



# CIS PRODUCT LINEUP

Camera & Imaging Systems



# Corporate Profile

## About us

Corporate name	CIS Corporation
Location	539-5, Higashi Asakawa-machi, Hachioji-shi, Tokyo, 193-0834, JAPAN Tel +81-42-664-5535 (Head Quarters)
Foundation	September 1 <sup>st</sup> , 1978
President	Yusuke Muraoka
ISO	ISO9001:2015 edition      ISO14001 (HQ only)

## Corporate History

Sep. 1978	Founded CAFLO Corporation
Mar. 1991	Started manufacturing VCC camera series (CCD models)
Jan. 1992	Renamed to CIS Corporation
May. 1995	Acquired ISO9002 certification
Nov. 1995	First shipment of CE certified products
Jun. 1996	Started manufacturing digital cameras
May. 1998	Acquired ISO9001 certification
Dec. 2000	Acquired ISO14001 certification
Apr. 2002	Increased capital to 60 Million YEN
Nov. 2002	Acquired ISO9001 certification, year 2000 version
Aug. 2003	Certified as SONY Green Partner
Oct. 2004	Increased capital to 90 Million YEN
Oct. 2005	Established Software Development Center
Sep. 2007	Opened Hachioji Office
May. 2011	Opened Solution Development Center in Nakano, Japan
Mar. 2015	Reacquired ISO14001 certification
Mar. 2018	Acquired ISO9001 certification (year 2015 version) and ISO14001 certification (year 2015 version) from the third-party institution
Dec. 2020	Relocated Sales Div. and Engineering Div. to Takao

## From Camera to Imaging Systems

### Imaging System Solution

CIS has consistently pursued “small footprint”, “high speed”, and “high performance” in our product design and development. While maintaining these key product features, CIS is pursuing new technologies such as new sensors, new digital interface, hardware and software integration, and proprietary signal processing algorithm.

CIS offers total imaging solution to meet with customer’s various needs, by way of proposing optimal system architecture and the most suitable camera interface, electric and mechanical design, development of system software, and when applicable, development of image processing application software.

### Expert Engineering Teams

We have in-house professional teams devoted to mechanical design, circuit design, FPGA logic development, system software development and algorithm development. From planning to design, entire engineering processes are handled within CIS.

We can provide one-stop-shop services for realizing your requirements in design, development and mass production of image processing systems and cameras.

Furthermore, we have started releasing unique, high image-quality color cameras incorporating Clairvu™, CIS’s proprietary image processing engine.

### Manufacturing



CIS runs its own clean rooms for the assembly and inspection in Tokyo, Japan.

With its thorough quality assurance system and know-hows acquired over 20+ years in operation, we have won high appraisal from our customers, and we will strive to remain so.

※ The chassis for cameras in 29mm cubic size (29×29×29mm) and 29×29×55mm size are sequentially switched to solid color design.

VGA  
SXGA  
2M



	VGA High speed	SXGA High speed	SXGA High speed	2M High speed
Interface	CXP3 × 1lane	CXP1-CXP3 × 1lane	CXP3 · CXP6 × 1lane	CXP1-CXP3 × 1lane
Model name (B/W) (Color)	VCC-VCXP5M VCC-VCXP5R	VCC-SXCXP3M VCC-SXCXP3R	VCC-SXCXP5M VCC-SXCXP5R	VCC-2CXP2M
Sensor	Pregius IMX287	PYTHON 1300	Pregius IMX273	PYTHON 2000
Sensor size	1/2.9 type CMOS	1/2 type CMOS	1/2.9 type CMOS	2/3 type CMOS
Unit cell size (μm)	6.9 μm × 6.9 μm	4.8 μm × 4.8 μm	3.45 μm × 3.45 μm	4.8 μm × 4.8 μm
Effective pixels (H) × (V)	720 × 540	1280 × 1024	1456 × 1088	1984 × 1264
Resolution	VGA	SXGA	SXGA	2M
Frame rate	583fps(at VGA), 523fps(CXP3 · 8bit), 437fps(CXP3 · 10bit), 320fps(CXP3 · 12bit)	168fps(CXP3 · 8bit)	276fps(8bit), 226fps(10bit), 165fps(12bit)	85fps(CXP3 · 8bit/10bit)
Pixel clock	74.25MHz	72MHz	74.25MHz	72MHz
Shutter	OFF~1/20,000s	OFF~1/10,000s	OFF~1/66,666s	OFF~1/5,000s
Lens mount	C mount	C mount	C mount	C mount
Dimensions (W) × (H) × (D)mm	29 × 29 × 29	29 × 29 × 29	29 × 29 × 29	29 × 29 × 29
Features	Connector: BNC, External trigger, Long distance transmission, ROI, H&V flip, Defective pixel correction, Gain: 0~48dB, PoCXP	Connector: BNC, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Sequence control, Shading correction, PoCXP	Connector: BNC, External trigger, ROI, H&V flip, Defective pixel correction, Shading correction, Gain, Gamma correction, PoCXP	Connector: BNC, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Shading correction, PoCXP

2M  
5M



	2M High speed	5M High speed	5M High speed	5M High speed
Interface	CXP3 · CXP6 × 1lane	CXP1-CXP6 × 1lane	CXP3-CXP6 × 1lane/2lanes	CXP3/CXP6 × 1lane
Model name (B/W) (Color) (NIR)	VCC-2CXP6M VCC-2CXP6R	VCC-5CXP3M VCC-5CXP3R VCC-5CXP3NIR	VCC-5CXP4M VCC-5CXP4R	VCC-5CXP7M VCC-5CXP7R
Sensor	Pregius IMX422	PYTHON 5000	Pregius IMX250	Pregius S IMX547
Sensor size	1/1.7 type CMOS	1type CMOS	2/3 type CMOS	1/1.8 type CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm	4.8 μm × 4.8 μm	3.45 μm × 3.45 μm	2.74 μm × 2.74 μm
Effective pixels (H) × (V)	1632 × 1248	2592 × 2048	2464 × 2056	2472 × 2064
Resolution	2M	5M	5M	5M
Frame rate	239fps(CXP6 · 8bit), 195fps(CXP6 · 10bit), 166fps(CXP6 · 12bit)	85fps(CXP6 · 8bit/CXP6 · 10bit), 43fps(CXP3 · 8bit/CXP3 · 10bit)	163fps(CXP6 · 8bit × 2lanes), 145fps(CXP6 · 10bit × 2lanes), 90fps(CXP6 · 12bit × 2lanes)	101fps(CXP6 · 8bit), 82fps(CXP6 · 10bit), 68fps(CXP6 · 12bit)
Pixel clock	74.25MHz	72MHz	74.25MHz	74.25MHz
Shutter	OFF~1/66,000s	OFF~1/10,000s	15 μs~200ms	91 μs~200ms
Lens mount	C mount	C mount	C mount	C mount
Dimensions (W) × (H) × (D)mm	29 × 29 × 55	29 × 29 × 55	55 × 55 × 30	29 × 29 × 55
Features	Connector: BNC, External trigger, Long distance transmission, ROI, 2 × 2 binning (B/W model only), Defective pixel correction, PoCXP	Connector: BNC, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Sequence control, Shading correction, PoCXP, NIR model is also available.	Connector: BNC, External trigger, Long distance transmission, ROI, H&V flip, Defective pixel correction, Gain: 0~36dB, PoCXP/External power supply is selectable.	Connector: BNC, External trigger, Long distance transmission, ROI, 2 × 2 binning (B/W model only), Defective pixel correction, Shading correction, Gain, Gamma correction, PoCXP

