GAS DETECTION THERMAL IMAGING CAMERA
AMPERIS TC706
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WARNINGS AND PRECAUTIONS

GAS DETECTION THERMAL IMAGING CAMERA

- Infrared gas leak temperature imager uses a very sensitive thermal sensor, so in any case (power on or off) shall not be directed at the device lens strong radiation sources (such as the sun, direct laser beam or reflection, etc.), Otherwise it will cause permanent damage to the Infrared Gas Leak Detector Imager.

- Do not strongly shake or hit the equipment during transportation and use.

- It is recommended to use the original packing box when storing the equipment, and place it in a cool, dry, ventilated environment without strong electromagnetic field.

- Avoid oil stains and all kinds of chemical contamination of the lens surface and damage the surface. When finished, close the lens cap.

- It is recommended to backup. In order to prevent the potential danger of data loss, please copy (backup) the data to the computer frequently.

- An infrared gas leak detector may require 8-10 minutes of warm-up before the data can be read accurately.

- Each Infrared Gas Leak Detector has been calibrated at the factory. Temperature correction is recommended every year.

- Do not open the cabinet or modify it. The maintenance can only be carried out by our authorized personnel.
INTRODUCTION

Thank you for choosing TC 706 infrared gas leak detection thermal imager.

TC 706 infrared gas leak detection thermal imager is infrared system, long-wave infrared quantum well focal plane array detector, electronic processing systems and image processing software, the infrared radiation measurement object is converted to visual thermal images, to long-range Detection of sulfur hexafluoride gas and other trace leakage point, and quantitatively shows the target surface temperature, is a fast, accurate, non-contact detection of live equipment and other micro-leakage and thermal fault of advanced measuring instruments. The brand of the camera is Dali or Dali TC706.
ACCESSORIES

Standard
- TC 706 infrared gas leakage thermal imager
- Shoulder strap
- Safety box
- Lens cap
- Li-on Battery(2pcs)
- Charger
- Video output cable
- Power adapter
- SD Card
- SD Card reader
- User manual
- Network cable (Mini-USB to RJ45)

Optional
- Wide angle lens
- Telephoto lens
- Tripod
FUNCTIONS

TC 706 have below functions:

- 11 color pallet
- 11 language
- 1-8x digital zoom
- 10 movable spot temperature measurement
- 5 movable area temperature measurement
- 2 line temperature measurement
- Shortcut customization
- Auto focus
- Electrical focus
- Power saving mode
- LCD brightness adjustment
- Video output NTSC or PAL
- Network settings
- Time/date settings
- Factory reset
- SD card unloading, formatting
- SD card capture, video storage
- Capture voice or text annotations
- Snapshot continuous shooting
- Alarm catch
- Alarm video
- Isothermal function
- Temperature setting
- Gas leak detection and jitter mode
- Built-in common material ratio emissivity selection table
- CMOS visible image and storage
- Infrared and visible light image fusion
- Integration of high and low temperature
# FUNCTION KEYS AND INTERFACE

