



Z1000

User Manual

Statement

- ◆Thanks for your purchase of the Z1000 series vehicle!
 - ◆Z1000 is a electrical drift car capable of keeping balance by itself.
 - ◆Please read the Users' manual carefully, to make known the safety warning and precautions before use.
 - ◆The Users' manual can help you know about Z1000 and its use and maintenance quickly.
 - ◆This manual suits to the Z1000 series balance car.
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WARNING!

- ◆Before you drive the Z1000 car to get on road, please learn how to drive it safety, to avoid collision, falling down or losing control of it, and other risks.
- ◆You may learn the safe driving skills by referring to the "Users' manual" .
- ◆This Users' manual informs the customers all the operational instruction and precautions, so users of Z1000 products must read it carefully and operate according to the manual's requirements. If the user did not do operations according to the prompts or violates the alarming contents, our company will not be responsible for any result thereof.
- ◆If you want to get relevant service and support of the product, please contact local agents.

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1. Document outline

1.1 About this manual

For your safe driving, please read this manual carefully before using the balance car. You shall be ensured to drive the balance car in accordance with correct instructions.

- ◆ You shall be made known all the safety alarming and precautions listed in this manual, which is helpful for you to better drive the balance car.
- ◆ This manual suits to Z1000 series products.
- ◆ If you have any doubt or can not get information you want from this manual, please contact us in time.

1.2 Risks of driving

The balance car is an intelligent mobility scooter and assisting tool of recreation of living with self-balanced system. Its technology and production process have experienced strict examinations, however, if you did not use it according to the safety precautions specified in this manual, it can possibly bring injuries to you.

WARNING!

Whenever or wherever it falls, is out of control, is collided or runs in other accident, including not driving the balance car according to the manual's requirements, it is all possible to injure you or even kill you. To avoid risks bringing injury to you, please be sure to read this manual carefully.

1.3 Preparatory work before driving

Before using it, you shall check the Z1000 battery to make use it is properly charged, for details see section 5 of this manual. If you did not use it according to the precautions specified in the manual, it is possible to bring injury to you.

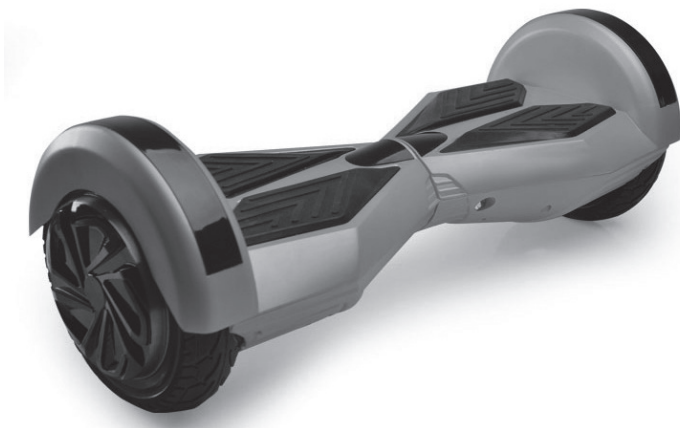
1.4 Relevant instructions for the document

The following instruction prevails for the whole content of "Users' manual", please pay special attentions to relevant "WARNING" and "NOTE".

