

KEYENCE

Ultra High-Speed, High-Capacity
Multi-Camera Image Processing System

XG-8000 Series

16x 21MEGA DIGITAL eXpandable CONTROLLER A.C.E.III COLOR 3+1 Processor Multi-Camera System 21

There is no Substitution for Resolution

4/3" CMOS Sensor

21 Megapixel Camera



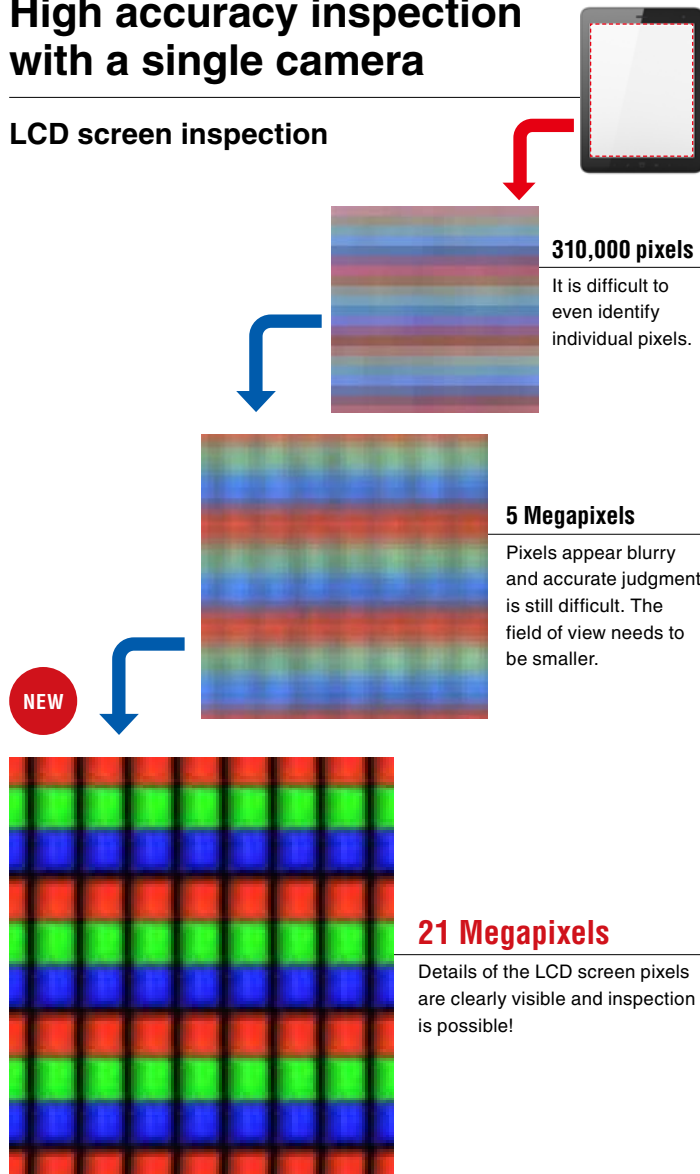
21 megapixel camera enables a wider range of inspection at higher accuracy



A 21 megapixel image, with a resolution of 5104 x 4092, can be captured at a rate of 9 FPS (110 ms). This allows minute detection of defects in a wide field of view, which was impossible with lower resolution cameras.

High accuracy inspection with a single camera

LCD screen inspection



Inspect a larger field of view

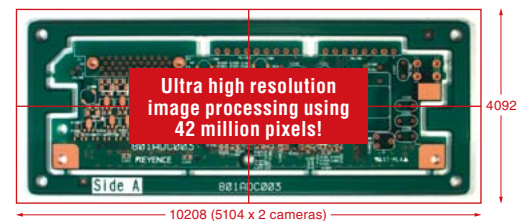
Inspection of IC printing on a tray

With 21 megapixel image processing, inspection of a large field of view can be completed at once while keeping the required resolution.



