

LEGWAY

User Manual on Spreading Wings Self-Balancing Unicycle

User Manual on Legway Spreading Wings Self-Balancing Unicycle

Thank you for selecting this product. We, legway will try our best to serve you!

When driving legway Spreading Wings self-balancing unicycle, you may crash, fall down or lose control. To ensure your driving safety, you must read this manual wholly and carefully before using legway self-balancing unicycle. This manual is applicable to the series of Spreading Wings products manufactured by Nanjing Legway Intelligent machinery Co., Ltd.

The articles contained in the packing container can be shown as follows: a legway self-balancing unicycle, a recharger, a learning assisted wristband, a user manual, a specifically customized bookmarks, a pieces of Warranty Card / Certificate of Quality.

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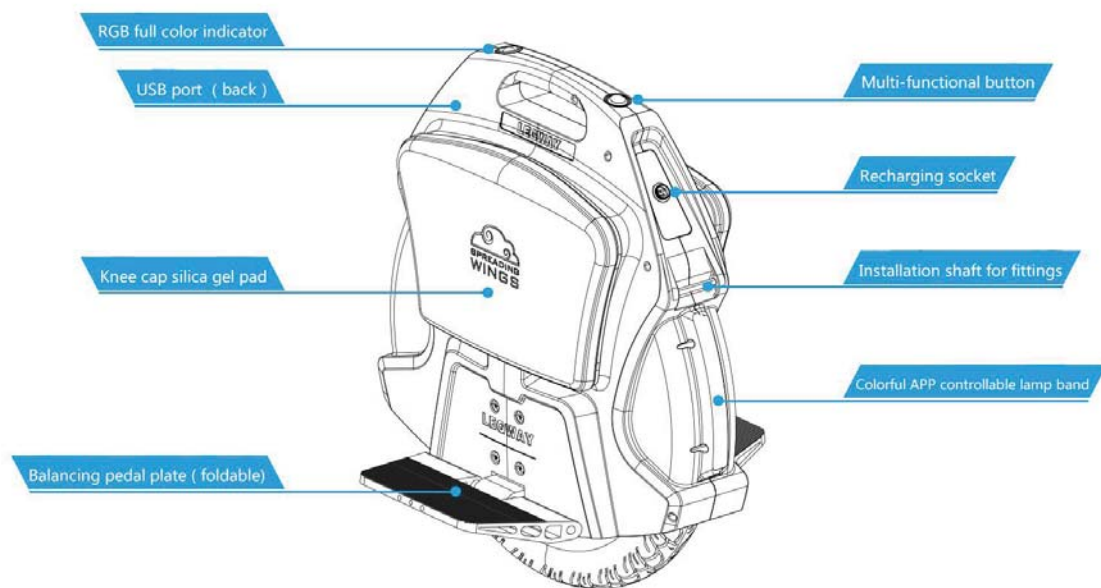
1. Introduction on Products

1.1 An introduction on legway self-balancing unicycle

Legway self-balancing unicycle is a new generation tool for entertainment and fitness that is energy saving, environmentally friendly and portable. As a high tech intelligent product, it has been integrated the technologies such as: fuzzy algorithm aviation inertial navigation technology, cellphone APP, wireless bluetooth data transmission. Small and portable, legway self-balancing wheelbarrow can be a great assistant for your life and entertainment.

1.2 Introduction on Products

The main components can be shown in the figure as follows:



1.3 Operating mode

There are two operating modes of legway self-balancing unicycle, driving mode and mobile power source mode.

① Driving mode

Driving mode is the operating mode of legway self-balancing unicycle that is most commonly used. Under the driving mode, the motor driving modules, gesture testing modules, bluetooth module, USB power source output module, colorful focus APP controllable lamp band are working normally, which can offer the coolest driving experience for the drivers.

The method of entering this mode is to click the functional button under the shutdown state.

