

BALLUFF



 *innovating automation*

Automating
Your Machinery

FOR PACKAGING,
FOODS, BEVERAGES,
PHARMACEUTICALS
AND COSMETICS

Distributed by Valin Corporation | www.valin.com | (800) 774-5630 | customerservice@valin.com

Automation technology

WE ARE AT HOME
IN MANY
DIFFERENT SECTORS



CONTENTS

6

**SAMS –
SIMPLE, FLEXIBLE, INTELLIGENT**



Transparency brings optimal performance.

12

FOOD INDUSTRY



Perfectly prepared.
Hygienic and high quality.

22

BEVERAGE INDUSTRY



At rapid pace.
Smooth flowing and reliable.

28

**PHARMACEUTICALS AND
COSMETICS INDUSTRIES**



Flexibly deployed.
Precisely metered.

34

PACKAGING INDUSTRY



Prepared for anything.
Tailor-made and efficient.

PRODUCT OVERVIEW 48

APPLICATIONS 54

CUSTOM TAILEDOR TOTAL PACKAGES 56

USE CASE 58

ABOUT BALLUFF 60

REFERENCES 62

SAMS – simple, flexible, intelligent

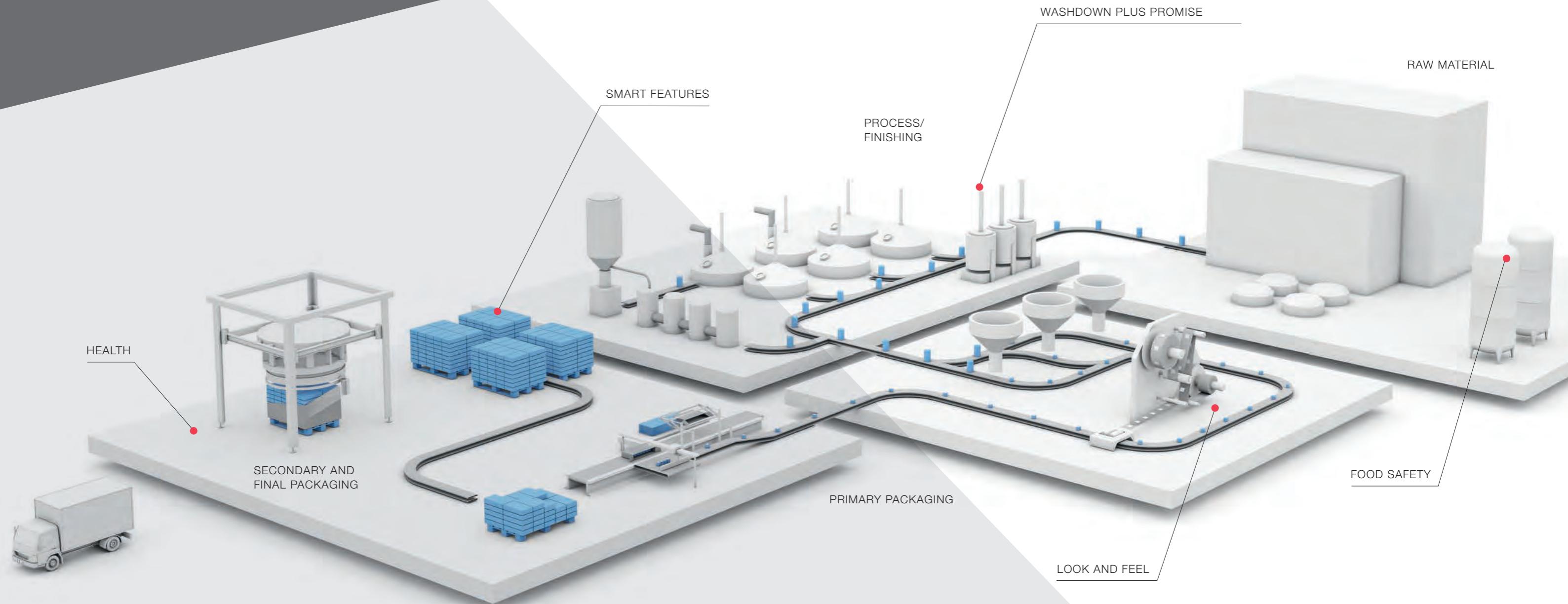
TRANSPARENCY BRINGS OPTIMAL PERFORMANCE.

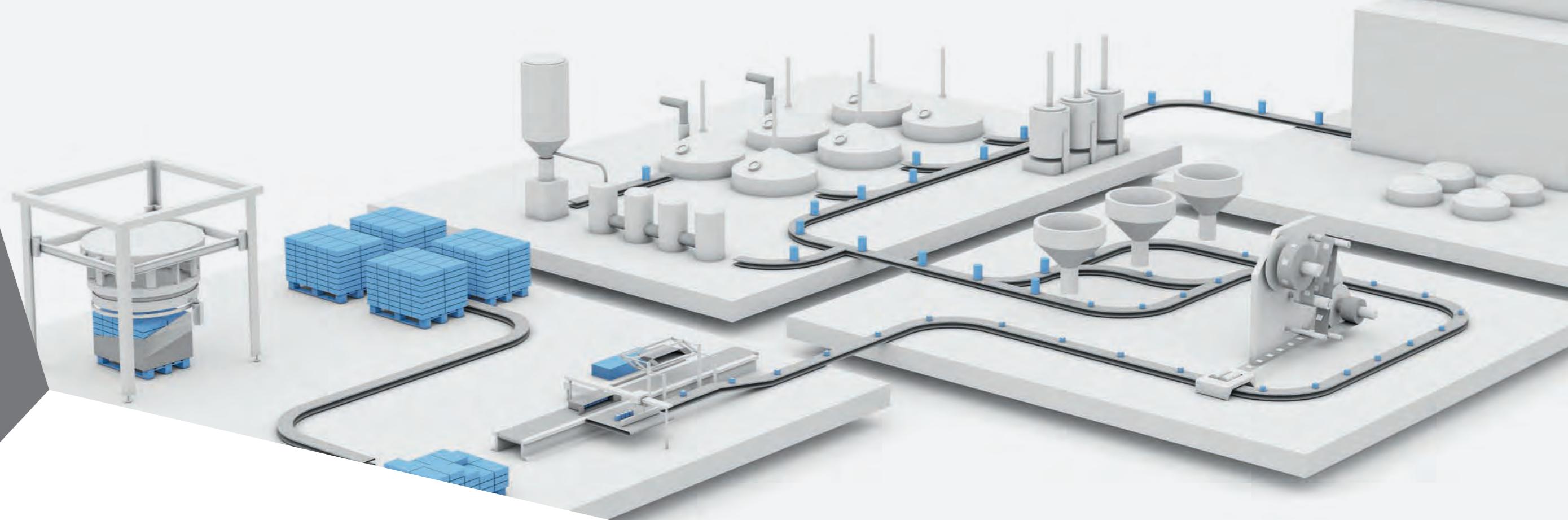
 *innovating automation*

Increasing the efficiency of machines and equipment requires high-performance, multi-functional solutions that provide not only machine control but also data about machine condition. This information lets you optimize the performance of every machine and, thereby, optimize the entire plant, so that you can design processes and sequences efficiently and flexibly. This information also enables full transparency. Changing requirements in filling and packaging can now be handled faster, more flexibly and more economically.

It's good to know that when using the innovative Smart Automation and Monitoring System (SAMS) from Balluff you have a system that lets you manage the automation of the entire production line uniformly and consistently. SAMS is also of interest to the machine builder tasked with equipping the food and beverage, pharmaceutical, cosmetic, and packaging industries.

Optimal Performance





THE WASH DOWN PLUS PROMISE

All the washdown components that are part of the Smart Automation and Monitoring System (SAMS) are designed so that they can withstand the tough demands of cleaning processes. At home in extremely harsh environments, they meet Ecolab requirements. They are perfectly protected from cleaning agents and water, and with a rating of at least 1000 cleaning cycles our products far exceed the requirements for IP69K. The result: significantly longer service life, less maintenance effort and expense, and overall significant cost savings.

LOOK AND FEEL

With their consistent design, the housing, connector and fastening of the components form a unit, this allows for easy installation and connection. The all-encompassing operating and configuration concept of SAMS increases machine flexibility and availability. You can use standard data profiles for parameterizing, configuring and even non-contact teaching with a mobile terminal device. This minimizes machine damage and production stoppages due to incorrect handling. And it lessens your training effort significantly, since using our intuitive solutions quickly becomes second nature while you prevent errors and mistakes.

SMART FEATURES

Once placed in service, the devices are turned into data sources which you can use for reliable operation of your equipment. For example, you can gain temperature monitoring, relative humidity measurement, inclination detection, vibration monitoring, signal quality display, operating hours counters or time functions. Such features eliminate the need for additional devices with a monitoring function, significantly reducing your inventory levels. In addition, each component can be uniquely located within the system by pinging.

HEALTH

Our intelligent components open up new possibilities, for example, in condition monitoring of machines and equipment or predictive maintenance. This condition information is always available to you uniformly, everywhere and directly – whether via the colored LED indicator directly on the device or on dashboards for further analysis. You can know the status of every sensor, every machine and the entire production line. You can detect trends so that the performance of your production is significantly improved. Together with our powerful network technology and cloud computing, intelligent manufacturing and the Industrial Internet of Things (IIoT) become reality.

Food industry

PERFECTLY PREPARED. HYGIENIC AND HIGH QUALITY.

B *innovating automation*

The components in our SAMS are, thanks to Washdown-Plus, designed for more than 1000 cleaning cycles and, thereby, exceed the requirements of IP69K. This provides for long service life and less maintenance effort.

