BUWIZZ APP USER GUIDE

BuWizz brick 2.0 & BuWizz 3.0 Pro

iOS & Android App

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- **Connect BuWizz inside BuWizz App (Do not pair in Bluetooth settings)**
- **Control your model and have fun!**

1. Introduction

Dear BuWizz user, thank you for purchasing the BuWizz brick.

As you can quickly figure out, BuWizz 2.0 can control four LEGO® PF motors (or lights) with smooth precision and raw power at the same time, using a smartphone or tablet over Bluetooth LE connection. BuWizz 3.0 Pro extends the support to LEGO® Powered Up, Spike, EV3, Boost and Wedo 2.0 components. The PF servo motor can achieve all 15 positions (7 positions clockwise, 7 positions counter clockwise plus center position), at least two motors (regardless if M, L or XL) can be powered from each PF output. Power source - an embedded battery - can be fully charged when powered from any USB output (even a laptop or PowerBank-type battery) in about 2.5 hours.

Have at least as much fun playing with BuWizz as we have fun developing it.
Thank you for your support and feedback.

Sincerely,
The BuWizz Team
support@BuWizz.com

2. Compatibility

BuWizz 2.0 is compatible with the following LEGO® peripherals:
- **Power Functions** Medium, Large, XL, Servo motor, Train motor and LED lights
- **9 V system** motors, including high performance RC and BuWizz motors (PF to old 9 V connector cable needs to be purchased separately).
- **12 V compatibility:** BuWizz in Ludicrous mode can easily power old 12 V motors (Trains, Technic) and lights
- **4.5 V compatibility:** BuWizz in Slow mode can safely power old 4,5 V motors (4.5 V trains & Technic motors) and lights

BuWizz 3.0 Pro is compatible with the following LEGO® peripherals:
- **Power Functions** Medium, Large, XL, Servo motor, Train motor and LED lights
- **9 V system** motors, including high performance RC and BuWizz motors (PF to old 9 V connector cable needs to be purchased separately).
- **Powered Up** motors and LEDs
- **Spike** motors and sensors
- **Boost** motors and sensors

BuWizz App iOS version is compatible with following Apple products, having Bluetooth version 4.0 or higher, running iOS 9.3 or higher:
- iPhone 4S and newer iPhones (including Plus, X and Pro models)
- iPad 3 and newer (including iPad, iPad Pro and all iPad Air versions)
- iPad Mini – all versions
- iPod touch 5th generation and newer

BuWizz App Android version is compatible with devices with BLE (Bluetooth 4.0 or higher), running Android 5.0 or higher.

3. First steps

BuWizz 2.0:
- After receiving BuWizz brick(s), please charge them first.
- Connect a micro USB cable to BuWizz (USB charger, computer, PowerBank battery,…).
- During charging LED may turn off, don't worry BuWizz is still charging.
- When BuWizz is not connected to USB power, the LED will glow green regardless of battery state.
- If BuWizz battery is depleted beyond level, suitable for normal operation, the LED will alternate quickly between red and green for a few seconds, then BuWizz will turn off
- If BuWizz cannot be turned on by pressing the power button, then battery is completely depleted or battery protection kicked in.
- In either of the cases above, please connect the charger – only briefly to reset the protection circuit or for 2-3 hours to completely charge the depleted battery.

BuWizz 3.0
- After receiving BuWizz brick(s), please charge them first.
- Connect a USB C cable to BuWizz (USB charger, computer, PowerBank battery,…).
- During charging LED on PU port 1 will indicate charging.
- When BuWizz is not connected to USB power, the LED will glow/blink in the color of the battery status.
- If BuWizz battery is depleted beyond level, suitable for normal operation, the LED on PU port 1 will alternate quickly between red and green for a few seconds, then BuWizz will turn off.
- If BuWizz cannot be turned on by pressing the power button, then battery is completely depleted or battery protection kicked in.
- In either of the cases above, please connect the charger – only briefly to reset the protection circuit or for 1-2 hours to completely charge the depleted battery.

BuWizz can operate with charger connected. In fact, connecting a PowerBank type battery can greatly extend the playtime and you can leave the battery connected to BuWizz while operating your model.

NOTE: BuWizz turns off automatically after ~10 minutes if not in use (i.e. no commands are received over Bluetooth connection).

4. BuWizz app installation

iOS (iPhone, iPad, iPod Touch):
1. Go to App Store
2. Search for BuWizz and choose App(on iPad: select "iPhone Only" in the drop down menu on the left side)
3. Install the app

Android (version 5.0 and up):
1. Go to Play Store
2. Search for BuWizz and choose App.
3. Install the app

We suggest you to install the latest BuWizz app and not the legacy one.

5. Connecting to your BuWizz

1. Connect electronic components to output ports
2. Press power button – LED will blink when BuWizz is not connected to app and glow constantly when connected
3. Start BuWizz app on your device

Make sure BuWizz is fully charged. If not, please recharge BuWizz as described in section 3.

NOTE: BuWizz 2.0 cannot be turned OFF when connected to app (LED glows solid). Please disconnect BuWizz inside app, and then you can turn BuWizz off by pressing the button. Please check FAQ in chapter 9 for more info.

NOTE: BuWizz 3.0 can be turned OFF when connected by holding the power button for ~ 3 seconds
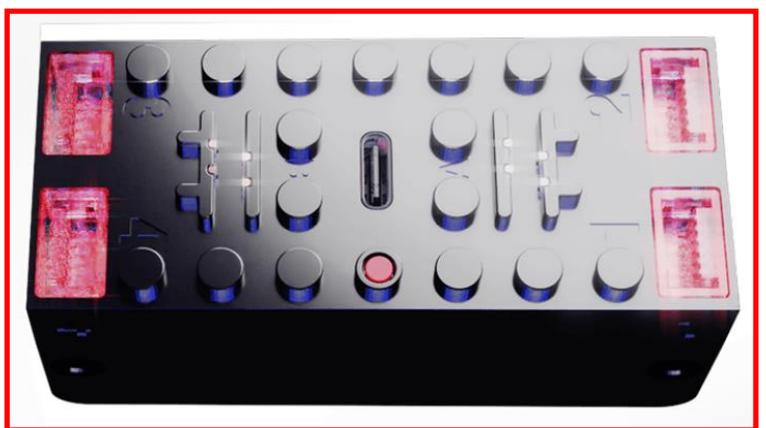
6. BuWizz 2.0 LED status

When BuWizz 2.0 is turned on & not connected to the BuWizz app

GREEN blinking: battery level 2/3 to Full

ORANGE blinking: battery level 1/3 to 2/3

RED blinking: battery low, please recharge

RED/GREEN blinking fast: battery critically low. BuWizz 2.0 will not work, please recharge

When BuWizz 2.0 is turned on & connected to app

GREEN constantly on: connected to app, battery level 2/3 to Full

ORANGE constantly on: connected to app, battery level 1/3 to 2/3

RED constantly on: connected to app, battery low, please recharge

RED/GREEN blinking fast: connected to app, battery critically low. BuWizz 2.0 will not work, please recharge

When BuWizz 2.0 is charging & turned on

ORANGE constantly on: charging (connected or not connected to app)

GREEN **constantly on:** fully charged (connected or not connected to app)

Firmware update

SLOWLY BLINKING RED: firmware update

NOTE: BuWizz 2.0 turns off automatically during charging. No LED is lit, but charging still continues. Please check FAQ in chapter 9 for more info.

7. BuWizz 3.0 Pro LED status

When BuWizz 3.0 Pro is turned on & not connected to the BuWizz app

    GREEN blinking on all PU ports: battery level 2/3 to Full

    ORANGE blinking on all PU ports: battery level 1/3 to 2/3

    RED blinking on all PU ports: battery low, please recharge

    RED/GREEN blinking fast on PU port 1: battery critically low. BuWizz 3.0 Prowill not work, please recharge

When BuWizz 3.0 Pro is turned on & connected to app

    GREEN constantly on all PU ports (Unless changed by user): connected to app, battery level 2/3 to Full

    ORANGE constantly on all PU ports (Unless changed by user): connected to app, battery level 1/3 to 2/3

    RED constantly on all PU ports (Unless changed by user): connected to app, battery low, please recharge

    RED/GREEN blinking fast on PU port 1: connected to app, battery critically low. BuWizz 3.0 Pro will not work, please recharge

When BuWizz 3.0 Pro is charging & turned on

    GREEN breathing on PU port 1, other PU ports blinking according to the state of battery.

When BuWizz 3.0 Pro is charging & turned off

    GREEN breathing on PU port 1, other PU ports are off

Firmware update

    PU Ports 1&2 and 3&4 are blinking RED/GREEN alternately

    All PU ports are blinking in a RED spinning pattern

8. Running BuWizz app

IMPORTANT for Android:

Please grant BuWizz app "Location Permission", or the app will not work

GPS/Location must be turned on or Bluetooth scan will not work (requirement by Google)

Note, you can find following video tutorials for BuWizz app on BuWizz's Youtube channel:

BuWizz App Quick look and tutorial: https://youtu.be/ZgCNt7FwQkY

Simple car set-up tutorial: https://www.youtube.com/watch?v=K04dYWdDqYw

Tracked vehicle set-up tutorial: https://www.youtube.com/watch?v=WsMuO5tcz_w

1. **Start the BuWizz App**

2. **Use already premade profiles, press Plus Symbol** ➕ **to create a new profile or press Import icon** ⬇ **to import profile.**

3. **Once you create a new profile, you can rename it by clicking on the name in the top left corner:**
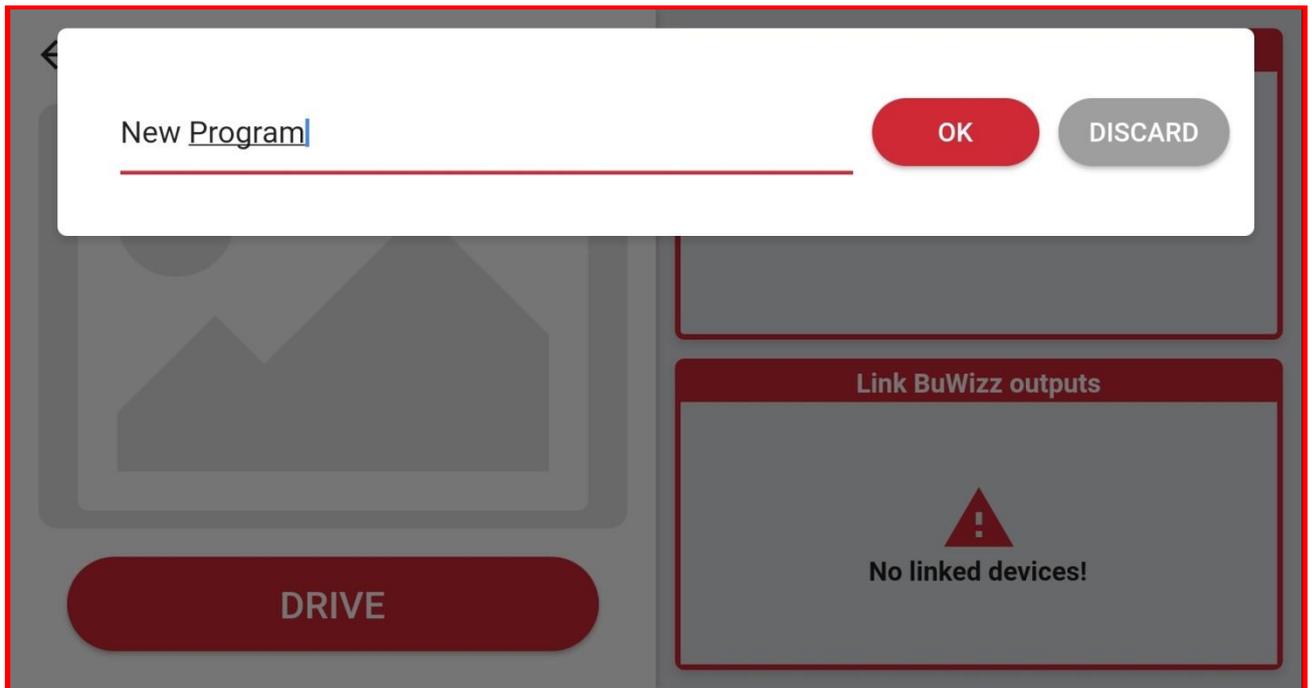
4. **You can choose custom profile's photo from camera or gallery:**
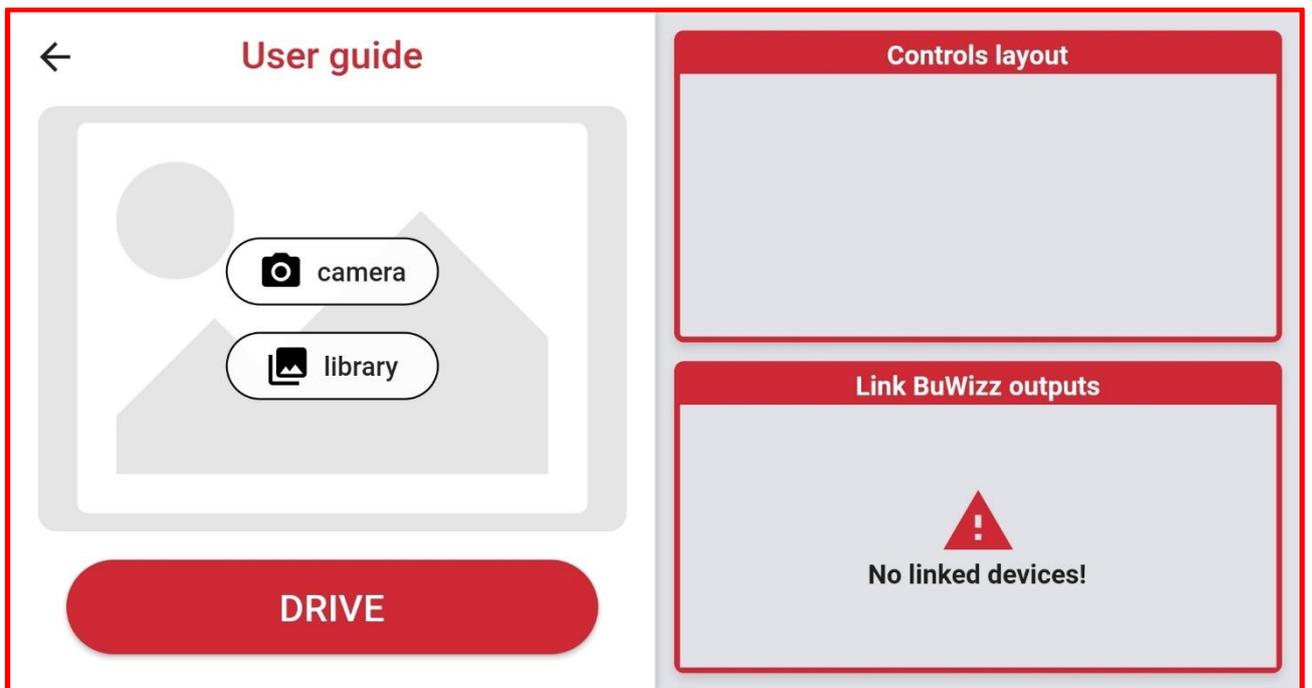
5. **Select the Controls layout window to set up your controls:**
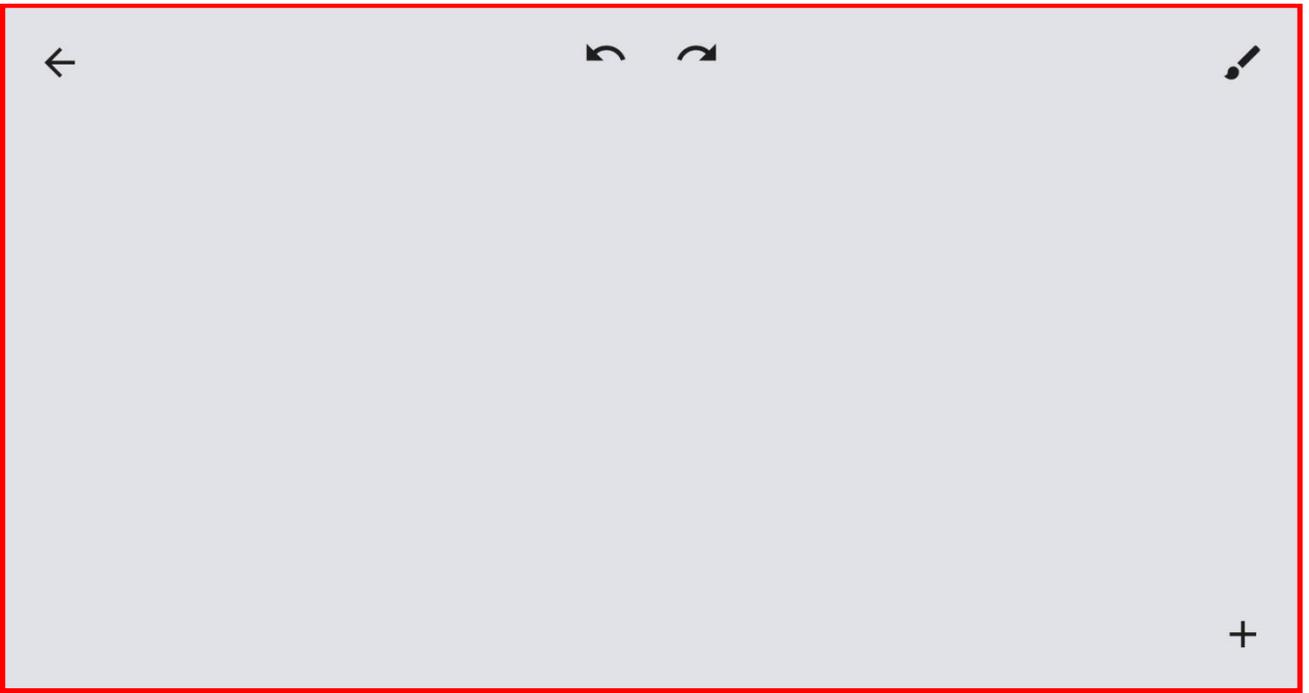
6. **Press the + to add gauges and controls:**
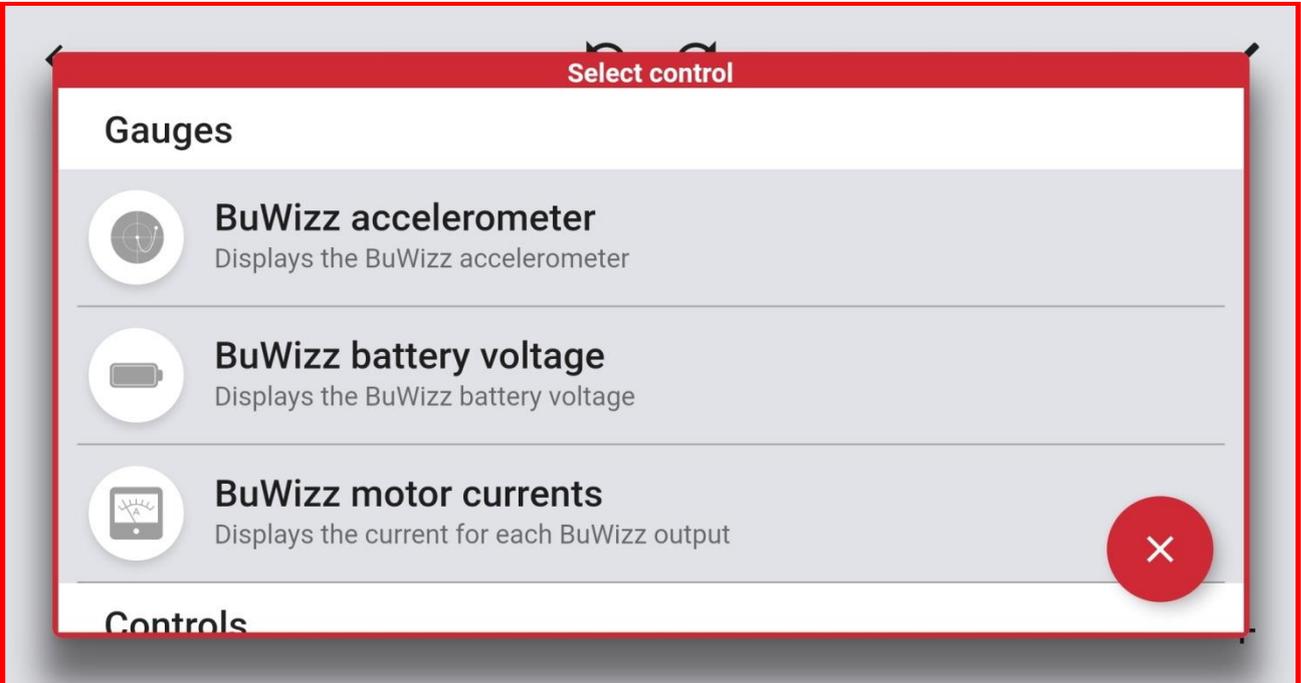
7. **Slide down the Select control window to choose controls**
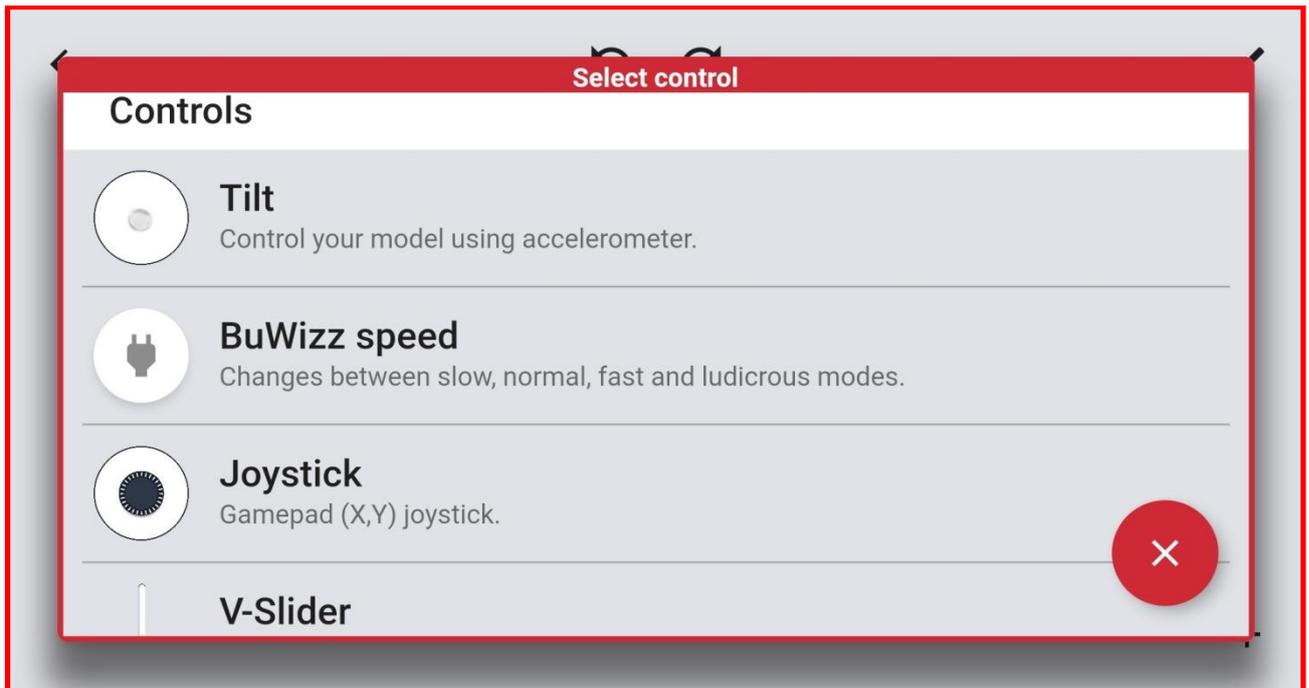
8. **Hold and drag the control to place it in Controls layout.**
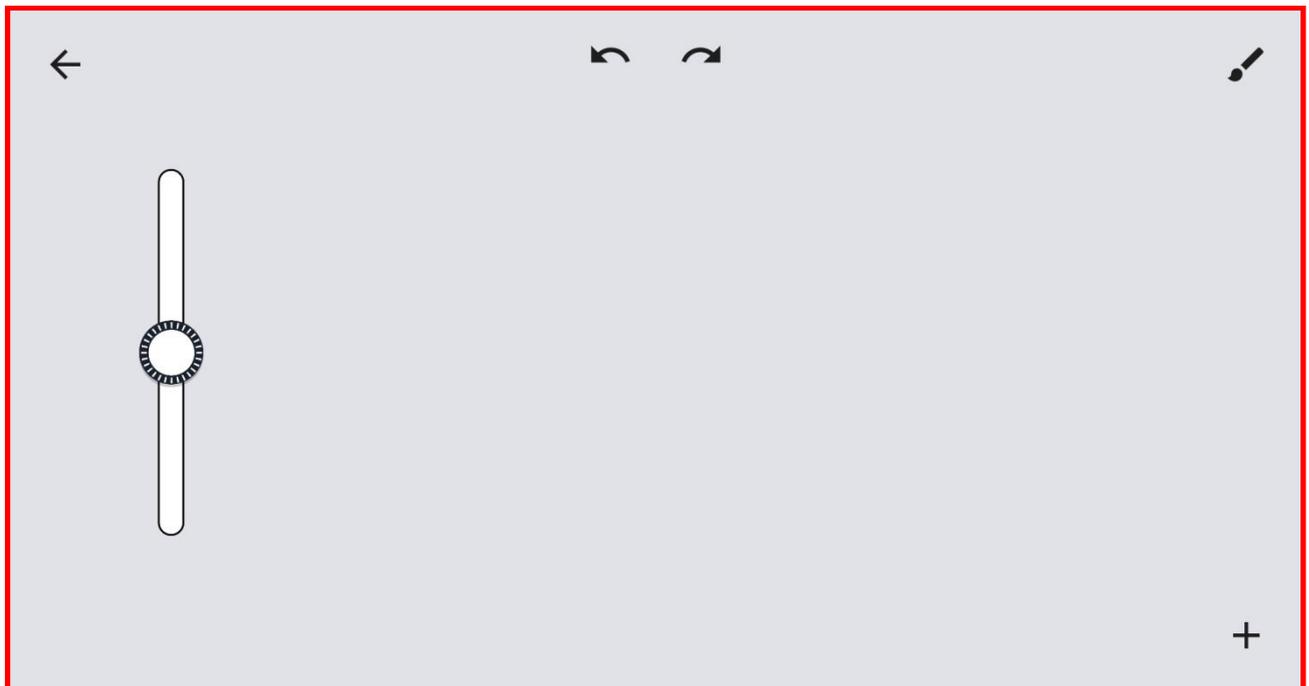
9. **Tapping on the control** allows you to modify its attributes:
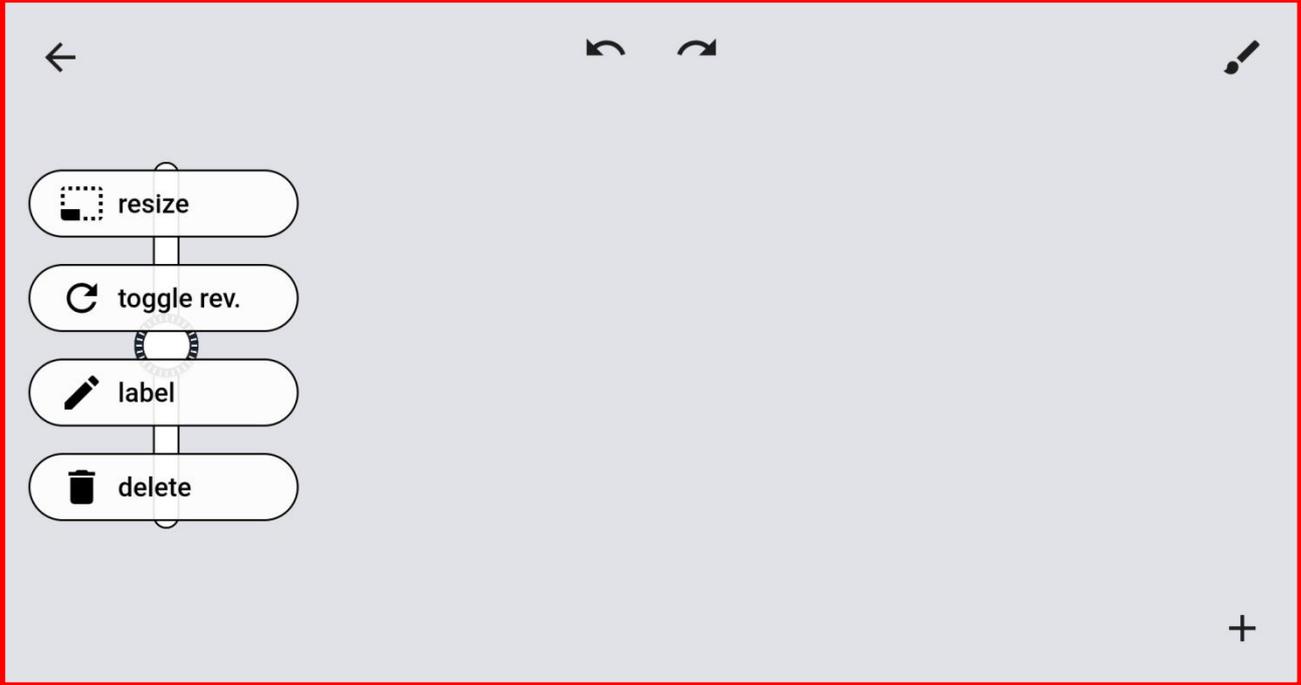
10. To change the size of control select the resize option and slide left/right.

