Baumer
Passion for Sensors

VeriSens® vision sensors

Image-based quality control – easy and intuitive.

Eyeing your quality.

Simply focused on the essentials.

Baumer is a global leader in sensor solutions for factory and process automation. More than 2,700 employees in 39 subsidiaries in 19 countries are at your service across the globe.

Baumer ranks with its powerful vision sensors among the world's most successful suppliers in this product category. Our customers profit from a structured product portfolio with high functionality and innovative features.

Everything we do is governed by our mission to continuously improve our products and shape technological developments. At the same time we focus on high performance, outstanding quality and simple operation – giving you more time for solving your application needs.

Where standard products come to their limits, we develop market-oriented, customized components in close cooperation with our customers. The result: Your decisive competitive edge.




The right vision sensor for your application.

Are you looking for a sensor where maximum functional and operational flexibility go together with easy process integration? *VeriSens*® vision sensors offer all these benefits – and still many more.

What exactly is a *VeriSens*® vision sensor?
VeriSens® is a complete image processing system in the shape of a sensor. An image sensor, illumination (or illumination connection), optics (also interchangeable lenses), hardware / software, as well as Ethernet and digital interfaces, e.g. for PLC connection, are integrated in a compact, industry-suited housing. After typical one-time configuration on PC, a vision sensor is ready to perform a specific task like a conventional sensor.
VeriSens® vision sensors solve inspection tasks and can perform up to 32 feature checks simultaneously:

- Presence and completeness checks
- Determination or inspection of object position and orientation
- Reading and verifying human-readable imprints (OCR / OCV)
- Reading and checking matrix codes and barcodes including GS1 codes

How does a *VeriSens*® vision sensor work?
VeriSens® acquires images, evaluates them and communicates the results to the system control or to individual components in your system. Initial configuration on PC allows you entry of image acquisition parameters, selecting tools for feature checks and setup of the required interfaces.

Where does *VeriSens*® make the most sense?
VeriSens® vision sensors tap their full potential of efficiency wherever various features must be checked in parallel or part locations vary, tasks which usually are only mastered by sophisticated sensor technology. This also includes applications where a visual inspection is advisable and/or contactless checks are required. An intelligent sensor like *VeriSens*® is also the optimum component for checking (even different) batches in the line or communicating collected data.
VeriSens® vision sensors operate extremely efficient – depending on the scope of feature checking, more than 8,000 inspections per minute can be performed.

VeriSens® vision sensors at a glance

- Wide variety of feature checks with one single sensor
- Easy configuration within a few minutes
- Compact, industry-suited metal housing with protection class IP 67 or IP 69K
- Intuitive and unified configuration software
- Versatile connection options via digital I/O and Industrial Ethernet

inspect award 2021 winner

VeriSens® – tried and tested in many industries.

We have earned a reputation supplying the automotive, food and beverage as well as packaging industry where we have acquired many years of expertise. We are also close to the medical and pharmaceutical sector by supplying sensor technology to perform inspection tasks and to provide vital findings.

Every industry has its particular needs. We would like to give you a brief overview of how and where our detection and inspection technology is applied.

Food and beverage industry

- Checking best-before dates
- Presence and position of straws on primary packaging
- Position of safety closures
- and many more

Example:
Inspection of best-before dates

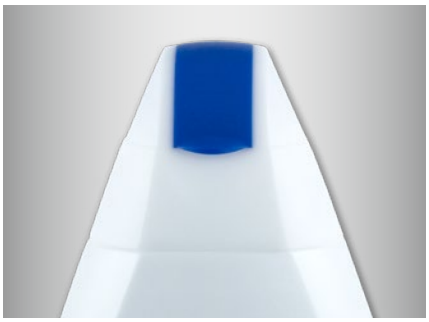
OK

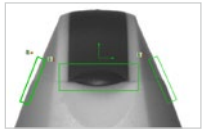
NOK

Packaging industry

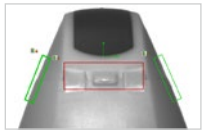
- Cap monitoring
- Foil wrapping seams
- Label inspection (logo, text, code, product content, etc.)
- and many more

Example:
Inspection of forward cap alignment





OK

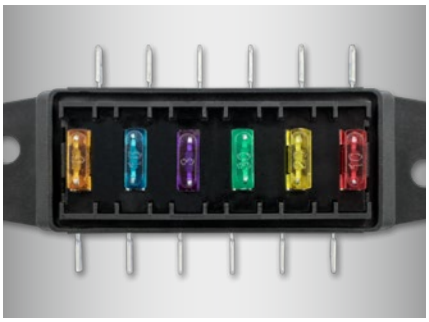


NOK

Automotive industry / electronics

- Assembly and surface mounting monitoring
- Presence and alignment check of pins
- Detection of overmolding, injection molding errors, scratches, etc.
- and many more

Example:
Inspection of fuse type (color) position



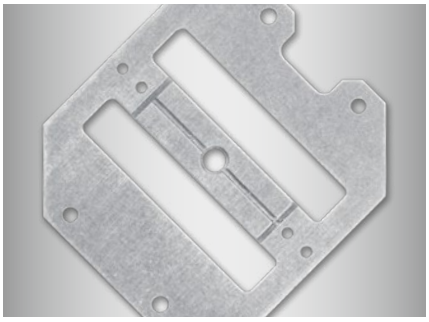
OK

NOK

Assembly / handling

- Position detection for pick-and-place
- Presence check and position monitoring of components
- Position of protective caps or plugs
- and many more

Example: Position detection of blanked parts for pick-and-place



OK

NOK

Inspired by nature.

Flexibility
We recognize objects in their entirety and this way can easily determine their position.

Object recognition
We can identify objects even in weak light – namely, by their contour.

Clearly focused
We can focus on specific details.

Robust
Our sensitive eye lense is protected by the flexible eyelid.

A clever mind on top
The eye requires intelligence.

Light conditions
Using artificial illuminations we can see even in weak light.

Communicative
Our eyes are linked to the high-speed network of our nervous system.

Our technology as evolution.

Flexibility
No matter how something is positioned on the conveyor belt – the integrated 360° *FEXLoc*® part recognition always keeps *VeriSens*® feature checks on track.

Clearly focused
VeriSens® offers free choice of lenses to ensure optimum object focusing.

Object recognition
VeriSens® features a contour-based mode of operation – in real time calculated by the patented Baumer *FEX*® image processor.

Robust
Every *VeriSens*® provides at least IP 67 protection. Industry-suited metal housing and modular tube system protect the entire vision sensor, even including the interchangeable lens.

Clever technology combined
VeriSens® is a perfectly harmonized system to see, decide, communicate – and even to learn new things.

Communicative
VeriSens® provides results over Ethernet, Industrial Ethernet or digital I/Os and even controls Universal Robots (UR).

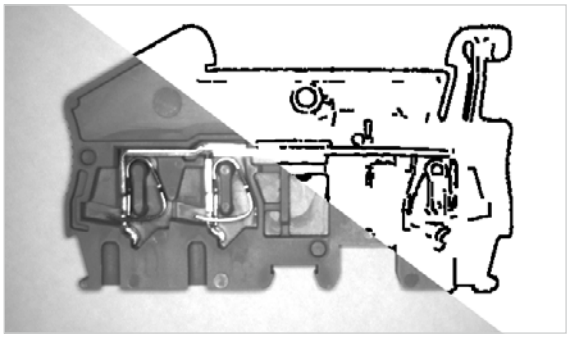
Light conditions
VeriSens® features integrated machine vision illumination. Besides powering external illumination, the models of the XC series are the only vision sensors with fully integrated flash controller to multiply brightness.

VeriSens® – even faster and more objective than nature.

Do you want to benefit from the flexibility and versatility of image-based product verification as well? As a compact image processing system in the shape of a sensor, *VeriSens*® is an ideal component which comes with all the necessary hardware and software and is also intuitively configurable using a PC.

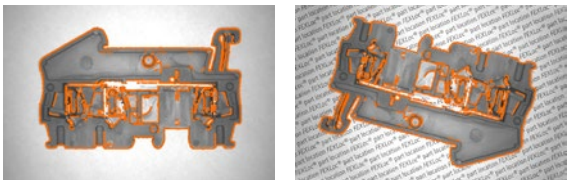
What makes *VeriSens*® so special for our customers?

- **Patented Baumer *FEX*® image processor – inspired by nature**
  Any process deviations, such as varying light intensity, demanding object surfaces or ambient background influence quality in image processing. *VeriSens*® acts like human beings who can still recognize trees and houses clearly by their contours even in dismal weather: The patented *FEX*® image processor calculates contours in real time where others discern only shades of gray. Contour-based image processing works reliably and quickly – even in less stable ambient light conditions.



Visualization of the detected object by conventional image processing (bottom) and contour-based technology using Baumer *FEX*® image processor (top)

- ***FEXLoc*® part location – to simplify the machine design**
  The location of parts during feeding does not matter to *VeriSens*®. Reliable 360° part recognition enables virtual object alignment to check the correct positions. This means that mechanical part alignment is no longer necessary.
  All XF, XC, and CS series models are equipped with integrated *FEXLoc*® part location.