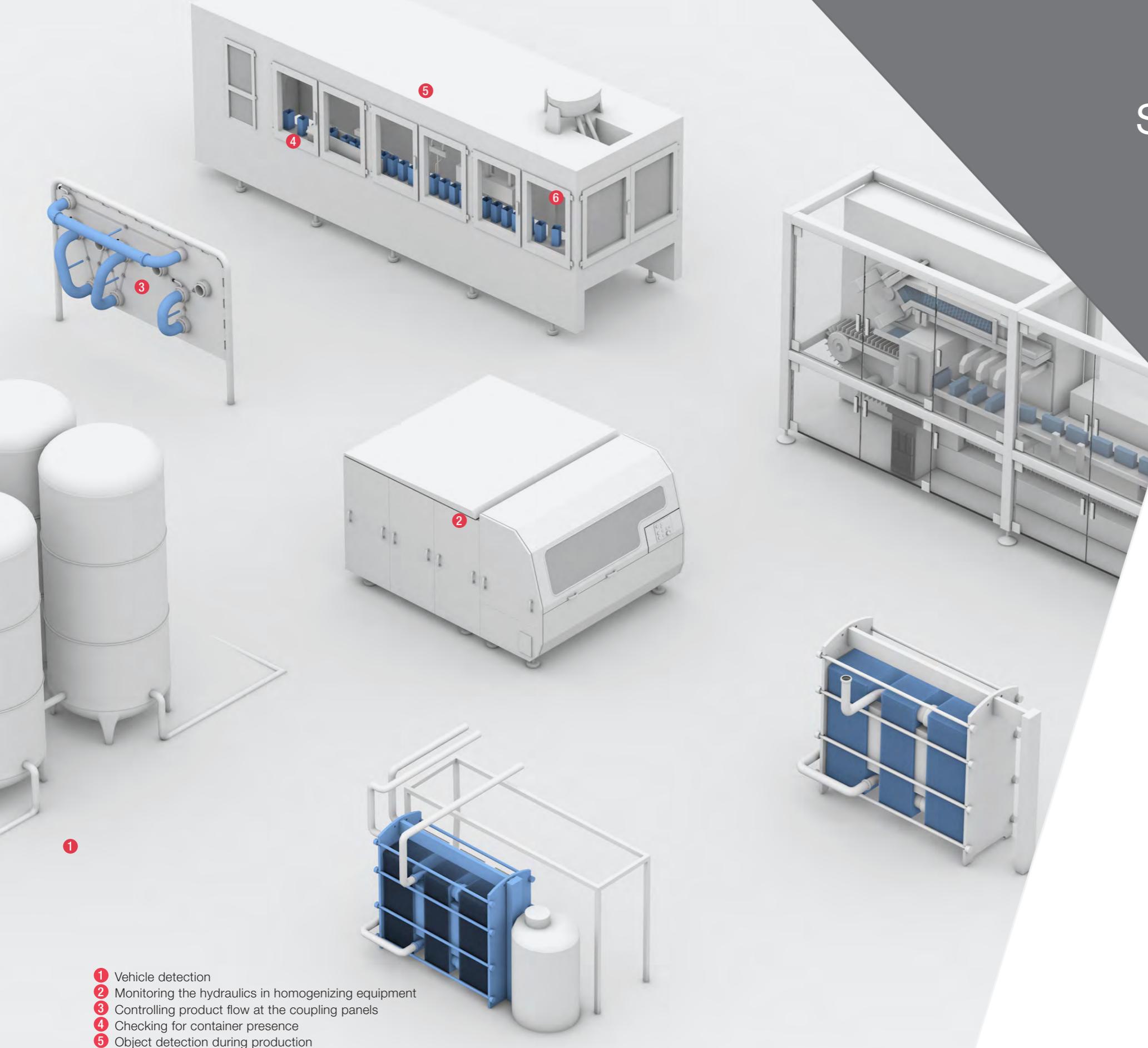
DAIRY

The dairy industry is subject to the strictest hygienic and quality regulations. This is why a real-time capable and transparent production process with modular production lines is indispensable for efficient production. Only in this way, can traceability and flexibility be ensured. Our comprehensive product portfolio enables you to optimally configure your equipment and machines for meeting the demands of your customers.

MEAT PROCESSING

Cleanliness has the highest priority in the meat processing industry as well. Only if the hygienic standards are taken into account when the machine is built can the desired high quality of the end product be ensured. We offer a wide range of sensors that provide the greatest reliability even in harsh application conditions.





Solutions for dairy



VEHICLE IDENTIFICATION
BIS Industrial RFID Systems



MONITORING THE HYDRAULICS
IN HOMOGENIZING EQUIPMENT
BSP Pressure Sensors

The milk transport vehicles are equipped with RFID tags. Now every transport step can be tracked: from the laboratory test to quality inspection, to the pumps moving milk from the vehicle tank to the storage containers, to cleaning of the vehicle tank. This optimizes transport and ensures reliability. Since the data is transmitted directly, the time until the laboratory confirms the inspection is shortened. Information from the laboratory about the milk quality, transport time for the milk, as well as the tank cleaning process can be retrieved at any time.

Features

- Reliable track-and-trace
- Automated logistics



CONTROLLING PRODUCT FLOW
AT THE COUPLING PANEL
BES Inductive Sensors

Coupling panels are used for manual changes between different piping paths. The coupling elbows are used to connect the pipes in various combinations. Elbow position is detected by a BES inductive sensor, whose housing is resistant to abrasive and aggressive media. The LEDs are protected from mechanical damage as well, and the housing construction is optimized for frequent cleaning.

Features

- Ecolab certified, IP69K
- Flush-mounted
- Various form factors



CHECKING THE PRESENCE OF THE
CONTAINER FOR SECURE FILLING
BUS Ultrasonic Sensors

To be able to fill milk products such as yogurt or café latte in containers, the container must first be detected. The BUS ultrasonic sensor from Balluff detects from above whether the container is present. Only then is the product dispensed.

Features

- Can be used for pressures of up to 6 bar
- PTFE membrane provides aggressive media protection
- Stainless steel housing
- Digital display with direct measurement value output



OBJECT DETECTION DURING
PRODUCTION
BOS Photoelectric Sensors

Hygienic regulations are especially critical in the production of milk products. Optical sensors for object detection from Balluff meet the relevant washdown requirements. These rugged sensors can be cleaned in-process using any of the common procedures. Aggressive media such as cleaning agents have no effect on them.

Features

- Ecolab certified, in IP69K
- Bright, homogeneous light spot for simple alignment
- Long ranges and precise object detection
- Available in all optical function principles



COLORED LABEL DETECTION
BFS Photoelectric Color Sensors

When detecting label colors, even the slightest shade differences need to be recognized. This means the sensors have to reliably detect faded colors or differences in print quality. Our BFS color sensor handles this with aplomb.

Features

- Great precision
- Especially insensitive to ambient light thanks to pulsed white light
- IO-Link versions available
- Fiber optics for use in challenging ambient conditions

Solutions for meat processing





SCANNING THE PDF417 CODE OF THE DELIVERED RAW MATERIALS
BVS Optical Identification

When the raw product is delivered it must first be detected and identified. This is done using so-called PDF417 codes located on the raw product. Unfortunately, these codes are frequently not at the same height. By using the portable reader BVS HS-P the codes can still be read simply and flexibly.

Features

- Common 1D-, stacked and 2D barcodes as well as direct marking codes can be read quickly and reliably
- Rugged, industrial grade design
- IP65 with drop protection up to 2 m
- Work without fatigue thanks to low weight and ergonomic shape



DETECTING HOOKS IN CONVEYOR SYSTEMS
BIS Industrial RFID Systems

BIS Industrial RFID Systems from Balluff reliably detect the position of the hooks when transporting meat product – including in wet areas. The RFID technology lets you not only detect the position of the hook, but also identify it precisely. This ensures traceability of the animal halves all the way to the end consumer. With on-board smart features – such as vibration detection – you can see any irregularities in the transport system at a glance on dashboards. All devices are resistant to aggressive cleaning agents and temperature shocks.

Features

- Ecolab certified, IP69K protection
- Always traceable in real time
- RFID systems, sensors, readers and transponders can be easily combined with each other
- Using our RFID Configurator you can assemble just the right RFID system for your application online

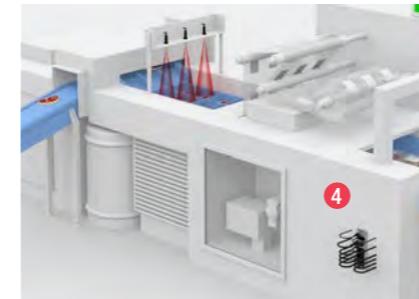


OPTICAL DETECTION ON AUTOMATIC SAWS IN THE CUTTING PROCESS
BOS Retroreflective Sensors

To detect meat pieces in the open process our BOS retroreflective sensors are the right choice. The transmitter and receiver are housed together in a single unit so that you can easily mount this light barrier and align it quickly with its generous mounting tolerances. Depending on the model, our retroreflective sensors work with highly visible red light, invisible infrared light, or very precise laser light that is ideally suited for detecting small parts. The bullnose version with its M18 threads or two side through holes provides great mounting flexibility.

Features

- Contamination compensation
- Integrated inclination detection optionally available
- Switching output is configurable



TRANSPORT SIGNALS RELIABLY AND ERROR-FREE
BNI Network Blocks

By combining industrial networks with the IO-Link communication standard you have an efficient infrastructure for reliably collecting and managing large quantities of data, for example, in a meat processing machine. Often all you need is a BNI IO-Link network module for recording and transferring the data. In harsh environments the demands are especially high. Cleaning the equipment with aggressive media places much strain on the modules. The IO-Link network modules from Balluff are constructed with a rugged plastic housing with wash-down capability and Ecolab certification. This makes them ideal for use in these applications and environments.

Features

- Ecolab certified, IP69K protection
- 8 IO-Link ports
- Integrated communication interfaces to the IT
- Integrated web server for parameterizing the connected IO-Link devices
- Diagnostic data made available in the web server

A blurred background image of a beverage filling line. Numerous clear glass bottles are visible, some filled with a dark liquid and others with a light liquid. A robotic arm with a gripper is positioned in the center, appearing to move between the bottles. The scene is set in a industrial environment with various pipes and machinery in the background.

