

Iron2020BSI CoF

4.2 Megapixel, Small, Rugged, Low Power with Large Feature Set

Innovative Approach

Iron2020BSI CoF is an ultra-thin high speed, low-cost, low-power Rolling shutter CMOS camera with a SFP+ interface which supports 4.2 Megapixel high quality video at rates up to 74.0 fps.

Intelligent Design

With an extremely compact form factor, the **Iron2020BSI CoF** fits into small spaces. The superior sensor performance provides high quality images with great dynamic range, low noise and excellent low-light vision capabilities.

Key Features:

- 4.2 Megapixel up to 74.0 fps
- Monochrome and UV Enhanced sensor variation
- Up to 4 W power at full rate
- Full image processing feature set
- CoaXPress-over-Fiber (CoF) v2.1 standard compliant
- Gen<i>Cam compliant
- 1 CoaXPress-over-Fiber (CoF) link
- C or CS lens mounts available
- Commercial and Industrial grade options
- Full EMVA1288 report
- Full built-in self-test (BIT)
- Full built-in voltage testing
- Customization as per user requirements

Applications:

- Perimeter vision
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

TECHNICAL DATA

| Pixel Size 6.5 μm x 6.5 μm Resolution 2048 (H) x 2048 (V) Sensor Size 18.8 mm diagonal Sensor Opport Gpixel GSENSE2020BSI Sensor Type CMOS Output Interface CoaXPress-over-Fiber (CoF) v2.1 Supported Interface rates 10G Interface Connector SFP+ Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution • 1 Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen<⇒Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (OE) >95% at 550 nm Shortest Exposure 4.62 μs IR Filter (optional) - | General | |
|--|---------------------------------|---|
| Sensor Size 18.8 mm diagonal Sensor Gpixel GSENSE2020BSI Sensor Type CMOS Output Interface CoaXPress-over-Fiber (CoF) v2.1 Supported Interface rates 10G Interface Connector SFP+ Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen <i>Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Shortest Exposure 4.62 µs IR Filtr (optional) - Exposure control Automatic/Manual Color Control PigB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto Manual black level • Binning • Firam counter • Auto Fixed pattern noise correction • Firam counter • Defect pixel or rection • Gain (Analog / Digital) • Firam counter • Firam counter • Binning • Firam counter • Deperational Time Counter • Binning • Firam counter • Operational Time Counter • Binning </i> | Pixel Size | 6.5 μm x 6.5 μm |
| Sensor Type CMOS Output Interface CoaxPress-over-Fiber (CoF) v2.1 Supported Interface rates 10G Interface Connector SFP+ Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen- <i>Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise < 1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control + Roll of Sets + Auto / Manual White balance + LUT Image enhancement - Defect pixel correction + Gain (Analog / Pigital) + Auto / Manual black level + Binning + Frame counter + Operational Time Counter + Binning + Frame counter + Operational Time Counter + Binning + Frame counter + Operational Time Counter + Binning + Frame counter + Operational Time Counter + Binning + Control + Control</i> | Resolution | 2048 (H) x 2048 (V) |
| Sensor Type CMOS Output Interface CoaXPress-over-Fiber (CoF) v2.1 Supported Interface rates 10G Interface Connector SFP+ Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen-ci-Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25°C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control •RGB offests •Auto / Manual White balance •LUT Image enhancement •Defect pixel correction •Gain (Analog / Digital) •Auto / Manual black level •Binning •Auto Exposure / Gain • Flat field / Fixed pattern noise correction •Additional on camera processing •ROI | Sensor Size | 18.8 mm diagonal |
| Output Interface Supported Interface rates 10G Interface Connector SFP+ Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen-⟨□>Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced - 1.9 e- at 25°C Full Well Charge Dynamic Range Signal-to-Noise Ratio (SNR max) Quantum Efficiency (QE) Shortest Exposure 4.62 μs IR Filter (optional) Exposure control Automatic/Manual Color Control P Gel offsets - Auto / Manual White balance - LUT Image enhancement Additional on camera processing FROI Image flip - Frame counter - Operational Time Counter - Binning - Image flip - Frame counter - Operational Time Counter - Binning | Sensor | Gpixel GSENSE2020BSI |
| Supported Interface rates 10G Interface Connector | Sensor Type | CMOS |
| Interface Connector Number of Connectors 1 Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution Tap Geometry 1X-1Y Image Acquisition Camera Control Gen-ci>Cam Electronic Shutter Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) Quantum Efficiency (QE) Sp5% at 550 nm Quantum Efficiency (QE) Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Color Control PAGB offsets - Auto / Manual White balance - LUT Image enhancement PAGB offsets - Auto / Manual White balance - LUT Image enhancement Additional on camera processing PAGI - Frame counter - Derect power counter - Derect power ocurrection - Gain (Analog / Digital) - Auto / Manual black level - Elinning - Auto Exposure / Gain - Flat field / Fixed pattern noise correction - Image flip - Frame counter - Operational Time Counter | Output Interface | CoaXPress-over-Fiber (CoF) v2.1 |
| Number of Connectors Output Resolution 11 or 12 bit Maximum Frame Rate 74 fps @11 bit resolution 43 fps @12 bit resolution 1x-1Y Image Acquisition Continuous / Triggered Camera Control Gen <i>>Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced 1</i> | Supported Interface rates | 10G |
| Output Resolution 11 or 12 bit Maximum Frame Rate • 74 fps @11 bit resolution • 43 fps @12 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen<⇒Cam | Interface Connector | SFP+ |
| Maximum Frame Rate • 74 fps @11 bit resolution Tap Geometry 1X-1Y Image Acquisition Continuous / Triggered Camera Control Gen < i>→ Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise < 1.9 e - at 25 °C | Number of Connectors | 1 |
