



Iron CoaXPress 250

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron CoaXPress 250** is an ultra-thin high speed, low-cost, low-power global shutter CMOS camera with a micro-BNC interface which supports 5.01 MP high quality video at rates up to 155.5 fps.

Intelligent Design

Our camera incorporates Pregius's IMX250 global shutter sensor with a 3.45µm pixel size. With an extremely compact outline and low-key design, the **Iron** can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities.

Applications:

- Perimeter vision
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

Key Features:

- 3.15 Megapixel up to 155.5 fps
- Monochrome and Color models
- Up to 3.2W 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

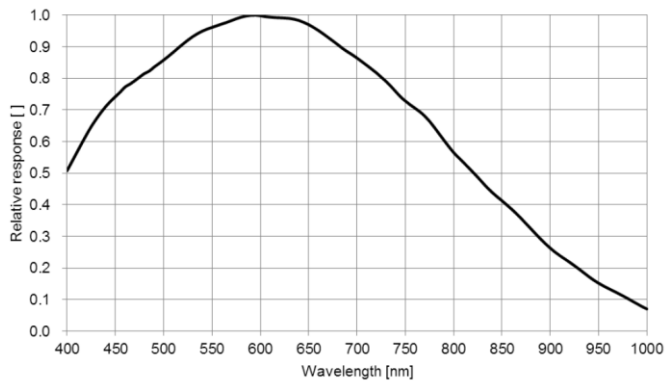
Feature	Description
Pixel Size	3.45 μm x 3.45 μm
Resolution	2448 (H) x 2048 (V)
Sensor Size	11.0 mm diagonal
Sensor	Sony Pregius IMX250 CMOS sensor
Output Interface	6.25 Gbps CoaXPress 1.1, 12.5 Gbps CoaXPress 2.0
Interface Connector	Micro-BNC
Output Resolution	8, 10 or 12 bit
Max Frame Rate	155.5 fps @8 bit resolution 84.8 fps @10 bit resolution 84.8 fps @12 bit resolution
Image Acquisition	Continuous / Triggered
Camera Control	Gen<i>i>Cam
Electronic Shutter	Global shutter
Sensor Positioning	Full pan/tilt calibration for optical axes (optional)
Monochrome/ Color	Monochrome / Color
Temporal Noise	< 2.2 e ⁻ @25°C
Full Well Charge	9828 e ⁻
Dynamic Range	> 70.8dB @520nm
Signal-to-Noise Ratio (SNR max)	40 dB @520nm
Quantum Efficiency (QE) X FF	> 63% @525nm
Shortest Exposure	10 μs
On camera processing	<ul style="list-style-type: none"> Defect pixel correction ROI Frame counter Flat field / Fixed patter noise correction Auto/Manual black level Auto Exposure/Gain Auto/Manual White balance Image flip LUT Gain (Analog / Digital) Binning Operational Time Counter

Mechanical & Electrical

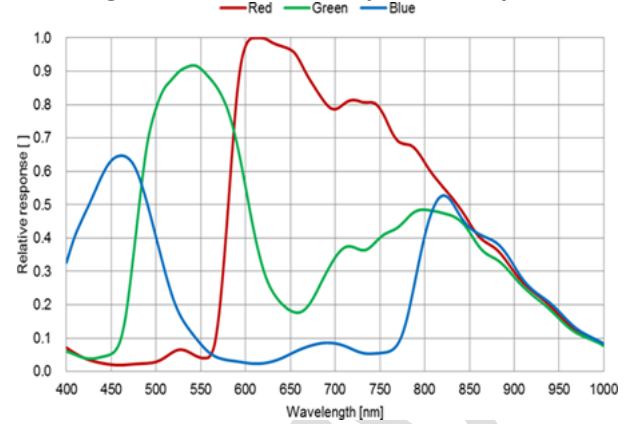
Feature	Description
Dimensions (including lens mount)	44 mm x 44 mm x 35.3 mm (Height x Width x Depth)
Lens Mount	C-mount, CS-mount, EF-mount or DC Auto Iris lenses
Weight (without lens)	~50g
Power Input	PoCXP full support (7-28V with external power option)
Power Consumption	<3.2W @ 24V DC
Operating Temperature	-30°C to 70°C, 20-85% humidity (non-condensing)
Storage Temperature	-30°C to 75°C, 20-85% humidity (non-condensing)
Ingress Protection	Optional IP67 (with protective lens tube)
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

Absolute Quantum Efficiency

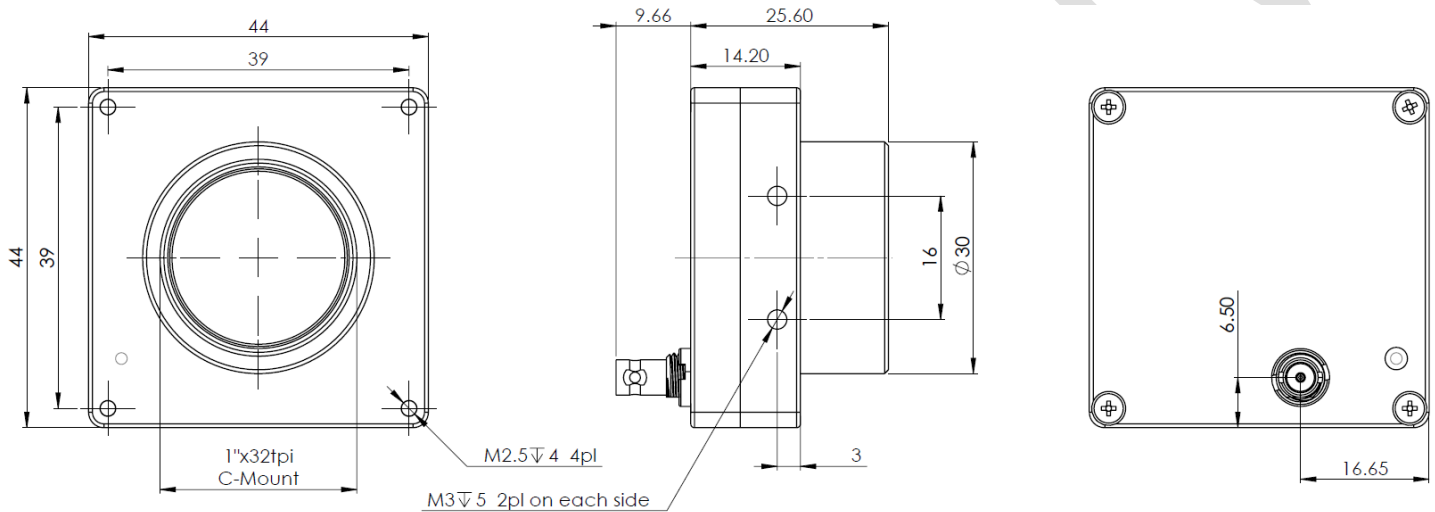
Pregius's IMX250 Mono Spectral Response



Pregius's IMX250 Color Spectral Response



Mechanical Drawings



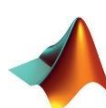
Compatibility

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:



Linux

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.

KAYA Instruments

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Iron CoaXPress 252

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron CoaXPress 252** is an ultra-thin high speed, low-cost, low-power global shutter CMOS camera with a micro-BNC interface which supports 3.15 MP high quality video at rates up to 205.8 fps.

Intelligent Design

Our camera incorporates Pregius's IMX252 global shutter sensor with a 3.45µm pixel size. With an extremely compact outline and low-key design, the **Iron** can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities.

