ThermalTronix
TT-1260S-UTCM
Thermal Imaging System

User Manual

Warning & Attention

 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:
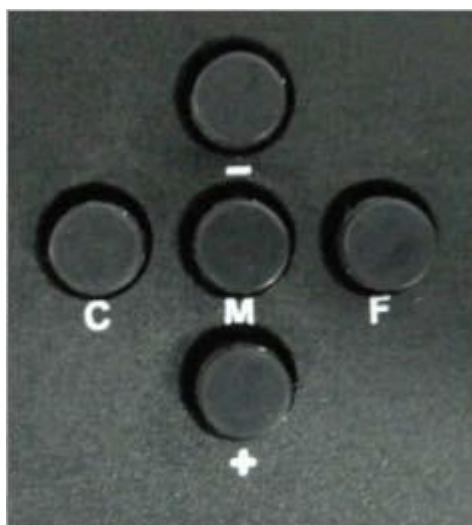
Figure.2.2.1 Control panel

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.

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.

Calibration key. Long press (≥3s) to do calibration manually.

Cursor key. Press to activate the crosshair menu.

Table.2.2.1 Shortcut key combinations

No.	Combinations	Description
1	**MENU+UP**	Display the crosshair.
2	**MENU+DOWN**	Hide the crosshair.
3	**F+UP**	Activate **Dead pixel correction menu (see 3.1.4)**
4	**F+DOWN**	Activate **Factory default menu (see 3.1.5)**
5	**UP+DOWN**	Automatic focusing.
6	**MENU+UP+DOWN**	Activate **Mode setup menu (see 3.1.3).**

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 end
2	GND	Power ground
3	RS485A	Com port
4	RS485B	Com port
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

This chapter is mainly to show you how to execute the camera program. The program comprises of five menus: main menu, crosshair menu, mode setup menu, dead pixel correction menu and factory default menu. For more details, please see the following parts of contents.

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. Keep pressing **MENU** button until menu prompt disappeared to exit.

Auto:2 Mode:2 G:15 B:16 P:1	F:Y E:N AF:N C:0 ID:0	Protocol:PELCO-D

Figure.3.1.1.1 Main menu interface

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

0: manual gain, manual brightness;

1: manual gain, auto brightness;

2: auto gain, auto brightness;

Mode: X   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 occasion

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

G: XXX   Gain value, range: 0-255

B: XXXXX   Brightness value, range: -2048-+2048

G: XXX	Gain value, range: 0-255
B: XXXXX	Brightness value, range: -2048-+2048
P: X	White/black hot display mode
	0: black hot 1: white hot
F: X	Filter status (on/off)
	Y: on N: off
E: X	Image enhancement status
	Y: on N: off
AF: X	**A**utomatic focusing.
	Y: on N: off
C: XXX	Adjust non-uniformity parameter value.
ID: XXX	ID number, range: 0-255.
Protocol: XXX	Select the communication protocol. Two options: PELCO-D and PELCO-P.

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

Mode: X can only choose the existed mode, but cannot adjust it.

3.1.2 Crosshair menu

Press **F** button to activate crosshair menu. Press **UP** or **DOWN** button to change the option value.

Cur: N   X:192   Y:144   Exit:
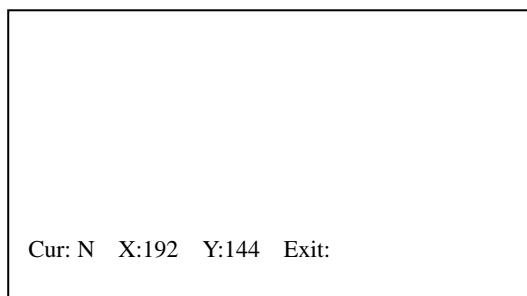
Figure.3.1.2.1 Crosshair menu interface

Cur: X	Y-display the cursor; N-hide the cursor;
X: XXX	Display the crosshair position in X-axis;
Y: XXX	Display the crosshair position in Y-axis, range;
Exit	Exit crosshair menu. Press **MENU** button to select the **Exit** option and press **UP** button to exit the menu.

3.1.3 Mode setup menu (user defined)

User can define the mode, as they want. They can define eight modes from mode 2 to mode 9.

