X-9000_V3 Wheel Lift Assist System

EBMX Wheel Lift Control

Wheel Lift Assist (WLA) is a ground up system developed in house by EBMX Global.

Using real-time IMU data the system can reduce or modulate throttle and apply regenerative breaking force based on user defined settings. This allows the user to adapt it to a wide range of riding scenarios.

The system is fully tunable by the rider for stunting, launching or as a form of anti-rotation assistance.

Importantly, WLA will never apply throttle on its own, it will only reduce throttle through logic-based intervention and apply regenerative braking.

Settings Overview

Out of the box the WLA system comes pre-configured, requiring only minor adjustments to get started.

Activation & Setup

To use WLA, you need to accept the waiver and enable WLA through the EBMX app. Once enabled, double-tap the “On” button on the display. Your display will show an angle icon or a bike lift icon (this will vary depending on the display model).

The first step is to level the IMU for the surface you intend to ride, this is done by placing the bike into level 0 which activates the Auto Horizon feature.

By default, Auto Horizon calibrates automatically after 1 second, but this delay can be adjusted between 0–30 seconds or turned off entirely.

Depending on the use, riding style or goals, you may need to fine tune WLA. If the bike rises too quickly or too slowly or acceleration feels delayed the following settings can be adjusted.

Adjusting WLA settings affects bike performance and handling. Always make changes gradually and test carefully in a safe, controlled environment. Improper settings can lead to unexpected bike behavior. You must agree to the waiver before operating WLA.

Throttle Off Set Angle

This is the defined set angle where all throttle input is removed (Throttle Off).

When the IMU detects the bike reaching this angle, throttle instantly cuts to zero.

Within 10 degrees approaching this set point the modulation is very aggressive.

It is important to set this value beyond your intended balance angle. This ensures there is sufficient throttle available to maintain your position without premature cut-off.

For launching, it is recommend to keep the default set point at 50 degrees, but increase the Modulation Control Percentage to allow for a more responsive take off.

Start Set Angle

This is the angle when throttle modulation begins, based solely on the bike’s angle as detected by the IMU.

For heavier bikes, we recommend setting this between 10–15 degrees. This introduces a slight delay before modulation begins, allowing the bike more time to rise naturally before WLA engages.

Lower angles cause WLA to act sooner, resulting in smoother, less aggressive rotation. If you find the front wheel is difficult to lift when modulation begins, try increasing the Start Set Angle.

To maintain smooth operation, there must be at least a 30-degree gap between the Start Set Angle and the Throttle Off Set Angle.

For launching scenarios, a lower Start Set Angle is preferred to ensure timely and controlled engagement of the system.

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Maximum Set Angle
The set angle at which regenerative braking is applied, if Braking Force is enabled in settings. The strength of the braking is determined by the regen braking percentage configured in the Power Modes and Levels page. This is most effective with aftermarket batteries. Note that regenerative braking performance can vary between motors. Some may offer stronger or weaker regen depending on their design and capabilities. If Braking Force is not enabled, the system will take no action when the Maximum Set Angle is reached.
Braking Force Percentage
The amount of regenerative braking applied when hitting the Maximum Set Angle. The strength of the braking is determined by the regen braking percentage configured in the Power Modes and Levels page. This is most effective with aftermarket batteries.
Auto Horizon Timer
When the display is set to Level 0, the IMU will automatically level itself after the time delay set by the Auto Horizon Timer.
Modulation Control Percentage
This percentage controls the amount of throttle modulated. A lower percentage will allow more throttle, making the bike feel more aggressive. A higher percentage will reduce throttle resulting in a smoother and less aggressive response.
Speed
If enabled, WLA will automatically deactivate once the bike exceeds the specified speed set.
Rise Aggression
This setting uses acceleration and angle speed data to modulate throttle based on the Modulation Control Percentage. The lower the Rise Aggression setting, the faster the bike will rotate. The higher the Rise Aggression setting, the slower the bike will rotate based on the Modulation Control Percentage setting. A balance between the Rise Aggression setting and the Modulation Control Percentage gives greater control when launching. For beginners, we recommend keeping Rise Aggression at its default setting and making adjustments primarily via the Modulation Control Percentage.
Timer
This setting specifies the time allowance for WLA to control of the wheel lift.