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Power button</td>
<td>Press this switch for more than three seconds to turn on / off the camera. Note: after shutting down, turn on the boot again at least 20 seconds to ensure that the thermal imager is safe</td>
</tr>
<tr>
<td>2</td>
<td>Menu / Confirm button</td>
<td>Including upper, lower, left, right and menu / confirm (middle) keys. In different operating modes have different functions. Intermediate key activation menu, up and down left and right keys for menu switching operation, the middle key to confirm the selection. If you do not activate the menu, in the infrared and CCD mode: up and down key digital zoom, left and right keys manual focus; fusion mode: the upper and lower keys to adjust the integration of the upper and lower keys, the middle button to activate the menu, up and down left and right keys for menu switching operation, area size, left and right keys manual focus; temperature object editing mode: When the temperature measurement point is selected, press the middle button to pop up the Properties dialog box, the A key to select the upper and lower objects, the left and right keys to select the flat object, the up and down keys to adjust the object parameters, the middle key to confirm the selection, and the C key to deselect. When the temperature measurement line is selected, press the middle button to pop up the Properties dialog box, press S key to switch the focus, press the four arrow keys to move or change the length. When the temperature measurement area is selected, press the middle button to pop up the Properties dialog box, press 5 key to switch the focus, press the four arrow keys to move the area or regional size change.</td>
</tr>
<tr>
<td>3</td>
<td>Cancel / Auto focus key</td>
<td>• In menu mode, press the key to cancel the current menu operation. • When the image is frozen or played back, press this key to return to the active mode. • When the temperature target is selected, press the key to delete the temperature measurement target. • Long press for more than 3 seconds, IR, auto mode auto focus.</td>
</tr>
<tr>
<td>4</td>
<td>Freeze / save key</td>
<td>Used to freeze or save images. Short press to freeze the image, press cancel button to return to the active mode and press again to save the image. If the Voice Comment function or Text Comment function is on, the Comment dialog box will pop up. In the file management, select one of the pictures or video, press the S key to prompt whether to delete the item. Long press for more than 3 seconds for the screen recording, during the video, short press to stop and save the video</td>
</tr>
</tbody>
</table>
| 5  | Select / Auto key             | Three functions:  
  a) Select the target. In active mode, short press the key to select the target. Each time the key is pressed, the next target is selected and the selected target will be marked in yellow. This feature includes:  
  • Temperature measurement points, lines and areas  
  • Point, line, and area - switch the points, lines, and areas that are added to the interface from top to bottom. Press the menu key will pop up the property box, press “C” key to delete the selected temperature measurement object.  
  • Color pallet  
  • When the color is selected, press the up and down keys to toggle the selectable color. The selected color is about three seconds after becoming the color of the current image and is the default color of the next boot.  
  • Upper and lower limits  
  • Select the upper and lower limits of the color, press the left and right keys to increase or decrease the upper and lower temperature range of the color bar; press the up and down keys, shift the color corresponding to the temperature range. If you modify any of the parameters in automatic mode, it will change to manual mode.  
  b) The second function is calibration. Press A for more than 3 seconds, the thermal imager will automatically correct to get accurate measurements.  
  c) The third function is to transfer the picture to Bluetooth. Open the Bluetooth, select the picture to be transmitted, press the A key prompt to send. |
# Function Keys and Interface

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>F1 custom key</td>
<td>The default is short press chart; long press 3 seconds to open the laser; then press and hold 3 seconds to turn off the laser</td>
</tr>
<tr>
<td>7</td>
<td>F2 shortcut keys</td>
<td>Short press to switch the mode between observation and jitter; long press 3 seconds to turn on the lights, and then press and hold 3 seconds to turn off the lights.</td>
</tr>
<tr>
<td>8</td>
<td>F3 shortcut keys</td>
<td>Jitter sensitive stage. F1 as a custom shortcut key, in addition to the default function, can be defined as the following functions:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Image playback, recording - press to enter the image playback mode or start recording;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lighting - press this button to turn on the lights, then press this button to turn off the lights;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Temperature point, temperature area - click to increase the temperature measurement point or area, and then click to delete the temperature measurement point or area;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- LCD brightness adjustment - click the pop-up LCD (OLED) brightness adjustment bar;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Digital zoom - press the pop-up digital zoom bar;</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Fusion Transparency Adjustments - Click the pop-up blend transparency adjustment. (After the pop-up bar, according to the adjustment bar shows the direction, press the up or down or left and right keys to adjust).</td>
</tr>
<tr>
<td>9</td>
<td>Microphone</td>
<td>Used to save the image for voice annotation.</td>
</tr>
</tbody>
</table>
FUNCTION KEYS AND INTERFACE

<table>
<thead>
<tr>
<th>#</th>
<th>Name</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>Network interface</td>
<td>USB to RJ45</td>
</tr>
<tr>
<td>12</td>
<td>Power interface</td>
<td>DC12V</td>
</tr>
<tr>
<td>13</td>
<td>Video output</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>SD slot</td>
<td></td>
</tr>
</tbody>
</table>
OPERATION
Battery - Install / Uninstall

Open the battery cover: slide down the battery cover button; push the battery cover to close the battery cover.

Install: Insert the battery with the end of the battery into the battery compartment, pushing the battery until the battery lock is locked;

Uninstall: Remove the battery by pressing the two snap buttons on the rear end of the battery to the center and then pulling it out.

When inserting the battery, please pay attention to the shape of the battery face down, if the opposite direction can not be inserted, do not force too much damage to the instrument or battery.

Note: The instrument should use the standard battery, otherwise the battery size and voltage may be incorrect, and damage the mechanical or electrical performance of the instrument.

3. WARNING:

- Never disassemble, incinerate or puncture battery;
- Never short circuit the battery;
- Keep battery dry
- Keep out of reach of children;
- Always dispose of battery in accordance with local, state and federal regulations
OPERATION

Battery - Change battery

When the battery is empty and blinks for about 1 minute and 50 seconds, the instrument displays a low battery message and shuts down automatically after about 10 seconds.

