

Quick Start Guide

Uncooled Infrared Thermal Imager



- USER MANUAL -



Under no circumstances (power on/power off) do not look directly at high intensity radiation sources such as the sun



Do not touch the surface of the lens



Do not disassemble the battery cell



Do not touch the Type-C interface with wet hands



Do not bend or damage the connecting cables

Package Contents

Package Dimensions		Total Packaged Weight	
215×205×95mm		≤ 1300g	
			
Main Unit (X1)	User Manual (X1)	18650 Li-ion Batteries (x2)	Charger (X1)
			
Quick-Release Clamp (X1)	30MOA Tilt Clamp (X1)	Regular Clamp (X1)	Wrench (X1 Kit)
			
Lens Cleaning Cloth (X1)	Handheld Grip (X1)	Handheld Grip Rail (X1)	

CATALOGUE

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Thank you for choosing us! To ensure you have the best user experience, we recommend reading this user manual carefully before use. If you have any questions, please feel free to contact us.

1 Product Overview

The DOT thermal imager is equipped with a 640×512/12um high-resolution detector, paired with 35mm/50mm infrared lenses, a 1200m laser rangefinder module, and a 2.4-inch high-resolution AMOLED display. It features touch operation and is suitable for both search and aiming. It is applicable in various scenarios such as night observation, hunting, and surveillance. It can provide clear thermal images, assisting users in observing and precisely aiming in low-light conditions.

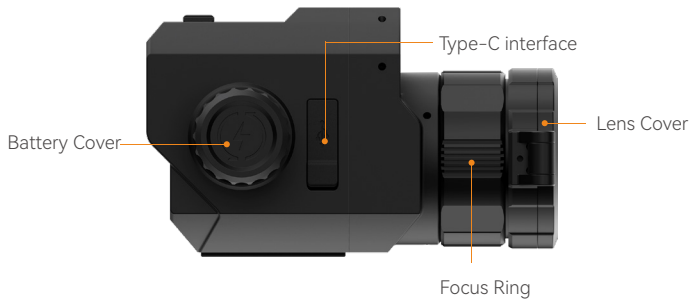
2 Functional Features

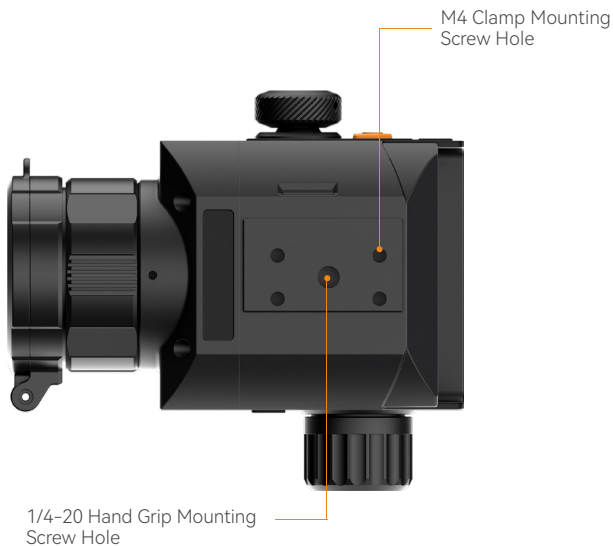
1. Quick Menu: Reticle, Ballistic Calculation, Picture-in-Picture, Image Brightness Adjustment, Image Contrast Adjustment; (User Customization Supported)
2. Laser Pointer;
3. Pseudo-color Mode: White Hot, Black Hot, Red Hot, Iron Red, Bird Watching;
4. Scene Mode: General, High Contrast, Low Contrast;
5. Image Brightness Adjustment;
6. Image Contrast Adjustment;
7. Picture-in-Picture;

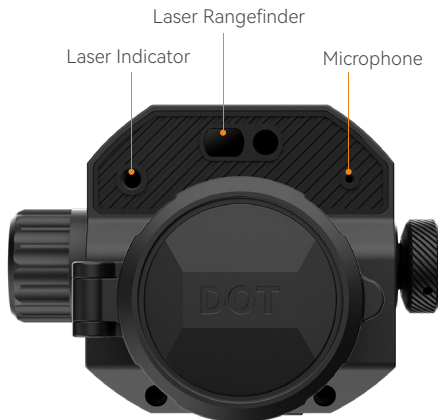
8. Hotspot Tracking;
9. Image Calibration:
10. Bad Pixel Calibration;
11. Display Brightness Adjustment;
12. Language Settings;
13. WiFi;
14. Auto Shutdown;
15. Time/Date Settings;
16. Local File Management, Photo/Video Viewing and Deletion;
17. IMU Calibration;
18. Zeroing and Reticle Settings, Supports Image Freeze;
19. Ballistic Calculation Function;
20. Device Authorization;
21. Factory Reset and Formatting;
22. Device Information Viewing;
23. Firmware Upgrade;
24. Standby Screen Off;
25. Battery Polarity Free Support;
26. Touchscreen Support.

