

# CIS



# CIS

Camera & Imaging Systems  
PRODUCT LINEUP

## CIS Corporation

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Distributor

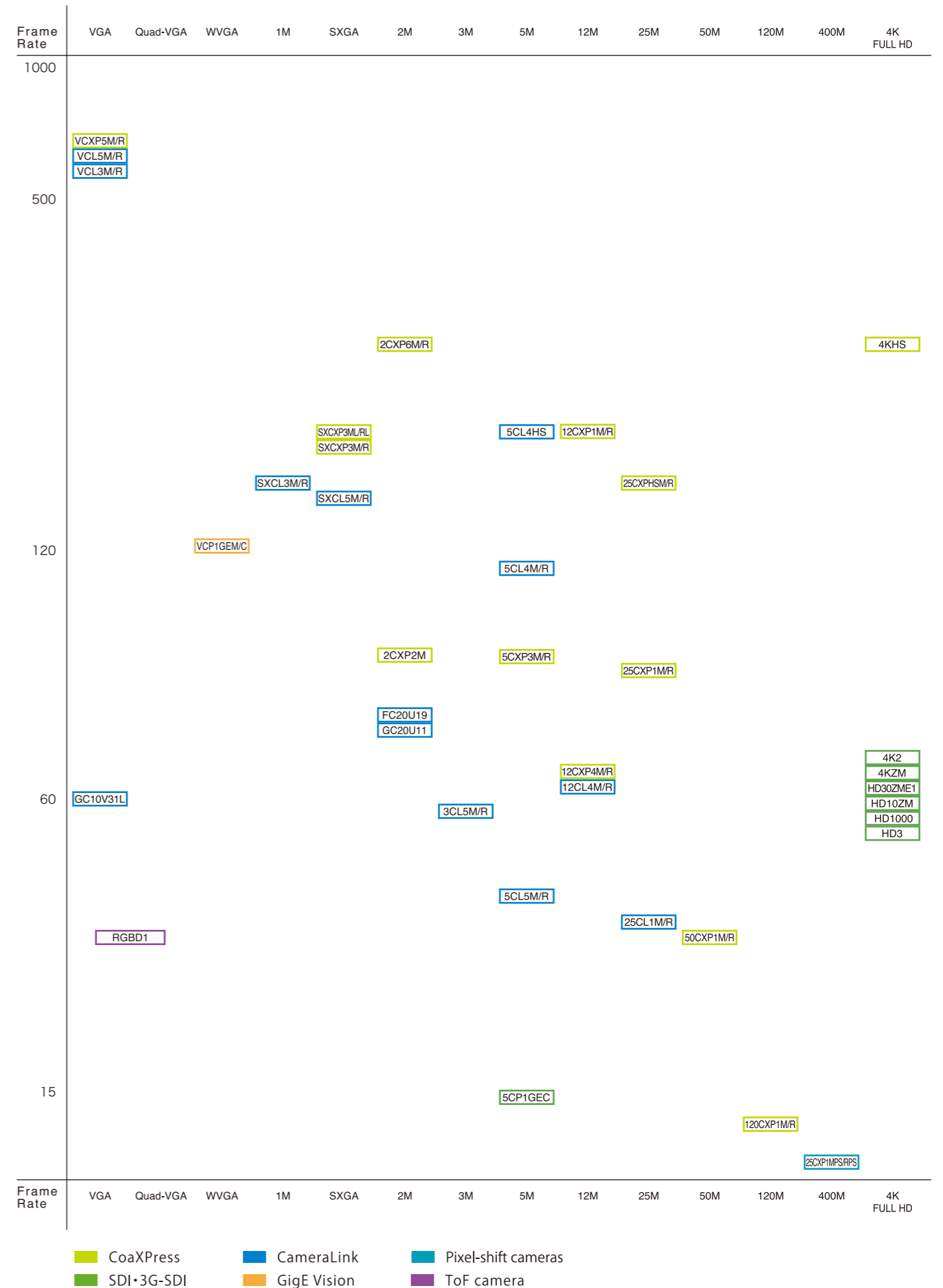
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# Selection Guide

Interface	Sensor	Resolution
CoaXPress	CMOS	VGA • SXGA • 2M • 5M • 12M • 25M • 50M • 120M • 400M • 4K
Camera Link	CMOS	VGA • SXGA • 2M • 3M • 5M • 12M • 25M
GigE Vision (PoE)	CMOS	WVGA • 5M
USB3.0	CCD(ToF) & CMOS	ToF(VGA) + RGB(Quad-VGA)
SDI • 3G-SDI	CMOS	4K • Full HD

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## About us

Corporate name	CIS Corporation
HQ location	Head Quarter / Factory 539-5, Higashi Asakawa-machi, Hachioji-shi, Tokyo, 193-0834, JAPAN Tel 042-664-5535 fax 042-669-7471
Foundation	September 1st, 1978
Employees	120
President	Yusuke Muraoka
Office locations	Hachioji OFFICE (Sales Div., Engineering Div.) 6F, 9-8, Azuma-cho, Hachioji-shi, Tokyo, 192-0082, JAPAN Tel 042-664-5568 fax 042-645-0441  Higashi Nakano OFFICE (Solution Development Center) 2F, 5-5-5, Tokumasu Bldg., Higashi Nakano, Nakano-Ku, Tokyo, 164-0003, JAPAN
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	Required ISO14001 certification
Mar. 2018	Acquired ISO9001 certification (year 2015 version) and ISO14001 certification (year 2015 version) from the third-party institution.

## 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 customers' 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.

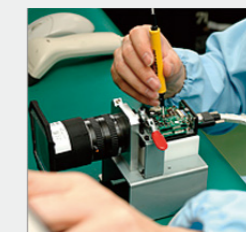
### Expert Engineering Teams

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 shall strive to remain so.

※The products with the size of 29×29×29mm are going to be erased their printing of the camera cover and changed to solid color.

