



Datasheet Iron2509 CoaXPress

Iron2509 CoaXPress

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

Innovative Approach

Iron2509 CoaXPress is an ultra-thin high speed, low-cost, low-power Global shutter CMOS camera with a Micro-BNC interface which supports 9.1 Megapixel high quality video at rates up to 289.0 fps.

Intelligent Design

With an extremely compact form factor, the **Iron2509 CoaXPress** 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:

- 9.1 Megapixel up to 289.0 fps
- Monochrome, Color and IR Enhanced sensor variation
- Up to 5 W power at full rate
- Full image processing feature set
- CoaXPress v2.1 standard compliant
- Gen<i>Cam compliant
- Up to 2 CoaXPress links
- C 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

| General | |
|---------------------------------|---|
| Pixel Size | 2.5 μm x 2.5 μm |
| Resolution | 4200 (H) x 2160 (V) |
| Sensor Size | 11.8 mm diagonal |
| Sensor | Gpixel GMAX2509 |
| Sensor Type | CMOS |
| Output Interface | CoaXPress v2.1 |
| Supported Interface rates | CXP-12, CXP-6 or CXP-3 |
| Interface Connector | Micro-BNC |
| Number of Connectors | High Speed Version : 4 Normal Speed Version : 2 |
| Output Resolution | 8, 10 or 12 bit |
| Maximum Frame Rate | High Speed Version <ul style="list-style-type: none"> • 289 fps @8 bit resolution • 289 fps @10 bit resolution Normal Speed Version <ul style="list-style-type: none"> • 120 fps @8 bit resolution • 120 fps @10 bit resolution • 120 fps @12 bit resolution |
| Tap Geometry | 1X-1Y |
| Image Acquisition | Continuous / Triggered |
| Camera Control | Gen<i>Cam |
| Electronic Shutter | Global |
| Monochrome / Color | Monochrome, Color or IR Enhanced |
| Temporal Noise | <1.6 e- at 25 °C |
| Full Well Charge | 6700 e- |
| Dynamic Range | >65 dB at 520 nm |
| Signal-to-Noise Ratio (SNR max) | 38.1 dB at 520 nm |
| Quantum Efficiency (QE) | >65.5% at 520 nm |
| Shortest Exposure | 2.5 μs |
| IR Filter (optional) | <ul style="list-style-type: none"> • UV cut below 400 nm • IR cut above 700 nm |
| Exposure control | Automatic/Manual |
| Gain control | Automatic/Manual |
| Color Control | <ul style="list-style-type: none"> • RGB offsets • Auto / Manual White balance • LUT |
| Image enhancement | <ul style="list-style-type: none"> • Defect pixel correction • Gain (Analog / Digital) • Auto / Manual black level • Binning • Auto Exposure / Gain • Flat field / Fixed pattern noise correction |

| | |
|---------------------------------|---|
| Additional on camera processing | <ul style="list-style-type: none"> • ROI • Image flip • Frame counter • Operational Time Counter • Binning |
| Power Input | <ul style="list-style-type: none"> • PoCXP • External 11 V - 28 V input |
| Power Consumption | <5 W at 24 V DC |
| Configuration software | Gen<i>Cam Standard software |
| Synchronization | Protocol/External I/O Trigger |
| Exposure Strobe output | Yes |

| General Purpose Inputs and Outputs | |
|------------------------------------|---|
| I/O lines | <ul style="list-style-type: none"> • 2 singled-ended TTL output • 2 singled-ended TTL/LVTTL input |
| Usage | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 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 | <ul style="list-style-type: none"> • 4 general purpose timers • Configurable delay and duration • 32-bit accumulator |
| Counters | <ul style="list-style-type: none"> • 4 general purpose counters • Configurable value and duration • 32-bit counter |

| Mechanical | |
|-----------------------------------|--|
| Dimensions (including lens mount) | 44 mm x 44 mm x 39 mm (1.7" x 1.7" x 1.5") |
| Weight (without lens) | 100 g (3.5 oz) |
| Lens Mount | C |
| Sensor Alignment | Active |
| Ingress Protection | Optional IP67 (with protective lens tube) |

| Environmental Conditions | |
|-----------------------------------|---|
| Operating ambient air temperature | Commercial : 0°C to +50°C (32°F to +122°F) Industrial : -40.0°C to +80°C (-40°F to +176°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 | <ul style="list-style-type: none"> • The European Council EMC Directive 2004/108/EC • The Unites States FCC rule 47 CFR 15 |
| EMC - Emission | <ul style="list-style-type: none"> • EN 55022:2010 Class B • FCC 47 Part 15 Class B |
| EMC - Immunity | <ul style="list-style-type: none"> • 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 |