Battery safety and usage

• Batteries should be stored in an ambient temperature of -4°F (-20°C) to 67.9°F (+20°C). Lithium batteries will self-discharge during storage, so they should be fully charged before storage. Self-discharge may affect long term battery performance. Furthermore, it is recommended that the battery should be charged in a set time, as below;

Ambient temperature of:
1. -4°F (-20°C) to 67.9°F (+20°C), once every 6 months
2. 67.9°F (+20°C) to 113°F (+45°C), once every 3 months
3. 113°F (+45°C) to 149°F (+60°C), once every month
• Battery should have greater than 50% charge prior to recharge.

• The ambient temperature for charging should be 32°F (0°C) to 104°F (+40°C). If under 32°F (0°C), the battery capacity will be diminished; if over 104°F (+40°C), the battery may overheat, resulting in permanent damage.

3. WARNING:

• Never disassemble, incinerate or puncture battery
• Never short circuit the battery
• Keep battery dry
• Keep out of reach of children
• Always dispose of battery in accordance with local, state and federal regulations
OPERATION

Quick Guide - Get infrared imaging

- After installing the battery, press the thermal imager power switch (more than 3 seconds) until the boot screen appears. After about 15 minutes, the instrument is initialized and entered into the working state.
- Open the lens cover, aim at the target, adjust the focal length of the camera, so that the target image is clear.
- Press the “A” key for automatic calibration to obtain the best thermal image

3. WARNING:

- Focusing is not clear and can cause measurement errors
OPERATION
Quick Guide - Temperature measurement

- Move the target object to the cross temperature point on the screen, and the “XX” displayed in the upper right corner of the screen is the temperature of the target at the temperature measurement point. If you want to temperature more accurate, you can press the “A” key for 3 seconds after the measurement.

- If you want to display the thermal image on the current screen for detailed temperature measurement, you can press the “S” key to freeze the image, and then analyze. You can also press the “S” key to store the thermal image and analyze it.

- When the target temperature is greater or less than the upper or lower temperature corresponding to the infrared camera temperature measurement file, the screen temperature will show > XXX °C or <XXX °C to prompt the user.

- If you need to modify the properties of the temperature measurement object, you should first select the temperature measurement object, and then press the Enter key, the screen is displayed on the temperature object properties dialog box. The following figure is the temperature measurement, temperature measurement, temperature measurement area of the property dialog box:

![Property Dialog Box]

The properties of the temperature measurement spot can modify the radiation coefficient, distance and reference object, left and right keys to choose, press the A key to switch up and down. When the “reference object” option is changed to “on”, the temperature value displayed by other temperature measurement objects is the temperature difference from the temperature...
The temperature line is divided into the upper and lower pages. The properties of the temperature measurement line can modify the ratio, the distance, the maximum temperature, the lowest temperature, the average temperature, the maximum temperature difference, the intersection temperature and the reference object, the left and right keys, Switch up and down. When the “reference object” option is changed to “on”, the temperature value displayed by other temperature measurement objects is the temperature difference from the temperature.

The properties of the temperature measurement area can modify the ratio, distance, maximum temperature, minimum temperature, average temperature, maximum temperature difference and reference temperature, left and right keys to choose, press the A key to switch up and down. When the “Reference object” option is changed to “On”, the temperature value displayed by other temperature measurement objects is the temperature difference with the temperature measurement result of this temperature measurement area.

NOTE: Infrared thermal imager can only set one reference temperature measurement target.
OPERATION
Quick Guide - Freeze and save image - Playback - Export - Led screen settings

Freeze and save image
There are three ways to save the image:
• Press the Enter key to select the “Photo” option in the menu, the system will automatically save the image
• Press the “S” key to freeze the image and press it again to store it.
• By setting the shortcut key to “take pictures” option, press the shortcut key to save the image

Playback
There are two ways to open the file
• Press enter key to activate the main menu, select “File Manager” menu, then select the submenu (via the arrow keys to select)
• Click the “Preview” option in the floating panel to open the selected file (via the left and right keys to switch selection)
• After you open the image, you could use upper and lower sections of the playback control panel keys to playback the current store images.
• Press Cancel key to exit and return to the current state.

Export saved images
Can use card reader to download, delete, format the TF files.

