CIS PRODUCT LINEUP

Camera & Imaging Systems

Corporate Profile

About us

Corporate name	CIS Camera Product
Location	Website:www.ciscamera.com Email:vc_tech@126.com
Foundation	September 1st, 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.
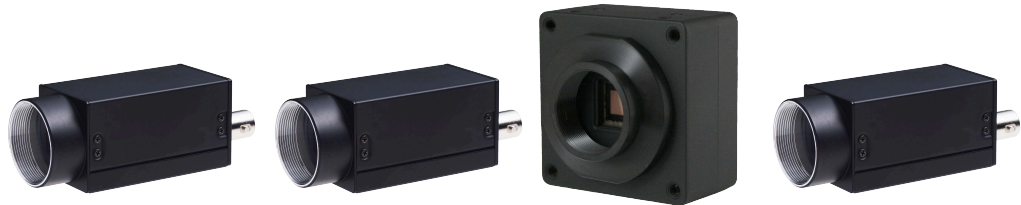
Manufacturing

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.

CoaXPress

※ 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）	6.9μm×6.9μm	4.8μm×4.8μm	3.45μm×3.45μm	4.8μm×4.8μm
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）	4.5μm×4.5μm	4.8μm×4.8μm	3.45μm×3.45μm	2.74μm×2.74μm
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	15μs〜200ms	91μs〜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)	VCC-12CXP4M VCC-12CXP4R	VCC-20CXP6M VCC-20CXP6R	VCC-24CXP7M
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)	3.45μm×3.45μm	2.74μm×2.74μm	2.74μm×2.74μm
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	2.68μs～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)	VCC-25CXP1M VCC-25CXP1R VCC-25CXP1NIR VCC-25CXP1MBN	VCC-25CXPHSM-F / VCC-25CXPHSM (without heatsink) VCC-25CXPHSR-F / VCC-25CXPHSR (without heatsink) VCC-25CXPHSNIR-F / VCC-25CXPHSNIR (without heatsink)
Sensor	PYTHON 25K	GMAX0505
Sensor size	APS-H CMOS	1.1 type CMOS
Unit cell size (μm)	4.5μm×4.5μm	2.5μm×2.5μm
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	6μs～2s
Lens mount	M48 mount	M48 mount
Dimensions (W)×(H)×(D)mm	65×65×65	65×125×93.3 (VCC-25CXPHSM-F / VCC-25CXPHSR-F / VCC-25CXPHSNIR-F) 65×65×93.3 (VCC-25CXPHSM / VCC-25CXPHSR / VCC-25CXPHSNIR) ※ 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.

CoaXPress

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)	**VCC-120CXP1M** **VCC-120CXP1R**	**VCC-127CXP6M** **VCC-127CXP6R**	**VCC-250CXP1M** **VCC-250CXP1R**
Sensor	120MXSM	Pregius IMX661	CANON LI8020SAM
Sensor size	APS-H CMOS	3.6 type CMOS	APS-H CMOS
Unit cell size (μm)	2.2μm×2.2μm	3.45μm×3.45μm	1.5μm×1.5μm
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	22μs〜15s	200μs〜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

	21M Ultra-high speed
Interface	CoaXPress over Fiber　QSFP28×1
Model name　(B/W)　(Color)	**VCC-21CoF2M** **VCC-21CoF2R**
Sensor	GSPRINT4521
Sensor size	APS-H CMOS
Unit cell size (μm)	4.5μm×4.5μm
Effective pixels (H)×(V)	5120×4096
Resolution	21M
Frame rate (TBD)	510fps(8bit), 410fps(10bit), 250fps(12bit)
Pixel clock	-
Shutter (TBD)	4μs〜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

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

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.

