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# GAMEPAD MAPPING MANUAL

## 1. REQUIREMENTS

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

Gamepad mapping requires Reach Control V3.4.1 or above.

Reach Control supports Xbox 360 style gamepad controllers. The following is a list of devices that are known to work with Reach Control:

- **Xbox 360 Wired Controller**
- **Xbox One Wired Controller**
- **Logitech F310 Gamepad**



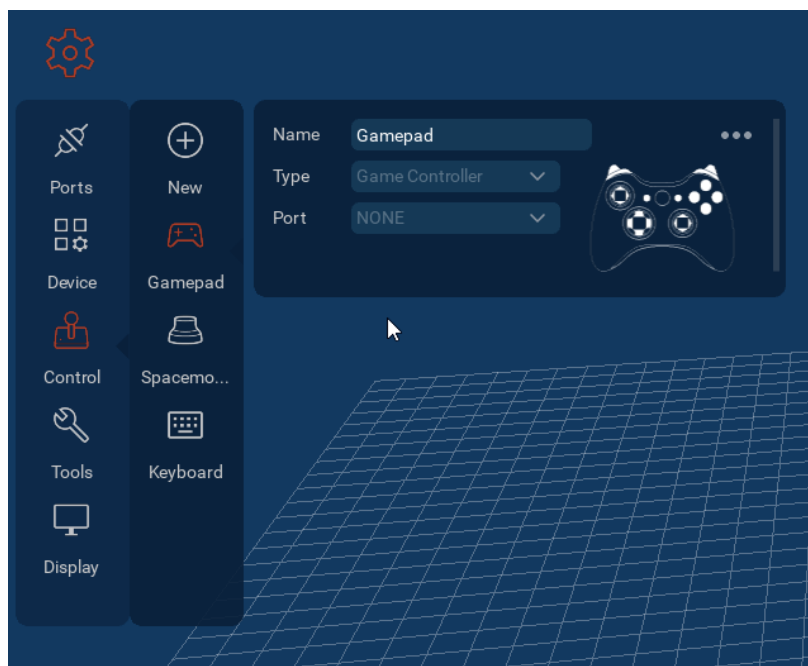
Other devices may work but have not been tested by Reach Robotics.

## 2. INITIAL SETUP

Reach Control will automatically connect to your gamepad when you open the software. Ensure that it is plugged in and that only one gamepad is connected.

### STEP 1. ACCESS THE GAMEPAD MENU

Go to the settings menu (Gear Icon) > Control > Gamepad



STEP 2. EXPAND THE GAMEPAD MENU

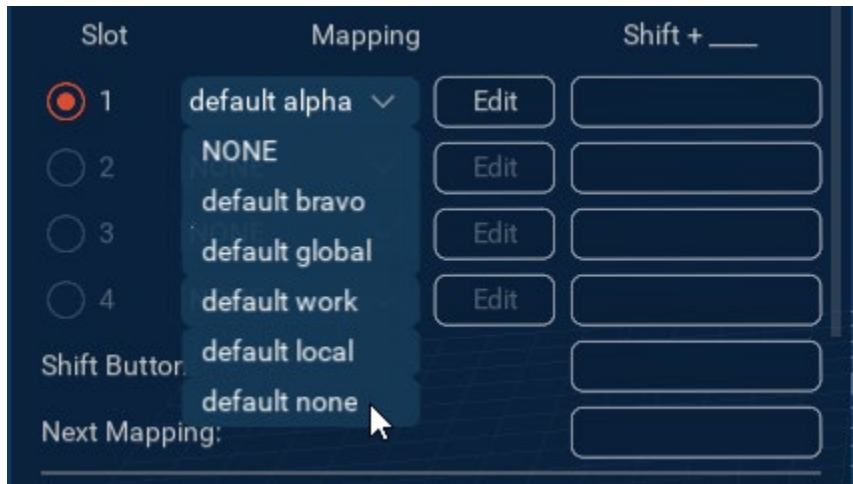
At the top-right corner of the Gamepad window, click the three dots to access the configuration menu.



### 3. CREATING A MAPPING

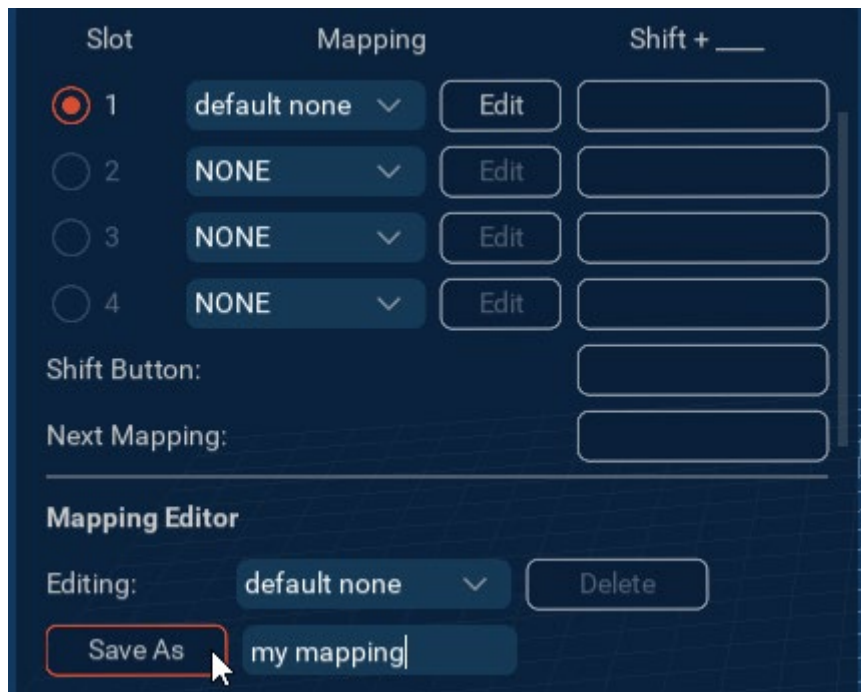
To use a gamepad to control a Reach Robotics manipulator, you must create a mapping in Reach Control.

