



**O1-A Thermal
Imaging Sight User
Manual**

Notes

The user manual details the use of the thermal imager and the precautions. For the protection of the operator safety, as well as the reasonable and effective maintenance and use of the thermal imager, and also to guarantee the normal life of the thermal imager, the company requires the user to read and strictly abide by the requirements of the following operating specifications before using the thermal imager.

Prior to the publication of a new user handbook, the use and maintenance of the thermal imager should be subject to this manual, other materials are only for reference.

Any problems during use by each unit, please give us feedback so we can plan future modifications.

The content of this "user manual" is only for the reference of customers, not as the judging criteria for the delivery and acceptance of the product.

Precautions



Warning

- Do not expose the thermal imager directly to sunlight, carbon dioxide lasers, welding machines and other high-intensity radiation sources;
- The time interval between the start-up and last shutdown should be longer than 20 seconds;
- The thermal imager combines sophisticated optical instruments and electrostatic-sensitive electronic equipment, please do not arbitrarily throw, beat or vibrate the thermal imager and its ancillary components, to avoid structural parts or installation size deformation;
- Do not disassemble the thermal imager by yourself, in case of malfunction please get in touch with the manufacturer, otherwise no warranty;
- When the thermal imager is not in use or during the transportation, please remove the battery and place the thermal imager in a packing box;
- Please replace the battery in time when the battery power is too low, to avoid the over discharge damage to the battery;
- To connect the external power supply, remember to confirm the battery removed from the thermal imager.
- The use environment beyond the requirements of this manual may cause damage to the imager.



Attention6

- To clean the non-optical surface of the imager, do not use chemical solvents, thinner, etc. for scrubbing, wipe the shell with clean, soft and dry flannel;
- The infrared lens of thermal imager is coated with a layer of anti-reflection film for prevention of reflection, only clean it when it is obviously dirty. The frequent wiping of the lens may cause the abrasion of the lens coating. Please avoid touching the lens surface, the acidic substances of skin left by fingerprints can damage the coating layer and lens surfaces, clean the lens with special lens cloth only;
- Observation completed or no further operation for a long time after start-up, please shut down in time, to prolong the effective use time of the thermal imager.



Attention8

- Before the use of first time, please unpack and check if the thermal imager is complete.



Attention8

- To install the battery, please put all the battery positive outward, negative facing inside, can not be reversed.
- Make sure that the thermal imager was shut down before the battery disassembly, otherwise opening the battery compartment cover in the power-on state will cause serious damage to the thermal imager;
- For the first time use, please make sure that the battery has power;
- Please do not disassemble, throw or short-circuit the battery , so as to avoid the accident;
- Battery during use, charge and storage, if found overheating, discoloration, deformation, emitting smell or other anomalies, should be immediately stopped.



Attention11

- Before the boot interface appears, the color stripe test interface appears firstly on the screen, this is the display start prompt, not the thermal imager anomaly.



Attention.....18

- Please make sure that the lens cover is closed before the image background correction
- During the calibration process, the image screen will pause for 1 second, and that's not the thermal imager anomaly.



Attention.....19

- Before the operation of reticle function, please make sure the reticle is turned on, otherwise, there will not be any response to the operations under the reticle menu.
- The factory default setting for reticle status is hidden. Thereafter, each time after the start-up, the reticle status of show or hide, as well as the reticle type are determined by the state before last shutdown.

After reticle function is turned on, the reticle type identifier will be displayed in the upper-left corner of the screen.



Attention.....33

- After the restoration of the factory settings, all calibration data is lost and needs to be reset.

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1 Overview

The OW1 is an infrared sighting scope that can be installed on various firearms for night hunting. It is lightweight, compact, portable, also has the characteristics of long battery time, good concealment, strong penetrating capability for smoke, dust or darkness. Product as shown in Figure 1.