Resize the control by sliding left and right
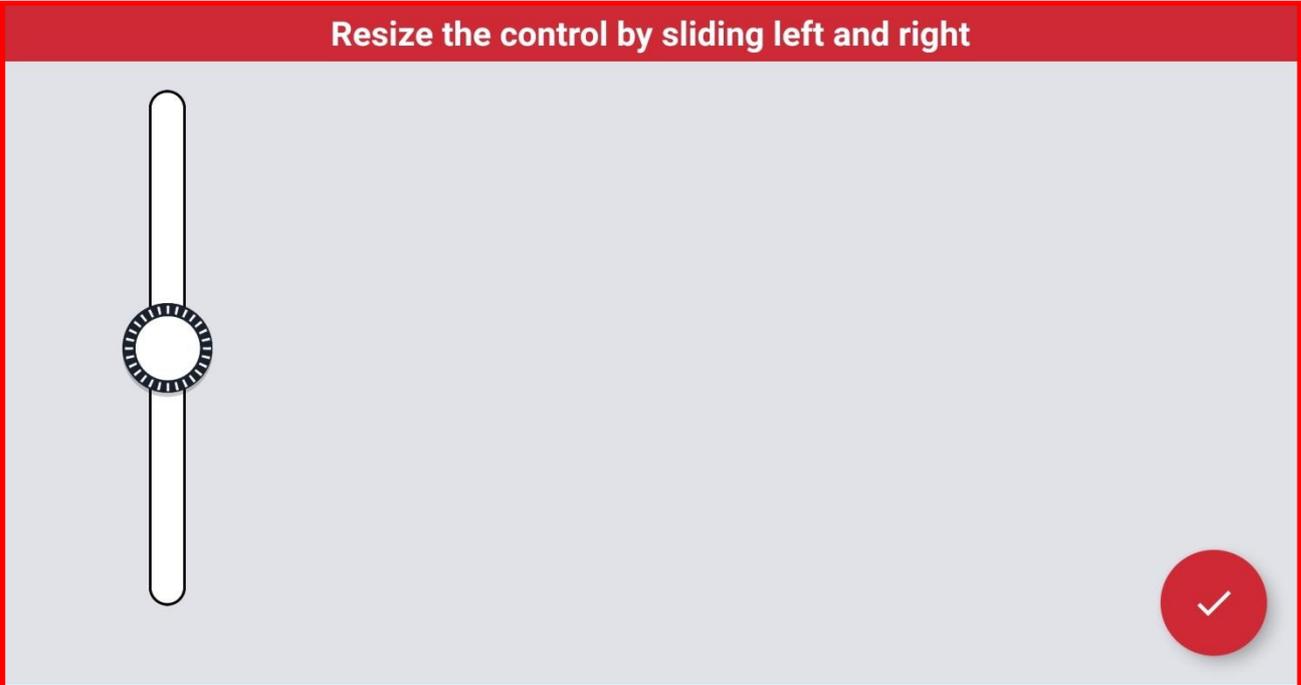
11. Tap the label option to add a helpful text label for the current control

12. You can use above steps to add a Horizontal slider and BuWizz Battery voltage indicator:
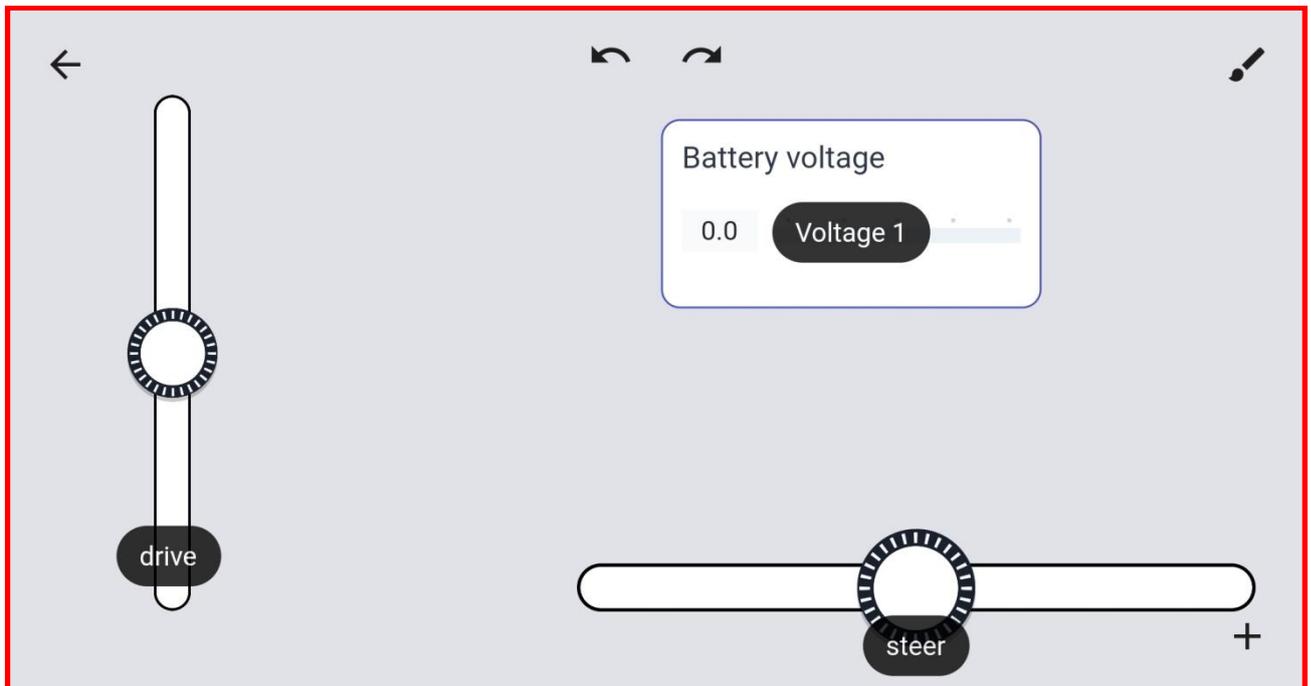
13. You can change the profile background by tapping paintbrush icon in the top left corner of the Controls layout.
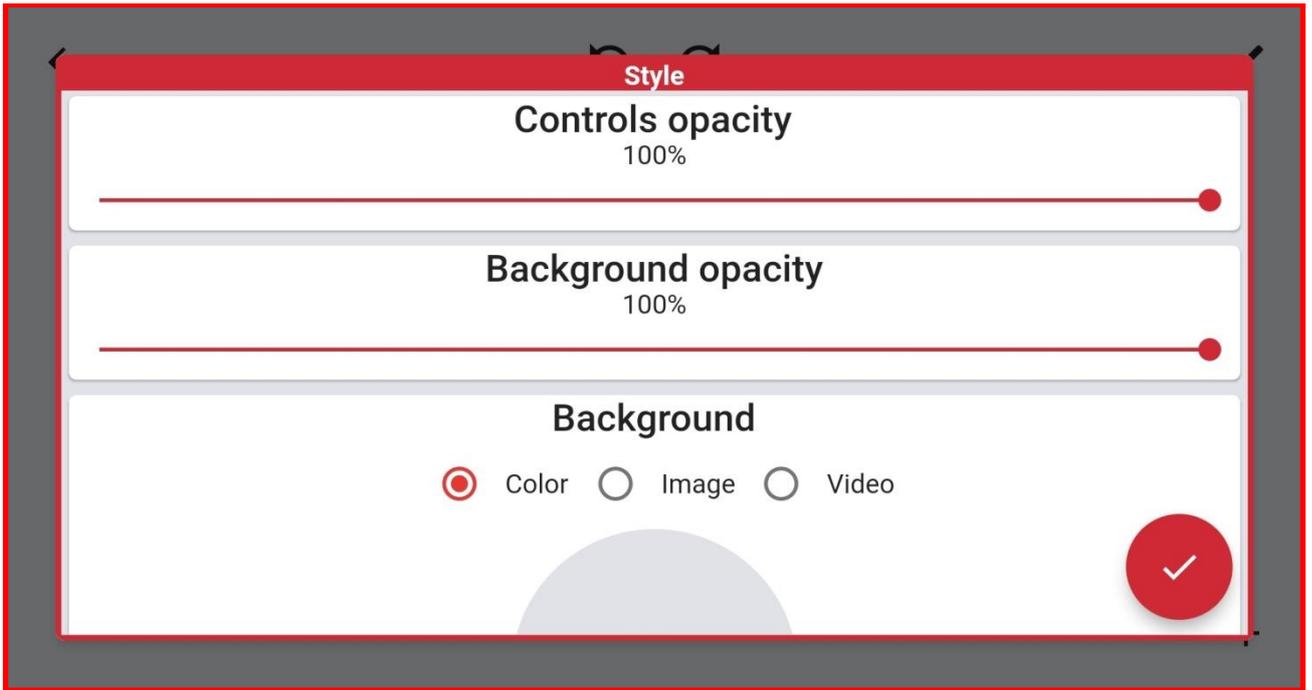
14. You can choose from multiple colors or use a custom image or video for background.
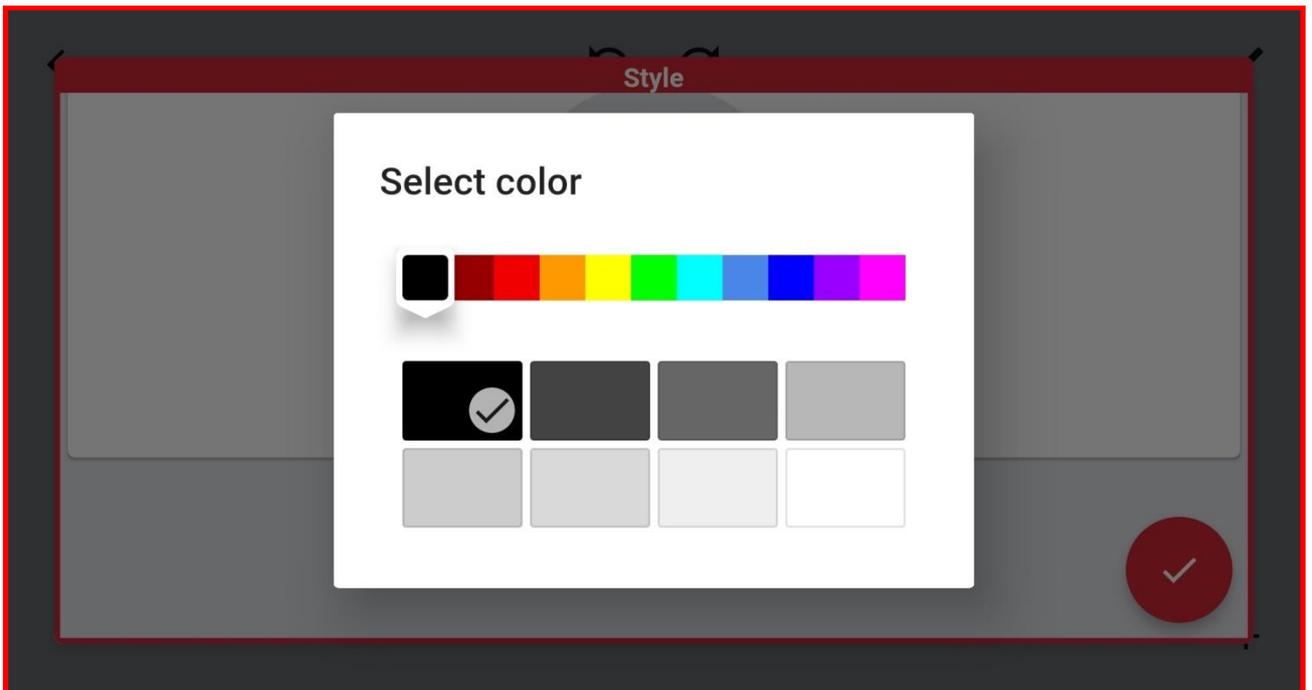
15. Once you set up your Controls layout go back to the main menu and select Link BuWizz ouputs to link controls to output ports.
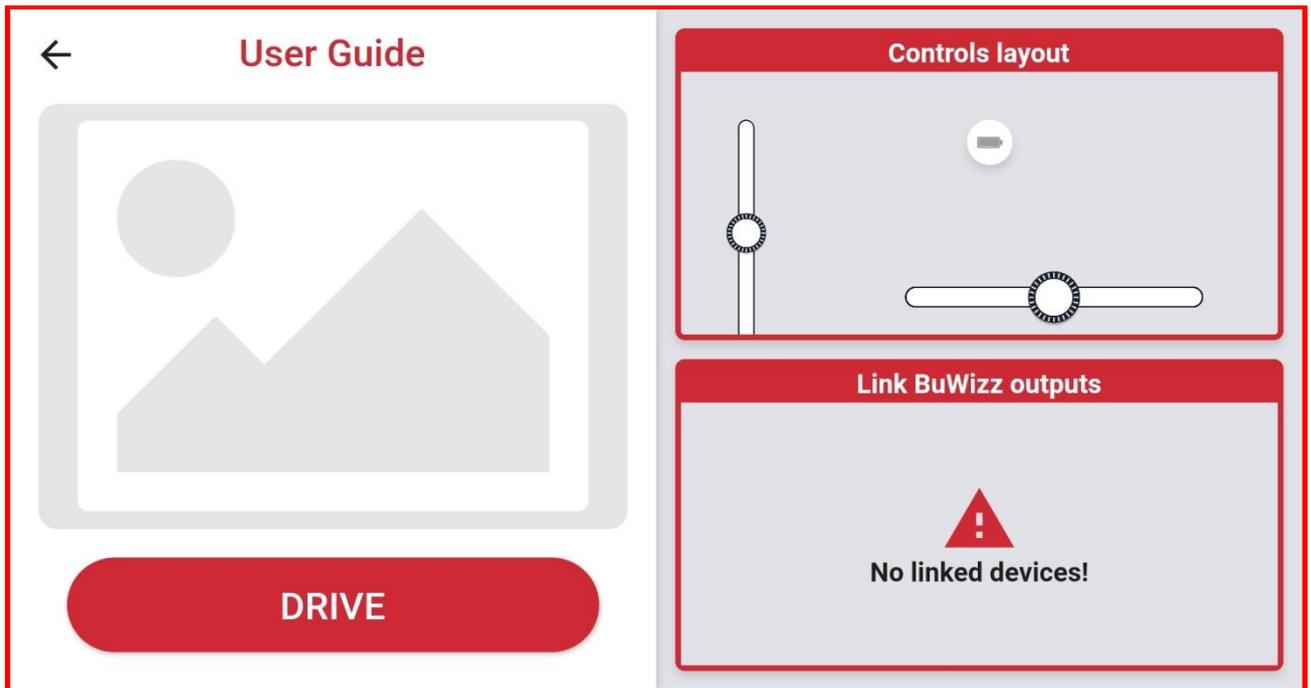
**16. Inside Link BuWizz ouputs you can select available BuWizz bricks or select a template:**
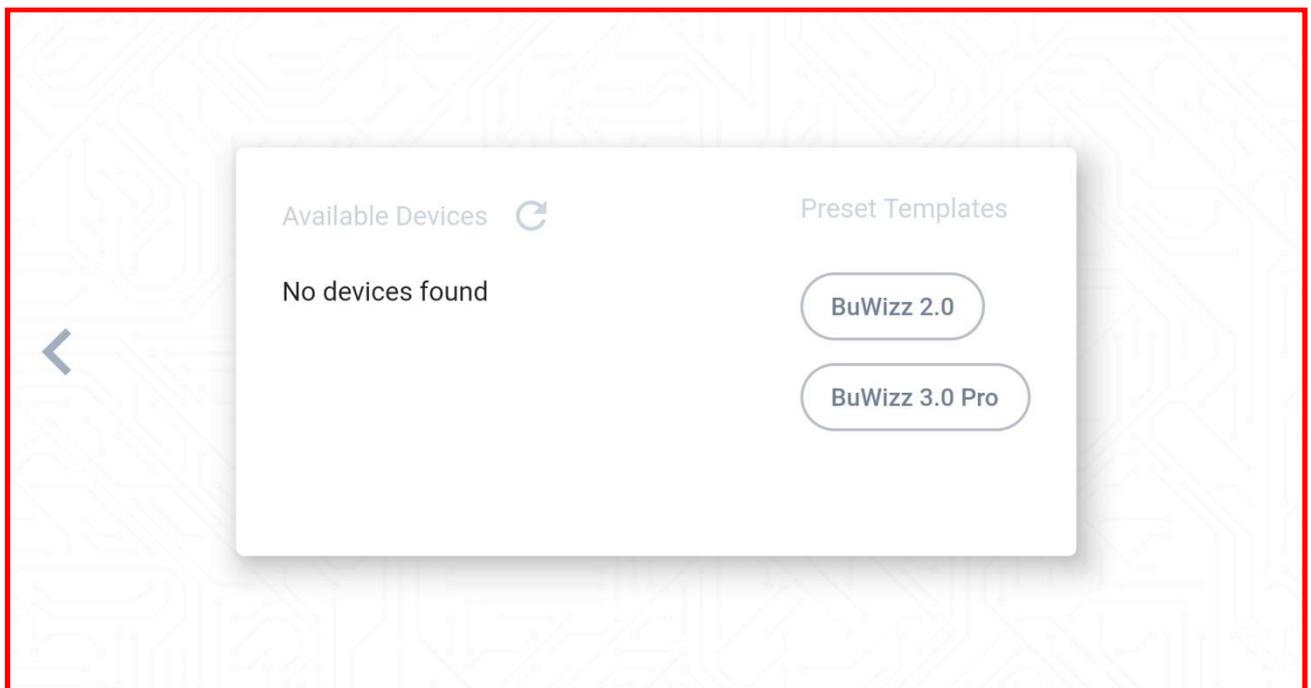
17. Once you selected the BuWizz brick/template you can start assigning the ports/functions/gauges.
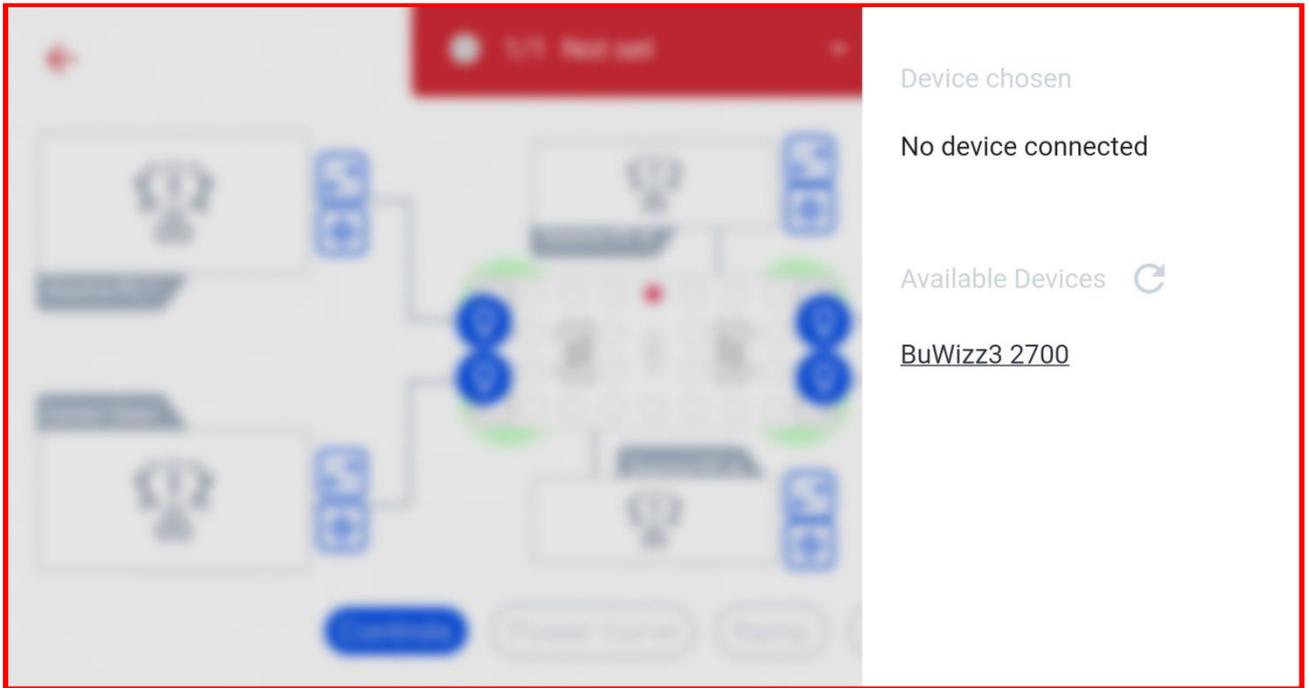

