

ALBERT®

Self-learning vision system based on artificial intelligence

VisionSystems
DESIGN
2017 Innovators
Awards
BRONZE



ALBERT®

KEY ADVANTAGES

Simple

Learns and assesses the quality of your products directly from the production line without complicated settings.

Intelligent

Independently decides whether a product can be accepted and can control it in a more strict or tolerant way according to different production requirements.

Self-learning

Quickly learns the characteristics of a new product under inspection.

Suitable to identify complex defects

Is capable to understand the quality of products even with complex features and high variability.

IP65 Rated

APPLICATIONS

Ideal to quality check a variety of baked goods such as croissants and cookies but also frozen products, chocolates and various other foods, even when presented in a disorderly manner and with different orientations.

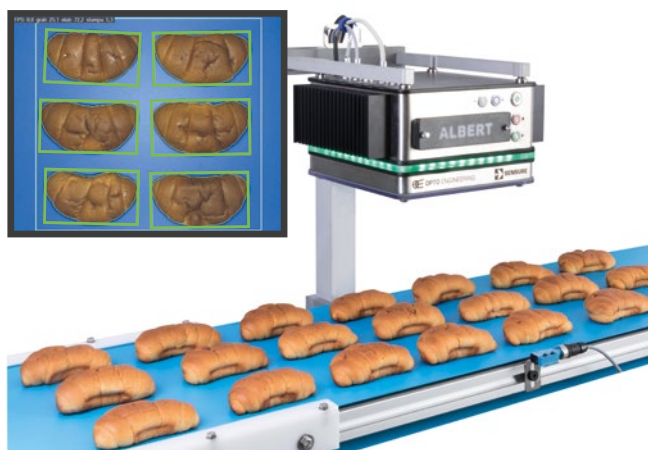
ALBERT® is a complete and independent unit for visual inspection, based on the most advanced artificial intelligence techniques.

ALBERT® learns the characteristics of a product directly from the production line and **autonomously** assesses its quality. ALBERT® is very simple to use and does not require complicated programming procedures by experienced users, so it is quickly ready to control new products with different characteristics.

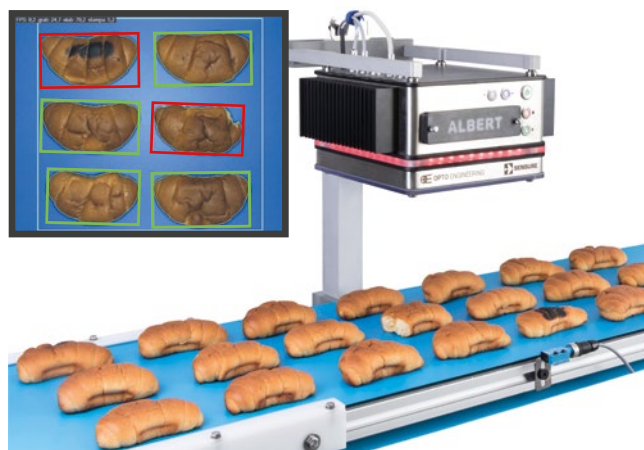
No traditional machine vision system is able to analyze complex objects or products with high variability as **simply** as a human

operator would: ALBERT®, on the other hand, interprets the concept of "quality" just like the fastest and most trained of your quality control operators. ALBERT® is able to adapt to the production requirements of the moment since its "severity" level can be increased or decreased at the touch of a button, thus loosening or tightening the product acceptance criteria.

Each time, ALBERT® chooses autonomously which will be the features to monitor that best describe the quality of your products. At any time and with a simple click, ALBERT® can learn how to sort a new product or adapt to changing production conditions.