Press **MENU** button, **DOWN** button and **UP** button at the same time to activate user-defined

configuration setup menu. Press **UP** or **DOWN** button to change the option value.

```
Mode: 2   Gain: 32   Bright: 188   Save:   Exit:
```
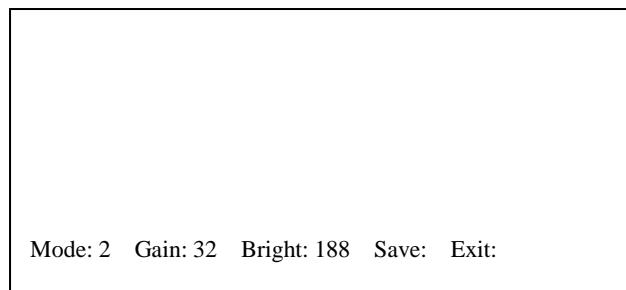
Figure.3.1.3.1 Mode setup menu

Mode: X	Display the mode number.
G: XXX	Gain value, range: 0-255;
B: XXX	Brightness value, range: 0-255;
Save:	Save configuration setup
Exit:	Exit configuration setup. Press **MENU** button to select the **Exit** option and press **UP** button to exit the menu.

Note: The Mode **X** displayed on the main menu interface will be the current mode.

3.1.4 Dead pixel correction menu

User can manually correct the dead pixel single by single or correct all dead pixels
automatically by the camera.

Press **F** button and **UP** button at the same time to activate dead pixel correction menu.

```
X: XXX   Y: XXX      Ent:   Esc:
```
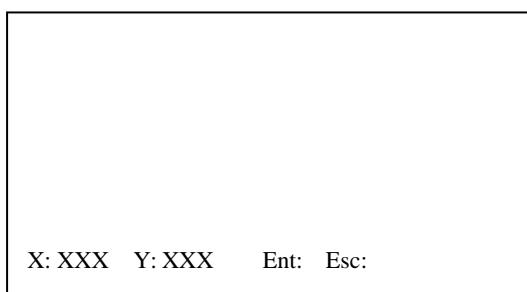
Figure.3.1.4.1 Dead pixel correction menu interface

X: XXX	Dead pixel position in X direction;
Y: XXX	Dead pixel position in Y direction;
Ent:	Save dead pixel correction parameter and exit the menu;
Esc:	Exit dead pixel correction menu without saving change.

Note: Move the crosshair to the dead pixel by pressing **UP/DOWN** buttons and then press **C** button to replace the dead pixel.

3.1.5 Factory default menu

User can restore the factory default setting via this menu. Press **F** and **DOWN** buttons to activate the factory default menu.

```
┌─────────────────────────────────────┐
│                                     │
│                                     │
│                                     │
│                                     │
│                                     │
│  Def: N      Revise: N     AutoDoZero: N │
└─────────────────────────────────────┘
```
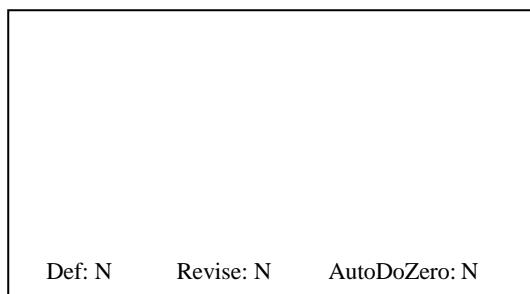
Figure.3.1.5.1 Factory default menu interface

Def: N/Y	Display option of restoring factory default, such as dead pixels and language.
Revise: N/Y	Enable or disable the revise function.
AutoDoZero: N/Y	Enable or disable the function of zeroing automatically.

Note: use **UP/DOWN** buttons to choose option value. Keep pressing **MENU** button until the menu disappeared to exit.

3.2 Main operation description

3.2.1 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.

3.2.2 Auto imaging mode setup

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

Exit: Press **MENU** button continuously until menu disappeared.

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.

3.2.3 Imaging mode selection

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

Exit: Press **MENU** button continuously until menu disappeared.

Note: The camera has ten modes under Auto X 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. If user wants to adjust particular parameter configuration, please see next section **3.2.4 User-defined Imaging Configuration setup.**

3.2.4 User-defined imaging configuration setup

Setup: Press **MENU** button, **UP** button and **DOWN** button at the same time to activate **Mode setup menu**. Press **MENU** button to select **Mode: X** or **G: XXX** or **B: XXXX** menu. Press **UP** button or **DOWN** button to modify the parameter values.

