

Self-balancing Vehicle

Use and Maintenance Manual

Freego[®]

Self-balancing Scooter

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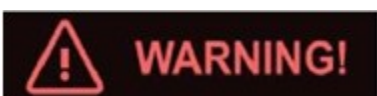


Dear user,

Thanks for your trust and favor for Self-balancing vehicle!

With patented intelligent balance technology, Self-balancing vehicle optimizes travel mode of humans by virtue of its "green, environmental-friendly, intelligent and safe" R&D concept and its hyper-modern features of "vehicle and human body combined and movement with heart".

Unsafe driving cannot ensure your absolute safety. Before use, please read and follow contents of the *Use and Maintenance Manual*. If you have any question or have no *Use and Maintenance Manual* for *Self-balancing vehicle* and safety video, please contact relevant retailer or wholesaler.



- If the vehicle is out of control during driving, there will be a very big danger.
- Please do not drive the vehicle in field with extremely high danger coefficient (e.g. cliff and steep hill) by yourself. To reduce risk of injury, make sure to read and follow all instructions and warnings.

Relevant documents for users:

- *Use and Maintenance Manual for Self-balancing vehicle*---to help you know this product and learn how to drive it. To reduce risk of injury, please do read following contents.
- Safety video---to show use methods and safety warnings.

	Actions may cause injury.
	Actions may damage the product.
	Pay attention to relevant useful information.

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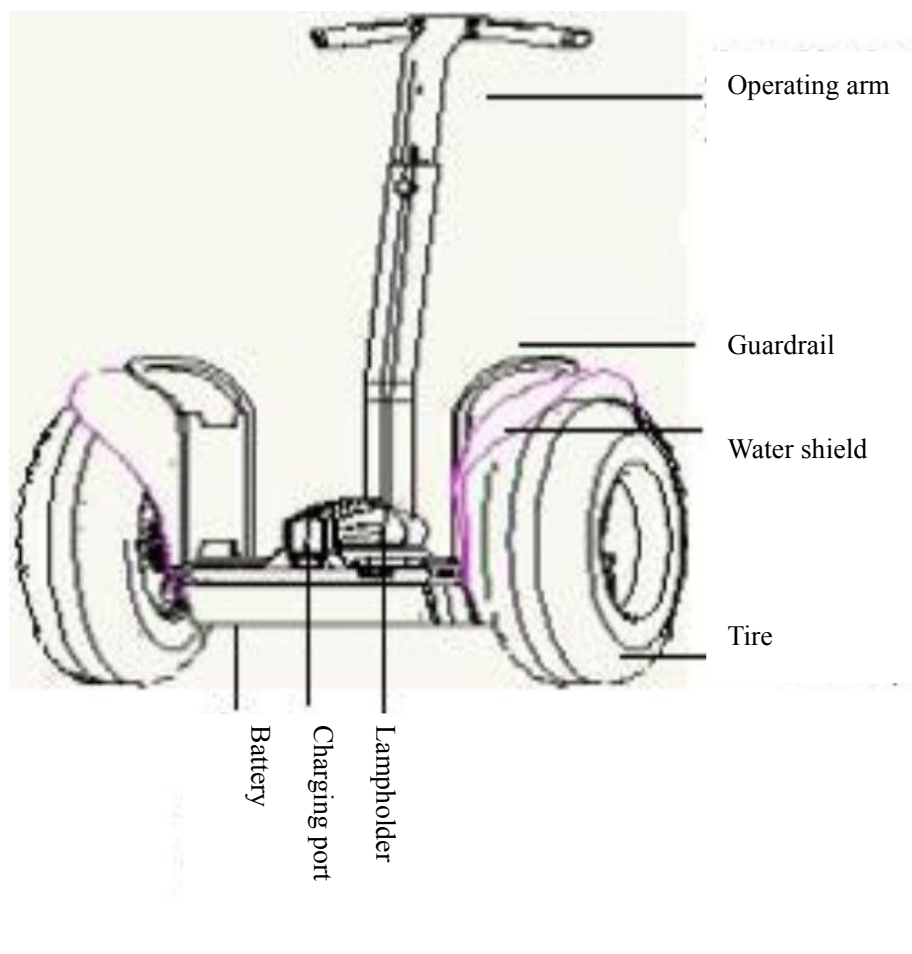
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Chapter I Introduction to Self-balancing vehicle

1. Overview Drawing of Self-balancing vehicle



2. Serial Number of Self-balancing vehicle

Each Self-balancing vehicle has a unique serial number, including vehicle identification code and control serial number. The serial number should be kept properly. It is very important for part replacement and repair in future.

- Vehicle identification code: stand behind the vehicle and pull up the rear part of the right pedal. Then you will see bar code and vehicle nameplate.
- Serial number of controller: on the reverse side of the controller.

3. Technical Data of Self-balancing vehicle



Article Name	WX off-load
Max Load	120kgs
Min Load	30kgs
Net Weight	56kgs
Max	20km/h
Range	30-50km
Max Climb Capability	30°
Turning Radius	0m
Battery	Lithium Battery
Charging Time	2-4h
Charging Size	100-240V
Vehicle Size	850*520*1320 mm
Warranty	6 months for battery and 1 year for system



Article Name	WA city version
Max Load	120kgs
Min Load	30kgs
Net Weight	50kgs
Max Speed	20km/h
Range	30-50km
Max Climb Capability (Max Climb Capability)	30°
Turning Radius	0m
Battery	Lithium battery
Charging Time	2-4h
Charging Size	100-240V
Vehicle Size	740*520*1290 mm
Warranty	6 months for battery and 1 year for system

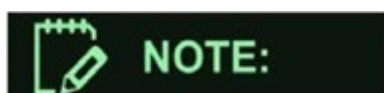
4. Operation and Use Restrictions for Self-balancing vehicle (Restrictions on Structural Weight)

- Restriction on user's weight: User's weight must not be smaller than 45kg; otherwise safe driving cannot be realized (if user's weight is lower than 45kg, the balance system will not work properly and deceleration and stop functions will not be realized).
- Restriction on load weight of operating arm: load applied to operating arm should not exceed 4.5kg; **otherwise risk of injury will be increased.**

Chapter II Working Principle of Self-balancing vehicle

1. Working Principle of Self-balancing vehicle

The Self-balancing vehicle walks like humans. If user leans forward, it will walk forward and keep balance; if user leans backward, it will walk backward and keep balance. Power of the machine will drive it to move forward toward the direction you lean. This technology is called power balance technology. At static condition, center of gravity of body, tires and ground should keep a straight line. When center of gravity breaks away from this line and leans backward, the vehicle will feel this change and the system will keep balance---namely move to the leaning direction and keep balance. When center of gravity leans to left with left foot as a pivot, the vehicle will move toward left. On the contrary, when center of gravity leans to right, the vehicle will move toward right and realize turning. For turning, both feet should step on the pedal and only center of gravity should shift. If only one foot is used, the vehicle will not keep balance and may cause fall.



When the vehicle is running on a slope or unsmooth ground, the operating arm should be kept vertical to prevent automatic turning of the vehicle.

1.1 Balance indicator

Balance indicator is installed on the control panel. It is used to directly show if the vehicle is balanced and if user can step on the pedal safely. When operating arm is vertical, the vehicle will be balanced if all indicators are illuminated.



