Iron2509 CoaXPress

Iron CoaXPress
Small Form Factor, Ruggedized Camera

Innovative Approach

The **Iron 2509** is a high speed, low-cost, low-power global shutter CMOS camera with up to 50 Gbps CoaXPress v2.1 interface (Micro-BNC connector) which supports 9 MP high quality video at rates of up to 289 fps.

Intelligent Design

Our camera incorporates Gpixel's GMAX2509 sensor – manufactured in Israel by the company's Belgian branch. The GMAX2509 is a global shutter sensor with a 2.5µm pixel size. With a compact outline the camera can be fitted into tight spaces. Superior sensor performance allows very low light vision capabilities. The camera has two models: NS which operates at 12bits and HS which operates at 10bits and higher frame rates.

Applications:

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

Key Features:

- 9 Megapixel up to 289 fps
- Monochrome and Color models
- Up to 5W power at full rate
- Full image processing feature set
- Up to 50 Gbps CoaXPress interface
- C, CS, F or EF mounts available
- Full EMVA1288 report
- Full built-in self-test (BIT)
- Full built-in voltage testing
- Customization as per user requirements

March 2023

Technical Data

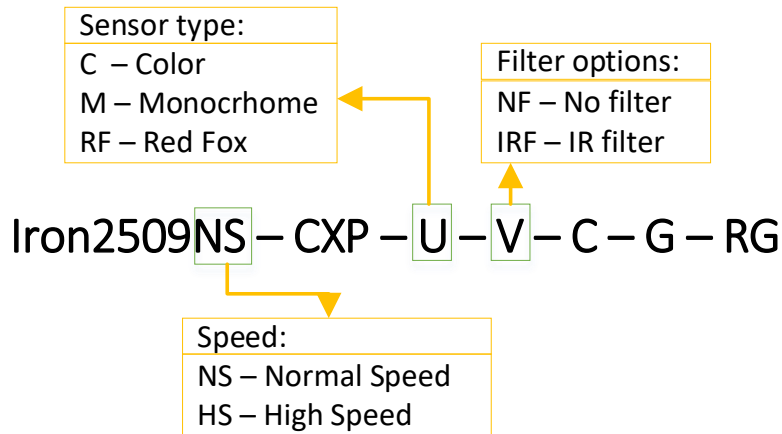| Feature	Description
Pixel Size	2.5 µm x 2.5 µm
Resolution	4200 (H) x 2160 (V)
Sensor Size	10.5 mm x 5.4 mm	2/3"
Sensor	Gpixel GMAX2509
Output Interface	x 4 channels CoaXPress v2.1 up to 50Gbps (CXP3, CXP6, CXP12) for HS version x 2 channels CoaXPress v2.1 up to 50Gbps (CXP3, CXP6, CXP12) for NS version
Interface Connector	x 4 Micro-BNC for HS version x 2 Micro-BNC for NS version
Output Resolution	8 bit, 10 bit, 12 bit
Max Frame Rate	High Speed Version: 289 fps @ 8 bit and 10 bit Normal Speed Version: 120 fps @ 8, 10 and 12 bit
Image acquisition	Continuous / Triggered
Camera Control	Gen<i>Cam
Electronic shutter	Global shutter
Monochrome/ color	Monochrome / Color
Temporal noise	<1.8 e$^-$
Full well charge	6.7 ke$^-$
Dynamic range	> 62dB @ 10 bit > 65dB @ 12 bit
Signal-to-Noise Ratio (SNR max)	38.2dB
Quantum efficiency (QE) X FF	<65.5% @500nm
Shortest Exposure	2.5 µs
On camera processing	- 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
GPIO connection	Two inputs, two outputs, external trigger & strobe controller

Mechanical & Electrical

Feature	Description
Dimensions [1]	44 mm x 44 mm x 39 mm (Height x Width x Depth)
Weight (without lens)	<100g
Typical current	210mA @ 24V
Operating Temperature	-40°C to 80°C, 20-85% humidity (non-condensing)
Storage Temperature	-40°C to 85°C, 20-85% humidity (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
Ingress Protection	Optional IP67 (with protective lens tube)
Lens Mount	C-mount, CS-mount, F-mount or EF-mount
Power Input	PoCXP full support (11-28V with external power option)
Power Consumption	<5W @ 24V DC

