

Overflow Technical Manual - BUM

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1 Introduction

Overflow will be exhibited at Brasov Underground Museum for a duration of four months in the catacombs of Brasov. Consisting of multiple systems communicating and a mix of custom hardware and software, it is of utmost importance to ensure correct functionality and usage. This document will present the steps to take in installing the project, maintaining and debugging it.

2 Description of the System

The following diagram describes all the connection between the subsystems of Overflow. As it can be seen the system comprises of a raspberry pi, a display system (in this case a TV), and an input system (the pedestal with a keyboard).

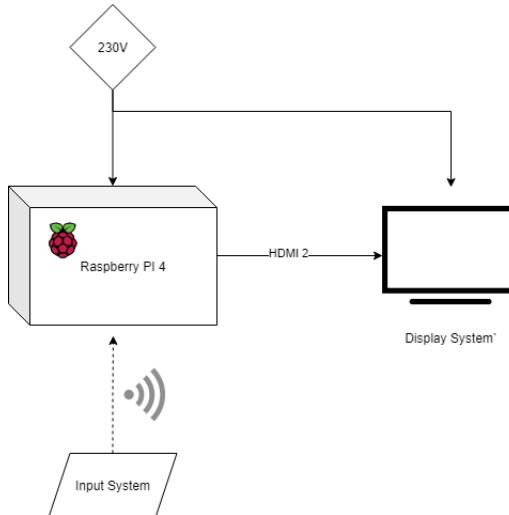


Figure 1: System Diagram

Sound and video is communicated via HDMI to the display system from the raspberry pi. The Input system, consists of a numerical pad keyboard which communicates via a receiver that is connected to the raspberry pi. Figure 2 shows the inside of the raspberry pi with its connections. Starting from the left is the USB-C Power cable, then HDMI and then the receiver from the keyboard is plugged in on the right.



Figure 2: Raspberry Pi Connection Wires

3 Power up

Upon receiving this document you should also receive an instructional video of how the power up and connections need to be done. **Assuming the pedestal is functional**(batteries for the keyboard and leds have been changed), the following steps to powering overflow on are listed below. **Do not power on the raspberry pi until all connections have been made.**

1. Make sure the power cable and hdmi are correctly connected inside the gray box. Figure 3 shows the ports of the raspberry pi. The power cable is the one leftmost of the figure while there are 2 HDMI ports. **Use the rightmost HDMI port** to connect the raspberry pi as shown in Figure 4.

