

KEILER-25 LRF
InfiRay Finder Serie
Product Manual

V1.0

1. Delivery Package

- 1) Finder Thermal Imager
- 2) USB cable
- 3) Power adapter
- 4) Hand strap
- 5) Neck strap
- 6) Cloth for cleaning optics
- 7) Warranty card
- 8) User guide

2. Product overview

The Finder series are light and easy to carry and can be operated with one hand. With its compact size and light weight, it can be placed in the pocket any time. The built-in laser ranging can quickly locate the target distance. The ergonomic construction and powerful function make the Finder the best choice for outdoor exploration.

3. Units and Controls

- 1. Lens cap
- 2. Lens focus ring
- 3. Laser indicator
- 4. Laser rangefinder
- 5. Type C connector
- 6. Eyepiece diopter adjustment
- 7. Eyepiece
- 8. Infrared sensors switch
- 9. LED indicator
- 10. Down/Photo button
- 11. Up/Ranging button
- 12. Menu button
- 13. Power button



LED indicator displaying current status of the device





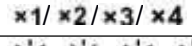
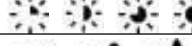





















LED indicator	LED status	Operating mode
●	normal	power on/fully charged
	flashing	standby
●	normal	charging
	flashing	less than 10% battery level

4. Button Operations

Button	Device status / current operation mode	First short press	Next short press	Long press
Power button (13)	Device is powered off			Power on the device
	Device is powered on	Standby	Undo the operation	Power off the device
	Defective pixels calibration interface	Add the defective pixel	Delete the defective pixel	Undo the operation
	Shortcut menu/Main menu	Return to the home screen		Power off the device
	Laser ranging mode	Exit laser ranging mode		
Menu button (12)	Device is powered on	Open shortcut menu 1	Open shortcut menu 2	Open main menu
	Shortcut menu 1	Open shortcut menu 2	Exit shortcut menu	Exit shortcut menu
	Shortcut menu 2	Exit shortcut menu		Exit shortcut menu
	Main menu	Confirm value, enter menu option		Exit menu option, main menu
	Laser cursor calibration/Defective pixels calibration interface	Switch cursor movement direction		Exit calibration
	Laser ranging mode	Switch single/continuous ranging		
Up/Ranging button (11)	Device is powered on	Turn the laser on/off		Turn the laser ranging on
	Laser ranging mode	single ranging		Exit laser ranging mode
	Shortcut menu 1	E-zoom switching		
	Shortcut menu 2	Image mood switching		
	Main menu	Navigation up		
	Laser cursor calibration/Defective pixels calibration interface	Move one pixel up/right		Move 10 pixels up/right
Down/Photo button (10)	Device is powered on	Photographing		Begin video recording


	Video recording	Photographing	Stop and save video recording
	Shortcut menu 1	Screen brightness adjustment	
	Shortcut menu 2	Sharpness adjustment	
	Main menu	Navigation down	
	Laser cursor calibration/Defective pixels calibration interface	Move one pixel down/left	Move 10 pixels down/left
Up button (11) + Down button (10)	Device is powered on	Shutter correction	Background correction

5. Menu/Status Bar Icons

	Image mode: white hot
	Image mode: Black hot
	Image mode: Red hot
	Image mode: Color
	E-zoom
	Display brightness
	Image sharpness
	Calibration mode: Automatic Calibration
	Calibration mode: Manual Calibration
	Time and Date
	Wi-Fi
	Video out
	PIP
	Digital Compass
	Motion sensor
	Auto Display Off
	Calibration mode
	More
	Laser cursor calibration
	Defective pixel calibration
	Compass calibration
	System information
	Factory reset
	Return to the Main Menu
	Single ranging
	Continuous ranging
	Battery indicator

6. Battery and Safety

Finder series is supplied with a rechargeable Li-ion Battery Pack which enabled the thermal imager to be used for up to 6 hours. The battery should be charged before first use.

