Handheld Thermography Camera

HIKMICRO SP Series

User Manual

Safety Instruction

These instructions are intended to ensure that user can use the product correctly to avoid danger or property loss.

Laws and Regulations

Use of the product must be in strict compliance with the local electrical safety regulations.

Transportation

- Keep the device in original or similar packaging while transporting it.
- Keep all wrappers after unpacking them for future use. In case of any failure occurred, you need to return the device to the factory with the original wrapper.
- Transportation without the original wrapper may result in damage on the device and the company shall not take any responsibilities.
- Do not drop the product or subject it to physical shock. Keep the device away from magnetic interference.

Power Supply

- The input voltage should meet the Limited Power Source (7.2 VDC, 890 mA) according to the IEC61010-1 standard. Please refer to technical specifications for detailed information.
- Make sure the plug is properly connected to the power socket.
- DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.

Battery

- This device is not suitable for use in locations where children are likely to be present.
- CAUTION: Risk of explosion if the battery is replaced by an incorrect type. Replace with the same or equivalent type only. Dispose of used batteries in conformance with the instructions provided by the battery manufacturer.
- Improper replacement of the battery with an incorrect type may defeat a safeguard (for example, in the case of some lithium battery types).
- Do not dispose of the battery into fire or a hot oven, or mechanically crush or cut the battery, which may result in an explosion.

- Do not leave the battery in an extremely high temperature surrounding environment, which may result in an explosion or the leakage of flammable liquid or gas.
- Do not subject the battery to extremely low air pressure, which may result in an explosion or the leakage of flammable liquid or gas.
- Dispose of used batteries according to the instructions.
- DO NOT charge other battery types with the supplied charger. Confirm there is no flammable material within 2 m of the charger during charging.
- When the device is powered off and the RTC battery is full, the time settings can be kept for 6 months.
- In the first use, power on the device and charge the RTC battery with the lithium battery for more than 4 hours.
- The battery voltage is 7.2 V, and the battery capacity is 4800 mAh.
- Use the battery provided by a qualified manufacturer. Refer to the product specification for detailed battery requirements.
- The battery is certified by UL2054.

Maintenance

- DO NOT maintain the camera when it is powered on, or it may cause electric shock! If the product does not work properly, please contact your dealer or the nearest service center. We shall not assume any responsibility for problems caused by unauthorized repair or maintenance.
- A few device components (e.g., electrolytic capacitor) require regular replacement. The average lifespan varies, so periodic checking is recommended. Contact your dealer for details.
- Wipe the device gently with a clean cloth and a small quantity of ethanol, if necessary.
- Clean the lens with cotton wool and 99% ethyl alcohol.
- If the equipment is used in a manner not specified by the manufacturer, the protection provided by the device may be impaired.
- Please notice that the current limit of USB 3.0 PowerShare port may vary with the PC brand, which is likely to result in incompatibility issue. Therefore, it’s advised to use regular USB 3.0 or USB 2.0 port if the USB device fails to be recognized by PC via USB 3.0 PowerShare port.
- Your camera will periodically perform a self-calibration to optimize image quality and measurement accuracy. In this process the image will pause briefly and you’ll hear a “click” as a shutter moves in front of the detector. The self-calibration will be more frequent during start up or in very cold or hot environments. This is a normal part of operation to

ensure optimum performance for your camera.

Using Environment

- DO NOT expose the device to extremely hot, cold, dusty, corrosive, saline-alkali, or damp environments. Make sure the running environment meets the requirement of the device. The operating temperature shall be -20 °C to 50 °C (-4 °F to 122 °F), and the operating humidity shall be 95% or less.
- Place the device in a dry and well-ventilated environment.
- DO NOT expose the device to high electromagnetic radiation or dusty environments.
- DO NOT aim the lens at the sun or any other bright light.
- When any laser equipment is in use, make sure that the device lens is not exposed to the laser beam, or it may burn out.
- The device is suitable for indoor and outdoor uses, but do not expose it in wet conditions.
- The level of protection is IP 54.
- The pollution degree is 2.

Calibration Service

Please contact the local dealer for the information on maintenance points. For more detailed calibration services, please visit https://www.hikmicrotech.com/en/support/.

Technical Support

The https://www.hikmicrotech.com/en/contact-us.html portal will help you as a HIKMICRO customer to get the most out of your HIKMICRO products. The portal gives you access to our support team, software and documentation, service contacts, etc.

Emergency

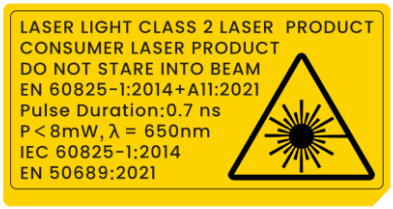
If smoke, odor, or noise arises from the device, immediately turn off the power, unplug the power cable, and contact the service center.

White Supplement Light

- The beam of the light at the distance of 200 mm is classified as Risk Group 1 (RG1).
- Wear appropriate eye protection or DO NOT turn on the white light when you assemble, install or maintain the camera.
- If appropriate shielding or eye protection is not available, turn on the

light only at a safe distance (1.3 m) or in the area that is not directly exposed to the light when installing or maintaining the device.

Laser



- Complies with 21 CFR 1040.10 and 1040.11 except for conformance with IEC 60825-1 Ed.3., as described in Laser Notice No. 56, dated May 8, 2019.
- Warning: The laser radiation emitted from the device can cause eye injuries, burning of skin or inflammable substances. Prevent eyes from direct laser and wear a pair of goggles for your safety. The operating wavelength of the eyewear should be longer than laser peak wavelength and its optical density should be higher than 0D5+. The wave length is 650 nm, laser beam divergence angle is less than 1°x0.6°. The pulse duration is 0.7 ns, and the Max. average power is 8 mW. The laser meets the IEC 60825-1:2014, EN60825-1:2014+A11:2021 standard, and EN 50689: 2021 standard.
- Instantaneous exposure to this class 2 laser product is safe, but gazing at this laser product may cause dizziness, flash blindness and visual afterimage. Move your head away or close your eyes to avoid the laser radiation.
- Before enabling the Light Supplement function, make sure no human or inflammable substances are in front of the laser lens.
- Laser maintenance: It is not necessary to maintain the laser regularly. If the laser does not work, the laser assembly needs to be replaced in the factory under warranty. Keep the device power off when replacing laser assembly.
- Caution! Use of controls or adjustments or performance of procedures other than those specified herein may result in hazardous radiation exposure.

Limited Warranty

Scan the QR code for the product warranty policy.

Manufacture Address

Room 313, Unit B, Building 2, 399 Danfeng Road, Xixing Subdistrict, Binjiang District, Hangzhou, Zhejiang 310052, China

Hangzhou Microimage Software Co., Ltd.

COMPLIANCE NOTICE: The thermal series products might be subject to export controls in various countries or regions, including without limitation, the United States, European Union, United Kingdom and/or other member countries of the Wassenaar Arrangement. Please consult your professional legal or compliance expert or local government authorities for any necessary export license requirements if you intend to transfer, export, re-export the thermal series products between different countries.

Symbol Conventions

The symbols that may be found in this document are defined as follows.

Symbol	Description
 Danger	Indicates a hazardous situation which, if not avoided, will or could result in death or serious injury.
 Caution	Indicates a potentially hazardous situation which, if not avoided, could result in equipment damage, data loss, performance degradation, or unexpected results.
 Note	Provides additional information to emphasize or supplement important points of the main text.

Contents

1 Overview

1.1 Device Description

The handheld thermography camera is a device with both optical images and thermal images. It can do thermography, PCB and electrical panel intelligent inspection, distance measurement, video recording, snapshot capturing, alarm, and it can connect to Wi-Fi, hotspot and Bluetooth. The built-in high-sensitivity IR detector and high-performance sensor detect the variation of temperature and measure the real-time temperature. Refer to the production specification on HIKMICRO website for detailed information. The built-in laser module detects the target distance.

The device is easy to use, and adopts ergonomic design. It is widely applied to substations, electricity prevention detection of companies, and reconnaissance survey of construction field.

1.2 Main Function

Table 1-1 Main Function of the Device

Function	Description
Temperature Measurement	Detects the real-time temperature, and displays it on screen.
SuperScene+	Uses built-in algorithms to identify temperature measurement targets in PCB and electrical panel inspection and determines if any temperature anomalies exist.
Route Inspection	Checks the temperature of the check points in a predefined inspection route, and uploads the results to center client for analysis.
Distance Measurement	Detects the target distance with the laser light.
Fusion	Displays fusion of thermal view and optical view.
Palette and Alarm	Supports multiple palettes, and you can set the palette mode according to the alarm function.
Geographical Location and Direction Display	For some models that are equipped satellite positioning module and compass, geographical location and direction display are

	supported. The function is supported by certain models of this series.
HDMI Output	For some models that have a micro HDMI output interface, you can connect the device to a display unit to view live image.
Client Software Connection	● Mobile Phone: Uses HIKMICRO Viewer to see live image, capture, and recording, etc. on your phone. ● PC: Uses HIKMICRO Analyzer to see live image, capture, recording, receive alarm message and analyze files exported from the device and etc. on your PC. Uses HIKMICRO Inspector to create inspection routes, send route inspection tasks to devices, collect inspection results.
Bluetooth	Captured snapshots in the device Albums can be transmitted to the phone with Andriod system.

1.3 Appearance

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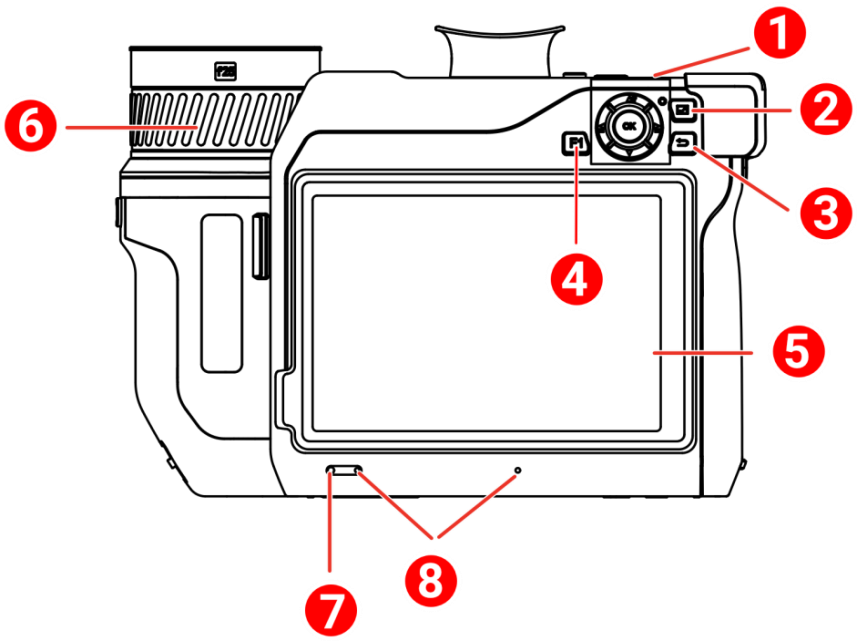

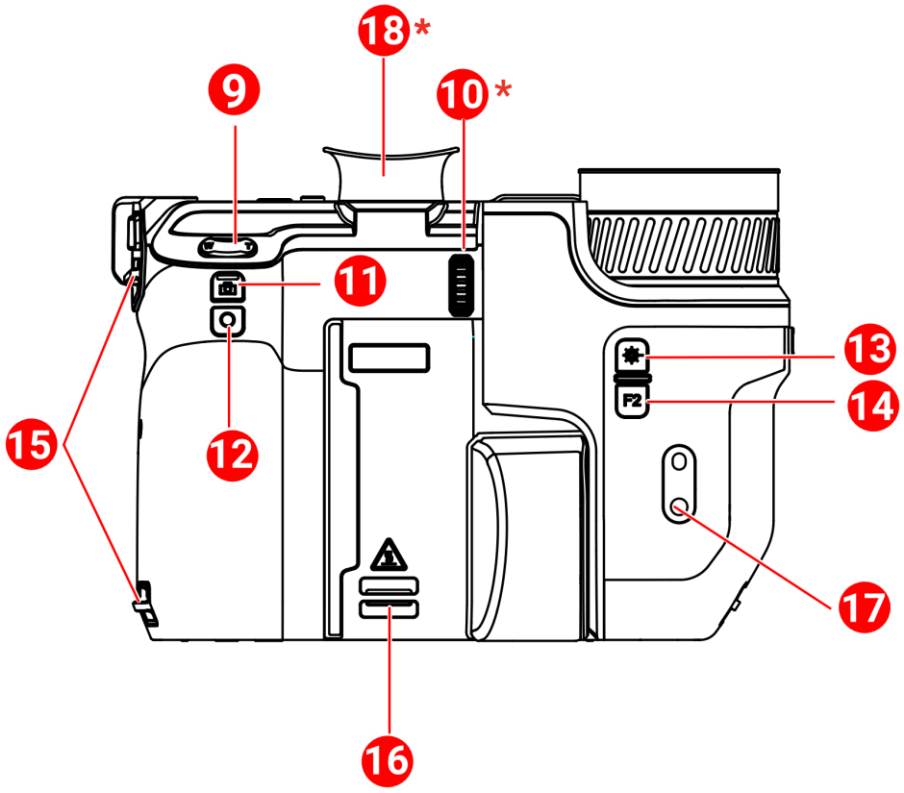

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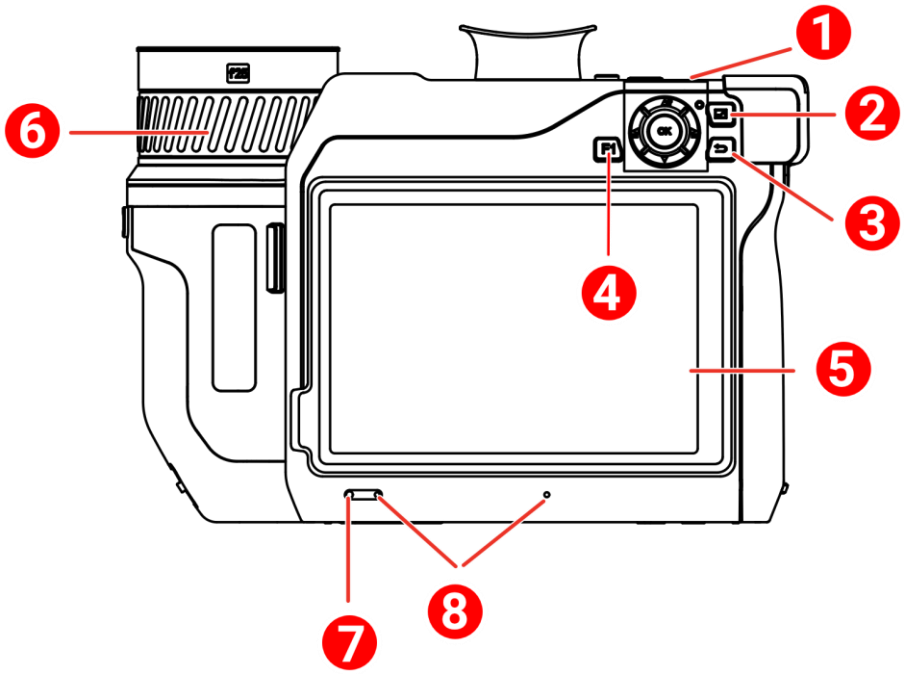