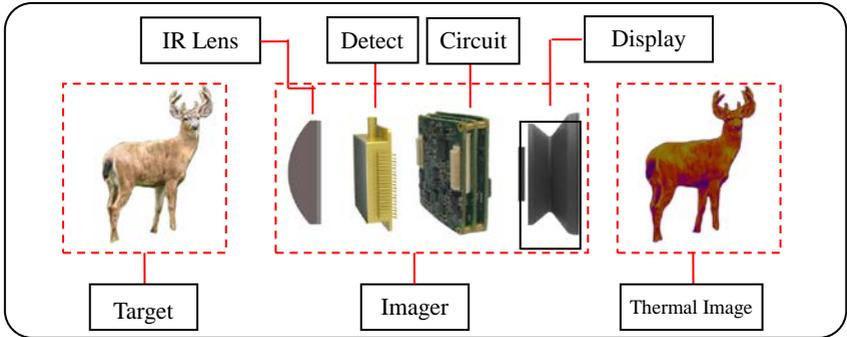


Figure 1. thermal imager

2. Structure and working principle

The working principle of the thermal imager is: the infrared radiation of the target object is focused on the photosensitive surface of the infrared focal plane detector through infrared optical system, after photoelectric conversion, the optical signal is converted into electrical signal, the digital video signal is

obtained by AD sampling, and then the infrared thermal image is output to the OLED screen after the image algorithm processing, and then the electronic reticle is supplemented to guide the user to view the target. The schematic diagram of the thermal imager is shown in Fig. 2.



3. Main performance and technical parameters

3.1 Main performance

- High resolution uncooled infrared detector
- 1024x768 high resolution OLED color display;
- Low-power design, 4 x CR123 batteries can last for 8 hours;
- Simple and quick operation, user-friendly and humanized interface design
- Short start-up time with rapid observation capability
- PIP, E-zoom function to improve aiming accuracy;
- Light leak-proof eyepiece design, good concealment;
- 7 reticle styles, 4 reticle colors, 4 calibration data, adapting to different guns;

- Protection level IP67, rain-proof, high reliability, sturdiness and durability.

3.2 Main specifications of thermal imager

The specifications of the thermal imager as shown in Table 1.

Fig.1 Technical parameters for thermal imager

Model No.	OW-1A	OW-1B
Detector		
Detector type	uncooled focal plane array infrared detector	
Resolution	384×288	
Pixel pitch	17μm	
Band width	8~14μm	
Optical performance		
Focal length	35mm	50mm
Field of view	10.5°×8°	7.5°×5.5°
Focusing	Manual focusing, 10 meters to infinity	
Eyepiece	Color OLED	
Diopter adjustment	-6D~+4D	
Sighting performance		
Effective distance	Clear night, humidity is not higher than 70%, in the transparent scene, observe the upright person target, the person	Clear night, humidity is not higher than 70%, in the transparent scene, observe the upright person target, the person

	discovering distance ≥2000m, recognition distance ≥550m	discovers distance ≥3000m, recognition distance ≥800m
reticle style	7 reticle styles available	
reticle color	Black, white, red, green 4 colors available	
reticle adjustment range	≥±15mil	
Reticle adjustment accuracy	≤0.5mil	≤0.35mil
Graphic display		
Image Ribbons	White hot, black hot, red hot, pseudo color	
E-zoom	×2、×4	
Brightness	0-99 speed adjustable	
Contrast	0-99 speed adjustable	
Power		
Battery	4 x CR123 batteries	
Battery time	7h (@25°C)	
Interface		
Electrical interface	PAL analog video RS232 serial port DC12V external power supply	
Firearms interfaces	Picattinny Rail	
Environmental adaptability		

Storage temperature	-45°C~+55°C	
Working temperature	-40°C~+50°C	
Vibration	Under the condition of whole machine packed, in the frequency 50hz~200hz~5hz, acceleration 2g, one scan in each of the mutually perpendicular directions, scanning time 15min	
Shock/ Impact	Half sine wave, acceleration 200g, duration 1ms, 100 times impacts in the positive direction of optical axis	
IP Rating	IP67	
Reliability		
Life	≥13000 shots	
MTBF	≥1500 h	
Physical characteristics		
Size	230mm×55mm×50mm	250mm×71mm×71mm
Weight	700g	800g

4. Packing Configurations

The thermal imager configuration table is as shown in Table 2, the corresponding figure is as shown in Figure 3.

