ThermalTronix

TT-1040S-UTCM

TT-1075S-UTCM

Thermal Imaging Camera

User Manual

⚠ **Warnings**

- Please avoid aiming the lens at extreme high temperature radiation source, such as the sun, molten steel or laser in any situation; otherwise the detector may be damaged.

- Please do not touch the lens to avoid contaminating and damaging. Please pay attention to protect the lens to avoid causing abrasion, scratches even breaches, otherwise, it will affect the device performance badly, even damage the device.

- This device is a precise optoelectronic product. Please protect it properly during usage, storage and transportation, where improper use (such as drop and collision) will cause damage to the device. If the internal connection is broken during the assembly process or the apparatus is damped (rain wet), the performance will be reduced and even the device will be damaged.

- Make sure that the power control connection is reliable. If the power control wire is in bad connection, it will damage the device.

- Ensure the proper connection of power control cable and data cable. Wrong connection may cause damage to the device.

- Do not swag fiercely or collide the device during transportation, otherwise, it will cause performance-reduction and even damage to it.

- Please use the specified power supply; otherwise, it will cause improper working, even damaging the apparatus.

If the product works abnormally, please contact the dealer or the nearest after-sale service center. Please do not dismantle or replace it in any manners.

Table of Contents

1. Overview

The **Figure.1.1** shows the overall dimension of the camera.

Figure.1.1 Overview of the camera

Figure.1.2 Back of the camera

2. Getting started

2.1. How to assembly

1．Check all units are in accordance with the packing list.

2．Make sure all parts are well-protected in the carry case.

3．Carefully take out the camera and other accessories.

4．Connect the video connector to the monitor.

5．Connect the power adapter and power cable

6．Connect the power cable to the power supply to power on the camera.

2.2. Control panel

The camera provides a control panel with five shortcut keys with various functions. The below is the figure of the control panel:

Figure.2.2.1 Control panel

The five keys have the below functions respectively:

+   **UP** key. When the menu is activated, press **UP** to adjust the selected parameters. The parameter value will be increased after pressing. When the menu is not activated, press **UP** to focus forwards.

-   **DOWN** key. When the menu is activated, press **DOWN** to adjust the selected parameters. The parameter value will be decreased after pressing. When the menu is not activated, press **DOWN** to focus backwards.

M   **MEMU** key. Press to activate or hide the menu. Press **MENU** to select the parameter, and modify the parameter value via **UP** or **DOWN** keys. Continuing pressing **MENU** key, the function option will be selected circularly. After one cycle, the menu will disappear and the change will be saved. The parameter setting will be the last-time setting after restarting next time.

C   **Calibration** key. Long press ($\geq$3s) to do calibration manually.

F   **Setting** key. Press to activate the setting menu. (Do not suggest the end-user to change the settings)

2.3. Interfaces & connectors

2.3.1. Video output interface

Figure.2.3.1.1 Video output interface

The above figure is a BNC video output interface.

2.3.2. Multiple interface

Figure.2.3.2.1 Multiple interface

The definition of each pin is as below:

No.	Pin name	Description
1	+12V	Positive power input
2	GND	Power ground
3	RS485A	RS485+
4	RS485B	RS485-
5	I/O1	User port
6	I/O2	User port
7	I/O3	User port
8	I/O4	User port
9	I/O5	User port
10	COM	

3. Operation guide

3.1. Menu description

3.1.1. Main menu

Press **MENU** button to activate main control menu. Press **UP** or **DOWN** button to change the

Option value. Press **MENU** button until **Exit**: option is selected and press **UP** button or **DOWN**
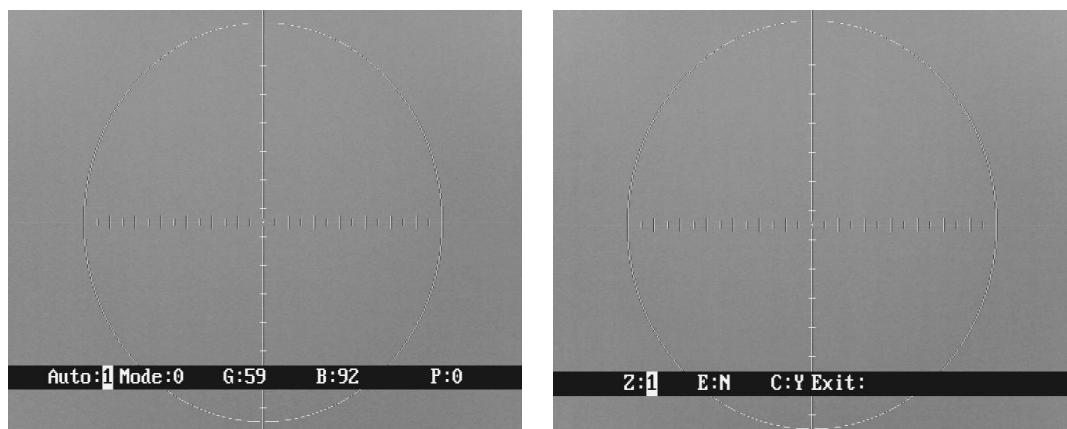
button to exit.

