TECHNICAL DESCRIPTION

IVC-3D Stainless Steel Smart Cameras

Advanced 3D inspection for harsh enviroments

SICK
Sensor Intelligence.

Advanced 3D inspection for harsh environments
IVC-3D Stainless Steel

The world's first 3D Smart Camera now meets the tough challenges of the food and beverage industry.

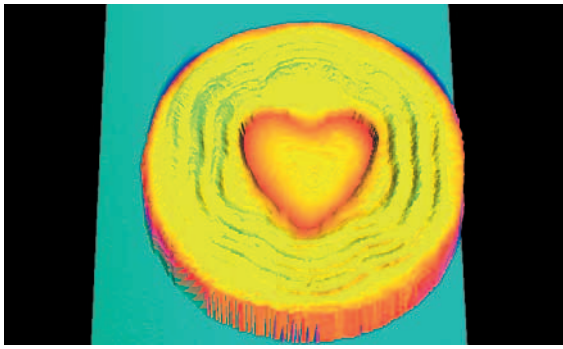
IVC-3D Stainless Steel helps you ensure excellent product quality throughout the production process – even in harsh environments.

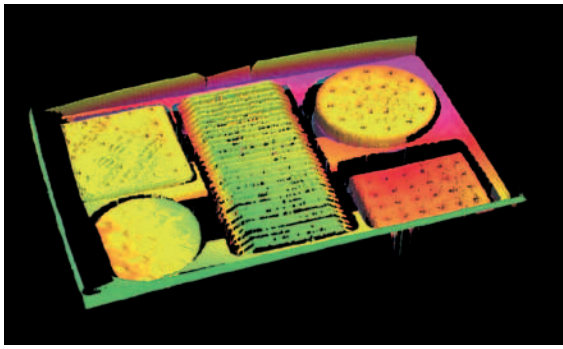
The IVC-3D Stainless Steel Smart Camera is specially designed for harsh environments combining imaging, lighting and analysis in a single, robust, stainless steel housing.

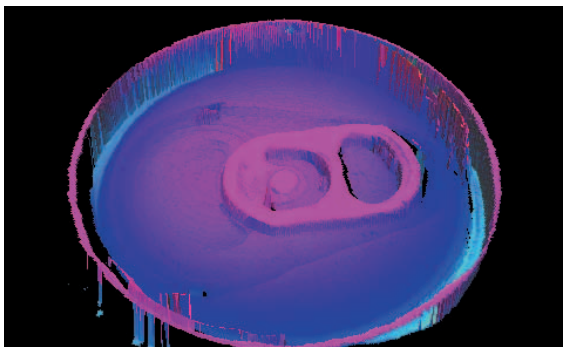
IVC-3D makes advanced 3D vision easy

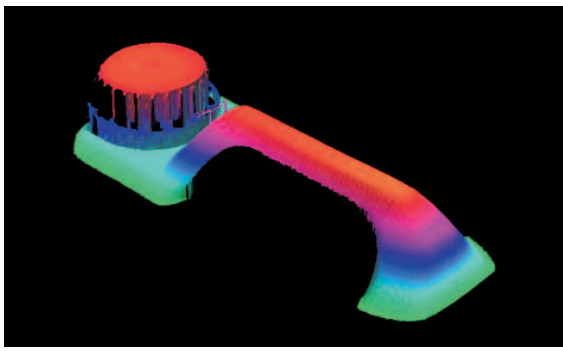
IVC-3D was the first 3D Smart Camera available on the market, and still keeps its leading position. The third dimension is created by laser triangulation: A 3D image is created as the object moves under a laser beam. Measuring in 3D provides information about object height, shape and volume, independent of contrast and color.
With the IVC-3D, applications and processes are kept at the highest levels of performance. It is easily configured with a PC using the IVC Studio user interface. An emulator allows users to work off-line and test their applications on batches of stored images. In addition, powerful toolsets for image analysis and communication make interfacing with PLCs, robots and control systems easy. Once the application is set up, the computer is not needed as the IVC Smart Cameras operate stand-alone or as part of the factory network.

