

## Iron2020BSI-UV CoaXPress

# Iron CoaXPress Small Form Factor, Ruggedized Camera

### Innovative Approach

The *Iron2020BSI-UV* is a high speed, low-cost, low-power rolling shutter CMOS camera with up to 12.5 Gbps CoaXPress v2.1 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

## Technical Data

Feature	Description
Pixel size	6.5 $\mu\text{m}$ x 6.5 $\mu\text{m}$
Resolution	2048 (H) x 2048 (V)
Sensor size	13.3 mm x 13.3 mm   1.2"
Sensor	Gpixel GSENSE2020BSI
Video output	CoaXPress v2.1 up 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 $\mu\text{s}$ @ 11-bit resolution in 6.6 $\mu\text{s}$ steps (up to 16 sec) 8.04 $\mu\text{s}$ @ 12-bit resolution in 11.2 $\mu\text{s}$ steps (up to 16 sec)
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input <sup>[1]</sup>	Pulse generator / Software (12 $\mu\text{s}$ latency, 8 ns jitter)
Triger mode	Free run / Internal
Trigger options	Edge
Output resolution	16bits HDR in API or 24bit RAW (2x 11 or 12 bit ADC)
Frame rate	74 fps @ 11 bit 43 fps @ 12 bit
Subsampling	1 x 2 / 2 x 1 / 2 x 2 (user configurable)
Monochrome/ color	Monochrome
Full well charge	55 ke <sup>-</sup>
Dynamic range	90.5dB
Dark Current	42 e <sup>-</sup> pxl/sec @ 21 °C
Signal-to-Noise Ratio (SNR max)	46 dB
Quantum Efficiency (QE) X FF	<85% @550 nm
Temporal Noise	1.6 e <sup>-</sup> or 1.2 e <sup>-</sup> with reduced dynamic range
Latency	< 100 $\mu\text{s}$ (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) <ul style="list-style-type: none"> <li>▪ Defect pixel correction</li> <li>▪ Digital binning (2 x 2)</li> <li>▪ ROI</li> <li>▪ Auto Exposure/Gain</li> <li>▪ Gain (Analog / Digital) – manual / auto</li> <li>▪ Auto/Manual black level</li> <li>▪ LUT</li> </ul>
Pulse generator	Yes, Programmable at 8 ns increments
Additional features	<ul style="list-style-type: none"> <li>▪ Over/under voltage protection</li> <li>▪ Three points of temperature sensing</li> <li>▪ Reverse voltage polarity protection</li> <li>▪ Frame-by-frame shutter speed change</li> </ul>
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

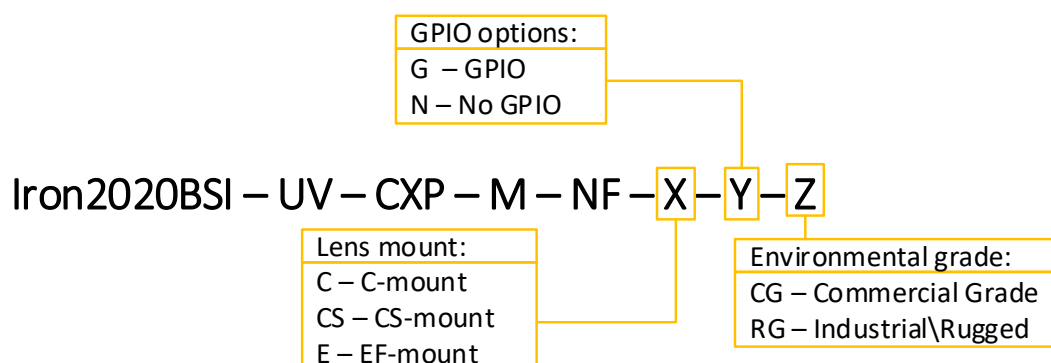
1. The output is synchronized to the trigger on a frame by frame basis

\* 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.

## 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:



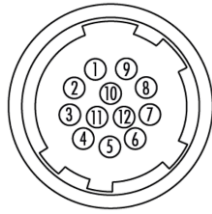
For example: an Iron 2020BSI-UV with a C-mount and GPIO that is rated for industrial use would go by Iron2020BSI-UV-CXP-M-NF-C-G-RG. It is also possible to buy peripheral equipment in addition to the camera as listed in the following table:

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

Please contact a sales representative over at [info@skyblue.de](mailto:info@skyblue.de) for a full list of peripherals including cables and frame grabbers.

