

ThermalTronix TT-1150B-UTCM **Thermal Imaging Module**

User Manual



Intellisystem Technologies S.r.l.

Via Augusto Murri, 1 - 96100 Siracusa - Phone +39 (0)931-1756256 / +39 (0)2-87167549 - Mobile (+39) 335 1880035
em@il: info@intellisystem.it WEB: <http://www.intellisystem.it>

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. FUNCTIONS	1
2. PRODUCT DIMENSIONS	2
3. PRODUCT INFORMATIONS	2
4. MAIN TECHNICAL SPECIFICATIONS	2
4.1 Detector	2
4.2 Module	3
5. INTERFACE	3
6. OPERATION GUIDE.....	4
6.1 Operation process.....	4
7.1.1 Startup.....	4
7.1.2 Image Adjustment.....	4
7.1.3 FOV switch.....	4
7.1.4 Shutoff camera.....	4
6.2 Control Key function explanations	5
6.3 OPERATING INTERFACE	6
7.3.1 Main menu.....	6
6.4 Crosshair.....	7
6.5 Configuration user defined setup	7
6.6 OPERATION GUIDE.....	8
7.6.1 Focus procedure.....	8
7.6.2 Image single point calibration procedure.....	8
6.7 Setup Instruction.....	9
7.7.1 Auto mode setup.....	9
7.7.2 Gain setup.....	9
7.7.3 Brightness setup.....	9
7.7.4 Polarity setup.....	10
7.7.5 Zoom setup.....	10
7.7.6 Filter setup.....	10
7.7.7 FOV Setup.....	11
7.7.8 Crosshair setup.....	11
7.7.9 Imaging configuration setup.....	12
7.7.10 User-defined imaging configuration setup.....	12
7.7.11 Image enhancement setup.....	12
7.7.12 Adjustment setup.....	13

INTRODUCTION

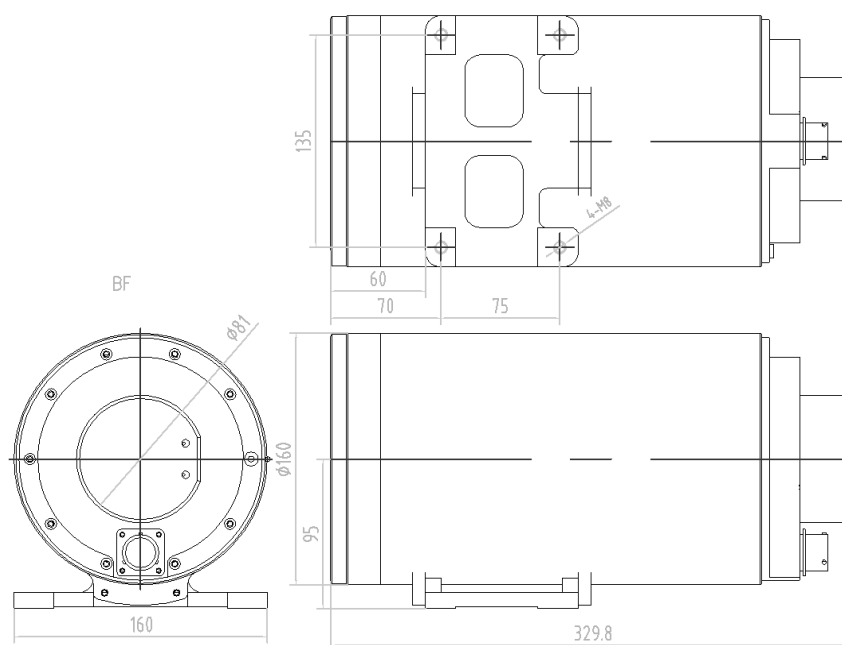
TT-1150B-UTCM Thermal Imaging Camera is specially developed for long range surveillance purpose especially under different environment situation.