Applications:

- Perimeter vision
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

Key Features:

- 3.15 Megapixel up to 205.8 fps
- Monochrome and Color models
- Up to 3.2W 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

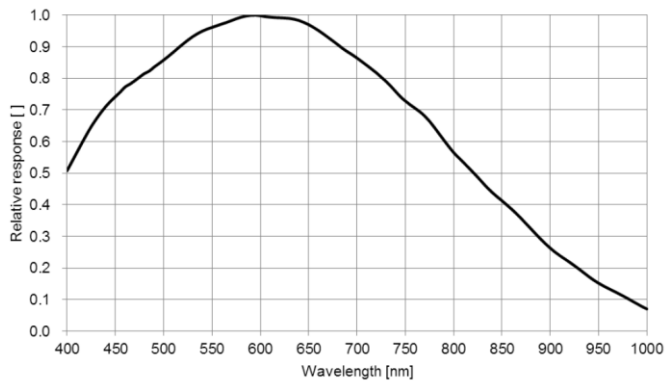
Feature	Description
Pixel Size	3.45 μm x 3.45 μm
Resolution	2048 (H) x 1536 (V)
Sensor Size	8.9 mm diagonal
Sensor	Sony Pregius IMX252 CMOS sensor
Output Interface	6.25 Gbps CoaXPress 1.1, 12.5 Gbps CoaXPress 2.0
Interface Connector	Micro-BNC
Output Resolution	8, 10 or 12 bit
Max Frame Rate	205.8 fps @8 bit resolution 112.3 fps @10 bit resolution 112.3 fps @12 bit resolution
Image Acquisition	Continuous / Triggered
Camera Control	Gen<i>i>Cam
Electronic Shutter	Global shutter
Sensor Positioning	Full pan/tilt calibration for optical axes (optional)
Monochrome/ Color	Monochrome / Color
Temporal Noise	< 2.2 e ⁻ @25°C
Full Well Charge	9828 e ⁻
Dynamic Range	> 70.8dB @520nm
Signal-to-Noise Ratio (SNR max)	40 dB @520nm
Quantum Efficiency (QE) X FF	> 63% @525nm
Shortest Exposure	10 μs
On camera processing	<ul style="list-style-type: none"> Defect pixel correction ROI Frame counter Flat field / Fixed patter noise correction Auto/Manual black level Auto Exposure/Gain Auto/Manual White balance Image flip LUT Gain (Analog / Digital) Binning Operational Time Counter

Mechanical & Electrical

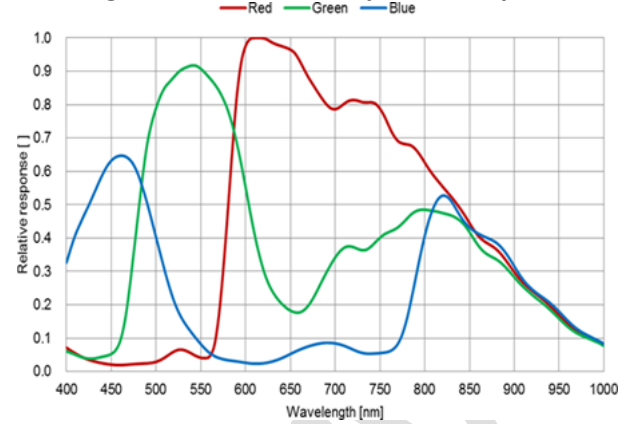
Feature	Description
Dimensions (including lens mount)	44 mm x 44 mm x 35.3 mm (Height x Width x Depth)
Lens Mount	C-mount, CS-mount, EF-mount or DC Auto Iris lenses
Weight (without lens)	~50g
Power Input	PoCXP full support (7-28V with external power option)
Power Consumption	<3.2W @ 24V DC
Operating Temperature	-30°C to 70°C, 20-85% humidity (non-condensing)
Storage Temperature	-30°C to 75°C, 20-85% humidity (non-condensing)
Ingress Protection	Optional IP67 (with protective lens tube)
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

Absolute Quantum Efficiency

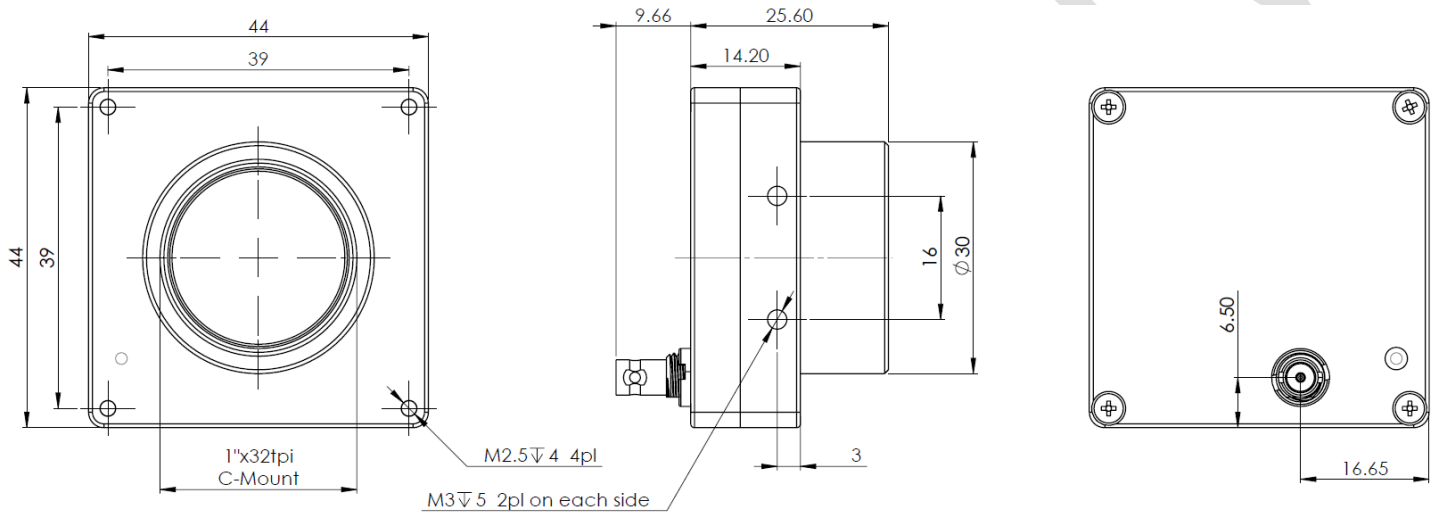
Pregius's IMX252 Mono Spectral Response



Pregius's IMX252 Color Spectral Response



Mechanical Drawings



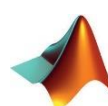
Compatibility

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❖ Supported vision standards:



❖ Supported vision libraries:



❖ Supported operating systems:



Linux

Contact Us

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Iron CoaXPress 253

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron CoaXPress 253** is an ultra-thin high speed, low-cost, low-power global shutter CMOS camera with a micro-BNC interface which supports 12.29 MP high quality video at rates up to 63.8 fps.

Intelligent Design

Our camera incorporates Pregius's IMX253 global shutter sensor with a 3.45µm pixel size. With an extremely compact outline and low-key design, the **Iron** can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities.

Applications:

- Perimeter vision
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

Key Features:

- 5.01 Megapixel up to 63.8 fps
- Monochrome and Color models
- Up to 3.2W 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

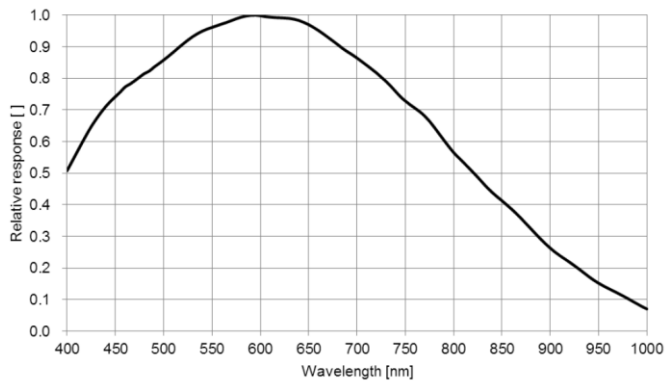
Feature	Description
Pixel Size	3.45 μm x 3.45 μm
Resolution	4096 (H) x 3000 (V)
Sensor Size	17.5 mm diagonal
Sensor	Sony Pregius IMX253 CMOS sensor
Output Interface	6.25 Gbps CoaXPress 1.1, 12.5 Gbps CoaXPress 2.0
Interface Connector	Micro-BNC
Output Resolution	8, 10 or 12 bit
Max Frame Rate	63.8 fps @8 bit resolution 45.5 fps @10 bit resolution 45.5 fps @12 bit resolution
Image Acquisition	Continuous / Triggered
Camera Control	Gen<i>i>Cam
Electronic Shutter	Global shutter
Sensor Positioning	Full pan/tilt calibration for optical axes (optional)
Monochrome/ Color	Monochrome / Color
Temporal Noise	< 2.2 e^- @25°C
Full Well Charge	9828 e^-
Dynamic Range	> 70.8dB @520nm
Signal-to-Noise Ratio (SNR max)	40 dB @520nm
Quantum Efficiency (QE) X FF	> 63% @525nm
Shortest Exposure	10 μs
On camera processing	<ul style="list-style-type: none"> Defect pixel correction ROI Frame counter Flat field / Fixed patter noise correction Auto/Manual black level Auto Exposure/Gain Auto/Manual White balance Image flip LUT Gain (Analog / Digital) Binning Operational Time Counter