Iron2509HSM-SC

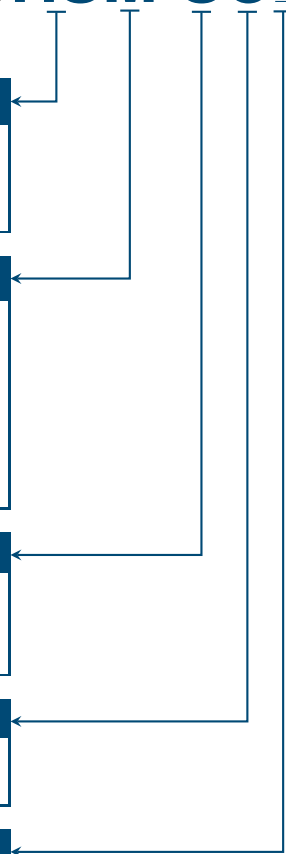
| Speed |
|-----------------|
| – Normal Speed |
| HS – High Speed |

| Color options |
|-------------------------|
| M – Monochrome |
| I – Mono with IR Filter |
| N – Color w/o IR Filter |
| C – Color |
| Z – IR Enhanced |

| Grade |
|----------------|
| S – Commercial |
| R – Industrial |

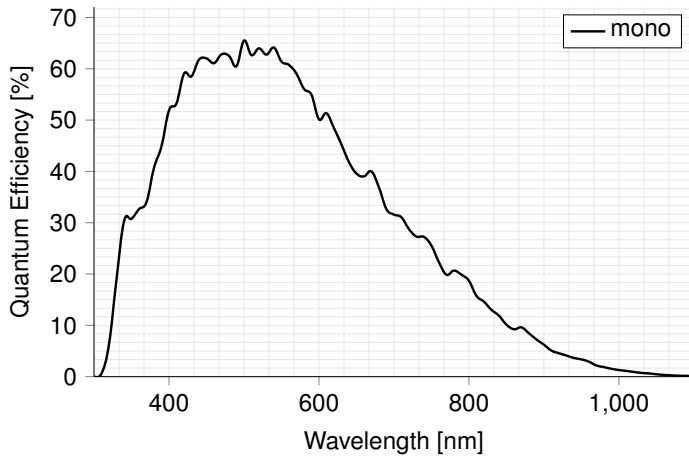
| Lens mount |
|-------------|
| C – C-Mount |

