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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.

Name	Gamepad				
Туре	Game Controller	~			
Port	NONE	~	00		
Slot	Mapping		Shift +		
() 1	default alpha $$	Edit			
	NONE 🗸	Edit			
	NONE 🗸	Edit			
	NONE 🗸	Edit			
Shift Butte	on:				
Next Map	ping:				
Mapping	Editor				
Editing:	default alpha	~ (Delete		
Save A	ve As custom alpha				
Den	Demand Device Axis				
~		~			



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

Slot	Mapping	Shift +
() 1	default alpha 🗸	Edit
	NONE	Edit
	default bravo default global	Edit
	default work	Edit
Shift Buttor	default local	
Next Mappi	default none ng:	

STEP 2. SAVE YOUR MAPPING TO A SPECIFIED NAME

Type in your desired name and click "Save As"

Slot	Mar	oping		Shift +
0 1	default none	~	Edit	
	NONE	~	Edit	
	NONE	~	Edit	
	NONE	\sim	Edit	
Shift Buttor	n:			
Next Mapp	ing:			
Mapping E	ditor			
Editing:	default no	one	\[Delete
Save As	my mapp	ing		



Slot	Maj	ping		Shift +		
0 1	my mapping	~	Edit			
	NONE	~	Edit			
	NONE	~	Edit			
	NONE	~	Edit			
Shift Butto	n:					
Next Mapp	ing:		477			
Mapping E	Mapping Editor					
Editing:	my mapp	ing	\[Delete		
Save	my mapp	ing				

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.

	Demand	Device		Axis
	Sign	Input	Sign	Input
1	velocity	 ✓ RIGHT 	rarm 🗸 a	· · ·
	+		$\overline{\bigcirc}$	
2				×



	Demand	Dev	/ice	Axis
	Sign	Input	Sign	Input
1	velocity	✓ RIGH [®]	TARM 🗸 A	~
	+	ft Bumper	ו	
2		\sim	~	~

Repeat this for the second input if you wish.

	Demand	Dev	/ice	Axis
	Sign	Input	Sign	Input
1	velocity	✓ RIGH	TARM 🗸 🖡	4 v
	+ Le	ft Bumper	× - R	ight Bumper ×
2				~

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

	Demand	Dev	ice	Axis	
	Sign	Input	Sign	Inp	ut
1	velocity	 ✓ RIGHT 	ARM \sim	А	~
	+ Le	ft Bumper 💙	$\bigcirc \square$	Right Bump	oer ×
2		V 1	~		~

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.

	Demand	De	vice	Axis	
	Sign	Input	Sign	Input	
1	velocity	 ✓ RIGH 	TARM \sim	А	\sim
	- Let	ft Bumper	*+	Right Bumper	*
2	velocity	✓ RIGH	IT ARM 🗸	В	~
	+	ft Trigger	ו-	Right Trigger	
3	pos preset	 ✓ RIGH 	TARM 🗸	Preset 0	~
	+	А	ו⊂		
4	pos preset	 ✓ RIGH 	TARM \sim	Preset 1	~
	+	В	ו⊂		
5		~)	~		~
	+				
6		~)	~		~
	+				
7		v	~		V)
	+				



STEP 4. SAVE YOUR MAPPING

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

Slot	Maj	oping	Sł	nift +
0 1	my mapping	- Ed	it 🗌	
	NONE	✓ Ed	it 🗌	
	NONE	- Ed	it 🗌	
	NONE	✓ Ed	it 🗌	
Shift Butto	n:			
Next Mapp	ing:			
Mapping E	ditor			
Editing:	my mapp	ing 🗸	Delete	
Save	my mapp	oing		
Dem	and	Device		Axis
Sign	Inpu	t	Sign	Input
1 veloc	ity 🗸	RIGHT ARM	~ A	~
	Left Bump	er × +	Righ	t Bumper ×
2 veloc	ity 🗸	RIGHT ARM	∨ В	~



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.

Slot	Mapping		Shift +
01	my mapping \vee	Edit	A X
() 2	default bravo \vee	Edit	
○ 3	default global \smallsetminus	Edit	В
	NONE 🗸	Edit	
Shift Butto	in:	Back *	
Next Mapping:			Left Stick Button*
Manning F	ditor		

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.

Slot	Mapping		Shift +
() 1	my mapping $$	Edit	
○ 2	default bravo 🗸	Edit	
	NONE 🗸	Edit	
	NONE	Edit	
	default alpha		
Shift Buttor	default global		Back
Next Mapp	default work		
Mapping Ed	default local		
	default none		
Editina:	my mapping	× (Delete



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.

Slot	Mapping		Shift +
() 1	my mapping $$	Edit	
○ 2	default bravo \smallsetminus	Edit	
() з	default global \sim	Edit	
	NONE 🗸	Edit	
Shift Butto	on:		Back ×
Next Mapping:			
Manning	Editor		



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.

Slot	Mapping		Shift +
() 1	my mapping \vee	Edit	
○ 2	default bravo \vee	Edit	
3	default global \vee	Edit	
	NONE 🗸	Edit	
Shift Butto	on:		Back ×
Next Mapping:			Left Stick Button*
Manning	ditor		



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.

Slot	Мар	ping		Shift +	
() 1	my mapping	~]	Edit		
○ 2	default bravo	~	Edit		
3	default global	~)(Edit		
	NONE	~ (Edit		
Shift Butte	on:			Back *	
Next Mapping:			Left Stick Button*		
Next Map	ping:			Leit Stick Button	
Next Map	ping: Editor	1571 - 78			
Next Map Mapping Slot	ping: Editor Map	ping		Shift +	
Next Map Mapping Slot	ping: Editor Map my mapping	ping	Edit	Shift +	
Next Map Slot 1 2	ping: Editor Map my mapping default bravo	ping ~ (~ (Edit Edit	Shift +	
Next Map Slot 1 2 3	ping: Editor Map my mapping default bravo default global	ping ~ (~ (Edit Edit Edit Edit	Shift + A * * * * * * * * * * * * * * * * * * *	
Next Map Slot 2 3 4	ping: Editor Map my mapping default bravo default global NONE	ping ~ (~ (~ (Edit Edit Edit Edit	Shift + A * X * B * Y *	
Next Map Slot Slot 2 3 4 Shift Butto	ping: Editor Map my mapping default bravo default global NONE	ping ~ (~ (~ (Edit Edit Edit Edit	Shift + A * X * B * Back *	

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.





"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