ThermalTronix

TT-1100B-UTCM

Thermal Imaging Module

User Manual

Please read this User's Manual before using the module !

⚠️ **Warnings**

Avoid aiming the window (with lens or not) at extreme high temperature radiation source (such as the sun, molten steel and laser) in any case (power on/off), or the detector may be damaged.

Do not contact the detector window with bare skin in order to avoid contaminating and damaging it owing to static. Pay attention to protection for the detector window when installing lens to avoid causing abrasion, scratch even breach to it. Otherwise, it will reduce badly the module performance, even damage the module.

This module is a high-precise photo electricity product, so please protect properly during using, storage, transportation, rough handling (such as drop, collision causing scathe to the detector outer cover, inner connecting wire rupture occurring in installation, being affected with damp, rain) is likely to incur module performance-reduction, even damage the module.

Make sure that the power control connection is reliable. If the power control wire is in bad connection when switch on the module, it will damage the module or even the detector.

During installing the module, protecting the lead-out wire and circuit board is recommended, or the static will cause module's performance-reduction, even improper operation.

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.

Please use the power supply according with product specifications or the module may work abnormally or even be damaged.

This module is a universal-used component, exclusively for user to develop further. Therefore, it is different from the complete product with integrated protective measures. The user needs to pay attention to the protection. Damage to the module is caused by the foregoing reasons, the supplier should not be responsible for repairing free of charge.

CONTENTS

1. Introduction

TT-1100B-UTCM Thermal Imaging Camera is specially developed for long range surveillance purpose especially under different environment situation.

2. Functions

1. Image Noise Reduction function, reduce Image background noise.
2. Image enhancing function: enhance the ability to detect small object
3. Manual calibration
4. Start-up auto calibration
5. Manual brightness and gain adjustment
6. Auto brightness and gain adjustment
7. Numerical 2X zoom function
8. Polarity (white hot/ black hot)
9. Crosshair display/movement/save
10. Standard PAL video output
11. Standard RS 485 interface
12. Viewer switch function
13. Auto focus function
14. Prevention of lightning

Product Informations

NO.	Model	Lens FOV characteristics		Remarks
		Wide FOV	Narrow FOV	
1	TT-1100B-UTCM	23.22ºX 17.21º	8ºX 6º	F98/33

3. Main technical specifications

3.1 Detector
Type: Microblometer
Thermal Response Time: 7ms
Resolution: 384x288
Wavelength: 8~14μm
Dead Point Number: <1%

3.2 Module
Brightness/Gain control: Auto/Manual
NETD: ≤100mk@30℃
Video: PAL
Frame Rate: 50Hz
Power Supply: DC12V±20%
Power Consumption: < 5W (Under normal temperature of 30℃, motor not working)
Working temperature: -40℃~60℃
Storage temperature: -40℃~70℃

4. Interface

Pin definition of cable output

Pin	Definition	Description	Remarks
1	DC12V	Input Power+	/
2	GND	Power Ground	/
3	KEY5（F）	Crosshair setting key	/
4	KEY3（C）	Single calibration key	/
5	VIDEO1	Video Output 1	Lower level trigger
6	GND	Video Ground	Lower level trigger
7	A+	485	/
8	B-	485	/
9	KEY4（M）	Menu Key	/
10	KEY1（+）	UP Key	/
11	KEY2（-）	Down Key	/
12	VIDEO2	Video Output 2	/

5. Operation Guide

5.1 Operation process

5.1.1 Startup

● connect all cables and start camera

● within next 6s, it is normal with this product that the screen keeps stable with no changes.

● Camera start working after another 15s.

5.1.2 Image Adjustment

● Open lens cap.

● Adjust lens focus to reach clearest IR image.

● Menu Key: setup various parameters to adjust brightness/gain values to adjust IR image

under different environment.

● Calibration Key: System is already developed with auto calibration function. After long

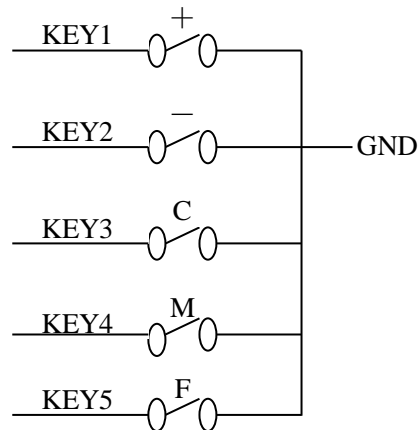time operation, operator could manually calibrate camera according Image displaying.

5.1.3 FOV switch

● Small object: switch view to narrow FOV

● Search object in wide area, switch view to wide FOV

5.1.4 Shutoff camera

Disconnect power, camera will be turned off.