LED screen settings
There are two ways for settings:
• 1. Press Menu key to activate the main menu. Choose general settings->LCD brightness adjustment to adjust LED screen brightness.
• 2. Set shortcut key to LCD brightness adjustment to adjust LED screen brightness

Note:
It is recommended to use the thermal camera curing formatting capabilities in software for SD card format
OPERATION
Quick Guide - Menu operating instructions

- Keyboard operation: press the “OK” button to pop up the floating panel, use left and right arrow keys on the floating panels to select the icon, click “OK” key to enter the relevant interface.
- Main menu interface: via “up and down” key to select the menu icon, click “OK” key to enter the submenu.
- Sub-menu interface: via “up and down” key to select, if there’s the “>” mark, using right-click to enter the lower menu
- Parameter interface: The “up and down” key is to modify, the “left and right” key is to choose
- <  > means modify the setting of the current menu.
- Press the “OK” button to confirm the changes, save and return to the previous menu, press the “C” key to cancel the changes and return to the previous menu.
- Cancel and return to the previous menu button. Save and return to the previous menu button. (For touch screen)
- Switch button, by the left and right keys to modify the switch settings
## OPERATION

Quick Guide - Graphic interface description - Screen graphic interface

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Company logo</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Emissivity</td>
<td>the current emissivity setting</td>
</tr>
<tr>
<td>3</td>
<td>Reference Temperature</td>
<td>Fixed reference temperature</td>
</tr>
<tr>
<td>4</td>
<td>Result</td>
<td>Indicates the temperature value of the target object. Back and yellow denotes the temperature value of the selected object.</td>
</tr>
<tr>
<td>5</td>
<td>Spot temperature measurement</td>
<td>white crosshair</td>
</tr>
<tr>
<td>6</td>
<td>System time</td>
<td>the current system time</td>
</tr>
<tr>
<td>7</td>
<td>Battery status</td>
<td>Indicates the current battery status.</td>
</tr>
<tr>
<td>8</td>
<td>Manual/automatic enhancement mode</td>
<td>choose manual or auto mode</td>
</tr>
<tr>
<td>9</td>
<td>Min temperature</td>
<td>indicate minimum value of the target</td>
</tr>
<tr>
<td>10</td>
<td>Palette</td>
<td>Palette bar. User can choose different palettes.</td>
</tr>
<tr>
<td>11</td>
<td>Calibration/Freeze</td>
<td>indicate the calibration status or freeze status.</td>
</tr>
<tr>
<td>12</td>
<td>Wifi</td>
<td>wifi is open wifi. Change aong with wifi signa</td>
</tr>
<tr>
<td>13</td>
<td>Bluetooth</td>
<td>Select Bluetooth function</td>
</tr>
<tr>
<td>14</td>
<td>Lens</td>
<td>0.5x or 2x</td>
</tr>
<tr>
<td>15</td>
<td>Record</td>
<td>current record status. Continuous capture mark Record mark</td>
</tr>
<tr>
<td>16</td>
<td>SD card</td>
<td>indicate the TF card load status</td>
</tr>
<tr>
<td>17</td>
<td>Mode switch</td>
<td>current mode: IR mode, CCD mode, fusion mode</td>
</tr>
</tbody>
</table>
OPERATION

Shortcut key interface
from left to right, up to down is adding spot, adding line, adding area, delete, taking photo, record, playback and main menu

Main menu interface
The main menu items: display the main menu item, namely the document management, temperature settings, image settings, camera settings, general settings, network settings, SD card management and system settings

Sub-menu interface

<table>
<thead>
<tr>
<th>No.</th>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Figure name</td>
<td>Displays the name of the dialog box. The name of the dialog box as shown in the example is “temperature measurement setting.”</td>
</tr>
<tr>
<td>2</td>
<td>Item title</td>
<td>A dialog box may contain more than one item. As shown in the above figure As shown in the example “emissivity”</td>
</tr>
<tr>
<td>3</td>
<td>Item Content</td>
<td>Each item corresponds to the content of a project, the left and right keys to make changes, “&gt;” indicates the power menu.</td>
</tr>
<tr>
<td>4</td>
<td>Parameter options</td>
<td>press the left button to select a different parameter.</td>
</tr>
</tbody>
</table>
OPERATION
Measurement Object Adding

The first four functions of the shortcut key interface are used to add or remove temperature measurement objects. Press the Enter key, activate the shortcut key interface, select the temperature measurement target to add and press the Enter key, the following dialog box pops up

If choosing [ ] press confirm button, eliminate all temperature measurement object

Note:
When deleting a single temperature measurement object, you can directly press the “A” key to select the temperature measurement object, and then press the “C” key to delete
OPERATION

Recording

This function is used to save the video, save format to MP4. Pressing the Enter key, floating menu pops up, select video and press the Enter key, as shown below

