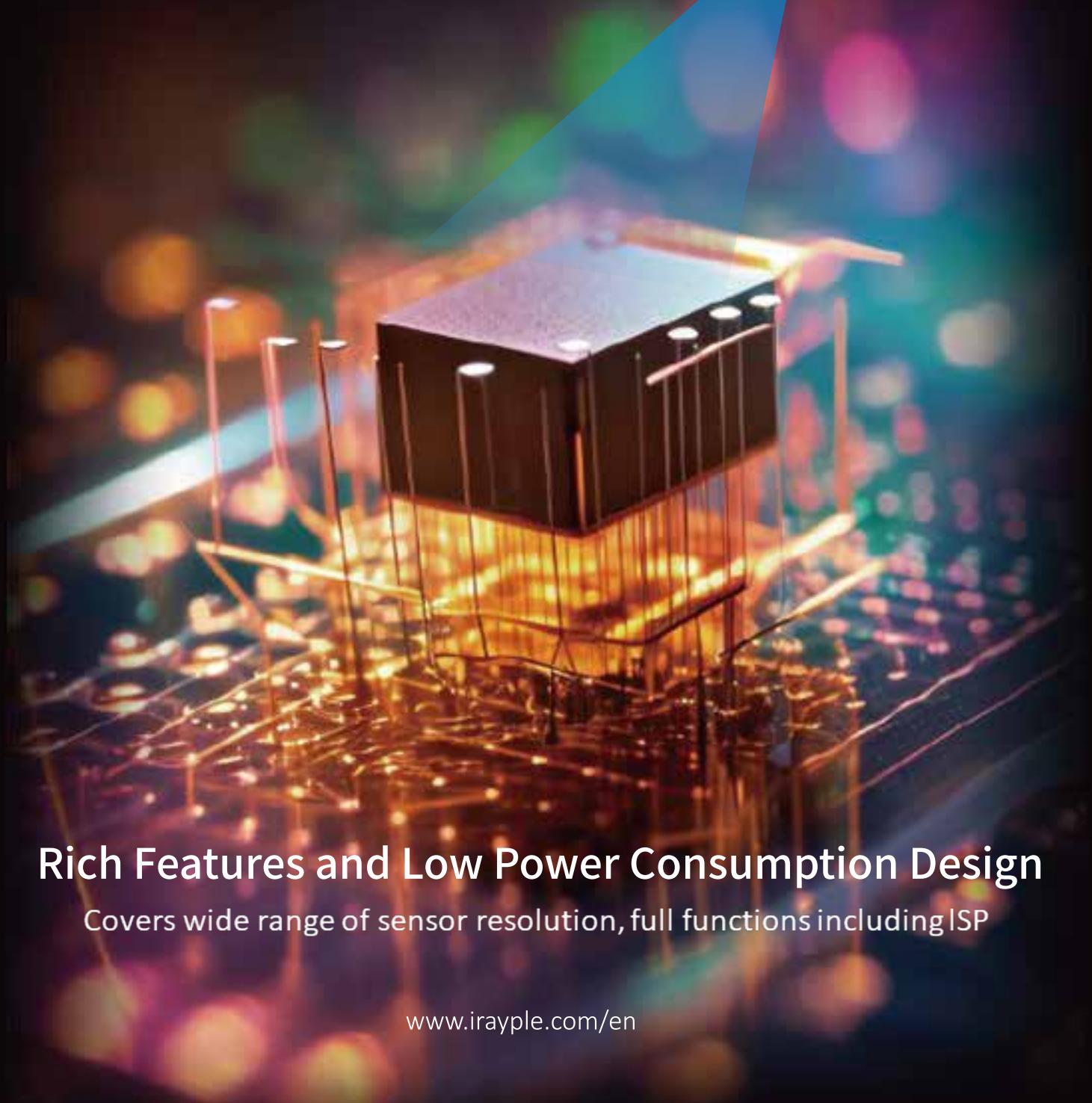


iRAYPLE

Area Scan Camera

A Pro Series



Empowering Intelligent Manufacturing and Business Efficiency

Design and specifications are subject to change without notice.

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Rich Features and Low Power Consumption Design

Covers wide range of sensor resolution, full functions including ISP

www.irayple.com/en



Various Features

Combines the powerful features of ultra-high-performance platform with multi-functional interpolation, lossless compression, CCM, super color palette, etc.