1. 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



2. Product Dimensions



2

3. Product Informations

NO.	Model	Lens FOV characteristics		Remarks
		Wide FOV	Narrow FOV	
1	TT-1150B-UTCM	12.8°X 9.6°	5.1°X 3.8°	F150/60

4. Main technical specifications

4.1 Detector

Type: Microbolometer

Thermal Response Time: 7ms

Resolution: 384x288

Intellisystem Technologies S.r.l.

Via Augusto Murri, 1 - 96100 Siracusa - Phone +39 (0)931-1756256 / +39 (0)2-87167549 - Mobile (+39) 335 1880035
 em@it: info@intellisystem.it WEB: <http://www.intellisystem.it>

Wavelength: 8~14μm

Dead Point Number: <1%

4.2 Module

Brightness/Gain control: Auto/Manual

NETD: ≤100mk@30°C

Video: PAL

Frame Rate: 50Hz

Power Supply: DC12V±20%

Power Consumption: < 5W (Under normal temperature of 30°C, motor not working)

Working temperature: -40°C~60°C

Storage temperature: -40°C~70°C

3

5. 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	/
13	KEY1(+)	Up key	Lower level trigger
14	KEY2(-)	Down key	Lower level trigger

Intellisystem Technologies S.r.l.

Via Augusto Murri, 1 - 96100 Siracusa - Phone +39 (0)931-1756256 / +39 (0)2-87167549 - Mobile (+39) 335 1880035
 em@il: info@intellisystem.it WEB: <http://www.intellisystem.it>

15	KEY4(M)	Menu key	Lower level trigger
----	---------	----------	---------------------

6. Operation Guide

6.1 Operation process

7.1.1 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.

7.1.2 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.

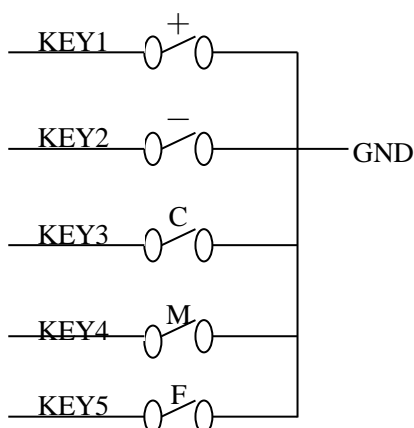
7.1.3 FOV switch

- Small object: switch view to narrow FOV
- Search object in wide area, switch view to wide FOV

7.1.4 Shutoff camera

Disconnect power, camera will be turned off.

6.2 Control Key function explanations



5

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.

6.3 OPERATING INTERFACE

7.3.1 Main menu

Press **KEY4 (M)** to activate the main menu.