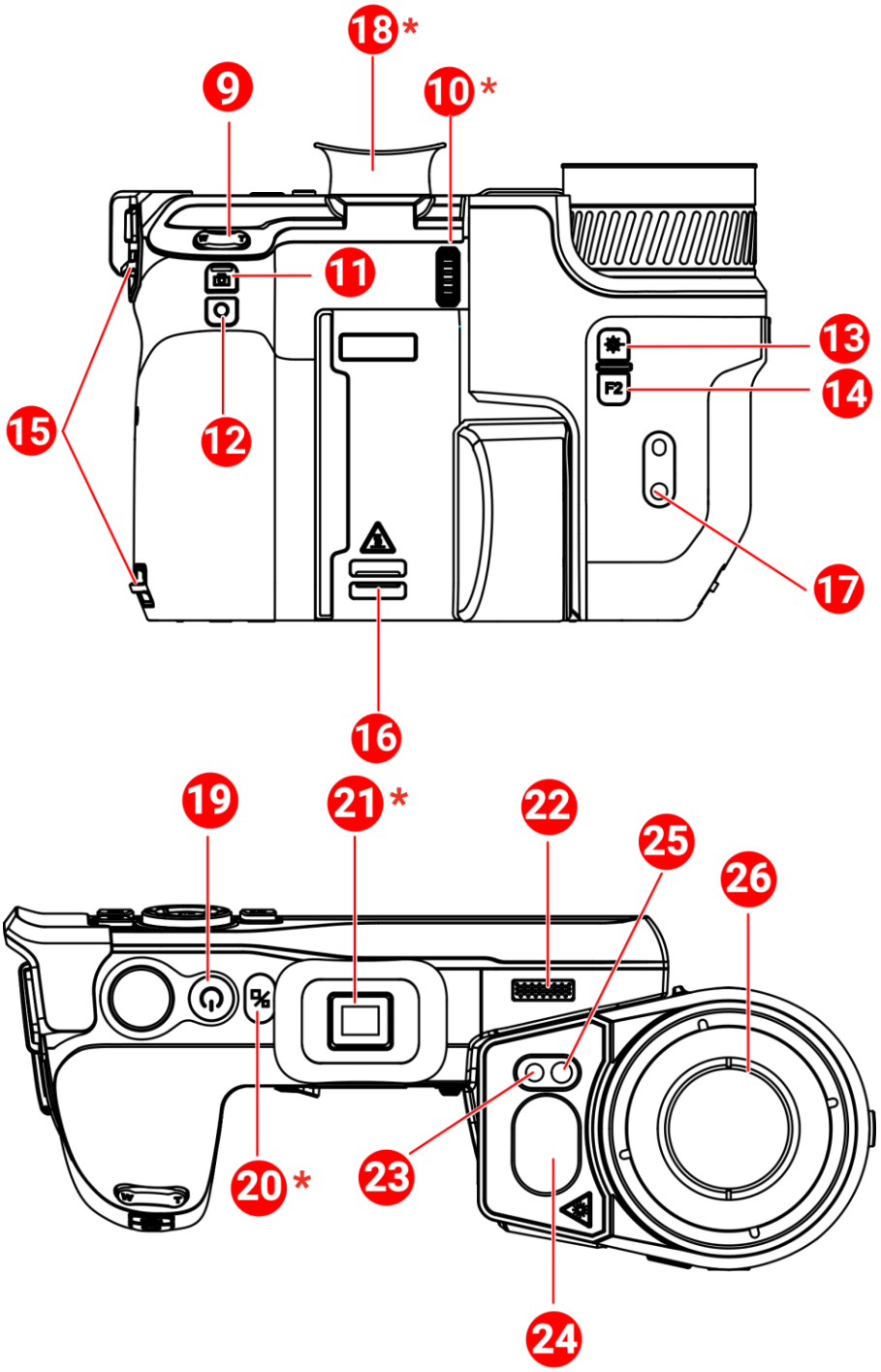
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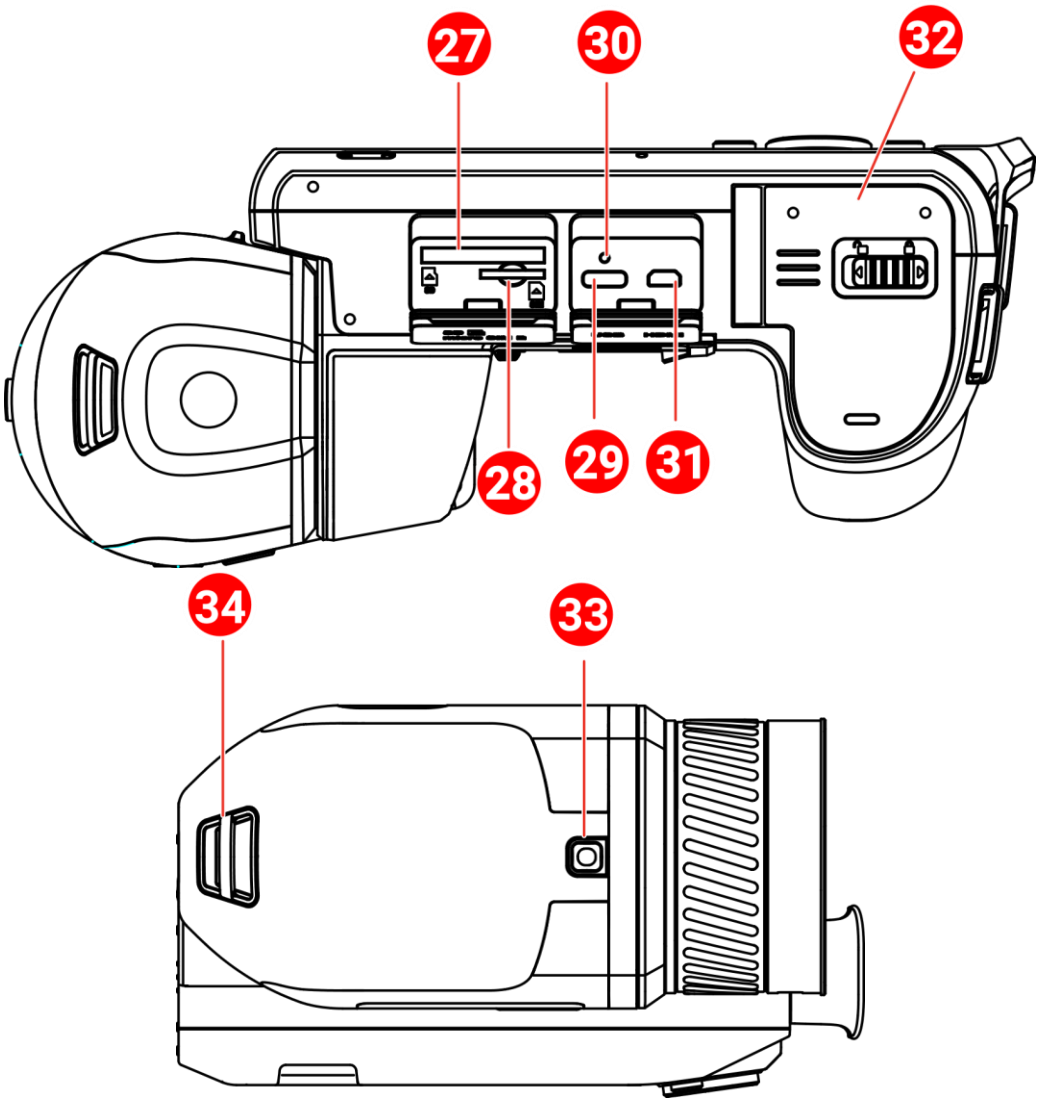


Figure 1-1 Buttons and Interfaces

Table 1-2 Button and Interface Description

No.	Description	Function
1	Navigation Button	Menu Mode: ● Press △, ▽, ◁, and ▷ to select parameters. ● Press OK to confirm. Non-Menu Mode: ● Press △ to turn on/off the LED light supplement. ● Press ◁ and ▷ to adjust focus.
2	File Button	Presses to enter albums.
3	Back Button	Exits the menu or returns to previous

No.	Description	Function
		menu.
4 & 14	Programmable Buttons	Presses F1/F2 button to use the custom function.
5	Touch Screen	● Shows the live view interface. ● Touch-screen operation.
6	Focus Ring	Adjusts focus to find clear targets.
7	Light Sensor	Senses the ambient brightness.
8	Microphone	Adds voice note.
9	Zoom Button	Presses ⊤ to zoom in, and press ⊥ to zoom out.
10	Diopter Adjustment Wheel	Adjusts the dioptric correction for the viewfinder.
11	Capture Button	● Press: capture snapshots/stop recording ● Hold: start recording
12	Focus Button	Presses to start focus.
13	Laser Button	● Press: measure the distance with laser once ● Hold: measure the distance with laser continuously
15	Hand Strap Attachment Point	Mounts the hand strap.
16 & 34	Neck Strap Attachment Point	Mounts the neck strap.
17	Tripod Mount	Mounts the tripod.
18	Viewfinder	Views live view through the viewfinder. See Display Switch Button.
19	Power Button	● Press: standby mode/wake up device ● Hold: power on/off
20	Display Switch Button	Switches the LCD and the Viewfinder.
21	Eyepiece Plug	Protects the eyepiece.
22	Loudspeaker	Plays voice note and voice alarm.
23	Optical Lens	Views the optical image.
24	Laser Distance Meter and Laser Output	Measures the distance with laser.

No.	Description	Function
25	Supplement Light	Increases ambient brightness in dark environment.
26	Thermal Lens	Views the thermal image.
27	Memory Card Slot	Inserts the memory card in it.
28	SIM Card Slot	Not Available.
29	Data Exchange Interface	Charges the device or export files with supplied cable.
30	Indicator	Indicates the charging status of the device. ● Solid red: charging normally ● Flashing red: charging exception ● Solid green: fully charged
31	Micro HDMI Interface	Connects the device with HDMI cable. A cable converter (HDMI Type D to HDMI Type A) is included in the carrying case.
32	Battery Compartment	Installs the battery in it.
33	Lens Release Button	Unlocks the interchangeable lens.

The laser radiation emitted from the device can cause eye injuries, burning of skin or inflammable substances. Before enabling the light supplement function, make sure no human or inflammable substances are in front of the laser lens.

2 Preparation

2.1 Cable Connection

Connect the device and power adaptor with a Type-C cable to charge the device battery. Alternatively, connect the device and PC to export files.

1. Lift the cable interface cover.
2. Connect the device and the Type-C cable.

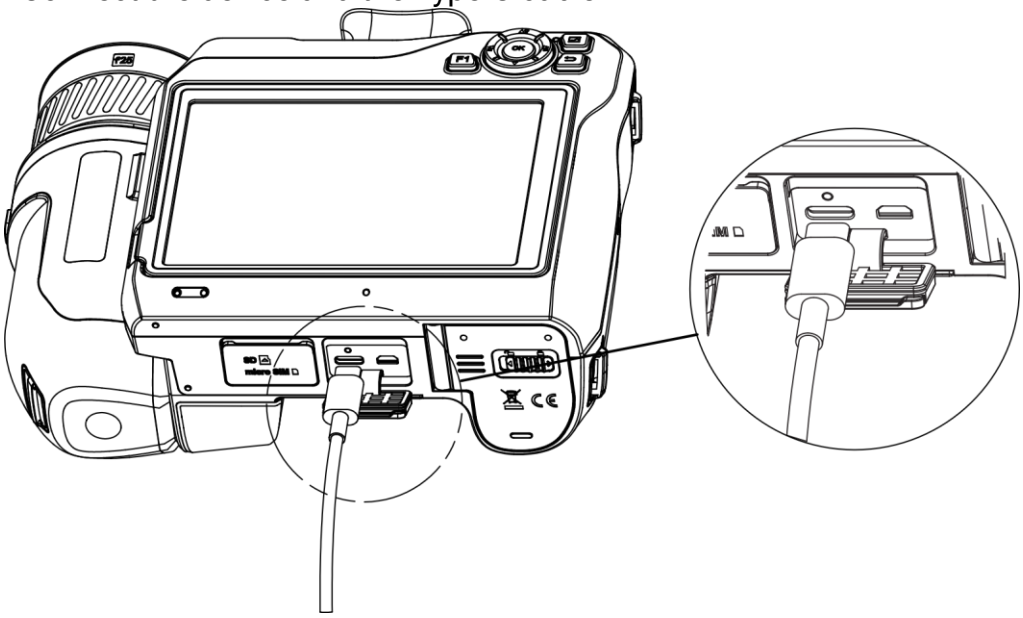


Figure 2-1 Connect to Type-C Cable

The power delivered by the charger must be between min 38 Watts required by the radio equipment, and max 50 Watts in order to achieve the maximum charging speed. USB PD fast charging is supported.

2.2 Charge Battery

2.2.1 Remove Battery

Before You Start

Turn off the device before you remove the battery.

1. Push the battery compartment lock leftwards to unlock the battery compartment, and then open the battery cover.

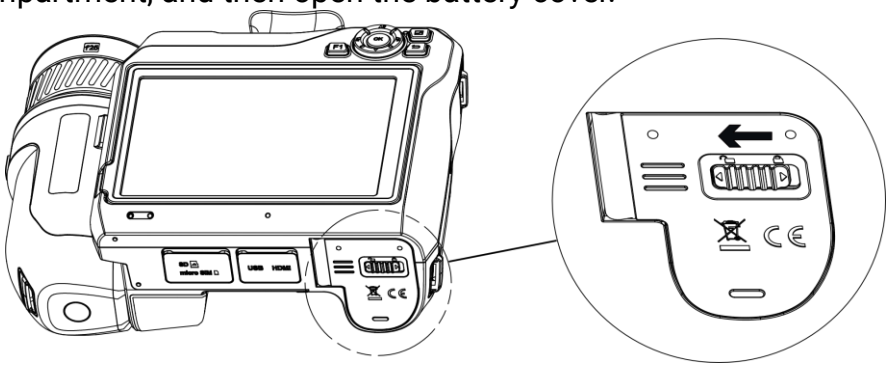


Figure 2-2 Unlock Battery Compartment

2. Push the inner battery lock (in the black circle) leftwards to release the battery.

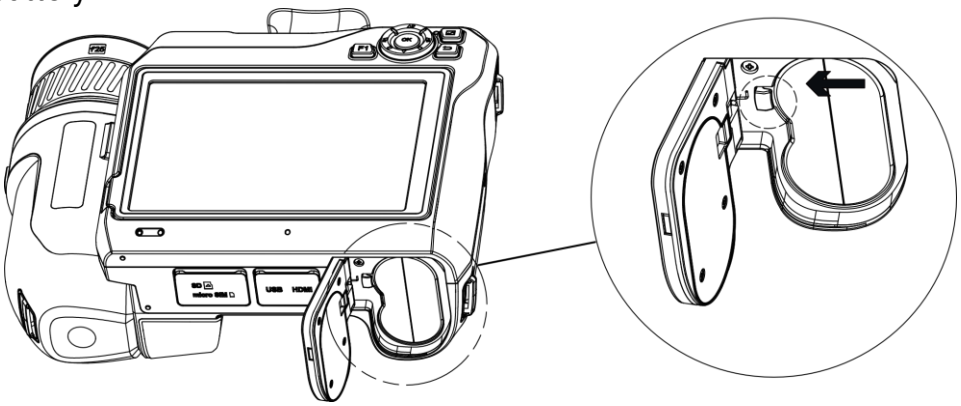


Figure 2-3 Release Battery

3. Take the battery out of the battery compartment.

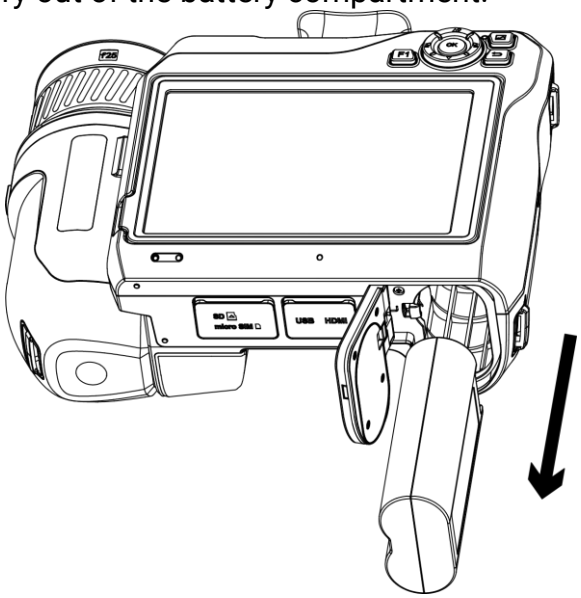


Figure 2-4 Remove Battery

2.2.2 Charge Battery via Charging Base

Please charge the battery with the cable and power adapter supplied by the manufacturer (or according to the input voltage from the specifications).

1. Put one or two batteries in the charging base.
2. Connect the supplied charging base to the power supply. The indicator in the middle is green if it works properly.
3. The left and right indicators show the charging status of the batteries.
   - Solid red: charging normally.
   - Solid green: fully charged.
4. Draw the battery from the charging base, and disconnect charging base from the power supply.

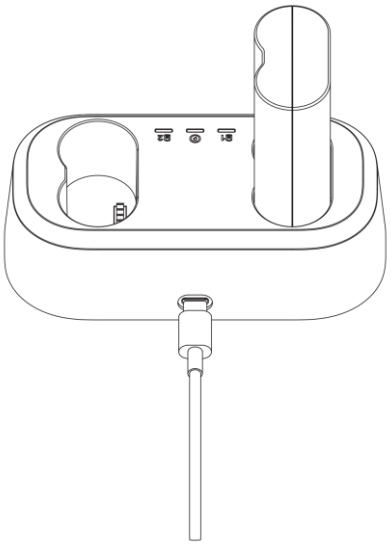


Figure 2-5 Charge Battery via Charging Base

In the first use, charge the device for more than 4 hours in the power-off status.

2.3 Change Interchangeable Lens

An interchangeable lens is a thermal lens that can be mounted to the device for obtaining different FOVs, scene scopes, and temperature

measurement ranges.

Before You Start

- Purchase a suitable interchange lens recommended by the device manufacturer.
- The device pops up a window to show the lens information or the calibration program when detecting a mounted lens.

1. Press the lens release button and turn the interchangeable lens anticlockwise until it stops.

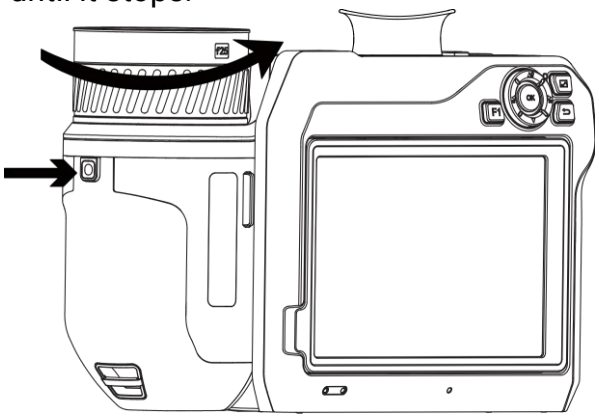


Figure 2-6 Release Lens

2. Remove the interchangeable lens carefully.

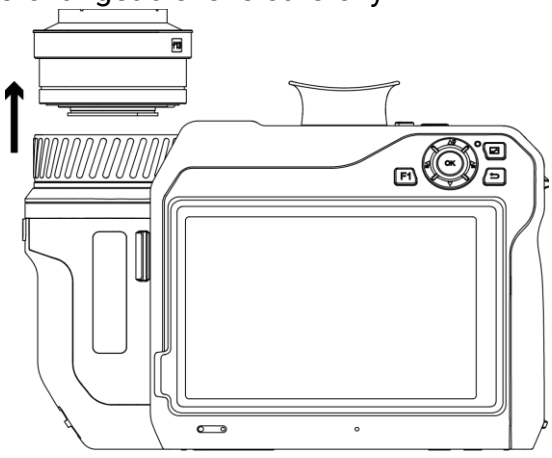


Figure 2-7 Remove Lens

3. Align the two white index marks on the device and the lens.

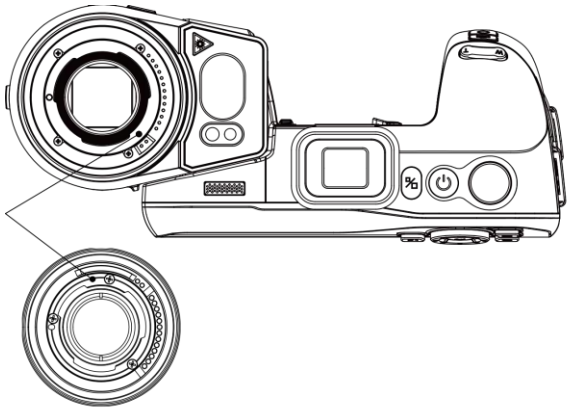


Figure 2-8 Align White Marks

4. Push the lens into position.

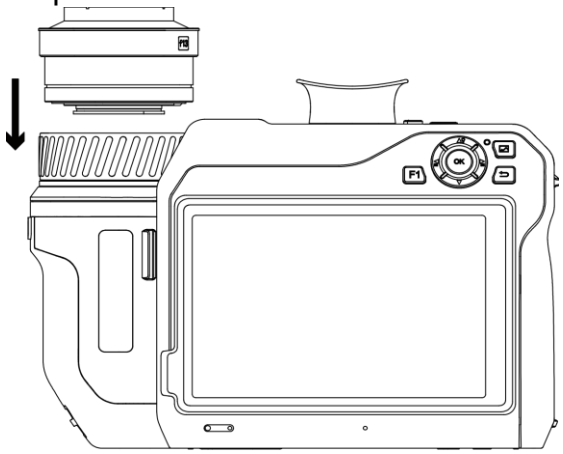


Figure 2-9 Mount Lens

5. Rotate the lens clockwise to fix it. The lens makes a click when it locks in place.

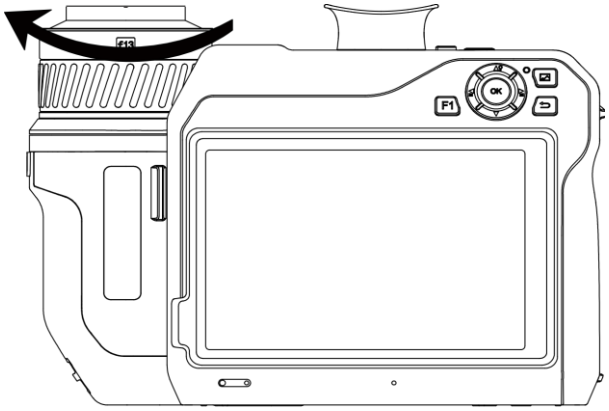


Figure 2-10 Fix Lens

A prompt pops up on the interface if the lens is not calibrated to the camera. Please contact the dealer or the nearest service center for lens calibration, or the temperature measurement accuracy is affected.