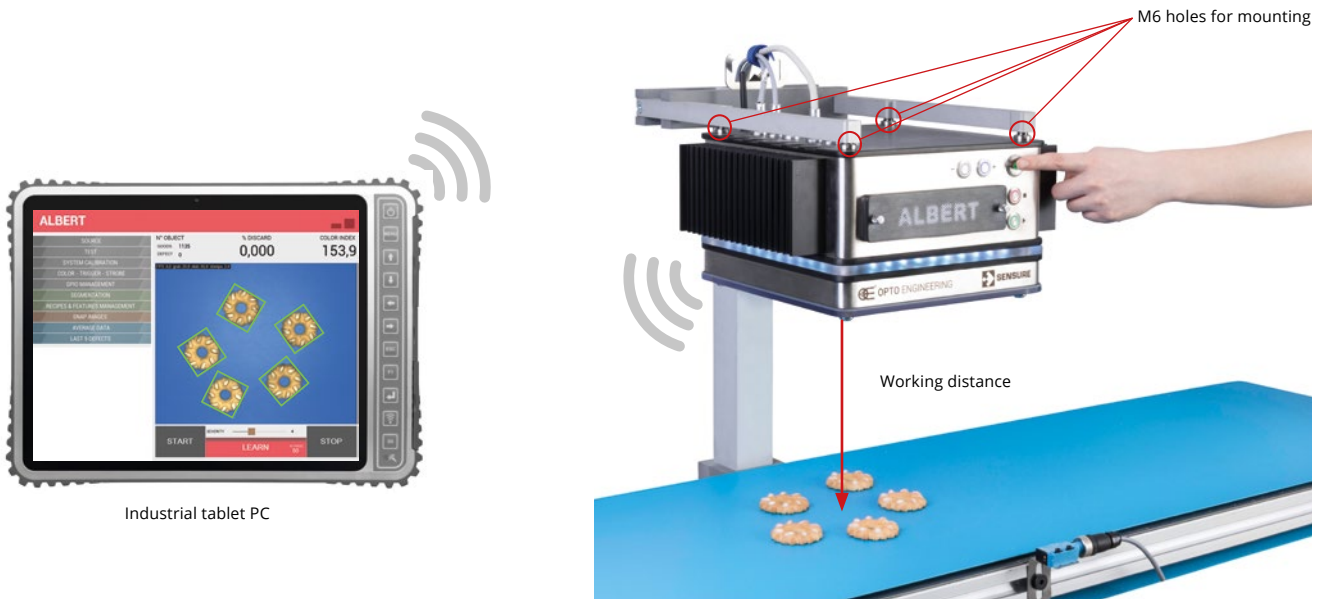
Inspection of croissants.



Installation

ALBERT® is extremely easy to install: just attach it to any mechanical fixture by means of the four threaded holes on top of the unit, making sure to respect the correct working distance from the conveyor belt. Once connected to a 24V power supply, simply press the “ON” button and wait less than a minute for ALBERT® to be ready for use.

The basic settings are extremely simple and fast: the process of adjusting the focus and identifying the product to be inspected is assisted by convenient software tools. The interaction with ALBERT® is possible both through the physical interfaces on the product or by connecting the unit to a tablet or industrial PC.



There are four M6 holes to mount ALBERT® on the production line at the correct working distance. ALBERT® can be configured using the buttons on the product or by tablet/PC.

Learning

The learning process is easily performed by presenting some products on your production line and activating ALBERT® in “LEARN” mode during normal operation.

Unlike traditional vision systems, ALBERT® autonomously learns the characteristics of your production in a few minutes: it is normally sufficient to present a few tens or a few hundreds of products during production to allow ALBERT® to learn their characteristics without complicated settings.

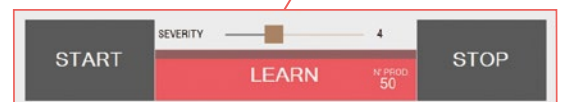
ALBERT® is able to tolerate up to 10% defective products during the learning phase, without affecting its ability to sort products correctly. ALBERT® will be ready to check your production once the status bar is full.

Moreover, whenever the goods on your production line change or anytime you want to adjust your quality control process to new production parameters, you can just press the “LEARN” button and ALBERT® will adjust itself accordingly.

Even during the learning phase, ALBERT® continues to monitor production, quickly adapting to the new inspection criteria without having to stop the line: no other vision system is so flexible and easy to configure.