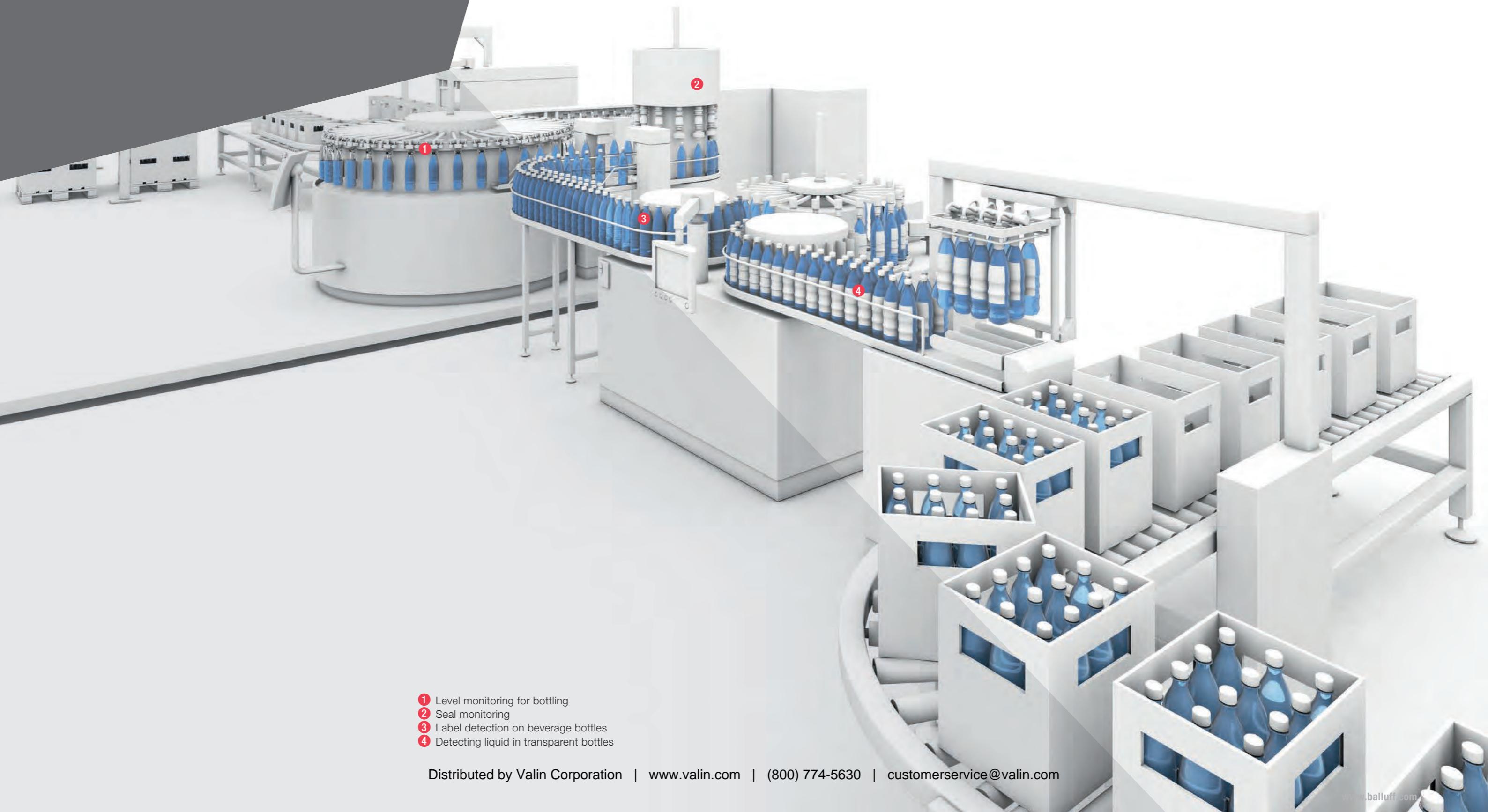
Beverage industry

AT RAPID PACE.
SMOOTH
AND RELIABLE.

 *innovating automation*

Filling plants are characterized by high technical demands and challenging environmental conditions. Sensors from Balluff are ideal for these situations. They ensure that beverages are filled aseptically and sterile, bottles are properly sealed and correctly labeled. Balluff components enable high cycle rates as well as fast and efficient filling processes.

Solutions for filling lines



- ① Level monitoring for bottling
- ② Seal monitoring
- ③ Label detection on beverage bottles
- ④ Detecting liquid in transparent bottles



LEVEL MONITORING FOR BOTTLING
BTL magnetostrictive linear position sensors

Stretch blow molding machinery is used in the beverage industry to produce bottles. The bottles can be filled immediately, which eliminates unnecessary transport. The high-precision BTL fill level sensor from Balluff monitors levels in the filling process. The temperature can also be monitored.

Features

- Ecolab certified, 3A approval, FDA-conformal
- Hygienic interface with the production environment
- Dynamic and precise
- Saves space by combining measured parameters (2 in 1)



SEAL MONITORING
BVS Vision Sensors

Checking seals in the beverage industry requires that many different features be inspected at the same time. The BVS Vision Sensor meets these requirements to ensure reliable monitoring.

Features

- Rapid installation and configuration ensure short setup times
- Convenient setup

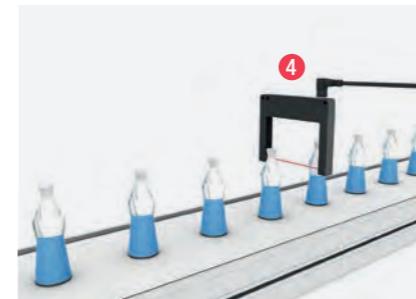


LABEL DETECTION
ON BEVERAGE BOTTLES
BOH Optical Sensor Heads

Bottles are labeled after filling. Only correctly labeled bottles may then be packaged. This means the label application process needs to be checked. Our BOH optical sensor with separate amplifier provides reliable information for missing or incorrectly placed labels.

Features

- Outstanding operability and readability of the processing electronics
- Compact form factor
- Fast changing for different settings and operating conditions
- Easy retrofit



DETECTING LIQUID
IN TRANSPARENT BOTTLES
BGL Fork Sensors

BGL fork sensors from Balluff use infrared light to detect all liquids with a water component above 15 %. They reliably detect levels through transparent container walls. Our fork sensors are available in stainless steel with Ecolab certification and in IP69K for washdown areas.

Features

- Fast, reliable inspection
- High output rate
- Also suitable for liquids in small, transparent hoses with a small diameter (≤ 6 mm)
- High process reliability
- Compact housing
- No adjusting required since the emitter and receiver are already aligned

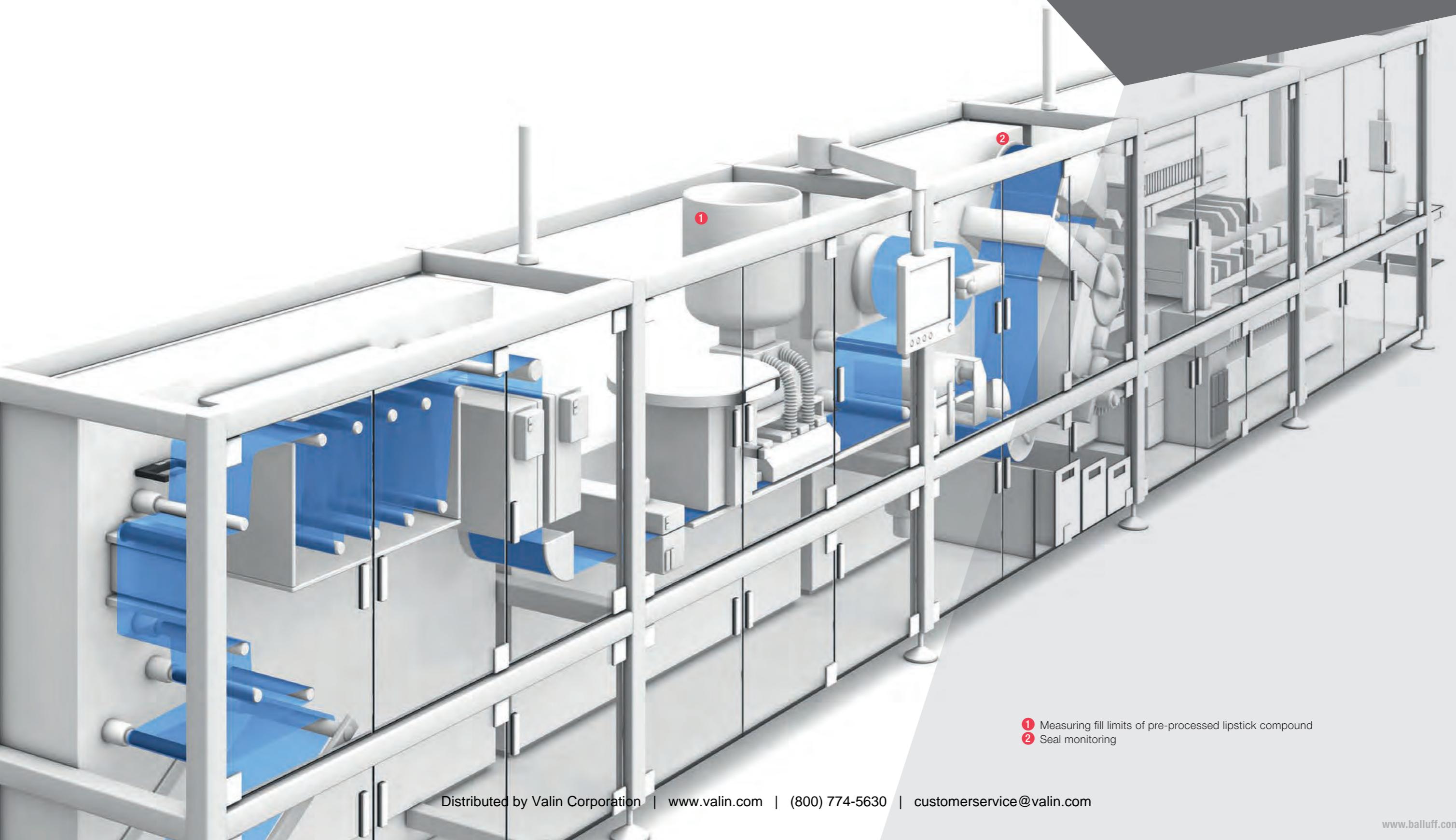
Pharmaceuticals and Cosmetics

FLEXIBLY DEPLOYED. PRECISELY METERED.

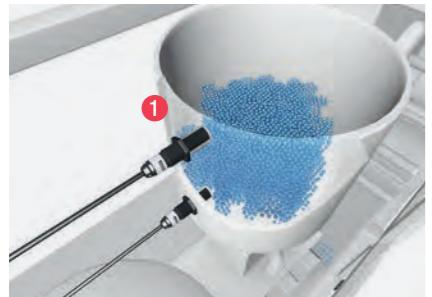
 *innovating automation*

Pharmaceutical and cosmetics applications demand high reliability, compact enclosures, minimal measuring tolerances, and the ability to flexibly integrate sensors into a system. Along with these requirements come a variety of tasks from positioning to feeding, to joining and marking, to sealing liquid or solid materials. At the same time the sensors need to handle many different kinds of packaging including ampules, bottles, cans or blister packs, with consistent quality, of course.

Solutions for the pharmaceutical and cosmetic industry



- ① Measuring fill limits of pre-processed lipstick compound
- ② Seal monitoring



MEASURING FILL LIMITS OF PRE-
PROCESSED LIPSTICK COMPOUND
BCS Capacitive Sensors

BCS capacitive sensors from Balluff reliably detect levels of various materials. Depending on the application type the level can be detected non-contact or in direct contact with the medium.

Features

- SmartLevel technology for conductive media
- Fast installation
- Good adhesion compensation
- Rated for autoclave use (protection against very high temperatures)



SEAL MONITORING
BLA Light Bands

Filling involves monitoring the height and diameters of bottles. This is done using the high-resolution BLA light array. First, the BLA detects the width of the bottle neck and compares it with previously taught-in values. Second, the correct cap is selected. Then another light band checks whether the cap is sitting flush on the bottle based on the bottle height.

Features

- Teach up to six different objects
- Rugged metal housing for use in harsh environments
- IO-Link versions available

Packaging industry

PREPARED FOR ANYTHING. TAILOR-MADE AND EFFICIENT.