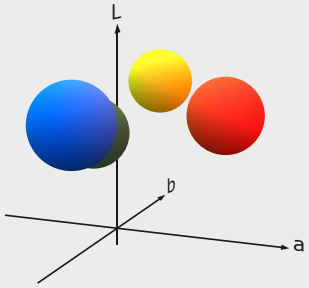


Virtual object alignment using *FEXLoc*®
left: object contours
right: object turned in front of severe background structures

360°

See the right colors even faster – with *ColorFEX*® in 3D

ColorFEX® is the unique, intelligent 3D color assistant for quick and intuitive setup of colors and their differentiation. Object colors and their shades are automatically identified and visualized in 3D. This allows for very easy and self-explaining setup of reliable color inspections.



TUTORIAL

Easy to use.

- **_SmartGrid_ – the intelligent calibration target**
  SmartGrid (patent-pending) provides four benefits: Supporting automated **teach-in for image distortion correction** in real time, it allows for precise object and dimensional checks even when _VeriSens_® is installed in inclined position. When **converting to world coordinates**, _VeriSens_® is receiving scaling specifications via _SmartGrid_ (optionally with **Z calibration**). _SmartGrid_ is the basis for **automated coordinate alignment** by _VeriSens_® when attached to Universal Robots (UR) to determine object positions.

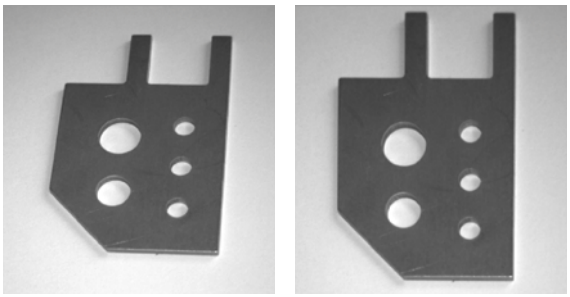
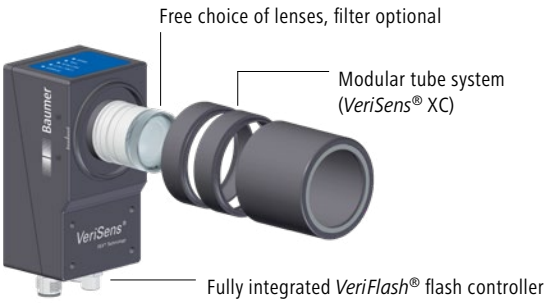


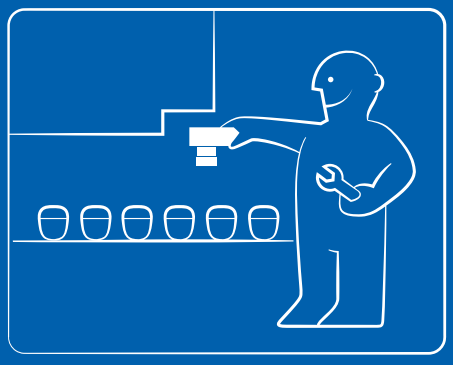
Image distortion correction (right: corrected)

- **Universal Robots (UR) control – easier than ever before**
  VeriSens® controls Universal Robots (UR) after just a few minutes of setup. Automated coordinate alignment via _SmartGrid_ replaces the conventional manual "hand-eye" procedure. _VeriSens_® _URCap_ is the user-friendly UR "app" and allows for easy vision sensor installation and integration into the program flow. UR programming utilizes only two additional nodes (commands) for image processing and thus remains as easy as ever: from tracking several objects including free space checks to identifying free storage space on to quality inspections and object identification – there are virtually no limits for applications.

- **Industry-suited design with IP 67 resp. IP 69K protection**
  VeriSens® vision sensors come in robust aluminium respectively stainless steel housing that is up to harsh industrial environments. The patented modular tube system for the models with C-mount interface provides optimum protection for interchangeable lenses. Variable intermediate rings allow fast and economical adaptation to longer lenses – retrospectively as well.



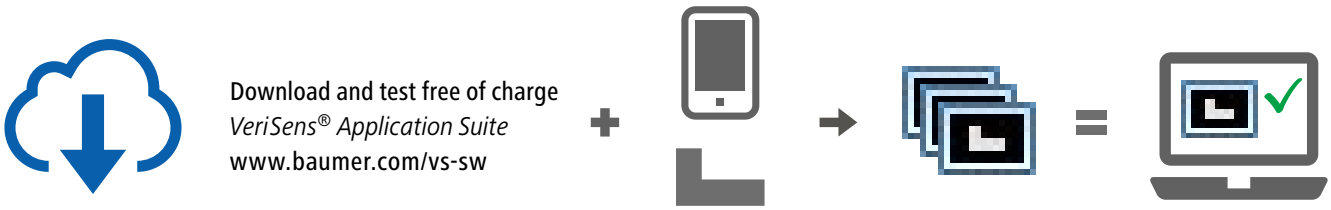
Easy to configure.



Unified configuration software and integrated web interface.

Thanks to *VeriSens® Application Suite*, the cross-series unified configuration software available in 9 languages, your vision sensor is configured in just four easy-to-understand steps. Even for beginners the first job configuration will take only a few minutes, saving valuable time on the project.
Software includes simulators for every device – any conventional digital camera or smartphone as image source will do.
The simulators allow you to test feature checks offline prior to product purchase. An installation is not required – no need for administrator privileges.

A configurable human-machine interface is already integrated within the device for customers who want to configure *VeriSens®* also during the production process.
The *VeriSens® Application Suite* needs only a few clicks to set web interface options (functionalities, user groups, design) and therefore will be operational in just a few minutes. Security is provided by the encrypted HTTPS connection (device dependent).
The *MultiViewer* feature enables selection of up to 16 *VeriSens®* vision sensors for view a standard web browser – therefore you will always be able to keep an eye on the entire production line.



Download and test free of charge
VeriSens® Application Suite
www.baumer.com/vs-sw

VeriSens® software at a glance

***VeriSens® Application Suite* for configuration and offline simulation**

- Intuitive to use, even for non-expert users
- 4 steps to solve your inspection task
- Optionally with pop-up context help

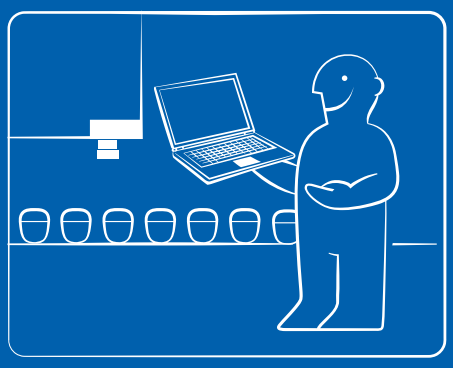
TUTORIAL

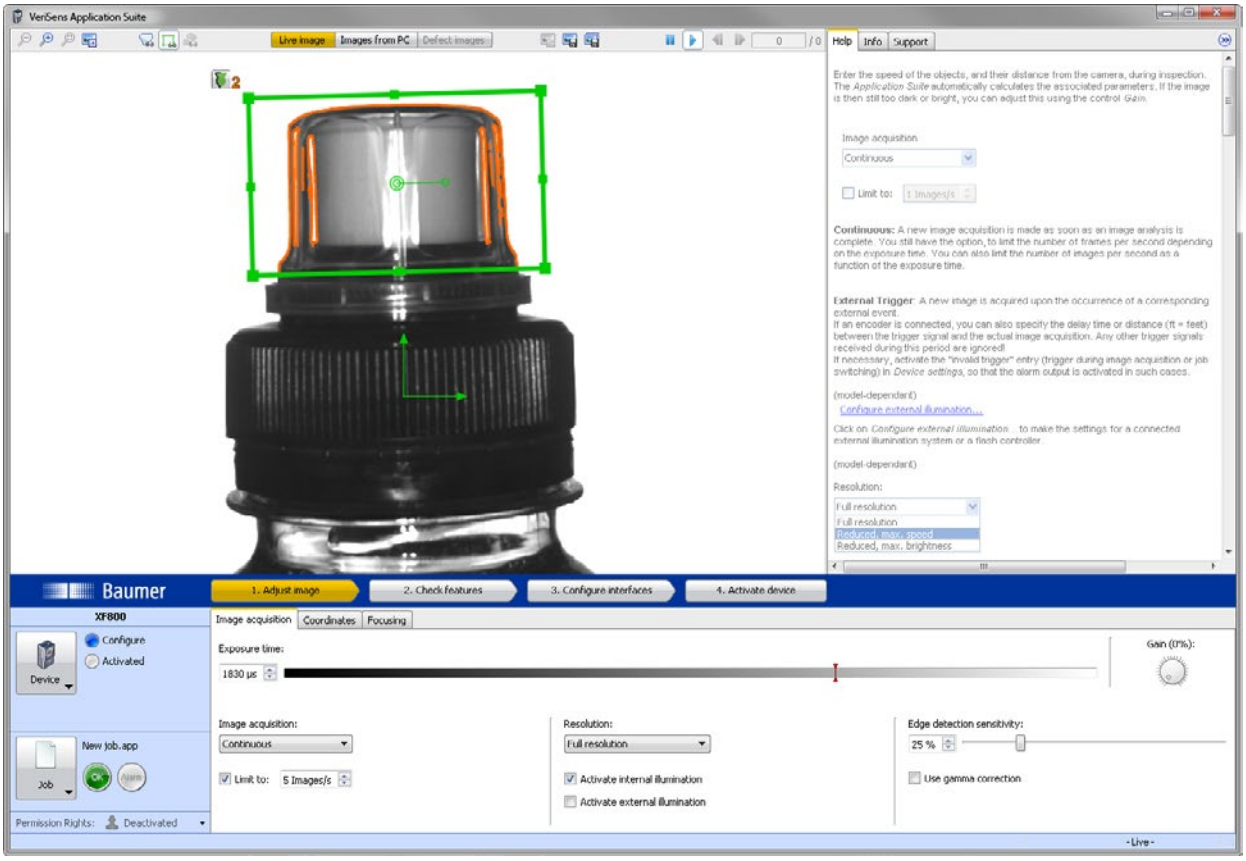
***VeriSens®* web interface for visualization and monitoring in operation**

