**Integrating A02YYUW and RaspberryPI**

Setup

* Have an running RaspberryPI 4 with either a DSI or SSH for access available
* Have a A02YYUW sensor

<https://wiki.dfrobot.com/_A02YYUW_Waterproof_Ultrasonic_Sensor_SKU_SEN0311>

The example here uses a Raspberry Pi IO Expansion Board. However, you can connect the sensor directly to the right pins on the RaspberryPI and it will work too.

**Configuring RaspberryPI**

The sensor needs to be attached to the UART bus. If you don’t know what UART is, this is a good link with a primer on how the UART works.

[**https://www.electronicwings.com/raspberry-pi/raspberry-pi-uart-communication-using-python-and-c**](https://www.electronicwings.com/raspberry-pi/raspberry-pi-uart-communication-using-python-and-c)

By default, the primary UART is assigned to the Linux console. If you wish to use the primary UART for other purposes, you must reconfigure Raspberry Pi OS. You can check this:

ls -l /dev | more

lrwxrwxrwx 1 root root 5 May 8 18:45 serial0 -> ttyS0

lrwxrwxrwx 1 root root 7 May 8 18:45 serial1 -> ttyAMA0

cd /boot

Add the following two lines to config.txt

enable\_uart=1

dtoverlay=disable-bt

Reboot the RaspberryPI.

Check if the UART is setup correctly.

ls -l /dev | more

You should see two lines passing by

lrwxrwxrwx 1 root root 7 aug 7 22:17 serial0 -> ttyAMA0

lrwxrwxrwx 1 root root 5 aug 7 22:17 serial1 -> ttyS0

A picture containing text

Description automatically generated

This means that the output of serial0 is forwarded to ttyAMA0.

You may also need to install the serial package for Raspberry PI.

sudo apt-get install python3-serial

**Connecting RaspberryPI and A02YYUW sensor**

The sensor has 4 wires: power, ground, transmission and receive

I’ve used the following setup:

* Sensor red wire = power => RasberryPI pin 4
* Sensor blue wire = TX => RaspberryPI pin 8 = GPIO14 = UART\_TXD0
* Sensor green wire = RX => RaspberryPI pin 10 = GPIO15 = UART\_RXD0
* Sensor black wire = ground = Raspberry pin 14

Diagram

Description automatically generated

A picture containing text, electronics

Description automatically generated

A picture containing text, electronics, circuit

Description automatically generated

Download the **A02YYUW** sensor library from

<https://github.com/DFRobot/DFRobot_RaspberryPi_A02YYUW>

/home/pi

sudo git clone https://github.com/DFRobot/DFRobot\_RaspberryPi\_A02YYUW

You should see a new directory

pi@raspberrypi:~ $ ls -l

totaal 40

drwxr-xr-x 2 pi pi 4096 mrt 4 2021 Bookshelf

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Desktop

**drwxr-xr-x 6 root root 4096 aug 7 22:44 DFRobot\_RaspberryPi\_A02YYUW**

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Documents

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Downloads

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Music

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Pictures

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Public

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Templates

drwxr-xr-x 2 pi pi 4096 mrt 5 2021 Videos

cd into the DFRobot directory

The directory consist of:

pi@raspberrypi:~/DFRobot\_RaspberryPi\_A02YYUW $ ls -l

totaal 36

-rw-r--r-- 1 pi pi 1287 aug 7 22:04 demo.py

-rw-r--r-- 1 root root 2465 aug 7 21:08 DFRobot\_RaspberryPi\_A02YYUW.py

drwxr-xr-x 2 root root 4096 aug 7 21:08 examples

-rw-r--r-- 1 root root 285 aug 7 21:08 library.properties

-rw-r--r-- 1 root root 1053 aug 7 21:08 LICENSE

-rw-r--r-- 1 root root 2269 aug 7 21:08 README\_CN.md

-rw-r--r-- 1 root root 2227 aug 7 21:08 readme.md

drwxr-xr-x 3 root root 4096 aug 7 21:08 resources

To check if the setup works

cd examples

python3 demo\_get\_distance.py

If you have connected the wires correctly you should see the following output:

pi@raspberrypi:~/DFRobot\_RaspberryPi\_A02YYUW/examples $ python3 demo\_get\_distance.py

Distance 1641 mm

Distance 1645 mm

Distance 1645 mm

Distance 1641 mm

Distance 1645 mm

Distance 1653 mm

Note: that if you move the sensor, the distance doesn’t change.

However, if you restart the script, the values are correct.

You can benchmark the distance using a ruler.

A picture containing wall, indoor

Description automatically generated

Text

Description automatically generated