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 2,300 employees in 38 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, customised 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 form 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

inVISION **TOP INNOVATION 2016**

Vision*Systems* DESIGN **2015 Innovators Awards SILVER**

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.

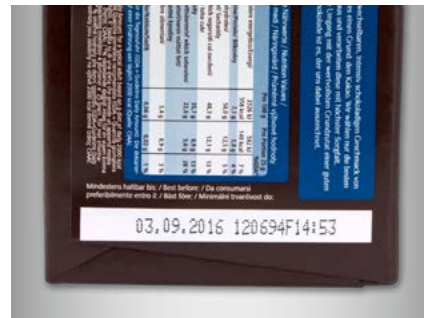Every industry has its particular needs. We would like to give you a brief overview of how and where our detection and inspection technology is applied.

Food and beverage industry
- Checking best-before dates
- Presence and position of straws on primary packaging
- Position of safety closures
- and much 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 much more

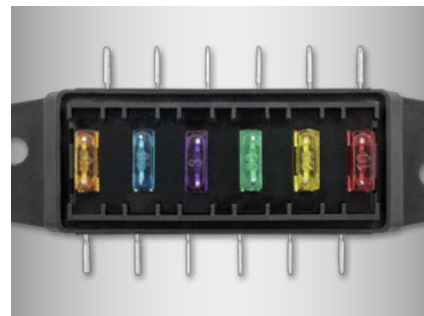Example:
Inspection of forward cap alignment
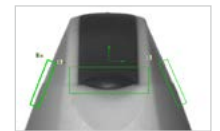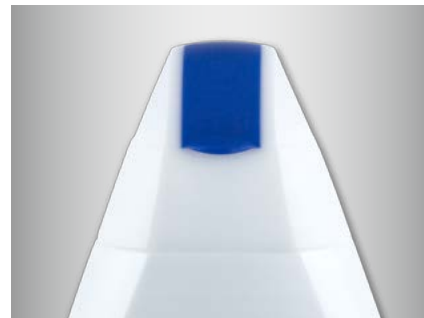
OK
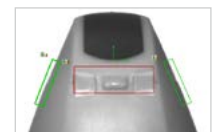
NOK

Automotive industry / electronics
- Assembly and surface mounting monitoring
- Presence and alignment check of pins
- Detection of overmolding, injection molding errors, scratches, etc.
- and much 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 much 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.

A clever mind on top
The eye requires intelligence.

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

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.

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® for obtaining results or monitoring targets – quickly and reliably using 5 digital outputs and Industrial Ethernet.

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.

■ ***VeriFlash®* – fully integrated flash controller for flexibility plus simplicity**
Particularly in complex applications, vision sensors require maximum flexibility in the selection of lens and illumination. And besides standard C-mount interface for interchangeable lenses, capabilities of powering external illumination are a must. With *VeriFlash®*, the *VeriSens®* XC series provides some more decisive added value: It is the first vision sensor platform with self-generated 48 V / 4 A flash pulse. Hence, expensive external flash controllers and the entailed programming effort belong to the past.

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

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

Color FEX® 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.
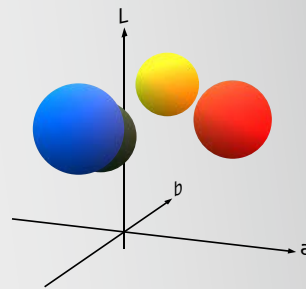
Easy to use.

- **_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.
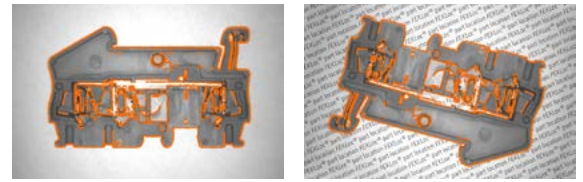
Virtual object alignment using _FEXLoc®_
left: object contours
right: object turned in front of severe background structures

360°

- **_VeriSens®_ XC Tube – Modular tube system**
  The modular tube system _VeriSens®_ XC Tube optimally protects
  interchangeable lenses – high IP 67 rating against dust and
  water is even ensured for long telephoto lenses. The smart
  solution involves a variable number of intermediate rings and
  this way it can quickly be adapted inside the machine. By keep-
  ing existing parts this solution is also very cost-efficient.

VeriSens® XC Tube system

Free choice of lenses
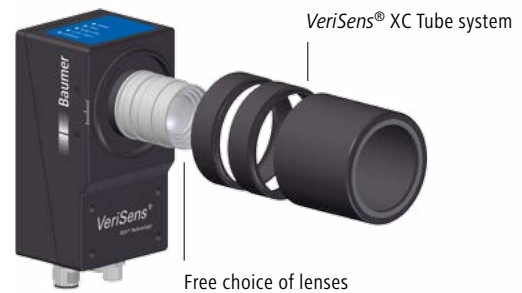
- **Industry-suited design with IP 67 resp. IP 69K protection**
  VeriSens® vision sensors come in robust aluminium respectively
  stainless steel housing that is up to harsh industrial environ-
  ments. _VeriSens®_ XC even provides modular lens protection for
  interchangeable lenses – since it can be appropriately configured
  to match the particular lens length.

Integrated PROFINET / EtherNet/IP™ support

VeriSens® models of the XF700 / 800, XC700 / 800 and ID510 series integrate Industrial Ethernet [1]
(PROFINET / EtherNet/IP™) to enable real-time process control via Ethernet which may reduce and
unify cabling topology between components according to the application requirements.

