Robot movements with joystick and tool Z - Rz move.

The joystick solution can be used on UR3 – UR5 and UR10 for control of the Universal-Robots movement and for tool Z - Rz move.

As the movement is hand controlled and communication is via Ethernet the repeatability might vary compared to using waypoints programmed directly on the robot.

1 Risk assessment.

Remember to perform risk assessment before use:

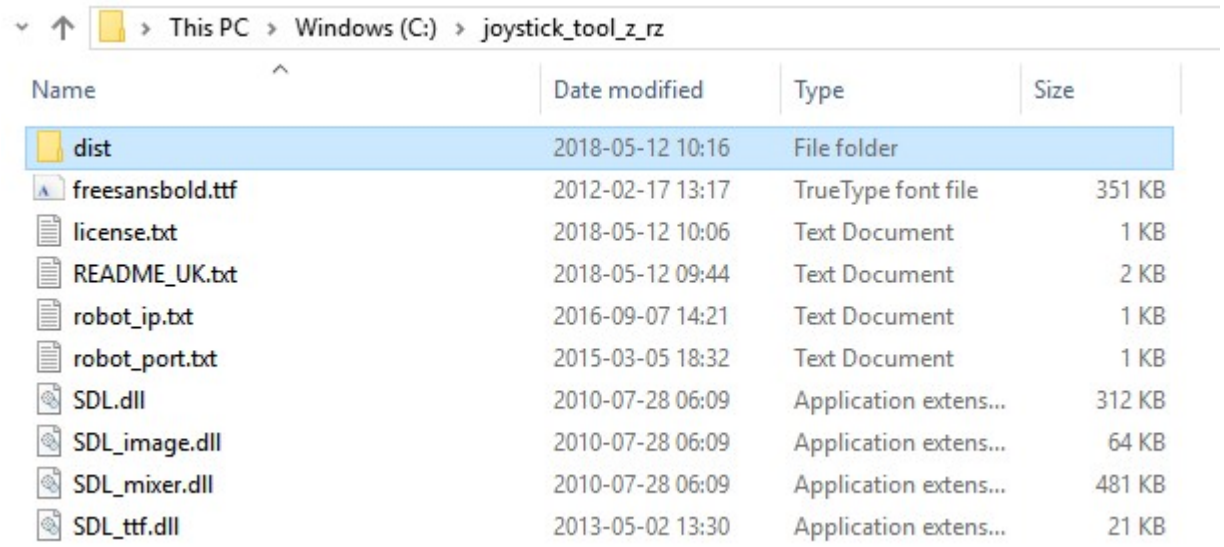
2 Program installation:

The application need to run on an external PC with Win 7 or 8 or 10 (PC and Win not included in packet).

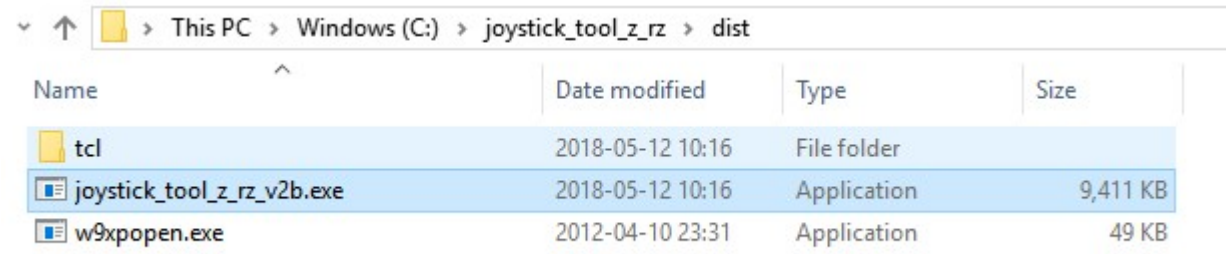
Create a folder with the name “joystick_tool_z_rz” in C: drive.

The application is delivered in a zip file.

Unzip the zip file in “joystick_tool_z_rz” directory.

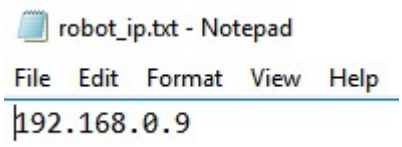


(The “.EXE” file will be located in C:\joystick_tool_z_rz\dist)

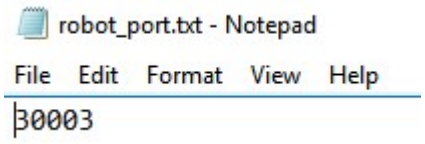


Configure the robot target IP address in the file robot_ip.tx. This is the IP address of the robot which must be connected to the same network as the PC where this joystick application is running. In this example the IP address of the robot is 192.168.0.9.

Example of addresses:



Configure the robot target Port address in the file robot_port.txt (Use 30003 as default).