- Visualization using the existing web browser, no plug-ins required
- Functionalities and design configured within few minutes
- Optimized for touch screen operation, optional user levels

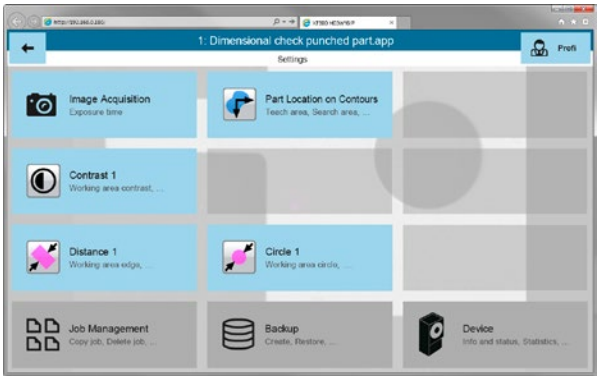
TUTORIAL

Absolutely powerful.

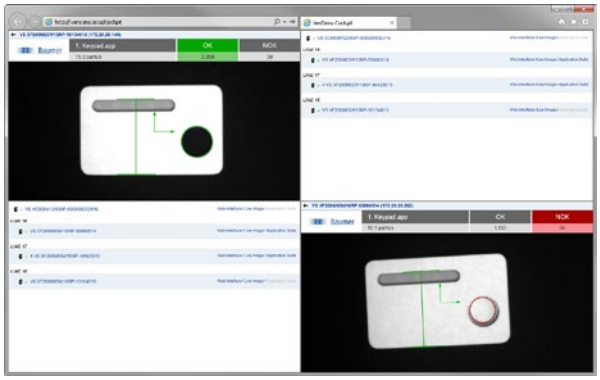




VeriSens® Application Suite

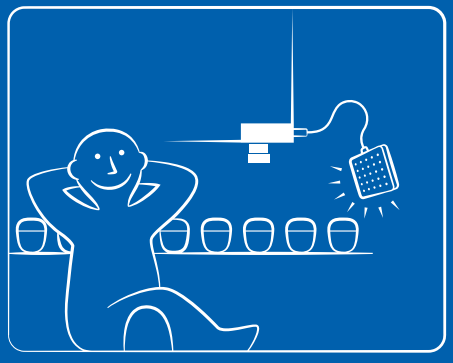


VeriSens® web interface



VeriSens® MultiViewer

Absolutely ingenious.



XF series: All aboard!

XF stands for "eXtended Functionality" – the series includes everything required to immediately enter the world of image processing. The versatile scope of functionalities ensures maximum flexibility of up to 22 feature checks and makes sure the right image tool is always available. A single sensor will suffice for simultaneously checking object properties and positions as well as reading text (OCR / OCV) and 1D / 2D codes. All XF series models feature robust 360° part location by *FEXLoc*® for reliable part recognition.

The XF models integrate LED illumination in white or infrared. Infrared with integrated daylight filter provides several application benefits such as highlighting particular object features and minimizing ambient light effects. Furthermore, nobody working nearby will be bothered by flashing *VeriSens*® illumination.

XF series

- Image evaluation: monochrome or color
- Includes all *VeriSens*® feature checks (up to 22)
- Integrated optics: 8 | 10 | 12 | 16 mm
- Integrated illumination, white or infrared
- Housing: aluminum (IP 67) or stainless steel (IP 69K)

- **Models XF700 / XF800 / XF900**
  Latest hardware generation to boost productivity, with enhanced identification algorithms (XF800 / XF900), integrated real-time distortion correction and Industrial Ethernet (PROFINET and EtherNet/IP™)

- **Models XF700C / XF800C (color)**
  Latest hardware generation with *ColorFEX*® color assistant for convenient and reliable color setup and integrated Industrial Ethernet (PROFINET and EtherNet/IP™)

- **Models XF800 / XF900**
  Identification functions additionally: 1D / 2D code identification, reading of plain text (OCR) without requiring previous font training, print quality evaluation (OCV)

- **Models XF900**
  The robot expert that integrates into the program flow of Universal Robots (UR) with the help of *VeriSens*® *URCap* – for image-based object tracking and robot-supported quality control, optional Z calibration for coordinate scaling in space

UNIVERSAL ROBOTS
Certified

XC series: Maximum flexibility.

XC is an abbreviation of "eXtended Functionality with C-mount" – the series for maximum functionality and versatility. Advanced users benefit from up to 22 feature checks and the freedom to choose lens and illumination.

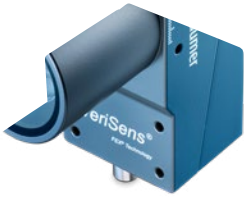
External illumination is supplied by the integrated *VeriFlash*® flash controller powering at the required pulse up to 48 V and 4 A. *ColorFEX*®, the intelligent and multiple award-winning 3D color assistant, enables intuitive and quick color setup in 3D.
The patented and modular *VeriSens*® XC Tube System is the optimum protection for interchangeable lenses and can be configured to match the individual size of the lens.

- **Models XC700 / XC800 / XC900**
  Latest hardware generation to boost productivity, with enhanced identification algorithms (XC800 / XC900), integrated real-time distortion correction and Industrial Ethernet (PROFINET and EtherNet/IP™),
  XC800 / XC900 with additional identification functions: 1D / 2D code identification, reading of plain text (OCR) without requiring previous font training, printing quality evaluation (OCV),
  XC900: The robot expert that integrates into the program sequence of Universal Robots (UR) with the help of *VeriSens*® *URCap* – for image-based object tracking and robot-supported quality control, optional Z calibration for coordinate scaling in space

- **Models XC700C / XC800C (color)**
  Latest hardware generation with *ColorFEX*® 3D color assistant for convenient and reliable color setup, XC800C with additional identification functions

XC series

- Image evaluation: monochrome or color
- Includes all *VeriSens*® feature checks (up to 22)
- C-mount and free choice of lenses
- *VeriFlash*® flash controller
- Industry-suited aluminum housing (IP 67)



UNIVERSAL ROBOTS+
Certified

CS / ID series: The experts.

The *VeriSens*® sensor functionalities of the CS and ID series focus on core application tasks making them the ideal entry-level product for image-based object inspection.

The **CS series** ("Check & Sort") provides every tool required for checking and sorting applications:

- **Model CS100**
  Either with white or infrared illumination – particularly easy-to-use vision sensors designed for product inspection with immediate results output via digital I/Os

The **ID series** ("IDentification") features both reliable text readers and code readers:

- **Model ID510 (text and code reader)**
  Latest hardware generation to double productivity, integrated Industrial Ethernet (PROFINET and EtherNet/IP™), enhanced identification algorithms, in addition: reading of plain text (OCR) without requiring previous font training, print quality evaluation (OCV)

- **Model ID100 (code reader)**
  Reads barcodes and matrix codes (1D / 2D codes including GS1) with quality evaluation

CS / ID series

- Image evaluation: monochrome
- Selected *VeriSens*® feature checks (up to 6)
- Integrated optics, 10 mm, 12 mm or 16 mm
- Integrated illumination, white or infrared
- Housing: aluminum (IP 67)