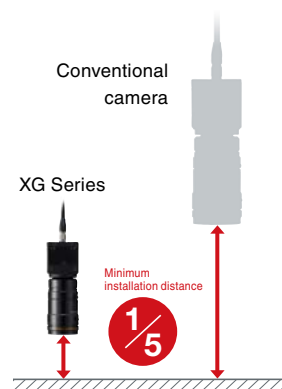
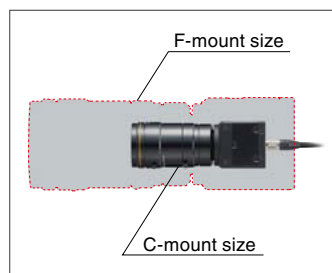
Two-camera connection for processing 42 megapixels at once

Connecting two 21 megapixel cameras allows processing of up to 42 million pixels. The two cameras can capture and transfer images simultaneously.



4/3" CMOS sensor, C-mount lens support

A high sensitivity, compact 4/3" CMOS sensor was chosen for this 21 megapixel camera. This allows the use of C-mount lenses designed for 4/3" sensors, resulting in a wider range of lens selection. Installation flexibility is greatly improved compared to conventional systems.



Support for C-mount lenses allows for the use of lenses with short focal lengths. The minimum installation distance is reduced to approximately 1/5.

EXAMPLE
Comparison of the WD required for a field of view of 100 mm 3.94"

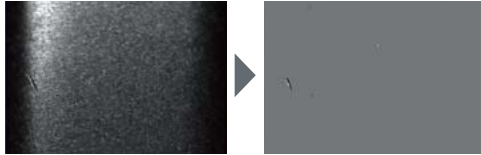
Advanced image processing tools and features of the XG-8000 Series

Various image optimization algorithms of the XG Series enables stable image capturing, even with varying environments or targets. Take full advantage of the 21 megapixel image by using various features.

Image Filters

Use various filters to improve image quality to make inspection easier or more stable

Surface quality on a metal roller



Original image

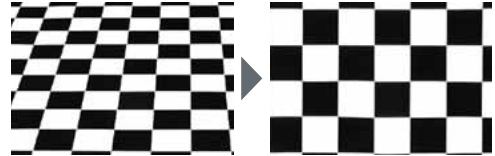
After image filtering

The Shading Correction filter is used to extract defects while smoothing out uneven illumination

Calibration

Correct lens or angular distortion

Correction of angular distortion



Original image

After calibration

Corrects camera tilt that may occur during installation. This is also effective when a camera is installed at an angle due to installation restrictions.

HDR Image Capture

High Dynamic Range (HDR) imaging creates evenly exposed images

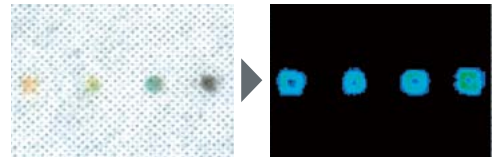
HDR image capturing
(Images are captured at different shutter speeds that are changed automatically)



Color processing

Optimal color processing for stable inspections using the new Advanced Color Extraction Engine (A.C.E. III)

Foreign particle detection on a non-woven cloth



Original image

Shading differential (contrast) view
Reliable extraction of all colors

Line Scan Camera

Line scan camera connectivity for inspection of web or rotating targets

Line scan cameras can also be connected to the XG-8000 Series. Compared to area cameras that capture the entire image in one capture, line scan cameras build an image by capturing one line of pixels at a time. This allows even lighting of hard to light targets like webs and cylindrical parts which makes inspection much easier. The 8K line scan camera can produce an image of up to 64 megapixels.



Inspection of foreign objects, flaws, or pinholes on films or sheets can be achieved even on high-speed production lines.



Defects on a metal roller surface can be inspected accurately by using a line scan camera.

