

OriginBot操作文档

操作步骤

一、准备工作

1.本地代码位置

- 机器人本地代码位于 `/root/ros_ws/` 文件夹下，文件夹内容如下：

```
1  TuyaOpen
2  catkin_ws
3  new_tuya.zip  #之前收到的Tuya压缩包，解压后包含上方两个文件夹，已进行修改从而实现demo
                  中功能
```

2.云端代码位置

- OriginBot机器人Github仓库https://github.com/WenqiWang1245/Tuya_GYH_OriginBot
- 如果需要在本地获取一份代码副本进行查看或进一步操作，可以使用 Git 命令克隆此仓库：

```
1  git clone https://github.com/WenqiWang1245/Tuya_GYH_OriginBot.git
```

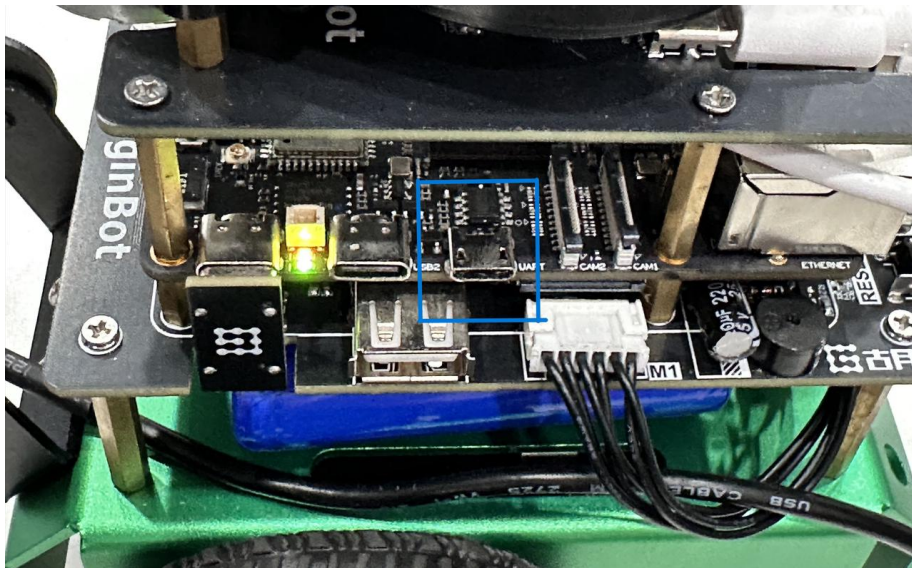
这会将仓库的 `main` 分支内容下载，后续可根据需要调整路径。

二、部署流程

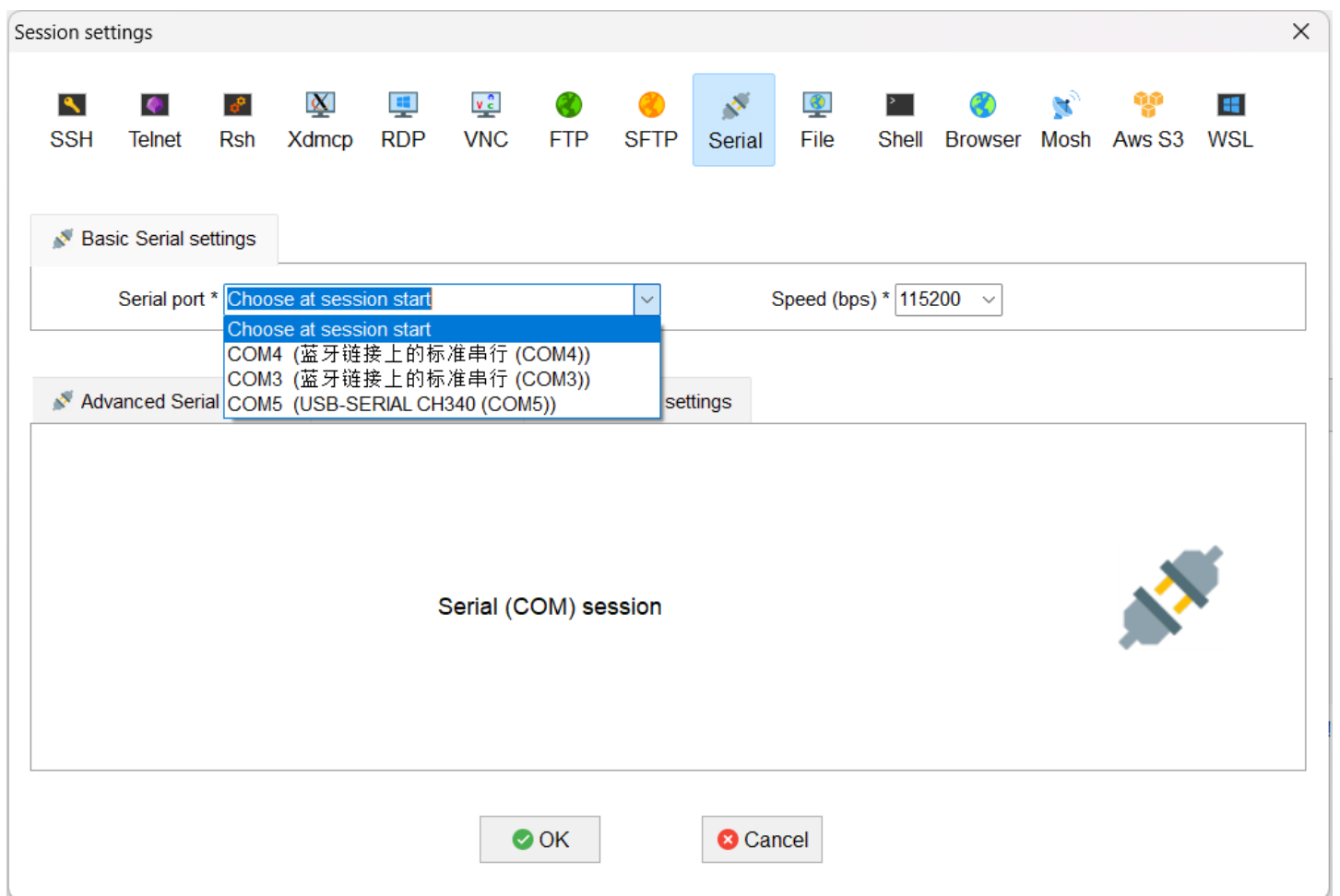
1.在MobaXterm上无线连接机器人

1) 使用micro-usb有线连接机器人

此处需要一根micro-usb线缆，将micro-usb一端接入OriginMan主控RDK X5从左至右数第三个micro-usb口(下图蓝色方框的micro-usb接口)，另外一端连接笔记本电脑。



然后进入MobaXterm，点击左上角Session，在上方选择Serial连接，Serial port选择下图中USB-SERIAL CH340（或类似选项），波特率选择115200，点击OK。



进入页面后，此时打开OriginBot开关，MobaXterm会进入系统，最后会显示 `ubuntu login:`，登录用户名为root，输入后点击键盘上Enter键，出现 `Password:`，登录密码也是root（输入时不显示），输入完后点击Enter键即可成功进入系统。

在系统终端逐行输入以下两行代码：

代码块

```
1 sudo nmcli device wifi rescan      # 扫描wifi网络
2 sudo nmcli device wifi list       # 系统会列出找到的wifi网络
```

在列出的WIFI网络中，可以找到想要连接的目标Wi-Fi，然后依次按下 **Ctrl+C** 和 **Esc** 键，**root@ubuntu:** 命令行出现后，输入如下代码：

