

# BALLUFF

sensors worldwide

## Sensor Solutions and Systems

Comprehensive expertise for industrial automation





As leading sensor specialists and systems providers founded over 90 years ago, Balluff GmbH has for decades been a recognized partner in factory automation. The global player has a strong presence with 61 sales branches and representative offices as well as nine production sites on all continents. The corporate headquarters in Neuhausen a.d.F. is located near Stuttgart.

Balluff stands for application-specific customer solutions, comprehensive services, individual consultation and prompt service. Our staff of more than 2750 employees is committed to providing outstanding service worldwide.

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# Systems and Service

**Ideal for the application. Customized.  
More than just components**

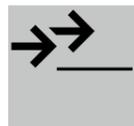
## **Long years of experience – comprehensive systems expertise**

With over 30 years of experience in identification technology, Balluff offers solid RFID development and applications know-how. This knowledge is the foundation for our comprehensive systems expertise with the entire spectrum of low-frequency, high-frequency and ultra-high frequency technology.

We offer an unmatched variety of data carriers, read/write heads and processors, which can be combined in a closed system according to your specific requirements. Each of these autonomous systems can be individually retrofitted and used regardless of location or manufacturer. If the systems are also used in conjunction with the appropriate network technology and individualized software, custom tailored solutions open up - depending on your needs with exclusive consulting, local startup assistance or complete project management.

## **Service - optimal support as you need it**

You can rely on us over the entire life cycle of our products and solutions. You receive our assistance from conception and planning of your projects to on-site testing and setup to training and support. Use the experience of the manufacturer to ensure your success.



