

## Smart Camera Series LSIS 400*i*

Fast and simple quality assurance through innovative and high-performance camera technology



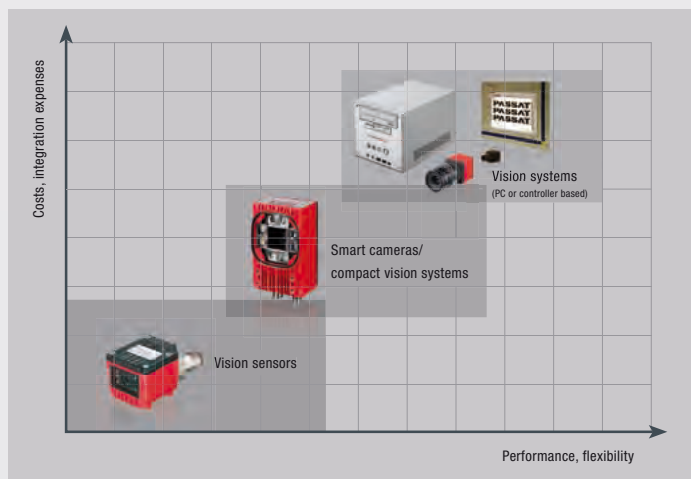
## The **LSIS 400i** series – the **smart camera** of the next generation.

Compact in cost – big in performance.

In industrial image processing, various device classes have established themselves in recent years. They differ primarily in flexibility and the associated integration expenses.

The PC-based vision systems offer peak performance. The smart cameras and compact vision systems score points with fast and low-cost integration and offer flexibility and performance that is absolutely adequate for many automation applications.

Industrial image processing systems in comparison.



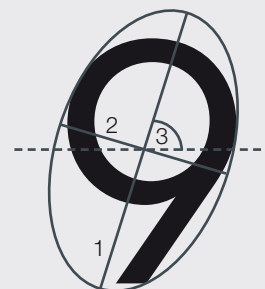
# The workhorse for image processing. Software with the **BLOB** effect.

## Intelligent, pixel-precise image processing.

BLOB stands for “Binary Large OBject” and identifies a contiguous area of pixels in an image. In general, BLOBs refer to individual pixel groups whose light intensity lies between defined limit values. By limiting BLOB features, such as area, circumference etc., individual objects or object groups can be specifically detected (circles, rectangles, squares, ...). In this way, presence or completeness inspections can be performed or the positions of objects determined.

### The fundamental functionalities of a BLOB tool

- **Area:** Summation of the pixels included in a BLOB  
Optional: Including possible holes within a BLOB.
- **Shape factor:** Ratio between area and circumference of the blob; normalised to values between 0 and 100. The shape factor classifies the geometric shape of a blob.
- **Circumference:** Length in pixels of the outer contour of a BLOB.
- **Circumscribing rectangle:** Height and width of the smallest rectangle that encloses the BLOB with sides parallel to the X and Y axes.



## **LSIS 400i** – the Leuze Smart Image Sensor, full of innovations.

### Its advantages in detail.

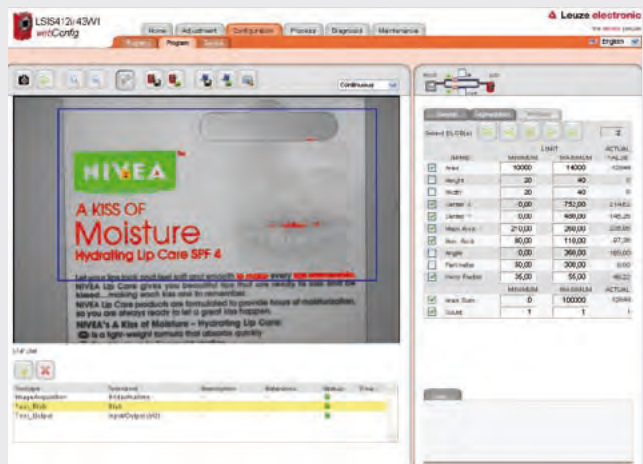
- **Easy configuration** via the integrated webConfig tool facilitates and simplifies application setup.
- **Homogeneous illumination** of the entire field of view for considerably better results than with conventional LED illumination.
- **Easy commissioning** and connection through M12 connection technology and intelligent fastening concept.
- **Integrated connectivity** offers easy configuration with Ethernet interface, exchange of process data via RS 232 interface and 8 digital, configurable inputs/outputs.
- **Suitable for industrial use:** metal housing with glass window and protection class IP 65.
- **Flexibility** through motor-driven focus adjustment and storage of the lot-specific camera distance in the test program; as a result, no manual focusing is necessary on the device.
- **Simple diagnostics** through bilingual display with buttons and LED status displays.
- **Extensive selection of accessories** simplifies installation, wiring and fastening.