VeriSens® vision sensors product overview

Additional devices (including IP 69K):
www.baumer.com/verisens

	Series (XF / XC / CS / ID)	Model with protection class		Sensor (Monochrome / Color)	Resolution [px]			LED illumination			Lens					Interface			
		IP 67 (100/200/510/700/800/900)	IP 69K (105/205)		752 / 640 × 480 (VGA, 1/3″ / 1/4″)	1280 × 960 (1.2 MP, 1/3″)	1600 × 1200 (2 MP, 1/1.8″)	White (integrated)	Infrared (integrated)	*VeriFlash*® flash controller		8 mm (integrated)	10 mm (integrated)	12 mm (integrated)	16 mm (integrated)	C-mount interface	Ethernet (TCP/UDP), Industrial Ethernet[1]	Ethernet (TCP/UDP)	Ethernet (TCP/UDP), RS485	Output (PNP / NPN)
Type key (e.g.): VS XF 800 M 03 W 12 I P	XF	800		M	03	12	20	W	I	X		8	10	12	16	00	I	E	R	P
Article No. / Type name																				
11700462 VS XF700M03W08IP	XF	■		M	■			■				■					■			P
11173091 VS XF700M03W12IP		■			■			■						■			■			
11173090 VS XF700M03W16IP		■			■			■							■		■			
11700463 VS XF700M03I08IP		■			■				■			■					■			
11173089 VS XF700M03I12IP		■			■				■					■			■			
11173088 VS XF700M03I16IP		■			■				■						■		■			
11210957 VS XF800M03W08IP		■			■			■				■					■			
11162177 VS XF800M03W12IP		■			■			■						■			■			
11162175 VS XF800M03W16IP		■			■			■							■		■			
11700461 VS XF800M03I08IP		■			■				■			■					■			
11173087 VS XF800M03I12IP		■			■				■					■			■			
11173086 VS XF800M03I16IP		■			■				■						■		■			
11700457 VS XF900M03W08IP		■			■			■				■					■			
11700458 VS XF900M03W12IP		■			■			■						■			■			
11700460 VS XF900M03I08IP		■			■				■			■					■			
11700459 VS XF900M03I12IP		■			■				■					■			■			
11197478 VS XF700C03W12IP	XF	■		C	■			■						■			■			P
11197479 VS XF700C03W16IP		■			■			■							■		■			
11210959 VS XF800C03W08IP		■			■			■				■					■			
11199868 VS XF800C03W12IP		■			■			■						■			■			
11199869 VS XF800C03W16IP		■			■			■							■		■			
11173085 VS XC700M03X00IP	XC	■		M	■					■						■	■			P
11173084 VS XC700M12X00IP		■				■				■						■	■			
11173083 VS XC700M20X00IP		■					■			■						■	■			
11166806 VS XC800M03X00IP		■			■					■						■	■			
11166807 VS XC800M12X00IP		■				■				■						■	■			
11166808 VS XC800M20X00IP		■					■			■						■	■			
11700454 VS XC900M03X00IP		■			■					■						■	■			
11700456 VS XC900M12X00IP		■				■				■						■	■			
11700455 VS XC900M20X00IP		■					■			■						■	■			
11181282 VS XC700C03X00IP	XC	■		C	■					■						■	■			P
11181283 VS XC700C12X00IP		■				■				■						■	■			
11166809 VS XC800C03X00IP		■			■					■						■	■			
11180704 VS XC800C12X00IP		■				■				■						■	■			
11048500 VS CS100M03W10EP	CS	■		M	■			■					■					□[2]		P
11076261 VS CS100M03W16EP		■			■			■							■			□[2]		
11089900 VS CS100M03I10EP		■			■				■				■					□[2]		
11093026 VS CS100M03I16EP		■			■				■						■			□[2]		
11048489 VS ID100M03W10RP	ID	■		M	■			■					■						■	P
11076263 VS ID100M03W16RP		■			■			■							■				■	
11173082 VS ID510M03W12IP		■			■			■						■			■			
11173081 VS ID510M03I12IP		■			■				■					■			■			

[1] PROFINET / Ethernet/IP™ [2] for configuration only

Vision Guided Robotics easier than ever before – *VeriSens*® for Universal Robots (UR) control.

Robots with "eyes" offer enormous versatility in the application. Pick and place flexibility, gripper clearance checks, overlap inspection, quality control, object identification and more – image processing paves the way.

TUTORIAL

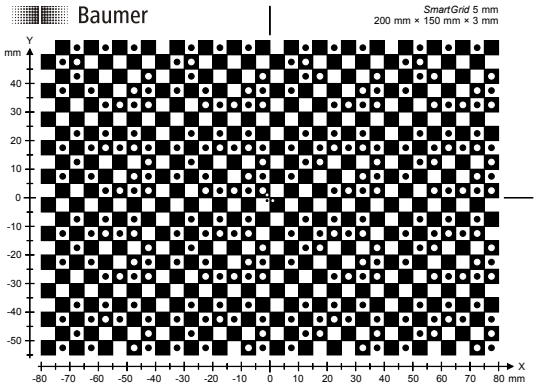
Why is *VeriSens*® so unique for use with Universal Robots?

- **Really easy:** It takes only two commands in UR programming to access the many great benefits of image processing, such as object tracking. Thanks to their excellent usability, vision sensors and robots significantly cut down on operator training time.
- **No longer manual but automated:** Automated coordinate alignment via *SmartGrid* eliminates the conventional required elaborate manual "hand-eye" procedure.
- **Matching all:** Object tracking, quality control, identification, installed at robot or overhead – the universal concept will support you in virtually any application and allows for fast adaptations.

SmartGrid

Innovative *SmartGrid* is the centerpiece for fast setup in few minutes:

- Teach-in for correction of image distortion in real time
- Conversion to world coordinates and orientation within the coordinate system
- Z-calibration for 3D scaling of coordinates
- Automated coordinate alignment between *VeriSens*® and Universal Robot



Application versatility

- Control object pick and place
- Quality control
- Object identification

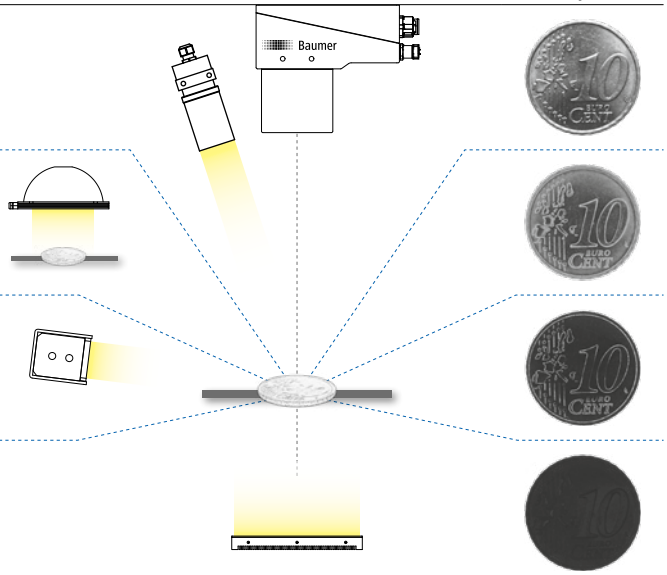
A question of light.

A decisive criterion for inspection stability in the application is the accentuation of differences in application-relevant features. Therefore illumination should be selected with utmost care in order to obtain optimum results. Basically, there is incident light, dark field and back light.

Colored illumination may cause strong contrast. Due to the topic's complexity, the following provides only a rough outline. The Baumer team will gladly be of help should you need more detailed support.

Illumination position

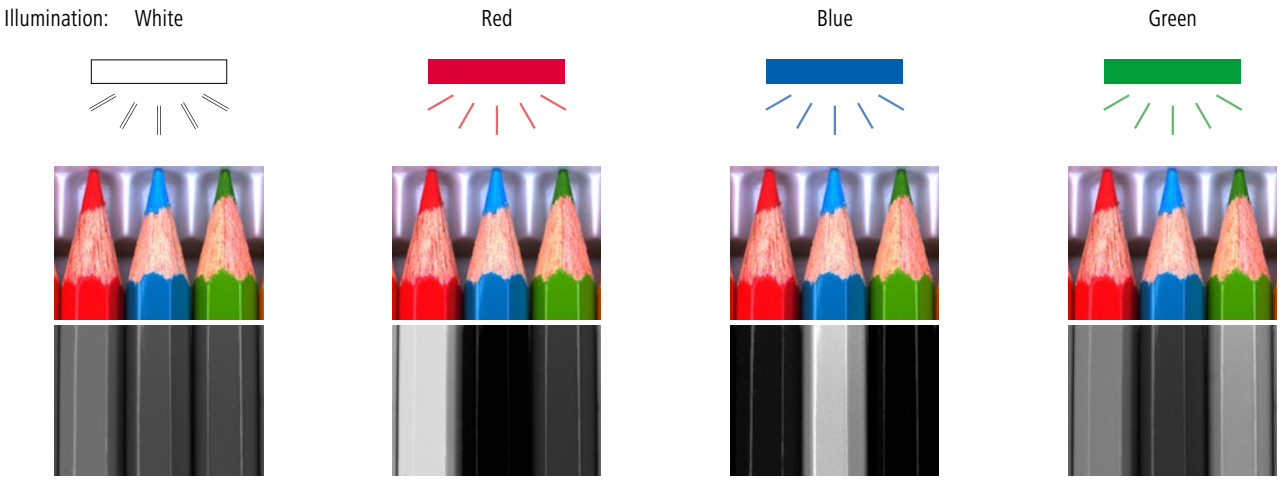
Illumination type	Ideal for	Object
Incident light Homogenous illumination of rough and matte objects	Presence and position checks, imprint inspection (OCR / OCV), e. g. best-before date	
Dome light Shadow-free illumination, suppression of surface irregularities and reflections	Inspection of severely glossy or mirroring objects, e. g. yogurt lids (seals)	
Dark field light Highlighting any unevenness, contours, edges and defects	Surface inspection, e. g. scratches or engravings	
Back light Inspected object illumination from below or behind delivers high-contrast shadow images	Contour-based inspection, e. g. accuracy of punched parts and mounting holes, measuring operations, presence checks of transparent packaging	



Colored illumination

Colored illumination may intensify or suppress defined colors also in monochrome imaging. The contrast created this way helps recognizing relevant features which is decisive for an application-specific and optimally matching solution.

