

Infonique iSEB Door V1.0

| Prepared by | Date | Version |
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Abstract

This document provides detailed of Infonique iSEB Door specification.

Document History

| Date | Rev | Modifier | Changes |
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| 24-Feb-2024 | 1.0 | Bing Ran | First Draft |
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1 Introduction

This document will discuss the details of the iSEB door.

2 iSEB Door

iSEB Door contains several module such as Door control unit, ESP32-S3-EYE, Relay module, voltage regulator module , Arduino Uno with iSEB expansion board and limit switch. iSEB Door able to control the door , perform human recognition and record the usage of the door usage. The following is showing the overview of the iSEB Door.

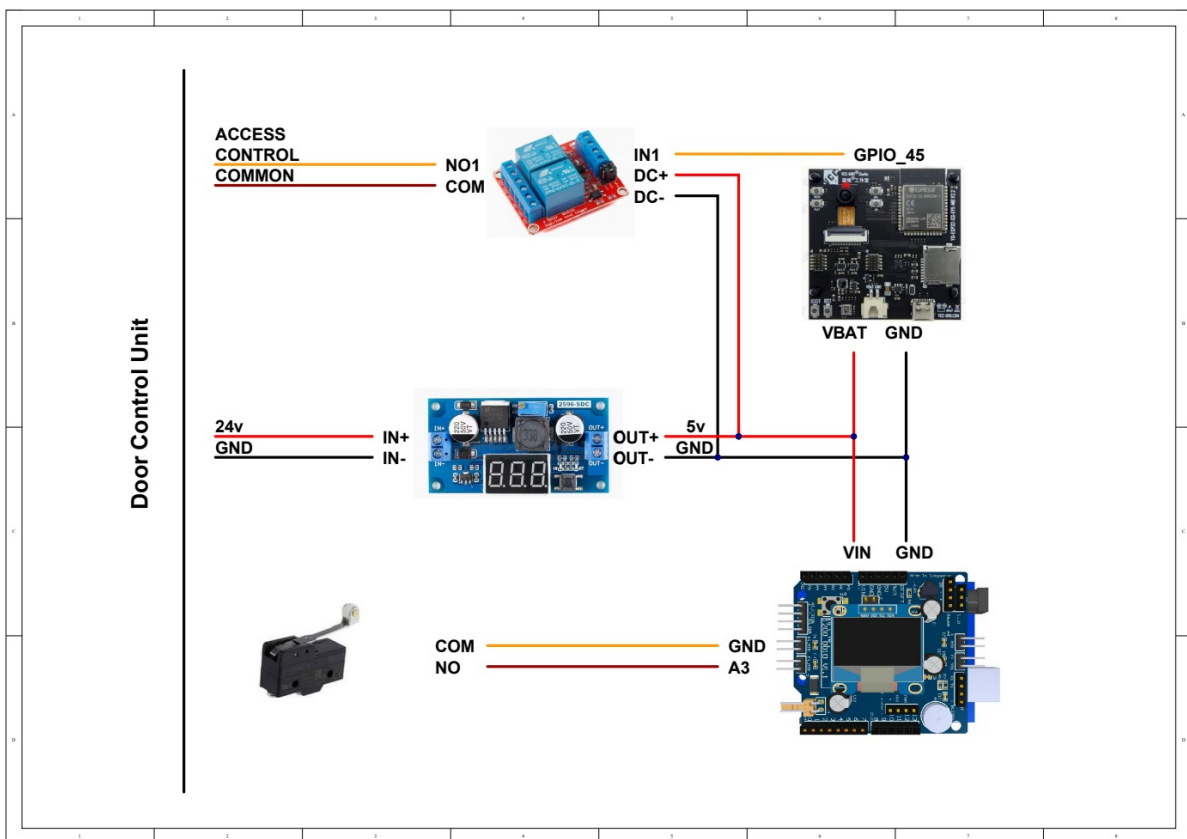


Figure 1: Overview of iSEB Door

3 Door Control Unit

iSEB door is using the DSW-60 from Deper. It is a slim and small size. It is a automatic swing door openers with motion sensors. The figure below is showing DSW-60 from Deper.



Figure 2: DSW-60 from Deper

We have to power up it with 240ac and there is a switch for us to switch on and off the door control unit. For iSEB door we only send signal to connector 1 of the door control unit hence we will focus on connector 1 only. The details of connector 1 is showing in the figure below.