- Attach the USB cable to the Type C connector on the device;
- Connect the other end of the USB cable to the power adapter or to a USB socket connected to another power source with rated output of 5V or less.
- Connect the power adapter to the mains power supply.
- The LED indicator shows red when charging and turns green when charging is finished.
- When the battery icon becomes  during use, it means the battery is low in power. Please charge in time, so as to avoid the loss of the life caused by over-discharged of the battery.

Safety Measures

- After a long storage time, the device should be partially charged, not fully charged or fully discharged.
- Don't charge your device immediately after you bring it from the cold to the warm. Wait 30-40 minutes for it to warm up.
- Do not use the charger if it is modified or damaged.
- The device should be charged at a temperature of 0°C to +40°C, otherwise the battery life will be significantly reduced.
- It is not recommended to connect third party devices that consume more energy than allowed.
- The equipment is equipped with short circuit protection system. However, situations that may lead to short circuits should be avoided.
- The recommended operating temperature for the device is between -10°C and +50°C. Do not use the product beyond this temperature range -- this may shorten battery life.
- When the device is used in sub-zero temperatures, the battery capacity drops. This is normal and does not indicate a defect.

7. Operation

ATTENTION! The lens of the device must not be pointed at any sources of intense energy, such as laser-emitting devices or the sun. This may damage the electronic components in the device. Damage caused by failure to comply with the operating guidelines is not covered under warranty.

Power on and image adjustment

- Remove the lens cap.
- Long pressing the power button for 2 seconds to power on. Waiting for 3 seconds to enter the main interface.
- Adjust the resolution of the icons on the display by rotating the diopter adjustment ring on the eyepiece.
- To focus on the object being observed, rotate the lens focus ring.
- Adjustment of display brightness, image mode and sharpness, as well as turning on the smooth digital zoom, are described in the QUICK ACCESS MENU FUNCTIONS section.

- Turn the device off after use with a long press of the power button.



- During using, the standby mode can let the device into a sleep state (turn off the display screen, the main chip is standby) by pressing the POWER button (13) briefly, which allows it to be quickly turned off, if necessary. And press the POWER button (13) again to wake up the device.

8. Home screen

When the device booted up, the home screen shows upon. There are some general information shows in the page. Detail as follows:

Left upper corner--Color palette, magnification, calibration mode, Wi-Fi (on), Automatic screen off (on);

Upper right corner--Battery level;

Lower left corner--Time and date;

Lower right corner--Video output icon (on).



The color of the battery icon represents the current battery level. When the battery icon is shown in red, it indicates that the battery is low. Please charge it in time

Icon	Color	Battery level
	Blue	30%-100%
	Yellow	20%-30%
	Red	Less than 10% , need to be charged shortly
	--	Charging

9. Calibrating the sensor

When the image is degraded or uneven, it can be improved by calibration. Calibration enables the detector temperature background to be equalized and defects in the image to be eliminated.

There are two calibration modes: manual (M) and automatic (A).

Select the required mode in the CALIBRATION section of the MAIN MENU .

- **M mode (manual).** The device needs to be calibrated manually. In the home screen, short pressing the UP (11) and DOWN (10) button for shutter calibration, and long pressing the UP (11) and DOWN (10) button for background calibration. The lens cap should be closed for background calibration. After completing the calibration process, remove the lens cap.
- **A mode (automatic).** The device is calibrated autonomously, in accordance with the software algorithm. The lens cap need not be secured (the sensor is closed by an internal shutter).

NOTE! Manual shutter calibration and manual background calibration are still possible even in mode A.

10. Photographing and Video Recording

Finder Series thermal imager is equipped with a function for video recording and photographing an observed image onto the built-in memory card. The files of images and videos will be named after the time, so it is recommended to synchronize the system time and date in the Settings of the APP before using the camera and video function. For specific operation, you can download the operation instructions of the APP from the company's website.

Photographing

- Take a photograph with a short press of the Down/Photo button (10) in home screen. The image freezes for 0.5 seconds and a photographing icon is displayed in the center of the display.
- The picture file is saved to the build-in memory card.