ALBERT® in “LEARN” mode.



Sorting

Once the learning process is complete, ALBERT® is ready for the sorting phase or “CHECK” phase: the products deemed inconsistent with the desired level of quality are reported via an integrated light bar and can be rejected from the line by interfacing ALBERT® with the most common ejection systems thanks to the preinstalled opto-isolated outputs.

ALBERT® is able to store images of defective products also keeping track of the reasons for rejection: this data can then be analyzed to improve the production process.

You can also adjust the “severity” level of the control parameters without having to stop the line: a dedicated slider bar allows the user to loosen or tighten the sorting criteria, quickly and easily adjusting ALBERT® to new quality parameters.

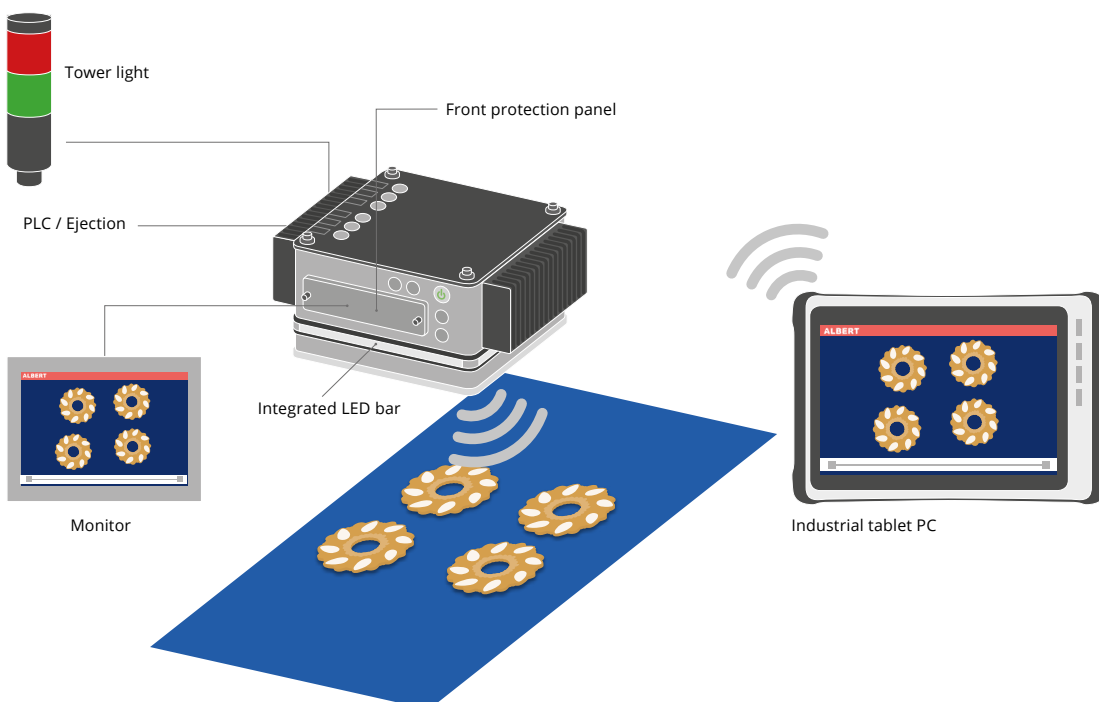


ALBERT® set to low (left) or high (right) severity level.

Interface

ALBERT® communicates its status through a LED bar that turns red when defective products are detected. ALBERT® is also preset to be interfaced with an industrial tower light already installed on your production line and reports defective products through appropriate output signals that can trigger up to six eject stations.

If you wish to view the images that ALBERT® is acquiring, you can do so wirelessly through an industrial tablet PC without losing IP65 rating or by connecting ALBERT® to a monitor after removing the front protection panel. Connecting ALBERT® to a monitor / tablet PC is also required to adjust the basic settings and to monitor rejection statistics on an external screen.



ALBERT® interfaces.