# Systems and Service

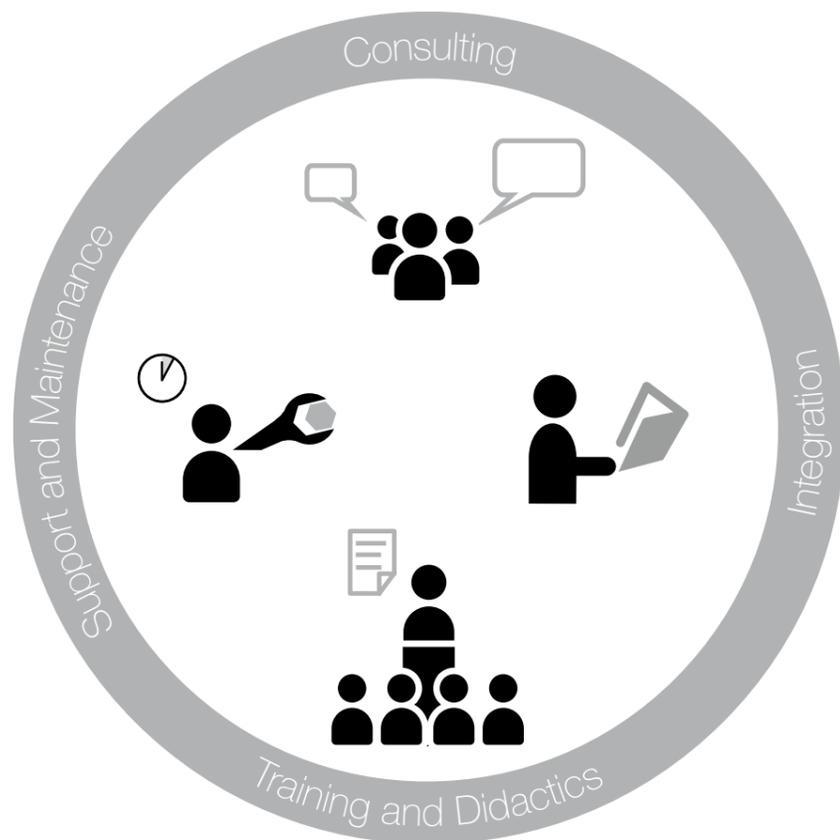
## We have what you need

### Transparency and security throughout the entire process

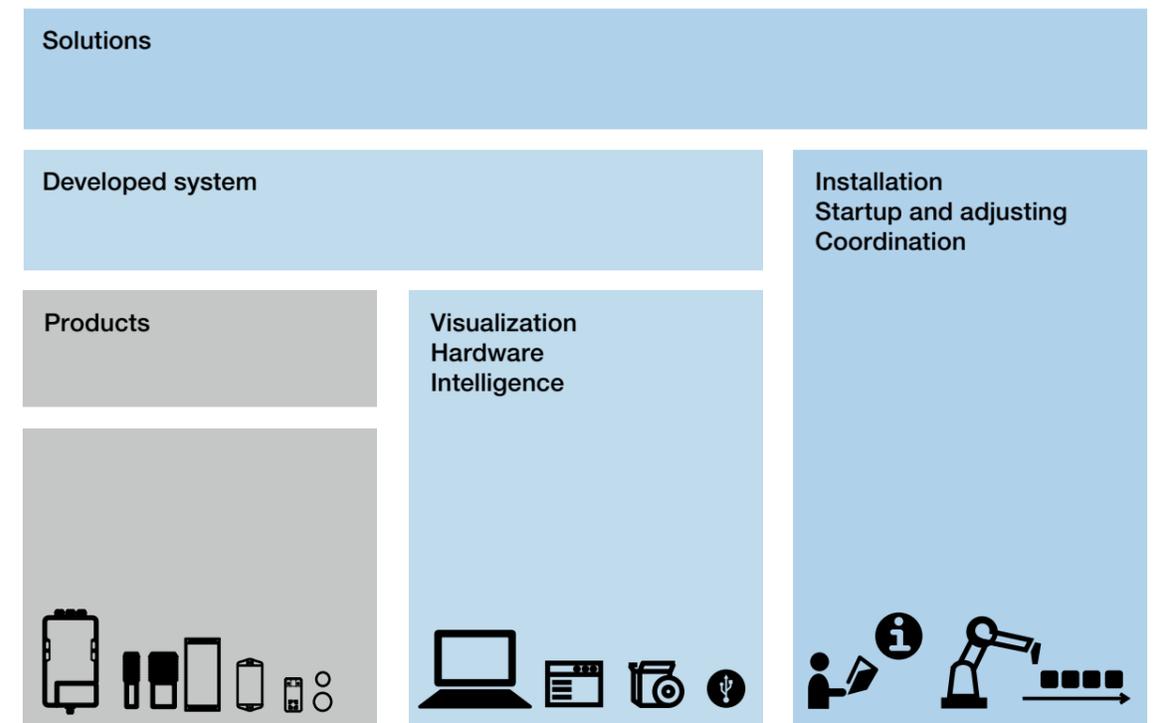
Balluff systems are used predominantly in informative automation. They acquire and evaluate data. And enable the corresponding status to be visualized. Automatic recording ensures transparency along the entire value creation chain. And the documentation lends security to the full process. Because every step is traceable.

### For maximum system availability

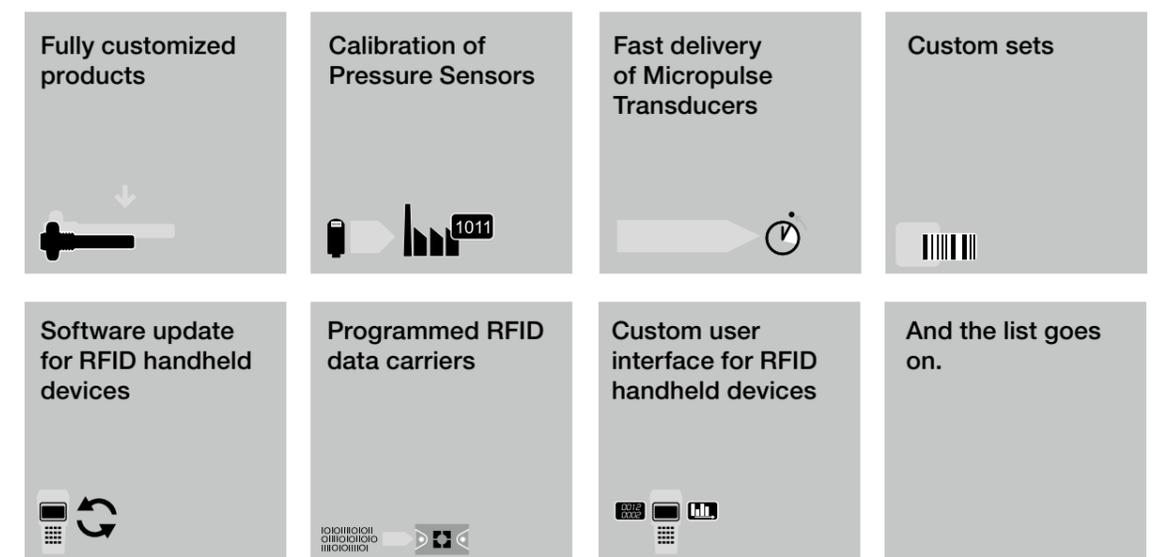
Our services guarantee custom-tailored solutions matched to your needs through our individualized support. We offer consulting, or we can design and plan your project. We handle programming for the software and test your application on-site. Once reliable functionality has been tested, we place the application in service, train your employees and provide support. For our systems and our vast portfolio of innovative, high-performance sensors - and - for maximum up-time and availability of your equipment.