![Recording Interface]

Press stop key to end the recording, and return to the current operation status
OPERATION

Photo

This item is for photo. And back up in the JPG format. Pop up the floating menu after pressing confirming key. Then finish the photo. If turn up function of mark. Backup note will pop up in the OSD as followed

Continuous photos mark will appears in the status column if set the continuous photo

Playback

his item is for the preview files of backup. Press confirming key. Pop up the floating items select preview and press confirming key will appears as followed

Switch to files by pressing key of left or right. Open it and it appears in the screen by pressing confirming key. Press C key to quit
OPERATION
Settings

- File management
- Temperature measurement setting
- Image setting
- Imaging setting
- General setting
- Photo & video capturing
- SD card management
- System setting
Press the Enter key to activate the left menu panel. Select the “Main Menu” option from the Up and Down keys to enter the main menu. Select the General Settings item in the menu and press the Enter key to bring up the General Settings dialog box. The user can set the automatic zero interval, shortcut key definition, Bluetooth, power saving mode, LCD brightness adjustment, temperature unit setting, distance unit setting and external video output switch. Press the up and down arrow keys to switch the items, left and right arrow keys to set the project content, “>” that there is subordinate menu, press the right button to enter
**OPERATION**

General setting

**Automatic calibration interval**: set automatic calibration interval to get a better thermal image, improve the accuracy of temperature measurement. The time unit is seconds.
Shortcut key:
Users could set the Functions of shortcut key. System offers image saving, temperature range switch, image playback, record, LED light, OLED light brightness adjustment, transparency adjustment, adding or delete spot, adding or delete area options for choice. When select shortcut key of light. It will open the lighting. Then it closes. When select shortcut key of spot 1. It will add or remove the spot 1. When select shortcut key of area 1. It will add or remove the area 1. When select shortcut key of record. It starts to record. When select shortcut key of photo. It starts to save the photos you took.

Power saving: Screen off and power off
Time of screen off: If without any operation thermal imaging camera will screen off to save power. Press any key except the power key thermal imaging camera will screen on. This function is not valid when time is set to 0 minute.
Time of power off: if without any operation, thermal imaging camera will power off to save power. This function is not valid when time is set to 0 minute.
OPERATION

General setting

_Auto off time:_ include laser and LED auto off time, used for auto off when the laser or LED turn on, the default time is 60s
OPERATION
General setting
OPERATION
General setting - Temperature measurement setting

Press the Enter key to activate the left menu panel. Select the “Main Menu” option from the Up and Down keys to enter the main menu, select the temperature setting item in the menu, press the Enter key to pop up the temperature setting dialog box. Users can set the gear, times the mirror, ambient temperature, reference temperature, temperature correction, the target temperature. Press the up and down arrow keys to switch the items, left and right arrow keys to set the project content, “>” that there are subordinate menu, press the right button to enter

**Mode:** set the infrared camera temperature mode (two mode) and observation mode, shaking mode.

**Lens:** Set different lens

**Environment Temp:** It will automatically detect the Environment Temp after the camera start-up.

**Ref Temp:** When it is enabled , the target temperature shown on the LCD is the D-Value between the real temp and the Ref-Temp
OPERATION

General setting - Temperature measurement setting

Object temperature: When turn on object temperature, the temperature target displays the object temperature in the bottom right corner
Press OK button to call out the “Adjustment” under menu “Measuring Setting”. In this menu, Emissivity, T correct, Distance, Humidity, T Reflect can be set. Use UP &Down button to select, use LEFT & Right to set the value. ” >” means there is sub menu, press Right Button to enter the sub menu.

**Emissivity:** Different target has different emissivity, so the user can set different emissivity for different target. If it is not set, then will use default setting. Attached Common emissivity table for reference.

**T correct:** Correct the target Temperature.

**Distance:** Setting the distance between the camera and the target to make sure exact measuring. Set the real distance if the distance is shorter than 10 meters. (unit 0.5m)

**Humidity:** Set the humidity of the using environment.

**T Reflect:** It will only functioned after it is enabled. Can use fixed temp as reference temperature.
**OPERATION**

General setting - Image settings

**Image Setting Menu**

Press OK button to call out the Image setting menu under “Setting”. In this menu, **Manual/Auto-Enhance Mode, IR transparency, Alarm setting, Isotherm, IR fusion, video output** can be set. Use UP & Down button to select, use LEFT & Right to set the value. " > " means there is sub menu, press Right Button to enter the sub menu.