| 1x-1Y Image Acquisition Continuous / Triggered Camera Control Gen <i>Scam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Quantum Efficiency (QE) Shortest Exposure 4.62 μs IR Filter (optional) Exposure control Automatic/Manual Color Control P GBB offsets - Auto / Manual White balance - LUT Image enhancement Additional on camera processing Additional on camera processing Additional Time Counter - Sinning - Counter - Coperational Time Counter - Binning - Counter - Coperational Time Counter - Binning - Counter - Coperational Time Counter - Binning - Counter - Coperational Time Counter - Coperational Time Counter - Coperational Time Counter - Binning</i> | Output Resolution | 11 or 12 bit |
| Image Acquisition Continuous / Triggered Camera Control Gen <i>>Cam Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 ℃</i> | Maximum Frame Rate | |
| Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) Quantum Efficiency (QE) Shortest Exposure 4.62 µs IR Filter (optional) Exposure control Automatic/Manual Gain control Color Control Image enhancement Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction Additional on camera processing ROI Image flip Frame counter Operational Time Counter Binning Counter Operational Time Counter Binning Counter | Tap Geometry | 1X-1Y |
| Electronic Shutter Rolling Monochrome / Color Monochrome or UV Enhanced Temporal Noise <1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control • RGB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto Exposure / Gain • Flat field / Fixed pattern noise correction Additional on camera processing • ROI • Image flip • Frame counter • Operational Time Counter • Binning | Image Acquisition | Continuous / Triggered |
| Monochrome / Color Temporal Noise 1.9 e- at 25 °C Full Well Charge 54000 e- Dynamic Range \$88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) \$95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Color Control PRGB offsets Auto / Manual White balance LUT Image enhancement Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction ROI Image flip Frame counter Operational Time Counter Binning Frame Counter Binning Auto Counter Operational Time Counter Binning Auto Counter Binning Automatic/Manual Automatic/M | Camera Control | Gen <i>Cam</i> |
| Temporal Noise <1.9 e- at 25 ℃ Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 μs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control Panton Pant | Electronic Shutter | Rolling |
| Full Well Charge 54000 e- Dynamic Range >88 dB at 550 nm Signal-to-Noise Ratio (SNR max) 46 dB at 550 nm Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control Page enhancement Page enhancement Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction Additional on camera processing ROI Additional Time Counter Operational Time Counter Binning | Monochrome / Color | Monochrome or UV Enhanced |
| Dynamic Range >88 dB at 550 nm | Temporal Noise | <1.9 e- at 25 ℃ |
| Signal-to-Noise Ratio (SNR max) Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 µs IR Filter (optional) Exposure control Automatic/Manual Gain control Color Control PRGB offsets Auto / Manual White balance LUT Image enhancement Defect pixel correction Gain (Analog / Digital) Auto Exposure / Gain Flat field / Fixed pattern noise correction ROI Image flip Frame counter Operational Time Counter Binning | Full Well Charge | 54000 e- |
| Quantum Efficiency (QE) >95% at 550 nm Shortest Exposure 4.62 μs IR Filter (optional) - Exposure control Automatic/Manual Gain control • RGB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto / Manual black level • Binning • Auto Exposure / Gain • Flat field / Fixed pattern noise correction Additional on camera processing • ROI • Image flip • Frame counter • Operational Time Counter • Binning | Dynamic Range | >88 dB at 550 nm |
| Shortest Exposure 4.62 µs IR Filter (optional) - Exposure control Automatic/Manual Gain control Automatic/Manual Color Control • RGB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto / Manual black level • Binning • Auto Exposure / Gain • Flat field / Fixed pattern noise correction Additional on camera processing • ROI • Image flip • Frame counter • Operational Time Counter • Binning | Signal-to-Noise Ratio (SNR max) | 46 dB at 550 nm |
| IR Filter (optional) Exposure control Automatic/Manual Gain control Automatic/Manual Color Control • RGB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto / Manual black level • Binning • Auto Exposure / Gain • Flat field / Fixed pattern noise correction Additional on camera processing • ROI • Image flip • Frame counter • Operational Time Counter • Binning | Quantum Efficiency (QE) | >95% at 550 nm |
| Exposure control Gain control Automatic/Manual Color Control • RGB offsets • Auto / Manual White balance • LUT Image enhancement • Defect pixel correction • Gain (Analog / Digital) • Auto / Manual black level • Binning • Auto Exposure / Gain • Flat field / Fixed pattern noise correction Additional on camera processing • ROI • Image flip • Frame counter • Operational Time Counter • Binning | Shortest Exposure | 4.62 μs |
| Gain control Automatic/Manual PRGB offsets Auto / Manual White balance LUT Image enhancement Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction Additional on camera processing ROI Image flip Frame counter Operational Time Counter Binning | IR Filter (optional) | - |
| Color Control RGB offsets Auto / Manual White balance LUT Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction ROI Image flip Frame counter Operational Time Counter Binning | Exposure control | Automatic/Manual |
| Auto / Manual White balance LUT Image enhancement Defect pixel correction Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction Additional on camera processing ROI Image flip Frame counter Operational Time Counter Binning | Gain control | Automatic/Manual |
| Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain Flat field / Fixed pattern noise correction Additional on camera processing ROI Image flip Frame counter Operational Time Counter Binning | Color Control | Auto / Manual White balance |
| Image flip Frame counter Operational Time Counter Binning | Image enhancement | Gain (Analog / Digital) Auto / Manual black level Binning Auto Exposure / Gain |
| Power Input • External 11 V - 28 V input | Additional on camera processing | Image flipFrame counterOperational Time Counter |
| | Power Input | External 11 V - 28 V input |