## Individual, fully customized products



## Matched to our products – services





# Industrial Networking and Connectivity

## Communication systems in industrial automation

### For the highest performance

Ever faster, more flexible, more efficient and variable production demands seamless communication from the sensor to the internet. The result is a growing amount of data within the production processes. This demands components which can make this information available. At the same time an infrastructure is required which transports the data across all levels.

The intelligent combining of powerful industrial networks with the IO-Link communication standard enables reliable and flexible information exchange in a variety of applications.

## Know what's happening: Transport information across systems

Just one interface for improved process quality

IO-Link fulfills the highest demands for data communication in the widest possible range of applications.





# Industrial Identification

## Industrial RFID and image processing systems ensure maximum quality

### Why RFID?

Balluff RFID systems ensure traceability, the ability to reliably track production and quality information through non-contact reading and writing of the data.

Data and flow of goods are linked with each other to optimize material flow. This prevents quality gaps, reduces the cost of rework and returns. Top quality leads to the greatest possible customer satisfaction and secures market share for users.

### Wide variety for secure identification

- In the smallest spaces or over long distances
- For the greatest variety of materials (wood, plastic, metal)
- With self-adhesive one-time labels or reusable tags
- From a few bits to 128 kilobytes
- Compatible with a broad range of controllers and communications interfaces

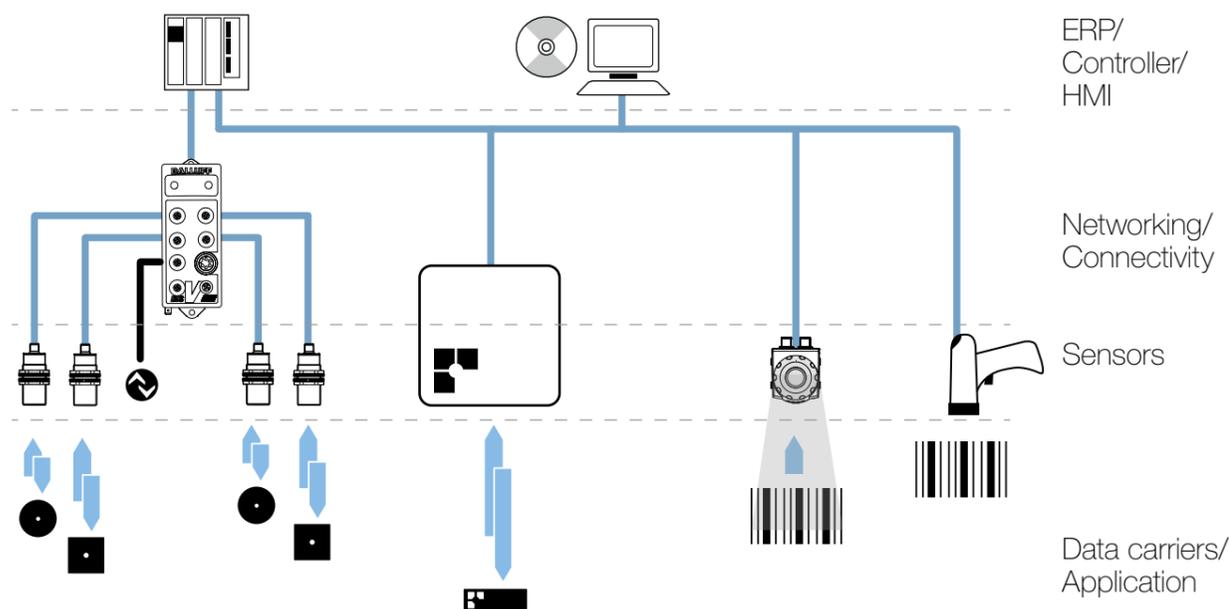
### Why image processing systems?

Industrial image processing using our vision solutions meets the increasing demand in modern production facilities for maximum quality and great flexibility.

