Instruction Manual
ACH20–1B Thermal Monocular Camera

Instruction Manual
ACH20–1B Thermal Monocular Camera

Thank you for purchasing this product. Lorex Technology Inc. is committed to providing our customers with a high quality, reliable security solution.

This manual refers to the following models:

ACH20–1B

For the latest online manual, downloads and product updates, and to learn about our complete line of accessory products, please visit our website at:

www.lorextechnology.com

Table of contents

1 Introduction 1

2 Important Safeguards and Warnings 2

2.1 Symbol Conventions 2

2.2 Safety Instructions 2

2.2.1 Transportation 2

2.2.2 Operation 2

2.2.3 Charging 3

2.2.4 Cleaning 3

2.2.5 Storage 4

2.3 Privacy Protection Notice 4

2.4 Disclaimers 4

3 What's Included 5

4 Camera Overview 6

4.1 Camera Overview 6

4.2 Camera Buttons 7

4.3 Camera Screen 8

5 Getting Started 9

5.1 Turn Your Camera On 9

5.2 Adjust the Diopter 9

5.3 Menu Navigation 9

6 Connecting to the App 11

6.1 Download the App 11

6.2 Enable Your Camera's Wi-Fi Hotspot 11

6.3 Connect to the App 12

7 Using the App 14

7.1 Live View Settings 14

7.1.1 Digital Zoom 14

7.1.2 Color Palette 14

7.1.3 Record Images & Videos 18

7.2 Function Settings 18

7.2.1 Laser Pointer 19

7.2.2 Fire Detection 19

7.2.3 Track Hot & Cold Points 20

7.3 System Settings 20

7.3.1 Automatic Sleep Mode 20

7.3.2 Automatic Shutdown 21

7.3.3 Change Measurement Unit (m to ft) 21

7.3.4 Switch to External PAL Display 21

7.3.5 Sign Out 21

7.3.6 Restore to Default Settings 21

8 Using Your Camera 22

8.1 Basic Operations 22

8.1.1 Turn On or Off 22

8.1.2 Digital Zoom 22

8.1.3 Color Palette (Colorization) 22

8.1.4 Laser Pointer 24

8.1.5 Record Images & Videos 24

8.2 Detection & Tracking Settings 25

8.2.1 Measure Range Distance (Ranging Mode) 25

8.2.2 Track Hot & Cold Points (Hot Point) 27

8.2.3 Fire Detection (Fire Warning) 28

8.2.4 Fire Detection Alarm 28

8.2.5 Standard or Search (Scene Mode) 29

8.3 General Camera Settings 30

8.3.1 Wi-Fi 30
8.3.2 Sleep Mode (Suspend Mode) 30
8.3.3 Automatic Sleep Timer (Auto Suspend)....31
8.3.4 Automatic Shutdown....32
8.3.5 USB Mode....33
8.3.6 FFC (Flat-Field Correction) Mode 35
8.3.7 DPC (Defective Pixel Correction)....36
8.3.8 Screen Brightness....37
8.3.9 Status Bar....38
8.3.10 Language Settings 40
8.3.11 System Information 41
9 Charging Your Camera 43
10 Updating Your Camera 44
11 Troubleshooting....45
12 Frequently Asked Questions 47
13 Technical Specifications....50
13.1 General 50
13.2 Thermal....50
13.3 Display....51
13.4 Function 51
13.5 Intelligence....51
13.6 Port....51
13.7 Power 52
13.8 Environment 52
13.9 Physical Characteristics 52
14 Notices 53

1 Introduction

Thermal imaging, or thermography, is a way to improve the visibility of objects in complete darkness, haze, or tough conditions. Your Thermal Monocular Camera uses infrared sensors to detect heat given off by a person, animal, or other object and can capture the temperature ranges of objects around us. It creates images of that radiation called thermograms, which display the relative temperatures of different objects with different shades or colors. In a thermogram, warm objects stand out in a contrast or often cooler background. It is widely used in outdoor scenarios for hunting, rescue, animal observation, and more.

2 Important Safeguards and Warnings

Follow all instructions for safe use and handling of your camera.

2.1 Symbol Conventions

The symbols found in this document are defined as follows.

Symbol & Name	Meaning
CAUTION	Indicates a potentially hazardous situation which, if not avoided, can result in minor to moderate injury, or serious damage to the product.
WARNING	Indicates a potentially hazardous situation which, if not avoided, can result in serious injury or death.
DANGER	Indicates a hazardous situation that, if not avoided, will result in death or serious injury.
ESD	Means that ESD (Electrostatic-sensitive device) precautions or controls need to be followed as the item is ESD susceptible or sensitive to electrostatic discharge.
ELECTRIC SHOCK	Indicates high voltage electricity. Take care to avoid coming into contact with electricity.
LASER RADIATION	Indicates a laser radiation hazard. Take care to avoid direct eye contact with the device's laser beam.
NOTE	Provides additional information to emphasize or supplement important points.

2.2 Safety Instructions

To prevent damage to property or injury to yourself or others, carefully read the safety instructions in its entirety before using your camera. Keep these instructions where all those who use your camera will read them.

2.2.1 Transportation

WARNING

- Transport your camera in the original packaging or the camera bag.
- Transport your camera within given temperature and humidity conditions.
- Be careful not to drop your camera. Internal mechanisms can become damaged through excessive vibration, impact (shock), or pressure.
- Avoid exposing your camera to moisture. Contact with water could cause permanent damage to the internal components.

2.2.2 Operation

- Ideal operating temperatures are –20 °C to +55 °C (–4 °F to +131 °F).
- Ideal operating humidity is ≤90% or less.

DANGER

- DO NOT expose your camera to moisture. Contact with water could cause permanent damage to the internal components. In case of liquid entering the camera, quickly turn off your camera and contact your local technical support center for further instructions.
- DO NOT insert foreign materials into your camera. Doing so may result in a short circuit, cause injury to you, and/or may damage your camera.

WARNING

- If your camera malfunctions, contact your local technical support center for further instructions.

CAUTION

- During use, place your hand through the adjustable camera wrist strap to prevent your camera from damage by being dropped.
- DO NOT use your camera in dusty or damp environments or near high electromagnetic radiation to prevent damage to internal circuits and parts.
- DO NOT point your camera lens directly into excessive light sources such as the sun or lasers.
- DO NOT disassemble or modify your camera. The internal components can only be repaired by a trained technician. Disassembling your camera without professional assistance may cause water to seep in, resulting in poor image quality.
- For returns, pack your camera in the original packaging with all items originally included by the manufacturer.

2.2.3 Charging

DANGER

- Improper battery replacement or use may result in fire, explosion, or other hazards.
- Only use accessories regulated by the manufacturer. Never use the charging cable or power adapter with another product.
- Make sure the plug is properly connected to the power socket.
- DO NOT charge your camera within 2 m of flammable materials.
- DO NOT connect multiple devices to one power adapter. The plug in the power socket could overheat and possibly cause a fire.
- If any smoke, odor, or noise comes from your camera while charging, quickly turn off your camera and unplug the charger. Contact your local technical support center for further instructions.

2.2.4 Cleaning

DANGER

- Turn your camera off before cleaning to prevent electric shock.
- Avoid exposing your camera to moisture. Contact with water could cause permanent damage to the internal components. In case of liquid entering your camera, quickly turn off your camera and contact your local technical support center for further instructions.

CAUTION

- Clean your camera with a cloth that is clean, soft, and dry.
- For any dirt that is hard to remove, gently wipe it away using a cloth dipped in neutral detergent. Ensure you wipe away any residue with another dry cloth.
- Never use volatile solvents such as alcohol, benzene, thinner, or cleaners that are strong and abrasive. Doing so may adversely affect your camera's surface coat and performance.

2.2.5 Storage

- Ideal storage temperatures are –20 °C to +60 °C (–4 °F to +140 °F).

WARNING

- Turn your camera off when it will not be used for an extended period.
- Fully charge your camera every 6 months to ensure the battery life quality.
- Store your camera in a dry, well-ventilated area.
- Store your camera within given temperature and humidity conditions.
- Keep out of the reach of children.
- DO NOT immerse your camera in water or expose to moisture.
- DO NOT subject your camera to excessive vibration, impact (shock), or pressure.
- DO NOT store in locations that:
  - Are poorly ventilated or exposed to extremely hot, humid, or cold temperatures
  - Are damp or dusty environments
  - Are next to equipment that produces high electromagnetic radiation
  - Are in direct sunlight or next to local heat sources

2.3 Privacy Protection Notice

Face recording without consent is illegal in certain jurisdictions. Lorex Corporation assumes no liability for use of its products that does not conform with local laws.

Ensure you are compliant to your local privacy laws. Most privacy laws require a clear and understandable notice about the use of cameras on premises *before* individuals enter. This gives individuals the option of not entering if they do not want to be recorded. Signs should also include contact information in case of questions or concerns.

2.4 Disclaimers

- This manual is for reference only.
- Lorex will not be held liable for any damages resulting from the use of this product.
- This manual will be updated according to the latest laws and regulations of related jurisdictions.
- Lorex reserves the right to change the appearance and software described in this manual at any time without prior notice. Product updates may result in some differences appearing between the actual product and this manual.
- There may be errors in this manual or deviations in the description of the functions, operations, and/or technical specifications. If any misunderstanding occurs due to print failure or misunderstanding of the content, we reserve the right of final explanation.
- If any problems occur while using your camera, please visit our support site help.lorextechnology.com or contact our customer support team.
- All logos, brands, trademarks, and registered trademarks are property of their respective owners.

3 What’s Included

The following accessories are packaged with your camera. Check that all accessories are included.

