## Assembly Work Instruction

### Bill of Materials

#### Components

|  |  |  |  |
| --- | --- | --- | --- |
| **Part Name** | **Qty** | **Image** | **Remarks** |
| Front Cover | 1 |  | 3Dprinted |
| Chassis | 1 |  | 3Dprinted |
| LED Holder | 1 |  | 3Dprinted |
| Device Mount | 1 | TBD | 3Dprinted |
| Wall Mount | 1 | TBD | 3Dprinted |
| Joint Screw | 1 | TBD | 3Dprinted |
| Joint Nut | 1 | TBD | 3Dprinted |
| Raspberry Pi 4 16GB RAM | 1 |  | Bought-out |
| Pre-flashed 32GB MicroSD Card | 1 |  | Bought-out, modified |
| Pi Camera Module v2 | 1 |  | Bought-out |
| SMD WS2812B LED | 1 |  | Bought-out |
| 5V 3010 Cooling Fan | 1 |  | Bought-out |
| 150mm MF Jumper Wire | 3 |  | Bought-out |
| 150mm FF Jumper Wire | 1 |  | Bought-out |
| M2.5x6 screws | 7 |  | Bought-out |

#### Equipment and Consumables

|  |  |  |  |
| --- | --- | --- | --- |
| **Part Name** | **Qty** | **Image** | **Remarks** |
| Hand Drill | 1 |  | Equipment |
| Hand Drill Cone Attachment | 1 |  | Consumable |
| Soldering Kit | 1 |  | Equipment |
| Solder Lead | 1 |  | Consumable |
| Electrical Tape | 1 |  | Consumable |
| Pen Knife | 1 |  | Equipment |
| Cutting Pliers | 1 |  | Equipment |
| Spray Paint - Black Doff | 1 |  | Consumable |
| Wood Filler | 1 |  | Consumable |
| Sandpaper 240 grit | 1 |  | Consumable |
| Sandpaper 500 grit | 1 |  | Consumable |
| Sandpaper 1000 grit | 1 |  | Consumable |
| Microfiber Towel | 1 |  | Equipment |
| Toothpick | 1 |  | Consumable |
| Hex Allen Key for M2.5 | 1 |  | Equipment |
| TV with HDMI plug | 1 |  | Equipment |

### **Preparing the 3Dprinted Parts**

#### Post-Processing of Blemishes

**Required Equipment and Consumables:**

Cutting Pliers, Hand Drill, Hand Drill Cone Attachment.

1. Clean up supports on the inside of Front Cover and Chassis parts

<insert image here>

1. Sand away corner radius imperfections at the bottom corners of front cover

<insert image here>

1. Deburr all vent holes on Chassis

<insert image here>

1. Deburr camera hole on Front Cover

<insert image here>

#### 2. Painting

*Note: This step applies for Front Cover and Chassis only.*

**Required Equipment and Consumables:**

Wood Filler, Sandpapers 240, 500, and 1000 grits, Spray Paint - Black Doff, Microfiber Towel.

1. Apply wood filler on blemishes.

<insert image here>

1. Apply excess wood filler on surfaces (facade on Front Cover, all outer faces on Chassis).

<insert image here>

1. Sand with 240 grit + water for 2 minutes.

<insert image here>

1. Wait for 10 minutes.

<insert image here>

1. Dry sand with 500 grit for 2 minutes.

<insert image here>

1. Dry sand with 1000 grit for 2 minutes.

<insert image here>

1. Clean part with dry microfiber cloth.

<insert image here>

1. Spray paint with any color, wait 20 minutes\*

<insert image here>

1. repeat steps 5-8 for 2 more times.
2. Wait 24 hour for the last coat of paint to dry.

#### 3. Post-Painting

*Note: This step applies for Front Cover and Chassis only.*

**Required Equipment and Consumables:**

Hand Drill, Hand Drill Cone Attachment, Toothpick.

1. Smoothen the edges of the camera hole.

<insert image here>

1. Poke open the paint/ filler in the LED hole.

<insert image here>

### **B. Preparing the Electronics**

#### Soldering Cooling Fan

**Required Equipment and Consumables:**

Pen Knife, Soldering Kit, Solder Lead, 150mm FF Jumper Wires.