Vision sensors, for example, offer extremely efficient functions that can be flexibly combined for reliable defect detection, precision quality inspection or for reliable reading and verification of codes.

### Vision solutions from Balluff are economical

- Cost reduction: one sensor instead of many
- Reduced scrap and downtime thanks to early defect detection
- Simple changing of the inspection task for changing lots means high system availability



## Proven in a broad range of applications

### Industrial identification means security

Industrial identification is in demand wherever the need is for quality, production reliability and optimized, traceable processes.



RFID supports process control: Are the parts being brought to the right production stage at the right time?



For engine assembly RFID ensures reliable parts traceability throughout all the production steps.



RFID ensures access control even through stainless steel.



Just-in-time: RFID ensures the correct delivery of all materials in intralogistics.



RFID ensures continuous material flow in kanban facilities.



RFID enables fully automated tool management, thereby guaranteeing optimal tool utilization.



Image-processing vision sensors read and inspect the codes on circuit boards.



Vision sensors check the position of screws in engine assembly.



Is the cap sitting on the bottle? Completeness inspection in bottling systems is handled by vision sensors.



# Object Detection

## Comprehensive portfolio for every sector of automation

### Mature technology for high efficiency

Secure running of automated processes demands proven technology and comprehensive know-how. With a broad range of highest-quality object detecting sensors, Balluff meets all the prerequisites.

Various measuring principles enable solid, liquid or granular media to be detected, their presence to be verified or their position to be detected. Reliable sensing remains unaffected by properties such as color, transparency, conductivity or surface characteristics. Measurement even through vessel walls is easily possible.

Non-contact detection ensures wear-free, noise immune and high-performance monitoring. We also provide technically and economically optimized individual solutions for unique tasks.

Build on our quality and long years of experience. Chart the course for high efficiency.



# Sensor Solutions and Systems

## Comprehensive expertise for industrial automation

**Everything from a single source**  
We have expertise in the entire technological spectrum using a variety of operating principles: high-quality sensors and systems for linear positioning and identification, sensors for object detection and fluid sensing. The full-range assortment includes optimal network and connection technology and a comprehensive line of accessory products.

We offer innovative, first-class products tested in our own accredited laboratory and maintain certified quality management in accordance with DIN EN 9001:2008. Our technology speaks for itself in international applications since it also meets regional standards.



# Object Detection

## Need-based solutions with the highest level of reliability

### Diverse sensor families for the greatest range of applications

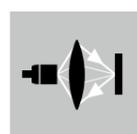
Do you require an inductive sensor for metal detection? Our inductive sensors alone include a selection of over 2500 varieties. Or do you need an all-in-one? Our ultrasonic family is ideal for any application or medium in your processes.

Use our photoelectric sensors to check colors, shapes and presence with absolute reliability. Or choose capacitive sensors for detecting both conductive and non-conductive media.

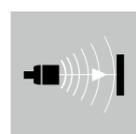
To determine the exact piston position in cylinders and grippers, use our magnetic cylinder sensors which have been optimized for robotics and automation. Likewise you can handle your tasks using the proven classics like our mechanical limit switches and rotary cam switches.

For the highest level of safety and reliability in virtually any environment we offer high pressure rated and temperature resistant, explosion protected, magnetic field- and weld-immune or Factor 1 sensors.

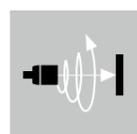
Let us help you make the right choice.



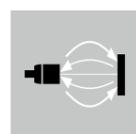
Photoelectric Sensors



Ultrasonic Sensors



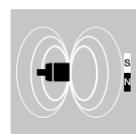
Inductive Sensors



Capacitive Sensors



Mechanical Limit Switches



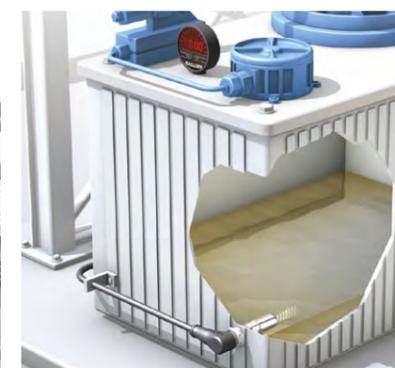
Magnetic Cylinder Sensors

## For reliable processes

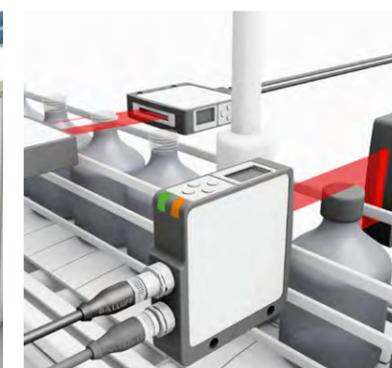
Our technologically mature products reliably handle applications such as position control, color sensing, temperature measurement, parts counting, level detection, register mark or stack height detection.