代码块

```
1 sudo wifi_connect "SSID" "PASSWD"
```

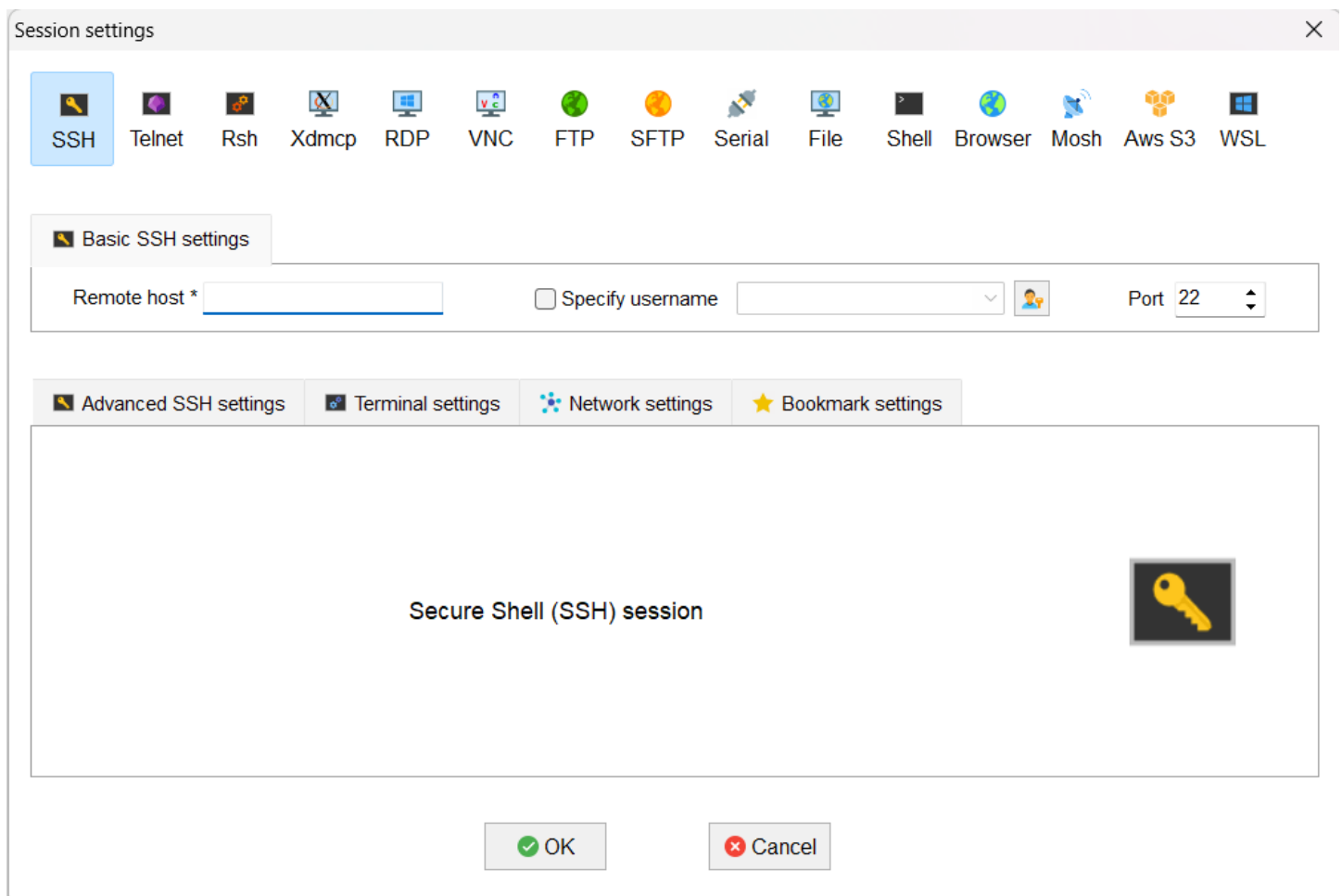
其中，SSID填入Wi-Fi名称，PASSWD填入Wi-Fi密码。

按下Enter键，即可连接上Wi-Fi。

连接上Wi-Fi后，可以在MobaXterm界面里输出的消息中 **wlan0** 部分找到机器人的ip地址，通过这个ip地址，就能够通过SSH无线连接机器人。

2) 使用SSH无线连接机器人

在MobaXterm中点击左上角Session，在上方选择SSH连接，Remote host处填上刚才显示的ip地址，其它地方保持不变，点击OK。



此时命令行终端会出现 `login as:`，输入root后点击Enter，输入密码root（此处输入不显示）即可通过SSH连接机器人。

2.运行节点

1) 启动底盘控制与激光雷达节点

请确认OriginBot顶部的激光雷达处于工作状态（正在旋转），如果雷达没有工作，请在其顶层主板侧边找到开关并拨到ON侧。

在命令行终端中输入如下代码启动机器人底盘控制与激光雷达检测功能：

代码块

```
1 ros2 launch originbot_bringup originbot.launch.py use_lidar:=true
```

输出内容如下图：

```
VERSION: 3.0.1
root@ubuntu:~# ros2 launch originbot_bringup originbot.launch.py use_lidar:=true
[INFO] [launch]: All log files can be found below /root/.ros/log/2000-01-01-08-00-58-615641-ubuntu-3567
[INFO] [launch]: Default logging verbosity is set to INFO
config_file path is /opt/tros/humble/lib/hobot_usb_cam/config/usb_camera_calibration.yaml
Hobot shm pkg enables zero-copy with fastrtps profiles file: /opt/tros/humble/lib/hobot_shm/config/shm_fastdds.xml
Hobot shm pkg sets RMW FASTRTS USE_QOS_FROM_XML: 1
[INFO] [vp100_ros2_node-4]: process started with pid [3600]
[INFO] [originbot_base-1]: process started with pid [3594]
[INFO] [static_transform_publisher-2]: process started with pid [3596]
[INFO] [static_transform_publisher-3]: process started with pid [3598]
[INFO] [static_transform_publisher-5]: process started with pid [3602]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[vp100_ros2_node-4]
[static_transform_publisher-5] [WARN] [0946684859.432465893] []: Old-style arguments are deprecated; see --help for new-style arguments
[vp100_ros2_node-4] [INFO] [0946684859.542581951] [vp100_ros2_node]: [NVILIDAR INFO] Current ROS2 Driver Version: 1.0.3
[vp100_ros2_node-4]
[static_transform_publisher-5] [INFO] [0946684859.557847381] [static_tf_pub_laser]: Spinning until stopped - publishing transform
[static_transform_publisher-5] translation: ('0.000000', '0.000000', '0.020000')
