

Product datasheet

AXO2 camera with IP protection



Version 1.1

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13 January 2025

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1 General product description

The AXO2 is compact , IP-protected GMSL2 Camera with a 6-axis motion tracking device.

The camera is suitable for:

Automotive/ADAS

Logistics

Barcode scanning

Food industry

Industrial

Heavy Machinery

Medical

People counting

Drones

Robotics

But not limited to

More than 20 sensors

Selection of more than 20 Sony and Omnivision sensors with Rolling or Global shutter types. Depending on your application, you can select sensor resolution, shutter type, and low-light sensitivity level.

Low-level camera control

Low-level camera control allows you to adjust gain, exposure time, FPS (frames per second), and ROI (region of interest) to achieve the best image quality together with maximum camera performance. All those controls are available in a camera driver.

GMSL2 connection

Secure GMSL2 connection allows you to get low latency video over a 15-meter single coax cable without an EMI issue and with a high data rate for high-resolution cameras.

High-performance motion tracking device (IMU)

The camera contains the high-performance motion tracking device (IMU) that combines a 3-axis gyroscope with 19-bit data output and 3-axis accelerometer with 18-bit output. IMU can be triggered with the camera frame V-sync output and also can be a source of the camera trigger. Low noise feature allows your software to implement image stabilisation and motion tracking algorithms.

Synchronization

Multiple camera synchronization is possible based on an internal V-sync generator, single master -> multiple slaves, and host synchronization signal.

Various lenses

There are more than 10 various lenses that can be installed with camera: from narrow field of view (FoV) to fish eye lenses.

2 Technical specification

2.1 Image sensor

List of supported image sensors:

Module	Mega-pixel	FPS	Pixel size	Sensor size	CMOS Sensor	Color	Resolution	Shutter
SONY IMX178	6.3	60	2.4 µm	1/1.8"	SONY Starvis	monochrome	3072 x 2048	Global Reset Shutter
SONY IMX183	20.2	24	2.4 µm	1"	SONY Exmor R	monochrome	5496 x 3672	Global Reset Shutter
SONY IMX183 - Color	20.2	24	2.4 µm	1"	SONY Exmor R	color	5496 x 3672	Global Reset Shutter
SONY IMX226	12.4	44	1.85 µm	1/1.7"	SONY Starvis	monochrome	4072 x 3046	Global Reset Shutter
SONY IMX226 - Color	12.4	44	1.85 µm	1/1.7"	SONY Starvis	color	4072 x 3046	Global Reset Shutter
SONY IMX250	5.1	130	3.45 µm	2/3"	SONY Pregius	monochrome	2464 x 2056	Global Shutter
SONY IMX250 - Color	5.1	130	3.45 µm	2/3"	SONY Pregius	color	2464 x 2056	Global Shutter
SONY IMX252	3.2	160	3.45 µm	1/1.8"	SONY Pregius	monochrome	2064 x 1544	Global Shutter
SONY IMX252 - Color	3.2	160	3.45 µm	1/1.8"	SONY Pregius	color	2064 x 1544	Global Shutter
SONY IMX264	5.1	30	3.45 µm	2/3"	SONY Pregius	monochrome	2464 x 2056	Global Shutter
SONY IMX264 - Color	5.1	30	3.45 µm	2/3"	SONY Pregius	color	2464 x 2056	Global Shutter
SONY IMX265	3.2	50	3.45 µm	1/1.8"	SONY Pregius	monochrome	2064 x 1544	Global Shutter
SONY IMX265 - Color	3.2	50	3.45 µm	1/1.8"	SONY Pregius	color	2064 x 1544	Global Shutter
SONY IMX273	1.6	225	3.45 µm	1/2.9"	SONY Pregius	monochrome	1456 x 1088	Global Shutter
SONY IMX273 - Color	1.6	225	3.45 µm	1/2.9"	SONY Pregius	color	1456 x 1088	Global Shutter
SONY IMX290	2.1	120	2.9 µm	1/2.8"	SONY Starvis	monochrome	1920 x 1080	Rolling Shutter