② Mobile power source mode

If you want to recharge your cellphone but don't want to open the driving functions of legway self-balancing unicycle on the special occasion (such as on the subway or bus), you can only open USB power source output mode, then you can select to enter the mobile power source mode.

Under this mode, mode driving module and gesture testing mode don't work but bluetooth module, USB power source output module, color focus APP controllable lamp band are working normally.

At this moment, legway self-balancing unicycle is equivalent to a super capacity mobile power source.

The method of entering this mode is to double-click the functional button under the shutdown state.

1.4 Operating principles

The operating principles of legway self-balancing unicycle is similar to the balancing system of the human body. When the center of body gravity is leaning toward the front, you want to walk forward to keep balancing; when the center of body gravity is leaning backward, you want to walk backward to keep balancing. Legway self-balancing unicycle can test the inclination angle of the driver by the built in inertial sensor, when testing that the driver is leaning forward, legway

self-balancing unicycle can accurately drive the wheel forward to keep balancing. When testing that the driver is leaning forward, legway self-balancing unicycle can lean backward in a similar way. The forward and backward balance can be realized by legway self-balancing unicycle itself; and the balance on the left or right side is similar to that of bicycle, which means the driver can keep balanced by certain speed and body swing. The speed of the driver can be controlled by the inclination degree. The greater inclination degree, the faster speed it will generate. If your body leans forward a little, it will speed up and if your body leans backward, it will slow down or stop.

2. Safety Instruction

There is always the security risk existing in any driving product and legway self-balancing unicycle is not exceptional anyway. So we remind you to drive it carefully and you should focus on the following safety matters.

2.1 Scope of application

As a kind of intelligent and portable tool for entertainment and fitness, legway self-balancing unicycle can never be replaced by the modern existing transportation. Don't drive your legway self-balancing unicycle on the public transport road please. In some countries or regions, it is not allowed to drive legway self-balancing unicycle on the public transport road. For specific conditions, please make consultation on the relevant authorities or you can contact the agents authorized by legway or after sale department of legway.

2.2 Attentions before driving

- ① Check the unicycle: just check whether the electric power is enough and shake it to ensure whether the unicycle has any abnormal sound or looseness.
- ② You need to find an open and flat ground for your exercise with an area of 10m*10m at least, indoors or outdoors.
- ③ Don't drive it on the wet and bumpy ground and the downward or upward ramp with more than 18 °.
- ④ You had better ask a good relative for learning driving together, thus you can offer the assistance and exchanges on experiences on driving learning, which is helpful for your fast learning.
- ⑤ Implement a good safety measures and it is suggested that you should put on helmet, glove, elbow and knee pads and other protection devices so as to avoid possible damage.
- ⑥ Please wear the proper clothes and don't wear any sharp ornaments and high-heeled shoes, which is helpful for you to handle the emergency.
- ⑦ It is suggested that the children under 15 years should not learn and drive it.
- ⑧ Sudden acceleration and deceleration shall be avoided and excessive leaning forward or backward of body is not allowed and any over-speed is not allowed as well.
- ⑨ Don't put your hands into pocket, otherwise you can not timely handle the emergency.
- ⑩ In the case that there is the risk of falling down top priority shall be given to protect personal security. High strength bumper materials are used as shell materials of legway self-balancing unicycle, so you don't need to worry about being broken of the unicycle body and the principle of protecting human instead of unicycle shall be practiced as well.