**18. For this example we tap inside SOURCE window, which opens up our custom Control Layout preview.**
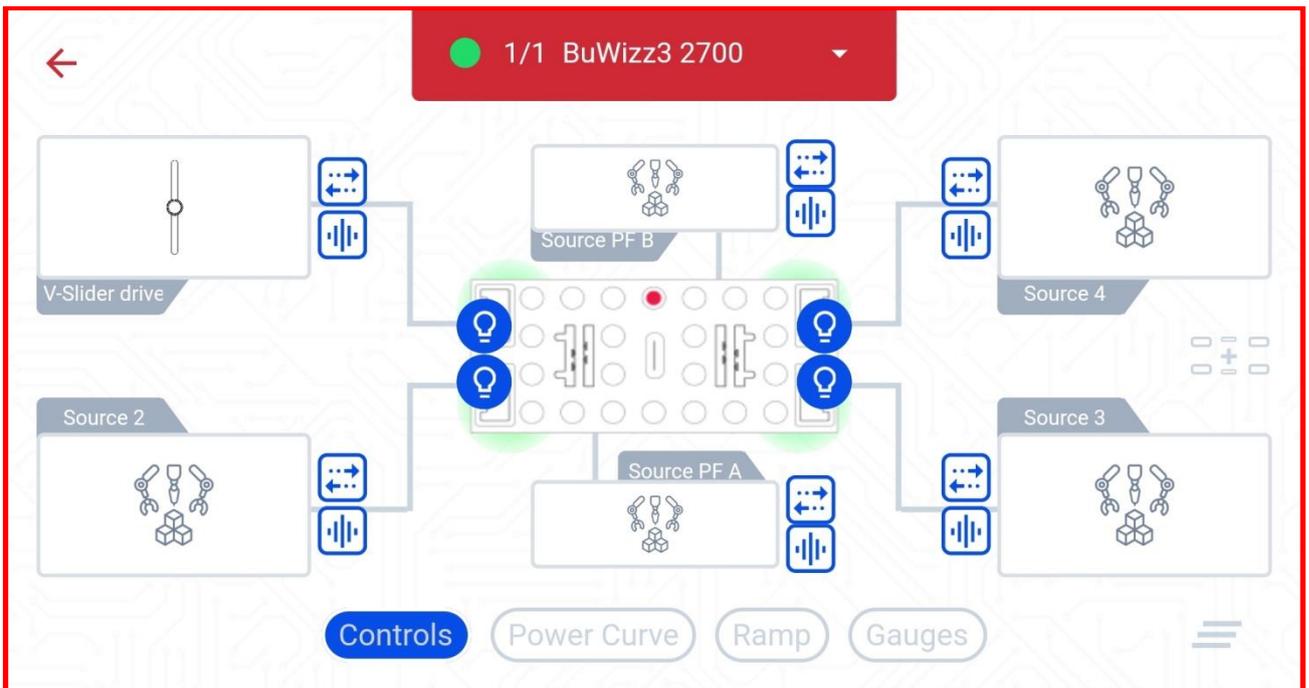
**19. Choosing the Drive slider links it to PU port 1. Press the checkmark icon to confirm selection.**
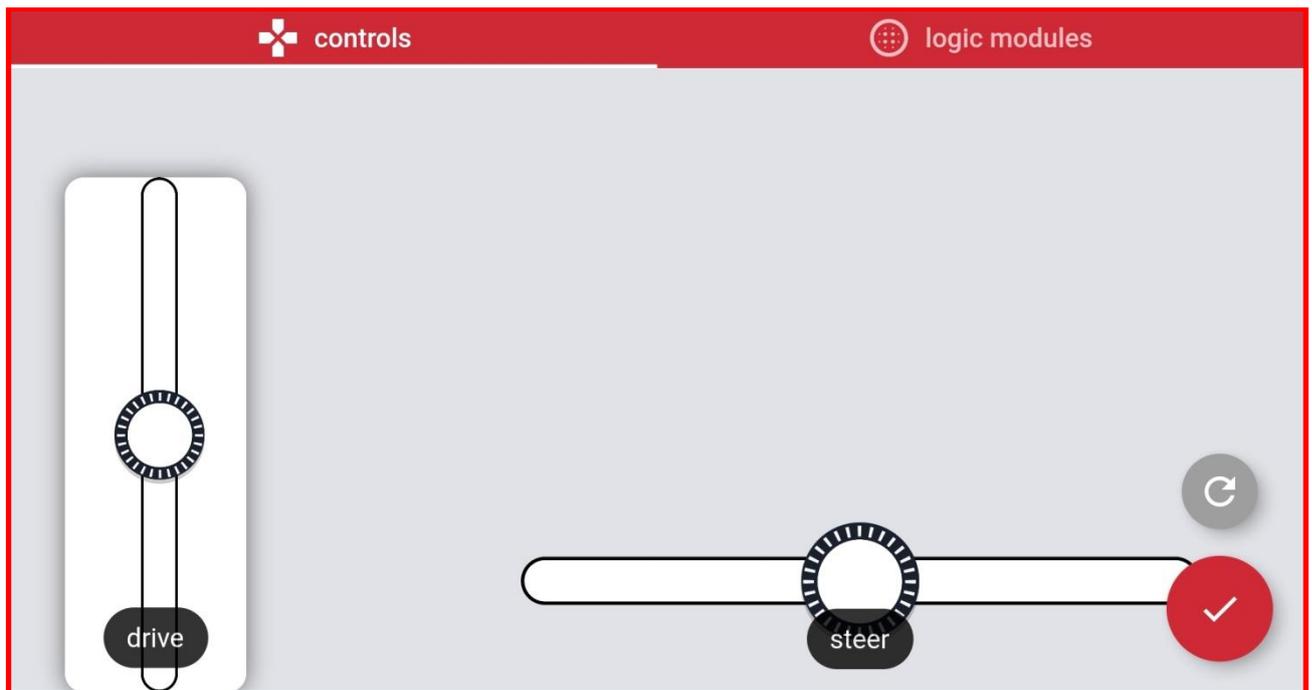
**20. Linked controls are shown in Link BuWizz ouputs window. You can assign same control to multiple sources.**
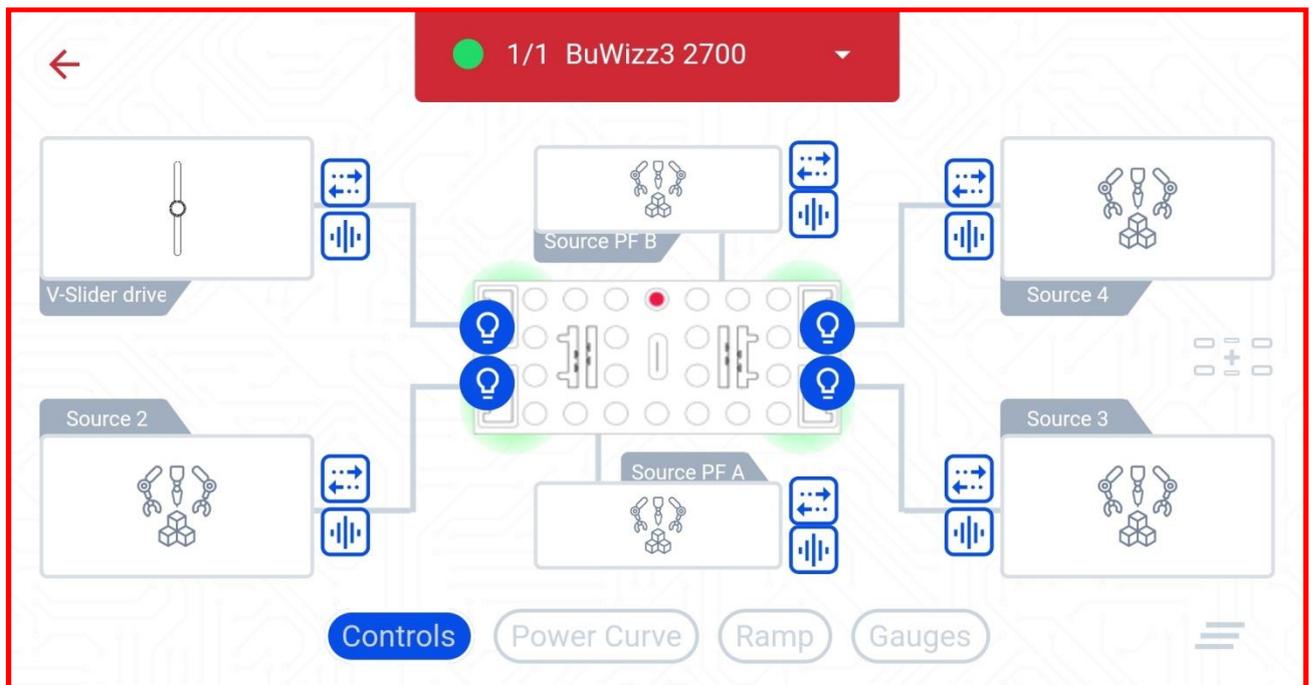
21. To reverse a port output tap the ⇄ **symbol.**
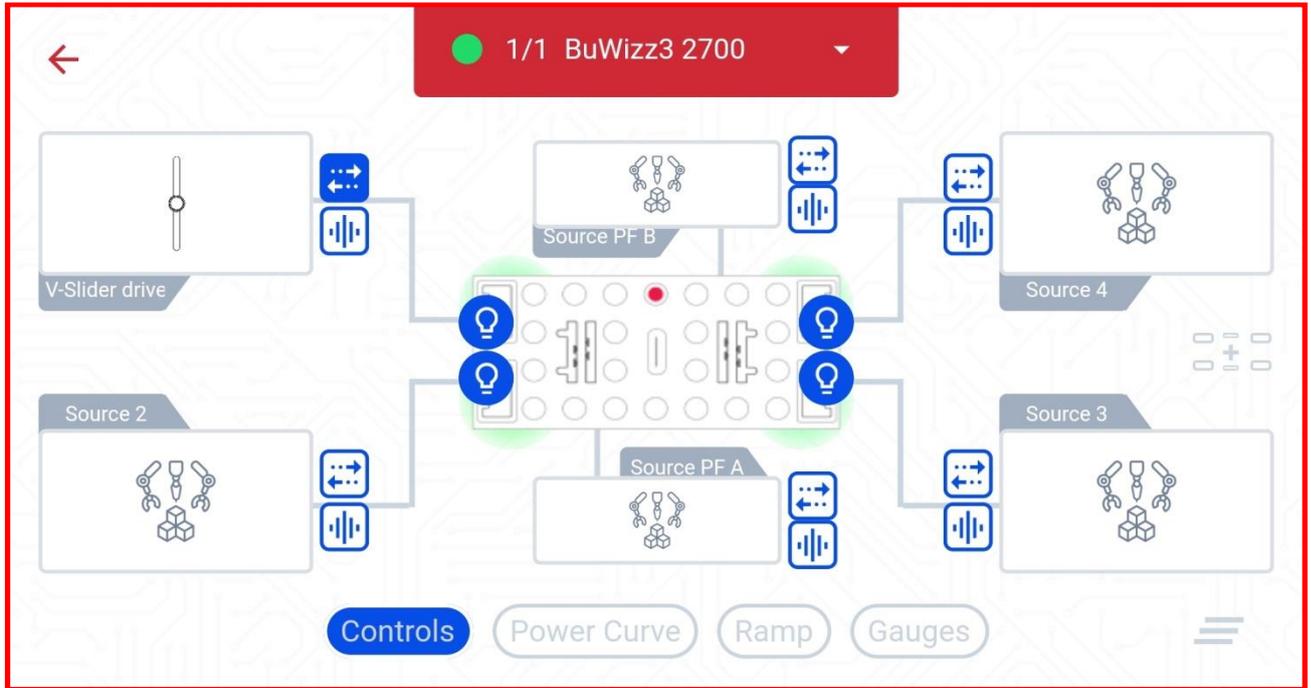
22. You can test the output ports by pressing ⇨|||⇦ **symbol as seen below, this will cause the PU port 1 to pulsate.**
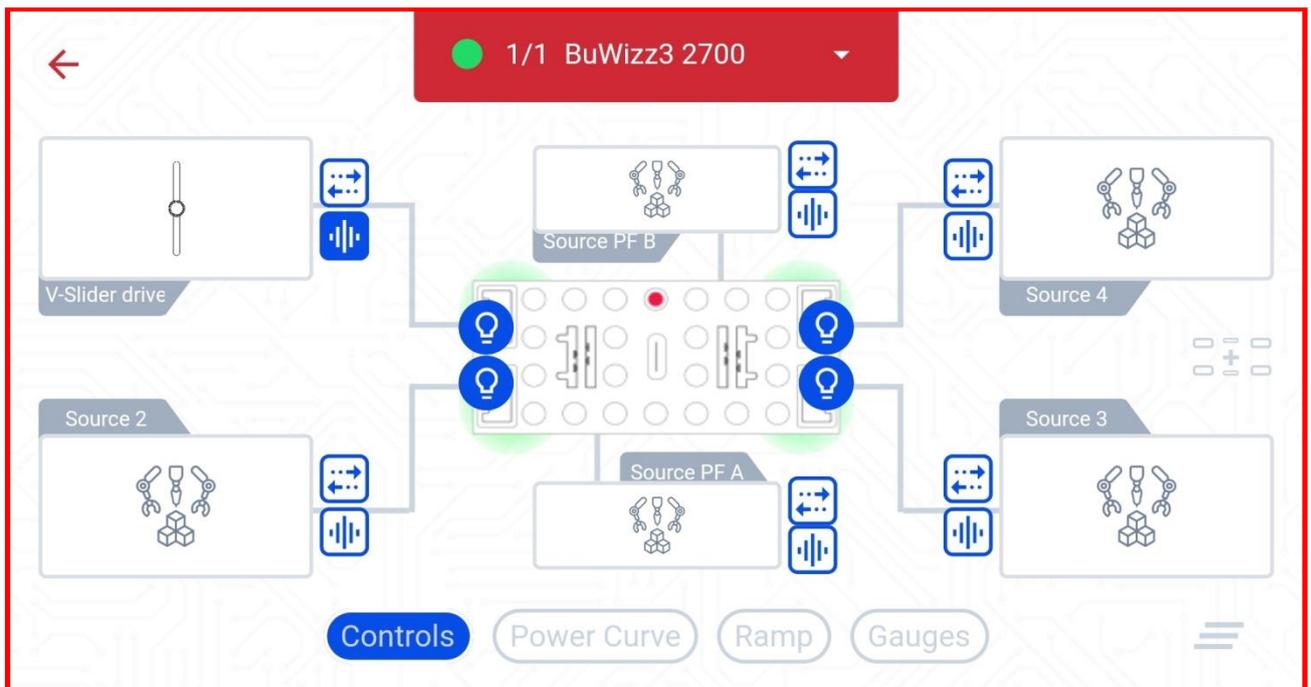
**23. To link a gauge to the BuWizz we select the Gauges filter:**
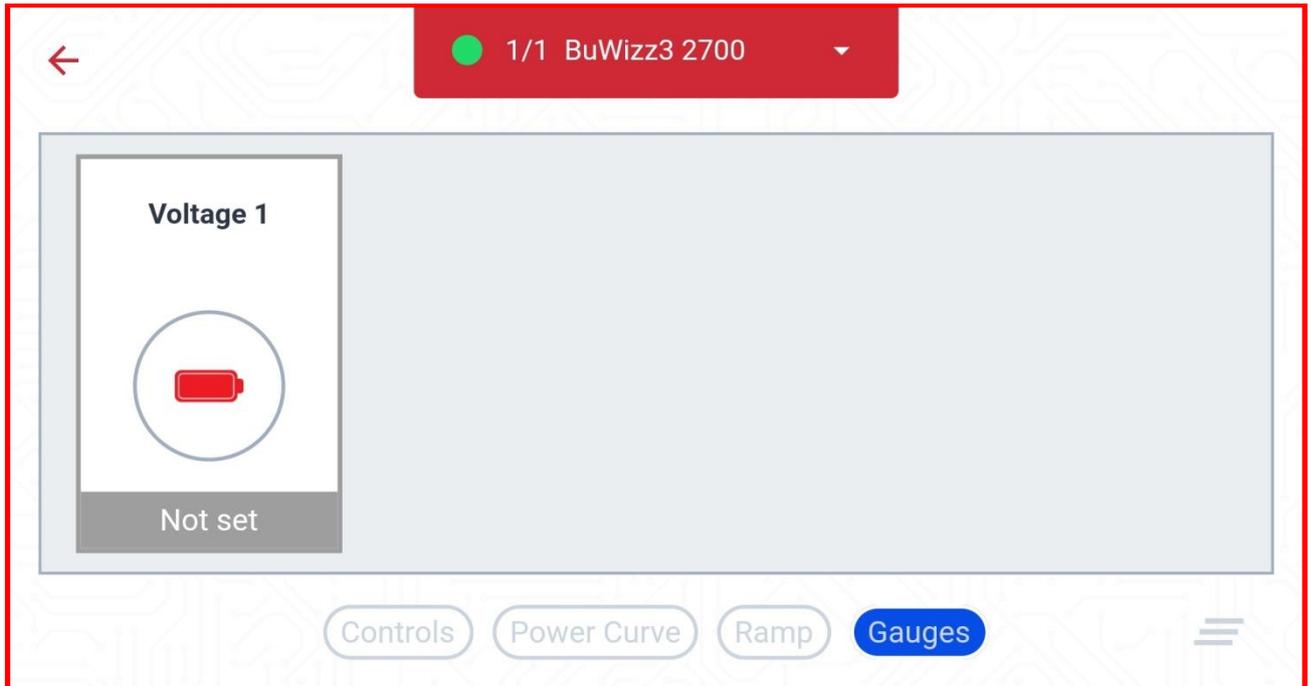
**24. Here we link the voltage gauge to the BuWizz:**
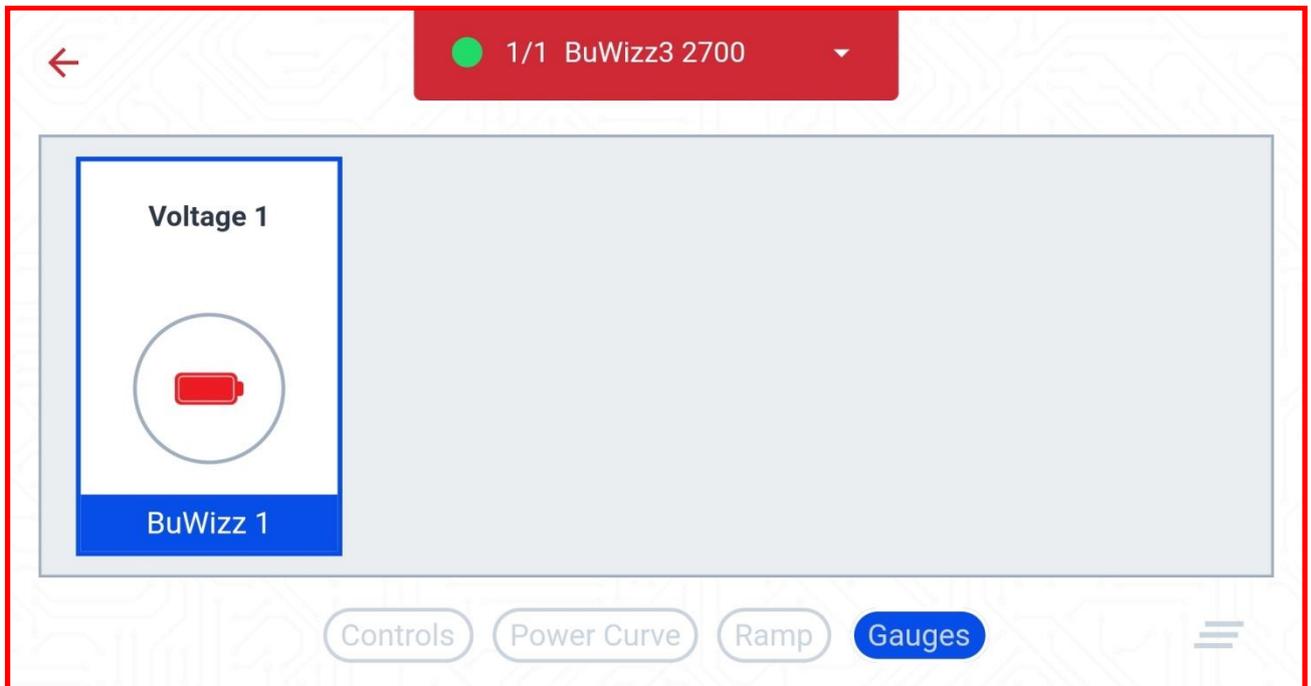
25. You can select the LED colors of each PU port by pressing the 💡 symbol next to it. This will open the RGB color mixer:
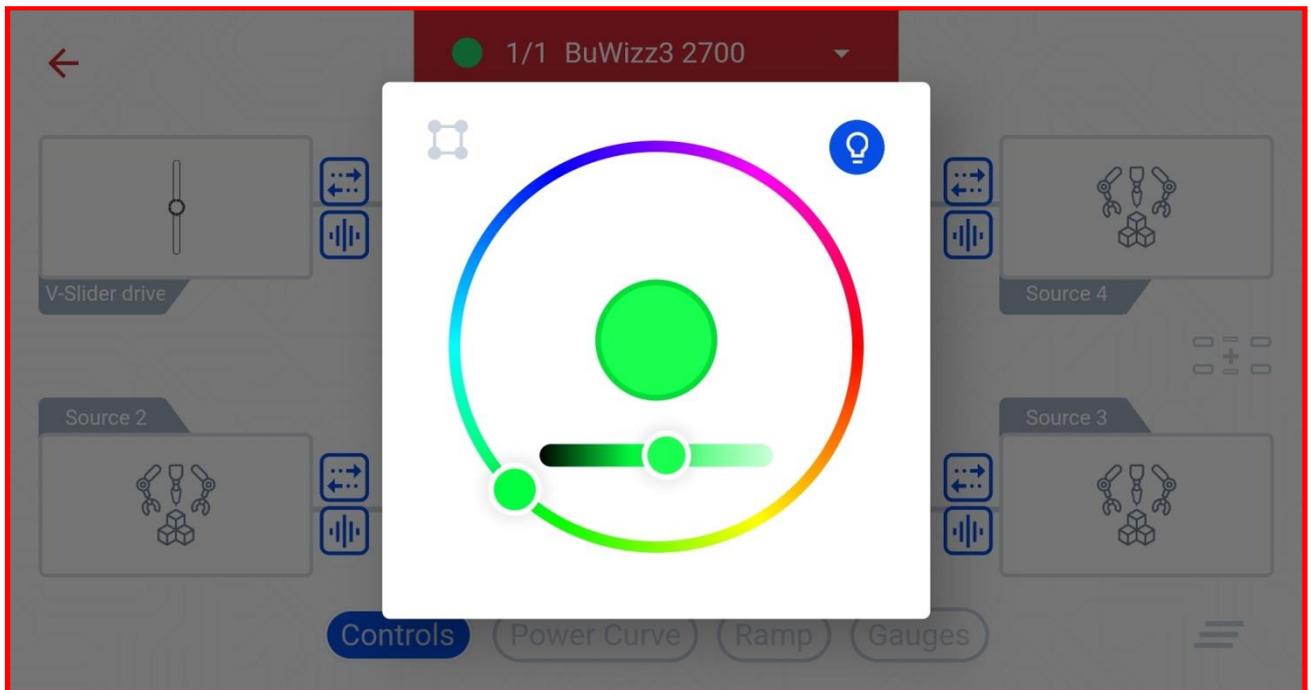

**26. Pressing the ⬚ symbol sets the same color value on all PU ports:**
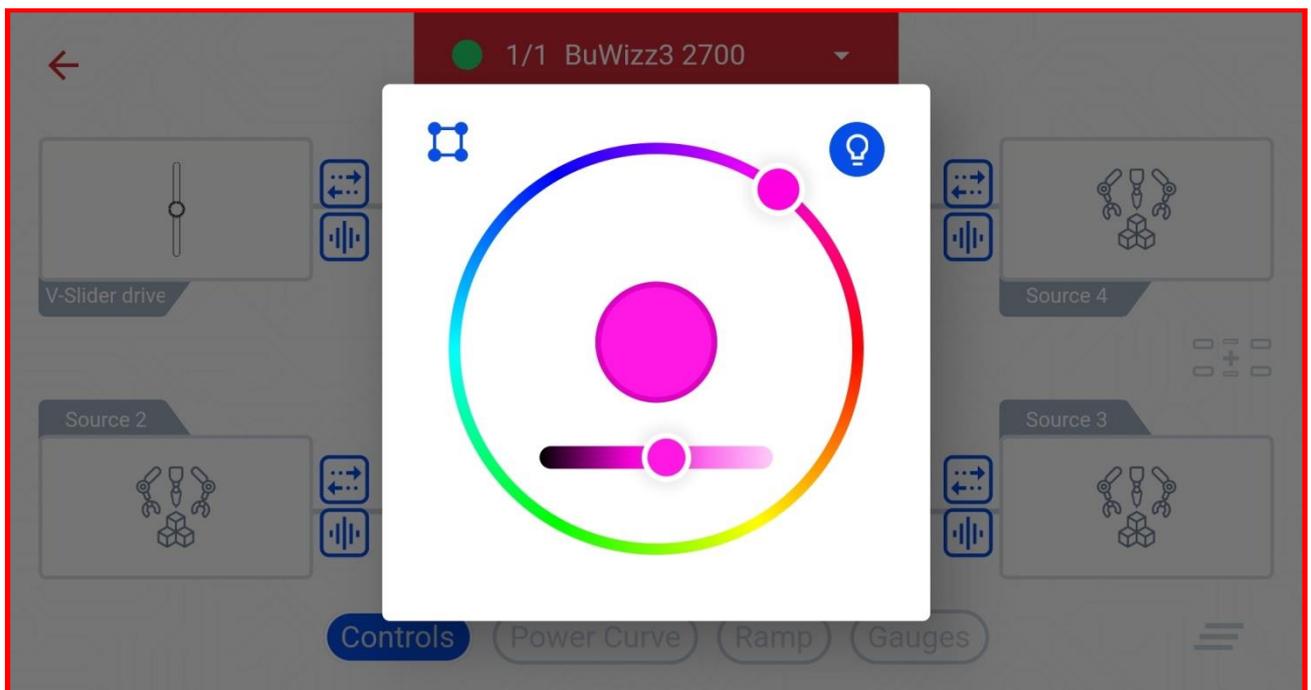
27. Press DRIVE once all the controls are linked to your BuWizz.
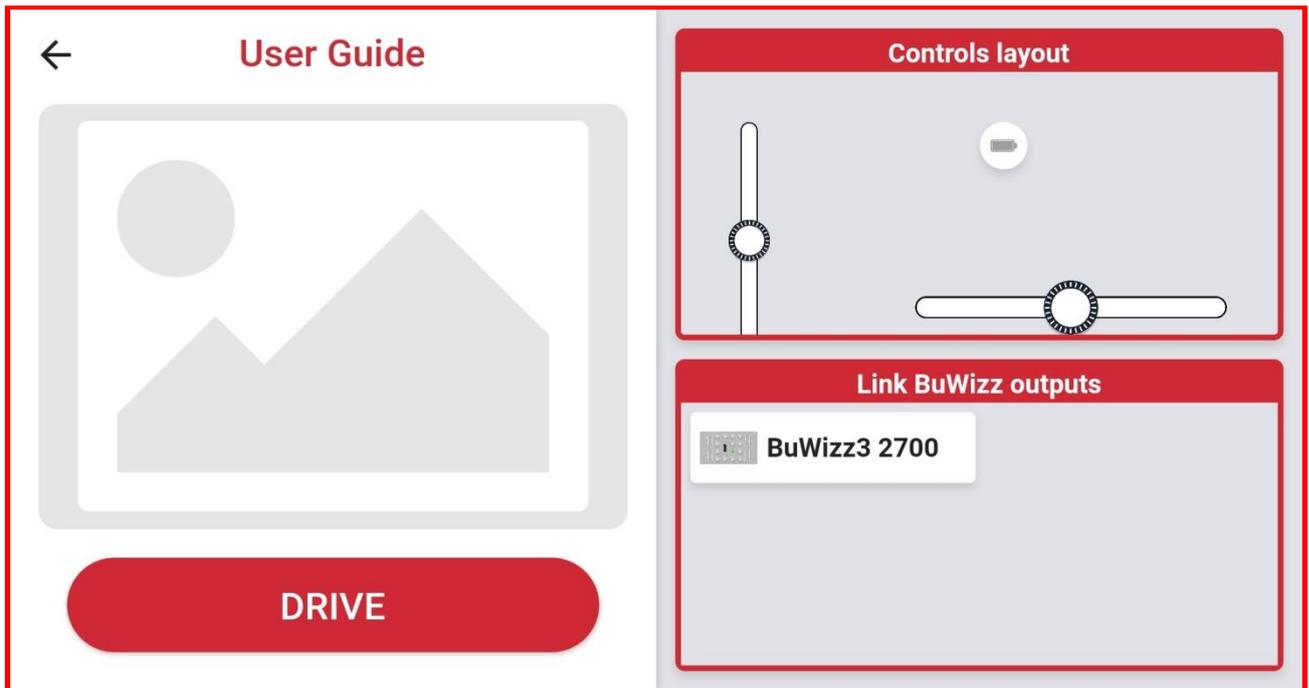
28. App is now connected and ready to play. Connection status is shown in the top of the window.
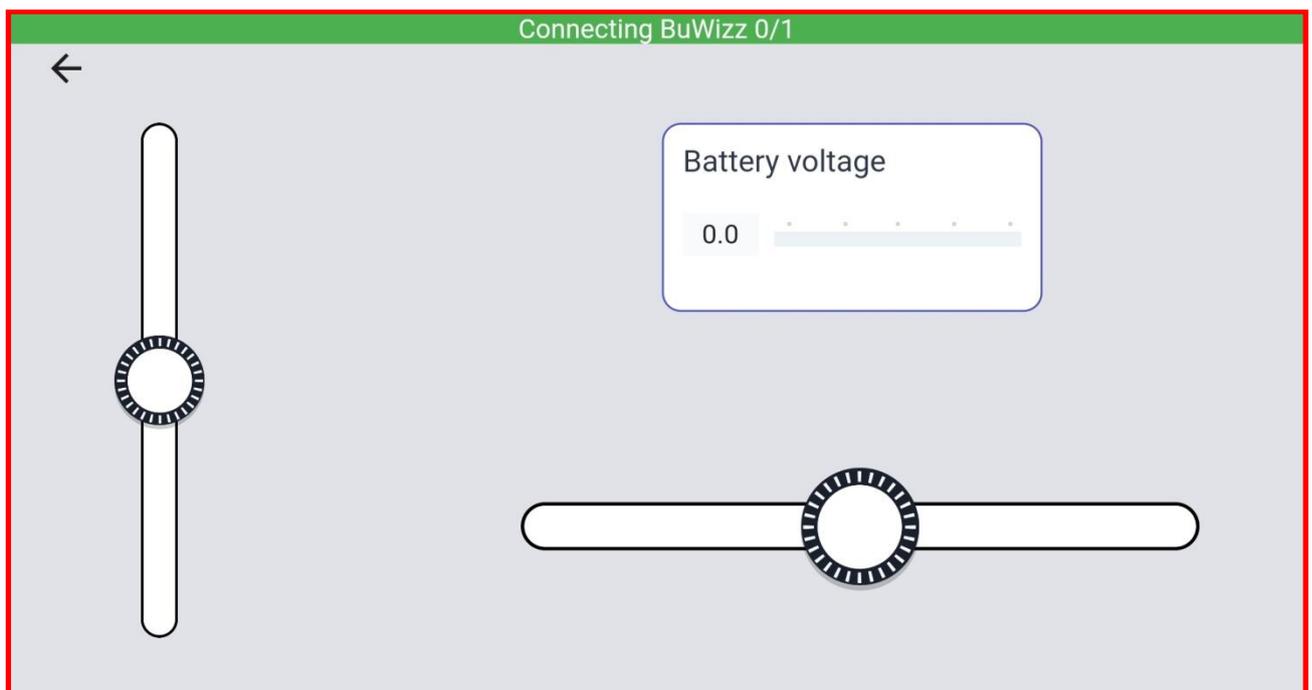
29. **When you are finished playing press the back arrow** to leave the control window. To disconnect from the BuWizz press back again to leave the control profile.
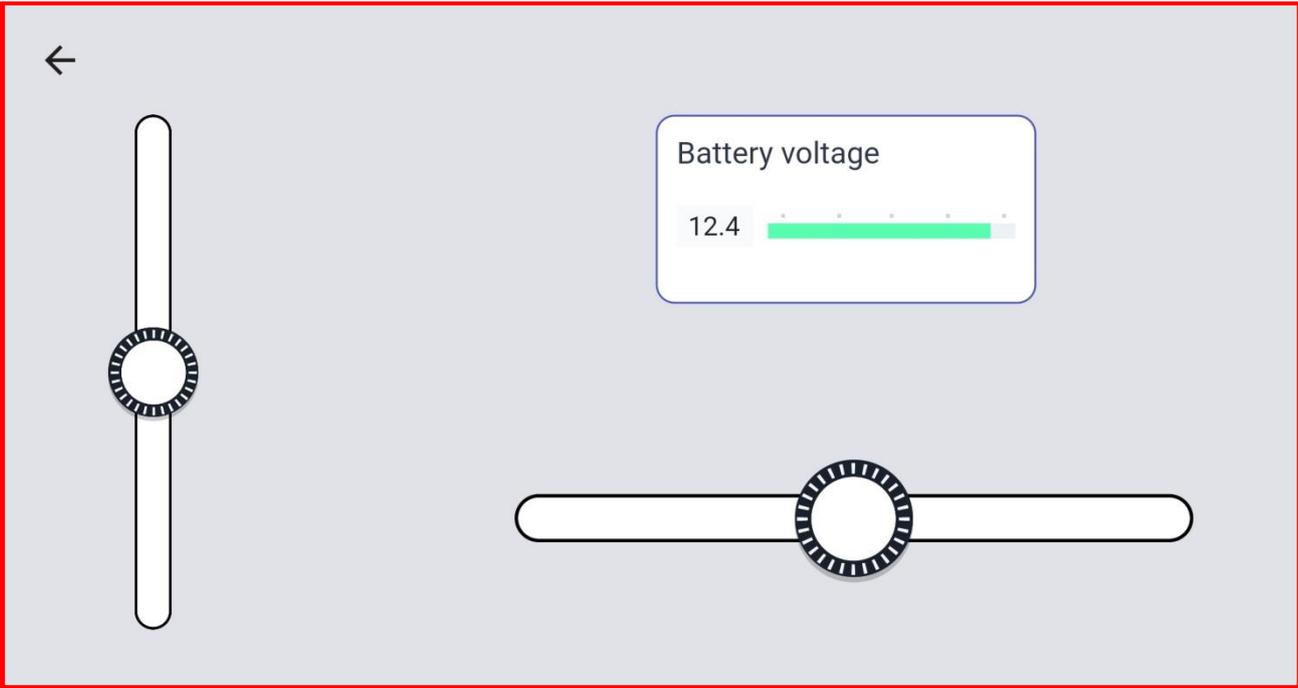
30. **You can Export a profile in order to share or save it by selecting the Share symbol** . **This allows you to save profile or share it using apps installed on your device.**
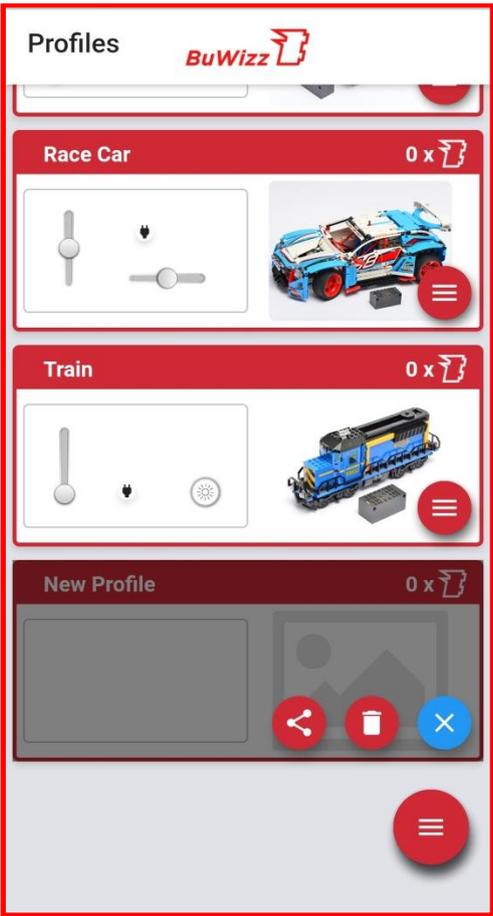
31. To delete a profile select it and press the trash symbol **.**

Are you sure you want to delete the New Profile profile?

