# USB3 Vision camera series

smallest single board design • lowest power consumption • ultra-fast





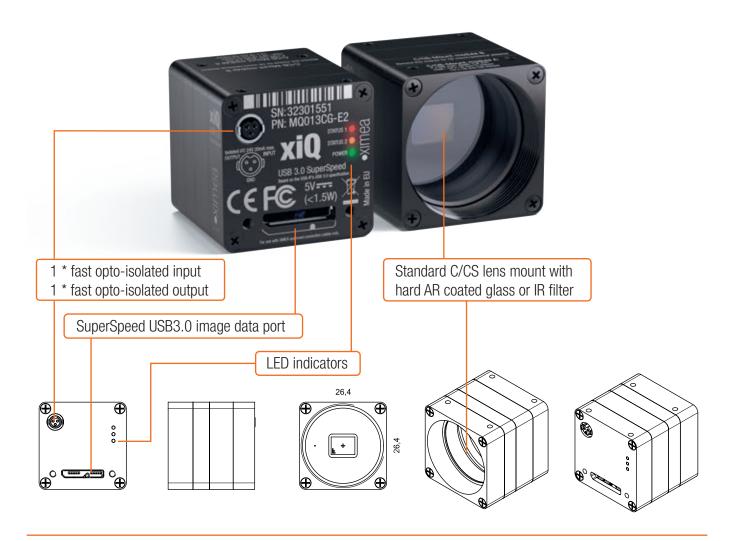
# xiQ - quick facts

**xiQ** [ksi-kju: or sai-kju:] is an ultra-compact USB3 Vision Standard compatible industrial camera family with outstanding features:

- Extremely small footprint
- Lowest thermal dissipation
- Single PCB, board level versions available: perfect for OEM integration



Industry standard interface	Compliant with USB 3.0 SuperSpeed specification
AIA standard compatibility	USB3 Vision Standard Compliant
Small	Fits into places where no other camera can fit
Cool	Due to low power consumption, 0.9 to 1.8 W, supplied via USB3.0 interface
Effective	5 Gb/s interface up to 400 Mpix/s data throughput
Fast	High speed, high frame rate: >500 fps at VGA and 90 fps at 4 Mpix resolutions
Robust	Full metal housing, no sheet metal covers
Lightweight	Facilitates increased performance of robotic arms and gimbals
Lens mount	Standard C-mount, convertible to CS mount or board level without mount
Connectivity	Programmable opto-isolated input and output, 3 status LEDs
Compatible	Support for Windows, Linux and Mac OS X, largest range of Image Processing Libraries
Software interfaces	GenICam / GenTL and highly optimized xiAPI SDK
Auto adjustments	Auto white balance, auto gain, auto exposure
Sensor Technology	Most recent generation of CMOS sensors with global shutter
Economical	Excellent value and price, low TCO and fast ROI



# xiQ - leading vision libraries supported

- Quick integration with third-party software using our easy-to-learn API/SDK and many examples made for AQSENSE SAL3D, Open CV, Aforge.NET, etc.
- All XIMEA cameras are plug-and-play compatible with most of the major image processing libraries on the market, including MVTec HALCON, National Instruments LabVIEW, MathWorks MATLAB, STEMMER IMAGING Common Vision Blox, OpenCV and many others.
- Support for GenlCam/GenTL ensures forward compatibility with emerging image processing libraries, frameworks and packages.
- One-stop support of the camera and vision libraries integration.
- Open online community: Share experience, exchange knowledge and solutions at www.ximea.com/community.

#### Compatible with more than 30 popular machine vision libraries:

Please checke webstie for up-to-date list:



























































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# xiQ - series camera specifications

#### Sensors and models:

Model 1)		Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB]	Optical size	Sensor size/ diagonal [mm]	FPS <sup>2)</sup>	Max. power consumption
MQ003MG-CM	b/w	CMOSIS CMV300	648x488	7.4	10	60 <sup>2)</sup>	1/3"	4.8 x 3.6	>500	1,3
MQ003CG-CM	Color	GIVIOSIS GIVIVSOO	VGA	7.4	10	00 ,	1/3	5.9	>5000	1.0
MQ013MG-E2	b/w	F0V D/760560							60	
MQ013CG-E2	Color	E2V EV76C560	1280x1024 1.3 MP	5.3	10	>60	1/1.8"	6.9 x 5.5 8.7		0.9
MQ013RG-E2	b/w NIR	E2V EV76C661								
MQ013MG-ON	b/w	Onsemi VITA1300	1280x1024 1.3 MP	4.8	10	53	1/2"	6.2 x 5.0 7.9	150	1.4
MQ013CG-ON	Color	Onsemi vna 1300								1.4
MQ022MG-CM	b/w		00404000		10	60 <sup>2)</sup> 2/3"				
MQ022CG-CM	Color	CMOSIS CMV2000	2048x1088 2.2 MP	5.5			11.3 x 6.0 12.8	170	1.8	
MQ022RG-CM	b/w NIR		∠.∠ IVII					12.0		
MQ042MG-CM	b/w									
MQ042CG-CM	Color	CMOSIS CMV4000	2048x2048 4.2 MP	5.5	10	60 <sup>2)</sup>	60 <sup>2)</sup> 1"	11.3 x 11.3 15.9	90	1.8
MQ042RG-CM	b/w NIR		11.2 1411					10.0		