1. Mechanical dimensions are subject to change

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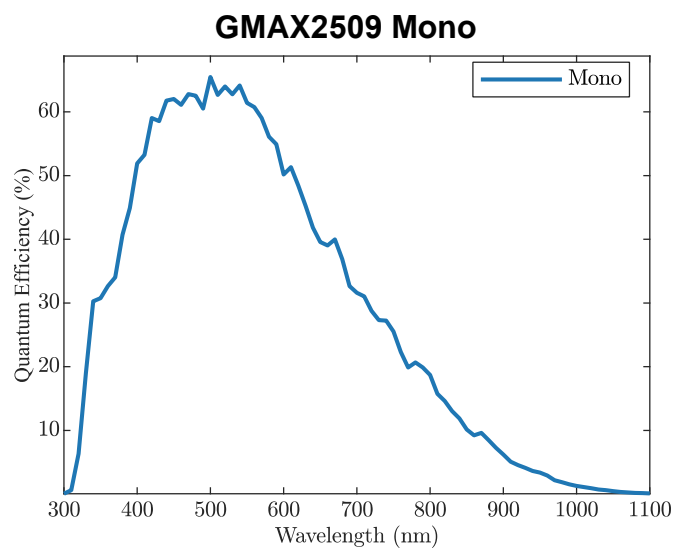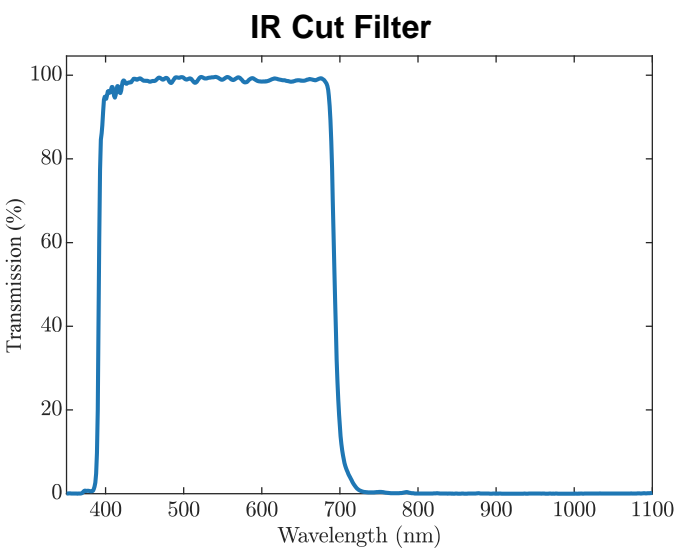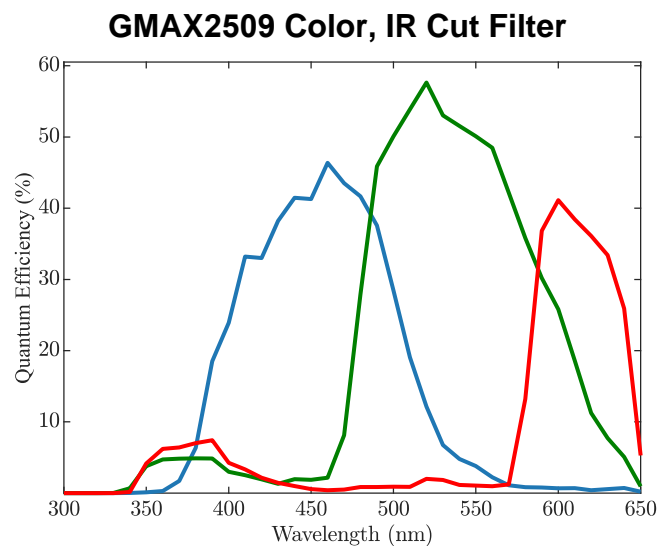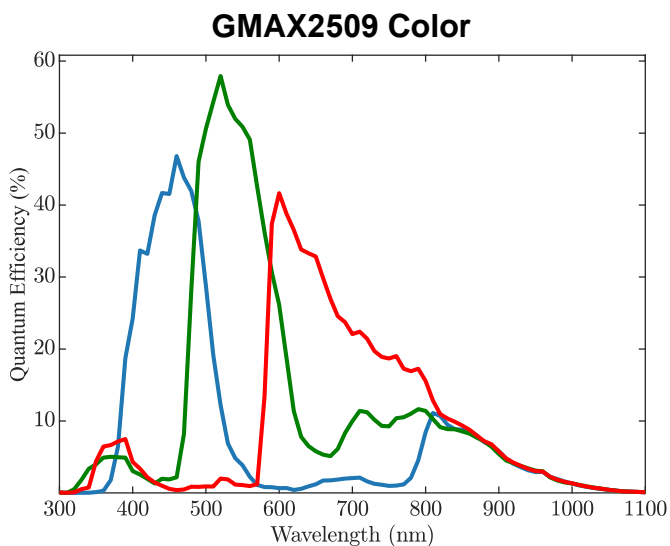
Ordering Information