3 Product Appearance









3.1 External Interfaces

- a) Mechanical Interface: Picatinny Rail;
- b) Video Interface: Type-C/WiFi;
- c) Communication Interface: Type-C/WiFi;

4 Touchscreen Operation Instructions

Current Status	Operation	Description
Main Screen	Short Press	Enter Quick Menu
	Long Press	Enter System Menu
	Two-finger Spread	Zoom In (Electronic Magnification)
	Two-finger Pinch	Zoom Out (Electronic Magnification)
	Swipe Left/Right	Switch Pseudo-color Mode
	Swipe Up	Switch Reticle Style
	Swipe Down	Switch Reticle Color
Menu Screen	Short Press	Tap Icon to Confirm/Modify Parameter Value
	Swipe Left/Right	Main Menu: Switch Menu Options Sub-Menu: /
	Swipe Up/Down	Main Menu: Return to Main Screen Sub-Menu: Scroll up and down

5 Button Definition

Button Name	Short Press	Long Press	Rotate
Multi-function Knob	Enter Quick Menu/ Confirm	Main Screen: Enter System MenuIn Menu: Exit Menu/ Return to Previous Level	Digital Zoom
Ranging Button	Ballistic Calculation/ Single Ranging	Continuous Ranging (On/ Off)	/
Pseudo-color Button	Pseudo-color Toggle	Laser Pointer (On/Off)	/
Power On/Off Button	Main Screen: Calibration In Menu: Return to the previous level/ Exit Menu	Press >3s: Power On/Off Press <3s: Enter Standby Mode	/
Photo-taking Button	Take Photo	Record Video (Start/Stop)	/
Note: Long press the power button for 10s to force shut down the device.			

In standby screen-off state, pressing any button or knob can wake up the screen.

6 Product Parameter

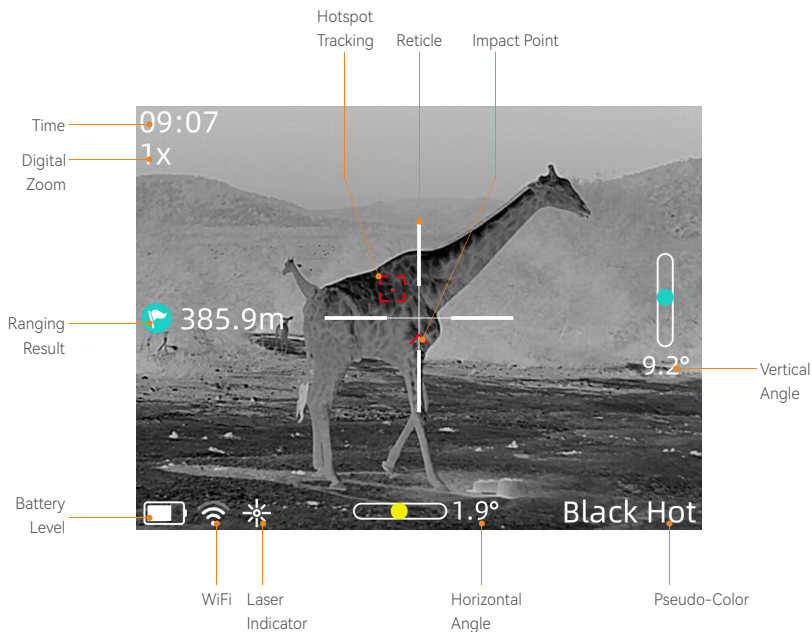
Specifications		
Type	DOT-635	DOT-650
Detector Parameters		
Detector	Uncooled Vanadium Oxide Microbolometer	
Resolution	640×512/12μm	
Frame	50Hz	
Optical Parameters		
NETD	≤ 25mK@300K	
Focusing Method	Manual	
Digital Zoom	1x/2x/4x	
Objective Lens	25mm	35mm
FOV	17.38° ×13.92°	12.29° ×9.84°
Detection Range (Target: 1.7m × 0.5m, P(n)=99%)	1180m	1650m
Display		
Type	AMOLED	
Resolution	2.4 inches 600×450	