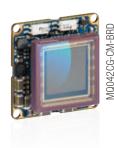
Note 1: Please add "-BRD" in the model name to address the board level cameras

Note 2: HDR mode available

Note 3: RAW, 8 bit, full resolution

#### Interfaces, connectors, environmental:

Description	Value
Optimum ambient temperature	+10 to +25 °C
Ambient temperature operation	-10 to +55 °C (non condensing humidity)
Environment	Ingress Protection IP40
USB3.0 connectors	Standard USB3.0 Micro-B connnector with thumbscrews
I/O & sync connector	Hirose SR38-4R-3S(71) with optional locking nut



#### Compatibility:

Standard Windows, Linux & MacOS operation systems • GenlCam / GenTL • Single SDK/API for all XIMEA camera models.

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#### Contact:

Please visit **ximea.com** for complete product information.

E-mail our sales team at **sales@ximea.com** for your price and further information.



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# USB3 High-end CCD camera series



single board design • USB3.0 bus powered • fastest multi-tap readout





#### xiD - series camera specifications

**xiD** is an ultra-compact USB3.0 camera family using the most recent CCD sensors for industrial and scientific purposes with outstanding features:

- ultra-low read-out noise, clear 14 bits/pixel images in all modes
- partial readout and several binning modes with enhanced sensitivity and highest frame rates
- board level cameras available

#### Sensors and models:

Model 1)	Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB] <sup>2)</sup>	FWC [e-]	Sensor size [mm]	Diagonal [mm]	Power [W]	FPS 3)
MD028xU-SY	SONY ICX674	1934 x 1456, 2.8 MP	4.54	8,10,12,14	71.1	20000	8.8 x 6.6	11	3.6 W	56.9
MD061xU-SY	SONY ICX694	2754 x 2204, 6.1 MP	4.54	8,10,12,14	71.8	19500	12.5 x 10.0	16	3.9 W	28.4
MD091xU-SY	SONY ICX814	3384 x 2708, 9.1 MP	3.69	8,10,12,14	68.4	12000	12.5 x 10.0	16	4.2 W	19.5
MD120xU-SY	SONY ICX834	4242 x 2830, 12.0 MP	3.1	8,10,12,14	63.1	10000	13.2 x 8.8	15.8	4.5 W	15.3

**Note 1:** various models available: x = C color, M mono

Note 2: 26 MHz readout frequency

Note 3: 52 MHz, 4 taps, RAW14 bits; + 20% in overclocked mode, 12bit packed

- Sony "EXview HAD CCD II" pixel technology with improved light efficiency for the near-infrared spectrum.
- XIMEA's proprietary CLEANPATH readout and sensor driving circuitry, enabling scientific imaging with extremely low readout noise and high fidelity in color reproduction.
- Global shutter CCD with interline transfer 1, 2 or 4 tap readout with 14 bit ADC
- No selected grades all cameras are scientific grade

#### Compatibility:

Standard **Windows, Linux & MacOS** operation systems • USB3.0 • GenICam / GenTL • Single SDK/API for all XIMEA camera models. Compatible with the widest range of vision libraries. Please check website for up-to-date list!





