

## Iron 2020E

# Iron CoaXPress Small Form Factor, Ruggedized Camera

### Innovative Approach

The **Iron 2020E** is a high speed, low-cost, low-power global/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 220fps.

### Intelligent Design

The GSENSE2020e is a global/rolling shutter sensor with a 6.5 $\mu$ m pixel size. With a compact outline the camera can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities.

### Applications:

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

### Key Features:

- 4 Megapixel up to 220 fps
- Up to 4W power at full rate
- Full image processing feature set
- Optional Pan/Tilt alignment of the sensor
- Up to 12.5 Gbps CoaXPress interface
- C / CS / EF or DC Auto Iris 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 GSENSE2020e
Video output	CoaXPress 2.0 up to 12.5 Gbps (CXP3, CXP6, CXP12)
Interface connector	Micro-BNC
Digitization	10 bit, 12 bit
Electronic shutter	Rolling / Global shutter
Shutter speed	Global: 2.54 $\mu\text{s}$ @12-bit resolution Rolling: 18.4 $\mu\text{s}$ @12-bit resolution
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input <sup>[1]</sup>	External, pulse generator, SW
Triger mode	Free run, externally or internally triggered
Trigger options	Edge, de-bounce
Output resolution	16bits HDR in API or 24bit RAW (2x 10 or 12 bit ADC)
Frame rate	Global: 94 fps in HDR 220 fps @10 bit Rolling: 47 fps in HDR 94 fps @12 bit
Subsampling	1 x 2 / 2 x 1 / 2 x 2 (user configurable)
Monochrome / color	Monochrome
Full well charge	Global HDR: 17.1 ke <sup>-</sup> Rolling HDR: 40 ke <sup>-</sup>
Dynamic range	Global HDR: 63dB Rolling HDR: 78dB
Dark current	17 e <sup>-</sup> pxl/sec @ 21 °C
Quantum efficiency (QE) X FF	<72% @595 nm (according to sensor performance)
Temporal noise	Global HDR: 7.2 e <sup>-</sup> @25C Rolling HDR: 2.6 e <sup>-</sup> @25C
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)
On camera processing	<ul style="list-style-type: none"> <li>▪ Defect pixel correction</li> <li>▪ Digital binning (2 x 2)</li> <li>▪ ROI <sup>[2]</sup></li> <li>▪ Auto Exposure/Gain</li> <li>▪ LUT</li> <li>▪ Gain (Analog / Digital) – manual / auto</li> <li>▪ Auto/Manual black level</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>▪ Per frame ROI change</li> <li>▪ Per-pixel FPN (optional)</li> <li>▪ Multi ROI Support (vertical only. Horizontal at full resolution)</li> <li>▪ Reverse voltage polarity protection</li> <li>▪ Frame-by-frame shutter speed change</li> <li>▪ Global reset</li> </ul>
GPIO connection	Two inputs, two outputs, external trigger & strobe controller

