
SYSTEM ARCHITECTURE SPECIFICATION

for

DEPARTUREBOARD

Version 1.0

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1 Introduction

1.1 Purpose

This document is intended to be a specification for the hardware requirements of DepartureBoard, a modular display system, intended for displaying public transportation departures in real-time via a LED grid. This document will specify the requirements for the wireless connectivity, electrical connectivity, modularity, expandability, power delivery architecture, brightness control, testing, programming and protection.

Please refer to the Software Architecture Specification (SAS) to understand the Software and Firmware requirements for the DepartureBoard.

1.2 Intended Audience and Reading Suggestions

This document is intended for all interested in building or contributing to the development of DepartureBoard.

1.3 Project Scope

Todo

2 System Level Components

2.1 Architecture

For DepartureBoard, the design is split into three modules, of which two are required for operation. The actual display itself consists of two connected modules, the Display module which houses an LED grid capable of output the desired image, and the compute module which wireless communicates to a server to receive new data and update the display. The display module also contains the power delivery system, responsible for supplying power to the compute module, when connected to the display module.

In addition to the display module and compute module there is an optional action module which serves as an accessory to the DepartureBoard. The action module also connects to and powers a compute module, and contains a button which can be programmed to perform a specific action. The action module must provide power to it's compute module via battery, as the action module must be self-contained and wireless.

Both the Action Module and Display Module shall support the Matter communication protocol and be compatible with HomeKit+iOS 16. This support necessitates support via the compute module of both WiFi and Bluetooth Low Energy (BLE).

2.2 Compute Module

Todo

2.3 Display Module

Todo

2.4 Action Module

Todo

3 Expansion

Todo

4 Brightness Control

Todo

5 Communication Requirements

5.1 Compute Module

Todo

6 Power Delivery Architecture

6.1 Compute Module

Todo

6.2 Display Module

Todo

6.3 Action Module

Todo

7 Programming

7.1 Compute Module

Todo

8 Electrical Protection And Isolation

8.1 Compute Module

Todo

8.2 Display Module

Todo

8.3 Action Module

Todo

9 Automated Test Support

9.1 Compute Module

Todo

9.2 Display Module

Todo

9.3 Action Module

Todo