For example, blue light cast on a multi-color surface will be reflected by the blue content only. The more blue content is in object, the more light is reflected and the brighter will appear the object. In an analog way, red content illuminated in blue appears extremely dark.



Technical data

General data	XC700 / XC800 / XC900			XF700 / XF800 / XF900 | CS100 | ID100 / ID510		
Resolution	640 × 480 px	1280 × 960 px	1600 × 1200 px	752 × 480 px		
Sensor	1/4" CCD (monochrome, color)	1/3" CCD (monochrome, color)	1/1.8" CCD (monochrome)	1/3" CMOS (monochrome, color)		
LED illumination	Fully integrated *VeriFlash*® flash controller for external illumination			White (LED class: Risk group 1 low risk, EN 62471:2008) Infrared (860 nm) (LED class: free group risk-free, EN 62471:2008)		
Lens	Interchangeable lens (C-mount)			f = 10 mm	f = 8 / 12 mm	f = 16 mm
Min. object distance	Depending on interchangeable lens			50 mm	50 mm	70 mm | 100 mm [1]
Max. object distance	Depending on interchangeable lens			∞	450 mm	300 mm
Speed High-resolution mode High-speed mode* (*limited resolution)	Max. inspections / s 118 (monochrome) | 116 (color) 144 (monochrome)	Max. inspections / s 32 (monochrome) | 31 (color) 54 (monochrome)	Max. inspections / s 21 (monochrome) 35 (monochrome)	Max. inspections / s 50 (monochrome) | 50 (color) 100 (monochrome, XF series only)		
Defect image memory	32	8	4	32		
Number of jobs	Up to 255 on the device (can be exchanged via process interface)					
Features per job	32					

Electrical data	XC700 / XC800 / XC900	XF700 / XF800 / XF900 | CS100 | ID100 / ID510
Power supply	⎓ 24 V ± 25 % / Class 2 per NEC / Protection class III | 18 … 30 V [2]	
Power consumption	Max. 42 W (with IO and illumination)	Max. 18 W (with IO) | Typical 5 W (I_{max} = 1 A at 24 V) [2]
Inputs	8 … 30 V	
Outputs	PNP I_{peak} = 100 mA and I_{eff} = 50 mA	
Digital input	Trigger, Job selection, External teach-in, Encoders (CH-A, CH-B) 500 kHz	
Digital output	Pass / Fail 1-5 [3], Flash Sync, Alarm, Camera Ready, Output Enable	
Communication Initial setup Process interface	 Ethernet (10BASE-T / 100BASE-TX) PROFINET (CC-A) [1] / Ethernet/IP™ [1], TCP / UDP (Ethernet) [4], RS485 [5]	

[1] XF / XC 700 / 800 / 900, ID510 only
[2] CS100 / ID100 only
[3] VS xxxxxxxxxxRP: 1-3
[4] exept CS100
[5] VS xxxxxxxxxxRP only

Integr. flash controller	XC700 / XC800 / XC900	XF700 / XF800 / XF900 | CS100 | ID100 / ID510
Voltage (permanent) Voltage (pulsed)	⎓ 12 V DC or ⎓ 24 V DC ⎍ 24 V DC or ⎍ 48 V DC	–
Current (permanent) Current (pulsed)	I_{max} = 800 mA at ⎓ 24 V DC (+/-10 %, at least +/- 100 mA, at 25 °C) I_{max} = 4 A at ⎍ 48 V DC (+10 / -20 %, at least +/- 100 mA, at 25 °C)	–
Flash time	Max. 1 ms (Duty Cycle max. 1:10)	–

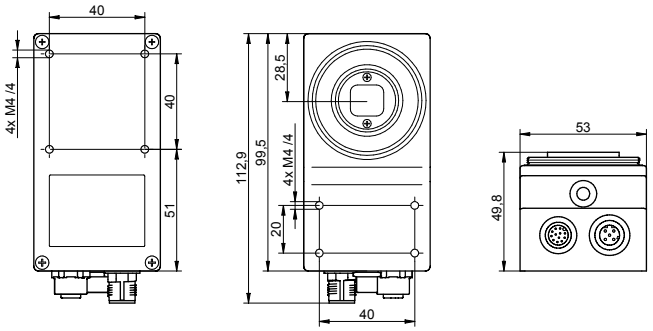
Operating conditions	XC700 / XC800 / XC900	XF700 / XF800 / XF900 | CS100 | ID100 / ID510
Operating temperature	+5 … +55 °C @ measurement point	+5 … +60 °C | +5 … +50 °C [2] @ measurem. point
Storage temperature	-20 … +70 °C	
Humidity	0 … 90 % (non-condensing)	
Protection class	IP 67 (XC series: with tube)	IP 67
Vibration load	IEC 60068-2-6, IEC 60068-2-64	
Mech. shock resistance	EN 60068-2-27	

Mechanical data	XC700 / XC800 / XC900	XF700 / XF800 / XF900 | CS100 | ID100 / ID510
Width × Height × Depth	53 mm × 99.5 mm × 49.8 mm (without lens / tube)	53 mm × 99.5 mm × 38 mm
Material	Housing: aluminum Cover glass tube: PMMA	Housing: aluminum Cover glass: PMMA [6]
Weight (approx.)	300 g (without lens / tube)	250 g

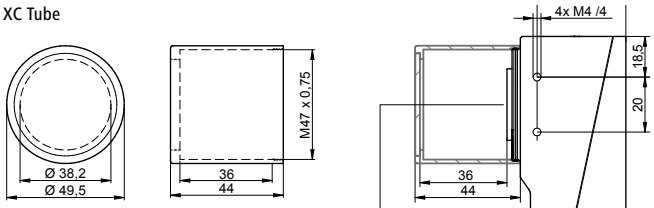
Code types / OCR	XC800 / XC900	XF800 / XF900 | ID510 | ID100
Barcode [7]	2/5 Industrial, 2/5 Interleaved, Codabar, Code 39, Code 93, Code 128, PharmaCode EAN 8, EAN 13, UPC-A, UPC-E: Base code + variants Add-On 2, Add-On 5 GS1 DataBar (RSS): Limited, Expanded, Expanded Stacked GS1 DataBar (RSS-14): Omnidir, Truncated, Stacked, Stacked Omnidir GS1 128	
Matrix code [7]	DataMatrix (ECC 200), GS1-DataMatrix, QR, PDF417	
Font [8]	Many font styles (recommended: sans serif, proportional), Dot Matrix, Characters: A-Z a-z 0-9 + - . : / ( )	

[6] for XF700 / XF800 / XF900, CS100, ID510 with infrared illumination: daylight filter 780 nm integrated
[7] incl. quality rating of all barcodes according to ISO / IEC 15416 as well as all matrix codes according to ISO / IEC 15415 or AIM DPM-1-2006
[8] XC800 / XC900, XF800 / XF900, ID510 only

Dimension drawing (XC series)

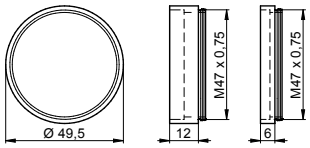


XC Tube



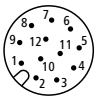
C-mount support

XC Tube Module



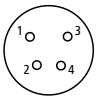
Dimensions in mm

Electrical connection [1] M12 / 12-pin, A-coded



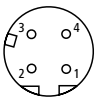
1: Power (+18-30 V DC)	7: OUT3
2: Ground	8: IN3
3: IN1 (Trigger)	9: OUT4 | RS485+ [2]
4: OUT1	10: IN4
5: IN2	11: IN5
6: OUT2	12: OUT5 | RS485- [2]

Electrical connection illumination [1,3] M8 / 4-pin [4]



1: +24 V or +48 V Flash
2: +12 V or +24 V Flash
3: Ground
4: Flash Sync [5] PNP 100 mA

