SPACEMOUSE

MAPPING MANUAL | V1.0

Contents

SPACEMOUSE MAPPING MANUAL

1. REQUIREMENTS

The Reach Control software allows a user of Reach Robotics manipulators to use a SpaceMouse to control the movements of the product.

SpaceMouse mapping requires Reach Control V3.4.1 or above.

Reach Control supports 3D Connexion Space Mice. The following is a list of devices that are known to work with Reach Control:

- **SpaceMouse Pro**
- **SpaceMouse Pro Wireless**
- **SpaceMouse Compact**
- **SpaceMouse Wireless**

Other devices may work but have not been tested by Reach Robotics.

2. INITIAL SETUP

Reach Control will automatically connect to your SpaceMouse when you open the software. Ensure that it is plugged in and that only one SpaceMouse is connected.
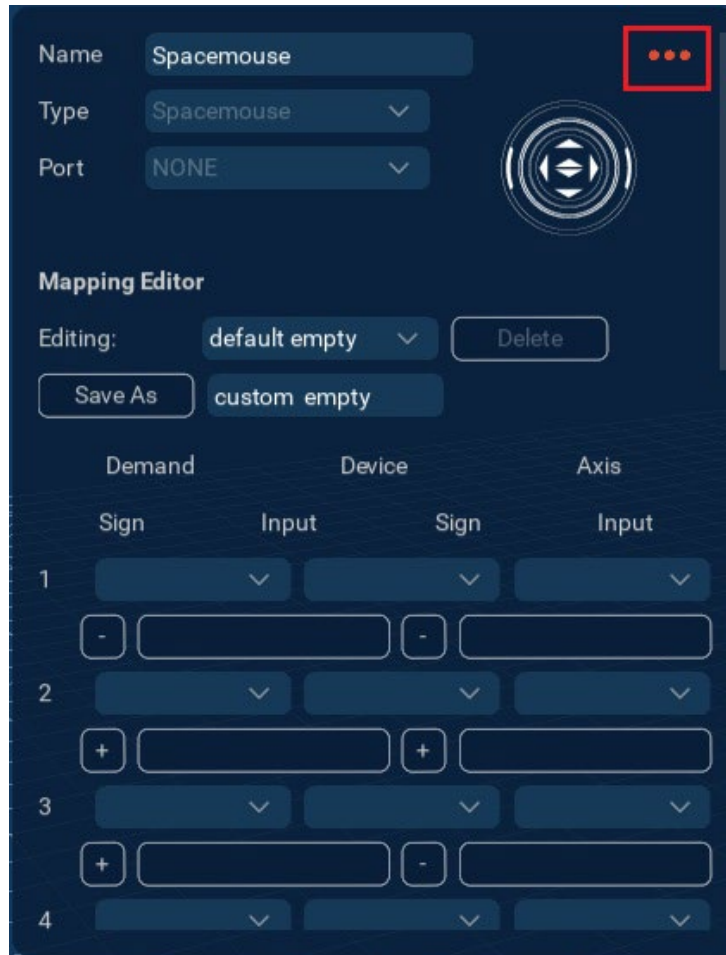
STEP 1. ACCESS THE SPACE MOUSE MENU