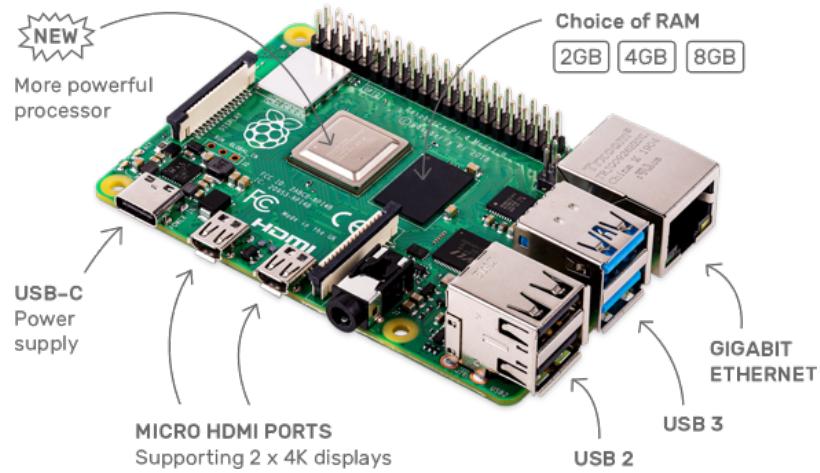


Figure 3: Raspberry pi 4 Pinout

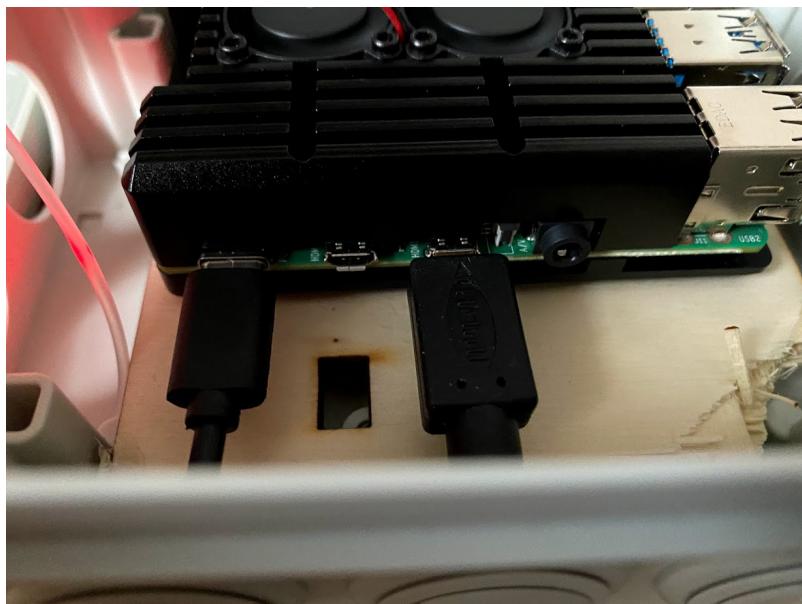


Figure 4: Connection of Power and HDMI

2. Connect the HDMI cable coming from the raspberry pi to HDMI 2 on the TV. If another HDMI port is chosen, the raspberry pi will not boot up any image as it has been set to only display on HDMI 2 with a specific configuration. Figure 5 shows the connection, make sure it is pushed in all the way.

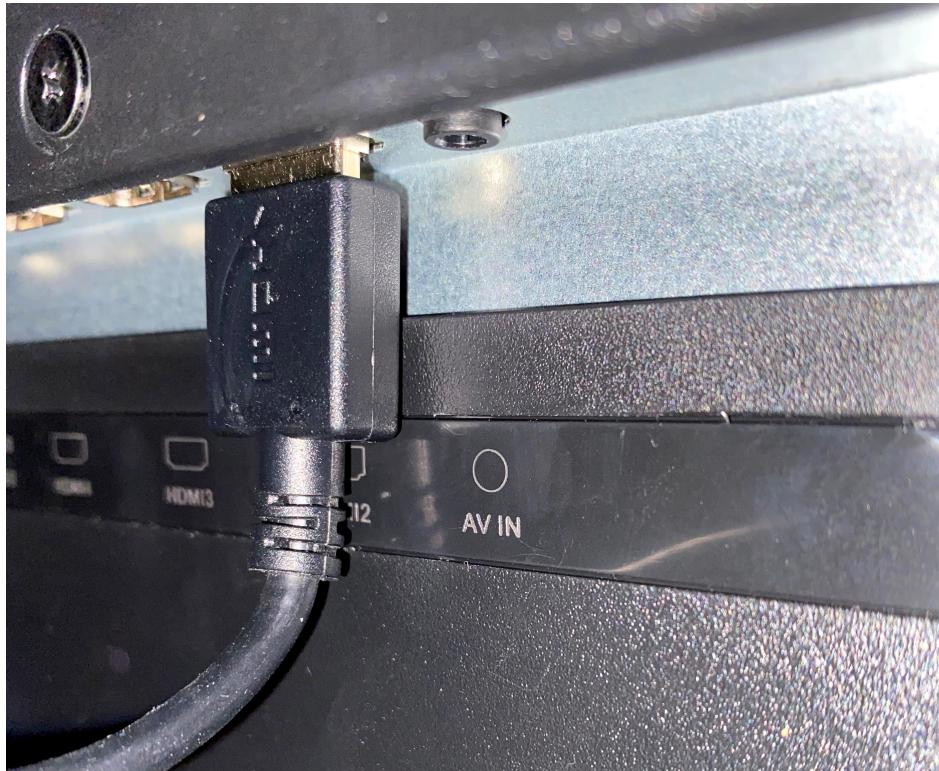


Figure 5: TV Connection HDMI 2

3. Power on the TV with the source on HDMI2. Make sure sound is also enabled as Overflow is an audio-visual simulation. We recommend having the volume setting at 50%, although you are free to set it to whatever in case it is too disturbing. The maximum volume will be at max when the congestion slider is the highest.