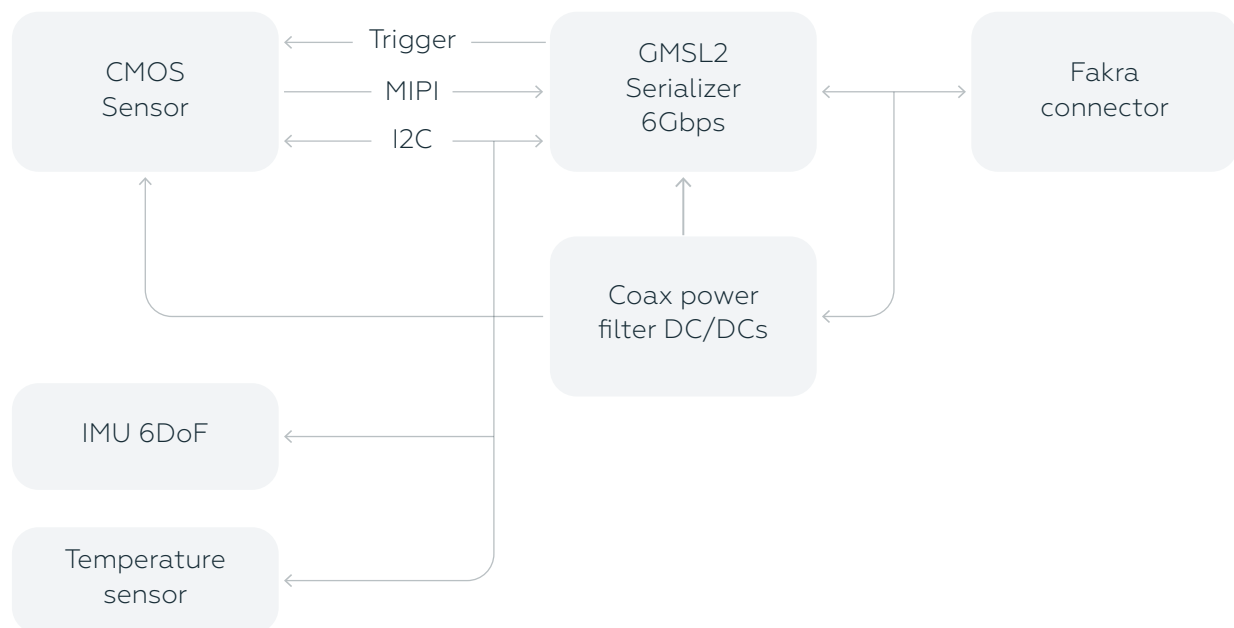
Module	Mega-pixel	FPS	Pixel size	Sensor size	CMOS Sensor	Color	Resolution	Shutter
SONY IMX296	1.6	60	2.9 µm	1/2.8"	SONY Starvis	monochrome	1920 x 1080	Rolling Shutter
SONY IMX296 - Color	1.6	60	3.45 µm	1/2.9"	SONY Pregius	color	1440 x 1080	Global Shutter
SONY IMX297	0.4	120	6.9 µm	1/2.9"	SONY Pregius	monochrome	728 x 544	Global Shutter
SONY IMX327 - Color	2.1	60	2.9 µm	1/2.8"	SONY Starvis	color	1920 x 1080	Rolling Shutter
SONY IMX335	5	60	2.0 µm	1/2.8"	SONY Starvis	monochrome	2592 x 1944	Rolling Shutter
SONY IMX335 - Color	5	60	2.0 µm	1/2.8"	SONY Starvis	color	2592 x 1944	Rolling Shutter
SONY IMX392	2.3	200	3.45 µm	1/2.3"	SONY Pregius	monochrome	1920 x 1200	Global Shutter
SONY IMX392 - Color	2.3	200	3.45 µm	1/2.3"	SONY Pregius	color	1920 x 1200	Global Shutter
SONY IMX412 - Color	12.3	40	1.55 µm	1/2.3"	SONY Starvis	color	4056 x 3040	Rolling Shutter
SONY IMX415	8.3	60	1.45 µm	1/2.8"	SONY Starvis	monochrome	3840 x 2160	Rolling Shutter
SONY IMX415 - Color	8.3	60	1.45 µm	1/2.8"	SONY Starvis	color	3840 x 2160	Rolling Shutter
SONY IMX462 - Color	2.1	120	2.9 µm	1/2.8"	SONY Starvis	color	1920 x 1080	Rolling Shutter
SONY IMX565	12	42	2.74 µm	1/1.1"	SONY Pregius S	monochrome+color	4096 x 3000	Global Shutter
SONY IMX566 - Color	8.1	62	2.74 µm	1/1.1"	SONY Pregius S	color	2856 x 2848	Global Shutter
SONY IMX567	5.1	96	2.74 µm	1/1.8"	SONY Pregius S	monochrome+color	2472 x 2064	Global Shutter
SONY IMX568	5.1	96	2.74 µm	1/1.8"	SONY Pregius S	monochrome	2472 x 2064	Global Shutter
SONY IMX568 - Color	5.1	96	2.74 µm	1/1.8"	SONY Pregius S	color	2472 x 2064	Global Shutter
SONY IMX662 - Color	2.07	90	2.9 µm	1/2.8"	SONY Starvis 2	color	1920 x 1080	Rolling Shutter
SONY IMX664 - Color	4.16	120	2.9 µm	1/1.8"	SONY Starvis 2	color	2688 x 1520	Rolling Shutter
SONY IMX900	3.2	100	2.25 µm	1/3.1"	SONY Starvis	monochrome	2048x1536	Global Shutter
SONY IMX900 - Color	3.2	100	2.25 µm	1/3.1"	SONY Starvis	color	2048x1536	Global Shutter
SONY ISX031 - Color with HDR	3.01	60	3.0 µm	1/2.42"	Automotive with integrated ISP	color	1920 x 1536	Rolling Shutter
Omnivision OV7251	0.3	120	3.0 µm	1/7.5"	Omnivision	monochrome	640 x 480	Global Shutter
Omnivision OV9281	1	120	3.0 µm	1/4"	Omnivision	monochrome	1280 x 800	Global Shutter