[1] EtherNet/IP™ after software update Q2/2017

Easy
to configure.
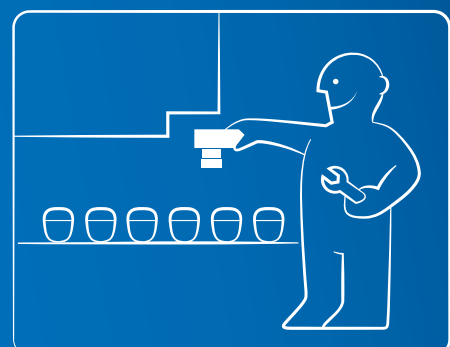
One configuration software to fit all *VeriSens®*.

VeriSens® Application Suite – convenient configuration of any *VeriSens®* vision sensor

Thanks to *VeriSens® Application Suite*, the cross-series unified configuration software, 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.

VeriSens® optical character recognition (OCR) offers another special feature: it works without prior font training and can be set up with just a few clicks.
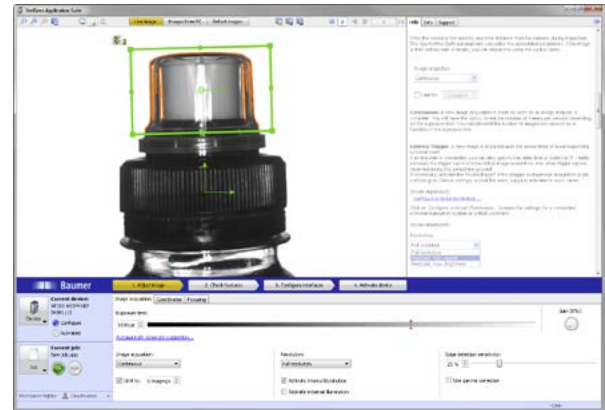
VeriSens® web interface – configurable user interface for operation

A configurable human-machine interface is already integrated 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, layout) and therefore will be operational in just a few minutes.

The *MultiViewer* feature [1] included in version v2.7.0 and up 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.
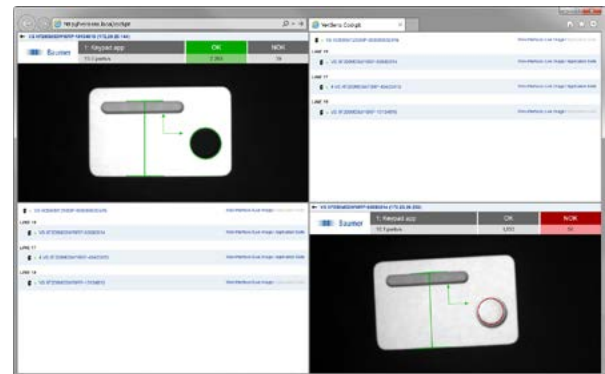
[1] presently for ID510 and XF / XC 700 / 800

VeriSens® software at a glance

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

Visualization in the VeriSens® web interface
- 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

Absolutely powerful.
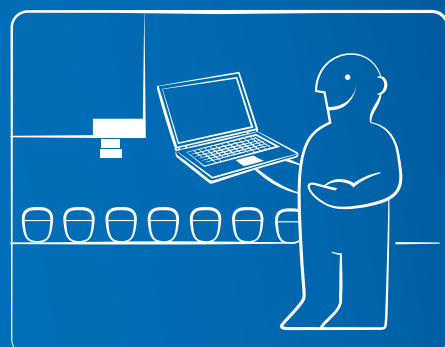
On stand-by for test – Product simulators provide clarity before purchasing
Start right away – no purchase neccessary. The software is available for download free of charge at www.baumer.com/verisens/appsuite.

Software includes product 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.
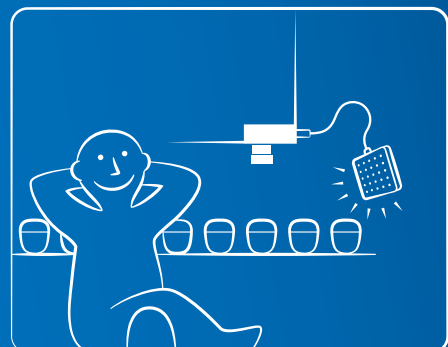
Download *VeriSens® Application Suite* including web interface
www.baumer.com/verisens/appsuite

Baumer
Passion for Sensors

Test it!

VeriSens® Application Suite:
www.baumer.com/verisens/appsuite

Absolutely ingenious.

XF series: All aboard!

XF stands for "e**X**tended **F**unctionality" – the series includes everything required to immediately enter the world of image processing. The versatile scope of functionalities ensures maximum flexibility of up to 20 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.

All 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.

■ **Models XF700 / XF800**
New hardware generation to double productivity, with enhanced identification algorithms (XF800) and integrated Industrial Ethernet [1] (PROFINET and EtherNet/IP™)

■ **Models XF205 / XF800**
Extended identification functionalities: 1D/2D code identification, reading of plain text (OCR) without requiring previous font training, print quality evaluation (OCV)

■ **Models XF105 / XF205**
Stainless steel housings in washdown design with IP 69K protection for use in food & beverage and the pharmaceutical industries

XF series

■ Image evaluation: monochrome
■ Includes all *VeriSens*® feature checks (up to 20)
■ Integrated optics, 10 mm, 12 mm or 16 mm
■ Integrated illumination, white or infrared
■ Housing: aluminum (IP 67) or
  stainless steel (IP 69K)

[1] EtherNet/IP™ after software update Q2/2017

XC series: Maximum flexibility.

XC is an abbreviation of "e**X**tended Functionality with **C**-mount" – the series for maximum functionality and versatility. Advanced users benefit from up to 20 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 from at up to 48 V and 4 A. *Color FEX*®, the intelligent and double-award-winning 3D color assistant, enables intuitive and quick color setup in 3D. The *VeriSens*® XC Tube System is the reliable modular lens protection adapting to the length of the lens.

