

Robot movements with joystick and record of path.

1	Risk assessment.....	1
2	Program installation:.....	2
3	Start the program.....	4
4	Placement of robot and tool head.....	5
5	Direct mode - Activate communication.....	6
5.1	Activations and deactivations of communication.....	6
6	Direct mode - Control of robot.....	7
6.1	X – Y direction:.....	7
6.2	Direct mode - Rotation:.....	8
6.3	Direct mode - Up/Down.....	9
6.4	Direct mode - Speed regulator X – Y and Up – Down Speed control.....	9
6.5	Direct mode - Trigger.....	10
6.6	Direct mode - Home Button.....	11
6.7	Recording mode - Recording of path.....	12

The joystick solution can be used on UR3 – UR5 and UR10 for control of the Universal-Robots movement and for recording of path.

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

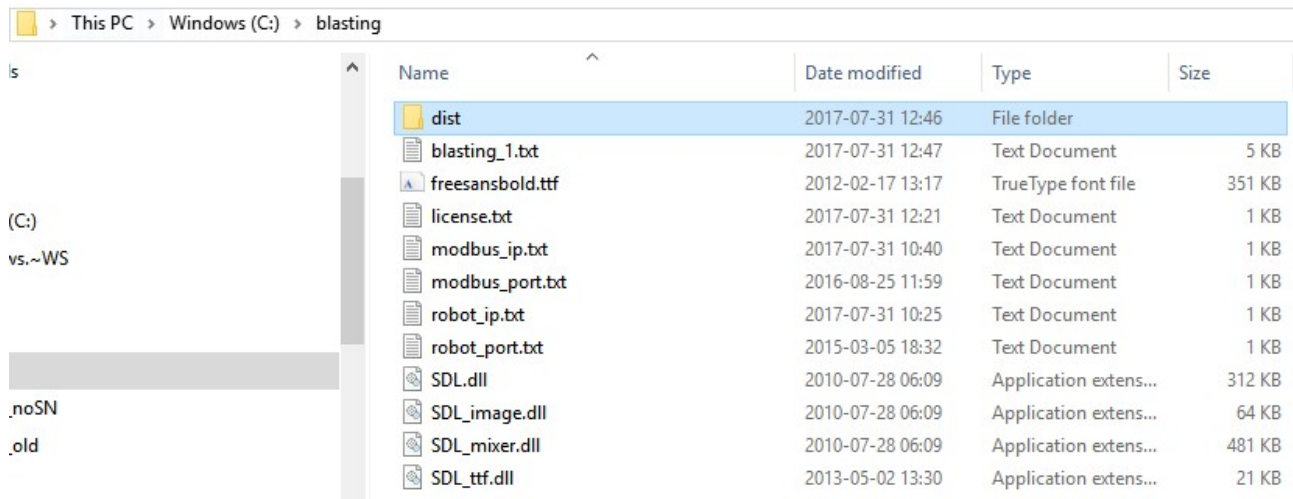
1 Risk assessment.

Remember to perform risk assessment before use:

2 Program installation:

Create a folder with the name blasting in C:

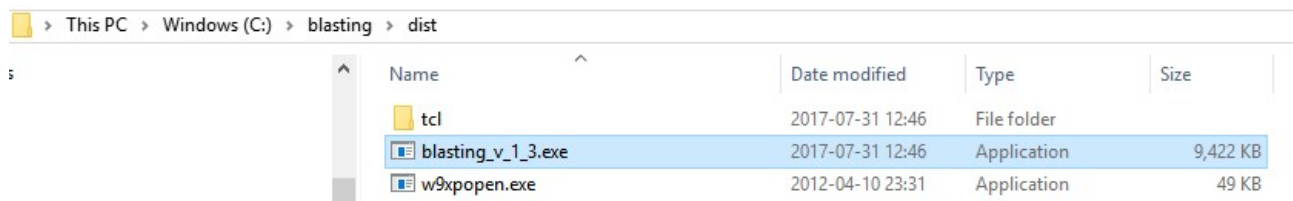
Unzip the zip file in blasting directory.