VGA  
SXGA



CMOS Interface	VGA High speed CXP3 × 1lane	SXGA High speed CXP1 - CXP3 × 1lane
Model name	VCC-VCXP5M VCC-VCXP5R	VCC-SXCXP3M VCC-SXCXP3R VCC-SXCXP3NIR(Near-infrared)
Sensor	Pregius IMX287	PYTHON 1300
Sensor size	1/2.9 type CMOS	1/2 type CMOS
Unit cell size (μm)	6.9 μm × 6.9 μm	4.8 μm × 4.8 μm
Effective pixels (H) × (V)	720 × 540	1280 × 1024
Resolution	VGA	SXGA
Frame rate	583fps(at VGA), 523fps(CXP3·8bit), 437fps(CXP3·10bit), 320fps(CXP3·12bit)	168fps(CXP3·8bit)
Pixel clock	74.25MHz	72 MHz
Shutter	OFF~1/20,000s	OFF~1/10,000s
Lens mount	C mount	C mount
Dimensions (W)x(H)x(D)mm	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, NIR model also available

2M  
5M



CMOS Interface	2M High speed CXP3 · CXP6 × 1lane	5M High speed CXP1 - CXP6 × 1lane
Model name	VCC-2CXP6M VCC-2CXP6R	VCC-5CXP3M VCC-5CXP3R VCC-5CXP3NIR(Near-infrared)
Sensor	Pregius IMX422	PYTHON 5000
Sensor size	1/1.7 type CMOS	1 type CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm	4.8 μm × 4.8 μm
Effective pixels (H) × (V)	1632 × 1248	2592 × 2048
Resolution	2M	5M
Frame rate	239fps (CXP6·8bit), 195fps (CXP6·10bit), 166fps (CXP6·12bit), 120fps (CXP3·8bit), 97fps (CXP3·10bit), 83fps (CXP3·12bit)	85fps(CXP6·8bit/CXP6·10bit), 43fps(CXP3·8bit/CXP3·10bit)
Pixel clock	74.25MHz	72MHz
Shutter	OFF~1/66,000s	OFF~1/10,000s
Lens mount	C mount	C mount
Dimensions (W)x(H)x(D)mm	29 × 29 × 55	29 × 29 × 55
Features	Connector:BNC, External trigger, Long distance transmission, ROI (Vertical direction only), 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 also available

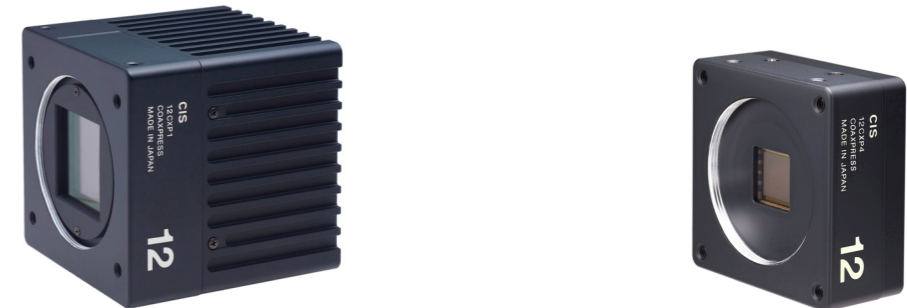
Models with  
LED controller  
2M



CMOS Interface	SXGA with LED control CXP1 - CXP3 × 1lane	2M High speed CXP1 - CXP3 × 1lane
Model name	VCC-SXCXP3ML	VCC-2CXP2M
Sensor	PYTHON 1300	PYTHON 2000
Sensor size	1/2 type CMOS	2/3 type CMOS
Unit cell size (μm)	4.8 μm × 4.8 μm	4.8 μm × 4.8 μm
Effective pixels (H) × (V)	1280 × 1024	1984 × 1264
Resolution	SXGA	2M
Frame rate	168fps(CXP3·8bit)	85fps(CXP3·8bit/CXP3·10bit)
Pixel clock	72MHz	72MHz
Shutter	OFF~1/10,000s	OFF~1/5,000s
Lens mount	C mount	C mount
Dimensions (W)x(H)x(D)mm	29 × 29 × 55	29 × 29 × 29
Features	Connector:BNC, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Sequence control (lighting can be controlled as well), Shading correction, PoCXP, External power supply shall be up to 46W	Connector:BNC, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Shading correction, PoCXP

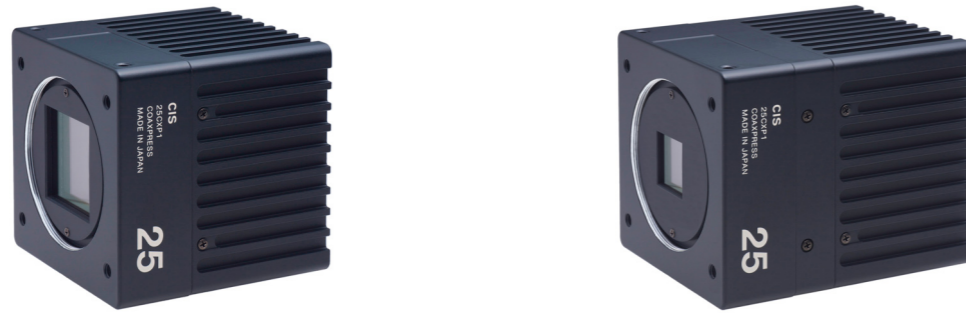
(Please ask us for compatible CCS products.)