Table 2. the thermal imager configuration table

Serial No.	Name	Qty
①	Thermal imager	1
②	Video output cable	1
③	Packing box	1
④	Lens wiping cloth	1
⑤	User manual	1
⑥	Packing list	1



Figure 3: packing configuration

5. Operation Instructions

Warning

- Do not expose the thermal imager directly to sunlight, carbon dioxide lasers, welding machines and other high-intensity radiation sources;
- The time interval between the start-up and last shutdown should be longer than 20 seconds;
- The thermal imager combines sophisticated optical instruments and electrostatic-sensitive electronic equipment, please do not arbitrarily throw, beat or vibrate the thermal imager and its ancillary components, to avoid structural parts or installation size deformation;
- Do not disassemble the thermal imager by yourself, in case of malfunction please get in touch with the manufacturer, otherwise no warranty;
- When the thermal imager is not in use or during the transportation, please remove the battery and place the thermal imager in a packing box;
- Please replace the battery in time when the battery power is too low, to avoid the over discharge damage to the battery;
- To connect the external power supply, remember to confirm the battery removed from the thermal imager.
- The use environment beyond the requirements of this manual may cause damage to the imager.

Attention

- To clean the non-optical surface of the imager, do not use chemical solvents, thinner, etc. for scrubbing, wipe the shell with clean, soft and dry flannel;
- The infrared lens of thermal imager is coated with a layer of anti-reflection film for prevention of reflection, only clean it when it is obviously dirty. The frequent wiping of the lens may cause the abrasion of the lens coating. Please avoid touching the lens surface, the acidic substances of skin left by fingerprints can damage the coating layer and lens surfaces, clean the lens with special lens cloth only;
- Observation completed or no observation operation for a long time after start-up, please shut down in time, to prolong the effective use time of the thermal imager.

5.1 The thermal imager components

The thermal imager components is as shown in Figure 4, Figure 5.



Fig 4. thermal imager components diagram



Fig 5. thermal imager components diagram

5.2 Preparation before usage

5.2.1 Unpacking

NOTE

- Before the first time use of the thermal imager, please make sure to unpack and check the completeness of the imager.
- Open the packing box, check the completeness according to the thermal imager configuration table (Table 2);
- Check the lens, body, eyepiece and press keys of the imager and see if there is obvious damage;
- Check whether the lens is dirty, if there is obvious stain, please use the lens cloth to wipe the lens, so as to ensure it clean.

5.2.2 Battery Installation

Attention

- To install the battery, please put all the battery positive outward, negative facing inside, can not be reversed.
- Make sure that the thermal imager was shut down before the battery disassembly, otherwise opening the battery compartment cover in the power-on state will cause serious damage to the thermal imager;
- For the first time use, please make sure that the battery has power;
- Please do not disassemble, throw or short-circuit the battery , so as to avoid the accident; Battery during use, charge and storage, if found overheating, discoloration,deformation, emitting smell or other anomalies, should be immediately stopped.

The thermal imager requires 4 x CR123 batteries, install the batteries by following the steps:

- Open the battery cover counterclockwise according to the direction as OPEN shows on the cover, as shown in Figure 6;
- Inserting the batteries, all batteries are positive facing out, as shown in Figure 7;
- Close the battery cover, tighten the battery compartment cover clockwise according to the direction as CLOSE shows on the cover, as shown in Figure 8.



Figure 6. Open battery cover



Figure 7. Insert the batteries



Figure 8. Close battery cover



Figure 9. Thermal imager press key diagram

5.3 Button functions

The button diagram of the thermal imager is shown in Figure 9, the button function table is shown in table 3.

Table3. The imager button function table

Serial No.	Key	Icon	function
①	Power		Switch on,switch off,standby,exit menu
②	Main menu		Enter each level menu
③	Direction	 : Up  : Left  : Down  : Right	Operation key, Function key

5.4 Switch on and switch off

5.4.1 Switch on

When the imager is off, long press the power button for 3 seconds, until the boot screen as shown in Figure 10 appears on the eyepiece screen, the thermal imager starts.



Figure 10. splash screen

Note: Before the boot interface appears, the color stripe test interface appears firstly on the screen, this is the display start prompt, not the thermal imager anomaly.

5.4.2 Switch off

When imager is on, long press the power key, the progress bar showing shutdown appears on the display, as shown in Fig. 11, until the progress bar is finished, the screen is off, the thermal imager shuts down and then release the power button.