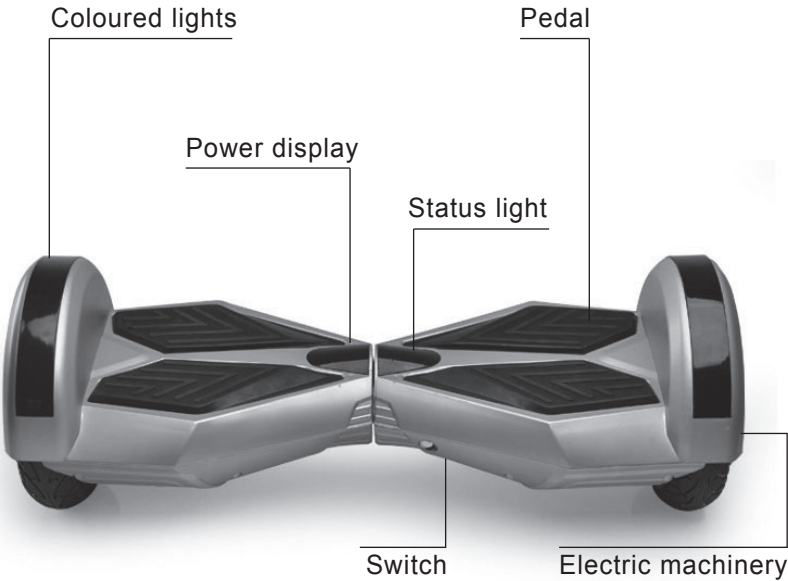
2. Product introduction

2.1 Z1000 series vehicle model description

Z1000 is a high-tech mini electric car with double wheel and self balance which uses the dynamic balance principle to control moving forward, backward, turning and stopping. Z1000 has obvious advantages like lightweight and fashionable appearances, flexible control and low carbon, environmental-friendly feature, so it is the best accompanying object for recreation, scenery touring, short distance scooting and various applications in life.



2.1 Z1000 Component description



2.3 Z1000 working principle

♦Z1000 balance car uses the dynamic balance principle, through the built-in gyroscope and acceleration sensors. It relies on the body gravity center changes to measure the changes of vehicle body posture, and uses the servo control system to drive the motor precisely to do the corresponding adjustment. When a human body stands on the Z1000 balance car, and bends forward, the system can sense it automatically and drive wheels precisely to move forward for keeping balance. When the gravity center bends backward, the wheel will move backward, and in case of turning, it can slow down and control left, right foot to bend to front or back to make the gravity center deflect to left for turning left, and to right for turning right according to the self turning requirements.

♦Z1000 built-in inertia dynamic stabilizing system can keep horizontal in forward and backward directions, but it can not ensure the stability in left and right direction.

So, drivers of Z1000 must slow down for turning, to avoid body injuries due to too large centrifugal forces.

3. Z1000 control and information display devices

3.1 Pedal sensor

Z1000 has four sensors below the pedals. When users step on the Z1000 pedals, Z1000 can adjust automatically to the balance mode.

◆When driving Z1000, you must ensure the pedals are in stamping on condition. No stamping on parts other than the pedals.

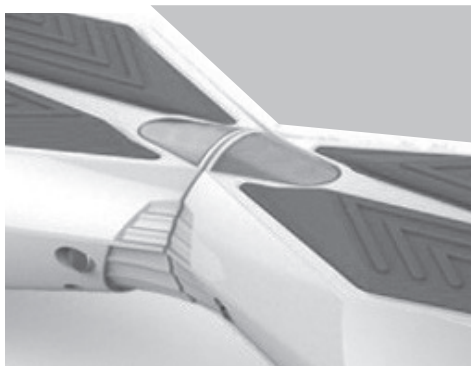
◆Please do not put stuffs you bring on the pedal, or else you can not switch off the Z1000, which will increase chances of collision of Z1000, for avoiding the body injury or damage to the Z1000 itself.

3.2 Display panel

The display panel is located in middle of Z1000, used to display the operational data of Z1000.

◆A is battery level display zone: if the green light is on, it means Z1000 battery level is good. If it turns to yellow one, it means the battery level available is 40%. If the yellow light turns to red one, the available battery level is 10%, which means the user needs to charge it in time.

◆B is operational indicator light: when users press the pedal switch, the operational indicator light will be lit, showing the system is entering the operational condition. If there is something wrong with the operation of system, the operational indicator will turn to red light.



4. Safe use of Z1000

4.1 About the safe use

We hope all drivers can drive Z1000 safely and enjoy pleasures brought by Z1000. The experiences in your learning to ride a bike, drive a car, skiing or other similar transport tools in the past, can be used in our products, letting you better drive the balance car.

◆If you observe the relevant contents of "Users' manual", you will be able to drive Z1000 safely. So, we strongly suggest you read the "Users' manual" carefully before the first time of your driving of Z1000. Each time before driving, please check if tires of Z1000 have damages, and its parts are loose or not. If any strange condition happens, please contact the agents for repair in time.

◆Please read the "Users' manual" carefully, you will get lots of important safety information, including speed limit, indicator light warning, safe switching off and so on.

◆Please do not use Z1000 to do anything endangering human bodies and property safety.

◆Please do not modify any part of Z1000 at will, or else it will affect performance of Z1000 or even damage it, and cause severe damage accordingly meanwhile.