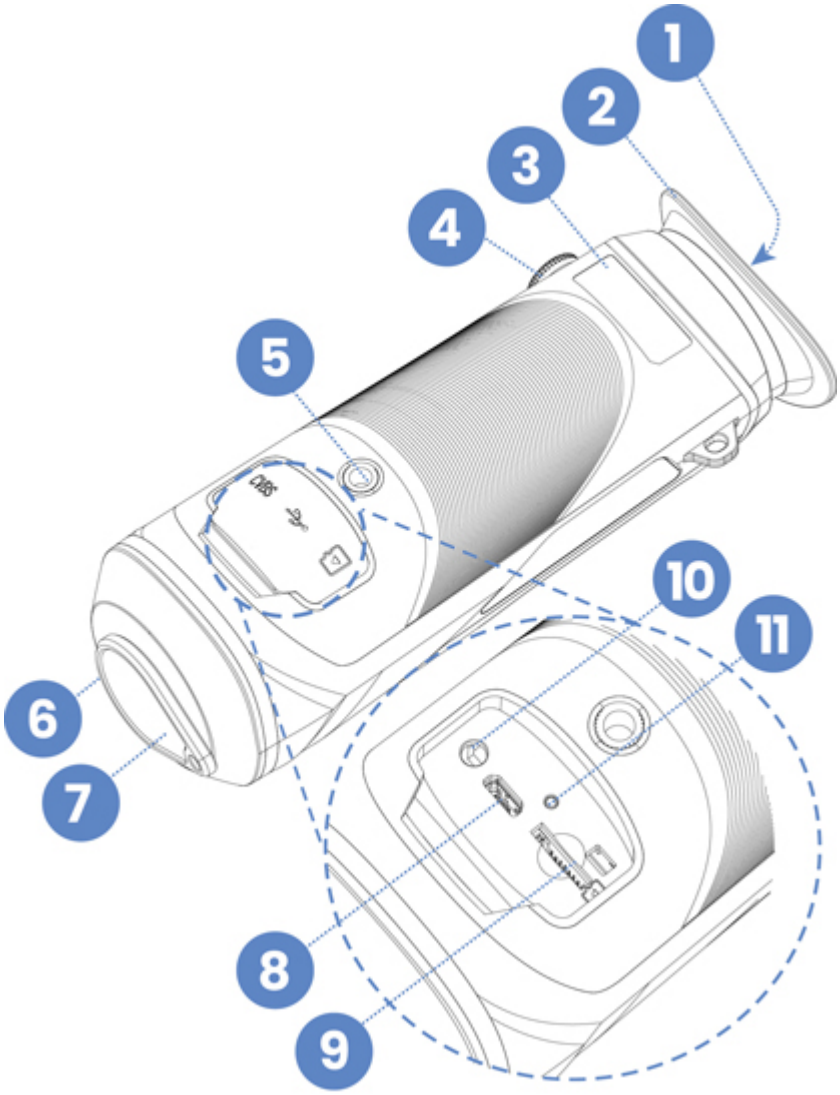
Name	Quantity
Thermal Monocular Camera	x1
Micro-USB Cable	x1
Universal Power Adapter	x1
Plug Adapter*	x5
Camera Bag	x1
Legal and Regulatory Information	x1
QSG and Warranty Card	x1

*Different international plug adapters included. Use the plug specific to your region.

4 Camera Overview

Review the names and functions of working parts that belong to your camera.

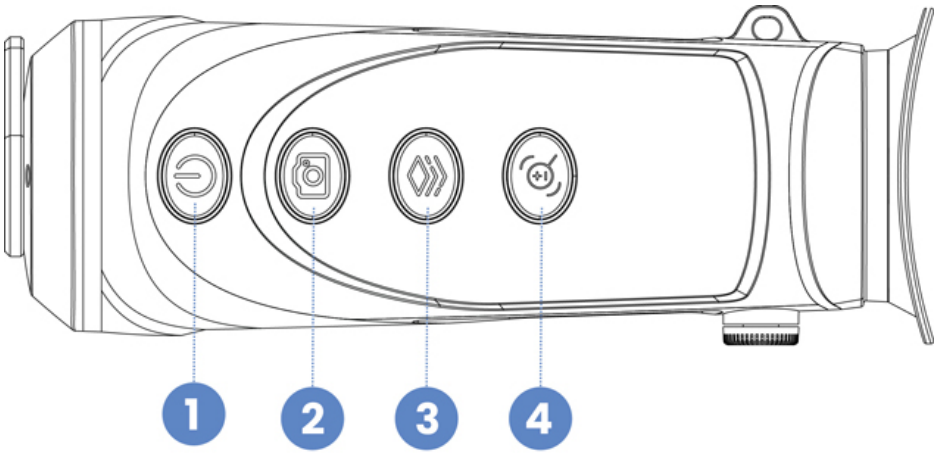
4.1 Camera Overview



No.	Name	Function
1	**Screen**	Displays your camera's menu and the image to be taken. Only visible when you hold your camera to your eye or when you connect through the app.
2	**Eyeshade**	Blocks light and helps you concentrate on taking a photo. Comes in a soft material for more comfortable viewing.
3	**Serial Number (S/N)**	A unique group of numbers and letters assigned to your camera. Used to connect your camera to the app.
4	**Diopter Adjustment Dial**	Adjust the diopter according to your eyesight to ensure your view is clear and not blurry.
5	**Tripod Thread**	Install a tripod (not included).

6	**Laser Pointer**	Emits an intense beam of light to highlight or point out certain things. Technical specification for the laser pointer: • Wavelength: 650 nm • Beam diameter < 15 x 20 mm (10 m) • Maximum average output power: 0.9 mW **LASER RADIATION** Exposure to laser light can cause significant damage to the eyes. Never look into the laser beam directly or through a piece of optical equipment.
7	**Lens Cap**	Protect your camera lens from dust when your camera is not in use.
8	**USB Port**	Connects to a micro-USB data cable for charging or exporting files.
9	**MicroSD Card Slot**	Insert a microSD card for local storage.
10	**CVBS Port**	Connects to an external PAL display for expanding your camera's image.
11	**Charging Indicator**	Shows your camera's battery charging status. • **Red:** Charging • **Green:** Fully Charged • **Off:** Not Charging • **Flashing Red & Green:** Charging Error

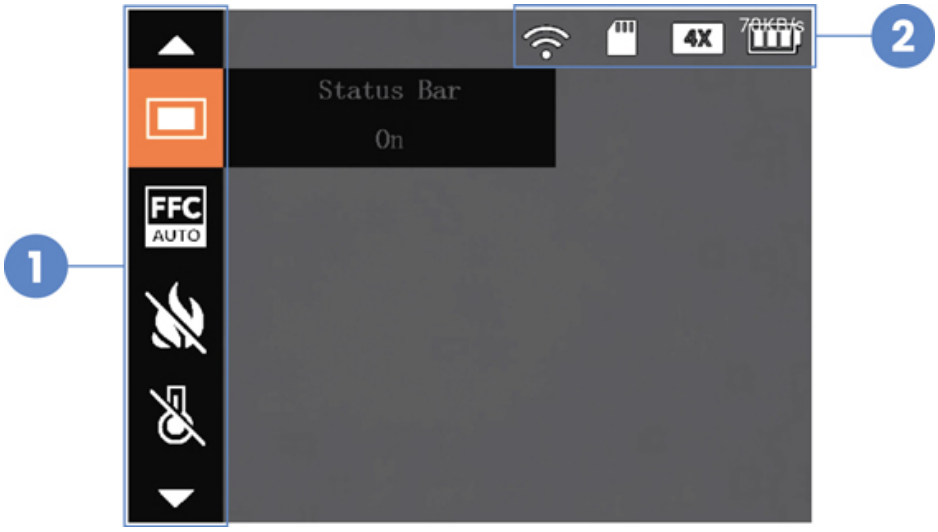
4.2 Camera Buttons



No.	Name	Function
1	**Power**	• Press and hold to turn your camera on/off. • Press to turn sleep mode on/off (Suspend Mode).
2	**Capture**	• Press and hold to record videos. • Press to capture images.

3	**Mode**	• Press and hold to enter the menu. • Press to select the color palette (Colorization).
4	**Zoom**	• Press and hold to manually adjust the shutter. • Press to use digital zoom. Keep pressing to zoom in and out. • Press twice quickly to enable or disable the laser pointer.

4.3 Camera Screen



No.	Name	Function
1	Menu	Adjust settings, enable Wi-Fi, and setup options from your camera's menu.
2	Status Bar	The status bar displays information pertaining to Wi-Fi, the microSD card, zoom, and battery level. For more details, see 8.3.9 *Status Bar*, page 38.

5 Getting Started

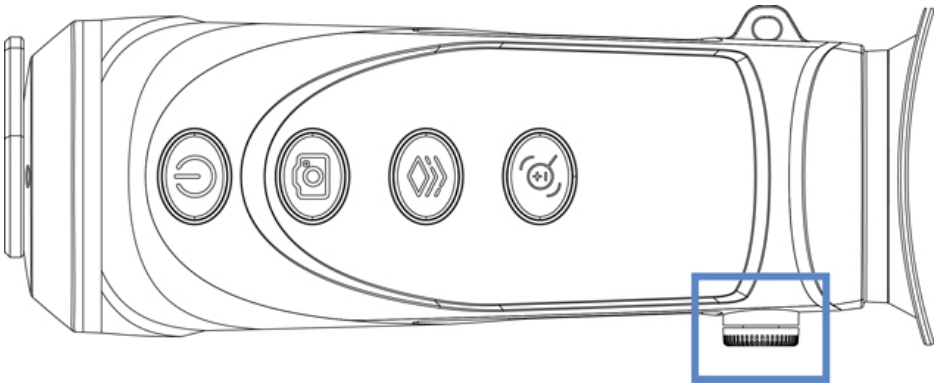
To ensure proper use of your camera, be sure to read the 2 *Important Safeguards and Warnings*, page 2.

5.1 Turn Your Camera On

1. Charge your camera before using it for the first time. Open the sealing cap covering the USB port, then connect the micro-USB cable to your camera for charging. Plug the other end to a charger and power source.
2. Press and hold until your camera's screen turns on.

5.2 Adjust the Diopter

Before you begin, it is highly recommended that you adjust your camera's diopter to your eyesight. Focusing your view will minimize eye strain and fatigue.



- Point your camera at something solid.
- Begin turning the diopter adjustment dial. As you are adjusting the dial, move it left or right until the display appears clearly in your camera's screen.

5.3 Menu Navigation

Use your camera's buttons to navigate through the menu.

While your camera is on, press and hold to open the menu, then navigate as indicated:

Navigation	Button
Enter the menu	Press and hold
Move up	Press
Move down	Press
Confirm	Press
Exit	Press

6 Connecting to the App

Follow the steps below to connect your camera to the app.

NOTE
The frequency bands and transmitting power (radiated and/or conducted) nominal limits applicable to this radio equipment are as follows: Wi-Fi 2.4 GHz (2.4 GHz to 2.4835 GHz) 20 dBm.