Go to the settings menu (Gear Icon) > Control > SpaceMouse
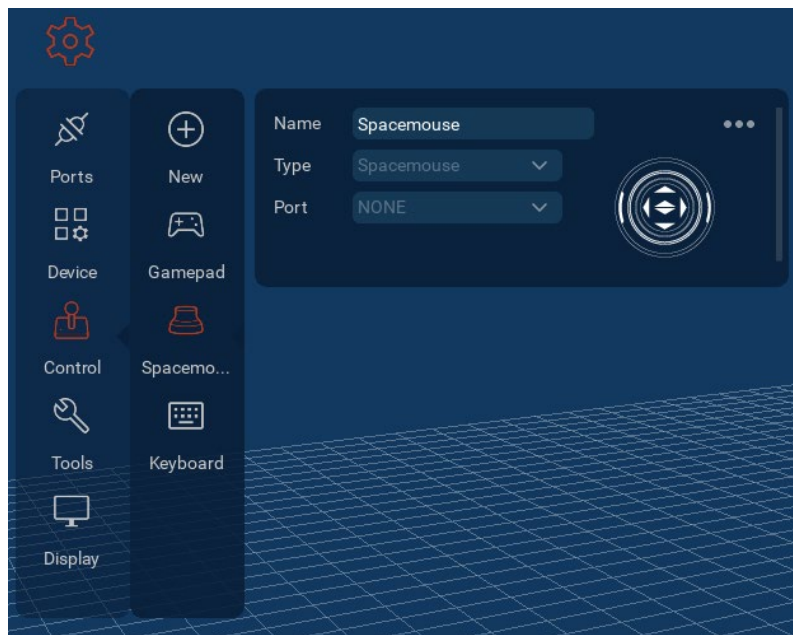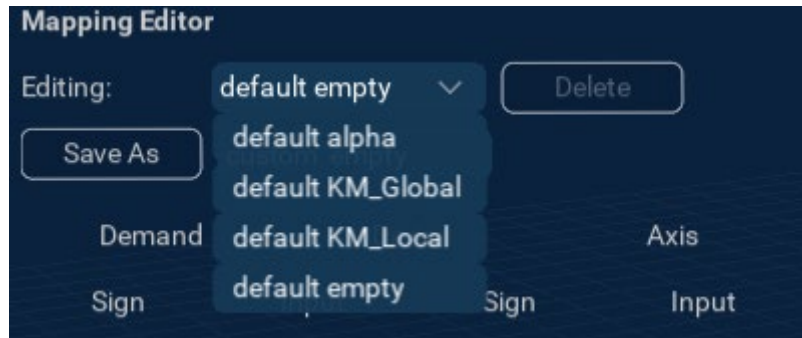
STEP 2. EXPAND THE SPACEMOUSE MENU

At the top-right corner of the Gamepad window, click the three dots to access the configuration menu.
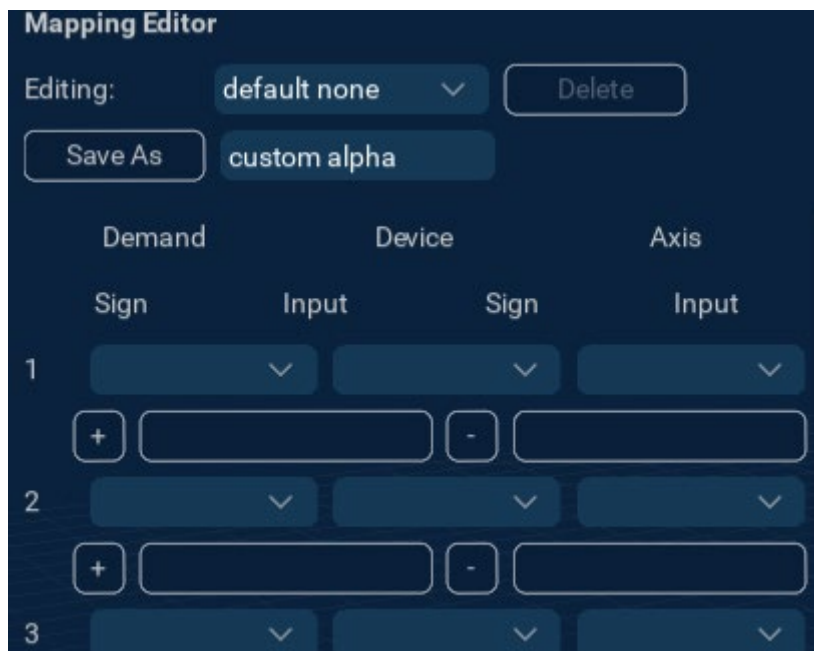
3. CREATING A MAPPING

