

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



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

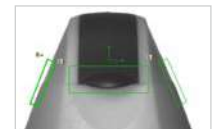
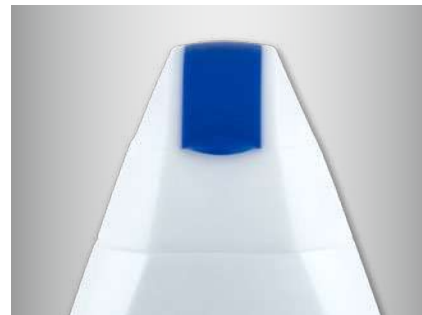


Packaging industry

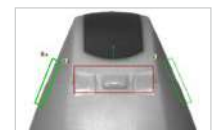
- Cap monitoring
- Foil wrapping seams
- Label inspection (logo, text, code, product content, etc.)
- and many more

Example:

Inspection of forward cap alignment



OK



NOK

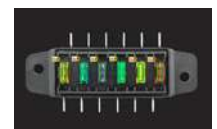
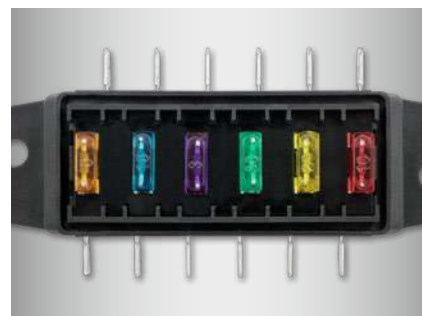


Automotive industry/electronics

- 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 & 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 & 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.