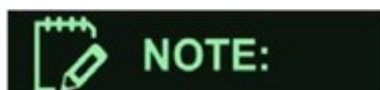
- **When balance indicators are not illuminated, please do not step on the pedal, because it is not at safe balance state!**
- **When an individual indicator is illuminated, please do not step on the pedal, because it has not reached a balance state.**
- **You can step on the pedal safely only when all indicators become green and clicker.**
- **All indicators are illuminated when vehicle is at static state (the vehicle is not at complete balance state if any one indicator is not illuminated).**

1.2 Charging indicator

Charging indicator is installed on control panel. In charging, it displays green or flickers green. When it is not illuminated, that means charging is not normal.

2. Description of Controller of Self-balancing vehicle

Controller of the product adopts 2.4GHZ wireless communication technique. Receiving and sending signals are controlled by a monolithic wireless transceiver for 2.4-2.5GHZ world universal frequency band ISM. For details, please refer to *Appendix 1: Instructions for Controller of Self-balancing vehicle*.



If electric quantity for remote control is insufficient, please replace battery in time.

3. Information on Parts of Self-balancing vehicle

3.1 Check sensor

Self-balancing vehicle has four light sensors which are installed under the pedal. They are used to sense if user steps on or leaves the pedal. When both feet step on the pedal properly, three sensors will become under pressure and thus drive normal work of the balance system. When less than 3 sensors are working, the maximum speed will be reduced automatically. When the sensor is not under pressure and starts rapid movement, Easy will give out a vibration warning. And then the vehicle will automatically switch to preparation mode.

3.2 Control panel

The controller is equipped with circuits for connection to battery, motor and inductor. Thus the control panel will give an instruction to the motor to drive rotation of tires. If the system senses a dangerous part, or the battery runs down to an unsafe range, the machine will automatically shut down.

3.3 Motor

Each tire is separately driven by an electric motor at high speed, which is featured by low noise and high efficiency. Each motor is equal to a computer controller and accurately standardizes actions of the machine. Each motor is divided into two circuits which can operate independently. If any one winding cannot work, the machine will shut down automatically.

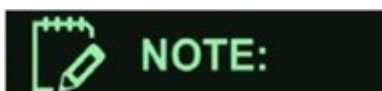
3.4 Balance sensor

The balancer is equipped with three angular velocity sensors (solid-state gyroscope) and two inclination sensor. The balance sensor sends to control panel information on the position of machine. All sensors are designed with machine control to ensure accurate work. If any one sensor cannot work, the machine will shut down automatically.

Chapter III Correct Understanding of Safety Warnings for Self-balancing vehicle

1. Speed Limit

When the Self-sending vehicle drives at the accepted highest speed, the speed limiter of machine will push the operating arm backward and reduce its speed automatically. When speed limiter is pushing operating arm backward, please do stop leaning forward. Always keep certain space with the operating arm. When the vehicle decelerates to a safe speed, the machine will resume normal work.



NOTE:

When vehicle speed approaches max value, the speed limiter will be activated (machine is raised at front part) under following operation modes.

- **Running upward on an abrupt slope, or a bumpy surface.**
- **Less than three sensors become stressed during driving.**
- **Several seconds after start-up.**
- **Low electric quantity.**
- **Battery is too hot or cold.**

2. Vibration Warning

2.1 Vibration warning refers to a kind of warning that informs prevention of machine falling. The operating arm vibrates slightly and rumbles. Speed limiter and safety shutdown may be activated depending on actual driving conditions.

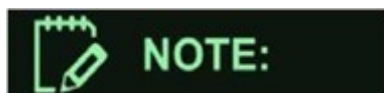
- In case of a vibration warning during driving, please decrease your speed.
- If warning still exists, stop driving and leave the machine. Do not retry before vibration warning is identified and eliminated.
- When warning stops, leave the vehicle immediately till you have eliminated all faults and ensure that automatic shutdown will not be activated.

2.2 Warning will be given in case of following conditions.

- When vehicle runs on a steep slope or rough ground surface.
- When vehicle meets a barrier, or suddenly increases or decreases speed.
- When user steps on the pedal while the machine has not become balanced.
- When battery has low electricity quantity and is too cold.

2.3 State of warnings during driving and solutions

Causes for warnings	Solutions
Vehicle runs too violently, suddenly accelerates or stops.	Try to drive the vehicle as smooth as possible and operate at a slow speed.
Body leans on operating arm, thus power is enhanced.	Keep enough space between body and operating arm.
Road surface is uneven and abrupt, thus power is enhanced.	Please drive the vehicle on an even road. If on a slope, keep the machine vertical to the slope; or get off the vehicle, adjust to unmanned mode and push the machine forward.
Power is continued being enlarged when vehicle meets a barrier like door, or roadside hinders movement of the tires.	Stop pushing the barrier. Get off the machine, switch to unmanned mode, and steel the machine clear of the barrier.
Driving to fast backwards.	Decrease speed or stop running backwards, and turn to forward running.
Automatic safe shutdown is activated.	Leave the vehicle within 10s.



When driving in a too narrow section, pay attention to widths of tires and road surface and prevent wall climbing.

2.4 State of warnings during unmanned mode and solutions

Warning will be given out if the vehicle runs too fast under unmanned mode. Warning may also be given out if tires rotate when you push the machine up stairs.

Causes	Actions
Machine is moved too fast under unmanned mode.	You should move the machine slowly and carefully under unmanned mode. Place the machine under your body (place it under your body when moving it downstairs).
You step on the pedal when the machine is just started up but has not been well prepared.	Leave the machine. Then step it on again when balancer indicator becomes green.

3. Safe Shutdown

3.1 Under manned use mode

When machine detects a fault with any chassis system or battery running down to unsafe range, safe shutdown will be activated automatically. For automatic shutdown, the machine will decrease speed automatically and then give a vibration warning. The balance indicator will flicker and give warning sound. You have to leave the machine within 10 seconds. The machine will stop immediately when tire speed becomes zero after 10 seconds. If safe shutdown happens, please immediately stop driving. Move your feet from the machine (one for each time).

3.2 Under unmanned mode

The machine will shut down automatically when anti-theft detection system is activated. The machine will run further for no more than 1.5m after it is stolen.

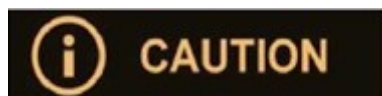


When safe shutdown is brought about due to no or low electric quantity, do not try for restart or driving. The machine has no enough power to keep balance. If continuing with restart or driving, you may fall from the machine. And the battery may be damaged, thus its service life and efficiency will be degraded.

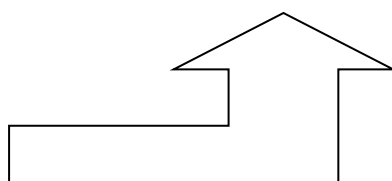
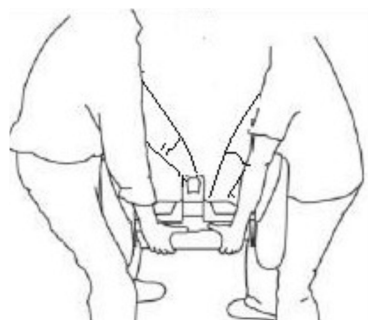
Chapter IV Assembly of A New Self-balancing vehicle

1. Check Parts

Open the packing case, and take out handle carefully and put it aside. And then take out the vehicle body. Then please immediately check if articles in the packing case are shown as below. In case of missing articles, please contact your retailer at once.



The vehicle body is very heavy. Please take it out upward carefully. If the vehicle body is lifted by two persons, please fasten the wheel hub with hands. Do not directly lift the fender; otherwise it may be damaged or your finger may be jammed.



