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Autonomous Vehicles Research Studio

Setup Guide – Router to PC Setup

v 2.0 — 18th April 2023

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A. IP Setup / Change

Note: The ground control station PC has already been configured with IP 192.168.2.5 to connect to the provided router that has the IP 192.168.2.1. The steps below are in case the IP needs to be changed. If you just need to confirm/test the connection, please see section C.

1. Make sure both the ground control station PC and the router are powered on.

2. With the router connected directly to the ground control station PC via an ethernet cable, open the Network and Sharing Center (search for Control Panel, and then navigate to Control Panel > Network and Internet > Network and Sharing Center).

3. Click on the Ethernet link, as shown in Figure 1, to open the Ethernet Status dialog box.
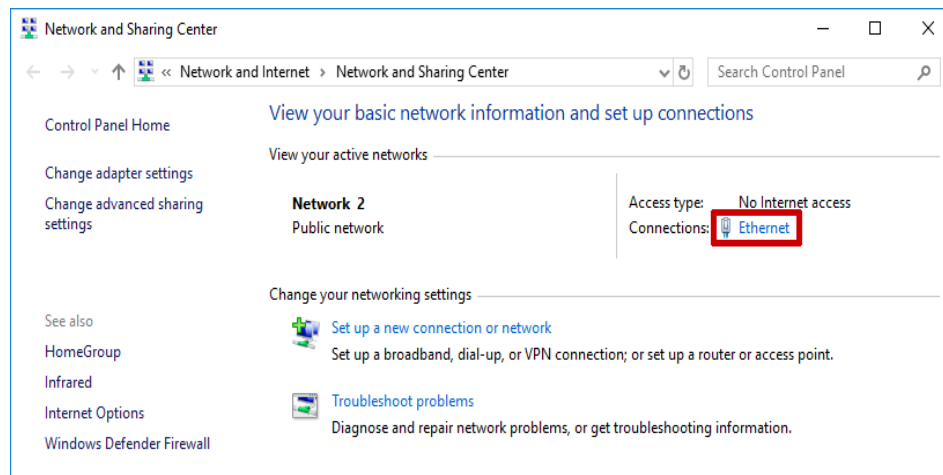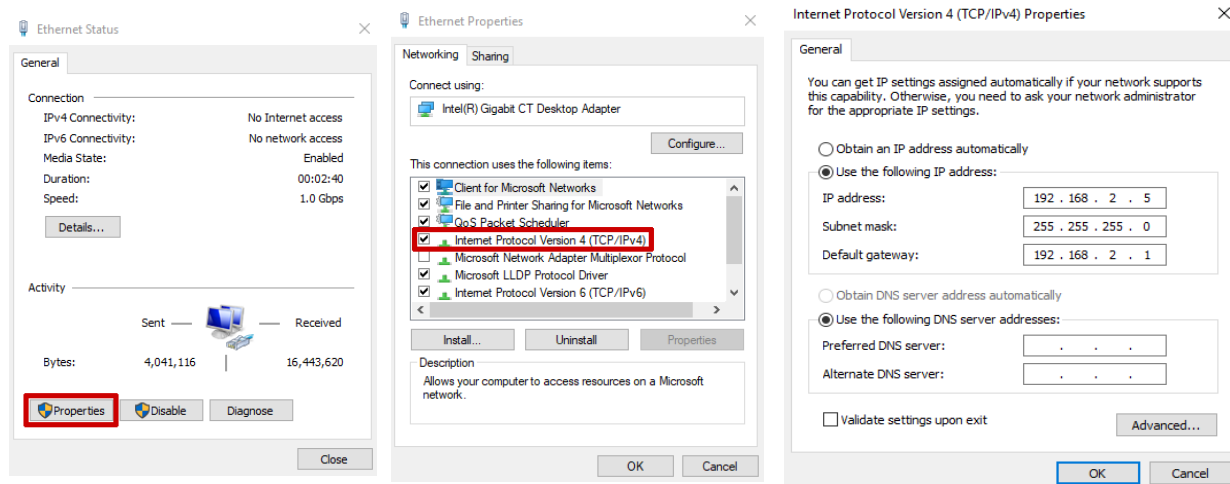

Figure 1: Ethernet Status settings via the Network and Sharing Center

Note: In case an ethernet cable is plugged into the second ethernet port on the PC (for Prime cameras or Internet), a second link labelled Ethernet 2 will also be displayed. These steps are NOT meant for that link.

