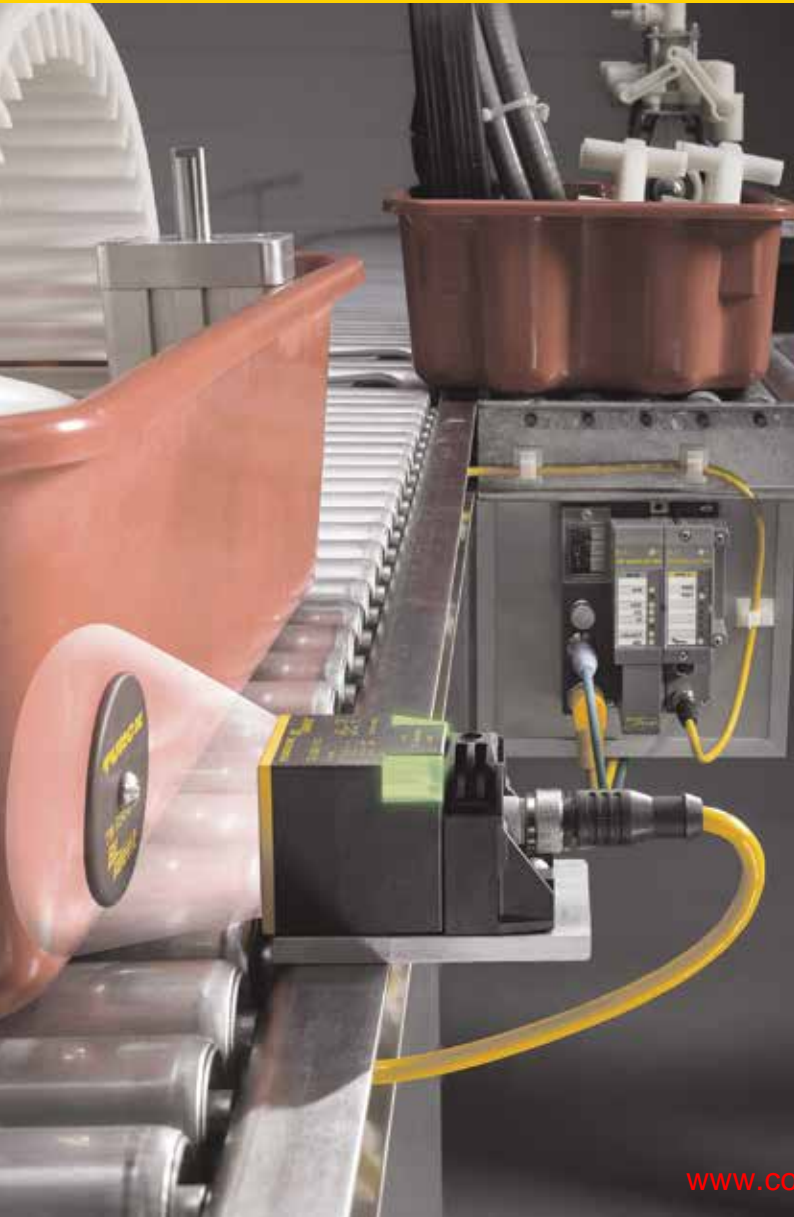Your Global Automation Partner

The Full Range for RFID

TURCK

Turck is a global leader in industrial automation technology. Over 4,000 employees in 28 countries strive to deliver the best sensor, connectivity, and fieldbus technology products on the market. To do this more efficiently, Turck production facilities are strategically located across the globe, including sites in the United States, Germany, Switzerland, Mexico and China. This allows Turck to adapt to specific market conditions, and bring product to the market faster.

Turck strives to provide our customers with not only the best products on the market, but also the best service and support. Our highly trained engineering staff is available to walk you through your system requirements and help find solutions to difficult application problems. Unlike other companies, when you call Turck, you will always be able to speak directly with an engineer in a matter of minutes! Combine this with a network of 2,000 experts across the United States, and you literally have the finest assembly of industrial automation professionals at your doorstep.

RFID

Radio frequency identification (RFID) has been providing manufacturers with high-quality monitoring systems to deliver unparalleled control and visibility over automated operations for increased efficiency gains and improved production. In order to ensure the correct solution is implemented, manufacturers should examine and recognize that there is a difference between the various RFID technologies such as Low Frequency (LF - 125 kHz), High Frequency (HF - 13.56 MHz) or Ultra-High Frequency (UHF 866-956 MHz). With each industrial application presenting a unique set of challenges and demands, it is important to know the speed, range, read/write operations, environment and number of tags the application requires to achieve the necessary level of control.

