

Keyboard remote control

Note: The virtual machine needs to be in the same LAN as the car, and the ROS_DOMAIN_ID needs to be consistent. You can check [Must Read Before Use] to set the IP and ROS_DOMAIN_ID on the board.

1. Start and connect the agent

Take the supporting virtual machine as an example, enter the following command to start the agent,

```
sudo docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privileged --net=host microros/micro-ros-agent:humble udp4 --port 8899 -v4
```

```
yahboom@yahboom-VM:~$ sudo docker run -it --rm -v /dev:/dev -v /dev/shm:/dev/shm --privileged --net=host microros/micro-ros-agent:humble udp4 --port 8899 -v4
[1735179211.772044] info      | UDPv4AgentLinux.cpp | init      | running... | port: 8899
[1735179211.772581] info      | Root.cpp            | set_verbose_level | logger setup | verbose_level: 4
[1735179325.739277] info      | Root.cpp            | create_client
```

Then, turn on the car switch and wait for the car to connect to the agent. The connection is successful as shown in the figure below,

```
[1735179211.772044] info      | UDPv4AgentLinux.cpp | init      | running... | port: 8899
[1735179211.772581] info      | Root.cpp            | set_verbose_level | logger setup | verbose_level: 4
[1735179325.739277] info      | Root.cpp            | create_client | create      | client_key: 0x0E5C3397, sess
ion_id: 0x81
[1735179325.739348] info      | SessionManager.hpp | establish_session | session established | client_key: 0x0E5C3397, addr
ess: 192.168.2.102:49954
[1735179325.971694] info      | ProxyClient.cpp    | create_participant | participant created | client_key: 0x0E5C3397, part
icipant_id: 0x000(1)
[1735179326.046043] info      | ProxyClient.cpp    | create_topic      | topic created      | client_key: 0x0E5C3397, topl
c_id: 0x000(2), participant_id: 0x000(1)
[1735179326.159287] info      | ProxyClient.cpp    | create_publisher  | publisher created   | client_key: 0x0E5C3397, publ
isher_id: 0x000(3), participant_id: 0x000(1)
[1735179326.176344] info      | ProxyClient.cpp    | create_datawriter | datawriter created  | client_key: 0x0E5C3397, data
writer_id: 0x000(5), publisher_id: 0x000(3)
[1735179326.184566] info      | ProxyClient.cpp    | create_topic      | topic created      | client_key: 0x0E5C3397, topl
c_id: 0x001(2), participant_id: 0x000(1)
[1735179326.263761] info      | ProxyClient.cpp    | create_publisher  | publisher created   | client_key: 0x0E5C3397, publ
isher_id: 0x001(3), participant_id: 0x000(1)
[1735179326.276817] info      | ProxyClient.cpp    | create_datawriter | datawriter created  | client_key: 0x0E5C3397, data
writer_id: 0x001(5), publisher_id: 0x001(3)
[1735179326.285996] info      | ProxyClient.cpp    | create_topic      | topic created      | client_key: 0x0E5C3397, topl
c_id: 0x002(2), participant_id: 0x000(1)
[1735179326.345401] info      | ProxyClient.cpp    | create_publisher  | publisher created   | client_key: 0x0E5C3397, publ
isher_id: 0x002(3), participant_id: 0x000(1)
[1735179326.365619] info      | ProxyClient.cpp    | create_datawriter | datawriter created  | client_key: 0x0E5C3397, data
writer_id: 0x002(5), publisher_id: 0x002(3)
[1735179326.372863] info      | ProxyClient.cpp    | create_topic      | topic created      | client_key: 0x0E5C3397, topl
c_id: 0x003(2), participant_id: 0x000(1)
[1735179326.379913] info      | ProxyClient.cpp    | create_publisher  | publisher created   | client_key: 0x0E5C3397, publ
isher_id: 0x003(3), participant_id: 0x000(1)
[1735179326.448851] info      | ProxyClient.cpp    | create_datawriter | datawriter created  | client_key: 0x0E5C3397, data
writer_id: 0x003(5), publisher_id: 0x003(3)
[1735179326.548363] info      | ProxyClient.cpp    | create_topic      | topic created      | client_key: 0x0E5C3397, topl
c_id: 0x004(2), participant_id: 0x000(1)
[1735179326.565153] info      | ProxyClient.cpp    | create_subscriber | subscriber created   | client_key: 0x0E5C3397, subs
criber_id: 0x000(4), participant_id: 0x000(1)
[1735179326.574254] info      | ProxyClient.cpp    | create_datareader | datareader created  | client_key: 0x0E5C3397, data
reader_id: 0x000(6), subscriber_id: 0x000(4)
```

2. Start the keyboard control program

2.1 Code path

Virtual machine code path:

```
/home/yahboom/yahboomcar_ws/src/yahboomcar_ctrl/yahboomcar_ctrl
```

2.2 Run command

Take the matching virtual machine as an example, you can directly enter it in the terminal,

```
ros2 run yahboomcar_ctrl yahboom_keyboard
```

```
yahboom@yahboom-VM:~$ ros2 run yahboomcar_ctrl yahboom_keyboard

Control Your SLAM-Bot!
-----
Moving around:
  u      i      o
  j      k      l
  m      ,      .

q/z : increase/decrease max speeds by 10%
w/x : increase/decrease only linear speed by 10%
e/c : increase/decrease only angular speed by 10%
t/T : x and y speed switch
s/S : stop keyboard control
space key, k : force stop
anything else : stop smoothly

CTRL-C to quit

currently:      speed 20.0      turn 300.0
```

Then, according to the instructions below, press the corresponding button to control the movement of the car,

2.3 Direction control

| Button | Linear angular velocity | Direction | Button | Linear angular velocity | Direction |
|--------------------------|-------------------------|--------------|--------------------------|----------------------------|---------------|
| [i] or [I] | [linear, 0] | Go forward | [u] or [U] | [linear, angular] | Turn left |
| [,] | [-linear, 0] | Go backward | [o] or [O] | [linear, -angular] | Turn right |
| [j] or [J] | [0, angular] | Rotate left | [m] or [M] | [-linear, -angular] | Reverse left |
| [l] or [L] | [0, -angular] | Rotate right | [.] | [-linear, angular] | Reverse right |

2.4 Speed control

| Button | Speed change | Button | Speed change |
|------------|----------------------------------------------------|------------|----------------------------------------------------|
| 【q】 | Increase both linear and angular velocities by 10% | 【z】 | Decrease both linear and angular velocities by 10% |
| 【w】 | Increase only linear velocity by 10% | 【x】 | Decrease only linear velocity by 10% |
| 【e】 | Increase only angular velocity by 10% | 【c】 | Decrease only angular velocity by 10% |
| 【t】 | Switch between linear velocity X-axis and Y-axis | 【s】 | Stop keyboard control |

Note: Since the car is a two-wheeled balancing structure and cannot move sideways, the **【t】** key is meaningless.