■ **Models XC700 / XC800 (monochrome)**
New hardware generation to double productivity, with enhanced identification algorithms (XC800) and integrated Industrial Ethernet [1] (PROFINET and EtherNet/IP™)

■ **Models XC100 / XC200 (color)**
Color FEX® color assistant for convenient and reliable color setup, XC200 with additional identification functions: 1D / 2D code identification, reading of plain text (OCR) without requiring previous font training, printing quality evaluation (OCV) – also in color

XC series

- ■ Image evaluation: monochrome or color
- ■ Includes all *VeriSens*® feature checks (up to 20)
- ■ C-mount and free choice of lenses
- ■ *VeriFlash*® flash controller
- ■ Industry-suited aluminium housing (IP 67)

[1] EtherNet/IP™ after software update Q2/2017

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** ("**C**heck & **S**ort") 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** ("**ID**entification") features reliable text and code readers:

- **Model ID510 (text and code reader)**
  New hardware generation to double productivity, with enhanced identification algorithms and integrated Industrial Ethernet [1] (PROFINET and EtherNet/IP™), 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)

[1] EtherNet/IP™ after software update Q2/2017

VeriSens® vision sensors product overview

Type key (e.g.): VS XF 800 M 03 W 12 I P	Series (XF/XC/CS/ID)	IP67 (100/200/510/700/800)	IP 69K (105/205)	Sensor (Monochrome/Color)	752/640×480 (VGA, 1/3")	1280×960 (1.2 MP, 1/4")	1600×1200 (2 MP, 1/1.8")	White (integrated)	infrared (integrated)	VeriFlash® flash controller	10 mm (integrated)	12 mm (integrated)	16 mm (integrated)	C-mount interface	Industrial Ethernet [1]	Ethernet (TCP/UDP)	Ethernet (TCP/UDP), RS485	Output (PNP/NPN)
	XF	800		M	03	12	20	W	I	X	10	12	16	00	I	E	R	P

XF series [2]

Article No.	Type name	Series	IP67	IP69K	Sensor	752/640×480	1280×960	1600×1200	White	infrared	VeriFlash	10 mm	12 mm	16 mm	C-mount	Ind. Ethernet	Eth. (TCP/UDP)	Eth. RS485	Output
11173091	VS XF700M03W12IP	XF	■		M	■			■				■			■			P
11173090	VS XF700M03W16IP		■			■			■					■		■			
11173089	VS XF700M03I12IP		■			■				■			■			■			
11173088	VS XF700M03I16IP		■			■				■				■		■			
11162177	VS XF800M03W12IP		■			■			■				■			■			
11162175	VS XF800M03W16IP		■			■			■					■		■			
11173087	VS XF800M03I12IP		■			■				■			■			■			
11173086	VS XF800M03I16IP		■			■				■				■		■			
11127070	VS XF105M03W10EP	XF		■	M	■			■			■					■		P
11127048	VS XF105M03I10EP			■		■				■		■					■		
11127047	VS XF105M03I16EP			■		■				■				■			■		
11127049	VS XF205M03W10EP			■		■			■			■					■		
11128398	VS XF205M03W16EP			■		■			■					■			■		
11128399	VS XF205M03I10EP			■		■				■		■					■		

XC series [2]

Article No.	Type name	Series	IP67	IP69K	Sensor	752/640×480	1280×960	1600×1200	White	infrared	VeriFlash	10 mm	12 mm	16 mm	C-mount	Ind. Ethernet	Eth. (TCP/UDP)	Eth. RS485	Output
11173085	VS XC700M03X00IP	XC	■		M	■					■				■	■			P
11173084	VS XC700M12X00IP		■				■				■				■	■			
11173083	VS XC700M20X00IP		■					■			■				■	■			
11166806	VS XC800M03X00IP		■			■					■				■	■			
11166807	VS XC800M12X00IP		■				■				■				■	■			
11166808	VS XC800M20X00IP		■					■			■				■	■			
11116656	VS XC100C03X00EP	XC	■		C	■					■				■		■		P
11116724	VS XC100C12X00EP		■				■				■				■		■		
11128427	VS XC100C03X00RP		■			■					■				■			■	
11128428	VS XC100C12X00RP		■				■				■				■			■	
11152187	VS XC200C03X00RP		■			■					■							■	
11152186	VS XC200C12X00RP		■				■				■							■	

CS series [2]

Article No.	Type name	Series	IP67	IP69K	Sensor	752/640×480	1280×960	1600×1200	White	infrared	VeriFlash	10 mm	12 mm	16 mm	C-mount	Ind. Ethernet	Eth. (TCP/UDP)	Eth. RS485	Output
11048500	VS CS100M03W10EP	CS	■		M	■			■			■					■		P
11076261	VS CS100M03W16EP		■			■			■					■			■		
11089900	VS CS100M03I10EP		■			■				■		■					■		
11093026	VS CS100M03I16EP		■			■				■				■			■		

ID series [2]

Article No.	Type name	Series	IP67	IP69K	Sensor	752/640×480	1280×960	1600×1200	White	infrared	VeriFlash	10 mm	12 mm	16 mm	C-mount	Ind. Ethernet	Eth. (TCP/UDP)	Eth. RS485	Output
11048489	VS ID100M03W10RP	ID	■		M	■			■			■						■	P
11076263	VS ID100M03W16RP		■			■			■					■				■	
11173082	VS ID510M03W12IP		■			■			■				■			■			
11173081	VS ID510M03I12IP		■			■				■			■			■			