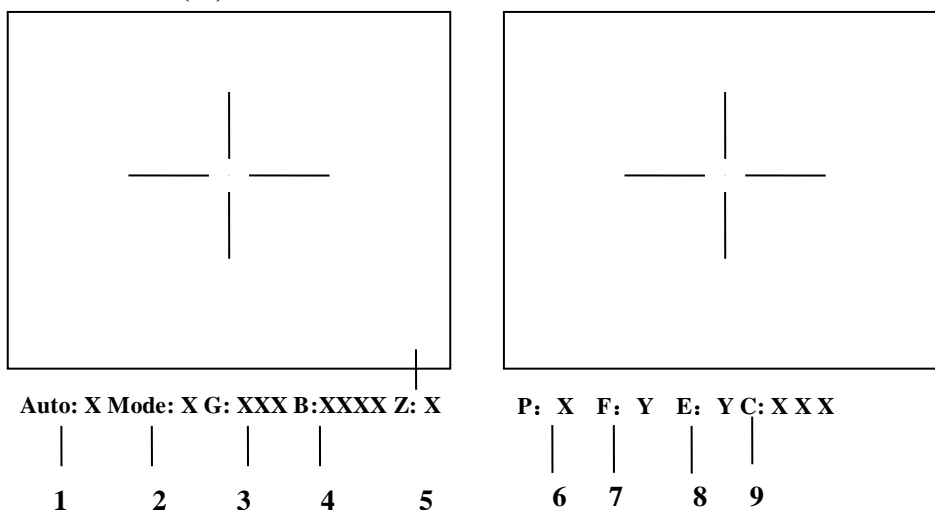


Figure 7

- 1. Auto: X** Image adjust mode
 0: manual brightness, manual gain mode
 1: auto brightness, manual gain mode
 2: auto brightness, auto gain mode
- 2. Mode: X** Configuration imaging mode
 0: Suitable for observation of big-object under good weather condition
 1: Suitable for observation of target within sky-line under good weather condition
- 3. G: XXX** Parameter of current set up gain, range: 0—255
- 4. B: XXXX** Parameter of current setup brightness, range: -2048—+2048
- 5. Z: X** Current mode of zoom function
 1: 1X zoom 2: 2X zoom
- 6. P: X** Current mode of color swap (white/black hot mode)
 0: black hot 1: white hot
- 7. F:** Setup noise-reduction on-off
 Y: on N: off

8. **C: X X X** Adjust the parameter of non-uniformity
9. **FOV:** Switch Wide FOV/ Narrow FOV
10. **ID: X** Camera Communication address, ranges: 0~255.

6.4 Crosshair

Press **KEY5 (F)** to activate crosshair setup menu

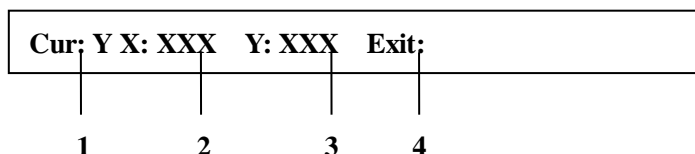


Figure 8

1. **Cur: Y** Crosshair display/hide
2. **X: XXX** Display crosshair position in X direction
3. **Y: XXX** Display crosshair in position Y direction
4. **Exit:** Exit crosshair menu

6.5 Configuration user defined setup

Press **KEY4 (M)**, **KEY1 (+)**, **KEY2 (-)** at the same time to activate user-defined configuration setup.

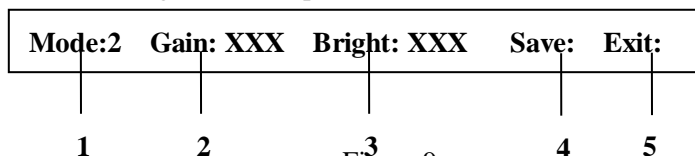


Figure 9

1. **Mode: 2** Configuration No.
2. **Gain: XXX** Gain value (0~+255)
3. **Bright: XXX** Brightness value (-2048~+2048)
4. **Save:** Save configuration setup
5. **Exit:** Exit configuration setup

6.6 OPERATION GUIDE

7.6.1 Focus procedure

Note:

The maximum driver output of focusing motor is DC7~9V ,100mA; please select the correct motor, if motor selected under special conditions such as startup is likely to exceed the stipulated drive capacity, please design independently motor to supply power and driver. Treat the stipulated output signal only as control signal; otherwise it will cause module damage.

Only ordered the electric lens with the module together, the auto focus can be realized.

8

7.6.2 Image single point calibration procedure

Press the **KEY3 (C)** to perform single point calibration

Note:

At the time of module startup, auto single point calibration is done for repetitious times.

After startup, because module is in thermal equilibrium forming process, it may need single point calibration for many times, after a long time (for example over 45 minutes) the system reaches thermal equilibrium, usually, there is no need to do single pixel calibration.

Common module bearing built-in single pixel calibration organ can do single point calibration at any moment. It is normal when you hear “KA” noise during single pixel calibration.

If module without built-in single pixel calibration organ , please aim detector window at the black body full of field of view or analog symmetric object to do single pixel calibration, such as original lens cover、 symmetrical wall, or goal residual image may occur.

