SONY

XCL-CG Series

Digital Video Camera

XCL-CG510 (B/W) / XCL-CG510C (colour)
2/3-type 5.1MP 35fps

Camera Link®

Key Features
Cubic Size
High Compatibility

XCL-SG Series

Digital Video Camera

XCL-SG510 (B/W) / XCL-SG510C (RAW colour)
2/3-type 5.1MP 154fps

Camera Link®

Key Features
High Frame Rate 154 fps
Image Processing Feature

Exmor Pregius Link CL

	XCL-CG510	XCL-CG510C	XCL-SG510	XCL-SG510C
Sensor	Global Shutter CMOS		Global Shutter CMOS	
Number of Output Pixels	5.1 Mega		5.1 Mega	
B/W / Colour	B/W	Colour	B/W	RAW colour
Frame Rate	35 fps (Base, 8 bit, 3tap, Mono/Raw)		154 fps (80bit(DECA), 8 bit, 10tap, Mono/Raw)	
Dimensions (W x H x D)	29 × 29 × 30 mm (13/16 × 13/16 × 1 3/16 inches)		44 × 44 × 30 mm (13/4 × 13/4 × 1 3/16 inches)	
Multi ROI	–		•	
Wide Dynamic Range (Wide-D)	–		•	
Area Exposure	–		•	
Area Gain	•		•	
Frame Accumulation	–		•	
Defect Correction	•		•	
3 x 3 Filter	•		•	
Shading Correction	•		•	
Temperature Readout	•		•	
LUT	•		•	

A new series of PoCL compatible Camera Link interface digital camera equipped with a Global Shutter CMOS Sensor.
With 5.07 million pixel high resolution and 35 fps high frame rate, the XCL-CG Series achieves a compact 29 (W) x 29 (H) x 30 (D) mm size. Easy replacement for the conventional CCD equipped model XCL-C Series.
Selections available based on the high-performance model XCL-SG Series and your application.
Responds to the needs for high reliability, high speed, and high sensitivity that are required for image processing including machine vision, etc.

Features

High Frame Rate

XCL-SG510 | XCL-SG510C | XCL-CG510 | XCL-CG510C

XCL-SG510/SG510C

Selects a max. frame rate of 154 fps due to the combination of "Bit length" and "CameraLink tap".

Bit length	CameraLink tap (Pixel clock frequency: when 85 MHz)					
	1	2	3	4	8	10
8	16 fps	32 fps	48 fps	64 fps	124 fps	154 fps
10	16 fps	32 fps		64 fps		
12	16 fps	32 fps		64 fps		
16	Only when Wide-D					

XCL-CG510/CG510C

Supports Base Configuration 3tap.

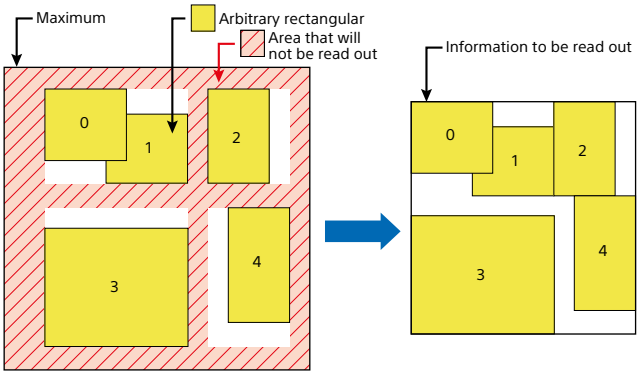
Bit length	CameraLink tap (Pixel clock frequency: when 75 MHz)		
	1	2	3
8	14 fps	29 fps	35 fps
10	14 fps	29 fps	
12	14 fps	29 fps	

Multi ROI

XCL-SG510 | XCL-SG510C

Arbitrarily read out images including any 8 (max.) rectangular area from the maximum effective imaging area.
Due to this, you will be capable of limiting read out information, thus accelerating the frame.