Video Recording

- In home screen, press and hold the Down/Photo button (10) to start video recording.
- A tooltip showing the recording time (showing in MM:SS (minutes: seconds) format) will appear in the upper right corner of the display.
- The red dot in the tooltip flashes during recording.
- During recording, short press the Down/Photo button (10) to take a photographing also.
- Stop the video recording by pressing and holding down the Down/Photo button (10).
- Video and picture files are stored in the built-in memory card after video recording has been turned off.

Note!

- 1) You can enter and work on the menu during video recording.
- 2) When the video recording time exceeds 1 hour, that is, the tooltip shows 59:59, and the next second will automatically jump to 00:01 to start the counting of the next hour.
- 3) The maximum duration of a video recording file is five minutes. After this time, the video will be recorded onto a new file.
- 4) The number of files is limited by the capacity of the device's built-in memory. Regularly monitor the amount of free memory in the built-in memory card, transferring footage and photographs to other media to free up space on the memory card.

Memory Access

When the device is turned on and connected to a computer, it is recognized by the computer as a flash memory card, which is used to access the device's memory and make copies of pictures and videos.

- Turn on the device and connect it to the computer through the USB cable.

- Double-click "my computer" on the desktop - double-click to open the device named "Infiray"



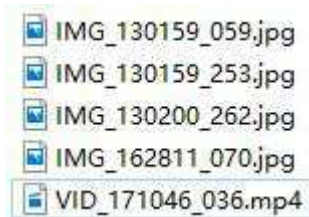
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then click and open the device named "Internal Storage" to access memory.



to access

- There are different folders named by time in memory 20191218 ;
- Recorded videos and photographs are saved in these folders in the format: IMG_HHMMSS_XXX. jpg (for photos) and VID_HHMMSS_XXX.mp4 (for video). HHMMSS- hour minute second; XXX - three-digit common file counter (for photos and video). The counter used in the naming of multimedia files is NOT reset.



11. Laser and Laser Ranging Function

Finder series has built-in laser function for laser indication and laser ranging.

Laser Indication Function

- Turn the laser on with a short press of the UP/Ranging button (11) in home screen.
- When the laser is on, the red laser cursor appears synchronously on the screen to indicate the position indicated by the laser.
- Short press the UP/Ranging button (11) again to turn off the laser indication function.

Laser Ranging Function

- Press and hold the UP/Ranging button (11) to switch on the laser ranging function in home screen.
- The laser cursor opens automatically, and the tooltip at the bottom of the screen displays the current ranging mode and the distance of the target indicated by the cursor.
- There are two kinds of ranging modes: single ranging and continuous ranging . Short press Menu button (12) to switch between the two modes.
- In single ranging mode, short press the UP/Ranging button (11) is required for ranging.
- In the continuous ranging mode, the distance of the target indicated by the cursor will be refreshed automatically every 1 second, without any keystroke operation.
- Ranging range and accuracy is 600m±1m, and it will be affected by fog and heavy rain and other weather;
- After the distance measurement is completed, long press the UP/Ranging button (11) to exit the laser ranging function.

Note!

- 1) Laser will not be automatically turned on in ranging mode!
- 2) In Laser Ranging mode, short press the Power button(13) to exit the range mode and return to the home screen.



12. Shortcut Menu Functions

The basic settings (use of the smooth digital zoom function, display brightness adjustment, image mode and sharpness adjustment) are changed via the Shortcut Menu.

- In home screen, by pressing MENU button (12) to enter shortcut menu 1-shortcut menu 2-exit the menu accordingly.
- After entering the menu, press UP button (11) to set the parameters at the top of the screen and press Down button (10) to set the parameters at the bottom of the screen.

Smooth Digital Zoom- by pressing the UP button (11) to change the digital zoom value from $\times 1.0$ to $\times 4.0$ in shortcut menu 1.

Display Brightness- by pressing the DOWN button (10) and changing the display brightness level from 1 to 4 in shortcut menu 1.

Image Mode- by pressing the UP button (11) to change the image mode in shortcut menu 2. The icons from left to right are white hot, black hot, red hot, color.