Yes   No
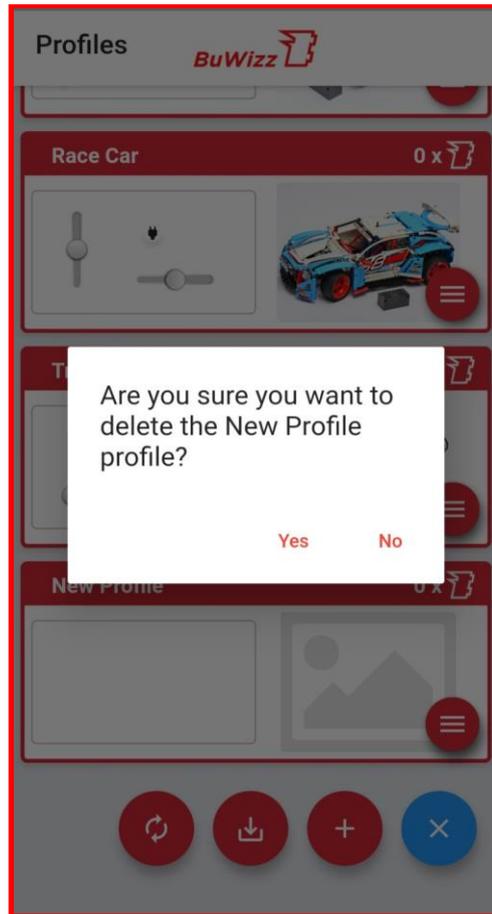
9. Advanced App Functions

BuWizz App allows you to check, rename, update your BuWizz brick and set up advanced control functions such as Mixers, Power Curves and PU motor center steering

BuWizz manager – BuWizz 2.0 and 3.0.

1. **To access the BuWizz manager, press the gear icon in the top right corner of the BuWizz app.**

2. **A list of available BuWizz devices will be shown with detailed information:**
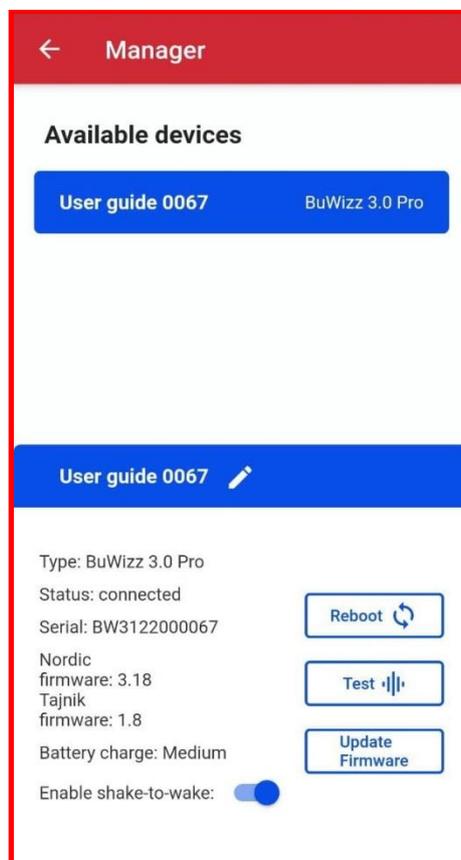
3. **Here you can rename, reboot, test and update the BuWizz bricks. Please note that the shake-to-wake, rename and firmware update is and currently only available for BuWizz 3.0**

Center steering – BuWizz 3.0 Pro only

Center Steering Module allows you to center the steering mechanisms which use the PU L and XL and Spike Prime motors for steering. **THE MOTOR MOVEMENT ANGLE HAS TO BE MECHANICALLY LIMITED** in order for Center Steering calibration to succeed. Example of a simple mechanical angle limiter below:
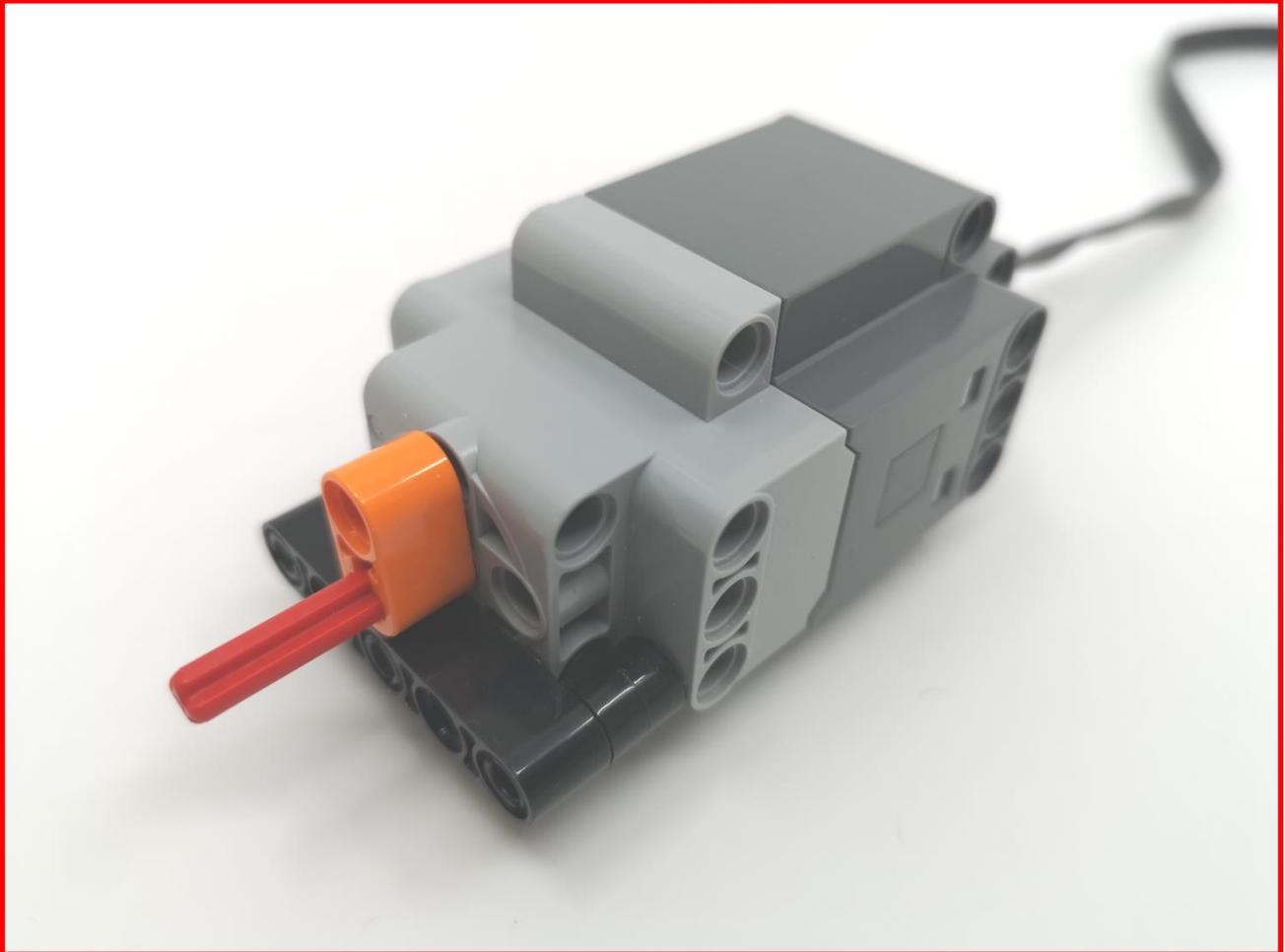
4. **To access Center Steer module go to the Link output windows and select the first output you want the mixer to apply for – in this case PU Source 2.**
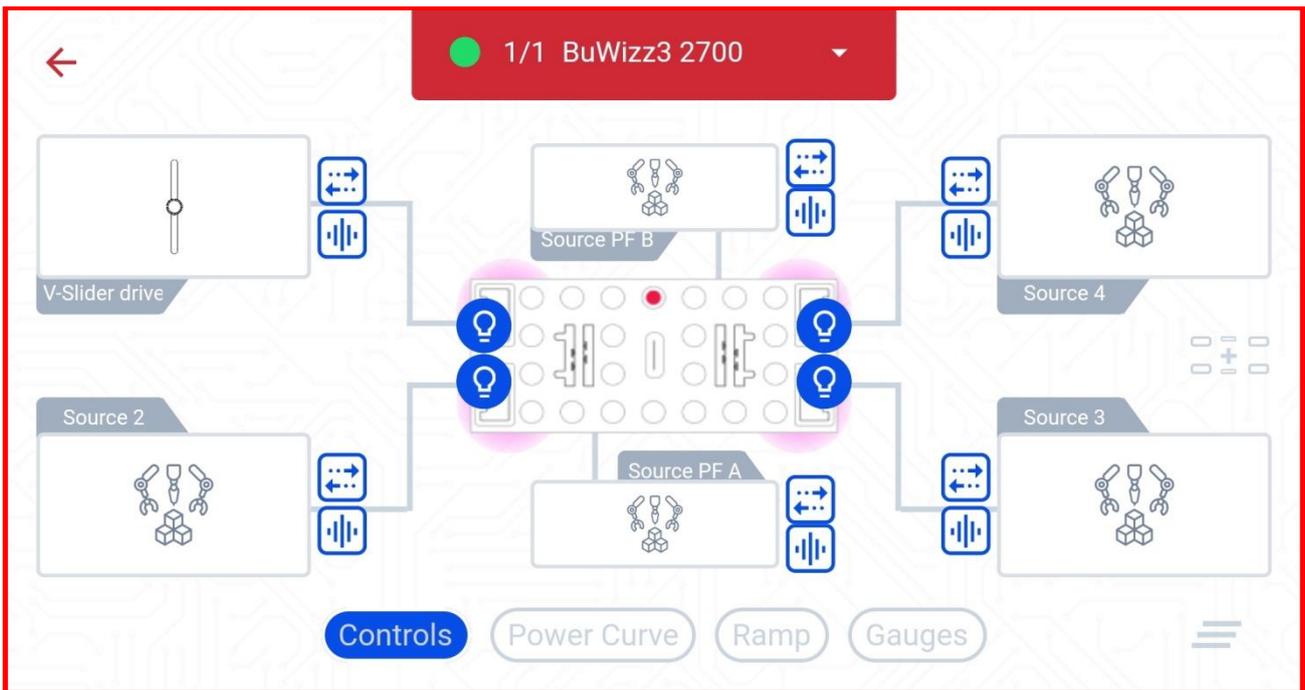
5. **Instead of choosing the controls tab, choose the logic modules tab and press the + symbol to add the Center Steer module.**
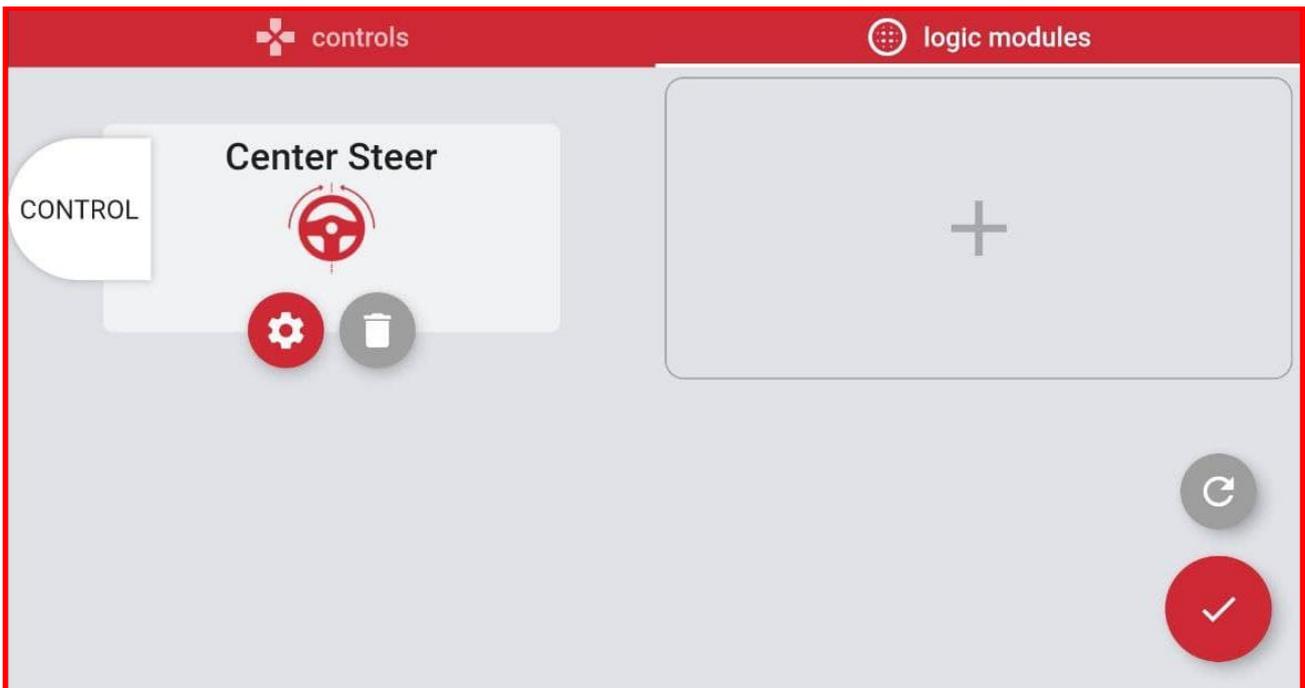
6. Pressing the **gear icon** will open the menu with the following **settings**.

Centering PVM power and time settings

Offset from steering max: 3 °

Centering PVM power: 50 %

Centering PVM time: 2000 ms

Centering PVM power and time settings
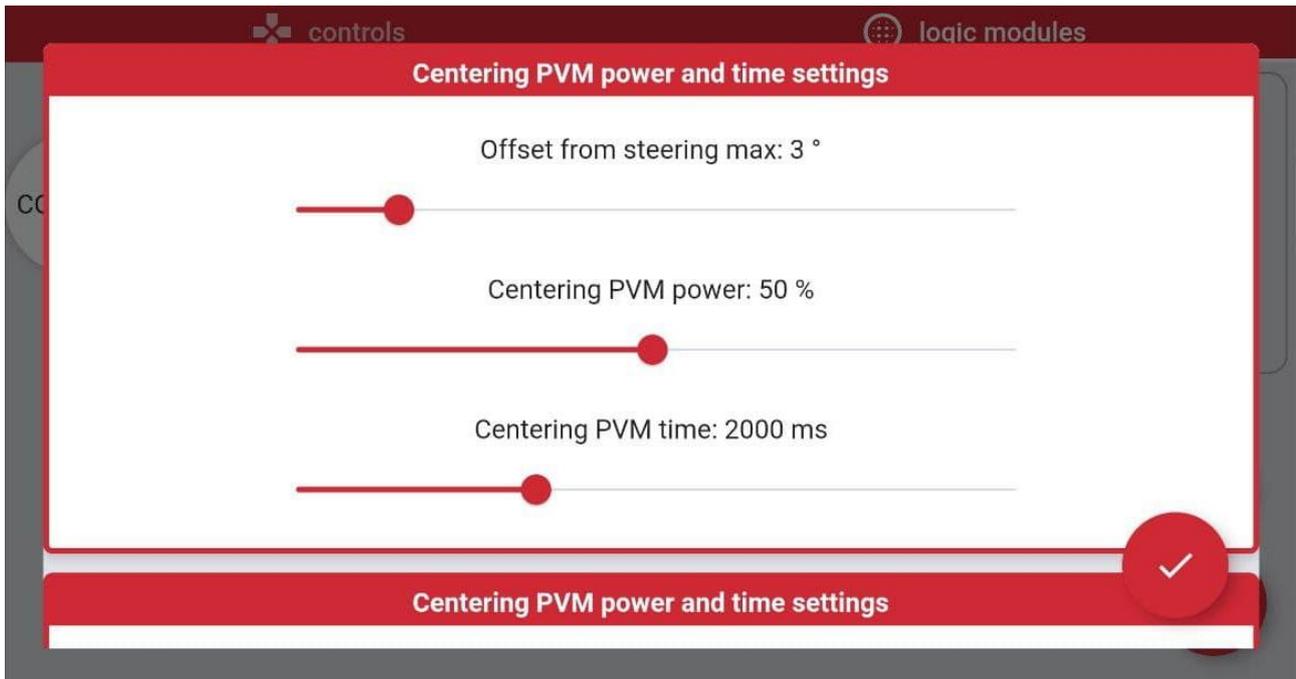
7. Description of the centering settings:
   - **Offset from the steering angle – This setting reduces the maximum calibrated angle in order to stop the motor stalling once the steering reaches the mechanical limits. Recommended offset from the steering max: 3° - 10°.**
   - **Centering PWM power – Power used to calibrate the steering. Use as low as possible while still having enough to steer the wheels. WARNING, if the power is set too high it can stall and temporarily disable the motor! Recommended Centering PWM power: 50%.**
   - **Centering PWM time – The time the center steering module spends steering the wheels in each direction. If the time is too low the motor may not reach the final position, longer times are recommended for models with large gearing or rack lengths. Recommended time: 2.0 seconds.**

8. The Center Steering Module already comes with **three safe presets**:
   - **The light preset is designed for models such as 42124 Off-Road Buggy.**
   - **Medium setting is designed for a model such as 42099 4x4 X-treme Off-Roader.**
   - **Heavy setting is set up for heavy models like 42114 Articulated Hauler.**

9. **Custom** steering module **settings** allow the user to change the controller **parameters** at **their own risk.**
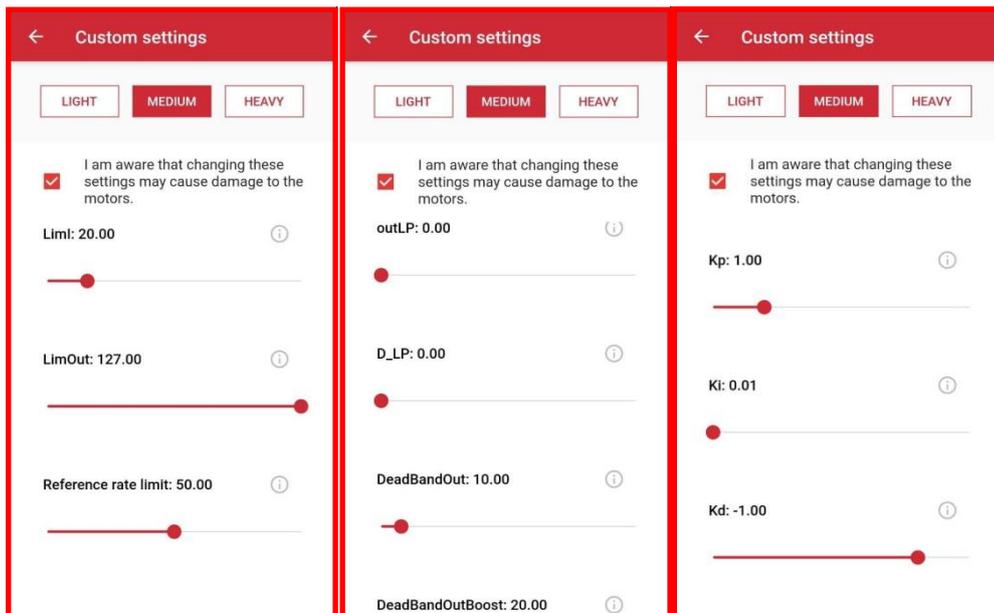

10. Summary of the **steering parameters** and their **affects**:

- **Kp** - this is the **main proportional influence** of the steering controller, it tells the steering with what kind of a gain it should work. Having it low reduces the steering response, having it too high can cause it to oscillate. **Recommended setting: 0,5 – 3,0.**
- **Ki** - This is the **integral influence** of the controller, having it too high can cause oscillation. **Recommended setting 0.01.**
- **Kd** - This is the **derivative influence** of the controller. **Recommended setting is -1.0**, but it can be increased to -0,5 for heavy models where the steering system is slower.
- **outLP** - this is an **output low pass filter** which can be used to slow the system down in order to prevent oscillations, but it's not needed most cases. **Recommended setting: 0.**
- **D_LP** - This is an **additional derivative low pass filter** which can be used if needed. **Recommended setting: 0**
- **DeadBandOut** - this factor sets a **deadpoint band** for the **servo output**, having it too low may cause the servo to constantly try to adjust the position, having it too high will cause the steering to be less accurate. **Recommended setting: 5 – 20.**
- **DeadBandOutBoost** - This is the **boost the servo motor receives to move the steering** from standstill. Some boost is recommended to overcome the initial friction and inertia but having it too high may cause oscillations. **Recommended setting: 5 - 20.**
- **LimI** - **limits** the **integral part** of the controller. **Recommended setting: 20.**
- **LimOut** - **limits the current consumption** of the servo motor. Reducing it may reduce the torque of the steering system. **Recommended setting 25 - 127.**
- **Reference rate limit** affects the **speed of the entire servo steering system**. **Recommended setting 25+ for lighter models and lower for heavier models.**

Recommendation: Changing the Kp, DeadbandOut, DeadBandBoost and ReferenceLimit is usually enough for basic fine tuning of the center steering module. Other parameters can usually be left at default settings.