12M



CMOS Interface	12M High speed CXP1 - CXP6 × 4lanes	12M High speed CXP3 - CXP6 × 1lane/2lanes
Model name	VCC-12CXP1M VCC-12CXP1R	VCC-12CXP4M VCC-12CXP4R
Sensor	PYTHON 12K	Pregius IMX253
Sensor size	4/3 type CMOS	1.1 type CMOS
Unit cell size (μm)	4.5 μm × 4.5 μm	3.45 μm × 3.45 μm
Effective pixels (H) × (V)	4096 × 3072	4096 × 3000
Resolution	12M	12M
Frame rate	163fps(CXP6·8bit), 130fps(CXP6·10bit), 78fps(CXP3·8bit), 69fps(CXP3·10bit)	65fps(CXP6·8bit/10bit×2lanes), 32fps(CXP6·8bit×1lane/CXP6·10bit×1lane/CXP3·8bit×2lanes/CXP3·10bit×2lanes), 16fps(CXP3·8bit×1lane·8bit/CXP3·10bit×1lane)
Pixel clock	72MHz	74.25MHz
Shutter	OFF~1/30,000s	OFF~1/51,000s
Lens mount	M48 mount	M42 mount
Dimensions (W)x(H)x(D)mm	65 × 65 × 65	55 × 55 × 30
Features	Connector:DIN, External trigger, Long distance transmission, ROI, Sub-sampling, Defective pixel correction, Sequence control, Shading correction, PoCXP	Connector:BNC, External trigger, Long distance transmission, ROI (Vertical direction only), 2 × 2 binning (B/W model only), Defective pixel correction, Shading correction, Gain 0 ~ 36dB

25M



CMOS	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> (Near-infrared) <b>VCC-25CXP1MBN</b> (with Binning function)	<b>VCC-25CXP1MPS</b> <b>VCC-25CXP1RPS</b>
Sensor	PYTHON 25K	GMAX0505
Sensor size	APS-H CMOS	1.1type 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	—
Shutter	OFF~1/30,000s	6μs~2s
Lens mount	M48 mount	M48 mount
Dimensions (W)x(H)x(D)mm	65 × 65 × 65	65 × 65 × 93.3 (without heatsink) 65 × 125 × 93.3 (heatsink attached) ※Heat dissipation may be necessary depends on its installation condition.
Features	Connector:DIN, External trigger, Long distance transmission, ROI, Sub-sampling, Binning (BN model only), Defective pixel correction, Sequence control, Shading correction, PoCXP	Connector:HD-BNC, External trigger, Long distance transmission, ROI, Defective pixel correction, Shading correction, Gamma correction

50M

120M



CMOS	50M High resolution	120M Ultra-high resolution
Interface	CXP3/6 × 4lanes, CXP12 × 2lanes	CXP3/6 × 4lanes, 6 × 2lanes
Model name (B/W) (Color)	<b>VCC-50CXP1M</b> <b>VCC-50CXP1R</b>	<b>VCC-120CXP1M</b> <b>VCC-120CXP1R</b>
Sensor	CMV50000	120MXSM
Sensor size	35mm CMOS	APS-H CMOS
Unit cell size (μm)	4.6 μm × 4.6 μm	2.2 μm × 2.2 μm
Effective pixels (H) × (V)	7920x6004	13264×9180
Resolution	50M	120M
Frame rate	30fps	9.4fps(CXP3·8bit×4lanes/CXP6·8bit×2lanes /CXP6·8bit×4lanes/CXP6·10bit×4lanes)
Pixel clock	69MHz	—
Shutter	TBD	OFF~1/20,000s
Lens mount	M58 mount	M48 mount
Dimensions (W)x(H)x(D)mm	75 × 75 × 85	65 × 65 × 68
Features	Connector:HD-BNC, External trigger, Long distance transmission, ROI, Binning, Defective pixel correction, Shading correction, Gain setting, PoCXP, CoaXPress CXP-3/6/12, CXP2.0 complied	Rolling shutter, Connector:DIN, Long distance transmission, ROI, Defective pixel correction, Shading correction, Strobe out, Long time exposure, PoCXP, High-speed processing

400M



CMOS	Max 400M pixels Ultra-high resolution
Interface	CXP3-CXP6 × 4lanes
Model name (B/W) (Color)	<b>VCC-25CXP1MPS</b> <b>VCC-25CXP1RPS</b>
Sensor	PYTHON25K
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	81.8fps (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)x(H)x(D)mm	65 × 65 × 93.3
Features	Global shutter, DIN connector B/W : 10240 × 10240/20480 × 20480 Color : 5120 × 5120/10240 × 10240(Equivalent to 3CMOS True color) Build-in Piezo actuator drive unit Provides pixel-shift image composition software

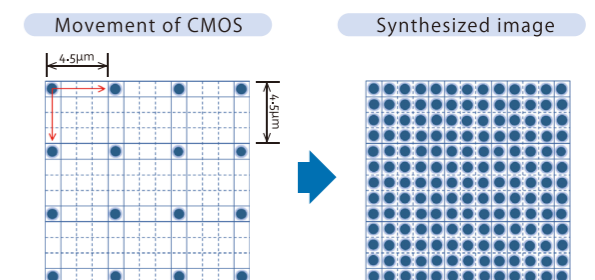
Pixel-shift Technology

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.

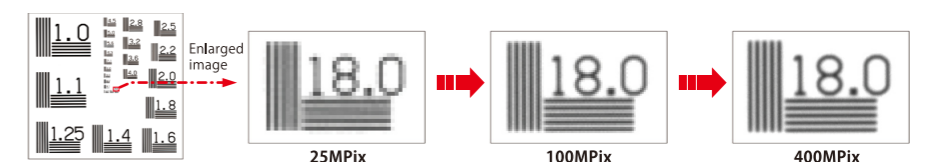
【Precise image sensor positioning】

In the case of VCC-25CXP1MPS, an ultra high def image of 400M pix. is generated using 25M pixel CMOS. This is done by shifting X and Y axes between the sensor's pixel pitch 4 times in each direction (4x4 of 4.5 μm/4), capturing images at each position, and synthesizing them to create a single image.