### Faster integration through webConfig

- Configuration directly via the web browser
- Faster and simpler access to the device via Ethernet interface
- No configuration software needs to be installed on the PC



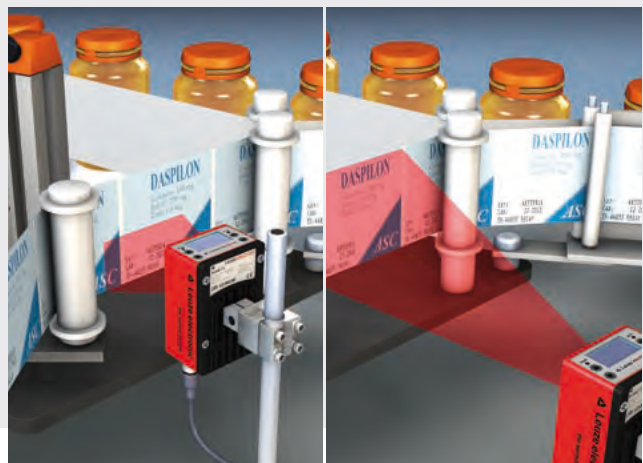
### More flexible use through motor-driven focus adjustment

- On lot changes, the new test program is loaded with the focus setting for the specific camera distance. By means of the motor-driven focus adjustment, the device moves to the appropriate focus position, i.e. no manual focusing is necessary on the device
- The motor-driven focus adjustment is also an advantage if the installation position of the machine is very limited or if the smart camera was mounted in such a way that it cannot be accessed from the outside during normal operation



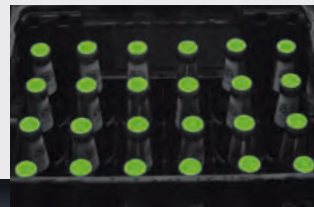
### Better results through homogeneous illumination

- Very uniform, rectangular, illuminated field of view at distances to the test object in the range from 50 mm to 250 mm
- Compared with conventional LED illumination, the recorded image is considerably more homogenous and more detailed. This results in better, faster and more reliable image processing

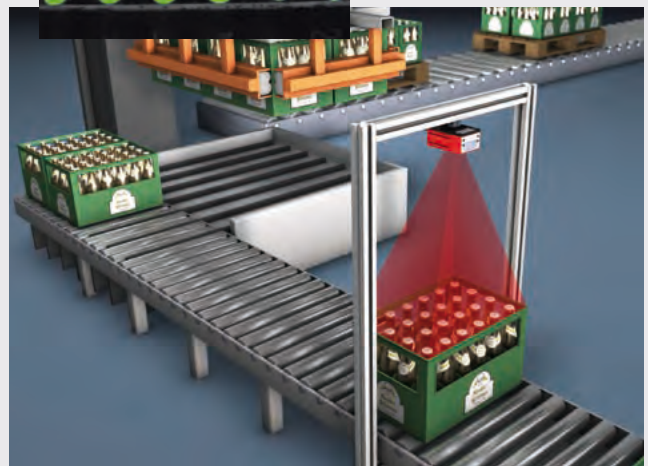


# Smart Image Sensor **LSIS 410i**. BLOB applications in practice.

With the LSIS 410i, you can utilise a camera system that is equipped with a powerful, software-based BLOB detection tool. Use it to simply and reliably perform a wide range of tasks during completeness and presence inspections or position detection.



Completeness inspection



Presence inspection



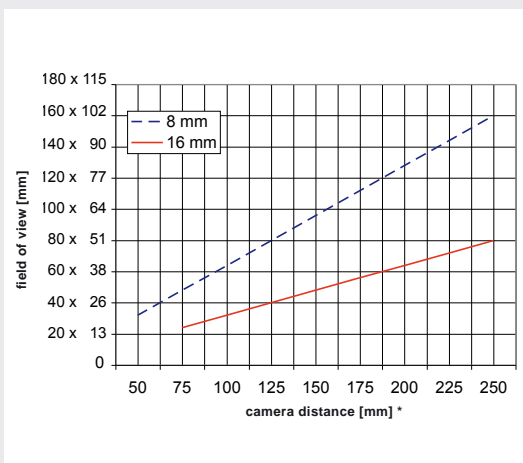
Position and orientation





# Specifications for the **LSIS 400i** series.

The diagram shows the field of view as a function of camera distance for focal lengths 8 mm and 16 mm. The camera distance is the distance between the front edge of the camera and the object.



\* At a distance of 250 mm, homogenous illumination of the field of view is ensured through the integrated illumination. Longer camera distances can also be realised with the system – if necessary with external illumination. For this purpose, simply extrapolate the axes of the diagram.

<b>Electrical data</b>	
Operating voltage	18 ... 30 V DC (PELV, Class 2)
Power consumption	max. 10 W
Process interface	RS 232
Service interface	Ethernet 10/100 Mbit/s
Sw. inputs/outputs	8, configurable
Inputs	18 ... 30 VDC
Outputs	max. 60 mA
<b>Optical data</b>	
Image sensor	Global shutter CMOS
Number of pixels	752 x 480
Electronic shutter speeds	54 µs ... 20 ms
Integrated LED illumination	white
Focal length	8 mm / 16 mm
Object distance	50 mm ... ∞ / 75 mm ... ∞
<b>Mechanical data</b>	
Protection class	IP 65
VDE safety class	III
Housing	diecast aluminium
Weight	500 g
Dimensions	75 x 55 x 113 mm
<b>Environmental data</b>	
Ambient temperature operation (storage)	0 °C ... +45 °C (-20 °C ... +70 °C)
Rel. air humidity (non-condensing)	max. 90 %
Laser class	LED Class 1 acc. to EN 60825-1:2003-10
Vibration	IEC 60068-2-6, test FC
Shock	IEC 60068-2-27, Test Ea
Continuous shock	IEC 60068-2-29, Test Eb
Electromagnetic compatibility	EN 61000-6-2, EN 61000-6-4 IEC 60068-2-27, Test Ea