Functions	
Laser Rangefinder	5~1200m/905nm
IRS	Support (Red Light)
Hot Spot Tracking	Support
Picture-in-Picture (PiP)	Support
Photo/Video Playback	Support
Gyroscope	Support
Ballistic Calculation	Precise/Simplified Calculation, BDC Reticle
Zeroing Method	Manual Zeroing
Scene Modes	General, High Contrast, Low Contrast
Pseudocolor	White Hot, Black Hot, Iron Red, Red Hot, Bird Watching
Calibration Methods	Auto/Manual Shutter Calibration
WiFi	2.4GHz, 802.11b/g
System	
Language Settings	Simplified Chinese / English
Storage Capacity	64GB
Image/Video Format	JPG/MP4
Real-Time Video Output	UVC Digital Video
Power	
Battery	One Removable Battery 18650
Operating Time (@22° C)	≥ 5h

Power Interface	Type-C 5V	
Communication Interface	Type-C	
Physical Parameters		
Mounting Interface	Picatinny Rail	
Humidity	10%~95%(Non-condensing)	
Protection Rating	IP67	
Operating Temperature	-20°C ~+60°C	
Storage Temperature	-30°C ~+70°C	
Weight (Excluding Battery)	≤ 330g	≤ 350g
Dimensions	93×64×105mm	93×64×111mm

Note: Due to continuous product improvements and upgrades, parameters in the table may be subject to modifications without further notification.

7 Main Interface

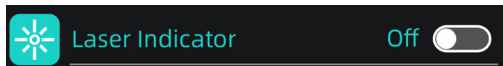


8 Menu Introduction

Long press the knob to enter the system menu. Rotate the knob to move the cursor to function item. Press the knob shortly to turn on/off or enter the function.

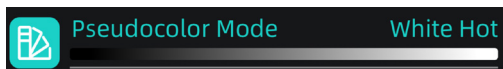
8.1 Laser Pointer

Short press the knob to turn the laser pointer on/off.



8.2 Pseudo-color

Short press the knob to switch pseudo-color modes (White Hot/Black Hot/Red Hot/Iron Red/Bird Watching).



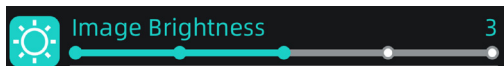
8.3 Scene Mode

Short press the knob to switch scene modes (General/High Contrast/Low Contrast).



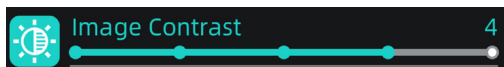
8.4 Image Brightness

Short press the knob to adjust the brightness of the displayed infrared image (1-5 levels).



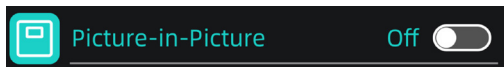
8.5 Image Contrast

Short press the knob to adjust the contrast of the displayed infrared image.



8.6 Picture-in-Picture

Short press the knob to turn the Picture-in-Picture function on/off.



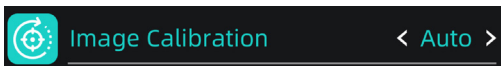
8.7 Hotspot Tracking

Short press the knob to turn the hotspot tracking function on/off.



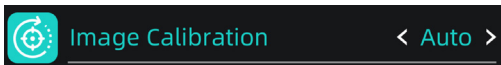
8.8 Image Calibration

Short press the knob to switch the image calibration method (Automatic/Manual/Scene).



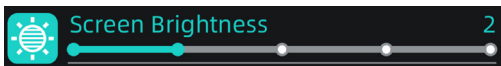
8.9 Bad Pixel Calibration

Short press the knob to enter the bad pixel calibration interface, Before performing bad pixel calibration, please cover the objective lens or aim at a uniform reference surface. In the bad pixel calibration interface: Rotate the knob to adjust the cursor. Short press the knob to switch between adjusting the X coordinate and the Y coordinate. When the cursor moves to the bad pixel, press the photo button to perform calibration. Long press the knob to exit.



8.10 Display Brightness

Short press the knob to adjust the display brightness (1-5 levels).



8.11 Language

Short press the knob to switch the current display language (Simplified Chinese/English).



8.12 WiFi Hotspot

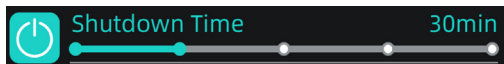
Short press the knob to turn the WiFi hotspot on/off.

