GoPiGo Getting Started

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Resources

MagPi magazine is free on pdf. They have several good general books on the Raspberry Pi.

1. https://magpi.raspberrypi.org/books (Raspberry Pi Books)
2. https://magpi.raspberrypi.org/issues (MagPi Magazine)

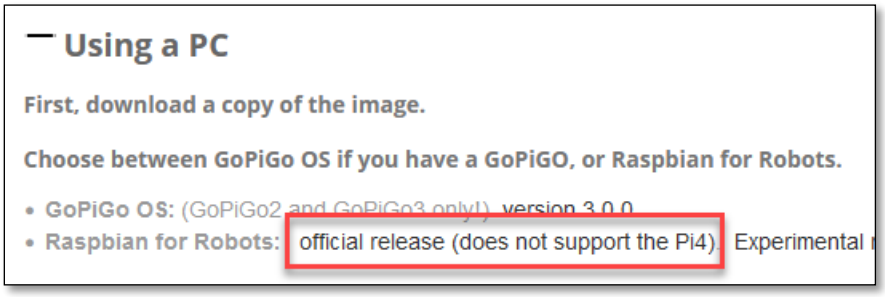
Setup GoPiGo

NOTE: Username: **pi** Password: **robots1234**

Raspbian is Linux: All commands in **Raspbian** are **case sensitive**

NOTE: Remove all USB drives from computer except the MicroSD adapter.

1. Go to: https://www.dexterindustries.com/howto/install-raspbian-for-robots-image-on-an-sd-card
2. Click Using a PC.



3. Extract the img file from the zip file.
4. Insert the Transcend adapter with the MicroSD card into a USB port on your computer.
5. Download and install **Raspberry Pi Imager** https://www.raspberrypi.org/blog/raspberry-pi-imager-imaging-utility
    a. **Operating System → Choose OS →** At the bottom of the list: **Use custom**
    b. **Storage:** Choose **TS-RDFS SD Transcend**
    c. **Write:** Write the image
6. Make sure the GoPiGo is powered off.
7. Insert the MicroSD card in Raspberry Pi.
8. Connect an ethernet cable between your computer and the GoPiGo. (If you don't have an ethernet cable or an ethernet port on your laptop, let me know.)
9. Power up the GoPiGo. This will take a little longer the first time you boot the robot.
10. In your local web browser → Go to http://dex.local
11. Click the **VNC** icon.
12. You should see the Dexter Industries desktop of the GoPiGo.
13. In the upper right side you should see an Up Down arrow that will show connection properties.
14. Click and connect to your local Wifi network.

15. Point to the Wireless icon → This will show you the robot's wireless **wlan0** IP Address.
16. Disconnect the ethernet cable. Reconnect to your network.
17. In your local web browser → Go to the IP address of the robot.
18. You should see the same Dexter Industries desktop.

Email IP Address on Startup

We want our GoPiGo to email us the IP address whenever it starts up.

1. On the GoPiGo desktop.
2. Use the Web Browser on the upper right side to go to https://github.com/itinstructor/WNCCNASA
3. Logon with your GitHub account.
4. Go to **Code** → **Download ZIP**.
5. The file will download quickly. On the lower left side of the browser → Right Click on the file → **Open in Folder**.
6. Right Click the Zip file → **Extract Here**.
7. Right Click **startup_mailer.py → Copy.**
8. Go to Documents → Create a folder named **Code** → Paste the file into that folder.
9. Right Click on **startup_mailer.py** → **Thonny Python IDE**
10. Change the **EMAIL_DESTINATION** email address to your own email address.
11. Save the file.
12. Open a terminal.
13. Type in the following to make the script executable.

```
sudo chmod +x /home/pi/Documents/Code/startup_mailer.py
```

14. There should not be any errors if the command was successful.
15. Test the script with the following command.

```
python3 /home/pi/Documents/Code/startup_mailer.py
```

16. In a few moments, you should receive an email with your GoPiGo IP address.

Run startup_mailer.py Script on Startup

1. At the terminal, type in the following command to access the Raspbian scheduler.

```
crontab -e
```

2. Press Enter to edit the file with nano
3. Cursor to the bottom of the file. (The mouse will not work.)
4. Type in the following information. (Sleep 10 waits 10 seconds after startup to run the script.)

```
@reboot sleep 10 && python3 /home/pi/Documents/Code/startup_mailer.py
```

5. Type **CTRL+O** to Write Out the file.
6. Press **Enter** to Write the file.
7. Press **CTRL+X** to Exit nano.
8. Double Click the Shut Down icon on the desktop.
9. Wait until the GoPiGo has a chance to shutdown.
10. Turn on your Pi and you should receive an email with your IP address.

Power the GoPiGo

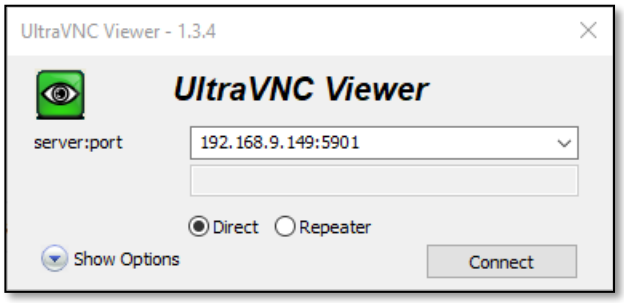
*Notice the power switch on the battery. The battery will need to be *on* before starting the robot. **However,** the robot should be turned off **before** turning off the battery.

Connect to the GoPiGo with UltraVNC

With UltraVNC you can copy and paste from your desktop to your robot.