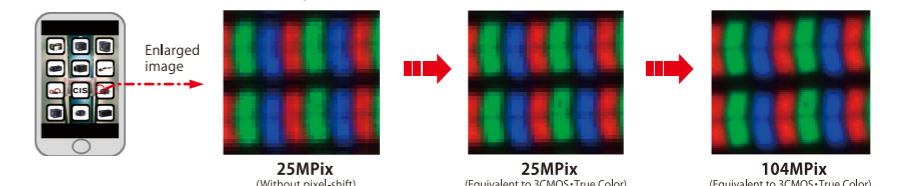
Displacement accuracy of the pixel shift is less than ±0.2 μm. The time required for the CMOS to move to the predefined position is less than 10ms.



Shoot a chart by VCC-25CXP1MPS (B/W)



Shoot a LCD of smart phone by VCC-25CXP1RPS (Color)



※The products with the size of 29×29×29mm are going to be erased their printing of the camera cover and changed to solid color.

## VGA



CMOS	VGA 1TAP,2TAP,3TAP	VGA 1TAP,2TAP,3TAP Pixel clock selectable	VGA Ultra small 22mm cubic in size
Interface	PoCL・non-PoCL (Auto selection)	PoCL・non-PoCL (Auto selection)	PoCL-Lite
Model name (B/W) (Color)	<b>VCC-VCL3M</b> <b>VCC-VCL3R</b>	<b>VCC-VCL5M</b> <b>VCC-VCL5R</b>	<b>VCC-GC10V31L</b>
Sensor	PYTHON 300	Pregius IMX287	MT9V024
Sensor size	1/4 type CMOS	1/2.9 type CMOS	1/3 type CMOS
Unit cell size (μm)	4.8 μm × 4.8 μm	6.9 μm × 6.9 μm	6.0 μm × 6.0 μm
Effective pixels (H) × (V)	640 × 480	720 × 540	752 × 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)	60fps
Pixel clock	72MHz・36MHz (Selectable at 2TAP output)	74.25MHz・64.969MHz・37.125MHz (Selectable)	24.545 MHz
Shutter	OFF ~ 1/10,752s	OFF ~ 1/50,000s	OFF ~ 1/30,000s
Lens mount	C mount	C mount	NF mount
Dimensions (W) × (H) × (D) mm	29 × 29 × 29	29 × 29 × 29	22 × 22 × 22
Features	External trigger, ROI, Sub-sampling, Defective pixel correction, Power auto selection ※Baud rate needs to be specified at order	External trigger, ROI, H&V flip, Defective pixel correction, Shading correction, Cursor indication, One push white balance, Power auto selection	External trigger, ROI, NIR sensitivity, Ultra compact size (22mm cubic, 19g), Low power consumption 0.65W

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

## SXGA

## 2M



CMOS	SXGA 1TAP,2TAP,3TAP Pixel clock selectable	SXGA 1TAP,2TAP,3TAP Pixel clock selectable	2M High speed
Interface	PoCL・non-PoCL (Auto selection)	PoCL・non-PoCL (Auto selection)	PoCL・non-PoCL
Model name (B/W) (Color)	<b>VCC-SXCL3M</b> <b>VCC-SXCL3R</b>	<b>VCC-SXCL5M</b> <b>VCC-SXCL5R</b>	<b>VCC-GC20U11CL / PCL</b> <b>VCC-FC20U19CL / PCL</b>
Sensor	PYTHON 1300	Pregius IMX273	CMV2000
Sensor size	1/2 type CMOS	1/2.9 type CMOS	2/3 type CMOS
Unit cell size (μm)	4.8 μm × 4.8 μm	3.45 μm × 3.45 μm	5.5 μm × 5.5 μm
Effective pixels (H) × (V)	1280 × 1024	1440 × 1080	2048 × 1088
Resolution	SXGA	SXGA	2M
Frame rate	Base: 152fps(3tap) 84fps(2tap) 42fps(1tap)	Base: 136fps(3tap) 91fps(2tap) 46fps(1tap)	Base: 70fps(2tap)
Pixel clock	72MHz・36MHz (Selectable at 2TAP output)	74.25MHz・64.969MHz・37.125MHz (Selectable)	79.99MHz
Shutter	OFF ~ 1/10,000s	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, Sub-sampling, Defective pixel correction, Power auto selection ※Baud rate needs to be specified at order.	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	External trigger, ROI, Gain: 0 ~ 12dB, 8bit/10bit output, Manual gain control

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

## 3M

## 5M



CMOS	3M 1TAP,2TAP,3TAP	5M 1TAP,2TAP,3TAP	5M High speed/Various features/Thin type
Interface	PoCL・non-PoCL (Auto selection)	PoCL・non-PoCL (Auto selection)	PoCL・non-PoCL (Selectable)
Model name (B/W) (Color)	<b>VCC-3CL5M</b> <b>VCC-3CL5R</b>	<b>VCC-5CL5M / VCC-5CL5M63</b> <b>VCC-5CL5R / VCC-5CL5R63</b>	<b>VCC-5CL4M / VCC-5CL4MS</b> <b>VCC-5CL4R / VCC-5CL4RS</b>
Sensor	Pregius IMX265	Pregius IMX264	Pregius IMX250
Sensor size	1/1.8 type CMOS	2/3 type CMOS	2/3 type CMOS
Unit cell size (μm)	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm
Effective pixels (H) × (V)	2064 × 1544	2448 × 2048	2448 × 2048
Resolution	3M	5M	5M
Frame rate	Base: 56fps(3tap) 45fps(2tap) 23fps(1tap)	Base: 36fps(3tap) 29fps(2tap) 15fps(1tap)	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
Pixel clock	74.25MHz	74.25MHz(SCL5series)/63.64MHz(Only63modelisselectable)	74.25MHz / 84.86MHz (HS model)
Shutter	OFF ~ 1/50,000s	OFF ~ 1/50,000s	OFF ~ 1/55,000s OFF ~ 1/60,000s (HS model)
Lens mount	C mount	C mount	M42 mount
Dimensions (W) × (H) × (D) mm	29 × 29 × 29	29 × 29 × 29	55 × 55 × 25
Features	External trigger, ROI, Sub-sampling, Defective pixel correction, Gain: 0 ~ 42dB, Manual gain control, Power auto selection	External trigger, ROI, Sub-sampling, Defective pixel correction, Gain: 0 ~ 42dB, Manual gain control, Power auto selection	External trigger, Vertical ROI, Defective pixel correction, Gain: 0 ~ 36dB