#### 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**

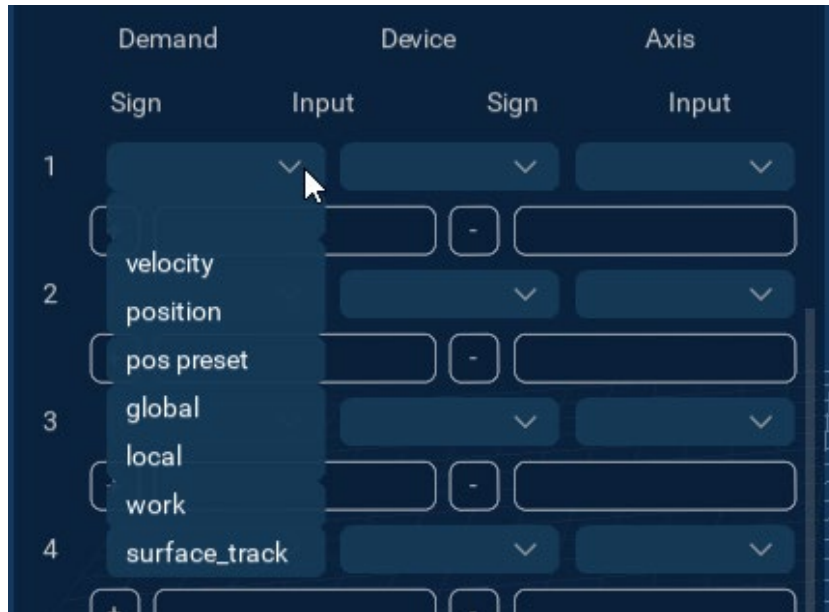
Scroll down to customise your mappings.



### PICK A DEMAND

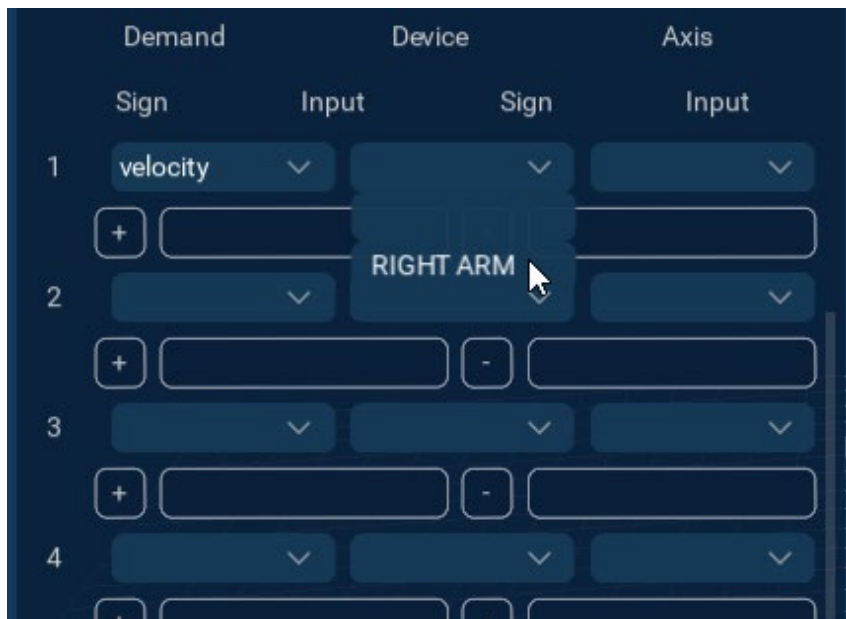
Firstly, pick your demand type from the drop-down list:

