

# Productive 4.0

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## Master's Thesis Abstract

by

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“Planar multilayer reconfigurable antenna for UHF RFID readers”

Every entrepreneur knows that inventory processes and assets tracking of objects in stock can be extremely time-consuming and expensive. UHF RFID systems are constantly growing in popularity, replacing systems for marking assets with barcodes. Despite the high popularity, it should be noted that the implementation of such a system is still associated with high costs and the investment in infrastructure that should work properly in difficult industrial conditions. Increasing the accuracy of the system requires the installation of a large number of antennas and readers. This work presents a model of an antenna with a directional beam of radiation that can be steerable. Use of this type of antenna allows to reduce the number of components of the entire system, allowing to lower system costs. By implementing the appropriate location algorithms, it is possible to estimate the position of objects in 3D space.

Paper presents the process of designing a microstrip antenna operating on the UHF frequency with reconfigurable radiation pattern. Fabricated antenna is fed by aperture coupled microstrip with air gap. The antenna structure consists of an additional layer of superstrate over the radiation layer. Passive elements have been placed on the superstrate layer. Proper opening or shortening of elements to the ground, changes the antenna radiation pattern – causing the main beam to be deflected.