Stable Structural Performance

AA six-axis adjustment & four-side installation support



Low Power Consumption Design

Designed with low power-consuming platform



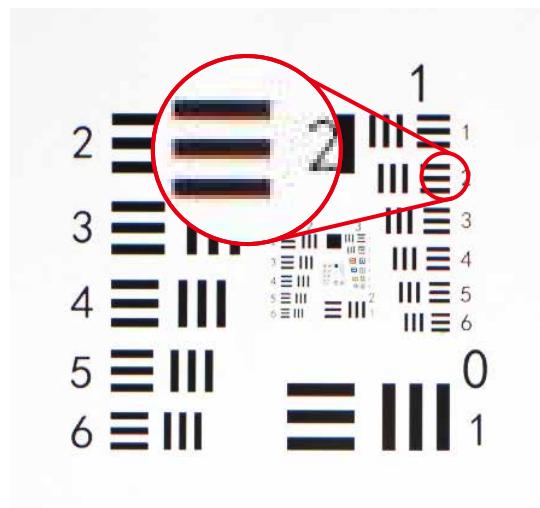
Various Features

Combines the powerful features of ultra-high-performance platform with multi-functional interpolation, lossless compression, CCM, super color palette, etc.

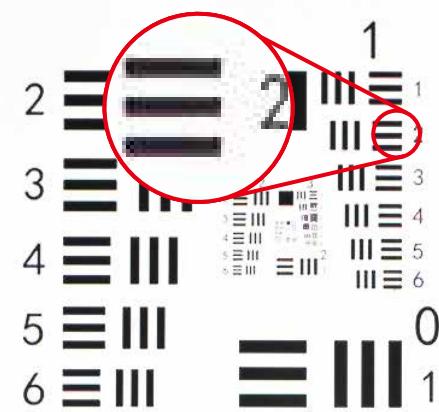


Interpolation Algorithm

The interpolation algorithm uses a 5 x 5 pixel radius de-mosaicing method to eliminate false color. It also incorporates noise reduction and sharpening techniques to enhance overall image quality.



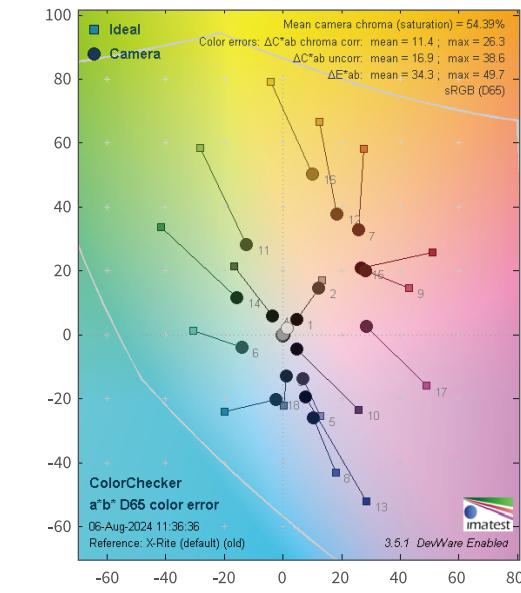
Before



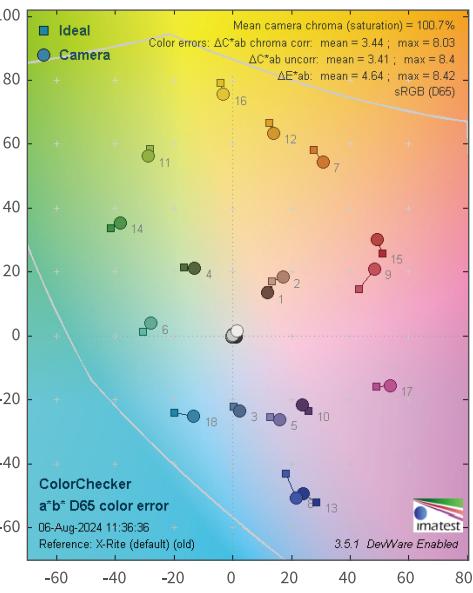
After

Color Correction Matrix (CCM)

Utilize a Color Correction Matrix (CCM) to address color shifts caused by white balance and apply non-linear adjustments to the RGB channels, enhancing the vividness of the image colors.



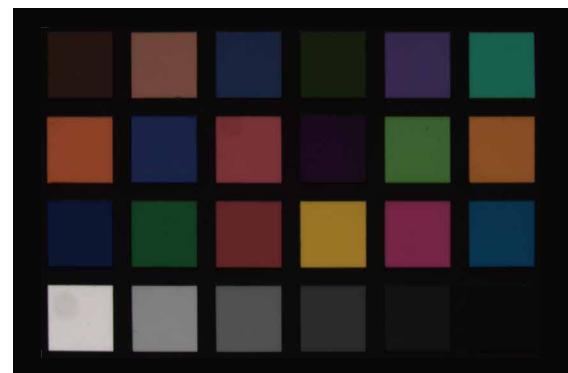
Before



After

Super Color Palette

The six-axis algorithm enhances image richness and depth, significantly improving color perception and contrast for a more vibrant and dynamic visual experience.