## 12M

## 25M



CMOS	12M	25M High speed/Various features
Interface	PoCL・non-PoCL (Selectable)	PoCL・non-PoCL (Selectable)
Model name (B/W) (Color)	<b>VCC-12CL4M</b> <b>VCC-12CL4R</b>	<b>VCC-25CL1M</b> <b>VCC-25CL1R</b>
Sensor	Pregius IMX253	PYTHON25K
Sensor size	1.1 type CMOS	APS-H CMOS
Unit cell size (μm)	3.45 μm × 3.45 μm	4.5 μm × 4.5 μm
Effective pixels (H) × (V)	4096 × 3000	5120 × 5120
Resolution	12M	25M
Frame rate	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	84.86MHz	72MHz (8tap) / 85MHz (8・10tap)
Shutter	OFF ~ 1/51,000 s	OFF ~ 1/30,000s
Lens mount	M42 mount	M48 mount
Dimensions (W) × (H) × (D) mm	55 × 55 × 25	65 × 65 × 40.5
Features	Gain: 0 ~ 36dB, Camera Link, Base, Medium, FULL, 8tap 10bit, 10tap 8bit complied, Fixed trigger shutter mode, Pulse width trigger shutter mode	External trigger, ROI, 2 × 2 binning (B/W model only), Defective pixel correction, Sequence function, Shading correction

## Board Cameras

### Board Cameras

Must have functions ready and supports several kinds of interfaces with various sensors. GigE Vision PoE and USB3.0 supported, high image quality with image processing function, yet cost effective. Both board type and cased type are prepared for GigE camera.



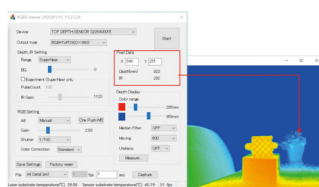
Resolution	5M	WVGA	ToF (VGA) + RGB (Quad-VGA)
Interface	GigE (PoE)	GigE (PoE)	USB3.0
Model name	(B/W) (Color) <b>DCC-5CP1GEC (Board type)</b> <b>VCC-5CP1GEC (Cased type)</b>	(B/W) <b>DCC-VCP1GEM (Board type)</b> <b>VCC-VCP1GEM (Cased type)</b>	(B/W) (Color) <b>DCC-RGBD1</b>
Sensor	MT9P006	EV76C541	MN34906 (ToF), AR-0135 (RGB)
Sensor size	1/2.5type CMOS	1/4type CMOS	1/4type CCD (ToF), 1/3type CMOS (RGB)
Unit cell size (μm)	2.2μm × 2.2μm	4.5μm × 4.5μm	5.6μm × 5.6μm (ToF), 3.75μm × 3.75μm (RGB)
Effective pixels (H)×(V)	2592 × 1944	752 × 480	640 × 480 (ToF), 1280 × 960 (RGB)
Frame rate	6fps~112fps (Depends on the image size)	30fps~120fps	30fps
Lens mount	M14 mount (Board type) / C mount (Cased type)	M14 mount (Board type) / C mount (Cased type)	ToF/RGB: M12 mount (S mount), Dedicated lens installed.
Dimensions (W)×(H)×(D)mm	42×42×11.6 (Board type) / 47×47×34 (Cased type)	42×42×11.6 (Board type) / 47×47×34 (Cased type)	50×55×35 (Excluding projection)
Features	Common features of DCC/VCC model : Rolling shutter, ROI, AE/AWB, One Push WB, Gain control Features of DCC model only : Adaptor for M12 lens (Optional item)	Common features of DCC/VCC model : Global shutter, AE, Shutter control, Gain control Features of DCC model only : Adaptor for M12 lens (Optional item)	[RGB sensor] Global shutter, Simplified AE (Gain control/Exposure control), One Push WB [ToF sensor] Depth (Distance) data, IR (Near-infrared) data output [ToF light source] LD (Laser Diode) wavelength 850nm 2 lights installed

Specification is subject to change without prior notice.

## RGB ToF Camera (DCC-RGBD1)

This is a twin-lens board camera which integrates ToF camera and RGB camera. With ToF camera, distance can be measured by using near-infrared light emitted from the camera.

### ToF camera development kit



Operation example of Operation check exe (Indicate the simplified information on 1 pixel.)

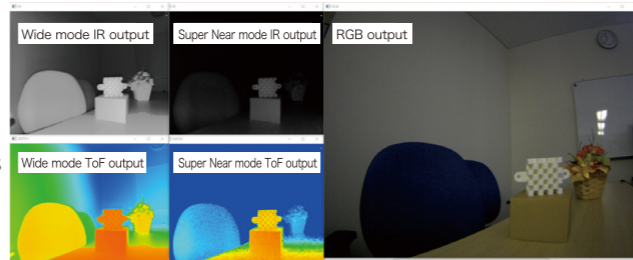
- Suitable for a simplified evaluation of ToF.
- Provides SDK for controlling and other purposes of various cameras.
- Provides support for dedicated ROS driver and various libraries for controlling and other purposes of various cameras.  
For Windows: Provides DLL/C++/C# sample code project/Operation check exe  
For Linux: Provides ROS driver package from TORK
- Enables to built into various applications by the support of ROS driver.

### Acquires information on RGB and Depth by one camera

- Synchronizes and outputs YUV+Depth information by using on-board FPGA.
- Corresponds to a seamless measurement in the range of 30cm~5m.  
(At Super Near mode: 15cm~70cm, At Wide mode: 30cm~5m)
- High accuracy mode (Accuracy when averaging 100 pictures): Error ±2mm (@15cm), ±10mm (@5m)
- Since the measurement is performed under CIS's conditions, the value may not be fulfilled depends on the environment.