4. Plug in the brick for the gray box. Upon plugging in, you should start seeing the raspberry pi booting up through a series of resolution adjustments. The screen will turn black and come back to displaying something, this is normal. If however, the TV shows "No signal" on the screen, something is wrong and all the connections should be re-checked. One minute in, raspberry pi should be fully boot up and display start "Overflow". *In case Overflow is not displayed after 1 minute, and instead a desktop environment is, you may unplug and plug the rpi again. Sometimes the auto start of the program fails.* Finally Figure ?? shows how the final booted up system should look like.



Figure 6: Booted up and running!

In any case, all these steps can be considered reviewed by watching the instructional video.

4 Maintenance

As for the maintenance, the gray box for the raspberry pi has been left with 2 rubber holes pulled out for ventilation. **Do not cover these holes, the raspberry pi has active ventilation which needs to recirculate air.** When attaching the box, please do so by having these holes facing the ground, all other sides of the case are waterproofed.

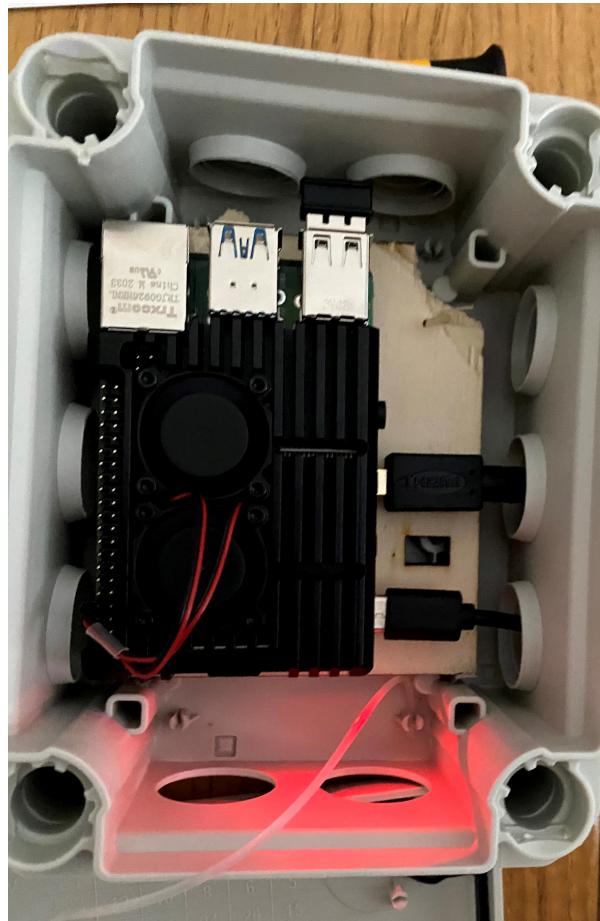


Figure 7: Ventilation holes

The pedestal contains batteries for both the leds and the keyboard. The batteries for the leds are easily interchangeable. However, for the keyboard should last on a single battery for around 3 weeks. **If the battery runs out for the keyboard overflow will stop being functional, so it can be checked once in a while.** We believe the leds should last as well, due to the presence sensor but we found out they get dimmer and dimmer. The use of better batteries than ikea should help with this. An instructional video on how to change this batteries has been sent with this document.

5 TV Settings

The TV has been set with the following settings, please do not reset the TV or exchange it with another, if done so these are the contrast and brightness settings.