Before



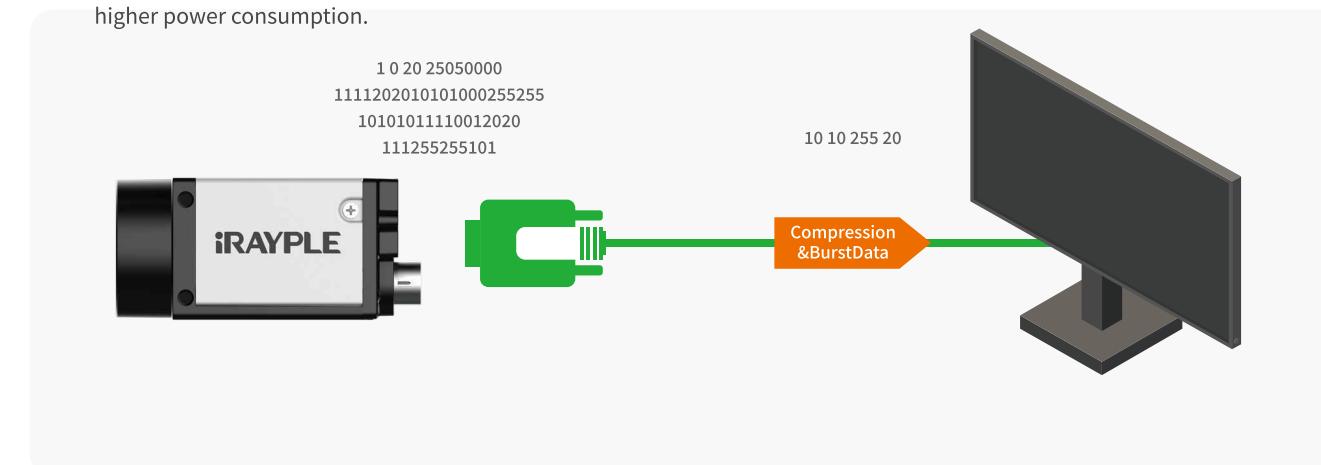
After

Lossless Compression

The system offers two lossless compression modes: Compression and Burst.

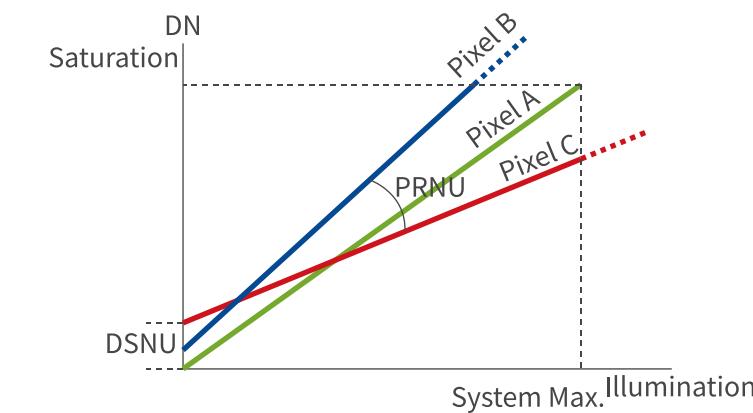
Compression Mode: This mode compresses image data without altering the image acquisition frame rate, resulting in relatively low power consumption.

Burst Mode: This mode compresses image data while simultaneously increasing the image acquisition frame rate, leading to higher power consumption.

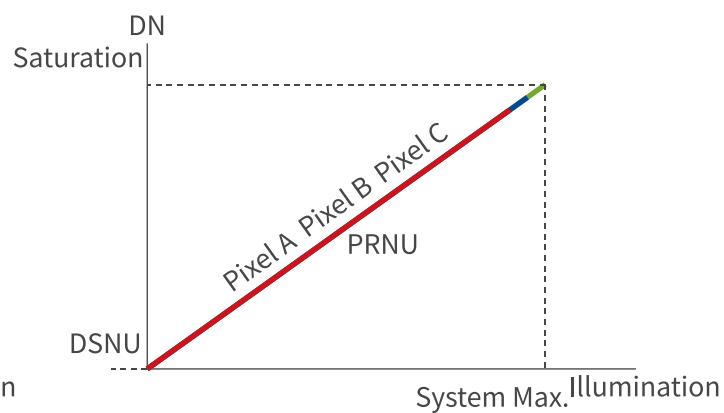


Flat Field Correction (FFC)

FFC ensures image consistency by simultaneously addressing both dark signal non-uniformity and pixel light response variations at the pixel level. It effectively eliminates artifacts caused by uneven external lighting or lens-induced dark corners, further enhancing overall image uniformity.