- 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

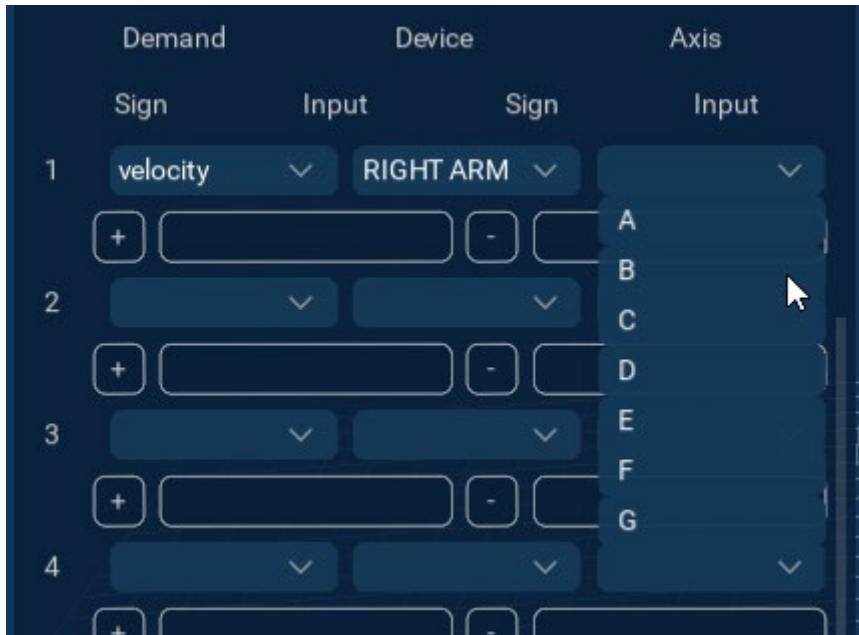
Pick your configured manipulator from the dropdown menu. Ensure that your manipulator is configured and connected.



### PICK THE AXIS

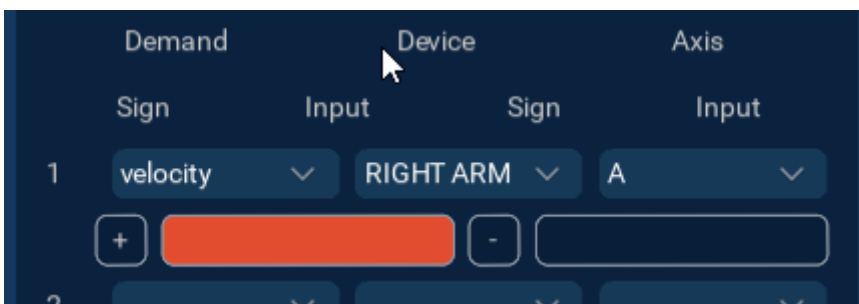
From the axis drop down select the axis you wish to control.

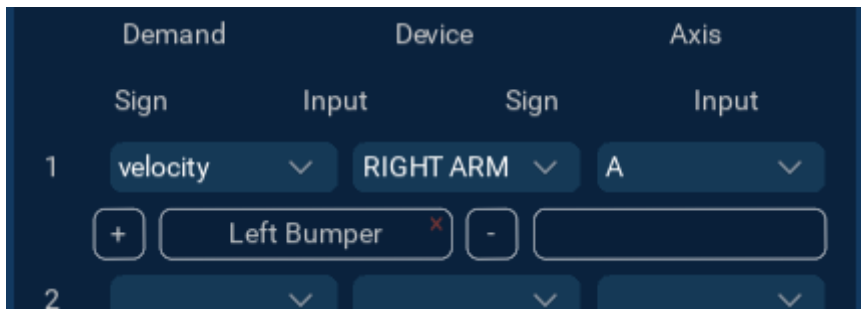
- For Velocity / Position Control you will select a specific joint,
- For pos presets you can select your desired pos preset.
- For kinematic controls, you can select a specific kinematic axis (x, y, z, roll, pitch, yaw).



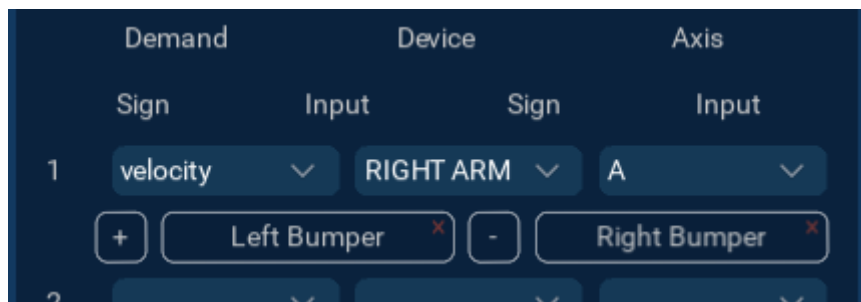
### CONFIGURE YOUR INPUT

To select the desired input, click on the corresponding input button, then press the desired button / input on your controller. For a joystick or trigger, flick the input that you wish to use.





Repeat this for the second input if you wish.