Figure 8: TV settings 1

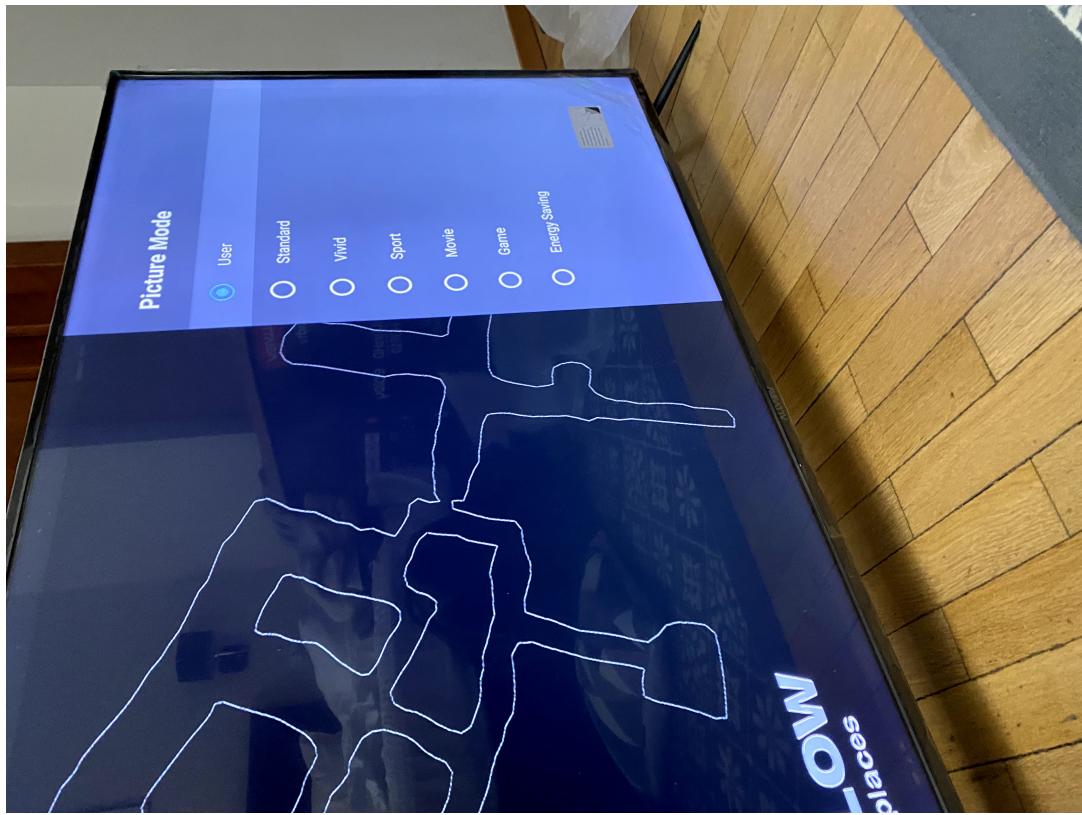


Figure 9: TV settings 2

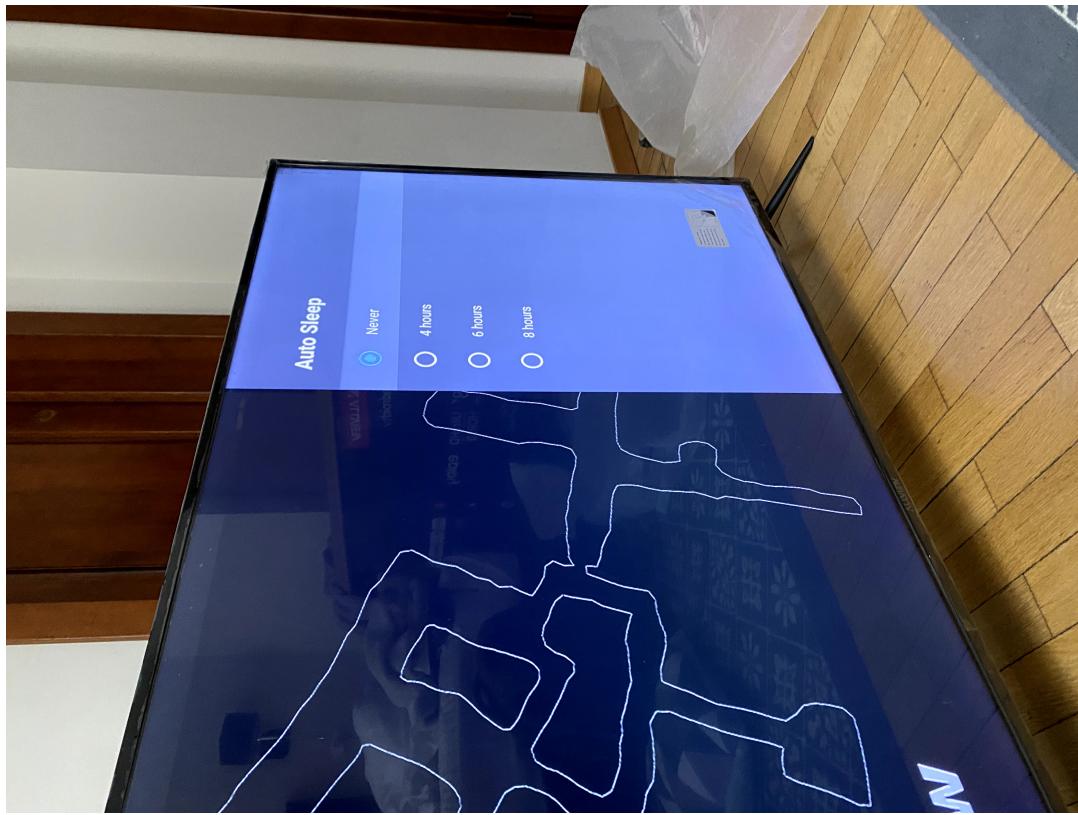