◆**Standerdized by JIIA 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.
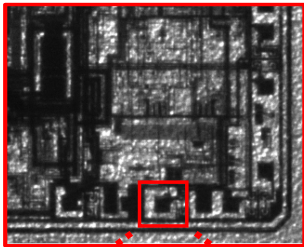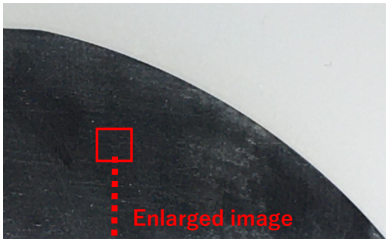

Visible light

SWIR

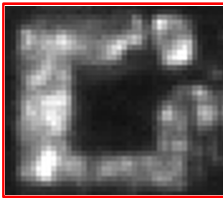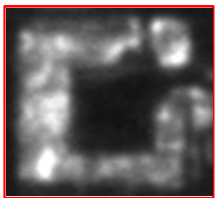|	SXGA Visible+SWIR image sensor
Interface	CXP3×1lane
Model name (B/W)	**VCC-SXCXP1SW**
Sensor	SenSWIR IMX990 (SWIR)
Sensor size	1/2 type
Unit cell size (μm)	5μm×5μm
Effective pixels (H)×(V)	1296×1032
Resolution	SXGA
Frame rate	134.7fps(8bit), 125.3fps(10bit), 71.5fps(12bit)
Pixel clock	74.25MHz
Shutter	10μs～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)

Enlarged image

Enlarged image

	Max. 21M pixels Visible + SWIR sensor installed
Interface	CXP3×1lane
Model name (B/W)	**VCC-SXCXP1SWPS-9 (9 times pixel-shift)** **VCC-SXCXP1SWPS-16 (16 times pixel-shift)**
Sensor	SenSWIR IMX990 (SWIR)
Sensor size	1/2 type CMOS
Unit cell size (μm)	5μm×5μm
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

SWIR (1200nm)
Without pixel-shift・1.3M

SWIR (1200nm)
With 16 times pixel-shift・21M

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

Pixel-shift Camera

	Max. 400M pixels Ultra-high resolution
Interface	CXP3/CXP6×4lanes
Model name　　　(B/W)　(Color)	**VCC-25CXP1MPS** **VCC-25CXP1RPS**
Sensor	PYTHON 25K
Sensor size	APS-H CMOS
Unit cell size（μm)	4.5μm×4.5μm
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)
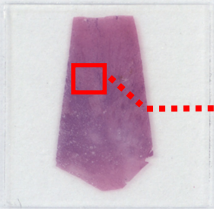
Enlarged image

16 times pixel-shift（400M)
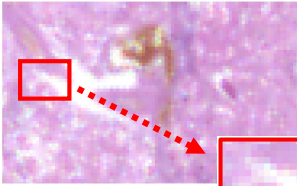
Enlarged image

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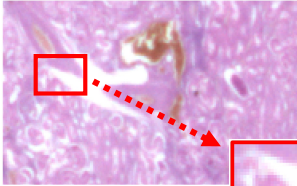**（25M Pixel-shift camera Color model)**

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)	VCC-VCL3M VCC-VCL3R	VCC-VCL5M VCC-VCL5R	VCC-GC20V41PCL VCC-FC20V49PCL
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)	4.8μm×4.8μm	6.9μm×6.9μm	5.5μm×5.5μm
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)	VCC-SXCL3M VCC-SXCL3R	VCC-SXCL5M VCC-SXCL5R
Sensor	PYTHON 1300	Pregius IMX273
Sensor size	1/2 type CMOS	1/2.9 type CMOS
Unit cell size (μm)	4.8μm×4.8μm	3.45μm×3.45μm
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)	**VCC-GC20U11PCL** **VCC-FC20U19PCL**	**VCC-3CL5M** **VCC-3CL5R**	**VCC-5CL5M** **VCC-5CL5R**
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)	$5.5\,\mu$m$\times5.5\,\mu$m	$3.45\,\mu$m$\times3.45\,\mu$m	$3.45\,\mu$m$\times3.45\,\mu$m
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)	**VCC-5CL4M / VCC-5CL4MHS** **VCC-5CL4R / VCC-5CL4RHS**	**VCC-12CL4M** **VCC-12CL4R**	**VCC-25CL1M** **VCC-25CL1R**
Sensor	Pregius IMX250	Pregius IMX253	PYTHON 25K
Sensor size	2/3 type CMOS	1.1 type CMOS	APS-H CMOS
Unit cell size (μm)	$3.45\,\mu$m$\times3.45\,\mu$m	$3.45\,\mu$m$\times3.45\,\mu$m	$4.5\,\mu$m$\times4.5\,\mu$m
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.
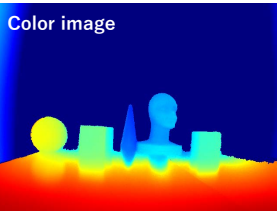

