

BALLUFF

Traceability for
production

HOW TO OPTIMIZE YOUR PROCESSES WITH INDUSTRIAL IDENTIFICATION



 *innovating automation*

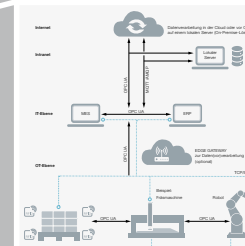
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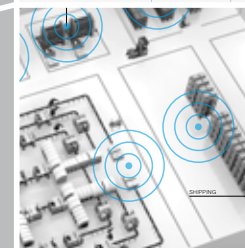
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Traceability

WHAT TRACEABILITY ACHIEVES

 *innovating automation*

Traceability is the ability to trace all processes in a production environment from raw material procurement to production to consumption and disposal. This has the goal of determining when and where a particular product was produced, how and by whom. This brings transparency to the production sequence, its framework, and the use of the (raw) materials.

Traceability thus includes materials, products and workpieces in the creation process. It can also be extended to supplier chains. Two aspects are thus important for traceability: internal traceability within the production environment and traceability of the supply chains. This is accomplished with the help of unique identifiers using Auto-ID technologies such as RFID, so that for example errors can be reliably detected and immediately corrected.

It may seem ambitious to achieve consistent, bi-directional data exchange from the sensor to the ERP system along with real-time capability for clear, simple data retention with fast data access. But in the production and logistics process the communicative interplay between various Auto-ID technologies really works. IIoT protocols such as MQTT (Message Queuing Telemetry Transport) and OPC-UA (Open Platform Communications Unified Architecture) already enable open channels from the sensor to the IT world.

The advantages of traceability

- Optimized production processes
- Fewer production errors and better production quality
- Increased efficiency for intralogistics and the shop floor
- More transparency in the value creation and supply chains
- Easier processing of complaints, including recalls
- Meets legal requirements (quality assurance and product liability) and the demands of manufacturers/buyers



The significance of the data sources

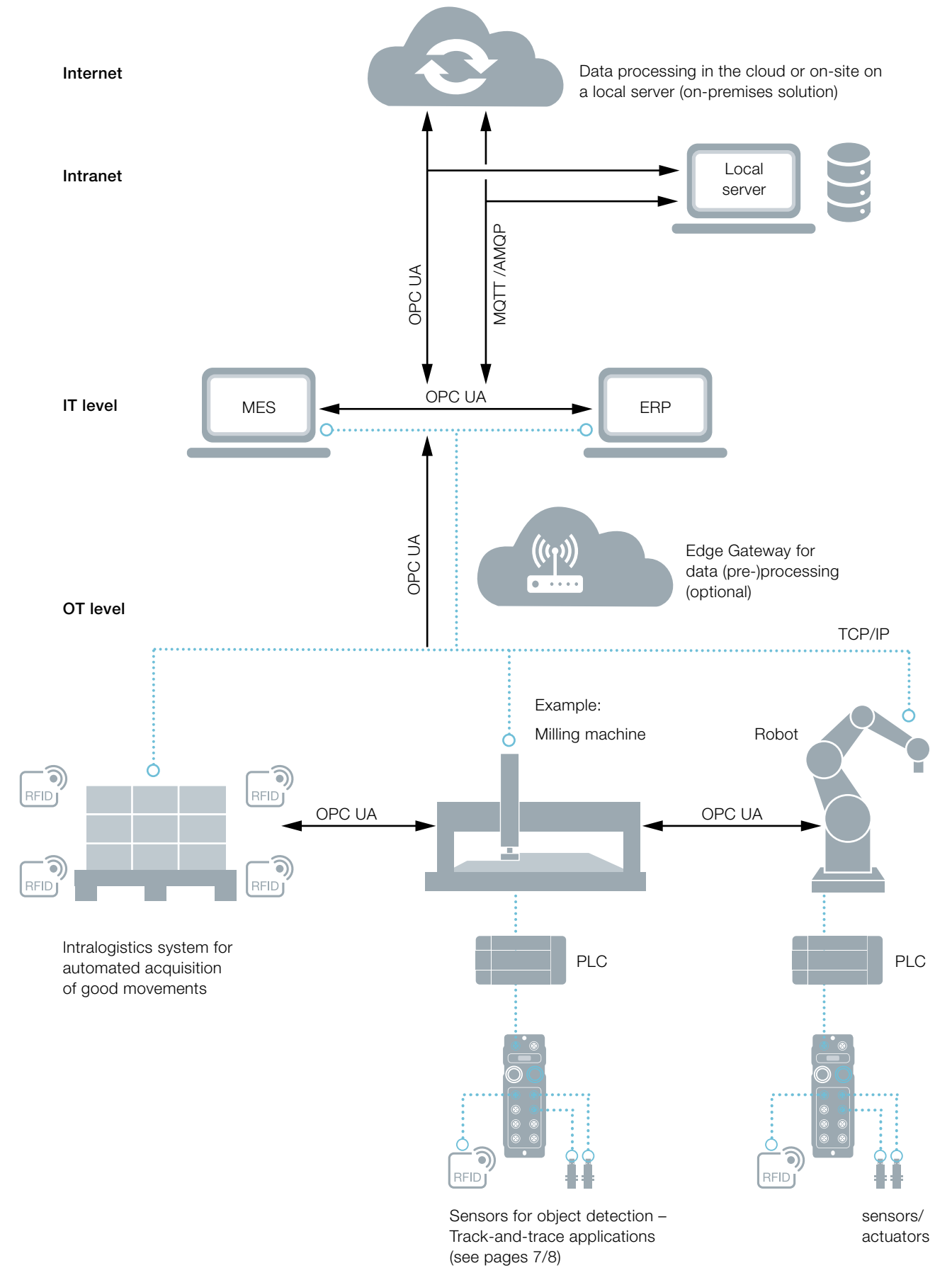
HOW TRACEABILITY WORKS



Process and quality data suitable for tracking are often generated on the shop floor on the sensor/ actuator level. The sensors are an especially important part of the equation here. On this field level, data is generated which are used to uniquely identify materials, products and workpieces so that they can be individually labeled for a specific process. This tells you which product is in production when, where and how. It makes it possible to document the production history of all production parts and all of the materials and equipment used – with time, place, and process.