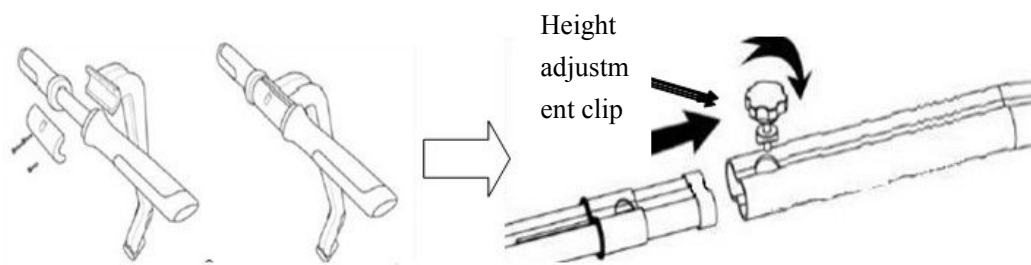
S/N	Parts	Qty
1	Vehicle body (including battery and wheel)	1
2	Rocker	1
3	Handle	1

6	Controller (including charger)	1
7	Self-balancing vehicle	1
8	M8 hexagon socket head cap screw (13# nut)	4
10	Hexagonal screwdriver (13# sleeve)	1

2. Assembly a New Car

After confirming all components are intact and complete, please assemble your new car according to following steps.

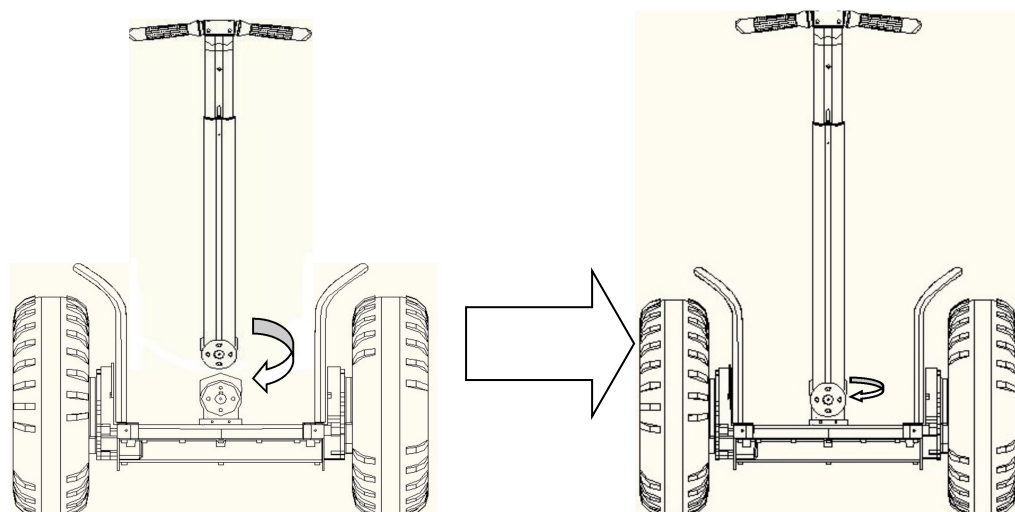
2.1 Install handle



1. Install the handle

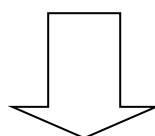
2. Connect upper and lower parts of operating arm and tighten height adjustment clip.

2.2 Install rocker

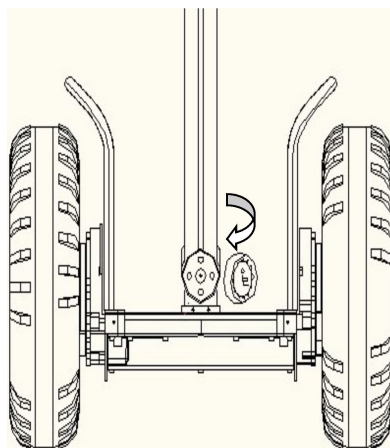


① Buckle the compression bar.

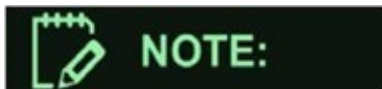
② Tighten screws.



Congratulations! Assembly is finished!



③ Close decorative cover.

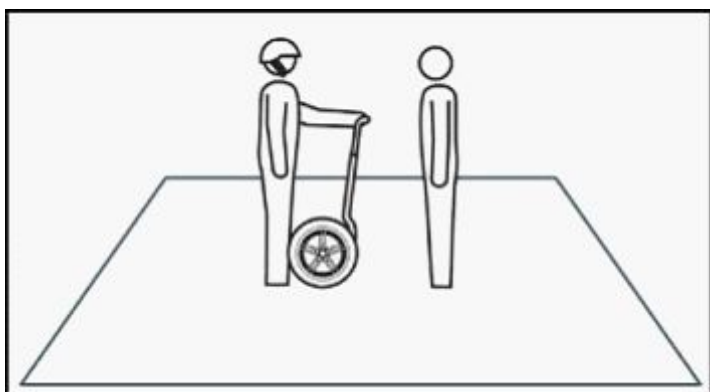


- Before removal of the operating arm, detach its decorative cover first.
- The height adjustment clip should be tightened. If too loose, it may fall and cause danger. Please be careful.

Chapter V Driving of Self-balancing vehicle

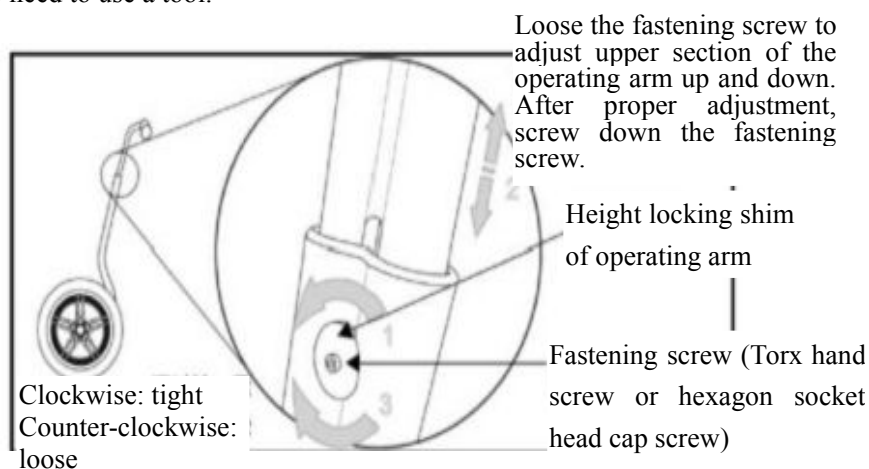
1. Preparation

- ① With respect to driving for the first time, select a proper driving site. It can be an indoor or outdoor site that must be sized 4x4m (16m²). It should be even but not too slippery or smooth. It should be free of barriers and motor vehicles, bikes, pets, children or any objects that will make you abstracted.



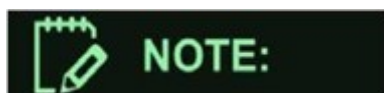
- ② There should be an instructor (coach) who has read this manual or watched safety video instructions and warnings, and is able to help you in driving.
- ③ Please make sure to wear a helmet and protective clothing to avoid possible injuries.

- ④ Move Self-balancing vehicle to center of the site.
- ⑤ Adjust operating arm to proper height. Adjust it as shown in below figure. It can be adjusted with hands. No need to use a tool.



2. Start Self-balancing vehicle.

Firstly switch on power of main system of Self-balancing vehicle. When Self-balancing vehicle gives out start-up sound and the indicator flickers, it means the main system has been successfully started; and then press "On/Off" key on the intelligent remote control to start Self-balancing vehicle. When Self-balancing vehicle gives out start-up sound again and all indicators are illuminated, it means the machine has been successfully started.