2.4 Detector Cleaning

Dust on the detector may cause blemishes in the image. To avoid detector damage, we recommended you to contact the nearest dealers or our service centers for help.

If you have to clean the detector on your own, please follow the steps:

Before You Start

- Prepare a pair of rubber gloves or rubber finger cover (not included).
- Prepare a compressed air canister (not included), a cleanroom wiper and a bottle of anhydrous ethanol (not included).

1. Remove the interchangeable lens carefully. Please see *Change Interchangeable Lens* for detailed information.

Wear a pair of rubber gloves or rubber finger cover before cleaning, in case of the chemical corrosion or the remaining fingerprints.

2. Use pressurized air from a compressed air canister to blow the dust off.
3. If there still have blemishes, use a supplied cleanroom wiper dipped in anhydrous ethanol to wipe it.

Please wipe the detector gently in a fixed direction.

2.5 Mount Hand Strap

1. Thread the hand strap through the hand strap clutch.

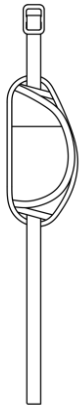


Figure 2-11 Thread Hand Strap

2. Insert one end of the hand strap through the two hand strap attachment points.

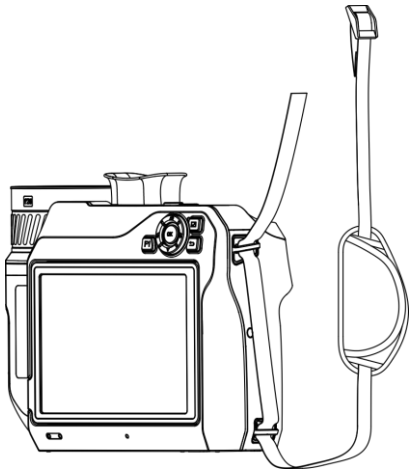


Figure 2-12 Thread Hand Strap Through Attachment Points

3. Thread hand strap through the hand strap buckle, and fasten the hand strap.

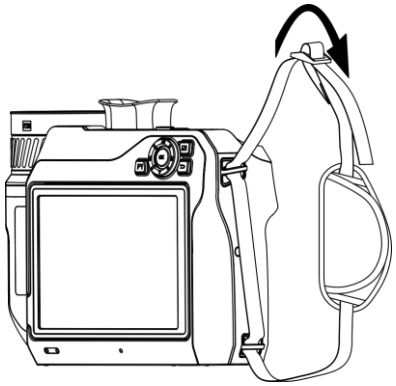


Figure 2-13 Fasten Hand Strap

4. Adjust the tightness of the hand strap as needed.

2.6 Mount Neck Strap

1. Insert one end of the neck strap through a neck strap attachment point.
2. Thread the neck strap through the buckle, and fasten the neck strap.

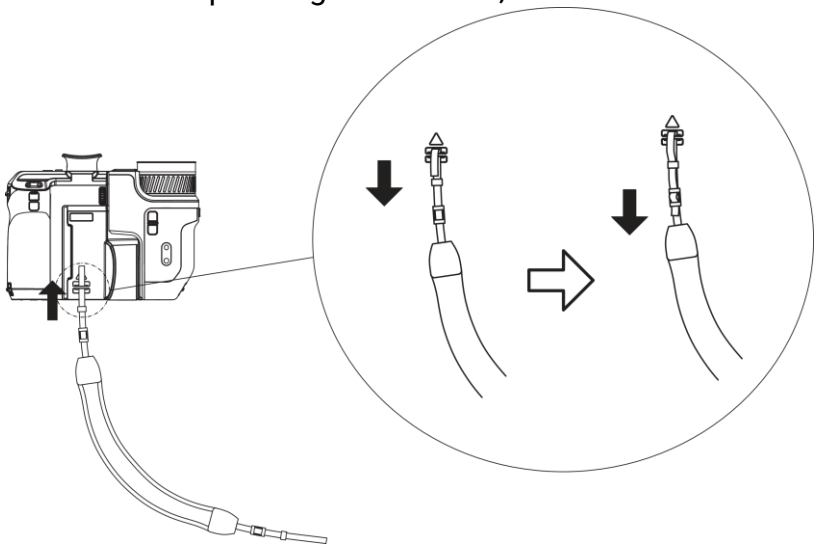


Figure 2-14 Fasten Hand Strap

3. Repeat above steps to complete mounting the neck strap.

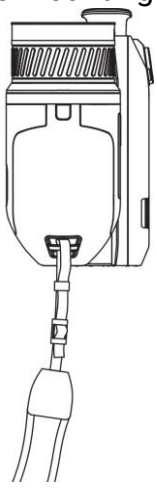


Figure 2-15 Install the Other End

2.7 Tilt Lens and Screen

You can tilt the lens and screen for different observation angles, as shown in *Figure 2-16*.

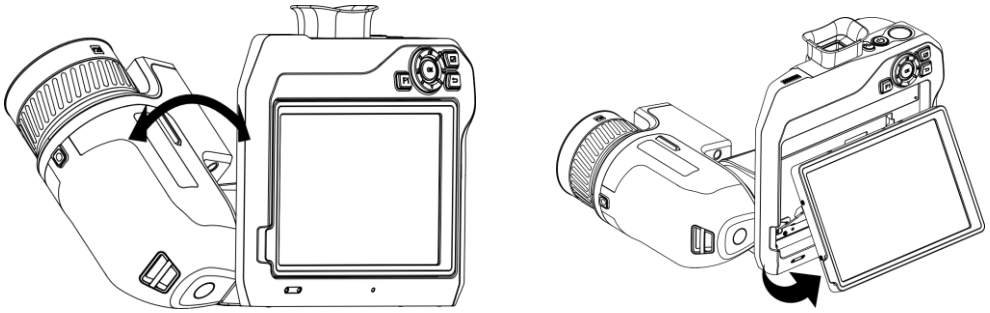


Figure 2-16 Tilt Lens and Screen

2.8 Power On/Off

Power On

Remove the lens cover, and hold ⏻ for over three seconds to turn on the device. You can observe the target when the interface of the device is stable.

- It may take at least 30 s until the device is ready for using when you power on it.
- It is necessary to set system language and time and date when you power on the device for the first time. Press ⮌ to save and exit.

Power Off

When the device is turned on, hold ⏻ for three seconds to power off the device.

Auto Power-off

Select ⚙, and go to **Device Settings > Auto Power-off** to set the automatic shutdown time for device as required.

2.9 Sleep and Wake

Sleep and wake function is used to save energy and increase battery time.

Sleep and Wake Manually

Press ⏻ to enter sleep mode and press it again to wake the device up.

Set Auto Sleep

Select ⚙, and go to **Device Settings** > **Auto Sleep** to set waiting time

before auto sleep. When there is no button pressing or screen tapping operation on device for more than the set waiting time, device enters sleep mode automatically.

Press ⏻ to wake the device up.

Device Sleep, Scheduled Capture and Video Recording

When the device is recording a video clip or on scheduled capturing, auto sleep will not be triggered. However, press ⏻ will stop the video recording or scheduled capture and force the device into sleep mode.

2.10 Operation Method

The device supports both touch-screen control and button control.

Touch-Screen Control

Tap the screen to set parameters and configurations.

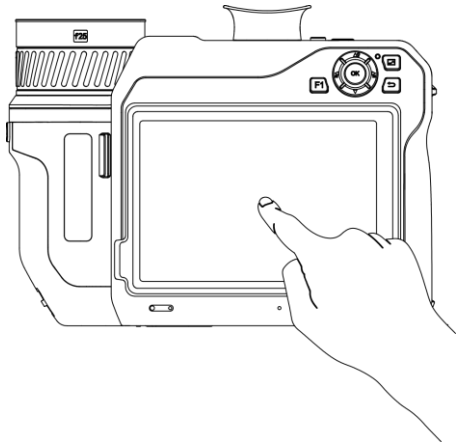


Figure 2-17 Touch-screen Control

Button Control

Press the navigation buttons to set parameters and configurations.

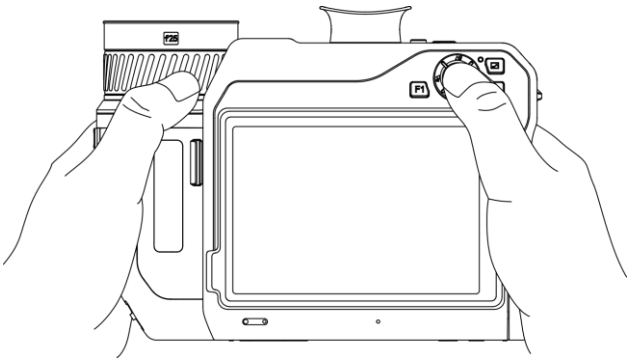


Figure 2-18 Button Control

- In menu mode, press △, ▽, ◁, and ▷ to select parameters.
- Press OK to confirm.

2.11 Menu Description

In the observation interface, tap the screen to show the menu bar, and swipe down the 1/3 area on the top of the screen to call the swipe-down menu.

2.11.1 Live View Interface

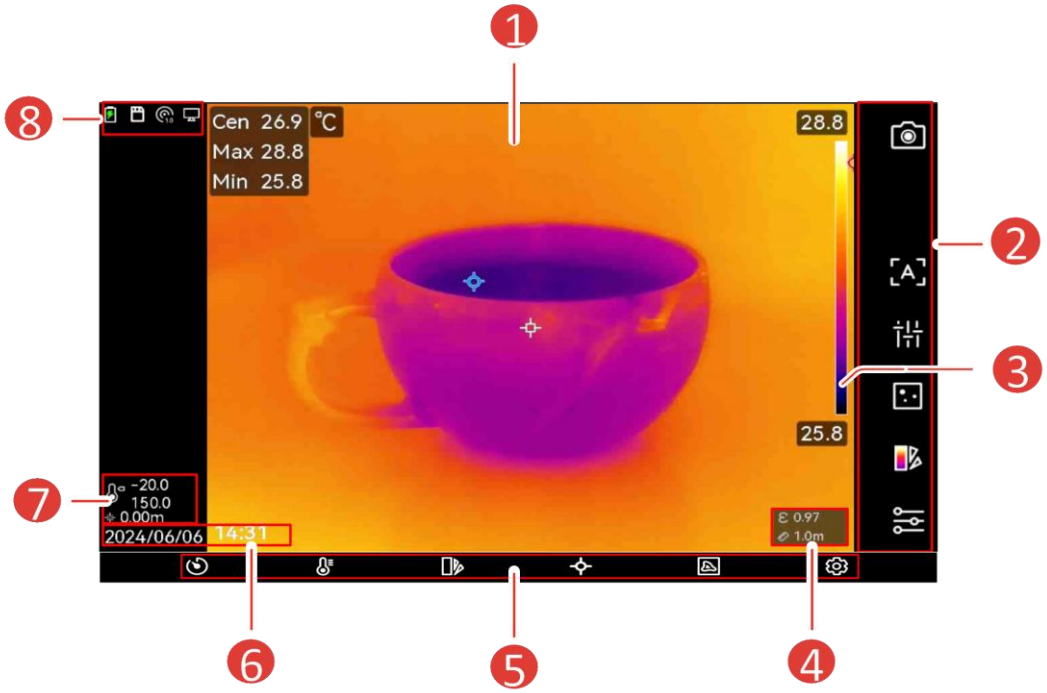


Figure 2-19 Live View

Table 2-1 Live View Interface Description

No.	Descriptions
1	Live view interface. Display the thermal images of the target and its real-time temperature values.
2	Shortcut bar. Record/camera mode, focus mode, level & span mode, display mode, palettes, and measurement settings support quick operation.
3	Palette bar and display temperature range. The upper and lower values of the palette bar represent the max.

No.	Descriptions
	temperature and the min. temperature of the current display temperature range.  If a "~" appears before a temperature value, it means that your device is not well prepared for accurate temperature measurement. Take target temperatures when the sign disappears.
4	Emissivity and Distance. Display the emissivity of the target and the observation distance between the target and the device.
5	Menu. Please see *Main Menu* for more details.
6	Time and date. Display the system time.
7	Temperature range and measured distance with laser. Display the set temperature measurement range and measured the distance with laser.
8	Status bar, where device working status, such as, battery and connections, are displayed. Please see *Table 2-2* for more details.

Table 2-2 Description of Status Display

Status Display	Description
	Battery Status
	The device is connected to PC via Type-C cable.
	Wi-Fi is connected.
	Memory Card is inserted.
	Bluetooth is on.
	Interchangeable Lens is mounted on the device and the interchangeable lens type is on the bottom right of the icon.
	The inspection data is transmitting to the device.
	Cast Screen is on.
	Compass is on. The number stands for the calibration level. Numbers smaller than 3 mean that the compass is not properly calibrated and the direction displayed might not be correct.
	Show current temperature measurement range. The devie only measures the temperatures in the

Status Display	Description
	range. Tap ⚙ > Temp Measurement Settings > Temperature Range to change working range.
	Display measured distance with laser. Tap ⚙ > **Display Settings** > **Distance** to switch it on/off.
	Display the longitude and latitude of the device. Tap ⚙ > **Device Settings** > **GPS** to switch it on/off.
	Display the device location. Tap ⚙ > **Device Settings** > **Compass** to switch it on/off.

Table 2-3 Description of Shortcut Function

Icon	Description
	Tap to take snapshots and record videos. ● Tap to take snapshots. is in picture capture progress. Tap to stop. ● Press and hold to record videos. is in video recording progress. Tap to stop.
/ /	Tap to switch focus mode. Please see *Focus* for more details.
	Tap to switch manual and auto level & span. Please see *Adjust Level & Span* for more details.
/ / / /	Tap to switch display mode. Please see *Set Display Mode* for more details.
	Tap to switch palettes. Please see *Set Palettes* for more details.
	Tap to set temperature measurement parameters such as humidity, emissivity, distance, and temperature. Please see *Set Measurement Parameters* for more details.

2.11.2 Main Menu

Figure 2-20 Main Menu

Table 2-4 Description of Main Menu

Icon	Description	Icon	Description
	Shutter. Tap to calibrate image one time (FFC).		Temperature Measurement Tool. Tap to set temperature measurement tools. Please see *Set Measurement Tool* for more details.
	Level & Span. Please see *3.5* for more details.		Display Mode. Tap to switch display modes. Please see *Set Display Mode* for more details.
	Palettes. Please see *Set Palettes* 3.3 for more details.		Settings.

2.11.3 Swipe-Down Menu

In live view interface, swiping on the screen from upper to lower to call the swipe-down menu. With this menu, you can turn on/off device function, change display theme, and adjust screen brightness.

Tap and hold Wi-Fi, Hotspot, and Bluetooth icon in swipe-down menu to enter corresponding configuration interface.

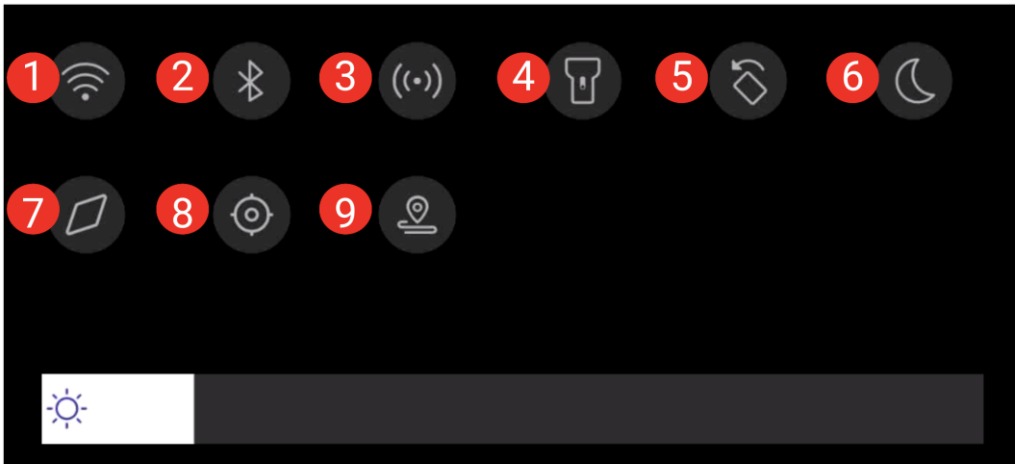


Figure 2-21 Swipe-down Menu

Table 2-5 Swip-down Menu Table

No.	Function
1	Wi-Fi
2	Bluetooth
3	Hotspot
4	Flashlight
5	Auto-Rotation
6	Dark/Bright Mode
7	Compass
8	GPS
9	Inspection Mode

3 Display Settings

Your device will periodically perform a self-calibration to optimize image quality and measurement accuracy. In this process the image will pause briefly and you'll hear a "click" as a shutter moves in front of the detector. The self-calibration will be more frequent during start up or in very cold or hot environments. This is a normal part of operation to ensure optimum performance for your device.