Figure.3.1.1.1 Main menu interface

Auto: XXX   Display the current image auto mode. Three options:

0: manual gain, manual brightness;

1: manual gain, auto brightness;

2: auto gain, auto brightness;

Mode: XXX   Display the current image mode. There are 10 options, where 0 and 1 are

fixed factory default settings and 2-9 are user-defined settings.

0: Suitable for observation of big-object under good weather condition

1: Suitable for observation of target within sky-line under good weather condition

2～9: User-defined based on different practical occasions.

Note: when Auto 0 and 1, Mode X cannot be adjusted; when Auto 2, Mode X can be adjusted.

<u>**G: XXX**</u>	Gain value, range: 0-255
<u>**B: XXX**</u>	Brightness value, range: -2048-+2048
<u>**P: XXX**</u>	White/black hot display mode
	0: black hot 1: white hot
<u>**Z: XXX**</u>	Zoom status
	1: No zoom 2: 2X
<u>**E: XXX**</u>	Image enhancement status
	Y: on N: off
<u>**C: XXX**</u>	Display the crosshair or not.

<u>**Exit:**</u>   Exit crosshair menu. Press **MENU** button to select the **Exit** option and press **UP** button to exit the menu.

Note: When exiting the main menu, any change will be saved automatically and will also be used when restarting next time.

<u>**Mode: XXX**</u> can only choose the existed mode, but can not adjust it.

3.1.2. System menu

Press **F** button and enter the password: MC+—MC, will pop up the below interface:

```
Com:  Mode:  AF:  RS:  Video:  Protect:  Alarm:  Recover  Exit:
```

Figure.3.1.2.1 System menu

AF: XXX   automatic focusing;

RS: XXX   Set the zeroing parameter

Video: XXX   Set the image quality

Protect: XXX   Set the switch status to protect the detector from being burned

                     Y: on   N: off

Alarm: XXX   Reserved for alarm;

Recover: XXX   Recover all menus setting for factory default

Exit: Exit setting menu. Press **MENU** button to select the **Exit** option and press

                     UP button to exit the menu.

3.1.3. Communication menu

In System menu, press **M** button to select **Com: XXX,** and press + or − button to enter the password: +-MC+-, will pop up the below interface:

```
ID:   BaudRate:   Protocol:   Exit:
```

Figure.3.1.3.1 Communication menu

ID: XXX   ID number, range: 0~+255.

BaudRate: XXX   Set Baud rage value;

Protocol: XXX   Select the communication protocol. Three options: INTELLISYSTEM,

                     PELCO-D and PELCO-P;

Exit:　　　　　　Exit configuration setup. Press **MENU** button to select the **Exit** option and press **UP** button to exit the menu.

3.1.4. Mode menu

In System menu, press **M** button to select **Mode: XXX** and press + or − button to enter the password: +-MC+-, will pop up the below interface:

Mode:	Gain:	Bright:	Save:	Exit:

Figure.3.1.4.1 Mode menu

Gain: XXX　　Gain value, range: 0~+255;

Bright: XXX　　Brightness value, range: -2048~+2048;

Save: XXX　　Save configuration setup;

Exit:　　　　　Exit configuration setup. Press **MENU** button until **Exit** option is selected and press **UP** button or **DOWN** button to exit.

3.2. Main operation description

3.2.1. Focusing

When there is no menu displayed, press **UP** or **DOWN** button to adjust the focus, or press the **UP** and **DOWN** buttons at the same time to do autofocus.

3.2.2. Single pixel correction setup

Press **C** button to do single pixel correction.

Note:

● Camera will do single pixel correction automatically for several time when power on.

● After start-up, since the camera is in thermal equilibrium processing, it may need single pixel correction for several times. After about 45 minutes, the system reaches thermal equilibrium.

If so, the system usually has no need to do single pixel correction.

● The camera running built-in calibration mechanism can do calibration anytime. Besides, it is normal when you hear some "click" noise during calibration.

3.2.3. Auto imaging mode setup

Setup: Press **MENU** button until **Auto: XXX** is activated, press **UP** button or **DOWN** button to select needed mode.

Exit: Press **MENU** button until **Exit:** option is selected and press **UP** button or **DOWN** button to exit.**.**

Note: There are three modes:

● **Auto 0**: Manual gain, manual brightness. The camera will not adjust brightness and gain automatically according to the observed object.

● **Auto 1**: Manual gain, auto brightness. The camera adjusts brightness automatically according to the observed object and you may adjust gain manually.

● **Auto 2**: Auto gain, auto brightness. The camera can adjust both brightness and gain automatically according to the observed object.