Mechanical & Electrical

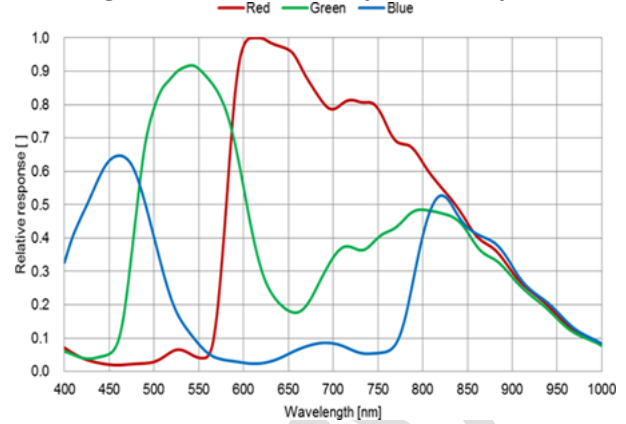
Feature	Description
Dimensions (including lens mount)	44 mm x 44 mm x 35.3 mm (Height x Width x Depth)
Lens Mount	C-mount, CS-mount, EF-mount or DC Auto Iris lenses
Weight (without lens)	~50g
Power Input	PoCXP full support (7-28V with external power option)
Power Consumption	<3.2W @ 24V DC
Operating Temperature	-30°C to 70°C, 20-85% humidity (non-condensing)
Storage Temperature	-30°C to 75°C, 20-85% humidity (non-condensing)
Ingress Protection	Optional IP67 (with protective lens tube)
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

Absolute Quantum Efficiency

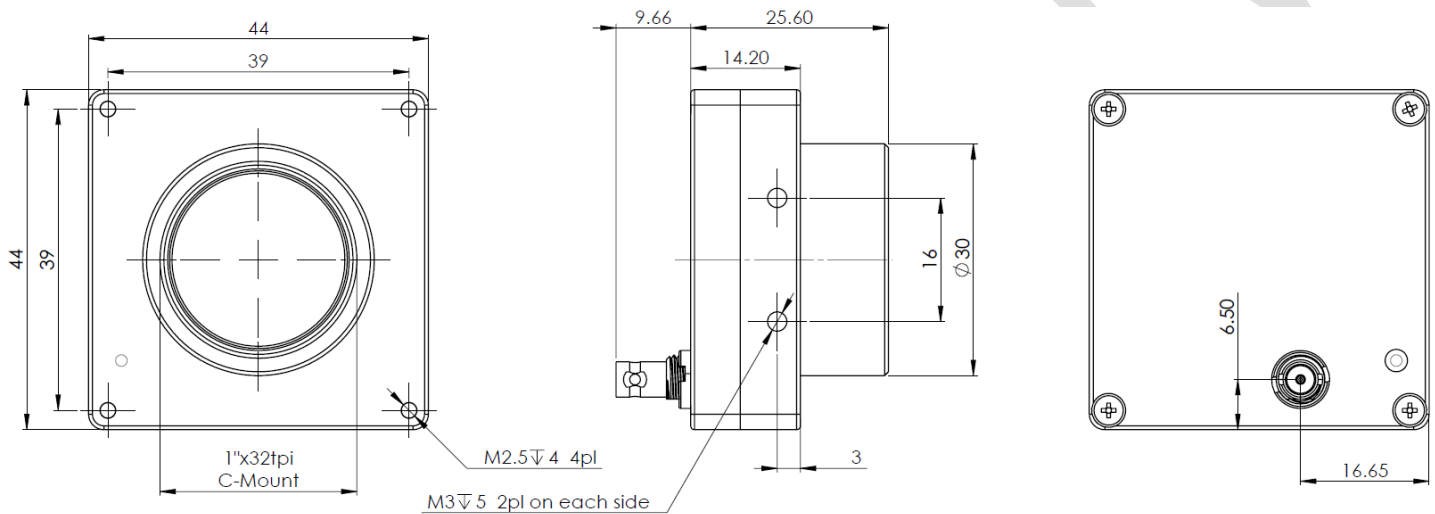
Pregius's IMX253 Mono Spectral Response



Pregius's IMX253 Color Spectral Response



Mechanical Drawings



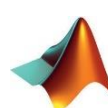
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❖ Supported vision libraries:



❖ Supported operating systems:



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Iron CoaXPress 255

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron CoaXPress 255** is an ultra-thin high speed, low-cost, low-power global shutter CMOS camera with a micro-BNC interface which supports 8.85 MP high quality video at rates up to 87.6 fps.

Intelligent Design

Our camera incorporates Pregius's IMX255 global shutter sensor with a 3.45µm pixel size. With an extremely compact outline and low-key design, the **Iron** can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities.

Applications:

- Perimeter vision
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

Key Features:

- 8.85 Megapixel up to 87.6 fps
- Monochrome and Color models
- Up to 3.2W 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

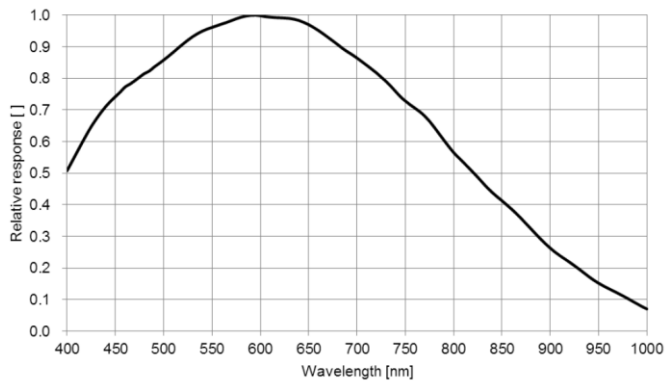
Feature	Description
Pixel Size	3.45 μm x 3.45 μm
Resolution	4112 (H) x 2160 (V)
Sensor Size	16.0 mm diagonal
Sensor	Sony Pregius IMX255 CMOS sensor
Output Interface	6.25 Gbps CoaXPress 1.1, 12.5 Gbps CoaXPress 2.0
Interface Connector	Micro-BNC
Output Resolution	8, 10 or 12 bit
Max Frame Rate	87.6 fps @8 bit resolution 62.5 fps @10 bit resolution 62.5 fps @12 bit resolution
Image Acquisition	Continuous / Triggered
Camera Control	Gen<i>i>Cam
Electronic Shutter	Global shutter
Sensor Positioning	Full pan/tilt calibration for optical axes (optional)
Monochrome/ Color	Monochrome / Color
Temporal Noise	< 2.2 e ⁻ @25°C
Full Well Charge	9828 e ⁻
Dynamic Range	> 70.8dB @520nm
Signal-to-Noise Ratio (SNR max)	40 dB @520nm
Quantum Efficiency (QE) X FF	> 63% @525nm
Shortest Exposure	10 μs
On camera processing	<ul style="list-style-type: none"> Defect pixel correction ROI Frame counter Flat field / Fixed patter noise correction Auto/Manual black level Auto Exposure/Gain Auto/Manual White balance Image flip LUT Gain (Analog / Digital) Binning Operational Time Counter

Mechanical & Electrical

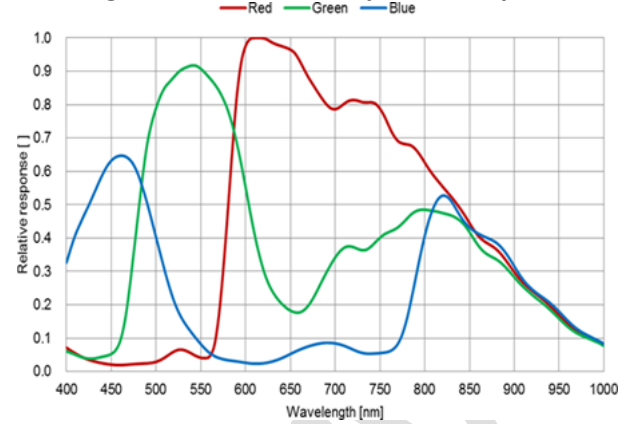
Feature	Description
Dimensions (including lens mount)	44 mm x 44 mm x 35.3 mm (Height x Width x Depth)
Lens Mount	C-mount, CS-mount, EF-mount or DC Auto Iris lenses
Weight (without lens)	~50g
Power Input	PoCXP full support (7-28V with external power option)
Power Consumption	<3.2W @ 24V DC
Operating Temperature	-30°C to 70°C, 20-85% humidity (non-condensing)
Storage Temperature	-30°C to 75°C, 20-85% humidity (non-condensing)
Ingress Protection	Optional IP67 (with protective lens tube)
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