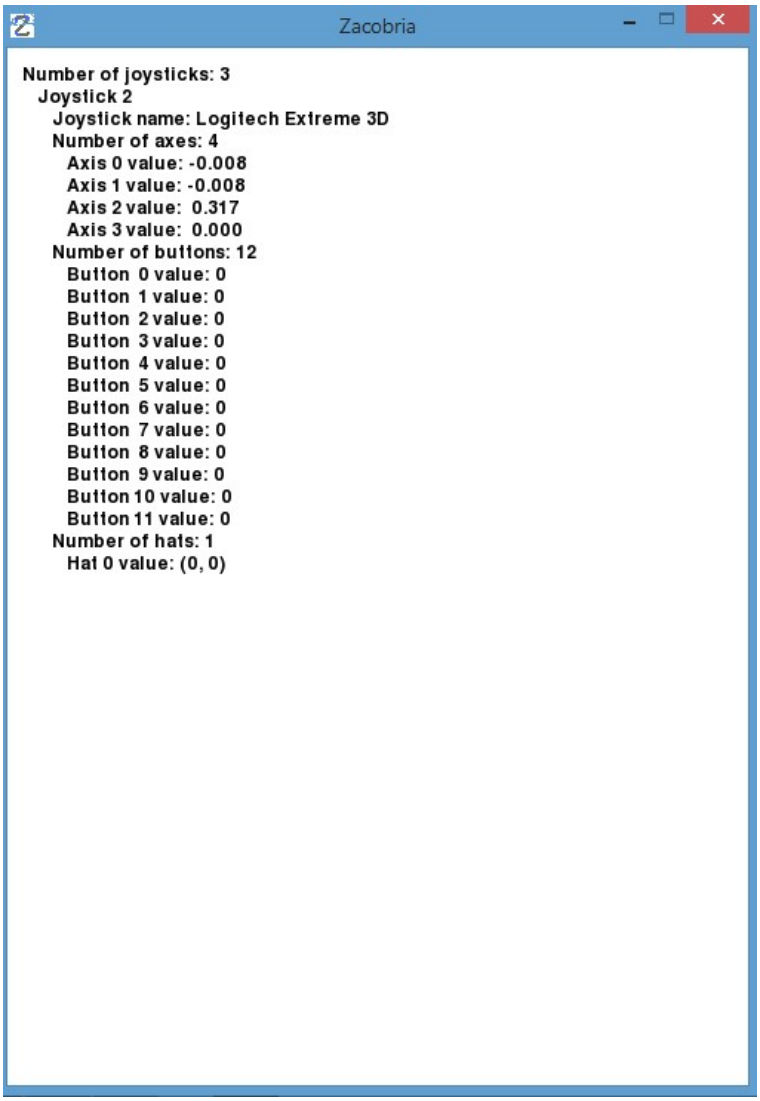
Connect the joystick to the computer USB port and let Windows find it and install driver.

3 Start the program.

Run “joystick_tool_z_rz_v1_2b.exe” from **C:\joystick_tool_z_rz\dist** folder. Maybe consider to create a shortcut to the EXE file.

The first time it can take a few seconds if a virus scanner is analyzing the file.

When the program is started and there is a proper connection to the robot – a screen will appear with button overview if the joystick has been installed correct and the license file is correct.

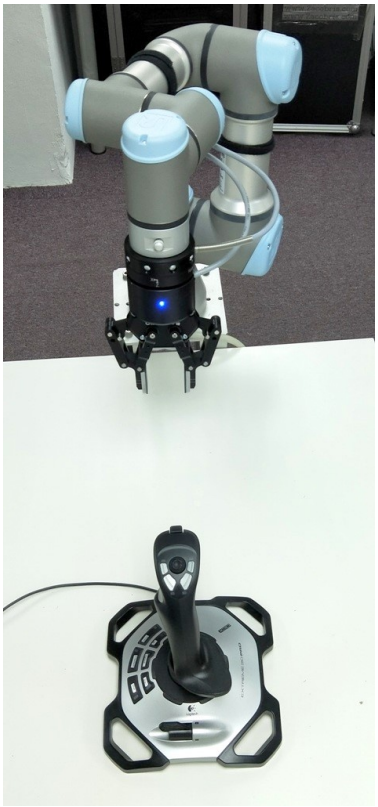


4 Placement of robot and tool head.

Dismount any tool on the robot before testing. Place the robot so the coordinates are viewed as “Feature Base” and with following values.

X = 0
Y = 300
Z = 350
Rx = 3.14
Ry = 0.0
Rz = 0.0

Notice where the cable is coming out from the robot is the Y axis.



5 Activate communication.

5.1 Activations and deactivations of communication.

In order to get the robot to move the communication has to be opened by pressing the “Start com”. After pressing “Start” wait 5 seconds and then the robot can be controlled by the joystick.

The communication can be disabled by pressing “Stop com”.

6 Control of robot X – Y direction:

X and Y direction is controlled with the “Hat” on the joystick.

6.1 Control of Robot - Rotation:

Rotation vector (Rx, Ry, Rz) are controlled with the joystick handle by push-pull-rotate in each direction.

6.2 Up/Down.

Up/Down – is activated by the trigger on the robot and by using the variable speed slider up/down (+/-) control.

In plus direction and pressing the trigger will move the robot upwards.

In minus direction and pressing the trigger will move the robot downwards.

The up/down speed can be controlled with the variable button.

7 Speed slider regulator for Up/Down:

The variable up/down (+/-) speed slider control – can also be used for speed regulator for X and Y directions (Hat control).

Notice:
The speed for Rx, Ry and Rz is fixed and is not affected by the speed slider.

7.1 Tool Rz move:

Press the top left side button – and use the Speed slider to control the Tool Rz direction and the speed.

This might require two hands – place the right hand on the top button and the left hand on the speed slider – Press the top button and at the same time adjust the speed slider to the desired direction and speed.

Notice that the speed is slow when the speed slider is in the middle position and then the robot moves faster in one direction when the speed slider is turned upwards – and the robot also moves faster but in another direction when the speed slider is turned downwards.

7.2 Tool Z move

Press the top right side button – and use the Speed slider to control the Tool Z direction and the speed.

This might require two hands – place the right hand on the top button and the left hand on the speed slider – Press the top button and at the same time adjust the speed slider to the desired direction and speed.

Notice that the speed is slow when the speed slider is in the middle position and then the robot moves faster in one direction when the speed slider is turned upwards – and the robot also moves faster but in another direction when the speed slider is turned downwards.