

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The *Iron 2020BSI* is a high speed, low-cost, low-power rolling shutter CMOS camera with up to 12.5 Gbps CoaXPress 2.0 interface (Micro-BNC connector) which supports 4 MP high quality video at rates of up to 74fps.

Intelligent Design

The GSENSE2020BSI is a rolling shutter sensor with a 6.5µm pixel size. With a compact outline the camera can be fitted into tight spaces. Superior sensor performance and non-standard UV sensitivity allow excellent low-light vision capabilities.

Applications:

- Perimeter vision
- Low light surveillance
- Special Effects
- Virtual Reality

Key Features:

- 4 Megapixel up to 74 fps
- Up to 4W power at full rate
- UV light sensitivity
- Full image processing feature set
- Up to 12.5 Gbps CoaXPress interface
- C / CS / EF lens mounts available
- Full EMVA1288 report
- Full built-in self-test (BIT)
- Full built-in voltage testing
- Customization as per user requirements

Datasheet | Iron CoaXPress 2020BSI-UV

Technical Data

Poot size Nesculation 6.5 µm x 6.5 µm Resculation 2046 (Hy x 2048 (V) Sensor Size 13.3 mm x 13.3 mm x 13.3 mm 1.2" Sensor Opixal GSENSE2020BSI Video output CoakPress 2.0 µb to 12.5 Gbps (CXP3, CXP6, CXP12) Interface connector Micro-BNC Digitization Dual 11 bit, Dual 12 bit Electronic shutter Rolling shutter with global reset Shutter speed 4.62 µb get1-bit resolution in 6.6 µb steps (up to 16 sec) 8-04 µb @12-bit resolution in 11.2 µb steps (up to 16 sec) 8.04 µb @12-bit resolution in 11.2 µb steps (up to 16 sec) Exposure control Ord fill Internal / Auto Image acquisition Continuous / Triggered Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I ^{cl} Pulse generator / Software (12 µb steps (up to 16 sec) Trigger input I	Feature	Description
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Full well charge 55 ke* Dynamic range 90.5dB Dark Current 42 e* pxl/sec @ 21 °C Signal-to-Noise Ratio (SNR max) 46 dB Quantum Efficiency (QE) X FF <	Subsampling	1 x 2 / 2 x 1 / 2 x 2 (user configurable)
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Signal-to-Noise Ratio (SNR max) 46 dB Quantum Efficiency (QE) X FF <85% @550 nm	Dynamic range	90.5dB
Quantum Efficiency (QE) X FF <85% @550 nm	Dark Current	42 e ⁻ pxl/sec @ 21 °C
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Latency < 100 µs (on top of exposure time) Communication latency Gen <i>Cam - ~5 ms Direct camera access - ~0.5 ms Regulation FCC Part 15 Class A, CE, RoHs2 (official certification optional) • Defect pixel correction • Digital binning (2 x 2) • ROI • Auto Exposure/Gain • Gain (Analog / Digital) - manual / auto • Auto/Manual black level • LUT Pulse generator Yes, Programmable at 8 ns increments Additional features • Over/under voltage protection • Three points of temperature sensing • Reverse voltage polarity protection • Frame-by-frame shutter speed change</i>	Quantum Efficiency (QE) X FF	<85% @550 nm
Communication latency Gen <i>Cam - ~5 ms Direct camera access - ~0.5 ms FCC Part 15 Class A, CE, RoHs2 (official certification optional) Defect pixel correction Digital binning (2 x 2) ROI Auto Exposure/Gain Gain (Analog / Digital) - manual / auto Auto/Manual black level LUT Pulse generator Yes, Programmable at 8 ns increments Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change</i>	Temporal Noise	1.6 e ⁻ or 1.2 e ⁻ with reduced dynamic range
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 Digital binning (2 x 2) ROI Auto Exposure/Gain Gain (Analog / Digital) – manual / auto Auto/Manual black level LUT Pulse generator Yes, Programmable at 8 ns increments Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change 	Regulation	FCC Part 15 Class A, CE, RoHs2 (official certification optional)
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 Auto Exposure/Gain Gain (Analog / Digital) – manual / auto Auto/Manual black level LUT Pulse generator Yes, Programmable at 8 ns increments Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change 		Digital binning (2 x 2)
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 Auto/Manual black level LUT Pulse generator Yes, Programmable at 8 ns increments Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change 		 Auto Exposure/Gain
Pulse generator Yes, Programmable at 8 ns increments Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change		Gain (Analog / Digital) – manual / auto
Pulse generator Yes, Programmable at 8 ns increments Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change		 Auto/Manual black level
Additional features Over/under voltage protection Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change		■ LUT
 Three points of temperature sensing Reverse voltage polarity protection Frame-by-frame shutter speed change 	Pulse generator	Yes, Programmable at 8 ns increments
 Reverse voltage polarity protection Frame-by-frame shutter speed change 	Additional features	 Over/under voltage protection
■ Frame-by-frame shutter speed change		
GPIO connection Two inputs, two outputs, external trigger & strobe controller		
	GPIO connection	Two inputs, two outputs, external trigger & strobe controller

