



GT Series

Handheld Thermal Imager

User Manual

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Manual Usage Guidelines

This manual contains functional descriptions and product usage/management guidelines for various imager models. Due to functional differences among models within the same series, the manual may include explanations that are not applicable to your specific model. All pictures, charts, and other information provided herein are for descriptive and explanatory purposes only and are subject to change without notice due to firmware updates or other reasons. Please note that information regarding new features in the latest firmware may not be included in a timely manner. Use this manual under the guidance and assistance of professionals trained in supporting the product.

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1. Safety Instruction

Read all the safety notes and instructions in the AccuMEMS User Manual for use of the AccuMEMS products. Failure to heed the following instructions can lead to electric shock, fire and/or severe injuries.

1.1 ESD WARNING

The imager lens is electrostatic-sensitive. Proper ESD protection required. Avoid touching the imager lens. Unauthorized contact may result in damage.

1.2 Power Supply

- Voltage Compliance: Input voltage must comply with IEC62368 Limited Power Source specifications (5 VDC, 2A). Refer to technical specifications for full requirements.
- Manufacturer Standards: Use only adapters from qualified manufacturers. Refer to the product specification for detailed power requirements.
- Connection Requirements: Securely insert plug into power socket until fully engaged.
- DO NOT connect multiple devices to one power adapter, to avoid over-heating or fire hazards caused by overload.

1.3 Battery

- Warning: Explosion Hazard
Confirm there is no flammable material within 2 m of the charger during charging.
- Prohibited Disposal Methods
 - DO NOT dispose in fire or high-temperature ovens.

- DO NOT mechanically crush or cut the battery.
- DO NOT expose the battery in an extremely high temperature 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.
- DO NOT place the battery near heating or fire source. Avoid direct sunlight.
- DO NOT swallow the battery to avoid chemical burns.
- DO NOT place the battery in the reach of children.
- **Mandatory Disposal:** Follow battery manufacturer's recycling instructions precisely.
- **Integrated Battery Maintenance**
 - The built-in battery cannot be dismantled. Please contact the manufacture for repair if necessary.
 - For long-term storage: Maintain full charge every 90 days. Otherwise, damage may occur.
 - Before using the device after storage, turn off the device and charge it for at least 30 minutes.
 - Fully charged battery preserves time settings for 60 days (when the device is powered off).

1.4 Using Environment

- **Running Environment Requirement of the Device:**
 - The operating temperature shall be -10°C to 50°C (14°F to 122°F), and the operating humidity shall be 95% or less.
 - Place the device in a dry and well-ventilated environment.
- **Prohibitions:**
 - 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.

- The device is suitable for indoor and outdoor uses, but do not expose it in wet conditions.

1.5 Transportation

- Packaging Requirements: Transport the device exclusively in its original packaging or equivalent protective materials. Retain all packaging components after unboxing for potential reuse
- Return & Liability Conditions: In the event of device failure requiring factory return: Must utilize original packaging for transportation. Transportation without original packaging may cause damage, and the manufacturer assumes no liability for damages occurring under such circumstances.
- Operational Prohibitions: DO NOT drop the product or subject it to physical shock. Keep the device away from magnetic interference.

1.6 Maintenance

- DO NOT maintain the imager 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.
- Wipe the device gently with a clean cloth and a small quantity of ethanol, if necessary.
- Any operation outside manufacturer-specified parameters immediately voids all safety functions of this device.