Figure 10: TV settings 3

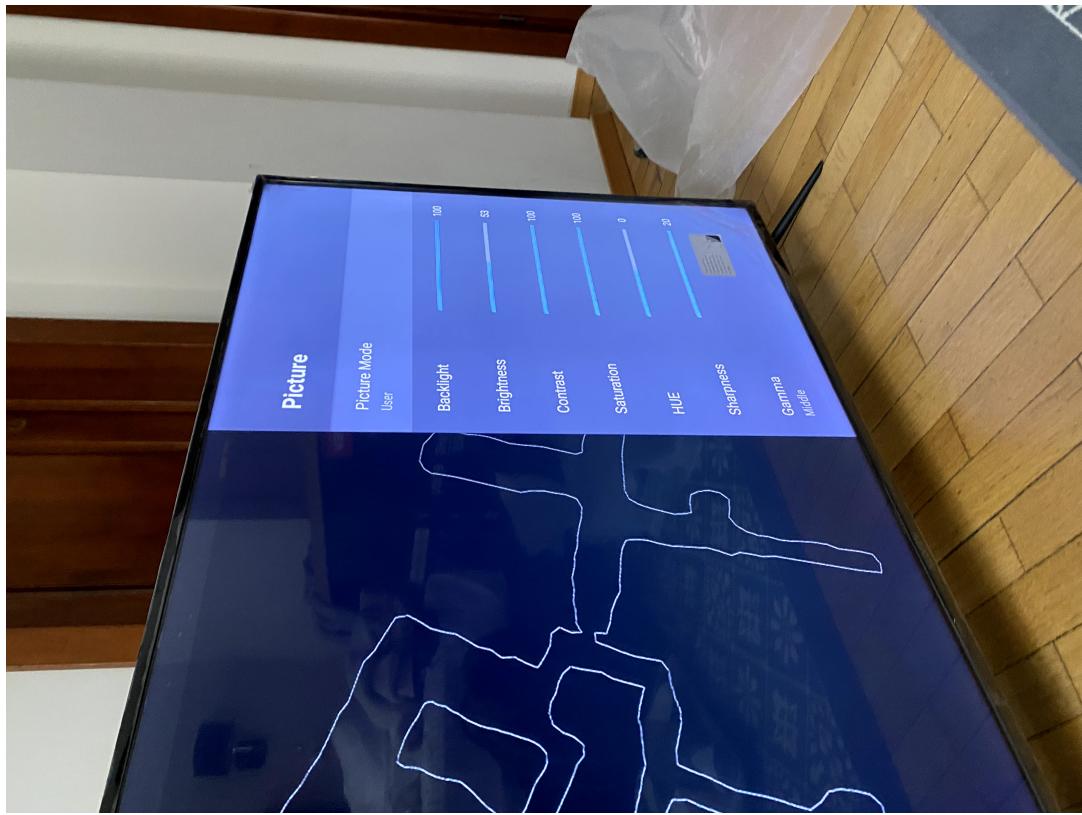


Figure 11: TV settings 4