Pixel response curves are inconsistent under the same lighting
=> Negative impact on FPD detection

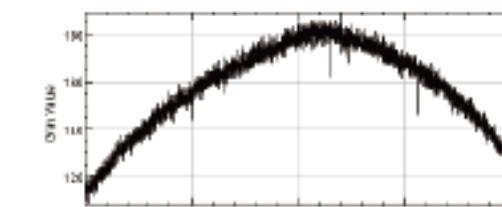
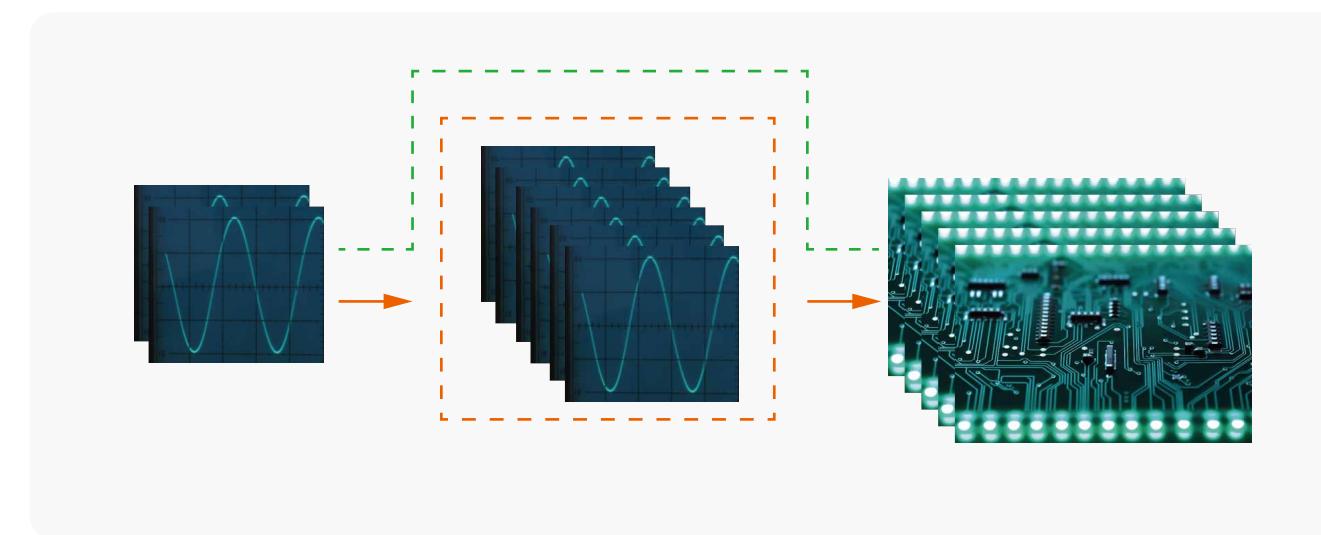


Consistent pixel response values under the same lighting
=> Suitable for FPD detection

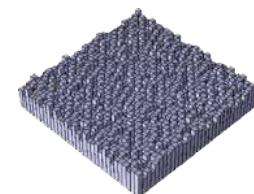
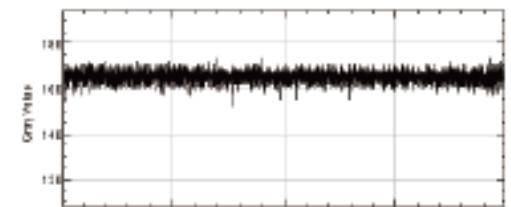
Pixel Consistency Correction

Trigger Cache

The trigger cache mode supports up to 8 groups of cache signals, effectively preventing the loss of trigger signals when their frequency exceeds the processing capability.