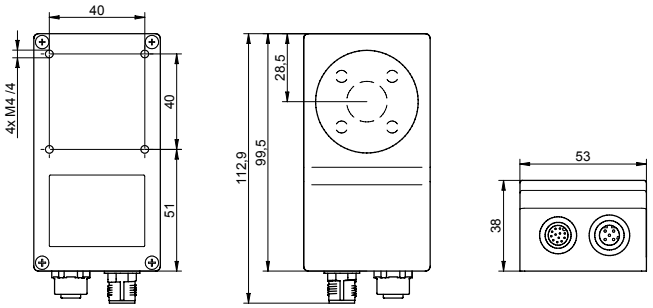
Ethernet connection [1] M12 / 4-pin



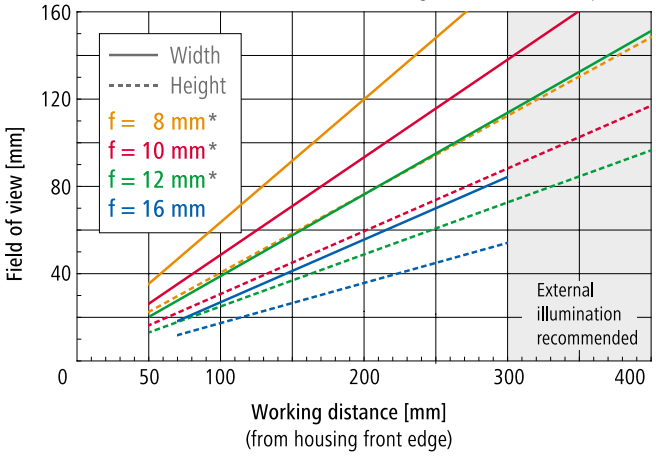
1: TD+
2: RD+
3: TD-
4: RD-

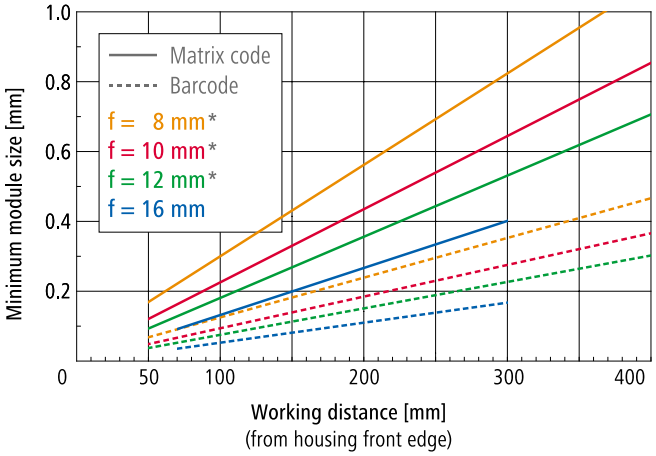
[1] on device
[2] RS485: VSxxxxxxxxxxRP only
[3] XC series only
[4] voltage outputs configurable by software
[5] voltage according to power supply

Dimension drawing (XF / CS / ID series)



* working distances > 400 mm possible





Device dependent:

System design

Lab setup accessories (optional)

11048083	Connecting cables *VeriSens*®, adapter M12 / DC socket
11079750	Power supply 24 V / 1 A, international, DC plug
11051407	Laboratory stand, hinged bracket, mounting material

Mounting accessories (optional)

11177010

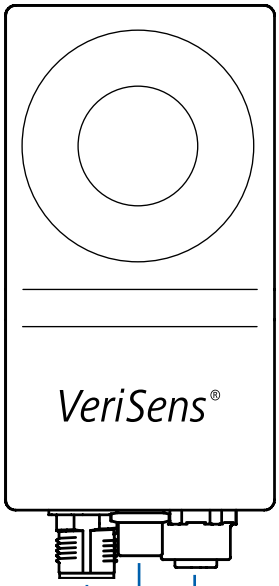
VeriSens® mounting adapter

Polarization filter (optional)

11161075

ZVF-Filter Pol. *VeriSens*® ID / CS / XF

(VS xxxxxxxxWxxxx only)



Lens accessories (optional)

11088325	XC Tube, M47, length 44 mm (scope of delivery *VeriSens*® XC)
11115649 11089149	XC Tube Module, M47, 6 mm XC Tube Module, M47, 12 mm
11010529	Close-up ring set 6-part, 0.5 / 1 / 5 / 10 / 20 / 40 mm
11092000 11175428 11167713	Pentax® polarization filter, linear: filter thread 27 mm [1] filter thread 30.5 mm [2] filter thread 40.5 mm [3]
11006551	Pentax® color filter [1] (red), filter thread 27 mm
11097573	IR cut filter, C-mount, height 2.5 mm, screw-in tool
11097576	Daylight filter, C-mount, height 2.5 mm, screw-in tool

Compatible to lenses:

[1] Article No. 11150226 / 11150228 / 11003417

[2] Article No. 11008992 / 11150229 / 11150230 / 11003041 11175031 / 11175034 / 11175035 / 11175036

[3] Article No. 11150223 / 11002877

Connecting cables [4]
shielded, to free cable end

11201118	2 m
11195097	5 m
11195098	10 m
11201128	2 m
11195094	5 m
11195095	10 m

[4] suitable for robotics, UL approved

Ethernet cables
shielded, to RJ-45 plug

2 m	11048502
5 m	10165276
10 m	11051929
2 m	11048592
5 m	11048594
10 m	11051950

Monitor (All-in-one PC, optional)

11122988

ZVP-ALL_IN_ONE_PC.DE (10.4", 1024 × 768 px, Stylus)

11093293

ZVP-ALL_IN_ONE_PC.EN (10.4", 1024 × 768 px, Stylus)

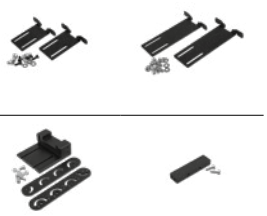
Illumination cables

11088882	1.5 m	Extension cable shielded, male conn. straight M8, to female conn. straight M8 [5]
11136134	0.3 m	Extension cable shielded, male conn. straight M8, to female conn. straight M8 [5]
11089179	0.3 m	Adapter cable, male connector straight M8, to JST SMP-03V (3-pin) [5]
11089178	0.3 m	Adapter cable, male connector straight M8, to JST SMP-02V (2-pin) [5]
10163693	2 m	Adapter cable, free cable end, to female connector straight M8 [5]
11175008	0.15 m	Adapter cable, ZVI-LUMIMAX® T1 at *VeriSens*® XF / XC / CS / ID series

[5] *VeriSens*® XC series only

Set of mounting brackets

11092203 11092204	VB Fix Kit FLDR-i90B, small (57 mm) VB Fix Kit FLDR-i90B, large (93 mm)	for LED ring light FLDR-i90B to *VeriSens*® XC series
11136136 11136139	VB Fix Kit RONDO-LX, small (57 mm) VB Fix Kit RONDO-LX, large (93 mm)	for LED ring light ZVI-RONDOLX to *VeriSens*® XC series
11076264	ZVI-VB Fix Kit Industrial Light	for illumination (e. g. Spot 5W) to *VeriSens*® XF / XC / CS / ID
11175009	ZVI-VB Fix Kit Adapter Spot5W	



Interchangeable lenses (C-mount, *VeriSens*® XC series only)

Article No.	Type name	Focal distance [mm]	Aperture speed range	Minimum distance [m]	Maximum lens length [1] [mm]	Filter thread [mm]	XC Tube Module [2] (Art. Nr. 11089149)
11037579	ZVL-FL-HC0416X-VG [3]	4.2	F1.6 - C	0.20	44	–	1 piece
11008992	ZVL-FL-HC0614-2M	6	F1.4 - 16.2	0.10	38	30.5	1 piece
11150223	ZVL-FL-CC0814A-2M	8	F1.4 - 16.2	0.10	37	40.5	1 piece
11002877	ZVL-FL-CC0815B-VG [3]	8.5	F1.5 - C	0.20	40	40.5	1 piece
11150226	ZVL-FL-CC1214A-2M	12	F1.4 - 16.2	0.10	46	27.0	1 piece
11150228	ZVL-FL-CC1614A-2M	16	F1.4 - 16.2	0.10	33	27.0	–
11150229	ZVL-FL-CC2514A-2M	25	F1.4 - 16.2	0.10	38	30.5	1 piece
11003417	ZVL-FL-CC3516-2M	35	F1.6 - 16	0.40	36	27.0	–
11150230	ZVL-FL-CC5024A-2M	50	F2.8 - 22.2	0.30	47	30.5	1 piece
11003041	ZVL-FL-CC7528-2M	75	F2.8 - 32	0.70	60	30.5	3 pcs

[1] measured from C-mount support (see XC series scale drawing)
[2] necessary with lens length > 36 mm
[3] only compatible to *VeriSens*® with 0.3 MP resolution (VS XCxxxx03xxxxx)

External illumination modules [4]