12M  
20M  
24M



	12M High speed	20M High speed	24M Small size
Interface	CXP3-CXP6 × 1lane/2lanes	CXP12 × 2lanes/1lane, CXP6 × 2lanes/1lane, CXP3 × 2lanes	CXP3/CXP6 × 1lane
Model name (B/W) Color	<b>VCC-12CXP4M</b> <b>VCC-12CXP4R</b>	<b>VCC-20CXP6M</b> <b>VCC-20CXP6R</b>	<b>VCC-24CXP7M</b>
Sensor	Pregius IMX253	Pregius S IMX531	Pregius S IMX540
Sensor size	1.1 type CMOS	1.1 type CMOS	1.2 type CMOS
Unit cell size (μm)	3.45 μm × 3.45 μm	2.74 μm × 2.74 μm	2.74 μm × 2.74 μm
Effective pixels (H) × (V)	4096 × 3000	4512 × 4512	5328 × 4608
Resolution	12M	20M	24M
Frame rate	65fps(CXP6 · 8bit/10bit × 2lanes), 32fps(CXP6 · 8bit/10bit × 1lane), 16fps(CXP3 · 8bit/10bit × 1lane)	79.6fps(CXP12 · 8bit × 2lanes)	21.9fps(CXP6 · 8bit), 17.6fps(CXP6 · 10bit), 14.7fps(CXP6 · 12bit)
Pixel clock	74.25MHz	74.25MHz	74.25MHz
Shutter	OFF~1/51,000s	2.68 μs~200ms	OFF~1/83,333s
Lens mount	M42 mount	M48 mount	C mount
Dimensions (W) × (H) × (D)mm	55 × 55 × 30	65 × 65 × 93.3	29 × 29 × 55
Features	Connector: BNC, External trigger, Long distance transmission, ROI, 2 × 2 binning (B/W model only), Defective pixel correction, Shading correction, Gain: 0~36dB, PoCXP	Connector: HD-BNC, External trigger, Long distance transmission, ROI, H&V flip, Binning, Defective pixel correction, Shading correction, Gain, Gamma correction, PoCXP	Connector: BNC, External trigger, Long distance transmission, ROI, Defective pixel correction, Shading correction, Gain, Gamma correction, PoCXP

25M



Without heatsink



With heatsink

	25M High speed	25M Ultra-high speed
Interface	CXP1-CXP6 × 4lanes	CXP6/12 × 4lanes/1lane
Model name (B/W) (Color) (NIR) (Binning)	<b>VCC-25CXP1M</b> <b>VCC-25CXP1R</b> <b>VCC-25CXP1NIR</b> <b>VCC-25CXP1MBN</b>	<b>VCC-25CXP1M-F / VCC-25CXP1M (without heatsink)</b> <b>VCC-25CXP1R-F / VCC-25CXP1R (without heatsink)</b> <b>VCC-25CXP1NIR-F / VCC-25CXP1NIR (without heatsink)</b>
Sensor	PYTHON 25K	GMAX0505
Sensor size	APS-H CMOS	1.1 type CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm	2.5 μm × 2.5 μm
Effective pixels (H) × (V)	5120 × 5120	5120 × 5120
Resolution	25M	25M
Frame rate	82fps(CXP6 · 8bit), 65fps(CXP6 · 10bit), 40fps(CXP3 · 8bit), 34fps(CXP3 · 10bit)	150fps(CXP12 × 4 · 8bit), 141fps(CXP12 × 4 · 10bit), 88fps(CXP6 × 4 · 8bit), 68fps(CXP6 × 4 · 10bit), 44fps(CXP12 × 1 · 8bit), 35fps(CXP12 × 1 · 10bit), 23fps(CXP6 × 1 · 8bit), 18fps(CXP6 × 1 · 10bit)
Pixel clock	72MHz	1152MHz
Shutter	OFF~1/30,000s	6 μs~2s
Lens mount	M48 mount	M48 mount
Dimensions (W) × (H) × (D)mm	65 × 65 × 65	65 × 125 × 93.3 (VCC-25CXP1M-F / VCC-25CXP1R-F / VCC-25CXP1NIR-F) 65 × 65 × 93.3 (VCC-25CXP1M / VCC-25CXP1R / VCC-25CXP1NIR) ※ Heat dissipation is necessary for this model without heatsink.
Features	Connector: DIN, External trigger, Long distance transmission, ROI, Sub-sampling, Binning (Binning model only), Defective pixel correction, Sequence control, Shading correction, PoCXP, NIR model and Binning model are also available.	Connector: HD-BNC, External trigger, Long distance transmission, ROI, Defective pixel correction, Shading correction, Gamma correction, PoCXP, NIR model is also available.

120M

127M

250M



	120M Ultra-high resolution	127M Ultra-high resolution	250M Ultra-high resolution
Interface	CXP3/6 × 4lanes, CXP6 × 2lanes	CXP6/12 × 1lane/2lanes	CXP6 × 4lanes
Model name (B/W) (Color)	<b>VCC-120CXP1M</b> <b>VCC-120CXP1R</b>	<b>VCC-127CXP6M</b> <b>VCC-127CXP6R</b>	<b>VCC-250CXP1M</b> <b>VCC-250CXP1R</b>
Sensor	120MXSM	Pregius IMX661	CANON LI8020SAM
Sensor size	APS-H CMOS	3.6 type CMOS	APS-H CMOS
Unit cell size (μm)	2.2 μm × 2.2 μm	3.45 μm × 3.45 μm	1.5 μm × 1.5 μm
Effective pixels (H) × (V)	13264 × 9180	13408 × 9528	19568 × 12588
Resolution	120M	127M	250M
Frame rate	9.4fps(CXP3 · 8bit × 4lanes/ CXP6 · 8bit × 2lanes/CXP6 · 8bit × 4lanes/CXP6 · 10bit × 4lanes)	18.5fps(CXP12 · 8bit × 2lanes), 13.1fps(CXP12 · 10bit × 2lanes), 11.1fps(CXP12 · 12bit × 2lanes), 9.2fps(CXP12 · 8bit × 1lane)	5fps(CXP6 · 8bit/10bit), 3.2fps(CXP6 · 12bit)
Pixel clock	-	74.25MHz	1152MHz
Shutter	OFF~1/20,000s	22 μs~15s	200 μs~15s
Lens mount	M48 mount	M72 mount	M48 mount
Dimensions (W) × (H) × (D)mm	65 × 65 × 68	100 × 100 × 100	100 × 100 × 94.9
Features	Rolling shutter, Connector: DIN, External trigger, Long distance transmission, ROI, Defective pixel correction, Shading correction, Gain, Strobe out, Long time exposure, PoCXP, High-speed processing	Connector: Micro BNC External trigger, ROI, 2 × 2 binning, Defective pixel correction, Shading correction, Gain, Gamma correction, Flat field correction, PoCXP, Cooling fan installed.	Rolling shutter, Connector: DIN, External trigger, Long distance transmission, ROI, Binning, Defective pixel correction, Shading correction, Strobe pulse control, Gain, Gamma correction, PoCXP, Cooling fan installed.

## CoF Camera

21M



CoaXPress-over-Fiber (CoF) is a significant extension of the existing CoaXPress specification to support transport over fiber optics.