### Small footprint • USB3.0 interface utilized

- 50(W) × 55(H) × 35(D)mm
- USB3.0 UVC (Power feeding is not supported)
- A cable for power supply is supplied as an accessory.



## Accessories



Camera lens mount conversion ring						
Model name	<b>M48-F mount conversion ring (Turn-style)</b>	<b>M48-F mount conversion ring</b>	<b>M48-C mount conversion ring</b>	<b>M48-M42 mount conversion ring</b>	<b>M42-F mount conversion ring</b>	<b>M42-C mount conversion ring</b>
Features	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 M48 to M42 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. Conform to RoHS2 (DTPS-1215-06).

## Semi-custom Lens

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

### Features

#### 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.

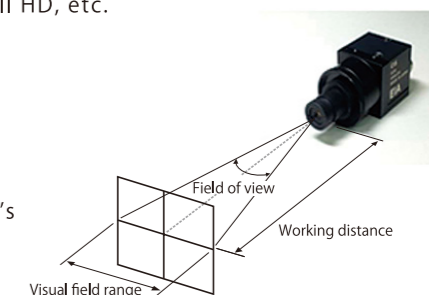


#### Lens Variation

- 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.

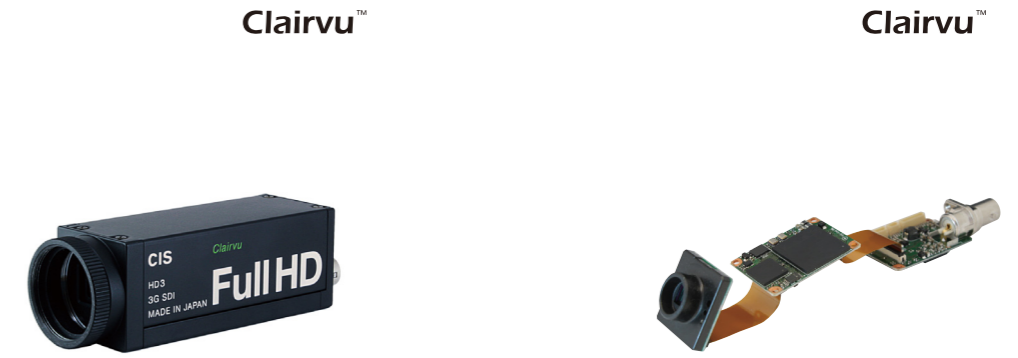


4K  
FULL HD



CMOS	BT.2100 complied 4K UHD 60fps	BT.2100 complied 4K UHD 60fps	4K High speed
Interface	Quad 3G-SDI / HD-SDI	Quad 3G-SDI / HD-SDI	CoaXPress CXP12 × 4lanes
Model name (B/W/Color)	<b>VCC-4K2</b>	<b>DCC-4K2</b>	<b>VCC-4KHS</b>
Sensor	Pregius IMX255	Pregius IMX255	GMAX0505 (Always cutout the center area to use)
Sensor size	1 type CMOS	1 type CMOS	1.1 type CMOS (Always cutout the center area to use. 2/3 type as an optical system)
Unitcell size (μm)	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm	2.5 μm × 2.5 μm
Effective pixels (H) x (V)	3840 × 2160	3840 × 2160	3840 × 2160
Video output	2160p, 1080p, 1080i	2160p, 1080p, 1080i	◆ Resolution 8M
Signal I/F	3G-SDI × 4ch, 3G-SDI × 1ch, HD-SDI × 1ch	3G-SDI × 4ch, 3G-SDI × 1ch, HD-SDI × 1ch	◆ Frame rate 240fps
Sync system	Internal sync / External sync	Internal sync / External sync	◆ Pixel clock 74MHz
Shutter	OFF ~ 1/13,600s	OFF ~ 1/13,600s	TBD
Lens mount	M42 mount	M42 mount	B4-bayonet / Cmount
Dimensions (W)x(H)x(D)mm	65 × 65 × 110	Lens mount block 65 × 65 × 12, Main block 65 × 29 × 89 (Excluding projection)	100 × 100 × 100
Features	Image with no distortion with global shutter, ISP Clairvu™, Max. 4K 60fps high speed processing capability, 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	Image with no distortion with global shutter, ISP Clairvu™, Max. 4K 60fps high speed processing capability, 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	Image with no distortion with global shutter, Connector: HD-BNC, ISP Clairvu™, 4K2K complied, 240fps high speed processing capability

FULL HD



CMOS	Compact size 1080p 60fps	Compact size 1080p 60fps
Interface	3G-SDI / HD-SDI	3G-SDI/HD-SDI
Model name (B/W/Color)	<b>VCC-HD3N</b>	<b>DCC-HD3N</b>
Sensor	Pregius IMX265	Pregius IMX265
Sensor size	1/1.8 type CMOS	1/1.8 type CMOS
Unitcell size (μm)	3.45 μm × 3.45 μm	3.45 μm × 3.45 μm
Effective pixels (H) x (V)	1920 × 1080	1920 × 1080
Video output	1080p, 1080i, 720p	1080p, 1080i, 720p
Signal I/F	3G-SDI, HD-SDI, BNC75 Ω	3G-SDI, HD-SDI, BNC75 Ω
Sync system	Internal sync / External sync	Internal sync / External sync
Shutter	OFF ~ 1/13,600s	OFF ~ 1/13,600s
Lens mount	C/CS mount (C mount conversion ring attached)	None
Dimensions (W)x(H)x(D)mm	29 × 29 × 77	Sensor board 25.4 × 25.4, Main board 25.4 × 38, Driver board 25.4 × 43
Features	Image with no distortion with global shutter, ISP Clairvu™, Max. 1080/60p (at 3G-SDI output) high speed processing output, BT.709 Gamma curve, Color correction, NR, LTC, GenLock, GenLock Offset, OSD	Image with no distortion with global shutter, ISP Clairvu™, Max. 1080/60p (at 3G-SDI output) high speed processing output, BT.709 Gamma curve, Color correction, NR, LTC, GenLock, GenLock Offset, OSD