Communicative

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

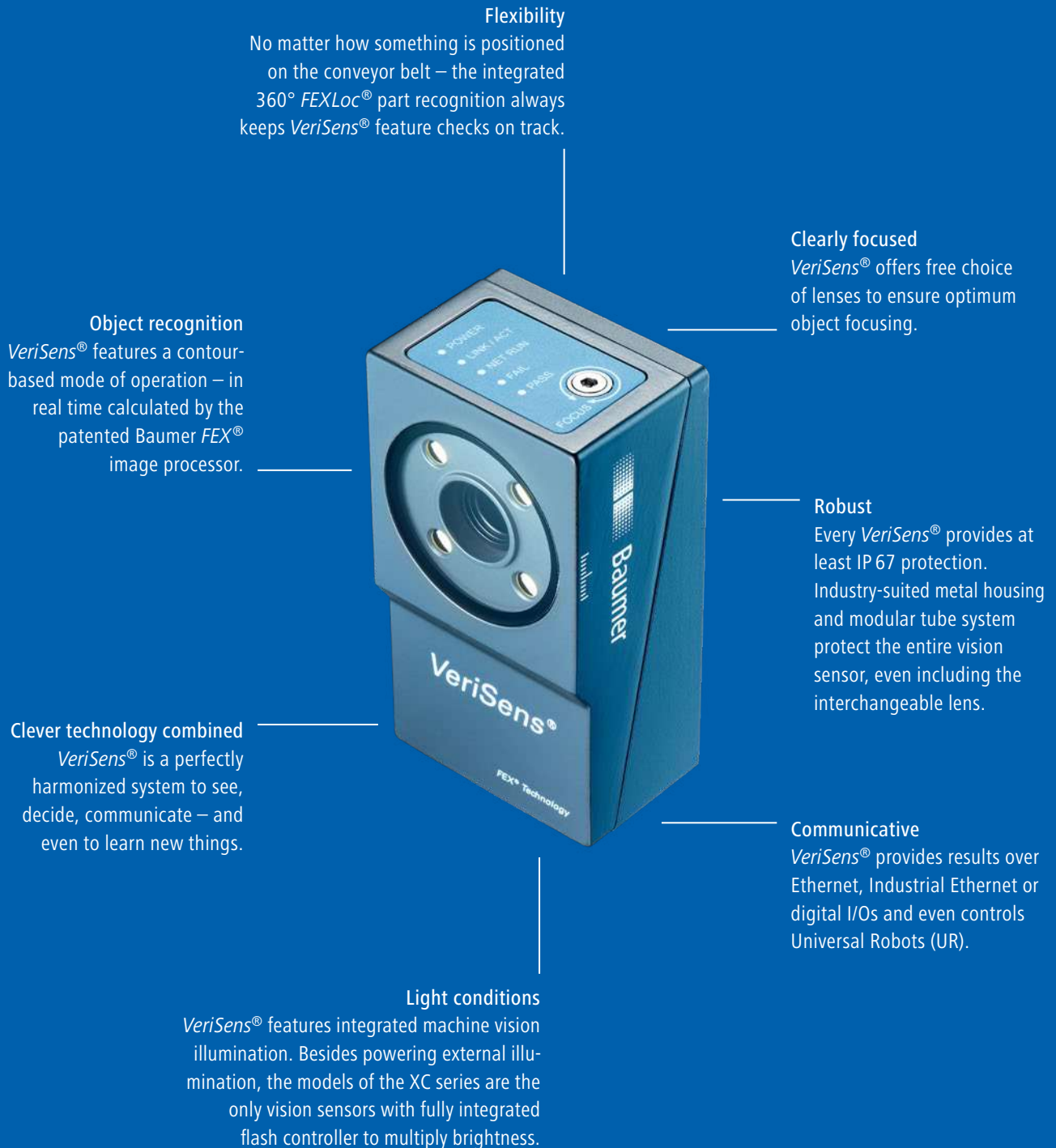
A clever mind on top

The eye requires intelligence.

Light conditions

Using artificial illuminations we can see even in weak light.

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.

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.

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.

Object recognition

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

Clever technology combined

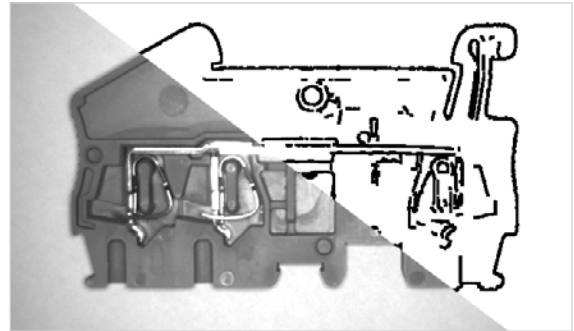
VeriSens® is a perfectly harmonized system to see, decide, communicate – and even to learn new things.

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.

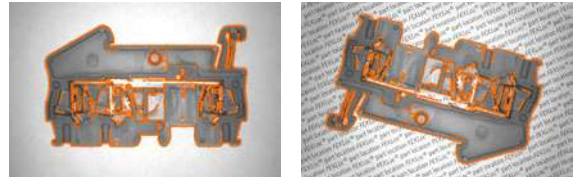
What makes *VeriSens*® so special for our customers?

- **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.

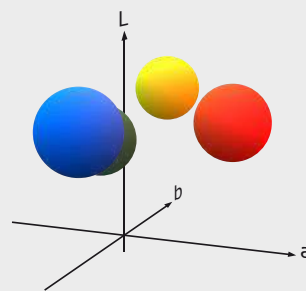


Virtual object alignment using *FEXLoc*®
left: object contours
right: object turned in front of severe background structures



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.



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.

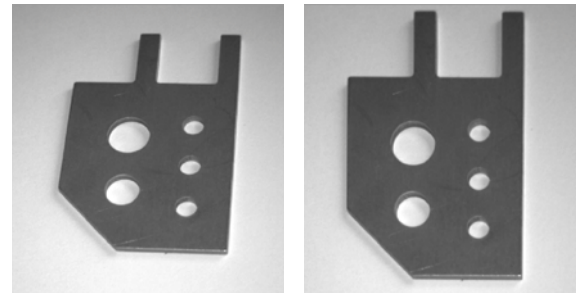


Image distortion correction (right: corrected)

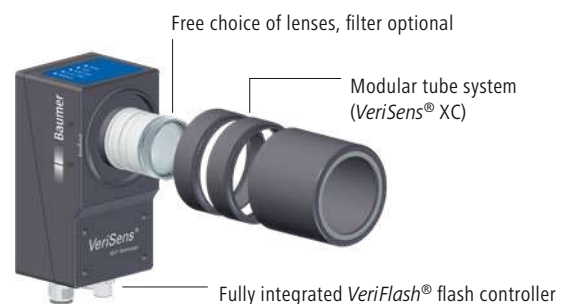
- **Universal Robots (UR) control** – easier than ever before

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.

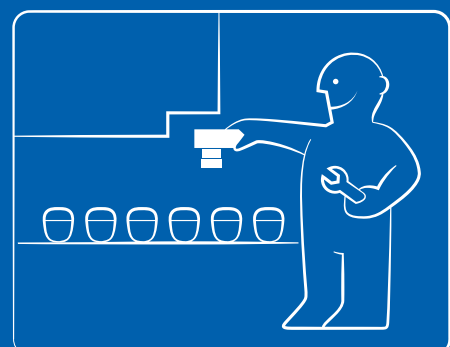


- **Industry-suited design with IP 67 resp. IP 69K protection**

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

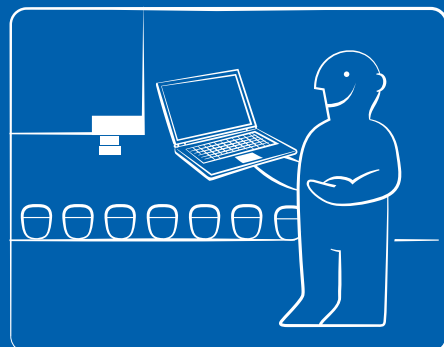
VeriSens® web interface for visualization and monitoring in operation