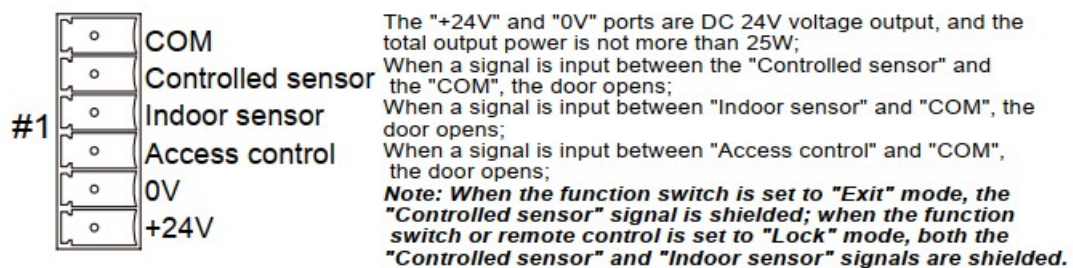


Figure 3: Connector 1

iSEB door will open the door by shorting COM to Access control. Beside that, 0v and +24v will supply power to voltage regulator module. Beside that to configure the other parameter of the door control unit we will need setting panel to configure it. The details of the setting panel is showing in the figure below.

Automatic swing door operator * Installation guide

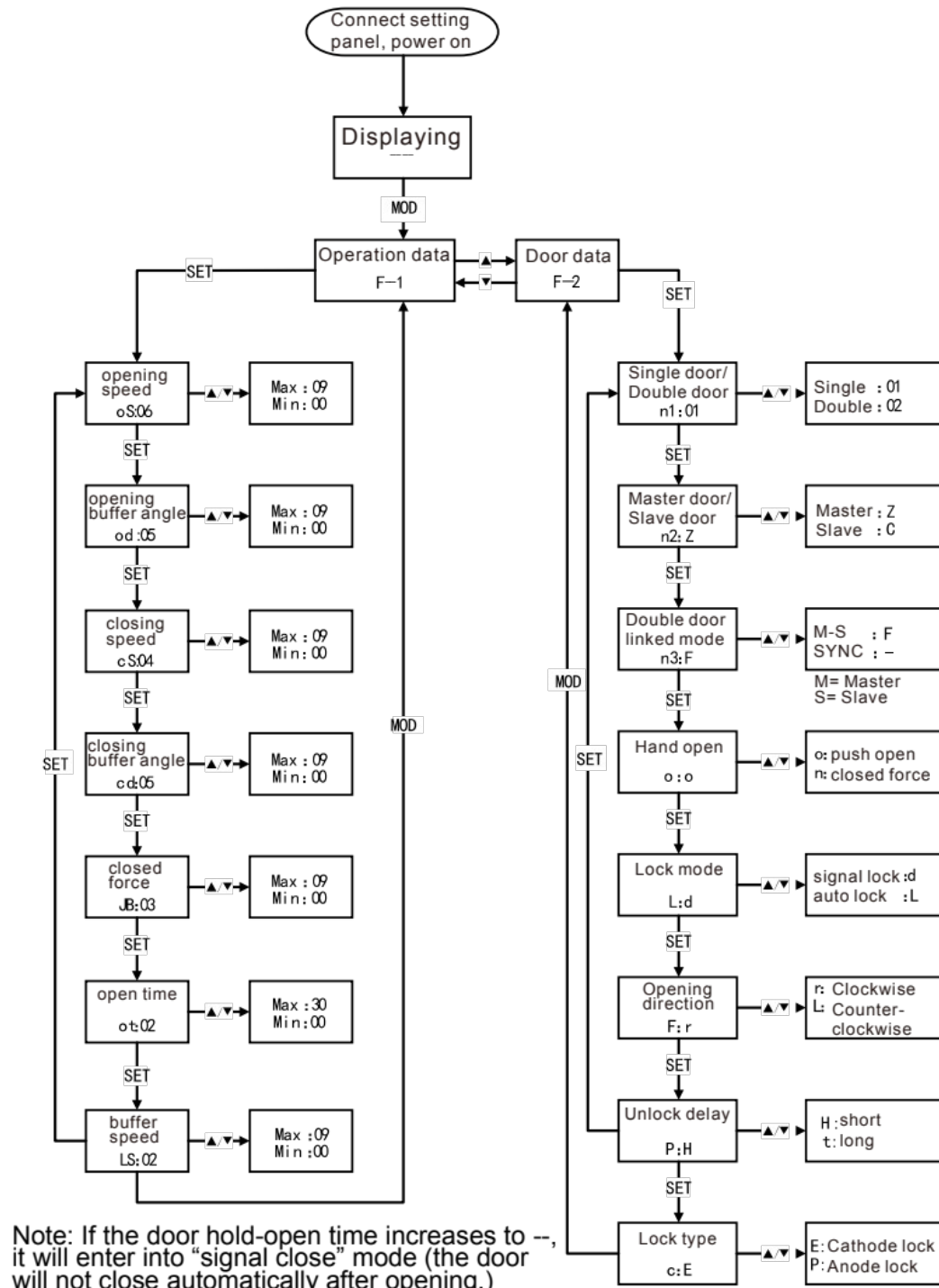


Figure 4: Detail of setting panels

4 Voltage regulator module

ISEB door is using LM2596 module as the voltage regulator module. Voltage regulator module will convert 24v to 5v because the operating voltage of other module is 5v. The following figure is showing LM2596 module.



Figure 5: LM2596 module

There is variable resistor, 7 segment display and a switch on the LM2596. The variable resistor is to adjust the output voltage. 7 segment display is showing the input or output voltage of the LM2596S. The switch is to toggle the 7 segment display to show input or output voltage.

5 ESP32-S3-EYE

