**Advanced Installer Main Menu**

Raspberry Pi OS is an open-source operating system specifically designed and built for the Raspberry Pi. The latest version is based on Debian. Debian is a popular open-source Linux distribution. This guide was written in October 2021. Changes to version numbers will occur over time and every attempt will be made to keep this guide accurate. This guide will be based on installing Raspberry Pi OS from a blank microSD card and the rest of the required program for the GSM Monitoring system.

Prerequisites:

1. Raspberry Pi 4
2. microSD card (with SD adapter)— at least 8GB although 32GB can be used which allows for more software to be loaded.
3. Micro HDMI to HDMI cable — you can also use a Micro HDMI to HDMI adapter with a regular HDMI cable.
4. 5V DC via USB-C connector for power.
5. Keyboard
6. Mouse
7. Monitor
8. A way to write from your computer to your microSD card
9. Basic technology knowledge
10. Internet connectivity

**Step 1**: Download and Install Raspberry Pi Imager

The first step is to download the Raspberry Pi Imager from the official Raspberry Pi website <https://downloads.raspberrypi.org/imager/imager_latest.exe>. This tool will allow you to choose an OS, have it downloaded automatically, and write it to the SD card of your choice. Do not download files from third-party websites as they may be malicious. Only use trusted sources. The imager tool is available on Windows, macOS, and Ubuntu. Images shown will be from a Mac, but the tool will work the same across the supported platforms.

**Step 2:** Choose OS

Several operating systems are available for selection within the Raspberry Pi Imager choose *Raspberry Pi OS Full (32-bit) Desktop*. This version includes a GUI and more software installed than the non-full version. The size of this image is around 2.5 GB. This process will take several minutes as Raspberry Pi Imager downloads the latest updates of the Raspberry Pi OS and burns it to the microSD card.

**Step 3:** Set up the IP addresses

1. Set the camera IP address as follows:

IP: 192.168.2.250

Subnet mask: 255.255.255.0

Gateway: 192.168.2.249

1. Set the Raspberry Pi eth0 IP address as follow:

IP: 192.168.2.249

Gateway: leave blank, otherwise you lose internet connectivity

Make sure the IP camera has power then connect it to eth0 of the Raspberry Pi. The green and orange LED of the eth0 should start blinking. Connect the Raspberry Pi to the WIFI network so you can use the internet connectivity for the rest of the installation.

**Step 4:** GSM Modul integration and configuration

Open terminal, copy and paste each of the following lines in red and do each line as a step.

wget https://www.waveshare.com/w/upload/0/00/SIM7600\_NDIS.7z

sudo apt-get install p7zip-full -y

7z x SIM7600\_NDIS.7z -r -o./SIM7600\_NDIS

cd SIM7600\_NDIS

sudo apt install raspberrypi-kernel-headers

sudo apt-get install --reinstall raspberrypi-bootloader raspberrypi-kernel

sudo su

make clean

make

ls

insmod simcom\_wwan.ko

lsmod

Next Steps

sudo apt update -y

sudo apt dist-upgrade -y

sudo rpi-update

sudo reboot

sudo apt install libqmi-utils

sudo apt-get install udhcpc

After installed, use these commands to get an ip address

sudo ip link set wwan0 down

sudo qmicli -d /dev/cdc-wdm0 --dms-set-operating-mode='online'

echo 'Y' | sudo tee /sys/class/net/wwan0/qmi/raw\_ip

sudo ip link set wwan0 up

Google to find the APN of your sim card, here we are using T-Mobile.

sudo qmicli --device=/dev/cdc-wdm0 --device-open-proxy --wds-start-network="ip-type=4,apn= fast.t-mobile.com" --client-no-release-cid

sudo udhcpc -i wwan0

ip a s wwan0

You should now have an IP address

You must priorities the route of the internet by changing the metrics. Metrics are used to prefer an interface over another one, lowest wins. dhcpcd will supply a default metric of 200 + if\_nametoindex(3). An extra 100 will be added for wireless interfaces. So now you need to change the metrics for the eth0, wlan, and wwan by going to /etc/dhcpcd.conf, double click and type the following:

interface eth0

metric 400

interface wlan0

metric 0

interface wwan0

metric 100

with this set up, the wlan0 will be the main internet connection when connected, then wwan0. Since the IP camera is connected straight to the eth0, then it needs to have the least priority.