To use a gamepad to control a Reach Robotics manipulator, you must create a mapping in Reach Control.
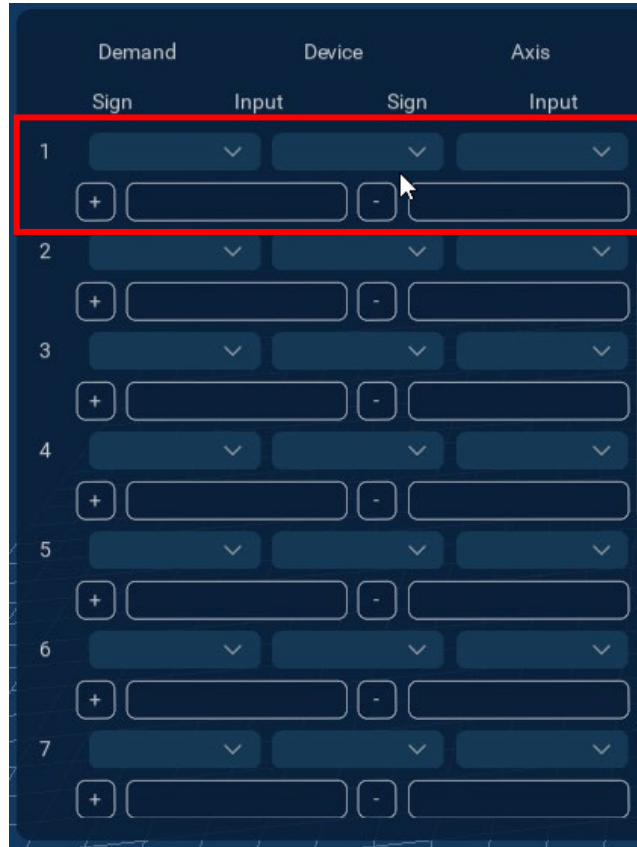
STEP 1. SELECT THE DEFAULT NONE MAPPING

STEP 2. SAVE YOUR MAPPING TO A SPECIFIED NAME

Type in your desired name and click "Save As"
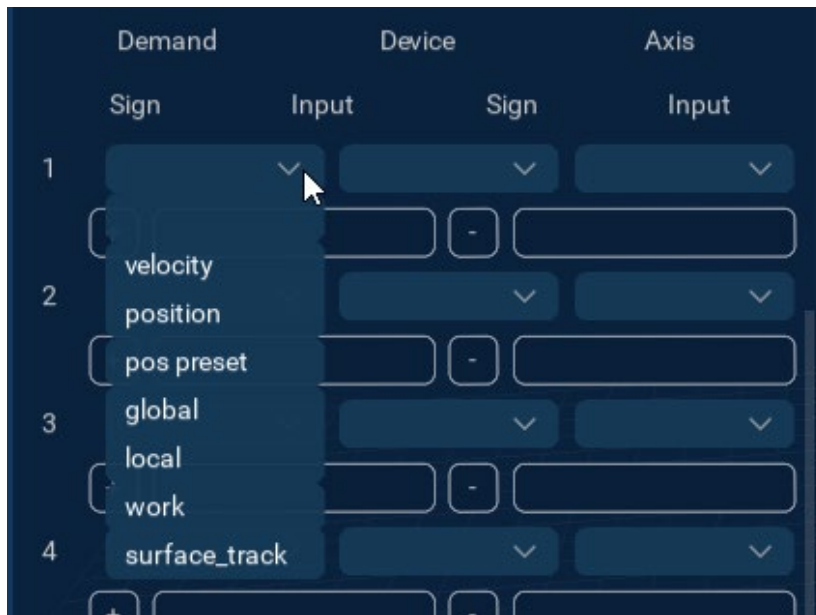
STEP 3. CONFIGURE YOUR MAPPINGS

Scroll down to customise your mappings.

PICK A DEMAND

Firstly, pick your demand type from the drop-down list:

- Velocity and Position correspond to individual joint controls.
- Pos Presets Control the ability to stow/deploy your manipulator.
- Global, Local, and Work correspond to kinematic controls on for your manipulator.

PICK YOUR MANIPULATOR

Pick your configured manipulator from the dropdown menu. Ensure that your manipulator is configured and connected.
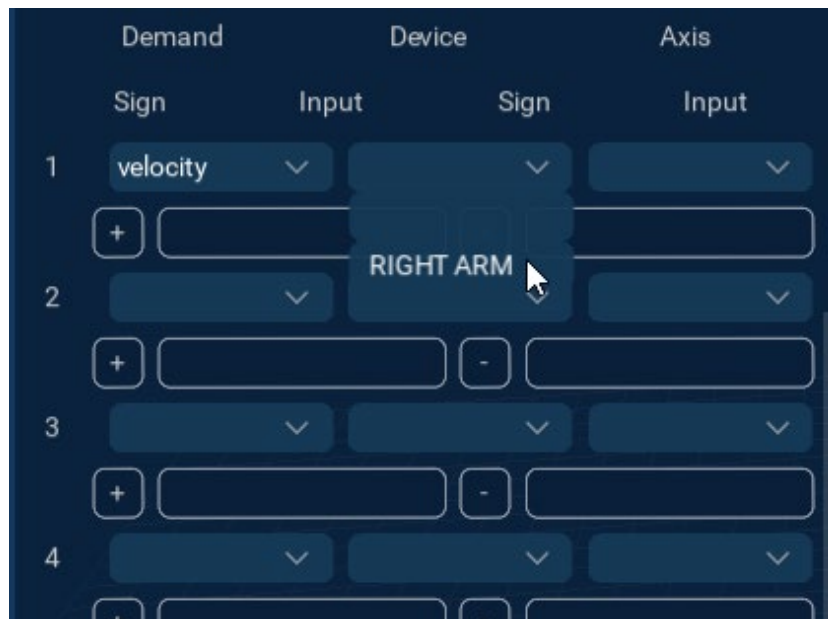