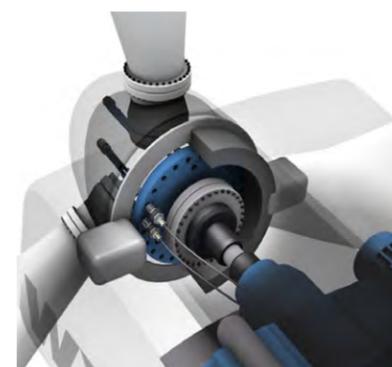
On the conveyor belt photoelectric sensors perform presence checking of engines.



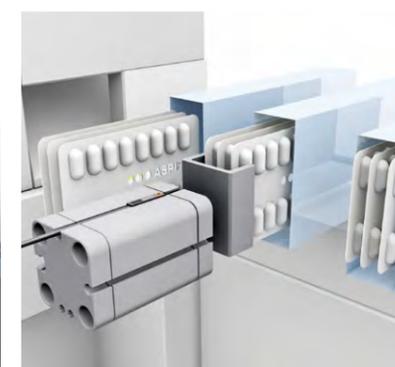
Capacitive sensors monitor the level in an oil tank in machine building.



Photoelectric sensors are recommended for cap checking in a pharmaceutical filling system.



Inductive sensors detect rotor speed in power technology.



Magnetic sensors monitor the position of pneumatic grippers in the packaging industry.



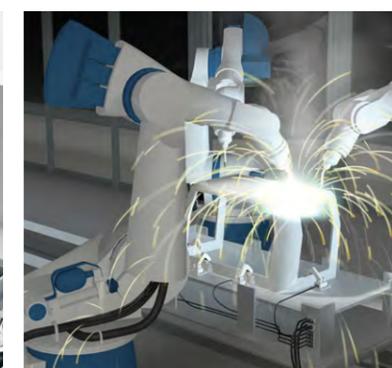
Mechanical sensors are ideal for position detection in robotics control.



In the handling sector inductive sensors check for the presence of components.



In the plastics industry ultrasonic sensors precisely count the number of workpieces produced.



When things get really hot in factory automation, weld-immune inductive sensors can take the heat.





# Linear Position Sensing and Measurement

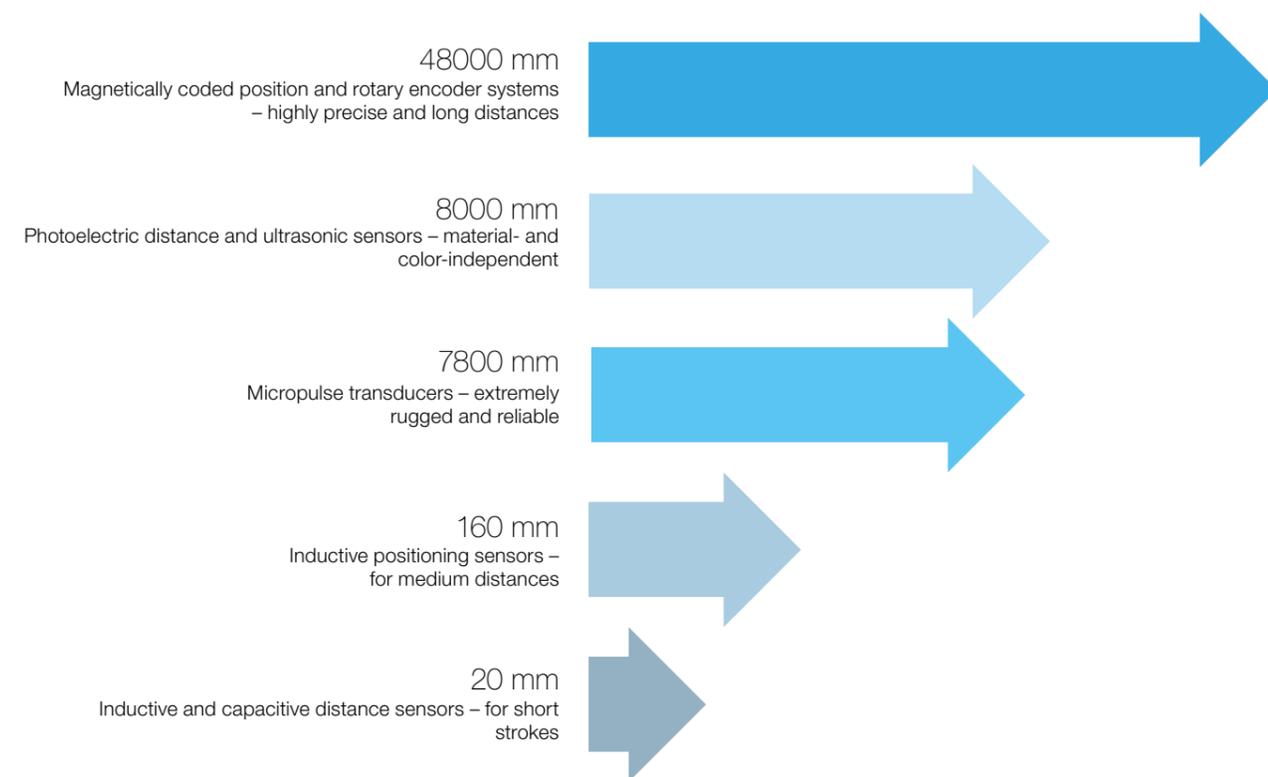
## The right measuring principle for the maximum result

