Sony IMX545	2.74	GS	C	10	–	–
exo542	16.1	5,320 × 3,032	16.8 mm	Sony IMX542	2.74	GS	C	7	–	23
exo901	16.4	8,016 × 2,048	22.7mm	Sony IMX901	2.74	GS	C	7.5	–	15
exo183	20.2	5,496 × 3,672	1"	Sony IMX183	2.4	RS	C	6	12	17
exo541	20.3	4,504 × 4,504	17.45 mm	Sony IMX541	2.74	GS	C	6	–	18.4
exo540	24.5	5,320 × 4,600	19.27 mm	Sony IMX540	2.74	GS	C	5	–	15

MIKROTRON
a **TKH Vision** brand

Modular Building Blocks
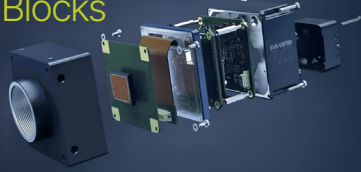
The modular architecture of SVS-Vistek cameras enables a simplified camera design with proven modular functionality. Individual components can be combined to create an individual solution. This allows us to quickly integrate new cameras variants, sensors and special requests into our camera series. Many industrial applications require cameras with special features. Be it just a special paint job, a specific lens mount, a special interface or a special firmware function. Our OEM customers benefit from this modularity through short development times and attractive pricing.

> System Performance

High speed recording unit shows the blast of thermal shield in missile nose cone in slow motion. The recording provides engineers and researchers with a unique opportunity to study the behavior of the system in detail. The high-speed camera captures every aspect of the event, from the initial ignition of the thermal shield to the subsequent expansion of the gases and the impact on the surrounding structure.

Customers with similar projects and requirements purchased this: **MotionBLITZ CVR High-Speed Recording System**

☑ Recordings of up to 12 seconds at full speed of 560 fps possible

☑ High-quality images for precise slow motion analyses

EoSens - High-Speed Cameras

Our High-Speed cameras of Mikrotron are used in industrial image processing wherever processes need to be examined within a few milliseconds. With frame rates of up to 225.000 fps, the most precise analyses of processes and objects are possible. If the focus is on high resolutions, recording speeds of several hundred frames per second are still possible.

Key facts **EoSens**

• Very high Framerates: e.g. EoSens9.5 with 509fps @ 9.5 MP

• Fast CoaXPress-12 Interface

• Stable under difficult lighting conditions, vibrations and strong shocks

EoSens

Camera Link   CXP-6   CXP-12

Model	[MP]	Resolution [Pixel]	Format	Sensor	Pixel [μm]	Shutter	Mount	max. Frame Rate [fps]		
EoSens 1.1	1.1	1,280 × 864	4/3″	Lux13HS	13.7	GS	C / F	–	–	3,674
EoSens 1.3	1.3	1,280 × 1,024	4/3″	LUPA1300-2	14	GS	C / F	506	–	–
EoSens 2.0	2	1,920 × 1,080	4/3″	Lux19HS	10	GS	C / F	–	–	2,247
EoSens 3.0	3	1,690 × 1,710	1″	LUPA3000	8	GS	C / F	285	566	–
EoSens 4.0	4	2,336 × 1,728	4/3″	AM41	7	GS	C / F	–	563	–
EoSens 9.5*	9.5	4,096 × 2,304	2″	LUX9512	6.5	GS	M58 / Flat Front	–	–	509
EoSens 10*	10	4,608 × 2,176	4/3″	Gsprint4510	4.5	GS	M42 / F	–	–	463
EoSens 21	21	5,120 × 4,096	29.5mm	Gsprint4521	4.5	GS	F / Flat Front	–	–	230

SVS-VISTEK
a **TKH Vision** brand

SVS-Vistek GmbH
Gilching, Germany
www.svs-vistek.com

SVS-Vistek has been a renowned specialist in machine vision cameras for more than **30 years** and offers a comprehensive portfolio of high-resolution cameras with up to **245 megapixels**. As part of SVS-Vistek, Mikrotron completes the range with **high-speed** and recording cameras. Feel free to visit us on our website to explore our full range of products.