	21M Ultra-high speed
Interface	CoaXPress over Fiber QSFP28 × 1
Model name (B/W) (Color)	<b>VCC-21CoF2M</b> <b>VCC-21CoF2R</b>
Sensor	GSPRINT4521
Sensor size	APS-H CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm
Effective pixels (H) × (V)	5120 × 4096
Resolution	21M
Frame rate (TBD)	510fps(8bit), 410fps(10bit), 250fps(12bit)
Pixel clock	-
Shutter (TBD)	4 μs~60,000s
Lens mount	TFL-II mount
Dimensions (W) × (H) × (D)mm	80 × 80 × 150
Features	External trigger, ROI, H flip, 2 × 2 binning, Defective pixel correction, Shading correction, Gain, Gamma correction

### Pros of using CoF

#### ◆ Transmit images with broad spectrum

Up to 5,000MB/s bandwidth from camera to host PC memory.

#### ◆ Cable length

Cable length is not an issue as fiber connectivity is basically not limited in length. Therefore, cables can be routed freely according to customers' applications.

#### ◆ Standardized by JIA and IEEE

The wide variety of connectivity options for CoF has already been available from multiple companies. Therefore, customers can obtain cables which suit to their application easily at low cost.

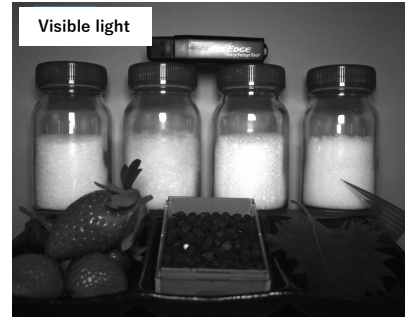
# SWIR Camera

SXGA



CIS SWIR camera, VCC-SXCXP1SW, can detect and inspect objects in the region of 400nm to 1,700nm wavelength spectrum.

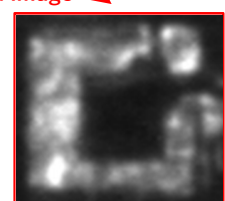
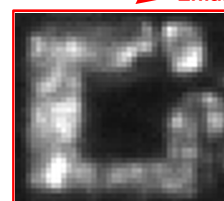
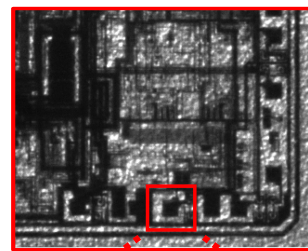
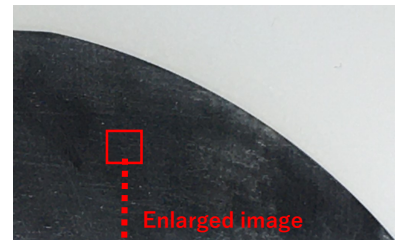
	SXGA Visible+SWIR image sensor
Interface	CXP3 × 1lane
Model name (B/W)	<b>VCC-SXCXP1SW</b>
Sensor	SenSWIR IMX990 (SWIR)
Sensor size	1/2 type
Unit cell size (μm)	5 μm × 5 μm
Effective pixels (H) × (V)	1296 × 1032
Resolution	SXGA
Frame rate	134.7fps(8bit), 125.3fps(10bit), 71.5fps(12bit)
Pixel clock	74.25MHz
Shutter	10 μs ~ 200ms
Lens mount	C mount
Dimensions (W) × (H) × (D)mm	65 × 65 × 65
Features	Connector: BNC, External trigger, ROI, H&V flip, Lighting trigger control, Detection wavelength spectrum: 400nm~1700nm, PoCXP



21M



↓ Object of shooting: Back side of silicon wafer (Shot under visible light)



↑ Shot silicon wafer under SWIR (1200nm)  
The circuits on the front side are transmitted and became visible.

	Max. 21M pixels Visible + SWIR sensor installed
Interface	CXP3 × 1lane
Model name (B/W)	<b>VCC-SXCXP1SWPS-9 (9 times pixel-shift)</b> <b>VCC-SXCXP1SWPS-16 (16 times pixel-shift)</b>
Sensor	SenSWIR IMX990 (SWIR)
Sensor size	1/2 type CMOS
Unit cell size (μm)	5 μm × 5 μm
Effective pixels (H) × (V)	1296 × 1032
Resolution	(9 times pixel-shift) 5M · 12M (16 times pixel-shift) 5M · 21M
Frame rate	117.9fps(8bit), 110.5fps(10bit), 66.2fps(12bit)
Pixel clock	74.25MHz
Shutter	-
Lens mount	C mount
Dimensions (W) × (H) × (D)mm	65 × 65 × 95
Features	Global shutter, Connector: BNC, External trigger, ROI, Defective pixel correction, Shading correction, Gain, Gamma, Detection wavelength spectrum: 400nm~1700nm, PoCXP non-compliant, Build-in Piezo actuator drive unit

# Pixel-shift Camera

400M



Max. 400M pixels Ultra-high resolution	
Interface CXP3/CXP6 × 4lanes	
Model name (B/W) (Color)	<b>VCC-25CXP1MPS</b> <b>VCC-25CXP1RPS</b>
Sensor	PYTHON 25K
Sensor size	APS-H CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm
Effective pixels (H) × (V)	5120 × 5120
Resolution (B/W) (Color)	25M · 100M · 400M 25M · 25M (Equivalent to 3CMOS True color) · 104M (Equivalent to 3CMOS True color)
Frame rate	81.4fps(CXP6 · 8bit at 25M), 11.1fps(CXP6 · 8bit at 100M), 2.7fps (CXP6 · 8bit at 400M)
Pixel clock	72MHz
Shutter	OFF~1/30,000s
Lens mount	M48 mount
Dimensions (W) × (H) × (D)mm	65 × 65 × 93.3
Features	Global shutter Connector: DIN B/W: 10240 × 10240/20480 × 20480 Color: 5120 × 5120/10240 × 10240 (Equivalent to 3CMOS True color) Build-in Piezo actuator drive unit

## Pixel-shift Technology

CIS realized ultra-high resolution cameras by using patented piezo-actuator-based pixel shift technology.

This technology increases the resolution by shifting the sensor in μm order, creating virtual pixels in between physical pixels, and by synthesizing images obtained at each position. For color models, the same technology is applied for obtaining all R, G, and B information in each and every pixel, thereby producing an image quality equivalent to 3-image sensor cameras.

These cameras are suitable not only for Machine Vision applications, but also for research applications and image archiving purposes.

**VCC-25CXP1MPS**  
(25M Pixel-shift camera B/W model)

Watch

**Without pixel-shift (25M)**

Enlarged image

**16 times pixel-shift (400M)**

Enlarged image

**VCC-25CXP1RPS**  
(25M Pixel-shift camera Color model)

Body tissue

**Without pixel-shift (25M)**

Enlarged image

**16 times pixel-shift**  
(104M Equivalent to 3CMOS · True color)

Enlarged image



※ The chassis for cameras in 29mm cubic size (29×29×29mm) are sequentially switched to solid color design.

