

User Manual

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Project: The Guard DAWG System
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1.0 Product Description

The Guard DAWG System provides a home/small office security solution that is easy to use. Like other similar systems in the market, it allows any user's home/office to maintain the same safety of the locked door. However, with our system a user gets an option of a much *easier* and *faster* access to their place. Our system is using fast facial recognition modules that detect a registered person in the matter of seconds. On average, it takes longer than 10 seconds to get the keys out of pocket and unlock a door for a person. Besides, if an individual is carrying heavy objects and has at least one of their hands busy, it is much more advantageous to have a fast facial recognition system that requires a single button press as opposed to regular lock that requires a physical key. Though, our system has two backups that prevents a user from being locked out in case of failure. The backups in case of facial recognition failure are the numeric keypad override and physical key.

2.0 Product Illustrations



Figure 1: Door with the DAWG System external box installed to the right of it.



Figure 2: Internal side of the door with the push bar and microcontroller housing



Figure 3: System housing with the number pad and camera



Figure 4: Close up to the push bar and the microcontroller housing.

3.0 Setup Instructions

Setup for the system requires two main processes, one physical, and one software. The physical process refers to how you mount the door system itself, and the software processes involve just changing the configuration file on the Raspberry Pi so it knows the IP address of the machine you've designated as your Facial Recognition server.

Mechanical:

1. Find the locations the Raspberry Pi and the camera are going to be
 - a. The camera goes on the outside of the door, facing in towards the door from the right side (right, if you're looking at the door from outside) (*Figures 1 & 3*)
 - i. You can use L-shaped mounting brackets, or mount the camera to the frame of the door
 - b. The Pi is going to be mounted inside, pin-side towards the wall, so the camera ribbon connection is facing towards the camera on the other side of the wall
 - i. The Pi can also be mounted to the frame of the door, or using L-shaped mounting brackets
2. Assure that no wall-interior systems are between the Pi and the camera
 - a. If so, repeat step 1 with a location that doesn't interfere with any electrical wiring or other systems inside of the wall
3. Make a slot in the wall wide enough for the ribbon cable to pass through
 - a. Wider is better, though make sure to close and re-insulate as necessary once the Raspberry Pi and camera are mounted and connected
4. Attach the ribbon cable to the J3 connector on the Raspberry Pi, between the Audio and HDMI connectors, and put it in the enclosure
5. Mount the Raspberry Pi enclosure, with the ribbon cable going through the wall
6. Attach the ribbon cable to the camera outside, and put the camera in its enclosure
7. Mount the camera enclosure
8. Install the push bar according to the instructions on its manual
9. Find a location for the controller enclosure to be mounted on the inside of the door, and the keypad to be mounted on the outside of the door (*Figures 2 & 4*)
10. Make a slot through the door for the keypad wires to go through
 - a. Close and insulate as well, when the controller enclosure and keypad are mounted and connected
11. Mount the controller enclosure and place the wires through the slot, connecting to the controller enclosure and keypad both once through
12. Mount the keypad on the outside of the door
13. Mount the Hall Effect sensor to the opening edge of the door, and a magnet opposite it when closed
 - a. You may need to embed the magnet in the door frame for this to work, after cutting out part of the frame
14. Connect the Hall Effect sensor to its respective connections with the controller enclosure
15. Connect the push bar to the controller enclosure
16. Connect power to both the controller enclosure, and to the Raspberry Pi
 - a. For faster transmission speeds, it is recommended to connect an ethernet wire to the Raspberry Pi from a router, modem, or switch connected to the same LAN system the Facial Recognition server is on

Software

1. Connect to the Pi, and find the project folder and a file called "face-config.json"
 - a. either headless or by temporarily plugging in a display, keypad, and mouse
2. Find the IP address of the Facial Recognition server, and type that in for the "server" field's value
3. If installing our server software, download our GitHub project to the server
4. Install the necessary Pip requirements for Python 3.5+
5. Run the "application.py" file with Python 3.5+
 - a. For Ubuntu, connect the process to systemctl to have this automatically happen upon startup
6. If the Pi is configured to run the process upon startup [**Recommended**], reboot the Raspberry Pi
 - a. If not, and it is desired to manually set the process to run on startup, connect it to the Pi's systemctl process
 - b. Then, reboot, and check if the system is running
7. If the Pi is not desired to run the process on startup, run the application
8. Make sure both the Pi and server acknowledge the connection was made (via their respective log files, or terminal for manual run mode)
 - a. If not, diagnose connection or process issues, and try again

4.0 Usage Instructions

To unlock the door:

1. Look directly into the camera
2. Press "D" on the keypad
3. Green LED will flash for recognized face
4. Door will unlock if face is recognized

In case the system fails to recognize the face or the guest is not registered:

1. Enter door passcode (yellow LED starts blinking)
2. Press "E" on the keypad
3. Green LED will flash for correct password
4. Door will unlock if the passcode is correct

In case the system fails to recognize the passcode or has a major outage:

1. Unlock the door with a mechanical key

5.0 Troubleshooting Instructions

Common Issues		
<i>Issue</i>	<i>Reasons</i>	<i>Solution</i>
Registered faced is not being recognized (or takes way too long)	<i>Connection</i> from the server that runs recognition software <i>is lost</i> or <i>is too weak</i>	Either wait for connection to reestablish or use alternative unlocking options (passcode or key).
	Camera is blurry/foggy/broken	Clean the camera lense with special camera lense cleaning solution. Replace the camera by unscrewing the screws in its casing. Carefully take the pull the ribbon cable from the processor board (Raspberry PI). Connect the ribbon cable of a new camera to the socket. Put the camera back into its casing.
Keypad is not functioning	The connection got loose.	Open the system casing and reconnect the wires.
	Key broke off	Replace the keypad by opening the casing and detaching the old keypad, then, connecting the respectful pins - wires pairs to each other.
LED stopped working	Any of the LEDs stopped functioning.	Not crushual to normal system functioning. Return to manufacturer to replace.

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