4.2 Loading weight limit of driver

◆Loading weight limit is due to the following two points: 1. To ensure safety of the driver. 2. To reduce Z1000 loss due to overloading.

◆The max. loading weight of drivers is 100kg.

◆The min. loading weight of drivers is 35kg.

WARNING:It may bring you risk of falling down to exceed the loading weight limit.

4.3 The max. driving distance

The max. driving distance of Z1000 is related to many factors, for example,

- ♦Road condition: on smooth and even ground, it will drive for a longer distance, or it will drive for a shorter distance.
- ♦Body weight: the driver's body weight will affect the driving distance.
- ♦Environmental temperature: to store and drive Z1000 at the recommended temperature, will increase the driving distance, or at the extreme temperature it will decrease the driving distance.
- ♦Maintenance: proper battery charge and maintenance will increase its driving distance, or it will be decreased.
- ♦Speed and driving style: to keep driving at medium speed will increase the driving distance, or if it is frequently started, stopped, accelerated, decelerated, the driving distance will be decreased.

4.4 Speed limit

- ♦The max. driving speed of Z1000 is 10km/h.
- ♦If the driving speed is over the max. allowable speed, the Z1000 buzzer will sound alarming.
- ♦At the regulated speed, Z1000 can maintain a good balance for the driver. If the driving speed is over the specific speed, the Z1000 will tilt up to make it able to limit the speed within the safety speed.

5. Learning to drive Z1000

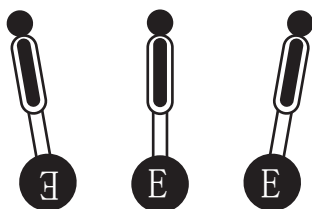
When using Z1000, you should pay attentions to the relevant safety precautions. Therefore, you must get a full understanding of all the precautions mentioned in the "Users' manual" before driving it, which is extremely important for you.

5.1 Operational procedures of Z1000

♦Step 1: to start Z1000, you press down the power-on button (or the power on button on the remote).

♦Step 2: to prepare for driving, you stamp on the pedal with one foot to turn on the pedal switch to let the operational indicator light lit, and the system enter the self-balance condition. After keeping the balance of the car body, you stamp on another foot to start operation.

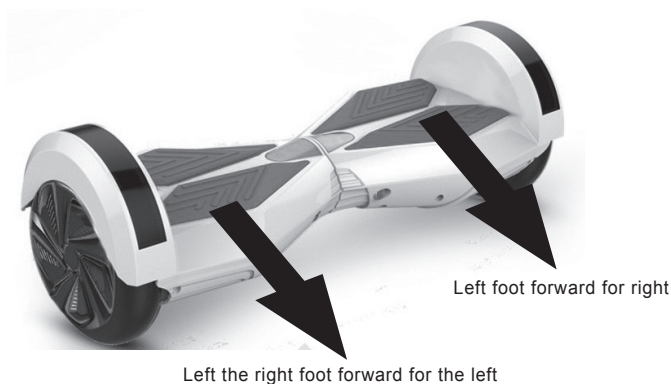
♦Step 3: after successfully operating the Z1000 and standingup, if you keep the gravity center balanced, the Z1000 will also keep still. You then can control the Z1000 moving forward or backward by bending your body forward or backward in a small degree, but you must remember not to bend your body too much.



NOTE: If the Z1000 platform is not in horizontal condition when turning on the pedal switch, the buzzer will alarm and the alarming light will be lit, the system can not enter the self-balance condition, at this occasion, any operation is prohibited.

◆Step 4: to operate Z1000 in the left and right direction.

◆Step 5: to get down the car. Before getting down, you need to let the Z1000 stop moving. By keeping in a balance condition, you let one of your feet step down first, and another foot leave the pedal quickly.



Sketch map for driving Z1000 (generally for Z1000 balance car).

WARNING:Sharp turning is forbidden when driving at high speed, to avoid danger.

No transverse driving or turning can be done on slope, as this will cause shifting of Z1000 balancing angle, affecting safe driving.

5.2 Protection function of Z1000

During driving, if the system error or illegal operation happens, the Z1000 will remind the driver in different ways.

For forbidding riding, the alarming light will be lit always, and the buzzer will give alarming at intervals, the system can not enter the self-balance mode.