Absolute Quantum Efficiency

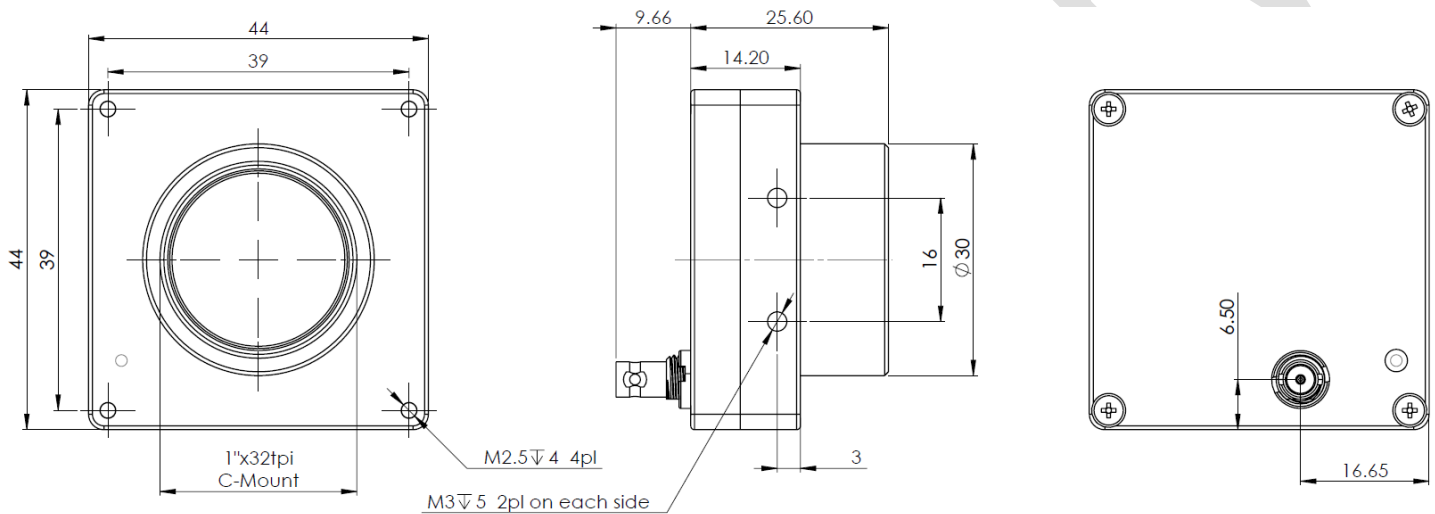
Pregius's IMX255 Mono Spectral Response



Pregius's IMX255 Color Spectral Response



Mechanical Drawings



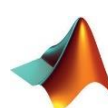
Compatibility

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❖ Supported vision standards:



❖ Supported vision libraries:



❖ Supported operating systems:



Linux

Contact Us

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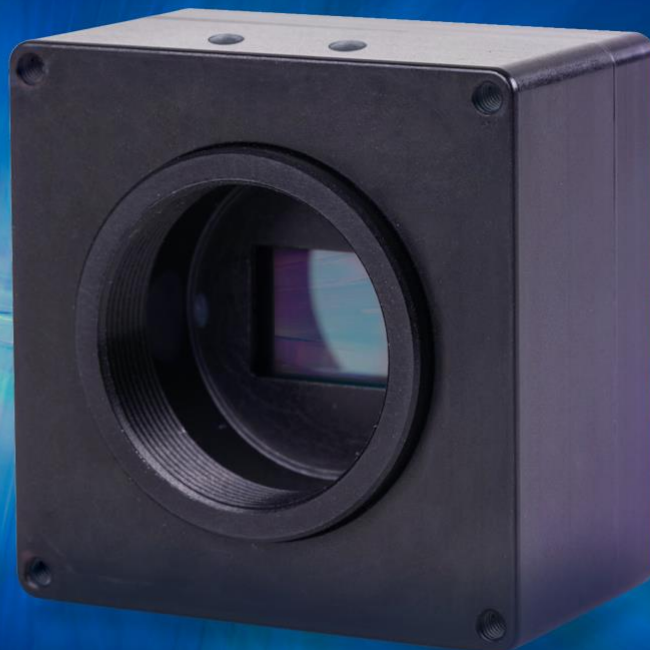
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Iron 2011E

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron 2011E** 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 2 MP high quality video at rates of up to 403fps.

Intelligent Design

Our camera incorporates Gpixel's GSENSE2011e sensor – manufactured in Israel by the company's Belgian branch. The GSENSE2011e is a global/rolling shutter sensor with a 6.5µm 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
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality
- 3D

Key Features:

- 2 Megapixel up to 403 fps
- Monochrome and Color models
- 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 μm x 6.5 μm
Resolution	2048 (H) x 1152 (V)
Sensor size	13.3 mm x 7.5 mm 1"
Sensor	Gpixel GSENSE2011e
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 μs @12-bit resolution Rolling: 18.4 μs @12-bit resolution
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input ^[1]	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: 403 fps @ 10 bit 166 fps @ HDR Rolling: 167 fps @ 12 bit 81 fps @ HDR
Subsampling	1 x 2 / 2 x 1 / 2 x 2 (user configurable)
Monochrome/ color	Monochrome
Full well charge	Global HDR: 17.1 ke ⁻ Rolling HDR: 40 ke ⁻
Dynamic range	Global HDR: 63dB Rolling HDR: 78dB
Dark current	17 e ⁻ pxl/sec @ 21 °C
Quantum efficiency (QE) X FF	<72% @595 nm (according to sensor performance)
Temporal noise	Global HDR: 7.2 e ⁻ @25C Rolling HDR: 2.6 e ⁻ @25C
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)
On camera processing	<ul style="list-style-type: none"> Defect pixel correction Digital binning (2 x 2) ROI ^[2] Auto Exposure/Gain LUT Gain (Analog / Digital) – manual / auto Auto/Manual black level
Pulse generator	Yes, Programmable at 8 ns increments
Additional features	<ul style="list-style-type: none"> Over/under voltage protection Three points of temperature sensing Per frame ROI change Per-pixel FPN (optional) Multi ROI Support (vertical only. Horizontal at full resolution) Reverse voltage polarity protection Frame-by-frame shutter speed change Global reset
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	$\leq 0.15^\circ$
Operating temperature	-40°C to 85°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

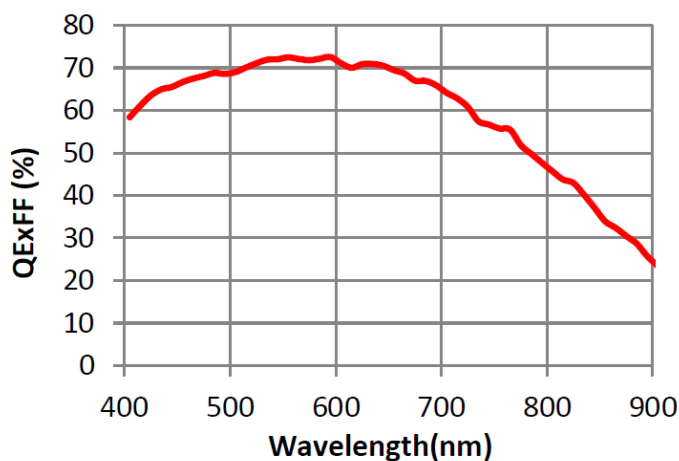
2. ROI position can change on a frame by frame basis

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

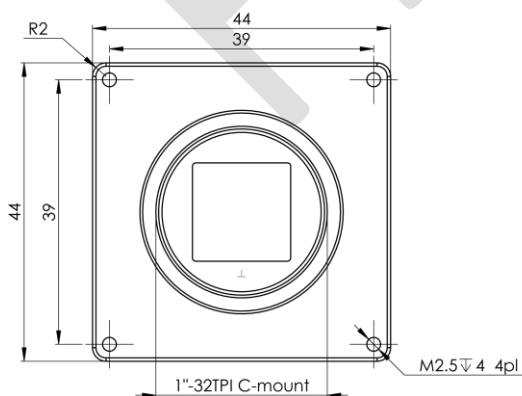
** KAYA Instruments reserves the right to update the data sheet from time to time without prior notice.