**Balluff position measurement – the right solution for you**  
Balluff position measurement technology provides efficient customized solutions ranging from position detection to distance measurement. With very diverse operating principles for distances from 1 to 48,000 mm and resolutions from 1 to 100 µm. And for angles up to 360° with an accuracy of 0.01°.

Choose what is ideal for you and we will customize exactly to your requirements, taking into account both technical and economical aspects.

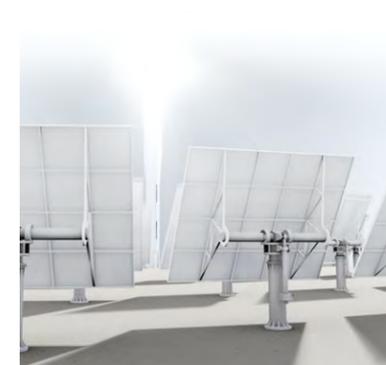
Optimum solutions fulfill your specific measurement tasks, function reliably, and are flexible and cost-effective at the same time.

Robust industrial Balluff position measurement technology is accurate, reliable, non-contact, and wear-free. Their quality is sophisticated. That is attested to by their longtime success.



## For the greatest number of diverse applications

Areas in which high reliability and precision are demanded are typical fields of application for Balluff distance measurement technology. Various form factors and operating principles make the systems and sensors universally applicable. Non-contact, precise and using absolute measuring principles – these features are decisive for broad industrial use. This is why Balluff linear measurement has proven itself in so many areas. In factory automation for example, in machine and systems building, in drive technology or energy production.



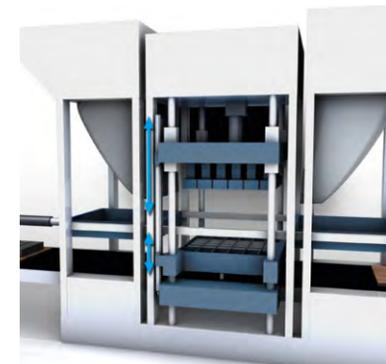
Incremental magnetically coded position and rotary encoder measurement systems have proven themselves for years in high-precision mirror guiding to follow the sun.



Absolute magnetically coded position and rotary encoder systems ensure high-dynamic and precise positioning of the components.



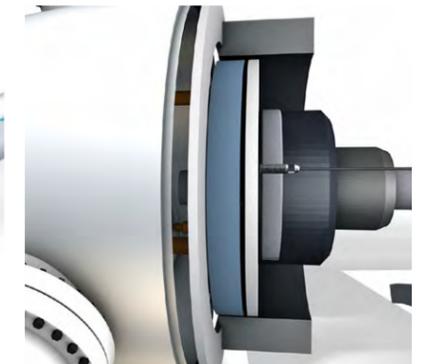
Inductive travel sensors provide linear positioning monitoring of drive spindles and clamping fixtures for tools.