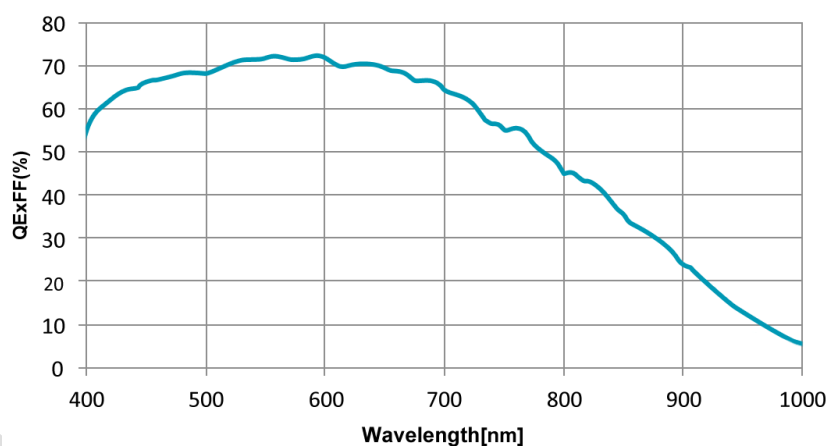
## Mechanical & Electrical

Feature	Description
Dimensions	44 mm x 44 mm x 51.8 mm (Height x Width x Depth)
Lens mount	C-mount, CS-mount, EF-mount or DC Auto Iris lenses
Weight (without lens)	<100g
Typical current	170mA @ 24V
Power consumption	<4W @ 24V DC
Mount	Front mount
Heat dissipation	Front heat dissipation
Sensor Mechanical Positioning	≤ 0.15°
Operating temperature	-40°C to 80°C, 10-90% humidity (non-condensing)
Storage temperature	-40°C to 90°C, 10-90% humidity (non-condensing)
Shock/Vibration	MIL 810F

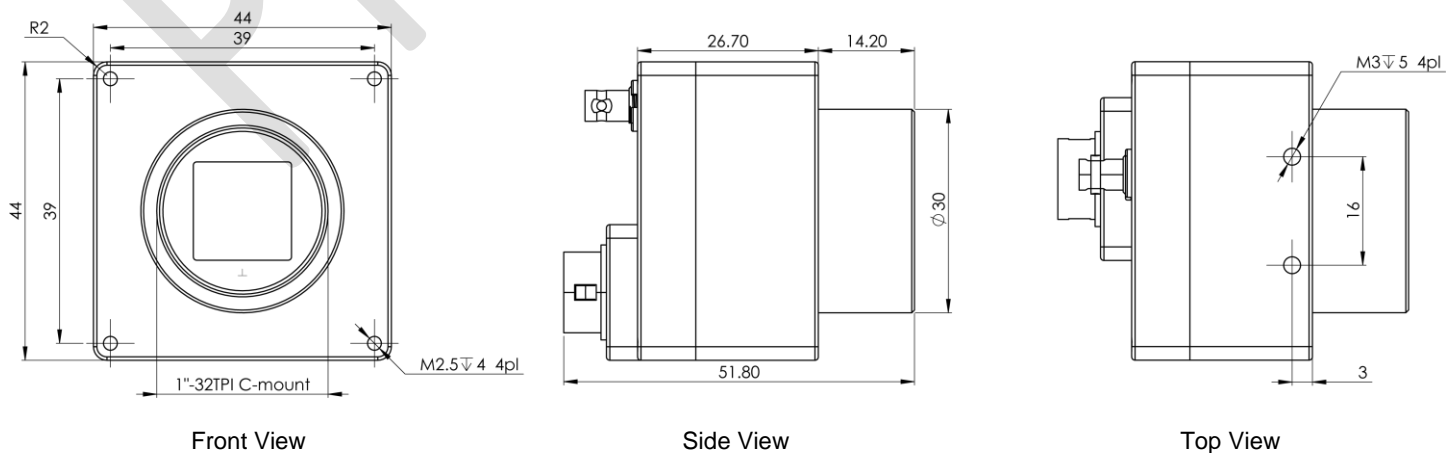
1. The output is synchronized to the trigger on a frame by frame basis
  2. ROI position can change on a frame by frame basis
- \* Performance is measured at full resolution, maximum bitness and the maximum frame rate for that bitness  
 \*\* KAYA Instruments reserves the right to update the data sheet from time to time without prior notice.

## Absolute Quantum Efficiency

### GSENSE2020e Spectral Response

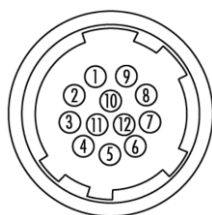


## Mechanical Drawings



# 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 (LVTTL)         |
| 4. RS232 TX           | 10. IN1/OUT1 Return    |
| 5. OUT2 Return (OPTO) | 11. IN2 Return (LVTTL) |
| 6. RS232 Return       | 12. OUT2 (OPTO)        |

## 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

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