[static_transform_publisher-5] rotation: ('0.000000', '0.000000', '0.000000', '1.000000')
[static_transform_publisher-5] from 'base link' to 'laser link'
[static_transform_publisher-3] [INFO] [0946684859.557875006] [static_transform_publisher_NK9fp7MFuSpngIXN]: Spinning until stopped - publishing transform
[static_transform_publisher-3] translation: ('0.000000', '0.000000', '0.000000')
[static_transform_publisher-3] rotation: ('0.000000', '0.000000', '0.000000', '1.000000')
[static_transform_publisher-3] from 'base link' to 'imu link'
[static_transform_publisher-2] [INFO] [0946684859.557850214] [static_transform_publisher_vz301j0tIlgCEetj]: Spinning until stopped - publishing transform
[static_transform_publisher-2] translation: ('0.000000', '0.000000', '0.053250')
[static_transform_publisher-2] rotation: ('0.000000', '0.000000', '0.000000', '1.000000')
[static_transform_publisher-2] from 'base footprint' to 'base link'
[originbot_base-1] [INFO] [0946684859.588594200] [originbot_base]: originbot serial port opened
[vp100_ros2_node-4] p:/dev/ttyUSB0,b:230400
[vp100_ros2_node-4] [VP100 Message]: Now NVILIDAR is scanning .....
[originbot_base-1] [INFO] [0946684860.099586785] [originbot_base]: IMU calibration ok.
[originbot_base-1] [INFO] [0946684860.600068360] [originbot_base]: OriginBot Start, enjoy it.
```

2) 启动 `cmd_pub` 节点

打开一个新的终端，再次通过SSH连接机器人，连接完成后，逐行输入以下代码：

代码块

```
1 cd ros_ws/catkin_ws/ #输入后命令行提示更改为root@ubuntu:~/ros_ws/catkin_ws#
2 source install/setup.bash
3 ros2 run cmd_pub cmd_pub
```

输入与输出内容完整如下：

代码块

```
1 root@ubuntu:~# cd ros_ws/catkin_ws/
2 root@ubuntu:~/ros_ws/catkin_ws# source install/setup.bash
3 root@ubuntu:~/ros_ws/catkin_ws# ros2 run cmd_pub cmd_pub
4 [INFO] [1747732698.896327220] [f_receiver_node]: FReceiverNode initialized.
   Subscribing to lidar data.
```

3) 连接涂鸦APP

再次打开一个新的终端，通过SSH连接机器人，连接完成后，逐行输入如下代码

代码块

```
1 cd ros_ws/TuyaOpen/apps/tuya_cloud/switch_demo/.build/bin/
2 ./switch_demo_1.0.0
```

