

Assignment nr.3

Towards IoT: Smart Temperature Monitoring

Luca Casadei - 0001069237
Francesco Pazzaglia - 0001077423

Last modified: February 27, 2025

Contents

1 Introduction

1

1 Introduction

This document describes a smart temperature monitoring system consisting of four integrated subsystems:

- **Temperature Monitoring Subsystem** (ESP32): Continuously samples temperature data and communicates via MQTT;
- **Control Unit** (Java/Vert.x): Acts as system brain handling state management, data aggregation, and inter-subsystem coordination;
- **Window Controller** (Arduino): Manages physical window actuator and operator interface with LCD display;
- **Dashboard** (Python/Tkinter): Provides GUI for remote monitoring and control;

The system features two operational modes: *AUTOMATIC* with temperature-dependent window control, and *MANUAL* for direct operator intervention. Communication uses MQTT for sensor data, HTTP for dashboard updates, and serial protocol for actuator control.