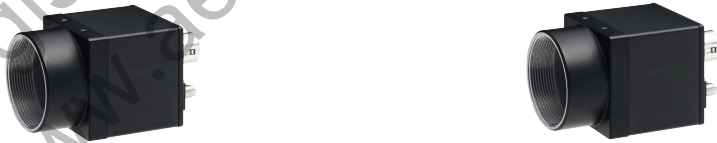
## VGA



	VGA 1TAP, 2TAP, 3TAP	VGA 1TAP, 2TAP, 3TAP Pixel clock selectable	VGA High speed
Interface	PoCL · non-PoCL (Auto selection)	PoCL · non-PoCL (Auto selection)	PoCL
Model name (B/W) (Color)	<b>VCC-VCL3M</b> <b>VCC-VCL3R</b>	<b>VCC-VCL5M</b> <b>VCC-VCL5R</b>	<b>VCC-GC20V41PCL</b> <b>VCC-FC20V49PCL</b>
Sensor	PYTHON 300	Pregius IMX287	CMV2000
Sensor size	1/4 type CMOS	1/2.9 type CMOS	1/4 type CMOS
Unit cell size (μm)	4.8 μm × 4.8 μm	6.9 μm × 6.9 μm	5.5 μm × 5.5 μm
Effective pixels (H) × (V)	640 × 480	720 × 540	640 × 480
Resolution	VGA	VGA	VGA
Frame rate	Base: 538fps(3tap) 268fps(2tap) 134fps(1tap)	Base: 519fps(3tap)/578fps(3tap · at VGA) 317fps(2tap) 175fps(1tap)	Base: 502fps(2tap)
Pixel clock	72MHz · 36MHz (Selectable with 2TAP output)	74.25MHz · 64.969MHz · 37.125MHz (Selectable)	79.99MHz
Shutter	OFF~1/10,752s	OFF~1/50,000s	OFF~1/50,000s
Lens mount	C mount	C mount	C mount
Dimensions (W) × (H) × (D)mm	29 × 29 × 29	29 × 29 × 29	29 × 29 × 29
Features	External trigger, ROI, Sub-sampling, Defective pixel correction, Power auto selection ※ Baud rate needs to be specified when ordering.	External trigger, ROI, H&V flip, Defective pixel correction, Shading correction, Cursor indication, One push white balance, Power auto selection	High speed 500fps, External trigger, ROI, Low power consumption 1.6W

(Baud rate is selectable from 115,200bps and 9,600bps.)

## SXGA



	SXGA 1TAP, 2TAP, 3TAP Pixel clock selectable	SXGA 1TAP, 2TAP, 3TAP Pixel clock selectable
Interface	PoCL · non-PoCL (Auto selection)	PoCL · non-PoCL (Auto selection)
Model name (B/W) (Color)	<b>VCC-SXCL3M</b> <b>VCC-SXCL3R</b>	<b>VCC-SXCL5M</b> <b>VCC-SXCL5R</b>
Sensor	PYTHON 1300	Pregius IMX273
Sensor size	1/2 type CMOS	1/2.9 type CMOS
Unit cell size (μm)	4.8 μm × 4.8 μm	3.45 μm × 3.45 μm
Effective pixels (H) × (V)	1280 × 1024	1440 × 1080
Resolution	SXGA	SXGA
Frame rate	Base: 152fps(3tap) 84fps(2tap) 42fps(1tap)	Base: 136fps(3tap) 91fps(2tap) 46fps(1tap)
Pixel clock	72MHz · 36MHz (Selectable with 2TAP output)	74.25MHz · 64.969MHz · 37.125MHz (Selectable)
Shutter	OFF~1/10,000s	OFF~1/50,000s
Lens mount	C mount	C mount
Dimensions (W) × (H) × (D)mm	29 × 29 × 29	29 × 29 × 29
Features	External trigger, ROI, Sub-sampling, Defective pixel correction, Gain, Power auto selection ※ Baud rate needs to be specified when ordering.	External trigger, ROI, H&V flip, 2 × 2 binning (B/W model only), Defective pixel correction, Shading correction, Cursor indication, One push white balance, Power auto selection

(Baud rate is selectable from 115,200bps and 9,600bps.)

# Camera Link

※ The chassis for cameras in 29mm cubic size (29×29×29mm) are sequentially switched to solid color design.

- 2M
- 3M
- 5M



	2M High speed	3M 1TAP, 2TAP, 3TAP	5M 1TAP, 2TAP, 3TAP
Interface	PoCL	PoCL · non-PoCL (Auto selection)	PoCL · non-PoCL (Auto selection)
Model name (B/W) (Color)	<b>VCC-GC20U11PCL</b> <b>VCC-FC20U19PCL</b>	<b>VCC-3CL5M</b> <b>VCC-3CL5R</b>	<b>VCC-5CL5M</b> <b>VCC-5CL5R</b>
Sensor	CMV2000	Pregius IMX265	Pregius IMX264
Sensor size	2/3 type CMOS	1/1.8 type CMOS	2/3 type CMOS
Unit cell size (μm)	5.5 μm × 5.5 μm	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm
Effective pixels (H) × (V)	2048 × 1088	2064 × 1544	2448 × 2048
Resolution	2M	3M	5M
Frame rate	Base: 71fps(2tap)	Base: 56fps(3tap) 45fps(2tap) 23fps(1tap)	Base: 36fps(3tap) 29fps(2tap) 15fps(1tap)
Pixel clock	79.99MHz	74.25MHz	74.25MHz
Shutter	OFF~1/50,000s	OFF~1/50,000s	OFF~1/50,000s
Lens mount	C mount	C mount	C mount
Dimensions (W) × (H) × (D)mm	29 × 29 × 29	29 × 29 × 29	29 × 29 × 29
Features	External trigger, ROI, Gain: 0~12dB, 8bit/10bit output	External trigger, ROI, Sub-sampling, Defective pixel correction, Gain: 0~42dB, Power auto selection	External trigger, ROI, Sub-sampling, Defective pixel correction, Gain: 0~42dB, Power auto selection, Pixel clock selectable model VCC-5CL5M63 / R63 are also available.

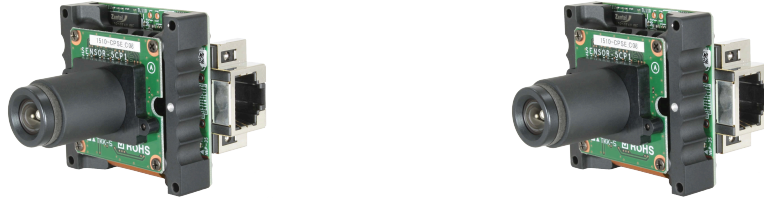
- 5M
- 12M
- 25M



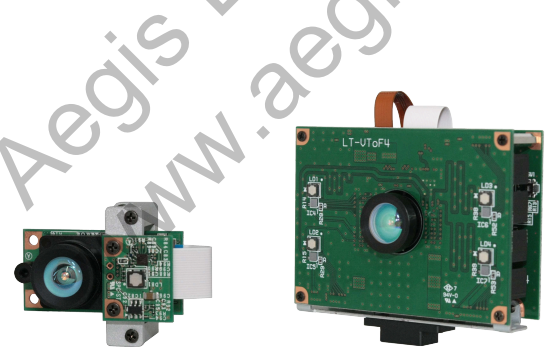
	5M High speed, Thin type	12M High speed, Thin type	25M High speed/Various features
Interface	PoCL · non-PoCL (Selectable)	PoCL · non-PoCL (Selectable)	PoCL · non-PoCL (Selectable)
Model name (B/W) (Color)	<b>VCC-5CL4M / VCC-5CL4MS</b> <b>VCC-5CL4R / VCC-5CL4RHS</b>	<b>VCC-12CL4M</b> <b>VCC-12CL4R</b>	<b>VCC-25CL1M</b> <b>VCC-25CL1R</b>
Sensor	Pregius IMX250	Pregius IMX253	PYTHON 25K
Sensor size	2/3 type CMOS	1.1 type CMOS	APS-H CMOS
Unit cell size (μm)	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm	4.5 μm × 4.5 μm
Effective pixels (H) × (V)	2448 × 2048	4096 × 3000	5120 × 5120
Resolution	5M	12M	25M
Frame rate	Deca: 163fps(10tap)8bit HS model Deca: 114fps(8tap)10bit Full: 114fps(8tap)8bit Med: 57fps(4tap)8bit/10bit Base: 42fps(3tap)8bit Base: 28fps(2tap)8bit/10bit	Deca: 63fps(10tap)8bit 53fps(8tap)10bit Full: 53fps(8tap) Med: 27fps(4tap) Base: 13fps(2tap)	Deca: 32fps(10tap)8bit Full: 22/25fps(8tap)8bit Med: 11fps(4tap)8bit/10bit(B/W model only) Base: 5fps(2tap)8bit/10bit(B/W model only)
Pixel clock	74.25MHz / 84.86MHz (HS model)	84.86MHz	72MHz(8tap) / 85MHz(8 · 10tap)
Shutter	OFF~1/50,000s / OFF~1/60,000s (HS model)	OFF~1/51,000s	OFF~1/30,000s
Lens mount	M42 mount	M42 mount	M48 mount
Dimensions (W) × (H) × (D)mm	55 × 55 × 25	55 × 55 × 25	65 × 65 × 40.5
Features	External trigger, ROI, Defective pixel correction, Gain: 0~36dB	External trigger, Camera Link, Base, Medium, Full, 8tap 10bit, 10tap 8bit complied, Gain: 0~36dB	External trigger, ROI, 2 × 2 binning(B/W model only), Defective pixel correction, Sequence control, Shading correction