3. Performance Parameters

Items	Specifications	Parameters	Remarks
Product name	Brand	LEGWAY	①Maximum speed: it

	Model	Spreading Wings Yun Zero	can be varied based on the drivers' weight, road conditions and the environmental temperatures. ②Range : it can be varied based on the drivers' weight, road conditions and the environmental temperatures. ③ Maximum load: it includes the weight of unicycle body, driver and the articles on the unicycle. ④Maximum climbing angle: the angle may be varied based on the different weight and speed. ⑤ Weigh of unicycle body: not including the weight of training wheel.
	Maximum speed	18km/h (11mps) ①	
	Continuously driving mileage	30~35km/h (18~21miles) ②	
	Maximum load	120kg (264lbs) ③	
	Maximum climbing angle	18°④	
	Battery	260Wh Lithium	
	Temperature	(14°F~122°F)	
	Recharger voltage	AC120V 60Hz	
	Full recharge time	120min	
Appearance and weight	Size	455*156*500mm3	
	Weight of unicycle body	13.5kg (29.8 lbs) ⑤	
	Tire size	Φ407mm (16 in)	
	Distance from pedal to ground	110mm	

4. Usage

4.1 Multi-functional button

There are two kinds of operation of multi-functional button: click and double-click.

In the state of shutdown, click the multi-functional button to enter the driving mode. Legway self-balancing unicycle can be automatically balanced within 2 seconds. Under the driving mode, click the multi-functional button, you can shut off legway self-balancing unicycle.

Under the shutdown state, double-click multi-functional button to enter the mobile power source

mode. Under the mobile power source mode, double-click the multi-functional button, you can shut off the legway self-balancing unicycle.

The two methods mentioned above are the software shut off methods, namely the shutting off can be judged through testing the button state by the processor in legway self-balancing unicycle.

Before shutting off, the related driving data can be saved. In addition, there is a kind of compulsory shutting off, namely press the multi-functional button for more than 8~10 seconds under any state, legway self-balancing unicycle can enter the shutdown state. This method can be used to compulsorily shut off the power source in the unexpected case, thus ensuring the safety of human and unicycle.

4.2 RGB full color indicator

A full color LED is used as the status indicator light in legway self-balancing unicycle and the different unicycle status information can be indicated by various color and flickering methods. The flickering status and its meaning can be shown as follows:

Color	Color flickering mode	Description on status
Green	Breathing light	Electric quantity of battery: 100%~50%
Yellow	Breathing light	Electric quantity of battery: 50%~20%
Red	Breathing light	Electric quantity of battery: 20%~10%
Red	Heart beating light	Electric quantity of battery: 10%~0%
Purple	Flickering light	Too large inclination angle of unicycle body
Blue	Flickering light	Too great current or too high temperature
Red	Flickering light	Over speed or overhanging of unicycle body
Blue	Breathing light	Mobile power source mode

4.3 Colorful APP controllable lamp band

There is a colorful light band in front and back of legway self-balancing unicycle. You can set the color, brightness and flickering methods through cellphone client. For further information on the introduction on the cellphone client and usage, you can log on the official website of legway.

In the default, legway self-balancing unicycle can self-test the hardware after starting up. At this moment, the light bands light on. After 2 seconds, light band will display the quantity of electricity which can be divided into 8 levels for indication. Such levels can be expressed with the numbers of the green lights. With quantity of electricity being reduced, the number of green lights will gradually be decreased.

4.4 Driving steps

①Start up

One hand should get hold of the handle and put legway self-balancing unicycle on the ground with

the vertical status and extend two pedal plates, click the multi-functional button, then RGB full color indicator light and colorful APP controllable light band will light on. At the same time, the buzzer will tick as the warning tone, and then you can be ready to ride.

② Getting on unicycle

After shutting on, legway self-balancing unicycle can be automatically balanced within 2 seconds of initialization.

Then we can try to step one leg on the pedal plate thus to ensure which leg is more powerful electricity (generally right leg). You can put the more powerful leg on the pedal plate with the body of unicycle leaning inward with 10° and the inner side of shank should prop up the unicycle body with some strength, and then slowly move forward. When it reaches a certain speed, another foot should put on the pedal on the other side.

③ Driving

You can find a wall or fence as support device or let one of your friends sitting near you or use training wheel. Under the outside support, you can firstly stand on legway self-balancing unicycle and slowly move it by leaning your body forward, thus gradually knowing the driving experience. After that, you can gradually reduce the dependence on auxiliary supports until you can drive it without them.