◆When getting on the car, the platform tilts forward or backward at angles over 10 degrees.

◆The battery voltage is too low.

◆It is in charging process.

◆During driving, the platform tilts up, no operation is allowed.

◆Over-speeding of the vehicle body.

◆Shortage of battery level

◆The vehicle body rocks back and forth exceeding 30S.

◆The system enters the protection mode, with the alarming light lit constantly, the buzzer gives alarming at high frequency during driving.

◆The platform tilts forward or backward at angles over 35 degree, causing it entering the stop condition.

◆The tire is blocked and stops running, it enters the stop condition after 2S.

◆The battery voltage is lower than the protection level, it enters the stop condition after 15S.

◆Due to the constant large current discharge (for example, to climb a long and steep slope for a long time), it enters the stop condition after 15S.

WARNING: When Z1000 enters the stop condition, the system will lock the machine automatically. To unlock it, you need to press the lock button. When the battery is depleted or the system produces safe stop information, please do not continue to drive Z1000, or else, the car can not reach the balance condition due to the low battery level, which can possibly cause damages to the driver. If the battery level reaches the min. limit, continuous driving of Z1000 will affect the battery life.

5.3 Practice of Z1000 driving

Before you drive Z1000 outdoors, you shall ensure that you can drive Z1000 skillfully for consideration of your safety.

- ◆Please wear comfortable leisure and sports clothes as possibly, and wear flat shoes, letting your body keep to be flexible.
- ◆Please practice driving of Z1000 in spacious site, until you can manage getting on it, driving it forward and backward, turning, stopping and getting off skillfully.
- ◆You should mind if the ground is flat or not.
- ◆You may learn to drive it in different landforms, and you must remember to slow down when encountering unfamiliar landform. Anytime you shall not let the Z1000 leave the ground surface.
- ◆The Z1000 is designed as a recreational tool for flat pavement. If users drive it on uneven pavement, he or she shall slow it down.
- ◆If you can not drive Z1000 skillfully, please avoid driving it at dangerous places with walking persons or obstacles. When passing through doorways, you shall mind your head and ensure you can pass it safely.

6. Instructions for safe driving

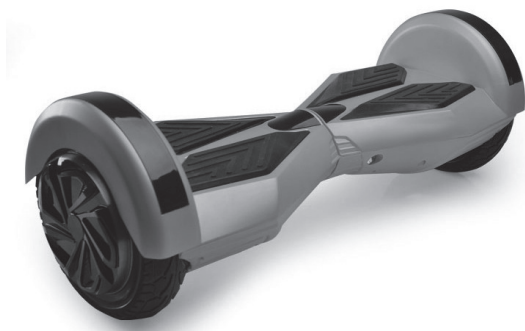
This section focuses on some safety knowledge and warning declaration, letting you have some understanding of the safety precautions before you use Z1000. In order to ensure you can drive Z1000 safely, you must read the "Users' manual" fully and observe the relevant safety instructions. Please mind all the safety warnings and precautions for use as mentioned in the "Users' manual" . To make known these safety precautions can improve the safety and pleasure of your driving of Z1000.

WARNING!

- ◆Whatever condition it is, it is possible to cause injuries due to losing control, collision and falling down when you use Z1000. To avoid the injuries, you have to read and refer the instructions of the "Users' manual" carefully for driving Z1000. Please ensure the product is in good condition for use, and use the product only after carefully reading and getting familiar with all the product materials provided by the company.
- ◆When you learn to drive Z1000, please ensure to implement safety measures, like wearing helmet, knee pad, elbow pad and others.
- ◆The Z1000 is only suitable to personal recreation, forbidden for use as public transport.
- ◆It is strictly forbidden to use this product in motor lanes.
- ◆No driving is allowed for kids, aged persons and pregnant women.
- ◆No driving after drinking wine or taking drugs.
- ◆No driving for transporting goods.
- ◆When driving Z1000, please observe local traffic laws and give way to pedestrians.
- ◆Please be aware of the front and remote object, keep good view sights to help you drive Z1000 safely.

