Track-and-trace

SOLUTIONS FOR TRANSPARENT PRODUCTION

Our total package: from evaluation to conception, to implementation

Digitalization and IIoT have meant rapid diversification of technology and increased pressure to integrate. This is creating ever new challenges for companies.

Balluff has well-founded know-how and decades of experience in automation processes, along with a broad range of products. This expertise enables us to offer you optimal solutions and to integrate them into your applications, according to your specifications.

Our services in detail

- Evaluating the current situation
- Developing the solution concept
- Carrying out feasibility studies
- Implementation and commissioning

Our application specialists and global service centers mean you can count on our worldwide support. You can rely on us for high system availability and fast project starts.

How we proceed – partnership in RFID project integration

As a rule, track-and-trace projects in the context of IIoT consist of appropriate RFID read/write devices, suitable data carriers, and the RFID middleware, as well as integration into your backend system.

Using your requirements as the starting point, we develop individual 360° IIoT solutions for which we evaluate the current situation, take into account your OT and IT infrastructure and apply the right strategy, methodology and technology.

The first step is determining a location and objective for your identification project, which our specialists will perform on-site. Then follows the creation of a rough concept based on a feasibility study. This is accompanied by a budget offer for your internal approval. Next, we construct a detailed specification of your processes, data flows and how IT is incorporated into the ERP system, along with the selection of the technology. Only when all the details have been clarified and the overall conception and architecture have been worked out (the specification book created) can the last step of implementation and commissioning begin.

The project can be revalidated after each step. You pay only for the delivered results. This allows you to retain maximum flexibility throughout the project, while also reducing your risk to a minimum.
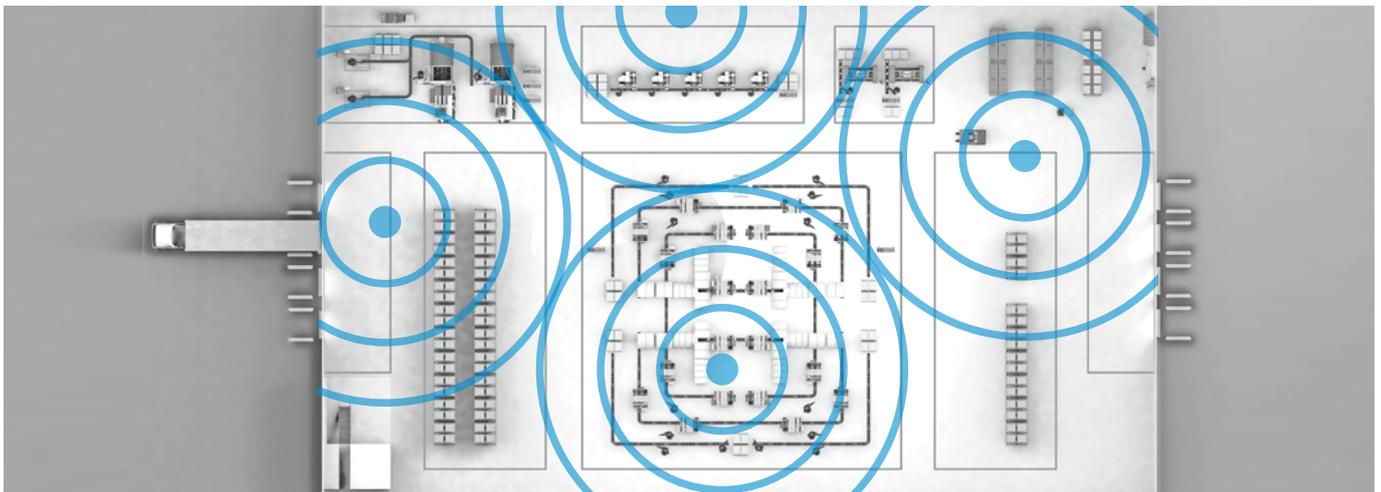
AN OVERVIEW OF OUR SOLUTIONS

UHF technology is especially useful for track-and-trace solutions in material tracking and digitizing production, as well as intralogistics processes.

Typical applications include:

- Automatic registering of in- or outgoing goods
- Monitoring work progress and material consumption
- Managing material requirement requests using e-kanban
- Tracking material flow
- Controlling machines and systems
- Equipping machines and systems in a targeted fashion

We master such applications using individualized concepts. In doing so we utilize the following RFID solutions:

- RFID gate
- RFID tunnel
- RFID checkpoint
- E-kanban
- Passive localization using UHF technology

RFID gate applications for batch tracing

Storage areas with high throughput are associated with large numbers of material postings. The goal is to always know exactly which items are leaving the warehouse and which articles are entering. Best is to detect this in automated fashion, without the need for an employee with a manual scanner. Our solution offers you a stationary RFID gate which automatically detects objects in bulk, at a distance of up to 6 meters. This saves you time and minimizes error rates. For additional user functionality, we can also integrate our SmartLight stack lights. This visualization means you always have a clear view of what is happening.

Your advantages

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

RFID tunnel for material flow control

The tunnel application enables fast identification of a large number of objects individually or in bulk, even in harsh surroundings. The RFID tunnel system, which was developed for rugged, industrial automation, integrates the RFID antennas and readers into the tunnel body.

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. The raw data is then sent to the Balluff middleware and prepared. This allows the information about the correct material, location and time to arrive 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.

Your advantages

- Individualized solution, perfect for your environment
- Time saving through automatic goods detection
- Possible integration into existing material handling systems
- Seamless integration into your existing IT systems

RFID checkpoint for detecting individual and smaller objects

If you need smaller detection ranges, we offer checkpoints that use short communication gaps. For example, an empty container placed on the empty materials cart is first brought past the checkpoint. Whenever a transponder has been detected, RFID sends a data record with location (reader and antenna number), container number (data carrier EPC) and the detection date (time stamp from middleware) to the ERP. For the benefit of the employee, successful detection can be visualized via the SmartLight.