*When 5 rectangles are selected



Wide Dynamic Range (Wide-D)

XCL-SG510 | XCL-SG510C

Restore the gradation for bright and dark areas that have lost the gradation in scenes with strong contrast.
Acquires images with 2 different exposure times and combines images of 16-bit length. When using in 8, 10, 12-bit length, adjusts the gradation using around 17 point LUT. Due to optimization through exposure time, there is no S/N deterioration of the image.

*You may not be able to correctly capture moving subjects since 2 images will be combined.

*Sample image

Sample of application

In the case that overexposure of the image occurs since only 1 light is used or the brightness of lights are changed in 2 steps since the image is too dark for recognition

"Area Gain" and "Area Exposure"

Overview

Since overexposure, etc. may occur in one shot, several shots may be necessary. By using the "Area gain" and "Area exposure" features, you can adjust areas necessary for inspection to optimal levels.

Merits: Reduction of processing speed | Cost reduction

By performing optimizing adjustments on the camera, the processing time on the PC is reduced, the tact time is improved, and high performance PCs won't be necessary, contributing to cost reduction.

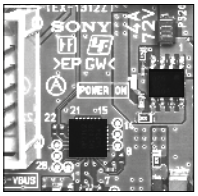
The difference between "Area Gain" and "Area Exposure"

	Valid cases	Equipped models
Area gain	1 - When capturing moving subjects (Processing for single frame) 2 - When you want to make minor adjustments of the brightness for each area (Area gain can be individually set for 16 areas)	XCL-SG510 | XCL-SG510C | XCL-CG510 | XCL-CG510C
Area Exposure	1 - When overexposure occurs with one shot and you want to suppress the exposure amount of that area 2 - When securing S/N by adjusting the exposure	XCL-SG510 | XCL-SG510C

Area gain

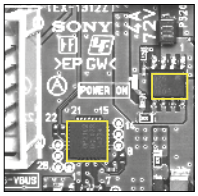
Individually set digital gain (0 to 32 times) to any of the 16 rectangular areas.
If several rectangular areas overlap, the gain value of the rectangular area with a smaller area number is prioritized.
Optimization of images for parts is available during parts inspection, etc.

When area gain is OFF



*Sample image

When area gain is ON



*Sample image

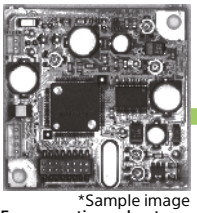
In case setting Gain=2 at Area 0 and Area 1

Area exposure

Set 2 types of exposure times for valid pixel areas and 16 arbitrarily selected rectangular areas.
Optimization of images for subjects such as parts inspection, etc. is possible.
Due to optimization through exposure time, there is no S/N deterioration of the image.

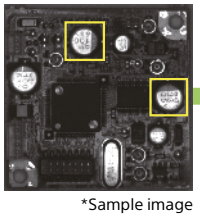
*You may not be able to correctly capture moving subjects since 2 images will be combined.

Exposure time: Long



*Sample image

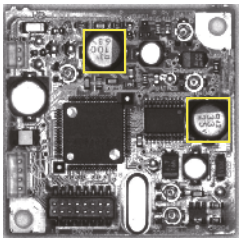
Exposure time: short



*Sample image

Combining Image

When area exposure is ON



*Sample image

The yellow framed "Exposure time: short" areas are optimized when images are combined.

Burst Trigger

XCL-SG510 | XCL-SG510C | XCL-CG510 | XCL-CG510C

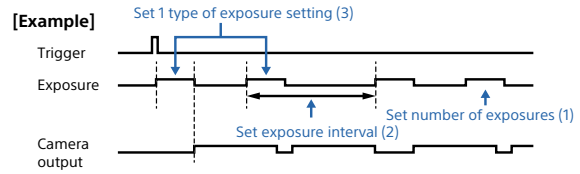
Capable of continuous shooting at the trigger timing and specifying the number of exposures, exposure interval, and exposure time. You can select from the mode that repeats one exposure time or the mode that switches between 2 exposure times repeatedly.
Furthermore, there is another mode that repeats only while the trigger signal is on.

