

Camera Digest Image Sensing Products

Machine Vision Camera < C-mount and High Shock & Vibration Resistance >

Polarization Camera GigE Vision Standard



		For NVIDIA® Jetson™	For Microsoft Windows
Model Name	Polarization Camera	XCG-CP510/CL (B/W)	XCG-CP510 (B/W)
	Polarization Camera SDK	XPL-SDKLJ *1	XPL-SDKW *2
Camera Features		B/W, 2/3-type, 5.1 MP, 23 fps, Capture a polarized image in 4 directions with one shot	
SDK Processing		■Degree of Polarization (DoP) ■Surface Normal ■Reflection (Cancel) ■Reflection (Enhance) ■Retardation* *Only for Windows	



Polarsens **Pregius** *Exmor*

*1 XCG-CP510/CL includes NVIDIA Jetson activated license of XPL-SDKLJ.

*2 XPL-SDKW license is sold separately.

Applications of Polarization Cameras and SDK <Processing examples>

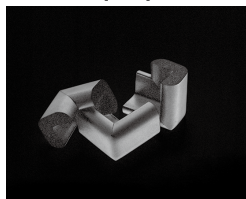
■ Degree of Polarization (DoP)

The degree of polarization (DoP) is calculated for each pixel and displayed as a degree of polarization image. This feature makes it easier to see low-contrast objects or objects that are difficult to recognize when they are the same color as the background.

[Input Image]



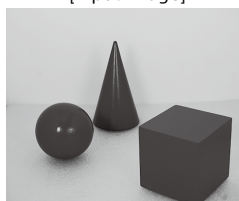
[DoP]



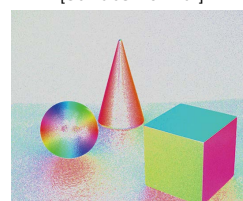
■ Surface Normal

The plane direction is estimated from the polarized state of each pixel and displayed as a surface normal image. The object plane direction is displayed with different colors by using a color map.

[Input Image]



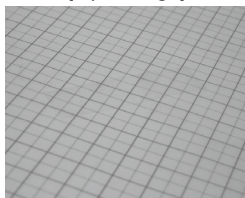
[Surface Normal]



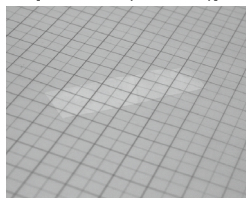
■ Reflection (Enhance)

Reflected components calculated from four direction polarized images are enhanced. Images reflected off transparent objects such as glass are enhanced when displayed. A transparent object can also be made more visible.

[Input Image]



[Reflection(Enhance)]

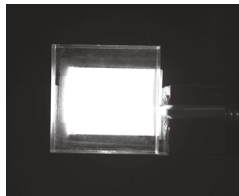


■ Retardation

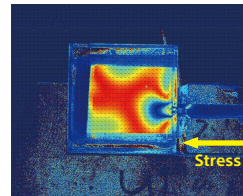
*Only for Windows

This indicates the direction and whether or not there is any distortion when light passing through the polarizing plate has passed through a transparent or semitransparent object. The measurement is effective for checking the distortion when passing through transparent or semitransparent objects such as glass and for checking stress.

[Input Image]



[Retardation]



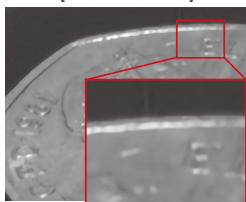
■ Demosaic

Our unique demosaic function is optimally designed for the polarizer array. The demosaic process reconstructs full resolution level image from the original pixels output of 4 directional polarizer array. With our SDK, polarization processing happens after demosaicing to create an image with a higher resolution.

[Raw Data]



[After Demosaic]



■ Reflection (Cancel)

Reflected components calculated from four direction polarized images are removed. Images reflected off transparent objects such as glass are reduced, making objects on the other side more visible. Reflections can be removed by both automatic calculation and manual angle adjustment.