To ensure this identifiability, each individual part needs to be reliably detected. This is enabled by various identification technologies: from the simple sensor with different physical operating principles to code readers and vision systems for barcode and datamatrix codes to RFID. Our product range offers this variety. It is the basis for our broad solution spectrum.

For the various technologies and their protocols to communicate seamlessly with each other, Balluff also provides you with custom tailored system solutions with IIoT capable hardware in combination with high-performance software. For consistent data communication from the field level to the internet you can choose between an on-premises solution on your local server or a cloud solution.



Common IIoT protocols such as MQTT or OPC-UA ensure consistency from the sensor to the IT world.

- MQTT (Message Queuing Telemetry Transport) – for machine-to-machine applications (M2M)
- OPC-UA (Open Platform Communications Unified Architecture) - for supporting a wide variety of systems: from the PLC in production to company servers

IT-OT connectors like Edge-Gateway acts as "universal translators" to provide interoperability.

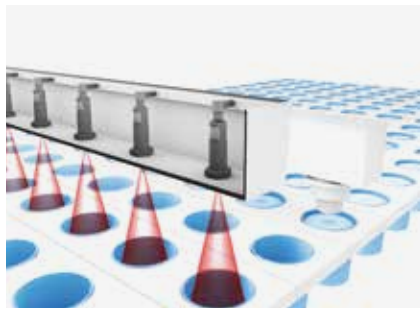
Simple queries for keeping the overview

TRACKING WITH SWITCHING AND MEASURING SENSORS

Simple tracking solutions can be implemented without great effort, because even simple switching and measuring sensors can be used for tracking. Since each of these sensors is connected to the controller, all the data automatically flow to this central point where they can be further processed. There in the controller, for example, a shift register can be used to create a representation of the system, assuming this is linked to other controllers and HMI solutions.

By using many inductive sensors for example you get information about the presence of an object: where it is now and what position it has already passed through. With measuring sensors such as the ultrasonic sensor, you can evaluate in greater detail since the measurement value also provides the distance value at the same time to provide greater information content. As the distance value changes, the system controller also gets information about the location of the object. What is possible with switching sensors only when they are linked together is achieved by just a single analog sensor.

Whatever sensor data you prefer to use for simple queries, Balluff offers the right technology for supporting your tracking solution.



CHECKING PRESENCE OF THE CONTAINER
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 ultrasonic sensor from Balluff detects from above whether the container is present. Only if this is confirmed is the product filled.

Features

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



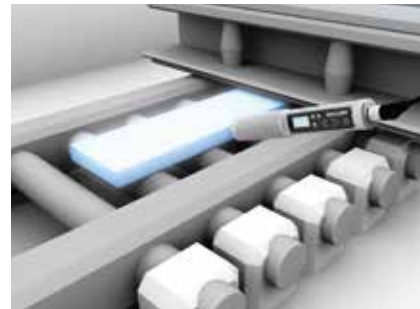
DETECT TIRES ON THE CONVEYOR BELT
BOS retroreflective sensors

Use our retroreflective sensors when removing the tire from the curing press after vulcanization without manual intervention. These sensors reliably detect whether there is another tire already on the conveyor just when one is being unloaded from the press. If not, automated unloading can start and the tire transported on to quality assurance.

For greater process security you can use our retroreflective sensors for additional inspections at any desired location on the conveyor line.

Features

- Simple alignment thanks to generous mounting tolerances and long range
- Reliably detect objects regardless of their surface, color and material, even with shiny surfaces

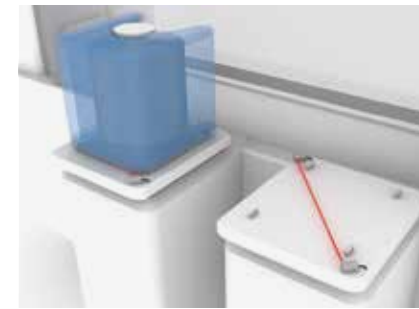


RELIABLY DETECT SLAB POSITION
BTS temperature sensors

Infrared temperature sensors are right at home in a steelworks. Designed for high temperatures, they monitor slab transport on reversing rollers. Reliable temperature detection is an ideal way of controlling and documenting your processes, so that all the batches can be traced. These sensors in the rugged M30 stainless steel housing have a multi-function display as well as an automatic display orientation and in the IO-Link version offer all the advantages of this innovative communication standard.

Features

- Secure detection of moving, glowing hot objects
- Simple, self-explanatory commissioning operation
- Available with IO-Link or analog interface

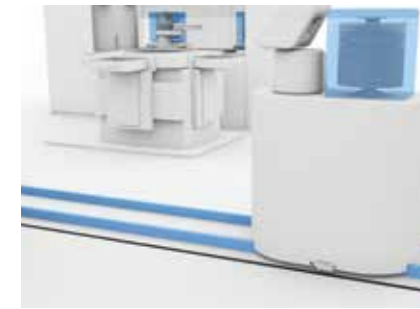


CHECKING FOR CARRIER PRESENCE
BOH photoelectric sensors

For presence checking in the semiconductor industry our space-saving through-beam sensors and diffuse sensors are ideal. They reliably detect for example whether a carrier is present on a load port. Their especially flat construction enables easy integration. The minimal installation surface on the load port, which is often no larger than the transport box, can then be simply maintained. This ensures that the machine only opens when a carrier has docked.

Features

- Very flat construction
- Space-saving
- Individual focus



CONTINUAL DETECTION OF THE AMHS POSITION
BML magnetic encoder systems

When continuous position detection of transport vehicles (AMHS) is called for, our magnetic encoder systems keep you on the safe side. These can be individually configured for your travel range. They are highly precise, so that they facilitate for example trouble-free transfer of the carriers to the load ports.

Features

- Non-contacting measuring principle, i.e. wear-free
- Extremely reliable and highly precise
- Versatile: Magnetic tape can be extended up to 48 m

For close range

TRACK AND TRACE WITH HF- AND LF-RFID

With HF (high frequency) or LF (low frequency) you can detect objects not only at close range, but also add information to them and use them for track-and-trace. This is made possible by a uniquely identifiable RFID data carrier which is fixed to the object and accompanies the object through the automated process.

The information on the data carrier can be read out by the read/write head as the object transits the plant while any desired data can be written to the data carrier. This is reported by the read/write head to the controller or to the higher level system. Then you can verify when a data carrier passed each individual processing station. Every process step is now traceable – you are performing track-and-trace.