**Step 5:** TensorFlow Installation

Open CMD in Raspberry Pi. Copy and paste all the following lines in red and do them one by one:

sudo apt-get update

sudo apt-get upgrade

git clone https://github.com/EdjeElectronics/TensorFlow-Lite-object-Detection-on-Android-and-Raspberry-Pi.git

mv TensorFlow-Lite-object-Detection-on-Android-and-Raspberry-Pi/ tflite1

cd tflite1

sudo pip3 install virtualenv

python3 -m venv tflite1-env

source tflite1-env/bin/activate

bash get\_pi\_requirements.sh

wget https://storage.googleapis.com/download.tensorflow.org/models/tflite/coco\_ssd\_mobilenet\_v1\_1.0\_quant\_2018\_06\_29.zip

unzip coco\_ssd\_mobilenet\_v1\_1.0\_quant\_2018\_06\_29.zip -d Sample\_TFLite\_model

python3 TFLite\_detection\_webcam.py --modeldir=Sample\_TFLite\_model

A new window will pop up now showing the video of the camera and green rectangles boxing the detected objects. Each rectangle should show the type of the object and the accuracy percentage level.

If you are using Google Coral, you need to open a command terminal and move into the /home/pi/tflite1 directory and activate the tflite1-env virtual environment by issuing:

cd /home/pi/tflite1

source tflite1-env/bin/activate

Add the Coral package repository to your apt-get distribution list by issuing the following commands:

echo "deb https://packages.cloud.google.com/apt coral-edgetpu-stable main" | sudo tee /etc/apt/sources.list.d/coral-edgetpu.list

curl https://packages.cloud.google.com/apt/doc/apt-key.gpg | sudo apt-key add -

sudo apt-get update

Install the libedgetpu library by issuing:

sudo apt-get install libedgetpu1-std

wget https://dl.google.com/coral/canned\_models/mobilenet\_ssd\_v2\_coco\_quant\_postprocess\_edgetpu.tflite

mv mobilenet\_ssd\_v2\_coco\_quant\_postprocess\_edgetpu.tflite Sample\_TFLite\_model/edgetpu.tflite

Now that everything is set up, it's time to test out the Coral's ultra-fast detection speed! Make sure to free up memory and processing power by closing any programs you aren't using. Make sure you have a webcam plugged in. Plug in your Coral USB Accelerator into one of the USB ports on the Raspberry Pi. If you're using a Pi 4, make sure to plug it in to one of the blue USB 3.0 ports. Make sure the tflite1-env environment is activate by checking that (tflite1-env) appears in front of the command prompt in your terminal. Then, run the real-time webcam detection script with the --edgetpu argument:

python3 TFLite\_detection\_webcam.py --modeldir=Sample\_TFLite\_model --edgetpu

**Step 6:** Installation and configuration of Node Red

Open the terminal and post the following commands

sudo apt-get install nodered

As with running Node-RED locally, you can use the node-red command to run Node-RED in a terminal. It can then be stopped by pressing Ctrl-C or by closing the terminal window. Due to the limited memory of some of the Raspberry Pi, you will need to start Node-RED with an additional argument to tell the underlying Node.js process to free up unused memory sooner than it would otherwise. To do this, you should use the alternative node-red-pi command and pass in the max-old-space-size argument. Execute the following command only if you have small memory in your pi:

node-red-pi --max-old-space-size=256

The install script for the Pi also sets it up to run as a service. This means it can run in the background and be enabled to automatically start on boot. The following commands are provided to work with the service and useful for trouble shooting:

* node-red-start - this starts the Node-RED service and displays its log output. Pressing Ctrl-C or closing the window does not stop the service; it keeps running in the background
* node-red-stop - this stops the Node-RED service
* node-red-restart - this stops and restarts the Node-RED service
* node-red-log - this displays the log output of the service
* You can also start the Node-RED service on the Raspberry Pi OS Desktop by selecting the Menu -> Programming -> Node-RED menu option.

Lastly you need to make Node-RED to run when the Pi is turned on, or re-booted, you can enable the service to autostart by running the command:

sudo systemctl enable nodered.service

Once Node-RED is running, you can access the editor in a browser. If you are using the browser on the Pi desktop, you can open the address: <http://localhost:1880>. To access Node red on a computer connected to the same network, you can go to http://<Pi wlan ip address>:1880. You can find the IP address by running hostname -I on the Pi.

