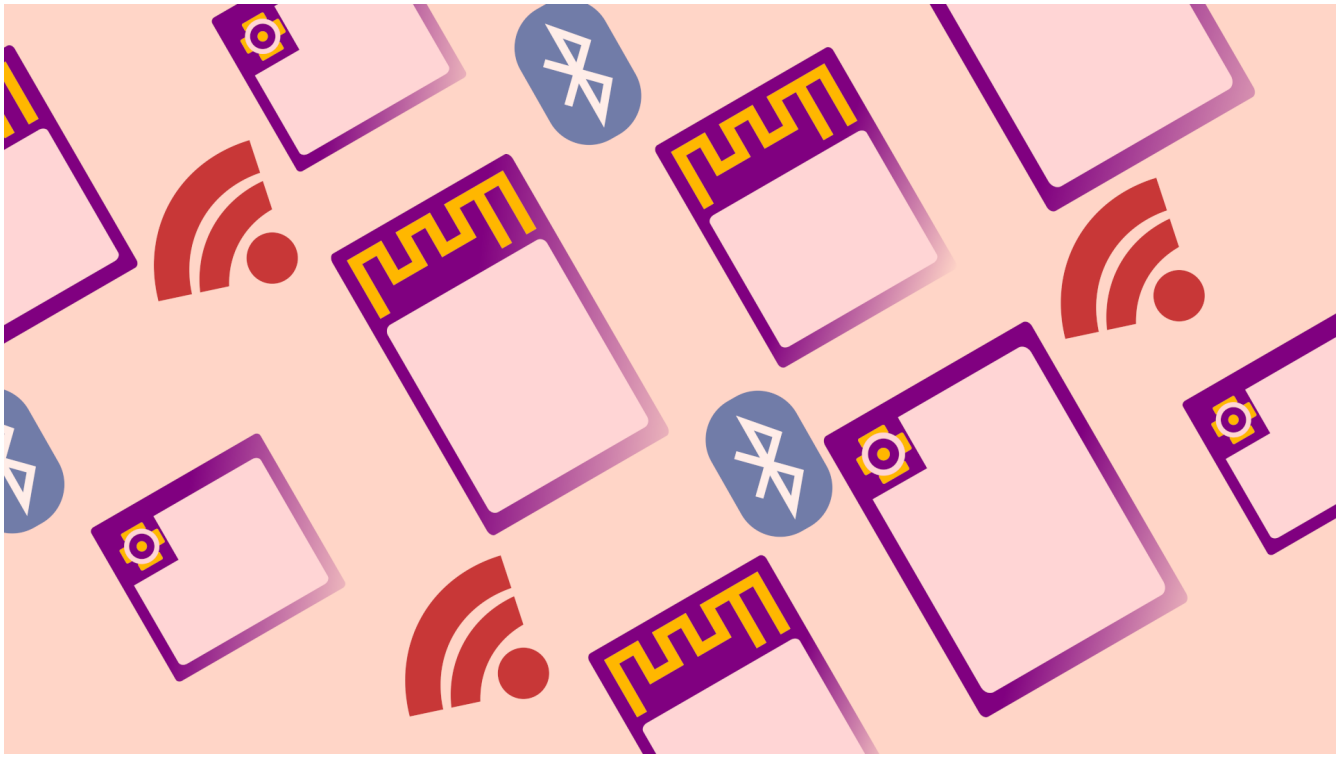
2. Customising ESP-AT Firmware

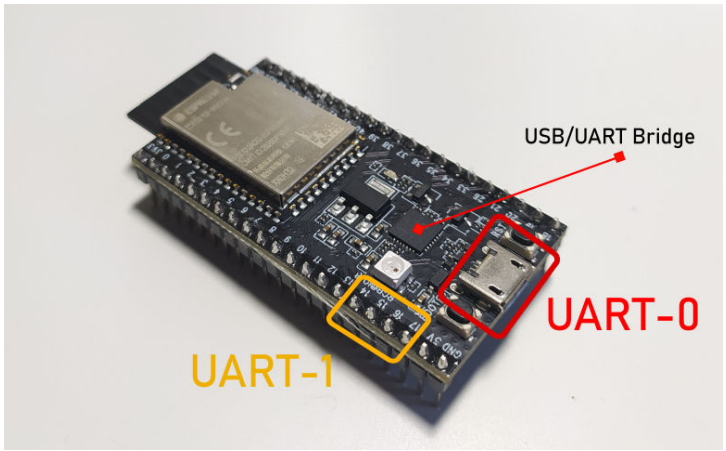


In the previous tutorial, we saw how to build and flash ESP-AT, but we didn't look at what configuration options were available. In this tutorial we will learn how to configure the ESP-AT firmware in order to use the UART-0 interface for both info logging and AT commands.

For this tutorial you'll need:

Introduction

All the ESP* modules come with the default AT firmware installed, but this firmware sends logs to the UART-0 interface (on our board, this is connected to the USB port throught the USB/UART bridge), and expects the commands to be sent to the UART-1 interface:



To use the UART-0 interface for both logs and commands, thus not requiring any additional USB/UART bridge, we must alter the configuration of the ESP-AT firmware. Recompiling the AT firmware is useful for other