For this to function the data carrier indicates its presence to the read head. At the same time it sends the information it carries – along with its unique name – in the form of a unique number assigned by the system operator or user. Depending on its memory capacity it provides space for additional information which you can define according to the application. This information is passed along to various controllers and PC systems.

For detecting and identifying objects at close range Balluff offers you a wide range of LF and HF variations with an extraordinary variety of data carriers, read/write heads and processor units. Our LF systems, which are ideal for challenging conditions such as metal surroundings, have long since established themselves as the standard for tool management. With our HF systems you can process and store very large quantities of data at high transmission speeds. And with our all-frequency BIS V processor unit you can operate all the RFID technologies simultaneously on one unit.



ROLL SHOP MANAGEMENT
BIS industrial RFID systems

To prevent process errors in the steel plant, rely more on automation. With the Balluff BIS M Industrial RFID system, you can automatically record and identify all tools used. This lets you quickly check whether the correct rolls are being used or whether the roll pairs match. Reconditioning of the rollers can also be documented. This consistently prevents errors and allows you to perform maintenance at just the right time.

Features

- RFID handhelds for mobile communication right where the action is

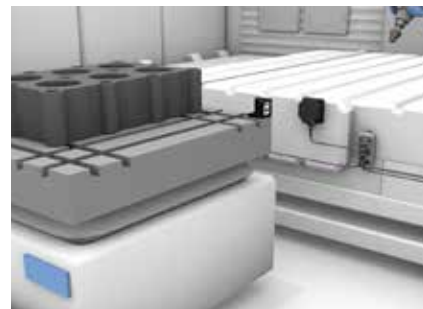


TRACKING PARTS IN PRODUCTION AND ASSEMBLY
BIS industrial RFID systems

Our high-speed RFID system ensures tracking of the circulating stock of your automated assembly system. The flexible BIS V processor unit uses high-speed read/write heads to process large data quantities in the shortest possible time. These are 8 times faster than the global standard ISO 15693, so that the cycle times are reduced and yield rates are increased. In short, you can put full reliance on the system. Because for quality assurance it records the entire production process and stores all the data.

Features

- Space for all the information with unrivaled storage capacity up to 128 kB
- Transparent – all the data available in real time
- Flexible – RFID and sensors can be combined using integrated IO-Link master



CORRECTLY MATCH AND TRACK WORKPIECES
BIS industrial RFID systems

Pallet systems that are equipped with RFID from Balluff can be externally loaded and unloaded automatically. This reduces internal setup times to virtually zero, so that the machine can produce without interruption. At the point where workpieces are brought in the BIS V frequency-neutral processor unit ensures correct association. This means you can flexibly process both large and small quantities of data – depending on whether you prefer decentralized or centralized data storage.

Features

- Automated workpiece management
- Reduced scrap, increased productivity
- High flexibility with all-frequency processor unit



IDENTIFY TOOLS IN THE MAGAZINE
BIS industrial RFID systems

BIS C industrial RFID systems operating at LF or BIS M at HF ensure that your CNC controller in milling machines and machining centers always has the correct tool data available (number, diameter, length, number of cuts, etc.). Reliably identified and transmitted, these parameters also form the basis for high-quality tool asset management including service life monitoring.

Features

- High degree of flexibility for you with many different types of data carriers and read/write heads, including a read/write head that operates at both LF and HF
- Technology-neutral processor unit – also suitable for large quantities of data



AUTOMATICALLY MANAGE TOOLS
BIS industrial RFID systems

When automated tool management is something that can otherwise be implemented only with difficulty, we offer you a PC-based, practical and elegant solution. You equip each individual machine with a read head (LF, HF, UHF) and the BIS V processor unit. Use the existing TCP/IP network interface to connect them to a PC associated with the production line. This PC contains a tool management system for the entire manufacturing unit (cluster, line, hall). Now nothing stands in the way of automated tool management.

Features

- Connect PC-based systems: two process interfaces (TCP/IP and USB)
- High flexibility: one device for all established RFID technologies (LF, HF, UHF)
- High performance: suitable for high memory and high speed data carriers
- Meets the highest industrial requirements, aluminum die-cast housing
- Connect various devices: freely configurable IO-Link master port V1.1



USE ALL RFID TECHNOLOGIES SIMULTANEOUSLY
BIS industrial RFID systems

Our rugged BIS V processor unit provides fast data transmission, short cycle times and high data security in all applications. This allows mixed operation of RFID technologies – LF, HF and UHF – at the same time on a single processor unit. Just one type of processor unit is all you need to handle any application. Whatever industry you are in, this high-performer features perfect electromagnetic compatibility and works with all common bus systems worldwide.

Features

- Mixed operation of LF, HF and UHF
- Four independently parameterizable ports for simultaneous operation of up to four read/write heads
- Integrated IO-Link master port for connecting IO-Link capable sensors/actuators or a sensor hub with up to 16 sensors
- Rationalize network structure, since sensor data can be bundled in any network technology

For large detection ranges

UHF-RFID OFFERS MULTI-TAGGING

Unlike LF and HF systems used for track-and-trace at close range, UHF RFID technology offers a large working range and enables multi-tagging. Because UHF systems communicate over a range of up to 6 m and can read multiple data carriers simultaneously. In other words: UHF allows bulk reading.

This makes UHF technology especially ideal for track-and-trace solutions in supply chain management and logistics. And UHF supports the digitalization of production and intralogistics processes. You can automatically register incoming and outgoing goods or reliably monitor the work progress and material consumption. We offer reliable solutions that we have tailored to your specific requirements.

Our wide-ranging solution spectrum with many different combination possibilities of data carriers and antennas makes using our systems highly flexible. And because we offer global standard interfaces they are simple to integrate and can be used with traditional controller systems or higher level IT systems.



MONITOR PRODUCTION PROCESS BIS industrial RFID systems

With a typical read range of 1 m the BIS VU-320 read/write head is versatile: for monitoring production processes, material flow control or for traceability solutions in harsh environments. This is because the rugged reader detects up to 50 data carriers simultaneously. One highlight is the integrated PowerScan function you can use to automatically adjust the reader for UHF data carriers. And with Auto-Setup the parameters can be set at the press of a button – no manual setting.