Your advantages

- Semi-automated detection prevents errors
- Hands-free RFID system eliminates the barcode scan time
- Possible integration into existing machine controllers (PLCs)

E-kanban – the intelligent supermarket

With an e-kanban solution from Balluff you can use RFID technology to automatically control the consumption of components and materials in the production process. Unlike traditional kanban methods, conventional elements such as kanban cards are replaced by RFID tags. This solution has universal application.

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 also deploying a SmartLight stack light you can visualize the material level and guide a worker at the same time. Because now the worker knows exactly where he needs to intervene.

Your advantages

- Any shelving type or container type
- Track-specific detection, freely selectable location (entry, exit, return)
- Stand-alone system from a single source (RFID hardware, additional components, visualization, software)
- Simple, software-assisted commissioning

Location tracking with RFID – always know the stock levels

Objects which are seldom used can be located using passive UHF RFID data carriers. For example, this is ideal to locate tools which are rarely used but need to be found quickly.

For this solution the RFID data carriers are detected as they pass by. RFID readers are attached to a transport vehicle, driverless transport system or a forklift, while storage bays, bins or storage areas are uniquely labeled using reference data carriers. You can locate the objects at any time because of the object data carriers are attached to them.

During pass-by both reference data carriers and object data carriers are detected at the same time. Our software evaluates the read results and associates 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 exact the localization information will be – without the need for costly battery-powered data carriers on the objects.
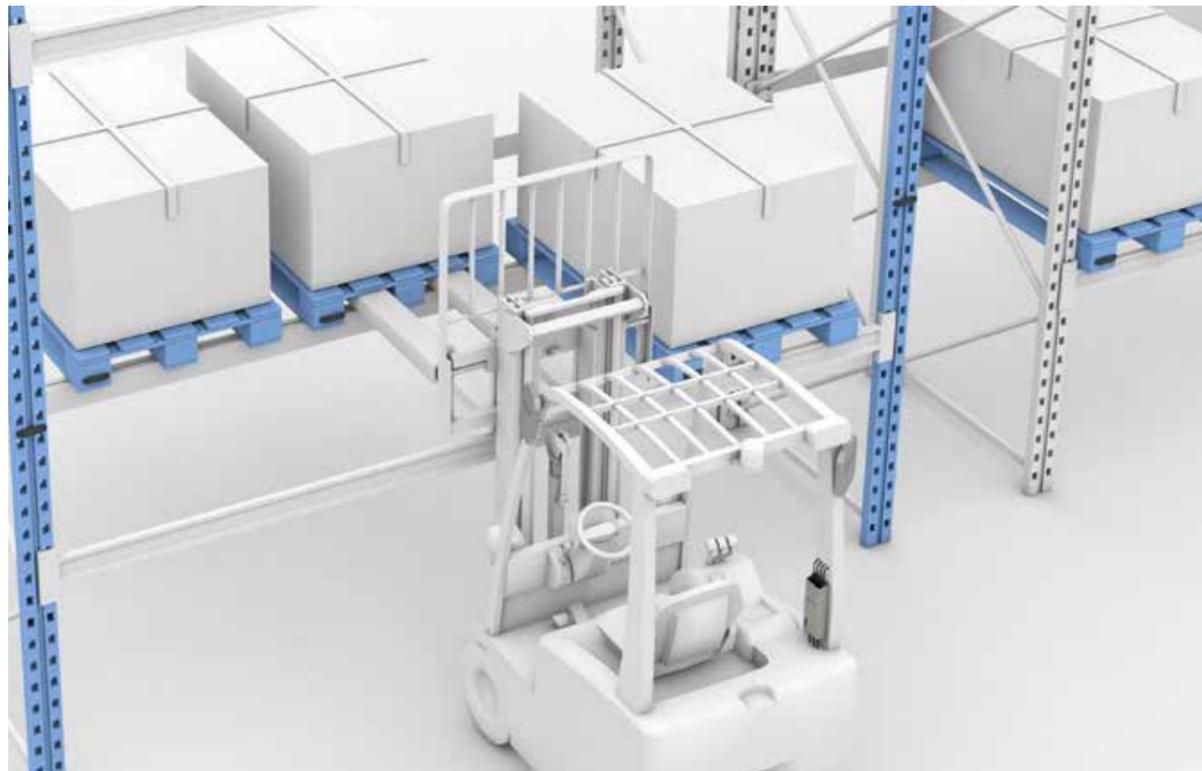
Location tracking with passive UHF RFID carriers

Overview of UHF technology

All these solutions are based on RFID using ultra-high frequency (UHF). UHF is a standard technology for any process needing identification solutions having a frequency range from 860 to 960 MHz. This frequency range is used by the Balluff BIS U RFID system.

The key benefits of BIS U

- Problem-free integration in applications via globally used standard interfaces
- Coherence to the global standard ISO 18000-6C and EPC Gen2 Class1
- Flexible use due to a wide range of different combinations of data carriers and antennas
- Ranges up to 6 m and more
- Bunching capability enables simultaneous detection of many data carriers (tags)
- Suitable for attachment to traditional control systems via bus interfaces and to higher level IT systems
- Complete tailored system solutions realizable
- A variety of accessories for an easy integration available in different applications

Learn more about the versatile solutions portfolio of Balluff in the field of RFID UHF technology at: www.balluff.de/go/rfid-bis-u

Learn more

To make sure you can take the best advantage of the opportunities presented by digitalization and IIoT, we support you with our custom tailored IIoT solutions. For more information go to: www.balluff.de/iiot-projects