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



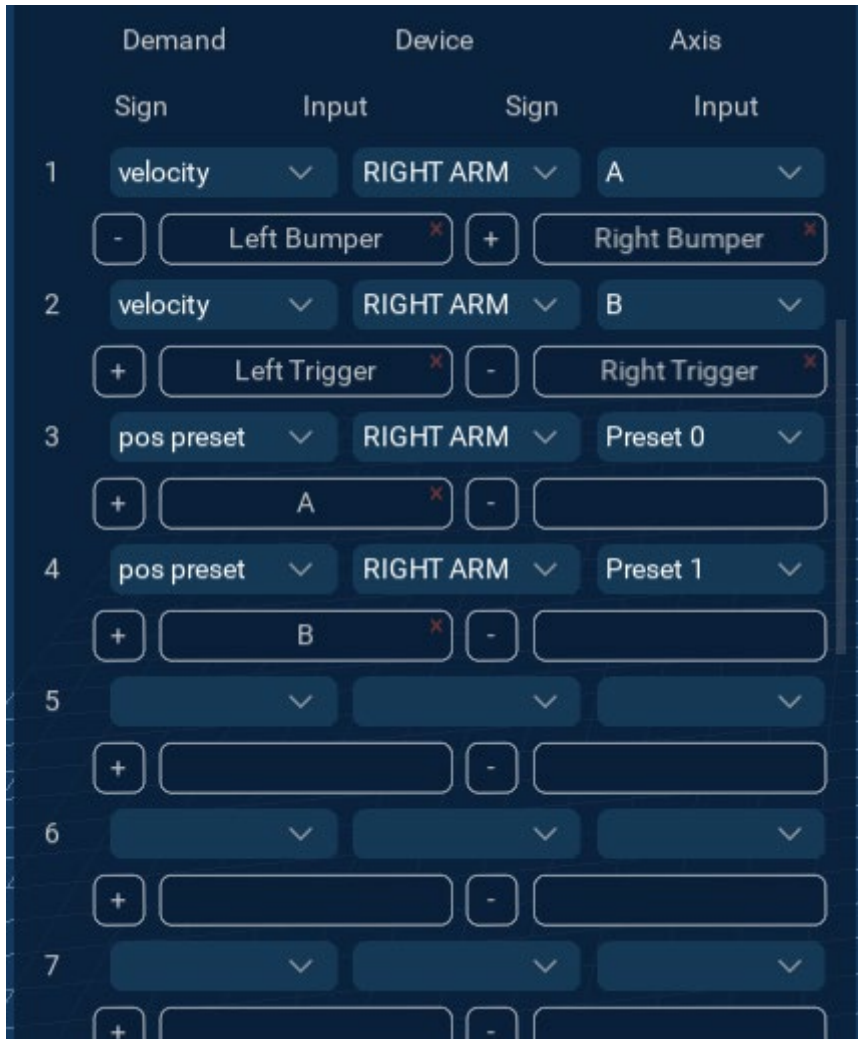
### CONFIGURE YOUR DIRECTION/SIGN

Test your configured control of the manipulator using the gamepad. If you wish to reverse the direction, press the sign buttons to toggle between "+" and "-".



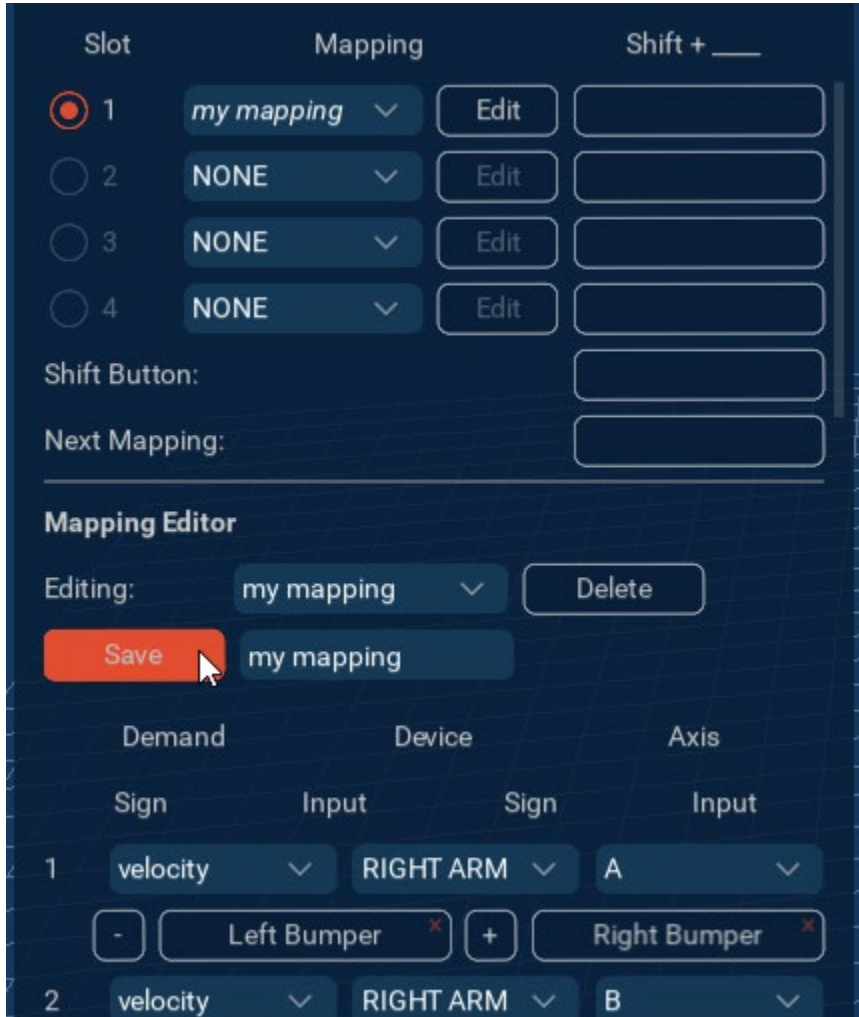


Repeat this for all other controls you desire.