11. Once all parameters are set, link the CONTROL to the steering slider.
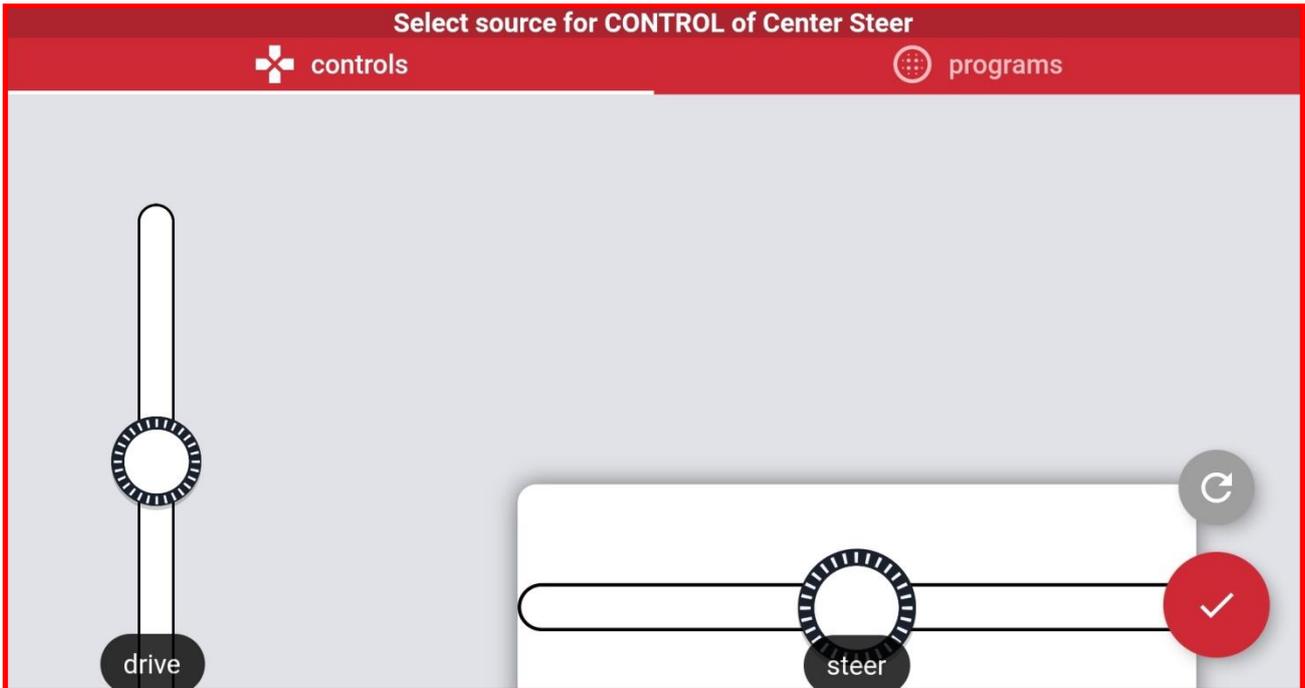
12. Once set go back to the Link Output Windows and select the Buwizz.
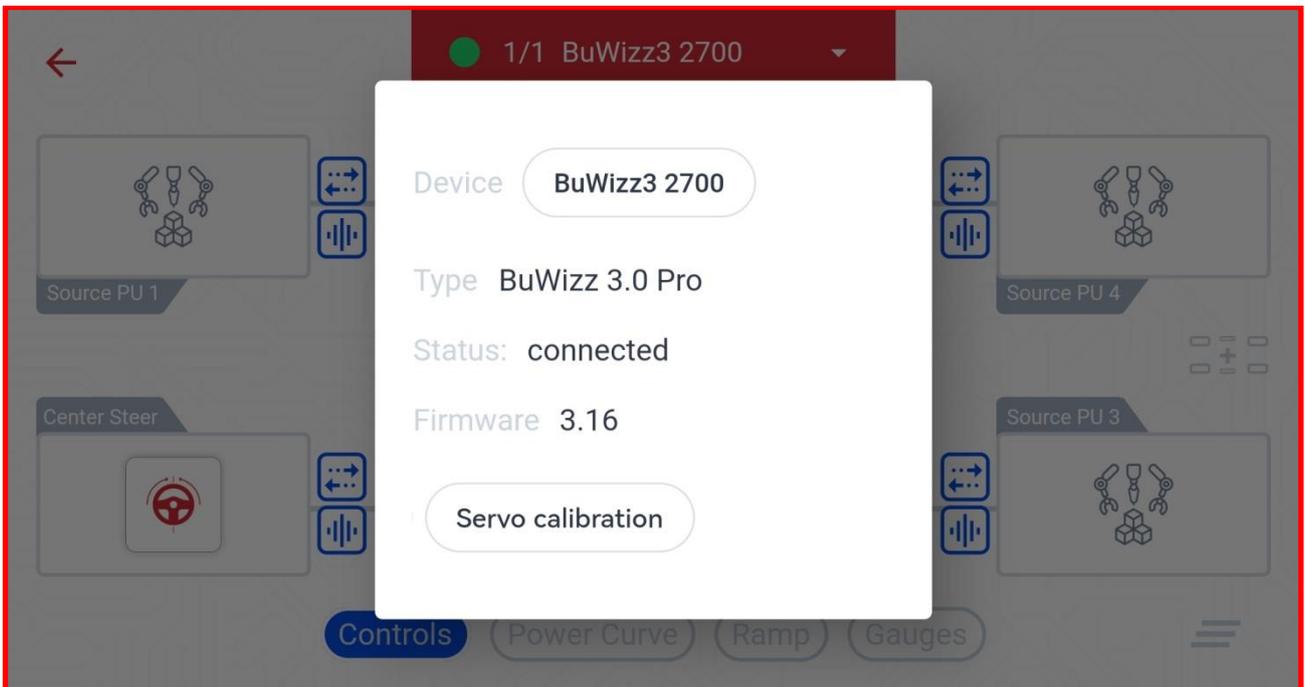
13. Select the Servo calibration. This will calibrate your steering and save the values into the profile for future use. You have to **calibrate your steering after** each **change of the settings.**
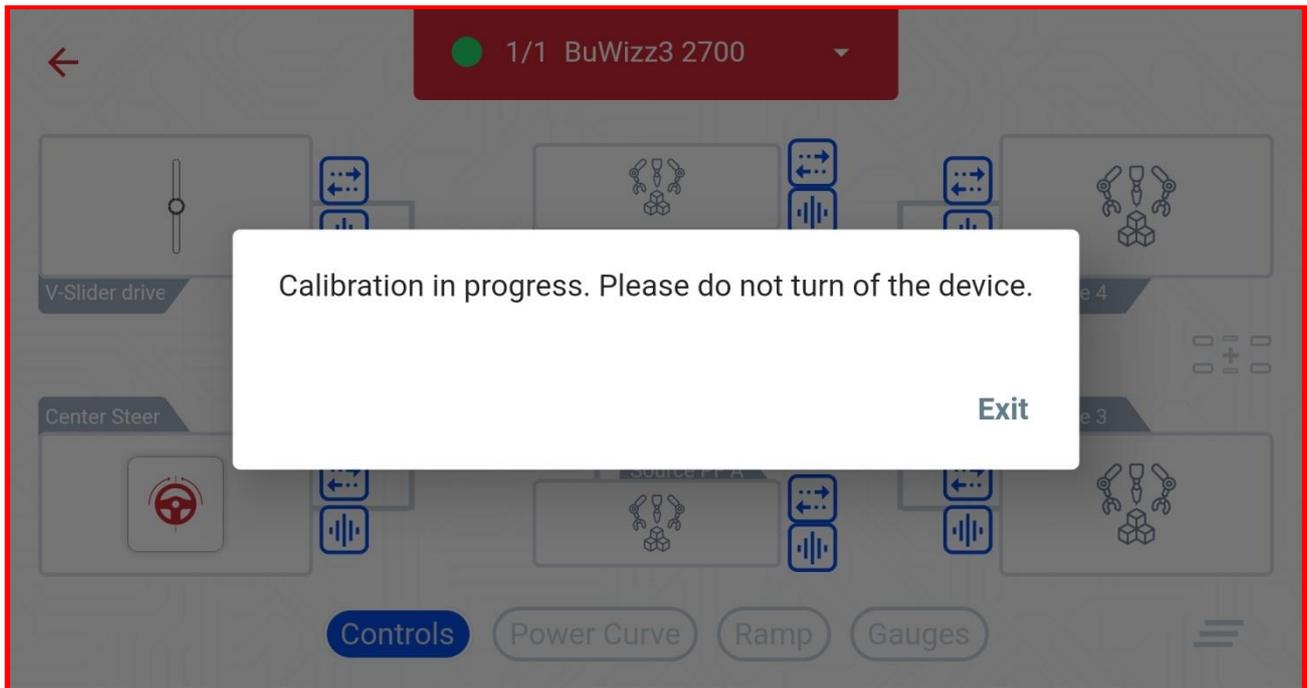
Tracked steer mixer

Tracked steer mixer allows you easier control of vehicles with independent motors for left and right side hand drive. It automatically calculates the output power levels for the drive motors according to the input drive and steer sliders and steering factors.

Tutorial for setting up the Mixer module for a simple tracked vehicle can be found here: https://www.youtube.com/watch?v=WsMuO5tcz_w

1. **To access Tracked Steer mixer go to the Link output windows and select the first output you want the mixer to apply for – in this case PU Port 1.**
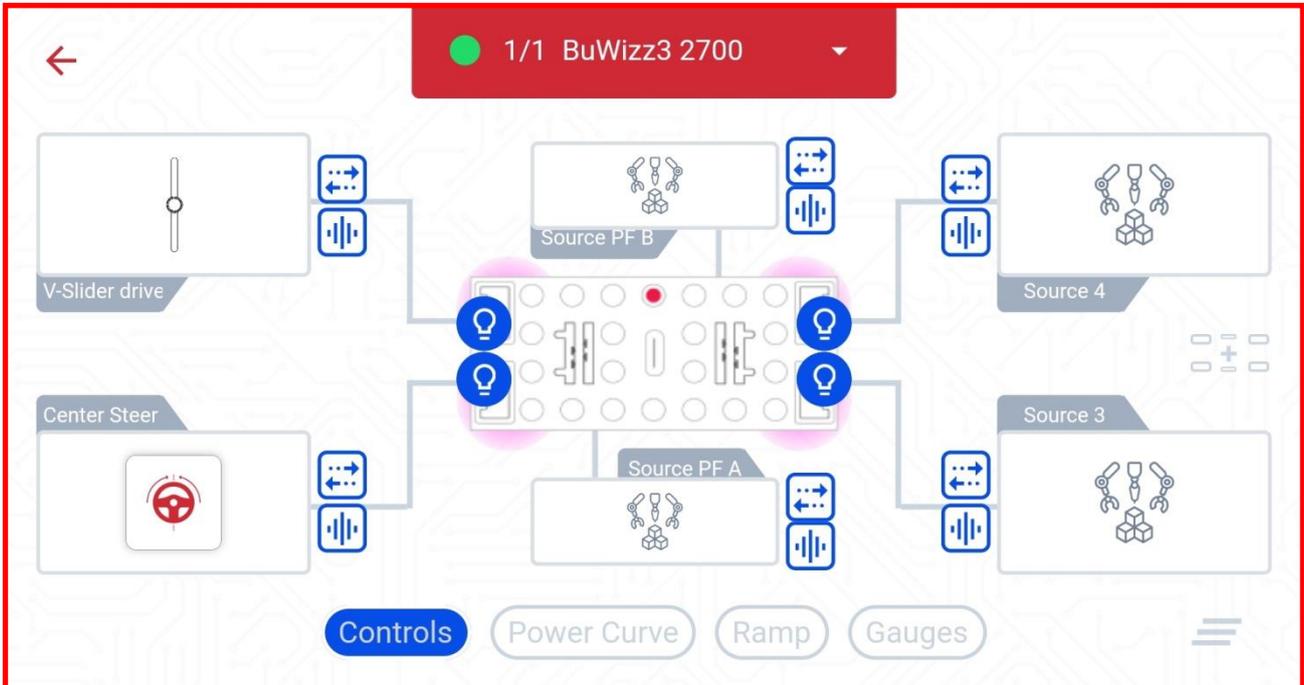
2. **Instead of choosing the controls tab, choose the logic modules tab and press the + symbol to add the Tracked Steer module.**
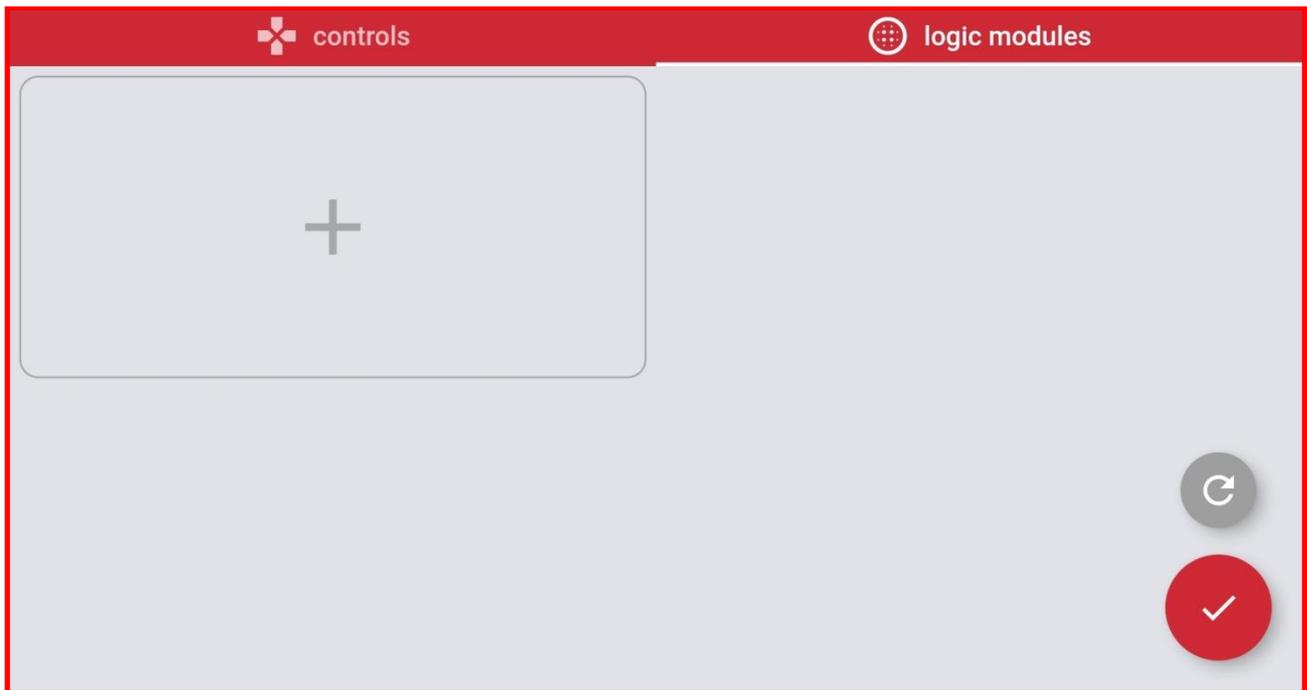

3. **Add the Tracked Steer module:**
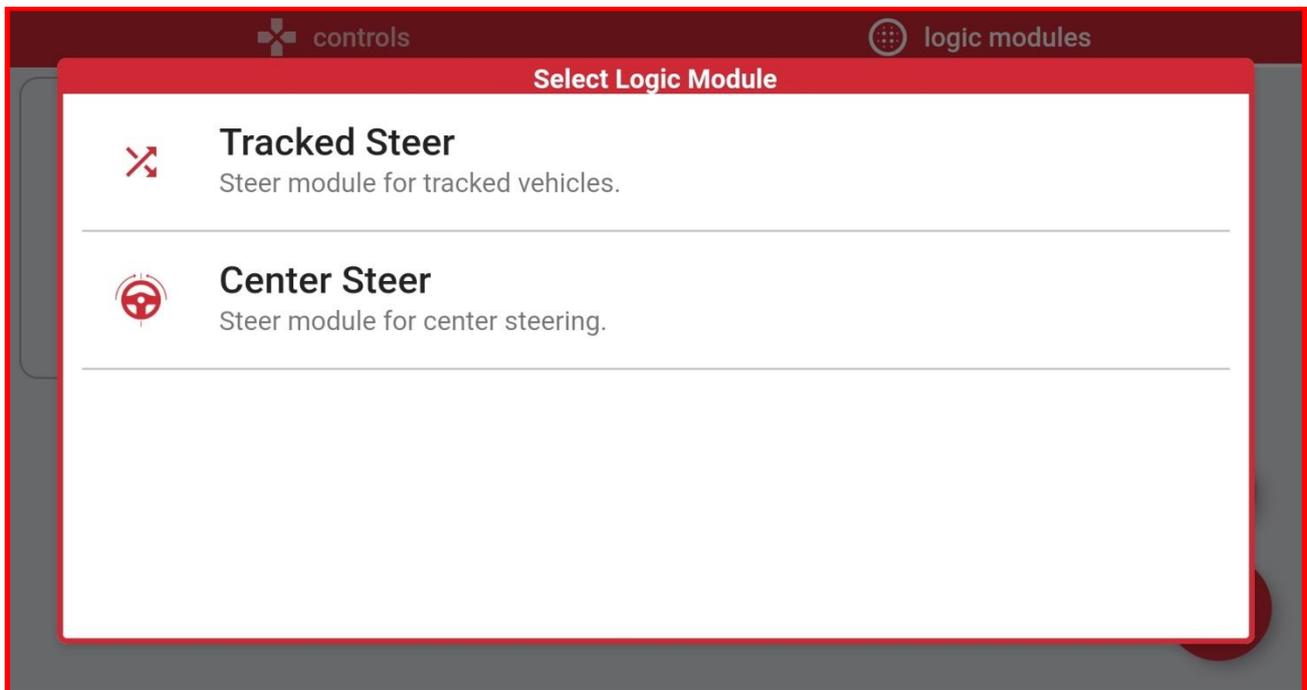
4. **Tapping the Gear symbol** allows you **to configure** the Tracked Steer Mixer. Tapping drive and steer allows you to link the sliders. Tapping LEFT or RIGHT links that Mixer output to BuWizz port.
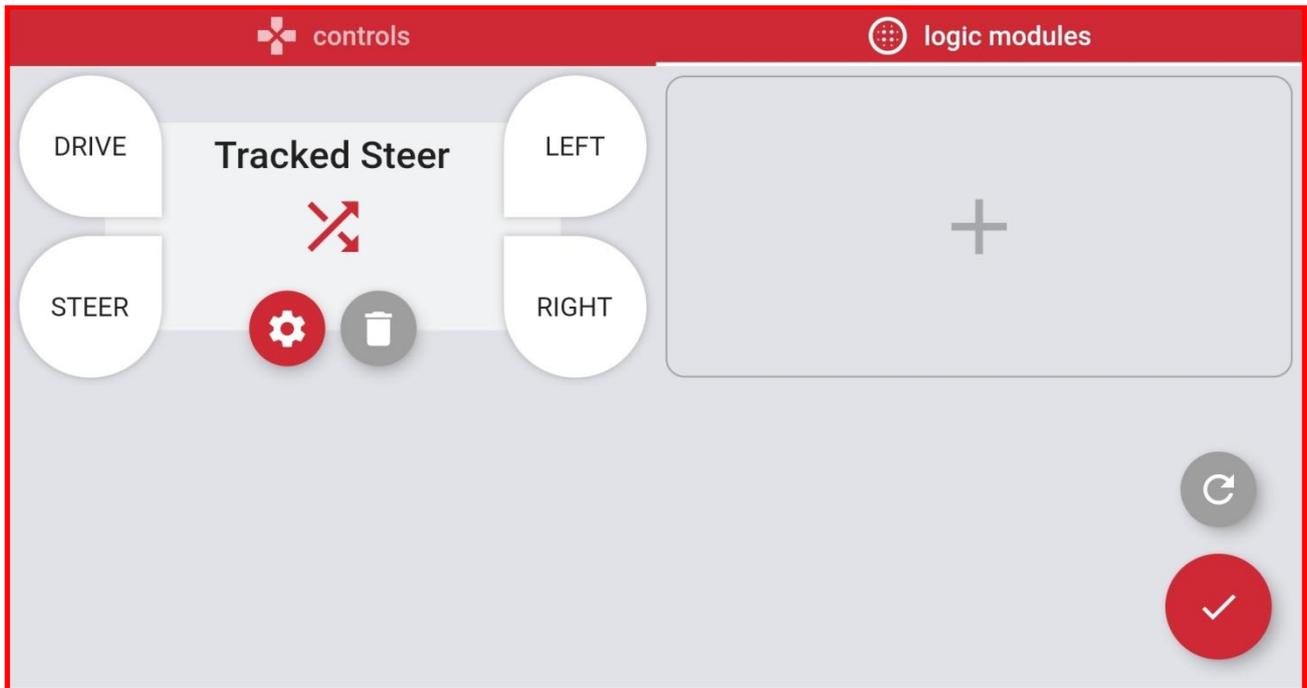

5. You can configure the steering factor and reverse it. Default steering factor setting is 1, which is a maximum setting. Steering factor 1 causes the drive motors to spin in opposite direction at full power when steering slider is at maximum and drive slider is at 0. Lowering the steering factor will reduce the difference between drive motors at full steering. For vehicles with **classic steering** and **independent left and right motor** control you can reverse the steering factor by **tapping when going backwards option**.
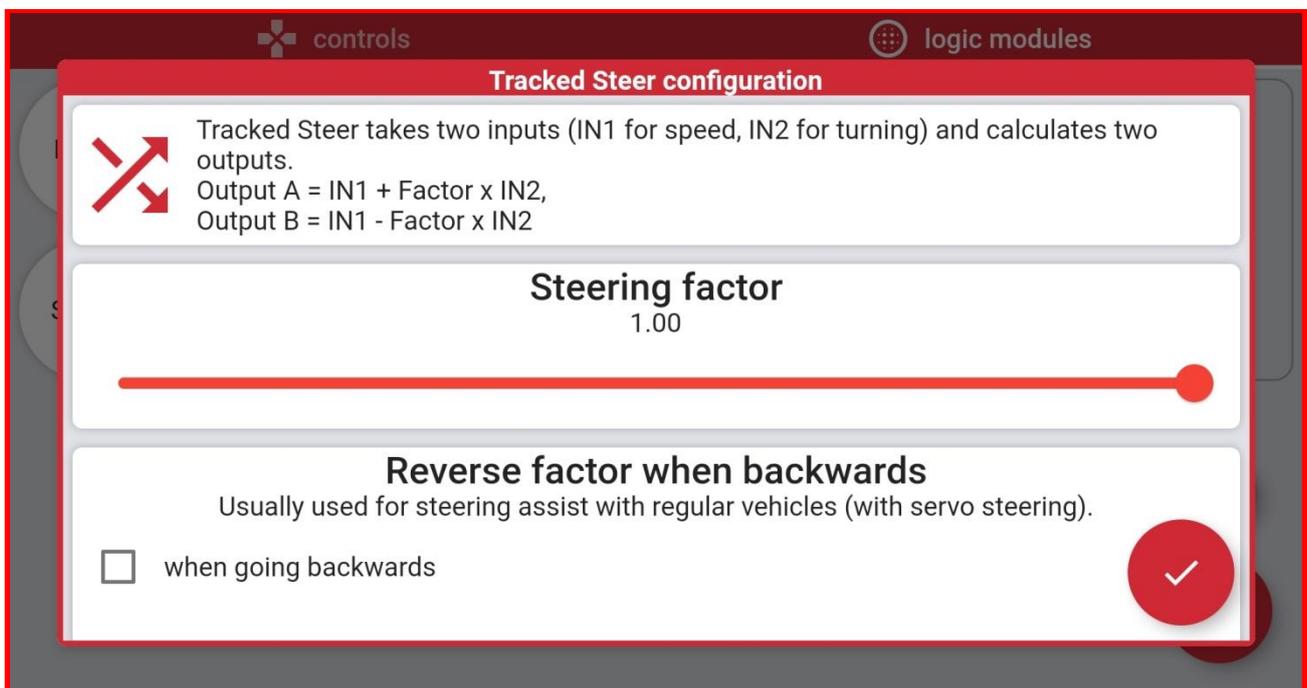
Gearbox Module - BuWizz 3.0 Pro only

The Gearbox Module allows you to use a supported Powered Up motor as a servo motor for switching gears in a combination with a wave selector. For the gearbox module to work properly, the mechanical movement has to be limited to 90°of movement for 2 positions, 180°of movement for 3 positions and 270 of movement for 3 positions. Set 42114 is a good reference for compatible gearbox design.