NOTE:
During start-up, please ensure that pedals of the Self-balancing system are almost in horizontal position.

3. Confirm that tortoise mode has been started.

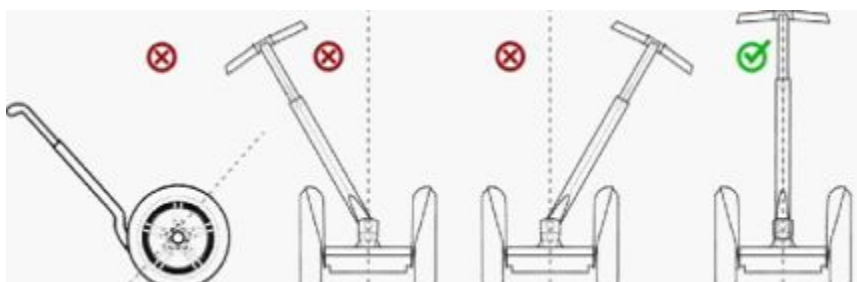
For first contact with Self-balancing vehicle, do not get on the vehicle! Beginners only have to take 2-3 minutes for practice. For safety, please follow below steps.

After Self-balancing vehicle is started, press "tortoise-rabbit switchover key" on the intelligent controller and switch to tortoise mode---a mode for beginners.

4. Notes before getting on the vehicle.

Stand right behind the Self-balancing vehicle, and hold the handle with both hands or one hand. Set right the operating arm (to make it under unstressed state) and adjust position of the handle till the pedal basically

remains level. At this time, all 5 green indicators are illuminated. It means the Self-balancing vehicle is at a correct preparation state. You can get it on. As shown in the figure.



Wrong and correct posts during start-up of Self-balancing vehicle

If the Self-balancing vehicle is at a wrong preparation post, the driver may fail to enter balance mode after getting it on, or the vehicle body may shake suddenly. All these conditions may cause danger and falling. Be sure to avoid getting it on hastily at a wrong post.

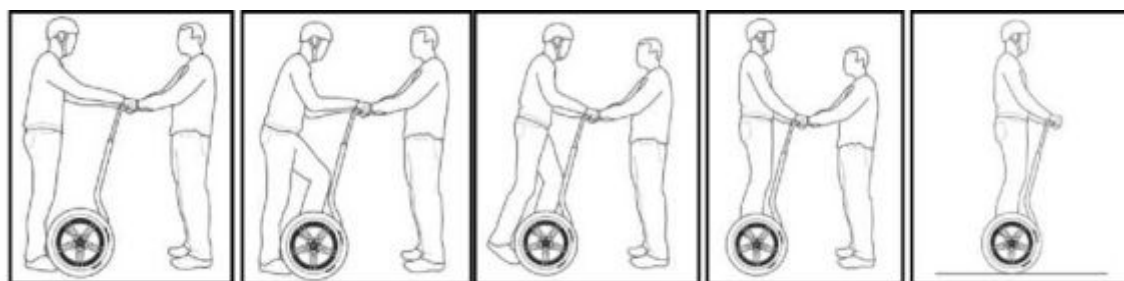
5. Get on the vehicle

5.1 Hold the handle with both hands, and step on the Self-balancing vehicle. Look at the front horizontally rather than downward.

5.2 Step one foot on the pedal first.

5.3 Slowly move the center of gravity of your body to the pedal and lift the other foot.

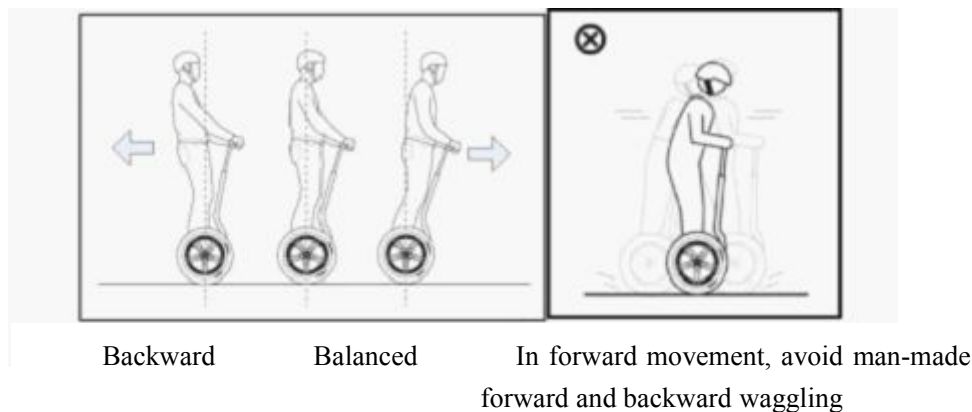
5.4 Now, try to avoid lateral movement of the operating arm, and then lift the other foot slowly from ground and step it on the pedal. Imagine you are standing on ground. Believe in balancing ability of the Self-balancing vehicle. Keep calm and relaxed, and look forward. Sequence of getting on posts is shown in following figure.



Keep relaxed. It is much easier than a bike. Some new drivers may involuntarily waggle front and back when getting on the Self-balancing vehicle. Please keep your body smooth and steady and keep your muscle relaxed. And hold the handle with the help of your coach. Your body will not waggle any more after adaption for a moment.

6. Forward and backward

6.1 Move forward slowly and feel movement of the Self-balancing vehicle, and then return to original state and feel its deceleration and stop. Never drive it too fast. Do repeat practice for several times and try to master methods to control movement of the vehicle with center of gravity of your body.



For beginners, drive the vehicle slowly and lightly and keep body relaxed. Your body will not be easy to shake if relaxed enough. Avoid wagging backward and forward or moving the center of gravity of the body suddenly, so as to prevent sudden slip or falling.

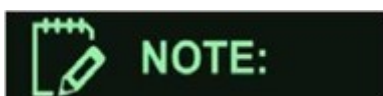
6.2 Look back and lean your body backward slowly, and move the Self-balancing vehicle backward slowly. And then return to original state and feel deceleration and stop of Self-balancing vehicle. Repeat practice for several times. Drive the vehicle carefully. Do not run into a wall or barrier. Reverse driving is not a normal driving mode. It cannot replace forward driving. Do not drive the vehicle backwards unless for several steps. Alternately replace backward movement with turning + forward movement. Too fast backward movement may cause trembling of the Self-balancing vehicle.

7. Braking

Move center of gravity of your body to the opposite direction of vehicle's movement to stop the Self-balancing vehicle. Methods:

7.1 During movement, gently pull back your hip (suppose you are preparing to sit down backwards) to stop the Self-balancing vehicles.

7.2 After the vehicle stops completely, distribute weight of your body equally to the center of pedal for stabilization. At this time, if you continue leaning backwards, the Self-balancing vehicle will move backwards.

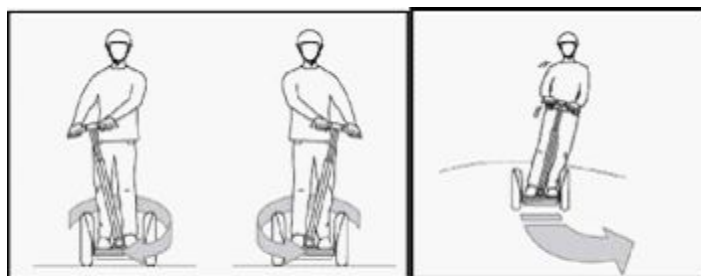


- Try to stop the vehicle gently and gradually. Avoid emergent braking as far as possible.
- Move back weight of your body gently from vehicle's movement direction to make it slowly stop.
- Try to avoid damp road surface. Emergent braking on damp road surface may cause tire slipping and bring about fall or injury of the driver!