3.1 Focus

Adjust the lens focal length properly before you set any other configurations, or it may affect the image display and temperature accuracy.

3.1.1 Focus Lens

1. Power on the device.
2. Aim the device lens to the appropriate scene.
3. Adjust the focus ring clockwise or anticlockwise until the target is clear.

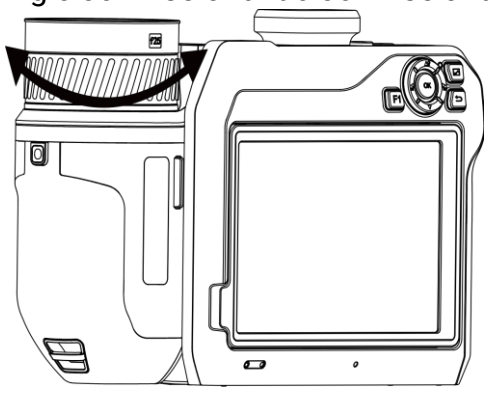


Figure 3-1 Focus Lens

DO NOT touch the lens, or the imaging effect may be affected.

3.1.2 Laser Assisted Focus

Aim the laser to the target and the device focuses automatically.

Before You Start

It is recommended to use this function in a non-glare environment, such as indoor environment.

The target should have good light reflection, such as white paper and cables.

1. Enable **Laser Assisted Focus** by the following ways:
   - Select , and go to **Capture Settings** > **Focus** > **Thermal Focus Mode** to enable **Laser Assisted Focus**.
   - In live view, tap the focus shortcut key in shortcut bar and switch to **Laser Assisted Focus** .
2. In the live view interface, aim image center at the target and press ◎ to finish focus.
3. When you see a red dot displayed in the image center and a laser dot at the target, release the trigger to start focusing automatically.

The laser radiation emitted from the device can cause eye injuries, burning of skin or inflammable substances. Prevent eyes from direct laser. Before enabling the function, make sure no human or inflammable substances are in front of the laser lens.

4. Optional: If the focusing effect is not satisfactory, slightly adjust the focus ring for better image.

3.1.3 Auto Focus

The device focuses automatically in current scene by comparing the brightness, contrast, etc. In this mode, you can pull the trigger or touch the screen to focus.

1. Enable **Auto Focus** by the following ways:
   - Select , and go to **Capture Settings** > **Focus** > **Thermal Focus Mode** to enable Auto Focus.
   - In live view, tap the focus shortcut key in shortcut bar and switch to **Auto Focus** .
2. In the live view interface, aim image center at the target and press ◎ to finish focus. The device adjusts its focus on targets in the image center.

3. Optional: If you want to switch the focus to other objects, tap the desired screen area to adjust the focus.

- DO NOT adjust the focus ring when the device is auto focusing, otherwise it will interrupt the auto focusing process.
- If the target is not clearly focused in this mode, adjust the focus ring to fine-tune the image.

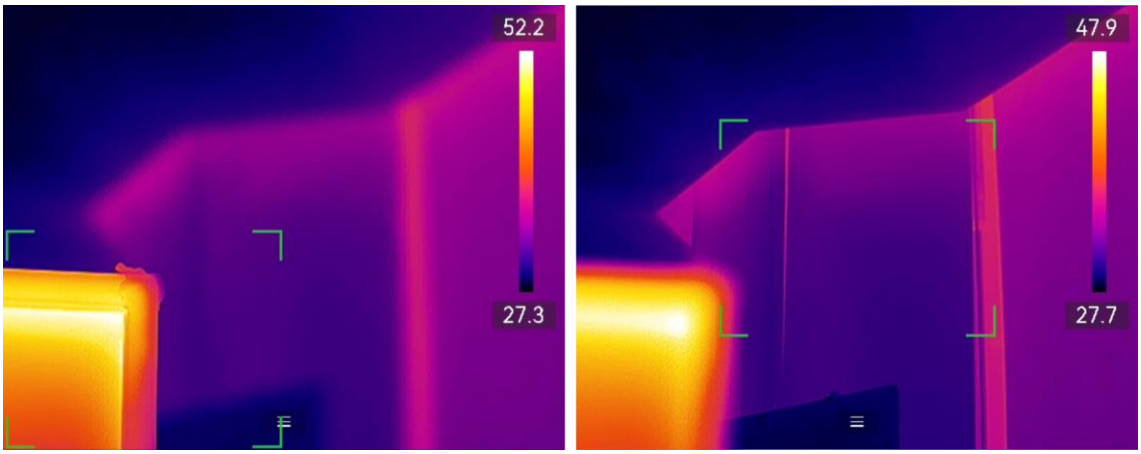


Figure 3-2 Switch Focus Object

3.1.4 Continuous Autofocus

In continuous autofocus mode, the device focuses on the target automatically to make the scene clear. Use this mode when the device is stationary.

Disable continuous autofocus mode when the device is moving, or it may affect the device function.

You can enable **Continuous Autofocus** by the following ways:

- Select , and go to **Capture Settings > Focus > Thermal Focus Mode** to enable **Continuous Autofocus**.
- In live view, tap the focus shortcut key in shortcut bar and switch it to **Continuous Autofocus** .

Then aim the device at the target, and the device focuses automatically.

Focus ring adjustment does not take effect in this mode.

3.1.5 High Temperature Priority

Enable the high temperature priority function if you want to focus on the high temperature object in the observation scene.

Select , and go to Capture Settings > Focus to enable High Temperature Priority.

The high temperature priority function is only supported in auto focus mode and continuous autofocus mode.

3.2 Set Screen Brightness

The device supports auto or manual screen brightness adjustment.

Table 3-1 Table 3-1 Screen Brightness Adjustment

Method	Operation
Manual	Select , and go to **Settings** > **Device Settings** > **Screen Brightness** to adjust the screen brightness. Or tap , and drag it to adjust the screen brightness.
Auto	Select , and go to **Settings > Device Settings > Screen Brightness** to enable **Auto**. Device adjusts the screen brightness automatically when the ambient brightness changes.

3.3 Set Display Mode

You can set the thermal/optical view of the device. **Thermal**, **Fusion**, **PIP**, **Visual,** and **Blending** are selectable.

1. Switch the display mode by the following ways:
   - Select from the main menu, and tap the icons to select a display mode.
   - In live view, tap the focus shortcut key in shortcut bar and switch display mode.

Display Mode	Description
	In thermal mode, the device displays the thermal view.
	In fusion mode, the device displays the thermal image of the live view outlined from visual image.
	In PIP (Picture in Picture) mode, the device displays thermal view inside the optical view. You can drag the corners of the PIP frame to move, enlarge, or contract it.
	In blending mode, the device displays the mixture view of thermal channel and visual channel. You can adjust the **Level** to change the optical-thermal ratio. The lower the value is, the denser the visual effect is.
	In visual mode, the device displays the visual view. You can drag the corners of the PIP frame to move, enlarge, or contract it.

2. Press ⮌ to exit.

3.4 Set Palettes

The palettes allow you to select the desired colors.

Switch palettes via from the main menu, or in the shortcut bar. Available common palettes are:

Palettes	Description
White Hot	The hot part is light-colored in view.
Black Hot	The hot part is black-colored in view.
Rainbow	The target displays multiple colors. It is suitable for scene without obvious temperature difference.
Ironbow	The target is colored as heated iron.
Red Hot	The hot part is red-colored in view.
Fusion	The hot part is yellow-colored and the cold part is purple-colored in view.
Rain	The hot part in the image are colored, and the else is blue.
Blue Red	The hot part in the image is colored red, and the else is blue.

- You can also press , and to switch the palettes.
- Common palettes are allowed to be reversed through **Settings** > **Capture Settings** > **Reversed Palette**. Colors representing high and low temperature display in reverse order.

3.4.1 Set Alarm Mode Palettes

Alarm mode palettes allows to mark the targets of certain temperature range with a different color from the rest.

1. Select from the main menu.
2. Tap to get more options.
3. Tap the icons to select an alarm tool.

Table 3-2 Icon Description

Icon	Alarm Mode	Description
	Above Alarm	Set the alarm temperature, and the targets with the temperature higher than the set value are displayed in red.
	Below Alarm	Set the alarm temperature, and targets with the temperature lower than the set value are displayed in blue.
	Interval Alarm	Set the alarm temperature section (e.g., 90 °C to 150 °C), and targets with the temperature in the range are displayed in yellow.

Icon	Alarm Mode	Description
	Insulation Alarm	According to the set values of **Indoor Temp.** and **Outdoor Temp.**, the device calculates the insulation value based on the built-in rules, and detects whetheher the insulation value of the target internal surface exceeds **Insulation Level** (normally 60 ~ 80). The area with insulation anormalies outside of the range is displayed in cyan.  ● It is suggested to set **Insulation Level** in 60 ~ 80. The higher the value is, the stricter requirements on insulation the target will have. ● It is suggested to go indoors and observe the target for result accuracy.

4. Set temperature values.
   - Press △ and ▽ to select between upper limit and lower limit. Press ◁ and ▷ to adjust the temperature.
   - Tap on the screen to select an interest area. The device automatically adjusts the upper and lower temperature limit of the selected scene. Press ◁ and ▷ to fine-tune the temperature.

You can tap **</>** on the left or right side of the value box to adjust the values. Press and hold to quickly adjust the values.

5. Press ⮌ to exit.

3.4.2 Set Focus Mode Palettes

Focus mode palettes allows to mark the targets of certain temperature range with fusion palettes and the others with white hot palettes.

1. Select  from the main menu.
2. Tap the icons to select an alarm tool.

Table 3-3 Icon Description

Icon	Palettes Mode	Description
	Above Focus	Targets with the temperature higher than the set value of temperature threshold are displayed with fusion palettes.
	Below Focus	Targets with the temperature lower than the set value of temperature threshold are displayed with fusion palettes.
	Interval Focus	Targets in the set temperature range are displayed with fusion palettes.

3. Set a temperature range.
   - Press △ and ▽ to select between upper limit and lower limit. Press ◁ and ▷ to adjust the temperature.
   - Tap on the screen to select an interest area. The device automatically adjusts the upper and lower temperature limit of the selected scene. Press ◁ and ▷ to fine-tune the temperature.
4. Press ↩ to exit.

3.5 Adjust Level & Span

Set a temperature range and the palette only works for targets within the temperature range. You can adjust the temperature range.

1. Select from the main menu.
2. Select **Auto** or **Manual** adjustment.
   - **Auto**: The device adjusts temperature range parameters automatically.
   - **Manual**: Adjust the range manually. **Level Only** and **Level or Span** modes are selectable.

Tap in the shortcut bar to quickly switch between auto and manual level & span.

3. For Manual mode, go to > **Temp Measurement Settings** > **Manual Level and Span Mode** to choose a preferred mode. **Level Only** and **Level or Span** are selectable.

Table 3-4 Manual Level & Span

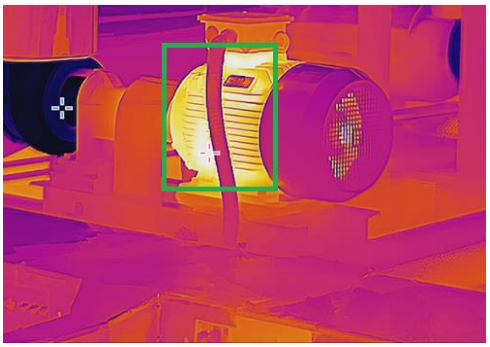
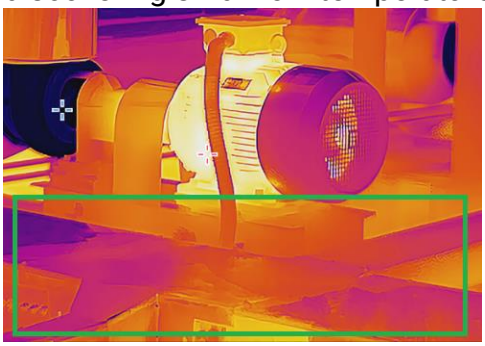
Mode	Mode Description	Operation
Level Only	You can adjust the maximum temperature and the minimum temperature respectively to expand or reduce the temperature range.	1. Tap an interest area on screen. A circle is displayed around the area, and the temperature range re-adjusts to show as many details of the area as possible. 2. Press and , or tap the value on screen to lock or unlock a value. 3. Press and , or scroll the adjustment wheel on screen to fine-tune the max. temperature and the min. temperature respectively. 4. Tap **OK** to finish.
Level or Span	You can adjust the maximum temperature and the minimum temperature at the same time while keeping the same temperature range.	1. Tap on an interest area on screen. A circle is displayed around the area, and the temperature range re-adjusts to show as many details of the area as possible. 2. Press and to fine-tune the max. temperature and the min. temperature respectively. 3. Tap **OK** to finish.

3.6 Set Color Distribution

Color distribution function provides different image display effects in auto level & span. Liner and histogram color distribution modes can be selected for different application scenes.

1. Select , and go to Device Settings > Color Distribution.
2. Select a color distribution mode.

Table 3-5 Color Distribution

Mode	Description
Linear	Linear mode is used to detect small high temperature targets in low temperature background. Linear color distribution enhances and displays more details of high temperature targets, which is good for checking small high temperature defective areas such as cable connectors. 
Histogram	Histogram mode is used to detect temperature distribution in large areas. Histogram color distribution enhances high temperature targets and remains some details of low temperature objects in the area, which is good for discovering small low temperature targets such as cracks. 

3. Press ⮌ to exit.

3.7 Adjust Digital Zoom

In the live view interface, zoom in or zoom out the image as follows:

- Press 𝕋 and 𝕎 to zoom in or zoom out by 0.1× continuously. Hold 𝕋 and 𝕎 to zoom in or zoom out by 1×, 2×, etc.
- Pinch to zoom out and spread to zoom in the image on screen.

The current digital zoom settings will not be restored when the device reboots.

3.8 Set Auto-Rotation

The device supports display auto-rotation where the status bar, shortcut bar and main menu shift from the horizontal direction to the vertical direction.

Switch on the auto-rotation function as follows:

- In live view, swipe down 1/3 area on the top of the screen to enter the swipe-down menu, and tap .
- Tap > **Device Settings** > **Auto-Rotation.**

In the vertical direction, tap in live view, and the main menu appears.

3.9 Display OSD Info

Select , and go to **Display Settings** to enable the information on-screen display.

Table 3-6 Display Settings

Function	Description
Status Icon	The device status icons, for example, battery status, memory card, hotspot, etc.
Time and Date	Device time and date.
Parameters	Thermography parameters, for example, target emissivity, temperature unit, etc.
Distance	Laser measurement result.
Brand Logo	The brand logo is a manufacturer logo displayed on the upper right corner of the screen.
Temperature Scale	Display the palettes bar and temperature range on the right side of the screen.

4 Temperature Measurement

The temperature measurement function provides the real-time temperature of the scene and displays it in the left corner in live view interface.

Your device will periodically perform a self-calibration to optimize image quality and measurement accuracy. In this process the image will pause briefly and you'll hear a "click" as a shutter moves in front of the detector. The self-calibration will be more frequent during start up or in very cold or hot environments. This is a normal part of operation to ensure optimum performance for your device.

4.1 Set Measurement Parameters

You can set measurement parameters to improve the accuracy of temperature measurement.

1. Select , and go to Temp Measurement Settings.
2. Set temperature measurement parameters as needed.
3. Return to previous menu to save the settings.

Parameters	Description
Temperature Range	Select the temperature measurement range. The device can detect the temperature and switch temperature range automatically in Auto Switch mode
Emissivity	Set the emissivity of your target.
Reflection Temperature	If any object (not the target) of high temperature is in the scene, and the target emissivity is low, set the reflection temperature as the high temperature to correct the temperature effect.
Ambient Temperature	Set the temperature for the observation environment. Swipe up and down to adjust the values.
Distance	The distance between the target and the device. You can customize the target distance or select the target distance as Near, Middle, or Far.
Humidity	Set the relative humidity of current environment.
External Optics Transmittance	Set the optics transmittance of external optical material (e.g.germanium window) to improve the temperature measuring accuracy.  When you install a macro lens, the device switches to macro mode automatically. In macro mode, settings such as display mode, distance, and optical transmissivity cannot be modified.

Select , and go to **Device Settings** > **Device Initialization** > **Remove All Measurement Tools** to initialize the temperature measurement parameters.

4.2 Set Image Measurement

You can set three types of temperature measurement tools.

Table 4-1 Icon Description

Icon	Description
	Hot Spot Temperature Measurement
	Cold Spot Temperature Measurement
	Center Spot Temperature Measurement

The setting methods of center spot, hot spot, and cold spot temperature measurement are all the same. Here is the example of image measurement.

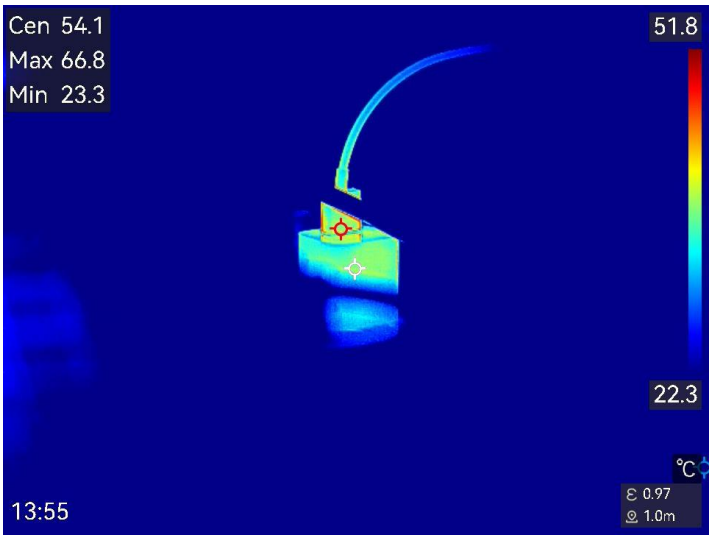


Figure 4-1 Image Measurement

4.3 Set Measurement Tool

You can set temperature measurement parameters to improve the accuracy of temperature measurement.