RFID systems contain three parts: the tag, transceiver, and interface. Tags can be active (requiring a battery) or passive. These tags contain internal circuitry that responds to a specific radio frequency that is provided by the transceiver. The transceiver, which is often called a reader or antenna, is responsible for communicating with the tag. The interface is the means of communicating the data to a higher level data collection device, such as a computer or a programmable controller. RFID in the industrial environment enables customers to improve accuracy, provide faster production speeds and minimize errors, as well as achieve substantial cost savings from both a material and labor standpoint.

Integrated identification of all components in car assembly process

Long range UHF technology in logistics

Identification for process control

BL ident® - MODULE RFID SYSTEM

Differences between HF and UHF

When choosing between two industrial RFID technologies, such as High Frequency (HF) and Ultra-High Frequency (UHF), it is important to understand their individual performance capabilities, strengths, weaknesses and application suitability. For example, water, carbon and other materials absorb UHF energy. This means that products containing a high water or carbon content can impact the ability to read or write to a tag. Therefore, when implementing RFID in and around liquid-bearing or carbon-composed products, HF is a better technology due to the absence of impact for this environmental factor. Furthermore, when selecting an RFID technology, understanding metal susceptibility is critical. HF tags have a shorter range and are more reliable on an object made of metal. Alternatively, UHF frequencies typically offer better range and can transfer data faster than low- and high-frequencies, but use more power and are less likely to pass through materials.

Another consideration when selecting the appropriate frequency for a corresponding application is the amount of electromagnetic interference (EMI). EMI is noise that can make it more difficult to obtain a clear signal and can be caused by a wide range of machines. Motors emit EMI and may need to be shielded to prevent interference with RFID systems. Conveyors with nylon belts and robots on assembly lines also cause interference in manufacturing processes.

Finally, RFID must adhere to individual restrictions imposed by each country. HF technology is accepted worldwide, but UHF frequencies differ depending on region. Please see the table below for a quick look at the specifications and capabilities of both technologies:

	HF – 13.56 MHz	UHF – 902-928 MHz
Communication range	Ranges in inches	Ranges in feet
Communication technology between read/write head and tag	Inductive coupling	Propagating radio wave
Field for tag identification	Homogeneous magnetic field	Inhomogeneous electromagnetic (EM) field
Interference	Not greatly influenced by surrounding environment	Highly influenced by surrounding environment
Materials with main influences	Metal	Metal and liquids
Multi-tag reading	Yes, several	Yes, over one hundred
Tag memory sizes	64 byte to 8 KB	24 to 138 bytes
Standards	ISO 15693	EPC Global Gen 2 – ISO 18000-6C

Fieldbus

BL ident – Interfaces

- Modular concept (BL20 and BL67) with up to 20 channels of RFID per gateway, standard I/O options can also be included

- Read/write heads can be installed up to 50 m from the RFID I/O card

- Versatile and simple fieldbus connection (PROFIBUS®-DP, DeviceNet™, CANopen, PROFINET®, Modbus® TCP, EtherCAT®, EtherNet/IP™)

- Programmable gateways using IEC61131-3 based programming software for distributed or independent control

- Single gateway and RFID I/O slice for UHF and HF applications
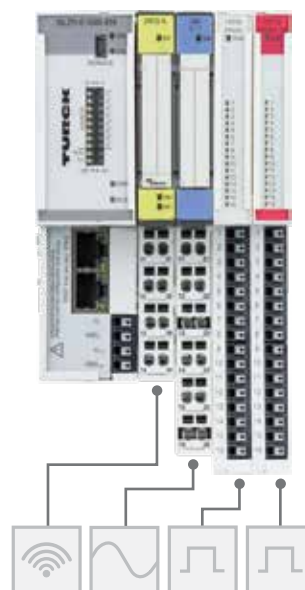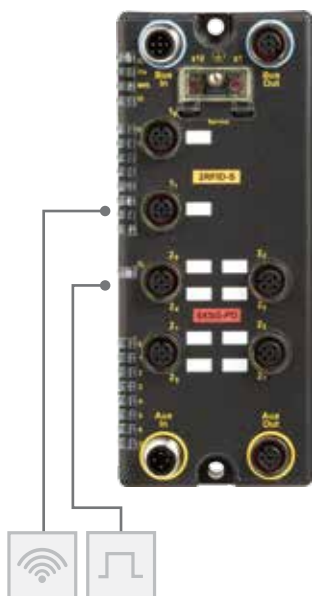
Optimized components
BL ident® offers many application-optimized components, such as the high-temperature HF or UHF data carriers for +240 °C, read/write heads for roller conveyors or high-speed applications, as well as components for food & beverage or the Ex-area.

