

Bachelor Project



**Czech
Technical
University
in Prague**

F3

**Faculty of Electrical Engineering
Department of Measurement**

Sensor network for Smart Agriculture

Jiří Maňák

**Supervisor: prof. Ing. Radislav Šmíd, Ph.D.
May 2024**

Acknowledgements

Declaration

Prohlašuji, že jsem předloženou práci vypracoval samostatně, a že jsem uvedl veškerou použitou literaturu.

V Praze, 1. May 2024

Abstract

Keywords: word, key

Supervisor: prof. Ing. Radislav Šmíd,
Ph.D.
Praha, Technická 1902/2, místnost:
A3-324

Abstrakt

Klíčová slova: slovo, klíč

Překlad názvu: Senzorová síť pro
Smart Agriculture

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Chapter 1

Introduction



Part I



Chapter 2

Conclusions



Bibliography

I. Personal and study details

Student's name: **Maák Jiří**

Personal ID number: **499229**

Faculty / Institute: **Faculty of Electrical Engineering**

Department / Institute: **Department of Measurement**

Study program: **Cybernetics and Robotics**

II. Bachelor's thesis details

Bachelor's thesis title in English:

Sensor network for Smart Agriculture

Bachelor's thesis title in Czech:

Senzorová síť pro Smart Agriculture

Guidelines:

Design and implement a module for data acquisition from sensors used in smart agriculture with a LoRa interface based on a microcontroller from the STM32 family, including PCB. Implement Over-The-Air firmware update capability, design a transmission protocol suitable for prolonged node inactivity, implement a sensor network with multiple nodes, and evaluate the transmission parameters. Experimentally evaluate the possibility of powering the module from a solar cell for outdoor use.

Bibliography / sources:

1. firemní literatura ST microelectronics
2. LoRa® Devices: Smart Agriculture Real World Solutions, Semtech 2023

Name and workplace of bachelor's thesis supervisor:

prof. Ing. Radislav Šmíd, Ph.D. Department of Measurement FEE

Name and workplace of second bachelor's thesis supervisor or consultant:

Date of bachelor's thesis assignment: **16.02.2024** Deadline for bachelor thesis submission: _____

Assignment valid until:

by the end of summer semester 2024/2025

prof. Ing. Radislav Šmíd, Ph.D.
Supervisor's signature

Head of department's signature

prof. Mgr. Petr Páta, Ph.D.
Dean's signature

III. Assignment receipt

The student acknowledges that the bachelor's thesis is an individual work. The student must produce his thesis without the assistance of others, with the exception of provided consultations. Within the bachelor's thesis, the author must state the names of consultants and include a list of references.

Date of assignment receipt

Student's signature