1. In order to control the Gearbox Module you first have to add a Gearbox button in the Drive Screen.
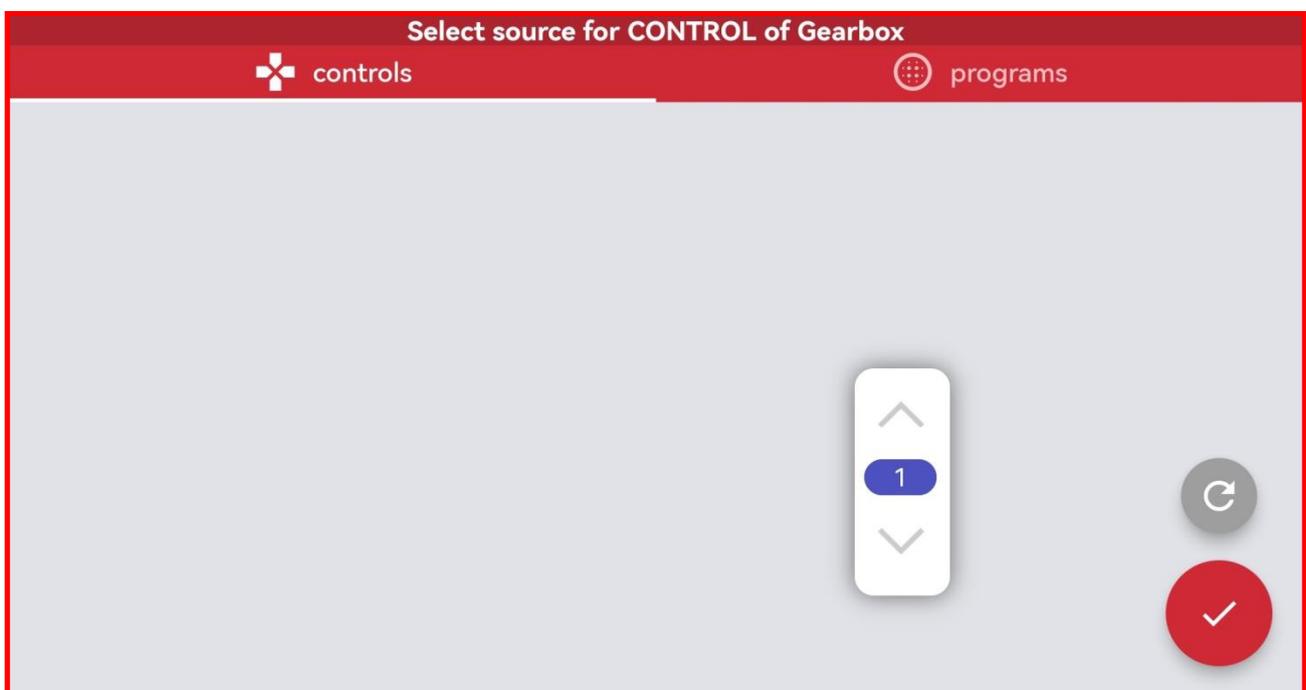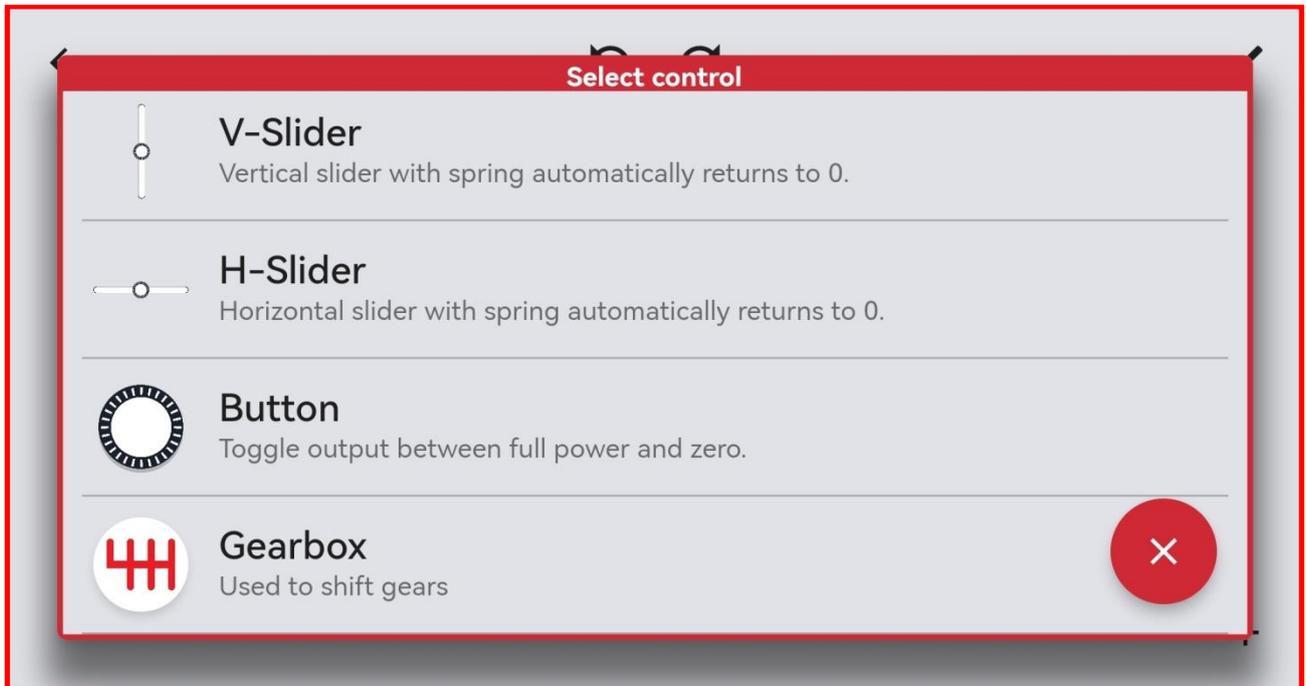
2. To **access** the **Gearbox Module** go to the Link output windows and select the output you want the mixer to apply for – in this case PU Port 1.
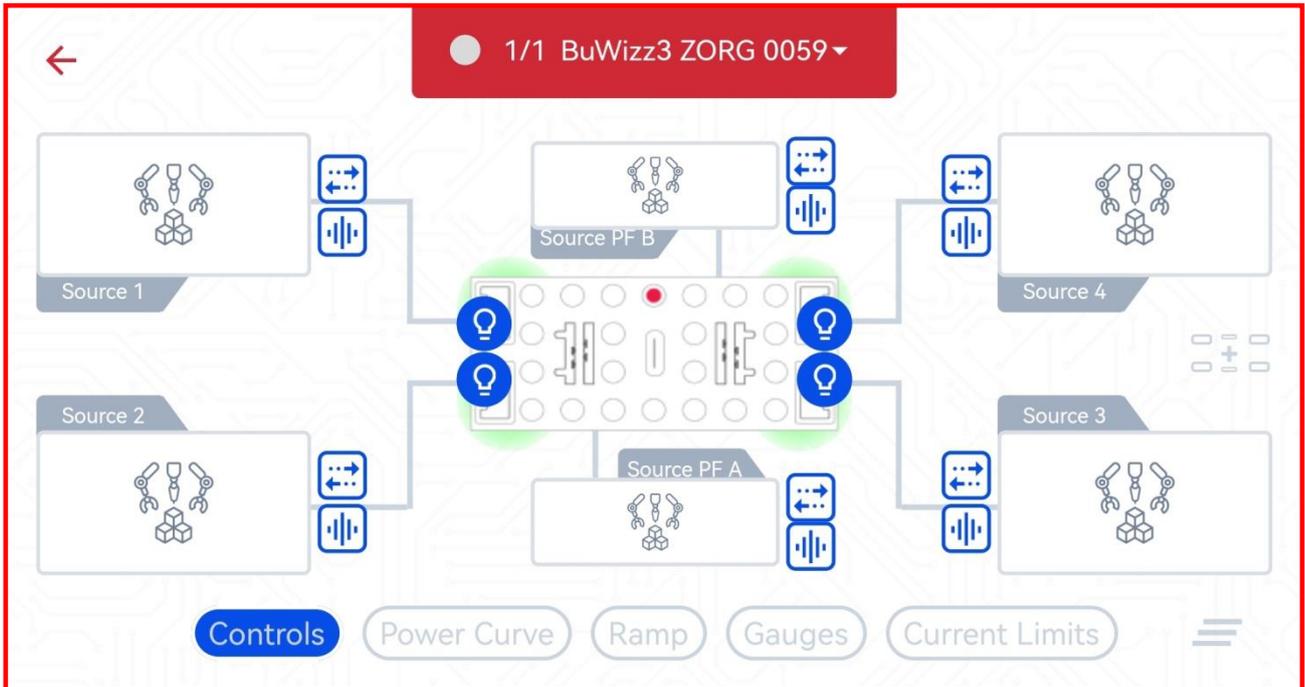
3. Instead of choosing the controls tab, **choose the logic modules tab and press the + symbol to add** the Gearbox module.
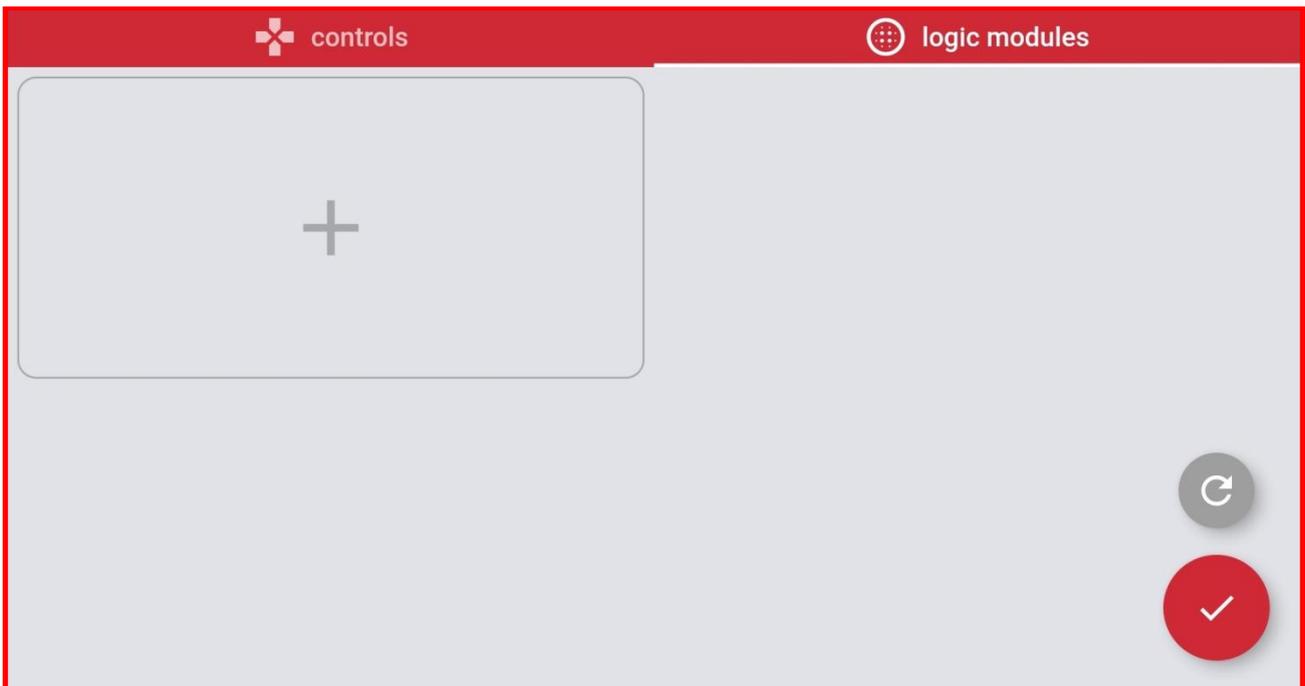
4. **Add** the Gearbox module.
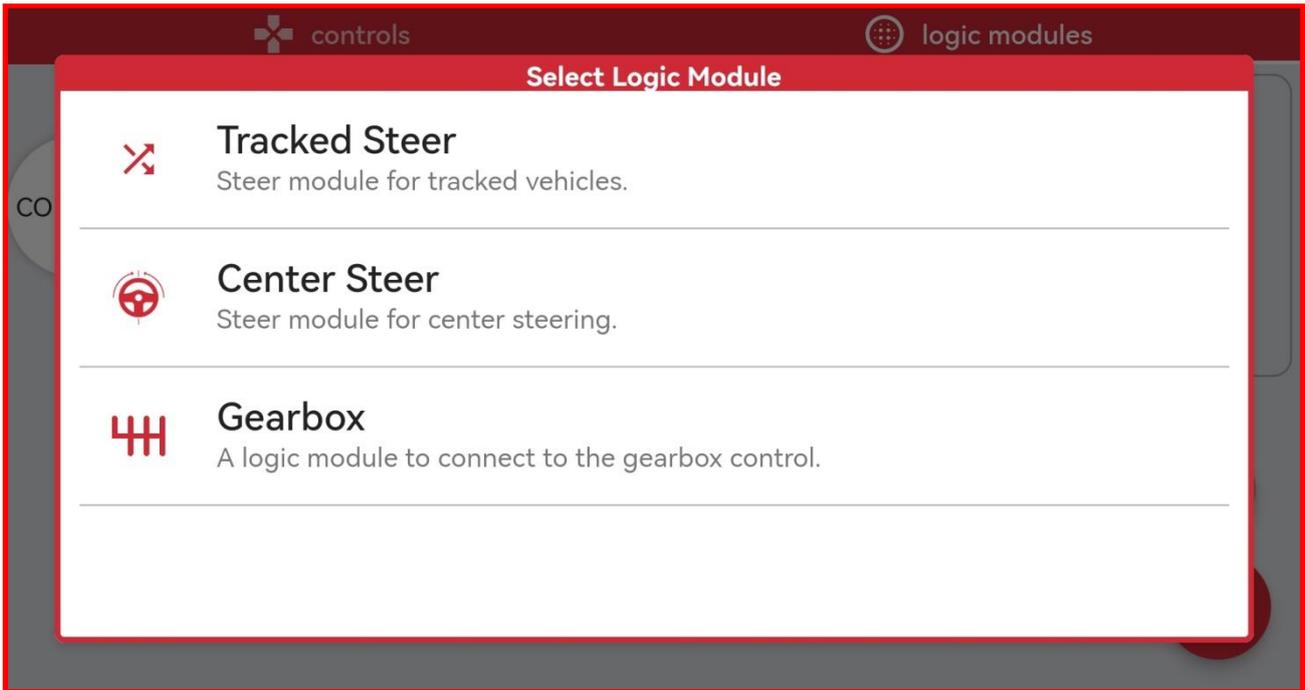
5. **Link** the before added **Gearbox button to the Gearbox module.**
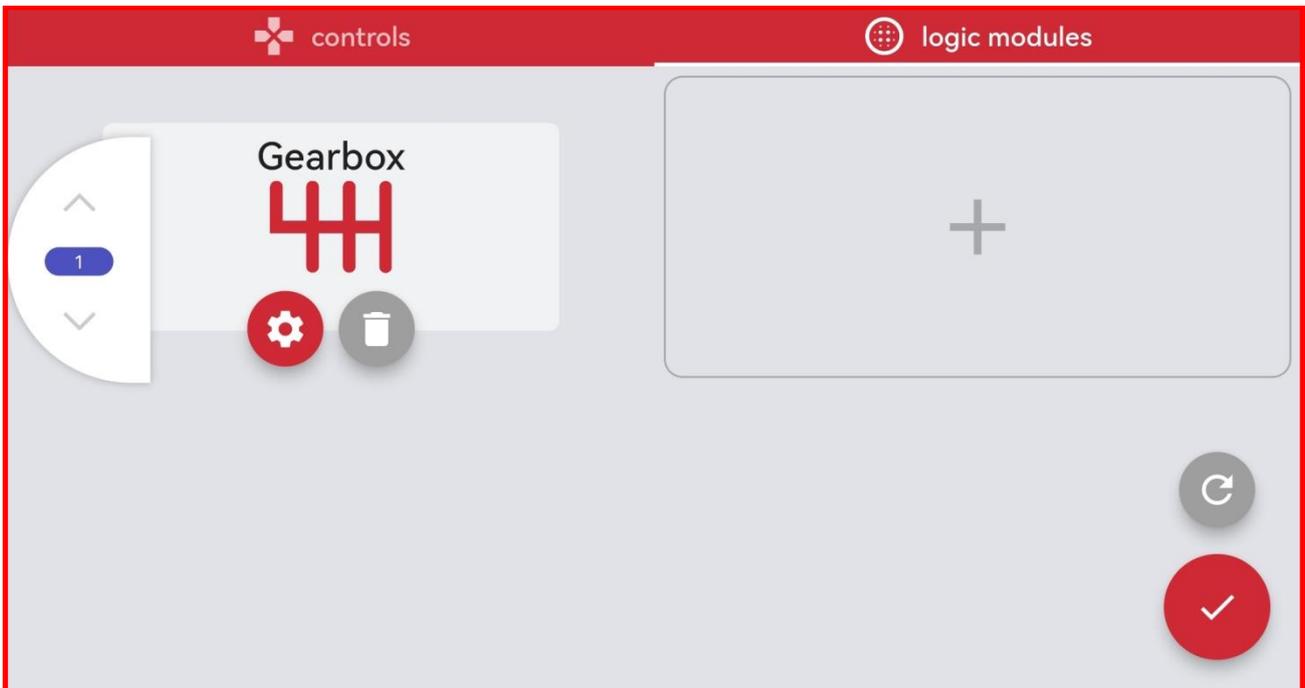
6. **Once everything is linked up, you can calibrate the Gearbox module by pressing the BuWizz and pressing the Servo Calibration button.**
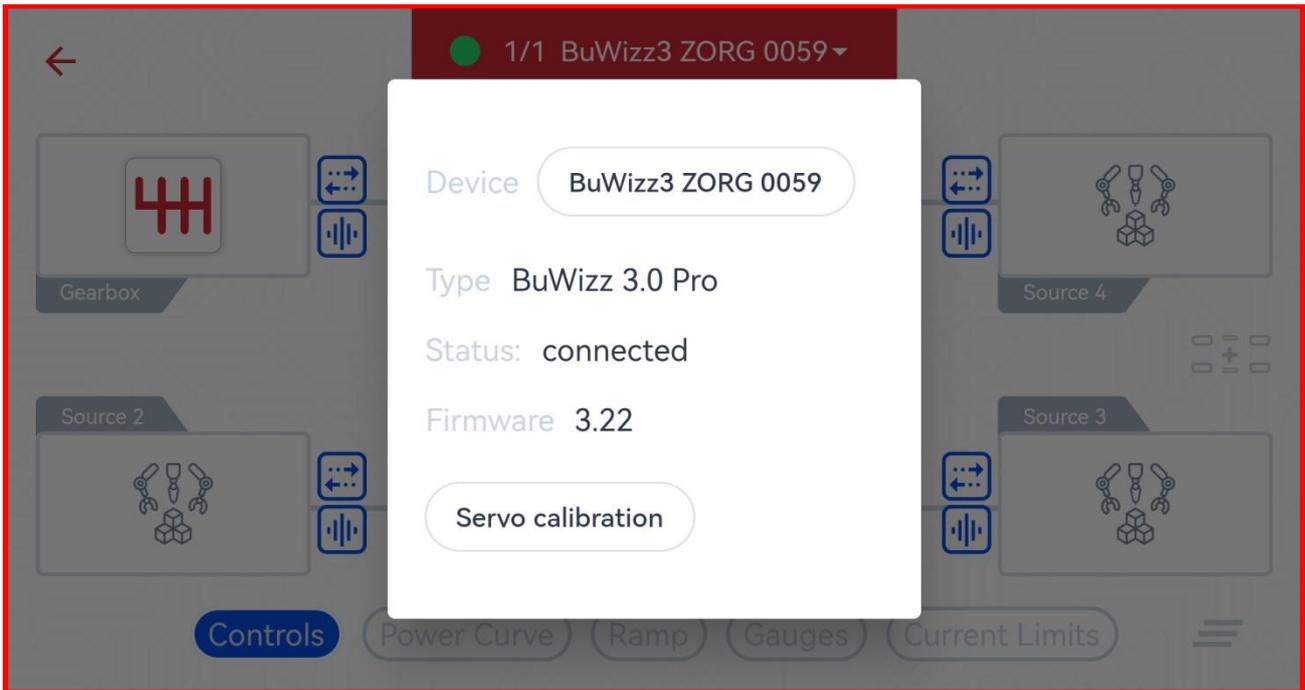
7. **You can adjust the way the Gearbox module behaves by pressing the gear icon will which open the menu with the following settings.**
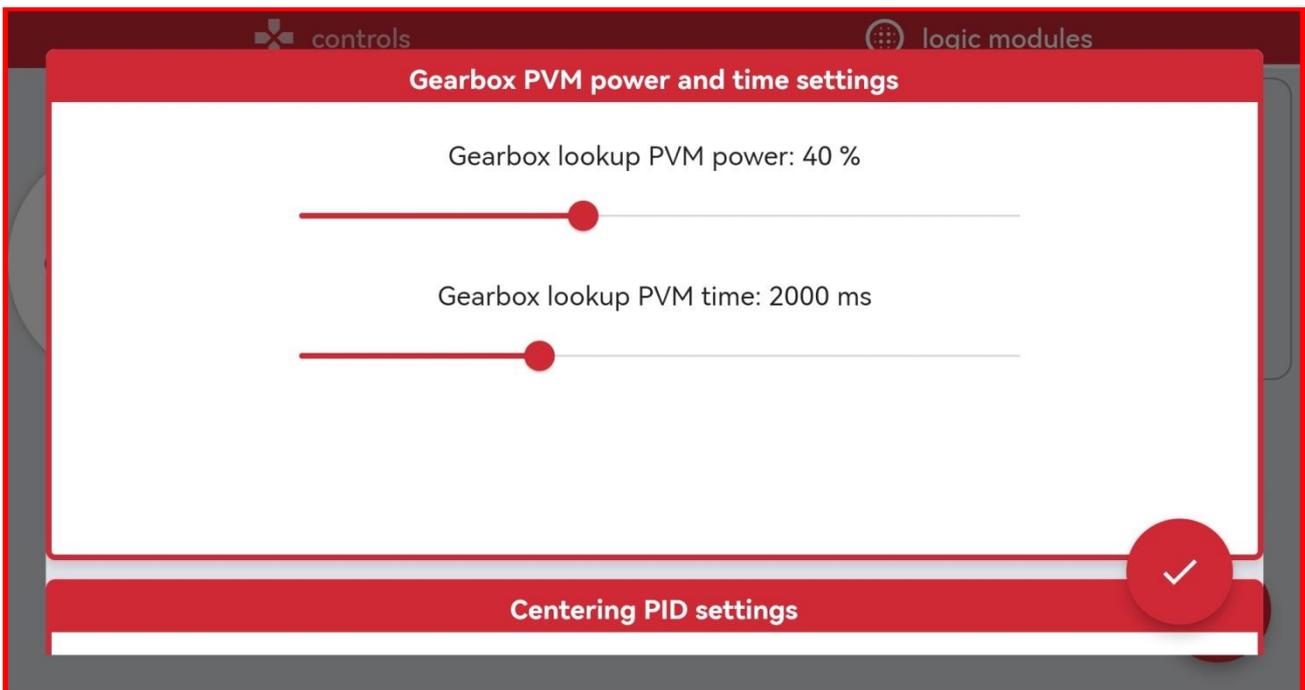
8. **Description of the centering settings:**
   - **Centering PWM power** – **Power** used to calibrate the steering. Use **as low as possible** while still having enough **to steer the wheels. WARNING, if the power is set too high it can stall and temporarily disable the motor!** Recommended Centering PWM power: 40-50%.
   - **Centering PWM time** – The **time** the center steering module **spends steering** the wheels in each direction. If the time is too low the motor may not reach the final position, longer times are recommended for models with large gearing or rack lengths. Recommended time: 2.0 seconds.

9. **Custom** centering PID **settings** allow the user to change the controller **parameters** at **their own risk.**

10. Summary of the **steering parameters** and their **affects:**

   - **Kp** - this is the **main proportional influence** of the steering controller, it tells the steering with what kind of a gain it should work. Having it low reduces the steering response, having it too high can cause it to oscillate.
   - **Ki** - This is the **integral influence** of the controller, having it too high can cause oscillation.
   - **Kd** - This is the **derivative influence** of the controller.
   - **outLP** - this is an **output low pass filter** which can be used to slow the system down in order to prevent oscillations, but it's not needed most cases.
   - **D_LP** - This is an **additional derivative low pass filter** which can be used if needed.
   - **DeadBandOut** - this factor sets a **deadpoint band** for the **servo output**, having it too low may cause the servo to constantly try to adjust the position, having it too high will cause the steering to be less accurate.
   - **DeadBandOutBoost** - This is the **boost the servo motor receives to move the steering** from standstill. Some boost is recommended to overcome the initial friction and inertia but having it too high may cause oscillations.
   - **LimI** - **limits** the **integral part** of the controller.
   - **LimOut** - **limits the current consumption** of the servo motor. Reducing it may reduce the torque of the steering system.
   - **Reference rate limit** affects the **speed of the entire servo system.**

Power curves

Power curves allow you to **adjust** the way the **port outputs** react to the **slider inputs**.

They are useful for uses such as adjusting motor's response, limiting output power, correction of steering angles, etc…

For an introduction to Power Curves, please check the following video tutorial: https://www.youtube.com/watch?v=qKsz6B3FO5s

1. To access Power Curves **go to Link BuWizz outputs window** and **select Power Curve filter**.
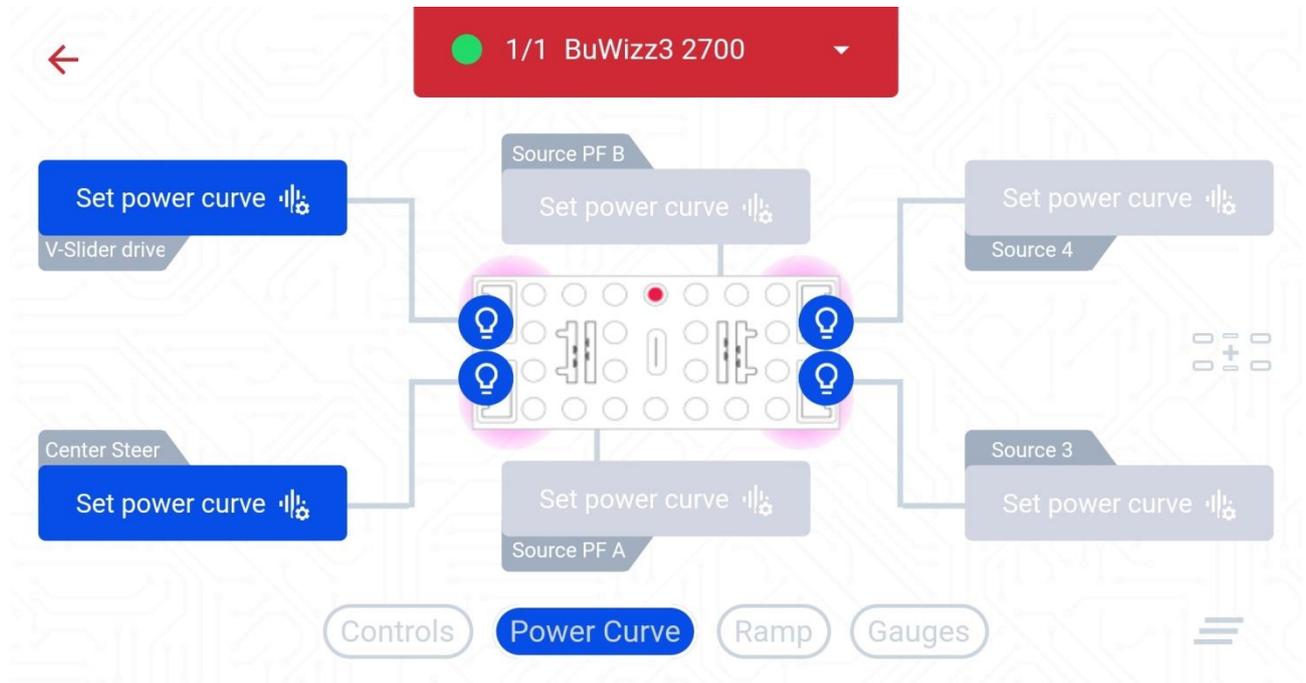
2. The following graph will be shown in the **default curve:**
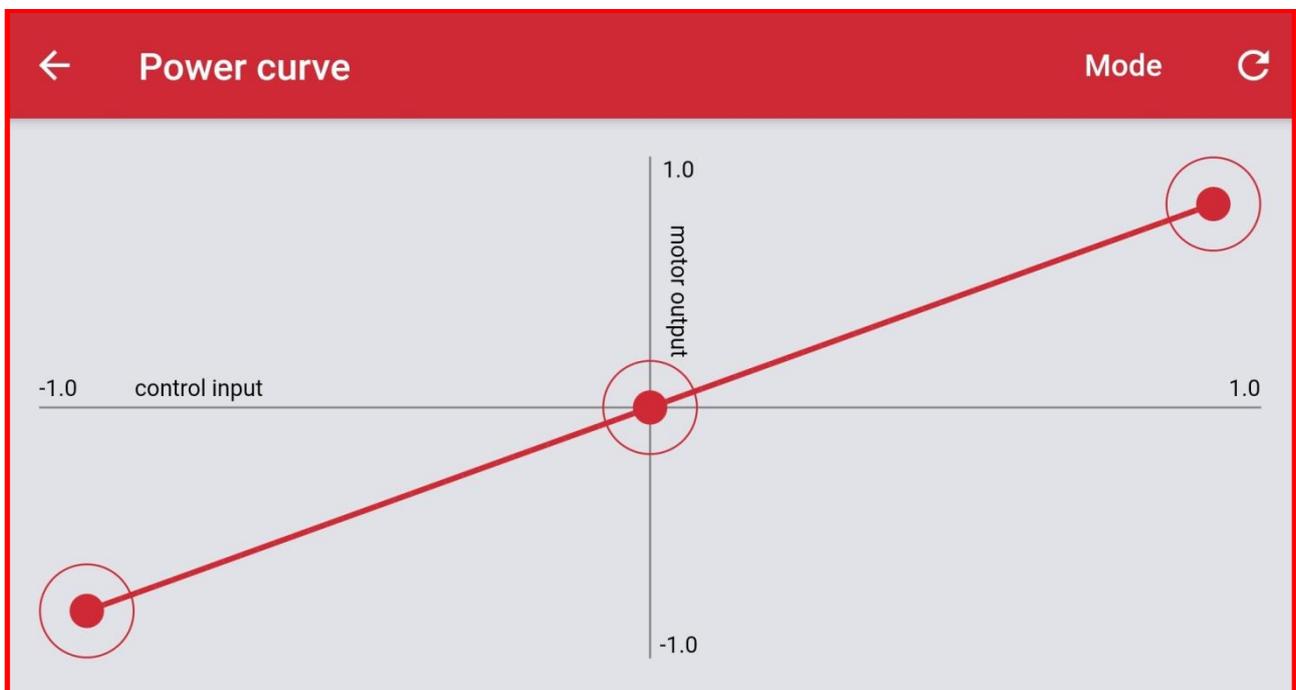
3. You can easily adjust the graph by moving the center and end points:
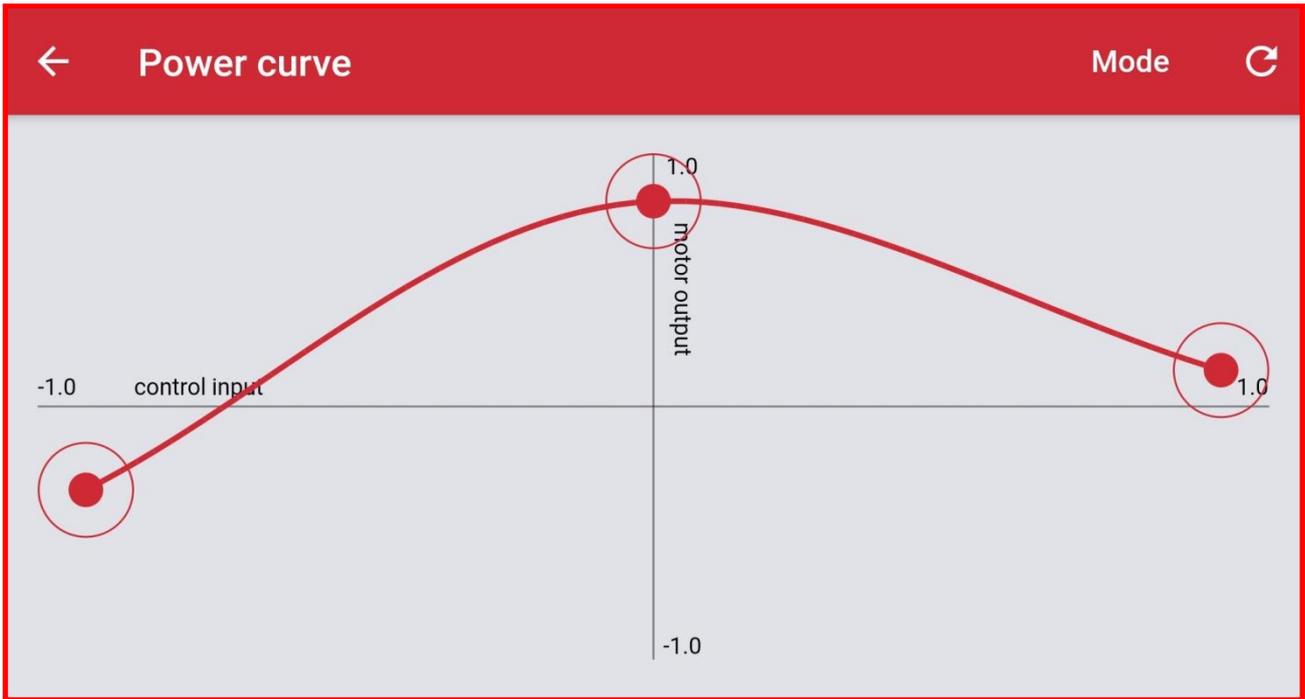
4. By tapping on the graph line you can add additional points (up to 10 points max):
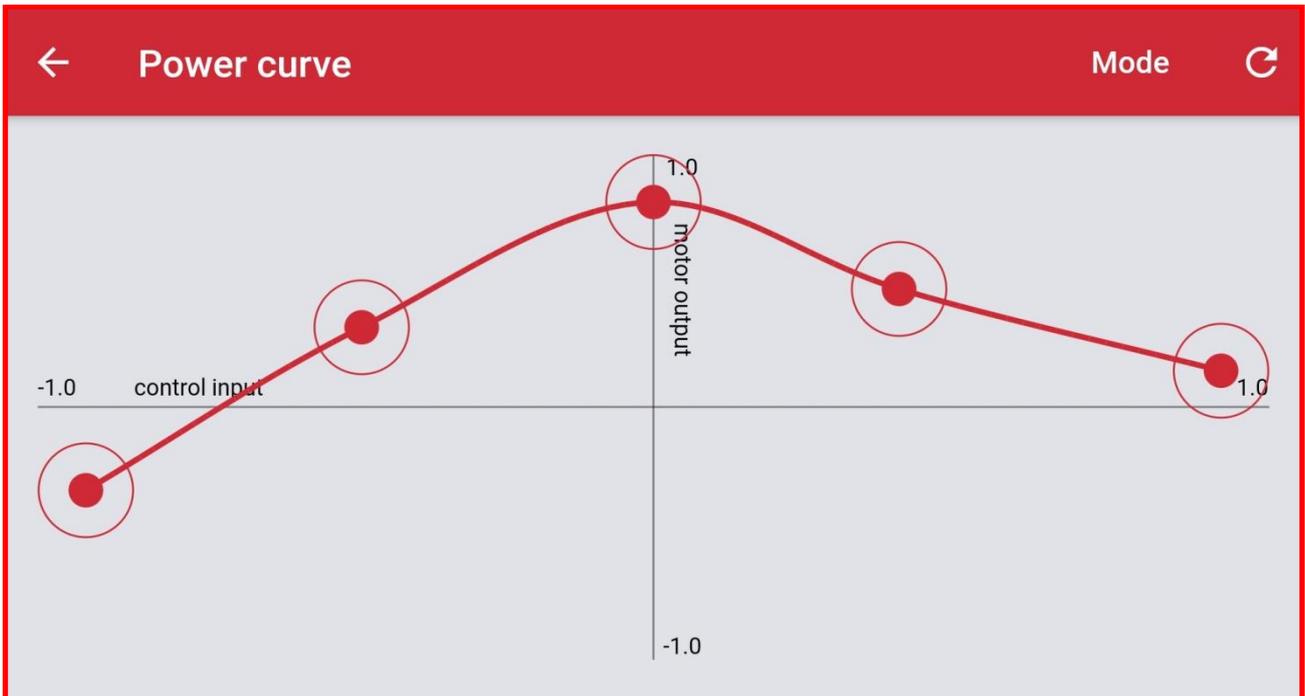
5. **Tapping** individual **points** allows you to **remove** them:
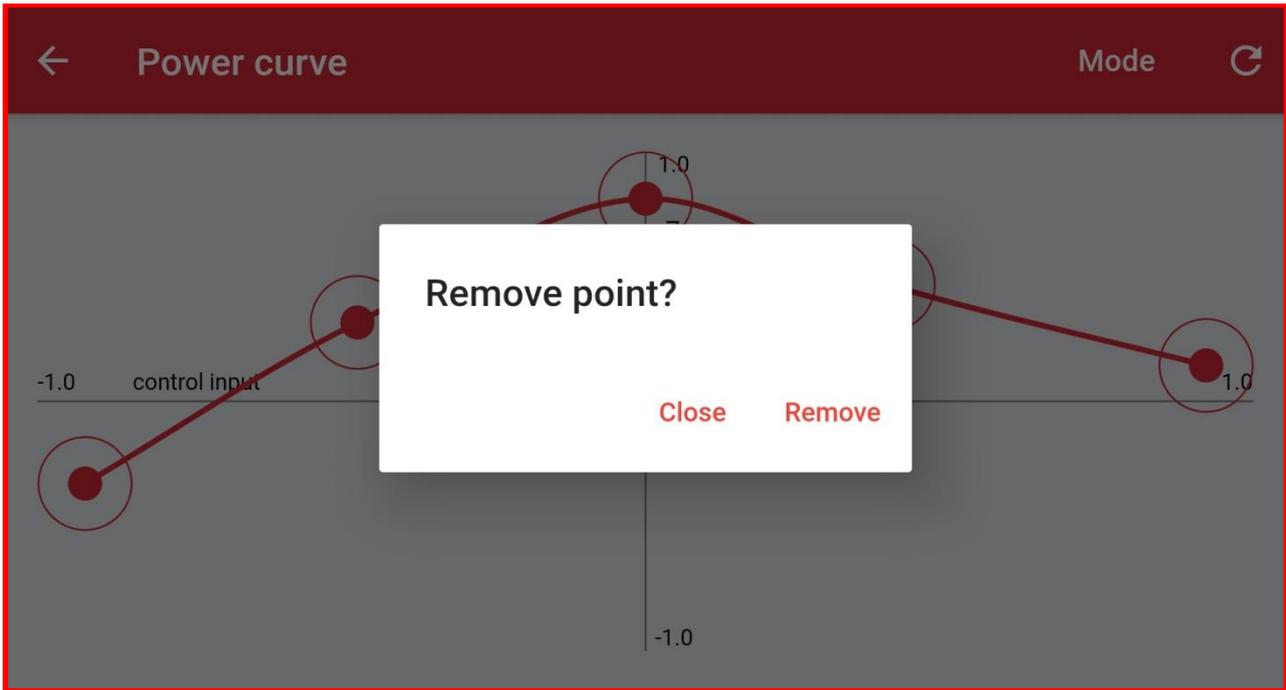
6. Pressing the ↻ in the right corner will **reset the power curve to default**.