4. In the Ethernet Status dialog box (Figure 2a), click on Properties, which opens an Ethernet Properties dialog box (Figure 2b). Double-click on Internet Protocol Version 4 (TCP/IPv4), which opens the properties dialog box (Figure 2c).

a. Ethernet Status   b. Ethernet Properties   c. IPv4 Properties

Figure 32: Setting a static IP for the ground control station PC

5. Set the IP address to `192.168.2.x`, where x can be any single digit from 2 to 9. This is the static IP that will be assigned to the ground control station PC and will be used in the communication infrastructure of all the models. Set the Subnet mask to `255.255.255.0` and the Default gateway to `192.168.2.1` (IP of the router).

> **Note:** Each PC/laptop used with the **Autonomous Vehicles Research Studio** should have a unique static IP. **The ground control station PC is pre-configured to 192.168.2.5**

6. Press OK in the IPv4 Properties dialog box, OK in the Ethernet Properties dialog box and Close in the Ethernet Status dialog box.

B. Connecting a Device Wirelessly

To connect additional vehicles to the UVS network the 5 GHz and 2.4 GHz bands on the router have been configured as follows:

5GHz:
SSID: Quanser_UVS-5G   Password: UVS_wifi
2.4GHz:
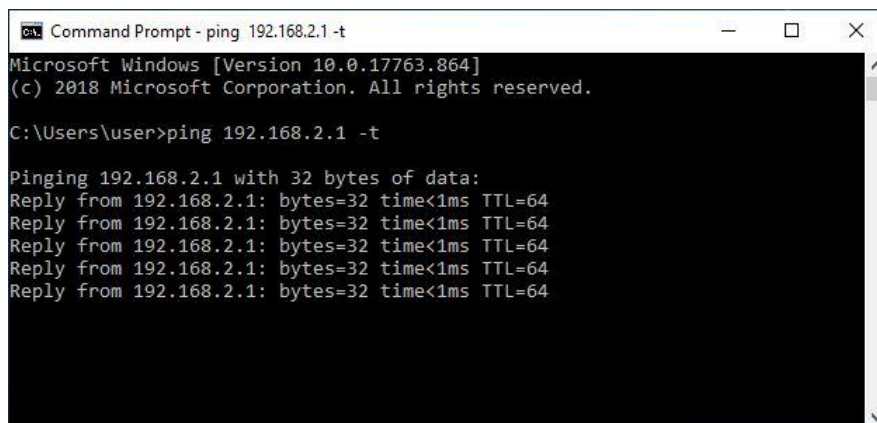SSID: Quanser_UVS   Password: UVS_wifi

Router login credentials are as follows:
Username: admin   Password: Quanser_123

C. Testing Router-PC Connectivity

1. Make sure both the ground control station PC and the router are powered on and that the router is connected directly to the ground control station PC via an ethernet cable. If using a laptop (not recommended), make sure to confirm you are connected to the router, either wirelessly or using an ethernet cable.

2. Open a Command Prompt (type cmd in the Start Menu).

3. Enter the following command: ipconfig and press enter. This should show something like the output in Figure 4. Showing your current computer's IP and the default gateway (router's IP).

4. Confirm that your computer is set up in the default IP (192.168.2.5) or to the one you set up in section A.

5. Enter the following command in the prompt: `ping 192.168.2.1` and press enter. If you see consistent replies from the router (Figure 4), the communication link between the ground control station PC and the router has been set up correctly.

```
Command Prompt - ping 192.168.2.1 -t                    —   □   ×
Microsoft Windows [Version 10.0.17763.864]
(c) 2018 Microsoft Corporation. All rights reserved.

C:\Users\user>ping 192.168.2.1 -t

Pinging 192.168.2.1 with 32 bytes of data:
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
Reply from 192.168.2.1: bytes=32 time<1ms TTL=64
```

Figure 4: Ping command from the ground control station PC to the router

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