**Step 7:** Install the prerequisites manage palette and inject the design flow in Node Red

Copy and post the following lines in red in the terminal of the Raspberry pi:

?

?

?

With Node-RED running, open the editor in a web browser. If you are using a browser on the same computer that is running Node-RED, you can access it with the url: <http://localhost:1880>. If you are using a browser on another computer, you will need to use the ip address of the computer running Node-RED: http://<ip-address>:1880. Import the flows for Node red by selecting file>import then copying and pasting the following lines in red (about 9 pages) in the pop-up window then click accept:

[{"id":"5496fb63.715064","type":"tab","label":"General","disabled":false,"info":""},{"id":"b8548de1.573d1","type":"ui\_button","z":"5496fb63.715064","name":"","group":"2b4fd5f7.85e05a","order":1,"width":0,"height":0,"passthru":false,"label":"Reboot","tooltip":"","color":"","bgcolor":"Red","className":"","icon":"","payload":"","payloadType":"str","topic":"","topicType":"str","x":120,"y":700,"wires":[["e558ec91.5e7cb"]]},{"id":"e558ec91.5e7cb","type":"exec","z":"5496fb63.715064","command":"sudo reboot","addpay":false,"append":"","useSpawn":"","timer":"","name":"Reboot","x":320.2222213745117,"y":699.9999761581421,"wires":[[],[],[]]},{"id":"1e1909e2.c49106","type":"exec","z":"5496fb63.715064","command":"vcgencmd measure\_volts core","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":410,"y":960,"wires":[["a91a199e.427d18"],[],[]]},{"id":"a91a199e.427d18","type":"function","z":"5496fb63.715064","name":"TEST","func":"var str = msg.payload;\nmsg.payload = str.substring(5,11);\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":670,"y":960,"wires":[["719be38d.bfb4cc","66629beb.e3c164","8a9180aa.e7ef1","88b89c9.e93e16"]]},{"id":"719be38d.bfb4cc","type":"debug","z":"5496fb63.715064","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":1570,"y":960,"wires":[]},{"id":"a8645ae2.2334f8","type":"remote-notification","z":"5496fb63.715064","confignode":"8c5fe222.d775f","name":"","notificationTitle":"payload.title","notificationTitleType":"msg","notificationBody":"payload.body","notificationBodyType":"msg","notificationSound":"default","notificationSoundComputed":"payload.sound","notificationSoundComputedType":"msg","output":1,"x":1370,"y":1040,"wires":[["f1f45450.250f78"]]},{"id":"f1f45450.250f78","type":"debug","z":"5496fb63.715064","name":"","active":true,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":1570,"y":1040,"wires":[]},{"id":"2a0df4e8.119f4c","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"{\"title\":\"Low Voltage\",\"body\":\"The Raspberry Pi is not under Voltage\"}","tot":"json"}],"action":"","property":"","from":"","to":"","reg":false,"x":1120,"y":1020,"wires":[["a8645ae2.2334f8"]]},{"id":"b9ca34c4.ae28c8","type":"ui\_toast","z":"5496fb63.715064","position":"top right","displayTime":"5","highlight":"red","sendall":true,"outputs":0,"ok":"OK","cancel":"","raw":false,"className":"","topic":"","name":"","x":1100,"y":1160,"wires":[]},{"id":"66629beb.e3c164","type":"function","z":"5496fb63.715064","name":"","func":"num = parseFloat(msg.payload);\nif(num >=0.80 && num <=1.25)\n msg.payload = \"Raspberry Pi is not under Voltage\";\nelse\n msg.payload = \"Rasberry Pi is under Voltage\"\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":920,"y":1160,"wires":[["b9ca34c4.ae28c8"]]},{"id":"8a9180aa.e7ef1","type":"function","z":"5496fb63.715064","name":"","func":"num = parseFloat(msg.payload);\nif(num >= 0.80 && num <=1.25)\n return msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":920,"y":1020,"wires":[["2a0df4e8.119f4c"]]},{"id":"88b89c9.e93e16","type":"function","z":"5496fb63.715064","name":"","func":"num = parseFloat(msg.payload);\nif(num < 0.80 || num > 1.25)\n return msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":920,"y":1080,"wires":[["d5da06af.aac378"]]},{"id":"d5da06af.aac378","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"{\"title\":\"Low Voltage\",\"body\":\"Rapsberry Pi is under Voltage\"}","tot":"json"}],"action":"","property":"","from":"","to":"","reg":false,"x":1120,"y":1080,"wires":[["a8645ae2.2334f8"]]},{"id":"1c583582.f750ba","type":"ui\_button","z":"5496fb63.715064","name":"","group":"2b4fd5f7.85e05a","order":1,"width":0,"height":0,"passthru":false,"label":"Check Rasp Voltage","tooltip":"","color":"","bgcolor":"Green","className":"","icon":"","payload":"","payloadType":"str","topic":"","topicType":"str","x":140,"y":960,"wires":[["1e1909e2.c49106"]]},{"id":"4cdd710b.71705","type":"remote-access","z":"5496fb63.715064","confignode":"8c5fe222.d775f","name":"","verbose":0,"x":160,"y":40,"wires":[[]]},{"id":"1ce04814.8fb858","type":"function","z":"5496fb63.715064","name":"take data","func":"var data = context.get(\"data\") || 0;\n\nif(msg.topic === \"text\"){\n data = msg.payload;\n context.set(\"data\",data);\n //if no output is needed while writting, stop the flow right here\n return\n}\nif(msg.topic === \"save\"){\n msg.payload = data;\n}\n\nreturn msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":580,"y":1460,"wires":[["5ebcc527.3192bc","dea6b49c.9243f8","13523084.0187bf"]]},{"id":"8c7ec1b8.efa2e","type":"ui\_text\_input","z":"5496fb63.715064","name":"Phone Number","label":"Phone Number","tooltip":"","group":"b55c5b66.8d52c8","order":1,"width":0,"height":0,"passthru":true,"mode":"text","delay":"0","topic":"task1","sendOnBlur":true,"topicType":"str","x":140,"y":1460,"wires":[["1ce04814.8fb858"]]},{"id":"dea6b49c.9243f8","type":"ui\_button","z":"5496fb63.715064","name":"","group":"b55c5b66.8d52c8","order":2,"width":0,"height":0,"passthru":false,"label":"Insert Phone Number","tooltip":"","color":"","bgcolor":"Orange","className":"","icon":"","payload":"msg","payloadType":"str","topic":"","topicType":"str","x":880,"y":1460,"wires":[[]]},{"id":"13523084.0187bf","type":"debug","z":"5496fb63.715064","name":"Take 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GSM","tooltip":"","color":"","bgcolor":"","className":"","icon":"","payload":"","payloadType":"str","topic":"topic","topicType":"msg","x":320,"y":100,"wires":[["66523c7.ca14ac4"]]},{"id":"49516dd6.4f0004","type":"inject","z":"5496fb63.715064","name":"","props":[{"p":"payload"},{"p":"topic","vt":"str"}],"repeat":"43200","crontab":"","once":true,"onceDelay":"10","topic":"","payload":"","payloadType":"date","x":120,"y":100,"wires":[["ac5c006c.95895"]]},{"id":"66523c7.ca14ac4","type":"exec","z":"5496fb63.715064","command":"sudo ip link set wwan0 down","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":540,"y":100,"wires":[["80213b9e.aa82e8"],[],[]]},{"id":"80213b9e.aa82e8","type":"exec","z":"5496fb63.715064","command":"sudo qmicli -d /dev/cdc-wdm0 --dms-set-operating-mode='online'","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":950,"y":100,"wires":[["b7a00464.111e68"],[],[]]},{"id":"b7a00464.111e68","type":"exec","z":"5496fb63.715064","command":"sudo qmicli -d /dev/cdc-wdm0 --dms-set-operating-mode='online'","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":650,"y":180,"wires":[["fd1fad95.3ff35"],[],[]]},{"id":"fd1fad95.3ff35","type":"exec","z":"5496fb63.715064","command":"echo 'Y' | sudo tee /sys/class/net/wwan0/qmi/raw\_ip","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":1130,"y":160,"wires":[["480e8a06.19fe94"],[],[]]},{"id":"480e8a06.19fe94","type":"exec","z":"5496fb63.715064","command":"sudo ip link set wwan0 down","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":560,"y":280,"wires":[["4728e1e5.2c10f"],[],[]]},{"id":"4728e1e5.2c10f","type":"exec","z":"5496fb63.715064","command":"sudo ip link 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Detect","tooltip":"","color":"","bgcolor":"Red","className":"","icon":"","payload":"yes","payloadType":"str","topic":"topic","topicType":"msg","x":130,"y":1720,"wires":[["c35fbda5.c1a43"]]},{"id":"c35fbda5.c1a43","type":"file","z":"5496fb63.715064","name":"","filename":"/home/pi/tflite1/Sample\_TFLite\_model/terminate.txt","appendNewline":true,"createDir":false,"overwriteFile":"true","encoding":"none","x":530,"y":1720,"wires":[["87189d78.4f4ba"]]},{"id":"752651d5.3bde3","type":"debug","z":"5496fb63.715064","name":"","active":false,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":850,"y":1940,"wires":[]},{"id":"c8246afc.f396e8","type":"exec","z":"5496fb63.715064","command":"/home/pi/TF.sh","addpay":"","append":"","useSpawn":"false","timer":"","oldrc":false,"name":"","x":620,"y":1880,"wires":[["752651d5.3bde3","b5760c66.fc72e"],[],[]]},{"id":"4e0ad1e6.c35e2","type":"ui\_button","z":"5496fb63.715064","name":"","group":"12aa27dd.6387d8","order":4,"width":0,"height":0,"passthru":false,"label":"Start detect","tooltip":"","color":"","bgcolor":"Green","className":"","icon":"","payload":"","payloadType":"str","topic":"topic","topicType":"msg","x":130,"y":1880,"wires":[["c8246afc.f396e8","4382a572.b8881c"]]},{"id":"b5760c66.fc72e","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"Waiting to start system","tot":"str"}],"action":"","property":"","from":"","to":"","reg":false,"x":1060,"y":1860,"wires":[["4e1053b7.4da02c"]]},{"id":"4382a572.b8881c","type":"delay","z":"5496fb63.715064","name":"","pauseType":"delay","timeout":"6","timeoutUnits":"seconds","rate":"1","nbRateUnits":"1","rateUnits":"second","randomFirst":"1","randomLast":"5","randomUnits":"seconds","drop":false,"x":600,"y":2060,"wires":[["aadde8b8.a79798"]]},{"id":"aadde8b8.a79798","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"System is running","tot":"str"}],"action":"","property":"","from":"","to":"","reg":false,"x":1060,"y":2040,"wires":[["4e1053b7.4da02c"]]},{"id":"87cf28dd.9853f8","type":"file in","z":"5496fb63.715064","name":"","filename":"/home/pi/tflite1/Sample\_TFLite\_model/detect.txt","format":"utf8","chunk":false,"sendError":false,"encoding":"none","x":220,"y":2360,"wires":[["69c5727f.88eeec"]]},{"id":"d1732bf8.f28738","type":"debug","z":"5496fb63.715064","name":"","active":false,"tosidebar":true,"console":false,"tostatus":false,"complete":"payload","targetType":"msg","statusVal":"","statusType":"auto","x":1490,"y":2360,"wires":[]},{"id":"69c5727f.88eeec","type":"function","z":"5496fb63.715064","name":"","func":"if (msg.payload === \"person\")\n return msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":520,"y":2360,"wires":[["169e3d5d.39d2f3"]]},{"id":"169e3d5d.39d2f3","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"{\"title\":\"Detect\",\"body\":\"Person is in the area\"}","tot":"json"}],"action":"","property":"","from":"","to":"","reg":false,"x":700,"y":2360,"wires":[["ed44b724.524a98"]]},{"id":"ed44b724.524a98","type":"remote-notification","z":"5496fb63.715064","confignode":"8c5fe222.d775f","name":"","notificationTitle":"payload.title","notificationTitleType":"msg","notificationBody":"payload.body","notificationBodyType":"msg","notificationSound":"default","notificationSoundComputed":"payload.sound","notificationSoundComputedType":"msg","output":1,"x":1050,"y":2360,"wires":[["d1732bf8.f28738"]]},{"id":"cd335ef.06b14a","type":"file