 *innovating automation*

PILLOW BAG AND CARDBOARD PACKAGING MACHINES

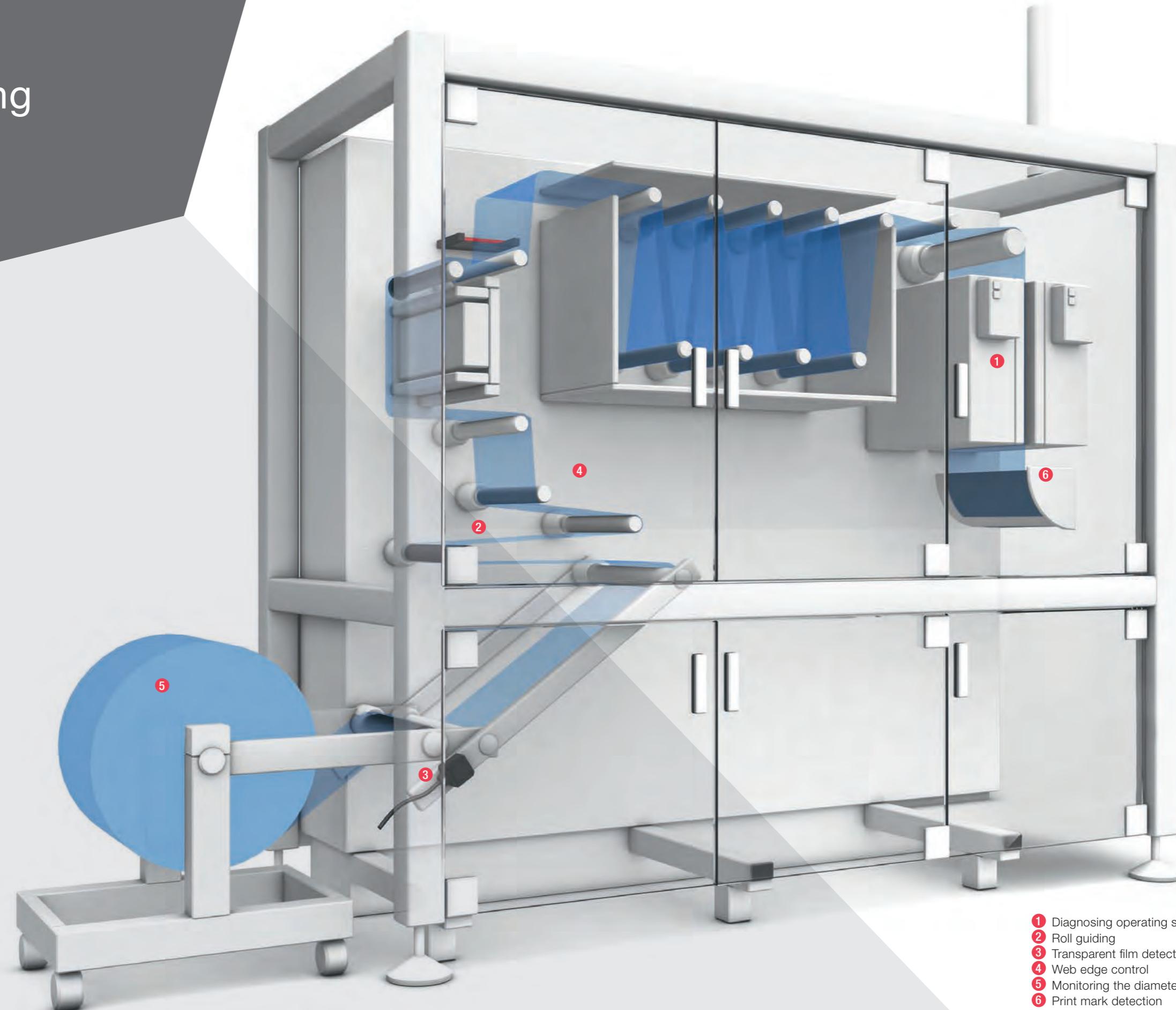
Pillow bag and cardboard packaging machines involve a large product variety, resulting in the need for maximum flexibility. The machines produce many different pillow and packaging shapes. This is because constantly new packaging concepts need to grab consumers' attention. The lot quantities become ever smaller and entail frequent format changes. The required flexibility and speed are reliably achieved with Balluff products.

PALLETIZING AND DEPALLETIZING SYSTEMS

The palletizing and depalletizing of boxes and cartons demands absolute accuracy and great flexibility. At the same time, the largest possible quantities need to be processed. You can get the professional support you need from Balluff. Whether for the reliable flow of material with track-and-trace, the correct handling of different packages, or the reliable handling of the packaging material, Balluff can offer reliable support. At the same time our sensors also ensure exact positioning for an uninterrupted packaging process.



Solutions for FFS packaging machines





DIAGNOSING OPERATING STATES
SmartLight – BNI Signal Tower Lights

If you need seamless visualization of the sequence on your production line, the SmartLight tower light provides the perfect solution. The SmartLight displays trends and tendencies, so that you can continually monitor various stages. The various modes – run light, stack light and level mode – can be set without making any mechanical changes. Use the controller to choose between Running Light and Color Gradient or the display of up to five color segments.

Features

- Highly flexible: can be changed on-the-fly with no mechanical reconfiguration necessary
- Simple to install and can be retrofitted anywhere
- Multi-color, bright LEDs with a broad color spectrum – individually definable
- With IO-Link for ideal use in the IIoT

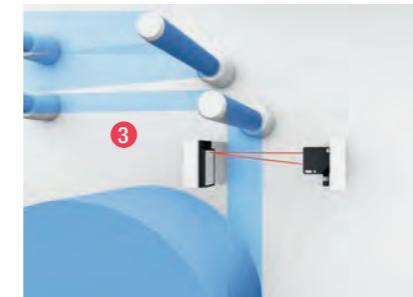


ROLL GUIDING
BSI Inclination Sensors

Trouble-free packaging on the pillow bag machine means ensuring that the roll material is continually tensioned and the correct length of film is always maintained. A BSI inclination sensor from Balluff assists in continual tensioning by directly measuring the angle of the dancer arm.

Features

- No additional target necessary: direct tilt angle measurement
- Simple installation and startup
- Greater accuracy than comparable solutions using an inductive sensor
- No mechanical correction – simple teaching of the zero point on pin 4

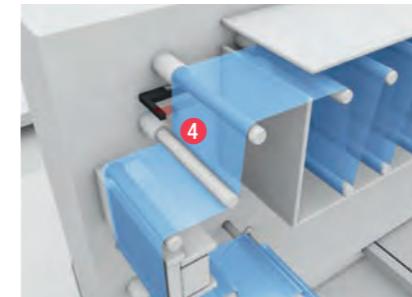


TRANSPARENT FILM DETECTION
BOS Photoelectric Sensors

Our BOS optical sensors reliably detect the presence of transparent film in pillow bag packaging.

Features

- Various optical technologies
- Background suppression



WEB EDGE CONTROL
BLA Light Bands

Our BLA light band sensors measure the edge position of fast-running film or woven bands. The determined values can be used to precisely control the drive and guides on your production equipment. The result is even and straight web running. Our sensors are available in a number of different versions. This allows you to respond flexibly to any customer requirement.

Features

- High linearity from especially even light distribution
- For tight mounting conditions: compact version in rugged fork-style housing or with narrow emitter/receiver strips and separate electronics

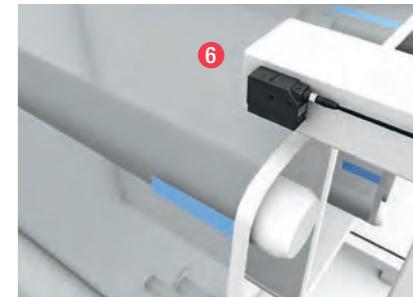


MONITORING THE DIAMETER OF FILM ROLLS
BOD Photoelectric Distance Sensors

To make sure depleted film rolls are replaced in time, their diameter must be continually monitored. The BOD photoelectric distance sensors from Balluff are ideal for this. They measure with extreme precision, regardless of color, material and degree of reflection of the foil.

Features

- Reduced downtimes thanks to precise and stable measurements
- Independent of the film properties
- Flexible use thanks to adjustable measuring range
- Fast and easy mounting, teach keys for setting
- Long service life and reliable functionality: rugged metal housing



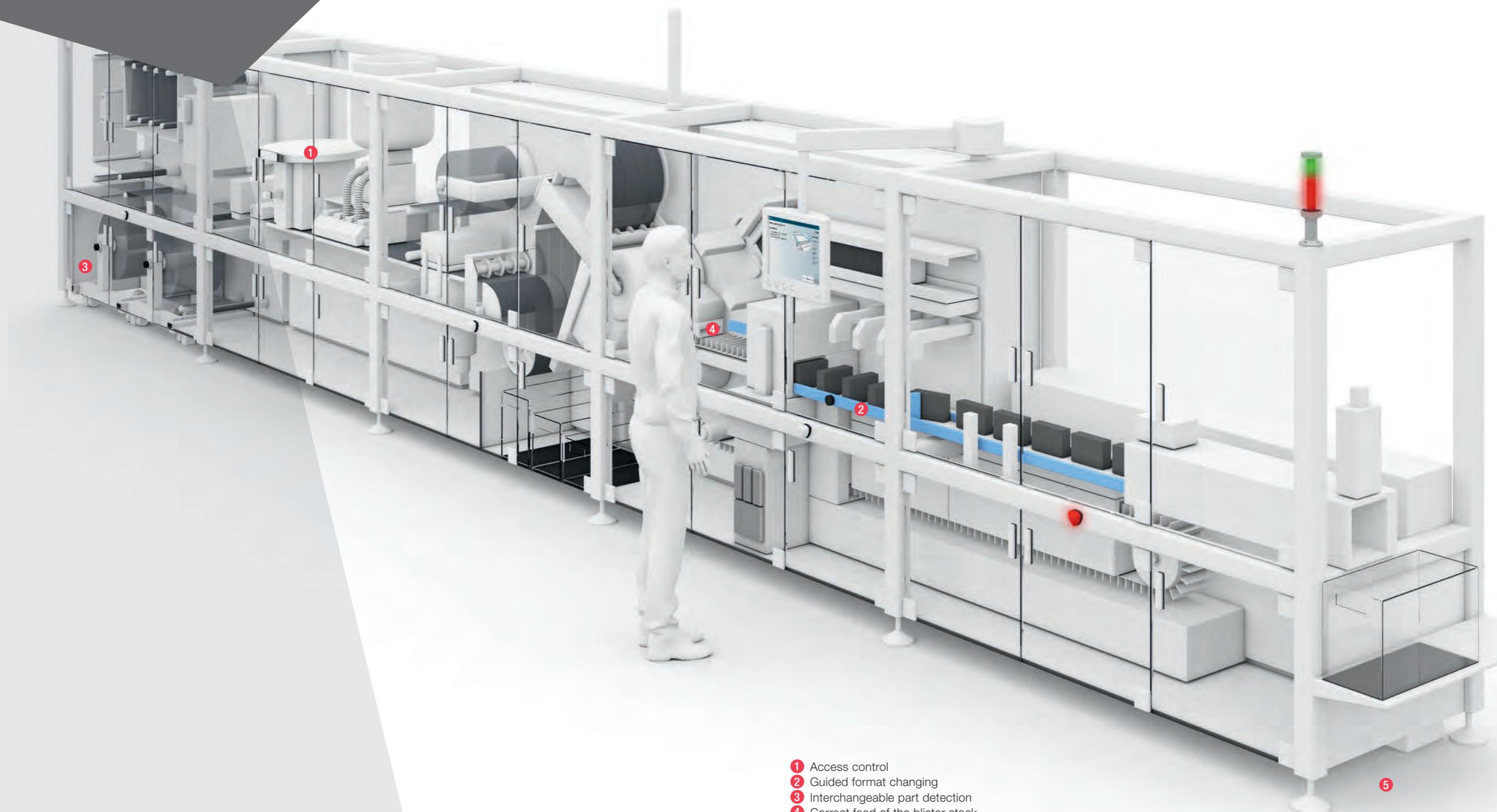
PRINT MARK DETECTION
BKT Contrast Sensors

Reference and print marks help to reliably detect packaging materials in automated production processes and to position them correctly. The BKT contrast sensor from Balluff reliably detects these reference marks.