[1] PROFINET / Ethernet/IP™ (EtherNet/IP™ after software update Q2/2017) [2] Additional devices: www.baumer.com/verisens

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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		
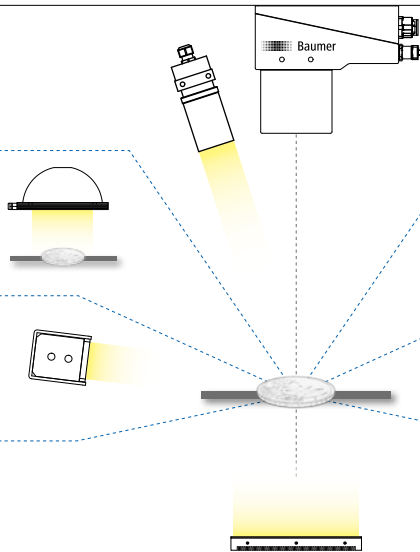
Colored illumination

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.
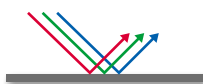
Illumination: White   Blue   Green   Red
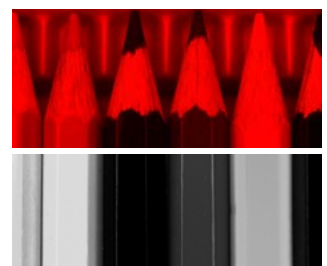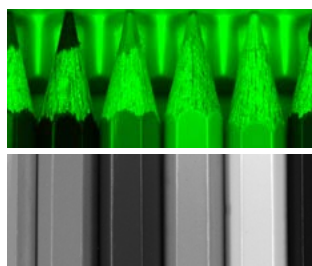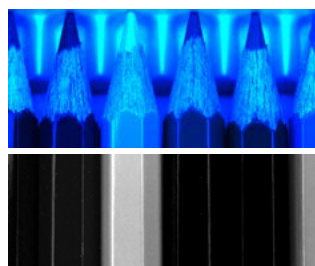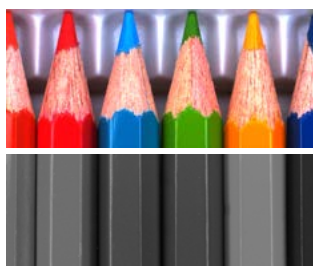
In a nutshell…

Why is external illumination so easy with *VeriSens*® vision sensors? Where integrated LED illumination does not provide the required results, the *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're 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

Industrial Light Fix Kit
with markings for reproducible setup

Baumer

LUMIMAX® Spot5W (with adapter)
Focusable optics, different illumination colors

Y-cable
connecting Spot5W directly to *VeriSens*®

Power supply
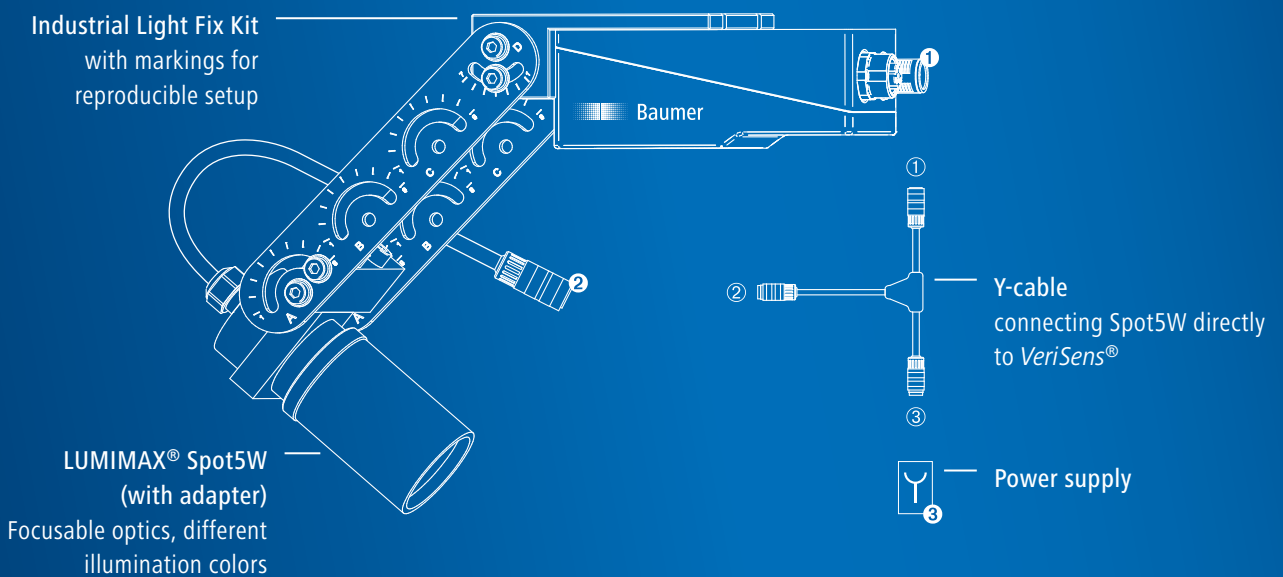
LUMIMAX® Spot5W   LUMIMAX® Spot5W adapter   Industrial Light Fix Kit   Y-cable