6.1 Download the App

Scan the QR code to download your camera's mobile app, **Thermal_Connection**.

iOS

Android

6.2 Enable Your Camera's Wi-Fi Hotspot

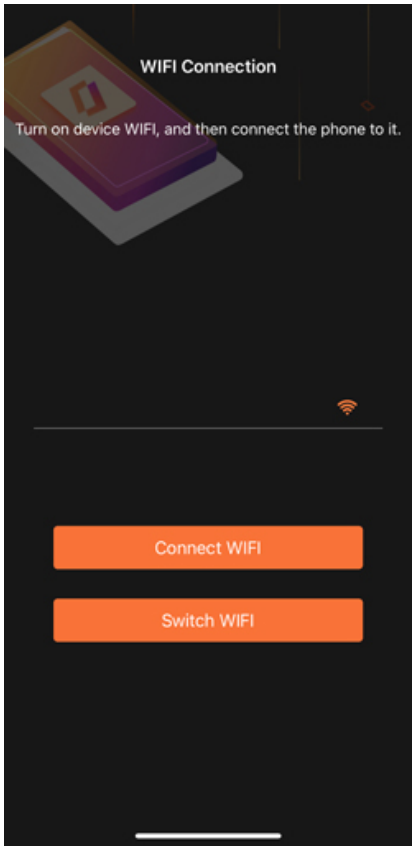
Looking into your camera:

1. Press and hold to open the menu.
2. Press or to navigate to **Wi-Fi**.
3. Press to open the setting.
4. Press to select **AP** (Access Point).
5. Press to confirm your setting. This will enable your camera's Wi-Fi hotspot.

6. Press to exit the menu.

6.3 Connect to the App

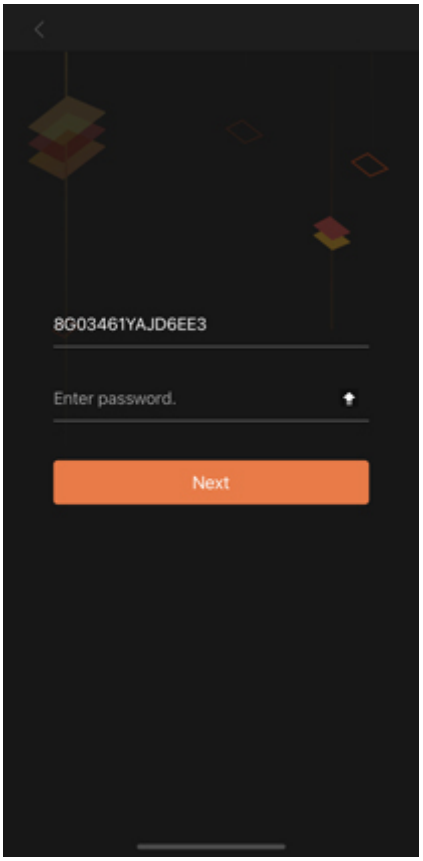
1. Open the app.



2. Tap **Switch WIFI**.
3. Tap on your Wi-Fi settings, and then tap your camera's name.

> **NOTE**
>
> - **Wi-Fi Name: Your camera's Serial Number (S/N)**
> - **Wi-Fi Password: The last 8–digits of your camera's Serial Number (S/N)**
>
> To access your camera's serial number from the system information screen, see 8.3.11 *System Information*, page 41.

4. In the app, tap **Connect WIFI**.



5. Enter your camera's Wi-Fi password, and then tap **Next**.

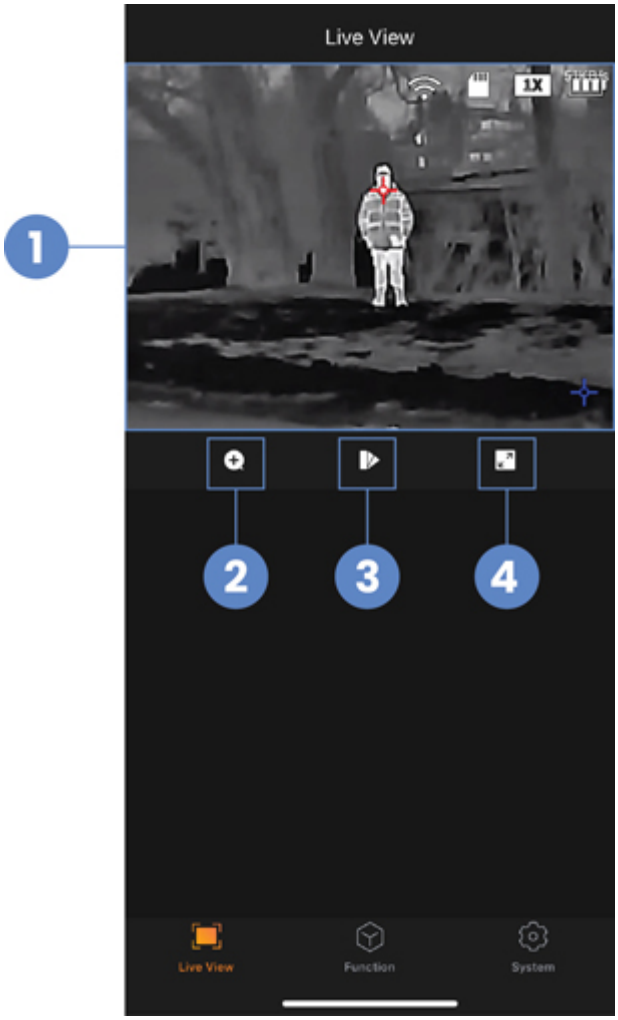
You will now be able to view your camera from the app and make some minor setting adjustments. For more details see 7 *Using the App*, page 14.

7 Using the App

Take some time to learn about using your camera through the companion app.

7.1 Live View Settings

The Live View is the first screen you will see when your camera connects to the app. It includes the following features:



1. Camera's Live View footage
2. Digital Zoom
3. Color Palette
4. Full-screen display (record images & videos)

7.1.1 Digital Zoom

Zoom in on a certain part of your camera's image to magnify details.

1. From Live View, tap .
2. Tap your preferred zoom range.
3. Tap **OK** to save.

7.1.2 Color Palette

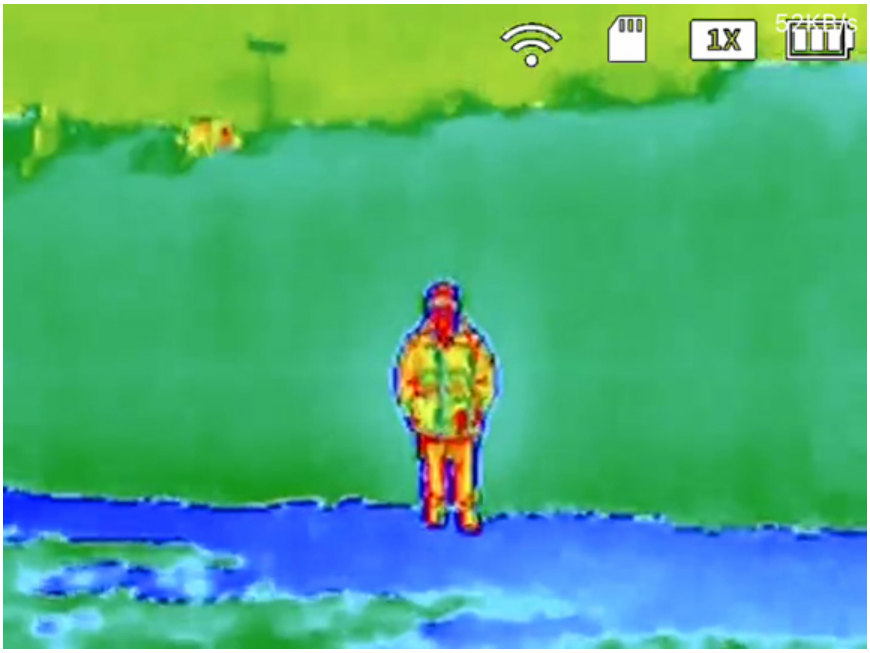
Select your camera's color palette for enhanced visual representations of thermal imaging.

1. From Live View, tap .

2. Tap on one of the following color palettes:
   - **Whitehot**: The most used palette, **Whitehot** displays warmer objects in white and then cooler objects in black, and everything in between in a shade of gray.

   - **Ironrow:** This is a general-purpose palette that uses a variety of colors to showcase heat distribution. Red indicates the highest temperature, with an array of colors cooling off to blue as the temperature in the image decreases.

- **RainBow:** Best suited for scenes with minimal heat change, **RainBow** uses different colors to display slight temperature changes despite low-contrast conditions.



- **Warning:** Based off **Whitehot**, **Warning** showcases warmer objects in a white color with heat indicated by a vibrant red. This palette was designed to quickly detect body heat.

3. Tap **OK** to save.

NOTE
Not all color palettes are suited for every situation. Select the option that best shows the thermal differences for your specific application.

7.1.3 Record Images & Videos

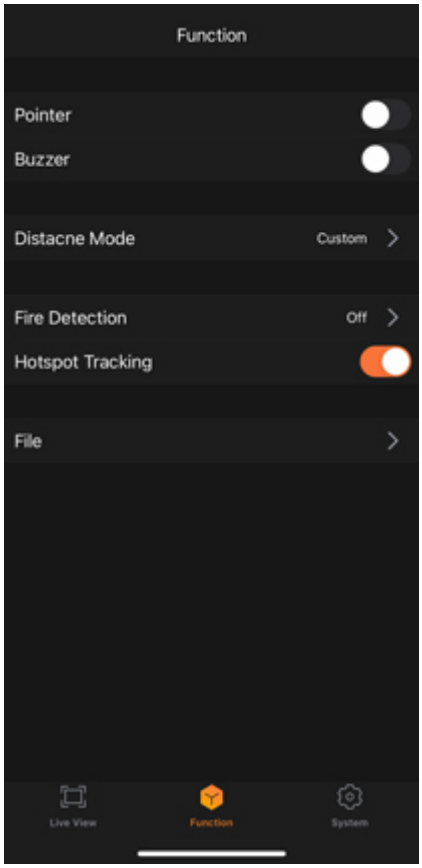
Record images and videos onto your camera's microSD card.

1. From Live View, tap .
2. Tap the screen to display the capture and record icons.
3. **To capture images:** Tap .
4. **To start or stop recording videos:** Tap .

> **NOTE**
>
> A blinking red dot next to a recording timer appears on the left of the screen to indicate that your camera is recording.

7.2 Function Settings

Enable some of your camera's features, like the laser pointer, fire detection, or track hot and cold points.