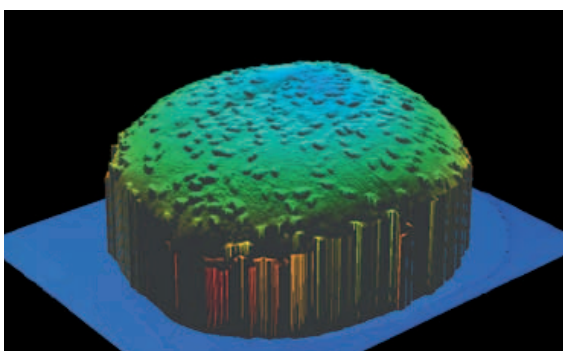
Applications





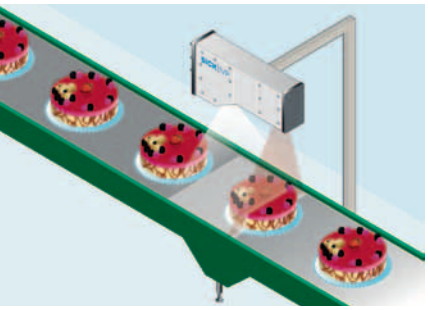






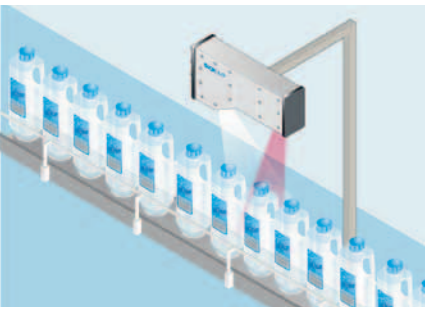
Robust solutions for harsh operating conditions

3D imaging is ideal where height, shape and volume are important features in production. The IVC-3D makes high-speed production processes cost-effective and accurate. Packaging problems are minimized and product quality meets the customers' high expectations. The IVC-3D Stainless Steel is well fitted for food production processes and easily measures features such as content, shape, volume and portions. With these unique capabilities and flexibility IVC-3D enables manufacturers to optimize production costs and reduce waste.



Quality inspection

The IVC-3D Smart Camera records the 3D shape at high speed as the baked cakes pass by on the conveyor belt. The camera checks that there are no dents or missing chunks, and that the height, volume, roundness and diameter are correct. Fast detection of production errors enables production control, waste reduction and less downtime.



Robust verification

The IVC-3D Smart Camera locates the cap and verifies that it is correctly assembled, independent of cap color. For many package types, the measurements in 3D can be made relative to the rest of the package. This gives a correct result even if the container itself is slightly tilted on the conveyor. IVC-3D provides robustness superior to any 2D solution.

Prepared for the food and beverage industry: IP 67 and ECOLAB

IVC-3D Stainless Steel is perfect for a wide range of applications in the food and beverage industry.

The hygienic, IP 67 rated design is easy to clean, and ECOLAB certified to be resistant to industrially used cleaning agents. This Smart Camera enables high-speed production processes to run smoothly through precise shape and volume measurements with instant response.

ECOLAB

Testing the resistance of materials to aggressive cleaning agents and disinfectants:

- 28 days reaction time
- 20 °C temperature
- no swelling
- no embrittlement

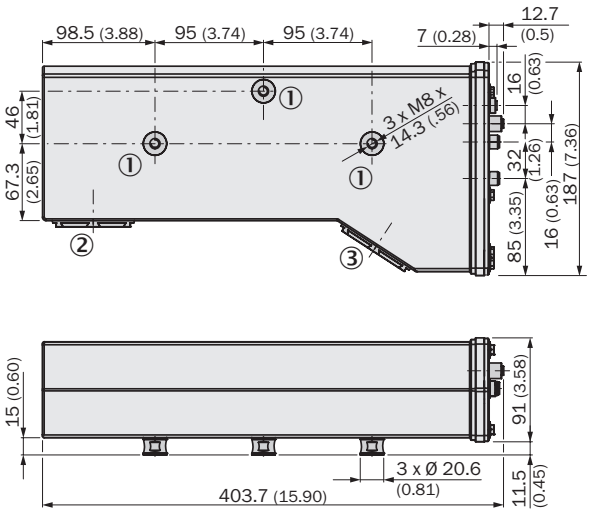
Field of view (H x W)
50 x 150 mm, 100 x 200 mm, 200 x 600 mm, 300 x 1000 mm