Technical data

General data	XC series			XF series | CS series | ID series		
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)		
LED illumination	Fully integrated *VeriFlash*® flash controller for external illumination			White (LED class: Risk group 1 low risk, EN 62471:2008) Infrared (LED class: free group (860 nm) risk-free, EN 62471:2008)		
Lens (integrated)	Interchangeable lens (C-mount)			f = 10 mm	f = 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, monochrome)	Max. inspections / s 50 | 118 [1] 100 | 144 [1]	Max. inspections / s 12 | 32 [1] 25 | 54 [1]	Max. inspections / s 7 | 21 [1] 15 | 35 [1]	Max. inspections / s 50 100 (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	XC series	XF series | CS series | ID series
Power supply	⎓ 18 … 30 V DC	
Power consumption	Typical 5 W | 8 W [1] (I_{max} = 1 A at 24 V), without illumination	Typ. 5 W | 8 W [1] (I_{max} = 1 A at 24 V)
Inputs	8 … 30 V DC	
Outputs	PNP 100 mA	
Digital input	Trigger, Job selection, External teach-in, Encoders (CH-A, CH-B) 500 kHz	[1] XF700 / 800, XC700 / 800, ID510 only
Digital output	Pass / Fail 1-5 [2], Flash Sync, Alarm, Camera Ready, Output Enable	[2] VS xxxxxxxxxxxRP: 1-3
Communication Initial setup Process interface	Ethernet (10BASE-T / 100BASE-TX) PROFINET (CC-A) [1] / Ethernet/IP™ [1,3], TCP/UDP (Ethernet) [4], RS485 [5]	[3] after software update Q2/2017 [4] exept CS100 [5] VS xxxxxxxxxxxRP only

Integr. flash controller	XC series	XF series | CS series | ID series
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	XC series	XF series | CS series | ID series
Temperature	Operating temperature: +5 … +50 °C @ measurement point, Storage temperature: -20 … +70 °C	
Humidity	0 … 90 % (non-condensing)	
Protection class	IP 67 (XC series: with tube)	IP 67 or IP 69K (model-specific)
Vibration load	IEC 60068-2-6, IEC 60068-2-64	
Mech. shock resistance	EN 60068-2-27	

Mechanical data	XC series	XF series | CS series | ID series
Width × Height × Depth	53 mm × 99.5 mm × 49.8 mm (without lens / tube)	53 mm × 99.5 mm (IP 69K: 107.5 mm) × 38 mm
Material	Housing: aluminum Cover glass tube: PMMA	Housing: aluminum (IP 69K: stainless steel 1.4404) Cover glass: PMMA [6]
Weight (approx.)	300 g (without lens / tube)	250 g (IP 69K: 700 g)

Code types / OCR	Model: XC800 / 200	Models: XF800 / 205 | 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): Base code + variants 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 / 105, XF800 / 205, 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 / 200, XF800 / 205, ID510 only

Dimension drawing (XC series)

XC Tube

Ø 38,2
Ø 49,5
36
44
M47 x 0,75

C-mount support

2x M4 / 4

XC Tube Module

Ø 49,5
12
M47 x 0,75
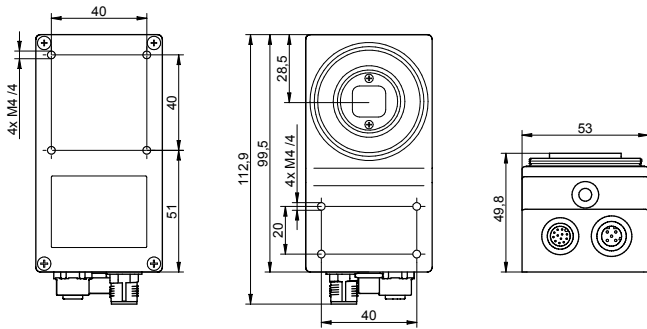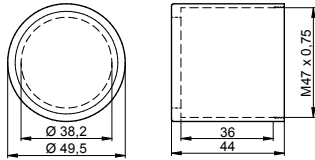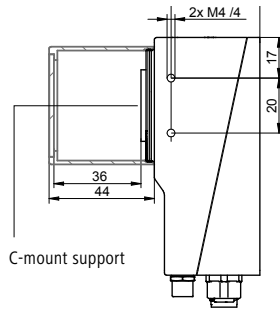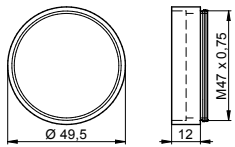
Dimensions in mm

Electrical connection [1] M12 / 12-pin
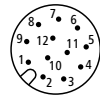
1: Power (+18-30 V DC)	7: OUT3
2: Ground	8: IN3
3: IN1 (Trigger)	9: OUT4 | RS485+ [2]
4: OUT1	10: IN4
5: IN2	11: IN5
6: OUT2	12: OUT5 | RS485– [2]

Electrical connection illumination [1] [3] M8 / 4-pin [4]
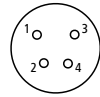
1: +24 V or +48 V Flash
2: +12 V or +24 V Flash
3: Ground
4: Flash Sync [5] PNP 100 mA

Ethernet connection [1] M12 / 4-pin
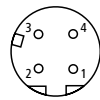
1: TD+
2: RD+
3: TD–
4: RD–

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

Dimension drawing (XF / CS / ID series)
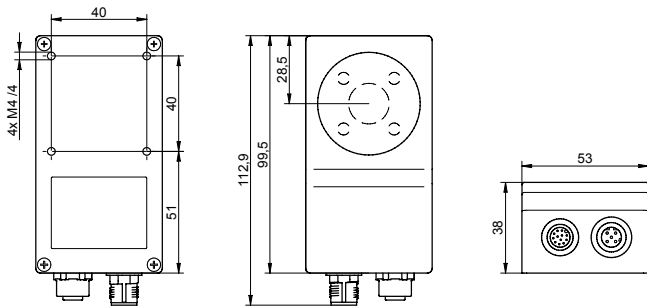
Dimension drawing (XF series in IP 69K)