21 Megapixel Camera Lineup

16x 21MEGA DIGITAL

16x speed
21 megapixel
color camera*1



16x speed
21 megapixel
monochrome camera*1



Model	XG-H2100C	XG-H2100M
Image Sensor	4/3-inch color CMOS sensor, 16x high-speed reading using square pixels, 20,970,000 pixels	4/3-inch monochrome CMOS sensor, 16x high-speed reading using square pixels, 20,970,000 pixels
Unit cell size	3.5 μm x 3.5 μm 0.14 Mil x 0.14 Mil	
Resolution	20,890,000 pixels 5104 (H) x 4092 (V)	
Scanning system	Progressive (110 ms: 21 megapixel mode, 40.2 ms: 5 megapixel mode)*2	
Pixel transfer frequency	195 MHz (16x speed)	
Transfer system	Digital serial transfer*3	
Electronic shutter	1/15, 1/30, 1/60, 1/120, 1/240, 1/500, 1/1000, 1/2000, 1/5000, 1/10000, 1/20000 Can be customized between 0.05 ms and 9000 ms.	
Lens mount	C-mount	
Operating environment	Ambient temperature	0 to +40°C 32°F to 104°F
	Relative humidity	35 to 85% RH (no condensation)
Weight	Approx. 300 g (not including the lens)	

- *1 Only compatible with the XG-8702L controller. The XG-E800 camera expansion unit (in addition to the XG-EC80L line scan camera unit) allows the addition of another 21 megapixel camera, allowing a total of two 21 megapixel cameras to be connected at once. (Note that the XG-EC80 area camera unit cannot be used for this camera.)
A 21 megapixel camera and a line scan camera cannot be connected simultaneously.
- *2 5 megapixel mode can be selected, which makes the camera usable as a 5 megapixel camera that operates faster than the XG-H500M/XG-H500C camera (61.2 ms).
- *3 Only camera cables dedicated for high-speed cameras can be used.

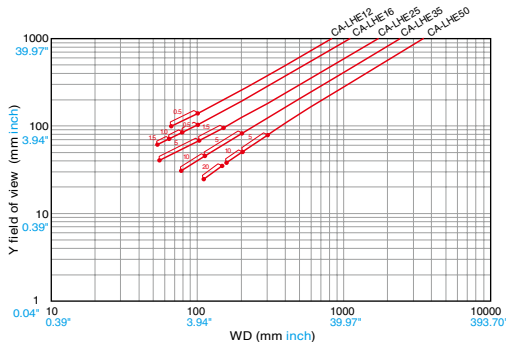
21 Megapixel Camera Lens Lineup



Model	CA-LHE12	CA-LHE16	CA-LHE25	CA-LHE35	CA-LHE50
Focal point	12 mm 0.47"	16 mm 0.63"	25 mm 0.98"	35 mm 1.38"	50 mm 1.97"
F-stop range (aperture)	F2.0 to F22	F2.0 to F22	F2.0 to F16	F2.0 to F16	F2.0 to F22
Minimum WD	0.1 m 0.3'	0.1 m 0.3'	0.15 m 0.5'	0.2 m 0.7'	0.3 m 1.0'
Mount	C-mount				
Filter size	55 mm 2.17" P0.75	40.5 mm 1.59" P0.5	40.5 mm 1.59" P0.5	37.5 mm 1.48" P0.5	37.5 mm 1.48" P0.5
Compatible image/CCD size	4/3"				
Distortion	0.59%	0.02%	-0.57%	-0.17%	0.80%
Resolution	160 cycles/mm at center, 80 cycles/mm on periphery				
Lens coating	Wide band multi-coating				
Ambient temperature/humidity range	0 to +50°C 32°F to 122°F, 35 to 80% RH (no condensation)				
Weight	Approx. 270 g	Approx. 250 g	Approx. 260 g	Approx. 210 g	Approx. 220 g

Field of View Chart

[When CA-LHE is used with the 21 megapixel camera]



KEYENCE

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SAFETY INFORMATION

Please read the instruction manual carefully in order to safely operate any KEYENCE product.

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