1.7 Emergency

Upon detecting smoke, abnormal odors, or noise originating from the device:

- immediately cut all power sources
- unplug the power cable

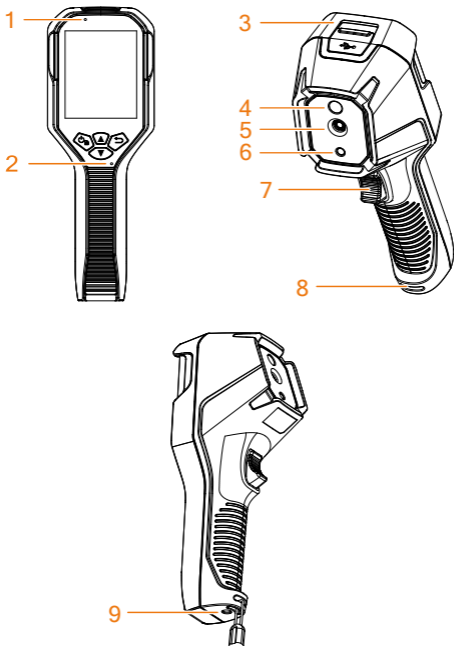
- notify authorized service center

1.8 Laws and Regulations








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

2. Product Appearance

Imager models may differ in appearance and componentry. Please refer to the actual products.



No.	Component	Function
1	Indicator of the Charger	<ul style="list-style-type: none"> ● Solid Red: Charging in progress.. ● Solid Green: Fully charged. ● Flashing red: charging exception.
2	Buzzer	Emit sound alarm.
3	Type-C Interface	Battery charging and data export.
4	Visual Lens	View the visual image.
5	Thermal Lens	View the thermal image.
6	Flashlight	<ul style="list-style-type: none"> ● Provides fill light for objects. ● Emits a flashing alarm signal.
7	Trigger	<ul style="list-style-type: none"> ● Single press to take a picture in real-time interface. ● Single press to go back to real-time interface in menu mode.
8	Strap Mount	Attach a wrist strap here.
9	Tripod Mount	Mount the device on a tripod.

Button	Function
	<ul style="list-style-type: none"> • Holding Button: Power On/Off • Single Press: Confirm operation or display settings.
	Go back to the previous menu or exit the current one.
 	<ul style="list-style-type: none"> • Single press  and  to configure parameters in menu mode. • Single press  to switch palettes in real-time interface.

3. Getting Started

3.1 Charging for the Imager

To charge the imager, plug in the included USB cable and use a power adapter to connect it to the power source.

The following requirements should be fulfilled by the power adapter (not included):


- Output Voltage/Current: 5 VDC/2 A
- Minimum Power Output: 10 W

NOTE

- To reach the maximum charging speed, the charger's power must be between the minimum 6.7 watts needed by the radio equipment and the maximum 10 watts.
- There is an integrated battery in the device. When charging the imager for the first time, leave it on for more than 3 hours.
- It is advised to charge the imager for at least half an hour before turning it on if it has been over-discharged from prolonged inactivity.

3.2 Power On/Off the Imager


Power On

To activate the device, hold  for more than 6 seconds. When the imager's interface is steady, you can see the target.


NOTE

After turning the imager on, it can take at least 30 seconds before it is ready for use.

Power Off

When powered on, hold the  button for 2 seconds to turn off the imager.

Auto Power-Off Configuration

To configure the imager's automatic shutdown time as needed, press  and go to **More Config** → **Auto Power-off**.




4. Usage Scene Configuration

To facilitate rapid anomaly detection, the **Usage Scene** offers a range of preset templates designed for different situations.

1. Choose a suitable scene or create a customized one according to detection targets. Refer to **4.1 Choose a Usage Scene** for detailed instructions.
2. (Optional) Adjust scene parameters. Refer to **4.2 (Optional) Configure Usage Scene Parameters** for detailed instructions.
3. (Optional) Configure alarms as needed. Refer to **5.3 Alarm Configuration** for detailed instructions.
4. See detection results in the real-time interface.

4.1 Choose a Usage Scene

Choose a scene according to the faults or irregularities you want to locate in a specific detection scene.

1. In real-time interface, press  to reveal the menu.
2. Press  \  to select **Usage Scene**.
3. Choose a desired scene.

Moisture Detect

This scene is used to detect water leaks on indoor building ceilings, walls, and floors.

UIRA-Scene technology enables rapid identification of irregularities during leak inspections. Upon activation, if moisture irregularities are detected, the system will mark them with “Suspect” indicators and red frames in the real-time interface.