**Manual/Auto/Auto-Enhance Mode**: Adjust the image quality for the user to get better image for analysis purpose

When Auto-Enhance Mode is activated, can switch between manual and automatic. Press “A “ button will enter manul mode, it can adjust the pallet with “UP, Down, LEFT, Right” buttons. Press “C” will return into Auto Mode.

When Auto-Enhance Mode is deactivated, can switch between manual and automatic. Press “A “ button will enter manul mode, it can adjust the pallet with “UP, Down, LEFT, Right” buttons. Press “C” will return into Auto Mode.

The modes can be switched with the Auto-enhance mode Button.

If select auto mode, the camera will automatically adjust the image hierarchy

If select “Auto-Enhancement “, both High temp target and low temp target can be viewed in the image.

If select Manual mode, User can set the pallet value to adjust the image quality. Press “UP” button to increase the level range, press Down to decrease the level range. Press Left button to reduce the upper limit, increase the bottom limit; Press RIGHT button to increase the upper limit, decrease the bottom limit
**Alarm Setting**

**Alarm Types:** It is only functioned when measuring. User cab set alarm OFF, High temp alarm, Low temp alarm here. It will alarm when proper setting is selected. Alarm color can be set in “Alarm Color”

**Alarm Color:** The color of the target area shown on the LCD will be changed into the alarm color set when the temperature is over the alarm temp. 9 color types can be selected. If “colorless” is selected, then the color will not change when alarm.

**Alarm Temperature:** Setting alarm Temperature. Only functioned when it is enabled.

**Alarmlink:** It will automatic saved when there is alarm including snapshots and video record.

**Time Interval:** Set the alarmlink time intervel.

**Alarm video time:** set alarm video time, can choose to turn off
OPERATION
General setting - Image settings

Isotherm Setup Menu

**Isotherm**: Activates the Isotherm display by displaying the image in the set temperature range by the specified color.
**Isotherm Color**: 9 colors available for your choice, Setting to Off, disables the feature.
**Isotherm low value**: Set the Isotherm low value
**Isotherm upper value**: Set the Isotherm upper value

IR Fusion High & Low temperature Menu

**IR Fusion High & Low temperature**: It consists of three options—IR Fusion High Temp, IR fusion Low Temp, and OFF. Set IR Fusion High Temp, when the actual temperature is higher than the temperature of IR fusion set up, CCD image will be shown. Vice versa
OPERATION
General setting - Network settings

Network Setup Menu
Press the menu button to show up the floating panel and choose the “setup” option to active the main menu. Select “Network function.

IP Address: This IP address must be the only one, can not be conflicted with the other IP address of the same network segment.

Sub network mask: Divide the segment of the sub network.

Default network gateway: Set the gateway address to realize the communication among different segment

Link Type: Default 10M / 100M Adaptive, 10M, 100M
OPERATION
General setting - SD card management

SD Card Management Figure
SD card unloaded successfully

SD Card Format Figure 1
SD Card Format Figure 2
Press the Enter key to pop up floating panel, then select “Settings” option to activate the main menu, select the “SD Card Management item in the setup menu.
Unload: Unload SD card.
Format: This function is used to format the SD card. Select the formatting options, pressing the confirm key to format, press cancel or “C” key to cancel the formatting

Note:
Verify that the file is no longer needed or have been backed up before formatting; after formation, the saved thermal imaging pictures will be lost unrecoverable. If format by PC, please select FAT32 to format the card.
OPERATION

General setting - Capture setting

Pressing confirm key to pop up the floating panel, then select “capture Settings” option to activate the main menu, selected the camera settings option

**Associated Pictures**: This function is to associate the infrared images with digital image, to save the picture together.

**Image annotation mode**: This option has two kinds of annotations, audio annotations and text annotations. Audio annotations is to add voice when you save the picture; text annotation is to add text messages when save the image.

**CS Shots**: Set Continuous capture the number of sheets can be set for 1, 3, 5, 10 shot.

**Continuous Capture Interval**: can be 0.5s or 1s.

**Menu Setting**: Set the path to save the file, directory type can be set by custom, by month, by date. In preview mode, the playback file path set by directory type
OPERATION
General setting - System settings

Press the Enter key to pop up “Settings” option to activate the main menu, select “System Settings” item in the setup menu. Users can customize the set system language, time / date formats, time / date, restore the factory value items. Pressing the up/down key to switch the setting, use left and right arrow keys to set the contents of the setting. The “>” indicates that there’s a lower-level menu, use right-click to enter.