PICK THE AXIS

From the axis drop down select the axis you wish to control.

- For Velocity / Position Control you will select a specific joint,
- For pos presets you can select your desired pos preset.
- For kinematic controls, you can select a specific kinematic axis (x, y, z, roll, pitch, yaw).
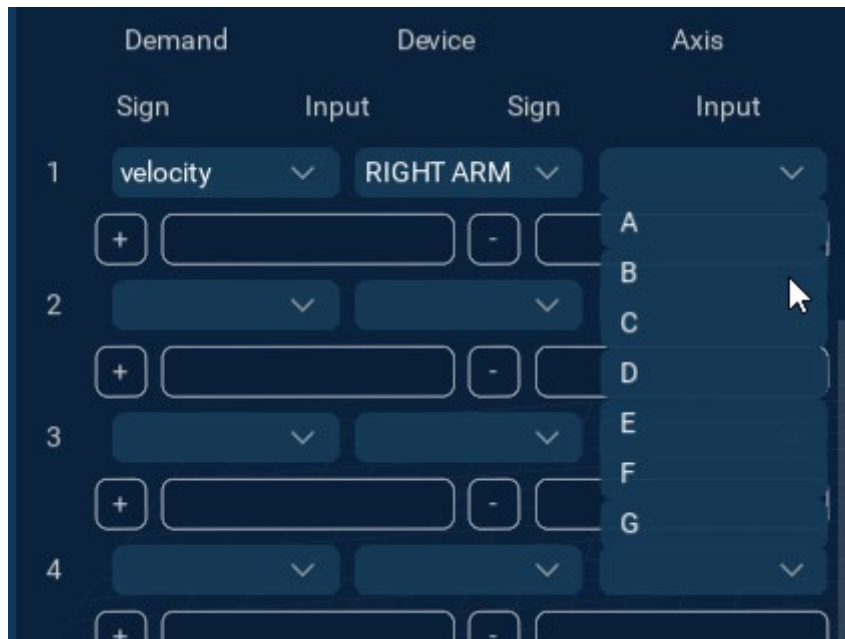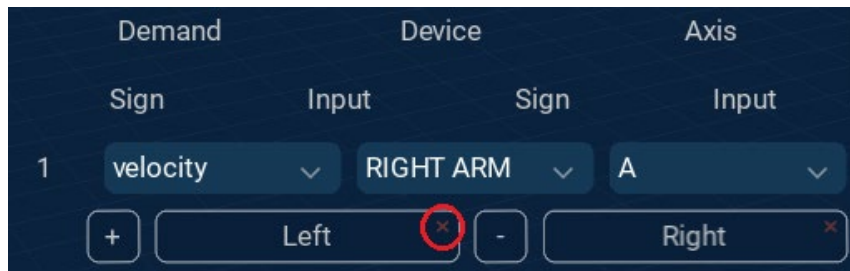
CONFIGURE YOUR INPUT