NOTE

- If the temperature difference in areas with moisture irregularities is too subtle to be detected, missed or incorrect reporting may occur.
- A secondary diagnosis using the UIRA-Scene function is recommended. The algorithm for this function is currently being updated.
- Simultaneously enabling UIRA-IR and UIRA-Scene reduces the frame rate.

Home Insulation

This scene is used to detect home insulation irregularities of indoor building structures such as walls and ceilings, common users can apply this scene.

UIRA-Scene technology enables rapid identification of irregularities during insulation inspections.

Upon activation, if insulation irregularities are detected, the system will mark them with “Suspect” indicators and red frames in the real-time interface. If air leak points are detected, the system will mark them with “Suspect Air Leak” indicators and red frames in the real-time interface.

NOTE

- If the temperature difference in areas with insulation irregularities is too subtle to be detected, missed or incorrect reporting may occur.
- A secondary diagnosis using the UIRA-Scene function is recommended. The algorithm for this function is currently being updated.

Pro Insulation

This scene is used to detect indoor insulation anomalies of building walls and ceilings. The required parameters include **Indoor Temp.**, **Outdoor Temp.**, and **Insulation Level**.

When indoor temperature is less than or equal to outdoor temperature, regions with insulation levels surpassing the preset

threshold will be highlighted in cyan. Conversely, if indoor temperature exceeds outdoor temperature, areas with insulation levels lower than the preset value will be marked in cyan.

NOTE

- **Indoor Temp.** represents the current indoor temperature.
- **Outdoor Temp.** represents the current outdoor temperature.
- **Insulation Level:** An integer ranging from 0 to 100. Typical values for new buildings fall within 60–80%.

Pro Moisture

To detect potential indoor moisture issues, it is necessary to configure **Relative Humidity**, **Ambient Temp.**, and **RH Threshold(%)**.

Regions with condensation deficiency will be highlighted in green when the measured relative humidity surpasses the specified **RH Threshold**.

NOTE

- **Relative Humidity** indicates the current relative humidity level.
- **Ambient Temperature** indicates to the current atmospheric temperature.
- **RH Threshold** represents the humidity upper limit of the target surface. A relative humidity of 100% signifies that water vapor condenses into liquid water (dew point), while levels around 70% or higher may promote mold growth.
- Values of **Relative Humidity** and **Ambient Temp.** can be acquired using hygrometers and thermometers, respectively.

Floor Heating

This scene is used to detect and monitoring faults in underfloor heating systems.

UIRA-Scene technology enables rapid identification of irregularities during floor heating inspections. Upon activation, if heat irregularities are detected, the system will mark them with “Suspect” indicators and red frames in the real-time interface.

NOTE

- If the temperature difference in areas with heat irregularities is too subtle to be detected, missed or incorrect reporting may occur.
- A secondary diagnosis using the UIRA-Scene function is recommended. The algorithm for this function is currently being updated.

Electrical Failure

Used for detecting and monitoring faults in wires, circuits, electrical components, terminators, and similar items.


Solar Panel

Used for detecting and monitoring faults in solar panels.

Custom

Allows users to create a personalized mode by saving preferred temperature measurement parameters for later use. Refer to **4.2 (Optional) Configure Usage Scene Parameters** for detailed instructions.

4.2 (Optional) Configure Usage Scene Parameters

Users can adjust related parameters to achieve more precise detection results. In **Usage Scene**, choose a desired scene and then press  to set parameters.

NOTE

Parameters vary depending on the selected scene.

Parameters	Description
------------	-------------

Distance	Set the distance between the imager and the target object.
Emissivity	Set the emissivity value according to the target object.
Palettes	Palettes represent temperature using different colors. Users can select a preferred color palette.
Level & Span	The temperature scale on the right helps visualize the color-temperature relationship in the image. Refer to 5.4 Level & Span Configuration for detailed instructions.
Temperature Range	Select the temperature measurement range. In Auto Switch mode, the device automatically detects temperature and switches ranges accordingly.
Alarm	When the target temperature triggers a set alarm rule, users can be notified through configured rules. Refer to 5.3 Alarm Configuration for detailed instructions.
Color Display	Choose between Linear and Histogram modes for different scenarios to enhance detail visibility:

- Linear: Optimized for detecting small high-temperature targets against a low-temperature background.
- Histogram: Enhances visibility of small low-temperature targets in high-temperature areas.