Language: Set the languages

Time / Date Format: Time/Date Setting Menu
Change the format of the time/date

Time Setting Menu
Customer can via the Time Setting menu to set the thermal imaging camera’s time. After the setting, the data the time will be saved. Users can customize to set the year, month, day, hour, minute entries. Press the left and right key to do the settings.

Note:
When left unused for a long time, due to the limited internal battery power, the thermal imaging camera need to re-adjust the system time.
OPERATION

General setting - System settings - System Version Info

System Version Figure
Display thermal imaging device model, device number, software version number and MAC address

Import: New SD card the Create DCIM / Import directory on the SD card, import the fixed file name as PicNote.cfg
File Name Form:
    [Note]
    Note1 =
    Note2 =
    Note3 =

Each line is not more than 20 words. After the import is complete, restart the instrument to take effect.

Export: TF card, make sure the SD card is in the machine, then select the menu and then click the Export button to export the contents stored in the TF card the DCIM / Export directory.

Note:
Recover factory setting will cancel all user-defined parameters.
OPERATION
General setting - File management - Playback

1 File management mode: press the Enter key to pop up floating panel select “Settings” option to activate the main menu, select the file management menu in the setup menu, press the confirm button to open the infrared image in the storage. The image arrangement format has abalone grid, press the upper, lower, left, and right arrow keys can switched the stored image. Pressing the “C” key to exit open image and return to the measurement state.

Image Playback Interface
The image playback interface: Via the left, right key to select the play button on the status bar, press the “confirm” key to take effect on the next key to show and hide the playback status bar (press the “on” button is displayed, press the “next” button is hidden) The icon buttons from left to right is as follows: the former one (above), the next (paragraph), sound recording, voice playback, text playback.

2 Preview mode: press the OK button to pop-up floating panel to select “Preview” option, enter the preview mode. Through the left and right keys to switch selection, select-ed press the OK button to enter the playback. Pressing the “C” key to exit open image and return to the measurement state.
OPERATION
General setting - File management - Delete

This function is used to delete data stored in files on the TF card. Open File Manager by the up and down keys to select the file you want to delete, press the “S” key to bring up the prompt box, delete the currently selected image files when the Enter key is pressed, the image voice or text comments will also be deleted, then press the “C” key to undelete.

Note:
Before deletion, make sure that the file is no longer needed or have backup, the deleted image can not be recovered.
# TROUBLESHOOTING

Please follow the table below to diagnose and correct the problem. If problem still exists, please contact our service department.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause &amp; Solution</th>
</tr>
</thead>
</table>
| The camera does not power on. | - Battery not installed or installed incorrectly  
- “Power off” protection is enabled  
- Battery is out of power.  
- Change battery.  
- Wait for 5 seconds and reboot. |
| The camera powers off automatically. | - Battery is out of power.  
- Change battery  
- AutoOffTime option is enabled  
- Set as None. |
| Battery depletion is too fast | - Environmental temperature is too low  
- Rechargeable battery is not charged completely.  
- Recharge the battery.  
- Rechargeable battery is out of power completely and cannot be recharged.  
- Change to new battery. |
| No thermal image | - Lens cover is not removed.  
- Remove lens cover.  
- In image freeze status  
- Press C key to exit. |
| Thermal image is white-black. | - White-black palette is selected  
- Select normal palette. |

www.amperis.com
support: info@amperis.com  t (+34) 982209920
# APPENDIX A
Common material emissivity FYI