ESP32-S3-EYE is a small-sized AI development board. It is based on the ESP32-S3 Soc and ESP-WHO, Espressif's AI development framework. It features a 2-Megapixel camera, an LCD display, and a microphone, which are used for image recognition and audio processing. ESP32-S3-EYE also offers plenty of storage, with an 8MB octal PSRAM and a 8MB flash. It also supports image transmission via WiFi and debugging through a usb port.

For iSEB door, we will involve only switches, 2-megapixel camera and an LCD display. The figure below is showing the ESP32-S3-EYE that used by iSEB door.

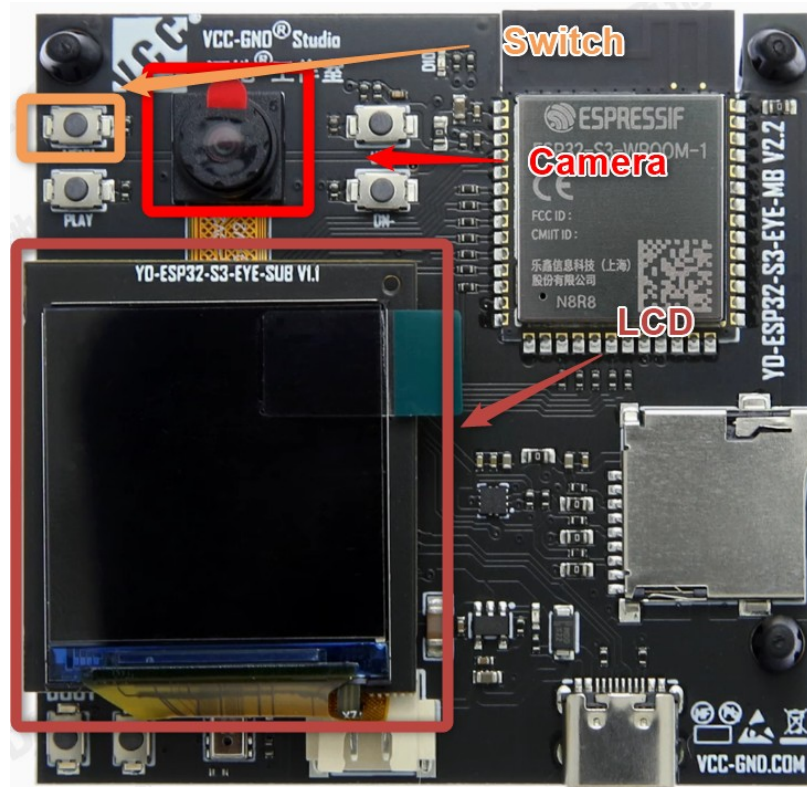


Figure 6: ESP32-S3-EYE

During start up, ESP32-S3-EYE will be in default mode. We have to press the switch to enter face recognition mode. ESP32-S3 EYE will detect human face and send signal to door control unit to open the door through GPIO45.

The sample code is available at <https://github.com/bingran/esp-who/tree/master>. The details of ESP32-S3-EYE such as setting up the debug environment and schematic diagram are mentioned in the github page also. The sample code used for iSEB door will be esp-who/example/esp32-s3-eye.