Fig 11. shutdown screen

5.5 Thermal imager adjustment and test

5.5.1 eyepiece diopter adjustment

In order to adapt to the users with different vision, the thermal imager has $-6^{\circ}\sim+4^{\circ}$ diopter adjustment. When the interface icon or text in the screen is blurred, that means the eyepiece does not match with the user's vision, please regulate the eyepiece.

After the boot, slowly rotate the eyepiece diopter adjustment ring, as shown in Figure 12, until the icon and text in the image are clearly visible, then the eyepiece has been fitted with the user vision, the regulation completed.



Fig 12. eyepiece diopter adjustment part

5.5.2 Focal length adjustment of IR lens

The lens of the thermal imager is provided with a lens ring, located at the end of the lens.

After the thermal imager is turned on, aim the thermal imager to the observation target, rotate the lens focusing ring according to the target position, and perform the focusing operation until the image is clear, as shown in Figure 13. When the target distance changed, the image may become blurred, and should rotate the focus ring to refocus, until the target image is clear.



Fig 13. Object lens focusing ring

5.6 The image interface of thermal imager

The image interface of thermal imager without operation as shown in Figure 14 .



Figure 14. The image interface of thermal imager without operation
 At the top of the screen shows the current assembly model, correction mode, image mode, E-zoom, power status, the corresponding status bar as shown in Figure 15.



Fig 15. status bar

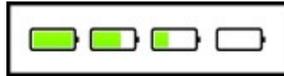
Reticle type: the factory default start-up reticle state is hidden, in this state, press the UP key  and DOWN key  simultaneously to control the show or hide of the reticle type. The selection of the reticle type can be adjusted by the advanced menu, please see 5.9.3 for details.

Calibration mode: the current calibration mode of thermal imager

Image mode: the current image mode of thermal imager

E-zoom: Showing the current E-zoom times for thermal imager

Battery status: the battery status of thermal imager. Battery status as shown in Fig.16, four display statuses in total.



16 Power status

5.7 Image adjustment

Short press the main menu button  , enter the main menu, menu interface as shown in Figure 17.



Figure 17. the main menu interface

In the main menu, the four direction buttons Up, Down, Left, Right control the four icons functions "Up, down, left, right" on the menu interface respectively.

To exit the main menu, short press the Power button  to exit.

5.7.1 E-zoom

The E-zoom can magnify the central area of the IR image and display, so as to make the target object more visible.

There are 3 E-zoom modes to choose: x1, x2, x4, representing the magnification of 1 time, 2 times and 4 times, as shown in Figure 18. Each time when the thermal imager is powered on, the default magnification mode is 1 time, prompt information appears in the upper-left corner of the screen.



Figure 18 the images of 3 magnification modes

Mode selection

- "x1" mode is recommended, when a wide-range search is needed to find the target, for the image field is wider, and it is conducive to find the target.
- "x2" or "x4" mode is recommended when the target state needs to be identified (such as whether the target is human or human).
- To aim, "x 2" or "x 4" mode is recommended, for the target image is more conducive to the sighting of hit point.

E-zoom operation procedure:

Under the main menu interface, as shown in Fig 20, the default mode is x1,

short press the Up button  to achieve the x1 - x2 - x4 loop magnification display.

5.7.2 Screen brightness regulation

Brightness regulation can increase or decrease the brightness of OLED display.

The thermal imager has 4 adjustable brightness levels, as shown in Fig 19, the brightness from dark to bright. The default brightness is level 3, users can choose the appropriate brightness according to individual viewing habits and the current environment.



Figure 19 Brightness levels

Brightness operation:

Under the main menu interface, as shown in Fig 20, short press the Down button to control the switch of screen brightness, so as to achieve the loop display of the 4 levels screen brightness.

5.7.3 Image mode

The image mode adjustment can make IR image display in different color, to facilitate the user to observe and recognize the target.

The thermal imager provides 4 image modes to users, namely white-hot, black-hot, red-hot and pseudo color, as shown in Figure 20. The default image

mode is "white-hot", and the current mode of the IR image is displayed in the upper left corner of the screen.