Before You Start

Set parameters such as **Humidity**, **External Optics Transmittance** and **Reflection Temperature**. For detailed explanations, see *Set Measurement Parameters*.

1. Tap to call the measurement tool bar.
2. Select a temperature measurement tool.

Table 4-2 Measurement Tools

Tool Name	Descriptions
Custom Spot	For configuring custom spot tools, see Measure by Custom Spot.
Line	For the configuring line tools, see Measure by Line.
Rectangle	For the configuring rectangle tools, see Measure by Rectangle.
Circle	For the configuring circle tools, see Measure by Circle.
ΔT	For the configuring ΔT tools, see Measure ΔT and ΔT Alarm.

Figure 4-2 Temperature Measurement Tools

What to do next

Set temperature alarm, then alarm actions such as audible warning and flashing alarm will be triggered when the tested temperature exceeds the set alarm value. See *Temperature Alarm*.

4.3.1 Measure by Custom Spot

The device can detect the temperature of a custom spot.

1. Tap to add a default spot.
2. Move the spot with the navigation buttons, or tap on the touch-screen to select a spot and move it.
3. Tap to modify temperature measurement parameters.

Table 4-3 Measurement Parameters of Custom Spot

Parameters	Description
Emissivity	Set the emissivity of your target.
Distance	Set the distance between the target and the device.
Temp.	Tap to display or hide the temperature measurement result.

4. Press .

The temperature of custom spot (e.g. P1) displays P1: XX.

If the tool-specific emissivity and distance are set, the measurement is conducted based on the parameters. Otherwise, the parameters set from **Temp Measurement Settings** are used for measurements.

5. Tap to add more custom spots.

- At most ten custom spots are supported.
- Drag the spot tool list on the left of the screen, or press , , and to view the whole tool list.

6. Optional: Modify the set custom spot tools, hide or display the tools and measurement results, etc.

	Tap to enter the editing interface and modify temperature measurement parameters such as emissivity and distance.
/	Tap to hide or display the tool and measurement results.
	Tap to delete the tool.

7. Press to save and exit.

4.3.2 Measure by Line

1. Tap .to generate a default line.

Only one line tool is supported.

2. Move the line to the required position.
   - Tap the line, and press , , and to move the line up/down/left/right.
   - Tap the line on touch-screen and drag it to the required position.
3. Adjust the length of the line.
   - Tap the end of the line, and press , , and to extend or shorten the line.
   - Tap and drag the end of the line to extend or shorten it.
4. Tap to modify temperature measurement parameters.

Table 4-4 Measurement Parameters of Line Tool

Parameters	Description
Emissivity	Set the emissivity of your target.
Distance	Set the distance between the target and the device.
Max./Min./Average Temperature	Tap to enable the temperature types to display. The max. temperature, min. temperature, and average temperature of the line can be displayed on the left of the screen.

5. Press ⮌.

If the tool-specific emissivity and distance are set, the measurement is conducted based on the parameters. Otherwise, the parameters set from **Temp Measurement Settings** are used for measurements.

6. Modify the set line tool, hide or display the tool and measurement results, etc.

	Tap to enter the editing interface and modify temperature measurement parameters such as emissivity and distance.
/	Tap to hide or display the tool and measurement results.
	Tap to delete the tool.

7. Press ⮌ to save and exit.

4.3.3 Measure by Rectangle

1. Tap ▢ to generate a default rectangle.
2. Move the rectangle to the required position.
   - Tap the rectangle, and press ◁, ▷, △ and ▽ to move the rectangle up/down/left/right.
   - Tap and drag the rectangle on touch-screen to move it to the required position.
3. Adjust the size of the rectangle.
   - Tap one corner of the rectangle, and press ◁, ▷, △ and ▽ to enlarge or contract the rectangle.
   - Tap and drag the corner of the rectangle on touch-screen to enlarge or contract it.
4. Tap ☰ to modify temperature measurement parameters.

Table 4-5 Measurement Parameters of Rectangle Tool

Parameters	Description
Emissivity	Set the emissivity of your target.
Distance	Set the distance between the target and the device.
Max./Min./Average Temperature	Tap to enable the temperature types to display. The max. temperature, min. temperature, and average temperature of the rectangle can be displayed on the left of the screen.

5. Press ⮌ to save the settings.

If the tool-specific emissivity and distance are set, the measurement is conducted based on the parameters. Otherwise, the parameters set from **Temp Measurement Settings** are used for measurements.

6. Tap ✚ to add more rectangle tools.

At most five rectangle tools are supported.

7. Optional: Modify the rectangle tools, hide or display the tools and measurement results, etc.

✎	Tap to enter the editing interface and modify temperature measurement parameters such as emissivity and distance.
👁/🚫	Tap to hide or display the tool and measurement results.
🗑	Tap to delete the tool.

8. Press ⮌ to save and exit.

4.3.4 Measure by Circle

1. Tap ◯ to generate a default circle.
2. Move the circle to the required position.
   - Tap the circle, and press ◁, ▷, △ and ▽ to move the circle up/down/left/right.
   - Tap and drag the circle on touch-screen to move it to the required position.
3. Adjust the size of the circle.

- Tap one point on the circle, and press , , and to enlarge or contract the circle.
- Tap and drag one point of the circle on touch-screen to enlarge or contract it.

4. Tap to modify temperature measurement parameters.

Table 4-6 Measurement Parameters of Circle Tool

Parameters	Description
Emissivity	Set the emissivity of your target.
Distance	Set the distance between the target and the device.
Max./Min./Average Temperature	Tap to enable the temperature types to display. The max. temperature, min. temperature, and average temperature of the circle can be displayed on the left of the screen.

5. Press to save the settings.

If the tool-specific emissivity and distance are set, the measurement is conducted based on the parameters. Otherwise, the parameters set from **Temp Measurement Settings** are used for measurements.

6. Tap to add more circle tools.

At most five circle tools are supported.

7. Optional: Modify the circle tools, hide or display the tools and measurement results, etc.

	Tap to enter the editing interface and modify temperature measurement parameters such as emissivity and distance.
/	Tap to hide or display the tool and measurement results.
	Tap to delete the tool.

8. Press to save and exit.

4.4 Measure ΔT and ΔT Alarm

By comparing the temperature difference (ΔT) between measurement tools, or between a measurement tool and a certain temperature, device can recognize temperature exception more accurately and rapidly. This function is commonly applied to the temperature measurement of temperature-sensitive targets such as current transformers.

Before You Start

Configure at least one temperature measurement tool.

- For configuring custom spot tools, see *Measure by Custom Spot.*
- For the configuring line tools, see *Measure by Line.*
- For the configuring rectangle tools, see *Measure by Rectangle.*
- For the configuring circle tools, see *Measure by Circle.*

1. Tap .
2. Add a ΔT tool.
   1) Input a tool name for the ΔT tool in **Name of Tool**.
   2) Select Compared Object.

You can compare the temperature difference between different or the same measurement tools, between a measurement tool and a number, etc. If you select **Number** as a compared object, input the value manually.

   3) Set Alarming ΔT: When the detected ΔT is greater than the set alarming ΔT, device triggers alarms.
   4) Tap OK to save the settings.
3. Optional: Repeat above steps to set other ΔT tools.
4. Optional: Modify the ΔT tools, hide or display the tools and measurement results, etc.

	Tap to enter the editing interface and modify ΔT tool parameters such as emissivity and distance.
/	Tap to hide or display the ΔT tool and measurement results.
	Tap to delete the ΔT tool.

5. Press to save and exit.

6. Enable **ΔT Alarm**.
   1) Select , and go to Temp Measurement Settings > Alarm Settings.
   2) Slide to enable **ΔT Alarm.**

If you do not enable **ΔT Alarm**, the alarm linkages also take effect, but the ΔT alarm information will not be uploaded to the surveillance center.

4.5 Temperature Alarm

When the temperature of targets triggers the set alarm, the device will perform configured actions, such as, flashing the rule frame, making an audible warning, or sending notification to the client software.

4.5.1 Set Alarms for Exceptional Temperatures

Alarm actions such as audible warning and flashing alarm are triggered when the tested temperature exceeds the set alarm value.

1. Select , and go to Temp Measurement Settings > Alarm Settings.
2. Set alarm parameters.

Alarm Threshold

When the tested temperature exceeds the threshold, the device sends alarm notification to the client software. It beeps if the **Audible Warning** is enabled. It flashes if the **Flashing Alarm** is enabled.

Alarm Linkage

- **Audible Warning**: The device beeps when target temperature exceeds the alarm threshold.
- **Flashing Alarm**: The flash light flashes when target temperature exceeds the alarm threshold.

If you set rectangle and circle tools to measure temperature, the alarm threshold and linkage method settings only works in the measured areas. Otherwise, the parameters are valid for pixel-to-pixel temperature measurement (whole-screen temperature measurement).

- **Alarm Capture**: The temperature values in live view interface turns red when target temperature exceeds the alarm threshold, and the device captures pictures and saved them to local albums automatically.

- When you reboot the device, **Alarm Capture** remains the last operation status.
- The captured pictures for **Alarm Capture** highlights the exceptional temperature in red.

- **Min. Alarm Interval:** Set the minimum interval for saving the alarm captured pictures.

3. Tap  to enable **Temperature Alarm**.

4.6 Calculate Area Size

The device can calculate the size of rectangles and show results on screen.

1. Select  , and go to **Measurement Settings > Area Size Calculation**.
2. Enable Area Size Calculation.
3. Draw one or several rectangles on screen.

The rectangles are those you draw for temperature measurement. See ***Measure by Rectangle*** for instructions.

4. In the live view interface, aim a rectangle at the target and press the laser button.

Make sure the lens is parallel to the target when measuring the area size.

Result

The target size is displayed above the rectangle.

4.7 Clear All Measurements

Tap  to clear all set temperature measurement tools.

5 SuperScene+

SuperScene+ uses built-in algorithms to identify temperature measurement targets in specific scenarios and determine if any temperature anomalies exist.

SuperScene+ has 2 working modes.

PCB Inspection

Used to identify high-temperature printed circuit board (PCB) components caused by breakdowns, soldering short circuits and other factors. For configuration and usage instructions, please refer to *PCB Inspection* .

Electrical Panel

Used to identify and detect temperature anomalies of terminals and fuses on electrical panels. For configuration and usage instructions, please refer to *Electrical Panel Inspection*.

- SuperScene+ is ONLY available on certain models.
- Some functions may be temporarily unavailable after SuperScene+ enabled. It is recommended to disable SuperScene+ when recognition is not necessary.

5.1 PCB Inspection

Used to detect temperature anomalies in components on PCBs. Before use, you need to configure the detection template and set the template parameters.

It is recommended to use a bracket to secure the device when configuring and using PCB inspection. A fixed detection distance and angle can help improve identification speed and accuracy.

1. Enable the PCB inspection. Go to **Settings > Capture Settings > SuperScene+ > SuperScene+**, and select PCB Inspection.

The first-time use requires creating an inspection template.

2. Press ⮌ to return to the previous menu.
3. Select **PCB Template** to add a new inspection template.
4. Set up the scene templates and related temperature measurement parameters.
   - For setting up the PCB template, see *Configure PCB Inspection Template.*
   - For editing a PCB template, see *Edit PCB Inspection Template*.
5. Return to the live view. PCB Inspection appears in the upper left corner of the screen.
6. Place a PCB and wait for the device to automatically identify and display measurement results.

Result

- Components with temperature anomalies will be marked with a red rectangle and temperature measurement results.
- Normal components will be marked with a green rectangle and temperature measurement results.

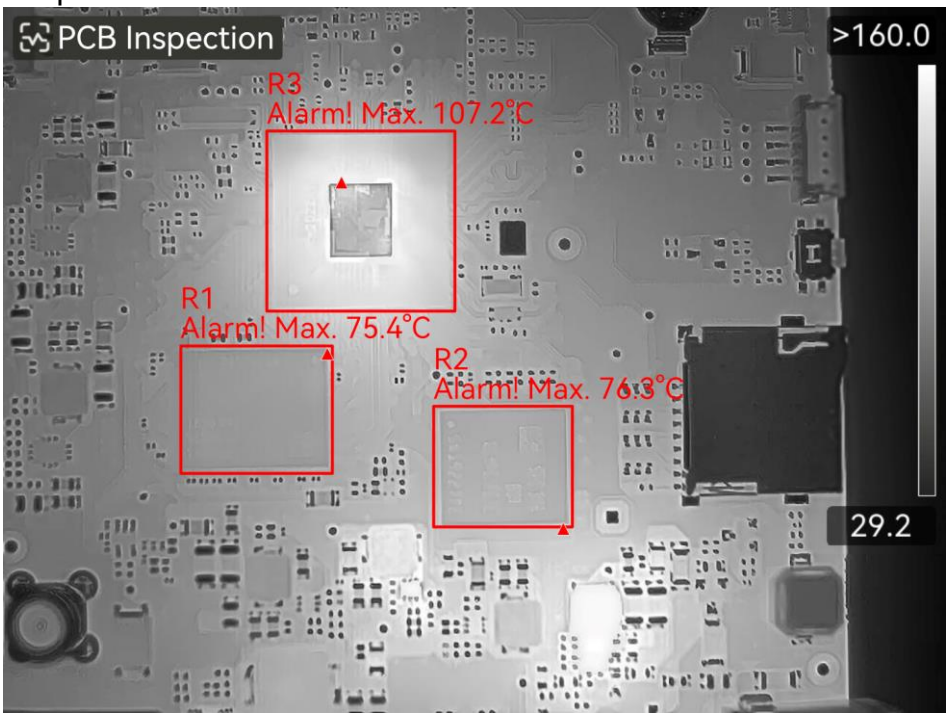


Figure 5-1 PCB Inspection

What to do next

If you need to capture or record inspection results, please refer to *Picture and Video.*

5.1.1 Configure PCB Inspection Template

When configuring an inspection template, you need to set at least one scene template (a thermal imaging picture of the PCB or its components), and set rectangle tools and corresponding temperature measurement parameters as needed.

1 PCB template includes up to 10 scene templates.

Before You Start

Set the inspection mode as PCB Inspection via Settings > Capture Settings > SuperScene+ > SuperScene+ Mode.

1. Enter Settings > Capture Settings > SuperScene+ > PCB Template.
2. Set the template name with the soft keyboard.
3. Press OK to start scene template settings.
4. Aim the device lens at the PCB or its components, then press button to capture a scene picture.

You can adjust the focus ring to have a clear image.

The image freezes, and the scene template name and target size filter are displayed at the top of the screen. The device automatically identifies PCB components and displays them in rectangle tools.

5. Edit rectangle tools and adjust parameters on the scene picture.

- Tap to filter unwanted rectangle tools.
- Edit the rectangle tool:
  1) Tap on 1 rectangle tool.
  2) Adjust its size and position as needed.
  3) Tap to enter the edit page and modify measurement tool parameters

Name of Tool	It is recommended to modify the tool name to a user-defined component name. The name is displayed at

	the top-left corner of the box.
Max. Temperature & Alarm Threshold	Enable **Max. Temperature** and set the **Alarm Threshold**. When the highest temperature within a tool exceeds the set threshold, the tool and its highest temperature will be displayed in red on live screen.
Emissivity	Set the emissivity of your target.
Distance	Set the distance between the target and the device

- Press OK or tap + to add a new tool.
- Repeat the above steps to set the name and parameters for each tool.

6. After editing, tap ✓ to modify the scene template name.
7. Press OK or tap ✓ to save.
8. Tap to add a new scene template. Repeat the above steps for configuration.

5.1.2 Edit PCB Inspection Template

PCB templates can be renamed or deleted. Scene templates support renaming, deleting, and modifying temperature measurement tools and parameters.

Rename and Delete PCB Inspection Templates

1. Go to **Settings** > **Capture Settings** > **SuperScene+** > **PCB Template**.
2. Tap ••• in the top-right corner and select either **Rename** or **Delete**.

Deleting the PCB template will also delete the scene templates within it.

Rename, Delete, or Edit PCB Scene Templates

1. Go to **Settings > Capture Settings > SuperScene+ > PCB Template**.
2. Select one scene template.
3. Press OK or tap the screen to display operation menu.
4. Choose **Edit**, **Rename**, or **Delete**.

For edit operations, refer to the relevant steps in *Configure PCB Inspection Template*.

5.2 Electrical Panel Inspection

After users set the detection parameters for electrical panel and temperature alarm rules, the device can automatically identify the detection target and determine if any anomalies exist in relevant electrical panel detection scenarios.

1. Set electrical panel identification parameters.
   1) Enter **Settings** > **Capture Settings** > **SuperScene+ > SuperScene+ Mode**, and select **Electrical Panel**.
   2) Select **Detection Type** as **Terminal** or **Fuse**.
   3) Select **Alarms** and set temperature alarm rules. The device supports **High Temp. Alarm** and **ΔT Alarm**.

Alarm Type	Description
High Temp. Alarm	When the highest temperature within the detected target's rectangle exceeds the set **Alarm Threshold**, the rectangle and its related information turn red. If the highest temperature is less than or equal to the **Alarm Threshold**, the rectangle and information keep green.
Temperature Difference Alarm	Detects the maximum temperature difference between the highest temperatures of multiple similar objects (rectangles). If the temperature difference exceeds the set **Alarm Threshold**, the rectangle with the highest temperature and its associated information turn red, while the others keep green.

   4) Return to the live interface. Electrical Panel will be displayed in the upper left corner of the screen.
2. Hold the device and aim the lens at the detection target, then wait for the results to display.

- Change a palette to display the target better when needed. Common palettes and the reversed palette are supported in this mode. See *Set Palettes* for operation instructions.
- Better recognition results are achieved when the lens is directly facing

the detection target (lens axis perpendicular to the detection target's plane). The lens can be slightly panned or tilted, but not by more than 45°.

The detected objects are displayed with rectangles and measurement results. Normal results are shown in green, and abnormal results are shown in red and require further inspection and confirmation.