Features

- Fast startup at the press of a button using Auto-Set-up
- Optimal adapting to the identification task with integrated PowerScan function
- Numerous software commands for expanded UHF functionality
- Function and status LEDs visible from any direction
- Can be used in combination with all BIS V interface versions (except CC-Link)



TRACK BATCHES BIS industrial RFID systems

For stock management with high throughput material postings should ideally be made automatically – without the need for manual scanning by a worker. Objects are detected using UHF in bulk at a stationary RFID gate. And at a distance of up to 6 m. This saves you time and minimizes error rates. And you always know exactly which items are leaving the warehouse and which articles are entering. You can also use the SmartLight stack light to visualize the information.

Features

- Automated goods movement detection – optimized for timing and always correct
- Minimizes errors – no entry mistakes or forgotten items
- Highly accurate awareness of stock levels through synchronizing of digital and actual inventory
- Optimized material flow
- Also suitable for use with fork lifts and other transport vehicles
- Reliable detection even in harsh environments

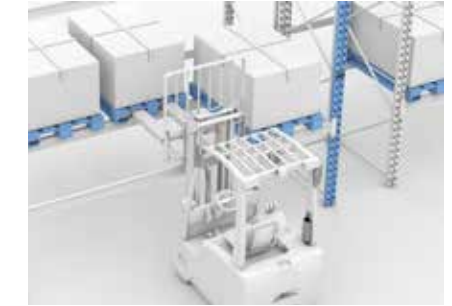


CONTROL MATERIAL FLOW BIS industrial RFID systems

Our rugged UHF tunnel application enables fast identification of a large number of objects individually or in bulk. We equip all goods with a transponder, so that they can be read in the detection range of the RFID antennas as they pass through the tunnel. Then the raw data is sent to the Balluff middleware and prepared. In this way the information about the correct material, the location and the time arrives at the host IT system. To be able to offer you an optimal solution the transport protocol (SOAP, REST API, ...) for the warehouse management system (WMS), the enterprise resource planning system (ERP) or for the quality assurance system is configured and implemented for your specific project.

Features

- Individualized solution, perfect for your environment
- Saves time through automatic goods detection
- Can also be integrated into existing material handling systems
- Seamless integration into your existing IT systems



ALWAYS HAVE AN OVERVIEW OF STOCK LEVELS BIS industrial RFID systems

Objects which are seldom used can be located using passive UHF RFID data carriers. Simply attach RFID readers for example to forklifts. Equip storage bins with reference data carriers and the objects with object data carriers. All the data carriers can be read on-the-fly at the same time and all objects located at any time. Our software evaluates the read results and matches the detected object data carriers with the reference data carriers. This data is then sent to a central server via WLAN so that all the information is available. The more frequent the pass-bys and reads, the more exactly the localization information will be – without the need for costly batter-powered data carriers on the objects.

Features

- Localize the entire stock
- Uses passive data carriers
- Bulk reading on-the-fly
- Information available in the central server

Vision Solutions

TRACK AND TRACE WITH OPTICAL IDENTIFICATION

Along with RFID, track-and-trace can also be accomplished using optical solutions. Every object, whether a material or a tool, is uniquely marked with 1D and 2D codes and can be read using cameras, code readers or mobile handhelds.

All the codes are permanently associated with the object, since they are glued on with a label, laser etched or otherwise printed or punched. This means every object can be uniquely identified. And this code information can be used in the warehouse or in production for example. It is also possible to link individual workpieces as well as their individual components to a container, since in production plants objects are typically recorded with their type and serial number. For additional information about things like the condition, the pre-history or any planned further processing you refer to a central database.

For optical identification Balluff offers economical solutions like code readers or convenient handhelds for portable reading as well as SmartCameras for demanding applications.

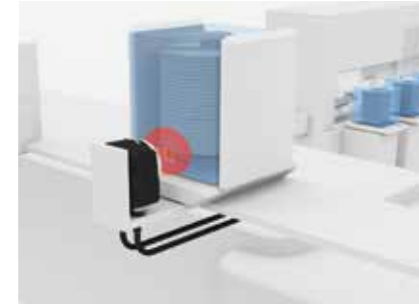


CORRECT ASSIGNMENT OF SLABS AND COILS
BVS SmartCamera

Reliable reading is also possible under challenging conditions. Simply use colored markings and barcodes for example to uniquely identify coils in sheet metal production or processing. The Balluff SmartCamera uses these markings to check whether slabs and coils are correctly assigned, quickly, reliably and regardless of their position.

Features

- External monitor for better process tracking
- Extensive range of accessories that meet industrial standards



RELIABLY TRACK CARRIERS
BVS vision sensors

To be able to track the wafer carrier positions in the system, you equip the carrier with 2D codes for optical reading. Our code readers read data matrix, QR and barcodes, so that every movement of the transport carriers is checked. And you always know exactly where the carriers are located.

Features

- Easy to integrate, intuitive and simple to operate
- All the data is available at a central location
- Minimal data load, since mass data can be decoupled from the process network



MOBILE IDENTIFICATION
BVS HS handheld code reader

Our BVS HS handheld code reader is used for example to uniquely identify cartons in place. When the size is changed you can then know that the carton placed into the magazine agrees with the new format. The handheld reads all kinds of 1D and 2D code types and is simple to integrate into industrial fieldbus networks.

Features

- Reliable read confirmation via acoustic signal, two green LEDs and projection of a green LED spot on the code that has been read
- Intuitive aiming system using a highly visible laser marking frame
- Charge once – up to 30,000 read cycles using lithium ion rechargeable battery
- Work without fatigue thanks to low weight and ergonomic shape

Create added value and be ready for the IIoT

CUSTOM TAILORED: FROM THE SOFTWARE TO THE 360° IIOT SOLUTION

Traceability projects related to the IIoT generally consist of sensors and Auto-ID. Also playing a key role is integration into the backend system of the user and thereby the software. Only custom tailored concepts will let you bundle and process all the data collected in the value creation chain to create added value.

Taking your requirements as the starting point, we develop individual 360° IIoT solutions for which we evaluate the current situation, take your OT and IT infrastructure into account and apply the right strategy, methodology and technology. We network your particular systems (MES, ERP, QA systems) and the information generated by them. Enriched by the additional information from the automation level, new information about the production processes can be gained and a measurable added value achieved.

Of course we will also help you to select the right hardware. We develop a custom, sustainable hardware concept for you, perform feasibility testing and integrate the hardware into your automation.