MathWorks™













































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# Subminiature USB2 cameras

smallest industrial grade camera • lowest power consumption • 5 Mpix



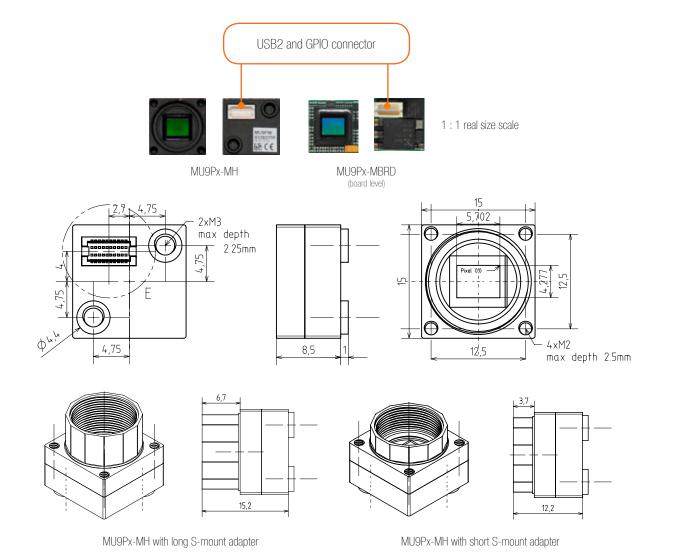


# xiMU - quick facts

**xiMU** [ksi-mju: or sai-mju:] is a subminiature USB 2.0, triggerable, fully industrial grade camera family with outstanding features:

- Incredibly small: World smallest USB camera with GenlCam/GenTL support.
- Low thermal dissipation
- Single PCB, board level version available

Sensor Technology	CMOS, rolling shutter with Global Reset Release
Acquisition Modes	Continuous, software trigger, hardware trigger
Partial Image Readout	ROI, Skipping and Binning modes supported
Image data formats	8, 10 or 12 bit RAW pixel data
Color image processing	Host based de-Bayering, sharpening, Gamma, color matrix
Hot/blemish pixels correction	On camera storage of pixel coordinates, host assisted correction
Auto adjustments	Auto white balance, auto gain, auto exposure
Flat field corrections	Host assisted pixel level shading
General Purpose I/O	4x I/O lines (bidirectional)
Synchronization	Hardware trigger input, software trigger, exposure strobe output, busy output
Housing and lens mount	Standard S-mount (M12). Two lens mount adapters available
Power requirements	Typ. 0.6 W, supplied via USB 2.0 interface
Operating systems	Windows, Linux Ubuntu, MacOS (>10.8)
Software support	xiAPI SDK, adapters and drivers for various image processing packages
USB standard compatible	USB 2.0, Universal Serial Bus Specification



### xiMU - leading vision libraries supported

- Quick integration with third-party software using our easy-to-learn API/SDK and many examples made for AQSENSE SAL3D, Open CV, Aforge.NET, etc.
- All XIMEA cameras are plug-and-play compatible with most of the major image processing libraries on the market, including MVTec HALCON, National Instruments LabVIEW, MathWorks MATLAB, STEMMER IMAGING Common Vision Blox, OpenCV and many others.
- Support for GenlCam/GenTL ensures forward compatibility with emerging image processing libraries, frameworks and packages.
- One-stop support of the camera and vision libraries integration.
- Open online community: Share experience, exchange knowledge and solutions at www.ximea.com/community.

#### Compatible with more than 30 popular machine vision libraries:

Please checke webstie for up-to-date list:



























































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# xiMU - series camera specifications

Sensors and models:

Model		Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB]	optical size	Sensor size/ diagonal [mm]	max. power consumption
MU9PM-MH 1)	b/w	Aptina MT9P031	2592 x 1944	2.2	0 10 10	70	1/2.5"	5.7 x 4.3	0.7 W
MU9PC-MH 1)	color	Apuna M19F031	5 MP		8,10,12	70	1/2.5	7.1	0.7 vv

Note 1: Please replace "-MH" with "-MBRD" in the model name to address the board level camera

#### Read out modes:

Standard mode	Binning/skipping	Pixels	FPS
0	1x1	2592 x 1944	5.8
1	2x2 bin	1296 x 972	17
2	4x4 bin	648 x 486	36
3	2x2 skip	1296 x 972	22
4	4x4 skip	648 x 486	83
5	6x6 skip	430 x 324	163
6	7x7 skip	368 x 376	200
7	7x7 skip/clip	320 x 240	232

### Interfaces, connectors, environmental:

Description	Value
Optimum ambient temperature	+10 to +25 °C
Ambient temperature operation	-10 to +55 °C (non condensing humidity)
Environment	Ingress Protection IP40
Size, Weight	MU9Px-MH: Height * width * depth : 15 x 15 x 8.5 mm, 3.4 g
	MU9Px-MBRD: Height * width * depth : 14 x 13.2 x 5.5 mm (with connector), 1.2 g
Connector mounted on the PCB	HRS DF12E(3.5)-20DP micro connector with USB 2.0 High-speed and digital I/O

#### Accessories:

Illustration	Description	Item-P/N
CAUPUP CONTRACTOR	Mini-USB Extension Board for MU9Px-MH	MU-MINIUSB

#### Compatibility:

Standard Windows, Linux & MacOS operation systems • GenICam / GenTL • Single SDK/API for all XIMEA camera models.