## Board Cameras

Must have functions ready and supports several kinds of interfaces with various sensors.  
GigE Vision PoE and MIPI supported, high image quality with image processing function, yet cost effective.



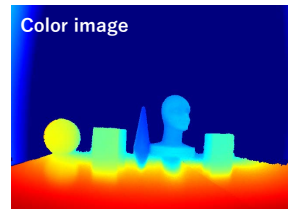
	WVGA	5M
Interface	GigE (PoE)	
Model name	(B/W) <b>DCC-VCP1GEM</b>	(Color) <b>DCC-5CP1GEC</b>
Sensor	EV76C541	MT9P006
Sensor size	1/4 type CMOS	1/2.5 type CMOS
Unit cell size ( $\mu\text{m}$ )	$4.5\ \mu\text{m} \times 4.5\ \mu\text{m}$	$2.2\ \mu\text{m} \times 2.2\ \mu\text{m}$
Effective pixels (H) $\times$ (V)	752 $\times$ 480	2592 $\times$ 1944
Frame rate	30fps~120fps	6fps~112fps (Depends on the image size)
Lens mount	M14 mount	M14 mount
Dimensions (W) $\times$ (H) $\times$ (D)mm	42 $\times$ 42 $\times$ 11.6	42 $\times$ 42 $\times$ 11.6
Features	Global shutter, AE, Shutter control, Gain, Adaptor for M12 lens (Optional item)	Rolling shutter, ROI, AE/AWB, One push WB, Gain, Adaptor for M12 lens (Optional item)



Shot with DCC-VToF4  
(Measurement range: 0.4~5m)



Near Far



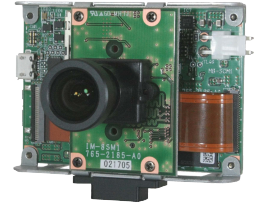
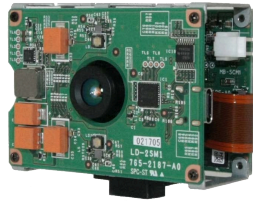
Near Far



	ToF (VGA)	ToF (VGA)
Interface	MIPI CSI-2 $\times$ 2lanes	
Model name	<b>DCC-VToF3</b> (Laser diode $\times$ 1 light mounted model)	<b>DCC-VToF4</b> (Laser diode $\times$ 4 lights mounted model)
Sensor	IMX570 (ToF)	IMX570 (ToF)
Sensor size	1/4.5 type CMOS	1/4.5 type CMOS
Unit cell size ( $\mu\text{m}$ )	$5\ \mu\text{m} \times 5\ \mu\text{m}$	$5\ \mu\text{m} \times 5\ \mu\text{m}$
Effective pixels (H) $\times$ (V)	640 $\times$ 480	640 $\times$ 480
Frame rate	30fps	15fps
Lens mount	M12 mount	M12 mount
Dimensions (W) $\times$ (H) $\times$ (D)mm	36 $\times$ 18 $\times$ 16	70 $\times$ 50 $\times$ 30
Features	LD(Laser Diode) wavelength 940nm $\times$ 1 light mounted, FOV 79° (H) $\times$ 61° (V), Measurement range: 0.4~1.5m, $\times$ 4 power supplies (DC12V, 1.8V, 2.7V, and 3.3V) are required. $\times$ External host (Jetson Nano) is required for camera control.	LD(Laser Diode) wavelength 940nm $\times$ 4 lights mounted, FOV 90° (H) $\times$ 69° (V), Measurement range: 0.4~5m, Power requirement: DC12V $\times$ External host (Jetson Nano) is required for camera control.

# AI Smart Camera

- VGA (ToF)
- 2M
- 4K



	VGA	2M	4K
Interface	USB3.0	USB3.0	USB3.0
Model name	<b>SCM1-ToF1</b>	<b>SCM1-2M1</b>	<b>SCM1-8M1</b>
Sensor	IMX570	AR0234CS	Pregius IMX715
Sensor size	1/4.5 type CMOS	1/2.6 type CMOS	1/2.8 type CMOS
Unit cell size (μm)	5.0 μm × 5.0 μm	3.0 μm × 3.0 μm	1.45 μm × 1.45 μm
Effective pixels (H) × (V)	640 × 480	1920 × 1200	3860 × 2190
Frame rate	30fps	30fps	30fps
Lens mount	M12 mount (Dedicated lens mounted)	M12 mount	M12 mount
Power supply	DC12V	DC12V/PoE (With adding I/F board)	DC12V/PoE (With adding I/F board)
Dimensions (W) × (H) × (D)mm	65 × 48 × 40.8 (Without I/F board) 65 × 48 × 64.4 (With I/F board)	65 × 48 × 58.5 (Without I/F board) 65 × 48 × 82.1 (With I/F board)	65 × 48 × 58.5 (Without I/F board) 65 × 48 × 82.1 (With I/F board)
Features	LD(Laser Diode) × 2 lights mounted, AI processor (i.MX8M Plus) installed, FOV: 63° (H) × 48° (V), Measurement range: 400~7000mm, Installed OS: Base system: Yocto, Linux Kernel: 5.15.32, U-Boot: 5.4.70 ※Complies to HDMI/GigE by adding optional I/F board.	ISP installed (AWB, AE), AI processor (i.MX8M Plus) installed, FOV: 51° (H) × 38° (V), Installed OS: Base system: Yocto, Linux Kernel: 5.15.32, U-Boot: 5.4.70 ※Complies to HDMI/GigE by adding optional I/F board.	ISP installed (AWB, AE), AI processor (i.MX8M Plus) installed, Installed OS: Base system: Yocto, Linux Kernel: 5.15.32, U-Boot: 5.4.70 ※Complies to HDMI/GigE by adding optional I/F board.

※Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.  
 ※Yocto Project® is a trademark of The Linux Foundation.