in","z":"5496fb63.715064","name":"","filename":"/home/pi/tflite1/Sample\_TFLite\_model/detect.txt","format":"utf8","chunk":false,"sendError":false,"encoding":"none","x":500,"y":2740,"wires":[["1554d1ea.70f2fe","948fa31a.7c081"]]},{"id":"1554d1ea.70f2fe","type":"function","z":"5496fb63.715064","name":"","func":"if (msg.payload == \"person\")\n return msg;","outputs":1,"noerr":0,"initialize":"","finalize":"","libs":[],"x":860,"y":2740,"wires":[["d04960a3.545bd"]]},{"id":"948fa31a.7c081","type":"trigger","z":"5496fb63.715064","name":"","op1":"","op2":"0","op1type":"nul","op2type":"str","duration":"30","extend":false,"overrideDelay":false,"units":"s","reset":"\"person\"","bytopic":"all","topic":"topic","outputs":1,"x":850,"y":2880,"wires":[["d29a2f2c.e7035"]]},{"id":"d04960a3.545bd","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"{\"title\":\"Person detect\",\"body\":\"Person is in the area\"}","tot":"json"}],"action":"","property":"","from":"","to":"","reg":false,"x":1080,"y":2740,"wires":[["72e3e290.1d059c"]]},{"id":"d29a2f2c.e7035","type":"file","z":"5496fb63.715064","name":"","filename":"/home/pi/tflite1/Sample\_TFLite\_model/detect.txt","appendNewline":false,"createDir":false,"overwriteFile":"true","encoding":"none","x":1220,"y":2880,"wires":[[]]},{"id":"e7be23ca.f31c1","type":"inject","z":"5496fb63.715064","name":"","props":[{"p":"payload"},{"p":"topic","vt":"str"}],"repeat":"","crontab":"","once":false,"onceDelay":0.1,"topic":"","payload":"","payloadType":"date","x":120,"y":2740,"wires":[["cd335ef.06b14a"]]},{"id":"72e3e290.1d059c","type":"remote-notification","z":"5496fb63.715064","confignode":"8c5fe222.d775f","name":"","notificationTitle":"payload.title","notificationTitleType":"msg","notificationBody":"payload.body","notificationBodyType":"msg","notificationSound":"default","notificationSoundComputed":"payload.sound","notificationSoundComputedType":"msg","output":1,"x":1310,"y":2740,"wires":[[]]},{"id":"4e1053b7.4da02c","type":"ui\_text","z":"5496fb63.715064","group":"12aa27dd.6387d8","order":6,"width":0,"height":0,"name":"","label":"","format":"{{msg.payload}}","layout":"row-center","className":"","x":1510,"y":1860,"wires":[]},{"id":"87189d78.4f4ba","type":"change","z":"5496fb63.715064","name":"","rules":[{"t":"set","p":"payload","pt":"msg","to":"System is disabled","tot":"str"}],"action":"","property":"","from":"","to":"","reg":false,"x":1020,"y":1720,"wires":[["4e1053b7.4da02c"]]},{"id":"2b4fd5f7.85e05a","type":"ui\_group","name":"Raspberi Pi Control","tab":"e90f92b5.ca36b","order":1,"disp":true,"width":"6","collapse":false,"className":""},{"id":"8c5fe222.d775f","type":"remote-config","name":"test","host":"localhost","protocol":"http","port":"1880","baseurl":"/ui","instancehash":"hkqodc40yoirg8kmryie9id8cbkmgqzp0fb5fd015h4pm1f9qyupmypdgxxeipzd","server":"nodered03.remote-red.com","region":"us"},{"id":"b55c5b66.8d52c8","type":"ui\_group","name":"Phone# Setting","tab":"e90f92b5.ca36b","order":3,"disp":true,"width":"6","collapse":false,"className":""},{"id":"ae14d714.6c04e8","type":"ui\_group","name":"Network","tab":"e90f92b5.ca36b","order":2,"disp":true,"width":"6","collapse":false,"className":""},{"id":"12aa27dd.6387d8","type":"ui\_group","name":"Motion Detection Control","tab":"e90f92b5.ca36b","order":4,"disp":true,"width":"6","collapse":false,"className":""},{"id":"e90f92b5.ca36b","type":"ui\_tab","name":"General","icon":"dashboard","disabled":false,"hidden":false}]