White hot 	A black and white palette (cold temperature corresponds to black, and hot temperature to white).
Black hot 	A black and white palette (cold temperature corresponds to white, and hot temperature to black).
Red hot 	
Color 	

Image Sharpness- by pressing the DOWN button (10) and changing the image sharpness level from 1 to 4 in shortcut menu 2.



Shortcut menu 1



Shortcut menu 2

13. Main Menu Functions



Main Menu



Sub Menu of More

- Enter the menu with a long press of the Menu button (12) in home screen.
- Press the UP (11) / DOWN (10) buttons to move through the menu functions, and the background of the option will become blue simultaneously.
- Press the Menu button (12) to set the parameters of the current option, or open the menu item.
- On the "More" option, short press the Menu button (12) to enter the sub menu for more settings.
- The button operation of the sub menu is the same as that of the Main Menu.
- To exit the menu, press and hold down the Menu button (12).
- Automatic exit from the menu occurs after 10 seconds of inactivity.

Composition and Description of the Main Menu

Wi-Fi



Selection of the Wi-Fi function

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Wi-Fi' option.
- A short press of the Menu button (12) switches the Wi-Fi on/off.
- The Wi-Fi icon is displayed in the upper-left status bar when it is on.

Video out



Selection of the video out function

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Video out' option.
- A short press of the Menu button (12) switches the video out on/off.

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- The Video out icon  is displayed in the lower-right corner when it is on.

PIP Mode



Selection of the Picture in Picture Mode

- Press and hold the Menu button (12) to enter the menu.
- Select the 'PIP Mode' option.
- A short press of the Menu button (12) switches the mode on/off.
- A 2x magnified image in a separate 'window' is appeared at the top of the display simultaneously with the main image.

Digital Compass



Selection of the Digital Compass

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Digital Compass' option.
- A short press of the Menu button (12) switches the compass on/off.
- The compass bearing is displayed in the top center of the image.



Motion Sensor



Selection of the Motion Sensor

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Motion Sensor' option.
- A short press of the Menu button (12) switches the Motion sensor on/off.
- When enabled, relevant functions will appear on the left side of the image.



Automatic Display-off



Selection of the Automatic Display-off

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Automatic Display-off' option.
- A short press of the Menu button (12) switches on/off.
- The icon is displayed in the upper-left status bar when it is on.

Calibration Mode

Selection of calibration mode. There are two calibration modes: automatic(A) and manual(M).

- Press and hold the Menu button (12) to enter the menu.
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- Select the 'Calibration Mode' option.
- A short press of the Menu button (12) to select A or M.

Automatic(A)

Calibration requirements in the automatic mode are determined by the software algorithm, with the calibration process being started automatically.

Manual(M)

The user independently sets the calibration requirements according to the image being observed.

More





Get more settings

- Press and hold the Menu button (12) to enter the menu.
- Select the 'More' option.
- A short press of the Menu button (12) to enter the sub menu for more settings.

Laser Cursor Calibration



When the target position pointed by the laser is not consistent with the cross-cursor position on the display, this function can be used to correct the cross-cursor position.



- Open the sub menu by pressing the Menu button (12).
 - Select the 'Laser Cursor Calibration' option
 - Enter the Laser Cursor Calibration interface with a short press of the Menu button (12).
 - A white cross cursor will appear on the display, and the laser is turned on automatically.
 - A tooltip will appear at the bottom of the display, which displays the moving direction (horizontal  and vertical  directional arrows) and position of the cursor.
 - The horizontal and vertical directional arrows indicate to move the cursor with the coordinates along the X and Y axes.
 - A short press of the Menu button (12) switches the cursor direction from the horizontal to the vertical and vice versa. The icon and text will be changed from white to blue when this direction is activated.
 - Use the UP (11)/DOWN (10) buttons to move the cursor to align its center with the position indicated by the laser. And with short press to move 1 pixel and long press to move 10 pixels each time.
 - To exit and save the 'Laser Reticule Calibration' function, press and hold down the Menu button (12).
 - No operation within 30s will exit the interface without saving data.
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**Defective
Pixels
Calibration**



When using the device, defective (broken) pixels may appear on the sensor: i.e. bright or dark points of constant brightness that are visible on the image. Finder Series offer the possibility of removing any defective pixels on the sensor, as well as to cancel any deletion.