5. Temperature Measurement










To get more precise and real-time temperature of the target, user can set spot tools and alarms as needed.

5.1 Measurement Tools Configuration

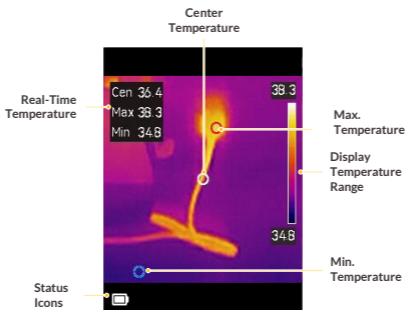
The device measures the entire scene temperature and can be configured to display center, hot, and cold points.

NOTE

Before using the measurement tools, remember turning off the IR Thermometer function.

1. In the real-time interface, press  to reveal the menu.
2. Press  to select **Temp. Settings**.
3. Select the desired spots to display their temperatures, and press  to enable them.
 - Max: Display the scene's hot point and its max. temperature.
 - Min: Display the scene's cold point and the min. temperature.
 - Cen: Display the scene's center point along with the temperature.
4. Optional: You can customize the user-defined spots if needed.
 - Select a user-defined spot, and press .
 - Press  \  \  to adjust the position of the spot.
 - Press  to save and exit.
5. Press  to save and exit.

The imager will display the real-time temperature on the upper left corner of real-time interface.



NOTE




- This manual is regularly updated; real-time interfaces may differ slightly from your specific model.
- Always refer to your imager.
- When temperature values display "~", measurements have not yet stabilized. This symbol typically appears during startup and disappears when stable readings are achieved.


5.2 Temperature Accuracy Parameters Configuration

To increase temperature measurement accuracy, you can adjust the measurement parameters.

NOTE

After adjusting the emissivity and distance parameters in the settings interface, the emissivity and distance values in the Usage Scene will also be modified accordingly.

1. Single press  to reveal the menu in the real-time interface.
2. Press  \  to choose the desired parameters.





- **Emissivity:** To configure the target's emissivity—the efficiency with which energy is released as thermal radiation—enable Custom and choose Emissivity.
 - **Distance:** Configure the distance between the target and the imager.
 - **Unit:** Go to **Display Config** to configure the temperature unit and distance unit.
3. Press  to save and exit.

5.3 Alarm Configuration

Configure the alarm rule and the imager will alarm when the detected temperature triggers the rule.

NOTE


Before using alarm trigger, please first turn on Alarm in Usage Scene. Otherwise, alarm trigger will not be visible in the settings interface. Only some scenes support the alarm function.






1. In real-time interface, press  to reveal the menu.
 2. Press  \  to select **Usage Scene**.
 3. Choose a scene with alarm function.
 4. Turn on alarm.
 5. Navigate to **Measurement** to configure an alarm rule. Set your desired temperature threshold under **Alarm Threshold**. The imager triggers an alarm when the target's temperature exceeds or falls below this preset value.
 6. Press  to save and exit.
 7. (Optional) Go back to **Settings** → **Alarm Trigger** and enable different alarm types.
- **Flashing Alarm:** The flash light flashes when the target temperature exceeds the alarm threshold (only supported by certain models).
 - **Audible Warning:** The device beeps when target temperature exceeds the alarm threshold.

- **Coloring Alarm:** When the target's temperature is higher than the set value, the target will become red; when the target's temperature is lower than the set value, the target will become blue (only supported by certain models).

5.4 Level & Span Configuration

Adjust the level & span parameters to get better image contrast.