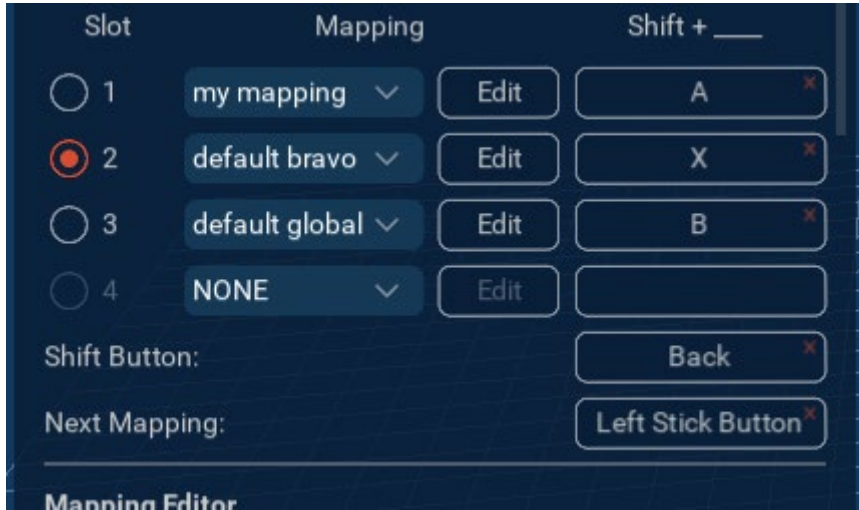
STEP 4. SAVE YOUR MAPPING

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



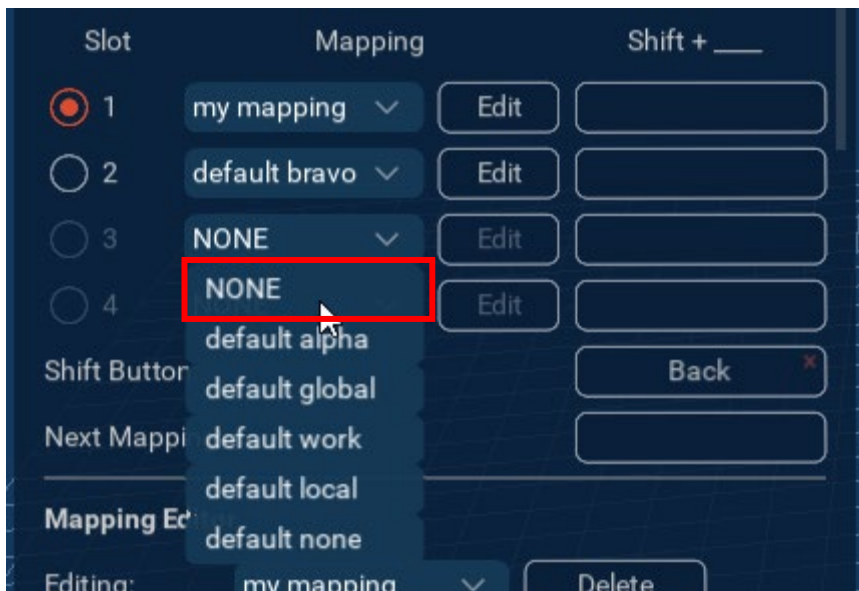
## 4. SETTING UP MAPPING SLOTS

In Reach Control you can alternate through 4 mappings mouse free. This is useful for alternating modes in Reach Control or for swapping control between manipulators. This can be done by either pressing a specified button to cycle through mappings or pressing a set combination of buttons to go to a specific mapping.



### STEP 1. SELECT YOUR DESIRED MAPPINGS

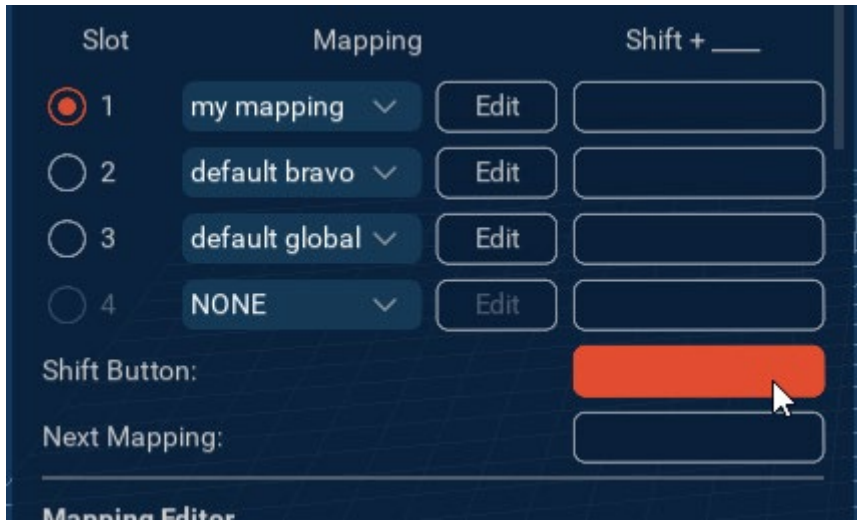
In the available slots, configure your desired mappings by assigning a mapping to each slot. Set a slot to “NONE” if you wish to have no mapping in that slot.