[Input Image]



[Reflection (Cancel)]



Machine Vision Camera < C-mount and High Shock & Vibration Resistance >

GigE Vision



XCG-CG510 (B/W)

XCG-CG510C (Color)

- 2/3-type Global Shutter CMOS
- 2,464 (H) x 2,056 (V) (5.1MP)*
- 23 fps (8 bit)
- 29 (W) x 29 (H) x 42 (D) mm / 65 g
- GigE Vision® (Ver.2.0 / 1.2)
- PoE / DC12V support
- Near-infrared sensitivity (B/W model only)
- IEEE1588 Compliant
- Defect pixel correction
- Look Up Table
- Image flip
- Partial scan, Binning (B/W model only)
- Quarter mode (Color model only)
- Trigger range (Noise filter)
- Hardware trigger / Software trigger
- Burst trigger / Free set sequence

*Effective pixels



Pregius

Exmor

XCG-CG240 (B/W)

XCG-CG240C (Color)

- 1/1.2-type Global Shutter CMOS
- 1,936 (H) x 1,216 (V) (2.4MP)*
- 41 fps (8 bit)
- 29 (W) x 29 (H) x 42 (D) mm / 65 g
- GigE Vision® (Ver.2.0 / 1.2)
- PoE / DC12V support
- Near-infrared sensitivity (B/W model only)
- IEEE1588 Compliant
- Defect pixel correction
- Look Up Table
- Image flip
- Partial scan, Binning (B/W model only)
- Quarter mode (Color model only)
- Trigger range (Noise filter)
- Hardware trigger / Software trigger
- Burst trigger / Free set sequence

*Effective pixels



Pregius

Exmor

XCG-CG160 (B/W)

XCG-CG160C (Color)

- 1/2.9-type Global Shutter CMOS
- 1,456 (H) x 1,088 (V) (1.6MP)*
- 75 fps (8 bit)
- 29 (W) x 29 (H) x 42 (D) mm / 65 g
- GigE Vision® (Ver.2.0 / 1.2)
- PoE / DC12V support
- Near-infrared sensitivity (B/W model only)
- IEEE1588 Compliant
- Defect pixel correction
- Look Up Table
- Image flip
- Partial scan, Binning (B/W model only)
- Quarter mode (Color model only)
- Multi ROI
- Hardware trigger / Software trigger
- Burst trigger / Free set sequence

*Effective pixels



Pregius

Exmor

XCG-CG40 (B/W)

- 1/2.9-type Global Shutter CMOS
- 728 (H) x 544 (V) (0.4MP)*
- 300 fps (8 bit)

- 29 (W) x 29 (H) x 42 (D) mm / 65 g
- GigE Vision® (Ver.2.0/1.2)
- PoE / DC12V support
- Near-infrared sensitivity
- IEEE1588 Compliant
- Defect pixel correction
- 3x3 filter
- Partial scan
- Trigger range (Noise filter)
- Hardware trigger / Software trigger
- Burst trigger

*Effective pixels



Pregius

Exmor

Camera Link



XCL-SG1240 (B/W)

XCL-SG1240C (Raw Color)

- 1.1-type Global Shutter CMOS
- 4,112(H)x3,008(V)(12.4MP)*
- 20 fps (8 bit / 3tap)
- 44 (W) x 44 (H) x 30 (D) mm / 96 g
- Camera Link® (Ver.2.0)
- PoCL / DC12V support
- Near-infrared sensitivity (B/W model only)
- RS-232C
- Area gain
- Defect pixel correction
- Shading correction
- Look Up Table
- 3x3 filter
- Image flip
- Partial scan, Binning (B/W model only)
- Trigger range (Noise filter)
- Hardware trigger / Software trigger
- Burst trigger

*Effective pixels



Pregius

Exmor

XCL-SG510 (B/W)

XCL-SG510C (Raw Color)