- Open the sub menu by pressing the Menu button (12).
 - Select the 'Defective Pixels Calibration' option
 - Enter the Defective Pixels Calibration interface with a short press of the Menu button (12).
 - A white cross cursor will appear on the display.
 - A 2x magnified image of the cross cursor area (PIP) will appear on the lower left corner of the display – that is required to facilitate a search for the defective pixel and to align the marker with it.
 - A tooltip will appear at the bottom of the display, which displays the current number of defective pixels calibrated, the moving direction (horizontal  and vertical  directional arrows) and position of the cursor.
 - The horizontal and vertical directional arrows indicate to move the cursor with the coordinates along the X and Y axes.
 - A short press of the Menu button (12) switches the cursor direction from the horizontal to the vertical and vice versa. The icon and text will be changed from white to blue when this direction is activated.
 - Use the UP (11)/DOWN (10) buttons to move the cursor to align its center with the defective pixel. And with short press to move 1 pixel and long press to move 10 pixels each time.
 - After the cursor aligns with the defective pixel, delete the defective pixel with a short press of the Power button (13).
 - Then, by moving the cursor across the display, you can delete the next defective pixel.
 - Short press the Power button (13) again at the same position to undo the calibration.
 - Each time you add or reduce a blind pixel, the number of defective pixels calibrated in the tooltip will change accordingly.
 - Long press the Power button (13) to cancel the all calibrations done this operation.
 - When the cursor is moved near the PIP and prompt box, the PIP
-

and prompt box are automatically moved to the top of the display.

- To exit and save the 'Defective Pixels Calibration' function, press and hold down the Menu button (12).
- No operation within 30s will exit the interface without saving data.



Compass Calibration



Calibrate the digital compass

- Open the sub menu by pressing the Menu button (12).
- Select the 'Compass Calibration' option with the UP (11) / DOWN (10) buttons.
- Enter the compass calibration interface with a short press of the Menu button (12).
- An icon like a triaxial coordinate system appears on the screen.
- Rotate the device in three axial directions in 30 seconds according to the direction shown as the icon to complete the compass calibration.
- Each axis completes at least one rotation of 360°.



System Information



View system information of this device

- Open the sub menu by pressing the Menu button (12).
- Select the 'System Information' option
- Open the system information box with a short press of the Menu button (12).

Factory Reset



Restore Factory Settings

- Open the sub menu by pressing the Menu button (12).
 - Select the 'Factory Reset' option
 - Enter the 'Factory Reset' sub menu with a short press of the Menu button (12).
 - Select the option '✓' to reset to factory settings or '✗' to cancel
-

with the UP (11) / DOWN (10) buttons.

- Confirm your selection with a short press of the Menu button (12).
The following settings will be restored to their factory state before being set by the user:

Image Mode -white hot

Digital Zoom -x1

Display Brightness - level 3

Image Sharpness - level 1

Calibration mode - automatic

Wi-Fi - off

Video out - off

PIP - off

Compass - off

Motion sensor - off

Automatic Display-off – off



Return to Main Menu

- Open the sub menu by pressing the Menu button (12).

- Select the 'Return to Main Menu' option

- Return to the main menu with a short press of the Menu button (12).




14. Wi-Fi Function

The device is equipped with wireless communication with external devices (computer, smartphone) via Wi-Fi.

- Press and hold the Menu button (12) to enter the menu.
- Select the 'Wi-Fi' option.
- A short press of the Menu button (12) switches the Wi-Fi on.
- The device is recognized by an external device under the label 'Finder_XXXXXX', where XXXXXX are six digits.
- Enter the password on an external device, and establish a connection. The initial password is 12345678.
- And then, the device can be controlled through APP.