| Custom options |
|----------------|
| O – Open Frame |

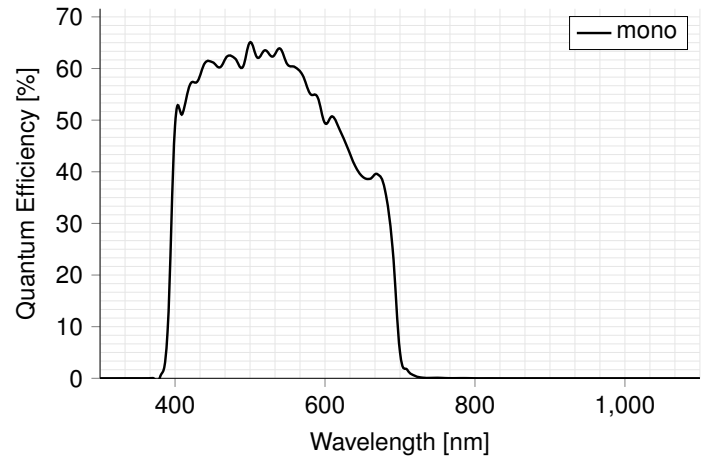


SPECTRAL RESPONSE

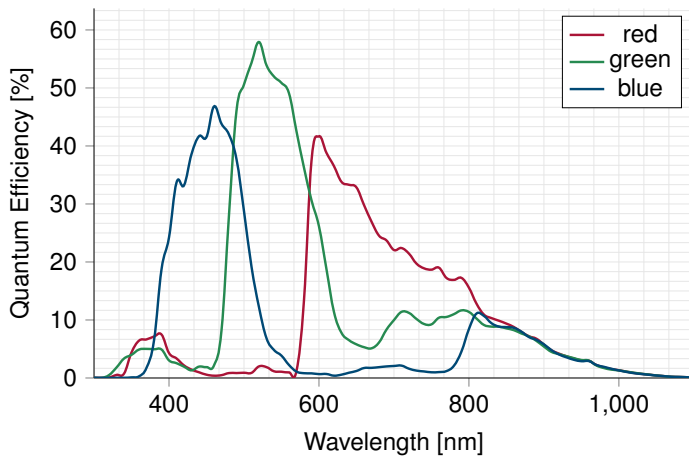
Monochrome



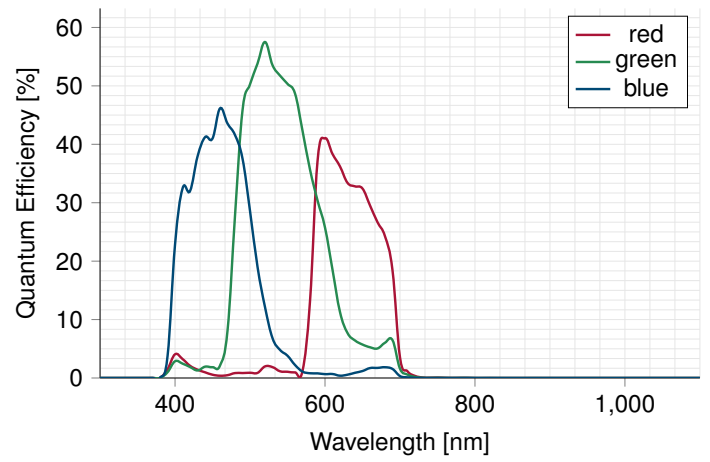
Monochrome with IR Cut Filter



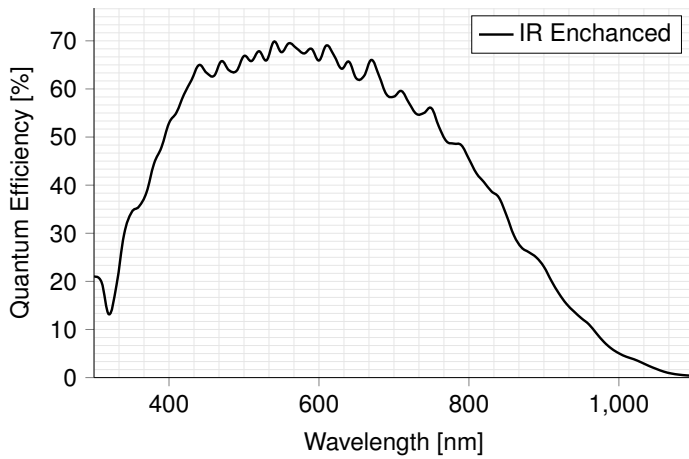
Color



Color with IR Cut Filter

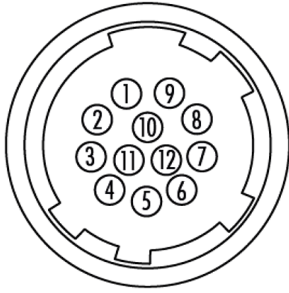


IR Enhanced



GENERAL PURPOSE INPUT OUTPUT

GPIO Pinout – 12 Pin Hirose Connector



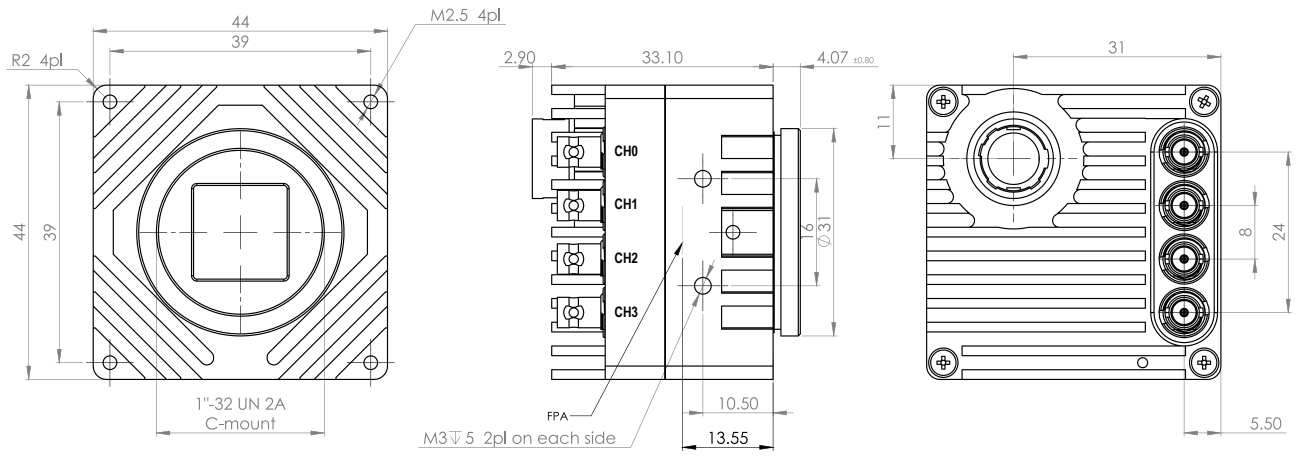
- | | |
|--------------------|---------------------|
| 1. DC Power return | 7. OUT1 (TTL) |
| 2. DC Power | 8. IN1 (TTL/LVTTL) |
| 3. RS232 RX | 9. IN2 (TTL/LVTTL) |