From evaluating the development of the tailor-made concept to implementation, we always take an individualistic approach. You determine the scope in each phase – no more or less than you need.



For greater productivity

ASSET TRACKING.

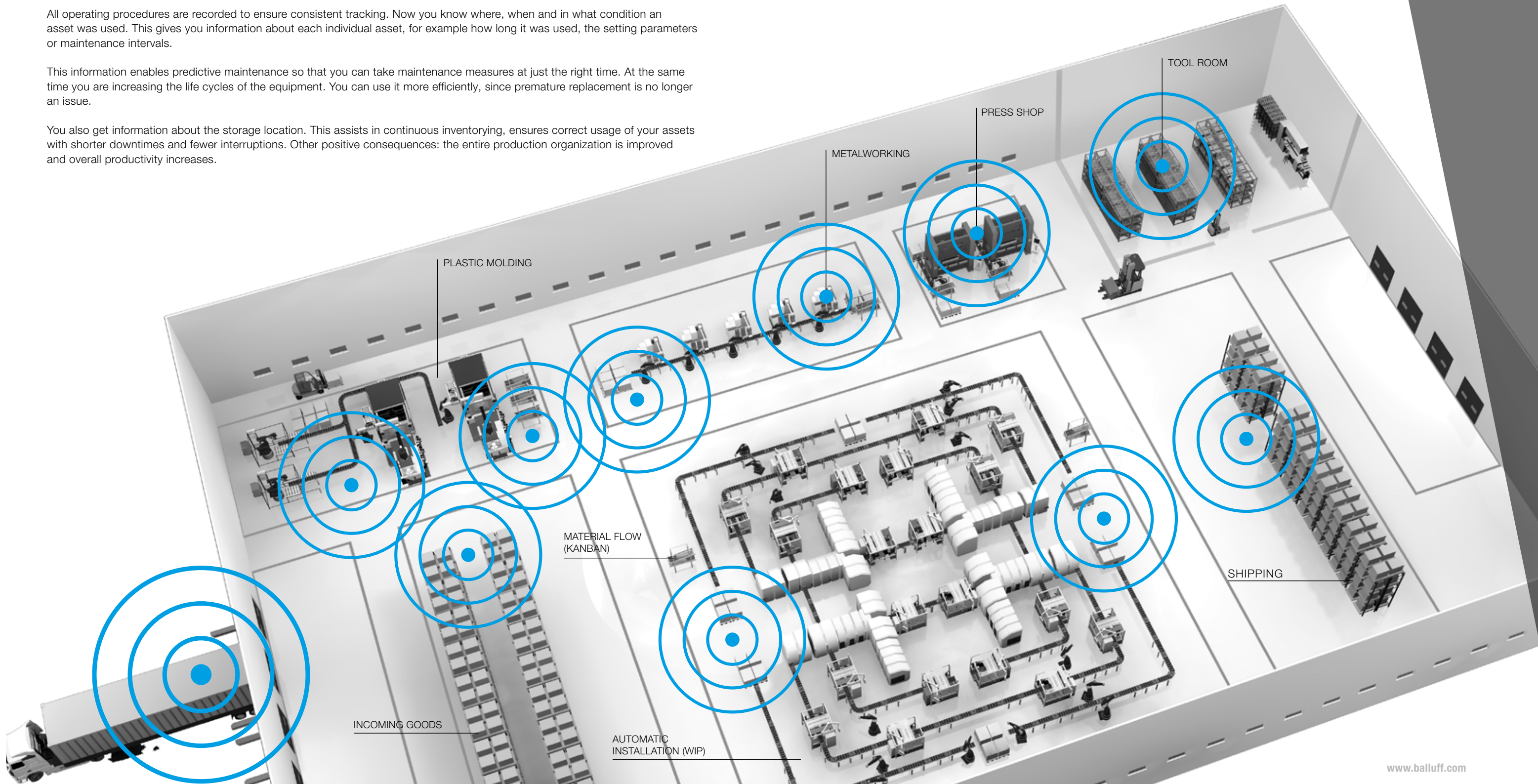


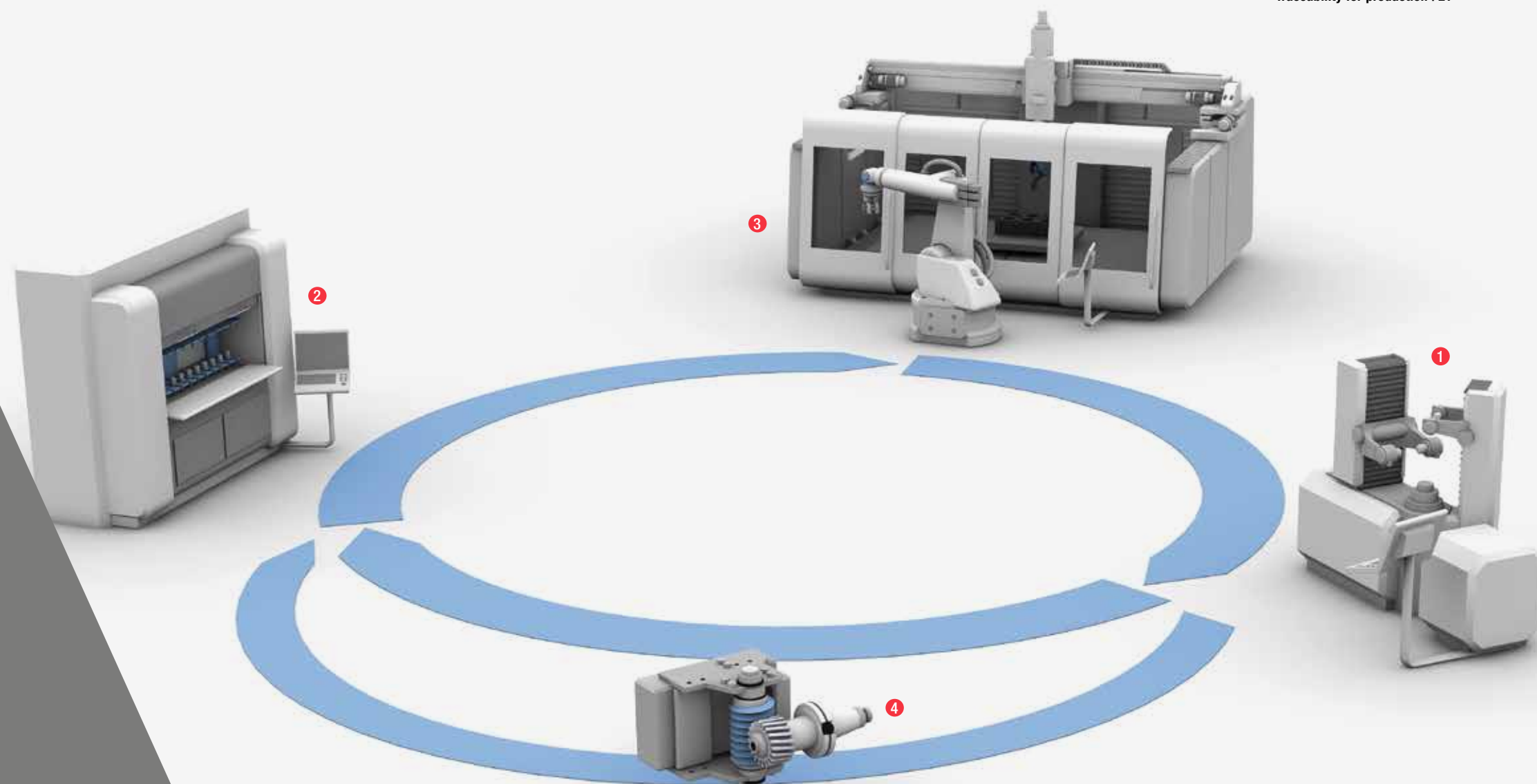
Asset tracking lets you track all the assets in a plant. From machine tools to molds and dies, modular automation sub-systems, workpiece carriers and containers or tanks and vessels that are among the most frequently tracked assets.