7. By selecting **Mode** you can choose between **two default curves** – **Linear and Exponential**. We suggest you use exponential functions for drive motor control and linear for servo motor control.
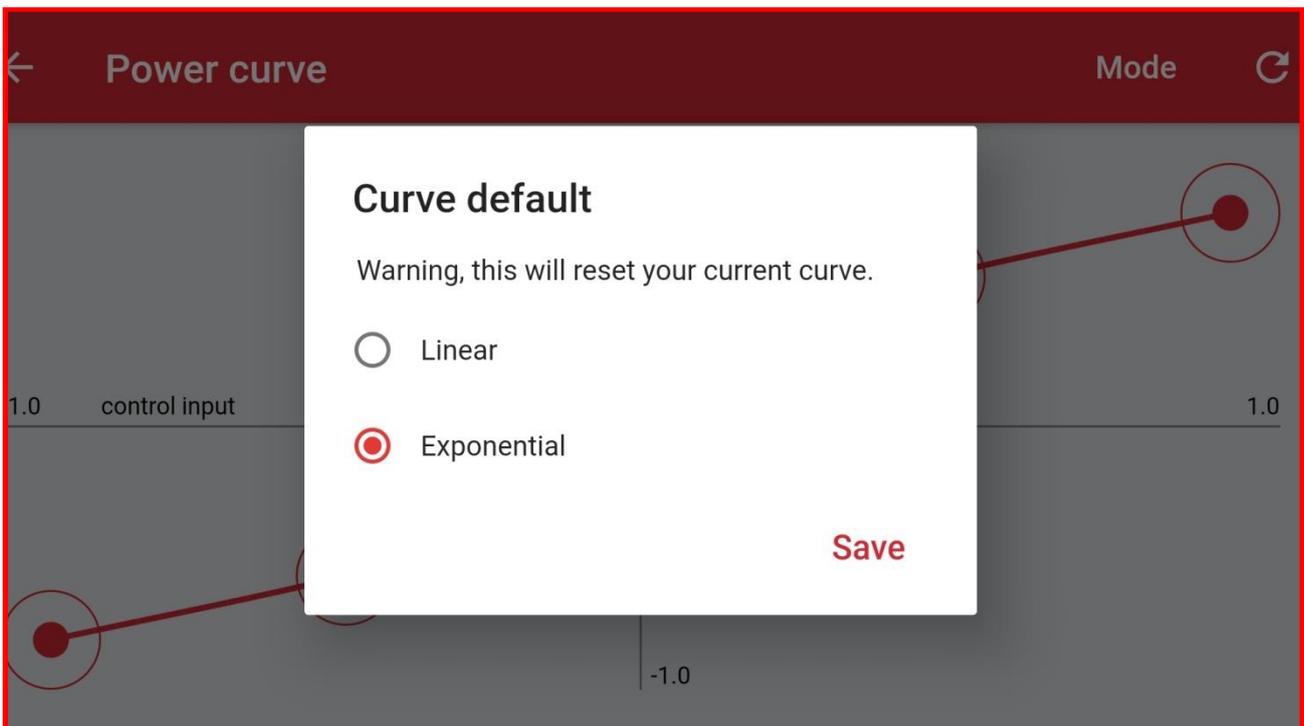
Examples for the use of Power curves

1. **Power curves can be used to limit the power going to the motor:**
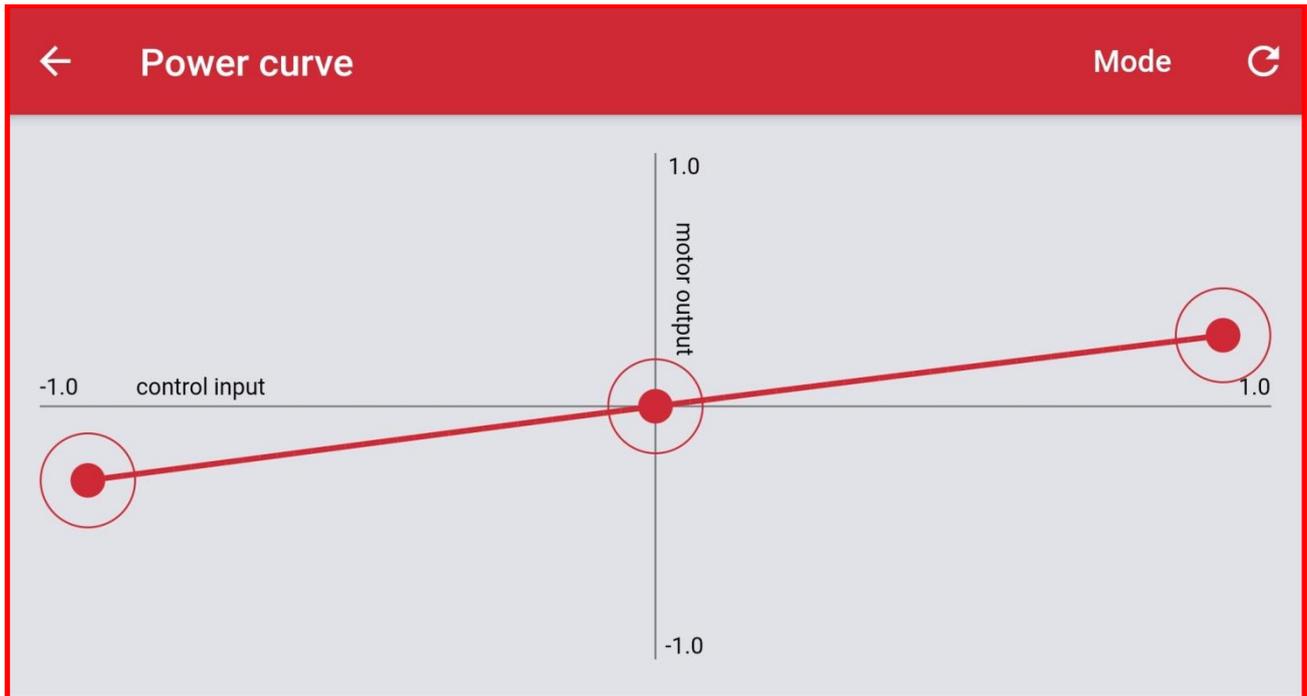
2. **You can offset the Power curves when used with a servo motor in order to adjust your model's steering angle:**
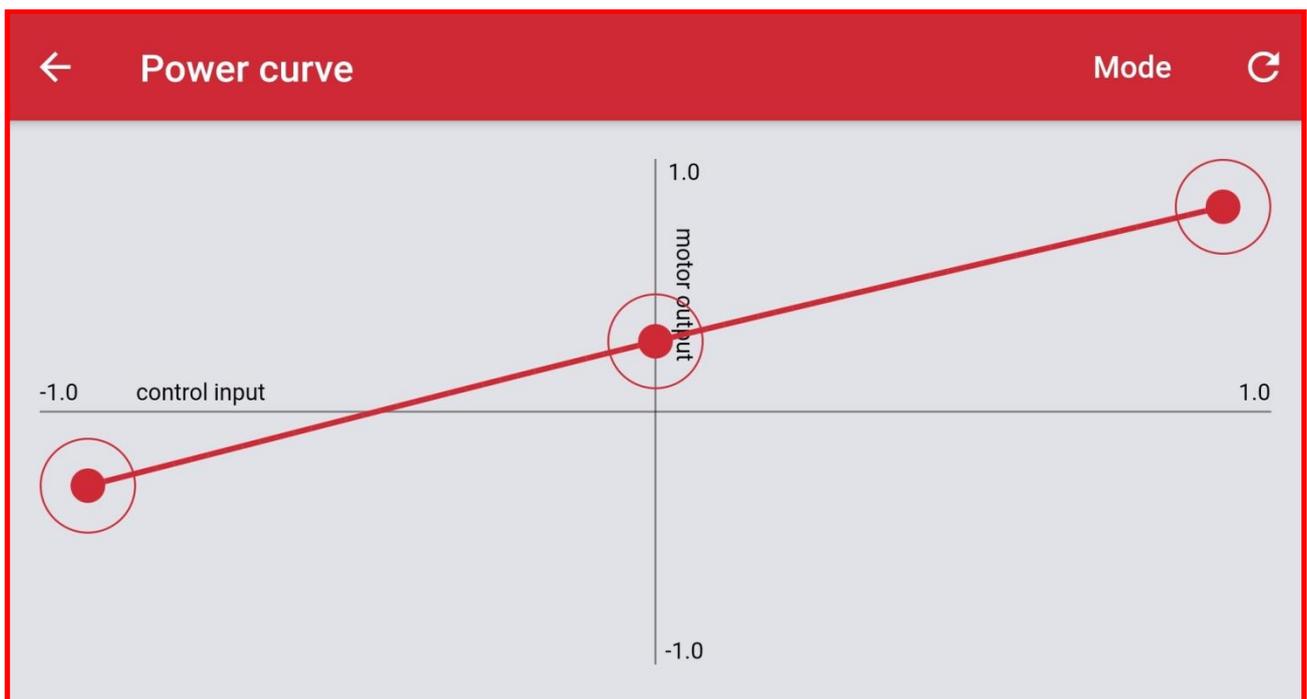
Tutorial for steering correction using Power curves can be found here:

https://www.youtube.com/watch?v=F_kjAfVWiuk

3. **Power Curves can be used to keep motor spinning in one direction only:**
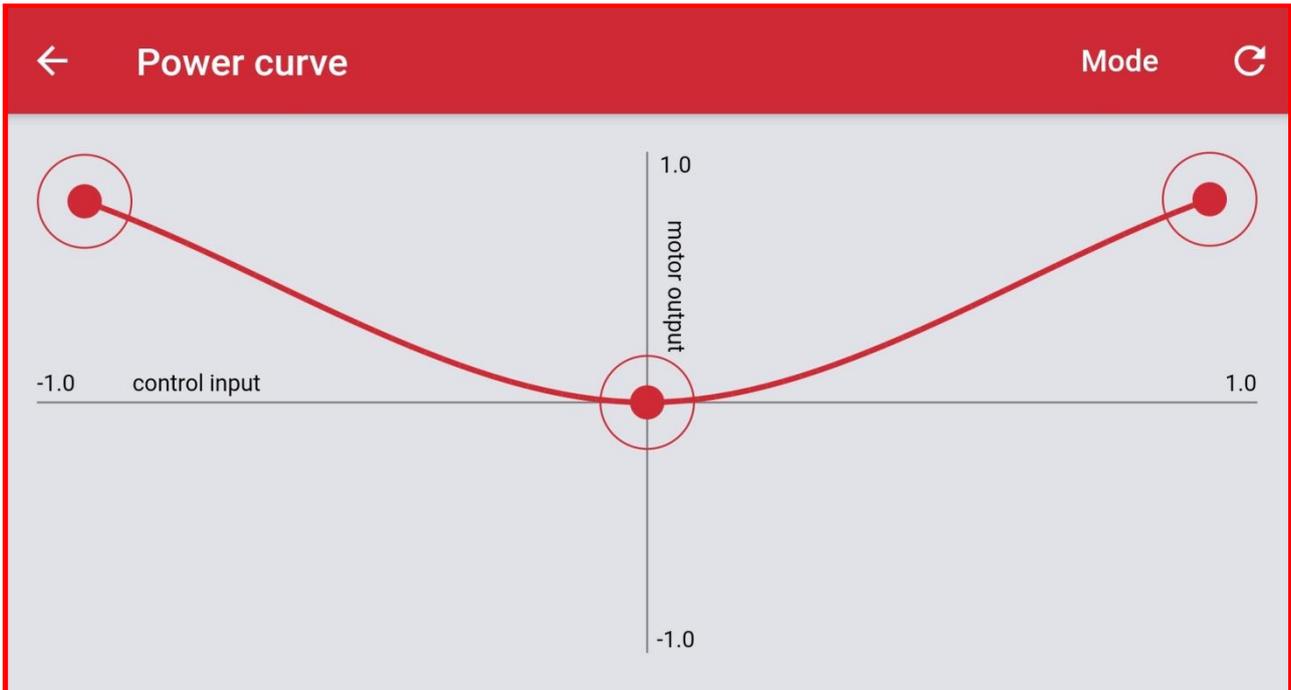
Tutorial to keep the motor spinning in one direction only can be found here:

https://www.youtube.com/watch?v=jmXSRX6NprE

4. **You can make your model crawl slowly when there is no input by offsetting the Power Curve.**
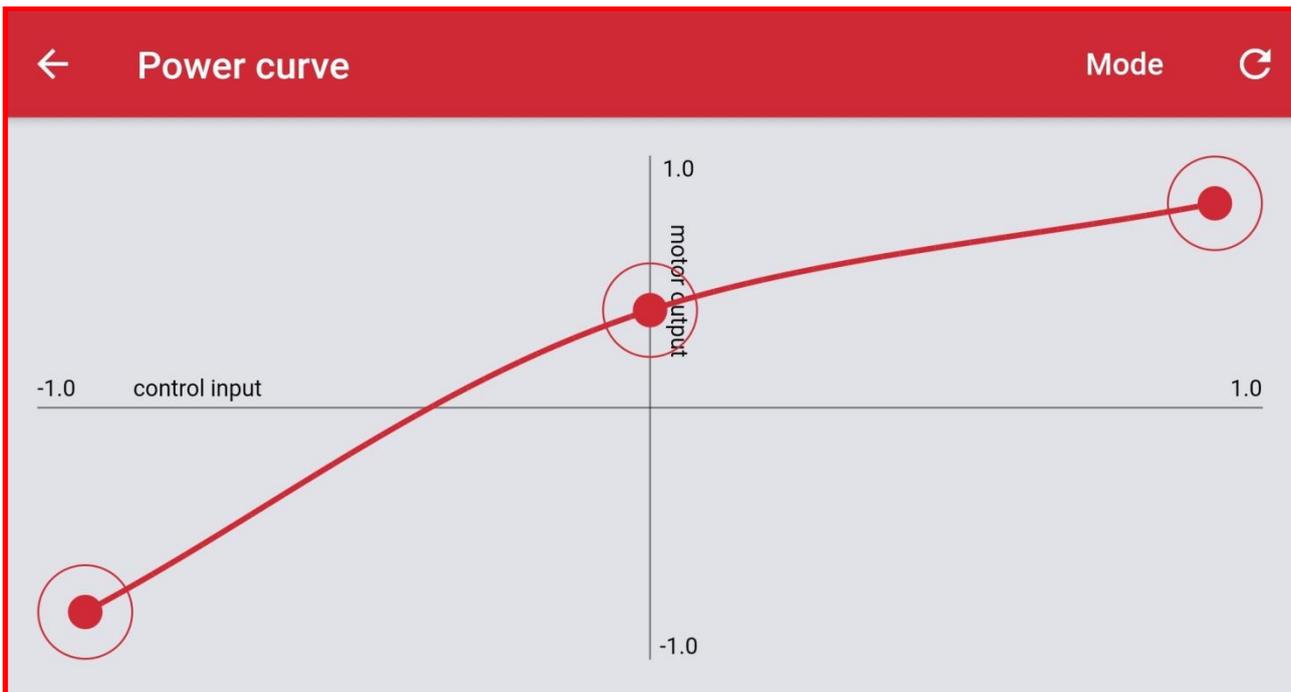
Tutorial to make your model crawl can be found here:

https://www.youtube.com/watch?v=JE6o2v8cLno

Ramp function

Ramps allow you to adjust the time needed for the port output to reach the level set by the slider input. Default value for BuWizz 3.0 Pro PF outputs is 0,13 seconds.

They are useful for smooth acceleration and deceleration which is useful such as heavy models.

1. **To access ramp go to Link BuWizz outputs window and select Ramp filter.**
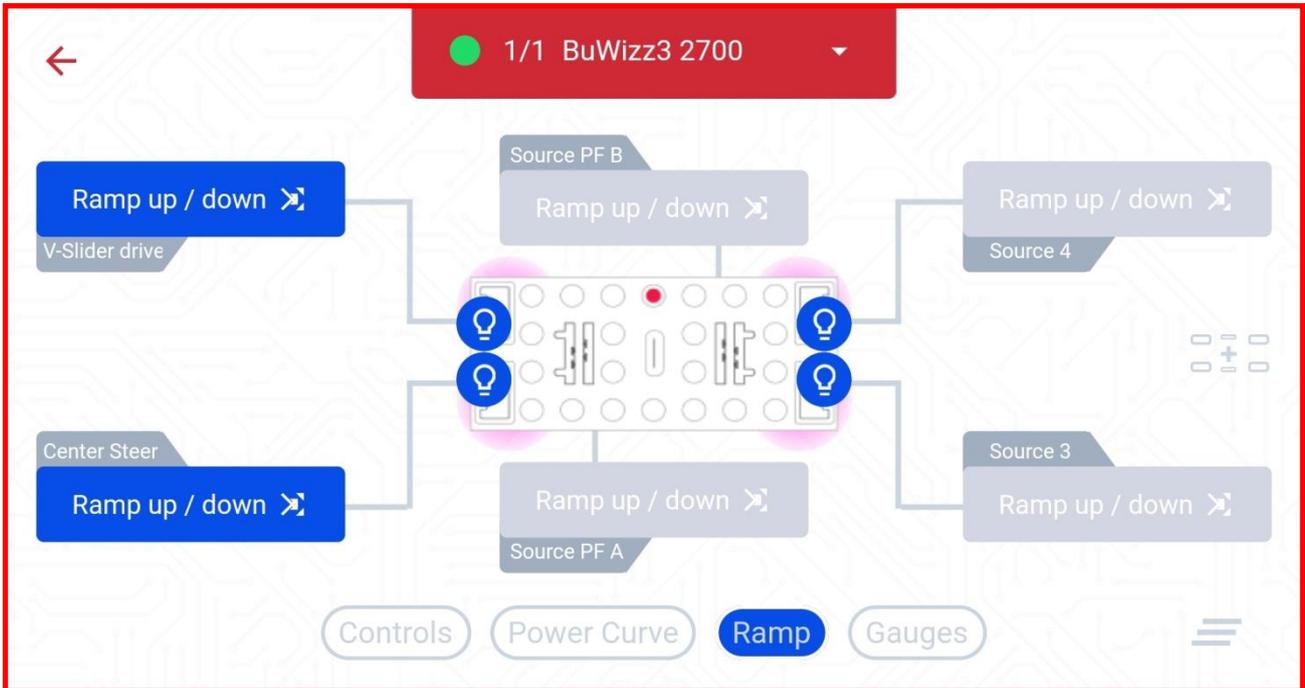
2. **Here you can set the Ramp Up and Ramp Down time in seconds.**
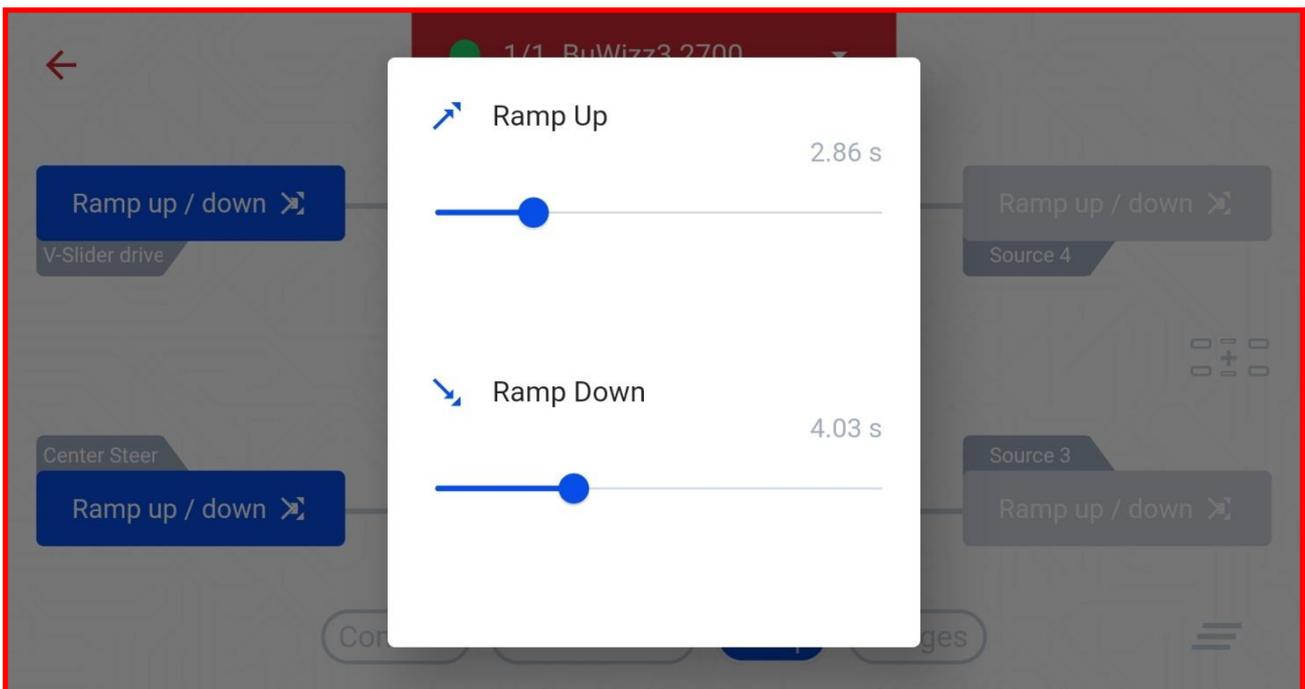
Current Limits

Current limits limit the current being drawn from the BuWizz brick by the motors in order to prevent overload of the battery.

By default the current limits are set to 2.0 A for PF ports and 1.0 A for the PU ports. Increasing these values may cause your BuWizz brick to overload, loose connection or shut down.