Figure 20. 4 image modes

WHI: white-hot, the object with relatively high temperature is displayed in black or gray;

BLC: black-hot, the object with relatively high temperature is displayed in black or dark gray;

RED: red-hot, the object with relatively high temperature is displayed in red, while the other object in black and white;

CLR: pseudo color, color mode, objects with different temperatures are displayed by colors, easy to identify;

Image mode adjustment

In the main menu interface, as shown in Figure 16, short press the Left



button, to achieve the image mode switch, to realize the loop display of the 4 image modes: white-hot, black-hot, red-hot, pseudo-color.

5.7.4 Calibration

Attention

- **Make sure the lens is covered by the lens cap before you make background calibration**
- **The image will freeze about one second when calibrating. It is normal**

Calibration can eliminate the snowflakes, jitter, stripes, etc. of the image, to make the image clear.

During the use of thermal imager, for the reason of long time work, the imager components get hot, which may cause snowflakes, jitters, stripes and so on to the IR image, and affect the viewing experience, users can perform image correction to eliminate the image abnormalities.

Steps of calibration:

- In the main menu interface, such as Figure 20, use the Right button  to control the correction mode;
- Short press the Right button  for shutter correction;
- Long press the Right button  for background correction. During the background correction, the words "Please make sure to cover the lens cover during background correction" will appear on the top of the screen,

and the disappearance of the prompt information indicates that the correction is complete, lens cover can be opened. Correction interface as shown in Fig 21.

The effect of background correction is better than the shutter correction, the use of background correction is recommended.



Fig. 21 background correction interface

5.8 Reticle function

Attention

- Before the operation of reticle function, please make sure the reticle is turned on, otherwise, there will not be any response to the operations under the reticle menu.
- The factory default setting for reticle status is hidden. Thereafter, each time after the start-up, the reticle status of show or hide, as well as the reticle type are determined by the state before last shutdown.
- After reticle function is turned on, the reticle type identifier will be displayed in the upper-left corner of the screen.

In the main menu interface, short press the main menu button  and switch to the second-level menu, the two-level menu is mainly reticle menu, controlling the various reticle functions in the image screen, the interface of second-level menu as shown in Figure 22.



Figure 22 interface of second-level menu

The way to open the reticle function: press the Up button  and the Down button  simultaneously, the reticle will appear on the image central area, and the icon representing the current reticle type will appear in the upper-left corner of the interface, See 5.6 Figure 14 for details.

In the second-level menu, the four direction buttons Up, Down, Left, Right control the "up, down, left, right" four icon functions.

To exit the menu interface, short press the power button .

5.8.1 Reticle color

The reticle color adjustment can make the reticle display in different colors to facilitate the users to observe and recognize the target. The thermal imager has 4 reticle colors for users to choose, namely white-hot, black-hot, red-hot and pseudo color, users could select the appropriate reticle color according to the individual viewing habit and image mode.

Steps of reticle color adjustment

In the second-level menu interface, as shown in Figure 22, short press the Up button  to control the reticle color switch, and achieve the loop display of reticle color white--black--green--red.

5.8.2 Reticle type

The thermal imager has 7 reticle display styles, the default is display without crosshair. The 7 reticle styles are as shown in Fig23.

Steps of reticle styles adjustment

In the second-level menu interface, as shown in Fig 22, short press Down button , control the switch of reticle styles, achieve the loop display of 7 reticle styles, the crosshair will be displayed in the center of the image. After calibration, users could sight and aim by using the crosshair center.

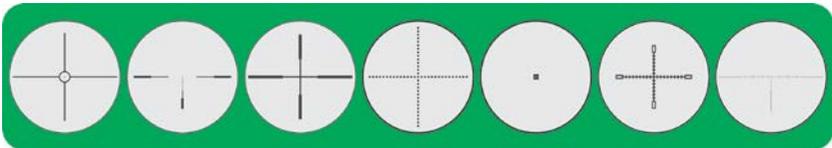


Fig23 7 reticle styles

5.8.3 Reticle states

The reticle state function is mainly to adjust the hide and show of the crosshair and the ranging function.

Steps of reticle state adjustment

In the second-level menu mode, short press the Left button , control the switch of reticle states, realize the loop of three modes: reticle -- reticle + ranging -- reticle + ranging hidden.

Reticle + distance measurement can achieve the ranging function, simultaneously ranging reticle appears in the lower-left corner of the screen, as shown in Figure 24.