- 2/3-type Global Shutter CMOS
- 2,464 (H) x 2,056 (V) (5.1MP)*
- 154 fps (80 bit / 10 tap)
- 44 (W) x 44 (H) x 30 (D) mm / 96 g
- Camera Link® (Ver.2.0)
- PoCL / DC12V support
- 80 bit (DECA) / Full / Medium / Base Configuration Support
- Near-infrared sensitivity (B/W model only)
- RS-232C
- Frame accumulate
- Area gain
- Shading correction
- 3x3 filter
- Partial scan, Binning (B/W model only)
- Multi ROI
- Trigger range (Noise filter)
- Hardware trigger / Software trigger
- Burst trigger

*Effective pixels



Pregius

Exmor

Machine Vision Camera < C-mount and High Shock & Vibration Resistance >

Camera Link



XCL-CG510 (B/W)

XCL-CG510C (Color)

- 2/3-type Global Shutter CMOS
 - 2,464 (H) x 2,056 (V) (5.1MP)*
 - 35 fps (8 bit/3tap)
 - 29 (W) x 29 (H) x 30 (D) mm / 53 g
 - Camera Link (Ver.2.0)
 - PoCL / DC12V support
 - Near-infrared sensitivity (B/W model only)
 - RS-232C
 - Defect pixel correction
 - Look Up Table
 - Image flip
 - Partial scan, Binning (B/W model only)
 - Trigger range (Noise filter)
 - Hardware trigger / Software trigger
 - Burst trigger
- Area gain
 - Shading correction
 - 3x3 filter
- *Effective pixels



Pregius

Exmor

XCL-CG160 (B/W)

XCL-CG160C (Color)

- 1/2.9-type Global Shutter CMOS
 - 1,456 (H) x 1,088 (V) (1.6MP)*
 - 127 fps (8 bit/3 tap)
 - 29 (W) x 29 (H) x 30 (D) mm / 53 g
 - Camera Link (Ver.2.0)
 - PoCL / DC12V support
 - Near-infrared sensitivity (B/W model only)
 - RS-232C
 - Defect pixel correction
 - Look Up Table
 - Image flip
 - Partial scan, Binning (B/W model only)
 - Decimation
 - Multi ROI
 - Hardware trigger / Software trigger
 - Burst trigger
- Area gain
 - Shading correction
 - 3x3 filter
 - Trigger range (Noise filter)
- *Effective pixels



Pregius

Exmor

USB3 Vision



XCU-CG160 (B/W)

XCU-CG160C (Color)

- 1/2.9-type Global Shutter CMOS
 - 1,456 (H) x 1,088 (V) (1.6MP)*
 - 100 fps (8 bit)
 - 29 (W) x 29 (H) x 30 (D) mm / 50 g
 - USB3 Vision (Ver.1.0.1)
 - USB bus power / DC12V support
 - Near-infrared sensitivity (B/W model only)
 - Area gain
 - Defect pixel correction
 - Look Up Table
 - Image flip
 - Partial scan, Binning (B/W model only)
 - Multi ROI
 - Quarter mode (Color model only)
 - Trigger range (Noise filter)
 - Hardware trigger / Software trigger
 - Burst trigger
- Shading correction
 - 3x3 filter
- *Effective pixels



Pregius

Exmor

Camera Link

CCD



XCL-C280 (B/W)

- 1/1.8-type EXview HAD CCD II™
- 1,920 (H) x 1,440 (V) (2.8MP)
- 26 fps (2ch)
- 29 (W) x 29 (H) x 30 (D) mm / 56 g



XCL-C130 (B/W)

XCL-C130C (Color)

- 1/3-type EXview HAD CCD®
- 1,280 (H) x 960 (V) (SXGA)
- 31 fps
- 29 (W) x 29 (H) x 30 (D) mm / 56 g



XCL-C30 (B/W)

XCL-C30C (Color)

- 1/3-type PS IT CCD
- 640 (H) x 480 (V) (VGA)
- 130 fps
- 29 (W) x 29 (H) x 30 (D) mm / 56 g



Accessory for Machine Vision Camera

Cable

- CCXC-12P02N (2m)
- CCXC-12P05N (5m)
- CCXC-12P10N (10m)
- CCXC-12P25N (25m)



Tripod Adaptor

VCT-333I



- 4K / 60 p
- 25x Optical Zoom
- Image Stabilizer
- 56 (W) x 64 (H) x 125 (D) mm
- 1/1.8-type CMOS Sensor
- Low Light
- Spot Focus / AE / AWB
- WDR
- ICR On Color