This screenshot shows a Windows File Explorer window with the address bar set to 'This PC > Windows (C:) > blasting'. The left sidebar shows the 'C:' drive and a folder named 'vs.~WS'. The main pane displays a list of files and folders:

Name	Date modified	Type	Size
dist	2017-07-31 12:46	File folder	
blasting_1.txt	2017-07-31 12:47	Text Document	5 KB
freesansbold.ttf	2012-02-17 13:17	TrueType font file	351 KB
license.txt	2017-07-31 12:21	Text Document	1 KB
modbus_ip.txt	2017-07-31 10:40	Text Document	1 KB
modbus_port.txt	2016-08-25 11:59	Text Document	1 KB
robot_ip.txt	2017-07-31 10:25	Text Document	1 KB
robot_port.txt	2015-03-05 18:32	Text Document	1 KB
SDL.dll	2010-07-28 06:09	Application extens...	312 KB
SDL_image.dll	2010-07-28 06:09	Application extens...	64 KB
SDL_mixer.dll	2010-07-28 06:09	Application extens...	481 KB
SDL_ttf.dll	2013-05-02 13:30	Application extens...	21 KB

(EXE will be located in C:\joystick\dist)



This screenshot shows a Windows File Explorer window with the address bar set to 'This PC > Windows (C:) > blasting > dist'. The left sidebar shows the 'C:' drive and a folder named 'vs.~WS'. The main pane displays a list of files and folders:

Name	Date modified	Type	Size
tcl	2017-07-31 12:46	File folder	
blasting_v_1_3.exe	2017-07-31 12:46	Application	9,422 KB
w9xpopup.exe	2012-04-10 23:31	Application	49 KB

Configure the robot target IP address in the file robot_ip.tx

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

```
robot_ip.txt - Notepad
File Edit Format View Help
192.168.0.9
```

```
robot_port.txt - Notepad
File Edit Format View Help
30003
```

```
modbus_ip.txt - Notepad
File Edit Format View Help
192.168.0.9
```

```
modbus_port.txt - Notepad
File Edit Format View Help
502
```

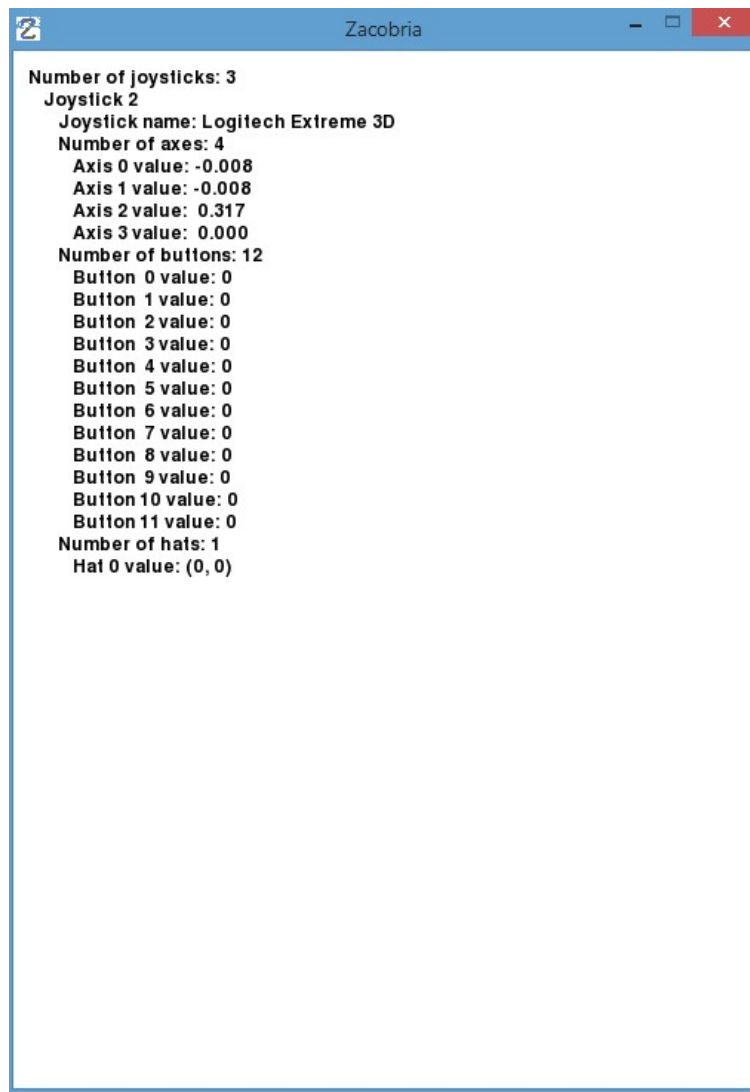
Connect the joystick to the computer USB port and let Windows find it and install driver.