1. Cut the plastic terminal.

<insert image here>

1. Strip the plastic insulation to expose ~10mm of copper wires for each red and black wire.

<insert image here>

1. Cut 2pcs of ~20mm of female jumper wires.

<insert image here>

1. Strip the plastic insulation to expose ~10mm of copper wires for each jumper wire (2pcs).

<insert image here>

1. Solder the exposed copper from the fan wires to the exposed copper from jumper wires.

<insert image here>

1. The soldered red wire and jumper are the "Fan live wire". The soldered black wire and jumper are the "Fan ground wire".

<insert image here>

1. Cover the exposed copper + solder lead with ~10mm electrical tape.

<insert image here>

#### 2. Soldering LED

**Required Equipment and Consumables:**

Pen Knife, Soldering Kit, Solder Lead, 150mm MF Jumper Wires x3.

1. Cut 3pcs of ~150mm of female jumper wires.

<insert image here>

1. Strip the plastic insulation to expose ~10mm of copper wires for each jumper wire (3pcs).

<insert image here>

1. Solder jumper wire #1 to the ground terminal of LED (marked with triangle cutout in front). This is the "LED ground wire".

<insert image here>

1. Solder jumper wire #2 to the live terminal of LED (diagonal to the ground terminal). This is the "LED live wire".

<insert image here>

1. Solder jumper wire #3 to the signal terminal of LED (from front view, above the ground terminal and to the right of the live terminal. Note: there is only one correct orientation). This is the "LED signal wire".

<insert image here>

### **C. Assembly**

#### 1. Enclosing Raspberry Pi

**Required Equipment and Consumables:**

Hex Allen Key for M2.5.

1. Insert the Pi Camera Module v2 into the designated slot on Raspberry Pi 4.

<insert image here>

1. Insert Raspberry Pi 4 into Chassis.

<insert image here>

1. Fix the Raspberry Pi with 2x M2.5 screws.

<insert image here>

#### 2. Assembling Cooling Fan

**Required Equipment and Consumables:**

NA.

1. Connect the "Fan live wire" to the 3v3 power port of Raspberry Pi 4 (numbered bubble #1, see Appendix A).

<insert image here>

1. Connect the "Fan ground wire" to the Ground port of Raspberry Pi 4 (numbered bubble #6, see Appendix A).

<insert image here>

1. Assemble the fan to the Chassis in its designated slot.

<insert image here>

#### 3. Assembling LED

**Required Equipment and Consumables:**

Hex Allen Key for M2.5.

1. Connect the "LED live wire" to the 5V power port of Raspberry Pi 4 (numbered bubble #2, see Appendix A).

<insert image here>

1. Connect the "LED signal wire" to the GPIO 18(PCM\_CLK) port of Raspberry Pi 4 (numbered bubble #12, see Appendix A).

<insert image here>

1. Connect the "LED ground wire" to the Ground port of Raspberry Pi 4 (numbered bubble #14, see Appendix A).

<insert image here>

1. Gently place the LED such that it aligns with the LED hole on the front cover.

<insert image here>

1. Secure the LED by tightening the M2.5 screw of the LED holder to the designated screw hole using M2.5 allen key. Ensure the LED is firmly held by the holder (no rattle, LED cannot rotate).

<insert image here>

#### 4. Assembling Front Cover

**Required Equipment and Consumables:**

NA.

1. Assemble the Pi Camera Module v2 into its designated location.

<insert image here>

1. Assemble the Front Cover to the Chassis.

<insert image here>

#### 5. Assembling Mounting Parts

**Required Equipment and Consumables:**

Hex Allen Key for M2.5.

1. Screw 4pcs of M2.5 screws to fix the Device Mount and Chassis together.

<insert image here>

1. Insert Nanogel to the Wall Mount.

<insert image here>

1. Assemble Device Mount to the Wall Mount.

<insert image here>

1. Adjust the angle of the Device Mount when necessary, then fix the position by tightening the Joint Screw to the Joint Nut.

#### 6. Final Check and Test

1. Plug the micro-HDMI end of the HDMI cable to the micro-HDMI slot on the device.

<insert image here>

1. Plug the HDMI end of the HDMi cable to a TV.

<insert image here>

1. Plug the power cable to the power slot on the device.

<insert image here>

1. Turn on the TV and device.

<insert image here>

1. Once the display is up, execute the “run.sh” file on the Desktop interface.

<insert image here>

1. Check if LED, Cooling Fan and TV display are running smoothly and expectedly.