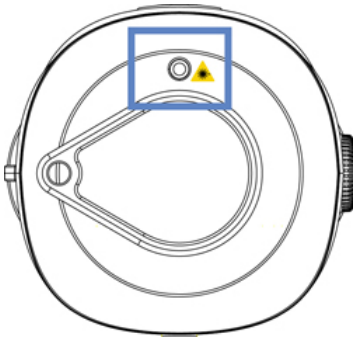


7.2.1 Laser Pointer

Use the laser pointer to illuminate a point of interest with a bright spot of colored light.

LASER RADIATION

Exposure to laser light can cause significant damage to the eyes. Never look into the laser beam directly or through a piece of optical equipment.



1. Tap **Function**.
2. Tap to enable **Pointer**. The laser pointer automatically turns on.

After a few seconds, the laser pointer automatically turns off.

7.2.2 Fire Detection

Detect fires in your camera's image with a red box surrounding the source. If enabled, you can set the fire detection sensitivity from high to low.

1. Tap **Function**.
2. Tap **Fire Detection**.
3. Tap on one of the options:
   - **Off:** Fire detection is turned off.
   - **High**, **Middle**, or **Low** Sensitivity: Your camera will detect fires based on the sensitivity level.
4. Tap **OK** to save.

7.2.3 Track Hot & Cold Points

Track the hottest and lowest temperatures in your camera's image at the same time. If enabled, your camera's image will display a red target tracking the hottest point and a blue target tracking the lowest point.

1. Tap **Function**.
2. Tap to enable **Hotspot Tracking**.

7.3 System Settings

Customize your camera's system settings or sign out.

7.3.1 Automatic Sleep Mode

Select how long your camera waits before entering sleep mode.

1. Tap **System**.
2. Tap **Automatic Maintenance**.
3. Tap **Auto Sleep Setting**.

4. Tap on one of the options:
    - **Off:** Automatic sleep mode is turned off.
    - **10 Mins**, **5 Mins**, **3 Mins**, **1 Min**: Your camera will automatically go into sleep mode after the selected time. Shorter times preserve your camera's battery life.
5. Tap **OK**, then **Save**.

7.3.2 Automatic Shutdown

Select how long your camera waits before turning off.

1. Tap **System**.
2. Tap **Automatic Maintenance**.
3. Tap **Auto Power OFF Setting**.
4. Tap on one of the options:
    - **Off:** Automatic shutdown is turned off.
    - **60 Mins**, **30 Mins**, **10 Mins**, **5 Mins**: Your camera will automatically shutdown after the selected time.
5. Tap **OK**, then **Save**.

7.3.3 Change Measurement Unit (m to ft)

Customize your camera's measurement unit.

1. Tap **System**.
2. Tap **Unit**.
3. Tap on one of the options:
    - **Meter:** Measure using a metric unit.
    - **Feet:** Measure using an imperial unit.
4. Tap **OK** to save.

7.3.4 Switch to External PAL Display

Connect your camera to an external PAL display for expanding output images and zooming in on details.

1. Tap **System**.
2. Tap **CVBS**.
3. Tap on one of the options:
    - **LOCAL:** View from your camera's screen.
    - **P:** View your camera's screen from a TV. Use your camera's CVBS port to connect to an external PAL display (cable not included).
4. Tap **OK** to save.

7.3.5 Sign Out

Disconnect your camera from the app by signing out of the app.

1. Tap **System**.
2. Tap **Sign Out**.
3. Tap **OK**.

7.3.6 Restore to Default Settings

Restore your camera's menu and app settings to its factory default settings.

1. Tap **System**.
2. Tap **Restore the Default**.
3. Tap **OK**.

	NOTE
Since the default setting for **Wi-Fi** is **Off**, your camera will disconnect from the app.	

8 Using Your Camera

8.1 Basic Operations

This section covers the basic operations for getting started with your camera.

8.1.1 Turn On or Off

To turn your camera on or off: Press and hold .

8.1.2 Digital Zoom

Zoom in on a certain part of your camera's image to magnify details.

To switch the zoom range: Press . Keep pressing to zoom in and out.

8.1.3 Color Palette (Colorization)

Select your camera's color palette for enhanced visual representations of thermal imaging.

To quickly change the color palette: Press .

NOTE
The color palette can also be changed from the menu by navigating to the setting **Colorization**.

Switch between any of the following color palettes:

- **White Hot:** The most used palette, White Hot displays warmer objects in white and then cooler objects in black, and everything in between in a shade of gray.

- **Iron Red:** This is a general-purpose palette that uses a variety of colors to showcase heat distribution. Red indicates the highest temperature, with an array of colors cooling off to blue as the temperature in the image decreases.

- **Black Hot:** Black Hot is the inverted version of White Hot, displaying warmer objects in black and then cooler objects in white, and everything in between in a shade of gray.

- **Alarm:** Based off White Hot, Alarm showcases warmer objects in a white color with heat indicated by a vibrant red. This palette was designed to quickly detect body heat.

NOTE

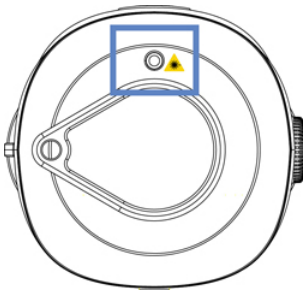
Not all color palettes are suited for every situation. Select the option that best shows the thermal differences for your specific application.

8.1.4 Laser Pointer

Use the laser pointer to highlight a point of interest by illuminating it with a bright spot of colored light.

LASER RADIATION

Exposure to laser light can cause significant damage to the eyes. Never look into the laser beam directly or through a piece of optical equipment.



To turn the laser on: Quickly press two times.

8.1.5 Record Images & Videos

Record images and videos onto your camera's microSD card.

NOTE

Your camera cannot record images or videos while the menu is open or when it is connected to a computer.

- **To capture images:** Press .
- **To start or stop recording videos:** Press and hold for 3 seconds. A blinking red dot next to a recording timer appears on the left of the screen to indicate that your camera is recording.

8.2 Detection & Tracking Settings

This section covers the key features for detection and tracking.

8.2.1 Measure Range Distance (Ranging Mode)

Measure the range distance between your camera and your target using the pre-set ranging modes for animals, people, etc.

NOTE

To change the measurement unit between metric or imperial from the app, see 7.3.3 *Change Measurement Unit (m to ft)*, page 21.

1. Press and hold to open the menu.
2. Press or to navigate to **Ranging Mode**.
3. Press to open the setting.

4. Press to select one of the modes:
   - **Wolf:** Measure your distance from a wolf, with a pre-set height of 1.2m.
   - **Customize:** Enter a custom height to measure your distance from your target.
   - **Wild Boar:** Measure your distance from a boar, with a pre-set height of 0.9m.
   - **Human:** Measure your distance from a human, with a pre-set height of 1.8m.
   - **Rabbit:** Measure your distance from a rabbit, with a pre-set height of 0.3m.
5. Press to confirm your setting.
6. For an accurate measurement, center your target in between the two horizontal green lines. Press or to reduce or expand the space between the lines.
7. Your camera will automatically measure the distance from your camera to your target and display it on the top left corner of the screen. Press to exit the ranging mode screen.

8.2.2 Track Hot & Cold Points (Hot Point)

Track the hottest and lowest temperatures in your camera's image at the same time. If enabled, your camera's image will display a red target tracking the hottest point and a blue target tracking the lowest point.

1. Press and hold to open the menu.
2. Press or to navigate to **Hot Point**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off:** Hot and cold points are turned off.
   - **On:** Your camera will track hot and cold points.
5. Press to confirm your setting.

6. Press to exit the menu.

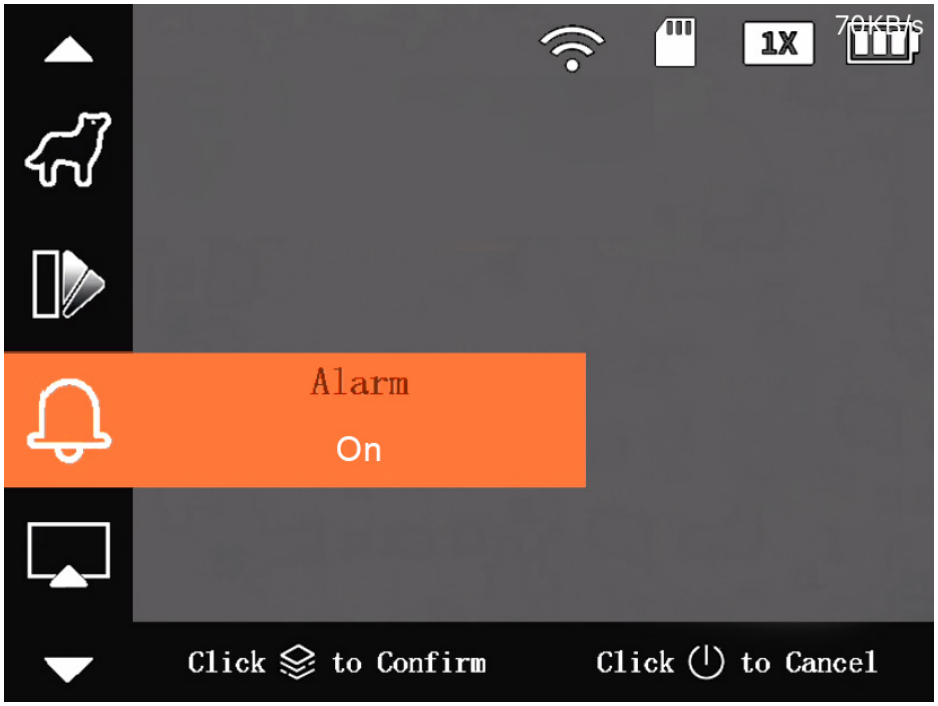
8.2.3 Fire Detection (Fire Warning)

Detect fires in your camera's image with a red box surrounding the source. If enabled, you can set the fire detection sensitivity from high to low.

1. Press and hold to open the menu.
2. Press or to navigate to **Fire Warning**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off:** Fire detection is turned off.
   - **High**, **Middle**, or **Low**: Your camera will detect fires based on the sensitivity level.
5. Press to confirm your setting.
6. Press to exit the menu.

8.2.4 Fire Detection Alarm

Set your camera to sound an alarm when fire is detected in the image.



NOTE

The fire detection alarm works only when your camera has fire detection enabled on either **High**, **Middle**, or **Low**. For full instructions, see 8.2.3 *Fire Detection (Fire Warning)*, page 28.

1. Press and hold to open the menu.
2. Press or to navigate to **Alarm**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off**: Your camera's fire detection alarm is off.
   - **On:** Your camera's alarm will sound when fire is detected.
5. Press to confirm your setting.
6. Press to exit the menu.