[6] working distances > 400 mm possible

Field of view [mm] vs Working distance [mm] (from housing front edge)

Width
Height
f = 10 mm [6]
f = 12 mm [6]
f = 16 mm

External illumination recommended

Minimum module size [mm] vs Working distance [mm] (from housing front edge)

Matrix code
Barcode
f = 10 mm [6]
f = 12 mm [6]
f = 16 mm

CE   RoHS COMPLIANT
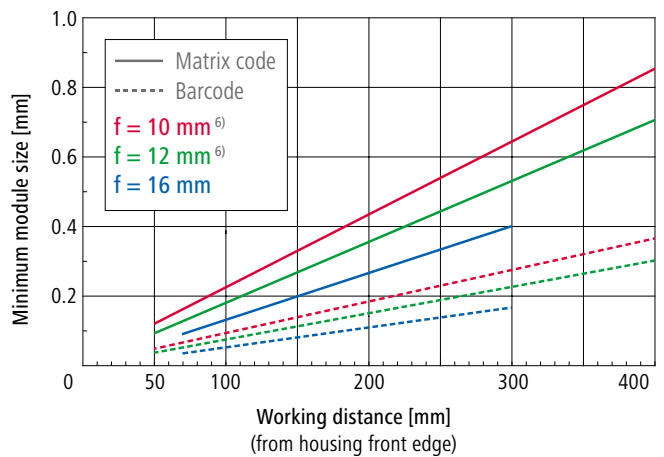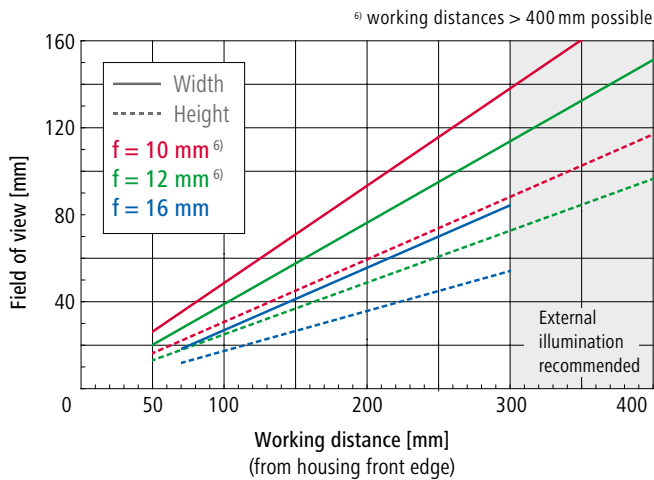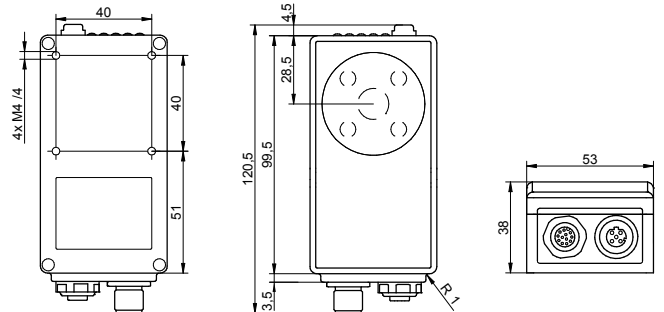
System design

Lab setup accessories (optional)

11048083	Connecting cables *VeriSens®*, 2 m, ready-for-use DC socket
11079750	Power supply 24 V / 1 A, plugs for EU, US, UK, AU, KR
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
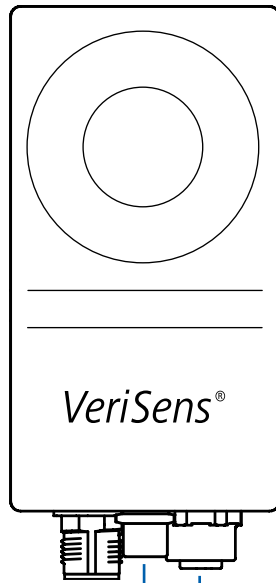
Lens accessories (optional)

11088325	XC Tube, M47, length 44 mm (scope of delivery *VeriSens®* XC)
11089149	XC Tube Module, M47, tube extension 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

VeriSens®

Connecting cables [2]
shielded, to free cable end

11048452	2 m
11043780	5 m
11048455	10 m
11048456	2 m
11043785	5 m
11048458	10 m
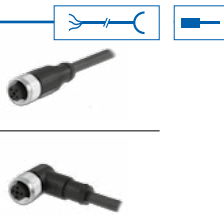
[2] suitable for drag chains

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 ([2] XC series only)

11088882	1.5 m	Extension cable shielded, male conn. straight M8, to female conn. straight M8 [2]
11136134	0.3 m	Extension cable shielded, male conn. straight M8, to female conn. straight M8 [2]
11089179	0.3 m	Adapter cable, male connector straight M8, to JST SMP-03V (3-pin) [2]
11089178	0.3 m	Adapter cable, male connector straight M8, to JST SMP-02V (2-pin) [2]
10163693	2 m	Adapter cable, free cable end, to female connector straight M8 [2]
11175008	0,15 m	Adapter cable, ZVI-LUMIMAX® T1 at *VeriSens®* XF / XC / CS / ID series

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 [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	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	0.45	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] incompatible to *VeriSens*® with sensor format 1/1.8" (VS XC700M20X00IP, VS XC800M20X00IP)

Externe Beleuchtungsmodule [3]

Article No.	Type name	Product description	Cable [cm]	Illuminated area [mm]	Outer dimensions [mm]	Height [mm]
Cable with M8 / 4-pin connector [3,4]						
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 [3,5] [7]						
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 [6]						
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