6 Relay module

iSEB door is using relay module to transfer signal from ESP32-S3-EYE to door control unit. This is because door control unit is working at higher voltage. The gpio of ESP32-S3 is only tolerate 3.3v, hence, a relay module is require to send signal from ESP32-S3-EYE to door control unit. The figure below is showing the relay module used in iSEB door.

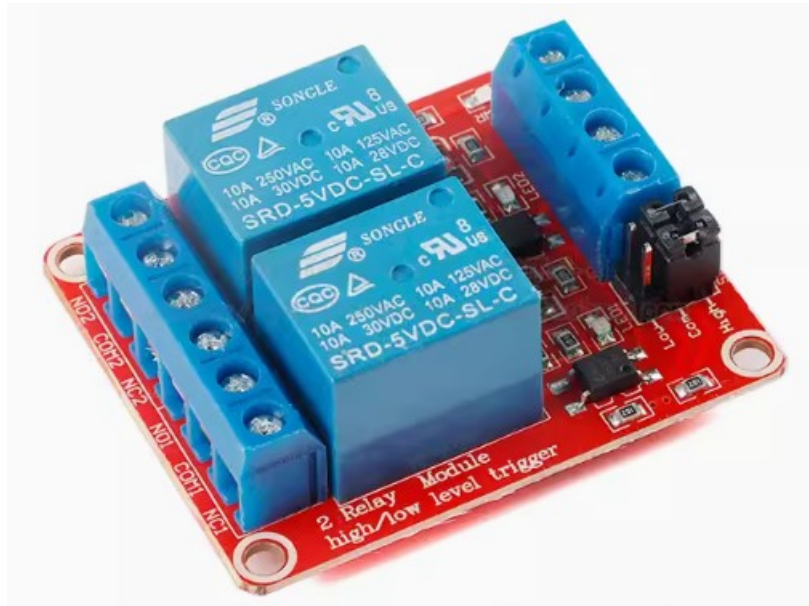


Figure 7: Relay module

It is a two way relay module but only one relay is used in iSEB door. It is a 5v relay because the system is working in 5v. It able to configure to receive high/low signal to turn on with the jumper. For iSEB door, we are using send low signal to turn on the relay to ensure the current require to source the opto isolator is enough.

7 Arduino UNO with iSEB expansion card

iSEB door is using Arduino UNO with iSEB expansion card to record the usage of the door , sound the buzzer when the door is not close and display the cout and status of the door. The figure below is showing the buzzer and switch of the iSEB expansion card.