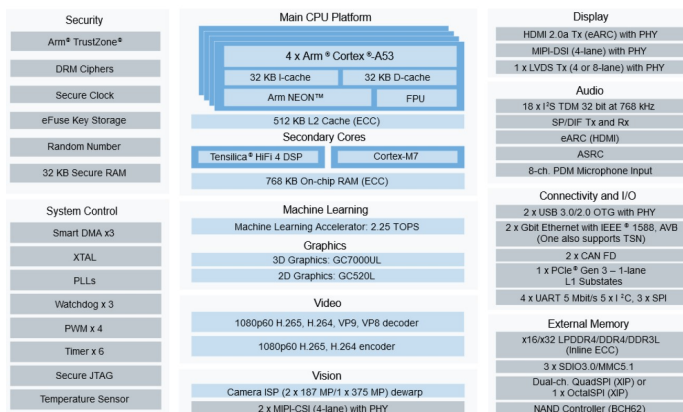
## Features of SCM Series Smart Camera

The SCM series is a miniature smart camera kit featuring a variety of image & ToF sensors. At the heart of the system is NXP Semiconductor's i.MX8M Plus, which features up to 4 cores of 1.8GHz Arm® Cortex® A53 core, 2.25TOPS machine learning accelerator for edge AI, and an embedded ISP which is capable of processing up to 13Mpix. Images.

This product's powerful computation resource and small footprint makes it suitable for such applications as payload-conscious drones, robotics/logistics, and security.

The initial product line-up will come in variety of sensors including 2M global shutter sensor, 4K rolling shutter sensor, VGA ToF sensor, and an RGB+depth product combining ToF sensor and 2M global shutter sensor. The base configuration supports USB3.0 I/F, and with an optional I/F board, the camera supports HDMI and GigE I/Fs as well.

This smart camera platform can cope with virtually any sensor equipped with MIPI I/F and with a resolution of up to 13Mpix., and we are ready to cater to your specific request for the choice of sensor and optics. Please contact CIS Sales for details.



- ← Applications for processor "i.MX8M Plus"
- System host
  - ISP processing
  - User application processing (Including AI)
  - Distance calculation (SCM1-ToF1)

※i.MX8M Plus is a registered trademark of NXP Semiconductors N.V.

**FULL HD**



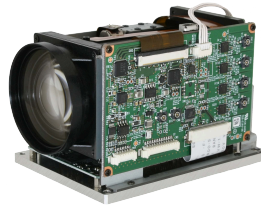
	Compact size 1080p 60fps	Ultra-high sensitivity Full HD 0.0005lux
Interface	3G-SDI / HD-SDI	3G-SDI / HD-SDI
Model name (Color)	<b>VCC-HD5 (Chassis type)</b> <b>DCC-HD5 (Board type)</b>	<b>VCC-HD1000A</b>
Sensor	Pregius IMX265	35mm FHDXSCA
Sensor size	1/1.8 type CMOS	35mm Full size
Unit cell size(μm)	3.45 μm × 3.45 μm	19 μm × 19 μm
Effective pixels(H) × (V)	1920 × 1080	1920 × 1080
Video output	1080p, 1080i, 720p	1080p, 1080i, 720p
Signal I/F	3G-SDI, HD-SDI, BNC75Ω	3G-SDI, HD-SDI, BNC75Ω
Sync system	Internal sync / External sync	Internal sync / External sync
Shutter	1/13,600~1/23.98s	1/11,200~1s
Lens mount	C mount	EF mount
Dimensions(W) × (H) × (D)mm	Chassis type: 29 × 29 × 55 Board type: IM board 29 × 29, MB board 25.4 × 38, PD board 25.4 × 43 (TBD)	75 × 75 × 85
Features	Image with no distortion with global shutter, ISP Clairvu™, Max. 1080/60p(with 3G-SDI output) high speed processing output, Conform to Gamma curve BT.709 and BT.2100, Conform to BT.2020, Color correction, Knee selectable, NR, LTC, GenLock, GenLock offset, OSD	Rolling shutter, ISP Clairvu™, Max. 1080/60p(with 3G-SDI output) high speed processing output, Color correction, HDR, Knee selectable, NR, LTC, GenLock, OSD, Ultra-high sensitivity 0.0005lux equivalent to ISO 4,000,000

**4K**

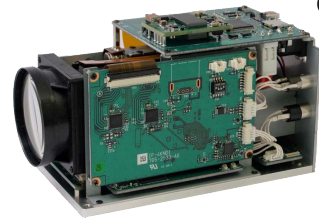


	BT.2100 complied 4K UHD 60fps	Compact size 4K UHD60fps
Interface	Quad 3G-SDI / HD-SDI	12G-SDI / 6G-SDI / 3G-SDI / HD-SDI
Model name (Color)	<b>VCC-4K2 (Chassis type)</b> <b>DCC-4K2 (Board type)</b>	<b>VCC-4K5 (Chassis type)</b> <b>DCC-4K5 (Board type)</b>
Sensor	Pregius IMX305	STARVIS2 IMX678
Sensor size	1 type CMOS	1/1.8 type CMOS
Unit cell size(μm)	3.45 μm × 3.45 μm	2.0 μm × 2.0 μm
Effective pixels(H) × (V)	3840 × 2160	3840 × 2160
Video output	2160p, 1080p, 1080i	2160p, 1080p, 1080i
Signal I/F	3G-SDI × 4ch, 3G-SDI × 1ch, HD-SDI × 1ch	12G-SDI, 6G-SDI, 3G-SDI, HD-SDI × 1ch, BNC75Ω
Sync system	Internal sync/External sync	Internal sync/External sync
Shutter	1/13,600~1/23.98s	1/13,600~1/23.98s
Lens mount	M42 mount	C mount
Dimensions(W) × (H) × (D)mm	Chassis type: 65 × 65 × 110 Board type: Lens mount block 65(W) × 65(H) × 12(D), Main block 65(W) × 29(H) × 89(D)(Excluding projection)	Chassis type: 29 × 29 × 77 Board type: Sensor board 25.4 × 26.6, Main board 25.4 × 38, Driver board 25.4 × 43 (Excluding projection)
Features	Image with no distortion with global shutter, ISP Clairvu™, Max. 4K60fps high speed processing output, SQD + 2SI system complied, Conform to Gamma curve BT.2100(HLG), Conform to BT.709 and BT.2020, Color correction, Knee selectable, NR, LTC, GenLock, OSD	Rolling shutter, ISP Clairvu™, Max. 4K60fps high speed processing output, Conform to Gamma curve BT.2100(HLG), Conform to BT.709 and BT.2020, Color correction, Knee selectable, NR, LTC, GenLock, OSD, low-latency

4K



Clairvu™



Clairvu™

	4K Lens mount Built-in ×18 zoom lens	4K Lens mount Built-in ×18 zoom lens
Interface	Quad 3G-SDI / HD-SDI / 3G-SDI	NDI® (Network Device Interface)
Model name (Color)	<b>DCC-4KZM (×18)</b>	<b>VCC-4KNDI (with chassis)</b> <b>DCC-4KNDI (without chassis)</b>
Sensor	STARVIS IMX334	STARVIS IMX334
Sensor size	1/1.8 type CMOS	1/1.8 type CMOS
Unit cell size(μm)	2.0 μm × 2.0 μm	2.0 μm × 2.0 μm
Effective pixels(H) × (V)	3840 × 2160	3840 × 2160
Video output	2160p, 1080p, 1080i	2160p, 1080p
Signal I/F	3G-SDI × 4ch, 3G-SDI × 1ch, HD-SDI × 1ch	NDI®
Sync system / Frame rate	Sync system: Internal sync / External sync	Frame rate: 60fps, 59.94fps, 50fps, 30fps, 29.97fps, 25fps, 24fps, 23.98fps
Shutter	1/13,600~1/23,98s	1/13,600~1/23,98s
Lens mount	×18 AF zoom lens fw=6.6mm, ft=120mm	×18 AF zoom fw=6.6mm, ft=120mm
Dimensions(W) × (H) × (D)mm	66 × 65 × 98	68.5 × 68 × 120.6 (Excluding projection)
Features	Rolling shutter, Connector: H.FL-R-SMT, ISP Clairvu™, Max. 4K60fps high speed processing output, SQD - 2SI system complied, Conform to Gamma curve BT.2100(HLG), Conform to BT.709 and BT.2020, Color correction, HDR, Knee selectable, NR, LTC, GenLock, OSD	ISP Clairvu™, Max. 4K60fps high speed processing output, Conform to Gamma curve BT.2100 (HLG), Conform to BT.709 and BT.2020, Color correction, HDR, Knee selectable, 2D/3D NR, OSD, Stereo line input, PoE+ complied

※NDI® is a registered trademark of Vizrt Group.