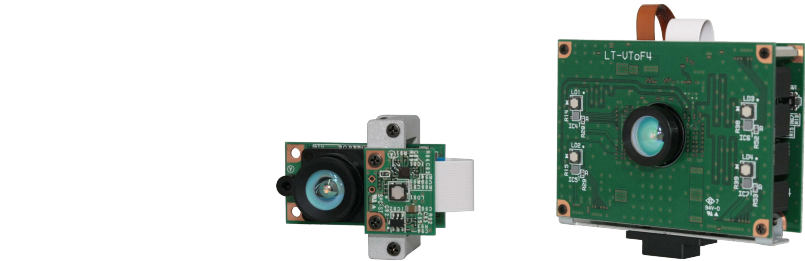|	WVGA	5M
Interface	GigE (PoE)	GigE (PoE)
Model name	(B/W) **DCC-VCP1GEM**	(Color) **DCC-5CP1GEC**
Sensor	EV76C541	MT9P006
Sensor size	1/4 type CMOS	1/2.5 type CMOS
Unit cell size (μm)	4.5μm×4.5μm	2.2μm×2.2μm
Effective pixels (H)×(V)	752×480	2592×1944
Frame rate	30fps～120fps	6fps～112fps (Depends on the image size)
Lens mount	M14 mount	M14 mount
Dimensions (W)×(H)×(D)mm	42×42×11.6	42×42×11.6
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
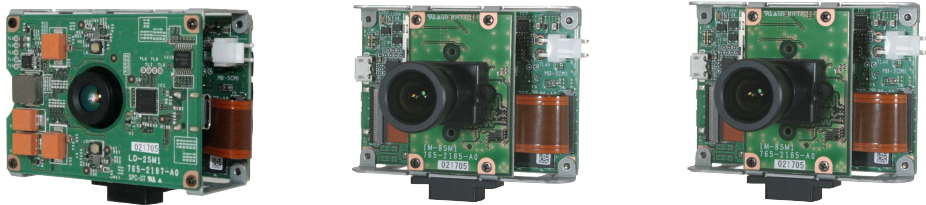**(Measurement range: 0.4～5m)**

Original image

Near ▬▬▬▬▬▬ Far

Color image

Near ▬▬▬▬▬▬ Far

B/W image

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

AI Smart Camera

	VGA	2M	4K
Interface	USB3.0	USB3.0	USB3.0
Model name	**SCM1-ToF1**	**SCM1-2M1**	**SCM1-8M1**
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)	5.0μm×5.0μm	3.0μm×3.0μm	1.45μm×1.45μm
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.
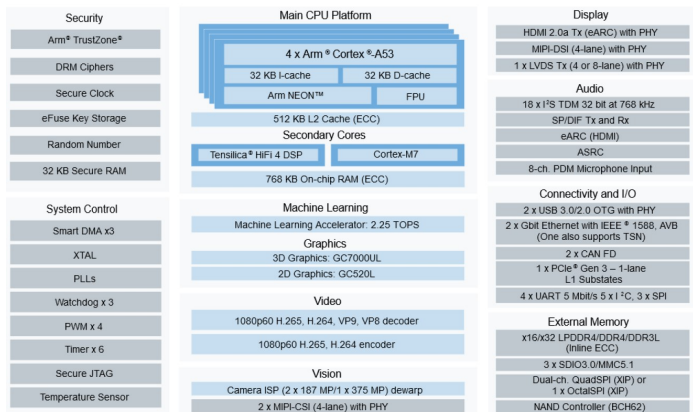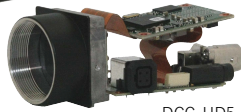
←Applications for processor "i.MX8M Plus"
・System host
・ISP processing
・User application processing (Including AI)
・Distance calculation (SCM1-ToF1)