(WiFi Name: DOT-xxxx, Password: 12345678)



8.13 Shutdown Time

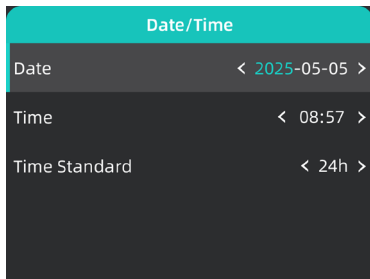
Short press the knob to select the auto shutdown time when the device is inactive (Never/30 minutes/60 minutes/90 minutes/120 minutes).



8.14 Time/Date

Short press the knob to enter the date and time settings interface. Long press the knob or short press the power button to return to the previous level.

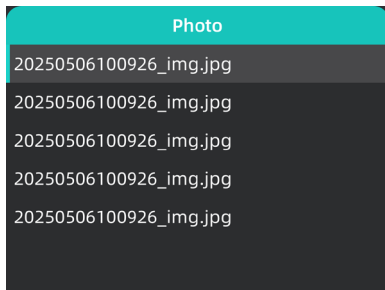
Rotate the knob to change the cursor position. Short press the knob to enter the function item where the cursor is located. The blue font lights up to indicate that the editing state has been entered. In the editing state: Rotate the knob to adjust the value. Short press the knob to switch sub-items. Long press the knob to exit the editing state.



8.15 Photo

Short press the knob to enter the photo preview interface. Long press the knob or short press the power button to return to the previous level.

Short press the knob to preview the photos stored in the device. Rotate the knob to change the cursor position. Short press the knob to preview the currently selected photo. In the photo preview display interface, rotate the knob to switch to the previous or next photo. Short press the photo-taking button to delete the current photo.

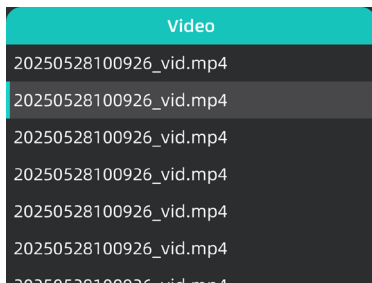


8.16 Video

Short press the knob to enter the video preview interface. Long press the knob or short press the power button to return to the previous level.

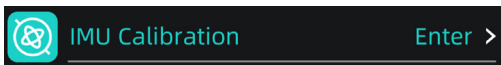
Short press the knob to preview the videos stored in the device. Rotate the knob to change the cursor position. Short press the knob to preview the currently selected video. In the video

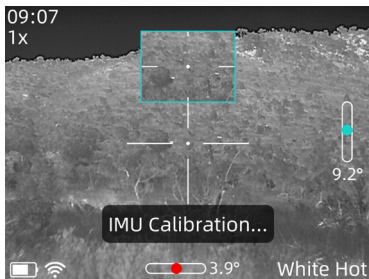
preview display interface, short press the knob to play/pause the video. Rotate the knob to switch to the previous or next video. Short press the photo-taking button to delete the current video.



8.17 IMU Calibration

Short press the knob to perform IMU calibration (Note: The device must be placed flat on a level surface).



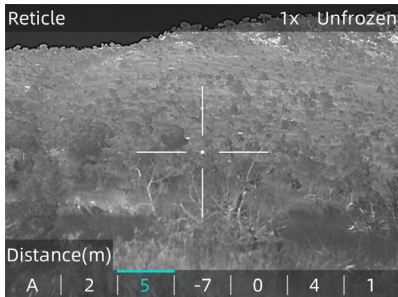


8.18 Reticle

Short press the knob to enter the reticle configuration interface. Long press the knob or short press the power button to return to the previous level.

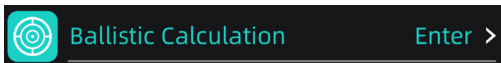
You can configure labels, patterns, distances, horizontal offset (X coordinate), vertical offset (Y coordinate), color, and line thickness. Rotate the knob to change the cursor position. Short press the knob to enter the function item where the cursor is located. The blue font lights up to indicate that the editing state has been entered. In the editing state: Rotate the knob to adjust the value. Short press the knob to exit the editing state. Short press the photo-taking button to zoom the image. Long press the photo-taking button to freeze the image.