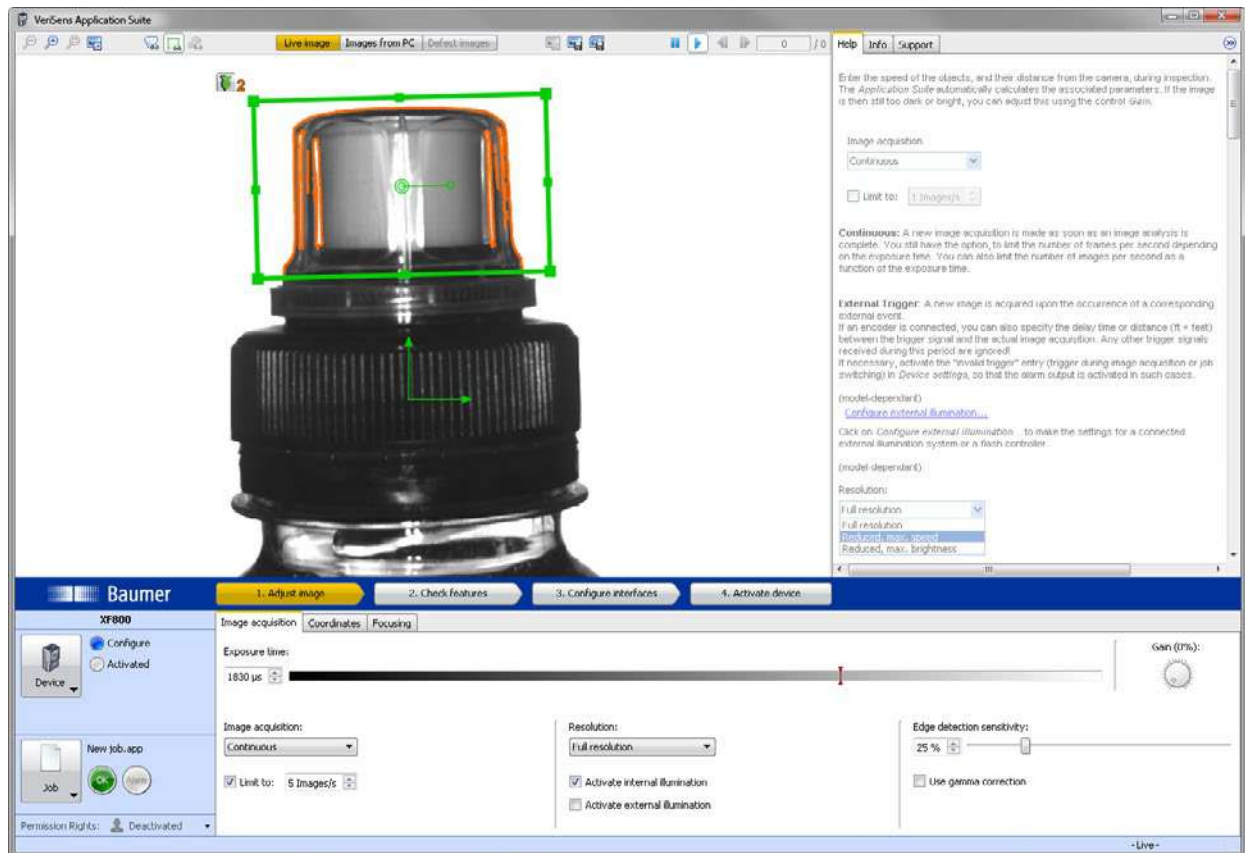
- Visualization using the existing web browser, no plug-ins required
- Functionalities and design configured within few minutes
- Optimized for touch screen operation, optional user levels



TUTORIAL

Absolutely powerful.