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

FULL HD

Clairvu™
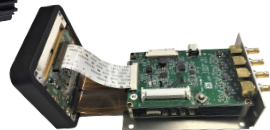
VCC-HD5

DCC-HD5

Clairvu™

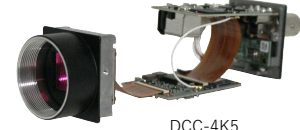|	Compact size 1080p 60fps	Ultra-high sensitivity Full HD 0.0005lux
Interface	3G-SDI / HD-SDI	3G-SDI / HD-SDI
Model name　　(Color)	VCC-HD5 (Chassis type) DCC-HD5 (Board type)	VCC-HD1000A
Sensor	Pregius IMX265	35mm FHDXSCA
Sensor size	1/1.8 type CMOS	35mm Full size
Unit cell size(μm)	3.45μm × 3.45μm	19μm × 19μm
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

Clairvu™

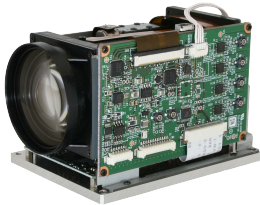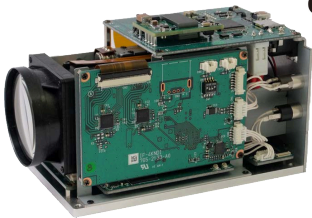VCC-4K2

DCC-4K2

Clairvu™

VCC-4K5

DCC-4K5

	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)	VCC-4K2 (Chassis type) DCC-4K2 (Board type)	VCC-4K5 (Chassis type) DCC-4K5 (Board type)
Sensor	Pregius IMX305	STARVIS2 IMX678
Sensor size	1 type CMOS	1/1.8 type CMOS
Unit cell size(μm)	3.45μm × 3.45μm	2.0μm × 2.0μm
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

Clairvu™ Camera

4K

	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)	**DCC-4KZM (×18)**	**VCC-4KNDI (with chassis)** **DCC-4KNDI (without chassis)**
Sensor	STARVIS IMX334	STARVIS IMX334
Sensor size	1/1.8 type CMOS	1/1.8 type CMOS
Unit cell size(μm)	2.0μm×2.0μm	2.0μm×2.0μm
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.
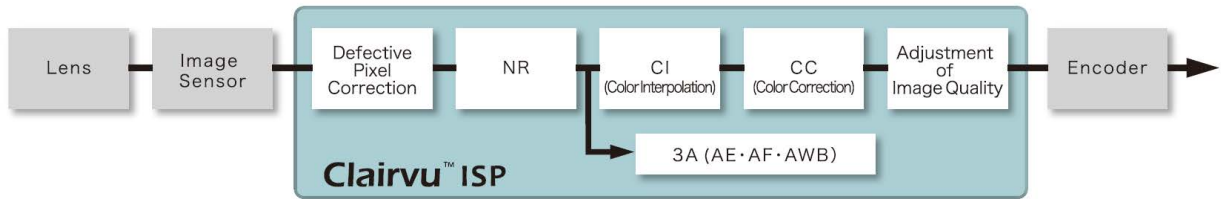
8K   Clairvu™   **Accessories**

VCC-8K1-EF

VCC-8K1-PL

	8K UHD60fps			Remote Control Unit
Interface	12G-SDI /12G-SDI / 12G-SDI /6G-SDI			
Model name (Color)	**VCC-8K1-EF (EF mount model)** **VCC-8K1-PL (PL mount model)**	Model name	**RU-100**	
Sensor	XGS45000			
Sensor size	Super 35mm CMOS			
Unit cell size(μm)	3.2μm×3.2μm			
Effective pixels(H)×(V)	7680×4320			
Video output	4320p、2160p			
Signal I/F	12G-SDI×4lanes、BNC75Ω	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.	
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 x 80 x 135mm PL mount model: 80 x 80 x 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	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.

```
Lens → Image Sensor → [ Defective Pixel Correction → NR → CI (Color Interpolation) → CC (Color Correction) → Adjustment of Image Quality ] → Encoder
                                                            ↓
                                                     3A (AE·AF·AWB)
                       Clairvu™ ISP
```