Linear Cross-Section



Linear Cross-Section

Before

After

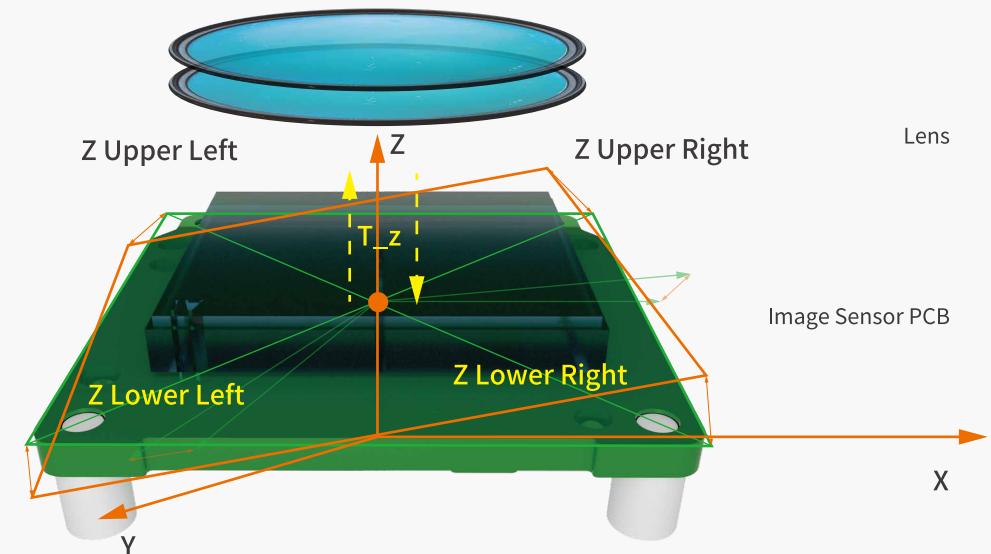
Stable Structural Performance

AA six-axis adjustment & four-side installation support



Active Alignment (AA)

HuaRay employs a bias adjustment method for the image sensor PCB. By analyzing the phase differences in surrounding curves, the system calculates the relative tilt between the lens and the sensor. These calculations are then fed back to the processor, which issues adjustment commands to complete the Active Alignment (AA) process accurately.

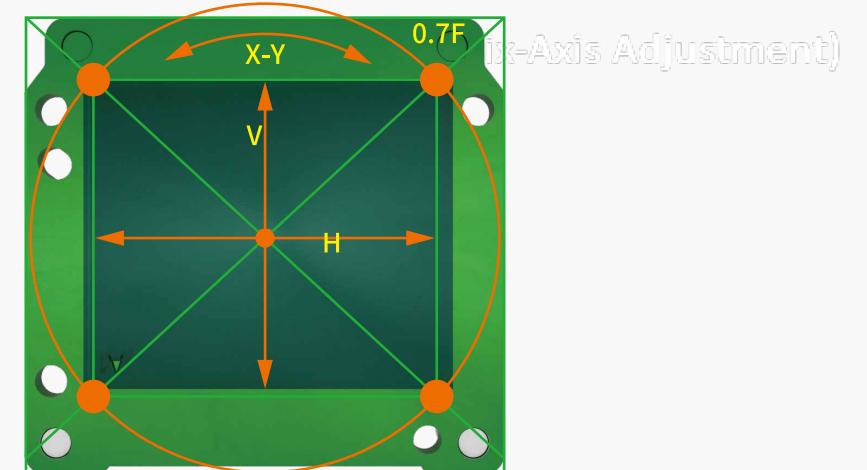


Active Alignment (AA Six-Axis Adjustment)

Active Alignment (AA) integrates the dispensing, alignment, and UV curing processes into a single workstation. This setup allows for precise adjustments of image center offsets, rotation offsets, and back focus, all within a unified system.

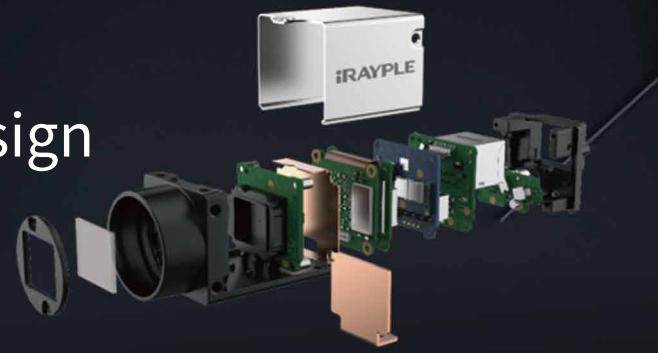


Device for AA Adjustment



Low Power Consumption Design

Designed with low power-consuming platform



By selecting low-power core image sensors and high-performance processor chips with minimal energy consumption, along with implementing efficient thermal design and optimizing software algorithms, the product's overall power consumption is significantly reduced.

APPLICATION SCENES

With the rapid development of intelligent manufacturing and the need to improve efficiency and quality control, the Industrial Camera has stepped in, bringing to focus the industry's need for informatization and reliability. The camera not only performs outstandingly, but is also highly reliable and durable. It can be used in multiple, complex industrial scenes and is widely used in the EV battery, 3C, semiconductor, and pharmaceutical industries.