3 Start the program.

Run `blasting_v1_3.exe` from `C:\blasting\dist` folder.

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.



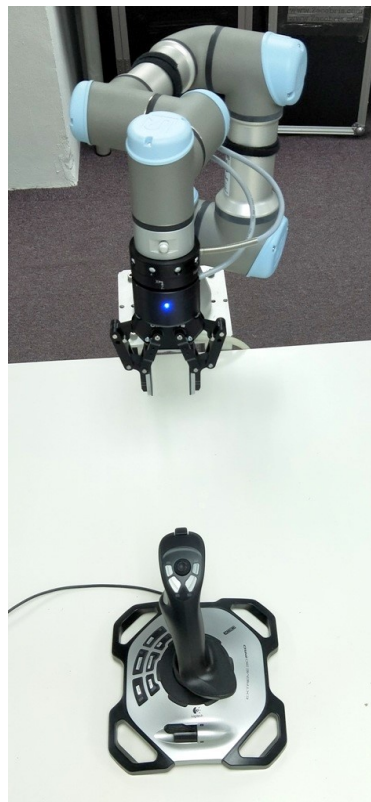
4 Placement of robot and tool head.

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 in the Y axis. Place the Joystick in front of the robot along the Y axis.



5 Direct mode - Activate communication.

5.1 Activations and deactivations of communication.

In “Direct mode” the robot is controlled directly with the joystick and the robot responds to joystick movements.

In order to get the robot to move the communication has to be opened by pressing the “Start”.

The communication to robot can be disabled by pressing “Stop”.



6 Direct mode - Control of robot.

6.1 X – Y direction:

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



6.2 Direct mode - Rotation:

Rotation vector (R_x , R_y , R_z) are controlled with the joystick handle by push-pull-rotate in each direction.



6.3 Direct mode - Up/Down.

Up/Down – is activated by the “Up” and “Down” button on the joystick.

6.4 Direct mode - Speed regulator X – Y and Up – Down Speed control.

The speed of R – Y and Up – Down can be controlled with the (+/-) control.

Notice:

The speed for Rx, Ry and Rz is fixed.



6.5 Direct mode - Trigger.

The trigger sets output 2 high on the robot when triggered.



6.6 Direct mode - Home Button.

The robot has a predefine “Home” position at

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

This position can be reached by pressing the “Home” (5) button of the joystick when the communication is enabled i.e. after pressing “Start”.

Notice: The “Home” button is not recorded if pressed while in “Record mode”. The main purpose of the “Home button” is to be able to send the robot fast to the “Home position” after recording and before playing back in order to have a defined starting position for start of recording and for start of playback.



6.7 Recording mode - Recording of path.

Press “Start” to enable the communication to robot.

Place the robot in the desired start position – for example using the “Home button (5)”.

Press “Record” to activate recording of path.

Move the robot with the joystick.

Press “Stop” when the recording of path is complete.

Press “Start” to enable the communication and move the robot to the starting position – for example by using the “Home button” (5).

Press “Playback” and the robot perform the recorded path.

