Your Global Automation Partner

TURCK

The Full Range for
Radio Frequency Identification

TURCK

Turck is a global leader in industrial automation technology. Over 4,800 employees in 30 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) provides manufacturers with high-quality 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 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 respond to a specific radio frequency, which 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, and 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 |

Comparing 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, materials such as water and carbon absorb UHF energy. This means that products containing 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-based 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 more reliable on objects 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 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 bytes to 8 KB	24 to 138 bytes
Standards:	ISO 15693	EPC Global Gen 2 – ISO 18000-6C

BL ident®– Flexible 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 as you are used to, 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.

Interfaces

Modular Interface

- Both traditional modular (BL20 and BL67) and modular block (BLC) concepts 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™)

- BL20 and BL67 offers programmability through IEC61131-3 based software for distributed or independent control

- BLCEN offers programmability via built-in ARGEE technology, which can add logic to compatible I/O devices without using a PLC

- Simultaneous support for HF and UHF applications in each I/O slice

Optimized components

BL ident offers many application-optimized components, such as high-temperature HF or UHF tags for +240 °C, transceivers 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 tags can be read and written on the fly at up to 0.5 ms/bytes, guaranteeing fast data transfer.

Block Interface

- Ultra-compact TBEN-S and TBEN-L RFID modules eliminate complex PLC-integration

- TBEN-S: 2 RFID ports, with 4 configurable digital I/O points for external devices

- TBEN-L: 4 RFID ports, with 8 configurable digital I/O points for external devices

- TBEN-S measures just 1.25 x 5.6 inches

- Brings data from read/write heads in HF or UHF frequency via PROFINET, EtherNet/IP, or Modbus TCP

Mobile Interface

- Track, control, and manage RFID applications easier than ever

- Provides an adaptable, economical industrial HF/UHF handheld solution

- Intuitive Turck RFID app solves a host of applications. (Customized solutions available)

- Can be used in conjunction with Turck's BL ident® RFID system

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 (960 MHz, ISO 18000-6C) – are available in one identification solution. HF and UHF transceivers can be connected and operated at the same interface.

Transceivers

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 transceivers for long-range applications

EPCglobal
CODESYS
Class 1 Gen 2
HF
UHF
ISO 18000-6C
ISO 15693
FDT/DTM
RFID

Future-proof investment

BL ident can be adapted flexibly to new system demands. If additional transceivers units are required, 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 intervals and increases the availability of your system. If you wish to extend your system, simply add or remove the electronic modules and the transceivers in ongoing operation.

Tags

Data Carriers

- Housing sizes as small as 7.5 mm

- Economical EEPROM tags for unlimited read applications

- FRAM tags for high-speed transmission and nearly unlimited write applications

- High temperature, −40 to +300 °C

- Tags 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)
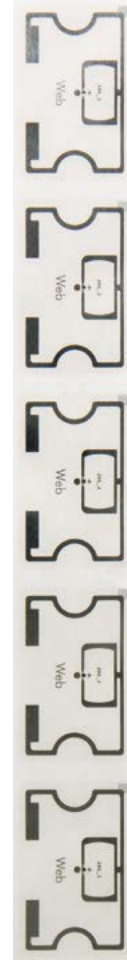
Maximum flexibility

As a BL ident user, you profit from an extensive portfolio of interchangeable components. We offer tags in many different designs, as well as industry-standard transceivers, interfaces, and fieldbus technology.
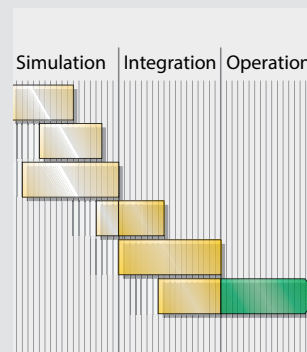
Fast implementation of projects

With BL ident, users can simulate the air-interface parameters of different system constellations, which reduces the effort and expenses for planning and enables you to implement your RFID projects much faster.

Simulation | Integration | Operation

TURCK

30 subsidiaries and over
60 representations worldwide!

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