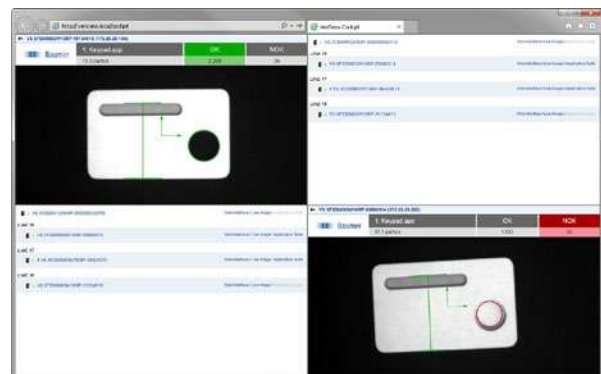




VeriSens® Application Suite

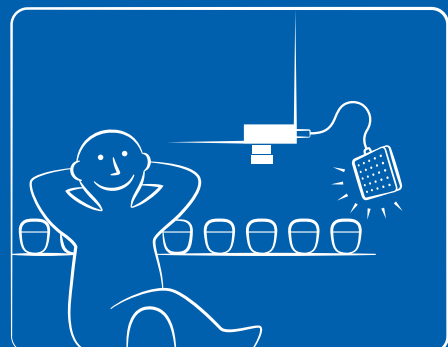


VeriSens® web interface



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





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)





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

Type key (e.g.): VS XF 800 M 03 W 12 I P			Series (XF/XC/CS/ID)	Model with protection class	IP 67 (100/200/510/700/800/900)	IP 69K (105/205)	Sensor (Monochrome/Color)	Resolution [px]	752/640 × 480 (VGA, 1/3" / 1/4")	1280 × 960 (1.2 MP, 1/3")	1600 × 1200 (2 MP, 1/1.8")	LED illumination	White (integrated)	Infrared (integrated)	VeriFlash® flash controller	Lens	8 mm (integrated)	10 mm (integrated)	12 mm (integrated)	16 mm (integrated)	C-mount interface	Interface	Ethernet (TCP/UDP), Industrial Ethernet ¹⁾	Ethernet (TCP/UDP)	Ethernet (TCP/UDP), RS485	Output (PNP/NPN)
			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																					
	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																									
																										

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

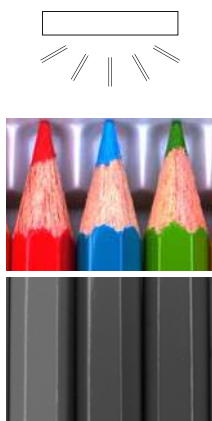
Illumination type	Ideal for	Object	
Incident light Homogenous illumination of rough and matte objects	Presence and position checks, imprint inspection (OCR/OCV), e. g. best-before date		
Dome light Shadow-free illumination, suppression of surface irregularities and reflections	Inspection of severely 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

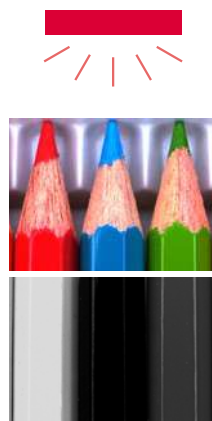
Colored illumination may intensify or suppress defined colors also in monochrome imaging. The contrast created this way helps recognizing relevant features which is decisive for an application-specific and optimally matching solution.

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.

Illumination: White



Red



Blue



Green



In a nutshell.

Why is external illumination so easy with *VeriSens*® vision sensors? Where integrated LED illumination does not provide the required results, *VeriSens*® XC series is the solution. Thanks to *VeriFlash*®, these sensors feature integrated flash controller which is directly connected to the external illumination. Just install and configure during setup using *VeriSens*® Application Suite – and you are ready to start!

In addition to the previously mentioned types of illumination, you have also the option to connect *VeriSens*® to high-end LUMIMAX® Spot5W made by iim AG – which also works with the XF, CS and ID models.

Just attach LUMIMAX® Spot5W to *VeriSens*® at the required distance and inclination angle using the Industrial Light Fix Kit and connect with Y-cable.