Inspection in the 3C Industry

Power Consumption



Inspection in the 3C Industry

/ APPLICATION SCENES



Inspection in the Semiconductor Industry

/ APPLICATION SCENES



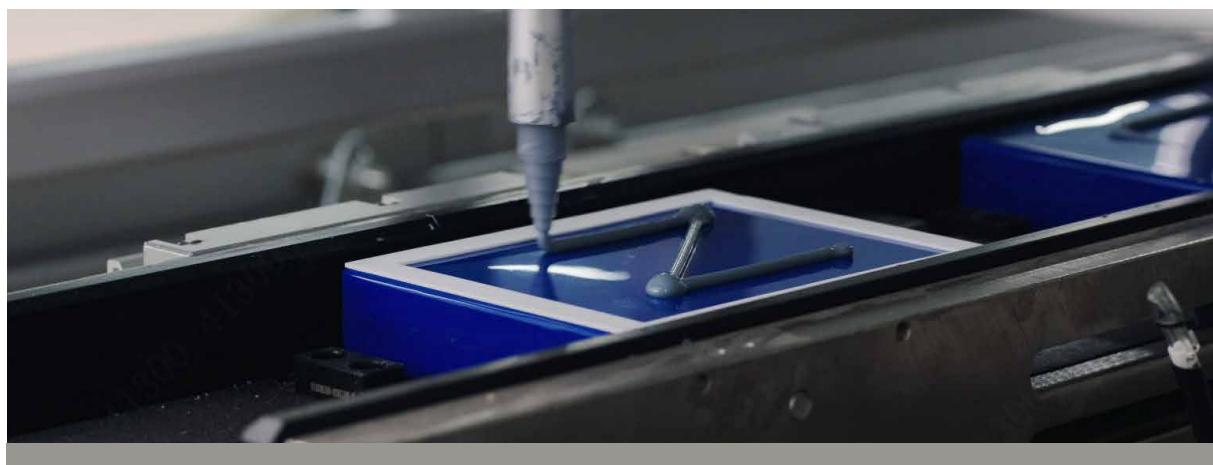
Inspection in the EV Battery Industry



Inspection in the Food and Beverage Industry



Inspection in the Pharmaceutical Industry



Inspection in the EV Battery Industry



Inspection in the Pharmaceutical Industry



Specifications

Model	*AH3600M/CU000E	*AH3800M/CU000E	*AH3B01M/CU000E	*AH7040M/CU000E	*AH7160M/CU000E	*AH5200M/CU000E
Resolution (MP)	6	20	20	0.4	1.6	2
Resolution (WxH)	3072x2048	5472x3648	5120x3840	720x540	1440x1080	1624x1240
Frame Rate (fps)	60	19.2	19.2	526.5	249.1	90
Sensor	IMX178	IMX183	AR2020	IMX287	IMX273	IMX430
Sensor Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Pixel Size (μm*μm)	2.4x2.4	2.4x2.4	1.4X1.4	6.9x6.9	3.45x3.45	4.5x4.5
Image Sensor	1/1.8"	1"	1/1.8"	1/2.9"	1/2.9"	2/3"
Shutter	Rolling	Rolling	Rolling	Global	Global	Global
Mono/Color	M/C	M/C	M/C	M/C	M/C	M/C
Exposure Time	NE:25μs~2.5sec	NE:43.76μs~2.5sec	NE:53μs~10sec	USE:1μs~4μs NE:15μs~10sec	USE:1μs~4μs NE:15μs~10sec	USE:1μs~4μs NE:15μs~10sec
Interface	USB3.0	USB3.0	USB3.0	USB3.0	USB3.0	USB3.0
Dimensions (mm*mm*mm)	29x29x30	29x29x30	29x29x30	29x29x30	29x29x30	29x29x30
Lens Mount	C	C	C	C	C	C
Power Supply	9 ~ 24 VDC (USB3.0 Provides Power supply)					