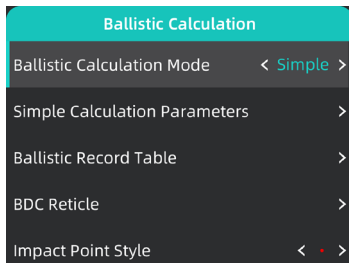
Note: Each set of labels has independent parameters.



8.19 Ballistic Calculation

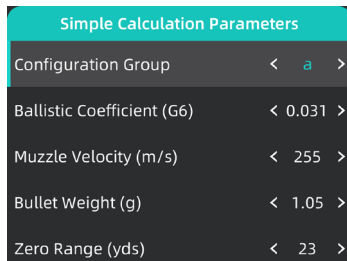
Short press the knob to enter the ballistic calculation interface. Rotate the knob to change the cursor position. Short press the knob to enter the function item where the cursor is located. Long press the knob or short press the power button to return to the previous level.





- Ballistic Calculation Methods: Precise/Simplified/Ballistic Record/BDC Mode (Precise calculation requires setting relevant parameters in the mobile APP)
- Simplified Calculation Parameters: Set parameters for simplified calculation (Configuration Group, Ballistic Coefficient, Muzzle Velocity, Bullet Weight, Zeroing Distance, Baseline Height, Temperature, Altitude, Unit Settings).

Note: Each configuration group has independent parameters. Rotate the knob to change the cursor position. Short press the knob to bring up the input box, enter the number, and select $\sqrt{}$ to save.



- Precise Calculation: Customize and input various ballistic parameters via the APP, and synchronize the bullet drop point to the device.
- Ballistic Record Table: Customize and input various ballistic parameters (distance, bullet drop point, etc.). Short press the photo-taking button to add a record. Long press the photo-taking button to delete the current item. Rotate the knob to change the cursor status. Short press the knob to enter the function item where the cursor is located. The blue font lights up to indicate that the editing state has been entered. In the editing state: Rotate the knob to change the sub-item. Short press the knob to bring up the input box, enter the number, and select $\checkmark$ to save.

Ballistic Record Table

Distance(Yard)	CM	MOA	MRAD
54.68	8.78	6.00	1.75
65.62	12.52	7.02	2.87
65.62	18.33	9.00	2.62

- BDC Reticle: Mark one or more bullet drop points on the reticle to assist with ballistic calculations.

Supports 7 groups of BDC reticle data (A~G), with each BDC group being independent. You can set the peephole auxiliary line, pattern style, and the screen clearing mode switch during ballistic calculation. The BDC reticle settings can customize the current group's bullet drop point label, display, pattern, distance, horizontal offset, vertical offset, color, and line thickness. Each BDC group can set up to 7 label bullet drop point reticles (A~G) to be displayed simultaneously, with at least 1 A-point label bullet drop point reticle set. Rotate the knob to change the cursor position. Short press the knob to enter the function item. Highlighting indicates entering the editing state. In the editing state: Rotate the knob to adjust the value. Short press the knob to exit the editing state. Short press the photo-taking button to zoom. Long press the photo-taking button to freeze the image.

8.20 Authorization Information

Short press the knob to enter the authorization interface, where you can view the device authorization list information. Rotate the knob to change the cursor position. Short press the knob to bring up the delete authorization dialog box. Long press the knob or short press the power button to return to the previous level.

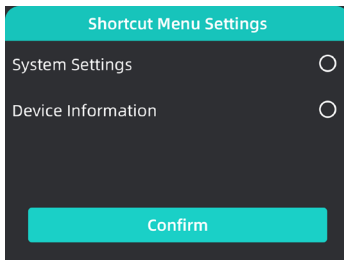
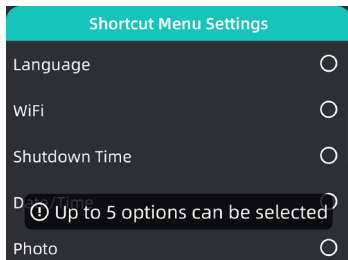
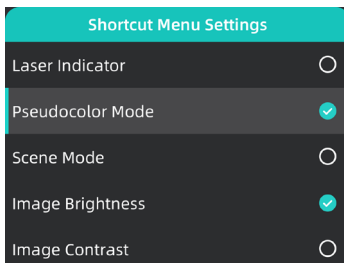
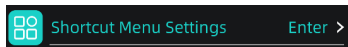


Authorization Information

Enter >

8.21 Quick Menu Settings

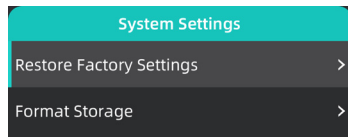
Short press the knob to enter the quick menu setup interface. Rotate the knob to browse items available for the quick menu. Press the knob briefly to select an item (up to 5 items can be selected). After selection, scroll to the "Confirm" button and press the knob briefly to confirm. Press and hold the knob or press the power button briefly to return to the previous level.