Smart Cameras

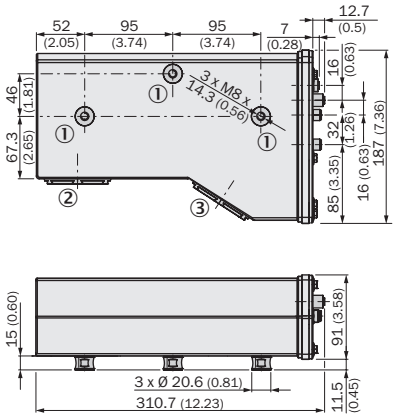
- Food grade stainless steel housing and PMMA windows
- Hygienic, IP 67 rated design for easy cleaning
- ECOLAB tested, resistant to aggressive cleaning agents and disinfectants
- Hose adaptor accessory for easy integration

Dimensional drawing

IVC-3D 200, IVC-3D 300



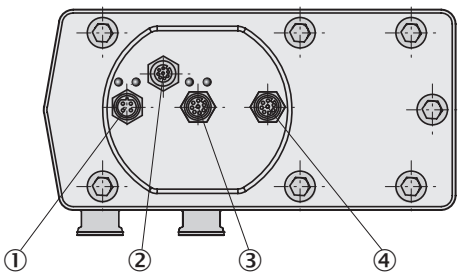
IVC-3D 50, IVC-3D 100



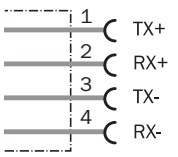
1 Fastening threads
2 Laser unit
3 Image sensor

Connection type

1 Ethernet: M12, 4-pin, D-coded, female
2 RS-485: M12, 8-pin, female
3 Power I/O: M12, 8-pin, male
4 Encoder: M12, 5-pin, male



1



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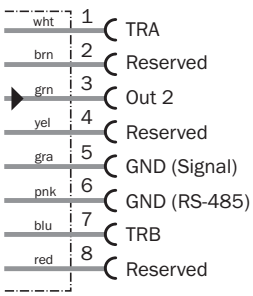

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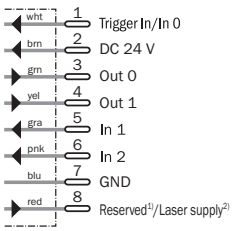
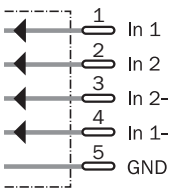


[1] Do not connect for IVC-3D products with a type code as IVC-3Dxxx1x
[2] Only in IVC-3D products with a type code as IVC-3Dxxx2x

4

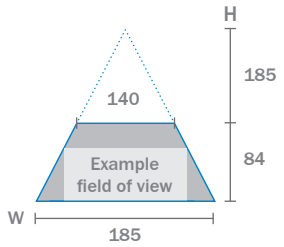


CE

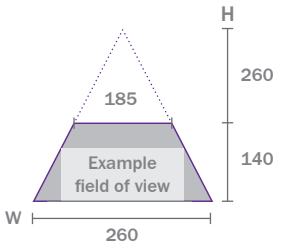
Laser class 2M

ECOLAB®

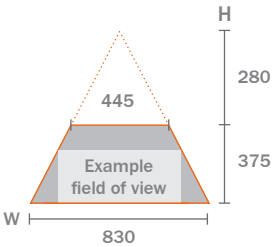
Field of view



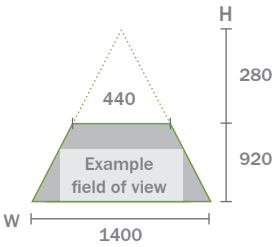
IVC-3D 50



IVC-3D 100



IVC-3D 200



IVC-3D 300

Measurement details

	IVC-3D 50	IVC-3D 100	IVC-3D 200	IVC-3D 300
Example FOV [1]	50 mm x 150 mm	100 x 200 mm	200 mm x 600 mm	300 mm x 1000 mm
Max. height range	84 mm	140 mm	375 mm	920 mm
Width at max. working distance [2]	185 mm	260 mm	830 mm	1400 m
Robust method	1024 points	1024 points	1024 points	700 points
High resolution method	2048 points	2048 points	2048 points	700 points
Max. profile width	2048 points	2048 points	2048 points	1400 points
Min. working distance	185 mm	260 mm	280 mm	280 mm
Height resolution [3]	0.04 mm	0.05 mm	0.2 mm	1.2 mm
Profile rate in image mode [4]	< 5000 profiles/s	< 5000 profiles/s	< 5000 profiles/s	< 5000 profiles/s
Profile rate in profile mode [4]	< 3700 profiles/s	< 3700 profiles/s	< 3700 profiles/s	< 3700 profiles/s

[1] Typical
[2] ± 10% for IVC-3D 30, ± 5% for the other FOV variants
[3] Represents what may be achieved but is application dependent
[4] Dependent on settings in grab setup