1. Go to **Settings** → **Usage Scene** → **Level & Span**.
2. Select **Setting Mode**, and press  to switch auto and manual adjustment.

Mode	Description
Auto	Enabling Auto mode can automatically adjust the display temperature range.
Manual	<p>In Manual mode, choose Parameters to access the settings interface.</p> <ul style="list-style-type: none"> ● Press  to lock or unlock the maximum and minimum temperature settings, and press  \  to adjust any unlocked values. ● Alternatively, unlock both the maximum and minimum temperatures and press  \  to increase or decrease either value individually while preserving the same temperature range. <p>You also have the option to enable Persist Saved.</p> <ul style="list-style-type: none"> ● When Persist Saved is enabled, the current manual mode settings will be saved and restored after the device restarts.

- When **Persist Saved** is disabled, the settings will not be saved upon restart, and the device will revert to automatic mode.

3. Press  to save and exit.

6. Display Configuration

6.1 UIRA-IR Configuration

The device supports **UIRA-IR** in both real-time view (for some models) and captured snapshots, improving object edge definition for clearer image quality. Actual performance may vary by model.

- Real-time View: When **UIRA-IR** is enabled, supported models enhance object contours during real-time viewing.
- Snapshot: **UIRA-IR** sharpens object outlines in captured images after activation.

NOTE

UIRA-IR is enabled by default. To disable it, go to **Settings** → **UIRA-IR** to turn it off.

6.2 Image Mode Configuration

You can configure the device's thermal/visual display mode. The selectable options include **Thermal**, **Fusion**, **PIP**, and **Visual modes**.

Image Mode is only supported by certain models. Please refer to the actual device.

1. Select an image mode by the following ways:

- Go to **Settings** → **Camera Config** → **Image Mode**, and select a preferred image mode.
- Press ▲ in live view to switch image modes.

Mode	Description
Thermal	In thermal mode, the device displays the thermal view.

Fusion	Thermal object image with visual outlines. This function is only supported by the models with visual lens.
PIP	In PIP (Picture in Picture) mode, the device displays thermal view inside the visual view. This function is only supported by the models with visual lens.
Visual	Visual object image only. This function is only supported by the models with visual lens.

2. Press  to save and exit.

6.3 On-Screen Info Configuration

Go to **Settings** → **Display Config** to turn on/off the information on-screen display.

- Parameters: Temperature measurement parameters.
- Temperature Scale: Display the palettes bar and temperature range on the right side of the screen.
- Screen Brightness: adjust the level of screen brightness as prefer.

7. Pictures and Videos

7.1 Capture Pictures

You can capture pictures in real-time interface and a thumbnail of the picture will be displayed in live view. The pictures will be automatically saved in the album. In the real-time interface, you can press and release the trigger to capture pictures.

You can also set the following parameters in **Settings** → **Capture Config** before capturing snapshots.

Parameters	Description
Capture Mode	<p>One Picture: Press the trigger once to capture one image.</p> <p>Capture Plan: Set Interval (the time interval of each snapshot to be taken) and Number (the number of snapshots to be taken in a roll, ranging from 2 to 10,000) for scheduled capture. Press the trigger in real-time interface, and the device captures the set number of images according to the set interval. Press the trigger again to stop capturing.</p>
Save Visual Image	If a visual image is needed to be saved separately, you can enable Save Visual Image (only supported by the models with visual lens).

File Naming

Files can be named using **Time Stamp** or **Numbering** (filename header + sequence number).

NOTE

You cannot capture pictures when the imager is connected with PC.













7.2 Record Videos

NOTE

If the recording environment is dark, you can turn on the flashlight for illumination.

1. Hold the trigger in real-time interface. When the recording icon and time display in the interface, recording begins, and you can release the trigger.
2. Press the trigger completes the recording. The device will display a pop-up notification saying "Recording Succeeded". The recording video will be saved.