■ 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	Color Interpolation	AWB
Sophisticated Color Compensation Technology	Low Pseudo-color	Auto white balance for natural color
Without Color correction → With Color correction	Non CIS camera / CIS camera	Regular AWB / CIS AWB
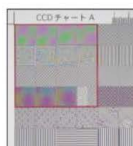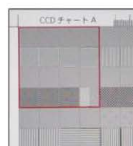
Accessories / Semi-custom Lens

Accessories

	Camera lens mount conversion ring					
Model name	**M58-F mount conversion ring**	**M48-F mount conversion ring (Turn-style)**	**M48-F mount conversion ring**	**M48-C mount conversion ring**	**M42-F mount conversion ring**	**M42-C mount conversion ring**
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	**6pins AC adaptor / DTPS-1215-06**
	12pins AC adaptor / 12V-1.5A-S12-A-A
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.

Comparison of lens size   Comparison of lens iris (f2.8)
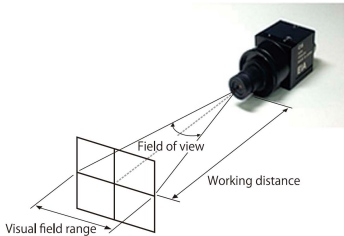
◆ Compact and Light Weight

- Improves vibration and shock resistance.

◆ Lens Variation

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

Field of view
Working distance
Visual field range

◆ Less prone to dust problems

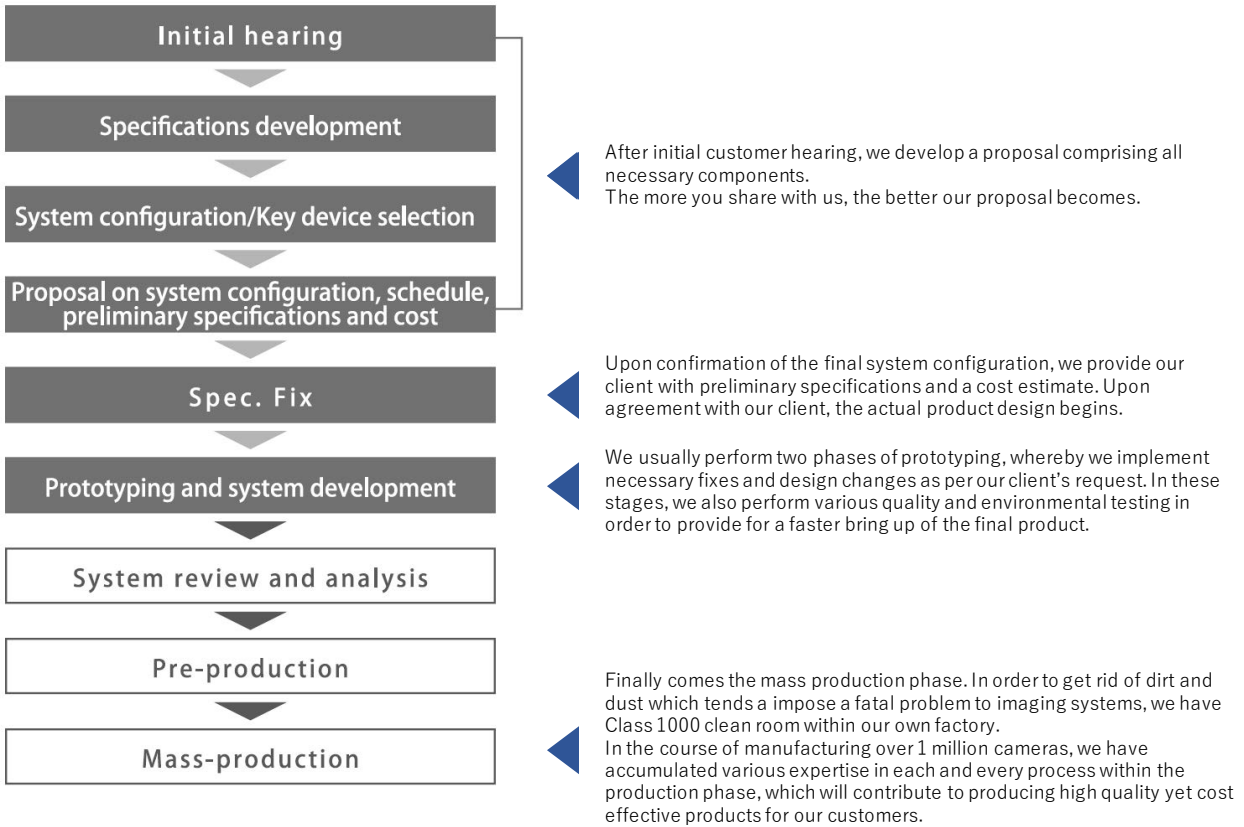- Lens cleansing and assembly all done in the CIS's clean room.