8.2.5 Standard or Search (Scene Mode)

View your camera on **Standard** mode or view your camera on **Search** mode to get targets with hot temperatures to stand out more.

1. Press and hold to open the menu.
2. Press or to navigate to **Scene Mode**.
3. Press to open the setting.
4. Press to select one of the modes:
   - **Standard:** Used during regular daily observation.
   - **Search**: Used to emphasize targets with hot temperatures.

5. Press to confirm your setting.
6. Press to exit the menu.

8.3 General Camera Settings

This section covers how to use the general camera settings.

8.3.1 Wi-Fi

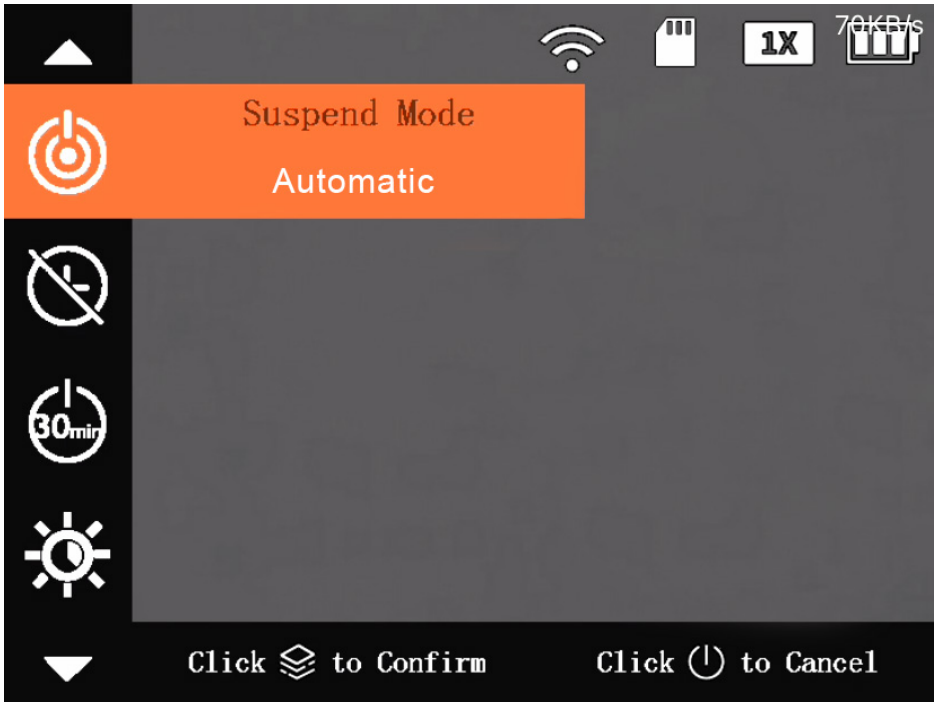
Connect your camera to the app using the hotspot-enabled Wi-Fi.

1. Press and hold to open the menu.
2. Press or to navigate to **WiFi**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off**: Your camera's Wi-Fi connection is turned off.
   - **AC (Access Point):** Enable your camera's Wi-Fi hotspot.
5. Press to confirm your setting.
6. Press to exit the menu.

NOTE
To wake your camera up from sleep mode, press .

8.3.2 Sleep Mode (Suspend Mode)

Set your camera to go into sleep mode (suspend mode) when it is idle to save power.



1. Press and hold to open the menu.
2. Press or to navigate to **Suspend Mode**.
3. Press to open the setting.
4. Press to select one of the modes:
   - **Smart:** The built-in distance sensor can detect whether your camera is being used; if no one is within a certain distance for a set period, the screen turns off.
   - **Automatic**: Your camera's screen turns off when the sleep timer expires. For instructions on setting your automatic sleep timer, see 8.3.3 *Automatic Sleep Timer (Auto Suspend)*, page 31.
5. Press to confirm your setting.
6. Press to exit the menu.

NOTE

To wake your camera up from sleep mode, press .

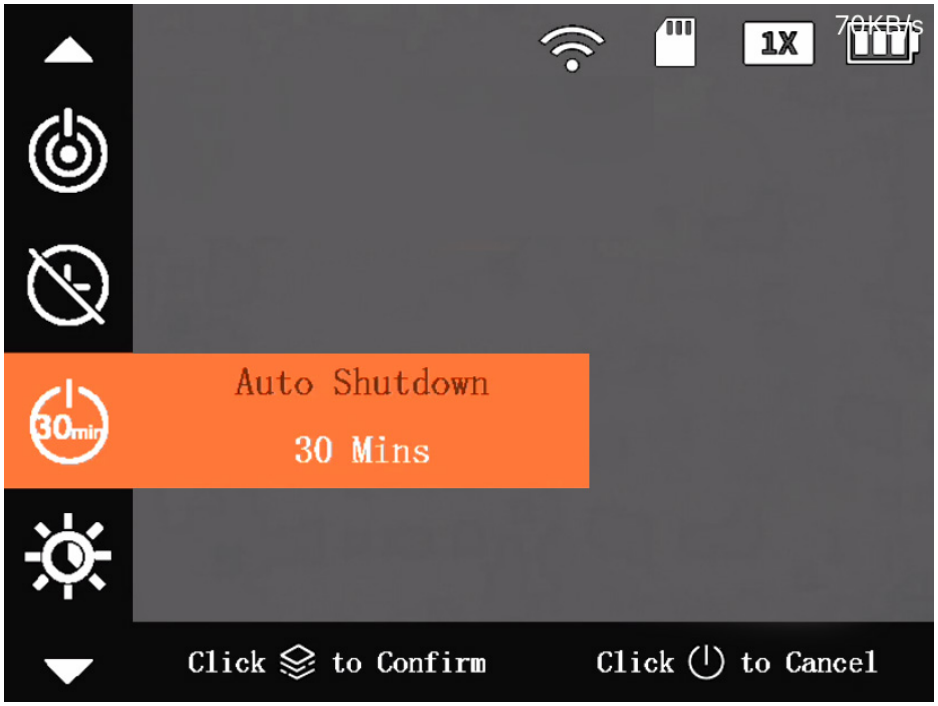
8.3.3 Automatic Sleep Timer (Auto Suspend)

Select how long your camera will sit idle before entering sleep mode.

1. Press and hold to open the menu.
2. Press or to navigate to **Auto Suspend**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off:** The automatic sleep timer is off.
   - **10 Mins**, **5 Mins**, **3 Mins**, **1 Min**: Select how long your camera will sit idle before entering sleep mode. Shorter times preserve your camera's battery life.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.4 Automatic Shutdown

Select how long your camera waits before turning off.



1. Press and hold to open the menu.
2. Press or to navigate to **Auto Shutdown**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Off:** The automatic shutdown is off.
   - **60 Mins**, **30 Mins**, **10 Mins**, **5 Mins**: Your camera will automatically shutdown after the selected time.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.5 USB Mode

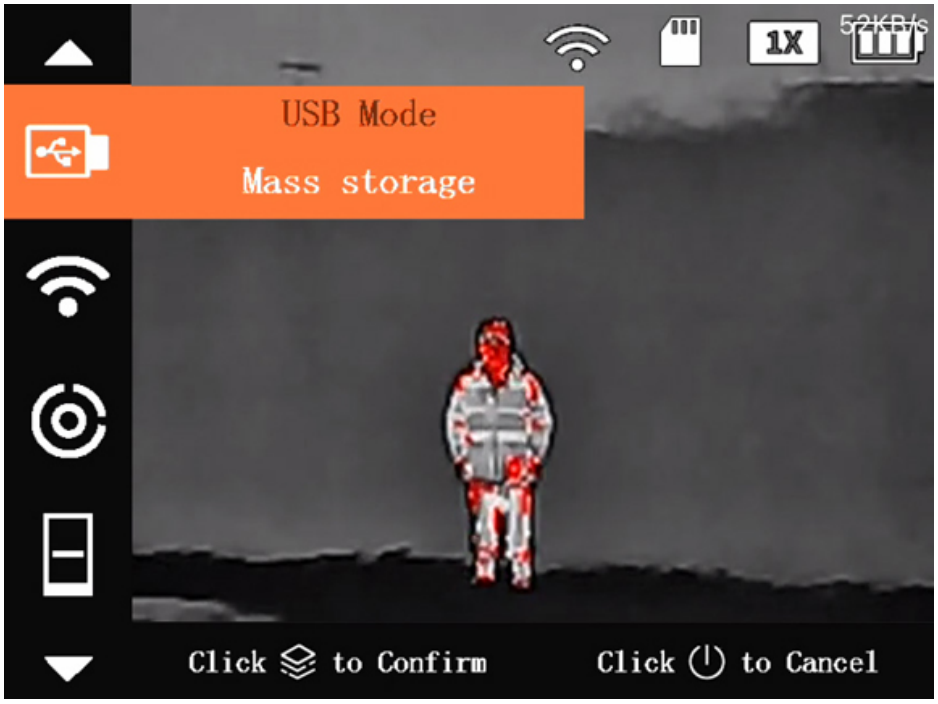
8.3.5.1 USB Mode

Set the USB mode when connecting your camera to the micro-USB cable and another source.