8K



VCC-8K1-EF



VCC-8K1-PL

Clairvu™

## Accessories

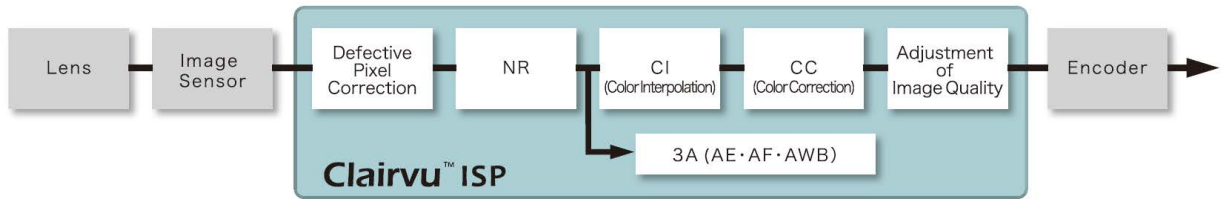


	8K UHD60fps
Interface	12G-SDI / 12G-SDI / 12G-SDI / 6G-SDI
Model name (Color)	<b>VCC-8K1-EF (EF mount model)</b> <b>VCC-8K1-PL (PL mount model)</b>
Sensor	XGS45000
Sensor size	Super 35mm CMOS
Unit cell size(μm)	3.2 μm × 3.2 μm
Effective pixels(H) × (V)	7680 × 4320
Video output	4320p, 2160p
Signal I/F	12G-SDI × 4lanes, BNC75 Ω
Sync system / Frame rate	Internal sync/External sync
Shutter	1/11,200~1/23,98s
Lens mount	EF mount with electronic contacts (-EF model)/ PL mount (-PL model)
Dimensions(W) × (H) × (D)mm	EF mount model: 80 × 80 × 135mm PL mount model: 80 × 80 × 138mm
Features	Image with no distortion with global shutter, ISP Clairvu™, Max. 8K60fps high speed processing output, Conform to Gamma curve BT.2100(HLG), Conform to BT.709 and BT.2020, Color correction, Knee selectable, NR, LTC, GenLock, OSD, low-latency

	Remote Control Unit
Model name	<b>RU-100</b>
Features	With RU-100 connected to CIS cameras, camera settings can be done with OSD (On Screen Display). RU-100 also can be used as a converter from USB to RS-232C so that you can use it to set camera settings via PC.
Connectable cameras	VCC/DCC-HD5 VCC-HD1000A VCC/DCC-4K2 VCC/DCC-4K5 VCC/DCC-4KNDI (Needs to be converted to 2.5mm plug)

## ISP Algorithm Clairvu™

Proprietary ISP (Image Signal Processor) engine for crisp, low pseudo-color, and low artifact, color image processing.



### ■ High Quality Image

Crisp, low pseudo-color, and low artifact color interpolation process produces high quality images equivalent to that of non-real time PC-based DPE application software.

### ■ CC (Color Correction)

Enables precise color reproduction by way of sophisticated color compensation technology (multiple-axis division of the color plain).

### ■ High Speed yet Cost Effective

Algorithm engine that processes 7680×4320 progressive image signals at 60fps can be implemented into a relatively small, a medium sized FPGA.

### ■ CI (Color Interpolation)

Color interpolation process produces color images out of signal output from Bayer array color sensor, and significantly affects its image quality. "Clairvu™" enables high resolution, low pseudo-color, and low noise at the same time.

### ■ AE (Auto Exposure)

According to the detected luminance conditions, diaphragm (lens iris), gain level, and shutter speed are controlled to keep the brightness of the image constant.

### ■ AF (Auto Focus)

Contrast detection method that defines the focus position for the maximum contrast as the full focus. Eliminating signal noises as much as possible, auto focus function is effective even for difficult scenes, such as the one under low illumination, telescopic zooming, and others.

### ■ AWB (Auto White Balance)

Human eyes are color flexible and sense the original colors even when the ambient light source changes. To acquire natural images, cameras need to have a similar function to human eyes, in other words, the function to correct the color depending on illuminating conditions. This is a so-called "White Balance" function. In addition to the conventional AWB to make the average color of the image by close to gray, CIS developed auto white balance algorithm to control its balance more precisely, estimating the color of the lighting source.

## <Signal Processing Technologies - Examples>

### Color Correction

Sophisticated Color Compensation Technology

Without Color correction

With Color correction

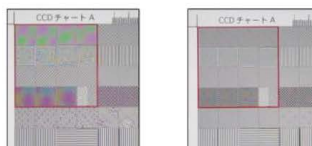


### Color Interpolation

Low Pseudo-color

Non CIS camera

CIS camera



### AWB

Auto white balance for natural color

Regular AWB

CIS AWB



# Accessories / Semi-custom Lens

## Accessories



Camera lens mount conversion ring						
Model name	<b>M58-F mount conversion ring</b>	<b>M48-F mount conversion ring (Turn-style)</b>	<b>M48-F mount conversion ring</b>	<b>M48-C mount conversion ring</b>	<b>M42-F mount conversion ring</b>	<b>M42-C mount conversion ring</b>
Features	Conversion ring from M58 to F lens mount.	Conversion ring from M48 to F lens mount. (Turn-style)	Conversion ring from M48 to F lens mount.	Conversion ring from M48 to C lens mount.	Conversion ring from M42 to F lens mount.	Conversion ring from M42 to C lens mount.



AC adaptor	
Model name / Part number	<b>6pins AC adaptor / DTPS-1215-06</b> <b>12pins AC adaptor / 12V-1.5A-S12-A-A</b>
Features	In warranty only when connected to the corresponding CIS cameras and accessories. 6pins AC adaptor: RoHS2 compliant 12pins AC adaptor: RoHS2 non-compliant

## Semi-custom Lens

CIS offers versatile semi-custom lenses as well as general lenses that meet customer's requirements.

### ◆ High Image Quality

- Fixed lens placement resulting in accurate optical axis and less aberration.
- Provision of fixed iris throttle plate according to usage conditions resulting in less image deterioration compared to standard mount lenses.

### ◆ Compact and Light Weight

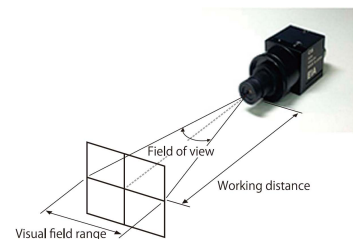
- Improves vibration and shock resistance.

### ◆ Lens Variation

- Resolution: EIA, VGA, SXGA, UXGA, 5M, 12M, Full HD, etc.
- Focal range: 16mm, 25mm, 35mm, 50mm, etc.

### ◆ Less prone to dust problems

- Lens cleansing and assembly all done in the CIS's clean room.