Absolute Quantum Efficiency

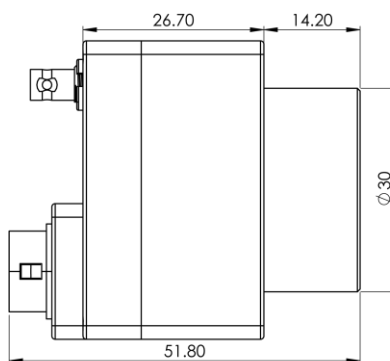
GSENSE2011e Spectral Response



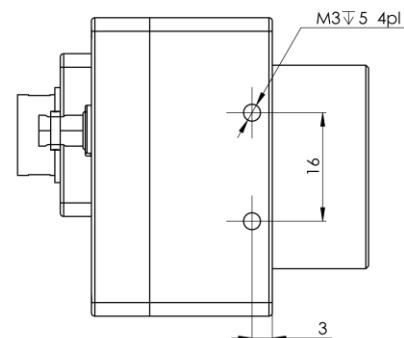
Mechanical Drawings



Front View



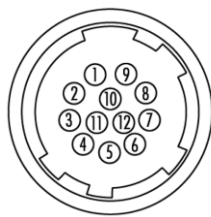
Side View



Top View

General Purpose Input Output

GPIO Pinout – 12 Pin Hirose Connector



- | | |
|--------------------|-----------------|
| 1. 5 VDC Return | 7. OUT1 (TTL) |
| 2. +5 VDC | 8. IN1 (OPTO) |
| 3. Reserved | 9. IN2 (LVTTTL) |
| 4. Reserved | 10. IN1 RTN |
| 5. OUT2 RTN (OPTO) | 11. IN2 RTN |
| 6. OUT1 RTN | 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

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.

KAYA Instruments

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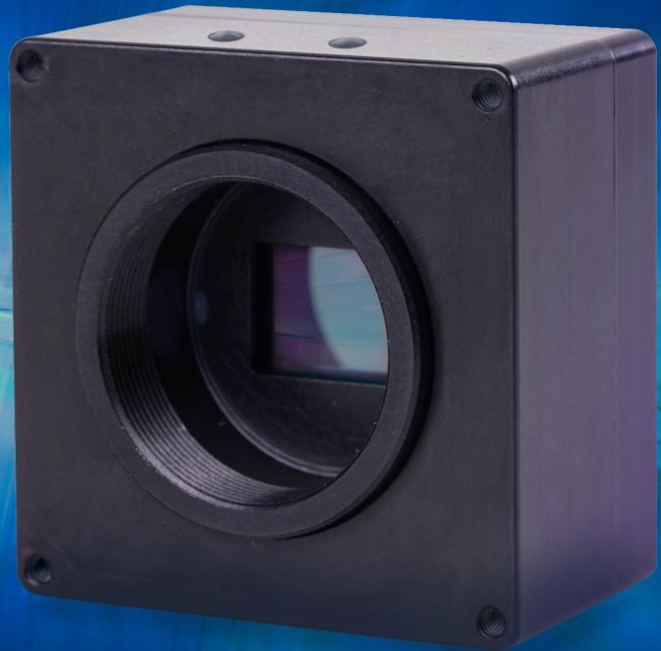
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Iron 2020BSI

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

Our camera incorporates Gpixel's GSENSE2020BSI sensor – manufactured in Israel by the company's Belgian branch. 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 allows very low light vision capabilities.

Applications:

- Perimeter vision
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality

Key Features:

- 4 Megapixel up to 74 fps
- Monochrome and Color models
- 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 μm x 6.5 μm
Resolution	2048 (H) x 2048 (V)
Sensor size	13.3 mm x 13.3 mm 1.2"
Sensor	Gpixel GSENSE2020BSI
Video output	CoaXPress 2.0 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 μs @ 11-bit resolution in 6.6 μs steps (up to 16 sec) 8.04 μs @ 12-bit resolution in 11.2 μs steps (up to 16 sec)
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input ^[1]	Pulse generator / Software (12 μs 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	54 ke ⁻
Dynamic range	88dB
Dark Current	42 e ⁻ pxl/sec @ 21 °C
Signal-to-Noise Ratio (SNR max)	46 dB
Quantum Efficiency (QE) X FF	<95% @550 nm
Temporal Noise	1.9 e ⁻ or 1.4 e ⁻ with reduced dynamic range
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)
On camera processing	<ul style="list-style-type: none"> Defect pixel correction Auto/Manual White balance ROI ^[2] Image flip Frame counter Flat field / Fixed patter noise correction LUT Gain (Analog / Digital) – manual / auto Auto/Manual black level Digital binning (2 x 2) Auto Exposure/Gain Operational Time Counter
Pulse generator	Yes, Programmable at 8 ns increments
Additional features	<ul style="list-style-type: none"> Over/under voltage protection Correlated double sampling support Per frame ROI change Global reset Multi ROI Support (vertical only. Horizontal at full resolution) Reverse voltage polarity protection Frame-by-frame shutter speed change Three points of temperature sensing Per-pixel FPN (optional)
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	$\leq 0.15^\circ$
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

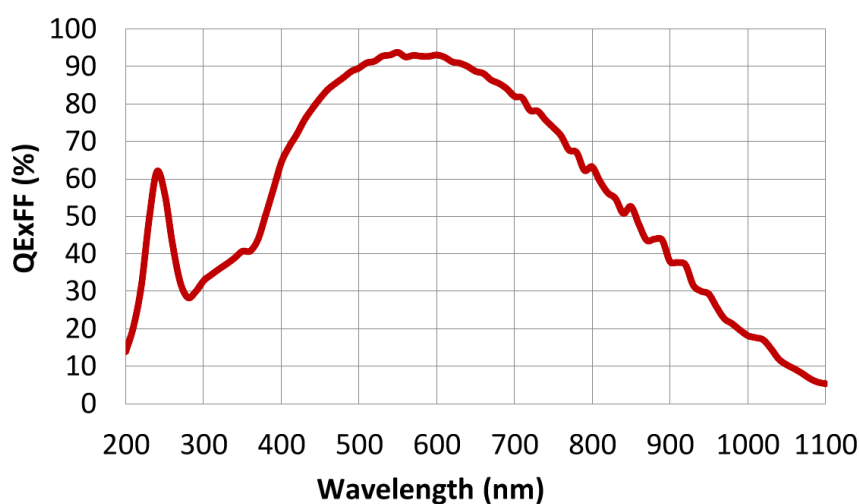
2. ROI position can change on a frame by frame basis

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

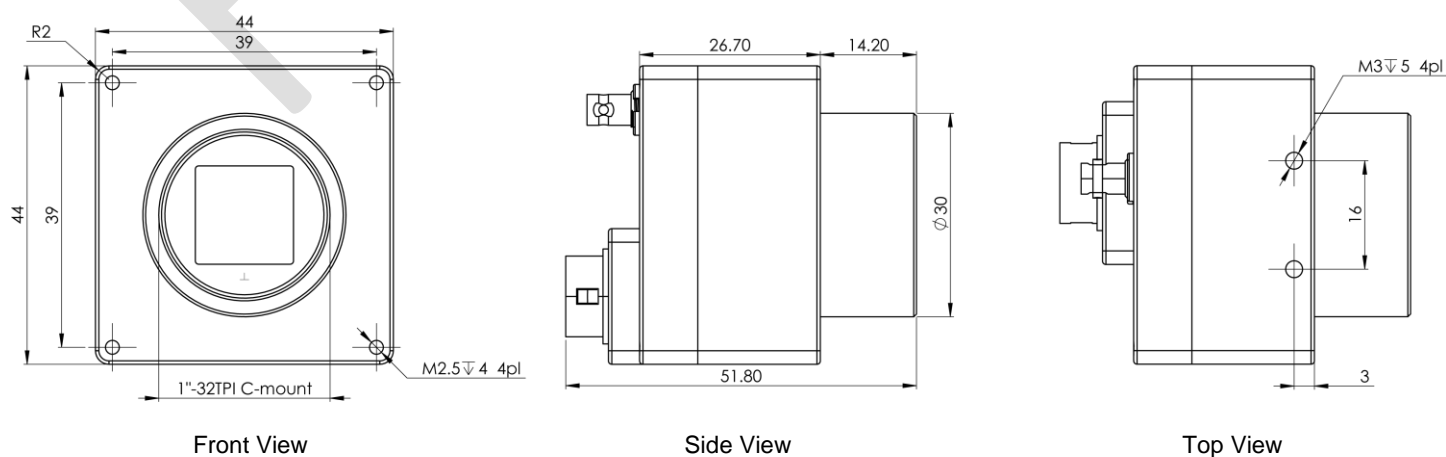
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Absolute Quantum Efficiency