purposes too, for instance the SPP protocol of classic BT is not enabled by default, and can be enabled with a few configuration changes.

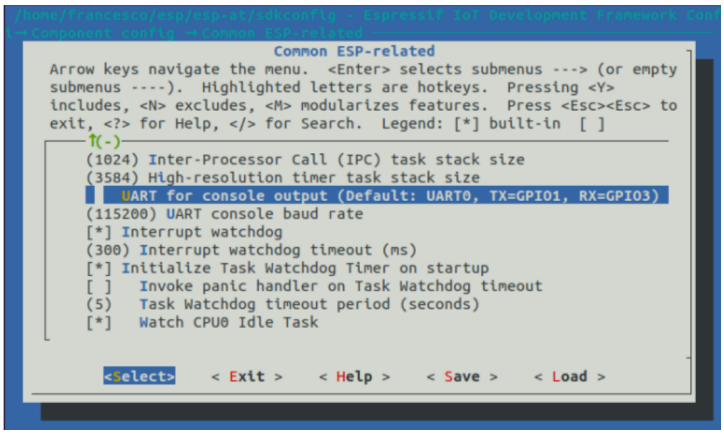
Updating Configuration with menuconfig

First let's check to see if the UART-0 interface is set as default console output port, so first head to the location you downloaded the ESP-AT source and open the menuconfig tool:

```
cd ~/esp-at
./build.py menuconfig
```

Go to *Component config* > *Common ESP-related* and you should see *UART for console output* set to:

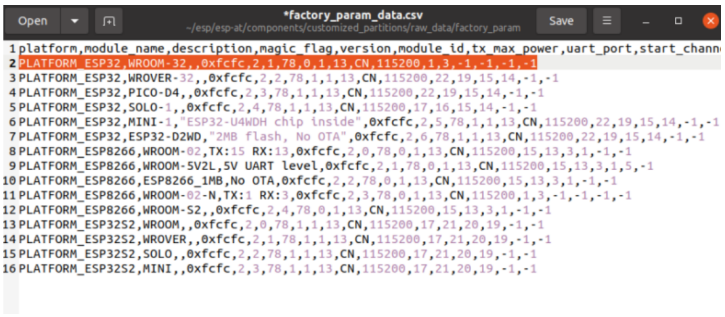
```
Default: UART0, TX=GPIO1, RX=GPIO3
```



Note that this is the console **output** port, it is not the **command** port, the configuration for the command port is not in the menuconfig, but it is in a configuration file:

```
gedit components/customized_partitions/raw_data/factory_param/factory_param_data.csv &
```