7.3 View Pictures and Videos

1. Press  to reveal the menu in the real-time interface.
2. Press  \  to select Pictures, and press  to enter the album.
3. Press  \  to select the picture or video, and press  to view it.
4. Optional: Press  to delete picture. Press  to delete video in view interface.
5. Press  \  to switch the picture or video.
6. Press  to exit.

7.4 Export Pictures and Videos


1. Connect the device to your PC with the included USB cable, and select **USB Drive** mode in the prompt on imager.
2. Open the detected disk, copy and paste the files to PC to view the files.
3. Disconnect the imager from your PC.




NOTE

For the first connection, the driver will be installed automatically.


8. Device Connection


8.1 Connect via Wi-Fi (If Applicable)

In the real-time interface, press  and go to **Settings** → **More Config** to enable **WLAN**. Remember download and install the APP on your phone before using the function.

1. Connect your device to a Wi-Fi network.
 - Press  \  to select Wi-Fi, and enter the password.
 - Press  to save and exit.
2. Add the device to the app.

8.2 Connect via Hotspot (If Applicable)

In the real-time interface, press  and go to **Settings** → **More Config** to enable **Hotspot**. Remember download and install the APP on your phone before using the function.

1. Turn on the device hotspot and complete settings.
 - Set the hotspot password.
 - Press  to save and exit.
2. Add the device to the app.

9. Maintenance



9.1 Time and Date Configuration

In the real-time interface, press  and go to **Display Config** → **Time and Date** to configure the information.

9.2 View Imager Information

In the real-time interface, go to **More Config** → **About** to view the detailed information of the imager.

9.3 Format Memory

1. In the real-time interface, press  and go to **More Config** → **Format Memory**.
2. Press  and select OK to start formatting storage.

9.4 Logs Configuration

The imager can retain its operational logs for troubleshooting purposes. This function can be enabled/disabled via **More Config** → **Save Logs**.

To export logs:

1. Connect the imager to a PC using the included USB cable.
2. Set the imager's USB mode to USB Drive.
3. Access operation logs in the device's root directory.

9.5 Upgrade

Before upgrade, download the upgrade file first. You can get the upgrade file through technical support.

1. Connect the imager to your PC via the included cable, and select USB Drive as the USB mode in the prompt on the imager.
2. Copy the upgrade file and replace it to the root directory of the imager.
3. Disconnect the imager from your PC.
4. Reboot the imager and then it will upgrade automatically. The upgrading process will be displayed in the main interface.

NOTE

After the upgrading, the imager automatically reboot. You can view the current version in **More Config** → **About**.

9.6 Restore Imager Configuration

In the real-time interface, press  and go to **More Config** → **Restore Device** to initialize the imager and restore default settings.

10. Guidance for Common Thermal Imaging Operations

The manual provides guidance on common issues for first-time users of imagers. For other questions or updated guidance, please contact technical support.

10.1 Can the UIRA-IR Algorithm Detect Water Leaks or Insulation Issues with 100% Accuracy?

No. Although the UIRA-IR algorithm delivers reliable detection performance, it does not achieve 100% accuracy. The algorithm is designed for preliminary screening by analyzing thermal image characteristics in various scenarios, based on clear images captured by users. If an area is marked as "Suspect," we recommend manual verification by professionals. Additionally, keeping your device's firmware updated ensures access to the latest algorithm enhancements.

10.2 Factors may Interfere with the Detection Results of UIRA-Scene

Different wall materials and surrounding heat sources

- Heat diffusion properties of different wall materials:

Some wall materials exhibit heat diffusion patterns that resemble common wall defects, making it necessary for experienced professionals to conduct further verification.

- Interference from ambient heat sources (e.g., heaters or air conditioning vents):

External heat sources may cause localized temperature increases on

wall surfaces, affecting detection accuracy.

10.3 Improve Water Leak Detection Success Rates

Method

1. Adhere to recommended leak area and detection distance guidelines. Ensure the leak area and detection distance match your device's IR resolution.