ALBERT® is designed to also control products characterized by a high degree of variability and impossible to parameterize through a traditional vision system, specifically in the food industry, but not exclusively. The most typical areas of use are the inspection of baked goods, frozen products, sweets, fish or meat. ALBERT® is also ideal for products that are presented in a disorderly manner or with different orientations (provided there's some spacing between them), or whose packaging cannot be represented by a predetermined pattern. In all of these cases, ALBERT® makes it possible to control the products avoiding excess scrap or continued assistance by operators experienced in programming.

ALBERT® is suitable for use on food lines thanks to the IP65 protection, the adoption of materials compatible with the food industry and the engineering solutions adopted.

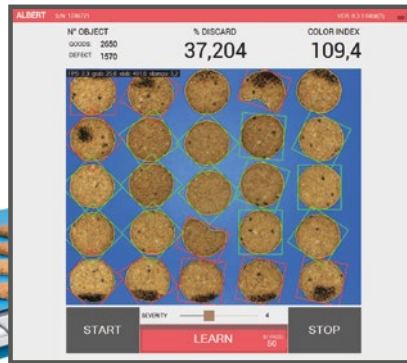
Bakery products with variations in color, shape or other attributes

ALBERT® is the ideal inspection solution for production lines of bakery products, such as biscuits, where traditional vision systems fail because product acceptance is not determined by a single

parameter but is rather a combination of multiple subjective variables.



Inspection of cookies.



Works with a variety of conveyor belts including mesh or white.

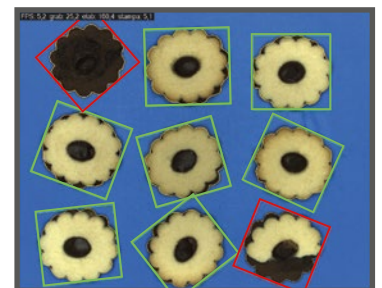
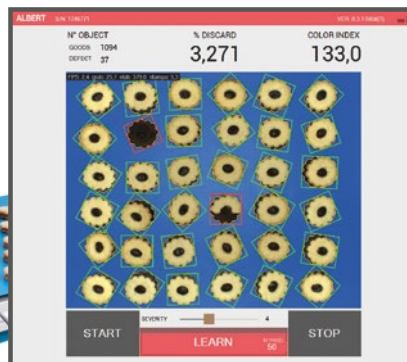
ALBERT® learns to know your production

Due to continuous and genuine changes in products such as chocolate or shortcrust pastry, no traditional on-line vision system is able to quickly learn and properly inspect this type of products like ALBERT® does.

In fact, ALBERT® can learn the natural change in color of the ingredients of a new batch in less than 5 minutes without the need to adjust complicated parameters each time.



Inspection of shortcrust pastry.

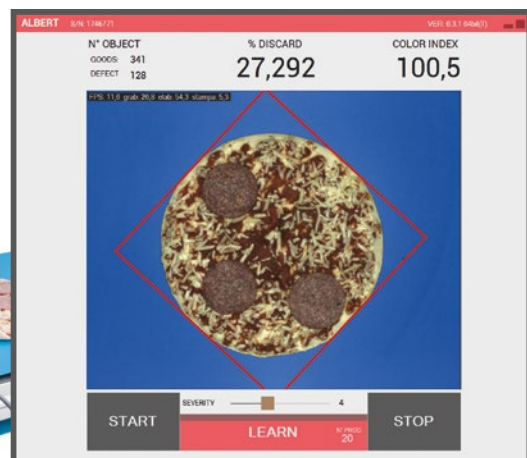
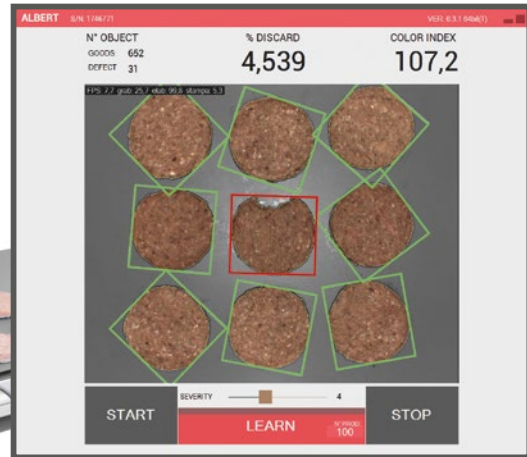


Zoomed in image.