Features

- Adjusting possible during operation
- IP67
- High switching frequency ensures a high fill rate

Solutions for carton packaging machines



- ① Access control
- ② Guided format changing
- ③ Interchangeable part detection
- ④ Correct feed of the blister stack
- ⑤ Code and plain text detecting on packaging



ACCESS CONTROL
BIS Industrial RFID Systems

With industrial RFID systems you restrict access to machines for safety and to prevent tampering. Distinguishing between persons enables limited access to certain screens. The views for the interface can be automatically changed. Access control allows operator working times to be viewed and regular maintenance to be performed.

Features

- Reliable reading with 3 mm thick stainless steel wall on 125 kHz RFID antenna
- Color coded key pendants for various user roles



GUIDED FORMAT CHANGING
BDG Position Indicator

Differing types of packaging, great product variety, and production of ever smaller lot sizes on a machine all result in frequent format changes. Digital BDG position Indicators from Balluff feature a display on which you can read all the settings for the format change. If the value is not correctly set, the machine will not start up, preventing unnecessary scrap.

Features

- Production security through semi-automated format change
- Clear user guidance for greater efficiency
- Simple to retrofit into an existing system

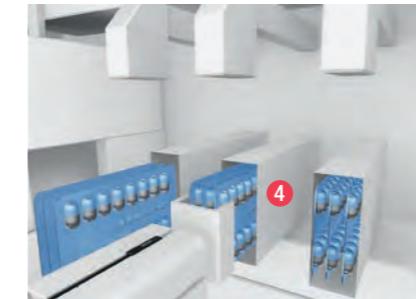


INTERCHANGEABLE PART DETECTION
BIS Industrial RFID Systems

Once the correct format is set, our RFID solutions offer you additional security. When changing a machine over to a new format you can use RFID data carriers or barcodes to ensure that the correct new parts are being used. Our HF-RFID technology (13.56 MHz) enables automatic interchangeable part detection. The various format parts are reliably detected and identified. With our vision sensors you can also detect whether the new parts have been correctly installed.

Features

- Short setup times and increased throughput
- Counterfeit protection for greater machine security and guaranteed protection
- Prevents machine damage from incorrect parts when starting up



CORRECT FEEDING OF THE BLISTER STACK
BMF Magnetic Field Sensors

Blister packs filled with tablets must be packed in boxes precisely portioned. This means they have to be fed with exact precision. Our BMF magnetic sensors monitor the position of the pneumatic grippers on the machine, thereby preventing deviations.

Features

- Precise positioning
- Correct feeding
- High flexibility
- Available for any T- or C-slot

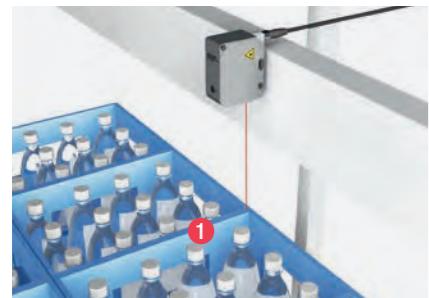


CODE AND PLAIN TEXT DETECTION ON PACKAGING
BVS Vision Sensors

Another step for quality assurance at the end of the packaging process is checking plain text on the packaging and verifying the printed barcode. Manufacturing, and expiration dates as well as serial numbers need to be quickly and reliably verified. BVS vision solutions from Balluff are a good solution to this and a wide variety of applications in image processing.

Features

- Read, check and verify codes and text in one step
- Flexible, targeted linking to the production environment
- SmartCamera available as IO-Link or fieldbus version
- Complete imaging and analysis in one product
- Standardized C-mount lenses and M12 connectors



VERIFYING STACK HEIGHT ON THE
PALLET

BOD Photoelectric Distance Sensors

The BOD photoelectric distance sensors check pallet heights with extraordinary accuracy, even over longer distances. The sensor is versatile thanks to settable measuring ranges and flexible for use with different pallet heights.

Features

- Reliable regardless of material or surface properties
- Parameterization and diagnostics functions via IO-Link
- Simple, intuitive operation with keys and display
- Maximum protection with Laser Class 1
- Long service life thanks to a rugged housing with higher enclosure ratings



EXACT POSITIONING OF STRETCH
FILMS

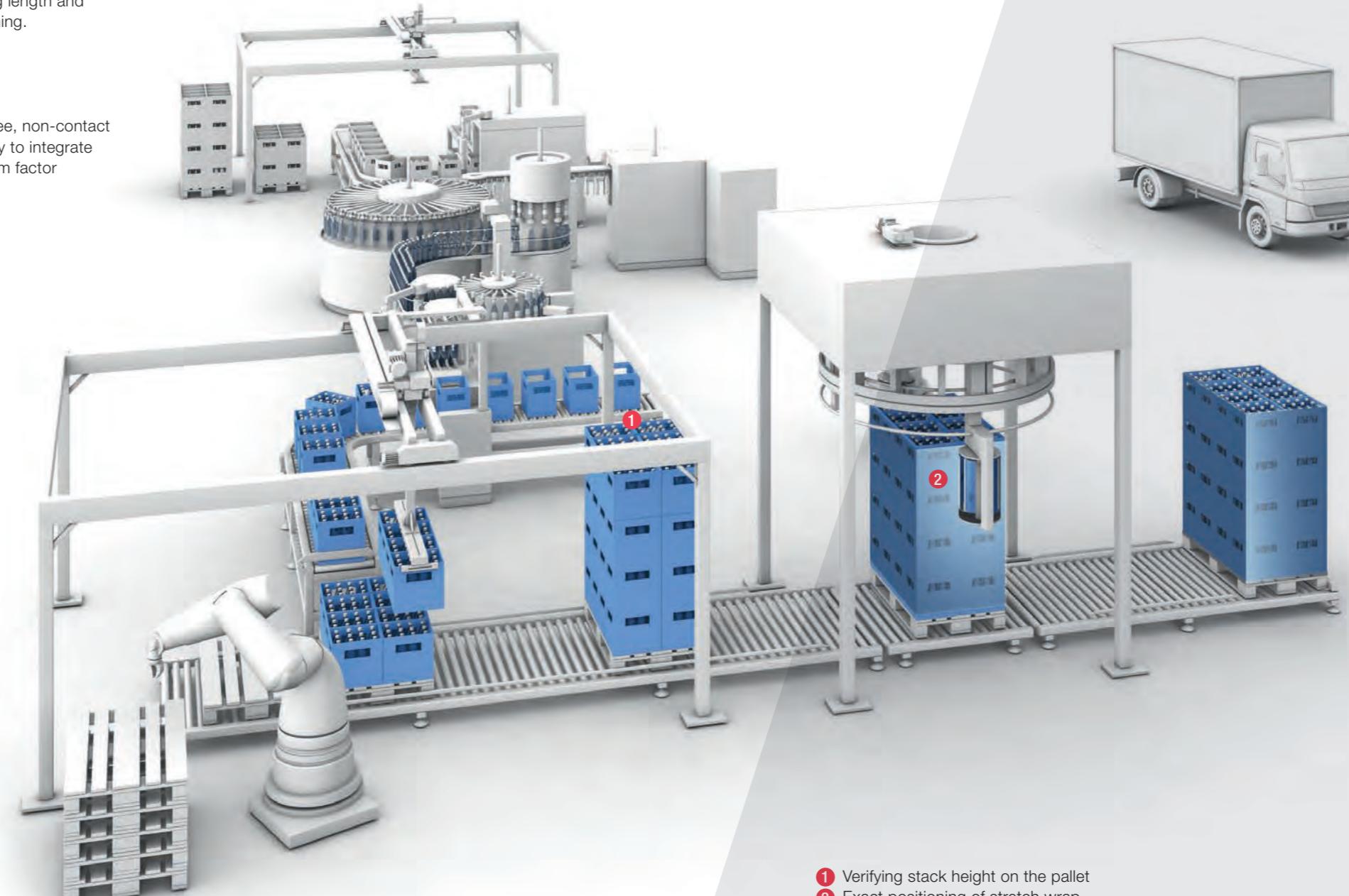
BML Magnetic Encoders

When wrapping the product with stretch wrap, conserving material is key. This means the stretch film must be precisely positioned. Our BML magnetic encoder is the ideal solution. They can be used for almost any measuring length and ensuring precise positioning.

Features

- Simple to use, wear-free, non-contact
- Space-saving and easy to integrate thanks to compact form factor

Solutions for palletizing and depalletizing machines



- ① Verifying stack height on the pallet
- ② Exact positioning of stretch wrap

INNOVATIVE SOLUTIONS
FOR ALL REQUIREMENTS.



