Autonomous   Vehicles Research Studio

Setup Guide – Ground PC Setup

v 2.0 — 18*th April* 2023

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A. Ground Control Station PC

The PC should be connected to the following components, as depicted in Figure 1.

1. Peripherals - mouse/keyboard
2. Localization cameras - OptiTrack camera hub and hardware key,
   see Step 3 – Camera mounting/setup document.
3. Router - ethernet connection, see Router below.
4. FrSky/joystick USB Dongle, see Step 6 – Joystick document.
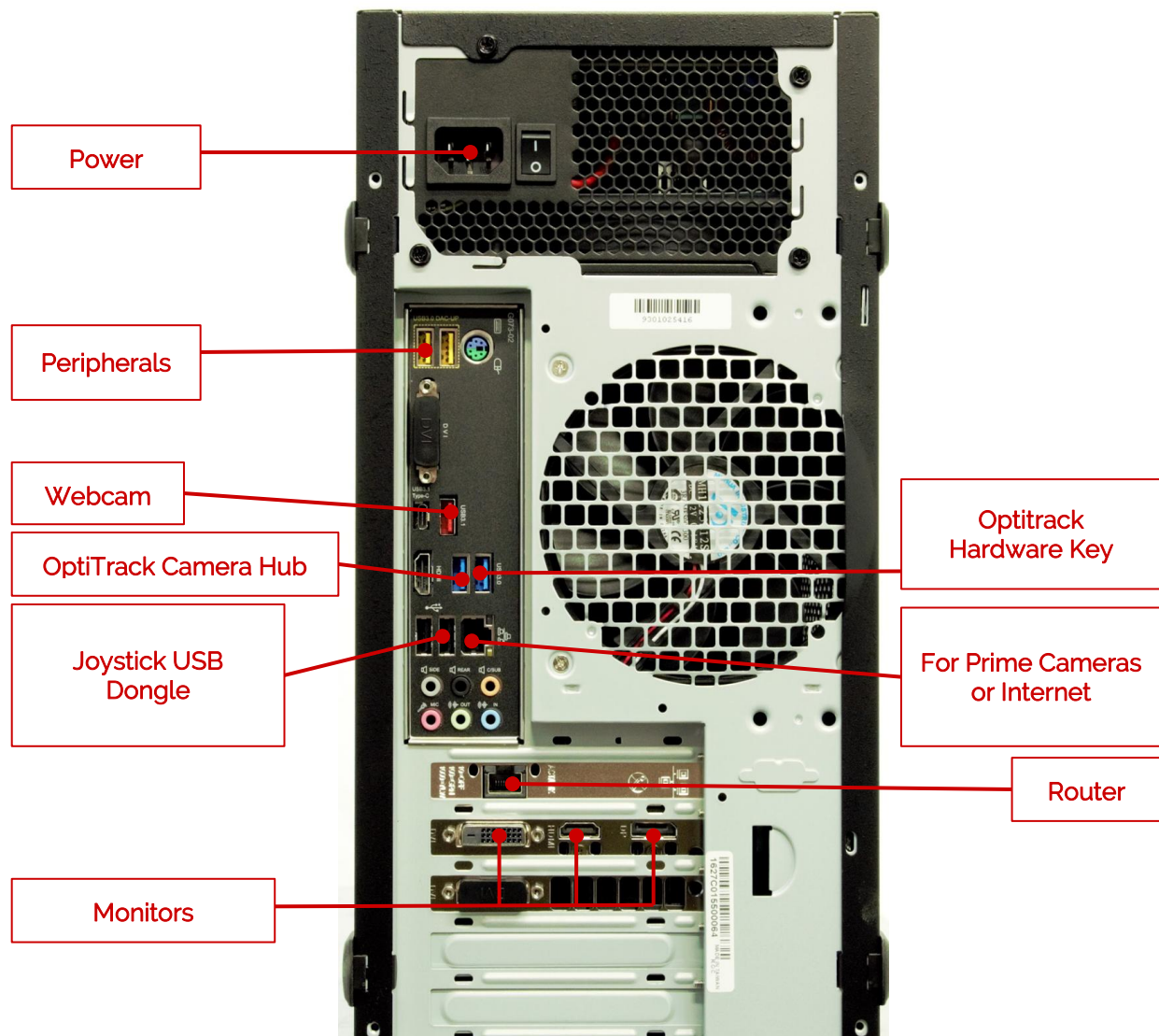5. Monitors
6. Webcam