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# High-speed PCle cameras



fastest image transfer • high resolution • no frame grabber required





#### xiB - series camera specifications

**xiB** is a compact camera using the most recent high resolution CMOS sensors with outstanding features:

- PCle x4 Gen2 interface for direct access to and from the computer memory with up to 20 Gbit / sec
- No frame grabber required
- Most recent high resolution CMOSIS sensors
- Robust PCle and Power/GPIO connectors, slim design
- Integrated Canon EF lens interface for control of dynamic aperture and focus.
- Windows and Linux support with DMA (direct memory access) image data transfer
- Compact housing: 60 x 60 x 38 mm

#### Sensors and models:

Model 1)	Sensor	Resolution	Pixel size [um]	ADC [bits]	DR [dB]	FWC [e-]	Diagonal [mm]	Power [W]	FPS <sup>2)</sup>
CB120xG-CM	CMOSIS CMV12000	4096 x 3072, 12 MP	5.5	8,10,12	60	13500	28	6.5	100
CB200xG-CM	CMOSIS CMV20000	5120 x 3840, 20 MP	6.4	12	66	15000	41	6	32

**Note 1:** various models available: x = C for color, M for monochrome

Note 2: RAW, 12 bit, full resolution

#### Compatibility:

Standard **Windows and Linux** operation systems • GenICam / GenTL • Single SDK/API for all XIMEA camera models. Compatible with the widest range of vision libraries. Please check website for up-to-date list!



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2102 Beech Court Golden, CO 80401 USA info@ximea.com Tel: +1 (303) 389-9838 Fax: +1 (303) 202-6350 outstanding performance for scientific purposes • minimal size



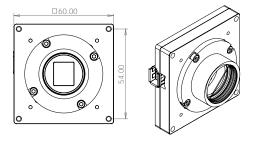


# xiCe, xiRAY - quick facts

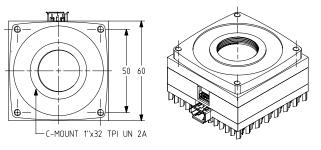
**xiCe and xiRAY** are ultra-compact camera families for scientific and special industrial purposes with outstanding specifications and extra features:

- ultra-low read-out noise, clear 14 bits/pixel images in all modes
- partial readout and several binning modes with enhanced sensitivity and higher frame rates
- TEC Peltier cooled versions and board level versions of cameras are available

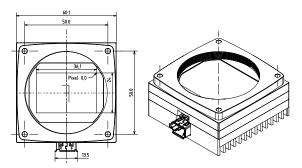
Sensor technology	CCD
Small	Fits into places where no other similar grade of camera can fit
Robust	Full metal housing, no sheet metal covers
Connectivity	Programmable input and output
Compatibility	Support for Windows and Linux, various Image Processing Libraries
Software interfaces	GenlCam / GenTL and highly optimized xiAPI SDK
Economical	Excellent value and price, low TCO and fast ROI
Auto adjustments	Auto white balance, auto gain, auto exposure
System integration	Single board design, perfect for OEM integration



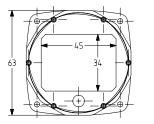
MR285 uncooled - standard housing



MR4021/MR4022 uncooled - standard housing



MR11002/MR16000 uncooled - standard housing





xiCOOL, xiRAY - standard cooled housing

#### Details X-ray cameras, xiRAY models:

	Magnification	1:1	Fiber center to center distance	6 μm
Fiber optics	Field of view	36 x 24 mm	FO plate thickness	5 mm
	Radiation hardened	yes	Extra-Mural Absorption	Enhanced Statistical
Scintillator	Phosphor composition	P43, Gd2O2S:Tb	Thickness	~22 µm
	Energy range	Min: 5 KeV, Max 100 KeV		
Cooling system	Туре	TEC Peltier cooler	Dissipation	Heatsink, optional fan
	Temperature	+12°C	Power supply / Control	Internal
Dhysical	Dimensions	63 x 63 x 63mm	Operating Temperature	-5+50°C
Physical	Power consumption	6W max		

# xiCe, xiRAY - leading vision libraries supported

- Quick integration with third-party software using our easy-to-learn API/SDK and many examples made for AQSENSE SAL3D, Open CV, Aforge.NET, etc.
- All XIMEA cameras are plug-and-play compatible with most of the major image processing libraries on the market, including MVTec HALCON, National Instruments LabVIEW, MathWorks MATLAB, STEMMER IMAGING Common Vision Blox, OpenCV and many others.
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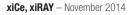






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## xiCe, xiRAY - series camera specifications