PRODUCT OVERVIEW

 *innovating automation*

Application	Products	Example	Functions, interfaces and properties
FOOD INDUSTRY			
Vehicle identification	BIS Industrial RFID Systems	BIS01E4	M30 style, working frequency 865 MHz...928 MHz (UHF), housing material stainless steel 14404, IO-Link 1.1 (COM3), M12 connector A-coded, washdown, IP69K, Smart Features
Monitoring the hydraulics in homogenizing equipment	BSP Pressure Sensors	BSP00Y6	Monitoring hydraulic pressure, measuring range 0...20 bar, housing material stainless steel (1.4301) PE, high-density polyethylene, IO-Link 1.1 (COM2), M12 connector A-coded, IP67
Controlling product flow at the coupling panels	BES Inductive Sensors	BES05WY	M18 style, nominal switching distance 8 mm, housing material stainless steel V4A, IO-Link 1.1 (COM3), M12 connector A-coded, washdown, IP69K, Smart Features
Checking the presence of the container for secure filling	BUS Ultrasonic Sensors	BUS006W	Form factor Ø 18 mm, analog current 4...20 mA, housing material stainless steel (1.4404), cable 2 m PVC, IP67
Object detection during production	BOS Photoelectric Sensors	BOS0286 BAM00UK	Series R254K, optical function principle retroreflective sensor, housing material PA plastic 12/PA PACM 12, IO-Link 1.1 (COM3), connection: M12 connector A-coded, Ecolab certified, washdown, IP69K, Smart Features
Colored label detection	BFS Photoelectric Color Sensors	BFS000M	Color sensor, Series 33M, dimensions 21 x 58.3 x 58 mm, IO-Link 1.1, 2x NO/NC, optical diffuse sensor, white light, connector, M8 x 1-male, 4-pin, anodized aluminum, Ub 21.6...26.4 VDC, approval/conformity CE, WEEE, EAC
Scanning the PDF417 code of the delivered raw materials	BVS Optical Identification	BVS001U	Light type: LED white light, interface RS232/USB, IP65
Position detection in the washdown area	BOS Photoelectric Sensors	BOS0285	Diffuse, triangulation, with background suppression, CCD technology, housing material PA plastic 12/PA PACM 12, IO-Link 1.1 (COM3), M12 connector A-coded, Ecolab certified, washdown, IP69K, Smart Features
Detecting hooks in conveyor systems	BIS Industrial RFID Systems	BIS01E7	Form factor M30, working frequency 13.56 MHz (HF), housing material stainless steel: 14404, IO-Link 1.1 (COM3), M12 connector A-coded, washdown, IP69K, Smart Features
Monitoring safety on automatic saws in the cutting process	BGL Opto-Electronic Protective Devices	BLG000Y	Non-contact (photoelectric), housing material aluminum, painted, yellow (RAL 1003), Connection 1: (Emitter and Receiver) M12 connector A-coded, IP65
Optical detection on automatic saws in the cutting process	BOS retroreflective sensors	BOS0286	Series: R254K, optical function principle: retroreflective sensor, housing material PA plastic 12/PA PACM 12, IO-Link 1.1 (COM3), M12 connector A-coded, Ecolab certified, washdown, IP69K, Smart Features
Transport signals reliably and error-free	BNI network modules	BNI00EK	IO-Link Profinet Master, 8 x Class A, housing material PPS plastic, power M12 I-coded, REST-API, JSON, Ecolab certified, washdown, IP69K, Smart Features

Application	Products	Example	Functions, interfaces and properties
BEVERAGE INDUSTRY			
Level monitoring for bottling	BTL magnetostrictive linear position sensors	BTL7-ZE/ZF-Digital Series	Measuring range 50...2500 mm (configurable), housing material stainless steel (1.4404)
Seal monitoring	BVS Vision Sensors	BVS000L	Sensor type CMOS image sensor black-white, resolution 640 x 480 pixels, housing material aluminum, die-cast, painted ABS, interface Ethernet 10/100 T, Terminal 1: connector 8-pin A-coded, Terminal 2: connector 4-pin D-coded, IP54
Label detection on beverage bottles	BOH Optical Sensor Heads	BOH005C	Series Z001, dimensions 16 x 4 x 8.5 mm, optical function principle: diffuse sensor, energetic, range 3...15 mm, cable with connector, M8 x 1-male, 1 m, PUR, housing material brass, nickel plated, IP65
Detecting liquid in transparent bottles	BGL Fork Sensors	BGL004N	Series F, dimensions 12 x 115 x 86 mm, cable with connector, M12 x1-male, 4-pin, 0.25 m, PUR, housing material stainless steel (1.4404), IP67/ IP69K
PHARMACEUTICALS AND COSMETICS			
Seal monitoring	BLA Light Bands	BLA0007	Series C, dimensions 38 x 20 x 68.3 mm, light array principle, CCD technology, range 0...2 m, housing material anodized aluminum, IO-Link 1.1 (COM2), IP67

Application	Products	Example	Functions, interfaces and properties
PACKAGING INDUSTRY			
Diagnosing operating states	SmartLight – BNI Signal Tower Lights	BNI0072	Interface IO-Link 1.1, COM2 (38.4 kBaud), connection M12x1-male, 4-pin, predefined colors: yellow, white, green, blue, red, orange, configurable; Runlight Mode, Level Mode, Segment Mode, Flexi-Mode, IP65
Roll guiding	BSI Inclination Sensors	BSI0012	Interface 2x Analog, current 4...20 mA, measuring axes 2, measuring range -90...90°, IP67
Transparent film detection	BOS Photoelectric Sensors	BOS0285	Interface IO-Link 1.1, COM3 (230,4 kBaud), analog, current 4...20 mA, Push-pull NO/NC PNP/NPN/push-pull NO/NC, connection connector, M12x1-male, 4-pin, range 30...250 mm, IP69K, Smart Features
Web edge control	BLA Light Bands	BLA0007	Interface IO-Link 1.1, COM2 (38.4 kBaud), connection 1: M8x1-male, 4-pin, connection 2: M8x1-female, 4-pin, connection 3: M8x1-male, 4-pin, range 0...2 m, IP67
Monitoring the diameter of film rolls	BOD Photoelectric Distance Sensors	BOD002M	Interface IO-Link 1.1, COM2 (38.4 kBaud), analog, voltage/analog, current selectable 4...20 mA, 0...10 V 2x PNP/NPN NO/NC, connection connector, M12x1-male, 4-pin, range 50...100 mm, IP67
Print mark detection	BKT Contrast Sensors	BKT0012	Interface PNP normally open/normally closed (NO/NC), connection cable, 2.00 m, PVC, range 1...250 mm, IP69K DIN 40050
Access Control	BIS Industrial RFID Systems	BIS01E2	Form factor cubical, working frequency 13.56 MHz (HF), housing material ABS GF16 (Novodur P2HGV), IO-Link 1.1 (COM3), cable 300 mm female M12 A-coded, cable length 300 mm, washdown, IP69K, Smart Features
Guided format changing	BDG Position Indicator	BDG0291	20 mm hollow shaft with integrated display, housing material PA12 and stainless steel, M12 connector A-coded washdown, IP69K, Smart Features
Interchangeable part detection	BIS Industrial RFID Systems	BIS01E7	Form factor M30, working frequency 13.56 MHz (HF), housing material stainless steel 14404, IO-Link 1.1 (COM3), M12 connector A-coded, washdown, IP69K, Smart Features
Correct feeding of the blister stack	BMF magnetic field sensors	BMF00M0	Dimensions: 5 x 5.4 x 27 mm, connection: cable TPE-V 2 m, switching frequency 10,000 Hz, IP67/68/69, ECOLAB certified
Code and plain text detection on packaging	BVS Vision Sensors	BVS002A	Sensor type CMOS 1/1.8" monochrome global shutter, resolution: 1280 x 1024 pixels, dimensions 62 x 55 x 110 mm, housing material aluminum, painted, interfaces LAN (Gigabit Ethernet); Profinet/EtherNet/IP; IO-Link, IP67
Verifying stack height on the pallet	BOD Photoelectric Distance Sensors	BOD002N	Series 24K, dimensions 50 x 21 x 50 mm, optical function principle: Triangulation, range 50...650 mm, housing material plastic, M12 connector A-coded, IP67
Exact positioning of stretch films	BML magnetic encoders	BML06HC	Dimensions: 16 x 18.6 x 54 mm, housing material die-cast zinc, nickel plated, chrome plated, measuring range 8190 mm, IO-Link 1.1; analog Sin/Cos (1 Vpp), IP67

Product group	Example	Functions, interfaces and properties
RAW MATERIAL/PROCESSING		
Optical Identification	BVS001Y	Bluetooth 2.0
Optical Identification	BVS0029	Aluminum, painted, LAN (Gigabit Ethernet); Profinet/EtherNet/IP, IO-Link
BFT	BFT0007	Stainless steel 1.4571, washdown, analog, current 4...20 mA
BFF	BFF0001	Stainless steel 1.4571, PNP NO/NC
BSP	BSP0103	Stainless steel 1.4404, PEHD plastic, Ecolab certified, washdown, IO-Link, analog voltage 0...10 V/current 4...20 mA, PNP NC/NO
IO-Link Profinet Master	BNI00EK	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 8 x Class A, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Digital Hub	BNI00F6	PPS plastic, Ecolab certified, washdown, IO-Link 1.1 (COM3), 8 x DIO, AUX power M12 I-coded, IP69K, Smart Features
IO-Link Digital Hub	BNI00F7	PPS plastic, Ecolab certified, washdown, IO-Link 1.1 (COM3), 8 x DIO, IP69K, Smart Features
IO-Link Profinet Master	BNI00F8	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 4 x Class A, 4 x Class B, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Analog Hub	BNI00F9	PPS plastic, Ecolab certified, washdown, IO-Link 1.1 (COM3), 4 x analog IN, 4 x DIO, IP69K, Smart Features
IO-Link Analog Hub	BNI00FA	PPS plastic, Ecolab certified, washdown, IO-Link 1.1 (COM3), 8 x analog IN, IP69K, Smart Features
Inductive IO-Link Couplers	BIC0086 BIC0087	Stainless steel 1.4404, Ecolab certified, washdown, IO-Link 1.1 (COM3), IP69K, Smart Features, continuous output current 1.5 A, transmission distance 0...5 mm, transparent channel and diagnostics channel (selectable)
IO-Link Profinet Master	BNI00EK	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 8 x Class A, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
PRIMARY PACKAGING – LIQUIDS		
Optical Identification	BVS0001	Aluminum, die-cast, painted ABS
Optical Identification	BVS002F	Painted aluminum
IO-Link SmartLight	BNI0072	PC, transparent, die-cast zinc, IO-Link, IP65, stacklight- runlight, level-mode, colors configurable
IO-Link Profinet Master	BNI00EK	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 8 x Class A, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Digital Hub	BNI00F6	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x DIO, AUX power M12 I-coded, IP69K, Smart Features
IO-Link Digital Hub	BNI00F7	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x DIO, IP69K, Smart Features
IO-Link Profinet Master	BNI00F8	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 4 x Class A, 4 x Class B, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Analog Hub	BNI00F9	PPS plastic, Ecolab certified, washdown, IO-Link, 4 x analog IN, 4 x DIO, IP69K, Smart Features
IO-Link Analog Hub	BNI00FA	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x analog IN, IP69K, Smart Features

Additional products can be found on our website at: www.balluff.de/go/product-finder