GSENSE2020BSI Spectral Response

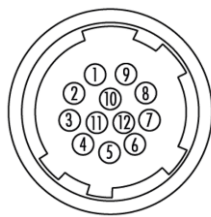


Mechanical Drawings



General Purpose Input Output

GPIO Pinout – 12 Pin Hirose Connector



- | | |
|--------------------|-----------------|
| 1. 5 VDC Return | 7. OUT1 (TTL) |
| 2. +5 VDC | 8. IN1 (OPTO) |
| 3. Reserved | 9. IN2 (LVTTTL) |
| 4. Reserved | 10. IN1 RTN |
| 5. OUT2 RTN (OPTO) | 11. IN2 RTN |
| 6. OUT1 RTN | 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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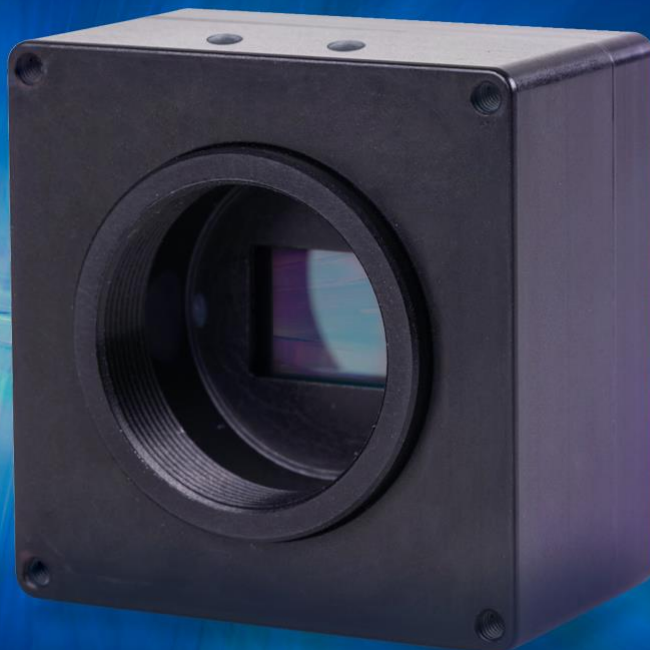
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Iron 2020E

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

Our camera incorporates GPIXEL's GSENSE2020e sensor – manufactured in Israel by the company's Belgian branch. The GSENSE2020e is a global/rolling shutter sensor with a 6.5µm 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
- Military/Defense systems
- Low light surveillance
- Special Effects
- Virtual Reality

Key Features:

- 4 Megapixel up to 220 fps
- Monochrome and Color models
- 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 μm x 6.5 μm
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 μs @12-bit resolution Rolling: 18.4 μs @12-bit resolution
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input ^[1]	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 ⁻ Rolling HDR: 40 ke ⁻
Dynamic range	Global HDR: 63dB Rolling HDR: 78dB
Dark current	17 e ⁻ pxl/sec @ 21 °C
Quantum efficiency (QE) X FF	<72% @595 nm (according to sensor performance)
Temporal noise	Global HDR: 7.2 e ⁻ @25C Rolling HDR: 2.6 e ⁻ @25C
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)
On camera processing	<ul style="list-style-type: none"> Defect pixel correction Digital binning (2 x 2) ROI ^[2] Auto Exposure/Gain LUT Gain (Analog / Digital) – manual / auto Auto/Manual black level
Pulse generator	Yes, Programmable at 8 ns increments
Additional features	<ul style="list-style-type: none"> Over/under voltage protection Three points of temperature sensing Per frame ROI change Per-pixel FPN (optional) Multi ROI Support (vertical only. Horizontal at full resolution) Reverse voltage polarity protection Frame-by-frame shutter speed change Global reset
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	$\leq 0.15^\circ$
Operating temperature	-40°C to 85°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

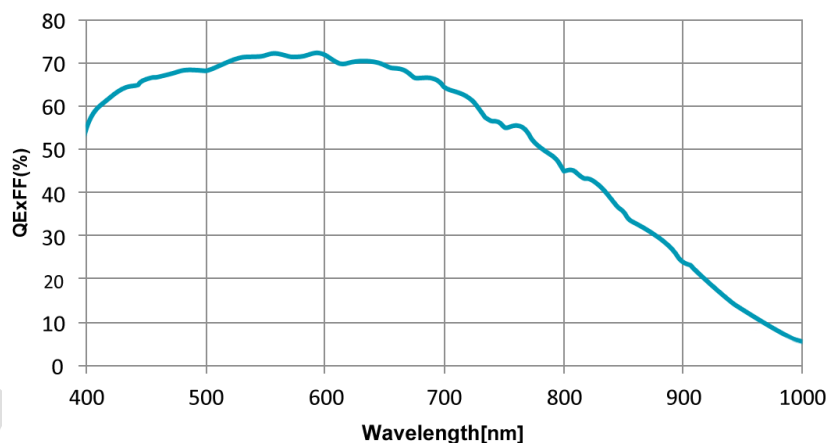
2. ROI position can change on a frame by frame basis

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

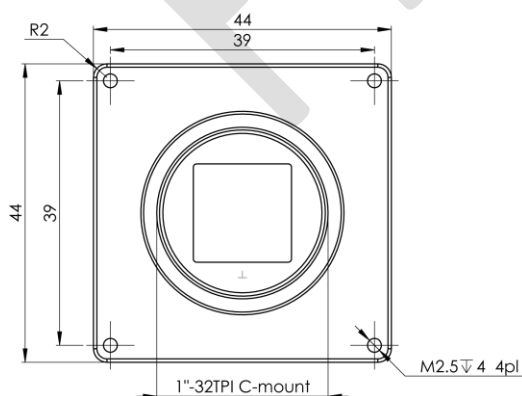
** KAYA Instruments reserves the right to update the data sheet from time to time without prior notice.

Absolute Quantum Efficiency

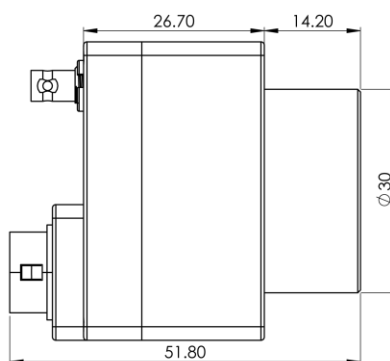
GSENSE2020e Spectral Response



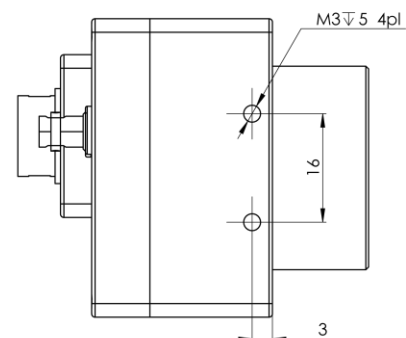
Mechanical Drawings



Front View



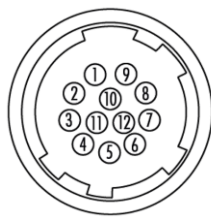
Side View



Top View

General Purpose Input Output

GPIO Pinout – 12 Pin Hirose Connector



- | | |
|--------------------|-----------------|
| 1. 5 VDC Return | 7. OUT1 (TTL) |
| 2. +5 VDC | 8. IN1 (OPTO) |
| 3. Reserved | 9. IN2 (LVTTTL) |
| 4. Reserved | 10. IN1 RTN |
| 5. OUT2 RTN (OPTO) | 11. IN2 RTN |
| 6. OUT1 RTN | 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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POB 25004, Haifa 3125001, Israel