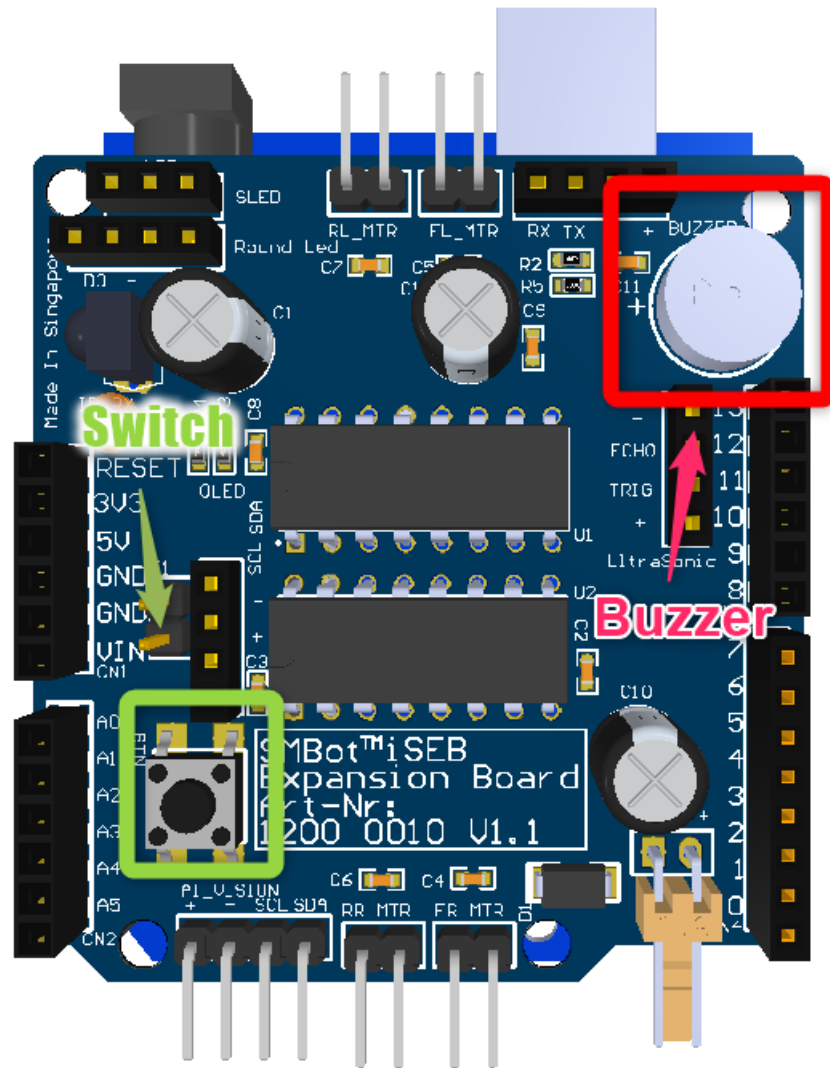


Figure 8: Buzzer and switch of the iSEB expansion card.

The user can clear the count of the usage of the iSEB door by pressing the switch of iSEB expansion card. The cout of the usage is stored in the eeprom hence the value is retained during power cycle.

The sample code for the arduin UNO with iSEB exapnsoin card will be available at <https://github.com/bingran/iSEB-Door>.

ISEB door will display the count of the usage and status of the door with LCD. The figure below is showing the LCD of iSEB expansion card.

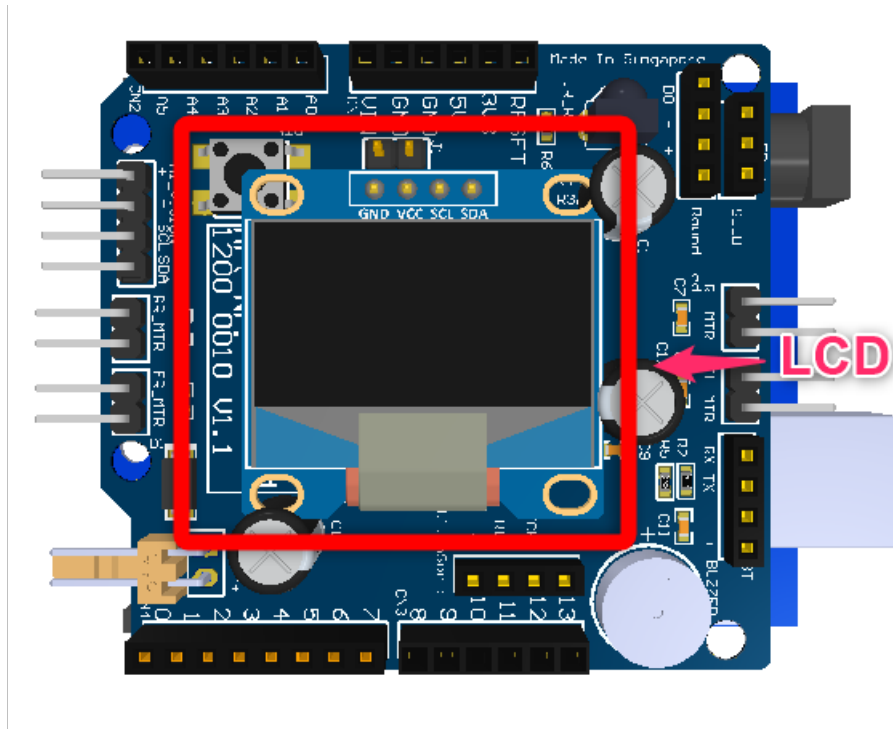


Figure 9: LCD of iSEB expansion card

Beside that arduino UNO is used to detect the status of the door with limit switch. The figure below is showing the limit switch .



Figure 10: limit switch

7.1 Arduino UNO with iSEB expansion card pinout

We will only list down the pinout involved in iSEB door.

| Pin | Function | Pin | Function |
|-----|----------|-----|--------------|
| D0 | UART Rx | D10 | N/A |
| D1 | UART Tx | D11 | Buzzer |
| D2 | N/A | D12 | N/A |
| D3 | N/A | D13 | N/A |
| D4 | N/A | A0 | N/A |
| D5 | N/A | A1 | N/A |
| D6 | N/A | A2 | Button Input |
| D7 | N/A | A3 | Limit switch |
| D8 | N/A | A4 | N/A |
| D9 | N/A | A5 | N/A |

Table 1 Expansion board pinout