

A wide range of sensitivity from visible light to 1700nm  
SONY IMX990, IMX991 adopted SWIR camera

NEW

# A wide-band and high-sensitivity SWIRcamera

**GiGE**  
VISION

**USB**  
VISION

**CAMERA**  
**Link**

**SenSWIR**



- Interface
  - GigE Vision
  - USB 3 Vision
  - Camera Link
- 0.3M (640x512)
- 1.3M (1280x1024)
- Lens Mount: C-mount
- Peltier cooling supported

## Feature

Sony's SenSWIR image sensor adopted wide-sensitivity SWIR camera with the addition of OMRON SENTECH's heat dissipation design

Adoption of IMX990, 991

IMX990 1/2-inch type (8.2 mm diagonal) approx. 1.34 effective megapixel SWIR image sensor  
IMX991 1/4-inch type (4.1 mm diagonal) approx. 0.34 effective megapixel SWIR image sensor

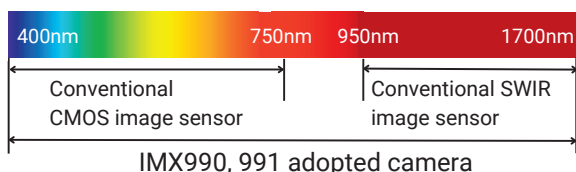
## About SenSWIR

# SenSWIR

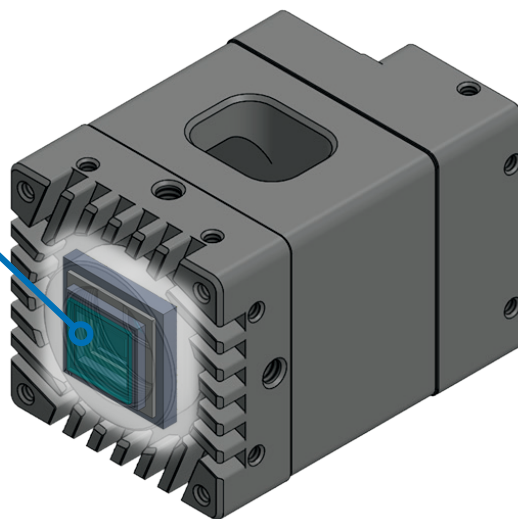
A wide-band and high-sensitivity SWIR image sensor technology implemented by the combination of compound semiconductor InGaAs photodiodes and Si readout circuits through Cu-Cu bonding

## Two functions in one camera

The camera with SenSWIR technology is compatible both with the SWIR spectrum and a wide band of 400 to 1,700 nm wavelengths, which includes the visible light spectrum. Inspections that previously required two cameras, one for visible light imaging and the other for SWIR, can now be carried out with one that integrates both functions. This not only widens the scope of items and purposes of inspection, but also helps to reduce system cost and accelerate image processing, improving throughput. Also, one camera means the captured images in two modes are identical to the pixel level, avoiding image shift



IMX990, IMX991



Taking image wavelength from 400nm to 1,700nm is available with just one camera unit!

Pride for Monozukuri  
(making)

OMRON SENTECH develops and manufactures cameras with pride in order to provide cameras that customers can choose with confidence and continue to use

**GiGE** **USB** **CAMERA Link**  
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## Selectable interface

The required interface will vary depending on the concept and purpose of the device.

Sometimes frame rate, sometimes stability, long-distance transfer, etc.

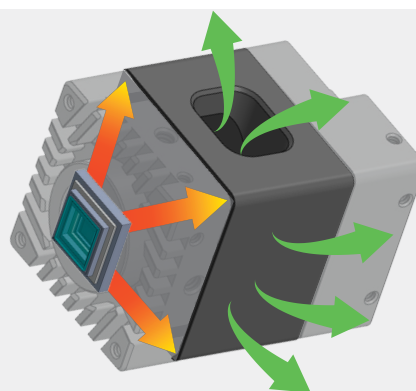
OMRON SENTECH's SWIR cameras are available in three types of interfaces and are proposed according to customer needs.



## Integrated thermoelectric cooling element adopted

If the internal temperature of the camera rises, the image quality will deteriorate and cause noise problems.

IMX991 and IMX991 adopted cameras with a thermoelectric cooling element to improve image quality and reduce noise problems by performing more efficient heat dissipation.



## Discerning heat insulation design

Patent pending

The OMRON SENTECH camera has a special heat dissipation design so that it can operate stably even with natural cooling using the heat dissipation of the individual camera without using air cooling or water cooling.

The special heat sink at the tip of the camera prevents heat from being trapped and helps to dissipate heat efficiently, and the heat dissipation block in the center of the individual has a mechanism to evenly dissipate heat from the element.