8. Turning

The Self-balancing vehicle will turn as directed by the movement direction of the handle. Lean the handle to left or right to make the vehicle turn to corresponding direction.

8.1 Firstly practice turning in situ. Slowly lean the handle to desired direction, and then the Self-balancing vehicle will rotate in situ till to an expected angle. Then the handle will be self aligned. Repeat practice at left and right for several times to master this skill.



Turn right in situ Turn left in situ and turning in movement

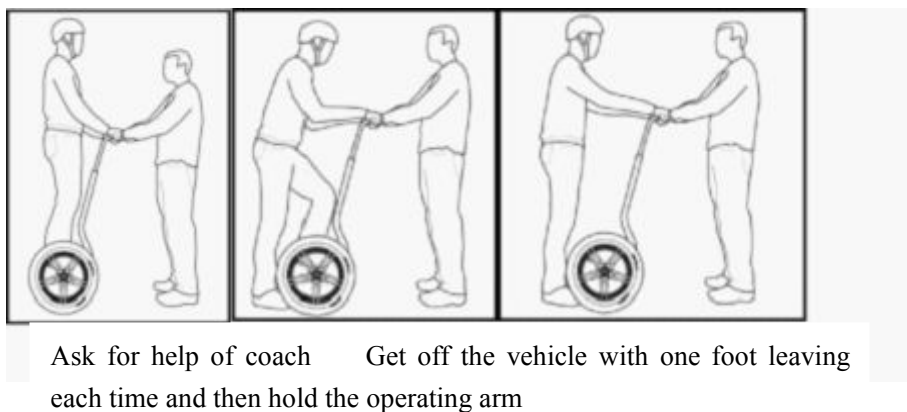
8.2 Turn the vehicle during movement. After you are familiar with forward & backward movement and rotation in situ, try to move forward slowly and meanwhile turn the vehicle. Keep your knees bent slightly and lean to desired turning direction. Turning angle should be consistent with angle of operating arm. Repeat

practice for several times and master the skill.

High-speed turning is very dangerous in situ or movement. That may make your body unbalanced and throw you out of the vehicle, thus make you fall. Therefore, please do decelerate during turning.

9. Get off the vehicle

When you are to get off the Self-balancing vehicle for the first time, ask for help from your coach. Get off the Self-balancing vehicle while he holding the handle. Control the center of gravity of your body. Do not waggle back and forward.



Specific methods:

① Hold the operating arm with both hands. Get off the vehicle with one foot each time. Both feet step down successively. Avoid backward or horizontal movement.

② After getting down the vehicle safely, do not leave your hands from the handle before machine is shut down; otherwise the vehicle will move forward and cause personal injury or death and damage.

③ Be sure to keep relaxed when you get off the vehicle. Avoid turning the handle as you are nervous. Handle turning at this time will cause turning of vehicle body, and make you panic and cause danger.

10. Drag the Self-balancing vehicle.



All descriptions in this chapter are very important. Please carefully read and strictly follow them. Our company will not bear any liability for all property and personal losses that are caused by breach of the *Safe Driving Guide*.

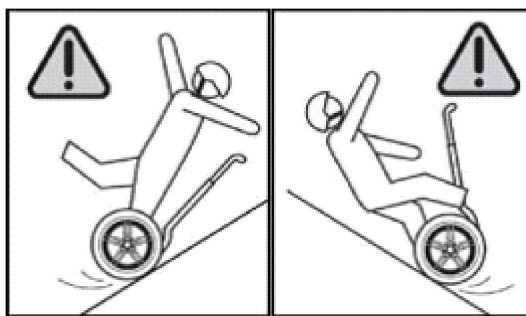
Self-balancing vehicle is a kind of sports and entertainment tool. Therefore it is subject to safety risks that may happen to all sports and entertainment activities. Strict accordance with contents of "Safe Driving Guide" will protect your or others' safety to greatest extent. You will not suffer any serious injury even though a serious unrecoverable fault happens to the vehicle or your body is suffering an emergency situation. However, you have to understand: once you drive the vehicle to a road or public place, you may be confronted with any risk as consequences of the illegal driving/improper operation of other people of communication media even though you are in complete accordance with this guide. Likewise, walking or bicycling may be injured by other communication media. Therefore, it is very important to keep properly vigilant and keep possible safe distance with other people and communication media.

1. Compulsory requirements

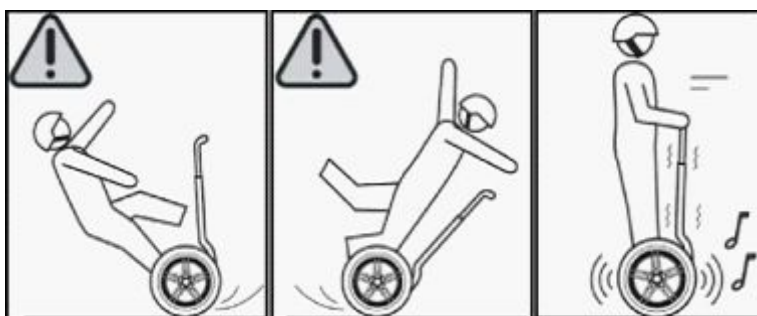
- Know and abide by local regulations. Drive the vehicle in places that are permitted by law.
- Before driving, put on helmet and protective articles for knees, elbows and wrists. This is the most effective protection for you.
- Check charging situation. During start-up, check electric quantity with a remote key. In case of insufficient indication, do not drive the vehicle for a long distance.
- Check basic balance situation of Way self-balancing vehicle. All exposed parts should be free of looseness, falling or damage. There should be no abnormal sound or continuous warning during driving.
- Before driving, ensure you are clear and in good conditions, and you have not drunk or taken sedative agents within 6 hours.

2. Strictly prohibited items

- Do not drive the vehicle in areas which are prohibited by national/local laws and relevant administration departments.
- Do not drive the vehicle in fields which are subject to risks or do not meet product use requirements, such as a dell/crack and an abrupt slope with gradient bigger than 30°.



- Do not drive the vehicle in severe weather like heavy rain and snow and under severe conditions like icy pavement, ponding and slippery soil road surface.



- Do not back the vehicle at high speed or turn it at high-speed reverse.
- Do not raise the Self-balancing vehicle to the sky under any conditions (e.g. crossing a pit at high speed). Do not transversely cross over a step.



- Do not drive into a motorway on road. This vehicle is prohibited to bicycle lane in some countries and regions. Please abide by local regulations.
- Both hands should not leave the operating arm during driving.
- Children under 14 years old should not drive the vehicle by themselves.
- Behaviors that may cause distraction should not be allowed during driving, i.e. making calls and checking electric quantity.
- Two or more persons should not be permitted to stand on the Self-balancing vehicle or drive it.
- Pregnant woman, intemperant, neuropath, cardiopathy people with limited action capability should not drive the vehicle.
- Do not drive the Self-balancing vehicle in unsafe environment, such as places in which inflammable

gas, steam, fluid, dust and fiber may cause a fire or explosion.

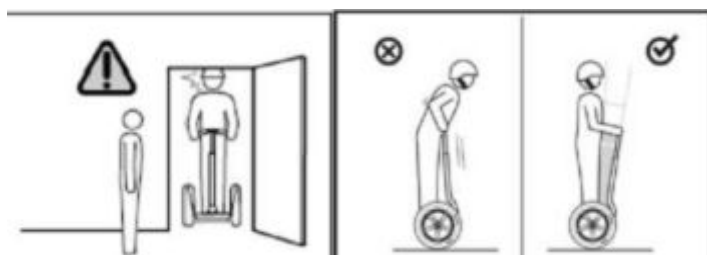
- Do not breach other regulations in this manual, especially contents that are explicitly prohibited in "Warning" and "Attention".