Linear transducers check parallelism, speed and close position on presses.



Linear transducers integrated into hydraulic cylinders provide exact measurement of position and traverse speed.



Inductive distance sensors precisely check the brake discs in wind power systems.



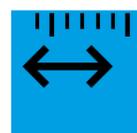
Optical distance sensors continuously determine dimensions or contours of products on the conveyor.



Ultrasonic sensors check the distance of transport boxes and detect whether they are full or not.



For fully automated control of the water level on weirs, inclination sensors detect all the intermediate positions.





# Process Sensors for Factory Automation

## Different demands require different concepts

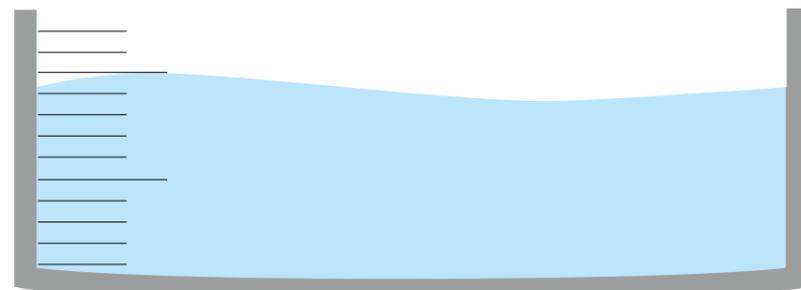
### Alternate sensor principles for solving any challenge

Flours, powders and granulates, coolants, hydraulic fluids and beverages are some of the media for which process sensors are used. Process technology is playing an increasingly important role for example in the largely discrete automobile industry. Chemical-physical processes such as degreasing, pickling and painting are being intelligently automated.

Pressure or level sensors are required in increasing numbers for every area of automation – with switching functions or with continuous signals.

Given the variety of branches with their various applications, the optimal sensor principle needs to be selected for each task: capacitive sensors and linear measurement systems for level detection, or pressure sensors for monitoring process media.

Let us recommend the right sensor for your specific task.



Level monitoring of process media



## Reliability for process technology

Monitoring of process media such as cooling lubricants, hydraulic oils, and pneumatic systems has an important influence on the manufacturing quality.



The capacitive SmartLevel principle ensures reliable signal detection.



Capacitive sensors can also be used for detecting solids.



Capacitive sensors measure levels of aggressive media.



Fast filling processes are precisely monitored by Micropulse transducers.



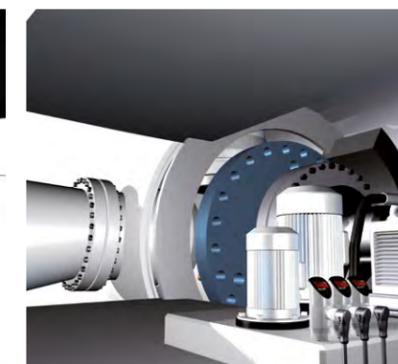
Sonar sensors offer hygienic level detection without contact with the media.



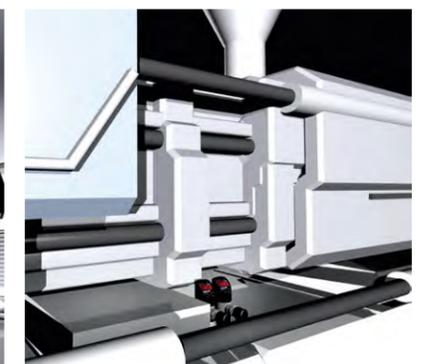
Monitoring vacuum gripping processes is the job of pressure sensors.



Pressure sensors ensure continuous inflow of coolants on machine tools.



In wind turbines the central hydraulic power unit is monitored using pressure sensors.



Pressure sensors measure the hydraulic pressure on the injection molding machine.