Exit: Press **MENU** button until **Save** is activated and then press **UP** button to save your setup and exit the menu. In case of no need to save, press **MENU** button until **Exit** is selected，and then press **UP** button to exit.

Note:

When user-defined configuration setup is activated, it will enter **Auto 2** mode automatically and exiting current menu will restore the original operation.

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 continuously until menu disappeared.

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 <u>B: XXXX</u> option is selected. Press **UP** button or **DOWN**

button to adjust brightness parameter value.

Exit: Press **MENU** button continuously until menu disappeared.

Note: This function is only valid when the auto imaging mode setup is <u>Auto 0.</u> In <u>Auto 1 and Auto</u>

<u>2,</u> brightness is automatically adjusted. When pressing **MENU** button, menu option will skip

brightness adjustment option.

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3.2.7 Polarity setup

Setup: Press **MENU** button until <u>P: X</u> is selected**.** Press **UP** button or **DOWN** button to

select black hot /white hot display mode (**see 3.1.1**).

Exit: Press **MENU** button continuously until menu disappeared.

3.2.8   Filter setup

Setup: Press **MENU** button until <u>F: X</u> option is selected. Press **UP** button or **DOWN** button

to set needed filter state.

Exit: Press **MENU** button continuously until menu disappeared.

Note: filter can improve image S/N (signal-to-noise), but may affect high frequency characteristic

of image and real time characteristic. This function is disabled in Mode 8.

3.2.9   Image enhancement setup

Setup: Press **MENU** button until <u>E: X</u> option is selected. Press **UP** button or **DOWN** button

to set needed enhancing state.

Exit: Press **MENU** button continuously until menu disappeared.

Note: Image enhancement can improve the observation effect, but may decrease the

Signal-to-Noise. This function is disabled in Mode 8.

3.2.10 Calibration 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 continuously until menu blanking, namely exit setup mode.

Note:

Set the calibration parameter if the images are non-uniformity

3.2.11 Crosshair setup

Setup: Press **MENU** button and **UP** button at the same time, crosshair is displayed. **Exit:**

Press **MENU** button until Esc option is selected and press **UP** button to exit. **Crosshair**

position setup

Setup: Press **F** button to activate cursor setup menu. **X: XXX** indicates the horizontal direction and **Y: XXX** indicates the vertical direction. Press **UP** button or **DOWN** button to set up the position.

Exit: Press **MENU** button to select option **Save**. Press **UP** button to save setup and exit crosshair setup. In case of no need to save, press **MENU** button to select option **Exit** and press **UP** button to exit.

Note: Press **UP** button or **DOWN** button once, crosshair moves one pixel.

3.2.12 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>Save</u>. Press **UP** button to save setup and exit. In case of no need to save, press **MENU** button to select <u>Exit</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.

3.2.13 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.

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 cannot 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

Items		ThermalTronix	
		TT-1260S-160-UTCM	TT-1260S-384-UTCM
Detector characteristics	Detector	Uncooled FPA microbolometer	
	Array size/format	160×120	384×288
Image characteristics	FOV/Min Focus distance	6.4°×4.8°/1.0m	13.7°×10.3°/1.0m
	Spatial resolution	0.69mrad	0.63mrad
	Thermal sensitivity	≤0.1℃@30℃	
	Frame rate	50HZ	
	Focus	Auto/Manual motorized, according to object scene auto focus	
	Spectral range	8-14um	
Thermal image adjust	Operation key	Yes	
	Brightness/Gain adjustment	Manual adjust brightness/gain, Automatic adjust brightness and manual adjust gain, Automatic adjust brightness/gain	
	Automatic adjust brightness/gain mode	2 fixed modes, 8 user-defined modes	
	Image Polarity	Hot black/hot white	
	Digital zoom	2X	
	Noise reduction	Yes	
	Image enhancement	Yes	
	Revise	Auto/manual	
	Crosshair	On/Off	
Power system	External power supply	10-15V DC	
	Power consumption	≤4.5W	
Environment	Operating temperature	-20℃ ~ +50℃	
	Storage temperature	-45℃ ~ +65℃	
	Encapsulation	IP40	
Physical characteristics	Weight	≤0.8Kg	
	Dimensions	≤169mm×62mm×78mm	
Interface	External DC input	Yes	
	Video output	PAL	
	Serial port	RS485	
	Pan/Tilt encoder interface (optional)	Yes	
	Alarm terminal (Optional)	On/off output	