# General Purpose Input Output

## GPIO Pinout – 12 Pin Hirose Connector



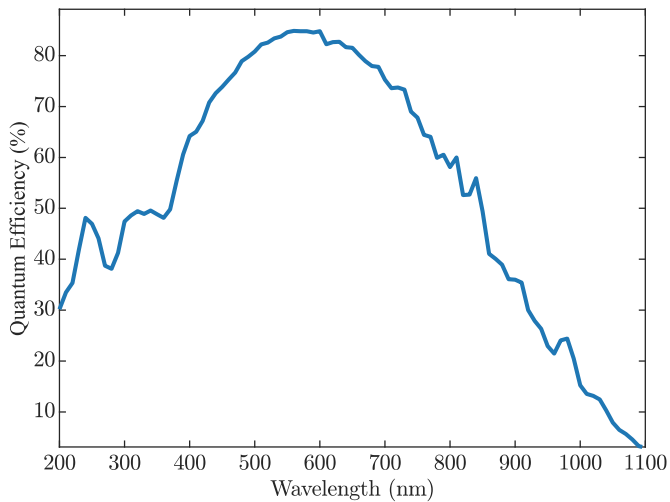
- |                       |                         |
|-----------------------|-------------------------|
| 1. DC Power return    | 7. OUT1 (TTL)           |
| 2. DC Power           | 8. IN1 (TTL)            |
| 3. RS232 RX           | 9. IN2 (LVTTTL)         |
| 4. RS232 TX           | 10. IN1/OUT1 Return     |
| 5. OUT2 Return (OPTO) | 11. IN2 Return (LVTTTL) |
| 6. RS232 Return       | 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:

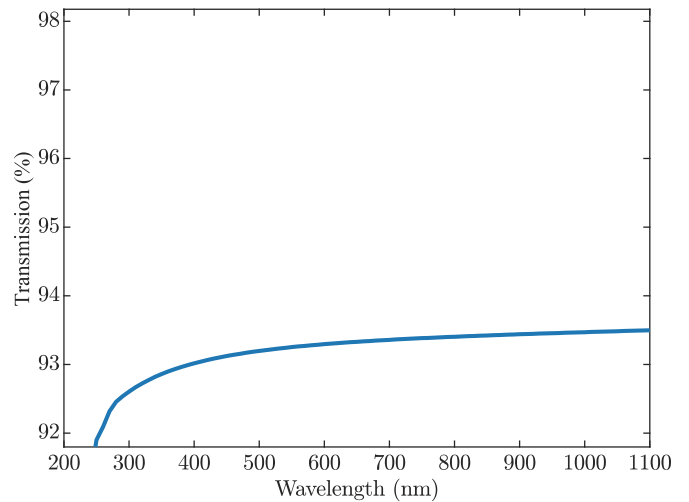
Product Name	Product Part Number
Hirose 12P connector, male	HR10A-10R-12PB
Hirose 12P connector, female	HR10A-10P-12S

## Absolute Quantum Efficiency

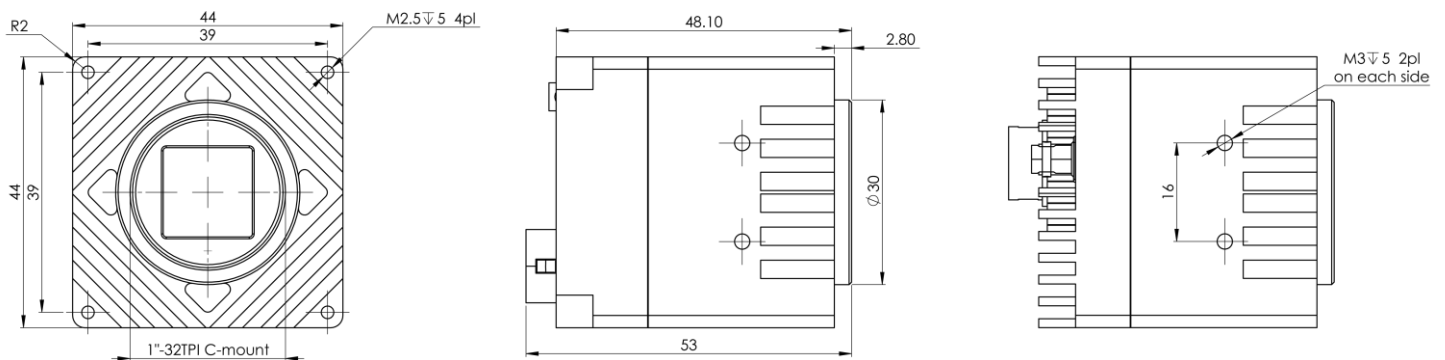
**GSENSE2020BSI Sensor**



**Iron 2020BSI Input Window**



## 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@skyblue.de](mailto:info@skyblue.de) – we will be happy to provide assistance and consultation.



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