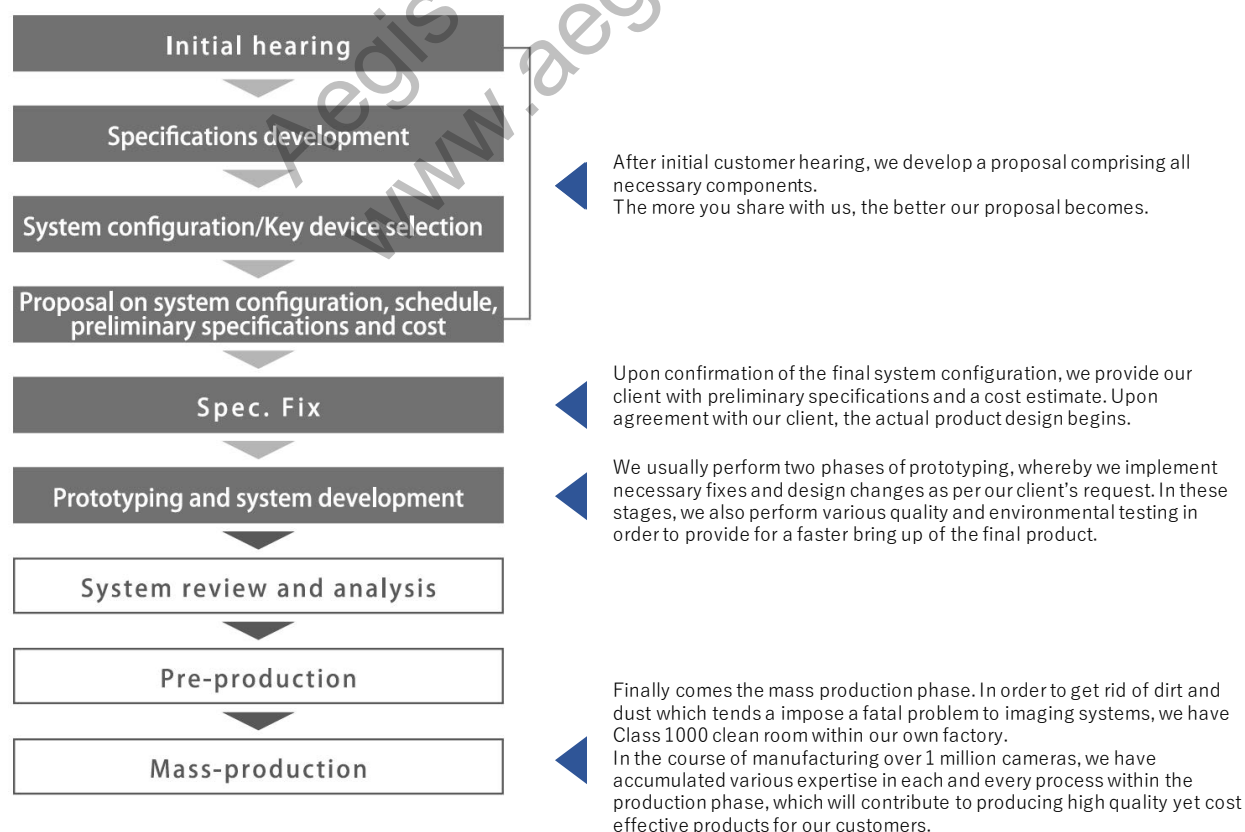
## Development of Image Processing Systems

On top of cameras, CIS offers total imaging solution to meet wide variety of customers' needs as a one-stop-shop, proposing system architecture and the most appropriate interface, designing and manufacturing, development of system software, and optimizing customer's image processing application and implementation.

### 1. CIS has in-house professional teams of each field

<b>Mechanical design</b>	Optical design knowledge, Heat dissipation design, Water & dust proof housing design, Miniaturization, Micro-motion control using piezo-actuator, Cost reduction know-how
<b>Circuit design</b>	Evaluation and design experience for various CCD and CMOS image sensors, Analog and digital circuit design, Miniaturization & low power dissipation design, High-speed interface circuit design (in the order of GHz)
<b>System software development</b>	System specification development, Real time image processing, System software development using RTOS, Embedded imaging application software development, PC application software development. We have deep experiences in design and development around TI's DSP.
<b>Algorithm development</b>	In order to draw maximum performance from the device, we provide optimization at an algorithmic level. Custom development of image processing application, Licensing of original image processing IPs.
<b>Quality assurance</b>	Product design verification (Electrical performance, functionality, anti-vibration, impact, dust and heat dissipation testing, conformance with various safety regulations including RoHS), Reliability testing including product safety.
<b>Production engineering</b>	Design review at pre-production stage: Review done on both product quality and ease of production for higher field. Promotion of automated production by use of software.
<b>Production</b>	Fully controlled production environment.

### 2. From Proposal to Mass Production

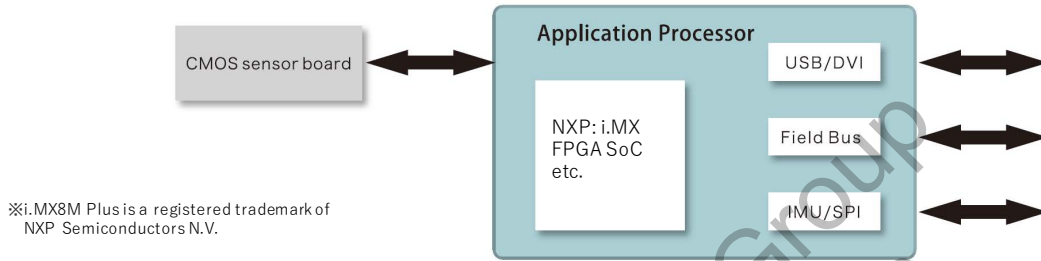


## Development of Image Processing Systems (Case example)

Here are some actual examples CIS developed.

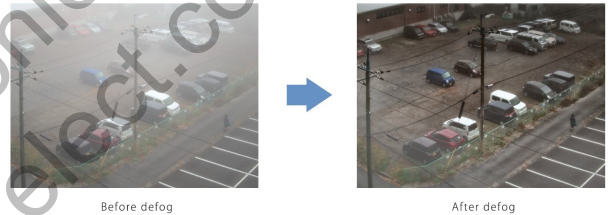
### ◆ Customized Smart Camera (Deep learning edge device)

A smart camera with CMOS sensor board which can be used as deep learning edge device. Smooth migration from common deep learning framework can be done. Compatible with IMU and Field Bus Interface.



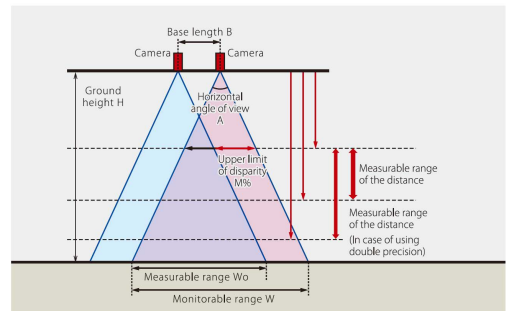
### ◆ Defog

The objects can be captured clearly under bad conditions such as fog and rain with CIS's proprietary image processing system.



### ◆ Stereo Camera Measurement

When captured the object by several cameras, the position of the object can be measured by using the disparity of the object captured by each camera.



Also, we have developed **Intelligent surveillance camera system** which image processing system unit is integrated with the camera and resulting in significant downsizing and cost efficiency, **High-speed real time image processing system** which supports hundreds to thousands fps by hardware (FPGA), **Multiple camera 3D image processing equipment** which generates accurate 3D data from two sets of stereo camera inputs, etc.

We will strive to develop higher performance systems using deep learning, GPGPU, or Edge Processor for deep learning.