④ Cornering

After learning how to drive straightly and smoothly, you can carry out cornering by adjusting the strength on the left or right pedal and changing the inclination on the left or right of unicycle body in combination with the turning of your body. The cornering difficulty is much easier than that of driving. You can master the cornering skill smoothly by more exercise.

⑤ Braking

You can brake legway self-balancing unicycle by changing the center of gravity from the direction opposite to the driving direction.

⑥ Getting off the unicycle

The speed can be reduced by leaning your body backward. After stopping your unicycle, you can lay down your left leg or right leg. Don't stop your unicycle suddenly, great acceleration may cause the slipping of the tire or circuit protection to the unicycle, thus causing unnecessary risk and damage.

⑦ Shutting off

When the unicycle stops, click multi-functional button then legway self-balancing unicycle can enter the power off status. In the case of emergency that causes failure of legway self-balancing unicycle in response to the button instruction, you can long press the multi-functional button about 8~10 seconds to forcibly shut off the unicycle.

4.5 Battery usage

① Recharging

Open the silicone protective cover on the recharging socket and guarantee that it is dry. Put the output end to the recharging socket of legway self-balancing unicycle, then insert the plug to 220V AC. The large power recharger is offered on legway self-balancing unicycle. Under the normally condition, it takes 120 minutes to complete the recharging. When the indicator light on the recharger turns red, which shows it is recharging; when the indicator turns green, which shows the recharging has been completed.

② Service life and endurance

High quality imported power lithium battery is used in legway self-balancing unicycle. Under the normal condition, it can reach 500 cycles of recharging (fully recharging and discharging cycle). After 500 cycles of recharging, its capacity will reduce to about 80% of the original level. After being used repeatedly, its capacity will reduce gradually. As the capacity of lithium battery is greatly affected by the environmental temperature, its mileage will be shorter in the cold winter. The mileage for continuously driving at normal level should be 30~35km.

4.6 Safety protection

①Speed limit protection

To avoid the accident caused by the over speed, maximum speed has been set for legway self-balancing unicycle. When the speed has reached the limit speed, legway self-balancing unicycle will positively adjust the gesture of unicycle body, slowly lift the pedal plate to force the center of your gravity to move backward so as to reduce the speed. When you notice that the pedal plate is lifted, you should immediately adjust the center of your gravity by stopping leaning forward and reducing the speed. With the reducing of speed, the pedal plate can be restored to the normal level.

The limit speed and upward protection inclination angle of legway self-balancing unicycle can be set through the cellphone client. For further information you can log on the official website to search LOPO instruction.

②Tilting protection

When the unicycle body slants to one side with more than 45°, the control system can start up the tilting protection with motor suddenly stopping running, thus avoiding the damage against person. After starting up the tilting protection, the buzzer can send out ticking as prompt. At the same time, RGB full color indicator light can flicker continuously in purple. Just put it on the ground vertically, you can remove the tilting protection to enter the driving mode. If it is not timely put on the ground vertically, it will shut off automatically within 10 seconds.

③Dangling protection

When the unicycle body is lifted, the control system will start up the dangling protection so as to prevent the damage by the idling running to the human. After the unicycle body is lifted to the air and when the speed has reached the limit speed, the buzzer will send out ticking as warning and RGB full color indicator light will flash continuously in red at the same time, and then the motor will stop running. After putting the unicycle body to the ground, you can click the multi-functional button to restore the driving mode. If you don't carry out such operation, it will shut off automatically within 10 seconds.

④Low power protection

If the power is lower than 20%, the red breathing light will light on and the maximum speed will be reduced to 70%. When the quantity of electric charges is reduced to lower than 10%, the red heart beating lamp will light on and the buzzer will send out ticking as warning. At this moment, please stop driving and timely recharge it.