\*The note of <patent pending / patented> indicates that the patent is pending or patented in Japan. (As of May 2022)



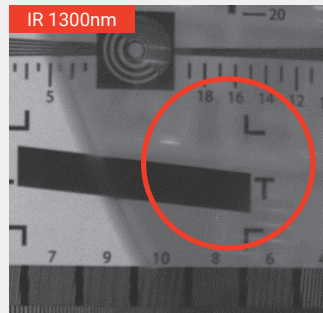
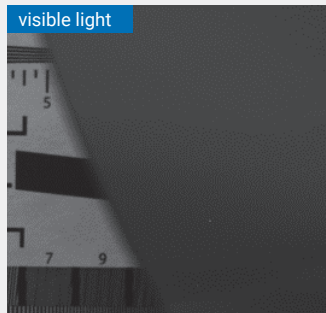
## Application

It makes possible to perform stable inspections that were difficult with visible light cameras by combining the sensitivity characteristics of IMX990 and IMX991 sensors with the external illumination (wavelength)



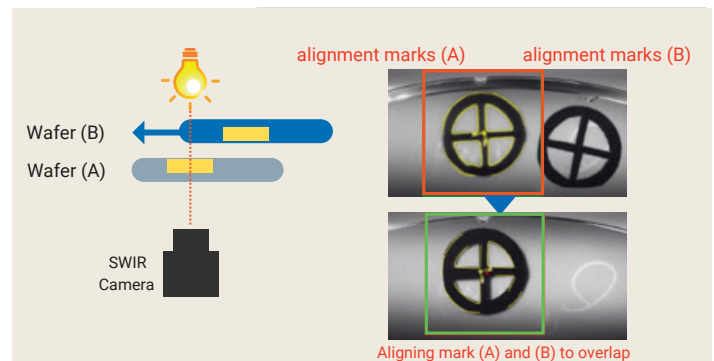
### Emphasis Transparency

It is possible to emphasize what you want to see in the inspection or let the unwanted object transmit by selecting the wavelength of the external illumination which is fit for objects



### Wafer transmission inspection

Inspecting wafer defects and contamination by passing through the wafer



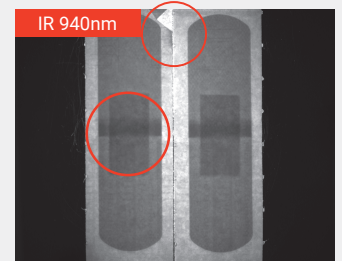
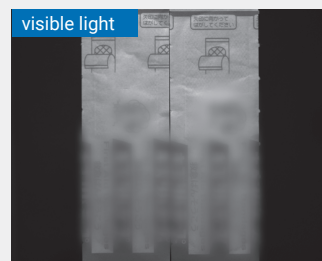
### Wafer alignment

Positioning while directly checking alignment marks  
Move the wafer (B) against the alignment mark ( ) of the wafer (A) after transmitting the wafer



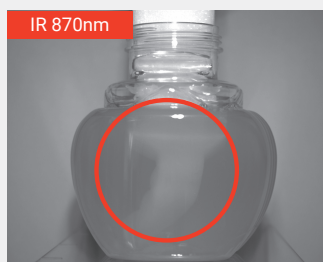
### Content inspection of the package bag

Inspecting chipping and cracking contents by penetrating package



### Content inspection of the packing paper

Inspecting packages for breakage, presence of contents and foreign objects by penetrating package



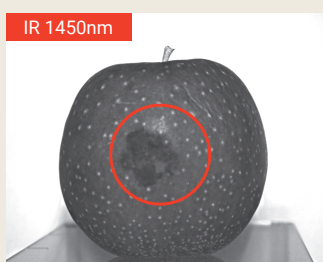
### Internal inspection of the air fresheners

Inspecting condition of the filter paper in the liquid by transmitting white turbid liquid using transmission wavelength of liquid



### Liquid inspection

stable inspection of transparent liquid volume and liquid leakage by emphasizing the absorption wavelength of the liquid



### Fruit and vegetable sorting

Inspecting freshness and damaged part of fruits and vegetables that cannot be seen from the appearance



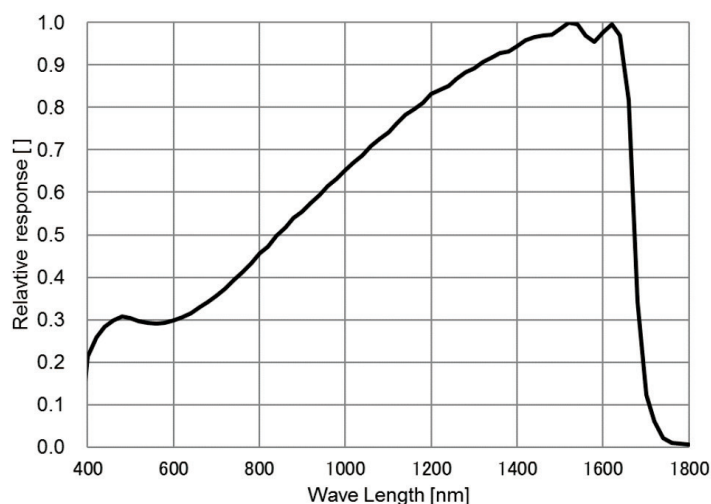
### Nature observation & Surveillance

Less affected by fine particles in the atmosphere and reducing the effects of fog, clouds, smoke, etc., due to the longer wavelength than visible light