This file lists all the modules and the default GPIOs and parameters for the AT firmware. Since we're using the ESP32-WROOM-32*, we'll need to update line 2:



With this row we replace the UART (command) port to UART-0, the TX pin to 1 and RX to 3, these are the GPIOs linked to the USB/UART bridge on the ESP32-DEVKIT-C:

```
PLATFORM_ESP32,WROOM-32,,0xfcfc,2,1,78,0,1,13,CN,115200,1,3,-1,-1,-1,-1
```

Build & Flash

We are now ready to build and flash the modified firmware:

```
./build.py flash
```

As in the last tutorial, if you get a SerialException:

you'll need to add the current user to the group dialout and restart the system:

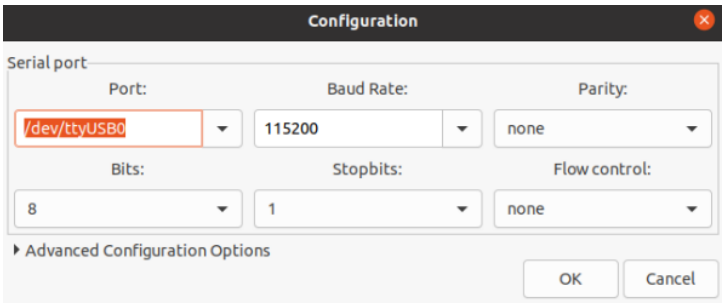
```
sudo adduser $USER dialout
sudo reboot
```

AT command test

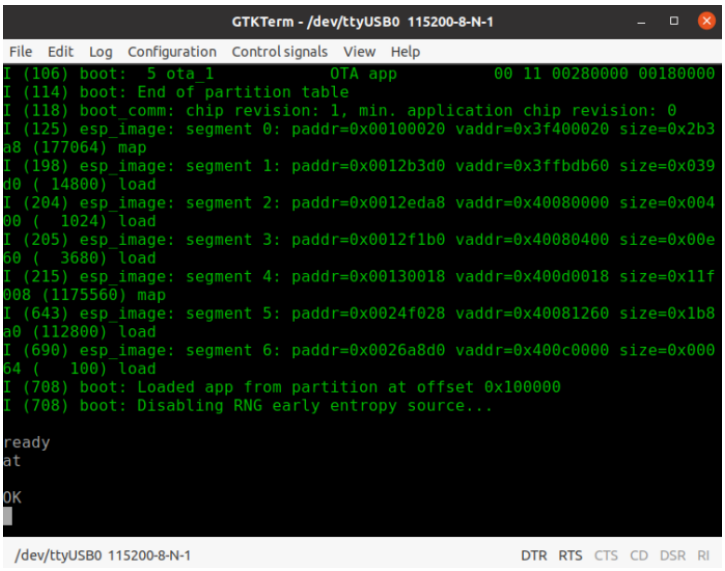
To test the firmware we have just flashed, open up a serial terminal – I am going to use GTKTerm, which can be found and installed from the software center.

ESP-AT expects CR LF as new line so we must set *Configuration->CR LF auto*. Then open *Configuration->Port* and set the serial port configuration to:

```
Baud Rate: 115200
Parity: none
Bits: 8
Stopbits: 1
Flow control: none
```



If everything was configured correctly, we should see the log output (since the UART-0 interface is still the log port), and once the module has initialised we should see *ready* outputted. You can now give the command `at`, which is a test command, and input the `CR LF` – this is achieved in GTKTerm by pressing both *ENTER* and *CTRL-J*:



The firmware should reply *OK* and thus our firmware has been correctly configured.

Conclusion

We configured and compiled the ESP-AT firmware to change the command output from the default UART-1 interface to the UART-0 interface, which is connected to the usb port in the ESP32-DEVKIT-C and we sent our first command and checked that everything works correctly. We are now ready to use the AT firmware for both WiFi and BLE application.