Product group	Example	Functions, interfaces and properties
PRIMARY PACKAGING – SOLIDS		
Optical Identification	BVS0037	Aluminum, powder coated, painted
Optical Identification	BAE0103	Steel, black, powder coated, zinc plated
Optical Identification	BVS002F	Painted aluminum
Optical Identification	BVS0001	Aluminum, die-cast, painted ABS
IO-Link Profinet Master	BNI005H	Die-cast zinc, IO-Link, Profinet, 8 x Class A, Power 7/8", IP67
IO-Link Ethernet/IP Master	BNI006A	Die-cast zinc, IO-Link, Ethernet/IP, 8 x Class A, Power 7/8", IP67
IO-Link Digital Hub	BNI00CP	Die-cast zinc, IO-Link, 8 x DIO, AUX Power 7/8", IP67
Inductive IO-Link couplers	BIC0086 BIC0087	Stainless steel 1.4404, IO-Link, IP67, Smart Features
IO-Link SmartLight	BNI0072	PC plastic, die-cast zinc, IO-Link, IP65, stacklight- runlight, level-mode, colors configurable
IO-Link Profinet Master	BNI00EK	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 8 x Class A, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Digital Hub	BNI00F6	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x DIO, AUX power M12 I-coded, IP69K, Smart Features
IO-Link Digital Hub	BNI00F7	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x DIO, IP69K, Smart Features
IO-Link Profinet Master	BNI00F8	PPS plastic, Ecolab certified, washdown, IO-Link, Profinet, 4 x Class A, 4 x Class B, power M12 I-coded, REST-API, JSON, IP69K, Smart Features
IO-Link Analog Hub	BNI00F9	PPS plastic, Ecolab certified, washdown, IO-Link, 4 x analog IN, 4 x DIO, IP69K, Smart Features
IO-Link Analog Hub	BNI00FA	PPS plastic, Ecolab certified, washdown, IO-Link, 8 x analog IN, IP69K, Smart Features
SECONDARY AND FINAL PACKAGING		
Optical Identification	BVS0037	Aluminum, powder coated, painted
Optical Identification	BAE0103	Steel, black, powder coated, zinc plated
Optical Identification	BVS002F	Painted aluminum
Optical Identification	BVS0001	Aluminum, die-cast, painted ABS
IO-Link Profinet Master	BNI005H	Die-cast zinc, IO-Link, Profinet, 8 x Class A, Power 7/8", IP67
IO-Link Ethernet/IP Master	BNI006A	Die-cast zinc, IO-Link, Ethernet/IP, 8 x Class A, Power 7/8", IP67
IO-Link Digital Hub	BNI00CP	Die-cast zinc, IO-Link, 8 x DIO, AUX Power 7/8", IP67
Inductive IO-Link couplers	BIC0086 BIC0087	Stainless steel 1.4404, IO-Link, IP67, Smart Features
IO-Link SmartLight	BNI0072	PC plastic, die-cast zinc, IO-Link, IP65, stacklight- runlight, level-mode, colors configurable

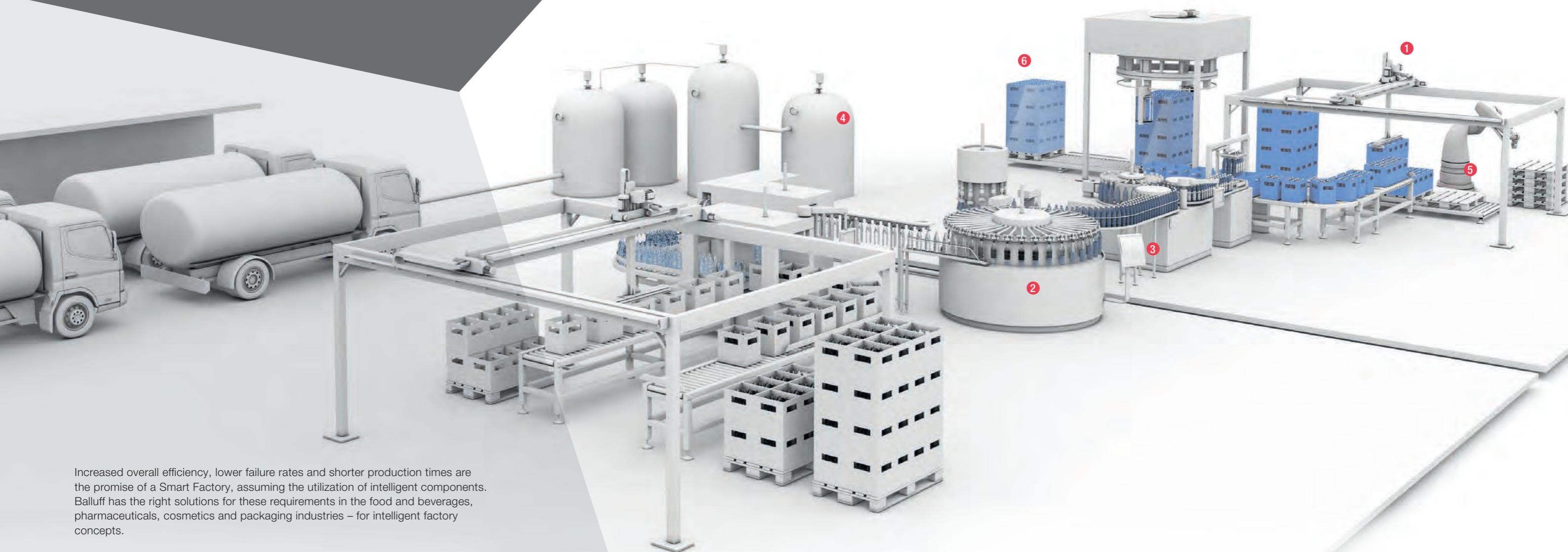
Product group	Example	Functions, interfaces and properties
RAW MATERIAL/PROCESSING		
PRIMARY PACKAGING – LIQUIDS/PRIMARY PACKAGING – SOLIDS, SECONDARY AND FINAL PACKAGING		
RFID	BIS01E5	Stainless steel 1.4404, washdown, IO-Link, Smart Features
RFID	BIS01E2	ABS plastic GF16, washdown, IO-Link, Smart Features
RFID	BIS01E4	Stainless steel 1.4404, washdown, IO-Link, Smart Features
Inductive Sensors	BES0438	Stainless steel 1.4571, Ecolab certified, washdown, PNP N.C.
Inductive Sensors	BES0437	Stainless steel 1.4571, Ecolab certified, washdown
Inductive Sensors	BES0443	Stainless steel 1.4571, Ecolab certified, washdown
Inductive Sensors	BES05Y7	Stainless steel 1.4571, washdown, IO-Link, Smart Features
Inductive Sensors	BES05WY	Stainless steel 1.4571, washdown, IO-Link, Smart Features
Photoelectric Sensors	BOS023J	Stainless steel 1.4571, washdown
Photoelectric Sensors	BOS023H	Stainless steel 1.4571, washdown, IO-Link, Smart Features
Photoelectric Sensors	BOS01KL	Stainless steel 1.4404, Ecolab certified, washdown, IO-Link
Photoelectric Sensors	BOS027M	Die-cast zinc, ABS plastic GF16, Ecolab certified, washdown, IO-Link
Photoelectric Sensors	BOS0286	Plastic: PA12, washdown, IO-Link, Smart Features
Photoelectric Sensors	BOS0285	Plastic: PA12, washdown, IO-Link, Smart Features
Photoelectric Sensors	BOS0284	Plastic: PA12, washdown, IO-Link, Smart Features
Photoelectric Sensors	BOS0283	Plastic: PA12, washdown, IO-Link, Smart Features
Condition Monitoring Sensors	BCM0001	Stainless steel 1.4404, washdown, IO-Link, vibration, temperature
Condition Monitoring Sensors	BCM0002	Stainless steel 1.4404, washdown, IO-Link, Smart Features
Ultrasonic Sensors	BUS006M	Stainless steel 1.4404, washdown
Ultrasonic Sensors	BUS006W	Stainless steel 1.4404, washdown, analog, current 4...20 mA
Ultrasonic Sensors	BUS006U	Stainless steel 1.4404, washdown, analog, voltage 0...10 V
BTL	BTL7-E570-Mxxxx-SF-F05*	Stainless steel 1.4404, hygienic design, analog, current 4...20 mA, 3A certificate
Magnetic Encoders	BML0902	Die-cast zinc, IO-Link
BMF	BMF00M1	PP plastic, Ecolab certified, washdown
BMP	BMP000J	Aluminum, plastic PA12, analog voltage 0...10 V/current 4...20 mA, IO-Link
BDG (DPI)	BDG028Z	Plastic: PA12, stainless steel 1.4404, Ecolab certified, washdown, IO-Link, Smart Features

* Please contact our Sales department to configure your product.

Additional products can be found on our website at: www.balluff.de/go/product-finder

APPLICATIONS FOR PACKAGING MACHINES.

BUILD
YOUR
SMART
FACTORY



Increased overall efficiency, lower failure rates and shorter production times are the promise of a Smart Factory, assuming the utilization of intelligent components. Balluff has the right solutions for these requirements in the food and beverages, pharmaceuticals, cosmetics and packaging industries – for intelligent factory concepts.

① CONTROLS ARCHITECTURE

- Reduces analog wiring and lowers costs by 15% to 20%
- Simplifies error clearing
- Enables transparency up to the sensor/device
- Simplifies changeover
- Reduces the number of connections
- Makes manual configuration of devices and sensors superfluous

② RETROFITTING – GUIDED FORMAT CHANGE AND INTERCHANGEABLE PART DETECTION

- Prevents changeover errors
- Reduces the scheduled downtime for changeovers
- Reduces product scrap when starting up after changeovers
- Precision positioning
- Ensures that the right parts are exchanged

③ PREDICTIVE MAINTENANCE

- Improves optimized diagnostic capabilities through more precise data
- Reduces unscheduled downtimes
- Reduces slowdowns
- Reduces product scrap

④ LEVEL MONITORING

- Dynamic and precise
- Compact design
- Easy retrofit

⑤ ROBOTICS

- Reduces wiring
- Reduces weight
- Integration into robotics controllers
- Simplifies installation
- Plugless quick-coupling for simple changeout of robot tools
- Offers full diagnostics

⑥ TRACEABILITY

- Tracks raw materials and finished goods
- Date and lot accuracy for any possible product recalls
- Rugged tags, embedded in holders, pallets, containers and fixtures
- Increases safety using access control

Custom tailored total packages

DIGITALIZATION AND IIOT SOLUTIONS – INDIVIDUALIZED FOR YOU

Tailored 360° solutions offer you complete support

Balluff supports you with custom digitalization and IIoT solutions. This enables the growing diversity of technology and the increasing pressure toward integration through digitalization to be securely managed. Our solutions are tailored precisely to your needs. Taking your requirements as the starting point, we develop individual 360° IIoT solutions for you in which we evaluate the current situation, the infrastructure of your information (IT) and operating technology (OT) and apply the right strategy, methodology and technology. In addition to implementation, we offer you individualized assistance throughout the entire life cycle.