To select the desired input, click on the corresponding input button, then press the desired button / input on your SpaceMouse.
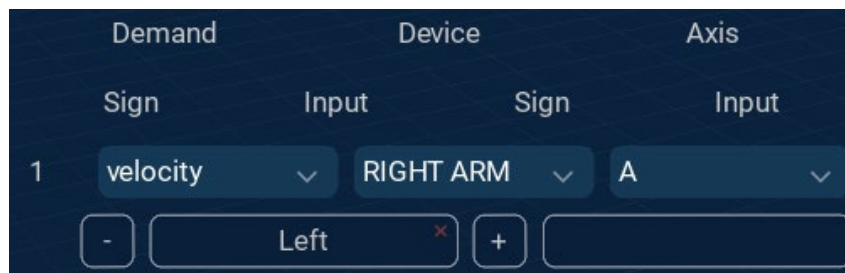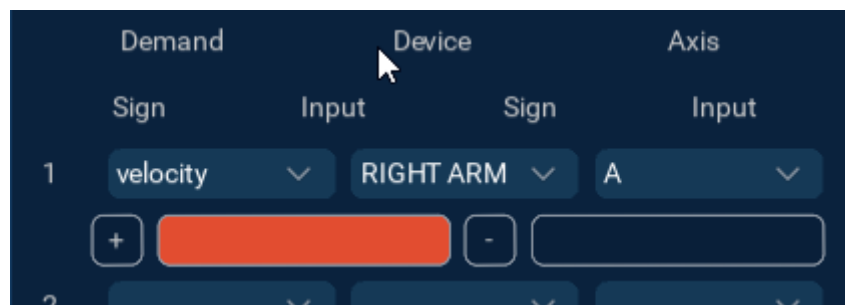
Repeat this for the second input if you wish.

To clear a mapping press the X button in the top left.

CONFIGURE YOUR DIRECTION/SIGN

Test your configured control of the manipulator using the SpaceMouse. If you wish to reverse the direction, press the sign buttons to toggle between "+" and "−".
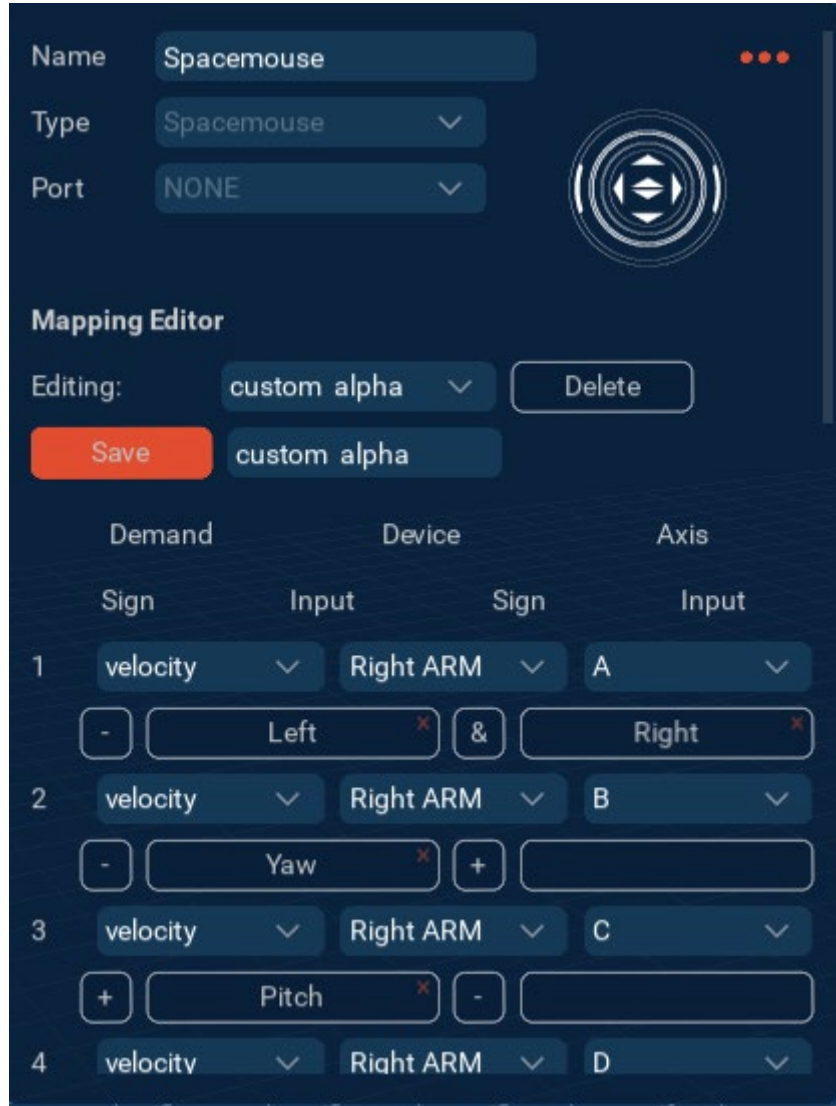
Repeat this for all other controls you desire.

STEP 4. SAVE YOUR MAPPING

After you have set up your mapping, save it by pressing "Save".