Clairvu™+ Clairvu™+ Clairvu™+



CMOS	Lens mount Built-in × 18 zoom lens	Lens mount Built-in × 18 zoom lens	Lens mount Built-in × 30 zoom lens
Interface	Quad 3G-SDI / HD-SDI	3G-SDI / HD-SDI	3G-SDI / HD-SDI
Model name (B/W/Color)	<b>DCC-4KZM (x18)</b>	<b>VCC-HD10ZM (x18)</b>	<b>VCC-HD30ZME1</b>
Sensor	STARVIS IMX334	MN34220	MN34220
Sensor size	1/1.8 type CMOS	1/3 type CMOS	1/3 type CMOS
Unitcell size (μm)	2.0 μm × 2.0 μm	2.75 μm × 2.75 μm	2.75 μm × 2.75 μm
Effective pixels (H) x (V)	3840 × 2160	1920 × 1080	1920 × 1080
Video output	2160p, 1080p, 1080i	1080p, 1080i, 720p	1080p, 1080i, 720p
Signal I/F	3G-SDI × 4ch, 3G-SDI × 1ch, HD-SDI × 1ch	3G-SDI, HD-SDI, BNC75 Ω	3G-SDI, HD-SDI, BNC75 Ω
Sync system	Internal sync / External sync	Internal sync / External sync	Internal sync / External sync
Shutter	OFF ~ 1/13,600s	OFF ~ 1/8,000s	OFF ~ 1/8,000s
Lens	With x18 zoom lens fw=6.6mm, ft=120mm	With x18 zoom lens fw=4.7mm, ft=84.6mm	With x30 zoom lens fw=4.3mm, ft=129.0mm
Dimensions (W)x(H)x(D)mm	66 × 65 × 98	60 × 55 × 98.8	52 × 55.4 × 99.6
Features	Rolling shutter, Connector: H.FL-R-SMT, ISP Clairvu™, Max. 4K60p 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. 1080/60p (at 3G-SDI output) high speed processing output, Color correction, WDR, 3DNR, LTC, GenLock, OSD	Rolling shutter, ISP Clairvu™, Max. 1080/60p (3G-SDI output) high speed processing output, Color correction, WDR, 3DNR, LTC, GenLock, OSD

Clairvu™ Accessories



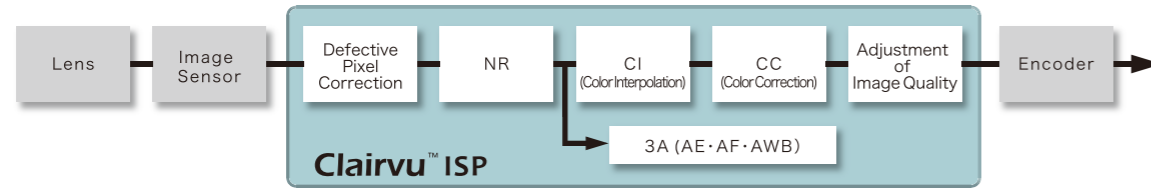
CMOS	Ultra-high sensitivity FullHD 0.0005lux
Interface	3G-SDI / HD-SDI
Model name (B/W/Color)	<b>VCC-HD1000</b>
Sensor	35mm FHD XSC
Sensor size	35mm Full size
Unitcell size (μm)	19 μm × 19 μm
Effective pixels (H) x (V)	1920 × 1080
Resolution	1080p, 1080i, 720p
Signal I/F	3G-SDI, HD-SDI, BNC75 Ω
Sync system	Internal sync / External sync
Shutter	OFF ~ 1/11,200s
Lens mount	EF/F mount
Dimensions (W)x(H)x(D)mm	75 × 75 × 85
Features	Rolling Shutter, ISP Clairvu™, Max. 1080/60p (at 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

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-HD3N VCC-HD10ZM VCC-HD30ZME1 VCC/DCC-4K2 VCC-HD1000 DCC-4KZM



## 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) Precise 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 3840×2160 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 ※Only for Clairvu+

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 be 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

**Color Interpolation**

Low Pseudo-color

**AWB**

Auto white balance for natural color

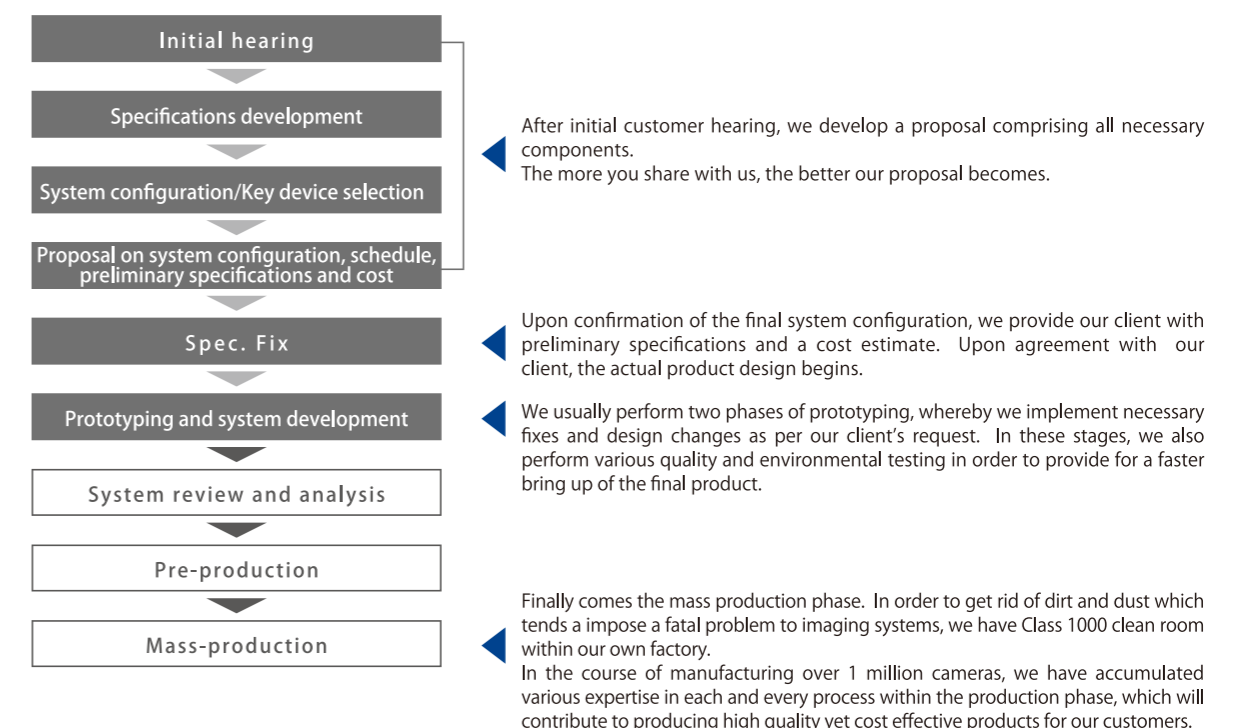
## Development of Image Processing Systems