Specifications

Model	*AH5207M/CU000E	*AH5508M/CU000E	*AH7900M/CU000E	*AH5908M/CU000E	*AH5B57M/CU200E	*AH5B57M/CV200E
Resolution (MP)	2	5	9	9	25	25
Resolution (WxH)	2048x1200	2448x2048	2448x2048	2448x2048	5120x5120	5120x5120
Frame Rate (fps)	150	70	40	39	14	30
Sensor	GMAX4002	SS	IMX267	SS	GMAX0505	GMAX0505
Sensor Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Pixel Size (μm*μm)	4.0x4.0	3.45x3.45	3.45x3.45	4.0x4.0	2.5x2.5	2.5x2.5
Image Sensor	1/1.7"	2/3"	1"	1.1"	1.1"	1.1"
Shutter	Global	Global	Global	Global	Global	Global
Mono/Color	M/C	M/C	M/C	M/C	M/C	M/C
Exposure Time	NE:5μs~10sec	NE:19μs~10sec	USE:1μs~4μs NE:15μs~10sec	NE:5μs~10sec	NE:5μs~10sec	NE:5μs~10sec
Interface	USB3.0	USB3.0	USB3.0	USB3.0	USB3.0	2*USB3.0
Dimensions (mm*mm*mm)	29x29x30	29x29x30	29x29x30	29x44x58	29x44x58	29x44x58
Lens Mount	C	C	C	C	C	C
Power Supply	9 ~ 24 VDC (USB3.0 Provides Power supply)					

Specifications

Model	*AH3600M/CG000E	*AH3B00M/CG000E	*AH3B01M/CG000E	*AH7040M/CG000E	*AH7040M/CG001E	*AH7160M/CG000E	*AH7160M/CG001E
Resolution (MP)	6	20	20	0.4	0.4	1.6	1.6
Resolution (WxH)	3072x2048	5472x3648	5120x3840	720x540	720x540	1440x1080	1440x1080
Frame Rate (fps)	19(32 @Brust Mode)	5.9 (10 @Brust Mode)	5.9 (10 @Brust Mode)	310(319.9 @Brust Mode)	123	77(100.5 @Brust Mode)	65.2
Sensor	IMX178	IMX183	AR2020	IMX287	IMX297	IMX237	IMX296
Sensor Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS
Pixel Size (μm*μm)	2.4x2.4	2.4x2.4	1.4X1.4	6.9x6.9	6.9x6.9	3.45x3.45	3.45x3.45
Image Sensor	1/1.8"	1"	1/1.8"	1/2.9"	1/2.9"	1/2.9"	1/2.9"
Shutter	Rolling	Rolling	Rolling	Global	Global	Global	Global
Mono/Color	M/C	M/C	M/C	M/C	M/C	M/C	M/C
Exposure Time	NE:25μs~2.5sec	NE:43.76μs~2.5sec	NE:53μs~10sec	USE:1μs~14us NE:15μs~10sec	USE:1μs~14us NE:15μs~10sec	USE:1μs~14us NE:15μs~10sec	USE:1μs~14us NE:15μs~10sec
Interface	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE
Dimensions (mm*mm*mm)	29x29x42	29x29x42	29x29x42	29x29x42	29x29x42	29x29x42	29x29x42
Lens Mount	C	C	C	C	C	C	C
Power Supply	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE

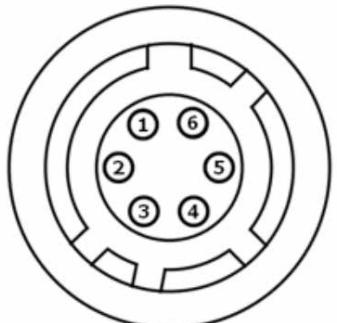
Specifications

Model	*AH5200M/CG000E	*AH5207M/CG000E	*AH7500M/CG000E	*AH5508M/CG000E	*AH7900M/CG000E	*AH5908M/CG200E	*AH7A20M/CG000E	*AH7900M/CG000E	
Resolution (MP)	2	2	5	5	9	9	12	25	
Resolution (WxH)	1624x1240	2048×1200	2448x2048	2448x2048	4096x2160	3840x2334	4096x3000	5120x5120	
Frame Rate (fps)	60(86.8@Brust Mode)	49(81@Brust Mode)	24(36@Brust Mode)	24(36@Brust Mode)	13 (22@Brust Mode)	13 (22@Brust Mode)	9.4 (16@Brust Mode)	4.5(7@Brust Mode)	
Sensor	IMX430	GMAX4002	IMX264	SS	IMX267	SS	IMX304	GMAX0505	
Sensor Type	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	CMOS	
Pixel Size (μm*μm)	4.5x4.5	4.0x4.0	3.45x3.45	3.45x3.45	3.45x3.45	4.0x4.0	3.45x3.45	2.5x2.5	
Image Sensor	2/3"	1/1.7"	2/3"	2/3"	1"	1.1"	1.1"	1.1"	
Shutter	Global	Global	Global	Global	Global	Global	Global	Global	
Mono/Color	M/C	M/C	M/C	M/C	M/C	M/C	M/C	M/C	
Exposure Time	USE:1μs~4μs NE:5μs~10sec	NE:5μs~10sec	USE:1μs~14μs NE:15μs~10sec	NE:15μs~10sec	NE:52μs~10sec	USE:1μs~14μs NE:15μs~10sec	NE:31.74μs~10s	USE:1μs~14μs NE:15μs~10sec	NE:5μs~10sec
Interface	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	GigE,POE	
Dimensions (mm*mm*mm)	29x29x42	29x29x42	29x29x42	29x29x42	29x29x42	29x29x42	29x44x58	29x44x58	
Lens Mount	C	C	C	C	C	C	C	C	
Power Supply	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	9-24 VDC,PoE	