All operating procedures are recorded to ensure consistent tracking. Now you know where, when and in what condition an asset was used. This gives you information about each individual asset, for example how long it was used, the setting parameters or maintenance intervals.

This information enables predictive maintenance so that you can take maintenance measures at just the right time. At the same time you are increasing the life cycles of the equipment. You can use it more efficiently, since premature replacement is no longer an issue.

You also get information about the storage location. This assists in continuous inventorying, ensures correct usage of your assets with shorter downtimes and fewer interruptions. Other positive consequences: the entire production organization is improved and overall productivity increases.





Greater efficiency for the machinery

TOOL-ID ENSURES OPTIMAL TOOL UTILIZATION

Tool-ID from Balluff is simple to integrate and a highly effective solution for increasing the efficiency of your machinery. Tool-ID ensures optimal tool utilization.

Tool-ID automatically detects all the tool parameters you have defined (tool number, tool diameter, tool length, number of cuts, ...), stores them directly on the tool or sends them to the controller. Tool-ID checks the current tool status, documents all the data and thereby enables a prognosis for future utilization. This is attractive for you as a user, since it increases the quality and efficiency of your production process and reduces your costs.

Tool-ID from Balluff is available as a complete solution for your tool management or as a simply retrofittable version for tool identification. Plug-and-play makes optimal tool utilization easy.

Questions? Contact us at tool-id@balluff.de for immediate and comprehensive assistance.



SET TOOLS BIS industrial RFID systems

The tool presetter with built-in RFID read/write unit uses the tool number to automatically know which tool has been inserted. It then writes the measured actual tool parameters to the RFID chip embedded in the tool holder.

Features

- No more manually kept, error-prone tool logs
- No incorrect tool assignments
- Reduced scrap since the tool is always in the best condition



DOCUMENT TOOL DATA BIS industrial RFID systems

Having the unique documentation of all the tool parameters on the RFID chip in the tool holder is of great value. In this way the tool attached to it can remain in storage for any length of time without its data getting lost. When needed again, the tool is immediately ready for use.

Features

- Unambiguous tool assignment
- All tool data is available at any time
- The tool is always in optimal condition
- Higher productivity

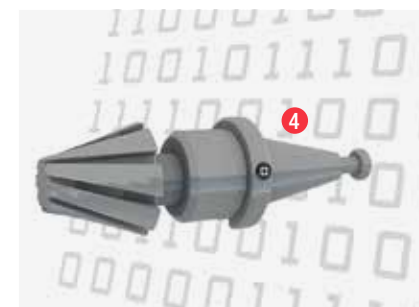


INFORM THE CNC CONTROLLER BIS industrial RFID systems

Before or when the tool is introduced into the spindle, the RFID chip reads out the actual tool parameters. Alternately the data can be read in when tools are placed in the tool store chain or magazine. In both cases the CNC controller gets all the current tool data in real time.

Features

- Optimal tool utilization because it is reworked at the right time
- Reduced storage levels
- Lowers costs