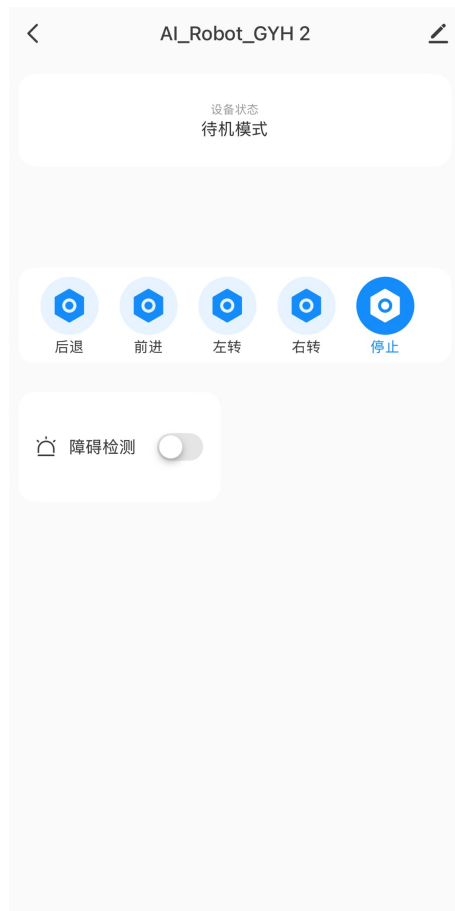
代码运行后，会弹出二维码：

```
[01-01 00:36:44 ty D][tuya_tls.c:569] TUYA_TLS Begin Connect m2.tuyacn.com:8883
[01-01 00:36:44 ty D][tuya_tls.c:337] mbedtls authmode: MBEDTLS_SSL_VERIFY_REQUIRED
[01-01 00:36:44 ty D][tuya_tls.c:350] load root ca cert.
[01-01 00:36:44 ty D][tuya_tls.c:640] socket fd is set. set to inner send/rcv to handshake
[01-01 00:36:45 ty D][tuya_tls.c:319] mbedtls cert_pkey_free.
[01-01 00:36:45 ty D][tuya_tls.c:681] handshake finish for m2.tuyacn.com. set send/rcv to user set
[01-01 00:36:45 ty D][tuya_tls.c:687] TUYA_TLS Success Connect m2.tuyacn.com:8883 Suit:TLS-ECDE-RSA-WITH-AES-128-CBC-SHA256
[01-01 00:36:45 ty I][mqtt_service.c:295] mqtt client connected!
[01-01 00:36:45 ty D][mqtt_service.c:299] SUBSCRIBE sent for topic d/ai/uidc868c92c0378e552 to broker.
[01-01 00:36:45 ty D][tuya_main.c:117] Tuya Event ID:15(TUYA_EVENT_DIRECT_MQTT_CONNECTED)
[01-01 00:36:45 ty I][tuya_main.c:118] Device Free heap 481056
```



```
[01-01 00:36:45 ty I][mqtt_bind.c:206] MQTT direct connected!
[01-01 00:36:45 ty I][mqtt_bind.c:207] Wait Tuya APP scan the Device QR code...
[01-01 00:36:45 ty D][mqtt_client_wrapper.c:58] MQTT_PACKET_TYPE_SUBACK id:1
[01-01 00:36:45 ty D][mqtt_service.c:331] Subscribe succeeded ID:1
[01-01 00:36:46 ty D][lan_sock.c:136] reg lan sock 6,read:0xaaaae4fbf200
[01-01 00:36:47 ty D][lan_sock.c:136] reg lan sock 7,read:0xaaaae4fbf5c8
[01-01 00:36:49 ty D][reset_netcfg.c:62] reset count write 0
[01-01 00:36:49 ty D][tal_kv.c:202] key:rst_cnt, len 1
[01-01 00:36:49 ty D][reset_netcfg.c:69] reset cnt clear!
```

使用 涂鸦 app进行二维码扫描，扫描后连接机器人，手机端出现如下机器人操作界面：



3.手机端额外功能操作

- 1.连续点击三次“前进”键，OriginBot会自动开始行驶正方形路径。
- 2.打开“障碍检测”功能开关，小车会自动缓慢前行，遇到障碍物会自动重新寻路，避开前方障碍。