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

Mechanical design	Optical design knowledge, Heat dissipation design, Water & dust proof housing design, Miniaturization, Micro-motion control using piezo-actuator, Cost reduction know-how
Circuit design	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)
System software development	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.
Algorithm development	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.
Quality assurance	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.
Production engineering	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.
Production	Fully controlled production environment.

2. From Proposal to Mass Production

Initial hearing

↓

Specifications development

↓

System configuration/Key device selection

↓

Proposal on system configuration, schedule, preliminary specifications and cost

> After initial customer hearing, we develop a proposal comprising all necessary components.
> The more you share with us, the better our proposal becomes.

↓

Spec. Fix

> Upon confirmation of the final system configuration, we provide our client with preliminary specifications and a cost estimate. Upon agreement with our client, the actual product design begins.

↓

Prototyping and system development

> We usually perform two phases of prototyping, whereby we implement necessary fixes and design changes as per our client's request. In these stages, we also perform various quality and environmental testing in order to provide for a faster bring up of the final product.

↓

System review and analysis

↓

Pre-production

↓

Mass-production

> Finally comes the mass production phase. In order to get rid of dirt and dust which tends a impose a fatal problem to imaging systems, we have Class 1000 clean room within our own factory.
> In the course of manufacturing over 1 million cameras, we have accumulated various expertise in each and every process within the production phase, which will contribute to producing high quality yet cost effective products for our customers.

Information

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.

CMOS sensor board ◄──► **Application Processor**

NXP: i.MX
FPGA SoC
etc.

USB/DVI ◄──►

Field Bus ◄──►

IMU/SPI ◄──►
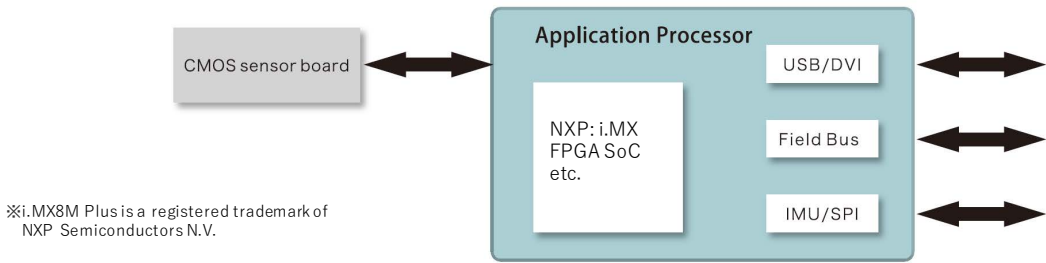
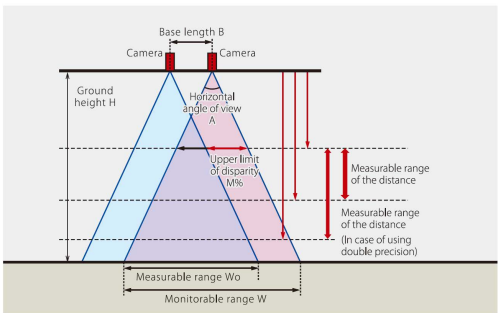※i.MX8M Plus is a registered trademark of
  NXP Semiconductors N.V.

◆ Defog

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

Before defog   After defog

◆ 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.

Base length B
Camera   Camera

Ground
height H

Horizontal
angle of view
A

Upper limit
of disparity
M%

Measurable range
of the distance

Measurable range
of the distance
(In case of using
double precision)

Measurable range Wo
Monitorable range W

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.

CIS

CIS Camera

CIS Camera Product

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