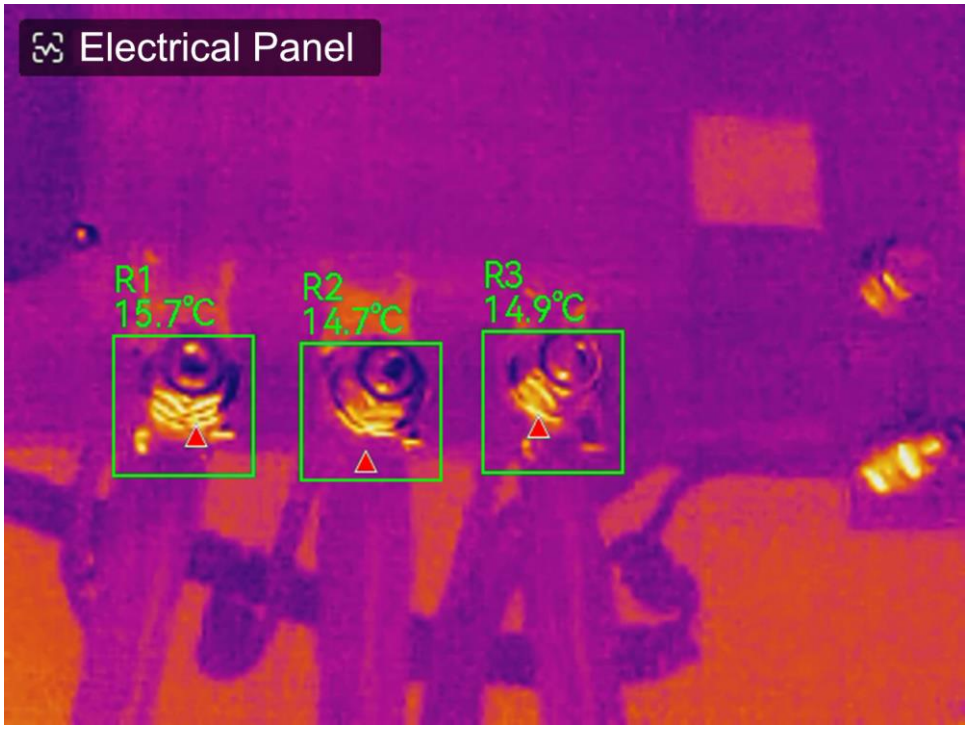


Figure 5-1 Electrical Panel

3. **Optional**: If you need to change detection type, tap Electrical Panel in the upper left corner to enter the settings interface.

What to do next

If you need to capture or record inspection results, please refer to *Picture and Video*.

6 Condensation Alarm

Condensation Alarm marks the surface in green where the relative humidity exceeds the set threshold.

1. Tap in live view to enter alarm palettes setting interface.
2. Tap to show more options.
3. Tap to enter condensation alarm interface.
4. Set parameters:
   - **Threshold**: The surface humidity threshold. Anywhere with higher humidity in the scene is marked with green.
   - **Ambient Temp**.: The environmental temperature around the target for humidity measurement accuracy.
   - **Relative Humidity**: The environmental relative humidity of the target for humidity measurement accuracy.

Ambient temperature and relative humidity should be adjusted each time you set condensation alarm, as they are affected by locations and weather. It is available to browse Weather application in your phone.

5. **Optional:** Tap **</>** to adjust parameter values.
6. Tap **OK** or Press to save and exit.

7 Route Inspection

In certain situation that requires temperature check for many inspect points, you can use the client software to create inspection routes that cover all the points and send a route inspection task to the device. After the device examines the temperatures of the inspect points, it uploads the results to the client software.

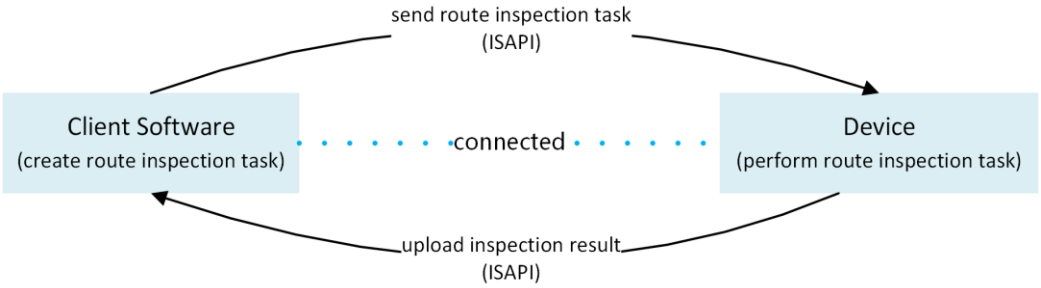


Figure 7-1 Route Inspection Work Flow

The device receives the tasks from and uploads the inspection results to the PC client software by its WLAN or Hotspot function.

7.1 Create Inspection Route and Send Task to Device

Create the inspection routes on the HIKMICRO Inspector. The client should be connected to the device before sending the route inspection task.

Before You Start

- Contact our technical support to get the HIKMICRO Inspector client software. Install the software to your PC.
- The PC should support WLAN function.

1. Open HIKMICRO Inspector.
2. Create inspect points and routes. See the user manual of HIKMICRO Inspector for instructions.
3. Connect your device and PC to the same LAN, and add your device into the client. Please see *Connect Device to HIKMICRO Inspector.*
4. Go to Task Management > Route Management to select a route and click Apply to Device.

What to do next

Check your device to see if the task is successfully received.

7.2 Perform Route Inspection

After receiving inspection tasks from the PC client, you can hold the device and check the inspect points on the route. Upload the results when the inspection is finished.

Before You Start

- Make sure your device has a memory card installed. See ***Appearance*** for instructions.
- Connect the device to the PC client, and make sure that your device has received inspection tasks from the PC client. See the user manual of HIKMICRO Inspector for instructions of applying inspection task to the device.
- Use HIKMICRO Inspector v1.2.0.100 or newer versions to acquire full product functionality. Otherwise, operations mentioned below may not be available. Contact our technical support to get the software.

1. Enter inspection mode to start.

   Enter the mode by one of the following ways:
   - Tap  in the swipe-down menu to enter the inspection route mode.
   - Go to **Settings** > **Device Settings** > **Inspection Route Mode** to enable the function.

When in the inspection route mode, the device files are not accessible.

2. Press  to enter the inspection task list.
3. Tap to select a task to start.

The font of task in progress is blue on the list.

4. Browse the inspect points and check the inspection requirements for each point.
   1) Tap the task to enter the task interface.

2) Press △ and ▽ to select an inspect point and check the point details.

- Before inspecting points, check the point reference images (labeled as No. 4 in figure below) to confirm the image requirements and amount of capturing.
- Check the point parameters (labeled as No. 6 in figure below) to see if the point requires QR code scanning or not. If **Scanning Required** is **Required**, then you should scan the QR code to check in before capturing point images.
- Check diagnostic method of the point (labeled as No. 7 in figure below). If it is an auto-diagnosed point, it shows the diagnostic standard. If it is a manual diagnosed point, it shows diagnosis options.

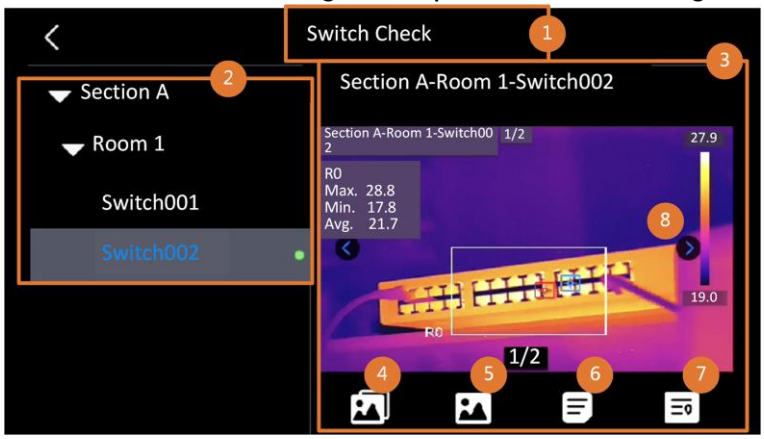


Figure 7-2 Route Inspection Work Flow

No.	Descriptions
1	Inspection task name.
2	Inspect point list. Press △ and ▽ to select an inspect point and check the point details.
3	Display inspect point details.
4	Point reference images. They show the parts and angles of targets required for inspection. Capture inspection images as the reference images show. There may be several parts or angles should be inspected. Tap the left and right arrow (labeled as No. 8 in figure above) to browse all reference images.
5	Tap to browse saved inspection captures. Tap the left and right arrow (labeled as No. 8 in figure above) to switch captured images.
6	Tap to check the parameters of the selected point.

No.	Descriptions
7	Check diagnostic information of the point.
8	Tap to switch images.

5. Inspect one point.
   1) Press and return to live view.
   2) Optional: Move to an inspect point and press to switch to the optical channel.
   3) Aim the lens to the QR code to scan.
   4) Press to capture inspect point images one by one according to the reference images until all required parts and angles of the point are captured.
   5) After capturing the last required image, mark the diagnosis result.

For auto-diagnosed points, device marks the result according to the predefined diagnosis standards. For points that need manual diagnosis, choose a result option after last capture.

6. After inspection of one point, device switches to the next point automatically. Press and to switch points.
7. Repeat above steps to complete inspection and diagnosis of all points.

   A completed task has shown before the task name in the list.

What to do next

- You can delete inspection tasks by selecting a task and tapping .
- Upload the results to the PC client after finishing the route inspection. See the user manual of HIKMICRO Inspector for instructions.

7.3 Upload Inspection Result and View Report

Upload the inspection results to the client software for central management and report generation.

Before You Start

Connect your device with the PC that has the client software installed. See the step of device connection in *Create Inspection Route and Send Task to Device* for instructions.

1. Open HIKMICRO Inspector.
2. Click and **Task Management** and check desired tasks.
3. Click **Read Inspection Result** to download the results from the device.

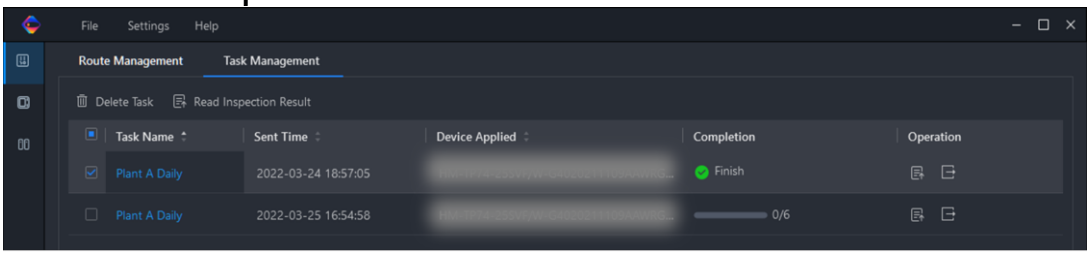


Figure 7-3 Task Management

The task status is shown in **Completion**.

4. Click on a finished task name to show result details.

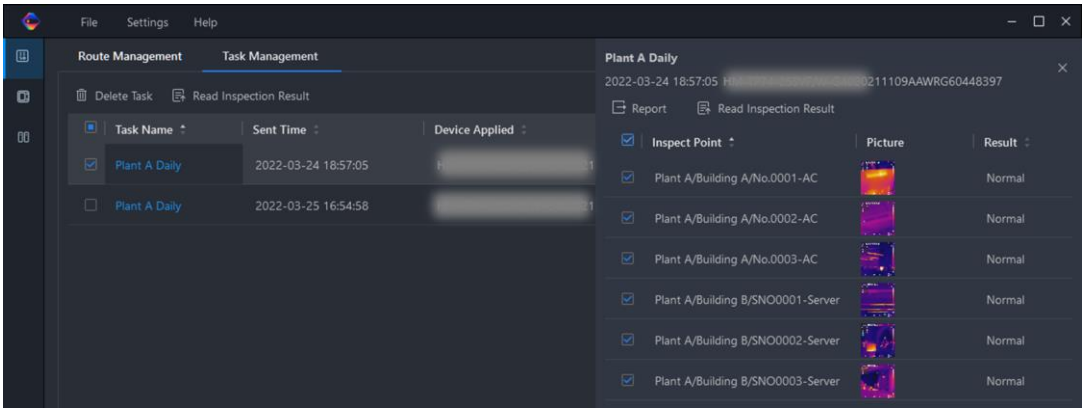


Figure 7-4 Inspection Results

5. Optional: Check a task or the desired inspect points and click **Report** for further analysis and report generation in HIKMICRO Analyzer.

- HIKMICRO Analyzer should be installed in your PC. Download the program from *https://www.hikmicrotech.com/en/industrial-products/hikmicro-analyzer-software/*.
- For the operations instructions in HIKMICRO Analyzer, tap to get the user manual.
- Please keep HIKMICRO Analyzer up-to-date for the best compatibility

and user experience.

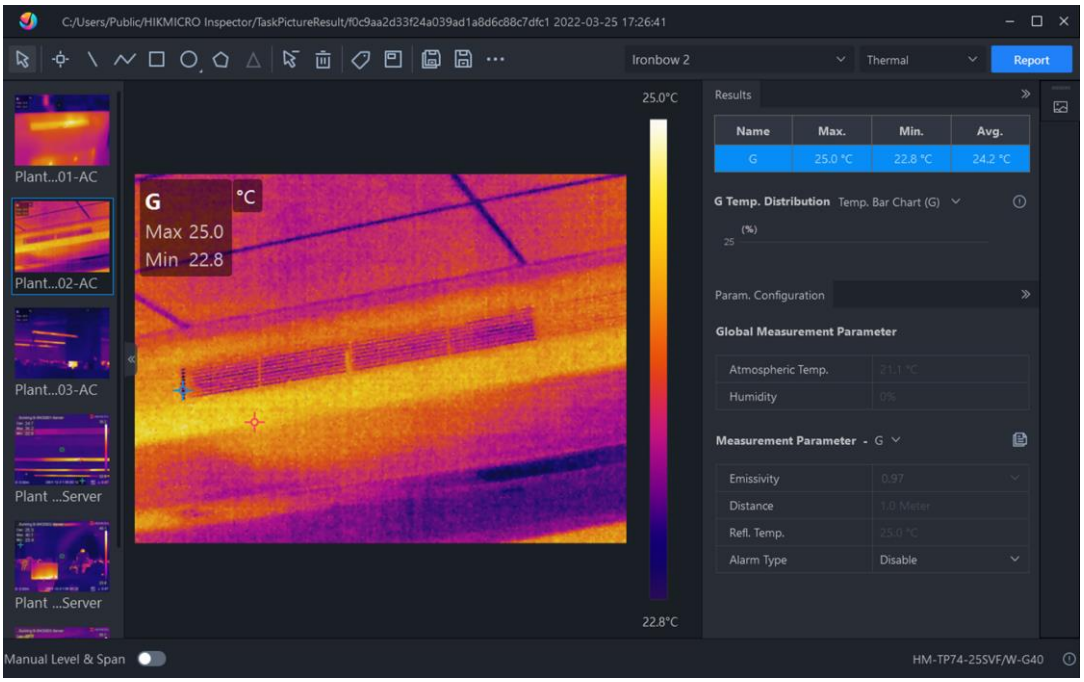


Figure 7-5 Analysis in HIKMICRO Analyzer

8 Picture and Video

Insert memory card into the device, then you can record videos, capture snapshots, and mark and save important data.

- Device does not support capturing or recording when the menu is shown.
- When the device is connected to your PC, it does not support capturing or recording.
- Go to **Settings** > **Device Settings** > **Device Initialization** to initialize the memory card as needed.
- You can pinch or spread your finger on screen to zoom in or out the image during recording or taking snapshots.

8.1 Capture Picture

Operate the device to capture live images and save the images in local albums.

Before You Start

- Make sure that there is a working memory card mounted in your device. See ***Appearance*** to locate the memory card slot of your device.
- Press △ in live view interface to enable flashlight in dark environment.

1. Set a capture mode. There are 2 modes available. Each mode requires different operations.
   1) Select ⚙, and go to **Capture Settings > Capture Mode**.
   2) Select a mode.

Table 8-1 Capture Modes

Capture Mode	Description
Capture One Image	Press 📷 once to capture one image.
Scheduled Capture	Camera captures snapshots according to the set the interval and number for scheduled capture.

2. Press ⮌ to return to the live view interface.
3. **Optional**: Pinch or spread your fingers on screen to zoom out or zoom in the image.
4. Aim the lens at your target and press or tap to capture images
   - Capture One Image mode, if **Edit before Saving** is NOT enabled (**Settings** > **Capture Settings**), the live image freezes and is saved in the default saving album. If **Edit before Saving** is enabled, the device enters the image editing interface.

Figure 8-1 Edit Image

Table 8-2 Editing Options

No.	Description
1	Text Note. 1. Tap to enter the editing page. 2. Tap on screen to input content and press ✓ to save the settings.
2	Voice Note. 1. Select voice note and enter voice recording page. 2. Press OK or tap to start recording. Press OK or tap again to stop recording. 3. Optional: You can tap to play the recording. If the voice note is unsatisfactory, tap to delete it. Repeat above steps to record again. 4. Press ⮌ to exit.
3	QR Code Note. Scan QR code to add information: 1. Tap **QR Code Note** and the device enters the scanning mode. 2. Aim the scanning frame at a QR code. Device reads the code and save the code information. 3. Optional: Input the QR code. 4. Press OK or tap the screen outside the scanning frame and **Scan Asset ID** interface will pop up. 5. Input the QR code message. 6. Tap ✓ to confirm the settings.
4	Tag Note. Set **Tag Note** to add text for captured pictures. It is a

No.	Description
	prerequisite to import a template first. Please see *Import and Manage Tag Note Templates* for more details. 1. Select **Tag Note**. 2. Select a tag and enter the tag settings. 3. Select at least 1 tag, and press OK to save the settings. 4. Optional: Press or button to switch between different tags, and press OK to save the settings.
5	Picture Note. Add visual image notes for captured radiometric images: 1. Tap in live view to enter **Capture Settings.** 2. Switch on Edit before Saving. 3. Press button or Tap in the shortcut bar in live view to capture snapshots. An image edition bar will pop up after the captured image freezes. 4. Tap to enter **Picture Note** interface. 5. Press button behind the device to add picture notes. 6. Press OK to save captured visual images to the local album. 7. Repeat step 5 and step 6 to add the next picture note. 8. Optional: Press on screen to save one captured visual image to the local album, and go back to image edition interface. The number of visual images will be displayed on the top of the **Picture Note** interface during taking the pictures, eg.”1/3”. No more than 3 pictures are supported. 9. Tap to save and exit.
6*	Editing thermal parameters. When the SuperScene+ is on, the captured image (.od.jpeg) does not support thermla parameter editing. ● Modify the image display mode, measurement parameters and tools, palettes, and level & span modes. ● **Optional:** If you need a PDF report of the file, tap on the upper right corner of the screen. Input **Report Name** and **Thermographer**, and tap to generate the report.