1. Press and hold to open the menu.
2. Press or to navigate to **USB Mode**.
3. Press to open the setting.
4. Press to select one of the modes:
   - **Off:** Turn the USB mode off when charging your camera.
   - **Mass Storage:** Import or export pictures, recordings, or files on your camera's microSD card. Connect the micro-USB cable into your camera's USB port and the other end into an available USB port on your computer.
   - **UVC:** For live viewing on your computer. Connect the micro-USB cable into your camera's USB port and the other end into an available USB port on your computer. Afterwards, open your computer's camera application and change the camera.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.5.2 Export Recordings

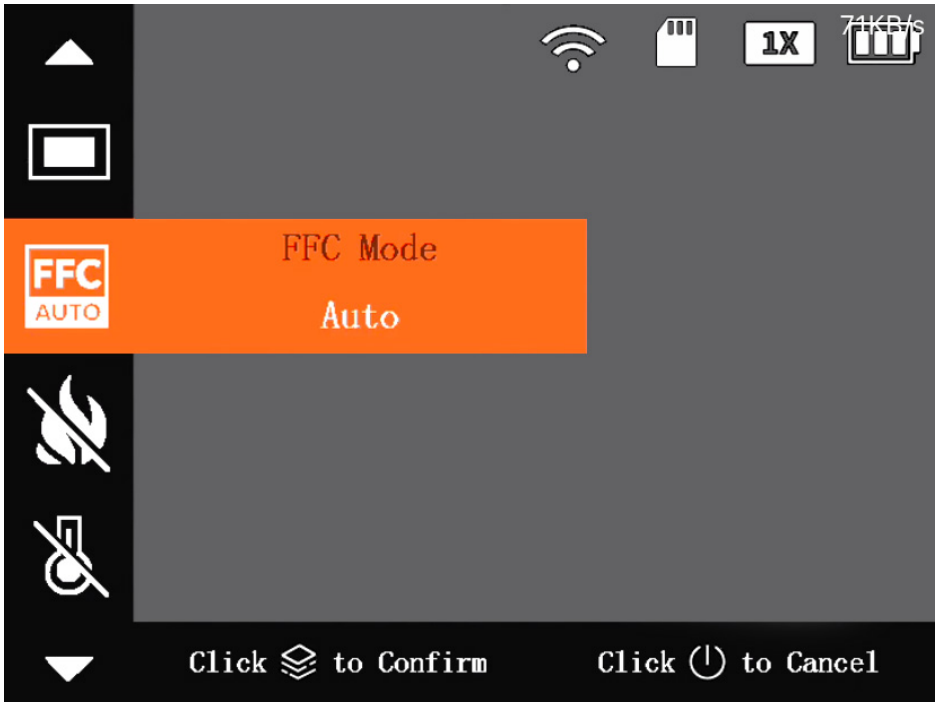
Export recorded images and videos from your camera's microSD card.



1. Press and hold to open the menu.
2. Press or to navigate to **USB Mode**.
3. Press to open the setting.
4. Press to select **Mass Storage**.
5. Press to confirm your setting.
6. Connect the micro-USB cable into your camera's USB port and the other end into an available USB port on your computer.
7. The microSD card's storage will open on your computer desktop. Select files to export, then copy them onto your computer.
8. After exporting, disconnect the micro-USB cable from your camera and computer.
9. Press to select **USB Mode Off**.
10. Press to confirm your setting.
11. Press to exit the menu.

8.3.6 FFC (Flat-Field Correction) Mode

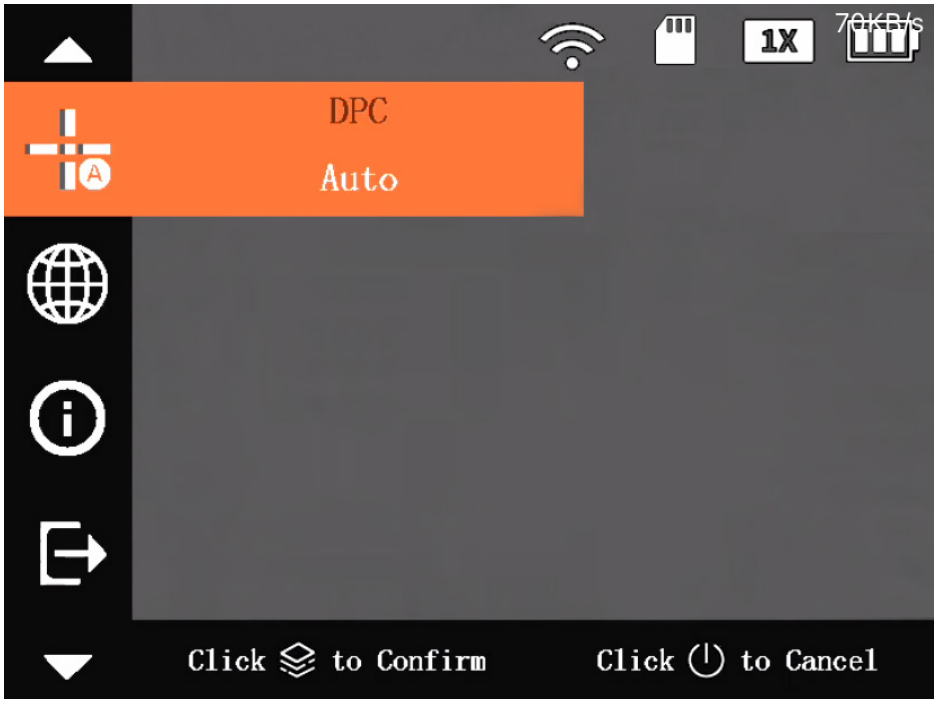
Use the FFC mode to remove typical optical artifacts, such as graininess, speckles, shading, etc. from your camera's image. Using FFC results in optimized image quality and helps to analyze temperature changes.



1. Press and hold to open the menu.
2. Press or to navigate to **FFC**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Auto:** (Default) Your camera periodically performs automatic FFC in response to typical FFC conditions.
   - **Manual**: Perform FFC only upon command. Press and hold to enable FFC manually as needed.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.7 DPC (Defective Pixel Correction)

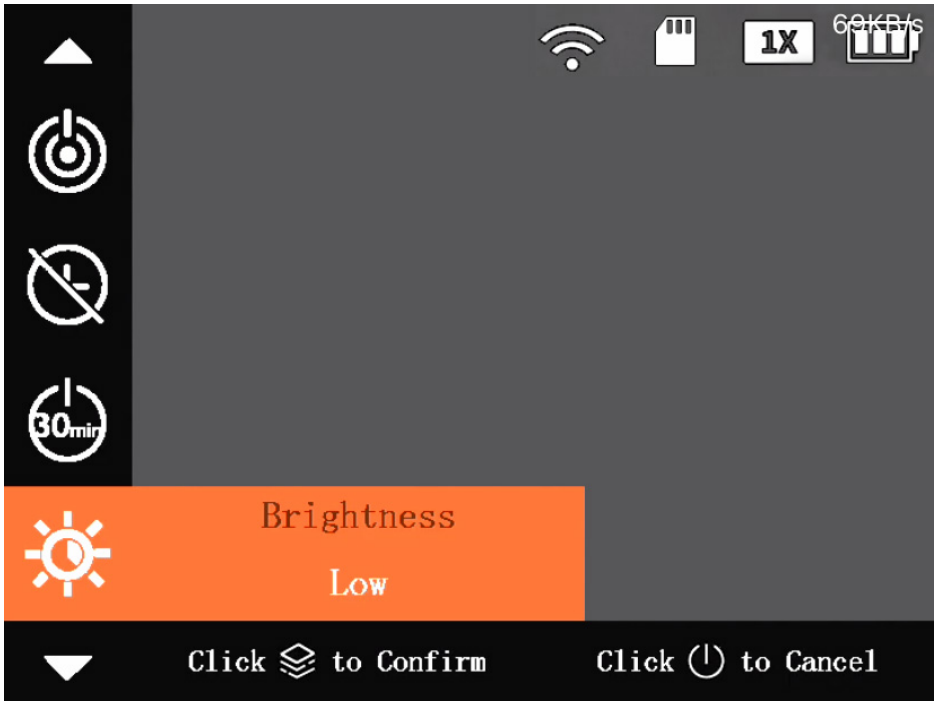
Use the DPC (Defective Pixel Correction) to correct pixel defects in your camera’s image.



1. Press and hold to open the menu.
2. Press or to navigate to **DPC**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Auto:** (Default) Your camera automatically calibrates defective pixels.
     - Press to start auto DPC.
     - Close the lens cap until your camera signals that auto correction is complete.
   - **Manual**: Correct the defective pixels manually.
     - Press to start DPC manually.
     - Press to switch between the X-axis and Y-axis.
     - Press and hold or to start correction.
   - **Restore:** DPC is restored to original state.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.8 Screen Brightness

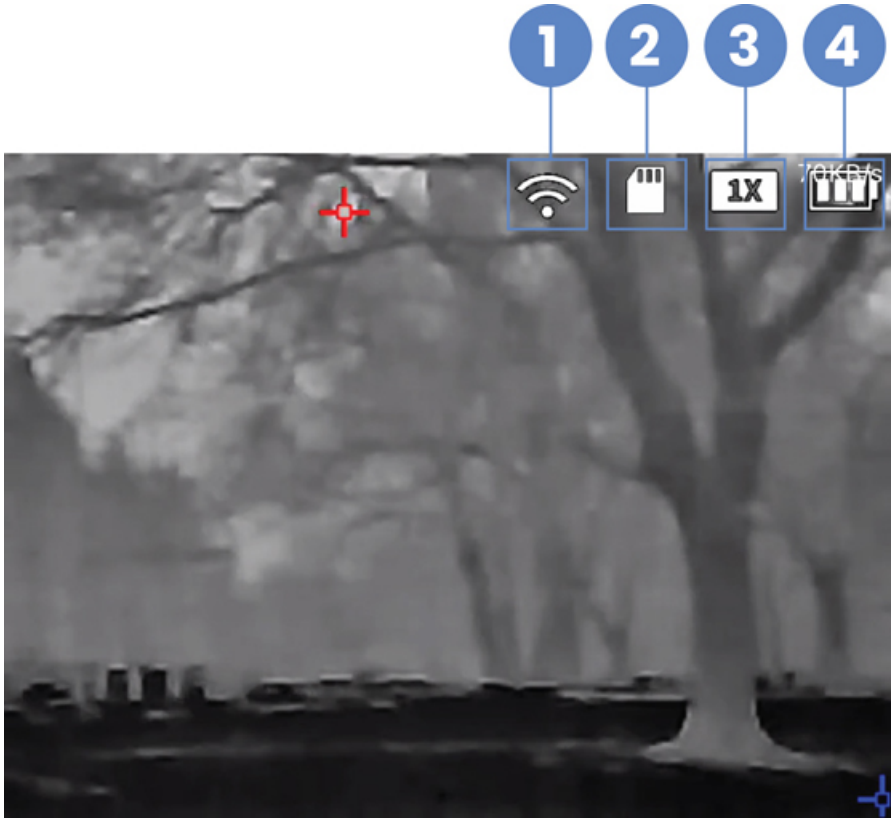
Adjust your camera's screen brightness level between low, medium, and high.