For example:

IR Resolution	Distance	Leak Area
96×96	≤ 1m	≥ 10cm×15cm
96×96	≤ 2m	≥ 20cm×30cm
256×192	≤ 2m	≥ 10cm×15cm
256×192	≤ 4m	≥ 20cm×30cm

Check your device's IR resolution under Specification.

2. Perform multiple inspections and dynamic comparisons:

Relying on a single thermal image may lead to errors. Compare images taken at different times (e.g., day vs. night), under varying temperature conditions, or from different angles. You can also observe the same area dynamically.

10.4 Higher-Quality Image

How to Take Clear Thermal Imaging Pictures?

Principle

Thermal image use colors to show temperature distribution. The temperature range of the target affects the image effect.

Method

1. When the actual temperature difference of the target in the image is higher than 10 °C (50 °F) or 20 °C (68 °F), the thermal image effect is most obvious, which helps to highlight the subtle temperature difference.
2. When the temperature difference of the target in the image is small, you can manually adjust the temperature range (if applicable) of the whole image to increase the contrast of the target.
3. It is recommended that the distance between the imager and the target should be within 2 meters (about 6.56 feet). Adjust the distance to ensure clear focus, especially for small targets.
4. Select an appropriate palette for the scene to get an image with high contrast.

10.5 Guidance on Using Thermal Imaging for Common Water Leak Detection

Principle

Water has a higher specific heat capacity than building materials, so the temperature change rate of the leaking area is different from that of the surrounding materials. The thermal imager captures this temperature difference to locate the leak point contactlessly.

Tips

1. Best Testing Time Period: Choose sunrise or sunset for testing. At this time, the temperature difference between indoors and outdoors is usually over 10 °C (50 °F), and the solar radiation heat gradient makes the thermal imaging of leak points inside the wall more obvious.

2. Environmental Condition Control: The surface temperature should be tested in dry and sunny weather. Rain and snow will lower the surface temperature and interfere with the infrared signal, which will seriously affect the accuracy of detection.
3. Priority Detection Area: Scan the weak links of building structures such as wall corners, window and door edges, existing cracks, pipe-through wall holes, and connections, which are high-risk areas for structural water leakage and pipe water leakage.
4. Dynamic Verification: Avoiding false alarms caused by single-time capture results. In the periods with significant day and night temperature differences, or after adjusting different angles to capture the same area multiple times. Dynamic verification can be used to exclude false alarms.

NOTE

- **Structural Leakage Test:** Spraying water on the wall to simulate wetting, or testing the residual water-stained area immediately after rain, can enhance the temperature difference contrast.
- **Pipe Leakage Detection:** For persistent water leakage, you need to take pictures during periods of water pressure changes (such as before and after peak water usage) and refer to the specific suggestions for pipe leakage detection.
- **Micro Leakage:** if the water leakage is very small and the temperature difference is not obvious, it is recommended to use devices with higher sensitivity and resolution (such as ≤ 40 mK thermosensitivity and $\geq 256 \times 192$ resolution) to improve detection rate.

10.6 Detect Water Pipe Leaks

- How to Use Thermal Imaging for Hot Water Pipe Leaks?

Principle

When hot water pipes leak, heat energy will conduct to the surface of buildings, and the leaked area will show as a high-temperature region

(usually in red or highlighted color) on the thermal image, which can help you locate the leakage point.

Tips

1. Time Selection: Select sunrise or sunset time when the environment temperature changes significantly and helps to enhance the temperature difference effect.
2. Pressure Verification: Use the pipe pressure tester to monitor the pressure change. If the pressure continues to decrease after pressurization, it can be preliminarily confirmed that there is a leak.
3. Temperature Difference Enhancement: Ensure the hot water temperature is at least 10°C higher than the room temperature and maintain the flow for 15-30 minutes. Under this condition, a detectable temperature difference can be formed in concrete, wood boards, or gypsum boards with a penetration depth of 3-5cm.
4. Pathway Tracking: System scans along the hot water pipe route, focusing on high-risk parts such as interfaces, valves, and wall-penetrating holes, as well as historical maintenance records.