5.2 Control Key function explanations

KEY1 (+): When the menu system is active, adjust the selected item parameter. Press the key to increase the parameter value. When the menu system is not active, press the key to focus forwards.

KEY2 (-): When the menu system is active, adjust the selected item parameter. Press the key to decrease the parameter value. When the menu system is not active, press the key to focus motor backwards.

KEY3 (C): Press it to activate image calibration.

KEY4 (M): Press it to activate or conceal the menu, select the operation function, use **KEY1 (+)**, **KEY2 (-)** to adjust the selected parameter value. When Press **KEY4 (M)**, each operation function is selected in cyclic order. After a cycle, system will conceal menu and save the menu setup. When module restarts after shutdown, each operation parameter setup is same as the setting last time when it shutdown.

KEY5 (F): Press to activate crosshair.

4 control key chart

If with RS485, thermal camera address is 1, baud :9600, **PELCO_D**, details refer to 5.3.

Control key in rear camera:

1） Iris close **(M key): without Menu, Press** M key into MENU ；Press M key to choose items in Menu。Change the value of choose with 〖-〗 and 〖+〗。Auto save value after power off 。address is 1 and PELCO-D protocol. command is：FF 01 04 00 00 00 06，terminate order is ： FF 01 00 00 00 00 02。

2） Iris open **(C key):** manually calibration press this key 。address is 1 and PELCO-D protocol. command is：FF 01 02 00 00 00 04，terminate order is：FF 01 00 00 00 00 02。

1） Near Focus （—）：if not in the menu ，manually adjust lens to near focusing if press key; in menu，Change the value of choose items if press this key。address is 1 and PELCO-D protocol. command is： FF 01 01 00 00 00 03，terminate order is：FF 01 00 00 00 00 02。

2） **Far Focus**（**+**）：if not in the menu ，manually adjust lens to Far focusing if press key；in menu，Change the value of choose items if press this key。address is 1 and PELCO-D protocol command is: FF 01 00 80 00 00 82，terminate order is： FF 01 00 00 00 00 02。

3） **ZOOM KEY:** auto focusing if press this key。address is 1 and PELCO-D protocol command is： FF 01 00 40 00 00 42，terminate order is：FF 01 00 00 00 00 02.

Note: the second bit is address in the protocol.

5 OPERATING INTERFACE

5.1 Main menu

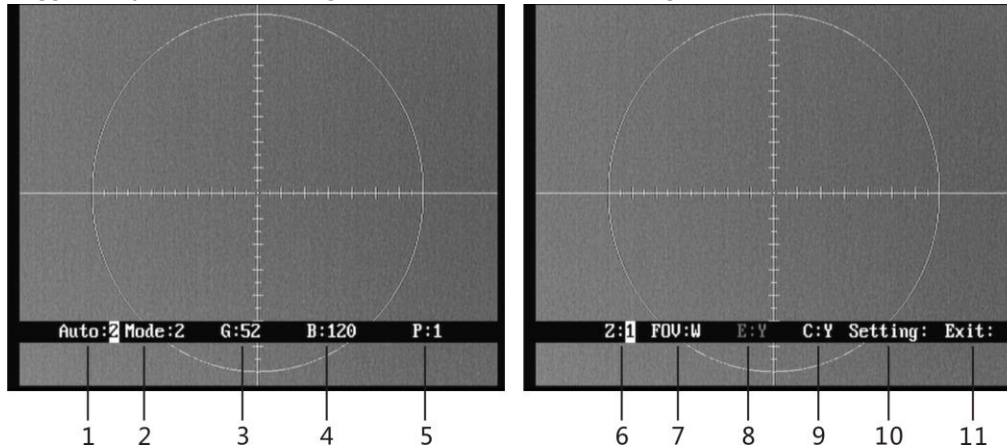Trigger 〖**Aperture- off**〗 to go to main menu, shown as Fig. 6：

Fig. 6

When the menu pops-up , trigger the 〖**Aperture- off**〗 to move the cursor , use 〖near focus〗 and 〖far focus〗 to modify the values or options. When you exit the menu, parameters automatically are saved.

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

> **Auto 0**：manual gain, manual brightness. Module won't adjust gain、brightness automatically according to the observed object.
>
> **Auto 1**：manual gain, auto brightness. User can manually adjust gain while adjust brightness according to the observed object.
>
> **Auto 2**：auto gain, auto brightness.

2、**Mode：X**　　　　Display the current image mode. Module has ten configuration setups under Auto2 mode. **Mode 0** and **Mode 1** are fixed factory default settings and **Mode 2-9** are user-defined settings. Details please refer to chapter 4.4.

> 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.

3、**G：XXX**　　Gain value, range: 0-255. This function is only effective when the auto imaging mode setup is **Auto 0** or **Auto 1**. In **Auto 2** mode, gain is automatically adjusted. When trigger 〖**Aperture- off**〗, cursor will skip gain setup option.