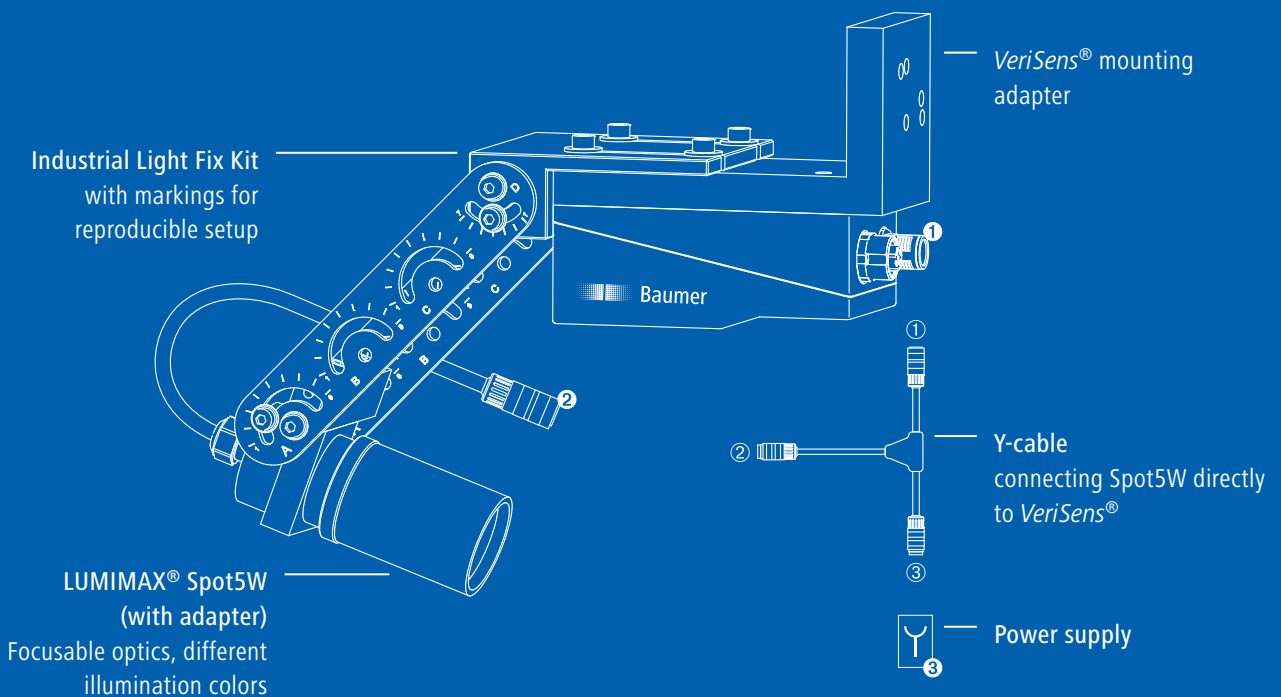
VeriSens® illumination concept with LUMIMAX® Spot5W

A single illumination to match multiple applications

- Adjustable glass optics for spotlight or homogenous illumination field
- Illumination in different colors and with polarization filter
- Flexible fixation at the XC / XF / ID / CS series

Installation and connection

- Easy and space-saving installation
- Angular and position adjustments reproducible by the applied markings
- Y-cable for quick installation and flashing via *VeriSens*® Flash Sync signal