| Power Consumption | <4 W at 24 V DC |
|------------------------|----------------------------------|
| Configuration software | Gen <i>Cam Standard software</i> |
| Synchronization | Protocol/External I/O Trigger |
| Exposure Strobe output | Yes |

| General Purpose Inputs and Outputs | |
|------------------------------------|---|
| I/O lines | 1 opto-isolated input 1 opto-isolated output 1 singled-ended TTL output 1 singled-ended TTL/LVTTL input |
| Usage | Any System I/O input lines can be connected to any I/O output line Any I/O input line can generate any trigger event Any I/O input line can trigger a timer Any I/O input line can trigger a counter |
| Electrical specifications | TTL lines: 5 V TTL compliant LVTTL lines: 3.3 V LVTTL compliant Isolated lines: opto-isolated lines with voltage range up to 30 V |
| Timers | 4 general purpose timersConfigurable delay and duration32-bit accumulator |
| Counters | 4 general purpose countersConfigurable value and duration32-bit counter |

| Mechanical | |
|-----------------------------------|--|
| Dimensions (including lens mount) | 44 mm x 44 mm x 90.4 mm (1.7" x 1.7" x 3.6") |
| Weight (without lens) | 233 g (8.2 oz) |
| Lens Mount | C or CS |
| Sensor Alignment | Active |
| Ingress Protection | Optional IP67 (with protective lens tube) |