Merits

- Optimal for capturing synchronized images with several cameras
- Optimal when 2 exposures are necessary due to the difference in

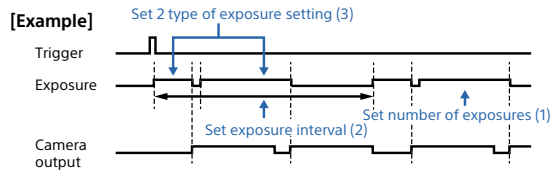
(A) When 1 pattern of exposure time is set

Set the number of exposures (1), exposure interval (2), and exposure time (3)
Continuous shooting at the trigger timing



(B) When 2 patterns of exposure times are set

Set the number of exposures (1), exposure interval (2), and exposure time (3)
Continuous shooting at the trigger timing

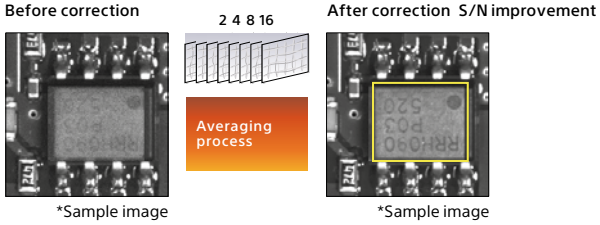


Frame Accumulation

XCL-SG510 | XCL-SG510C

Performs exposure in the specified amount of times and with the averaging process within the camera, outputs 1 image. Optimal for S/N improvement under high gain, canceling of the flicker status during high speed exposure, etc.
Select from 2, 4, 8, or 16 images for the averaging process.

*You may not be able to correctly capture moving subjects since several images will be combined.



Trigger Range Limitation

Choose to receive only the signal of the set trigger width as a trigger signal.
It functions as a noise filter that eliminates chattering and disturbance noise of the trigger signal line.
Furthermore, exposure start can be delayed following the set value of the trigger range if a trigger signal is input.

Defect Correction

Corrects white defect points and black defect points of the image sensor.
Corrections start from the periphery of the pixel coordinates where defects were detected.
Select between factory default settings and user settings

3 x 3 Filter

Apply various processing to the image through matrix operating in 3 x 3 pixels.
Perform processing including noise reduction, edge emphasizing, and contour extraction with 9 filter factor patterns.

Shading Correction

Corrects shading that occurs due to peripheral light falloff, light source irregularity, etc. that are characteristics of the lens.
A number of user data can be saved as user settings.
XCL-SG510/SG510C: 9 patterns
XCL-CG510/CG510C: 9 patterns

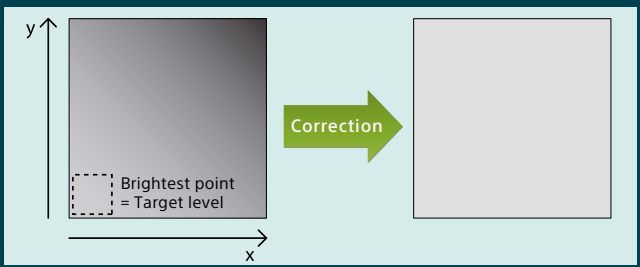


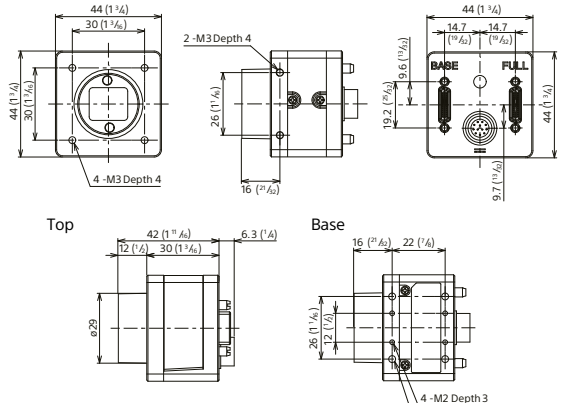
Image Flip

Images can be flipped vertically, horizontally, or 180°.