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

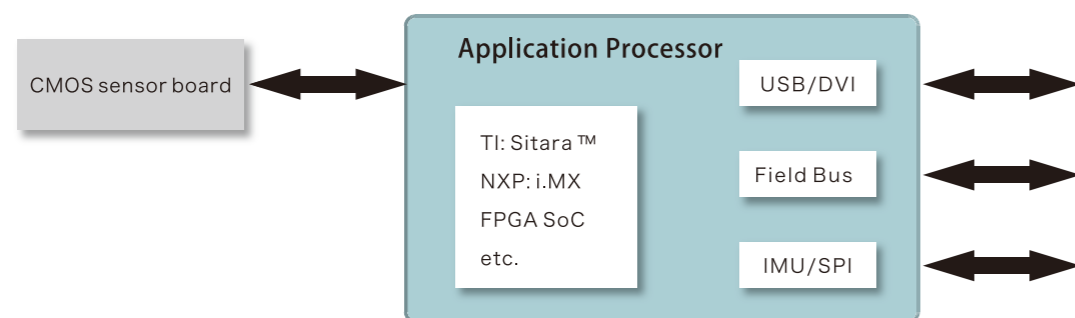


## Development of Image Processing Systems (Case example)

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.



### ◆ Intelligent surveillance camera system

The image processing system unit, which used to be done by dedicated machine, is integrated with the camera and resulting in significant downsizing and cost efficiency.



### ◆ High-speed image processing system

High-speed image processing system by hardware (FPGA). Supporting from hundreds to thousands fps of high-speed real time image processing.



### ◆ Defog

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

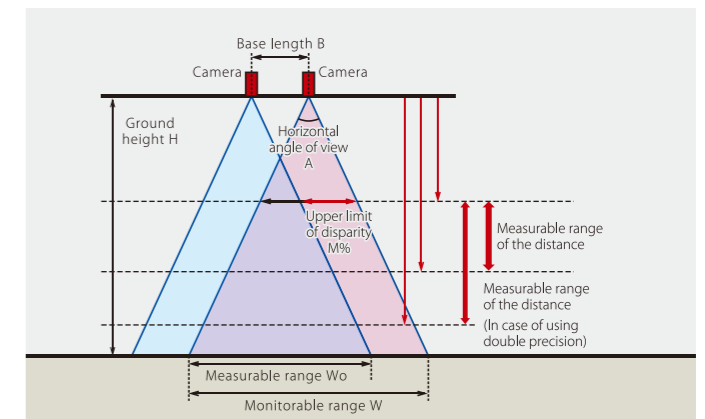


Before defog

After defog

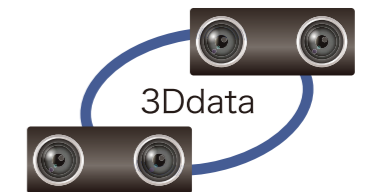
### ◆ Stereo camera measurement

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.



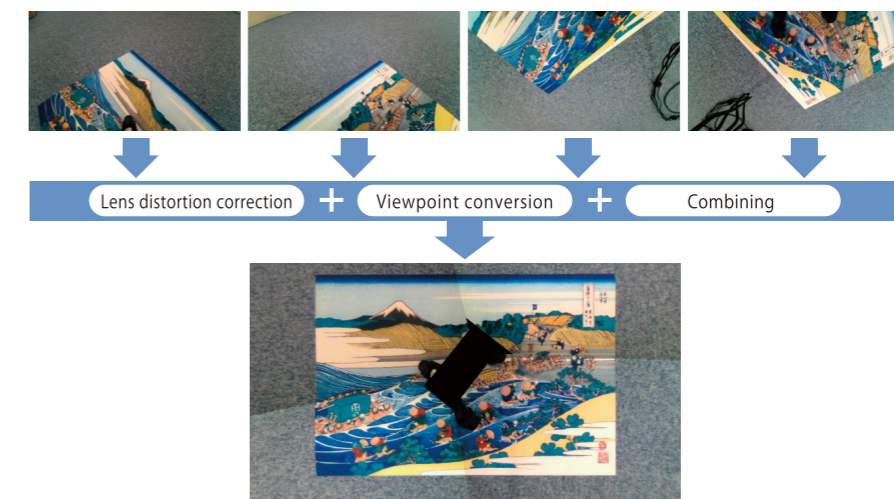
### ◆ Multiple camera 3D image processing equipment

This is a device to generate accurate 3D data from two sets of stereo camera inputs. The system is realized by combining a large-scale FPGA and a high-performance application processor.



### ◆ Stitching

The overall view of the object can be acquired as one picture by capturing the object from several directions, then execute distortion correction, viewpoint conversion, and combining each image.



※The black point at the center shows the position of the camera.

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