4. SETTING UP CONTROL GAINS

When using the space mouse, you may wish to modify the sensitivity of your manipulator to your controller. This can be done with the gain controls on the manipulator. To access the following settings, click on the 3 dots to expand the space mouse as mentioned Step 2 of Initial Setup. Scroll down until you see the following settings available:
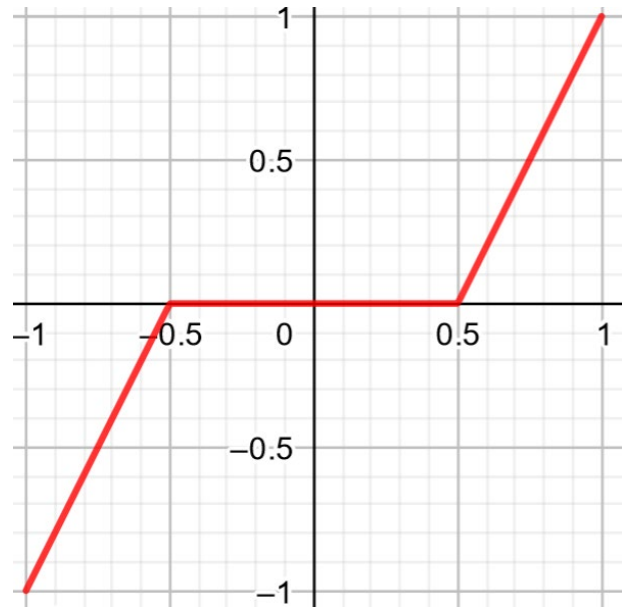

Control gains can be set for Individual Joint controls, Kinematics Translate controls, or Kinematic Rotate controls.

"Deadband" specifies what percentage of the SpaceMouse must be engaged before the device accepts commands.
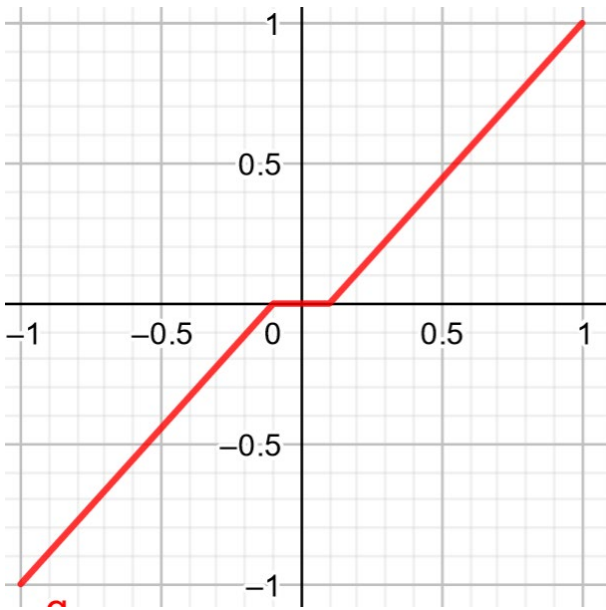
Deadband of 10%