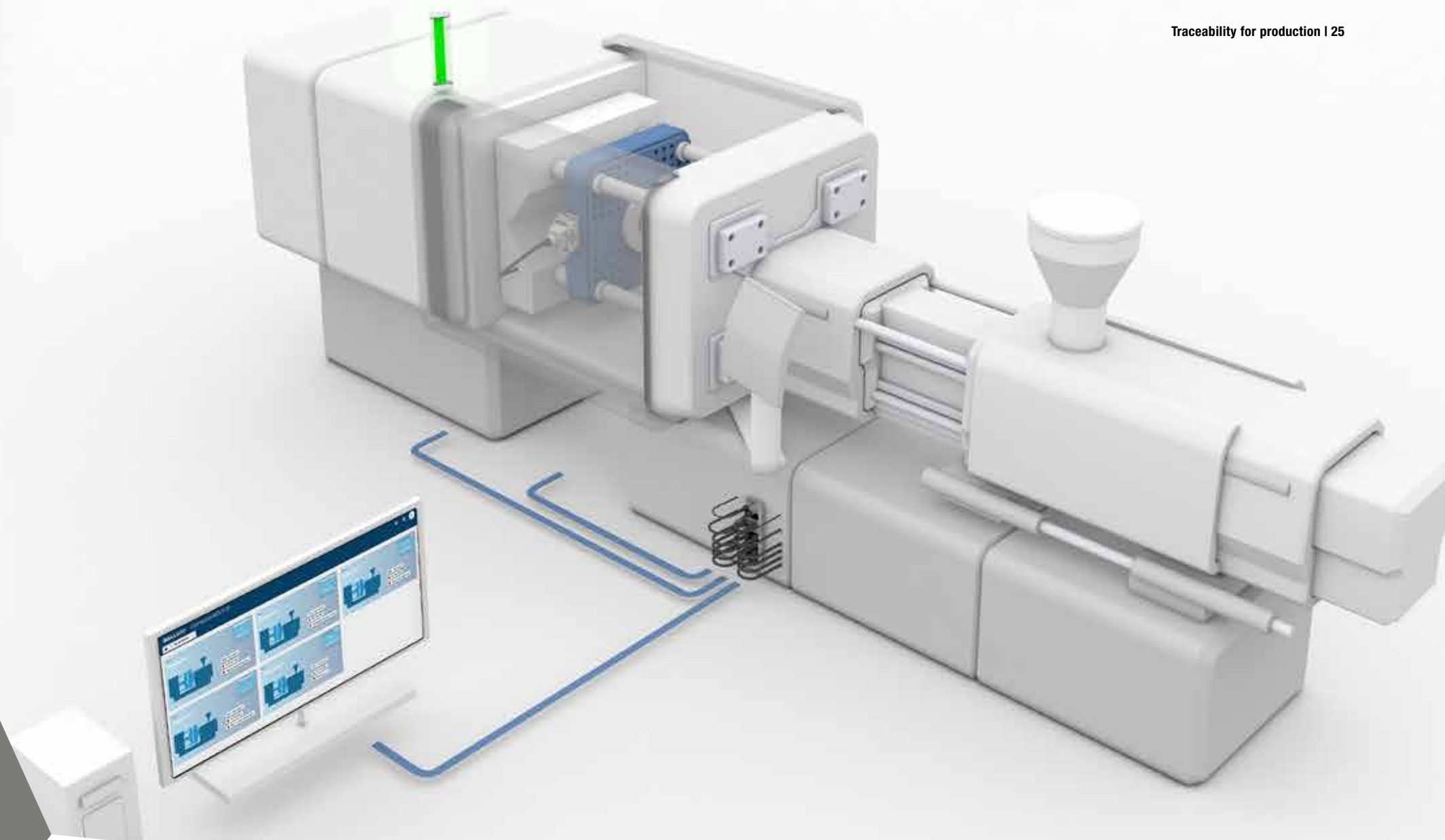


ORGANIZE DATA MAPPING BIS industrial RFID systems

The advantage of decentralized data retention on the RFID chip is that tool parameters are available continuously and independent of the central server. As the user, you define the extent to which these parameters are stored according to your requirements. Also important: so-called data mapping, i.e. organization of memory addresses coordinated between the presetter, inventory management and machine tool. Only when there is data mapping installed on the presetter can the system fulfill its task.

Features

- Handles many different requirements: wide range of data carriers



Monitor processes using digital tool management

CONNECTED MOLD-ID FOR THE PLASTICS INDUSTRY

The plastics industry also has Mold-ID and Connected Mold-ID solutions available for automated tool identification and management. Use them for optimal utilization of your injection molding tools. Mold-ID ensures condition-based maintenance of all your molds without having to maintain error-prone mold logs. All the relevant data is automatically recorded and documented by the autonomous system so that you have full tracking capability of your tool utilization and can ensure monitoring of maintenance and upkeep.

Combining Mold-ID with the Connected Mold-ID software presents a simple entry into digital tool management, because Connected Mold-ID acquires the data that is recorded for all the molds by RFID and stores it in a central database. In this way all the Mold-ID systems are networked. In your browser-based application you can display any desired piece of information about your injection molding tools including the maintenance limits and mold history.

This is how the Connected Mold-ID software gives you an optimal overview of your machinery. It ensures you of consistent process monitoring and gives you planning security. Connected Mold-ID creates transparency, increases flexibility and makes production more efficient. All these are factors that play a role in intelligent manufacturing and represent a step into the future.

We are happy to answer your questions. Contact us at: mold-id@balluff.com



Automatically control material
consumption in the production process

E-KANBAN

For your E-Kanban system we offer you RFID solutions you can use to automatically record the consumption of components and materials in the production process. Their use is universal and independent of shelving or container type. Track-specific recording and the utilization range (entry, exit, return) can be selected as needed. Startup is software-assisted and effortless. Another plus: you get the stand-alone system with RFID hardware, additional components, visualization and software all from a single source.

How does the whole system work? In our solutions we replace conventional elements such as kanban cards with RFID tags. Both container feed (material provision) and container name (production) as well as empty returns can be equipped with UHF reader components. Since the read/write heads are located in the track compartment beneath the containers you need to detect, the containers can be detected track-specific. This not only provides flexibility, but also keeps you informed at all times. By using the SmartLight stack light in addition you can visualize the material levels and the worker can see instantly where he needs to intervene. Visualization guides the worker simply and directly.

INNOVATIVE SOLUTIONS FOR ALL REQUIREMENTS



PRODUCT OVERVIEW



Application	Products	Example	Functions, interfaces and properties
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TRACKING WITH SWITCHING AND MEASURING SENSORS

Checking for carrier presence	BUS ultrasonic sensors	BUS0029	M18 × 52.5 mm, IO-Link 1.1, PNP/NPN normally open/normally closed, range 30...350 mm, 25 Hz
Detect tires on the conveyor line	BOS retroreflective sensors	BOS027M	15.4 × 51.1 × 42.7 mm, IO-Link 1.1, PNP normally open/normally closed, LED red light, range 0...8 m, M12 connector
Reliable slab position detection	BTS temperature sensors	BTS0002	M30 × 190 mm, IO-Link 1.1, simple to configure, measuring range 250...1250 °C, 2 × PNP normally open/normally closed, 1.4404 stainless housing
Checking for carrier presence	BOH photoelectric sensors	BOH002H	18 × 4.8 × 15 mm, through-beam sensor, range 0...2 m, Microspot-LED red light, housing material brass, requires amplifier
Continual detection of the AMHS position	BML magnetic encoder systems	BML0901	Absolute distance measuring system, 16 × 18.6 × 54 mm, IO-Link 1.1, measuring range 8190 mm, resolution 1 µm, read distance 0.01...1.3 mm, M12 connector

