ALBERT®

SELF-LEARNING VISION SYSTEM
BASED ON ARTIFICIAL INTELLIGENCE

VISION SYSTEMS

oe-albert.com
Why ALBERT®?

• It’s smart and easy to use
• It saves you time and money
• It is extremely flexible
• It is an easy and profitable investment
• It will lift a weight off your shoulders

We offer a free demo service:

Send us some of your samples and we’ll deliver a free assessment for your company.
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Self-learning vision system based on artificial intelligence

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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.
**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.

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.

**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.
HOW IT WORKS

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.

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.
APPLICATION EXAMPLES

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.

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.
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

**Model**: ALBERT-01  
**Description**: Self-Learning Vision system based on artificial intelligence  
**Application**: In-line inspection  
**Field of View**: mm x mm  
- 460 x 900  
- 1350 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**: m/s  
- 2  
**Number of parts per second**:  
- 3  
- 20  
**LED indicators**: Yes (STATUS and SEVERITY LEVEL)  
**N° of storable images**:  
- 4  
- ≈ 800K  
**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)  
**Voltage**: V, DC  
- 24 ± 5%  
**Maximum power consumption**: W  
- 150  
**Cable**: CBPWALB01 length 5 m IP68 (included)  
**Mechanical specifications**:  
- Width W: mm  
- 330  
- Height H: mm  
- 171  
- 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  

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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.
### ACCESSORIES AND COMPATIBLE PRODUCTS

#### Communication and visualization

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-KWP5170</td>
<td>Stainless steel PC Quad Core processor with fanless cooling system full IP65, 1 x GbE, 2 x USB 2.0, 1 x RS-232</td>
</tr>
<tr>
<td>CBETH001</td>
<td>Ethernet cable for Panel PC, 5 m, IP65</td>
</tr>
<tr>
<td>RT-JD-07006GB-2</td>
<td>USB Keyboard/IMouse desk set</td>
</tr>
<tr>
<td>RT-UT10</td>
<td>UniQTablet Ecom UT10, Intel Atom, Touch screen, IP54</td>
</tr>
</tbody>
</table>

#### Mounting

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMHOALB01</td>
<td>Support plate</td>
</tr>
</tbody>
</table>

#### Power Supplies

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-DRP-240-24</td>
<td>DIN rail power supply 240V ac - 24V dc 240 W</td>
</tr>
<tr>
<td>RT-DRP-480-24</td>
<td>DIN rail power supply 240V ac - 24V dc 480 W</td>
</tr>
<tr>
<td>RT-70261132</td>
<td>Power cord with schuko plug - open end cable, 3 m 10A 250V, single-phase</td>
</tr>
<tr>
<td>RT-DRT-240-24</td>
<td>DIN rail power supply 400V ac at three-phase - 24V dc 240 W</td>
</tr>
<tr>
<td>RT-DRT-480-24</td>
<td>DIN rail power supply 400V ac at three-phase - 24V dc 480 W</td>
</tr>
</tbody>
</table>

#### Sensors and signal

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-WTB9-3P2461</td>
<td>Background suppression sick photoelectric sensor 20 - 350 mm detection range, PNP output, block style</td>
</tr>
<tr>
<td>RT-69942075</td>
<td>LED signal tower with buzzer, 2 light elements, clear, green/red (LED colour), 24 V ac/dc</td>
</tr>
</tbody>
</table>

#### Lighting Components

##### Strobe

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>LTBP288036-W</td>
<td>High-power strobe bar light, 288 x 36 mm illumination area, white</td>
</tr>
<tr>
<td>LTBP048216-W</td>
<td>High-power strobe bar light, 216 x 48 mm illumination area, white</td>
</tr>
<tr>
<td>LTDV6CH</td>
<td>6-channel strobe controller</td>
</tr>
<tr>
<td>RT-LBL3-00-400-X-W-24V</td>
<td>LED bar light, white</td>
</tr>
<tr>
<td>RT-SD-1000D1-P5-EU</td>
<td>Light controller with 24V power adapter and Schuko plug</td>
</tr>
<tr>
<td>RT-EXT-24V-F-3M</td>
<td>Power cord, 2-pin SM male connector on one end, flying leads on other end - 3 m</td>
</tr>
</tbody>
</table>

##### Continuous

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-CBPW001</td>
<td>Ethernet cable, general purpose, 5 m, IP68</td>
</tr>
<tr>
<td>CBGPO001</td>
<td>Output cable, 5 m, IP68</td>
</tr>
<tr>
<td>CBPH001</td>
<td>Photoelectric sensor cable with M12 connector, 5 m, IP65</td>
</tr>
<tr>
<td>CBPH002</td>
<td>Photoelectric sensor cable with flying leads, 5 m, IP65</td>
</tr>
<tr>
<td>CBTL001</td>
<td>Tower light cable with M12 connector, 5 m, IP68</td>
</tr>
<tr>
<td>CBTL002</td>
<td>Tower light cable with flying leads, 5 m, IP68</td>
</tr>
<tr>
<td>CBPWAALB01</td>
<td>ALBERT power cable, 5 m, IP65</td>
</tr>
</tbody>
</table>

#### Other

<table>
<thead>
<tr>
<th>Product Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>RT-10060911</td>
<td>Set of 2 8&quot;x10&quot; white balance/exposure cards - 18% grey and 90% white for color calibration</td>
</tr>
</tbody>
</table>