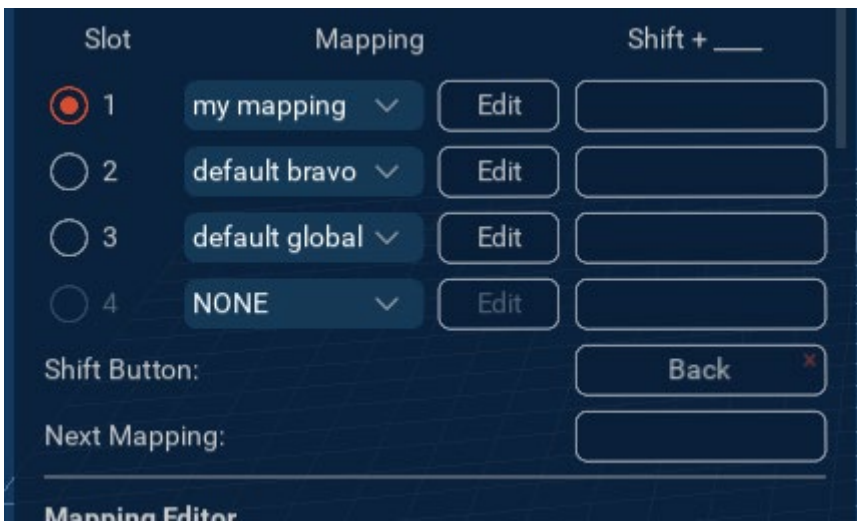
STEP 2. CONFIGURE YOUR SHIFT BUTTON.

The shift button is used in combination with another button to select a specific mapping.

Click on the empty button next the “Shift Button:”



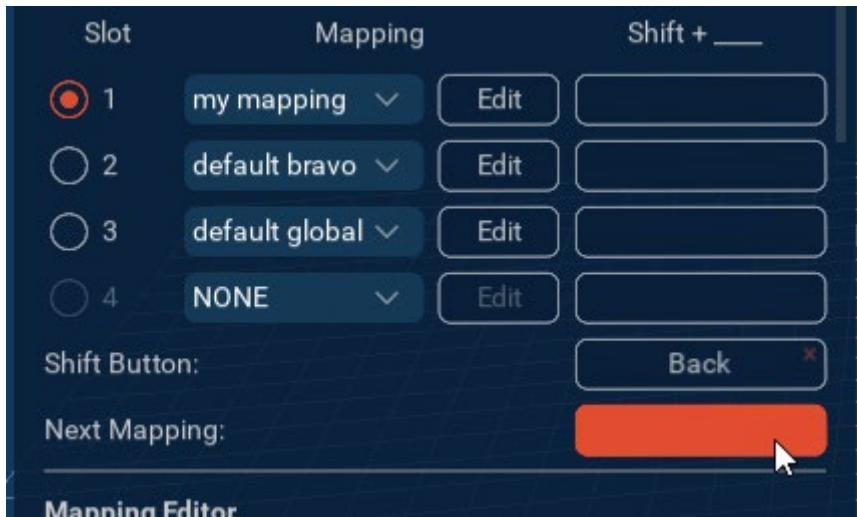
Press the button you would like to be your shift button on your gamepad.



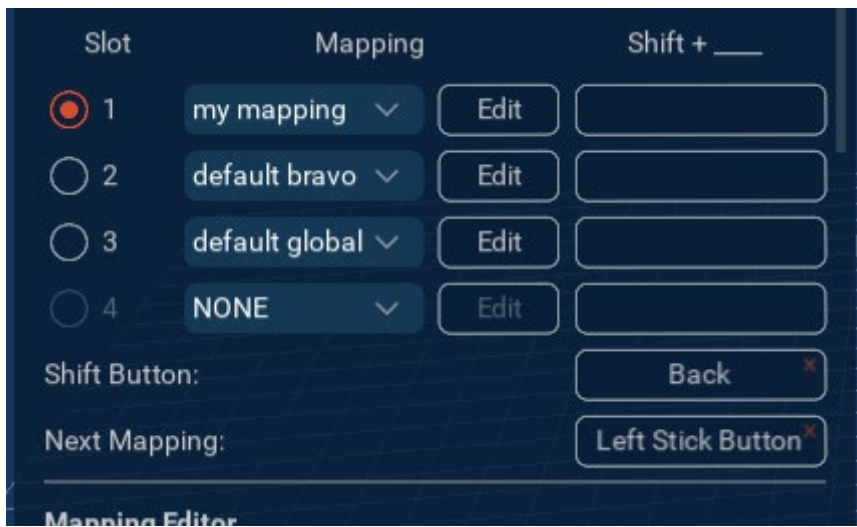
STEP 3. CONFIGURE YOUR NEXT MAPPING BUTTONE

The next mapping button is used to cycle between your mappings. When pressed, Reach Control will change the mapping to the next valid mapping.

Press the empty button next to “Next Mapping”.

