Lab 2 Appendix

Book Title: *Real-Time Environmental Monitoring: Sensors and Systems, Second Edition – Lab Manual*

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Equation Chapter 2 Section 1

Adding another network

You can add other networks by adding a file to your micro-SD image. Mount the SD (i.e., insert it back in) to the PC's SD adapter. On this drive, using a plain text editor (such as Notepad in Windows, or the RStudio editor) write a new text file named **wpa_supplicant.conf** with this content

```
country=US
ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
update_config=1

 network={
    ssid="NETWORK1-NAME"
    psk="NETWORK1-PASSWORD"
 }

 network={
    ssid="NETWORK2-NAME"
    psk="NETWORK2-PASSWORD"
 }
```

Country can be selected using the two-letter ISO code of your country. Here substitute Network1-Name, Network1-Password, … for the names and passwords of the networks you want to RPI to connect to when available. Do not use a word processor nor a Rich Text Editor. If using a Mac, select Plain Text instead of Rich Text. Do not use extension .txt, the filename has extension **conf**. Now unmount the SD card from the laptop or PC and insert it in the RPI.

A priority value can be used to define which network to use when all are available. For example, in the following network1-name will take priority over network2-name.

```
country=US
 ctrl_interface=DIR=/var/run/wpa_supplicant GROUP=netdev
 update_config=1

 network={
    ssid="NETWORK1-NAME"
    psk="NETWORK1-PASSWORD"
    priority=1
 }

 network={
    ssid="NETWORK2-NAME"
    psk="NETWORK2-PASSWORD"
    priority=2
 }
```

RPI

Basics of the Raspberry Pi and set up go to https://projects.raspberrypi.org/en/projects/raspberry-pi-setting-up

To learn the basics of the Raspberry Pi and set up go to

https://projects.raspberrypi.org/en/projects/raspberry-pi-setting-up

To learn about using the Raspberry Pi go to

https://projects.raspberrypi.org/en/projects/raspberry-pi-using

Peripherals and RPI

If you want, you can connect the RPI Zero W to its own peripherals not using headless mode. You can connect a mouse and keyboard using the micro USB port. You may need a small USB hub to connect both monitor and keyboard. The RPI has HDMI connectors. The Pi Zero has a micro HDMI port. Use a monitor preferably with HDMI input, and cables with HDMI on both

ends (one of these micro HDMI if using a Pi Zero). Alternatively for a monitor with VGA, NDVI and adapter of these to HDMI. Go to this link for more help on this

https://projects.raspberrypi.org/en/projects/raspberry-pi-setting-up/2

Once the pi zero boots up, we can use it using VNC instead of its own monitor, mouse, and keyboard. To start activate SSH for remote control and VNC

https://www.raspberrypi.org/documentation/remote-access/ssh/

https://www.raspberrypi.org/documentation/remote-access/vnc/

Other links

https://howtoraspberrypi.com/ssh-raspberry-pi-remote-control/

https://howtoraspberrypi.com/raspberry-pi-vnc/

VNC viewer: Virtual Network Computing (VNC)

VNC facilitates running the RPI headless. Download and install the VNC viewer. Link:

https://www.realvnc.com/en/connect/download/viewer/

Using the raspi-config, select Interface options, enable VNC and close the configuration tool.

The VNC viewer, allows to use a graphical interface to the RPI in headless mode. Open the VNC viewer and use File| New connection. At the dialog window type the IP address of the RPI and a friendly name (e.g., RPI0) (Figure 2.1). Click Ok, double click on the connection, type your username and password to the RPI to logon.

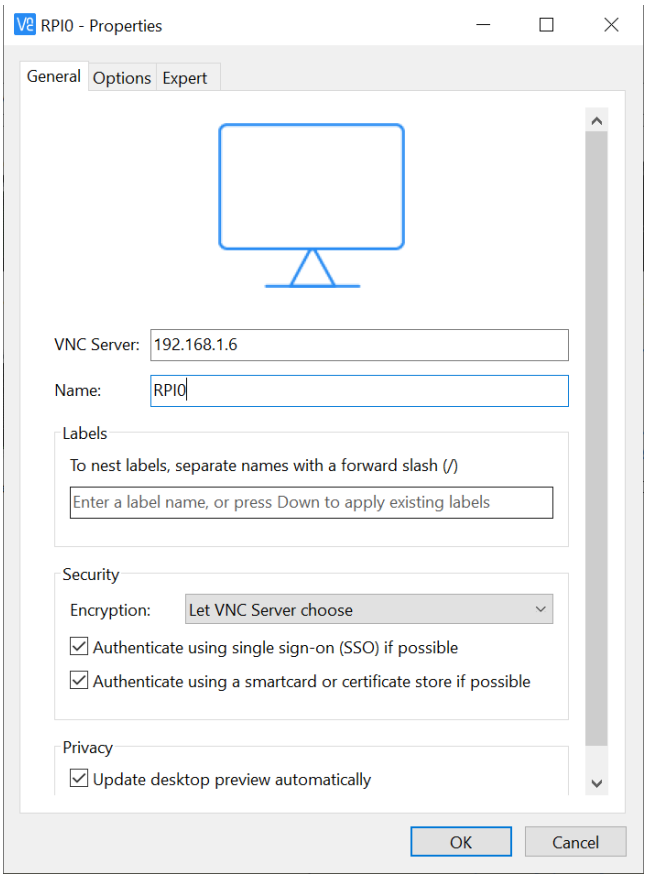

Figure 2.1 Creating new connection in VNC viewer

Arduino IDE on the RPI

If you want to install the Arduino's IDE using the GUI on a Raspberry Pi 3 or 4..

https://www.raspberrypi.org/forums/viewtopic.php?t=251194

```
cd ~
wget https://downloads.arduino.cc/arduino-1.8.11-linuxarm.tar.xz
tar -xvf arduino-1.8.11-linuxarm.tar.xz
cd arduino-1.8.11
sudo ./install.sh
```

From the Pi desktop; select the Start Menu, Programming, and click on the Arduino IDE option.