1. Press and hold to open the menu.
2. Press or to navigate to **Brightness**.
3. Press to open the setting.
4. Press to select one of the options:
   - **Low** (Default), **Middle**, or **High**: Select the lowest to highest screen brightness level. A lower brightness level preserves your camera's battery life.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.9 Status Bar

Your camera's status bar, located on the top right of the screen, displays information using the following icons:



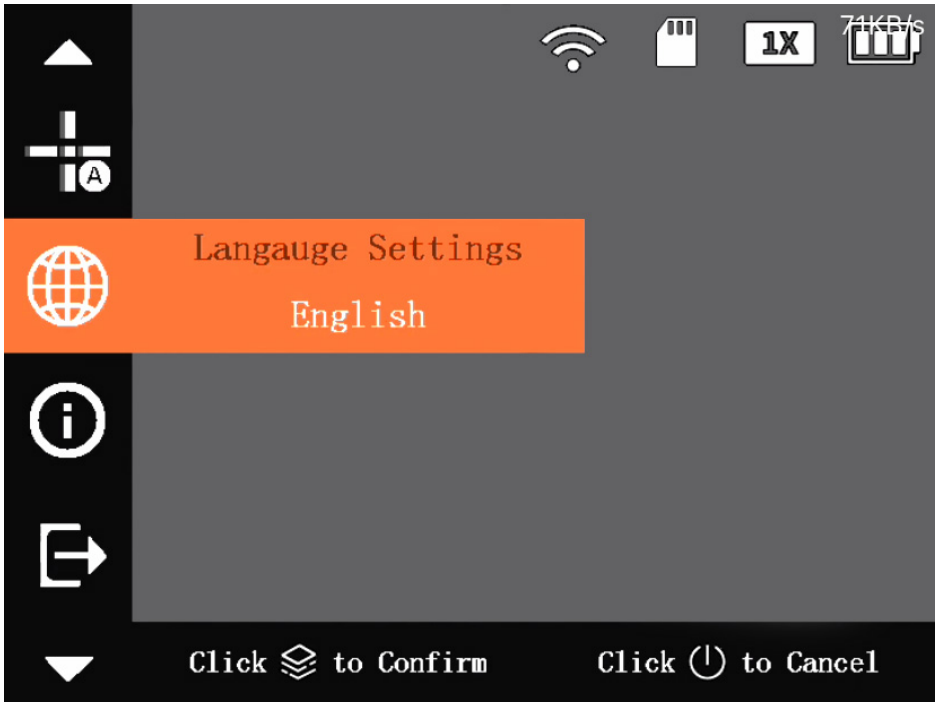
No.	Name	Function
1	Wi-Fi	Displays when there is a Wi-Fi connection.
2	MicroSD Card	• **White Icon:** Installed • **Red Icon:** Memory Full • **Red Icon with "X":** Not Installed • **Red Icon with "!":** Error — follow the formatting prompts
3	Digital Zoom	Supports **x1**, **x2**, **x3** and **x4** digital zoom. **NOTE** The number may vary depending on whether you are using it through your camera or the app.
4	Battery Level	Displays your camera's battery level.

To display or hide the status bar:

1. Press and hold to open the menu.
2. Press or to navigate to **Status Bar**.
3. Press to open the setting.
4. Press to select one of the options:
   - **On:** (Default) Shows the status bar.
   - **Off**: Hides the status bar.
5. Press to confirm your setting.
6. Press to exit the menu.

8.3.10 Language Settings

Change your camera's display to your preferred language.

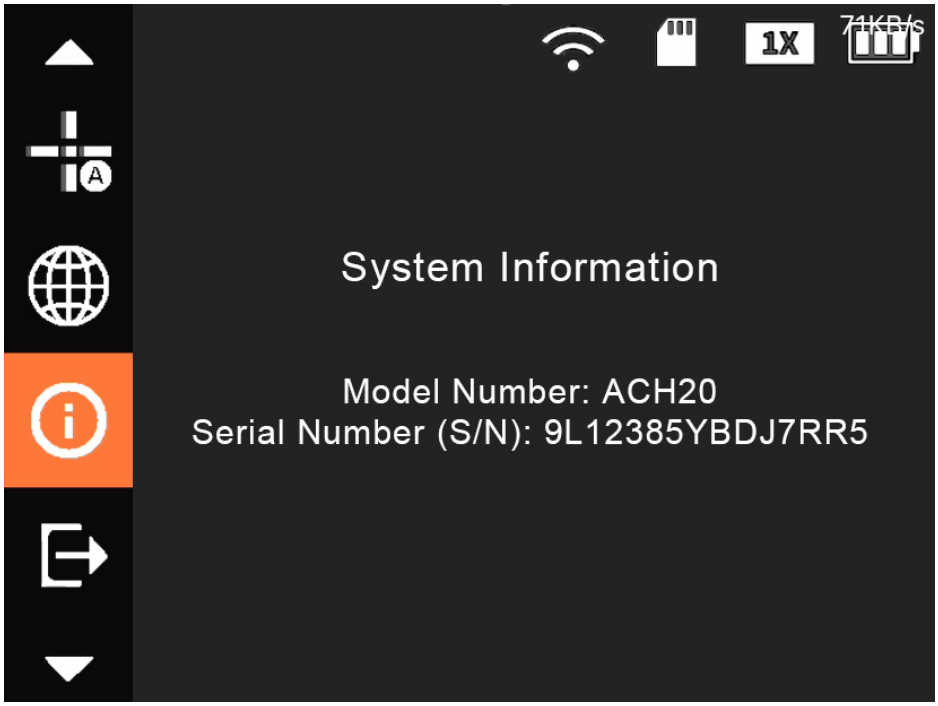


1. Press and hold to open the menu.
2. Press or to navigate to **Language**.
3. Press to open the setting.
4. Press to select your preferred language.
5. Press to confirm your setting.
6. Press to exit the menu.

NOTE
This will only change the language in your camera's menu, not the app.

8.3.11 System Information

Access your camera's system information, including your camera's serial number and firmware version number.



1. Press and hold to open the menu.
2. Press or to navigate to .
3. Press to open your camera's system information.
4. Press to exit the menu.

9 Charging Your Camera

The battery icon in your camera's status bar will indicate when your camera's battery level is low and needs charging.

1. Insert the adapter plug for your region into the back of the universal power adapter.
2. Open the sealing cap covering your camera's USB port.
3. Connect the micro-USB cable to your camera's USB port and the other end of the cable into the universal power adapter.
4. Plug into a power source.

Your camera has the following 4 charging statuses, as shown by the LED charging indicator located under the USB port.

Color	Status
Red	Charging
Green	Fully Charged
Off	Not Charging
Flashing Red & Green	Charging Error

NOTE

- Review the safety instructions for charging, see 2.2.3 *Charging*, page 3.
- Ensure the **USB Mode** is set to **Off**. For full instructions, see 8.3.5.1 *USB Mode*, page 33.
- Ensure you use the supplied micro-USB cable and that it is properly connected.

10 Updating Your Camera

Update your camera through the microSD card.

NOTE

To download the latest firmware update for your camera, contact the **Technical Support** team.

1. Insert a microSD card into your camera's microSD card slot.
2. Press and hold to open the menu.
3. Press or to navigate to **USB Mode**.
4. Press to open the setting.
5. Press to select **Mass storage**.
6. Press to confirm your setting.
7. Connect the micro-USB cable into your camera's USB port and the other end into an available USB port on your computer.
8. The microSD card's storage will open on your computer desktop. Copy the update program to the microSD card.
9. Press and hold and at the same time for 3 seconds. A blue screen will indicate that an update is in progress.

After a few minutes the update will complete and you will see your camera's live view image.

11 Troubleshooting

The following chapter provides some troubleshooting tips for using your camera.

1. **Camera's image/screen is blurry.**
   Adjust your camera's diopter to your eyesight. For full instructions, see 5.2 *Adjust the Diopter*, page 9.
2. **Camera Wi-Fi hotspot is not showing.**
   - Wait a moment for it to appear in your phone's Wi-Fi settings.
   - When enabling your camera's hotspot in your camera's settings, try to press a couple more times.
   - Ensure you have allowed the app to use your location, otherwise it will not be able to detect your camera's Wi-Fi. Navigate to your phone's settings, then open the **Thermal_Connection** app settings, and enable **Location — While Using the App**.
3. **Camera is not connecting to the app.**
   The Wi-Fi password is case sensitive. Make sure you enter the serial number in the same letter format, whether that is uppercase or lowercase.
4. **Camera has disconnected from the app.**
   - Your camera's hotspot dropped. Enable your camera's hotspot once more, and then login to the app again. For full instructions, see 6.2 *Enable Your Camera's Wi-Fi Hotspot*, page 11.
   - After being inactive, your camera will either go into sleep mode or automatically shutdown, which in turn causes it to time-out in the app. To connect to the app again, you will need to first tap **System > Sign Out**.
5. **Camera's Live View is frozen in the app.**
   If the Live View is frozen perform a hard close of the app, then open it again.
6. **Digital Zoom is not working.**
   Digital zoom will not work while your camera's menu is open. Press to exit the menu.
7. **Camera is not recording images and videos.**
   Recording images and/or videos will not work while the menu is open or when your camera is connected to a computer. Press to exit the menu.
8. **Camera's screen is black.**
   Restart your camera. Press and hold to turn your camera off, and then back on.
9. **Camera is not charging or slow to charge.**
   - Ensure you use the supplied micro-USB cable and that it is properly connected.
   - Review the charging safety instructions, see 2.2.3 *Charging*, page 3.
   - Ensure the **USB Mode** is set to **Off**. For full instructions, see 8.3.5.1 *USB Mode*, page 33.
10. **Camera's battery keeps draining.**
    You can preserve your camera's battery life in the following ways:
    - Turn off any camera settings or functions that are not being used.
    - Use your camera without the app, First, sign out your camera from the app (see 7.3.5 *Sign Out*, page 21), and then turn the Wi-Fi hotspot off (see 8.3.1 *Wi-Fi*, page 30).
    - Set your camera to go into automatic sleep mode after 1 minute of inactivity has passed. First set your camera's sleep mode to be automatic (see 8.3.2 *Sleep Mode (Suspend Mode)*, page 30), and then set the automatic sleep mode to 1 minute (see 8.3.3 *Automatic Sleep Timer (Auto Suspend)*, page 31).
    - Set your camera's screen brightness to low. For full instructions, see 8.3.8 *Screen Brightness*, page 37.
    - Set your camera's automatic shutdown to 60 minutes or less, see 8.3.4 *Automatic Shutdown*, page 32.

11. **Camera's image has lots of graininess or scratches.**
    - Turn your camera off, attach the lens cap, and allow it to rest for a few hours before using again.
    - To improve your camera's image quality set the **FFC Mode** to Auto. For full instructions, see 8.3.6 *FFC (Flat-Field Correction) Mode*, page 35.
    - To manually correct pixel defects in your camera's image, set the **DPC** settings to **Manual**. For full instructions, see 8.3.7 *DPC (Defective Pixel Correction)*, page 36.
12. **Camera's alarm is not turning on.**
    The fire detection alarm only works when fire detection has also been enabled. For instructions on setting fire detection, see 8.2.3 *Fire Detection (Fire Warning)*, page 28.