| 4. RS232 TX | 10. IN1 Return |
| 5. OUT2 Return | 11. IN2/OUT1 Return |
| 6. RS232 Return | 12. OUT2 (LVTTL) |

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:

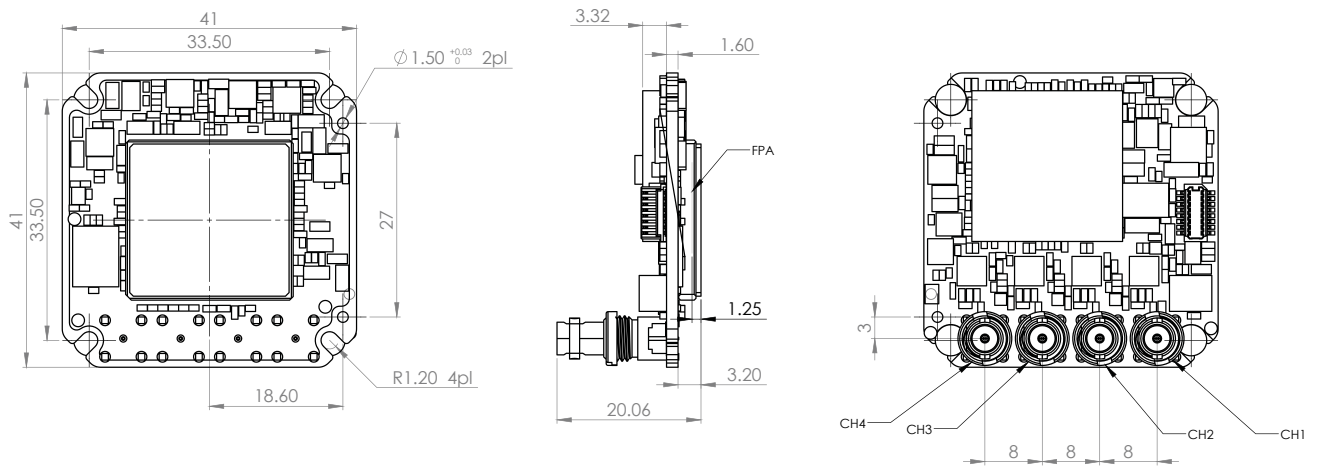
| Product Name | Product Part Number |
|------------------------------|---------------------|
| Hirose 12P connector, male | HR10A-10R-12PB |
| Hirose 12P connector, female | HR10A-10P-12S |

MECHANICAL DRAWINGS

C-Mount



Board Level



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.

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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.

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