Set Wi-Fi name and password

The Wi-Fi name and password of your device can be set in the APP!

- Click the "setting" icon  in the APP to enter the setting interface.
- In the text box, enter and submit the name (ssid) and password of the new Wi-Fi.
- It needs to restart the device to take the new name and password effect.

Note! When factory Settings are restored, the Wi-Fi name and password are also restored to factory

default Settings.

15. PIP Function

PIP (Picture in Picture) function enables you to view a magnified digital zoom image in a separate 'window' simultaneously with the main image.

- Press and hold the Menu button (12) to enter the menu.
- Select the 'PIP Mode' option.
- A short press of the Menu button (12) switches the mode on/off.
- A separate 'window' is appeared at the top of the display simultaneously with the main image.
- The image in the separate window is captured from the center area of the main image and then 2x magnified.

16. APP Technology

Finder thermal imagers support APP technology, which enables the transmission of an image in real time from the thermal imager to your smartphone or tablet via Wi-Fi.

Detailed instructions on the operation of APP technology can be found in a separate booklet or on the www.xinfrared.com website.

Note! The device's design includes the possibility of updating software. Updating is possible via the APP.

17. Technical Inspection

A technical inspection of the device is recommended before each use. Check:

- The external appearance of the device (there should be no cracks in the casing).
- The condition of the lens and eyepiece (there should be no cracks, greasy spots, dirt or other deposits)
- The condition of the rechargeable battery (this should be charged) and the electrical contacts (there should be no presence of salts or oxidation).

18. Maintenance

Maintenance should be carried out at least twice a year and consist of the following actions.

- Wipe the external surfaces of metal and plastic parts free of dust and dirt with a cotton cloth. Silicone grease maybe used for this.
- Clean the electrical contacts of the battery and battery slot on the unit using a non-greasy organic solvent.
- Check the glass surfaces of the eyepiece and the lens. If necessary, remove dust and sand from the lenses (preferably using a non-contact method). Cleaning of the external surfaces of the optics should be done with substances designed specially for this purpose.

19. Troubleshooting

This table lists all the problems that may arise when operating the device. Carry out the recommended

checks and repairs in the order shown in the table. If a defect should occur that is not listed in the table, or if it is impossible to repair the defect yourself, the device should be returned for repair.

Malfunction	Possible reason	Correction
Thermal imager does not power up.	Battery completely discharged.	Charge the battery
Does not operate from external power source.	USB cable damaged.	Replace USB cable.
	External power source discharged.	Charge external power source (if necessary).
Image is unclear, with vertical lines and uneven background.	Calibration required.	Perform image calibration according to Section 9 'Calibration' of the Instructions
Image is too dark.	Low brightness or contrast level set.	Adjust display brightness.
Coloured lines appeared on display or image has disappeared.	The device was exposed to static electricity during operation.	After exposure to static electricity, the device may either reboot automatically, or require turning off and on again.
Poor image quality / reduced detection distances.	These problems may occur during observation in difficult weather conditions (snow, rain, fog etc.).	
Smartphone or tablet cannot be connected to the device.	Device password has been changed.	Delete the network and reconnect using the device password.
	The device is in an area with a large number of Wi-Fi networks that may cause interference.	To ensure stable Wi-Fi operation, relocate the device to an area with fewer Wi-Fi networks, or into an area with none.
Wi-Fi signal non existent or interrupted.	Device is outside the area of Wi-Fi coverage. There are obstacles between the device and the receiver (e.g. concrete walls).	Relocate the device into direct line of sight of the Wi-Fi signal.
When used in low temperature conditions, image quality of the surroundings is worse than in positive temperature conditions.	In positive temperature conditions, objects being observed (surroundings and background) heat up differently because of thermal conductivity, thereby generating a high temperature contrast. Accordingly, image quality produced by the device will be higher.	
	In low-temperature conditions, objects being observed (background) do, as a rule, cool down to roughly the same temperature, because of which temperature contrast is substantially reduced and image quality (detail) is poorer.	