



fleischhauer **RFID** – Radio Frequency **ID**entification



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RFID (radio frequency identification) is currently the most innovative technology used for automatic identification and data collection purposes. It uses a microchip connected to an antenna (together called a transponder) to store information.

The advantage of RFID over other kinds of machine-readable technology such as barcodes or magnetic stripes lies in the fact that communication between the read/write unit and the transponder is contactless. Neither visual nor physical contact is necessary.

The energy needed to read, write and transmit information is generated by an electromagnetic field when it passes through the transponder's antenna. The position of the card during the reading process is totally irrelevant.

Due to the wide variety of transponders and readers, RFID technology can be employed in many areas, for instance, logistics, supply chain management, access control and archiving systems.

When planning a project the RFID components have to be carefully chosen and tested to assure their suitability for the environment they are going to be used in. It is especially important to take into account the presence of metal, humidity and competing electromagnetic fields as these can reduce the transponder's transmission range.

We are always happy to discuss the advantages that RFID can offer you. From planning to implementation, your project is in good hands with Fleischhauer.

❖ *For a summary of the most important facts and figures on RFID please see overleaf.*

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Advantages of RFID technology:

- contactless communication
- long life
- easy installation/integration
- resistant to dirt and damage
- variety of possible formats
- compatibility with other types of identification technology
- simultaneous processing of multiple transponders (anti-collision)
- fast and reliable recognition
- secure data transfer
- data protected by access rights and encoding
- resistant to vibration and shock
- data can be altered and added to (read/write)

Frequencies and Chips:

The electromagnetic waves used for technical communication are divided into frequency bands according to their length. There are various transponders available for use with each of the different frequency bands.

Frequency band	Low frequency (LF) 30 kHz – 300 kHz	High frequency (HF) 3 MHz – 30 MHz	Ultra high frequency (UHF) 300 MHz – 3 GHz
Usual wavelength	125 kHz, 134 kHz	13,56 MHz	433/868/915 MHz 2,45 GHz
Areas of use	access controls, animal recognition ...	public transport, access controls, ...	logistics, toll collection
Common types of chip	Hitag 1+2, Atmel 5551, 5530, EM 4102, 4150	Mifare, Legic, SR, I-Code, Tag-it	EM 4222, 4223, UCODE, XRAOO

Possible formats:

The multitude of possible applications is reflected in the variety of different RFID media:

- cards
- coins
- tickets (paper/foil)
- labels (sticky)
- tags
- glass transponders
- capsule transponders, e.g. key fobs, bracelets, watches, nails, ...

Areas used in today:

- access control
- time management
- billing by electronic ticket (public transport)
- continuous monitoring of the flow of goods
- positive and negative signalling of correct and incorrect processing
- electronic documentation
- sounding alarm when two objects approach each other
- automatic payment equipment/billing
- registration of loaned and returned objects
- anti-theft devices
- transmission of temperature readings at regular intervals or triggered by critical values

Frequently Asked Questions:

Over what distances can information be transmitted?

The range depends on the chip being used, the configuration of the read/write unit and the size of the transponder. Passive transponders can be used for distances between 1 cm and 350 cm.

What does the price of an RFID solution depend on?

The costs depend on the design of the data carrier, the type of chip and quantity. We can provide you with an individual quote, tailored to your needs. Normally the larger the chip's memory and the more specialised the chip itself, the higher the price per chip.

What is the difference between "transponder technology" and "RFID technology"?

None. They are just two ways of saying the same thing.

What is the difference between passive and active transponders?

Active transponders use an additional source of energy, e.g. a battery, to increase their transmission range. Passive transponders rely on induction from the magnetic field to generate the necessary energy.

Can RFID solutions be integrated into existing systems?

RFID systems are available with standard interfaces, which means they can be linked up to existing software. Please ask us for more information.

What does "read-only" and "read/write" mean?

In the case of read-only chips, the information on the chip is fixed (the chip's ID number). It can be read but not changed. With read/write chips, on the other hand, information can be read from the chip, existing information can be altered and new information can be saved to the chip.

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