4、**B：XXXX**   Brightness value, range: -2048-+2048. This function is only effective when the auto imaging mode setup is **Auto 0**. In **Auto 1** or **Auto 2** modes, brightness is automatically adjusted. When trigger『**Aperture- off**』, cursor will skip brightness setup option.

5、**P：X**   White/black hot display mode

　　　　　　0: black hot   1: white hot

6、**Z：X**   Zoom status

　　　　　　1: No zoom   2: 2

7、**FOV:X**   FOV mode display

　　　　　　N: narrow   W: wide

8、**E: X**   NC

9、**C：X**   Cross cursor display

　　　　　　Y: on   N: off

10、**Setting:**   use 『near focus』and 『far focus』to go to internal menu.

11、**Exit：XXX**   use 『near focus』and 『far focus』to exit the menu

Note: When exiting the main menu, all change will be saved automatically and will be taken effect when restarting next time.

5.2 System menu

In the main menu, move the cursor to "setting", and use 『near focus』or 『far focus』 to go to system menu.

You need to input password when go to system menu, the password is 『**Aperture-on**』『**Far Focus**』『**Aperture-on**』『**Near Focus**』『**Aperture-on**』『**Aperture-on**』. With the correct password, you will come to the system menu shown as Fig. 7：

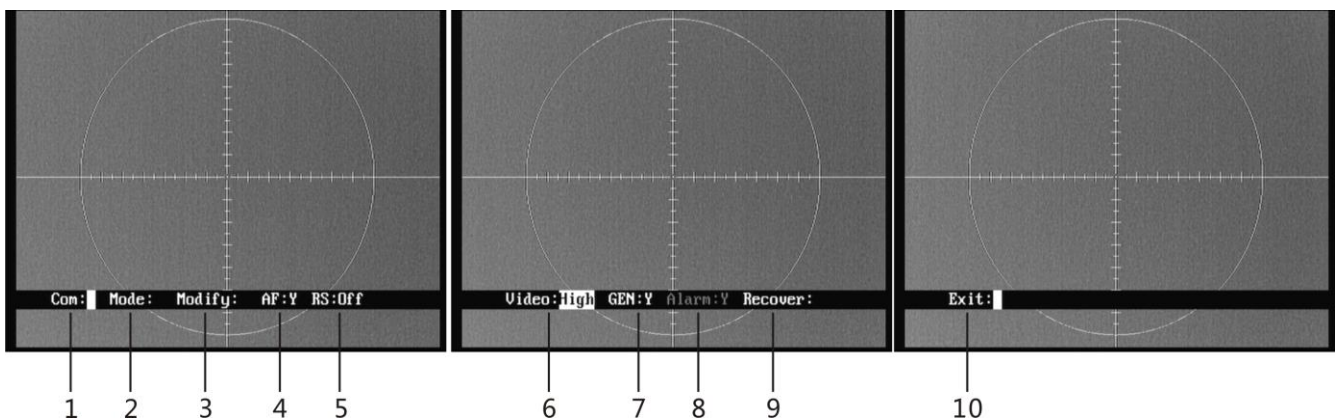Fig. 7

Trigger 『Aperture- off』and move the cursor, use 『near focus』and 『far focus』to modify the values or options. When you exit the menu, parameters will automatically be saved.

1、 **Com：XXX**   Please do not change the items within this menu, or the thermal camera may not be normally controlled.

2、 **Mode: XXX**   use『near focus』and 『far focus』to go to internal menu to setup mode parameters, please refer to 4.4.

3、 **Modify:**   For factory debugging

4、 **AF：X**   auto-focus switch status of the current object, "N" is recommended.

Y：on   N：off

5、 **RS: XXX**   auto calibration switch status of the current object.

Long：   long means boot to calibration one time, and correct once every 2 minutes within 10 minutes; correct once every 5 minutes within 10 to 30 minutes; correct once every 10 minutes within 30 to 1 hour; correct once every 20 minutes above 1 hour.

Short：   short means boot to calibration one time, and correct once every 1 minute within 10 minutes; correct once every 2 minutes within 10 to 30 minutes; correct once every 5 minutes within 30 to 1 hour; correct once every 10 minutes above 1 hour.

Off：   Manually calibration

6、 **Video：XXX**   Sensitivity, three modes:

Low sensitivity: User may select Low sensitivity when the ambient or object in high temperature

Middle sensitivity

High sensitivity: User select High sensitivity when the ambient or object in low temperature.

7、 **GEN：X**   Set the switch status to protect the detector from being burned

8、 **Alarm：X**   NC

9、 **Recover：XXX**   Recover all menus setting for factory default, **Aperture-off (M) key** for restore, and **Aperture-on (C)** key for cancel.