1. Go to www.uvnc.com Be careful, there are ads all over the place.
2. At the top of the page go to **Downloads → UltraVNC**
3. Toward the bottom you will find **UltraVNC 1.3.4**. (This is the current version as of 9-11-21)
4. Click on the name to download it. This will take you to a page with Installers.
5. You want the one for-64 bit operating systems. Click Download to the right.

6. The download will start in a few seconds.
7. The downloaded file will called **UltraVNC_1_3_4_X64_Setup** The version number may be different.
8. Double Click the file to start the installation.
9. When you get to select components → only choose **UltraVNC Viewer**.
10. Continue to install the program.
11. Run the program.
12. Type in the IP address of your robot. Add **:5901** to the end as shown in the screenshot.



13. You will be asked for a password: **robots1234**

You can now copy and paste code back and forth to the GoPiGo.

Update GoPiGo

Double Click **DI Software Update** on desktop. Follow the directions.

Multiple SSID's

If you are using the GoPiGo on multiple networks, edit the following file as shown. This command uses nano, a simple text editor built into the operating system.

```
sudo nano /etc/wpa_supplicant/wpa_supplicant.conf
```

The following is an example of adding the WNCC-Internet to your wireless networks.

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

network={
    ssid="network_one_here"
    psk="wpa_password"
    id_str="home"
}

network={
    ssid="WNCC-Internet"
    key_mgmt=NONE
    id_str="work"
}
```

1. **CTRL+O** (Writes the file)
2. Press **Enter** to finish saving the file.
3. **CTRL+X** (Exit nano)

The pi will automatically connect to whichever wireless network is closer and has better signal. You can add as many wireless networks to this file as you wish.

Set Timezone

1. Go to the Raspberry icon on the left side of the toolbar.
2. **Preferences** → **Configuration** → **Raspberry Pi Configuration** → **Localisation**.
3. Set **Timezone**.
    a. **Area:** America
    b. **Location:** Denver
4. Click OK twice.

Set 12-Hour Clock

To change the clock from military time to 12 hour time:

1. Right Click on the clock on the right hand side of the toolbar → **Digital Clock Settings.**
2. Change Clock Format to: **`%I:%M %p %x`**
    a. **%I:%M** = Hours Minutes

b. **%p** = AM PM

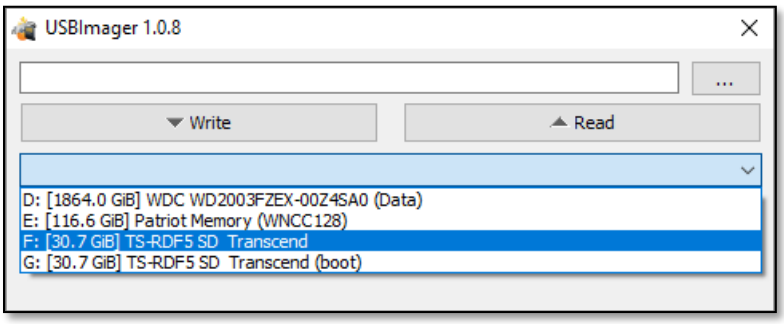
c. **%x** = current date

3. Click OK.

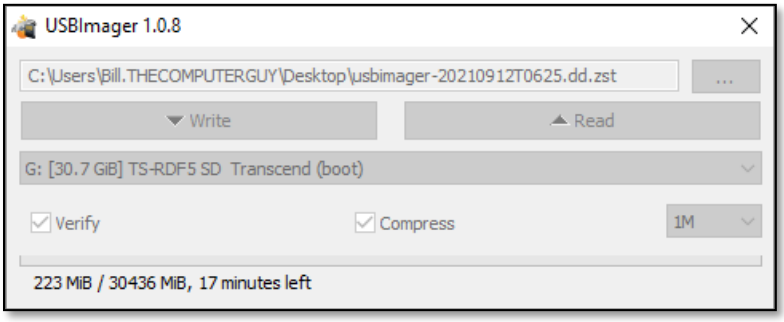
Backup GoPiGo to a File Image

Things go wrong. It is a good idea to back up your MicroSD card to a file image at this point and any point prior to making big changes.

1. Go to https://gitlab.com/bztsrc/usbimager
2. Download the windows GDI version.
3. This is a portable program, there is not an installation, the program runs from wherever you put it.
4. Click the downward pointing triangle as shown to select your MicroSD card. The card will show 2 partitions, it doesn't matter which one you choose, the entire card will be backup up to a file image.



5. Click **Compress**.
6. Click **Read**. The program will automatically create a compressed backup file of approximately 5GB on your Desktop.



Modular Robotics GoPiGo Documentation

This has the latest documentation for the GoPiGo. It has basic tutorials to get you started programming the robot.

https://readthedocs.org/projects/gopigo3/downloads/pdf/latest/ (pdf version)

https://gopigo3.readthedocs.io/en/latest/ (Web version)

Sample GoPiGo Python3 Programs.

There are sample Python3 programs in the GitHub Code folder. They use the Easy GoPiGo library. Movements and the led's on the GiPiGo are a good place to start programming.

https://gopigo3.readthedocs.io/en/master/api-basic/easygopigo3.html#easygopigo3 (Easy GoPiGo Library)

Learning Python

There are hundreds of tutorials and videos on learning Python. Here is a good resource for learning Python.

https://www.w3schools.com/python/default.asp

Code Examples and Projects on the GoPiGo

On your GoPiGo, there are some code examples.

1. In File Manager → go to **\Dexter\GoPiGo3** or **\Dexter\GoPiGo**
2. **\Dexter\GoPiGo3\Software\Python** is a good place to start.