DIPLOMA THESIS

Modular Smart Home System

Add subtitle

Performed in 2025/26 by:	Supervisors:
Fabian Schätzschock	Supervisor 1
Richard Krammer	Supervisor 2

St. Pölten, on 04.04.2025

_____

Submission Statement:	Supervisors:
Date:	

Affidavit

The undersigned candidates have chosen to prepare a diploma thesis with the following task description in accordance with the Schulunterrichtsgesetz (School Education Act) § 34 Abs. 3 Z 1 and § 37 Abs. 2 Z 2 [1], in conjunction with the provisions of the Prüfungsordnung BMHS (Examination Regulations for Vocational Middle and Higher Schools), Federal Law Gazette II No. 177/2012 [2], as amended

Modular Smart Home System
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Individual tasks within the overall project:

- **Fabian Schätzschock**: Task 1
- **Richard Krammer**: Task 2

The candidates acknowledge that the diploma thesis must be worked on and completed independently and outside of class time, although class results may be incorporated if appropriately cited as such.

The complete diploma thesis must be submitted digitally and in two printed copies to the supervising teacher no later than **04.04.2025**.

The candidates further acknowledge that cancellation of the diploma thesis is not possible.

Fabian Schätzschock   _____

Richard Krammer   _____

Contents

1 Introduction

1.1 Our Goal

The goal of this Project is to provide a open source all in one smart home solution that comes with a modular design and enables the user to easily modify and extend the system.

2 Executive Summary

3 Requirements

3.1 Hardware

3.2 Software

3.2.1 Microcontroller

3.2.2 Backend

3.2.3 Frontend

4 Concept

4.1 Networking Structure

4.1.1 MQTT

4.1.2 ESP NOW

5 ESP32

5.1 Project Structure

5.2 ESP NOW

6 Raspberry Pi

6.1 Raspberry to ESP Communication

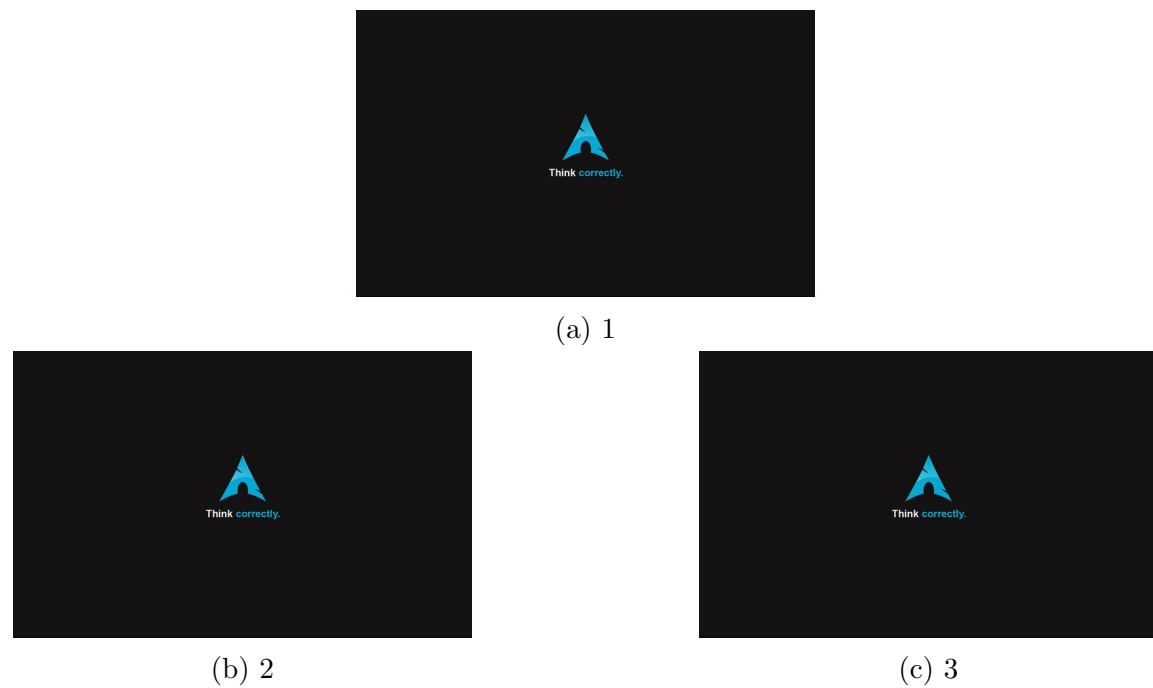## 6.2 Database

6.3 Web Server

(a) 1

(b) 2

(c) 3

Figure 6.1: Figure

7 Results

LaTeX is a widely used document preparation system [1].
LaTeX is a widely used document preparation system [3].

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[1]A footnote citation [3]

8 Time Tracking

8.1 Name 1

2024		
Week	**Task Description**	**Hours**
36	Preparation	12

2025		
Week	**Task Description**	**Hours**
35	Polishing	12

Total	**24**

Bibliography

[1] *Bundesgesetz über die Ordnung von Unterricht und Erziehung in den im Schulorganisationsgesetz geregelten Schulen.* 1986. URL: https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=10009600.

[2] *Prüfungsordnung BMHS, Bildungsanstalten.* 2012. URL: https://www.ris.bka.gv.at/GeltendeFassung.wxe?Abfrage=Bundesnormen&Gesetzesnummer=20007845.

[3] Wikipedia contributors. *LaTeX — Wikipedia, The Free Encyclopedia.* 2024. URL: https://en.wikipedia.org/wiki/LaTeX (visited on 12/06/2024).