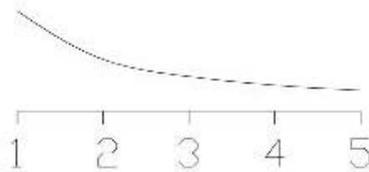


Fig. 24 ranging reticle

The position of digit 1 on the horizontal axis in the picture represents the displayed height in screen of 180cm object located at 100m away.

5.8.4 Zeroing

Open crosshair, in the second-level menu, short press the Right button , enter zeroing interface, as shown in Fig 25.



Fig 25. reticle position adjustment interface

In the zeroing interface, the reticles are displayed as small reticles, so as to facilitate the position adjustment. Control the reticle position movement in the direction of Up, Down, Left, Right by Up, Down, Left, Right buttons, reticle moves 1 pixel per click to the corresponding direction, and 40 pixels' movement per second by long press. The top and left status bar shows the cursor movement information, The digit of status bar changes by 2.4cm per 1 pixel movement, the total length of status bar is 240 pixels, divided into 12 segments.

According to the display position of the actual impact point in the screen, the thermal imager provides two kinds of zeroing ways, the specific steps are as follows.

Before the zeroing operation, please determine the selection of the reticle type.

5.9.3 The default reticle type is R1.

Steps of zeroing:

Zeroing mode1(actual impact point displayed in the screen):

- In the zeroing interface, use the crosshair central point to aim at the bull's-eye and shoot;
- After shooting, observe the locations of actual impact point and bull's-eye.
- If the actual location of the impact point can be seen in the thermal imager, then aim the crosshair central point to the bullseye, short press the main menu button , the image freezes, and the freeze icon appears in the upper-left corner of the screen, as shown in Figure 26;
- In the condition of image being frozen, by controlling the direction buttons, move the crosshair to the actual impact position;
- After moving the crosshair position to the actual impact point, long press the main menu button , the central screen appears OK box , release the main menu button, then the current reticle status is saved, and exit the menu interface.
- If exit without save, then short press the Power button  directly, exit.



Figure 26 image freeze icon

Zeroing mode 2(actual impact point can not be observed on the screen):

- In the zeroing interface, use the crosshair central point to aim at the bull's-eye and shoot;
- After shooting, observe the locations of actual impact point and bull's-eye.
- If the actual impact point can not be observed in the thermal Imager screen, aim the crosshair center to the bullseye, measure the distance between the actual impact point and the bullseye;
- According to the measurement distance to adjust the crosshair position, if the deviation from impact point to the bullseye is 2cm, then move 2.4cm horizontally (for position quantity see the upper scale, default correction distance is 100 meters).
- Move the crosshair to the actual impact point, zeroing completed, long

press the main menu button , the central screen appears OK

 box, release the main menu button, the current reticle state is saved, exit the menu interface(after reticle state save, all crosshair central point and small crosshair central point are adjusted to be consistent).

- To ensure the accuracy of the position, aim the crosshair after adjustment to the bullseye again, and shoot, then repeat the operations above, until the bullseye is hit.

- If exit without save, then short press the Power button , exit.

5.9 Advanced menu

In the main menu interface, long press main menu button , enter advanced menu interface, as shown in Fig 27.

Switch the options in advanced menu by the Up  and Down button , when certain option is switched to, its background color darkens;

then set the option parameters through the Left  and Right button .

After the operation, short press the Power button, exit the advanced menu interface, or pause for 20 seconds, the thermal imager will automatically exit the advanced menu interface.



Figure 27 Advanced Menu Interface

5.9.1 Contrast

Image contrast adjustment can increase or decrease the contrast of the image, make the target more prominent.

The thermal imager has 0-99 optional image contrast levels, contrast from 0-99, from weak to strong in turn. The default contrast is "50", users can choose the appropriate contrast according to individual viewing habits and current circumstances.

Steps of image contrast adjustment

- In the advanced menu, control the Up and Down button to switch options to the "contrast" option, by default, enter the advanced menu and directly select the "contrast" option;
- After switching to "contrast" option, adjust the contrast level by Left and Right button.
- Short press the Left or Right button, one level change each time; long press the Left or Right button, 10 levels change each time
- After operation, short press Up or Down button to enter other menu option settings, or short press Power button, exit the advanced menu interface.

