* workstation pro 17

https://www.youtube.com/watch?v=WN92\_\_i4rbw

[https://support.broadcom.com/](https://www.youtube.com/redirect?event=video_description&redir_token=QUFFLUhqbmc2ak9BemtQd09ReFVXQTcyT0wxOFQyOU13QXxBQ3Jtc0ttTHZKck1BU2lnSzNMZ1g0MmhEbXN5SkxTd195M2VDVVBJWUtYcjRNTnV0bFl4ZTNmd3l4bWxMa29UV2l6VnRuUlAtUEJET0dzUzBXQURuNTdaOWE2bEdqaEt3d3lEaE10dXMyMGJIOEstSnpQcUNNbw&q=https://support.broadcom.com/&v=WN92__i4rbw" \t "https://www.youtube.com/_blank)

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* Ubentu 22.04 (need workstation pro)

<https://www.youtube.com/watch?v=QYOzg33US5c>

<https://releases.ubuntu.com/22.04/>

* ROS2 humble (need Ubentu)

Ctrl+alt+t open the terminal

Download open VM tools to VM to enable clipboard copy and paste (ctrl+shift+v)

sudo apt-get install open-vm-tools open-vm-tools-desktop

Restart VM then you can do ctrl+shift+v

Then Follow the instruction on:

<https://docs.ros.org/en/humble/Installation/Alternatives/Ubuntu-Development-Setup.html>

* After downloading Ros2, download kortex api

<https://github.com/Kinovarobotics/ros2_kortex?tab=readme-ov-file>

* Ros2 create package tutorial

<https://docs.ros.org/en/humble/Tutorials/Beginner-Client-Libraries/Creating-A-Workspace/Creating-A-Workspace.html#new-directory>

<https://docs.ros.org/en/humble/Tutorials/Beginner-Client-Libraries/Creating-Your-First-ROS2-Package.html>

Ros2 to unity

https://github.com/RobotecAI/ros2-for-unity/releases/tag/1.3.0

* Axis studio

<https://neuronmocap.com/pages/axis-studio>

<https://neuronmocap.com/pages/unity>

<https://www.youtube.com/watch?v=20LMAKrdPG4> (Axis stuidio to Unity)

* Unity hub

<https://unity.com/unity-hub>

* Axis studio -> unity

https://support.neuronmocap.com/hc/en-us/articles/4404716922779-Install-Neuron-Mocap-Live-for-Unity

[https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2FKinovarobotics&data=05%7C02%7Cyuchen.xing%40uky.edu%7C9ab5e879400143cdb1cf08dcc9034e52%7C2b30530b69b64457b818481cb53d42ae%7C0%7C0%7C638606263231489639%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=jhNbIbhT81KUoE7XUhdR5K8%2Bh7gj5I%2Ff%2FHvzcbKp7jc%3D&reserved=0](https://nam04.safelinks.protection.outlook.com/?url=https://github.com/Kinovarobotics&data=05|02|yuchen.xing@uky.edu|9ab5e879400143cdb1cf08dcc9034e52|2b30530b69b64457b818481cb53d42ae|0|0|638606263231489639|Unknown|TWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0=|0|||&sdata=jhNbIbhT81KUoE7XUhdR5K8+h7gj5I/f/HvzcbKp7jc=&reserved=0" \o "Original URL: https://github.com/Kinovarobotics. Click or tap if you trust this link." \t "https://outlook.office.com/mail/inbox/id/_blank)

[https://nam04.safelinks.protection.outlook.com/?url=https%3A%2F%2Fgithub.com%2FBingHannah%2Fkinova-teleoperation%2Ftree%2Fmain&data=05%7C02%7Cyuchen.xing%40uky.edu%7C9ab5e879400143cdb1cf08dcc9034e52%7C2b30530b69b64457b818481cb53d42ae%7C0%7C0%7C638606263231499668%7CUnknown%7CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%3D%7C0%7C%7C%7C&sdata=0D18V4a8lfZVwJdhMqN4nD7SzL4j81vK1Bk8ywOlB80%3D&reserved=0](https://nam04.safelinks.protection.outlook.com/?url=https://github.com/BingHannah/kinova-teleoperation/tree/main&data=05|02|yuchen.xing@uky.edu|9ab5e879400143cdb1cf08dcc9034e52|2b30530b69b64457b818481cb53d42ae|0|0|638606263231499668|Unknown|TWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0=|0|||&sdata=0D18V4a8lfZVwJdhMqN4nD7SzL4j81vK1Bk8ywOlB80=&reserved=0" \o "Original URL: https://github.com/BingHannah/kinova-teleoperation/tree/main. Click or tap if you trust this link." \t "https://outlook.office.com/mail/inbox/id/_blank)

ros2 launch my\_robot\_description display.launch.py

Set the ip address and port number of communicate\_socket script the same as those in the 2 files in package my\_robot\_controller

ros2 run my\_robot\_controller socket\_node

<https://www.noitom.com/perception-neuron-downloads>

1. Download and install newest Dongle version of Axis Studio
2. workstation pro 17

https://www.youtube.com/watch?v=WN92\_\_i4rbw

[https://support.broadcom.com/](https://www.youtube.com/redirect?event=video_description&redir_token=QUFFLUhqbmc2ak9BemtQd09ReFVXQTcyT0wxOFQyOU13QXxBQ3Jtc0ttTHZKck1BU2lnSzNMZ1g0MmhEbXN5SkxTd195M2VDVVBJWUtYcjRNTnV0bFl4ZTNmd3l4bWxMa29UV2l6VnRuUlAtUEJET0dzUzBXQURuNTdaOWE2bEdqaEt3d3lEaE10dXMyMGJIOEstSnpQcUNNbw&q=https://support.broadcom.com/&v=WN92__i4rbw" \t "https://www.youtube.com/_blank)

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1. Download the latest version of Ubuntu and install in VM

<https://ubuntu.com/download/desktop>

1. Unlock copy and paste:

sudo apt-get install open-vm-tools open-vm-tools-desktop

Restart VM then you can do ctrl+shift+v

cd ~/ros2\_ws

colcon build --symlink-install

source /opt/ros/humble/setup.bash

source ~/ros2\_ws/install/setup.bash

**Simulation**

cd ~/ros2\_ws

**ros2 run my\_robot\_controller socket\_node**

**ros2 run my\_robot\_viewer viewer\_node\_simulation**

cd ~/workspace/ros2\_kortex\_ws

ros2 launch kortex\_description view\_robot.launch.py \

robot\_type:=gen3 \

gripper:=robotiq\_2f\_85

ros2 run cylinder\_viz cylinder\_publisher

**Physical:**

ros2 topic pub /joint\_trajectory\_controller/joint\_trajectory trajectory\_msgs/JointTrajectory "{

joint\_names: [joint\_1, joint\_2, joint\_3, joint\_4, joint\_5, joint\_6, joint\_7],

points: [

{ positions:[0,0,0,0,0,0,0], time\_from\_start: { sec: 10 } },

]

}" -1

cd ~/ros2\_ws

**ros2 run my\_robot\_controller socket\_node**

**ros2 run my\_robot\_viewer viewer\_node**

**ros2 run joint\_state\_to\_trajectory trajectory\_publisher**

ros2 launch kortex\_bringup gen3.launch.py robot\_ip:=192.168.1.10

**<http://192.168.1.10>**