Preliminary

4K

Color Camera Block < With Zoom Lens, High Resolution Image Quality and Multi Functions >

1/1.8-type CMOS Sensor • High Sensitivity

High Sensitivity High Resolution Super Image Stabilizer

4M

FCB-EW9500H (HDMI)

(30x Enhanced Optical Zoom)

- Output image size (HxV): 2,688x1,512¹, 2,560x1,440¹, 1,920x1,080, 1,280x720
- 56 (W) x 64 (H) x 125 (D) mm / 439 g
- Power consumption: 4.6 W (When the motor operates: 6.3W)

Full HD

FCB-EV9500M (MIPI)

FCB-EV9500L (LVDS)

(30x Enhanced Optical Zoom)

- Output image size (HxV): 1,920x1,080, 1,280x720
- 56 (W) x 64 (H) x 125 (D) mm / 439 g (FCB-EV9500M), 456 g (FCB-EV9500L)
- Power consumption: FCB-EV9500M: 4.7 W (When the motor operates: 6.8W) FCB-EV9500L: 5.5 W (When the motor operates: 7.8W)

Functions common to all 3 models

- 1/1.8-type STARVIS™ CMOS (4.17 MP)
- 36x StableZoom^{*2}
- 12x Digital Zoom
- Video output: Digital output
- Wide dynamic range
- Visibility enhancer
- High light compensation
- Defog (low/mid/high)
- Spot light avoidance
- Noise reduction (3D+2D / Independent setting (3D, 2D))
- Super image stabilizer (Super / Super+)
- Auto ICR
- IR Correction
- Privacy zone masking
- Slow AE response
- Motion detection
- ICR ON Color



STARVIS

For comparison images with the conventional models, please refer to the website. www.sony.co.jp/ISPJ/

1/2.8-type CMOS Sensor • Small Model

High Sensitivity Super Image Stabilizer Compatibility

Full HD

FCB-EV9520L (LVDS)

(30x Optical Zoom)

- 1/2.8-type STARVIS™ 2 CMOS (2.13 MP)
- Output image size (HxV): 1,920x1,080, 1,280x720
- 50 (W) x 60 (H) x 89.7 (D) mm / 239 g
- 36x StableZoom^{*2}
- 12x Digital Zoom
- Video output: Digital output
- Wide dynamic range
- Visibility enhancer
- High light compensation

- Defog (low/mid/high)
- Spot light avoidance
- Noise reduction (3D+2D / Independent setting (3D, 2D))
- Super image stabilizer (Super / Super+)
- Auto ICR
- IR Correction
- Privacy zone masking
- Slow AE response
- Motion detection
- ICR ON Color
- Power consumption: 4.4 W (When the motor operates: 5.4W)



STARVIS 2

For comparison images with the conventional models, please refer to the website. www.sony.co.jp/ISPJ/

4K

FCB-ER8530

(30x SRZ)^{*}

- 1/2.5-type Exmor R™ CMOS (8.51 MP)
- Output image size (HxV): 3,840x2,160, 1,920x1,080, 1,280x720, 720x480/576
- 50 (W) x 60 (H) x 93.3 (D) mm / 275 g
- 30x Super Resolution Zoom (SRZ)^{*}
- 20x Optical zoom
- Video output: Digital output
- 20x Optical Zoom

- Video output: Digital output
- Visibility enhancer
- High light compensation
- Defog (low/mid/high)
- Noise reduction (3D+2D / Independent setting(3D, 2D))
- Image stabilization
- Auto ICR
- IR Correction
- StableZoom™^{*2}
- Privacy zone masking
- Power consumption: 3.2 W (When the motor operates: 4.0 W)



Exmor R

^{*1} The 2,688x1,512 or 2,560x1,440 image with surrounding black frame is output in 2160p signal system. ^{*2} StableZoom increases the magnification by combining optical zoom and digital zoom. ^{*3} For 1080p, 1080i, and 720p only.

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