12 Frequently Asked Questions

The following FAQ answers many of the general questions about your camera.

1. **Does my thermal camera only work at night?**
   No, although thermal imaging cameras are most commonly used for nighttime vision, they can also be useful in daylight. The detection of heat radiation and the high contrast of thermal imaging cameras allow you to see the outlines of (warm-blooded) animals that camouflage well in their environments. It can also help distinguish animals or people in foggy or smoky conditions.
2. **Can my thermal camera see through walls, metal, or glass?**
   No, thermal imaging cameras do not see-through surface but detect surface temperatures.
3. **Is thermal imaging and night vision the same thing?**
   No, thermal imaging can produce pictures without visible light while night vision cameras work by boosting ambient light. Their only common purpose is increasing visibility in low light conditions.
4. **Can bright sunlight damage my camera lens?**
   Yes, aiming your camera lens with the lens cap open at powerful light sources (i.e. the sun) is not recommended, as this may adversely affect the accuracy or damage the thermal imager.
5. **What is the clicking noise my camera makes?**
   This is simply the noise your camera makes while you are shifting it between different fields of view. The noise you are hearing is your camera focusing and calibrating the image to achieve the highest resolution possible.
6. **Should I charge my camera's battery before first use?**
   Since your camera's battery is delivered partially charged, it is recommended that you fully charge it before first use.
7. **How do I charge my camera's battery?**
   For full instructions on charging your camera's battery, see 9 *Charging Your Camera*, page 43.
8. **How do I turn my camera on or off?**
   Press and hold .
9. **Where can I find the mobile app?**
   The **Thermal_Connection** Application can be downloaded on your smartphone with a valid Internet connection from iTunes or Google Play respectively.
   - To download the app for iOS, click here.
   - To download the app for Android, click here.
10. **Why do I need to allow my Location Permission on the app?**
    The app requires permission to detect your Wi-Fi network in order to connect your camera to the app.
11. **How do I connect my camera to the app?**
    For full instructions on connecting your camera to the app, see 6 *Connecting to the App*, page 11.
12. **How do I disconnect my camera from the app?**
    To disconnect your camera from the app, open the app and navigate to **System > Sign Out**.
13. **What is my camera's Wi-Fi name and password?**
    - **Wi-Fi Name:** Your camera's Serial Number (S/N)
    - **Wi-Fi Password:** The last 8-digits of your camera's Serial Number (S/N)
14. **Where is my camera's serial number?**
    Your camera's serial number can be found on:
    - The serial tag located on the side of your camera.
    - Your camera's system information. To access the system information screen, see 8.3.11 *System Information*, page 41.

15. **How do I record images and videos?**

    - **To capture images:** Press .
    - **To start or stop recording videos:** Press and hold for 3 seconds. A blinking red dot next to a recording timer appears on the left of the screen to indicate that your camera is recording.

    Note: Your camera cannot record images or videos while the menu is open or when connected to a computer.

16. **How do I zoom in my camera's image?**

    To switch the zoom range: Press . Keep pressing to zoom in and out.

17. How do I turn the laser pointer on?

    LASER RADIATION

    Exposure to laser light can cause significant damage to the eyes. Never look into the laser beam directly or through a piece of optical equipment.

    To turn the laser on: Quickly press two times.

18. **How do I change my camera's color palette?**

    To quickly change the color palette: Press .

19. **Which color palettes can I choose from?**
    Choose between **White Hot**, **Iron Red**, **Black Hot** & **Alarm**. For more details, see 8.1.3 *Color Palette (Colorization)*, page 22.

20. **How do I measure my target's range distance?**
    For full instructions on measuring your target's range distance, see 8.2.1 *Measure Range Distance (Ranging Mode)*, page 25.

21. **How do I track hot & cold points?**
    For full instructions on tracking hot & cold points, see 8.2.2 *Track Hot & Cold Points (Hot Point)*, page 27.

22. **How do I turn fire detection on?**
    For full instructions on turning fire detection on, see 8.2.3 *Fire Detection (Fire Warning)*, page 28.

23. **How do I turn the fire detection alarm on?**
    For full instructions turning the fire detection alarm on, see 8.2.4 *Fire Detection Alarm*, page 28.

24. **How do I export recordings?**
    Export recorded images and videos from your camera's microSD card. For full instructions, see 8.3.5.2 *Export Recordings*, page 34.

25. **Where does my camera store recorded images and videos?**
    Your camera stores recorded images and videos onto the microSD card.

26. **What is my camera's maximum storage capacity?**
    You can insert a microSD card with up to 256G storage space.

27. **How do I hide the icons on the top right of my camera's image?**
    For full instructions on hiding your camera's status bar, see 8.3.9 *Status Bar*, page 38.

28. **How do I change the language displayed in my camera's menu?**
    To change the language displayed in your camera's menu, see 8.3.10 *Language Settings*, page 40.

29. **How do I restore my camera's settings to default?**
    To restore your camera's settings to default, open the app and navigate to **System > Restore the Default**.
30. **How do I update my camera to the latest firmware?**
    For full instructions on updating your camera's firmware, see 10 *Updating Your Camera*, page 44.
31. **Where do I download my camera's latest firmware update?**
    To download the latest firmware update for your camera, contact the **Technical Support** team.
32. **Can I mount my camera to a tripod?**
    Yes, the tripod thread can be found on the bottom of your camera.
33. **Can I access my camera's Live View from an external monitor?**
    Yes, you can access your camera's Live View from an external monitor using the following two ways:
    - Connect your camera to your computer using the micro-USB cable. For full instructions, see 8.3.5.1 *USB Mode*, page 33.
    - Connect your camera to an external PAL display from your camera's CVBS port.
34. **What is the buzzer option in the app settings?**
    The buzzer is not compatible with your camera.

13 Technical Specifications

13.1 General

Appearance	Thermal Monocular Camera
Type	Monitor

13.2 Thermal

Detector Type	Vanadium oxide uncooled focal plane detector
Effective Pixels	256 x 192
Pixel Pitch	12 μm
Spectral Range	8 μm–14 μm
Sensitivity (NETD)	≤40 mK@f/1.0
Focal Length	7.5 mm; 10 mm; 15 mm
Aperture	F1.0
Field of View	7.5 mm (H: 24.0°; V: 18.0°) 10 mm (H: 17.3°; V: 13.1°) 15 mm (H: 11.7°; V: 8.8°)
Focus Control	Fixed-focal
Close Focus Distance	7.5 mm 1 m (3.28 ft) 10 mm 2 m (6.56 ft) 15 mm 3 m (9.84 ft)

DRI Detection Distance	Focal Length	Detection Distance	Recognition Distance	Identification Distance
	7.5 mm	• Vehicle: 777 m (2,549.21 ft) • Human: 291 m (954.72 ft)	• Vehicle: 194 m (636.48 ft) • Human: 75 m (246.06 ft)	• Vehicle: 97 m (318.24 ft) • Human: 37 m (121.39 ft)
	10 mm	• Vehicle: 1,111 m (3,645.01 ft) • Human: 416 m (1,364.83 ft)	• Vehicle: 277 m (908.79 ft) • Human: 107 m (351.05 ft)	• Vehicle: 97 m (318.24 ft) • Human: 53 m (173.88 ft)
	15 mm	• Vehicle: 1,666 m (5,465.88 ft) • Human: 625 m (2,050.52 ft)	• Vehicle: 416 m (1,364.83 ft) • Human: 160 m (524.93 ft)	• Vehicle: 208 m (682.41 ft) • Human: 80 m (262.47 ft)
Digital Zoom	4 levels			
Color Palettes	App: White Hot, Iron Red, Rainbow, Warning Camera: White Hot, Iron Red, Black Hot, Alarm			

13.3 Display

Video Compression	H.265
Frame Rate	25 Hz
Display Screen Dimensions	0.2 inch
Resolution	720 x 540

13.4 Function

Storage	MicroSD card (Max. 256G)
Laser Aiming	180 m (590.55 ft), Class 2 (IEC 60825-1)
Alarm	Yes

13.5 Intelligence

Fire Detection	Yes
Hot & Cold Spot Trace	Yes

13.6 Port

Analog Output	1 x CVBS output
Wi-Fi Hotspot	Yes
USB	Micro USB

13.7 Power

Power Supply	5 VDC, 0.3 A or built–in battery
Battery Capacity Display	Yes
Power Consumption	<1.5 W
Battery Life	9 h (Wi-Fi hotspot off, @25°C)
Charging Time	<3 h

13.8 Environment

Operating Temperature	–20 °C to +55 °C (–4 °F to +131 °F)
Operating Humidity	≤90%
Storage Temperature	–20 °C to +60 °C (–4 °F to +140 °F)

13.9 Physical Characteristics

Protection	IP67
Product Dimensions	170.9 mm × 57.6 mm × 58.6 mm (6.73" × 2.27" × 2.31") (L × W × H)
Packaging Dimensions	205 mm × 148 mm × 111 mm (8.07" × 5.83" × 4.37") (L × W × H)
Net Weight	350 g (0.77 lb)
Gross Weight	1 kg (2.20 lb)
Installation	Handheld; Tripod
Power Adapter	Included
Lens	Included
Bracket	Optional
Drop Test Height	2 m (6.56 ft)

14 Notices

The thermal product series may be subject to export controls in various countries or regions, including but not limited to, the United States, European Union, United Kingdom and/or other member countries of the Wassenaar Arrangement. Please consult your professional legal, compliance expert, or local government authorities for any necessary export license requirements if you intend to transfer, export, re-export the thermal product series between different countries.

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

Website
www.lorextechnology.com

Copyright
© 2023, Lorex Corporation
All rights reserved worldwide. Names and marks appearing herein are either registered trademarks or trademarks of Lorex Corporation and/or its subsidiaries. All other trademarks, trade names or company names referenced herein are used for identification only and are the property of their respective owners.

Legal disclaimer
As our product is subject to continuous improvement, Lorex Corporation & subsidiaries reserve the right to modify product design, specifications & prices without notice and without incurring any obligation.E&OE.

Publ. No.: LX400125
Release: 1.0
Commit: 60326
Head: 60326
Language: en-US
Modified: 2023-04-06
Formatted: 2023-04-06