Connector Pin-out

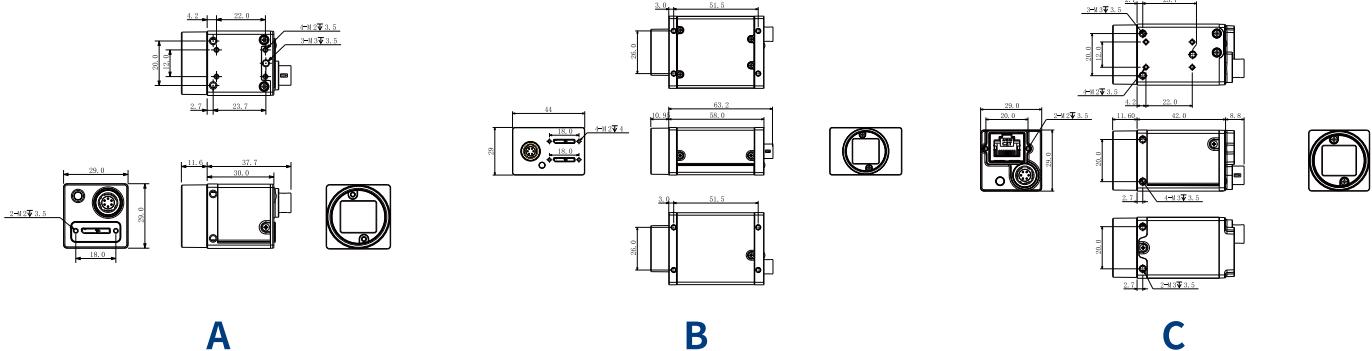
Area scan cameras use the 6-pin cable

Definitions of camera 6-pin ports			
Color	Pin	Description	Features
Blue	1	—	+9VDC to 24VDC power supply
Red	2	Line1	Opto-isolated input
Gray	3	Line2	GPIO (I/O can be configured for non-isolated software)
Black	4	Line0	Opto-isolated output
Green	5	—	Opto-isolated signal ground(ISO_GND)
Brown	6	—	Camera DC power ground and GPIO signal ground(GND)



Definition of 6-pin power port

Dimensions



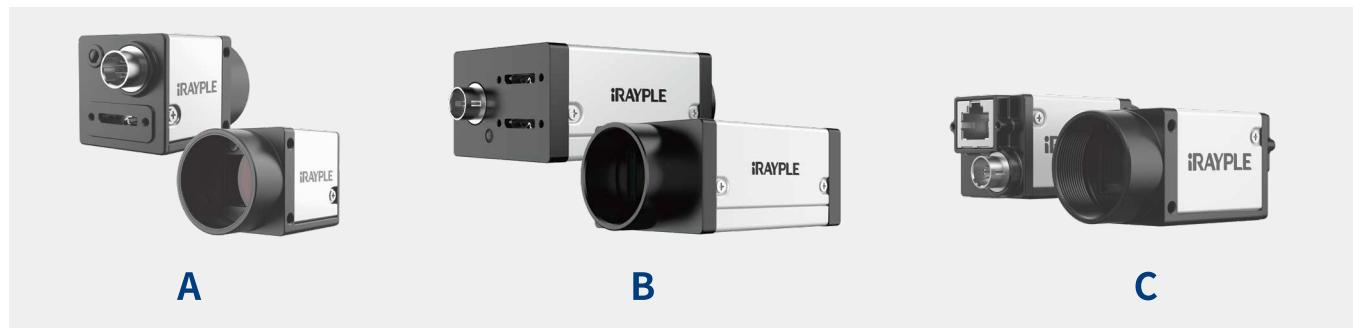
A

B

C

System Components

Compatible Device Models



Cables

Power & GPIO Cable		Ethernet Cable	
Static	Flexible	Static	Flexible
C01-IO-6PIN-DC-5M	C03-IO-6PIN-DC-FC-5M	C01-GE-RJ45-RJ45-5M	C03-GE-RJ45-RJ45-FC-5M
C01-IO-6PIN-DC-10M	C02-IO-6PIN-DC-FC-10M	C01-GE-RJ45-RJ45-10M	C03-GE-RJ45-RJ45-FC-10M