Ordering information

IVC-3D Stainless steel

Description	Model name	Order no.
IVC-3D 50	IVC-3D21113	1 050 157
IVC-3D 100	IVC-3D51113	1 050 158
IVC-3D 200	IVC-3D11113	1 048 004
IVC-3D 300	IVC-3D41113	1 049 024

Accessories

Description	Model name	Order no.
Ethernet cable 3 meter, M12, D-coded, 4-pin to RJ45	SSL-2J04-G03ME	6 029 630
Ethernet cable 5 meter, M12, D-coded, 4-pin to RJ45	SSL-2J04-G05ME	6 035 389
Power I/O cable 2 meter, M12, 8 pin to open	DOL-1208-G02MA	6 020 633
Power I/O cable 5 meter, M12, 8 pin to open	DOL-1208-G05MA	6 020 993
Encoder cable 2 meter, M12, 5-pin to open	DOL-1205-G02M	6 008 899
Encoder cable 5 meter, M12, 5-pin to open	DOL-1205-G05M	6 009 868
RS-485 cable 2 meter, M12, 8-pin to open	STL-1208-G02MA	6 029 330
RS-485 cable 5 meter, M12, 8-pin to open	STL-1208-G05MA	6 029 331
Protective hose 5 meter, with adapter plate	Protective hose	2 055 449
Calibration object for IVC-3D 50 and IVC-3D 100	IVCAL-P050	2 042 582
Calibration object for IVC-3D 200	IVCAL-P200	2 042 579
Calibration cones for IVC-3D 300	IVCAL-P300	2 042 542
Adapter for full Ethernet/IP standard compliance	EtherNet/ IP adapter	2 044 264
I/O extension box with 2 Ethernet ports, 4 in / 8 out	I/O extension box	6 037 654

Technical data	IVC-3D	21113 IVC-3D 50	51113 IVC-3D 100	11113 IVC-3D 200	41113 IVC-3D 300
Performance	5,000 profiles/second, image mode	■	■	■	■
	800 MHz processor and FPGA acceleration	■	■	■	■
Interface	10/100 MB Fast Ethernet [1]	■	■	■	■
Serial interface	RS-485	■	■	■	■
Digital I/O	3 program controlled inputs (1 trigger input)	■	■	■	■
	3 program controlled outputs	■	■	■	■
Digital inputs	HIGH = 10 V ... 28.8 V	■	■	■	■
Digital outputs	B-type < 100 mA tot. current of all digital outputs	■	■	■	■
Encoder interface	RS-422	■	■	■	■
Max encoder frequency	2 MHz	■	■	■	■
Enclosure rating	IP 67	■	■	■	■
Dimensions W x H x L	404 mm x 103 mm x 187 mm			■	■
	311 mm x 103 mm x 187 mm	■	■		
Weight	Approx. 6.7 kg			■	■
	Approx. 5.5 kg	■	■		
Housing material	Stainless steel	■	■	■	■
Connector material	Stainless steel	■	■	■	■
Window material	PMMA	■	■	■	■
Shock load	15 g, 3 x 6 directions	■	■	■	■
Vibration load	5 g, 58 ... 150 Hz	■	■	■	■
Laser class	Class II/2M	■	■	■	■
Imager	CMOS	■	■	■	■
Imaging angle	60.5°				■
	58°			■	
	61°		■		
	53°	■			
3D height resolution	0.04 mm	■			
	0.05 mm		■		
	0.2 mm			■	
	1.2 mm				■
Max. profile width	1,400 points				■
	2,048 points	■	■	■	
Laser wavelength	Typ. 658 nm ± 15 nm	■	■	■	■
Laser filter	60 nm FWHM	■	■	■	■
Laser modes	Continuous or flashed, software controlled	■	■	■	■
Power supply	24 V DC ± 20 %	■	■	■	■
Current consumption	< 1 A	■	■	■	■
Ripple	< 5 VPP	■	■	■	■
Ambient temperature	Operation: 0 °C ... +40 °C	■	■	■	■
	Storage: –20 °C ... +70 °C	■	■	■	■

IVC Studio PC application development tool
Min. system req. 550 MHz CPU, 128 MB RAM, CD-ROM or DVD, Fast Ethernet, Win 2000/WinXP.
Graphics driver support for OpenGL 1.3 or higher.
IVC Studio in English and in German.

[1] TCP/IP/ UDP/IP, Ethernet/IP

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