

# RFID Transponder M-RFID

## RFID technology - Uniquely unique –

RFID stands for Radio Frequency Identification. Every single RFID transponder, also called RFID tag or RFID chip that is produced has a unique, unchangeable identification number in its memory (ID). This makes the transponder suitable for the unique identification of objects. When a tag is attached to any type of unit, it can be localized and identified uniquely.



## The RFID transponder - the components –

The word transponder is made up from the components "transmit" and "respond". Essentially, the RFID tag consists of a data storage chip and an antenna. The coating is made of plastic.

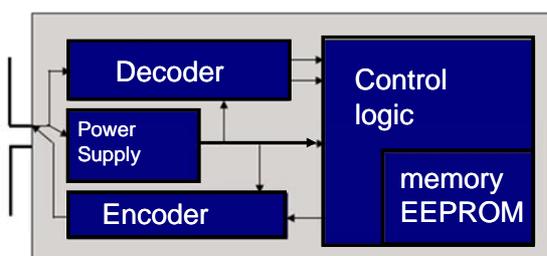


Figure 1: Structure of the RFID transponder

## The transponder - The principle –

When the transponder is within the reception range of a reader this triggers mutual communication. The data is transferred via electromagnetic waves. The transponder can deliver 1-bit information but can accept more complex data with the help of the memory. The stored information can be changed, overwritten or deleted.

A distinction is made between active and passive transponders. While the active RFID tags get the energy they need for wireless transmission from a battery, the passive transponders have no power supply.

## STEAG uses the passive system - How it works –

With the passive system, energy is supplied via an inductive coupling with the antenna of the reader. When the transponder enters the working range of a reader, it gets a high-frequency energy field from which it draws the energy needed to operate its circuits. The transponder contains an oscillating circuit that is synchronised to the same frequency. When the reader/writer approaches



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the alternating field, the energy needed to operate the microchip is coupled into the oscillating circuit via its coil. If enough energy is available, the transponder's transmission electronics transmit the content of the data memory to the reader via the antenna. This process is repeated cyclically as long as the transponder and reader are close to each other or until the dialogue is interrupted by an interface command. Data is transferred wirelessly. When the transponder leaves the working range of the reader, it is completely inactive.

## Some other things you should know

STEAG recommends that the tags are adhered to the unit to be identified. If this is not possible due to the specific conditions, prefabricated plastic holders can be used for the transponder. These can either be stuck on or fixed with cable ties to the objects. This allows users to attach the transponder themselves. It also means that the number of transponders can be extended at any time.

### Facts and figures for M-RFID:

- Transmission frequency: 13.56 MHz
- Standardised according to ISO 15693
- Write/read distance to approx. 1 cm
- Can be attached directly to metal
- Memory sizes 2 Kbit read & write
- Diameter: 14 mm
- Water tight
- Temperature range -20°C to 80°C

On request, designs and transponders suitable for other environmental conditions are available.

### Key:

RFID: Radio Frequency Identification

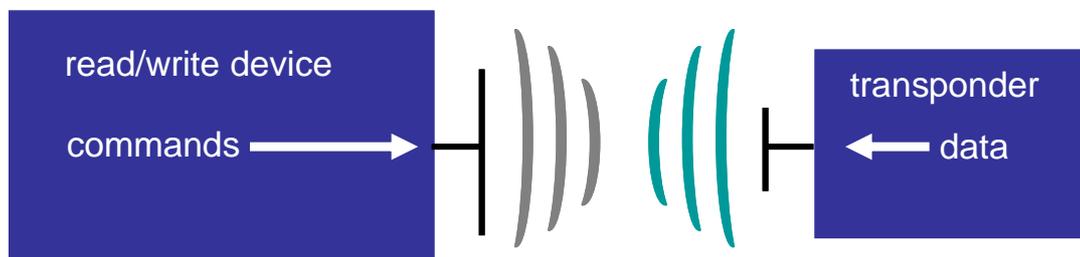


Figure 2: How a passive transponder works

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