Click Deploy to upload the flow and save it.

**Step 8:** Node-Red Dashboards

The node red dashboard is an add-on module that lets you create live dashboards. It is an optional module, and it is not installed by default. You can install the dashboard nodes from inside node-red just as you install other nodes by going to file > Manage palette > install.

First check Nodes tab and make sure you have all the following, and install any that are missing

node-red

1.3.4

node-red-contrib-image-output

0.6.2

node-red-contrib-image-output

0.6.2

node-red-contrib-play-audio

2.5.0

node-red-contrib-remote

1.2.3

node-red-dashboard

3.0.4

node-red-node-base64

0.3.0

node-red-node-pi-gpio

1.2.3

node-red-node-ping

0.3.1

node-red-node-random

0.4.0

node-red-node-rbe

0.5.0

node-red-node-serialport

0.14.1

node-red-node-smooth

0.1.2

node-red-node-tail

0.3.1

The install adds a new category to the node palette and a collection of UI (User Interface) nodes or widgets. The dashboard or display nodes appear on the User Interface (UI) dashboard. To access this dashboard by going to http://<ip\_address>:1880/ui. You should be able to see multiple pages that includes the all the design flow that was imported from the .json file or step 7 code.

**Step 9:** Node Red mobile app configuration app

A mobile app client for Node RED is a great tool to quickly access and Auto login to the Dashboard and enable the send push message from Node-RED to an app and send command to Node-RED from the phone. There is remote access and remote notification are not working now, so because you need to do the following step. Click on info > Flows> Main > remote access> edit button next to config box look like a pen > Delete>Now it took you back to the Edit remote-access node so click the edit button next to config box look like a pen > change the name if you want > base URL set to /ui > server location USA > click Connect Remote-Red App > scan the QR code with your phone app > click Add > Done > Deploy.

To start rednode on bootup, run the following commands in the terminal:

sudo npm install -g pm2

pm2 start /usr/bin/node-red -- -v

pm2 start /usr/bin/node-red --node-args="--max-old-space-size=256" -- -v

pm2 save

pm2 startup

**Step 9:** Remote Desktop Connection installation

Xrdp is an open-source implementation of the Microsoft Remote Desktop Protocol (RDP) that allows you to graphically control a remote system. With RDP, you can log in to a Raspberry Pi box from another computer running Windows, Linux or macOS, and create a real desktop session the same as if you had logged in to a local computer. The Pi and the client machine must be connected to the same network or to the Internet. To install it you need to run the following commands to install Pixel desktop:

sudo apt update

sudo apt-get install raspberrypi-ui-mods xinit xserver-xorg

Depending on your system, downloading, and installing Pixel packages may take some time. Once done, reboot the system for the changes to take effect:

sudo reboot

now you need to Installing Xrdp. Xrdp package is available in the default Raspbian Buster repositories. To install it, type:

sudo apt install xrdp

When the installation process is complete, the Xrdp service will automatically start. You can verify that Xrdp is running by typing:

systemctl show -p SubState --value xrdp

The command will print “running”. By default Xrdp uses the /etc/ssl/private/ssl-cert-snakeoil.key file which is readable only by users that are members of the “ssl-cert” group. You’ll need to add the user that runs the Xrdp server to the ssl-cert group. Execute the following command to add the user to the group :

sudo adduser xrdp ssl-cert

That’s it. Xrdp has been installed on your Pi. Now that you have set up the Xrdp server, it is time to open your Xrdp client and connect to the Pi.

**Step10** Installing PiTunnel

PiTunnel is a service for remotely accessing devices like Raspberry Pi, NVIDIA Jetson, Intel NUC, and the projects that you build on them. All you need is an internet connection and PiTunnel does the rest. A Device Monitor and Remote Terminal is included, and you can also create your own Custom Tunnels to access services running on your devices. Installing PiTunnel on a device is easy. It is simply a matter of opening a terminal and entering the following command:

curl -s https://pitunnel.com/install/C5pN7Uhog | sudo python3

pitunnel --host=192.168.2.250 --port=554 --name=CameraRTSP –persist

**Step11** Installing ifmetric

ifmetric is a Linux tool for setting the metrics of all IPv4 routes attached to a given network interface at once. This may be used to change the priority of routing IPv4 traffic over the interface. Lower metrics correlate with higher priorities. Set routing metrics for a network interface. Copy/Paste to avoid miss-spelling or accidently installing a different package.

sudo apt-get update -y

sudo apt-get install -y ifmetric