⑤Mal-operation protection

To prevent the damage caused by unicycle body to human in the case of being operated wrongly in the tilting, the unicycle can start up the tilting protection in tilting. At the starting up status, if it is not operated by human within five minutes, the system will automatically shut off.

4.7Usage for the hand strap for supporting learning

If you can't still drive legway self-balancing unicycle skillfully, you can avoid the damage by

scratches when using the learning supported hand strap.

①you can have hand strip pass through the handle of legway self-balancing unicycle and adjust the length of the hand strip to a proper position.

②if you are losing balance and have to jump from unicycle when driving, you can use the hand strip on hand to drag the unicycle to avoid the damage caused by its losing control.

5. Cellphone Clients

5.1 Introduction on Client

LOPO is a kind of interactive application based on the intelligent hardware, through which the communication can be achieved by bluetooth and intelligent hardware and the performance parameters can be displayed and modified and the operating data for equipment can be recorded through it as well. LOPO can enable you to realize the interaction with other clients and mutually participation in our well planned activities by sharing the data, thus sharing the new life experience brought by the intelligent hardware.

5.1 Client download

Currently the software can support two kinds of intelligent operational system: IOS and Android. You can carry out the correct software for downloading and installation according to the kinds of your cellphone. Such client can be downloaded from Android application market and App Store and you can also download from legway official website: <http://www.legway.cn/download/>

5.1 Clients usage

It is suggested that after opening the power source of legway self-balancing unicycle, you can open LOPO software by the mobile equipment, and then the mobile equipment can automatically search bluetooth equipment and connect with unicycle. Because the effective transmission distance of bluetooth, you should keep the distance between cellphone and unicycle less than 10 meters, otherwise it will automatically disconnects.

Attention: don't drive the unicycle while using LOPO to avoid the accident by distraction.

6. Care and Maintenance

5.1 Storage

①Please store legway self-balancing unicycle in a dry, suitable temperature and humidity area.

②The proper temperature for legway self-balancing unicycle is 10~30℃ and too low or too high temperature can have an adverse impact on the lithium battery. Don't use it under the temperature higher than 50℃. Don't put the unicycle to the environment with temperature above 40℃ for a long time.

③If you don't use it for a long time (more than 10 days), you should recharge it fully and put it to the cool and dry condition and recharge it at least once for each month to keep the activity of the battery.

Cautions: Don't put legway self-balancing unicycle in the car in the hot seasons for the high temperature may cause the failure of lithium battery or even burning.

6.2 Cleaning

①You should ensure that legway self-balancing unicycle is powered off before cleaning it.

②You can wipe your unicycle with soapy water and soft cloth and it is not allowed to clean the unicycle surface with gasoline, solvent and any chemical reagent.

③ During the cleaning, attention should be paid to not letting the water flow into the recharging outlet and USB port.

6.3 Changing the inner and outer tire.

- ① The tools necessary in changing the tires is cross screwdriver and allen driver.
- ② All the screws in the shell sides should be loosened with cross screwdriver (there are 12 screws in the unicycle body).
- ③ There are 6 screws near two pedal plates (including 4 on the side of unicycle body and 2 in the shell below the pedal plate), loose 6 screws on one side of battery box with allen driver (the unicycle should be put as RGB full color indicator extended forward and the box on the left side should be battery box).
- ④ You can open the side cover when loosening all 18 screws. Don't separate any wiring harness. Now you can change or repair the inner and outer tires.
- ⑤ After completing the repair, you can install the side cover to the original position and tighten the screws. If there is any looseness, you can erect the shell after connecting the lines based on the original positions.

6.4 Adjusting the tightness of the pedal plates

The pedal plate may get loose after long time of being used and it may automatically extend after closing it. At this moment, we suggest you tighten the inner hexagon screws (but not too tight) according to your need.

7. Warranty Policy

7.1 Provisions on warranty

The clients can enjoy the following "Three Guaranties" service in the case of the performance faults of products caused by non-artificial damage within the warranty period.