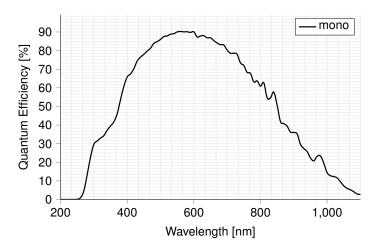
| Environmental Conditions | |
|-----------------------------------|---|
| Operating ambient air temperature | Commercial : 0° C to $+50^{\circ}$ C (32° F to $+122^{\circ}$ F) Industrial : -40.0° C to $+80^{\circ}$ C (-40° F to $+176^{\circ}$ F) |
| Operating ambient air humidity | 10% to 90% RH non-condensing |
| Storage ambient air temperature | Commercial : 0 °C to +55 °C (32 °F to +131 °F) Industrial : -40.0 °C to +85 °C (-40 °F to +185 °F) |
| Storage ambient air humidity | 10% to 90% RH non-condensing |
| Operational Shock | Tested per MIL-STD-810G Method 516.6, 3-axis Shock 75G |
| Operational Vibration | Tested per MIL-STD-810G Method 514.6, 3-axis Vibration Category 20 |
| MTBF | 2,100,000 hrs @ 50C (Telecordia) |

| Certifications | |
|---------------------------------|--|
| Electromagnetic - EMC standards | The European Council EMC Directive 2004/108/EC The Unites States FCC rule 47 CFR 15 |
| EMC - Emission | EN 55022:2010 Class BFCC 47 Part 15 Class B |
| EMC - Immunity | EN 55024:2010 Class B EN 61000-4-3 EN 61000-4-4 EN 61000-4-6 |
| Flammability | PCB compliant with UL 94 V-0 |
| RoHS | Compliant with the European Union Directive 2011/65/EU (RoHS2) |
| REACH | Compliant with the European Union Regulation No 1907/2006 |
| WEEE | Must be disposed of separately from normal household waste and must be recycled according to local regulations |

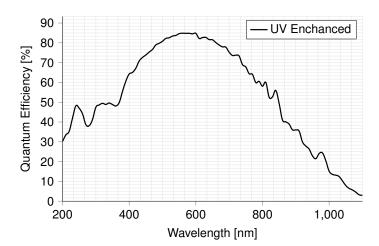


SPECTRAL RESPONSE

Monochrome

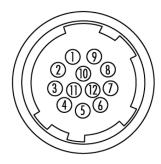


UV Enhanced



GENERAL PURPOSE INPUT OUTPUT

GPIO Pinout - 12 Pin Hirose Connector



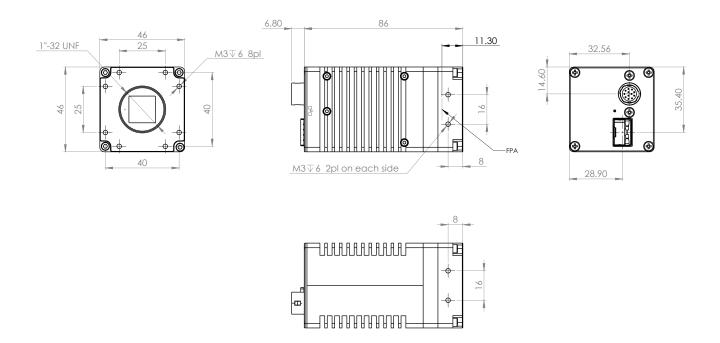
- 1. DC Power return
- 2. DC Power
- 3. RS232 RX
- 4. RS232 TX
- 5. OUT2 Return
- 6. RS232 Return
- 7. OUT1 (TTL)
- 8. IN1 (OPTO)
- 9. IN2 (TTL/LVTTL)
- 10. IN1 Return
- 11. IN2/OUT1 Return
- 12. OUT2 (OPTO)

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 |

MECHANICAL DRAWINGS

C/CS-Mount



Dimensions are in millimeters.

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.

KAYA Instruments

Please feel free to contact our sales team for pricing, availability, documentation or customization at our e-mails - we will be happy to provide assistance and consultation.

Sales Inquiries: info@skyblue.de Technical Support: info@skyblue.de

