AIROTEK Labs
Ashland High School
STEM Program

Pi-Door Reference

Revision 1 (January 17th, 2019)

OVERVIEW

The Pi-Door project represents the combined efforts of the talented programmers in Ashland High School's STEM program. The system consists of a windowed door with an IPS display and an SBC (Single Board Computer) that allows the door to be locked and unlocked remotely among other features. This sheet will serve as a reference in the event of a system rebuild or upgrade. Keep in mind that these features can change at any time as the code that powers the system is continually developed.

Components of the Door System

1. Electromechanical door locking system
2. Display and display mounting hardware
3. Magnetic field position sensor
4. Raspberry PI SBC and GPIO field
5. Environment sensor array (Not yet included)

Default Behavior

After all proper connectors are secured and power is provided, the system should boot and calibrate itself automatically. Assuming the system is preconfigured with a secure wireless or wired network, the operating system should automatically connect to the network before starting any system programs. The system's software is programmed to be fault tolerant during long term use. If a component of the system experiences a fatal error and crashes, the operating system is instructed to restart that component if possible. In the event of a full system failure, the locking mechanism will still be secure.

WARNINGS

Network Security

Encryption features have not been implemented in the most recent version of the door's software. Please use caution when controlling the device over a wireless network. Make sure the network infrastructure prevents packet capture operations and peer-to-peer communication if possible.

Failsafe

If the door lock fails to actuate, keep a spare key to allow emergency entry to the room. The least reliable system on the door remains the u-joint assembly that connects the electromechanical servo to the door lock. In the event of system reconstruction, please use this guide to pin numbers to assemble the electronic components correctly. Improper construction of the system can result in electrical failure or damage to the device, and may impose a fire or electrocution risk. For your own safety, keep water away from the electrical components of the system.
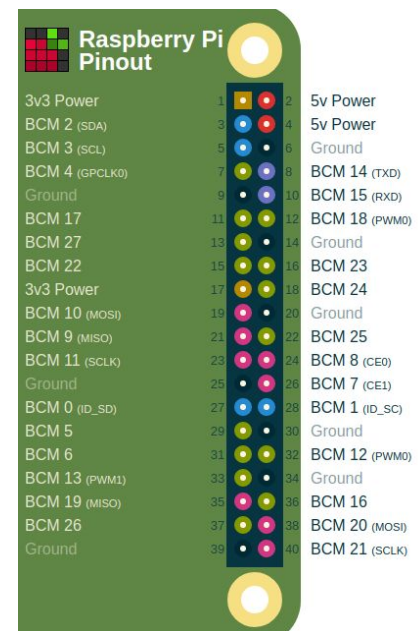
Pin Numbers and Devices Reference Table	
Servo Data Pin	BCM 18
Magnetic Switch Pin	BCM 16
Door Control Button Pin	BCM 21

*** This information is subject to change as the system is developed.