1. To access the Current limits, select the Current Limits in the Link BuWizz outputs screen.
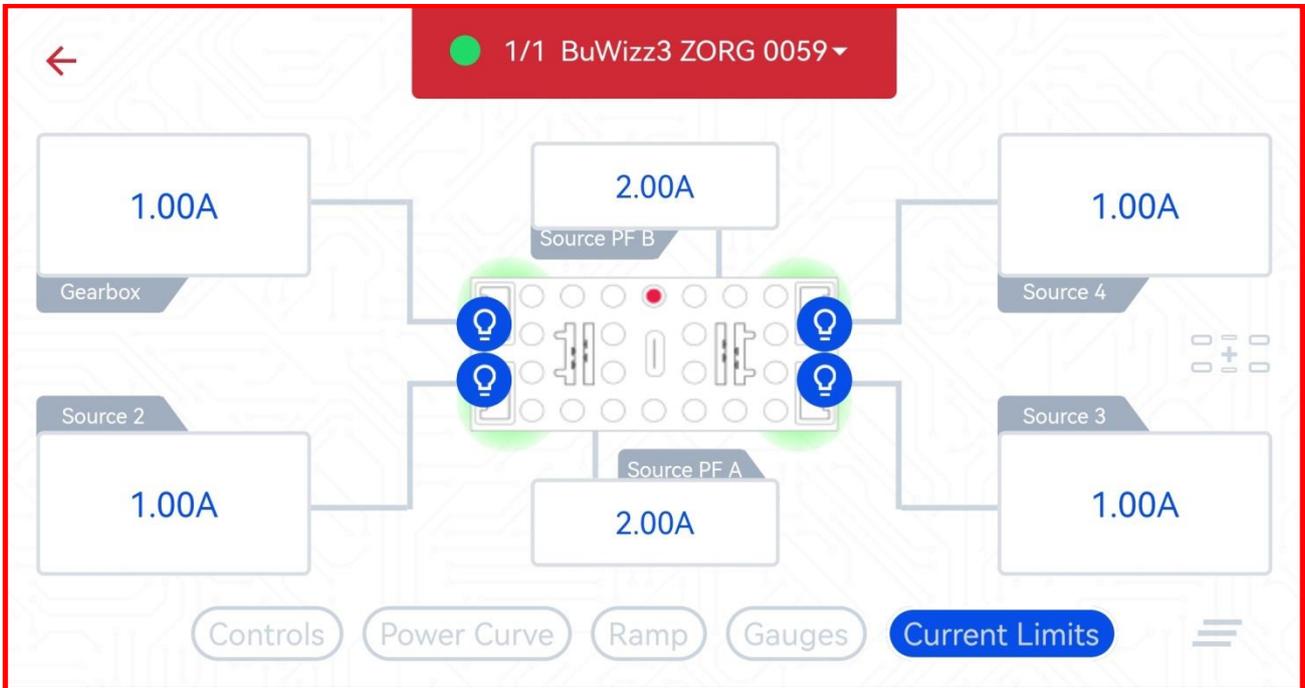
2. To adjust the Current Limits, simply press the desired port and a slider will show up. You can use the − and + button for fine adjustment.
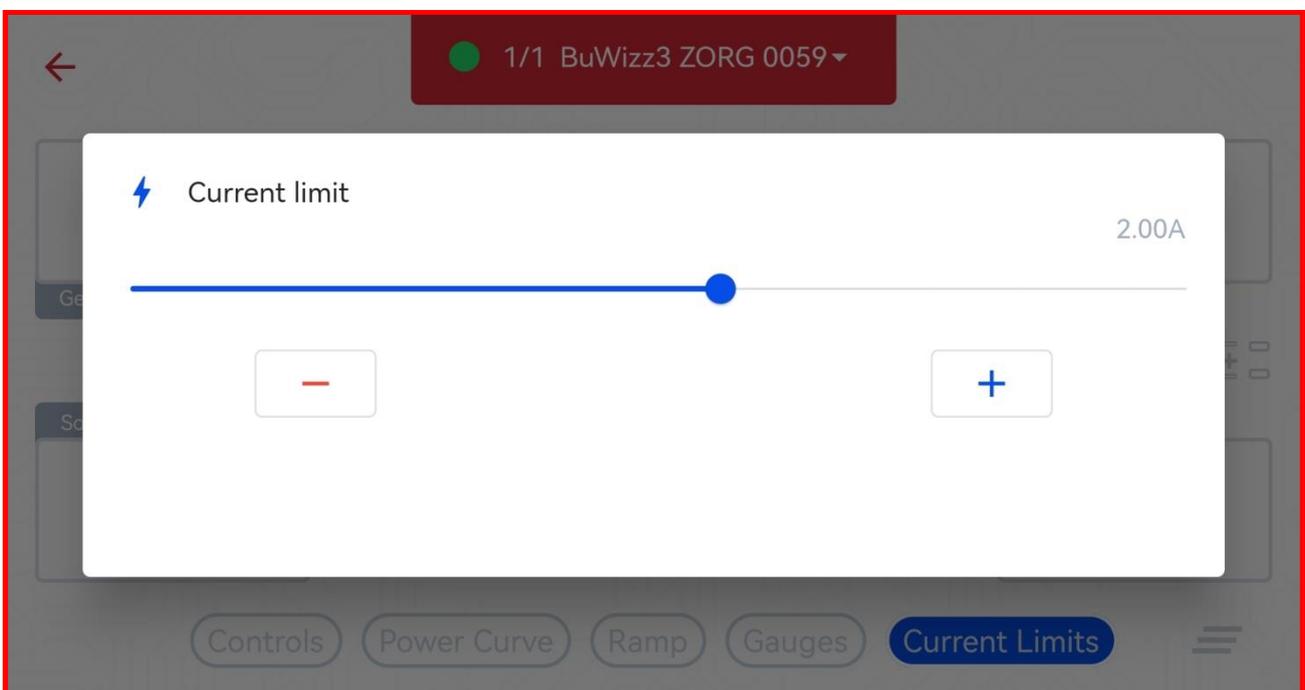
3. **Increasing the Current Limit pass its safe value will show up a warning.**
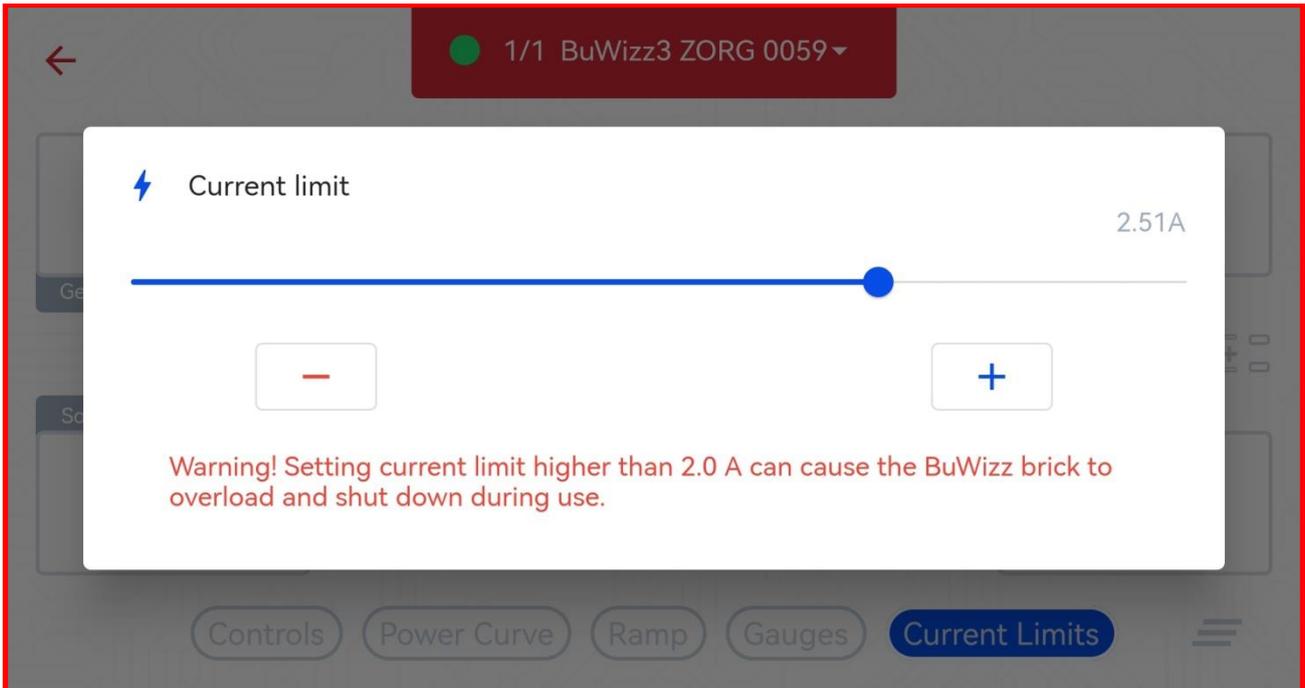
4. **Driving style can have a large effect on the currents being drawn from the motors and therefore the Current Limiters. Quickly and aggressively reversing a fast model can cause the motors to momentarily draw more current than limiters have time to limit. In such cases a lower Current Limiter value coupled with an increased Ramp Up and Down value can ease the model's acceleration to safe levels. Using the Current Limiters and Ramp Values also reduces the stress on the mechanical parts when suddenly accelerating or reversing at full power.**

Controller support

BuWizz App supports PS5, PS4 and Xbox controllers. It's recommended you **connect the controllers via a USB C cable**, otherwise a **Bluetooth connection is also possible.**

If connecting the gamepad **using Bluetooth, pair the device** as you would any other Bluetooth device.

1. Open the BuWizz app and **select/create your control profile.**
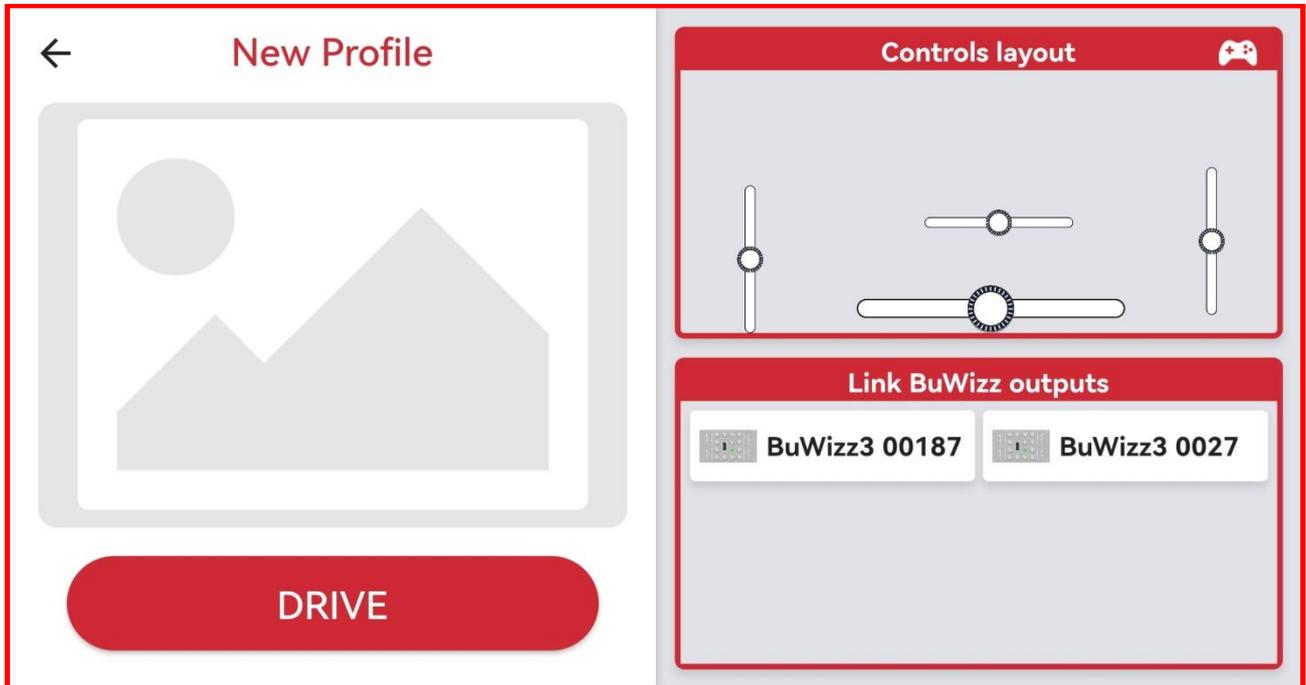
2. **Tap the controller icon** in the top right corner of the Controls Layout window.

3. Touching the icon will **toggle between the gamepad and the standard controls view.**
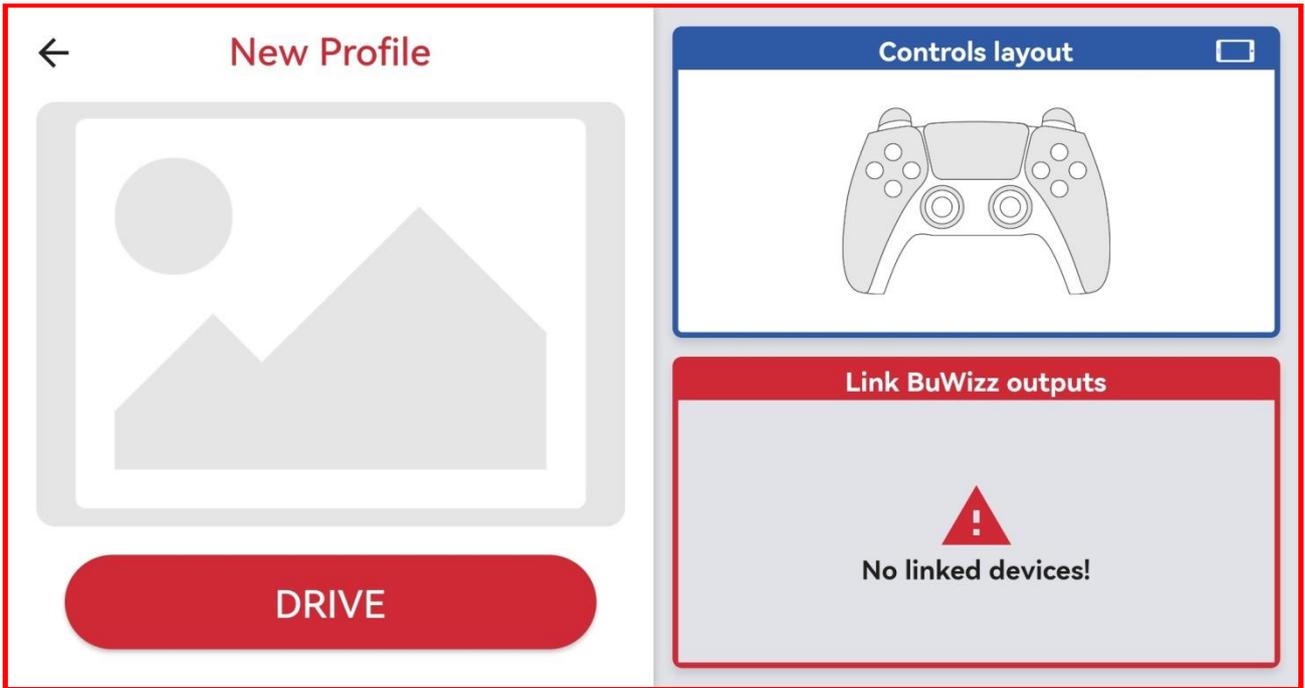
4. Once in the gamepad view, you will see the **individual windows for each of the gamepad buttons/joysticks.**
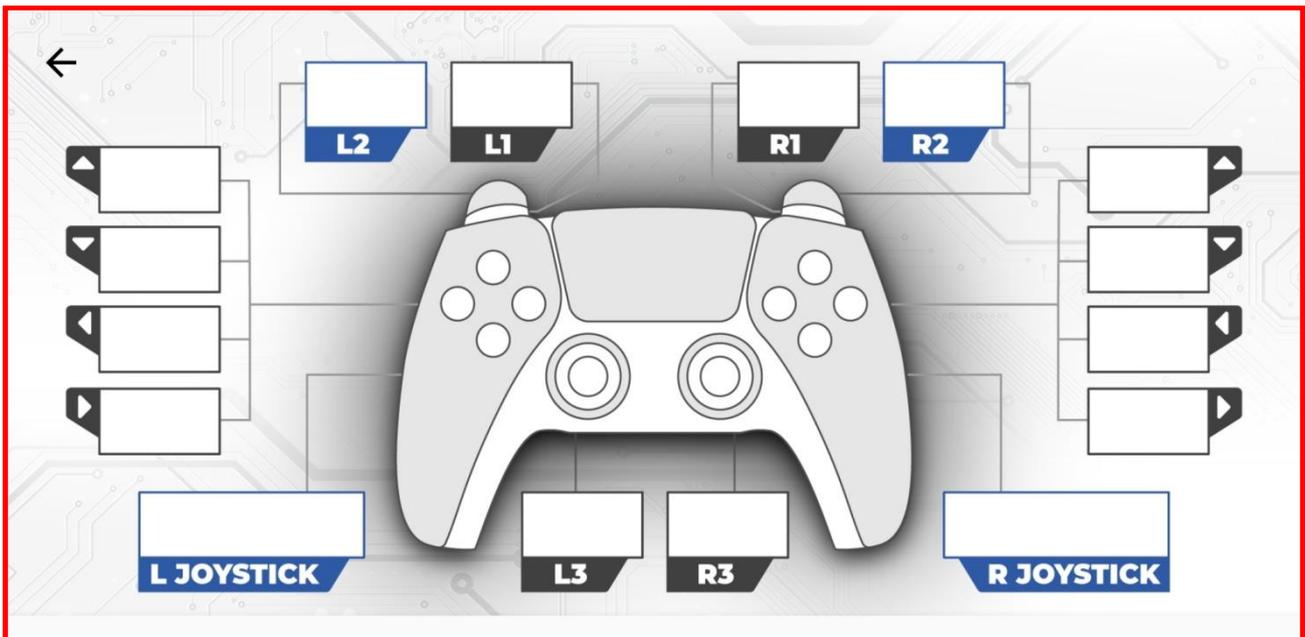
5. **Select the desired control** and assigning a control to a joystick. That will give and up, down or left, right option. Using **joysticks will provide analog control** to that command.

Selecting a controller button will provide a digital (full power) control to that command. You need to select two buttons to have a positive and negative control of that command.
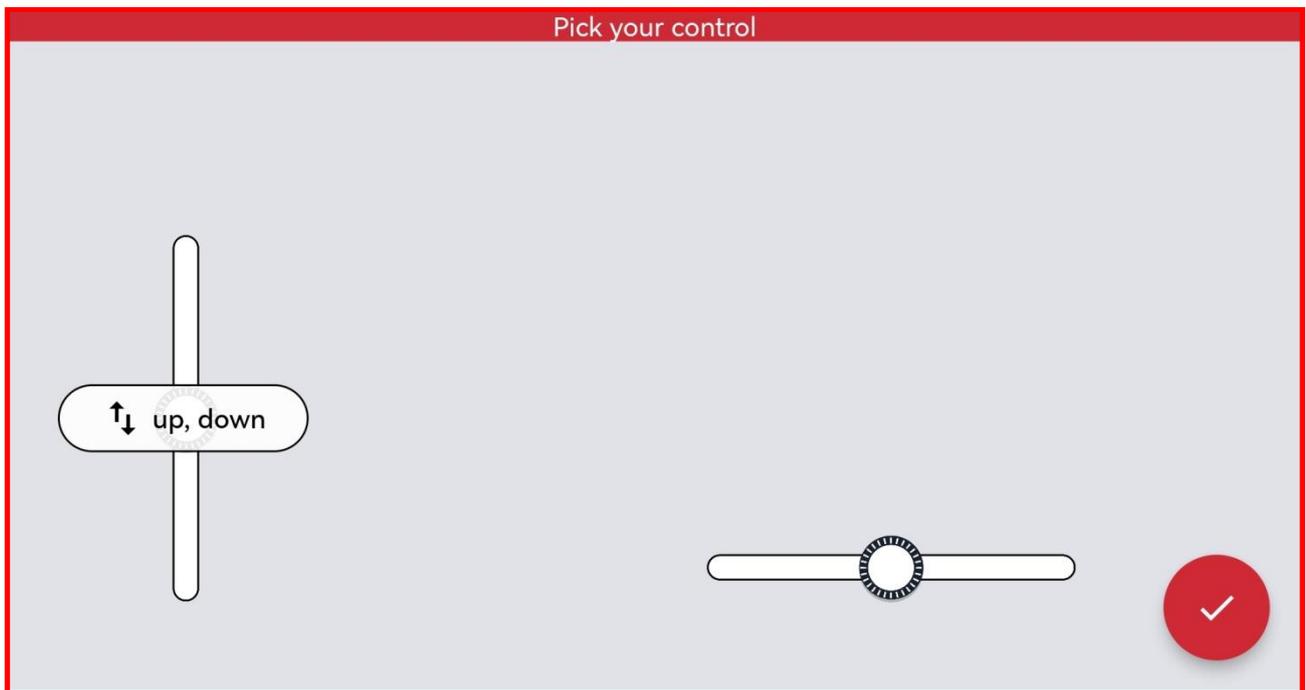
10. FAQ for BuWizz 2.0

Issue nr.	Symptom	Proposed solutions	Category	Support video
1	**BuWizz does not turn on when pressing the button**	1. Charge BuWizz for 3 hours 2. Check your charger and cable are working properly 3. Note, BuWizz turns off automatically during charging. No LED is lit, but charging still continues 4. In case BuWizz still does not turn on after charging for 3 hours, contact technical support	**Issue**	N/A
2	**Why is BuWizz LED shining/blinking green?**	1. Battery level between full and 2/3	**Question**	https://youtu.be/EBNI-YeFrFM
3	**Why is BuWizz LED shining/blinking orange?**	1. Battery level is between 2/3 and 1/3	**Question**	
4	**Why is BuWizz LED shining/blinking red?**	1. Battery level is under 1/3 2. Recharge BuWizz	**Question**	
5	**Why is BuWizz LED quickly blinking red/green?**	1. Quick blinking of red and green LED means battery is critically low 2. Recharge BuWizz	**Question**	
6	**BuWizz's LED is slowly blinking red**	1. Keep the BuWizz on until the battery is empty and the LED stops blinking. Afterwards recharge it and the issue should be resolved. In case of furthermore issues contact support.	**Issue**	N/A
7	**BuWizz will not turn off when pressing the button**	1. BuWizz is connected to the app and will therefore not turn off 2. Close BuWizz app and try turning off BuWizz again 3. If BuWizz still does not turn off, turn off Bluetooth on your phone and try turning off BuWizz again	**Issue**	N/A
8	**Is it possible to power 4 lego RC motors with one BuWizz?**	1. It is possible, but performance will suffer 2. 4x Buggy/RC motors is an extreme setup 3. We recommend using 2x BuWizz. 4. In ludicrous mode, you will experience over-current limiter engaging and your model can stop responding	**Question**	N/A
9	**Why does BuWizz need location permission?**	This is an Android requirement, we do not need your location. All apps which use Bluetooth LE need to have location permission (and Location set to "ON") or Bluetooth scan does not work	**Question**	N/A
10	**BuWizz will not pair with the phone**	1. DO NOT pair BuWizz with bluetooth 2. Pairing should not be performed 3. Use BuWizz app to connect	**Issue**	N/A
11	**BuWizz is not visible in the app**	1. Check your device is compatible with the BuWizz app (Bluetooth 4.0 or higher), running Android 4.4 or higher. 2. Give BuWizz app permission to access location information 3. Turn on bluetooth 4. Make sure your device is not outside the Bluetooth range - suggested range for detection of BuWizz is under 5 meters 5. In case the problem persists, contact technical support	**Issue**	N/A
12	**BuWizz is visible in the app, but will not connect**	1. Make sure your device is not outside the Bluetooth range -	**Issue**	N/A

		suggested range for detection of BuWizz is under 5 meters 2. Turn off BuWizz for 3 seconds and try reconnecting 3. Restart the BuWizz app 4. In case the problem persists, contact technical support		
13	**BuWizz works but at extremely low range**	1. Contact technical support	**Issue**	N/A
14	**My model loses connection when accelerating, braking or reversing in high speed/ludicrous mode**	1. BuWizz's internal overcurrent protection is tripping due to the current spikes due to the fast speed changes 2. Do not connect more than 2x XL, 2x L, 2x M or 1x RC or 1x BuWizz motor per output 3. Make sure to control motors carefully, avoiding quick speed changes and reversals of the power sliders. 5. In cases where swift control and reversals of motors are needed, use Slow or Normal mode. 6. Run several BuWizz bricks in parallel to increase number of motors running in parallel for huge models.	**Issue**	https://youtu.be/UdWjysslEe8
15	**App connects to BuWizz, but after a while model stops responding**	1. BuWizz will stop responding if the model leaves the range - for best performance keep your model with 15 meters of range 2. Battery is empty - recharge BuWizz 3.Under heavy load and drained battery, BuWizz will reset itself and terminate connection - recharge BuWizz	**Issue**	N/A
16	**BuWizz stops responding when control device has not been used for a while**	1. Check that BuWizz is still turned on (BuWizz turns off automatically if no commands are received for 10 minutes) 2. Exit the control profile and reconnect to BuWizz 3. In case of connection issues restart BuWizz or the app	**Issue**	N/A

11. FAQ for BuWizz 3.0 Pro

Issue nr.	Symptom	Proposed solutions	Category	Support video
1	**BuWizz does not turn on when pressing the button**	1. Charge BuWizz for 3 hours 2. Check your charger and cable are working properly 3. PU Port 1's LED should indicate charging 4. In case BuWizz still does not indicate charging or turn on after charging for 3 hours, contact technical support	**Issue**	N/A
2	**Why are BuWizz LEDs shining/blinking green?**	1. Battery level between full and 2/3	**Question**	
3	**Why are BuWizz LEDs shining/blinking orange?**	1. Battery level is between 2/3 and 1/3	**Question**	
4	**Why are BuWizz LEDs shining/blinking red?**	1. Battery level is under 1/3 2. Recharge BuWizz	**Question**	N/A
5	**Why is BuWizz PU port 1 LED quickly blinking red/green?**	1. Quick blinking of red and green LED means battery is critically low 2. Recharge BuWizz	**Question**	
6	**PU Ports 1&2 and 3&4 are blinking RED/GREEN alternately** **All PU ports are blinking in a RED spinning pattern**	1. Hold the power button for 5 seconds to reset the BuWizz	**Issue**	N/A
9	**Why does BuWizz need location permission?**	This is an Android requirement, we do not need your location. All apps which use Bluetooth LE need to have location permission (and Location set to "ON") or Bluetooth scan does not work	**Question**	N/A
10	**BuWizz will not pair with the phone**	1. DO NOT pair BuWizz with bluetooth 2. Pairing should not be performed 3. Use BuWizz app to connect	**Issue**	N/A
11	**BuWizz is not visible in the app**	1. Check your device is compatible with the BuWizz app (Bluetooth 4.0 or higher), running Android 4.4 or higher. 2. Give BuWizz app permission to access location information 3. Turn on bluetooth 4. Make sure your device is not outside the Bluetooth range - suggested range for detection of BuWizz is under 5 meters 5. In case the problem persists, contact technical support	**Issue**	N/A
12	**BuWizz is visible in the app, but will not connect**	1. Make sure your device is not outside the Bluetooth range - suggested range for detection of BuWizz is under 5 meters 2. Turn off BuWizz for 3 seconds and try reconnecting 3. Restart the BuWizz app 4. In case the problem persists, contact technical support	**Issue**	N/A

14	**My model loses connection when accelerating, braking or reversing hard**	1. BuWizz's internal overcurrent protection is tripping due to the current spikes due to the fast speed changes 2. Do not connect more than 2x XL, 2x L, 2x M or 1x RC or 1x BuWizz motor per output 3. Use Ramp functions and Current Limiters to ease the acceleration 4. Make sure to control motors carefully, avoiding quick speed changes and reversals of the power sliders. 6. Run several BuWizz bricks in parallel to increase number of motors running in parallel for huge models.	**Issue**	N/A
15	**App connects to BuWizz, but after a while model stops responding**	1. BuWizz will stop responding if the model leaves the range - for best performance keep your model with 15 meters of range 2. Battery is empty - recharge BuWizz 3.Under heavy load and drained battery, BuWizz will reset itself and terminate connection - recharge BuWizz	**Issue**	N/A
16	**BuWizz stops responding when control device has not been used for a while**	1. Check that BuWizz is still turned on (BuWizz turns off automatically if no commands are received for 10 minutes) 2. Exit the control profile and reconnect to BuWizz 3. In case of connection issues restart BuWizz or the app	**Issue**	N/A
17	**BuWizz will not charge**	1. Some newer chargers require communication in order to charge the device which is not possible if the BuWizz is too drained or turned off. 2. Turn on/charge BuWizz with an older charger or via USB port of a PC.	**Issue**	N/A
18	**Firmware update failure**	1. Try updating the firmware again. 2. If issue persists contact support.	**Issue**	N/A

Moves your bricks. Fast.