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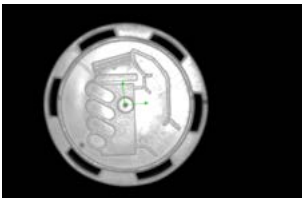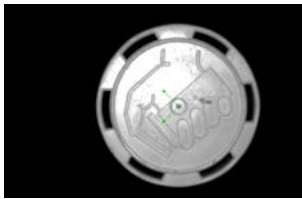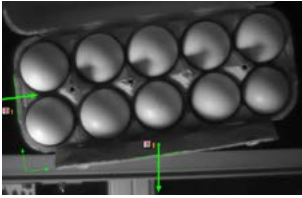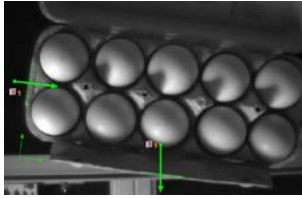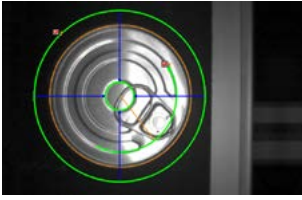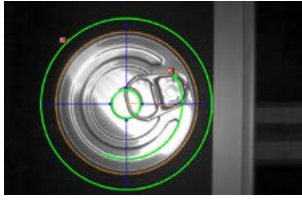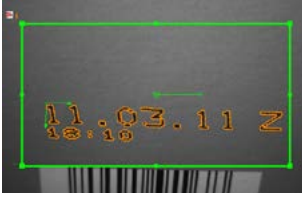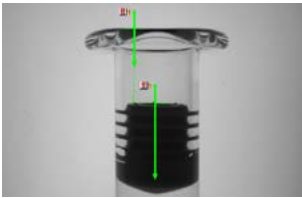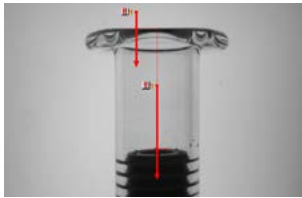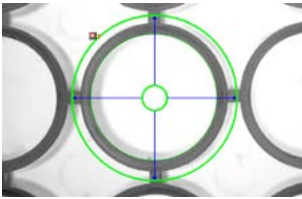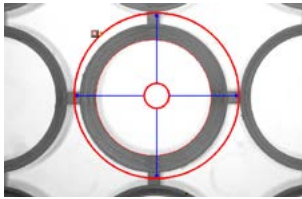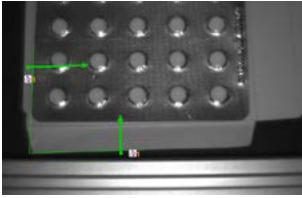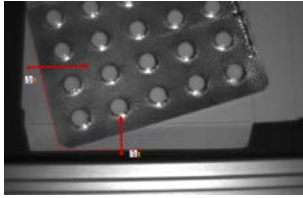
Illumination accessories (optional)

11167410	Polarization filter for FLDR-i90B	11167411	Support polarization filter for für FLDR-i90B	11167413	Diffusor A1 421 for FLDR-i90B-DP

VeriSens® feature checks: overview.

Purchasing a *VeriSens®* vision sensor includes a broad selection of product-specific tools for feature checks that can be immediately accesse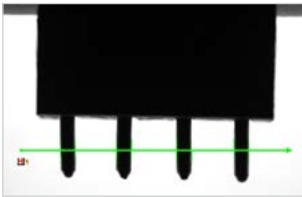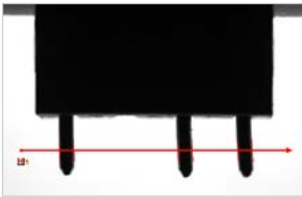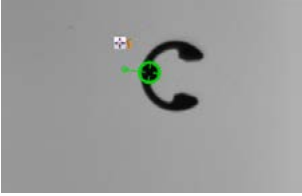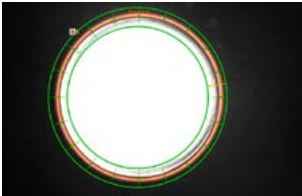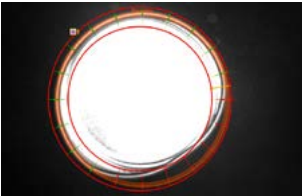d. *VeriSens®* vision sensors provide up to 255 jobs, each comprising up to 32 different feature checks combined with up to 20 different tools.
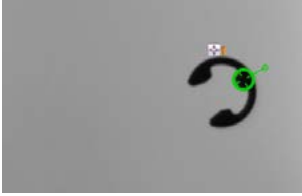
	Models	XC700[1]	XC800[1]	XF700 / XF105	XF800 / XF205	CS100	ID510	ID100
Part location								
Part location on contours (*FEXLoc®*) Determines the location and rotational position of a part based on its contours. All subsequent feature checks are aligned according to the determined position.		360°	360°	360°	360°	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.		■	■	■	■			
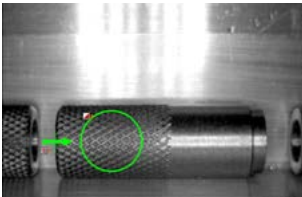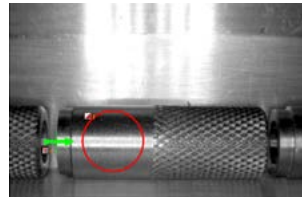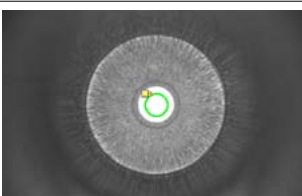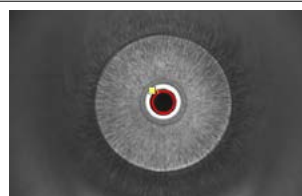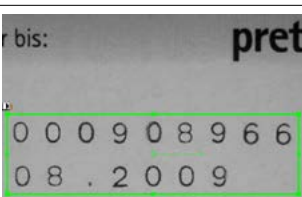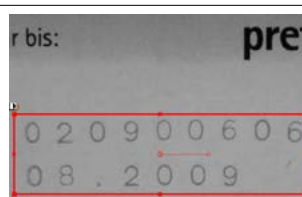
	Models	XC700[1]	XC800[1]	XF700 / XF105	XF800 / XF205	CS100	ID510	ID100