Article No.	Type name	Product description	Cable [cm]	Illuminated area [mm]	Outer dimensions [mm]	Height [mm]
Cable with M8 / 4-pin connector [4, 5]						
11085869	FLDR-i90B-W	LED ring light, white	30	ø 87	ø 93,5	24.6
11154321	FLDR-i90B-SR24	LED ring light, red 626 nm	30	ø 87	ø 93,5	24.6
11090900	FLDR-i90B-IR24	LED ring light, IR 875 nm	30	ø 87	ø 93,5	24.6
11086539	FLDL-i150x15-W	LED bar light, white, diffuse	100	148 × 15	158 × 17.5	20
11086540	FFPR-i100-W	LED dark field light, white, diffuse	30	ø 94,6	ø 100	40
11086541	FLDM-i100-W	LED dome light, white	30	ø 80	ø 130	61
11086536	FLDL-TP-Si36-W	LED back light, white, diffuse	100	36 × 36	47 × 47	15
11086538	FLDL-TP-Si85x77-W	LED back light, white, diffuse	100	85 × 77	95 × 95	15
11086537	FLDL-TP-Si200x100-W	LED back light, white, diffuse	100	200 × 100	228 × 116	23.5
11095910	FLFL-Si60-IR24	LED back light, IR 850 nm, diffuse	100	60 × 60	94 × 94	10
With M8 / 4-pin connector [4, 7]			[6]			
11130179	ZVI-RONDOLX_24VDC_weiss_120°	LED ring light, white, 120°	–	ø 67	ø 101	24
11130176	ZVI-RONDOLX_24VDC_IR850nm_50°	LED ring light, IR 850 nm, 50°	–	ø 67	ø 101	24
11130150	ZVI-RONDOLX_24VDC_IR850nm_120°	LED ring light, IR 850 nm, 120°	–	ø 67	ø 101	24
11130185	ZVI-TOPLINED1_24VDC_weiss_120°	LED bar light, white, 120°	–	78 × 25	78 × 25	23
11130186	ZVI-TOPLINED1_24VDC_SHweiss_120°	LED bar light, SH white, 120°	–	78 × 25	78 × 25	23
11130187	ZVI-TOPLINED1_24VDC_rot617nm_30°	LED bar light, red 617 nm, 30°	–	78 × 25	78 × 25	23
11135012	ZVI-TOPLIGHT80_24VDC_rot617nm_30°	LED incident light, red 617 nm, 30°	–	87 × 87	87 × 87	20
11130183	ZVI-ARCUSM_24VDC_weiss_120°	LED dark field light, white, diffuse	–	ø 68	ø 120	9.5
11130181	ZVI-HILIGHT80_24VDC_weiss	LED back light, white, diffuse	–	78 × 78	87 × 87	20
11130182	ZVI-HILIGHT120_24VDC_weiss	LED back light, white, diffuse	–	118 × 118	127 × 127	20

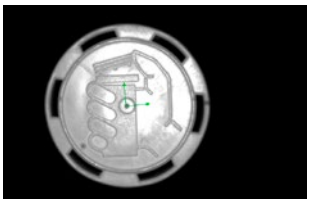
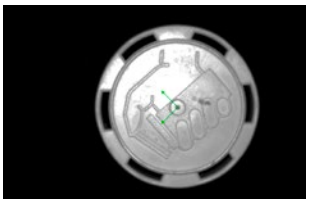
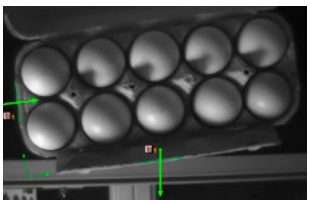
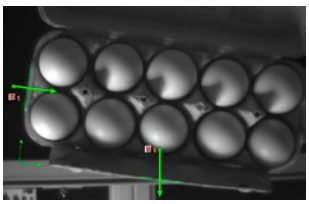
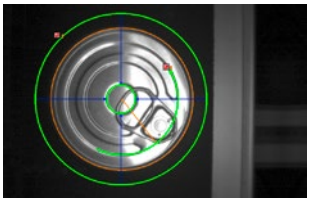
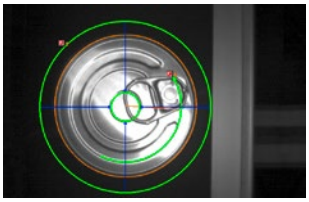
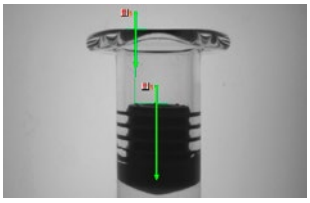
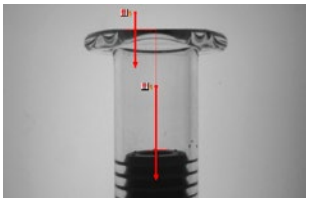
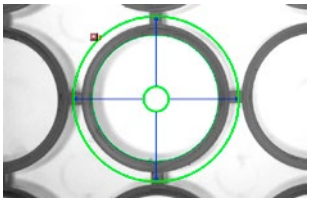
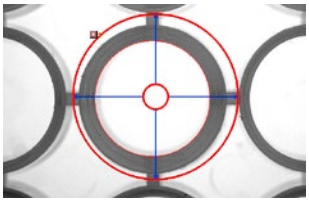
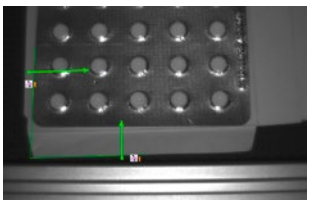
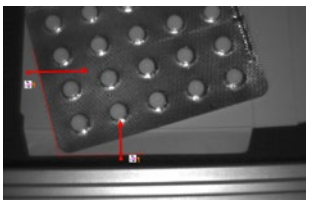
[4] *VeriSens*® XC series only
[5] supplier: Falcon Illumination MV GmbH & Co. KG
[6] connector directly on the device
[7] supplier: Büchner Lichtsysteme GmbH

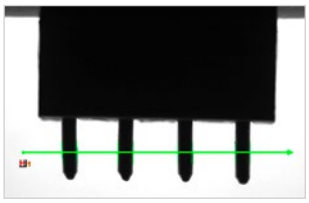
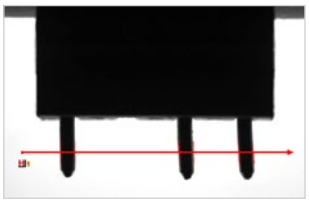
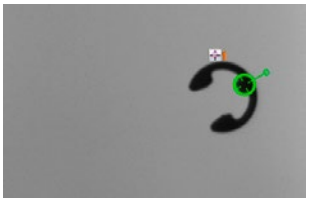
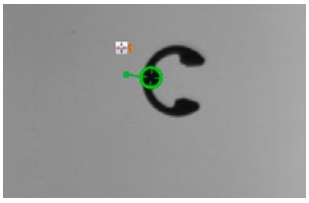
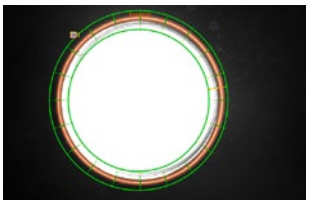
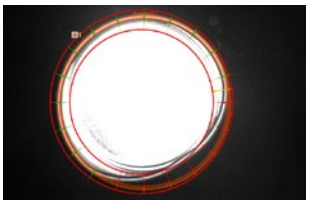
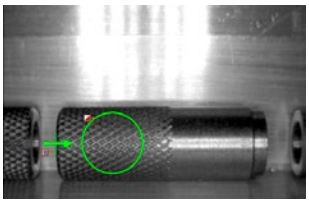
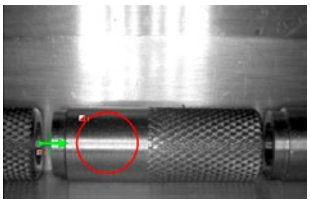
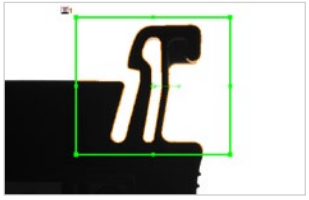
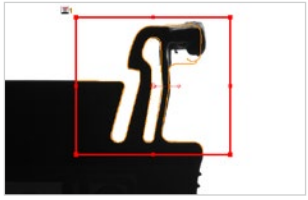
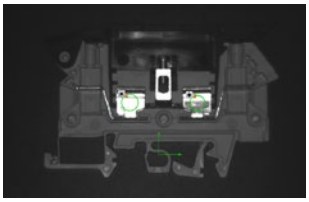
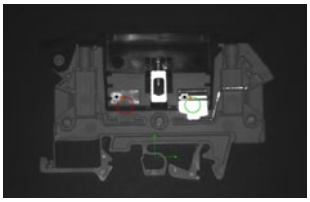
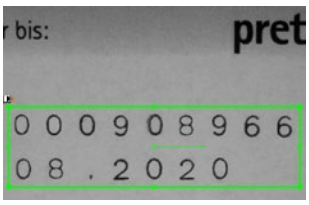
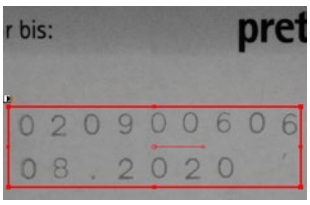
Illumination accessories (optional)