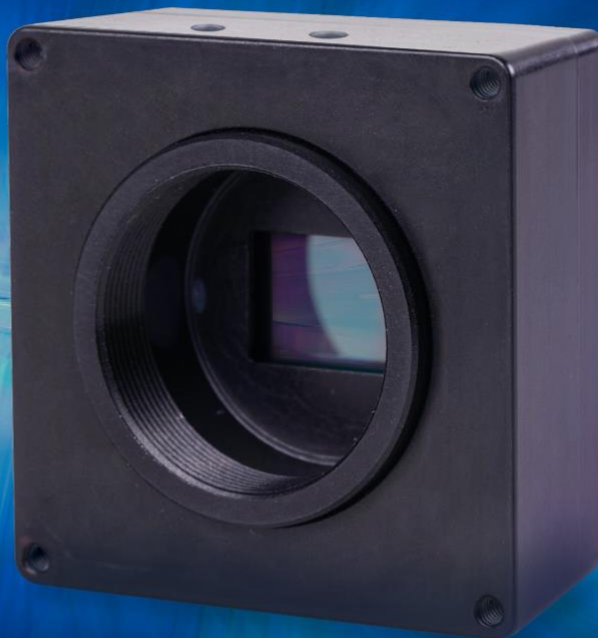
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Iron 3265

Iron CoaXPress Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron 3265** is a low-cost, low-power, high resolution global CMOS camera with up to 50 Gbps CoaXPress 2.0 interface (Micro-BNC connector) which supports 65 MP high quality video at rates of up to 71fps.

Intelligent Design

The GMAX3265 is a global shutter sensor with a 3.2µm 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
- 3D

Key Features:

- 65 Megapixel up to 71 fps
- Monochrome and Color models
- Up to 7.5W power at full rate
- Full image processing feature set
- Pan/Tilt alignment of the sensor
- Up to 50 Gbps CoaXPress interface
- F / 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	3.2 μm x 3.2 μm
Resolution	9344 (H) x 7000 (V)
Sensor size	29.9 mm x 22.4 mm 7/3"
Sensor	Gpixel GMAX3265
Video output	x 4 channels CoaXPress 2.0 up to 50 (12.5 x 4) Gbps (CXP3, CXP6, CXP12)
Interface connector	x 4 Micro-BNC
Digitization	10 bit, 12 bit
Electronic shutter	Global shutter
Shutter speed	13.35 μs
Exposure control	Off / Internal / Auto
Image acquisition	Continuous / Triggered
Trigger input ^[1]	External, pulse generator, SW
Triger mode	Free run, externally or internally triggered
Trigger options	Edge, de-bounce
Output resolution	8 bit, 10 bit, 12 bit
Maximal Frame rate	<div> <div>HS model:</div> <div> 71 fps @8 bit 61 fps @10 bit 51 fps @12 bit </div> </div> <div> <div>NS model:</div> <div> 35.5 fps @10 bit 29.6 fps @12 bit </div> </div>
Subsampling	1 x 2 / 2 x 1 / 2 x 2 (user configurable)
Monochrome/ color	Monochrome / color
Full well charge	10.9 ke ⁻ @ PGA gain x0.75
Dynamic range	66.0dB @ PGA gain x1.25
Dark current	5.3 e ⁻ pxl/sec @40°C
Quantum efficiency (QE) X FF	<65.3% @500 nm (according to sensor performance)
Temporal noise	1.9 e ⁻ @ PGA gain x6
Parasitic light sensitivity	<-89dB (angular dependence)
Angular response	15° (80% response)
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)
On camera processing	<ul style="list-style-type: none"> Defect pixel correction Digital binning (2 x 2) ROI ^[2] Auto Exposure/Gain LUT Gain (Analog / Digital) – manual / auto Auto/Manual black level Image H/V flip
Pulse generator	Yes, Programmable at 8 ns increments
Additional features	<ul style="list-style-type: none"> Over/under voltage protection Three points of temperature sensing Per frame ROI change Per-pixel FPN (optional) Multi ROI Support (vertical only. Horizontal at full resolution) Reverse voltage polarity protection Frame-by-frame shutter speed change Global reset
GPIO connection	Two inputs, two outputs, external trigger & strobe controller

Mechanical & Electrical

Feature	Description
Dimensions (without lens mount)	60 mm x 60 mm x 32.5 mm (Height x Width x Depth)
Lens mount	F-Mount, Canon EF-mount, Birger EF-mount
Weight (without lens or mount)	<100g
Typical current	312mA @ 24V
Power input	PoCXP full support (10-28V with external power option)
Power consumption	<7.5W @ 24V DC
Mount	Front mount
Heat dissipation	Front heat dissipation, optional TEC cooling
Sensor Mechanical Positioning	$\leq 0.15^\circ$
Operating temperature	-40°C to 65°C, 10-90% humidity (non-condensing)
Storage temperature	-40°C to 70°C, 10-90% humidity (non-condensing)
Shock/Vibration	MIL 810F

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

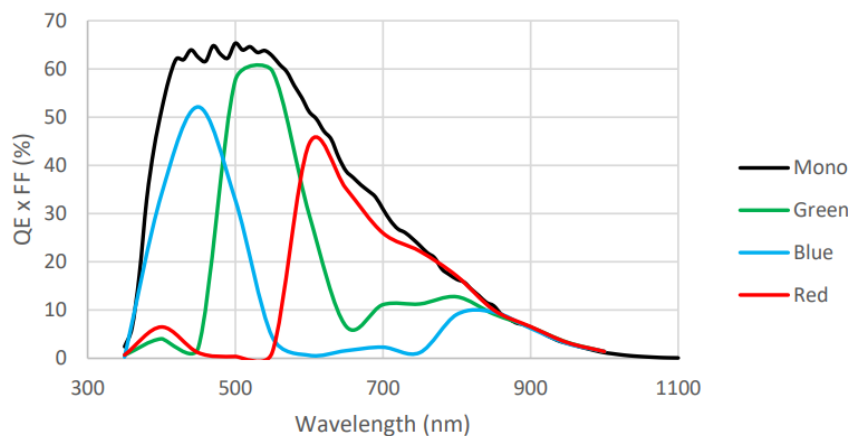
2. ROI position can change on a frame by frame basis

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

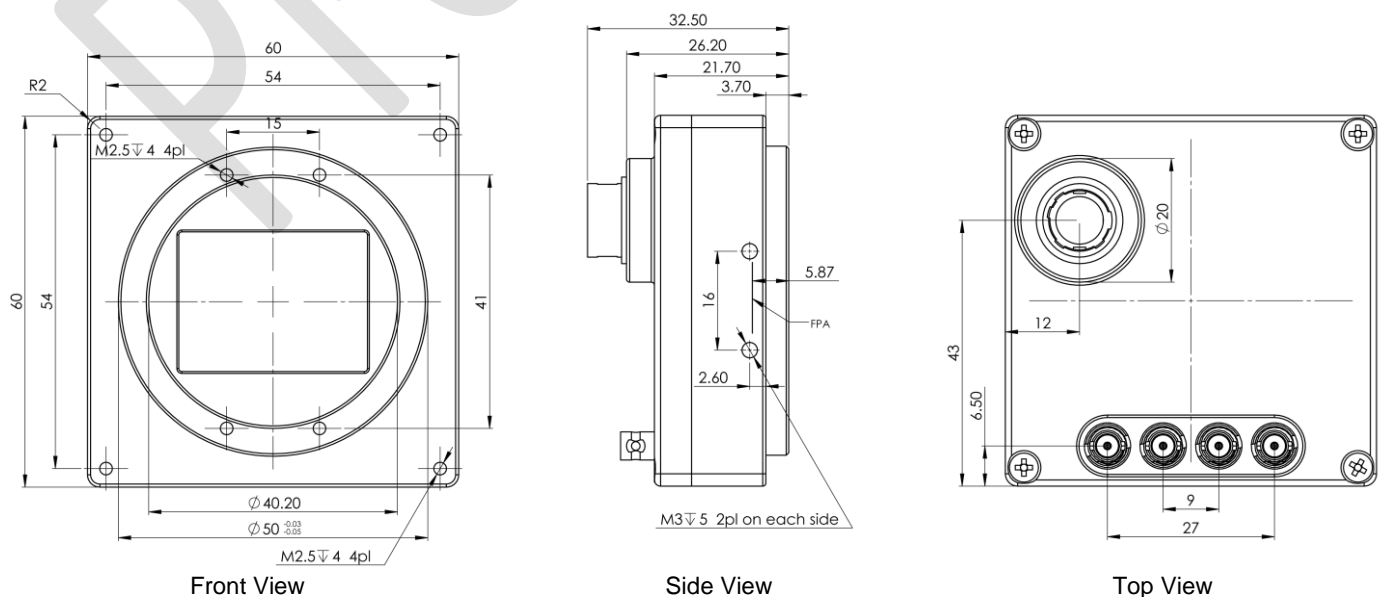
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Absolute Quantum Efficiency