#### MR, Sensors and models, optional Peltier cooled:

Model 1)	Cooled		Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB]	Sensor size	FPS <sup>2)</sup>
MR285MU-BH	MR285MC-BH	b/w	SONY ICX285	1376 x 1032 1.4 MP	6.45	8,10,12,14	70	10.2 x 8.3 mm 2/3"	15
MR285CU-BH	MR285CC-BH	color	30111 10/203						10
MR4021MU-BH	MR4021MC-BH	b/w	Truesense KAI-4021	2048 x 2048	7.4	8,10,12,14	70	15.2 x 15.2 mm 1"	5.5
MR4021CU-BH	MR4021CC-BH	color	Truesense NAI-402 i	4.2 MP					
MR4022MU-BH	MR4022MC-BH	b/w	Truesense KAI-04022	2048 x 2048 4.2 MP	7.4	8,10,12,14	75	15.2 x 15.2 mm 1"	5.5
MR4022CU-BH	MR4022CC-BH	color	Trueserise NAI-04022						
MR11002MU-BH	-	b/w	Truncana I/AI 11000	uesense KAI-11002 4008 x 2672 11 MP	9.0	8,10,12,14	70	36.1 x 24.0 mm	2.1
MR11002CU-BH	-	color	Truesense NAI-TTUUZ						
MR16000MU-BH	-	b/w	Truesense KAI-16000	4872 x 3248 16 MP	7.4	0.10.10.14	70	001040	1.4
MR16000CU-BH	-	color	Truesense NAI-10000		7.4	8,10,12,14	//	36.1 x 24.0 mm	1.4

Note 1: Please replace "-BH" with "-BRD" for board level cameras; not applicable for cooled models and MR402x

Note 2: RAW, 14 bit, full resolution

### xiCOOL, Sensors and models, Peltier cooled:

Model		Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB]	Sensor size	FPS 1)
MH110MC-KK	b/w	Truesense KAI-11002	4008 x 2672, 11 MP	9.0 µm	8,10,12,14	70	36.1 x 24.0 mm	2.1
MH110CC-KK	color	Truesense NAI-TTUUZ						
MH160MC-KK	b/w	Truesense KAI-16000	4872 x 3248	7.4 um	8.10.12.14	70	36.1 x 24.0 mm	1.4
MH160CC-KK	color	Truesense Mai-Toudu	16 MP	7.4 μπ	0,10,12,14	70	30.1 X 24.0 IIIIII	1.4

Note 1: RAW, 14 bit, full resolution

### xiRAY, Sensors and models, fiber optics coupled, Peltier cooled:

Model		Sensor	Resolution	Pixel size [µm]	ADC [bits]	DR [dB]	Sensor size	FPS 1)
MH110XC-KK	b/w	Truesense KAI-11002	4008 x 2672, 11 MP	9.0 µm	8,10,12,14	70	37,2 x 25.7 mm	2.1
MH160XC-KK	b/w	Truesense KAI-16000	4872 x 3248, 16 MP	7.4 μm	8,10,12,14	70	36.1 x 24.0 mm	1.4

Note 1: RAW, 14 bit, full resolution

### Interfaces, connectors:

Value	Description
Firewire connector	IEEE 1394A
I/O & sync connector	Hirose SR38-4R-3S(71) (MH models only)

#### Compatibility:

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# OEM cameras & custom engineering



cameras for special requirements • minimal size and power consumption





## **OEM & custom engineering** - when mainstream is not enough

Starting from scratch or using any existing XIMEA product as a seed, we provide services all the way up to full custom development and manufacturing.

XIMEA is the leading innovator and producer of digital cameras for industrial and scientific purposes with 20+ years of custom engineering experience, with hundreds of thousands of installed cameras all over the world and at major Fortune 500 companies.

- Proprietary technology for CCD sensor handling and cooling provides low noise readout and reduced power consumption.
- Ultra-low noise signal conditioning and acquisition.
- Single board hardware development, minimal size and power consumption.
- Variety of communication technologies: USB 2.0, USB 3.0, FireWire IEEE1394, Ethernet, CameraLink, PCle x4 / x8
- Hardware, FPGA, firmware and software co-development, multi-platform software development, maintenance and support.
- Assortment of state of the art CAE and CAD tools on regular maintenance.
- Leading edge measuring and test instruments.
- Ultra-High Vacuum equipment and technologies, ultra precision machining. All in-house.
- Guaranteed success.

#### Compatibility:

Standard **Windows**, **Linux & MacOS** (USB2 and USB3) operation systems • USB3.0 • GenlCam / GenTL • Single SDK/API for all XIMEA camera models. Compatible with the widest range of vision libraries. Please check website for up-to-date list!



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