**Client Software Setup**

**-Option 1 (Fresh install)**

1. On a raspberry Pi with Raspbian OS installed copy the scripts Main.py and Main\_Transmit.py to the desktop and the folder “Main” to the desktop. Copy run.desktop to the desktop.

2. Install all the necessary libraries by entering the following commands in a terminal:

-PIL (Python imaging library): sudo pip install pil

-guizero: sudo pip3 install guizero

-picamera: sudo apt-get install python-picamera python3-picamera

-numpy: sudo apt-get install python3-numpy

-gpiozero: sudo apt install python3-gpiozero

-argparse: pip install argparse

-matchbox keyboard: [Follow this tutorial(requires additional setup)](https://ozzmaker.com/virtual-keyboard-for-the-raspberry-pi/)

-imagetk: sudo apt-get install python3-pil.imagetk

-Subprocess: pip install subprocess.run

3. Setup task scheduling by typing “sudo crontab -e” in the terminal and adding the lines [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#crontab-setup). This will make the program schedule file transmission and reboots.

4. Setup main program autostart by running the command “mkdir /home/pi/.config/autostart” and then copying the file start.desktop to “/home/pi/.config/autostart”.

5. make the file receive folder by running the command “mkdir /home/pi/Desktop/receive”

6. Configure SCP transfer by following instructions outlined [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#scp-setup). The username is “pi” and the remote server is the ip of the server. The default password is pi

7. Reboot the system and it should startup, be sure to configure the settings properly in the program.

**-Option 2 (Clone a pre-existing system)**

1. Get to the desktop of a pre-existing system by one of the following options:

-Plug it into a display and plug in a keyboard and mouse

-Connect to the client via PuTTY and run the command “vncserver”. Then connect to the remote desktop via VNC Viewer. The ip should be listed at the end of the vnc server command return or you can type the IP of the client with “:1” added to the end. The username and password are both “pi”.

2. Connect an empty micro sd card to a USB port. Launch the raspberry pi images by pressing the windows key then opening “SD Card Copier” under “Accessories”. Under “Copy From Device” select the entry with “/dev/mmcblk0” in it, under “Copy To Device” select the attached SD card. It should be the only option.

3. Click start and allow it to copy the contents of the pre-existing client to the new card. This should take quite a while.

4. Remove the SD card and insert it into the new client PI and it will boot with all the contents and configurations of the pre-existing system.

5. Configure SCP transfer by following instructions outlined [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#scp-setup). The username is “pi” and the remote server is the ip of the server. The default password for is pi

6. Be sure to configure the settings properly in the program.

**Client Hardware Setup**

1. Follow [this](https://thepihut.com/blogs/raspberry-pi-tutorials/16021420-how-to-install-use-the-raspberry-pi-camera) tutorial on hooking up the camera to a PI

2. Replicate the wiring shown [here](https://github.com/cameroncircowestfalltechnik/Image_Compare/blob/main/Documentation/Wiring%20Diagram.png)

3. Replicate the machine I/O configuration specified below, an example as seen [here](https://github.com/cameroncircowestfalltechnik/Image_Compare/blob/main/Documentation/Machine%20IO%20Config.jpg)

-X20.0 ON CYCL STP CAMERA

-Y20.5 ON EJECT COMPLETE

-Y20.7 ON CLAMP FULL OPEN

4. Mount the system and display as seen in the CAD and attached images using items from the [BOM](https://github.com/cameroncircowestfalltechnik/Image_Compare/blob/main/Documentation/BOM.xlsx)

5. Connect the display and client power supply to mains power

**Server Software Setup**

**-Option 1 (Fresh Install)**

1. On a raspberry Pi with Raspbian OS installed copy the scripts Main\_Recieve.py to the desktop and the file “server\_receipt.csv” to a new folder called “receive” on the desktop. Copy the folder “archive” to the desktop (remove the placeholder files in each folder).

2. Install all the necessary libraries by entering the following commands in a terminal:

-Subprocess: pip install subprocess.run

3. Setup task scheduling by typing “sudo crontab -e” in the terminal and adding the lines [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#crontab-setup). This will make the program schedule reboot and auto starts the program.

4. Configure SCP transfer to the client by following instructions outlined [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#scp-setup). The username is “pi” and the remote server is the ip of all clients. (repeat the instructions of the first link for all client IP’s before using the second link). The default password for is “pi”

5. Reboot the system and it should startup automatically. It has no user interface so it will just load to the desktop.

**-Option 2 (Clone a pre-existing system)**

1. Get to the desktop of a pre-existing system by one of the following options:

-Plug it into a display and plug in a keyboard and mouse

-Connect to the client via PuTTY and run the command “vncserver”. Then connect to the remote desktop via VNC Viewer. The ip should be listed at the end of the vnc server command return or you can type the IP of the server with “:1” added to the end. The username and password are both “pi”.

2. Connect an empty micro sd card to a USB port. Launch the raspberry pi images by pressing the windows key then opening “SD Card Copier” under “Accessories”. Under “Copy From Device” select the entry with “/dev/mmcblk0” in it, under “Copy To Device” select the attached SD card. It should be the only option.

3. Click start and allow it to copy the contents of the pre-existing client to the new card. This should take quite a while.

4. Remove the SD card and insert it into the new client PI and it will boot with all the contents and configurations of the pre-existing system.

5. Configure SCP transfer to the client by following instructions outlined [here](https://github.com/cameroncircowestfalltechnik/Image_Compare#scp-setup). The username is “pi” and the remote server is the ip of all clients. (repeat the instructions of the first link for all client IP’s before using the second link). The default password for is “pi”

**Server Hardware Setup**

1. Insert an empty flash drive to one of the blue USB 2.0 ports and copy the folder “archive” to the drive. (remove the placeholder files in each folder)

2. Connect to power supply