3. Attentions to civilized/safe driving

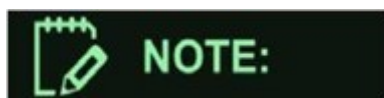
Please actively learn and abide by local traffic laws when driving the Self-balancing vehicle. Please keep proper manners and pay attention to surrounding people and things to avoid any collision. Please drive the vehicle under controllable conditions at a speed that is safe to yourself and others. Be well prepared to stop the vehicle. Respect pedestrians' right of way and avoid scare to them especially children. When passing by a pedestrian from behind, remind him and decrease driving speed. Try to pass by a pedestrian from left. When meeting a pedestrian face by face, keep on his right side and decrease driving speed.

If there are numerous pedestrians, please be sure to decelerate and pass them by at a same speed with them. Do not surpass a pedestrian unless there is enough space for safe passing. Do not pass through pedestrians at high speed. When driving together with other drivers of Self-balancing vehicles, keep proper safe distance and avoid danger and barriers; do not drive side by side unless there is enough space on left for pedestrians.

- Do not park the Self-balancing vehicle in a place that hinders pedestrians' walking.
- Do not drive the vehicle in a place with poor lighting. Please reduce vehicle speed as necessary and keep alert. And use an external driving lamp to ensure sufficient lighting.
- When driving a Self-balancing vehicle, you will be 24-30cm higher than usual. Therefore, please keep alert when passing a door frame or approaching a door, tree branch, all kinds of signs, plates or other lower barriers above your head so as to avoid injury.



- During driving, please keep your body relaxed and remain a post with both knees and elbows slightly bent and head raised.
- Do not drive the vehicle backwards unless several steps must be slowly reversed in case of a barrier.



Driving with body against the operating arm easily causes accidental fall and injury!

4. Actively learn safe protection measures

- Please carefully read this manual and watch safe driving instruction disk, and confirm and understand all of their contents. Do not permit others to use your vehicle unless he has carefully read this manual and watched the safe driving instruction disk.
- Please wear a helmet and fasten its ribbon. At any time when you drive this vehicle, please wear a helmet that has been approved, fits your head form, has a ribbon and is able to protect your afterbrain. Driver can put on protective equipment like gloves, eyeshade, waist support and kneecap according to driving conditions and his own driving experience.
- Do not drive the vehicle when you feel unwell or cannot abide by all instructions or warnings in this manual; also, do not drive it under influence of alcohol or medicine. When the vehicle gives a continuous warning against low electric quantity and limits speed, please get it off immediately and charge it to ensure safety.
- If necessary to carry some articles, please use recommended front storage box, side storage box or backpack. Do not put any other articles on the pedal. Total load capacity of the handle should not exceed 4.5kg; otherwise that may influence the balance ability of the vehicle.

5. Intelligent safety alarm/protection

5.1 The Self-balancing vehicle will limit its speed automatically under following conditions, namely limiting max speed to a safe range.

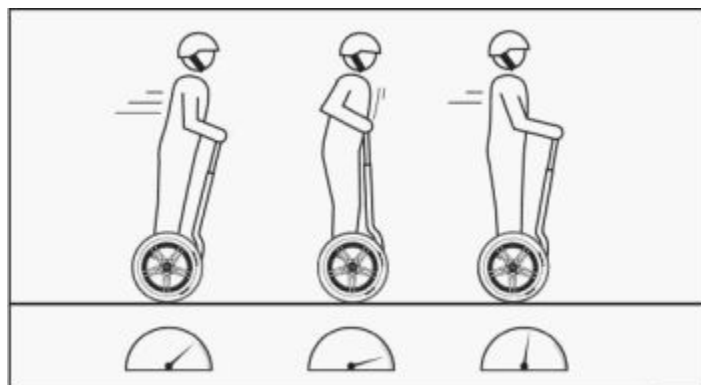
- Speed is too fast.

When you drive the vehicle too fast (over 20km/h at normal mode), the handle will produce a pushback force and push back the driver to ensure that vehicle speed will not be continuously increased. It means that your body leans too much and the vehicle drives too fast. The speed limit mechanism will be activated. At this time, please adjust your body leaning degree and keep space of a fist between body and operating arm.

- Insufficient electric quantity in battery.

When battery voltage decreases to below 30%, the max speed under normal speed will be gradually decreased, namely speed limit will be started when vehicle speed has not reached 20km/h. Typically, if

electric quantity in battery is only about 30%, the maximum speed will be set at 12-15km/h.



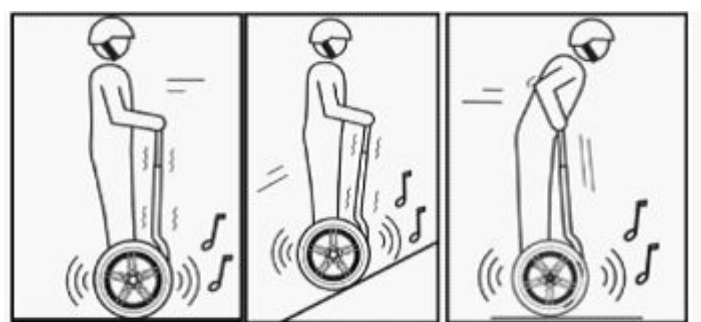
5.2 Intelligent alarm

- Vehicle is overloaded or has parked on a slope for a long time.

The intelligent safety alarm will be activated when load has exceeded a safe value for a certain time (such conditions as driving on an abrupt slope, in a dell, too big driver weight, parking on slope for a long time and conditions that cause continuous overload of the vehicle). Besides, the pedal may lean backwards obviously to indicate that the driver should get off the vehicle. At this time, the driver should get off the vehicle and hold the handle, and move the vehicle at assisted mode. Otherwise, the vehicle will enter a standby mode after 5 seconds. And the driver may possibly fall if still on board.

- Too low electric quantity.

The intelligent safety alarm will be activated when electric quantity of the battery is too low (usually lower than 10%). At this time, get off the vehicle immediately and charge the vehicle in time. In case of continuous driving, the pedal will be raised backwards to force the driver to get off.



Too fast backward movement;
climbing an abrupt slope; or parking
on slope for a long time

Too low electric quantity

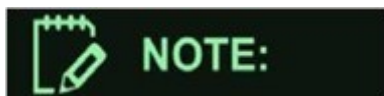
Chapter VII Use and Maintenance of Battery

1. Safety Check and Standard Use of Battery

- The battery should not be used any more in case of damage.
- The battery should not be used when it sends out a special smell or has high temperature.
- The battery should not be used in case it discharges any substance.
- Avoid contact with any articles that leak from the battery.
- Put battery in a place which is not accessible to children and pets.
- Battery contains toxic substances. Do not try opening battery; do not insert any other substance; or do not pry up its case.

2. Technical Parameters of Battery

Charging time	
First time	12 hours
Recharging	About 8 hours
Temperature range	
During use	(-10℃---50℃)
During charging	(-10℃---50℃)
During storage and transportation	(-20℃---50℃)
General conditions	
Battery capacity and voltage	5.8Ah 72V
Specifications	35.7*19*8.2 cm
Weight	10.3 kg



If used beyond specified range, the battery will be damaged and its efficiency will be decreased.

3. Battery charging

3.1 Charging time: depending on following conditions

- To reach maximum effect, the battery should be charged for at least 12 hours for the first time.
- Remaining electric quantity in battery---the less, the longer charging time;
- Battery temperature---it cannot be charged if it is too hot or cold, or charging will take longer time.