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- ◆During driving, your both legs keep relaxed, with knees bent slightly, so that you can keep balanced when riding on uneven ground.
 - ◆During driving, your feet shall be kept on the pedal all the time.
 - ◆Please wear clothes suitable for sports when you use Z1000, which benefits for you to better handle emergency conditions.
 - ◆Z1000 can be used by only one person, it is not allowed to carry two persons or more.
 - ◆The total weight of the user and the object carried, shall not exceed the max. load specified in the users manual of Z1000. or it is easier to make the users fall down or injured during driving, even damage the function of Z1000. Besides, the drivers' weight shall not be less than the min. weight specified in the users manual, or it is possible that the driver can not operate Z1000 properly, and especially for down slopes the driver can not slow down or stop it safely.
 - ◆You shall be sure to let the vehicle speed be within the limit not threatening safety of others and yourself, and prepare to stop Z1000 at anytime.
 - ◆When you run into a traffic accident with Z1000, please stay where you are to wait for relevant persons to come to handle it properly and legally.
 - ◆When you drive Z1000 and there is another person driving Z1000 to go with you, please keep a certain space from each other to avoid collision.
 - ◆Please remember all the time, when you drive Z1000, your body height is increased by about 10cm, so mind your head safety when passing gates.
 - ◆When turning, please mind your body gravity center's balance, to avoid falling down due to gravity center shift or too high speed.
 - ◆When driving Z1000, do not divert your attention, such as answering phone, listening to music or doing other things.

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- ◆It is not allowed to drive Z1000 on wet and sliding road in rainy days, backward for long distance or at high speed, or to turn during fast backward driving, or at too high speeds.
 - ◆This personal transport tool is not designed to be a medical care equipment, neither is it tested or proofed so. Therefore, the user must use Z1000 without help of others.
 - ◆No using of Z1000 in dark or improperly lit places.
 - ◆It shall be avoided driving on ground with obstacles or slippery, such as, snow, icy or wet and slippery ground.
 - ◆Please avoid driving on pavements with scattered things like twigs, trashes or little stone.
 - ◆Avoid driving in places narrow or with obstacles.
 - ◆Please use Z1000 in environments conforming to its using condition. If there are environments demanding permission of use from others, please get the permission first.
 - ◆No starting to go or stopping suddenly.
 - ◆Avoid driving on steep slopes.
 - ◆No driving Z1000 in unsafe environments, which refers to places prone to fire disasters or explosion or other dangerous incidents due to inflammable gas, vapor, liquid, dust or fiber and so on.



7. Battery use instructions

It includes description of Z1000 charging method, how to maintain the battery, and safety precautions, together with the battery specifications. In order to protect your and others' safety and maximize the battery life and promote its performance, please operate the battery according to the followings.

7.1 Low battery level

When you see the battery level indicator light is red and blinks, which means the battery level is low, we suggest you to stop driving. When the battery level is low, Z1000 has no enough energy to keep you driving normally, and the system will tilt up the base platform automatically, prohibiting users continuing to use. If you insist on driving Z1000, it is very easy to result in your falling down and injury, and it will also affect the battery service life meanwhile.

- ◆Please do not use the battery, if the following condition happens.
- ◆1. Some strange smell is released or the temperature is too high.
- ◆2. Any substance is leaked out.
- ◆Only professional person can remove, and repair the battery.
- ◆Do not touch any substance leaked from the battery.
- ◆Kids and animals are not allowed to touch the battery. Before installing the battery or driving, the charger must be plugged out. It is dangerous to do anything related to Z1000 when it is being charged.
- ◆The battery contains dangerous matters, no opening of the battery by yourself, and do not insert anything into the battery.
- ◆Only the charging device provided by us can be used for charging Z1000.
- ◆No charging to Li-ion battery that has been over-discharged. As the overdischarged battery has safety risks, it has to be disposed of as wastes.
- ◆Z1000 battery can only be used with the permission of the local laws.

7.2 Charging procedures

- ◆To ensure the charging port is dry.
- ◆To open the charging cover at rear of Z1000.
- ◆To connect one end of the charging device to the mains supply(100-240V ~50 /60 Hz) first, make sure the green light on the charger is lit normally, then plug the other end to Z1000.
- ◆When the red indicator light on the charger is lit, it means the charging is normal. Or please check if the circuit is connected properly.
- ◆When the indicator light on the charger turns from red to green, showing the battery is fully charged, you should stop charging, as long term charging may affect the battery life.