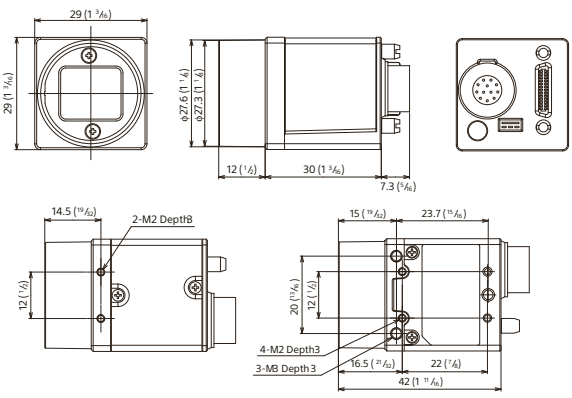
		ReverseX	
		0	1
ReverseY	0	Normal	Horizontal flip
	1	Vertical flip	180° rotation

Pregius Pregius is a trademark of Sony Corporation. The Pregius is global shutter pixel technology for active pixel-type CMOS image sensors that use Sony's low-noise CCD structure, and realizes high picture quality.

XCL-SG510/SG510C



XCL-CG510/CG510C



Units: mm (inches)

XCL-CG Series - XCL-SG Series- Specifications

		5.1M Camera Link®		5.1M Camera Link®	
Basic Specifications		**XCL-SG510**	**XCL-SG510C**	**XCL-CG510**	**XCL-CG510C**
B/W / Colour		B/W	RAW colour	B/W	Colour
Image Size		5.1 Mega			
Image Sensor		2/3-type CMOS Image sensors with a global shutter function (Pregius)			
Number of Effective Pixels (H x V)		2,464 × 2,056			
Cell Size (H x V)		3.45 µm × 3.45 µm			
Standard Output Pixels (H x V)		2,448 × 2,048			
Colour Filter		–	RGB colour mosaic filter	–	RGB colour mosaic filter
Frame Rate		16 fps (Base, 8 bit, 1tap, Mono/Raw) 32 fps (Base, 8 bit, 2tap, Mono/Raw) * 48 fps (Base, 8 bit, 3tap, Mono/Raw) 64 fps (Medium, 8 bit, 4tap, Mono/Raw) 124 fps (Full, 8 bit, 8tap, Mono/Raw) 154 fps (80 bit(DECA), 8 bit, 10tap, Mono/Raw) *At the time of shipment		14 fps (Base, 8 bit, 1tap, Mono/Raw) 29 fps (Base, 8 bit, 2tap, Mono/Raw)* 35 fps (Base, 8 bit, 3tap, Mono/Raw) *At the time of shipment	
Minimum Illumination		0.5 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/30 s)	12 lx (Iris: F1.4, Gain: +18 dB, Shutter: 1/30 s)	0.5 lx (Iris: F1.4, Gain: +18 dB, Shutter:1/30 s)	12 lx (Iris: F1.4, Gain: +18 dB, Shutter:1/30 s)
Sensitivity		F5.6 (400 lx, Gain: 0 dB, Shutter: 1/30 s)	F5.6 (2000 lx, Gain: 0 dB, Shutter: 1/30 s)	F5.6 (400 lx, Gain: 0 dB, Shutter: 1/30 s)	F5.6 (2000 lx, Gain: 0 dB, Shutter: 1/30 s)
SNR		More than 50 dB Lens close, Gain: 0 dB, 8 bit)			
Gain		Auto, Manual : 0 to 18 dB			
Shutter Speed		Auto, Manual : 60 to 1/100,000 s			
White Balance		–	Manual, One push	–	Manual, One push
Camera features					
Readout Modes		Normal, Binning (2x1, 1x2, 2x2), Partial Scan (Multi ROI)	Normal, Partial Scan (Multi ROI)	Normal, Binning (1x2, 2x1, 2x2)*1, Partial scan	Normal, Partial scan
Readout Features		LUT (Binarization, Gamma (Arbitrary value settable)), Test pattern			
Synchronization		Hardware trigger, Software trigger			
Trigger Modes		OFF (Free run), ON (Edge detection, Trigger width detection), Special trigger (Burst trigger/Bulk trigger/Sequential trigger)			