NOTE

The detection effect is influenced by water temperature (must be 10°C higher than the indoor temperature), pipe burial depth (concrete or dense materials over 5 cm deep may affect imaging), and contact material (wooden boards or gypsum boards can be detected). This method is applicable to contact heat transfer scenes. When pipes have no physical contact with building structures or when leakage water cannot penetrate to the surface, it will not be possible to detect due to lack of temperature difference contrast.

- How to Use Thermal Imaging for Detecting Leaks in Cold Water Pipes?

Principle

Cold water leakage causes heat conduction to the wall, which results in a lower temperature than that of the surroundings. The thermal imager captures the temperature difference and displays it as a low-temperature area (usually in blue).

Tips

1. Time Selection: The temperature difference between cold water and indoor temperature is usually small, and it is difficult for the temperature to conduct to the surface. You can select sunrise or sunset for testing, as the natural temperature difference can help enhance the contrast.
2. Pressure Verification: Use a pressurizing device to monitor the pressure of the pipe. If the pressure continues to drop, it can help confirm that a leak exists.
3. Operation in Winter: After preheating the wall and floor in the heating environment, continuously supply cold water to the cold water pipe to create a significant temperature difference.
4. Operation in Summer: Inject cold water into the cold water pipe during the low-temperature sunrise hours to enhance the test effects by leveraging the temperature difference between the environment and the water.
5. Temperature Difference Strengthening Method: Pour hot water into the cold water pipe and keep it for 15 minutes (refer to the hot water pipe testing tips), which can quickly generate a recognizable temperature difference.

NOTE

The detection effect is influenced by water temperature (must be 10 °C higher than the indoor temperature), pipe burial depth (concrete or dense materials over 5 cm deep may affect imaging), and contact material (wooden boards or gypsum boards can be detected). This method is applicable to contact heat transfer scenes. When pipes have no physical contact with building structures or when

leakage water cannot penetrate to the surface, it will not be possible to detect due to lack of temperature difference contrast.

10.7 Can the Thermal Imager Penetrate Walls or Floors?

No. Thermal imagers cannot penetrate walls or floors like X-ray machines. They can only detect heat emitted from the surface of an object. However, in certain cases, the thermal imager can detect anomalies inside walls or floors, such as water pipe leakage or heat loss due to poor insulation. This is because the thermal imager can capture the heat conducted to the surface of the wall or floor. If the pipe has no contact with the wall or ground, the temperature cannot be conducted, and the thermal imager cannot detect it.

10.8 Check a Thermal Imager's Temperature Accuracy

How to test the accuracy of the devices?

Tips

1. Pour crushed ice and water into the cup, and turn on the imager.
2. Mix the solution and let it stand for a few minutes.
3. Set the imager's emissivity to 0.95 and adjust the distance.
4. Point the imager at the solution to measure its temperature. To get the best effect, please measure the temperature of water surface and avoid measuring cup wall. The reading should be close to the freezing point (0 °C / 32 °F) and within the precision range.

10.9 Frozen Images

What are the clicking sound and frozen image after device startup?

This is a normal phenomenon of the thermal imaging device. To keep the measurement accuracy, the imager will automatically calibrate the environment temperature change. During this process, the screen may stutter and show "Image Calibrating...", and you can also hear a "click" sound from the device. This phenomenon usually occurs when the imager is moved quickly or when it is turned on for the first time.

10.10 Prolong Battery Life

How to extend the life of lithium batteries?

Tips

1. Initial Charging: Charge the device for 3 hours in the off state before first use.
2. Charging Cable: Use the included charging cable or an authenticated one.
3. Power Adapter: For best results, use a standard 5 V/2 A charger.
4. Storage and Reuse: When storing the device for a long time, charge it to full capacity every 3 months. Before using the device after storage, turn off the device and charge it for at least 30 minutes.

REGULATORY INFORMATION

FCC Compliance Statement

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 product has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This product generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this product does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

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