- ◆Please use all the local standard power extensions.
- ◆Please charge and store the battery as per the regulations, or the batter will be damaged and its life shortened.
- ◆The charging time of Z1000 is about 2 to 3 hours, extra long charging will affect the battery life.
- ◆The charging environment shall be kept clean and dry.
- ◆If the charging port is wet, no charging is allowed.

7. Battery use instructions

7.3 Conditions when temperature is too high or too low

◆If you want to maximize the operating proficiency of Z1000, the battery temperature shall be kept within the scope specified in the battery specifications.

The temperature before charging and during charging, must be within the recommended scope. When it is close to the recommended value, the charging proficiency is the highest. If it is too cold or hot, the charging time will be prolonged or it can not be fully charged.

7.4 Detailed parameters of battery

Item	Parameter
Battery type	Li-ion battery
Charging time	2-3 hours
Voltage	36V
Initial capacity	2-4Ah
Working temperature	-15 °C ~ 50 °C
Charging temperature	0 °C ~ 40 °C
Storage time (-20 °C ~ 25 °C)	12months
Relative temperature for storage	5%-95%

7.5 Precautions for battery transport

WARNING:Li-ion battery is considered as dangerous object, so its transport shall be permitted by the local laws.

NOTE: If you need to use airplanes to transport Z1000 with Li-ion battery, or use any other transport means to transport the Li-ion battery of Z1000 solely, please contact us.

8. Routine maintenance

Users need to make routine maintenance for Z1000. This chapter mainly describes relevant steps and important operational reminders for maintaining Z1000.

Before doing the following operations, ensure the power and charging line of Z1000 are disconnected. If the power is on or the battery is in charging, no operation is allowed.

8.1 Precautions before cleaning

- ◆To ensure the power and charging line of Z1000 are disconnected.
- ◆To use soft cloth to wipe the external case for cleaning Z1000.

WARNING!

- ◆The dust proof and water proof grade designed for Z1000 is IP54, limiting to proofing fine dust and splashed water. No high pressure water gun can be used for cleaning it, and submerging it into liquid is not allowed either, in order to avoid water or other liquid seeping inside to damage the internal electronic equipments permanently.

8.2 Storage

- ◆Before storage, charge Z1000 fully, preventing the battery being overdischarged due to long term storage.
- ◆If you store Z1000 for over a month, please take off the battery for storage, and ensure to make a complete discharge once at least for every three months.
- ◆If the storage environment temperature is below 0°C, please do not charge Z1000, you shall put it in a warm environment (above 10°C) for charging.
- ◆You may cover Z1000, to prevent dust depositing on Z1000 to affect its performance.
- ◆Please store Z1000 in dry indoor places with proper temperature.

WARNING!

- ◆To protect safety of the users, they shall not disassemble Z1000 by themselves, or it means the users give up their rights automatically for its repair.

9.Parameter

Detailed parameter		
Item	Parameter	Remark
Net weight	10 Kg	
Min. load	20 Kg	
Max. load	100 Kg	
Max. hourly speed	10 Km/h	
Max. distance per charge	15-20 Km	Varies depending on different landform, driving direction and loading weight.
Max. permission gradient	10 degree	Varies depending on different landform weight
Tum radium	0	
Power	Chargeable Li-ion battery	
Charging power	100-240V ~ 50/60Hz	Suitable for China
Length, width and height	600+230+210 mm	
Chassis height above ground	30 mm	
Pedal height above ground	110 mm	
Tire type	Inflation-&ee hollow tire	
Battery	36V 4.4AH	

10.Packing list

Detailed parameter		
No.	Item	Quantity
1	Host machine	1 set
2	Charger	1
3	Remote (optional)	1
4	The manual	1
5	Warranty card	1
6	Reminder of prohibitions for safe driving	1

When opening the package, if you find any damage or anything missing, please contact us, we will change or amend it as soon as possible.

11. Troubleshooting

The self check items of Z1000 are: sensor, static current of system, dynamiccurrent of system, motor running speed, waving and so on. When S2-15 defaults or defaults during the self check, and you can not solve it, please contact our service network stations for repair.

Have a pleasant use.

If there is problem happening when you use Z1000, please refer to the "Users' manual" . If you can not solve it after referring to the manual, please contact us.

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

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.

FCC Radiation Exposure Statement:

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment.

This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

Note: 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.