

## Aufgabe der Abschlussarbeit im ISE Bachelorstudiengang

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**Thema:** **Feasibility Study of a New Antenna on RFID Equipped Forklifts**

### Description:

For improvement of logistics and inventory processes in stores, warehouses and distribution centers, the METRO Group investigates the benefits of the use of RFID enabled forklifts which use 4 antennas and one reader. Because of the metallic construction of the forklift appropriately designed antennas are necessary.

The company Huber and Suhner AG proposes a model SPA-860/70/8/0/V by supplying a set of simulation results of a specialized two-patched antenna in a metal housing designed for use at a forklift.

### Thesis Tasks:

In order to evaluate the optimized antenna for this special application the task of this thesis in particular is:

- In a measurement inside of an anechoic chamber the characteristic of this antenna will be determined. Properties like the forward gain, front-to-back-ratio; axial ratio and other characteristic values are measured and analyzed. Additionally, the horizontal and vertical antenna pattern will be used to evaluate the simulation results. For analysis and visualization the tool MATLAB will be used.
- Analysis of the radiation fields of the antennas in the housing at an "Open Area Test Site" in order to:
  - Optimize the position of the two patch fields relative to each other inside the housing
  - Optimize the antenna-Pallet spacing
- Testing of the antenna at the forklift in a real life environment of a distribution center.
- Check the feasibility of an algorithm for the rejection of unwanted reads by the use of tag's signal response strength and realization of that algorithm if possible.

After completion of thesis work a public presentation of results is to be given at the department.