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# XCG-CP510(Camera) XPL-SDKW(SDK) Digital Polarized Technology

**Polarsens**



PoE

## Features

### Hardware

- Sensor specifications
  - 5.1 MP
  - Optical format (2/3")
- Interface related specifications
  - GigE Vision 1.2/2.0 interface with PoE support
  - Frame rate: 23 fps @ 8 bit, 15 fps @ 12bit
  - IEEE1588 synchronization
- Mechanical specifications
  - 29(H) x 29(W) x 42(L) mm
- Operating temperature
  - [-5°to +45°C] operating range

### Software

- PC-based Image processing library + SDK
- Viewer application for demo and evaluation
- CPU/GPU optimization
- Online/Offline processing support

### Licensing scheme

- Perpetual license per production system (PC)



## XCG-CP510

- Sony global shutter Polarsens CMOS sensor
- On-chip polarizer
- 5MP @ 23 fps
- GigE Vision 1.2/2.0, PoE
- IEEE1588 compliant

## Processing Library

- Software license (perpetual)
- Optimized Pre/Post-processing functions
- Support functions for ease of integration
- Independent from acquisition layer  
(offline processing support)

Sony presents a new machine vision solution package combining a polarized camera with a dedicated processing library & PC-based SDK. Based on Sony's newly developed Polarsens global shutter CMOS sensor, this innovative and compact GigE camera, XCG-CP510, delivers 5.1MP resolution at 23 frames per second.

The combined solution can be used to develop and provide an enhanced level of inspection and detection not normally possible in many different applications such as surface inspection, scratch detection, stress detection, reflection removal/enhancement or 3D reconstruction among others.

Digital Polarized Technology

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## XCG-CP510 Specifications

Basic Specifications	XCG-CP510
Image Sensor	2/3-type CMOS Image sensors with a global shutter function(Polarsens)
Image Sensor (Number of Effective Pixels, H x V)	2,464 x 2,056
Cell Size (H x V)	3.45 $\mu$ m x 3.45 $\mu$ m
Output Pixels (H x V)	2,448 x 2,048
Frame Rate	23 fps
Minimum Illumination (50%)	1.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/23 s)
Sensitivity	F4 (400 lx, Gain: 0 dB, Shutter: 1/23 s)
S/N Ratio	More than 50dB (Lens close, Gain: 0 dB, 8 bits)
Gain	Auto, Manual: 0 dB to +18 dB
Shutter Speed	Auto, Manual: 60 s to 1/100,000 s
White Balance	-
Camera features	
Readout Modes	Normal, Partial scan
Readout Features	Built-in test pattern
Synchronization	Hardware trigger, Software trigger, PTP (IEEE1588)
Trigger Modes	Edge detection, Pulse width detection, Bulk trigger, Sequential trigger
Userset	16 channels
User Memory	64 bytes x 16 channels
Other Features	Shading correction, Defect correction, Temperature readout, Area gain
Interface	
Video Data Output	Mono8, 10, 12-bit
Digital Interface	Gigabit Ethernet (100BASE-TX/1000BASE-T)
Camera Specification	GigEVision® Version 1.2/2.0
Digital Input/Output	ISO IN (x1), GP IN/OUT (x2,selectable)
General	
Lens Mount	C mount
Power Requirements	DC +12 V (+10.5 V to +15.0 V), IEEE802.3af(+37V to +57V)
Power Consumption	DC +12 V : 3.0W (max.)
	IEEE802.3af:3.7 W (max.)
Operating Temperature	-5°C TO +45°C(33°F to + 113°F)
Performance Guarantee Temperature	0°C to 40°C (32°F to 104°F)
Storage Temperature	-30°C to +60°C (-22°F to 140°F)
Operating Humidity	20% to 80% (no condensation)
Storage Humidity	20% to 95% (no condensation)
Vibration Resistance	10 G (20 Hz to 200 Hz)
Shock Resistance	70 G
Dimensions (W X H X D)*1	29 x 29 x 42 mm(excluding protrusions) 1 3/16 x 1 3/16 x 1 11/16 inches (excluding protrusions)
Mass	65g (2.3 oz)
Regulations	UL60950-1, FCC Class A, CSA C22.2-No.60950-1, IC Class A Digital Device, CE: EN61326 (Class A), AS EMC: EN61326-1, VCCI Class A, KCC, CISPR22/24+IEC61000-3-2/-3
Supplied Accessories	Lens mount cap(1)
	Operating instructions (1)

\*1 The values for dimensions are approximate.

## XPL-SDKW Features

Supported environment	Description
Operating system	Windows 7/8.1/10, 32/64bit
Optimization	GPU / CPU Optimization: Open CL v2.2 compliance.
Development language	C++ / C#
Development environment	Visual Studio 2015, 2017
Support Tools	
Viewer application	Image acquisition with XC-SDK / TLI interface or offline processing
Polar Cam setting	GUI panel for polar processing settings
Documentation	Doxygen based documentation
Sample code	C++ / C# Sample codes for various function implementation
License manager	GUID capture, license file importation, startup check
Support Functions	
Demosaic	Interpolation of Raw image
Raw extraction	Extract four ¼ size image buffer for each angle
Cosine fit	Define virtual polarizer angle for whole image
Average	Average all four angle to create non Polarized image
Visualization function	Colourmap conversion of input buffer
Software wrapper	Software wrapper for OpenCV
Pre Processing Functions	
Degree of Polarization	Calculate degree
Surface normal	Surface normal vector calculation
Stokkes vector extraction	Calculate S0, S1, S2 Stokkes vector
FFC	Flat field correction
Reflection Control	
Reflection cancelation	Pixel level reflection removal
Reflection enhancement	Pixel level reflection enhancement
Reflection extraction	Pixel level reflection extraction
Advanced reflection removal (manual)	Manual adjustment of Zenith angle (whole image)
Retardation (Stress)	
Stress measurement	Stress measurement (rad/nm)
Stress Direction	Phase orientation extraction
Stress map	Stress display as colour map
Backlight Calibration	Calibration module for backlight circular polarimetry

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