Figure 1: PC wiring

B. Router

The Autonomous Vehicles Research Studio comes with a NETGEAR R7000 - Nighthawk AC1900 high performance router (Figure 2). If you have a QDrone 2 it comes with a NETGEAR R7200 - Nighthawk AC2100. It is pre-configured to use both 2.4GHz and 5GHz bands for multiple PCs and autonomous vehicles. The Qdrone 1/2 and QBot 2/2e are pre-configured to automatically connect to the router when powered on, streamlining the connection process.
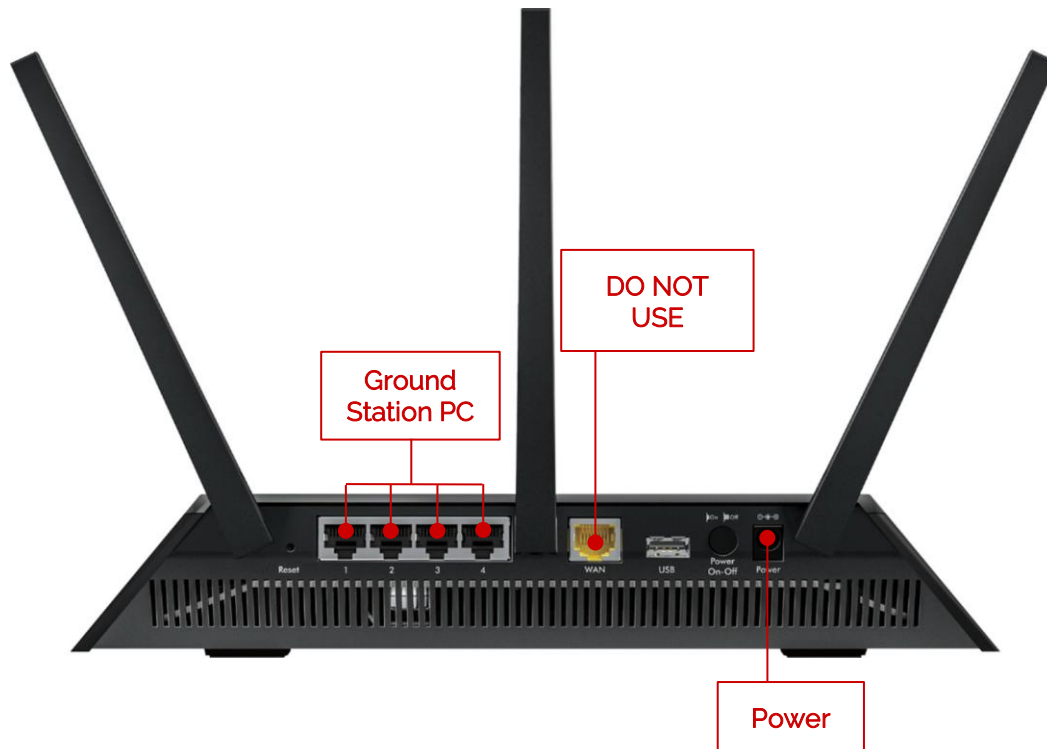

a. Front view of the router   b. Router power supply   c. Ethernet cable

d. Rear view of the router

Figure 2: the NETGEAR R7000 - Nighthawk AC1900 router

1. Both routers should look very similar to the one in Figure 2. Connect the power supply (Figure 2b) provided with the router to the power port on the back of the router (Figure 2d).
2. Connect the ground control station PC to the router by using the provided ethernet cable (Figure 2c) and one of the four ports on the back of the router labelled 1 to 4 (Figure 2d).

Note: DO NOT use the yellow port labelled WAN to connect to the ground control station PC. This port is used to provide an internet connection to the router, which is not recommended, as the router is configured to optimize local traffic only.

3. Connect the other end of the ethernet cable directly into the ground control station PC using the Ethernet port at the bottom (the PCI-Ethernet adaptor port, see Figure 2).

Note: DO NOT use an ethernet switch or any other device between the router and the ground control station PC

4. Turn on the router. After a few minutes, the lights on the front of the router (Figure 2a) should start flashing with a white light to indicate to the user that the particular ports are active.

C. Checkpoint – Setup Picture

Take a picture of your wired setup including the PC and router to confirm with a Quanser engineer or technical support specialist (tech@quanser.com) that the workspace is properly configured.

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