5.9.2 Brightness

Brightness adjustment could increase or decrease the image brightness.

The imager has 0-99 optional image brightness levels, with brightness level ranging from 0 - 99, from dark to bright in turn. The default brightness level is 50, users can choose the appropriate contrast according to individual viewing

habits and current circumstances.

Steps of image brightness adjustment

- In the advanced menu, switch to the brightness option by using Up and Down button.
- After switching to brightness option, adjust the brightness level by Left and Right button.
- Short press the Left or Right button, change 1 level per time; long press Left or Right button, change 10 levels per time.
- After the operation, short press the Up and Down button to enter the settings of other menu options, or short press the Power button, exit the advanced menu interface.

5.9.3 Reticle Type

The thermal imager can store up to 4 types zeroing positions. If the user has already stored the zeroing positions for a variety of models, after the replacement of the gun type, first select the corresponding stored zeroing type for the current gun type, the thermal imager will automatically match the reticle position to the current model, and ensure better sighting and aiming accuracy.

The default factory reticle status setting is hidden. After that, the default reticle type is the selected type of last operation.

The selection steps of reticle types:

- Under the advanced menu, switch to the "reticle type" option by the UP

and DOWN arrow keys;

- After switching to the "Reticle type" option, control the selection of reticle type R1, R2, R3, R4 by using LEFT and RIGHT arrow keys;
- After the operation, short press the UP and DOWN arrow keys to enter other menu options settings, or short press the power button, exit the advanced menu interface;
- If the stored reticle type does not match the current assembly requirement, repeat 5.8.4 to reset the reticle position.

5.9.4 Calibration mode

The thermal imager has two available reticle modes "A" and "M" for the users.

A: auto calibration, thermal imager correct the shutter aperiodically according to the internal parameters;

M: manual Calibration, thermal imager will not perform any correction actions during use, if needed, the user should correct manually, operation method see 5.7.4.

Selection steps of correction modes:

- Under the advanced menu, switch the option to the correction mode option by the UP and DOWN arrow keys;
- After switching to the correction mode option, select the automatic correction "A" and manual correction "M" through the LEFT and RIGHT keys, and the correction mode icon in the upper-left corner of the screen will also change accordingly;
- After the operation, short press UP and DOWN arrow keys to enter other menu options settings, or short press the POWER button, exit the

advanced menu interface;

5.9.5 Auto standby

The thermal imager provides the auto standby setup option.

When the automatic standby setting is turned on, the thermal imager will automatically go into hibernation without using or operating on it for a long time.

After the thermal imager goes into hibernation automatically, short press

the power button , the thermal imager can be woke up, while long press the power button, the thermal imager will be shut down.

The thermal imager sets up 4 types of automatic standby options, off, 5, 15, 30:

OFF: turn off the auto standby function, i.e., no hibernation.

5: indicates that the thermal imager will automatically hibernate after 5 minutes without operation.

15: indicates that the thermal imager will automatically hibernate after 15 minutes without operation.

30: indicates that the thermal imager will automatically hibernate after 30 minutes without operation.

Steps of auto standby setup

- Under the Advanced menu, switch the option to automatic standby by the UP and DOWN arrow keys;
- After switching to the “auto standby” option, control the selection of the

automatic standby setting by the Left and Right arrow keys.

- After the operation, short press UP and DOWN arrow keys to enter the settings of other menu options, or short press the Power button, exit the advanced menu interface;

5.9.6 PIP

The thermal Imager provides picture-in-picture(PIP), small window display function. After the PIP function is turned on, the original image is displayed on the main screen, while the lower-right corner of the screen displays the twofold enlarged image of certain area with reticle as center, as shown in Figure 28.



Figure 28 PIP is turned on

To sight, PIP mode is recommended, while target image is more conducive to aiming the hit point.

OFF: indicates that the PIP mode is turned off.

ON: indicates that the PIP mode is turned on.