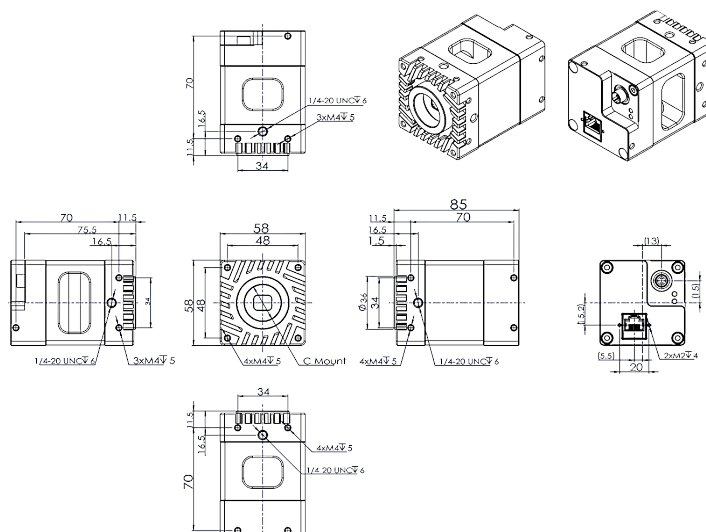
## Specifications

Model	0.3M	STC-LBS34POE-SWIR
	1.3M	STC-LBS132POE-SWIR
Image Sensor	0.3M	1/4" 0.3M Progressive SWIR CMOS (IMX991)
	1.3M	1/2" 1.3M Progressive SWIR CMOS (IMX990)
Shutter mode		Global Shutter
Effective Pixels	0.3M	656 x 520 (0.3M)
	1.3M	1,280 x 1,024 (1.3M)
Cell size		5.0(H) x 5.0(V) $\mu$ m
Scan mode		Full scan/ ROI
Maximum FPS	0.3M	242.2fps(8bit), 167.8fps(10bit) 223.7fps(10bit Packed), 42fps(12bit), 56fps(12bit Packed)
	1.3M	84fps(8bit), 42fps(10bit), 56fps(10bit Packed), 42fps (12bit), 56fps(12bit Packed)
Image format		Mono8 / Mono10 / Mono10Packed / Mono12 / Mono12Packed
Capable bandwidth		400 nm ~ 1,700nm
Electronic shutter		8 $\mu$ sec ~ 16.777 sec
Analog gain		0 ~ 14.8 dB
Digital gain		x1 ~ x3
ROI	0.3M	Horizontal : 8~640pixel/Vertical : 8~512Line image size adjust unit : H 8pixel/ V 8Line image offset adjustment valley : H 8pixel/ V 8Line
	1.3M	Horizontal : 8~1,280pixel/Vertical : 8~1,024Line image size adjust unit : H 8pixel/ V 8Line image offset adjustment valley : H 8pixel/ V 8Line
Gamma		Gamma 0.1~4.0
Binning		x2 Horizontal • Vertical / Off
Decimation		x2 Horizontal • Vertical / Off
Image Flip		Top bottom / right left / top bottom right left / off
Pixel defect correction		Maximum 8,192 pixels
Automatic image quality control		Automatic exposure : corresponded Auto Gain : corresponded Auto white balance : N/A
Operating mode		Edge preset / pulse trigger / free run (continuous mode)
Interface		PoE : IEEE802.3af CLASS3 (1000BASE-T)
Protocol		GigE Vision 2.1 GenICam SFNC 2.6 base IEEE1588(PTP)corresponded
Input/output terminal		1Input (opt isolated) / 1output (opt isolated) 1In/output (non-isolated, open collector)
Power input voltage		+10.8 ~ 26.4Vdc(power signal connector) Power Over Ethernet (IEEE802.3afbase)
Power consumption		+12V / +24V : 10.1 W, PoE : 10.2W
Lens mount		C mount
Weight		around 465g
Operating temperature (low limit)		Ambient environment temperature : 0°C, Ambient environment humidity : 20~85%RH (no condensation)
Operating temperature (high limit)		Ambient environment temperature : +56°C, Ambient environment humidity : 20~85%RH (no condensation), boundary temperature : +68°C

## Spectral characteristic table



## Drawing



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