No.	Description
	Generated reports are saved under the same path of the memory card as the image files. The PDF reports cannot be viewed on local device. Export and read reports on computers. See ***Export Files*** for instructions. When finishing all operations, tap to save the change and exit the editing interface.
7	Add or modify sketch. Tap on screen to show the menu. ● : Set the line thickness. ● : Set the line color. ● : Erase markings. ● : Clear the sketch. ● : Save the sketch. ONLY thermometric images (.jpeg) and SuperScene+ images (.od.jpeg) support sketch function.
8	After all information added to the image, select **Save** to exit.

- Scheduled Capture: A counter display in top of the screen showing the completed amount of capturing.
- Optional: You can set more capture settings as demanded.

Table 8-3 More Optional Capture Settings

Objective	Settings
Save an additional visual image together with the thermal image.	Select , and go to **Capture Settings**. Enable Save Visual Image and set Visual Image Resolution. If the targets are in poor light condition, enable **Flashlight**. The device turns on the flashlight when capturing images.
View clear thermal image on high resolution screen.	Select , and go to **Capture Settings.** Enable **SuperIR** before capturing. Resolution of captured thermal images with **SuperIR** is about 4 times as the original one.

What to do next

- Press to enter albums to view and manage files and albums. See *Manage Albums* and *Manage Files* for operation instructions.
- You can connect your device to PC to export local files in albums for further use. See *Export Files*.
- You can edit the saved images. See *Edit Images*.

8.2 Record Video

Before You Start

- A memory card should be mounted for video storage.
- Press in live view interface to enable the flashlight in dark environment if you want to record an optical video.

1. **Optional**: Adjust video parameters.

Table 8-4 Video Description

Parameter	Description
Video Type	Go to **Settings** > **Capture Settings** > **Video Type** to set saving video format. **Radiometric Video** Radiometric data is attached in videos of this format. They can only be played and further analyzed with HIKMICRO Analyzer. When the storage space is smaller than 500 MB, radiometric video recording is not allowed. Accidentally stopped recordings are not saved. **MP4** Recorded videos are saved in .mp4 format. These video clips can be played on local device, and any player that support this format. HIKMICRO Analyzer does not support playing this video format. Video type configuration is supported by certain models of

	this series. MP4 video type is adopted for the models of no such configuration option.
Frame Rate	Higher frame rate offers a smoother video with more details for watching especially when motion occurs. But higher frame rate also means bigger video size which consumes more storage space. Go to **Settings** > **Capture Settings** > **Frame Rate Configuration** to enable frame rate configuration. Then go to **Settings** > **Capture Settings** > **Frame Rate** to set the frame rate value. ● Frame rate configuration is not supported by certain models, see your actual product for reference. ● The frame rate is adjustable only when **Frame Rate Configuration** is enabled. ● When **Frame Rate Configuration** is enabled, the camera's visual channel is turned off. Therefore, you cannot change display mode or save the corresponding visual image during capture.
Record Audio	Audio is recorded by default when the device records a video. If audio is not needed, it can be turned off through **Settings** > **Capture Settings** > **Record Audio**.

2. **Optional**: Pinch or spread your fingers on screen to zoom out or zoom in the image.
3. In the live view interface, hold button or tap in the shortcut bar to start recording. The recording signs display on the top center of the interface.

The recording signs for radiometric video and MP4 videos are different. When you see 00:00:52, it is recording a MP4 video. When you see 00:00:52 hrv, it is recording a radiometric video.

4. When you finish, press OK/ buttons or tap in the shortcut bar to stop recording. The recording video will be saved automatically and exit.

You can also press OK or ⮌ to stop recording.

What to do next

Check the saved videos from 🖻 in menu mode. See *View and Manage Local Files* for more information.

8.3 Filename Header and File Naming

It is available to set the rules for file naming before picture capture and video recording. Tap ⚙ > **Capture Settings** to set filename header and select file naming modes.

Table 8-5 File Naming Rules

Elements	Description
Filename Header	Set the prefix for files of captured pictures and videos. Input the header and tap ✔ to confirm the settings.
File Naming	**Time Stamp** and **Numbering** modes are supported. **Time Stamp** consists “filename header”,”date and time”and “file format”. When the file naming is **Numbering**, the maximum number of saved files is 99,999. You need to delete some images before saving new ones if saved files is beyond 99,999.

8.4 View and Manage Local File

Device captured images and videos are saved in local albums. You can create, delete, rename and set an album as the default saving album. For files, operations, such as browsing, moving, favoriting and deleting, are available.

1. Press 🖻 to enter **Albums**.
2. To create, rename, delete and set an album as the default saving album, see *Manage Albums* for instructions.

3. For file operations, such as, moving, deleting or favoriting a file, see ***Manage Files*** for instructions.
4. To modify an image, for example, editing its text or voice notes and changing the thermal parameters, see ***Edit Images*** for instructions.

Image editing function varies within the series. See your actual device for available operation options.

5. Press ⮌ to exit.

8.4.1 Album Folder Types

The album contains 4 types of folders, among which 3 are special folders: default saving folder, deleted folder, and favorite folder.

Table 8-6 Album Folder Types

Folder Type	Folder Icon	Description
Default Saving		Newly captured images and videos are stored in this folder. There is ONLY 1 such folder in Albums. Both root directory folders and subfolders can be set as the default saving folder. If a subfolder is set as the default saving folder, a quick access path will be automatically generated and displayed in the root directory.
Regular		Stores images and videos. The folder supports up to 3 levels of subfolders, and up to 1000 subfolders and files.
Delete		Stores deleted images or videos. Files in this folder can be recovered to the original paths as needed. The folder can store up to 1000 files. No more deleted files can be stored before users manually clean it up when the folder is full. Delete or recover files as follows: 1. Enter Deleted folder. 2. Tap ☑ at the upper-right corner to start multiple selection.

Folder Type	Folder Icon	Description
		3. Select files and choose **Delete Completely** or **Recover**. **Note** ● Permanently deleted files cannot be recovered. ● When recovering deleted files, if the original folder has been deleted, the folder will be recreated at the original directory. If the original folder is full, recovering is not possible. ● If a file was favorited before deletion, it will be restored to Favorite folder when restored.
Favorite		Stores favorited images and videos. The folder can store up to 1000 files. No more deleted files can be stored before users clean it up when the folder is full. Files in the folder can be viewed, edited, and batch-sent, deleted, or removed from Favorite folder. **Note** ● Editing or deleting files in Favorite folder will also affect the original folder. ● When the device is connected to PC in USB drive mode, Favorite folder will not be displayed.

For operations on files within a common folder, please refer to ***Manage Files***.

8.4.2 Manage Albums

The local album supports creating folders and subfolders to manage images and videos captured by the device. Newly captured images and videos are saved in the **Default Saving Album**  .

Table 8-7 Albums Management

Task	Operations
Create a New Album	1. Press to enter **Albums**. 2. Tap to add a folder in the album root directory. 3. **Optional:** Choose a folder (default saving folder or regular folder) to create a subfolder. 3. Enter the name of the album with the soft keyboard. 4. Tap to finish. ● The newly created album becomes the default saving album and appears at the top of the album list. ● Creating a new subfolder is not allowed when the folder is full.
Rename an Album	1. Press to enter **Albums**. 2. Select the album to rename. 3. Tap •••, and select **Rename**. A soft keyboard is displayed. 4. Tap to delete the old name, and enter the new name for the album. 5. Tap to finish.
Change the Default Saving Album	1. Press to enter **Albums**. 2. Select the album you want to use as the default saving album. 3. Tap •••, and select Set as Default Saving Album. The default saving album appears at the top of the album list.
Delete an Album	1. Press to enter **Albums**. 2. Select the album you want to delete. 3. Tap •••, and select **Delete**. 4. Tap **OK** in the dialog box to delete the album.

Task	Operations
	Deleting a folder will also delete all files within it.

8.4.3 Manage Files

Several formats of image and video files are supported by the device.

For certain format file, you can edit the attached notes and modify thermal parameters on device. For all files, you can check their basic information, favorite, delete or move them among albums.

Table 8-8 File Type and Description

File Type	Format	Description
MP4 Videos	.mp4	Playing, moving, favoriting and deleting video files are supported on device.
Radiometric Videos	.hrv	Moving, favoriting and deleting video files are supported on device. Use HIKMICRO Analyzer to play and analyze the file. Please upgrade the software to the latest version, otherwise the .hrv file may not be supported.
Radiometric Images	.jpeg	Editing text and voice notes, moving files, checking basic information, modifying thermal parameters, favoriting and deleting files are supported on device.
SuperScene + Images	.od.jpeg	Images captured when SuperScene+ in ON. Editing notes, moving files, checking basic information, deleting and favoriting files are supported on device.  Modifying thermal parameters and analyzing in PC client are not allowed for this format.

Table 8-9 Files Management

Task	Operations
Operate single file	1. Press  to enter **Albums**.

Task	Operations
	2. Select the album storing the file to be operated. 3. In the album, select the file to be operated. 4. Tap •••, and select Move, Delete, Send, or Favorite. ● If you tap **Delete**, confirmed deletions will be moved to the Delete folder. ● If you tap **Move**, select a target folder to start moving. ● If you tap **Send**, files can be transferred to Android mobile devices via Bluetooth. ● If you tap **Favorite**, files are added to the Favorite folder.
Operate Multiple Files	1. Press to enter **Albums**. 2. Select the album storing the files. 3. In the album, tap to select the files to be batch-operated. 4. Tap **Delete**, **Send**, **Favorite** or **Move**. ● If you tap **Delete**, confirmed deletions will be moved to the Delete folder. ● If you tap **Move**, select a target folder to start moving. ● If you tap **Send**, files can be transferred to Android mobile devices via Bluetooth. ● If you tap **Favorite**, files are added to the Favorite folder.

Tap to select all files, and tap to deselect files.

8.4.4 Edit Images

Editing the notes saved with the images, and changing the thermal parameters are allowed on your thermal camera.

In live view, press to enter **Albums**.

1. Tap to open an album.
2. Tap to open an image file and tap on the image to call the editing menu.

Figure 8-2 Edit Image

3. Select an option and complete corresponding operations.

Table 8-10 Image Editing Description

No.	Description
1	Editing text note. Add a new text note or change the existed note, and press ✓ to save the settings.
2	Editing voice note. You can add a new voice note, play or delete an existed voice note. If the file already has a voice note, tap to play or delete the note. If the file has no voice note attached, press OK or tap
3	Editing QR code note. Add a new Asset ID or change the existed Asset ID, and press ✓ to save the settings.
4	Add visual picture note for the captured images. Please see *Table 8-2* for more details.
5	Add Tag Note, namely the standard text, to captured images. It is necessary to import a template first. Please see *Import and Manage Tag Note Templates* for more details.
6	File Details. Show basic information of the file, for example, the saving time, the last modified time, resolution, distance, emissivity, relative humidity, relection temperature of the file.
7	Editing thermal parameters of the image. Modify the image display mode, measurement parameters and tools, palettes, and level & span modes. **Optional:** If you need a PDF report of the file, tap on the upper right corner of the screen. Input **Report Name** and **Thermographer**, and tap ✓ to generate the report. • Generated reports are saved under the same path of the memory card as the image files. The PDF reports can not be viewed on local device. Export and read reports on computers. See ***Export Files*** for instructions. • When finishing all operations, tap to save the change and exit the editing interface.

No.	Description
8	Add or modify sketch to the file; favorite, delete, move or transmit the file.

8.4.5 Import and Manage Tag Note Templates

Tag note templates contains the predefined tag name and options. With the template imported and activated, users can quick add tags to captured snapshots.

Tag note templates are generated on the client software HIKMICRO Analyzer. Copy the templates of json format to the storage of your device, then you can use and manage the templates.

1. Generate tag note templates on HIKMICRO Analyzer.

- Download HIKMICRO Analyzer client software from our website *www.hikmicrotech.com* or contact our technical support team for help.
- Click on ⓘ at the upper right corner of the software window to get operation guide.
- Software generated templates are saved in the path of PC: Public\HIKMICRO Analyzer\TextRemarkTemplate.

2. Connect your camera to PC by the supplied cable. Copy and paste the template files to the TextNote folder of the device storage.

If more than one templates are imported, the last edited template is the active one by default. Up to 10 templates can be imported.

3. Go to Settings > Capture Settings > Tag Note Template to manage templates.
   1) Select a template.
   2) Tap on ••• at the upper right corner of screen.
   3) Set the template as the default template or delete the template.

8.5 Export Files

8.5.1 Export Files to PC

Connect the device to your PC with a supplied cable, you can export the recorded videos, captured snapshots, and PDF reports.

1. Connect the device to your PC with a USB cable.
2. Select **USB Drive** mode in the pop-up window on the device. will be displayed in the device status bar, and a notice for detecting a removable disk will pop up on your PC.
3. Open the detected disk, and select and copy the videos or snapshots to your PC.
4. Disconnect the device from your PC.

What to do next

You can import the captured snapshots to HIKMICRO Analyzer for further data analysis. See the *User Manual of HIKMICRO Analyzer* for the operation guide.

8.5.2 Export Files to HIKMICRO Viewer

Connect the device to HIKMICRO Viewer application on the phone, you can export the recorded videos, captured snapshots, and PDF reports.

For QR code download of HIKMICRO Viewer and the connection between the device and the application, please see *Connect Device to HIKMICRO Viewer via Wi-Fi* and *Connect Device to HIKMICRO Viewer via Hotspot* for more details.

1. Connect the device to HIKMICRO Viewer.
2. Tap **On-Device Files** in the home screen of HIKMICRO Viewer to select videos and snapshots.

When the device is connected via USB cable, it does NOT support On-Device Files viewing. Please disconnect the device at first.

3. Tap to export the files to the **Albums** of HIKMICRO Viewer.

You can follow one of the paths to **Albums**:

- Tap in the home screen of HIKMICRO Viewer to the Albums.
- Tap the thumbnail image on the lower left corner in Live View interface of HIKMICRO Viewer, and tap on the upper right corner to the Albums.

4. **Optional 1:** Share files with the third party. Select the videos and snapshots and tap to the third party.

Offline file sharing is NOT supported.

5. **Optional 2**: Save snapshots to your phone when you take a snapshot. Tap **Settings > General > Save Pictures to Phone.**

Videos is NOT supported to save to your phone.

8.5.3 Export Files via Bluetooth

It is available to export snapshots in the device **Albums** to the local album of your phone after the Bluetooth connection.

ONLY mobile phones with Android system are supported to receive images from the device via Bluetooth connection.

1. Turn on your phone Bluetooth.
2. Turn on the device Bluetooth. Select , and go to **Connections > Bluetooth** to enable the device Bluetooth.
3. Refresh the available Bluetooth list on the device, and pair the device Bluetooth with your phone Bluetooth.

- You can also press or **OK** to quit pairing.
- When pairing successfully, “Paired” is displayed on the Available Devices list of the device, and “Connected” on the phone.

4. Send snapshots in the device **Albums** to your phone.

- Send only one snapshot:

1) Tap the required snapshot, and enter to the detailed page.
2) Tap on any part of the screen to call the menu.
3) Tap ··· > ⇌, and choose the paired phone Bluetooth.
4) Tap OK to confirm the settings.

- Send no more than 16 snapshots:
  1) Tap ☑ to select more than one snapshots.
  2) Tap ⇌ to select a Bluetooth device.
  3) Choose the paired phone Bluetooth.
  4) Tap OK to confirm the settings.

- Videos are NOT supported to send to the phone via Bluetooth.
- Tap ↻ in the upper right corner to refresh the available Bluetooth list.

9 Distance Detection

The laser range finder consists of a laser transmitter and a laser receiver. The device detects the distance to a target by measuring the time it takes for a laser pulse to reach the target and return to the laser receiver. This time is converted to a distance, which is displayed on the screen.

Before You Start

- It is recommended to use this function in non-glare environment, such as indoor environment.
- It is recommended that the target has good light reflection, such as white paper and cable.

1. Select , and go to Device Settings > Display Settings.
2. Enable Distance.
3. Press to save and exit.
4. In the live view interface, aim the cursor at the target and hold the laser button.
5. Release the lase button to finish distance measurement.

Result

The distance displays on the left status bar of screen.

10 Geographic Location Display

Equipped with satellite positioning modules, the device is able to display its longitude and latitude on the live image and in the captured images.

1. Select , and go to **Device Settings > GPS**.
2. Tap to enable the GPS function. The device will prompt the GPS positioning result.

Result

You can see the location displayed at the left status bar of the screen.

- The satellite module is not able to receive signals when the device is indoor. Place the device in an empty outdoor space to receive signals.
- In an outdoor space, wait for a moment for the device to display its location.
- The location information is also attached in captured radiometric images. You can read the location by HIKMICRO Analyzer.
- Location display is only supported by models with satellite positioning modules.

11 Direction Display

Equipped with a compass, the device is able to display its direction on the live image and in the captured images.

The function is supported by certain models.

Select , and go to **Device Settings** > **Compass** to enable the compass modules, then follow the pop-up instructions to calibrate the compass. See *Calibrate Compass* for more information.

After successful calibration, you can see the direction displayed at lower right corner of the screen. It is recommended to read the direction when you lay the device horizontally.

To increase the direction accuracy, you can set the magnetic declination correction. See *Magnetic Declination Correction* for instructions.

The direction information is also attached in captured radiometric images. You can read the direction by HIKMICRO Analyzer.

11.1 Calibrate Compass

Compass calibration is a must for correction direction display.