LUMIMAX® Spot5W



LUMIMAX® Spot5W adapter



Industrial Light Fix Kit

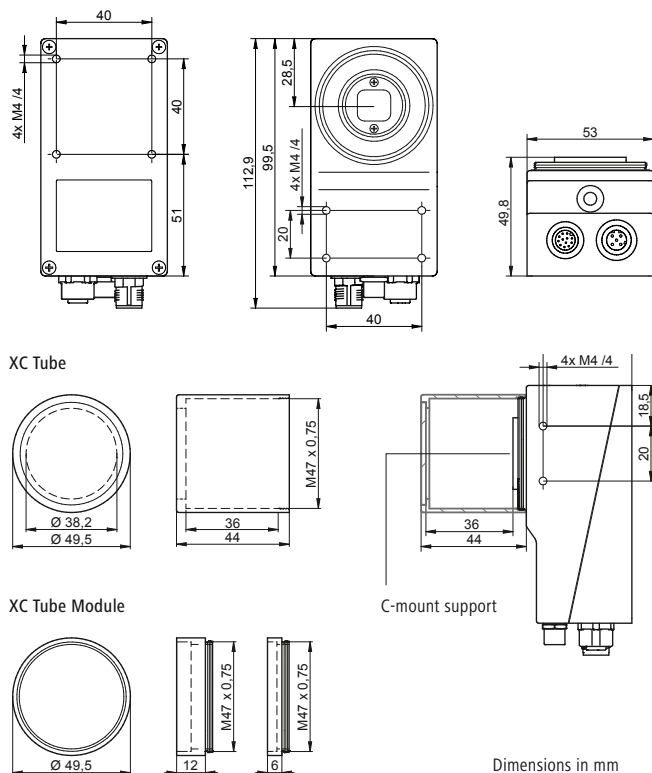


Y-cable

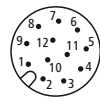
Technical data

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	Max. inspections / s		Max. inspections / s		Max. inspections / s		Max. inspections / s				
High-resolution mode	118 (monochrome) 116 (color)		32 (monochrome) 31 (color)		21 (monochrome)		50 (monochrome) 50 (color)				
High-speed mode* (* limited resolution)	144 (monochrome)		54 (monochrome)		35 (monochrome)		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				¹⁾ XF / XC 700 / 800 / 900, ID510 only ²⁾ CS100 / ID100 only ³⁾ VS xxxxxxxxxxxxRP: 1-3 ⁴⁾ expt CS100 ⁵⁾ VS xxxxxxxxxxxxRP only					
Digital output		Pass/Fail 1-5 ³⁾ , Flash Sync, Alarm, Camera Ready, Output Enable									
Communication		Ethernet (10BASE-T / 100BASE-TX) PROFINET (CC-A) ¹⁾ / Ethernet/IP ^{TM 1)} , TCP / UDP (Ethernet) ⁴⁾ , RS485 ⁵⁾									
Initial setup											
Process interface											
Integr. flash controller		XC700 / XC800 / XC900				XF700 / XF800 / XF900 CS100 ID100 / ID510					
Voltage (permanent)		≡ 12 VDC or ≡ 24 VDC				—					
Voltage (pulsed)		⌊ 24 VDC or ⌊ 48 VDC									
Current (permanent)		I _{max} = 800 mA at ≡ 24 VDC				—					
Current (pulsed)		I _{max} = 4 A at ⌊ 48 VDC									
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)

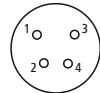


Electrical connection ¹⁾ M12 / 12-pin, A-coded



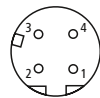
1: Power (+18-30 V DC)	7: OUT3
2: Ground	8: IN3
3: IN1 (Trigger)	9: OUT4 RS485+ ²⁾
4: OUT1	10: IN4
5: IN2	11: IN5
6: OUT2	12: OUT5 RS485- ²⁾

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

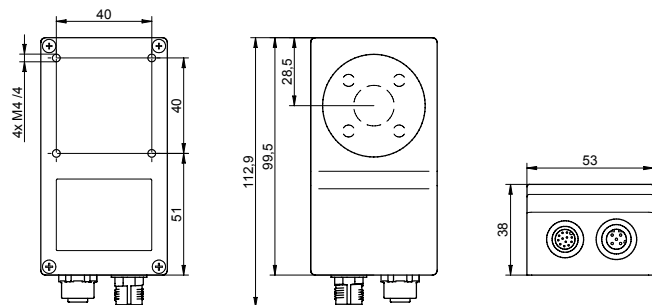
²⁾ RS485: VS xxxxxxxxxxxRP only

³⁾ XC series only

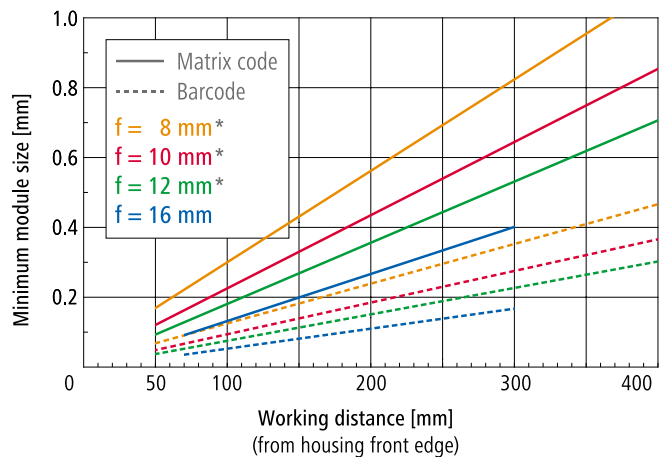
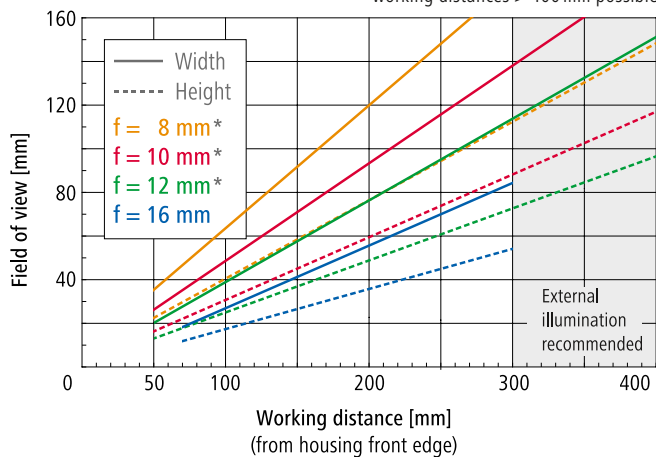
⁴⁾ voltage outputs configurable by software

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 <i>VeriSens</i> [®] , 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)



Connecting cables⁴⁾ 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

Lens accessories (optional)

11088325	XC Tube, M47, length 44 mm (scope of delivery <i>VeriSens</i> [®] XC)
11115649	XC Tube Module, M47, 6 mm
11089149	XC Tube Module, M47, 12 mm
11010529	Close-up ring set 6-part, 0.5 / 1 / 5 / 10 / 20 / 40 mm
11092000	Pentax [®] polarization filter, linear: filter thread 27 mm ¹⁾
11175428	filter thread 30.5 mm ²⁾
11167713	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