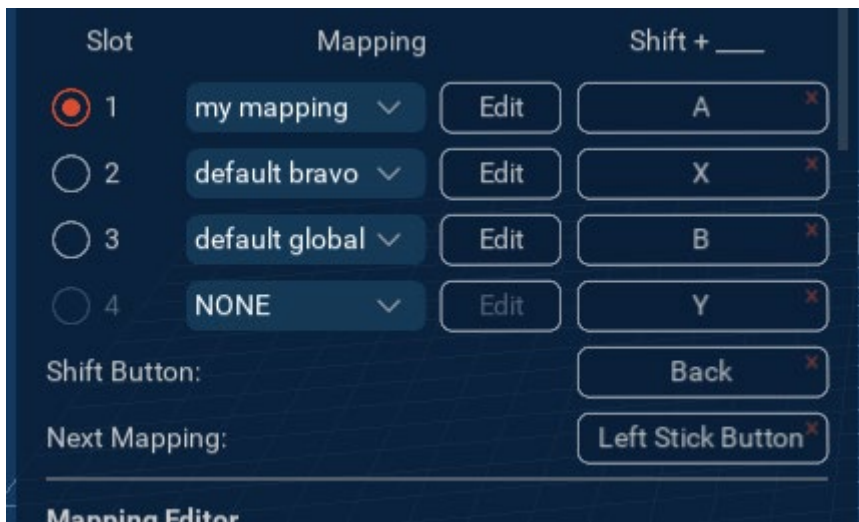
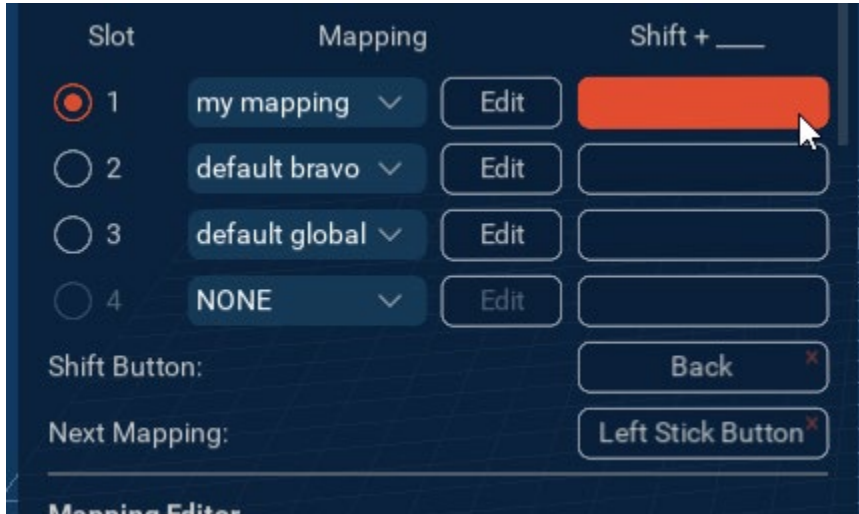


Press the button you would like to use as your next mapping button gamepad.



STEP 4. CONFIGURE YOUR MAPPING BUTTONS

For each mapping, press the appropriate mapping button that you would like to use to switch to the mapping.



Use the assigned shift button combined with the mapping button to switch to your desired mapping.

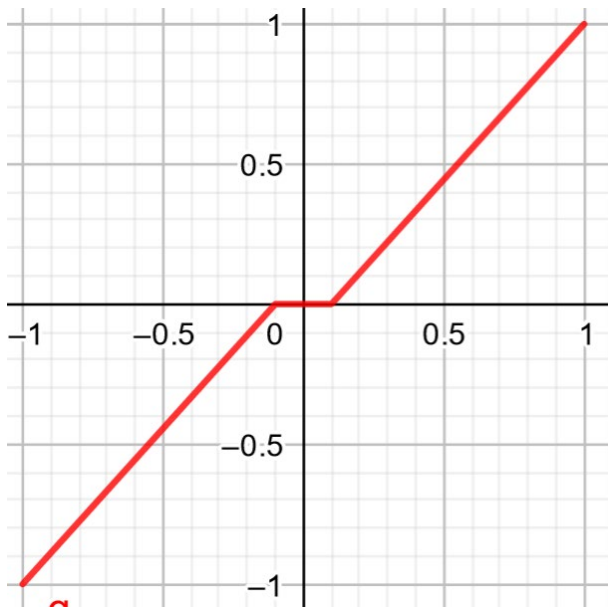
You can now use your configured “Next Mapping” button to cycle between mappings, or use the “Shift” button + your corresponding map button to go to a specific mapping.

## 5. SETTING UP CONTROL GAINS

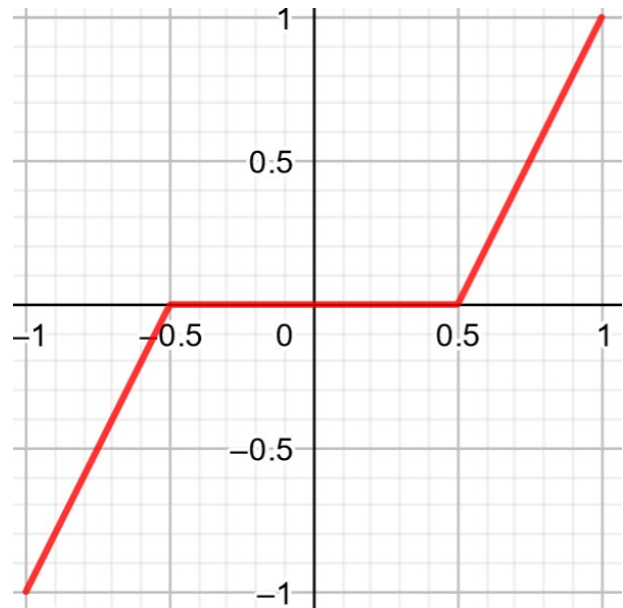
When using joysticks, you may wish to modify the sensitivity of your manipulator to your controller. This can be done with the gain controls on the manipulator.

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

“Deadband” specifies what percentage of the joystick must be engaged before the device accepts commands.