Userset		16			
User Memory		32 kbytes + 64 bytes x 16ch		64 bytes x 16ch	
Partial Scan	W (Pixel)	16 to 2,464			
	H (Line)	4 to 2,056			
GPO		EXPOSURE/Strobe/LVAL/FVAL/Sensor lead out/Trigger through/Pulse generation signal/User defined 1, 2, 3 (Output switching)			
Other Features		Wide dynamic range, Frame accumulation, Area exposure, Area gain, Defect correction, Shading correction, Temperature readout, LUT, 3 x 3 filter		Area gain, Defect correction, Shading correction, Temperature readout, LUT, 3 x 3 filter	
Interface					
Video Data Output		digital Mono 8, 10, 12, 16*2 bit (at the time of shipping 8bit)	digital Raw 8, 10, 12, 16*2 bit (at the time of shipping 8 bit)	digital Mono 8, 10, 12 bit (at the time of shipping 8bit)	digital Raw 8, 10, 12 bit (at the time of shipping 8 bit) digital RGB 24 bit
Base Clock (No. of Taps)		85/65/45 MHz switchable		75/45 MHz switchable	
Camera Link Tap		1/2/3/4/8/10 switchable		1/2/3 switchable	
Digital Interface		LVDS			
Camera Specification		Camera Link® Version2.0			
Output Data Clock		85MHz (1, 2, 3, 4, 8, 10tap), 65MHz (1, 2, 3, 4, 8, 10tap), 45MHz (1, 2, 3, 4, 8, 10tap)		75MHz (1,2,3tap), 45MHz (1,2,3tap)	
Digital I/O		ISO IN (x1), ISO OUT (x2), TTL IN (x1), TTL IN/OUT (x2, selectable)		TTL IN (x3), TTL OUT (x3)	
General					
Lens Mount		C mount			
Flange Back		17.526 mm			
Power Requirements		DC +12 V (10.5 V to 15.0 V), PoCL (10 V to 13.0 V)			
Power Consumption		5.0 W max. (DC +12V)*3		2.7 W max. (DC +12V)	
Operating Temperature		-5°C to +45°C (23°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 20 minutes for each direction -x, y, z)			
Shock Resistance		70 G			
Dimensions (W x H x D)		44 × 44 × 30 mm (excluding protrusions) 1 3/4 × 1 3/4 × 1 3/16 inches (excluding protrusion)		29 × 29 × 30 mm (excluding protrusions) 1 3/16 × 1 3/16 × 1 3/16 inches (excluding protrusion)	
Mass		Approx. 96 g (Approx. 3.4 oz)		Approx. 53 g (Approx. 1.9 oz)	
MTBF		70,523 hours (Approx. 8.1 years)		81,562 hours (Approx. 9.3 years)	
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			
Supplied Accessories		Lens mount cap (1), Operating instructions (1)			

*1 The frame rate does not change. *2 A feature valid when the wide dynamic range feature is ON.
*3 When supplying power (PoCL) with 1 camera cable, wide dynamic range, frame accumulation, and area exposure features are not available for use.

Distributed by

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