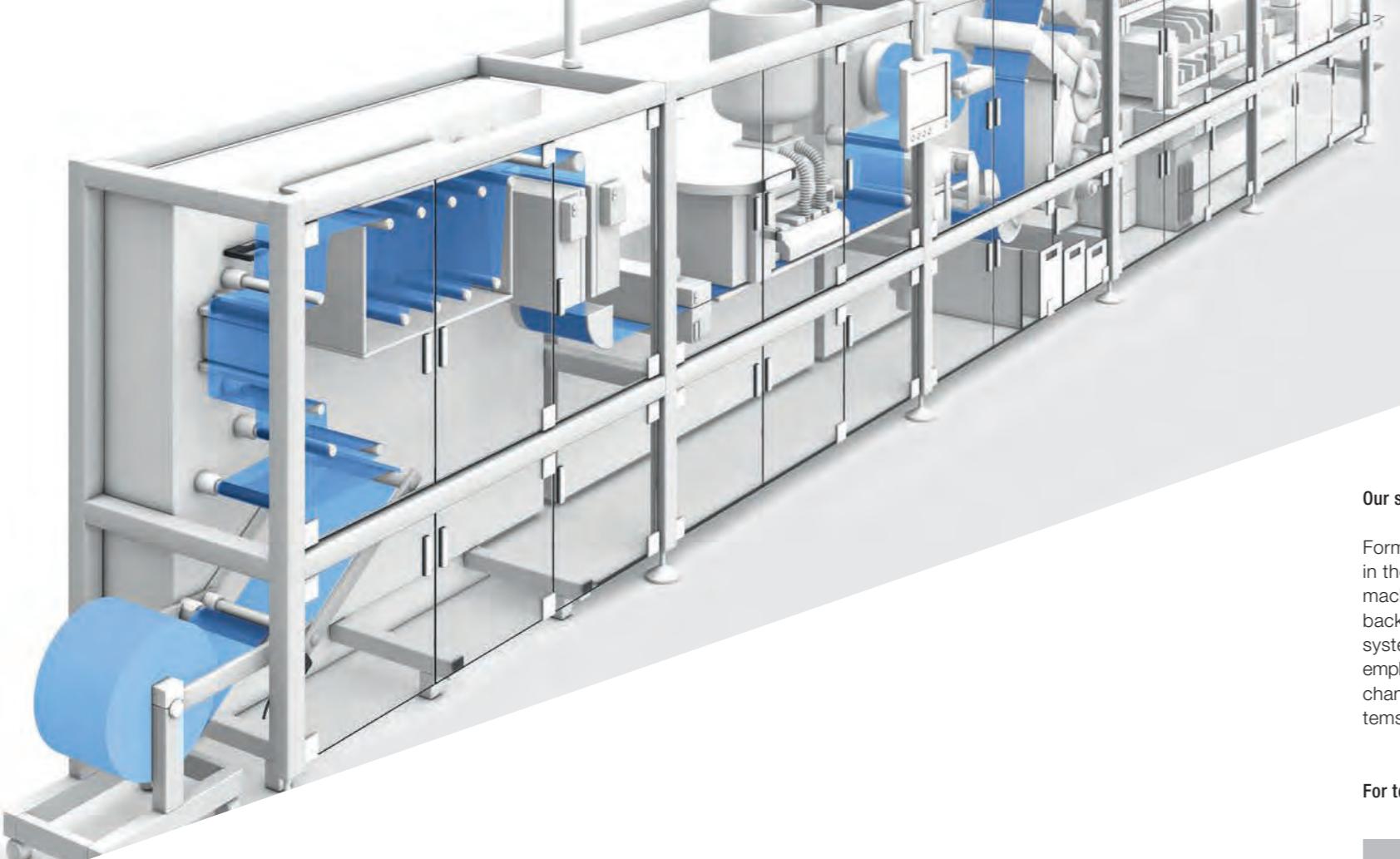
Economy and quality are priorities for us. And we think about data security from the very outset. Seamless linking of OT and IT is a matter of course for our experts. They make use of various competencies from IT and OT, research and development, process and project management as well as the sales area.

Hardware suited for the IIoT is the basis of our software solutions. We adapt our services to your situation, so that the hardware manufacturer is no longer critical. This enables us to implement the perfect interplay between hardware and software. How we proceed with our projects can be learned on the following pages.

Our service blocks at a glance

- 1 Seamless data security using appropriate defense strategies
- 2 Modern, stable and value-creating information flow using a custom-tailored backend
- 3 The greatest possible clarity using CI-conformal visualization of your automation processes for analyses of any kind
- 4 Matching hardware which we configure exactly for how it communicates with higher level systems, even up to the cloud
- 5 App development for any type of mobile terminal device or operating system
- 6 Provision of optimal hardware solutions with integration into your automation environment
- 7 Predictive maintenance and transparency through targeted data management
- 8 Perfect networking of sensors and software, OT and IT – for seamless functionality of devices and systems





Our solution

Format change is nothing new in the automation world. Balluff provides you with the right hardware for this in the form of sensors and RFID technology. The actual challenge begins with efficient feedback to man and machine as well as optimal and modern user guidance. We offer you a functional, lean and openly designed backend that enables simple management of recipe, machine and user data as well as linkage to additional systems. We build upon this basis and work together with you to develop the right user guidance for you and your employees. Using your own process know-how, together we ensure that all the recipe applications and changes are correctly managed and documented, and that this information is then available in all your systems.

For technical implementation of recipe and format changes we use the following service blocks



Use Case

RECIPE AND FORMAT CHANGES

We expand or merge your existing systems with custom digitalization and IIoT solutions. In developing these solutions we are always take your existing automation and IT environment into account. Our goal is to generate measurable added value for you in your specific production environment. How do you benefit? We don't actually penetrate the world of your existing systems (MES, ERP, QA systems), rather we network them and generate data there.

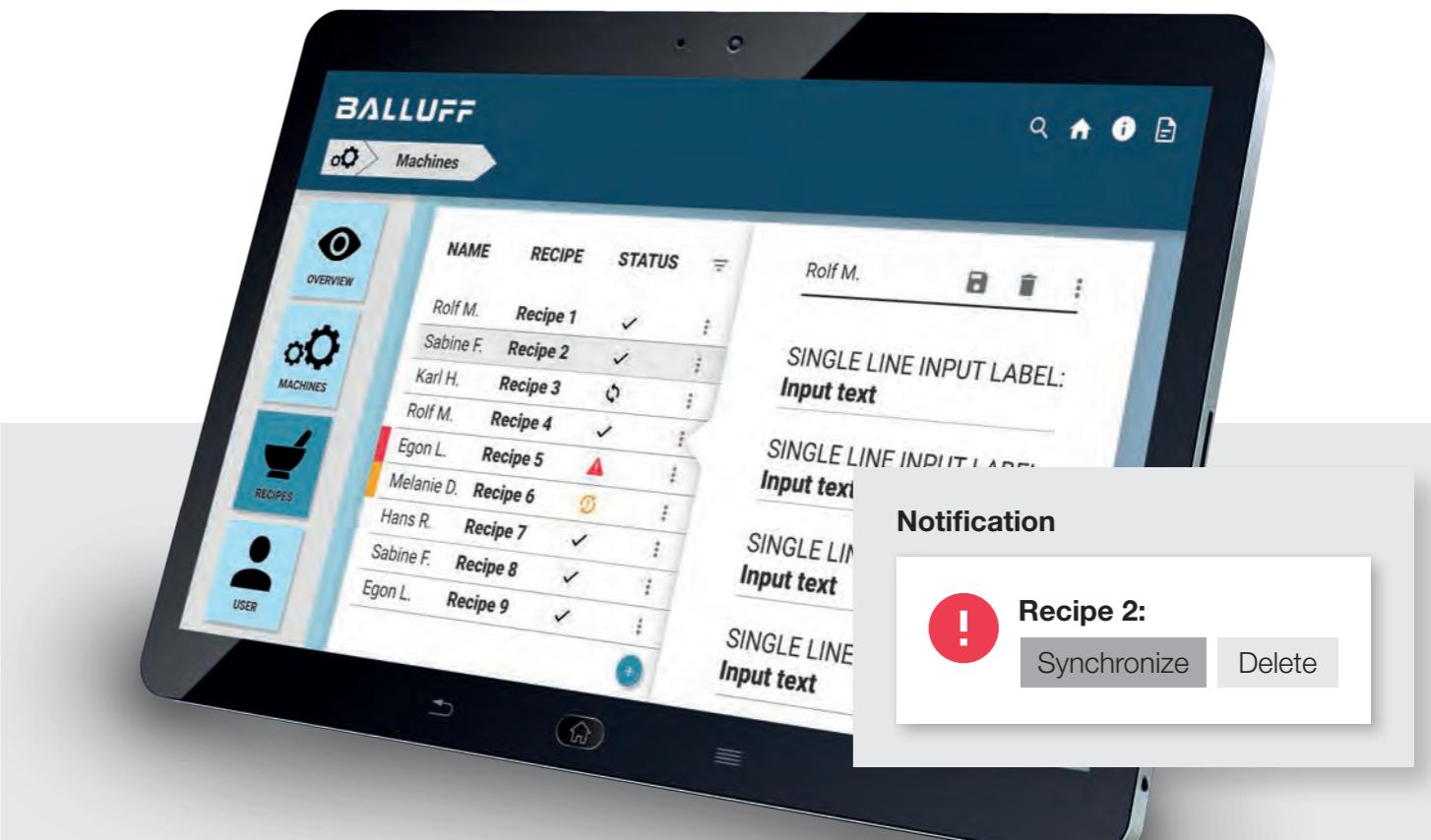
The information obtained through this associated data results in new realizations about your production processes. This would not be possible using singular data alone.

Your objective

You would like to increase the transparency of your production processes to meet the legal requirements and/or demands of your customers. For this you need a better overview of which equipment is currently in use, which recipes are being applied or where a recipe change has been made. You would also like to ensure that the formats are always correctly set at the start of production.

The challenge

- You have considerable maintenance effort and expense and many interfaces to various systems that need to be managed.
- You need simple user guidance and application for gaining employee acceptance to ensure that the processes are actually implemented.



Get inspired by our innovative solutions.
Information about our service blocks as part of custom digitalization and IIoT solutions, as well as more use cases can be found at our website.
www.balluff.de/iiot-projekte

**Balluff**

WE OPEN UP NEW PERSPECTIVES

Balluff is a leading provider of high-value sensor, identification and image processing solutions including networking technology and software for any automation requirement. Family owned for more than 100 years, Balluff currently employs around 3600 persons in 38 subsidiaries with sales, production and development facilities around the world to ensure your success. Together with our representatives we guarantee the highest quality standards in 68 countries so that you always get the best.

We perform top services for innovative solutions that increase your competitive ability. We deliver a consistent digital focus, manufacturing expertise, and high personal dedication.

We adhere to our motto "Innovating Automation" as pacesetters of automation, refiners and new developers, and technological trailblazers. In open exchange with associations, universities and research institutes as well as in close contact with our customers, we create new industrial sector solutions for automation. As a future-looking company we keep our eye not only on the traditional areas of automation, but also devote ourselves to the development of holistic applications for an increasingly digital and networked world.

We have the future firmly in view in everything we do. With a sophisticated environmental management system, we protect the environment and handle our resources with care. This also creates for you the best prerequisites for sustained action.

You can always rely on us, our products and our adherence to delivery dates and schedule — All in the name of mutually beneficial partnership.

REFERENCES

Our complete commitment is to the success of our customers. We draw on future-looking technologies, market-oriented solutions and the expertise of an experienced manufacturer to increase your competitiveness. This is why companies worldwide trust in Balluff solutions for packaging systems.

We work together with such companies as:



CONTACT
OUR
WORLDWIDE
SUBSIDIARIES

Headquarters
Balluff GmbH
Schurwaldstrasse 9
73765 Neuhausen a. d. F.
Germany
Phone +49 7158 173-0
Fax +49 7158 5010
balluff@balluff.de



www.balluff.com