Deadband of 50%

The exponent defines the response curve of how the SpaceMouse input controls the output. An exponent of 1 corresponds to a linear relationship between the input and the output. A higher exponent will ramp up the output slowly relative to the input. This is useful for when fine input control is required, but the full range of control is desired.
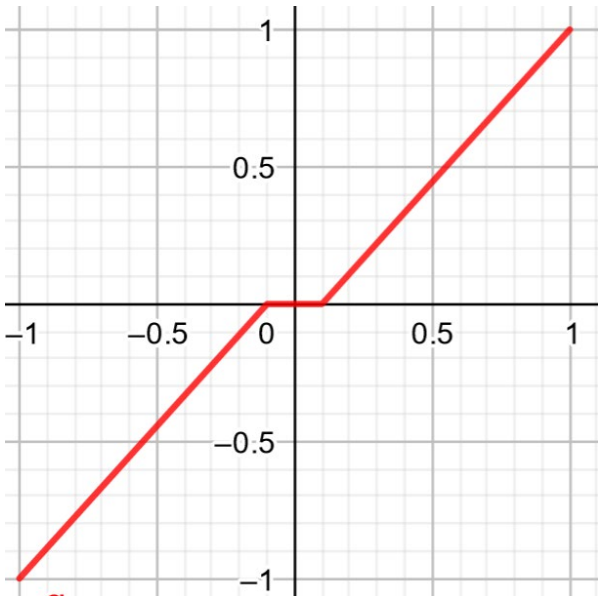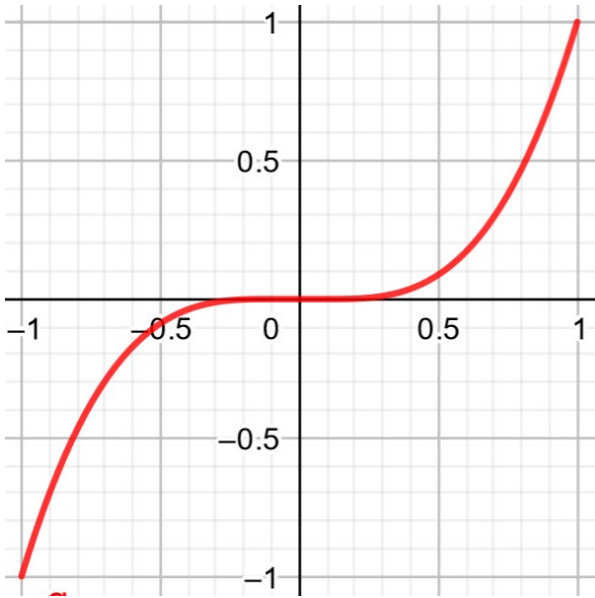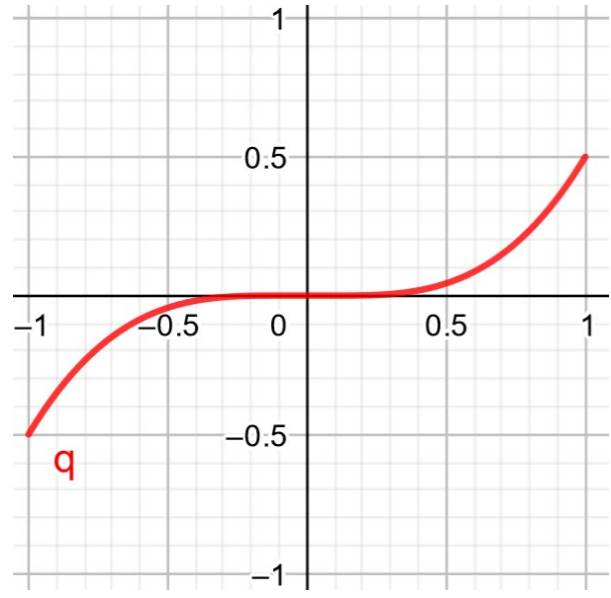

Exponent of 1.0
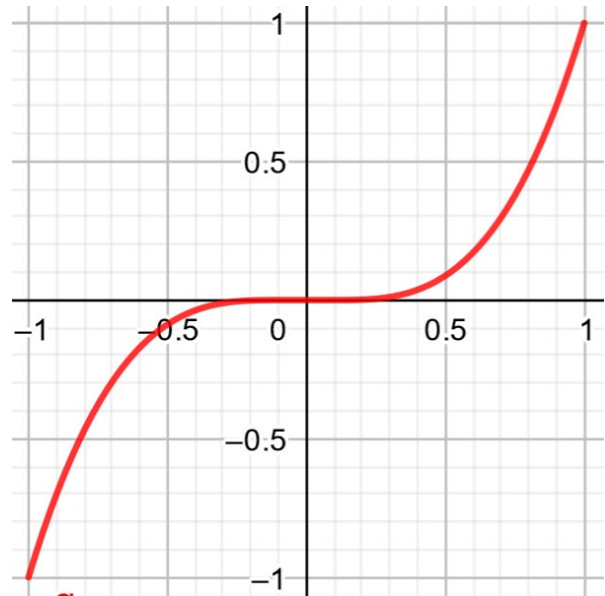
Exponent of 3.0

"Max" controls the scale of the output command. At 50% the max velocity output will be the max velocity of that joint. At 100% it will be at the full speed of the joint.

Max of 100   Max of 50 %

To see how each value affects the output you can use the following tool:

https://www.geogebra.org/calculator/mdaury2x

5. VERSION CONTROL

Version	Date published	Edited by	Updates made
V1.0	--/01/2024	David Silivestru	Initial version

6. NOTES

We do not recommend for the 3Dconnexion software to be installed as the space mouse is plug and play. Doing so it gives 2 individual functions to the side buttons of the 3D Connexion SpaceMouse Compact which will collide with the everyday use of the manipulator/reach control software.