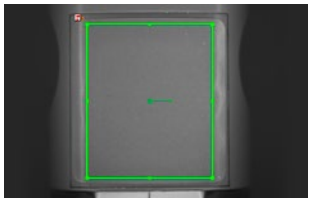
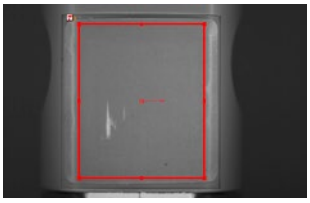
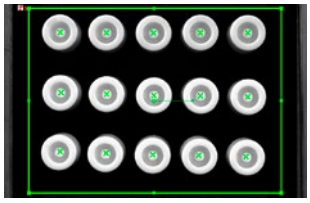
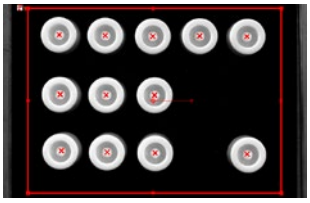
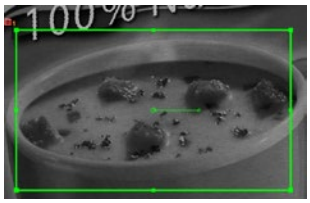
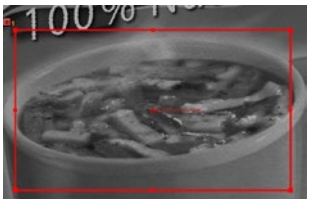
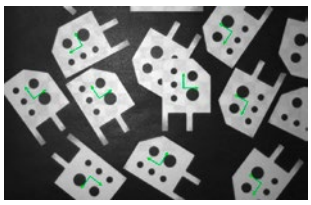
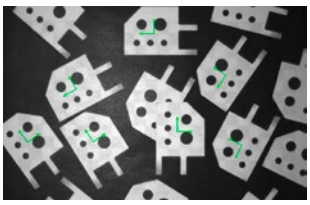
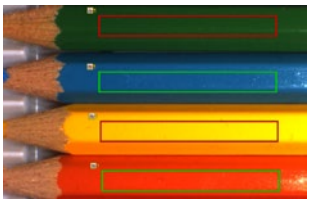
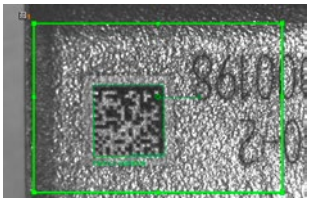
11167410	Polarization filter for FLDR-i90B	11167411	Support polarization filter for für FLDR-i90B	11167413	Diffusor A1421 for FLDR-i90B-DP

VeriSens® feature checks: overview.

VeriSens® vision sensors provide 23 different feature checks. The device-specific feature set is fully included with the purchase. Up to 32 checks can be performed all at once – with a single image acquisition – for comprehensive and efficient quality control.

				Models	XF700 / XC700 [1]	XF800 / XC800 [1]	XF900 / XC900	CS100	ID510	ID100
Part location										
	Part location on contours (*FEXLoc*®) Determines the location and rotational position of a part based on its contours. All subsequent feature checks are aligned according to the determined position.				360°	360°	360°	360°		
	Part location on edges (*FEXLoc*®) Determines the location and rotational position of a part from a single edge or two edges at right angles to each other. All subsequent feature checks are aligned according to the determined position.				■	■	■			
	Part location on circle (*FEXLoc*®) Determines the location and rotational position of circular parts. All subsequent feature checks are aligned according to the determined position.				■	■	■			
	Part location on text line Determines the location and rotational position of text within a working area. The text may change during this task. All subsequent feature checks are aligned according to the determined position.				■	■	■		■	
Geometry										
	Distance Determines the distance between two edges.				■	■	■	■		
	Circle Determines the diameter, location and roundness in comparison to a reference circle.				■	■	■	■		
	Angle Determines the angle between two edges.				■	■	■			

		Models	XF700 / XC700 [1]	XF800 / XC800 [1]	XF900 / XC900	CS100	ID510	ID100
Geometry								
	Count edges Determines the number of edges along a tracing ray.	 	■	■	■			
	Point position Determines the coordinates of one point.	 	■	■	■			
	Edge characteristics Compares the distances of edges along a tracing ray.	 	■	■	■			
Feature comparison								
	Count contour points Determines the number of contour points within a working area.	 	■	■	■	■		
	Contour comparison Compares the contour of a taught-in part with the contour of the current part.	 	■	■	■	■	■	
	Color identification Identifies color within the operating range and its deviation from the reference color.	 	■	■				
	Brightness Determines the average brightness in a working area.	 	■	■	■	■		
	Contrast Calculates the contrast in a working area.	 	■	■	■			

Models	XF700 / XC700 [1]	XF800 / XC800 [1]	XF900 / XC900	CS100	ID510	ID100
Feature comparison						
Area size Identifies light or dark respectively color-defined areas in the image. Determines the total area or the largest continuous area.			■	■	■			
Count areas Counts the visible continuous light or dark respectively color-defined areas in the image.			■	■	■			
Pattern comparison Compares the working area with a taught-in pattern.			■	■	■			
Find object positions Finds several objects based on a taught one.			■ M	■ M	■			
Color positioning Verifies presence of defined colors within defined image sections.			■	■				
Identification								
Barcode Reads barcodes. Determines quality according to ISO / IEC 15416, result is output via process interface, can be compared to a set value.				■	■		■	■
Matrix code Reads matrix codes (ECC 200, GS1, QR, PDF417) at any angle of rotation. Determines quality according to ISO / IEC 15415 or AIM DPM-1-2006, result is output via process interface, can be compared to a set value.				■	■		■	■
Text Reads numbers and characters. Characters read are output via process interface, can be compared to a set value.				■	■		■	

[1] Feature checks available: "M" corresponds to "monochrome sensors only"

Additional features to solve your application.

Models	XF700 / XF800	XC700 / XC800	XF900	XC900	CS100	ID510	ID100
Image acquisition							
Optics XF / CS / ID series: 8 mm | 10 mm | 12 mm | 16 mm Optics XC series: C-mount	■|-|■|■ -	-|-|-|- ■	■|-|■|- -	-|-|-|- ■	-|■|-|■ -	-|-|■|- -	-|■|-|■ -
Illumination XF / CS / ID series: White | Infrared Illumination XC series: *VeriFlash*® (integrated flash controller) (infrared: integrated daylight filter 780 nm)	■|■ -	-|- ■	■|■ -	-|- ■	■|■ -	■|■ -	■|- -
Configurable web interface: HTTP | HTTPS (live image, job switching, retrieving defect images, *MultiViewer* (700 / 800 /900))	■|■	■|■	■|■	■|■	■|-	■|■	■|-
Save images via: FTP | SFTP	■|■	■|■	■|■	■|■	■|-	■|■	■|-
Configuration via Ethernet	■	■	■	■	■	■	■
Functions							
Process linkage: Digital I/Os	5 / 5	5 / 5	5 / 5	5 / 5	5 / 5	5 / 5	5 / 3
Process interface for: Data output | Universal Robots (*URCap*)	■|-	■|-	-|■	-|■	-|-	■|-	■[1]|-
Universal Robots+ Certified (UR+)			■	■			
Ethernet (TCP/IP, UDP) | Industrial Ethernet (PROFINET, EtherNet/IP™) | RS485	■|■|-	■|■|-	■|■|-	■|■|-	-|-|-	■|■|-	■|-|■
Baumer *FEX*® image processor	■	■	■	■	■	■	
ColorFEX® intelligent 3D color assistant (device dependent)	■	■					
User administration / Password protection	■	■	■	■		■	■
Coordinate conversion | Automated coordinate alignment via *SmartGrid*	■|-	■|-	■|■	■|■			
Distortion correction (monochrome only) | Z calibration	■|-	■|-	■|■	■|■	-|-	-|-	-|-
Process integration							
Flexible result conjunction	■	■	■	■			
Result conjunction with integrated digital inputs	■	■	■	■			
Test functionality	■	■	■	■	■	■	■
High-speed mode (monochrome only)	■	■	■	■			
Gamma correction (monochrome only)	■	■	■	■			

[1] non-configurable, Industrial Ethernet not supported

- **Wide range of interfaces**
  Up to 5 digital inputs and outputs, process interface (device dependent) for result output and/or device control or encoder interface for path-based triggering and ejection – *VeriSens*® is prepared for almost any integration method. Prefabricated function blocks are available for the Siemens SIMATIC® S7.

- **Integrated FTP / SFTP client**
  To store live and defect images for tracking or later analysis and / or visualization as easily as possible, all *VeriSens*® vision sensors support FTP servers.

- **Remote access**
  The Ethernet interface integrated in all models allows remote access (including gateway and NAT support) via the *VeriSens*® *Application Suite* to enable worldwide product access.

- **Integrated test functionality**
  VeriSens® vision sensors offer an integrated test function which enables you to have images collected during a test run sorted according to good and reject parts in order to evaluate the reliability of the inspection task you created. The test function includes further useful features – ranging from statistical data processing including histogram representation to data export (CSV format).

- **User management**
  VeriSens® vision sensors feature an integrated user management with password protection, for example, to prevent modification of device settings by machine operators.

- **Backup & Restore function**
  All *VeriSens*® vision sensors support service and commissioning through a backup & restore function for the device software settings and inspection tasks stored in the device, to enable easy backup or transmission of this data to other devices.

Worldwide presence.

Africa
Algeria
Cameroon
Côte d'Ivoire
Egypt
Morocco
Reunion
South Africa

America
Brazil
Canada
Colombia
Mexico
United States
Venezuela

Asia
Bahrain
China
India
Indonesia
Israel
Japan
Kuwait
Malaysia
Oman
Philippines
Qatar
Saudi Arabia
Singapore
South Korea
Taiwan
Thailand
UAE

Europe
Austria
Belgium
Bulgaria
Croatia
Czech Republic
Denmark
Finland
France
Germany
Greece
Hungary
Italy
Malta
Martinique
Netherlands
Norway
Poland
Portugal
Romania
Russia
Serbia
Slovakia
Slovenia
Spain
Sweden
Switzerland
Turkey
United Kingdom

Oceania
Australia
New Zealand

For more information
about our worldwide
locations go to:
www.baumer.com/worldwide

Represented by:

Baumer
Passion for Sensors