Charging will be most effective when battery temperature is at a median of specific range.

3.2 Charging steps

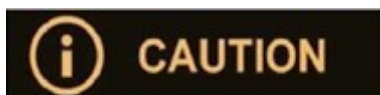
- Place the machine in a clean and dry place with proper temperature.
- Open the charging port. Check for cleanness and dryness of charging port, charger power line and AC outlet.
- Insert an end of charger power line into an AC outlet.
- Insert the other end of charger power line into the charging port.
- Check if indicator on the control console is illuminated in green and beeps.



Never insert the plug if charging port, charger power line and socket are damp.

3.3 Charging: After charging is finished, pull out the power line and then close the port cap according to following steps.

- Pull out charger power line from the socket.
- Pull out charger power line from the charging port.
- Put away the charger and close the port cap.



The port cap should keep closed unless opened at charging. The port is closed to prevent entrance of water or dust , which may cause damage to the machine.

3.4 Charging failure

If indicator is not illuminated when charger power line is inserted, it will mean charging failure. Please check following items:

- If indicator is not illuminated, check if AC is live and if charger power line is closely inserted into the port.
- If indicator is still not illuminated even though AC is live, pull out and re-insert the charger power line.
- If problem still exists, please contact relevant retailer or dealer.

4. Read Electric Quantity Icon

Electric quantity icon on the controller shows true state of electric quantity. More crossbands means much electric quantity. When there are less than 3 crossbands, the vehicle will enter speed limit mode. If electric quantity is too low, you will be informed of access to safe shutdown.

4.1 Surface charge (false full)

If battery is not charged for enough time, surface load will happen (false full). It refers to that actual electric quantity is much less than the displayed value. Driver should check the electric quantity with following methods. After vehicle starts up, first check displayed electric quantity and then drive the vehicle for 3-5 minutes, and lastly check displayed electric quantity. If displayed electric quantity is rapidly exhausted, it will mean that there is only surface load. Please recharge the battery as necessary.

4.2 Recalibrate the display

Items displayed on the controller may become inaccurate due to too long storage time. Please do recalibration according to following methods.

- Charge the battery for full 12 hours.
- When crossband at most bottom starts flickering (only 10% electric quantity is left),
- Put the machine in a safe place. Start the machine till electric quantity is exhausted and power is dormant.

5. Service Life and Replacement of Battery

A battery pack is composed of 20 sets of lithium batteries. Normal service life: 600-1,000 times for accumulative charging to replace battery, please contact local retainer or dealer.

Chapter VIII Standard Operation and Maintenance of Self-balancing vehicle

1. Standard Handling

Move the machine with a proper way. You'd better lift it with another person.

- Ensure that the machine is not under charging state.
- You'd better hold an unmovable part, such as battery holder.

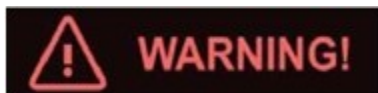


Never lift and hang the vehicle in air when it is under charging state.

2. Tire maintenance

To ensure safe and effective operation, please always check the tires.

- Check wheel & tire: when vehicle is parked, hold the tire and move it to two sides, and check if it shakes. If yes, please tighten wheel nuts.
- Tire pressure check: when vehicle is parked, check if there are foreign matters on left and right tires and if tires have same pressure. If not, please inflate tires at regular retail stores.

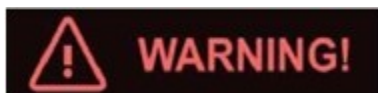


- Too high pressure will reduce road holding and traction and cause slipping and runaway.
- Too low pressure will aggravate tire wear. Different pressure of two tires will cause rotary movement to tire with lower pressure.

3. Keep vehicle clean

Form a good habit to clean the vehicle at regular intervals so as to maintain its optimal performance.

When vehicle is parked, gently wipe the vehicle body with soft cloth stained with soap and clean water and keep it clean.



Never clean vehicle body with alcohol, gasoline, kerosene, acetone or other corrosive chemical solvent, because that may cause surface damage and fault with internal elements and also disqualify warranty.

4. Prevent immersion in water

- Do not immerse battery into water.
- Do not drive in rain for a long time.

- Do not clean the vehicle with a high-pressure pipe. Parts must keep dry.
- Do not let water flow into charging port.

Chapter IX Common Trouble Shooting for Self-balancing vehicle

1. Self-balancing vehicle cannot be started

If the vehicle cannot be started by pressing remote start-up key, please conduct checks as described follows.

- 1.1 Press start-up key and check if there is an image display. If not, please replace battery of remote control.
- 1.2 Ensure that distance between remote control and machine is within 5m.
- 1.3 Make sure that there is electric quantity in battery.
- 1.4 Check if the pedal sinks and fails to pop up.

2. Failure to Enter Balance Mode

- 2.1 Ensure that the vehicle has been started up.
- 2.2 Make sure that operating handle is in the middle position and the battery holder remains level.
- 2.3 Guarantee that there are no heavy articles on the pedal.
- 2.4 Check if balance indicator in the middle is green while the other four are not illuminated.
- 2.5 Knock the pedal with foot gently, but do not step it on. Check if all five indicators flicker in green and if there is a rabbit icon displayed on the remote control.

3. Protective Plate Is Loose

Screw down screws on bag rack with a 5mm hexagon wrench. Check and confirm that the rack is fixed and not loose.

4. Tires Are Loose

Tool: 13mm socket spanner

- 4.1 Ensure that the vehicle is at static and uncharging state.
- 4.2 Lay the tire to be removed upward side and put the other on ground. Then detach tires safely.
- 4.3 Clean dirties on tire equipment.

4.4 Reinstall tires and screw down three nuts on tire.

5. Flat Tires

5.1 Check if tires are damaged. If yes, please contact retailer or dealer for replacement.

5.2 In case of no visible damage, check if valve is tightened.

5.3 Inflate the tire and check for air leakage. If yes, please contact retailer or dealer.

6. Safety Switch is Closed Automatically in Front of a Building

Keep 1.5m away from the machine, close anti-theft system or machine, and then reset the balance mode.

7. Machine Cannot be Shut Down

7.1 Check if pedal sinks and cannot pop up. If yes, please let it pop up carefully.

7.2 Keep pressing the start-up key for two seconds and check if the problem has been solved.

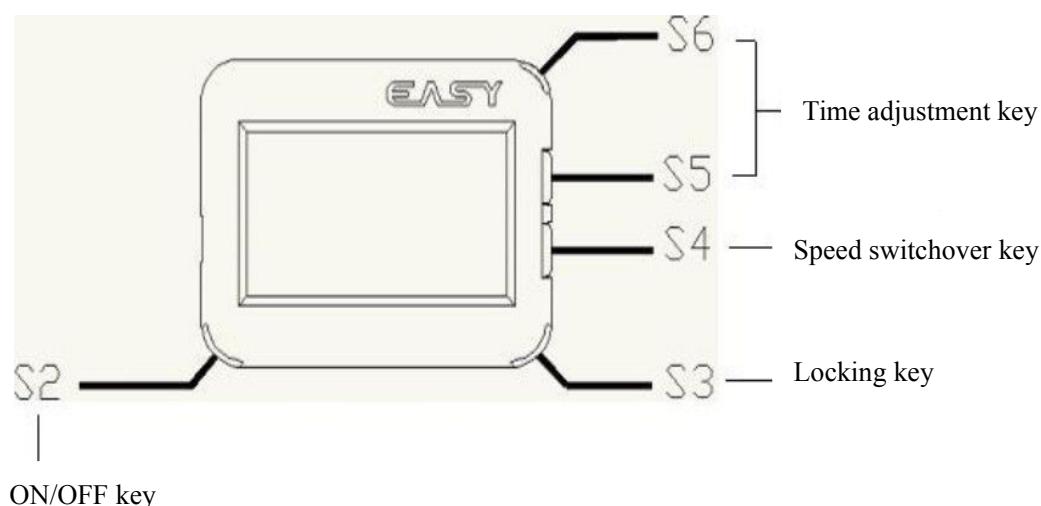
7.3 Check if there is electricity in battery of remote control.