<table>
<thead>
<tr>
<th>Material</th>
<th>Surface</th>
<th>Temperature°C</th>
<th>Emissivity (E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminum</td>
<td>Non-oxidized</td>
<td>100</td>
<td>0.20</td>
</tr>
<tr>
<td></td>
<td>Oxidized</td>
<td>100</td>
<td>0.55</td>
</tr>
<tr>
<td>Brass</td>
<td>Burnished to Brown</td>
<td>20</td>
<td>0.40</td>
</tr>
<tr>
<td></td>
<td>Dull luster</td>
<td>38</td>
<td>0.22</td>
</tr>
<tr>
<td></td>
<td>Oxidized</td>
<td>100</td>
<td>0.61</td>
</tr>
<tr>
<td>Copper</td>
<td>Seriously Oxidized</td>
<td>20</td>
<td>0.78</td>
</tr>
<tr>
<td>Iron</td>
<td>Oxidized</td>
<td>100</td>
<td>0.74</td>
</tr>
<tr>
<td></td>
<td>Rusty</td>
<td>25</td>
<td>0.65</td>
</tr>
<tr>
<td>Cast iron</td>
<td>Oxidized</td>
<td>200</td>
<td>0.64</td>
</tr>
<tr>
<td></td>
<td>Non-Oxidized</td>
<td>100</td>
<td>0.21</td>
</tr>
<tr>
<td>Wrought iron</td>
<td>Quarry-faced</td>
<td>25</td>
<td>0.94</td>
</tr>
<tr>
<td>Nickel</td>
<td>Polished</td>
<td>38</td>
<td>0.28</td>
</tr>
<tr>
<td>Stainless steel</td>
<td>Oxidized</td>
<td>60</td>
<td>0.85</td>
</tr>
<tr>
<td>Steel</td>
<td>Oxidized</td>
<td>200</td>
<td>0.79</td>
</tr>
<tr>
<td>Common brick</td>
<td>Surface</td>
<td>20</td>
<td>0.93</td>
</tr>
<tr>
<td>Concrete</td>
<td>Surface</td>
<td>20</td>
<td>0.92</td>
</tr>
<tr>
<td>Glass</td>
<td>Polished plate</td>
<td>20</td>
<td>0.94</td>
</tr>
<tr>
<td>Lacquer</td>
<td>White</td>
<td>100</td>
<td>0.92</td>
</tr>
<tr>
<td></td>
<td>Black</td>
<td>100</td>
<td>0.97</td>
</tr>
<tr>
<td>Carbon</td>
<td>Smoke black</td>
<td>25</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>Candle soot</td>
<td>20</td>
<td>0.95</td>
</tr>
<tr>
<td></td>
<td>Rough lead surface</td>
<td>20</td>
<td>0.98</td>
</tr>
<tr>
<td>Oil paint</td>
<td>Value of 16 colors</td>
<td>100</td>
<td>0.94</td>
</tr>
<tr>
<td>Paper</td>
<td>White</td>
<td>20</td>
<td>0.93</td>
</tr>
<tr>
<td>Sand soil</td>
<td>Surface</td>
<td>20</td>
<td>0.90</td>
</tr>
<tr>
<td>Timber</td>
<td>Dressed</td>
<td>20</td>
<td>0.90</td>
</tr>
<tr>
<td>Water</td>
<td>Distilled water</td>
<td>20</td>
<td>0.96</td>
</tr>
<tr>
<td>Skin</td>
<td>Human</td>
<td>32</td>
<td>0.98</td>
</tr>
<tr>
<td>Ceramic</td>
<td>Thin</td>
<td>21</td>
<td>0.90</td>
</tr>
<tr>
<td></td>
<td>Thick</td>
<td>21</td>
<td>0.93</td>
</tr>
</tbody>
</table>
### APPENDIX B

Factory default parameter setting table

#### Table.1 Measurement temperature setting table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature Range</td>
<td>-40 ~ 180°C 100~ 500°C</td>
</tr>
<tr>
<td>Lens</td>
<td>Standard</td>
</tr>
<tr>
<td>Temp Unit</td>
<td>°C</td>
</tr>
<tr>
<td>Ref Type</td>
<td>off</td>
</tr>
<tr>
<td>Ref Temp</td>
<td>30°C</td>
</tr>
</tbody>
</table>

#### Table.2 Measurement temperature correction table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emissivity</td>
<td>0.96</td>
</tr>
<tr>
<td>TCorrect</td>
<td>0°C</td>
</tr>
<tr>
<td>TAmbient Temp</td>
<td>Off</td>
</tr>
</tbody>
</table>

#### Table.3 Analysis setting table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temp Alarm</td>
<td>Off</td>
</tr>
<tr>
<td>Alarming Temp</td>
<td>50.0°C</td>
</tr>
<tr>
<td>Alarming Color</td>
<td>None</td>
</tr>
<tr>
<td>Isotherm Color</td>
<td>Off</td>
</tr>
<tr>
<td>Isotherm Temp</td>
<td>51.0°C</td>
</tr>
<tr>
<td>Isotherm Width</td>
<td>49.0°C</td>
</tr>
</tbody>
</table>

#### Table.4 System setting table

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Language</td>
<td>English</td>
</tr>
<tr>
<td>Auto calibration</td>
<td>60S</td>
</tr>
<tr>
<td>LCD brightness</td>
<td>80%</td>
</tr>
<tr>
<td>Video Mode</td>
<td>NTSC</td>
</tr>
<tr>
<td>StandbyTime</td>
<td>5 mins</td>
</tr>
<tr>
<td>AutoOffTime</td>
<td>15 mins</td>
</tr>
</tbody>
</table>