3.2.4. Imaging mode selection

Setup: Press **MENU** button until **Mode: XXX** is activated and press **UP** button or **DOWN** button to select needed mode.

Exit: Press **MENU** button until **Exit:** option is selected and press **UP** button or **DOWN** button to exit.

Note: The camera has ten modes under **Auto: XXX** mode, where 0,1 are fixed factory default and 2~9 are user-defined. Herein, user can only choose the mode but not able to adjust.

3.2.5. Gain setup

Setup: Press **MENU** button until **G: XXX** option is selected. Press **UP** button or **DOWN** button to adjust gain parameter value**.**

Exit: Press **MENU** button until **Exit:** option is selected and press **UP** button or **DOWN** button to exit.

Note: this function is only valid when the auto imaging mode setup is **Auto 0** or **Auto 1**. In **Auto 2** mode, gain is automatically adjusted. When pressing **MENU** button, menu will skip gain setup option.

3.2.6. Brightness setup

Setup: Press **MENU** button until **B: XXX** option is selected. Press **UP** button or **DOWN** button to adjust brightness parameter value.

Exit: Press **MENU** button until **Exit**:option is selected and press **UP** button or **DOWN** button to exit.

Note: This function is only valid when the auto imaging mode setup is Auto 0. In Auto 1 and Auto 2, brightness is automatically adjusted. When pressing **MENU** button, menu option will skip brightness adjustment option.

3.2.7. Polarity setup

Setup: Press **MENU** button until **P: XXX** is selected**.** Press **UP** button or **DOWN** button to select black hot /white hot display mode.

Exit: Press **MENU** button until **Exit**:option is selected and press **UP** button or **DOWN** button to exit.

3.2.8. Image enhancement setup

Setup: Press **MENU** button until <u>**E: XXX**</u> option is selected. Press **UP** button or **DOWN** button to set needed enhancing state.

Exit: Press **MENU** button until <u>**Exit**</u>: option is selected and press **UP** button or **DOWN** button to exit.

Note: Image enhancement can improve the observation effect, but may decrease the Signal-to-Noise. This function is disabled in Mode 8.

3.2.9.   Crosshair setup

Setup: Press **MENU** button until **C: XXX** menu option is activated; Press **UP** button or **DOWN** button to setup needed enhancing state.

Exit: Press **MENU** button until <u>**Exit**</u>:option is selected and press **UP** button or **DOWN** button to exit.

Note:

Set the calibration parameter if the images are non-uniformity

3.2.10.   Dead pixel correction setup

Setup: **Manually Setup:** press **F** button and **UP** button at the same time to activate dead pixel correction setup. Press **UP** button or **DOWN** button to move crosshair central dot to dead pixel position, and then press **C** button (calibration function) to replace current dead pixel (press **C** button again to cancel).

Exit: Press **MENU** button to select <u>**Esc**</u>, and then press **UP** button to exit.

Note: If immovable dead pixel exists in the image, calibration can not be done by pressing **C** button to activate dead pixel correction setup.

4. Troubleshooting

Please follow the below table to diagnose and solve the problem. If problem is still exited, please contact our service center.

Trouble	Reasons and solutions
The camera can not power on	● Power cable is not connected correctly →Connect the power cable again ● Thermal camera protection procedure →Wait for 10 seconds and turn on again
The camera powers off automatically	● The power cable connection is improper →Connect the cable properly
No thermal images	● The lens cover is not opened →Open the lens cover ● Switch between external power source and battery →Reboot the camera

5. Technical specifications

Item		ThermalTronix	
		TT-1040S-UTCM	TT-1075S-UTCM
Detector	Detector type	Uncooled FPA micro bolometer	
	Array size/format	384×288	
	Pixel size	25um	
	Wave range	8-14um	
	Focal length	40 mm	75mm
	IFOV	13.7°×10.3°	7.3°×5.5°
	NETD	≤100mK@30℃	
	Focus	Electric focusing	
	Frame rate	50HZ	
	Special resolution	0.63mrad	0.33mrad
Measurements	Brightness/gain	Manual brightness/gain; Automatic brightness/manual gain; Automatic brightness/gain	
	Automatic brightness/gain configuration adjustment	2 fixed patterns, 8 user-defined modes	
	Polarity reversal	Black hot/white hot	
	Electronic zoom	2x	
	Noise reduction	Yes	
	Enhancement	Yes	
	Calibration	Automatic timing calibration	
	Cross division	Demonstration/hide away	
Environment requirement	Work temperature	-20℃ ~ +55℃	
	Storage temperature	-40℃ ~ +65℃	
	Encapsulation	IP40	
Physical characteristics	Weight	≤0.7kg	≤1kg
	Dimensions	164mm×63mm×74mm	186mm×96mm×96mm

Power supply	Power consumption	≤6W
Interface	External power	YES (DC12V±20%)
	Video output	PAL
	Communication interface	RS485
	Control protocol	PELCO-D/PELCO-P/INTELLISYSTEM