TRACK AND TRACE WITH HF- AND LF-RFID

Roll shop management	BIS industrial RFID systems	BIS M-87...-...*	Handheld HF (13.56 MHz)
		BIS00YE	Data carrier, Ø 24.9 × 4.8 mm, HF with 13.56 MHz, installation with clear zone (in steel), storage temperature -40...220 °C
Tracking parts in production and assembly	BIS industrial RFID systems	BIS013U	Processor unit, 172 × 48 × 62 mm, IP65, 4 × RFID ports, IO-Link master port, working temperature max. +60 °C, zinc die-cast, various fieldbus variants
Correctly associate and track workpieces		BIS0140	Read/write head, M16 × 55 mm, brass, flush in steel, ISO 15693, IP67, round antenna, 0.3 m cable with M12 connector
		BIS00NW	Data carrier, Ø 22 × 21 mm, PA12, flush mount in steel, ISO 15693, IP68, round antenna, 2000 bytes storage
Identifying tools in the magazine	BIS industrial RFID systems	BIS0011	Data carrier Ø 10 × 4.5 mm, conforms to DIN 69873, LF with 455/70 kHz, round antenna, flush mount in steel, IP68, 511 bytes storage
Automatically manage tools		BIS004A	Data carrier, Ø 10 × 4.5 mm, conforms to DIN 69873, ISO 15693, HF with 13.56 MHz, round antenna, flush mount in steel, IP67, 2000 bytes storage
		BIS005Z	Read/write head Ø 14.5 mm, LF with 455/70 kHz, 5 m PUR cable with M12 female, order BCC0FCK adapter separately
Using all RFID technologies simultaneously		BIS013Z	Read/write head Ø 14.5 mm, HF with 13.56 MHz, 0.3 m cable with M12 connector
		BIS V...*	BIS-V processor unit for HF/LF/UHF, various fieldbus variants available

Application	Products	Example	Functions, interfaces and properties
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UHF-RFID OFFERS MULTI-TAGGING

Monitor production processes	BIS industrial RFID systems	BIS015Z	Read/write head 130 × 50.5 × 130 mm, UHF with 865...868 MHz for Europe, patch antenna, IP67, various frequency ranges for different world regions available
Track batches		BIS0193	UHF processor unit, Linux controller, Ethernet TCP/IP, OPC UA, 4 antenna ports, IO-Link master port, integrated secure element
Control material flow		BIS01AW	Read/write head 300 × 49 × 300 mm, UHF with 865...868 MHz for Europe patch antenna, IP67, various frequency ranges for different world regions available
Always have an overview of stock levels		BAE00LK	Handheld with graphic interface and touchscreen for mobile reading and writing of UHF data carriers, Bluetooth, WLAN or cable-attached dipole antenna for data transmission, IP65
		BIS0168	Data carrier, 27 × 97 mm, self-adhesive label, dipole antenna, 512 bits storage, metal-free mounting
		BIS0172	Data carrier, 15 × 12.5 × 80 mm, dipole antenna, 512 bits storage, can be mounted on metal

TRACK AND TRACE WITH OPTICAL IDENTIFICATION

Correct assignment of slabs and coils	BVS SmartCamera	BVS002F	62 × 55 × 110 mm, LAN (Gigabit Ethernet), Profinet, Ethernet/IP, IO-Link, object inspection, analyzing color, measurement, object detection, positioning, barcode, 2D-, OCR-identification
Reliable carrier tracking	BVS-E vision sensors	BIS0019	Focal length 8 mm, LED infrared, 3 × PNP normally open, range 50...1000 mm, reads various codes, interface Ethernet 10/100 Base T
Portable identification	BVS HS handheld code reader	BVS001Y	Handheld Code-Reader for all common 2D, 1D and stacked codes, Bluetooth 2.0 for data transmission, LED white light illumination, industrial grade housing

TOOL-ID ENSURES OPTIMAL TOOL UTILIZATION

Tool presetting	BIS industrial RFID systems	BIS0011	Data carrier Ø 10 × 4.5 mm, conforms to DIN 69873, LF with 455/70 kHz, round antenna, flush mount in steel, IP68, 511 bytes storage
Documenting tool data		BIS004A	Data carrier, Ø 10 × 4.5 mm, conforms to DIN 69873, ISO 15693, HF with 13.56 MHz, round antenna, flush mount in steel, IP67, 2000 bytes storage
Communicating with the CNC controller		BIS005Z	Read/write head Ø 14.5 mm, LF with 455/70 kHz, 5 m PUR cable with M12 female, order BCC0FCK adapter separately
Organizing data mapping		BIS013Z	Read/write head Ø 14.5 mm, HF with 13.56 MHz, 0.3 m cable with M12 connector
		BIS V...*	BIS V processor unit for BIS M, BIS L and BIS C, various fieldbus variants available

CONNECTED MOLD-ID FOR THE PLASTICS INDUSTRY

Mold-ID	Systems solutions	BAI CMI...*	Management software for managing Mold-ID data
		BNI00CE	Active distributor, Ethernet/IP, compact processor unit, web server, gateway for company network, rugged IP67 housing
		BIS018E	Read/write head with integrated processor unit, IP67, working temperature up to +70 °C
		BIS0180	HF data carriers (13.56 MHz)

* Please contact our Sales department to configure your product.



#B_IIoT

SEIZE THE OPPORTUNITIES OF THE INDUSTRIAL INTERNET OF THINGS WITH BALLUFF

The future of automation is digital and interlinked. As your automation partner we accompany you step by step on the path to the smart factory. And all the while we keep your competitive ability in view. Build on our expertise and experience, let us master the Industrial Internet of Things (IIoT) together.

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Questions? Our experts are eager and ready to assist you.



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OPENING UP NEW PERSPECTIVES


Balluff is a leading supplier of high-quality sensor, identification and image processing solutions including network technology and software for all automation requirements. Family-run for more than 90 years, the company employs 3600 employees in 38 subsidiaries with distribution, production and development sites worldwide, all working towards your success. Together with our branches, we guarantee the highest quality standards worldwide. This is how we empower you to always receive the best.

We give our all to provide top services for innovative solutions that increase your competitive edge. Through a consistent digital orientation of our company, the competence of a manufacturer and high personal commitment.

We live our motto 'innovating automation': we are automation pacesetters, developers and technological pioneers. In open interactions with associations, universities and research facilities, and in close contact with our customers, we create new industry solutions for automation. As a future-oriented company, we not only focus on the traditional areas of automation, but are also dedicated to developing holistic applications for an increasingly digital and connected world.

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 *innovating automation*

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