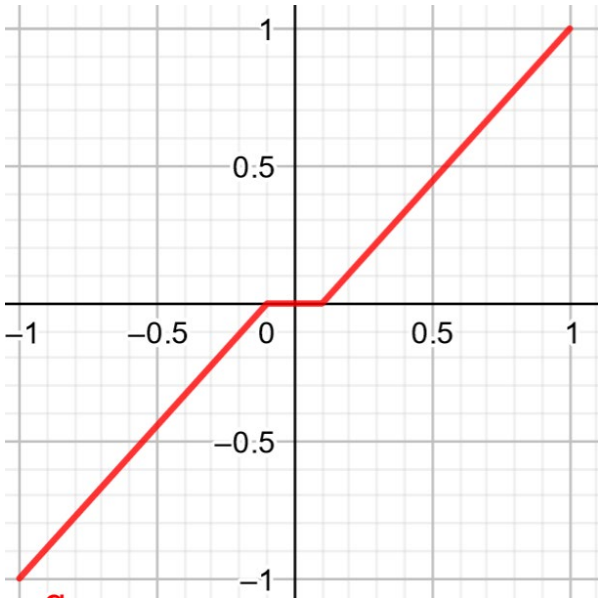


Deadband of 10%

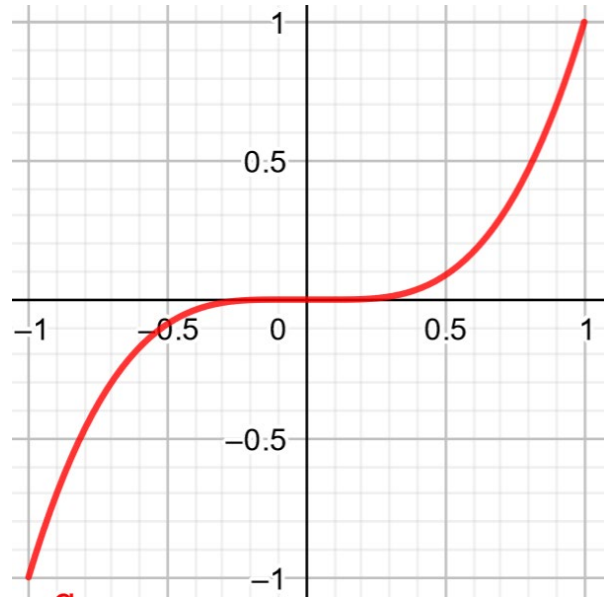


Deadband of 50%

The exponent defines the response curve of how the joystick 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.

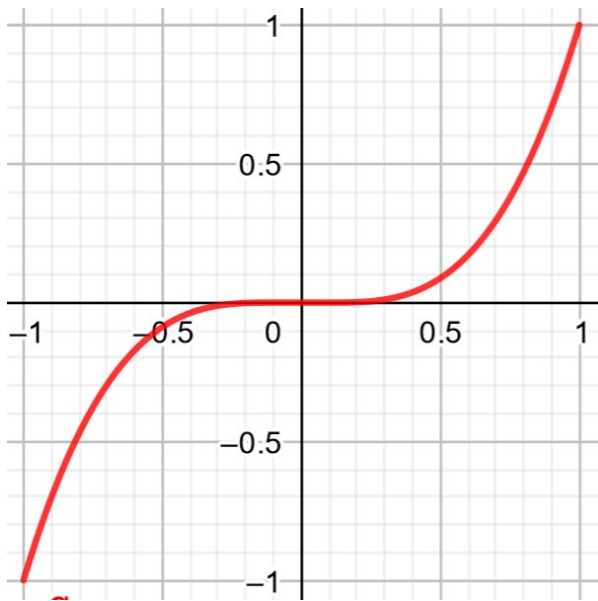


Exponent of 1.0

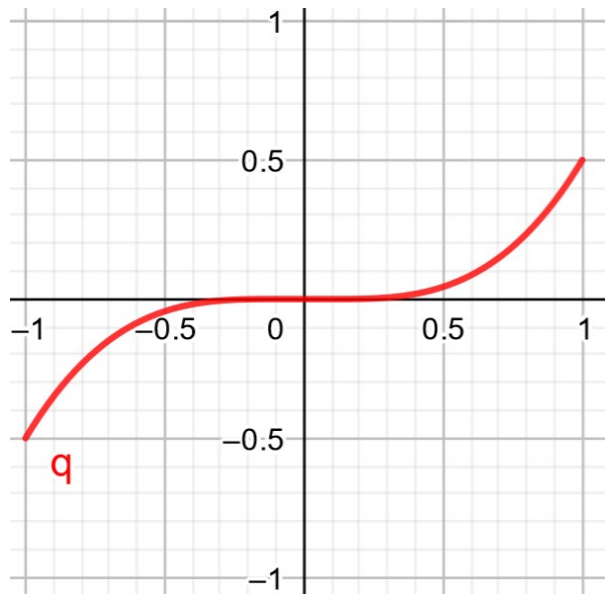


Exponent of 3.0

“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>



## 6. VERSION CONTROL

Version	Date published	Edited by	Updates made
V1.0	25/01/2022	Ethan Grenot	Initial version
V2.0	05/04/2023	Ellie Best	RR branding Update of RC screenshots