Geometry

Count edges
Determines the number of edges along a tracing ray.

| | | ■ | ■ | ■ | ■ | | | |

Point position
Determines the coordinates of one point.

| | | ■ | ■ | ■ | ■ | | | |

Edge characteristics
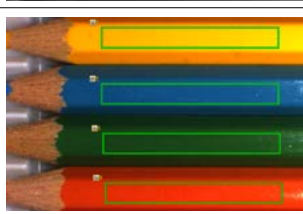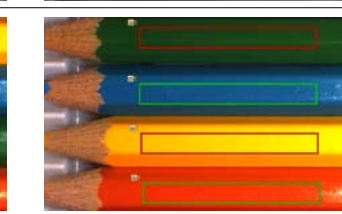Compares the distances of edges along a tracing ray.

| | | ■ | ■ | ■ | ■ | | | |
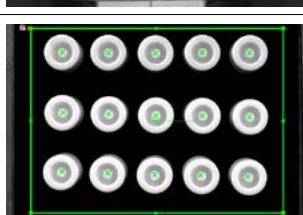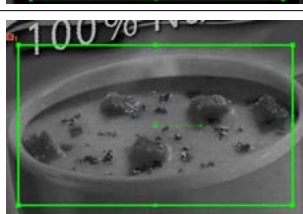
Feature comparison (monochrome / color)

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.

| | | ■ | ■ | ■ | ■ | ■ | ■ | |

Brightness
Determines the average brightness in a working area.

| | | ■ M | ■ M | ■ | ■ | ■ | | |

Contrast
Calculates the contrast in a working area.

| | | ■ M | ■ M | ■ | ■ | | | |

Color identification
Identifies color within the operating range and its deviation from the reference color.

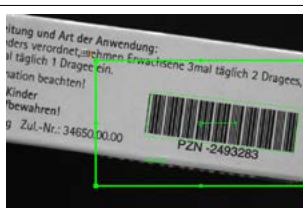| | | ■ C | ■ C | | | | | |

Feature comparison (monochrome / color)

		Models	XC700[1]	XC800[1]	XF700 / XF105	XF800 / XF205	CS100	ID510	ID100
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.			■	■	■	■			
Color positioning Verifies presence of defined colors within defined image sections.			■ C	■ C					

Identification (monochrome / color)

		Models	XC700[1]	XC800[1]	XF700 / XF105	XF800 / XF205	CS100	ID510	ID100
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" / "C" corresponds to "color sensors only (XC100 / 200)"

Additional features to solve your application.

	XC700[1]	XC800[1]	XF700/XF105	XF800/XF205	CS100	ID510	ID100
Image acquisition							
Optics: 10 mm | 12 mm | 16 mm | C-mount	-|-|-|■	-|-|-|■	■|■|■|-	■|■|■|-	■|-|■|-	-|■|-|-	■|-|■|-
Illumination: White | Infrared | VeriFlash® (integrated flash controller) (infrared: integrated daylight filter 780 nm)	-|-|■	-|-|■	■|■|-	■|■|-	■|■|-	■|■|-	■|■|-
Configurable web interface (live image, job switching, retrieving defect images)	■	■	■	■	■	■	■
Save images via FTP	■	■	■	■	■	■	■
Configuration via Ethernet	■	■	■	■	■	■	■
Functionalities							
Process linkage: Digital I/Os	5 / 3-5	5 / 3-5	5 / 3-5	5 / 3-5	5 / 5	5 / 3-5	5 / 3
Providing partial results via digital I/Os at different times	■	■	■	■			
Process interface for data output (Industrial Ethernet, Ethernet (TCP / UDP), RS485)	■	■	■	■		■	■[1]
Integrated Industrial Ethernet: PROFINET | EtherNet/IP™	■|■[2]	■|■[2]	■|■[2,3]	■|■[2,3]	-|-	■|■	-|-
Baumer FEX® image processor	■	■	■	■	■	■	■
Color FEX® intelligent 3D color assistant (model-specific)	XC100	XC200					
User administration / Password protection	■	■	■	■		■	■
Coordinate conversion	■	■	■	■			
Process integration							
Flexible result conjunction	■	■	■	■			
Result conjunction with integrated digital inputs	■	■	■	■			
Identification functions: Code | Text	-|-	■|■	-|-	■|■	-|-	■|■	■|-
Test functionality	■	■	■	■	■	■	■
High-speed mode (monochrome only)	■	■	■	■			
Gamma correction	■	■	■	■			

[1] non-configurable, e. g. PROFINET   [2] EtherNet/IP™ after software update Q2/2017   [3] XF700 / XF800 only

■ **Wide range of interfaces**
Up to 5 digital inputs and outputs, process interface (depending on model) 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 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 Funktion**
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.

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Egypt
Morocco
Reunion
South Africa

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Canada
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Venezuela

Asia
Bahrain
China
India
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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
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Italy
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