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 <i>VeriSens</i> [®] XF / XC / CS / ID series	

⁵⁾ *VeriSens*[®] XC series only

Set of mounting brackets

11092203	VB Fix Kit FLDR-i90B, small (57 mm)	for LED ring light FLDR-i90B to <i>VeriSens</i> [®] XC series
11092204	VB Fix Kit FLDR-i90B, large (93 mm)	
11136136	VB Fix Kit RONDOLX, small (57 mm)	for LED ring light ZVI-RONDOLX to <i>VeriSens</i> [®] XC series
11136139	VB Fix Kit RONDOLX, large (93 mm)	
11076264	ZVI-VB Fix Kit Industrial Light	for illumination (e. g. Spot 5W) to <i>VeriSens</i> [®] 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 ³⁾	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, 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
With M16/12-pin connector ⁷⁾						
11175031	ZVI-LED Spot5WFL-W/SPS-220	LED spot light, white	15	ø 30	ø 36	75–92
11175034	ZVI-LED Spot5WFL-R/SPS-220	LED spot light, red	15	ø 30	ø 36	75–92
11175035	ZVI-LED Spot5WFL-IR850/SPS-220	LED spot light, IR 850 nm	15	ø 30	ø 36	75–92
11175036	ZVI-LED Spot5WFL-B/SPS-220	LED spot light, blue	15	ø 30	ø 36	75–92

⁴⁾ VeriSens® XC series only

⁵⁾ supplier: Falcon Illumination MV GmbH & Co. KG

⁶⁾ supplier: Büchner Lichtsysteme GmbH

⁷⁾ supplier: iiM AG

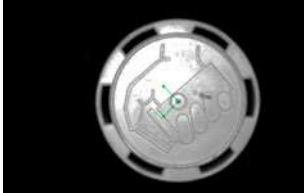
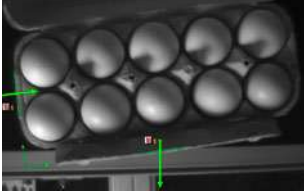
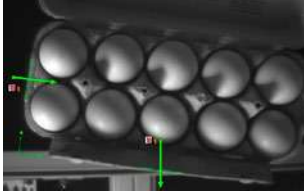
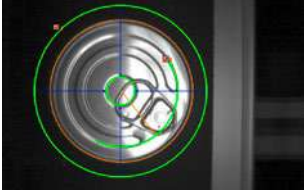
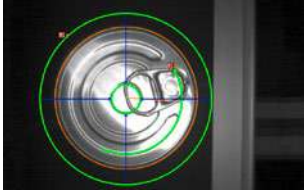
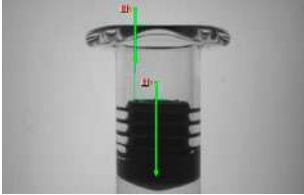
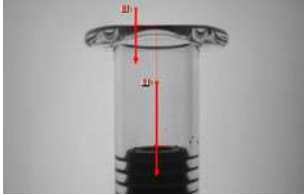
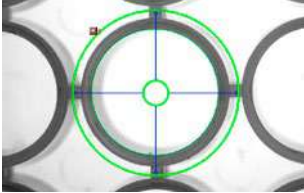
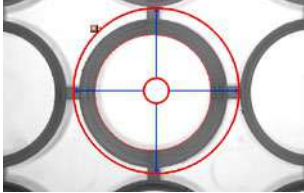
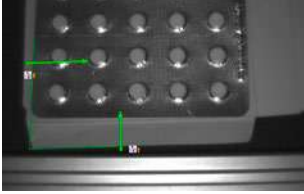
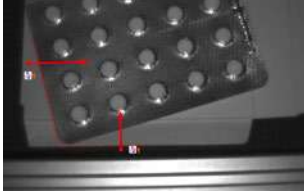
⁸⁾ connector directly on the device

Illumination accessories (optional)

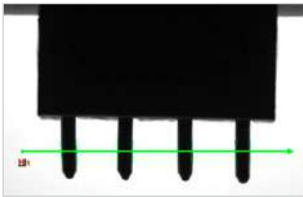
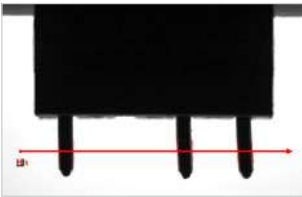
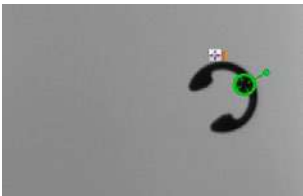
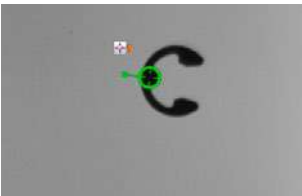
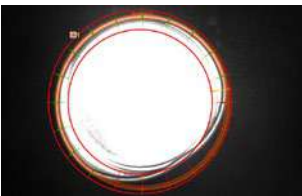
11167410	Polarization filter for FLDR-i90B	11167411	Support polarization filter for für FLDR-i90B	11167413	Diffusor A1421 for FLDR-i90B-DP
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VeriSens® feature checks: overview.