8.22 System Settings

Short press the knob to enter the system settings interface. Long press the knob or short press the power button to return to the previous level.

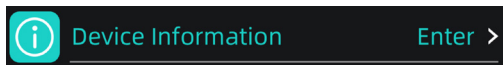
You can perform a factory reset on the device (reticle and ballistic calculation related parameters will not be reset) and format the storage (formatting disk data, i.e., photos and videos).



8.23 About Device

Short press the knob to enter the About Device interface. Long press the knob or short press the power button to return to the previous level.

You can view the relevant information of the current device (model, detector resolution, screen resolution, hardware version, firmware version, serial number, wireless physical address).



8.24 Firmware Upgrade

Method 1: Over-the-air (OTA) upgrade, which can be done by connecting the device to a mobile app for firmware upgrade.

Method 2: Local upgrade, where users can connect the device to a PC via a Type-C cable, then copy the firmware to the device's disk. After removing the Type-C cable, the device will pop up an upgrade prompt box.

9 Precautions

1. Under no circumstances (whether the power is on or off) should the device's lens be directly pointed at a strong heat source (such as the sun), as this may cause irreversible damage to the detector focal plane.
2. The rated charging voltage of this product is 5V. Please avoid overcharging to prevent affecting the service life of the infrared thermal imager. Charge the battery in time when the battery power is low.
3. It is recommended to use this product within the temperature range of -20°C to $+60^{\circ}\text{C}$. Avoid using it for a long time in high-temperature environments, as the infrared thermal imager will enter high-temperature protection mode and automatically shut down. Do not charge the device in an environment exceeding 40°C .
4. When using this product in a humid environment, please ensure that the Type-C interface cover is tightly closed.
5. Routine maintenance by the operator is limited to cable replacement or inspection, lens cover replacement, routine cleaning and maintenance, and functional checks to ensure the instrument is in good technical condition.
6. When the device is stored for a long time or not in use, please charge it at least once every two months and try to place it in a cool and dry environment.

7. If the device malfunctions, do not disassemble the module without authorization. Contact the manufacturer to troubleshoot before conducting any repairs. Disassembling the device by yourself may cause damage and void the warranty.

10 Troubleshooting

1. Device cannot be powered on

Solution: Replace the battery.

2. Device can't take photos/record videos

Solution: Internal storage is full. Transfer data or format the memory.

3. Device displays incorrect time

Solution: Reset the product's time and date in the menu.

4. Screen turns off during use

Solution: Short press the forward button to wake up from sleep and light the screen.

5. Blurry imaging during use

Solution: Turn the diopter adjustment wheel counterclockwise until the date, time, Wi-Fi signal, battery level or menu functions on the main interface are clearly visible. Then manually turn the focusing wheel to focus until the target is displayed clearly.

11 Storage and Transport

Here are methods for the product storage and transportation. To prevent potential dangers and property loss, please read carefully before use.

Storage:

1. Store the device in an environment of -30°C to 70°C , with relative humidity not exceeding 95%, free from corrosive gases, and with good indoor ventilation.
2. Charge the battery every two months at fixed intervals.

Transport:

During transportation, avoid rain, water immersion, upsidedown positioning, and prevent severe vibration and impact. Handle with care during transportation, and strictly avoid dropping.

FCC Caution:

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.

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

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.

The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction.

Specific Absorption Rate (SAR) information:

This device meets the government's requirements for exposure to radio waves. The guidelines are based on standards that were developed by independent scientific organizations through periodic and thorough evaluation of scientific studies. The standards include a substantial safety margin designed to assure the safety of all persons regardless of age or health. FCC RF Exposure Information and Statement the SAR limit of USA (FCC) is 1.6 W/kg averaged over one gram of tissue. Device types: This device has also been tested against this SAR limit.

This device was tested for typical body-worn operations with the back of the This device kept 0mm from the body. To maintain compliance with FCC RF exposure requirements, use accessories that maintain an 0mm separation distance between the user's body and the back of This device. The use of belt clips, holsters and similar accessories should not contain metallic components in its assembly. The use of accessories that do not satisfy these requirements may not comply with FCC RF exposure requirements, and should be avoided.