Frozen products with variations in color, shape or ingredients

The acceptance criterion for frozen products is often a complex combination of many parameters. Unlike traditional vision systems, ALBERT® is flexible and quickly learns the characteristics of products

such as frozen pizzas, semi-finished meat or fish products, allowing you to loosen or tighten the sorting parameters by simply adjusting a dedicated slider bar on the main interface.



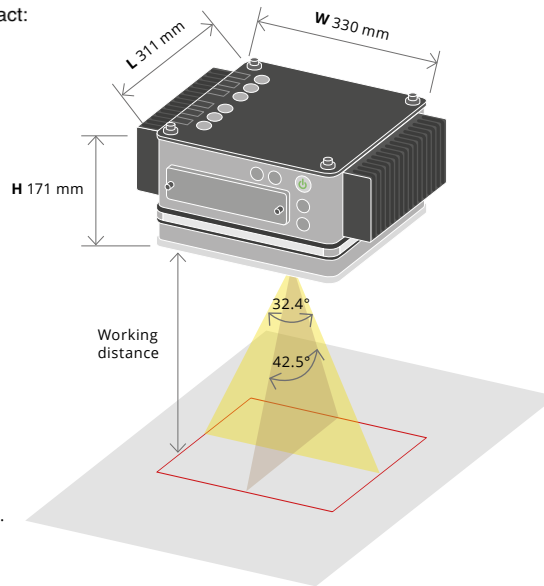
TECHNICAL SPECIFICATIONS



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ALBERT's Field of View.

Model

ALBERT-01

Description		Self-Learning Vision system based on artificial intelligence		
Application		In-line inspection		
		Working distance (mm) 1		
		460	900	1350
Field of View	mm x mm	400 x 295	800 x 590	1200 x 890
Minimum Working Distance	mm		100	
Optics		8 mm f1.4-f16 with manual focus adjustment		
Lighting system		LED diffuse strobe illuminator, 5700 K white		
Line speed 2	m/s		≈ 1	
Number of parts per second 3			20	
LED indicators		Yes (STATUS and SEVERITY LEVEL)		
N° of storable images 4			≈ 800K	
Ports				
Input				
Synchronization input		1, opto-isolated (on top of the unit)		
Output				
for tower light		2 lights, 1 siren (on top)		
for ejector (s)		6, opto-isolated (on top)		
Synchronization output		1, opto-isolated (on top)		
Communication				
Ethernet		2 (on top)		
Wireless		Wi-Fi (802.11n)		
USB 3.0		4 (front of the unit)		
HDMI		1 (front)		
DVI		1 (front)		
Power Requirements				
Voltage	V, DC	24 ± 5%		
Maximum power consumption	W	150		
Cable		CBPWALB01 length 5 m IP68 (included)		
Mechanical specifications				
Width W 5	mm	330		
Length L	mm	311		
Height H	mm	171		
Weight	kg	10		
Material		AISI304 stainless steel, anodized aluminum, scratch resistant polycarbonate (Lexan Margard®)		
Mounting		4X M6 holes (optional mounting accessories available)		
Environment				
Operating temperature	°C	10-40		
Storage temperature	°C	0-50		
Humidity		20-85% (with no condensation)		
IP class		65		
Installation		indoor use only		

- 1** Example values. Working distance must be set based on: size of the area to be imaged, size and number of pieces to be imaged and **type of control required**.
2 Approximate value. Higher speeds are possible. Please contact us to check compatibility with your production line.

- 3** Estimated value. The number of inspected parts per second may vary depending on their size and the speed of the line.
4 Estimated value based on 250 Kbytes images stored in 200 GB SSD memory.
5 Wireless antenna included.