# Accessories

## It's the small details that matter

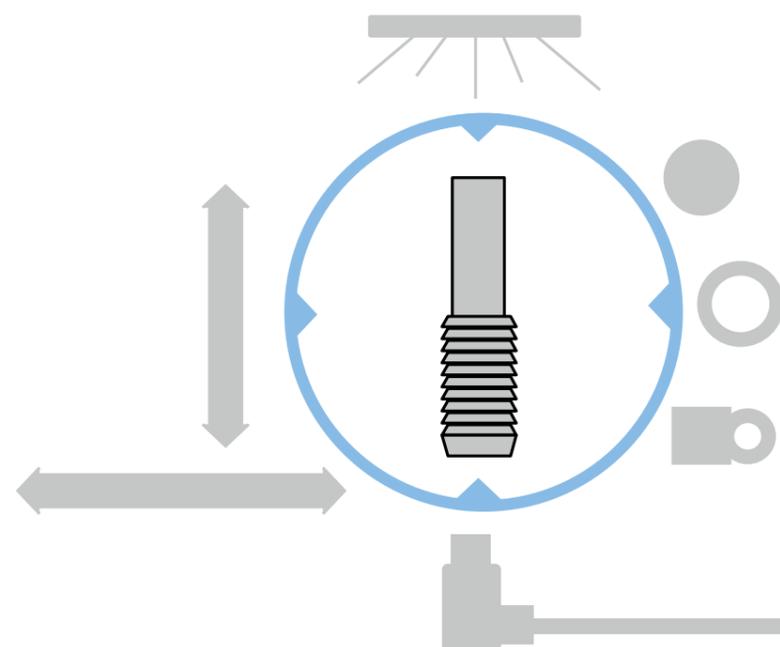
### The right concept for every sensor

The high-quality sensors you get from Balluff come with high-quality mounting accessories. A great selection of mechanical and electrical components helps you to perfectly integrate the sensor into your machines and equipment.

Our comprehensive cabling portfolio offers a variety of plugs, valve connectors and connection cables as well as fully potted passive splitters. Their rugged construction and long service life guarantee function security. Even in challenging conditions such as extremely high temperatures in the direct vicinity of welding operations.

Product-specific accessories such as reflectors, apertures, lenses and protective nuts are specially matched to your sensors and their applications. High-quality spot, background and ring lights ensure optimal illumination of the sensor field of view. Flexible mounting systems for exact positioning at virtually any angle are easy to use. And intelligent power supplies assist through simple monitoring of the equipment status.

Whether mechanical or electric: at Balluff you will find the right accessory for any sensor.



The optimum peripherals for the sensor

## Easy handling, precise positioning

A broad product range for virtually any application helps keep machines running.



The 3-D sensor holder enables flexible mounting of sensors and lights.



Our diverse range includes product-specific accessories such as reflectors for through-beam sensors.



Sensors are simple to position precisely using the flexible mounting system.



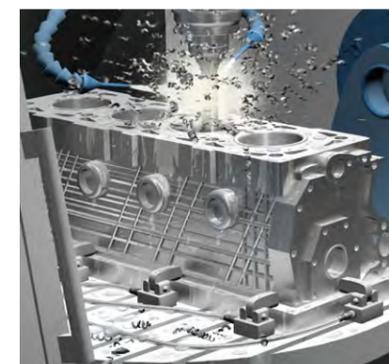
Intelligent power supplies are recommended for decentralized applications using IO-Link, with IP 67 protection.



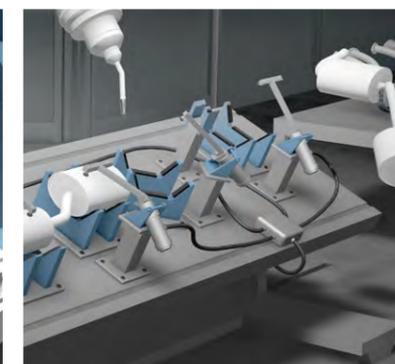
Ultra-reliable, efficient and compact power supplies support trouble-free operation of your equipment.



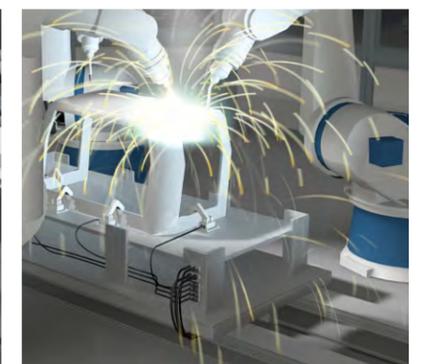
Mounting accessories such as mounting brackets for tubular sensors are optimally matched to the technology.



Rugged cables and connectors are needed when milling an engine block.



Accessories for extreme applications are the perfect complement in harsh, aggressive environments.



Our cables and connectors are also designed for welding equipment.





Systems and Service



Industrial Networking and Connectivity



Industrial Identification



Object Detection



Linear Position Sensing and Measurement



Condition Monitoring and Fluid Sensors



Accessories

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