- ① If there is any equipment performance problems occurring within 7 days since its purchase, the consumers can select to return, exchange or repair it.
- ② If there is any equipment performance problems taking place within 15 days since its purchase, the consumers can select to replace the products or repair it.
- ③ The warranty period for the whole unicycle, except the battery, inner and outer tires, knee cap silica gel pad and colorful APP controllable lamp band shall be one year.
- ④ Warranty periods for battery, inner and outer tires and colorful APP controllable lamp band are half year, one month and one month respectively and not any warranty is offered to the knee cap silica gel pad.
- ⑤ After replacing the product, the effective warranty period shall be calculated from the date when such replacement has been conducted.
- ⑥ The cost incurred by the replacing and repair of the unicycles and spare parts that meets the Three Guaranties shall be borne by Nanjing Legway Intelligent Machine Co.,Ltd.
- ⑦ To the product with fault, warranty period of which has expired or that are not within the scope of liability exemption, Nanjing Legway Intelligent Machine Co.,Ltd will offer the paid life time maintenance and service and certain cost on maintenance, spare parts and product transportation shall be collected.

7.2 Provisions on non-warranty

Any following cases (including but not limited to the following cases) are not listed within the service scope of "Three Guaranties".

- ① Any damages caused by use, care and adjustments which are conducted not according to the requirements as set out in *Client Manual*.
- ② The product has been used for the period exceeding the warranty period.

- ③The product doesn't have warranty cards, invoice or there is inconformity among invoice, warranty card and product.
- ④The product serial number in the warranty card or product model is not inconformity with that of the products and the ware and tear of motor number.
- ⑤Assembly or repair of product conducted by the person other than those authorized by Nanjing Legway Intelligent Machine Co.,Ltd.
- ⑥ The product damages caused by the accidents or human behaviors, such as mechanical disruption, breaking and serious oxidization, etc.
- ⑦The damages caused by the overloading, barrier crossing (including but not limited to the driving downward on the steps and falling) , other extreme sports, etc.
- ⑧The product damages caused by the transportation and handling during it is sent back to repair.
- ⑨The appearance damage may not be within the scope of warranty.
- ⑩ Other fault and damage caused by the other elements other than the design, technology, manufacturing and quality and other problems.

7.3 Replacing or return/ Repair flow

- ①The client can call 400-630-7856, the service hotline of Nanjing Legway Intelligent Machine Co.,Ltd for after service or directly contact the dealers at the purchase location for after sale service procedures and such contact information of different locations is available for inquiry on the official website.
- ②To the product needed to depot repair, the client should contact the dealer at the purchase location for logistic. Such result and repair procedures can be directly communicated between our company and the dealer.
- ③Within three days after receipt of the faulty products of clients, Nanjing Legway Intelligent Machine Co.,Ltd will report to the client the analysis on fault cause, fault liability, maintenance cost(the faulty product exceeding the warranty period or that are not within the scope of maintenance) and the completion time for maintenance.
- ④If the clients don't have any objection on the fault cause, liability on faults, maintenance cost and time, Nanjing Legway Intelligent Machine Co.,Ltd can carry out the repair to the faulty products within 7 working days since the date of confirmation.
- ⑤ To ensure a smooth exchanges, return or repair of products , you should correctly fill out client's purchase registration table.
- ⑥You should send back the warranty card when you carry out the exchange, return or repair of products and if there is any invoice, please send it back to us together.

If there is any problem taking place in the use of this product, please refer to *Clients Manual*, please contact our company by following methods when such problem can not be solved with reference to *Clients Manual*. Nanjing Legway Intelligent Machine Co.,Ltd wishes you happy in using our product!

Nanjing Legway Intelligent Machine Co.,Ltd.

After sales Hotline : 400-630-7856

Add: No.12 Xingke Road,

Economy and Technology Development Zone,

Nanjing,China

Website: www.legway.cn

FCC Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.