Long ranges
BL ident® achieves read/write ranges up to one meter in the HF range and several meters in the UHF range, depending on the environmental conditions. The data carriers can be read and written on the fly – up to 0.5 ms/byte guaranteeing fast data transfer.

Read/Write

BL ident – Read/Write Heads

- Robust industrial design based on field-proven housings
- Fully encapsulated design for IP67, IP68 and IP69K environments
- Several HF options available for flexible read/write ranges, mounting configurations, and environments
- Shielded serial communication to the fieldbus level allows for remote mounting up to 50 m
- Compact UHF read/write heads for long-range applications
- Hazardous location options available

Flexibly connected to the system
BL ident® can be connected to the control level via the IP20 and IP67 rated interfaces, using the approved fieldbus standards. Complex applications can use CoDeSys-programmable gateways, which provide localized control in the field.

HF and UHF – parallel operation
Both technologies – interference immune HF (13.56 MHz, ISO15693) and long range UHF (840…960 MHz, ISO 18000-6C/EPCglobal Class 1 Gen 2) – are available in one identification solution. HF and UHF read/write heads can be connected and operated at the same interface.

www.comoso.com

Data Carrier

BL ident – Data Carriers

- Housing sizes as small as 7.5 mm

- Economical EEPROM data carriers for unlimited read applications

- FRAM data carrier for high-speed transmission and nearly unlimited write applications

- High temperature, -40 to +300 °C

- Data carriers for autoclaves, water-vapor tight up to +121 °C

- Direct mounting on metal

- Customer specific solutions based on open and international standards (ISO 15693 and ISO 18000-6C)

EPCglobal

CODESYS

Class 1 Gen 2

HF

UHF

ISO 18000-6C

ISO 15693

FDT/DTM

RFID

Future-proof investment
BL ident® can be adapted flex-ibly to new system demands. If additional read/write units are re-quired, they can be added through the connection of further RFID modules to the existing interface. Changing the fieldbus can also be easily done.

SERVICE

Ruggedly engineered
The rugged and modular BL ident® concept extends the service inter-vals and increases the availability of your system. If you wish to extend your system, you can plug or remove the electronic modules and the read/write heads in ongo-ing operation.

TURCK

Turck's BL ident – Flexible Industrial RFID

Turck's flexible RFID solution, BL ident, was created to offer a solution for industrial RFID applications while retaining the flexibility of standard I/O solutions. BL ident allows you to order RFID in the same package you are familiar with as slices for distributed I/O. The Turck BL ident solution allows for easy integration into existing control systems and supports all of the major networking protocols, providing an all-in-one industrial RFID solution for whatever your application demands.

## Building an RFID solution for your application has never been easier. Simply follow these steps:

1 Choose your gateway. BL ident works with most forms of distributed I/O offered by Turck and with any industrial networking protocol, from in-cabinet or on-machine to modular and block I/O.

2 Choose your RFID. Turck offers both HF and UHF RFID in A modules (fully configurable) or S modules (simple configuration), and can be combined to offer flexibility for applications that may require both HF and UHF.

3 Choose your transceivers based on your RFID type (HF or UHF), production environment, and distance.

4 Choose your tags based on your RFID type (HF or UHF), production environment, number of read/write operations and memory requirements.

In four simple steps, you've created your own custom RFID solution tailored to your specific application needs.

Maximum flexibility
As a BL ident® user, you profit from an extensive portfolio of flexibly combinable components. We offer data carriers in many different designs as well as industry-standard read/write heads, interfaces, connections, and fieldbus technology for connection to the available fieldbus.

Simulation | Integration | Operation
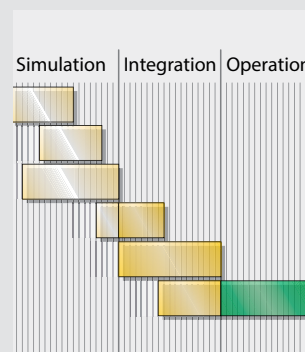
Fast implementation of projects
BL ident® supports you in fast project implementation. You can simulate the air-interface parameters of different system constellations. This reduces the effort and expenses for planning and enables you to implement your RFID project much faster.

TURCK

28 subsidiaries and over
60 representations worldwide!

B3006 B 08/16

www.turck.com

www.comoso.com