

# SEnSE: Building a Mifare-Compatible Tag on an FPGA Platform



## Motivation

A Mifare-compatible tag should be implemented based on an existing RFID-tag platform that uses an FPGA micromodule (XILINX Spartan-3). The design running on the FPGA contains a digital front-end that handles the ISO14443A-3 protocol and a programmable microcontroller that processes the commands on higher layer. In this project the design on the FPGA should be adapted and extended to also support Mifare-specific commands.

## Project description

- Goals
  - Get familiar with RFID-tag platform and Mifare protocol.
  - Extend and integrate Mifare-specific commands into the design on the FPGA.
- Tasks
  - Read into the topic
  - Get familiar with the RFID-tag platform and Mifare-specific commands/related work
  - Extend and adapt Design on FPGA
    - (Minor) changes in digital-front end
    - (Mainly) reprogramming microcontroller
    - Using special hardware/instructions for time-critical operations
  - Verify functionality with standard RFID reader

## Literature

- [H. Plötz, Mifare Classic – Eine Analyse der Implementierung](#)
- [Functional specification MIFARE Ultralight](#)

## Deliverables

- Project files (.zip, cleaned)
- Documentation (inline)
- Readme (getting started)
- Presentation (10 .ppt slides)

## Project schedule

- Start Immediately
- Month 1 Reading, getting familiar RFID-tag platform/Mifare protocol
- Month 2 Implement protocol/extensions
- Month 3 Final deliverables

## Master @IAIK Project

Studies:  INF  SEW  TEL

## Prerequisites

- Basic understanding of hardware design and assembly programming advantageous.

## Advisor / contact

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