2.2 Motion sensor

Parameter	Value	Comments
GYRO noise	2.8 mdps/rt-Hz	
GYRO Offset Temp Stability	±5	
GYRO Range & Resolution	±2000dps; 16/19-bits	
ACCEL Noise	AXY: 65; AZ: 70	In µg/rt-Hz
ACCEL Range & Resolution	±16g; 16/18-bits	
ODR & Sample Synch	32kHz; RTC	

2.3 GMSL2 serializer hardware

GMSL2 solution based on the Analog Devices MAX96717G serializer.



Besides of GMSL2 serializer, the board has power converters, a TMP102 temperature sensor, IMU ICM-42688-P, an analog switch IC for muxing sensor trigger I/O, VSYNC sensor I/O

Signals connection table

Camera signal	MAX96717G IO	Description
CAM_TRIG	MFP8	Sensor trigger input
CAM_FLASH	MFP5	Sensor VSYNC/Flash output
MUX_SEL	MFP0	Analog multiplexer A0 select pin
MUX_EN	MFP7	Analog multiplexer global enables signal
IMU_INT1	MFP6	ICM-42688-P, INT1
IMU_INT2	MFP4	ICM-42688-P, INT2

2.4 Lens mounting path

The camera has M12 with thread for an S-mount lens.

M12 lens can be used (S-mount lens) with an additional component – light filter.

The lens type depends on the sensor selected and can have various focal lengths, apertures, format, TTL, and distortion levels.

2.5 Compatible platforms



AquaEdge

Based on NXP i.MX8MP / i.MX95 SoC

Balanced computational power

Minimal power consumption

The AI engine is capable of running TensorFlow Lite/ONNX-based models

Linux-based software



Toradex Aquila AM69 Evaluation Kit

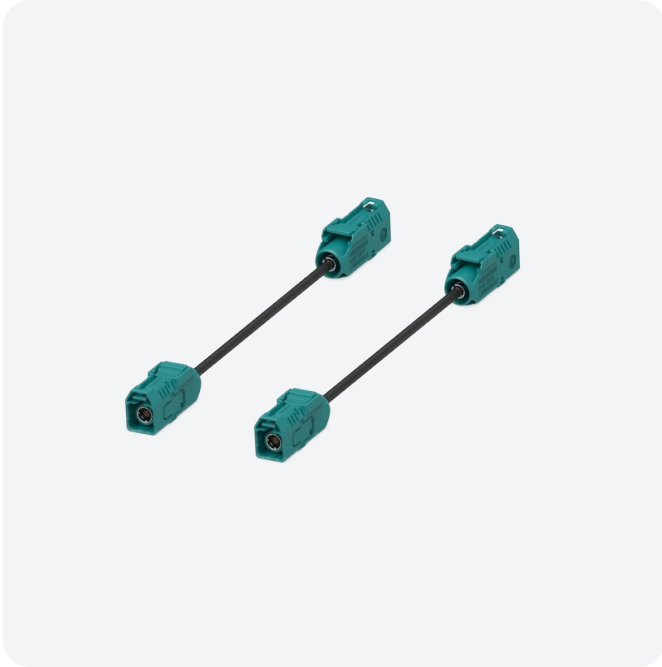
Based on Texas Instruments AM69A SoC
32TOPs AI engine

Support up to 8 cameras in parallel

Linux-based software



2.6 Accessories



Coax cable

15 m coax cable

with 2x Fakra Z Female connectors

2.7 Environmental requirements

No cooling requirements

Operating temperature range: -40..+85 °C

Power (over same coax cable with Fakra connector): 12 VDC and up to 300mA (depends on a sensor)

Waterproof: IP 67

Certification: CE, FCC, TELEC (Japan)

2.8 Technical drawings

The camera has the following dimensions:

