A12 - User Manual

Year: 2024 Semester: Spring Team: 2 Project: MOUSE
Creation Date: 4/6/24 Last Modified: April 13, 2024
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1.0 Product Description

MOUSE is the most affordable and effective mobile surveillance device in the market. MOUSE is built for any sort of property you want kept secure whether that be your home, warehouse, or office building. Don't worry about trying to cover every inch of your home or facility with security cameras; MOUSE will constantly traverse through your property to ensure any unwanted visitors are caught. MOUSE also maintains your privacy by only detecting movement and does not have the capability to record actual images or videos.

Inside your MOUSE package, you should find:

- An 18-volt rechargeable battery
- A charger for the 18-volt battery
- The MOUSE shell which includes the chassis, a bottom section of the shell, and the top portion of the shell as seen in Figure 1.
- A pamphlet with your MOUSE's IP address (e.g. http://174.129.215.96/) for the user interface
- User Manual
- Safety Instructions Packet

For MOUSE to start traversing through your property, you will record the path for MOUSE to follow and scan for intruders. Please refer to section 4.1 to learn more about this process. To view security alerts for movement detection data, you will need to view the user interface for your MOUSE droid found at the IP address provided to you in the pamphlet within the MOUSE package. Please refer to section 4.2 to learn more about viewing security alerts.

2.0Product Illustrations

Figure 1: Completely Assembled MOUSE Shell

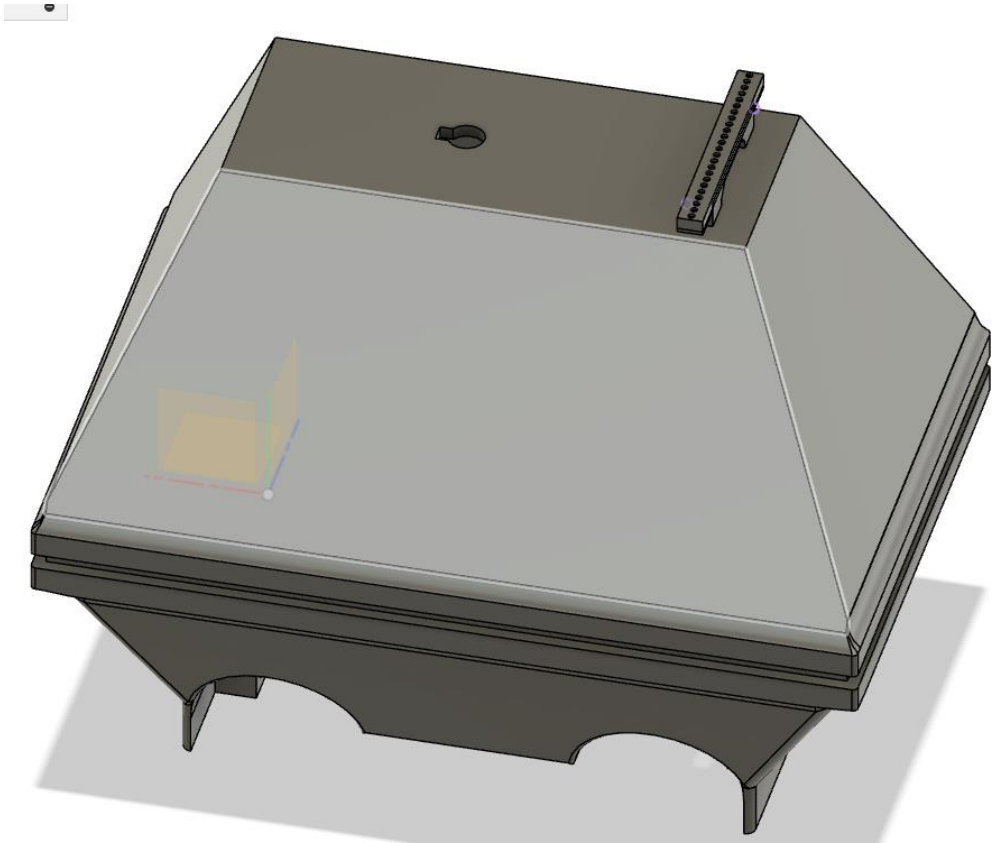


Figure 2: Top Section of MOUSE Shell

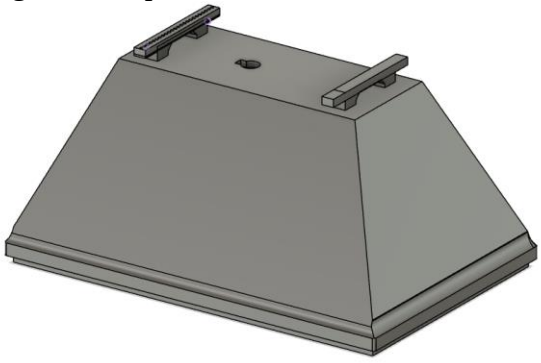


Figure 3: Bottom Section of MOUSE shell

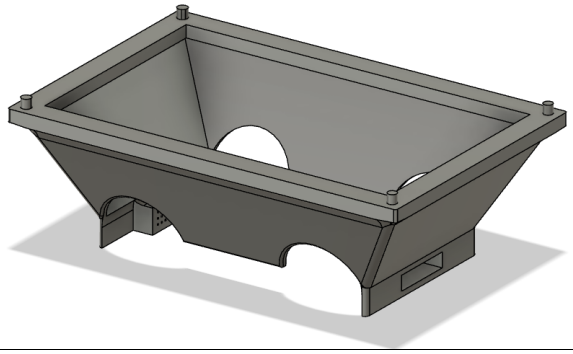
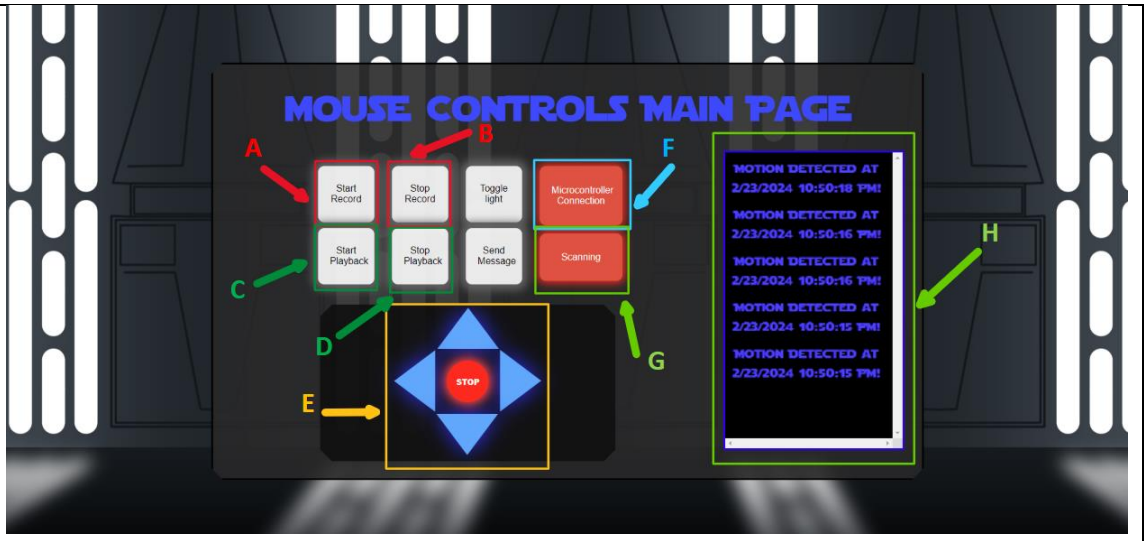


Figure 4: Subdivided User Interface



Recording:

- **A: Start Record Button**
- **B: Stop Record Button**

Play Back:

- **C: Start Playback Button**
- **D: Stop Playback Button**

Manual Movement:

- **E: Up, Down, Left, Right, and Stop Buttons**

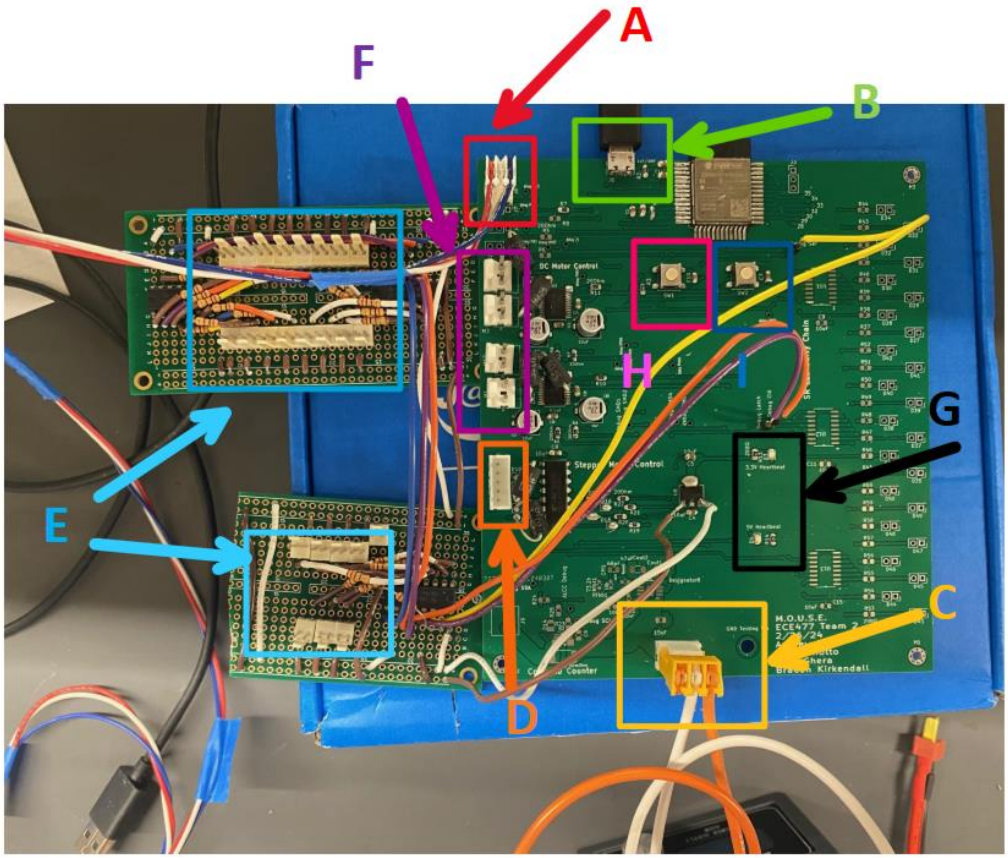
Connection Status

- **F: Microcontroller WiFi Connection Status Icon**

Movement Detection

- **G: Mode Icon (Scanning Mode Icon)**
- **H: Message Box containing Movement Detection Data**

Figure 5: Annotated PCB



A: Motion Detector Sensor Connector
B: Micro USB Connector
C: Power Connector
D: Motion Detector Motor Connector
E: LED Connectors
F: Movement Motor Connectors
G: Heartbeat LEDs
H: Reset Button
I: Boot Button

3.0Setup Instructions

Getting Setup

1. Go to section 3.1 to first charge MOUSE's battery.
2. Turn on MOUSE by flipping the power switch located on the exterior of the shell.
3. Go to section 3.2 to connect MOUSE to your local Wi-Fi

3.1 Charging/Recharging MOUSE:

1. Find the rechargeable 18-volt battery, its respective charger, and charging cord included in the MOUSE package.
2. Charge the battery until fully charged.
3. Open the lid of the top half of the shell of MOUSE.
4. Put the connector of the battery onto the MTA header on the PCB which is inside the bottom half of the shell of MOUSE. (Figure 5.C)
5. Place the battery in the battery holder section next to the PCB.
6. Reattach the lid of the top half of the shell of MOUSE.
7. Double check that the PCB is getting power by checking that the 5v and 3v3 heartbeat LEDs are turned on (Figure 5.G).

3.2 Connection to WiFi:

1. **Download the code** found here: https://github.com/cmiotto20/477Grp2/tree/main/INTEGRATED%20CODE/antenna
2. **Setup the ESP-IDF** for an ESP 32 S3: https://docs.espressif.com/projects/esp-idf/en/stable/esp32/get-started/index.html
3. **Import the code** from step 1 into ESP-IDF.
4. **Edit the constants *SSID* and *PASS*** (within */antenna/main/antenna_switch_example_main.c*) to match your desired Wi-Fi credentials.
5. **Open the lid** of the top half of the shell of MOUSE.
6. **Connect a USB micro cord** between your computer and the PCB and select the correct port on the ESP-IDF.
7. **Build and flash the code** to the microcontroller onboard the PCB. The ESP-IDF should say "flashed" once it has flashed successfully.
8. **Unplug** the micro USB cord**.**
9. **Reattach the lid** of the top half of the shell of MOUSE.
10. Once finished flashing, **go to the IP address** provided to you with your MOUSE (e.g. http://174.129.215.96/), and check to see if the microcontroller connection icon is green (as seen in Figure 4.F).

4.0 Usage Instructions

Getting Started

1. Go to section 4.1 to record a surveillance path for MOUSE to follow
2. Go to section 4.2 to view detected movement
3. Frequently check the top of MOUSE to view the battery status. If all LEDS are lit up, the battery is at full performance, and if only a few LEDS are lit up, the battery needs to be recharged. Please refer to section 3.1 on the procedure for recharging the battery.

4.1 Recording a path

1. Go to the IP address provided to you with your MOUSE (e.g. http://174.129.215.96/)
2. Check to make sure your MOUSE is connected to the internet by confirming that the microcontroller connection icon is green. If it is not, please go back to section 3.2.
3. Before you are ready to record your path it is important to note a few important details. MOUSE does not possess collision resistance features, so please make sure that your path stays clear while MOUSE traverses the recorded path. Additionally, you will need to

record the exact path you want MOUSE to follow; if you would like MOUSE to pace along a hallway, you must record the MOUSE both going down the hallway and coming back. Because of this it is important that MOUSE ends in the exact same spot it started.

4. When you are ready to begin recording your path, press the Start Record button on the user interface (as seen in Figure 4.A).
5. Press the up, down, left, right, and stop buttons accordingly to control MOUSE manually to drive along the desired path (as seen in Figure 4.E). Note that you do not need to hold these buttons, you only need to press them. For example, if you want MOUSE to go forward, you only need to tap the forward arrow once and it will continue to go forward until you press a different direction or the stop button.
6. When you have finished traversing the path, press the Stop Record button (as seen in Figure 4.B).
7. When you are ready for MOUSE to begin playing back the recorded path, press the Start Playback button (as seen in Figure 4.C).
8. When you would like MOUSE to stop playing back the recorded path, press the Stop Playback button (as seen in Figure 4.D).

4.2 Detecting Movement

1. Go to the IP address provided to you with your MOUSE (e.g. http://174.129.215.96/)
2. Check to make sure your MOUSE is connected to the internet by confirming that the microcontroller connection icon is green. If it is not, please go back to section 3.2.
3. MOUSE will only scan for movement detection when traversing a recorded path, so make sure you have followed section 4.1 and MOUSE is in movement playback mode.
4. On the right-hand side of the user interface, a message box will contain all movement detection data along with the time of the detected movement (as seen in Figure 4.H). To test if this is working properly, refresh the page frequently until the user interface displays a scanning icon (as seen in Figure 4.G). MOUSE should be stopped and rotating the scanner on the top of its shell. Move in front of the scanner and refresh the page to check whether movement was detected properly.

5.0 Troubleshooting Instructions

FQA:

- Q: Before I tried to flash, the ESP-IDF says that the port cannot be found but my micro-USB is plugged in to my computer and into the PCB.
  - A: Make sure the battery is fully charged and is plugged into the PCB.
  - A: Unplug the power from the battery and the micro-USB cord. Plug the power back in and then the micro-USB cord, and then search for the port again.
- Q: I have the ESP-IDF set up and the Wi-Fi credentials programmed in, but it won't flash.
  - A: Hold the boot button on the PCB (Figure 5.I), then while still holding the boot button, press and release the reset button on the PCB (Figure 5.H). Now try to flash.
  - A: Unplug the power, hold down the boot button (Figure 5.I), then insert the power. Now try to flash.
- Q: I put in my Wi-Fi credentials and flashed the code, but when I go to the provided IP address, the interface says the microcontroller is not connected.

    - A: Please check to make sure your Wi-Fi access point is reachable, if you properly flashed, or if you typed in the Wi-Fi credentials properly.
    - A: Power cycle MOUSE, by flipping the power switch.
    - A: To test if the issue is with the Wi-Fi access point or with the microcontroller, update the code to match credentials to a personal, mobile hotspot. After re-flashing, open your mobile hotspot page and make sure "Maximize compatibility" is enabled. If the mobile hotspot maintains a connection, the issue is most likely with your original Wi-Fi access point. If the mobile hotspot does not maintain a connection, the issue has to do with the PCB, the way you updated the code, or the way you flashed the code.
- Q: An LED or a motor is not turning on.
    - A: Please make sure whatever peripheral (LEDs, motors, etc.) has a proper connection with the PCB by checking each MTA mount (Figure 5.A, Figure 5.D, Figure 5.E, Figure 5.D).

If none of these debugging tips quite matched the issue your experiencing, we apologize, but please contact us (MOUSESupport@MOUSE.com) with your questions and we will be sure to get back to your quickly.