GMAX3265 Spectral Response

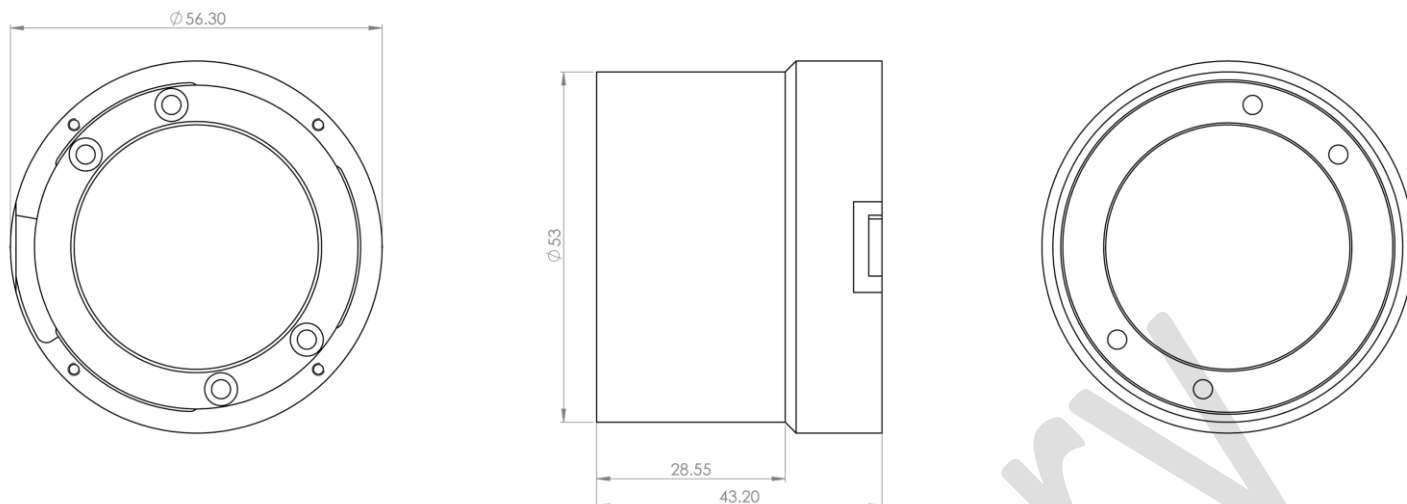


Mechanical Drawings

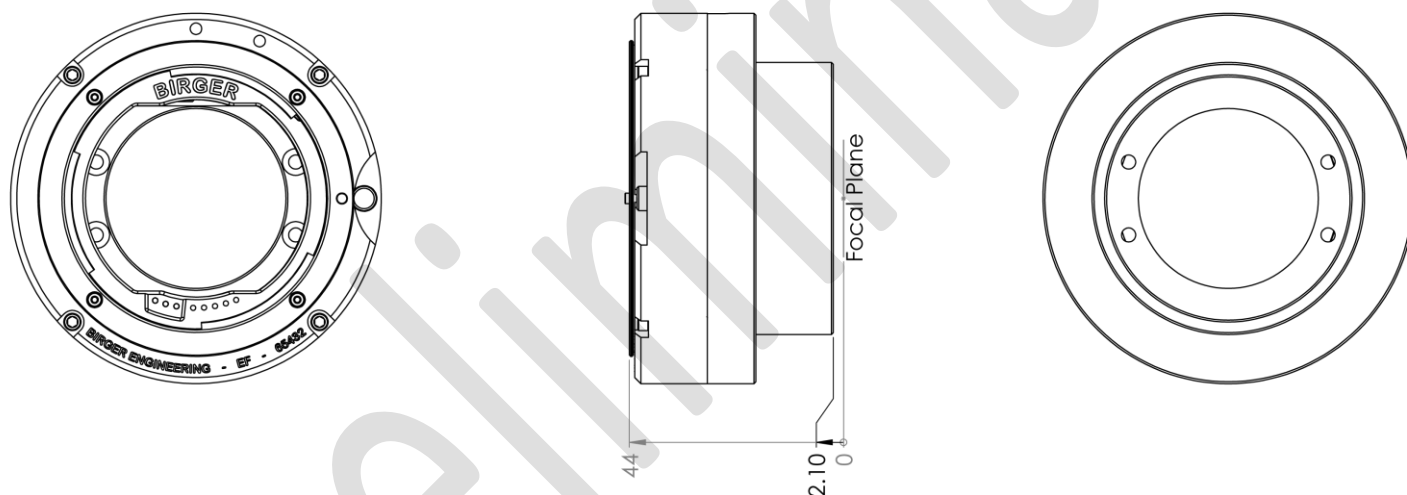


Lens Mounts Mechanical Drawings

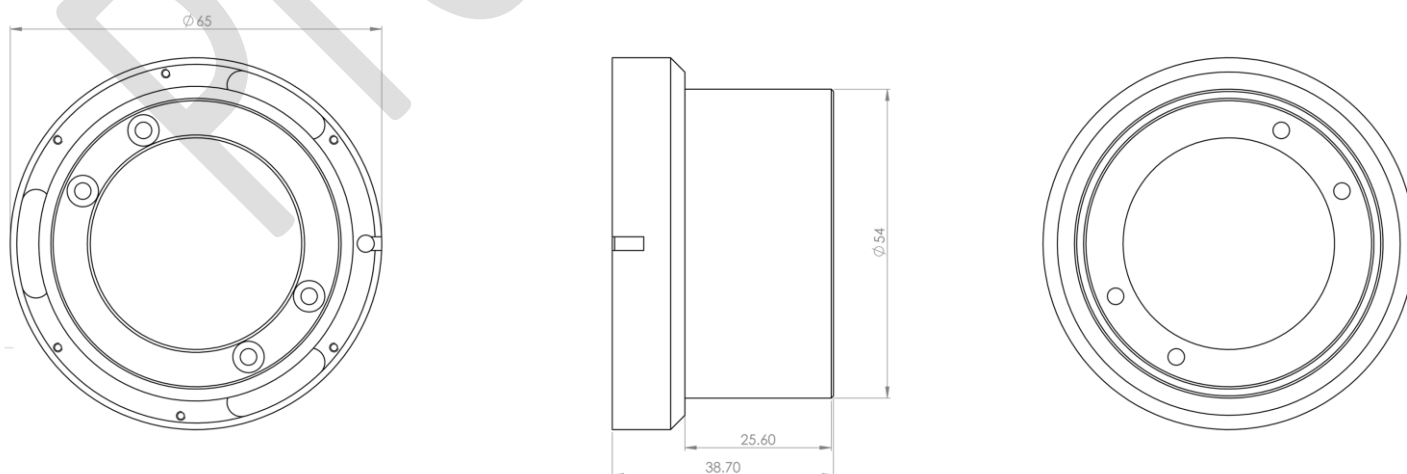
Nikon F mount:



Birger EF mount:

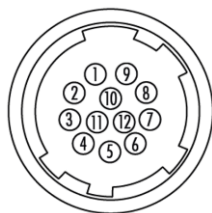


Canon EF mount:



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) |

Compatibility

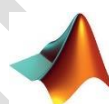
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❖ Supported vision standards:



❖ Supported vision libraries:



❖ Supported operating systems:



Windows



Linux

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

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