Steps of PIP mode setting:

- Under the advanced menu, toggle the option to PIP by the UP and DOWN arrow keys;

- After switching to the PIP option, select the On or Off of the PIP mode by the Left and Right arrow keys.
- After the operation, short press UP or DOWN arrow key to enter other menu option settings, or short press the POWER button, exit the advanced menu interface;

5.9.7 Bad pixel correction

In the Advanced menu, through the up and DOWN ARROW keys to switch options to the "Pixel correction" option;

After switching to the " Pixel correction " option, the right key is entered into the blind element correction interface, as shown in Figure 29, the lower left corner of the interface will display the selected number of bad points;

In the blind element correction interface, through the upper and lower direction keys to move the cursor to the blind element, short press up and down direction key, each move 1 pixels, long press the arrow keys, each move 40 pixels;

Focus on the center of the blind, short Press main Menu  keys, add blind yuan;

Can repeat the operation many times, to the screen all the highlights or dark spots disappear;

After the blind element is added, long press the main Menu key  to save the blind element and exit.



Fig. 29 Blind Pixel Correction interface

5.9.8 Reset to default

After entering advanced menu, select “Reset”, recover the imager to the factory default settings.

Steps of reset to default:

- Under the advanced menu, switch to the “Reset” options through UP and DOWN arrow keys.
- After switching to “Reset” option, short press the RIGHT key, the dialog box will appear as shown in Fig.30
- The dialog box will remind the user to confirm whether reset to default, by short pressing UP and DOWN arrow keys to select Yes or No.
- After being selected, the background color of the selected option will change to dark gray, and on each side an arrow will appear beside it. By default, the selection is No.



Figure 30 Reset to default dialog box

Note

- **All the settings including the Zeroing data will be erased when reset to Default.**

5.9.9 Language

The thermal imager has two languages settings: English and German, the user can set it up as needed.

EN: the current language is set to English.。

DE: DE: the current language is set to German.

Steps of language settings:

- In the advanced menu, short press UP and DOWN arrow keys to switch options to the "language" option;
- After switching to the language option, short press the LEFT and RIGHT keys to set the language.

- After the operation is completed, short press UP and DOWN arrow keys to enter other menu options settings, or short press the POWER button, exit the advanced menu interface.

6. Trouble shooting

If your instrument fails, first refer to the common failures shown in Table 4, if not the following failure reasons, please contact our company or seller as soon as possible.

Table 4. Fault detection, location and isolation

Fault Detection	Location	Solution
Long press power button, but cannot be switched on	Battery Installation Error	Open the battery cover to check
	Battery low power	Take out the batteries out for charging
	Battery cover loose	Tighten the battery cover
Poor image quality after boot, blurred image	Not focused	Rotate the lens focusing ring, until getting the image clear
Bright line, edge black, blurred image	No calibration	Make the calibration

blurred image	Not focused	Rotate the lens focusing ring, until the image clear
	Lens dirty	Clean the lens with special lens cloth
Image blur when observing target of different distance	Not focused	Rotate the lens focusing ring, until the image clear
Blurred display interface	Inappropriate eyepiece Vision	Adjust the diopter
Sudden shutdown	Battery cover loose	Tighten the cover
Calibration for several times, but still unable to hit the target.	The original position of reticle not zeroing	Set the original position to "0"
Shooting accuracy drops during use	Connection base loose	Check the connection base and tighten

7. Maintenance

7.1 Maintenance and calibration

After sighting or no operation for a long time after power-on, please shut down

in time to prolong the effective using time of the thermal imager.

The thermal imager lens is an important optical component. In the process of installation and usage, please avoid the oil stains and various chemical substance contaminated to prevent the damage to the lens surface. After use, please cover the lens cover.

When the thermal imager is not in use or during the transportation, please remove the battery and place the thermal imager in a packing box;

The thermal imager should be kept in a cool and dry environment as long as it is for long-term storage or not work.

Do not use chemical solvents, thinner, etc. for scrubbing, wipe the shell with clean, soft and dry flannel;

The thermal imager lens only needs to be cleaned when obviously soiled, please avoid touching the lens surface, the acid substance on the skin left by the fingerprint can damage the coating layer and the lens surface, clean the lens only by using the special lens cloth.

When not used for a long time, should be checked and corrected once every half year.

Appendix A: Accessories table

A.1 Fault detection, location and isolation

Serial no.	Name	Qty
①	Thermal imager	1
②	Video output cable	1
③	Packing box	1
④	Lens wiping cloth	1
⑤	User manual	1
⑥	Packing list	1

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