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:

Sensor type:
C – Color
M – Monocrhome
RF – Red Fox

Filter options:
NF – No filter
IRF – IR filter

$$Iron2509NS - CXP - U - V - C - G - RG$$

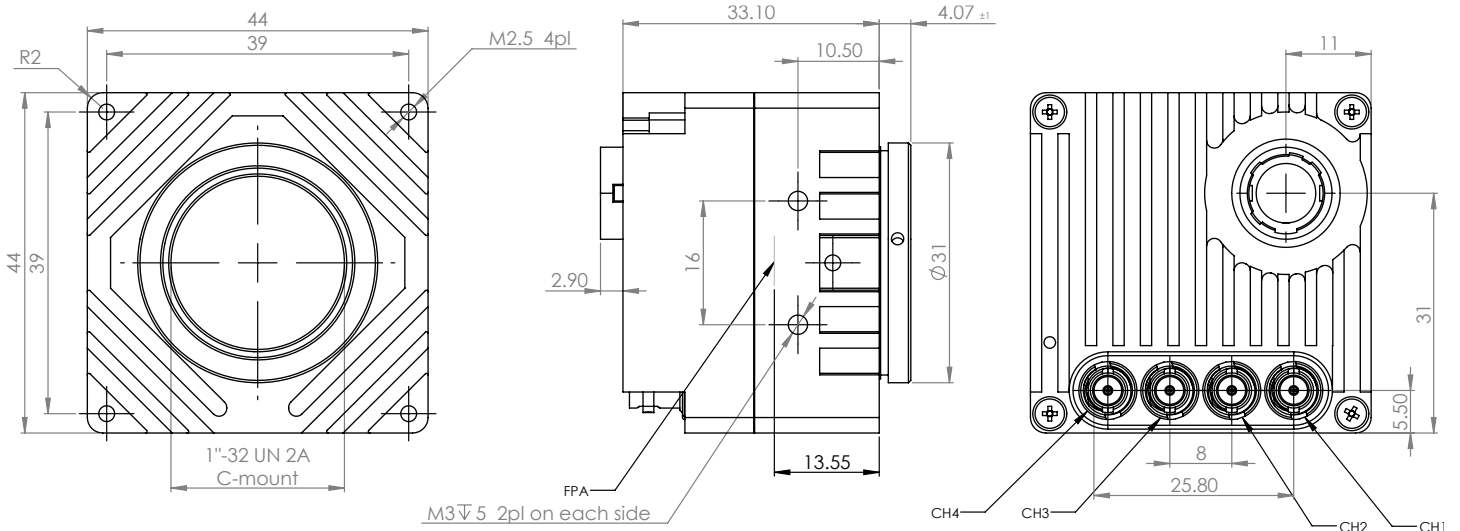Speed:
NS – Normal Speed
HS – High Speed

For example: an Iron CoaXPress 2509 with a colored sensor, UV-IR cut filter and C-mount, with a GPIO would go by Iron2509-C-IRF-C-G-CG. Please contact a sales representative over at info@kayainstruments.com for a full list of peripherals including cables and frame grabbers.
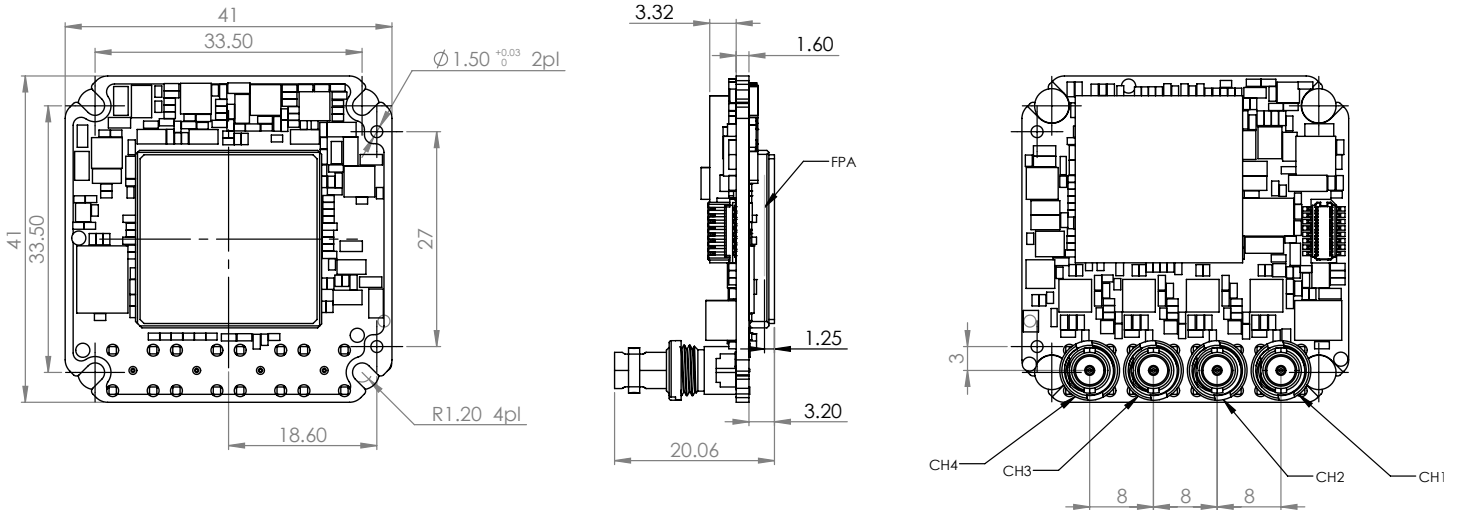
GMAX2509 Spectral Responses

GMAX2509 Color

GMAX2509 Color, IR Cut Filter

IR Cut Filter

GMAX2509 Mono

Mechanical Drawings*

Enclosed camera:

44
39
R2
M2.5 4pl
44
39
1"-32 UN 2A
C-mount
33.10
10.50
4.07 ±1
2.90
16
Ø31
13.55
FPA
M3▽5 2pl on each side
11
31
5.50
8
25.80
CH4 CH3 CH2 CH1

* Mechanical Dimensions are subject to change

Board Level Camera:

41
33.50
Ø1.50 +0.03/0 2pl
41
33.50
27
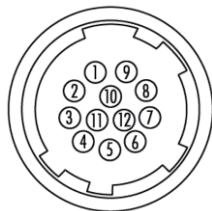R1.20 4pl
18.60
3.32
1.60
FPA
1.25
3.20
20.06
3
8 8 8
CH4 CH3 CH2 CH1

NOTE : 1. For NS version channels CH3 and CH4 are not assembled . 2. For board level , Sensor glass with is 0.7mm with RI=1.5

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 (TTL/LVTTL)
9. IN2 (TTL/LVTTL)
10. IN1/OUT1 Return
11. IN2 Return
12. OUT2 (TTL)

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

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** – we will be happy to provide assistance and consultation.

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