10、 **Exit：XXX**   use 『near focus』 or 『far focus』 to exit the menu.

5.45.3 Menu of communication protocol

In menu，move to "Com"，press 『near focus』or 『far focus 』in to menu of communication protocol.

Then input the passport：『Iris open』『far focus』『Iris open』『near focus』『iris open』『iris open 』。

As show in the picture 9。
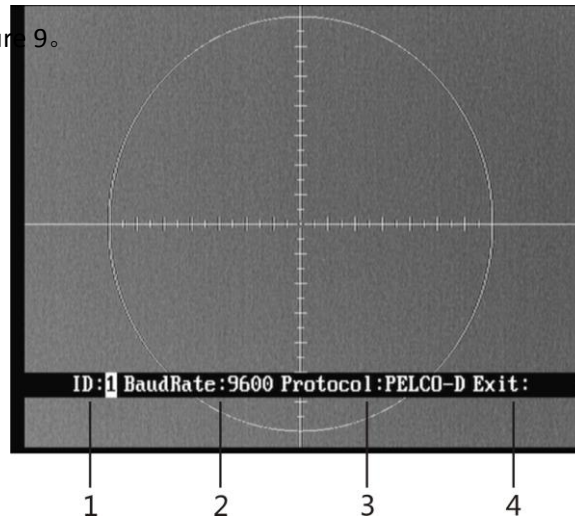
PICTURE 9

In menu，press 『iris close 』 to move cursor ，press 『near focus』 and 『far focus 』to change the value of choose items 。auto save after exit.

1、 ID： X   Address set。
2、 Baud Rate：XX   baud set 。
3、 Protocol：XXX   protocol set 。
4、 Exit：XXX   press key 『near focus』or 『far focus』 exit menu 。

5.4 Mode menu

In the system menu, move the cursor to "mode", and use 『near focus』or 『far focus』 to go to mode menu.

You need to input password when go to system menu, the password is 『Aperture-on』『Far Focus』『Aperture-on』『Near Focus』『Aperture-on』『Aperture-on』. With the correct password, you
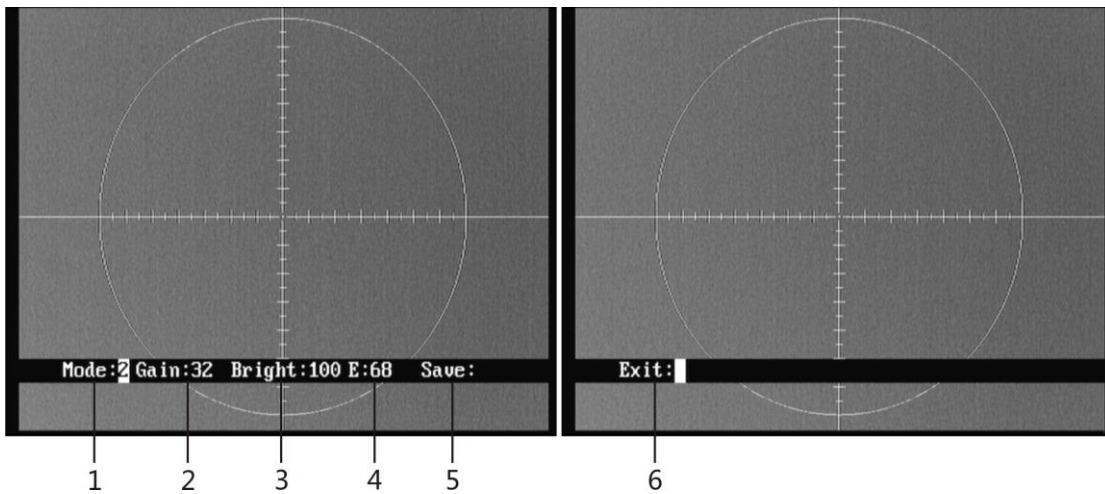
will come to the mode menu shown as Fig. 8.

Fig. 8

Trigger 『Aperture- off』and move the cursor, use 『near focus』and 『far focus』to modify the values or options.

1、 Mode**: X** display the current mode No.
2、 **Gain: XXX** Gain value, range: 0~255;
3、 **Bright: XXXX** Brightness value, range: 0～255;
4、 E**: XXX** Image enhancement status, range: 1～255. Effective only in **Mode1 or Mode 2**. The bigger the value is, the clearer the object is.
5、 **Save: XXX** use 『near focus』or 『far focus』to save the mode.
6、 **Exit: XXX** use 『near focus』or 『far focus』to exit the menu.

Note：
● When configuration user-defined setup is activated, it is automatically changed into **Auto 2,** and goes back to original working state after exit.