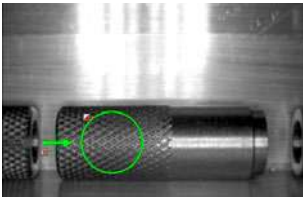
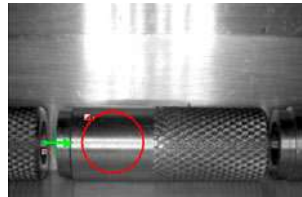
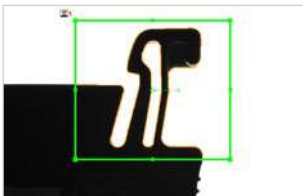
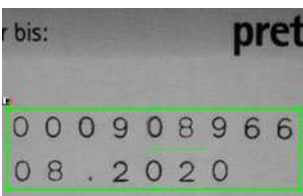
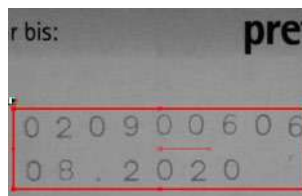
VeriSens® vision sensors provide 23 different feature checks. The device-specific feature set is fully included with the purchase. Up to 32 checks can be performed all at once – with a single image acquisition – for comprehensive and efficient quality control.

				Models					
				XF700 / XC700 "	XF800 / XC800 "	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°			
	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.			■	■	■			

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.			☒	☒	☒			

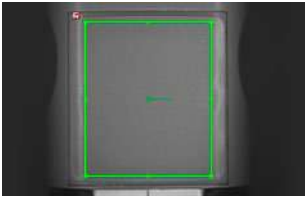
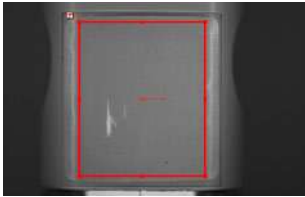
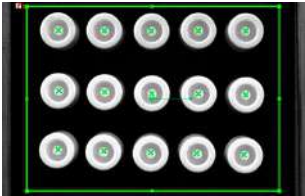
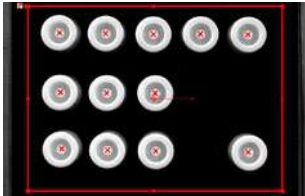
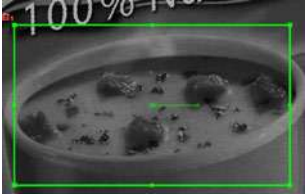
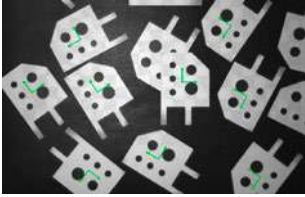
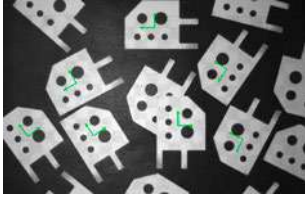
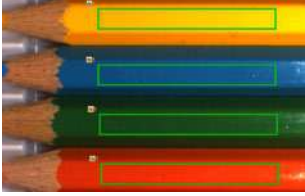
Feature comparison

	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.			☒	☒	☒			

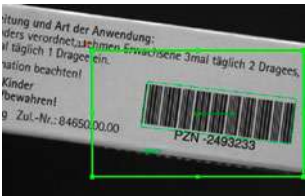
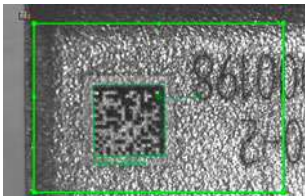
Models

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.

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
Process interface for: Data output Universal Robots (<i>URCap</i>)
Universal Robots+ Certified (UR+)
Ethernet (TCP/IP, UDP) Industrial Ethernet (PROFINET, EtherNet/IP™) RS485
Baumer <i>FEX</i> ® image processor
<i>ColorFEX</i> ® intelligent 3D color assistant (device dependent)
User administration / Password protection
Coordinate conversion Automated coordinate alignment via <i>SmartGrid</i>
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.

Models	XF700 / XF800	XC700 / XC800	XF900	XC900	CS100	ID510	ID100
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■ 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
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Romania
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Slovakia
Slovenia
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Sweden
Switzerland
Turkey
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