You need to calibrate the compass when you enable the function for the first time.

1. Call the calibration guide by the following ways.
   - Select , and go to **Device Settings** > **Compass** to turn the function off and on again.
   - Tap in the swipe-down menu to quickly turn on/off the compass.
2. When you enable compass for the first time, or the compass is magnetically interfered, compass calibration guide pops up. Follow the screen instructions to move and rotate the device.

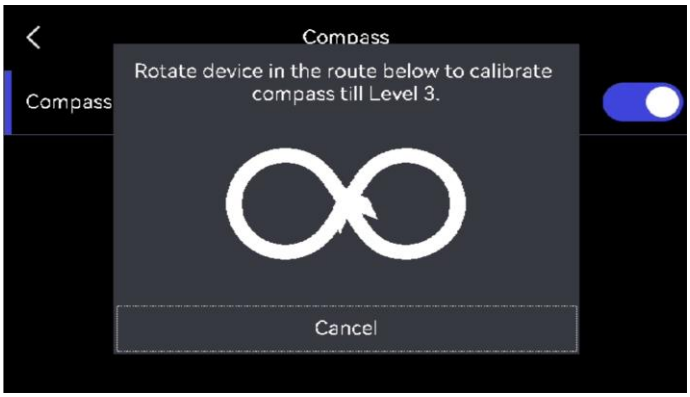


Figure 11-1 Calibrate Compass

- During calibration, keep moving and rotating the device to make sure that the device faces every possible direction.
- **Calibration Level** indicates the validity of calibration, higher level means more accurate compass reading. Calibration succeeds when the status bar in the live view interface shows, and **Calibrated Level** turns to 3.

3. Stop rotating the device when calibration success message pops up.

Result

The status bar in the live view interface shows after successful calibration. If the number in this icon is smaller than 3, it means that the compass is not properly calibrated and the direction displayed might not be correct.

11.2 Magnetic Declination Correction

Magnetic declination is the angle variation between magnetic north and true north. Adding the magnetic declination to the compass increase the accuracy of direction reading.

Go to **Local Settings** > **Device Settings** > **Compass** > **Magnetic Declination Correction** to add the declination of device location.

12 Add Device to Software Clients

When connected to certain applications or software clients on the mobile phone or computer, the device supports live view browsing, video recording and snapshot capturing, route inspection, thermal image analysis and etc.

Table 12-1 Device and software client Connections

Terminals	Software Clients	Description
Mobile Phone	HIKMICRO Viewer	Connect the device to Viewer via hotspot or Wi-Fi, performing live view browsing and function settings like snapshot capturing or video recording.
Computer	HIKMICRO Inspector	Connect the device to the network that Inspector is in, then Inspector can send inspection tasks to the device.
Computer	HIKMICRO Analyzer	Connect the device to Analyzer via a USB cable, achieving live view castscreen, snapshot capturing or video recording on Analyzer.

12.1 Connect Device to HIKMICRO Viewer via Wi-Fi

Before You Start

Scan the QR code below to download and install HIKMICRO Viewer on your phone.

Android

iOS

1. Select , and go to **Connections > WLAN** to enable Wi-Fi, and the searched Wi-Fi will be listed.
2. Connect your device to a Wi-Fi network.
   1) Select Wi-Fi to connect to and a soft keyboard is displayed.
   2) Enter the password.
   3) Tap to save the settings.
3. Connect your phone to the Wi-Fi network that the device is in.
4. Open HIKMICRO Viewer, and tap **+** > **Add Device** > **Connect** to add the device.
5. Optional: Scan QR code on the device with HIKMICRO Viewer.
   1) Connect your phone to the Wi-Fi network that the device is in
   2) Tap on the WLAN interface, and a QR code will pop up.
   3) Launch HIKMICRO Viewer to tap **+** > **Scan QR Code**
   4) Scan the QR code on the device with HIKMICRO Viewer.
   5) Tap **Join** in the pop-up window on your phone to confirm the settings.

12.2 Connect Device to HIKMICRO Viewer via Hotspot

Before You Start

Scan the QR code below to download and install HIKMICRO Viewer on your phone.

Android

iOS

1. Select , and go to **Connections > Hotspot** to turn on the device hotspot.
2. Set password for the hotspot.
   1) Tap **Set Password**, and input the password for the hotspot.
   2) Tap to finish.

3. Enable the Wi-Fi function of mobile phone and search the device hotspot to join.
4. Open HIKMICRO Viewer, and tap **+** > **Add Device > Connect** to add the device.
5. Optional: Scan QR code of the device hotspot with HIKMICRO Viewer.
   1) Turn on the device hotspot, and a QR code will pop up.
   2) Launch HIKMICRO Viewer to tap **+** > **Scan QR Code.**
   3) Aim the phone camera at the QR code of the device hotspot.
   4) Tap **Join > Connect** in the pop-up window on your phone to confirm the settings.

12.3 Connect Device to HIKMICRO Inspector

Before You Start

Download and install HIKMICRO Viewer on your PC. Please visit our website *www.hikmicrotech.com* to download the installation package.

1. Connect your device and PC to the same LAN. Available methods as below:

- Connect your PC and the device to the same Wi-Fi network.
  1) Tap > **Connections** > **WLAN** to enable the device Wi-Fi.
  2) Select Wi-Fi to connect to and enter the password.
  3) Tap to save the settings.
  4) Connect your PC to the Wi-Fi network that the device is in.
- Connect your PC to the device hotspot.
  1) Tap > **Connections > Hotspot** to turn on the device hotspot.
  2) Set password for the hotspot.
     - Tap **Set Password**, and input the password for the hotspot.
     - Tap to finish.
  3) Refresh PC WLAN list, and search the device hotspot to join.

2. Launch HIKMICRO Inspector, and click to add the device.

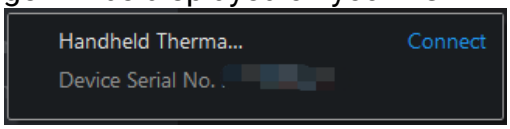
- Manually Add: Click **Add** and input IP address in the pop-up window.
- Automatically Add: Click **Online Device**, and available online devices will be displayed.

12.4 Cast Screen on HIKMICRO Analyzer

The device supports casting screen to HIKMICRO Analyzer PC client. You can connect the device to your PC via a Type-C cable, and cast the real-time live view of the device to your PC, and perform video recording or snapshots via Analyzer.

Live view function is ONLY supported in HIKMICRO Analyzer v1.7.0 and the newer versions. Please download or update to v1.7.0 and the newer versions.

1. Download and open HIKMICRO Analyzer on your PC. Please visit our website *www.hikmicrotech.com* or contact technical support or customer service teams for installation packages.
2. Connect the device with your PC via a supplied Type-C cable.
3. Select **USB Cast Screen** on the pop-up USB Mode interface of the device. will be displayed on the upper left corner on the device status bar.
4. Click **Refresh** in the Analyzer Live interface, and the reminder **New Device Detected** will appear.
5. Click **Connect** in the drop-down box in the Analyzer Live interface, and the real-time image will be displayed on your PC.



13 System Settings

13.1 Set LED Light

In live view mode, press to enable/disable the LED light. Or tap on the swipe-down menu.

13.2 Set Unit

Select , and go to **Device Settings** > **Unit** to set the temperature unit and distance unit.

13.3 HDMI Image Output

You can view the image on the display unit for details with this function.

If your device has a micro HDMI output interface, connect the device and a display unit to cast the image.

This function is only supported by the models with micro HDMI output interface.

13.4 Set Time and Date

1. Select , and go to Local Settings > Device Settings > Time and Date.
2. Set the date and time.
3. Press to save and exit.

Go to **Display Settings** to enable or disable time and date display.

14 Maintenance

14.1 View Device Information

Select , and go to **Local Settings** > **Device Settings** > **Device Information** to view the device information.

14.2 Upgrade Device

14.2.1 Upgrade Device via PC

Before You Start

- Please download the upgrade file from the official website *http://www.hikmicrotech.com* or contact the custom service and technical support to get the upgrade file first.
- Make sure that the device battery is fully charged.
- Make sure that Auto Power-off function is turned-off to avoid accidental suspension during upgrading.
- Make sure that a memory card has been installed to device.

1. Connect the device to your PC with cable.
2. Select **USB Drive** on the pop-up **USB Mode** window of the device. will be displayed on the device status bar, and a notice for detecting a removable disk will pop up in your PC.
3. Click the disk on your PC to open it.
4. Select and copy the upgrade file, and paste it to the root directory of the device.

Make sure that the upgrade file pasted to the root directory is extracted.

5. Disconnect the device from your PC.
6. Reboot the device and then it will upgrade automatically. The upgrading process will be displayed in the main interface.

After upgrading, the device reboots automatically. You can view the current version in **Device Settings** >**Device Information**.

14.2.2 Upgrade Device via HIKMICRO Viewer

Before You Start

Make sure that you have installed HIKMICRO Viewer on your phone. Please see Connect Device to HIKMICRO Viewer via Wi-Fi and Connect Device to HIKMICRO Viewer via Hotspot for installation.

1. Launch the client on your phone.
2. Upgrade the device. You can choose one of the following path:
   - In the home screen, tap **Device Upgrade** > **Check for Updates**.
   - In the home screen, tap **Device Info** > **Device Upgrade** > **Check for Updates**.

14.3 Restore Device

Select , and go to **Device Settings** > **Device Initialization** > **Restore Device** to initialize the device and restore default settings.

14.4 Initialize Memory Card

When a memory card is use on the handheld thermal camera for the first time, it needs to be initialized first.

Select , and go to **Device Settings** > **Device Initialization**> **Format Storage Card** to initialize the memory card.

If there are files in the memory card, make sure that the files have been backed up before memory card initialization. Once the card is initialized, data and files cannot be recovered.

14.5 Save Logs

Save device operation logs for quick troubleshooting. The logs are stored in memory card or built-in storage, and they are exported via PC.

1. Tap Settings > Device Settings.
2. Slide Save Logs to enable the logs collection function.
3. Select OK to confirm the settings.

- When you restart the device, tap Save Logs again to enable the function.
- When you need to export the logs to our technical support team, open the disk on your PC to copy and paste the .tar files stored in the log folder in the root directory of the SD card. Please see *Export Files* for exporting files.

14.6 About Calibration

Please contact the local dealer for the information on maintenance points. For more detailed calibration services, please refer to *https://www.hikmicrotech.com/en/support*.

15 Appendix

15.1 FAQ

Scan the following QR code to get device common FAQ.

Legal Information

Legal Information

About this Manual

The Manual includes instructions for using and managing the Product. Pictures, charts, images and all other information hereinafter are for description and explanation only. The information contained in the Manual is subject to change, without notice, due to firmware updates or other reasons. Please find the latest version of this Manual at the HIKMICRO website (www.hikmicrotech.com).

Please use this Manual with the guidance and assistance of professionals trained in supporting the Product.

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IN THE EVENT OF ANY CONFLICTS BETWEEN THIS MANUAL AND THE APPLICABLE LAW, THE LATTER PREVAILS.

Regulatory Information

These clauses apply only to the products bearing the corresponding mark or information.

FCC Information

Please take attention that changes or modification not expressly approved by the party responsible for compliance could void the user’s authority to operate the equipment.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

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

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

INFORMATIONEN FÜ R PRIVATE HAUSHALTE

(1) Getrennte Erfassung von Altgeräten: Elektro- und Elektronikgeräte, die zu Abfall geworden sind, werden als Altgeräte bezeichnet. Besitzer von Altgeräten haben diese einer vom unsortierten Siedlungsabfall getrennten Erfassung zuzuführen. Altgeräte gehö ren insbesondere nicht in den Hausmüll, sondern in spezielle Sammel- und Rückgabesysteme.

(2) Batterien und Akkus sowie Lampen: Besitzer von Altgeräten haben Altbatterien und Altakkumulatoren, die nicht vom Altgerät umschlossen sind, die zerstö rungsfrei aus dem Altgerät entnommen werden können, im

Regelfall vor der Abgabe an einer Erfassungsstelle vom Altgerät zu trennen. Dies gilt nicht, soweit Altgeräte einer Vorbereitung zur Wiederverwendung unter Beteiligung eines ö ffentlich-rechtlichen Entsorgungsträgers zugeführt werden.

(3) Möglichkeiten der Rückgabe von Altgeräten: Besitzer von Altgeräten aus privaten Haushalten können diese bei den Sammelstellen der ö ffentlich-rechtlichen Entsorgungsträger oder bei den von Herstellern oder Vertreibern im Sinne des ElektroG eingerichteten Rücknahmestellen unentgeltlich abgeben. Rücknahmepflichtig sind Geschäfte mit einer Verkaufsfläche von mindestens 400 m² fü rElektro- und Elektronikgeräte sowie diejenigen Lebensmittelgeschäfte mit einer Gesamtverkaufsfläche von mindestens 800 m², die mehrmals pro Jahr oder dauerhaft Elektround Elektronikgeräte anbieten und auf dem Markt bereitstellen. Dies gilt auch bei Vertrieb unter Verwendung von Fernkommunikationsmitteln, wenn die Lagerund Versandflächen für Elektro- und Elektronikgeräte mindestens 400 m² betragen oder die gesamten Lager- und Versandflächen mindestens 800 m² betragen. Vertreiber haben die Rücknahme grundsätzlich durch geeignete Rückgabemöglichkeiten in zumutbarer Entfernung zum jeweiligen Endnutzer zu gewährleisten. Die Möglichkeit der unentgeltlichen Rückgabe eines Altgerätes besteht bei rücknahmepflichtigen Vertreibern unter anderem dann, wenn ein neues gleichartiges Gerät, das im Wesentlichen die gleichen Funktionen erfü llt, an einen Endnutzer abgegeben wird.

(4) Datenschutz-Hinweis: Altgeräte enthalten häufig sensible personenbezogene Daten. Dies gilt insbesondere fü r Geräte der Informations- und Telekommunikationstechnik wie Computer und Smartphones. Bitte beachten Sie in Ihrem eigenen Interesse, dass für die Löschung der Daten auf den zu entsorgenden Altgeräten jeder Endnutzer selbst verantwortlich ist.

(5) Bedeutung des Symbols „durchgestrichene Mülltonne“:

Das auf Elektro- und Elektronikgeräten regelmäß ig abgebildete Symbol einer durchgestrichenen Mü lltonne weist darauf hin, dass das jeweilige Gerät am Ende seiner Lebensdauer getrennt vom unsortierten Siedlungsabfall zu erfassen ist.

EU Conformity Statement

This product and - if applicable - the supplied accessories too are marked with "CE" and comply therefore with the applicable harmonized European standards listed under the Directive 2014/30/EU (EMCD), Directive 2014/35/EU (LVD), Directive 2011/65/EU (RoHS), Directive 2014/53/EU.

Hereby, Hangzhou Microimage Software Co., Ltd. declares that this device (refer to the label) is in compliance with Directive 2014/53/EU.

The full text of the EU declaration of conformity is available at the following internet address:
https://www.hikmicrotech.com/en/support/download-center/declaration-of-conformity/

Frequency Bands and Power (for CE)

The frequency bands and modes and transmitting power (radiated and/or conducted) nominal limits applicable to the following radio equipment are as follows:

Wi-Fi: 2.4 GHz (2.4 GHz to 2.4835 GHz): 20 dBm;

5 GHz (5.15 GHz to 5.25 GHz): 23 dBm;

5 GHz (5.725 GHz to 5.875 GHz): 14 dBm

5.15-5.25GHz indoors use.

Bluetooth: 2.4 GHz (2.4 GHz to 2.4835 GHz): 20 dBm

RF Exposure Information

This device has been tested and meets applicable limits for Radio Frequency (RF) exposure.

For the device without a supplied power adapter, use the power adapter provided by a qualified manufacturer. Refer to the product specification for detailed power requirements.

For the device without a supplied battery, use the battery provided by a qualified manufacturer. Refer to the product specification for detailed battery requirements.

Directive 2012/19/EU (WEEE Directive): Products marked with this symbol cannot be disposed of as unsorted municipal waste in the European Union. For proper recycling, return this product to your local supplier upon the purchase of equivalent new equipment, or dispose of it at designated collection points. For more information see: *www.recyclethis.info.*

Regulation (EU) 2023/1542(Battery Regulation): This product contains a battery and it is in conformity with the Regulation (EU) 2023/1542. The battery cannot be disposed of as unsorted municipal waste in the European Union. See the product documentation for specific battery information. The battery is marked with this symbol, which may include lettering to indicate cadmium (Cd), or lead (Pb). For proper recycling, return the battery to your supplier or to a designated collection point. For more information see: *www.recyclethis.info*.

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

For the model SP120, please note that:

SP120H is a class B product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

Industry Canada ICES-003 Compliance

This device meets the CAN ICES-003 (A)/NMB-003(A) standards requirements.

For the model SP120, please note that:

This device meets the CAN ICES-003 (B) / NMB-003 (B) standards requirements.

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

(1) this device may not cause interference, and

(2) this device must accept any interference, including interference that may cause undesired operation of the device.

This equipment complies with IC RSS-102 radiation exposure limits set forth for an uncontrolled environment.

(i) The device for operation in the band 5150-5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems;

(ii) The maximum antenna gain permitted for devices in the band 5725-5875 MHz shall comply with the e.i.r.p. limits specified for point-to-point and non point-to-point operation as appropriate.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

Conformité Industrie Canada ICES-003

Cet appareil répond aux exigences des normes CAN ICES-003 (A)/NMB-003 (A).

Pour le modèle SP120, veuillez noter que:

Cet appareil répond aux exigences des normes CAN ICES-003 (B)/NMB-003 (B).

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radioexempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et

(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

ce matériel est conforme aux limites de dose d'exposition aux rayonnements, CNR-102 énoncée dans un autre environnement.

(i)Les dispositifs fonctionnant dans la bande 5150-5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux.

(ii) Le gain d'antenne maximal autorisé pour les appareils dans la bande

5725-5875 MHz doivent respecter le pire limites spécifiées pour le point-à-point et l'exploitation non point à point, le cas échéant.

Les utilisateurs de radars de haute puissance sont désignés utilisateurs principaux (c.-à-d., qu'ils ont la priorité) pour les bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient causer du brouillage et/ou des dommages aux dispositifs LAN-EL.

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