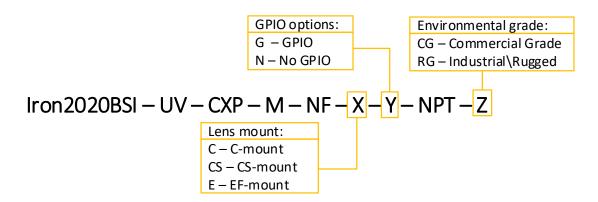
Mechanical & Electrical

Feature	Description
Dimensions	44 mm x 44 mm x 53 mm (Height x Width x Depth)
Lens mount	C-mount, CS-mount, EF-mount
Weight (without lens)	<100g
Typical current	170mA @ 24V
Power consumption	<4W @ 24V DC
Mount	Front mount
Sensor Mechanical Positioning	≤ 0.15°
Operating temperature	-40°C to 80°C, 10-90% humidity (non-condensing)
Storage temperature	-40°C to 85°C, 10-90% humidity (non-condensing)
Shock/Vibration	MIL 810F

^{1.} The output is synchronized to the trigger on a frame by frame basis

Ordering Information

KAYA's Part Numbers are intuitive and derived directly from the product's properties. Each index represents a different property of the camera, according to the following diagram:



For example: an Iron 2020BSI-UV with a C-mount and GPIO that is rated for industrial use would go by Iron2020BSI-UV-CXP-M-NF-C-G-NPT-RG. It is also possible to buy peripheral equipment in addition to the camera as listed in the following table:

Product Name	Product Part Number
Cable, 12P Hirose connector (f)	KY-CBL-006

Please contact a sales representative over at info@kayainstruments.com for a full list of peripherals including cables and frame grabbers.

^{*} Performance is measured at full resolution, maximum bitness and the maximum frame rate for that bitness

^{**} KAYA Instruments reserves the right to update the data sheet from time to time without prior notice.

General Purpose Input Output

GPIO Pinout - 12 Pin Hirose Connector

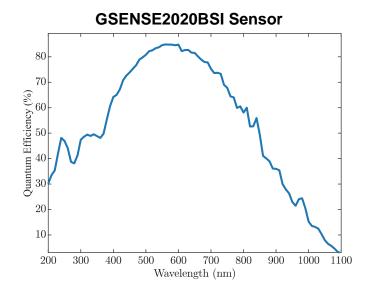


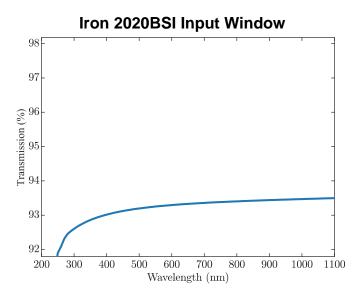
- 1. DC Power return
- 2. DC Power
- 3. RS232 RX
- 4. RS232 TX
- 5. OUT2 Return (OPTO)
- 6. RS232 Return
- 7. OUT1 (TTL)
- 8. IN1 (TTL)
- 9. IN2 (LVTTL)
- 10. IN1/OUT1 Return11. IN2 Return (LVTTL)
- 12. OUT2 (OPTO)

The GPIO connector used on the camera is a 12 pin male Hirose connector. It is recommended to use a cable with a matching Hirose 12 pin female connector. Hirose's manufacturer's part number is listed below:

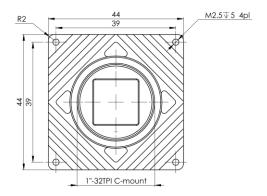
Product Name	Product Part Number	
Hirose 12P connector, male	HR10A-10R-12PB	
Hirose 12P connector, female	HR10A-10P-12S	

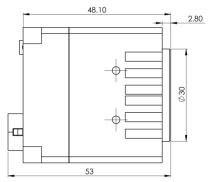
Absolute Quantum Efficiency

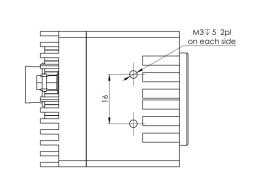




Mechanical Drawings







Compatibility

KAYA Instruments creates and maintains compatibility and interfaces for the most common and advanced vision image processing libraries and applications.

Major support is available for MVTec Halcon, National Instruments' LabVIEW and MathWorks' MATLAB.

Supported vision standards:



Supported vision libraries:











Supported operating systems:





Please check our website for an up-to-date list of other supported libraries and software package

Contact Us

Please feel free to contact our team with any question or further inquiry at info@kayainstruments.com - we will be happy to provide assistance and consultation.

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