Appendix 1

Instructions for Controller of Self-balancing vehicle

Controller of the product adopts 2.4GHZ wireless communication technique. Receiving and sending signals are controlled by a monolithic wireless transceiver for 2.4-2.5GHZ world universal frequency band ISM. (Below is a an overview drawing of the controller)

1. Rechargeable controller



1.1 Instructions for function keys

- ON/OFF key: keep pressing key S2 (for about 5 seconds).
- Time adjustment: key combination S5 and S6 is designed for time adjustment, key S6 for flickering of hour, minute and system data and key S5 for adjustment. Press key S6, and hour number will start flickering. Press key S5 at the same time for hour adjustment (only "+" adjustment). Press S6 again when hour is flickering, and then hour number will stop flickering while minute number starts flickering. When minute number is flickering, press key S5 for minute adjustment. Press key S6 again, AM and MP (24h) or either of them (12h) will flicker. Press key S5 for switchover of 24h and 12h systems.

Tortoise-rabbit mode switchover

- Speed switchover: S4 for tortoise-rabbit switchover. Press it once, and the current tortoise and rabbit states will be switched over once.
- Locking and unlocking: S3 for locking and unlocking. Press it, and the display screen will show a lock icon which means locking state. Press S3 again, and the icon will disappear and indicate successful unlocking.

1.2 Malfunction description

- When ON/OFF key is kept pressing, if there is no information like speed and electric quantity icon and waveform icon flickers, that will indicate start-up failure. That may be caused by too far distance with a car. Please move it closer and retry.
- Flickering waveform icon indicates communication failure.

2. Battery-type controller



2.1 Instructions for function keys

- ON/OFF: press S5
- Time adjustment: press S2 for adjustment of time and countdown mode; release it and press it again for mode selection. During flickering, press S5 for adjustment. In case of no any operation on S5, setting will quit automatically.
- Switchover of tortoise and rabbit modes: press S4 at normal mode to switch over tortoise and rabbit modes.

- Locking and unlocking: press S3 at normal mode for locking and unlocking. Press it, and the display screen will show a lock icon which means locking state. Press S3 again, and the icon will disappear and indicate successful unlocking.

2.2 Malfunction description

- Flickering or disappearing waveform icon indicates communication failure.
- The remote control will enter standby state 10 minutes after communication fails and speed value becomes 0. Press start-up key as necessary.

3. Description of screen icons



Rabbit icon displayed on screen of remote control (as shown in the figure) indicates that the Self-balancing vehicle is at normal mode.



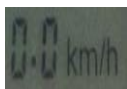
Tortoise icon displayed on screen indicates that the Self-balancing vehicle is at speed limit mode (max 10km/h). It is a proper time for beginner's practice.



Displayed crossbands indicate current electric quantity. There are a total of 8 crossbands. When there are remaining 3 crossbands, the Self-balancing vehicle will enter speed limit mode.



When a lock icon is displayed, it means activation of locking state and the vehicle will start anti-theft system.



Speed display: max 20km/h

Appendix 2

Several Modes and States of Self-balancing vehicle

Self-balancing vehicle is designed with different operating modes. Knowing and understanding all of them will help you better control it.

1. Standby mode

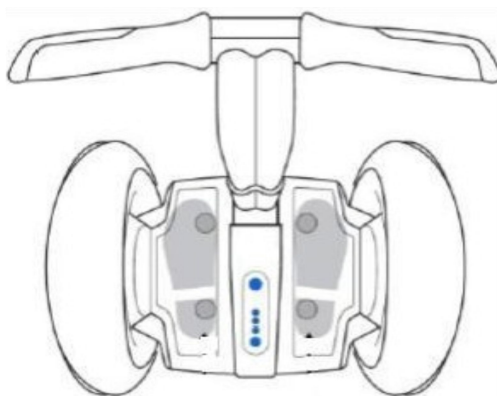
Standby mode refers to a mode under which the Self-balancing vehicle has been started up but has neither any movement nor balance ability. Self-balancing vehicle is at standby mode under following conditions:

- After start-up, it will enter standby mode.
- If it is not driven 5 minutes after start-up, it will automatically enter standby mode.

2. Balance mode

Balance mode refers to an operating mode under which the Self-balancing vehicle is subject to man riding. As long as you stand on the Self-balancing vehicle, it works under balance mode. To facilitate beginners' use and response to different road conditions, balance mode is divided into tortoise mode and rabbit mode.

Self-balancing vehicle uses 4 pedal loading sensors to detect if there is a driver standing on the pedal. The 4 sensors have same functions. The vehicle can enter balance mode as long as any of them detects people is standing on the pedal. As the 4 sensors are distributed at two sides, detection function will not be affected even though the driver raises one foot during driving.



2.1 Tortoise mode---a mode for beginners

Tortoise mode is a kind of balance mode that is especially designed for beginners or drivers unfamiliar with driving skills. Press intelligent remote key "tortoise-rabbit mode switchover". When a tortoise is shown on the screen, it means the vehicle has entered tortoise mode. Under this mode, maximum speed of the vehicle is limited to a lower value. It is suitable for a beginner to master driving skills.

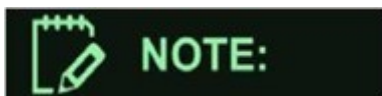
2.2 Rabbit mode---a normal mode

Normal mode is another kind of balance mode. You can adopt this mode to drive the vehicle when you master its driving skills and road conditions are good (e.g. there are no pedestrians on road and road surface is even. Press "tortoise- rabbit mode switchover" key on the intelligent remote control. When a rabbit icon is shown on the screen, it means the vehicle has entered normal mode. At normal mode, the Self-balancing vehicle has fastest speed and highest operation response sensitivity. Press "tortoise-rabbit mode switchover" key on the intelligent remote key to switch over tortoise mode and rabbit mode.

2.3 Locking mode

Locking mode is a protective function that applies to short-time parking of the vehicle when it is at start-up state and prevents people other than driver move the vehicle. To enter locking mode, press "locking" key on intelligent remote key when it is at start-up state. Press "locking" key to release it.

Driver can gradually know features of all modes and flexibly master them during test driving.



To enter balance mode when vehicle is at start-up state, gently step on the pedal for once. If driver has not gotten on the vehicle, never keep pressing the pedal with weights or feet. Otherwise the vehicle will have a wrong judgment that you have gotten on and then enter balance mode. That may possibly make the vehicle out of control and thus cause collision, damage or personal injury.

Appendix 3

Special Instructions for of Self-balancing vehicle

Dear user,

Upon reception of our product, please assemble the Self-balancing vehicle as instructed by Chapter IV of this manual.

Both vehicle and its remote control use new batteries. Please remember to complete first charging (for about 8 hours) before driving.

Special attentions:

Start-up: start the switch of main power source of the vehicle first, and then start that of the controller!

Shutdown: Please shut down the controller (all pedal indicators go out) first and then turn off main power source of the vehicle!

At last, wish you a pleasant riding experience!