6.7 Setup Instruction

7.7.1 Auto mode setup

Setup: Press **KEY4 (M)** until Auto: X is activated. Press **KEY1 (+)** or **KEY2 (-)** again to setup needed mode.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit auto setup mode.

Note:

Module auto mode setup provides three modes:

Auto 0: Manual mode, adjust manually gain、brightness. Module won't adjust gain、brightness automatically according to the observed object.

Auto 1: Semi-auto state, manually adjust gain while adjust brightness according to the observed object.

Auto 2: Full-auto state, module can automatically adjust gain, brightness according to the observed object.

7.7.2 Gain setup

Setup: Press **KEY4 (M)** until G: XXX menu option is activated, Press **KEY1 (+)** or **KEY2 (-)** again to setup gain parameter until infrared image is desirable.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit gain setup mode.

Note:

This function is only effective when the image auto mode setup is Auto 0 or Auto 1. In Auto 2 modes, gain is auto adjusted, when pressing **KEY4 (M)**, menu will skip gain setup option.

7.7.3 Brightness setup

Setup: Press **KEY4 (M)** until B: XXXX menu option is activated, Press **KEY1 (+)** or **KEY2 (-)** again to adjust brightness parameter until infrared image is desirable.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit brightness setup mode.

Note:

This function is only effective when the image auto mode setup is Auto 0. In Auto 1, Auto 2 brightness is auto adjusted; when Pressing **KEY4 (M)**, menu option will skip brightness adjust option.

7.7.4 Polarity setup

Setup: Press **KEY4 (M)** until P: X is activated, Press **KEY1 (+)** or **KEY2 (-)** again to select needed black hot /white hot display mode.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

10

7.7.5 Zoom setup

Setup: Press **KEY4 (M)** until Z: X menu option is activated. Press **KEY1 (+)** or **KEY2 (-)** again to setup image zoom.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

7.7.6 Filter setup

Setup: Press **KEY4 (M)** until F: N/Y menu option is activated. Press **KEY1 (+)** or **KEY2 (-)** to setup needed filter state.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

Note:

Menu options setup before Filter doesn't affect digit video output; this function setup affects digit video output. After setting up F: Y output signal from digit video interface will do noise-reduction filter simultaneously.

Filter can improve image signal-to-noise ratio S/N, but may affect image performance of high frequency and real time.

7.7.7 FOV Setup

Setup: Press **KEY4 (M)** until **V:N/W** menu option is activated. Press **KEY1 (+)** or **KEY2 (-)** to setup needed FOV state

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

7.7.8 Crosshair setup

Crosshair display/hide

Press **KEY5 (F)** to active crosshair menu and then press **KEY4 (M)** to active **X:** menu, press **KEY1 (+)** or **KEY2 (-)** to set the crosshair display or hide, choose “Y” to display the crosshair, choose “N” to hide the crosshair

Short cut key:

Press **KEY4 (M)**, **KEY1 (+)** at the same time, crosshair displayed.

Press **KEY4 (M)**, **KEY2 (-)** at the same time, crosshair hidden.

Crosshair position setup

Setup: In crosshair display state, press **KEY5 (F)** to activate **X: XXX** menu option. Press **KEY1 (+)** or **KEY2 (-)** again to set up crosshair horizontal position. Press **KEY4 (M)** again to activate **Y: XXX** menu option. Press **KEY1 (+)** or **KEY2 (-)** to set up crosshair vertical position. Press **KEY1 (+)** or **KEY2 (-)** once, crosshair moves one-pixel position.

Exit: Press **KEY4 (M)** to activate crosshair **Exit** menu option (Figure 10). Press **KEY1 (+)** again, crosshair menu hides.

Note:

If you want to save the position of the crosshair, please exit the menu and then press the **Key4 (M)** to active the main menu. Press **KEY4 (M)** continuously until menu hidden to save the configuration.

When crosshair off, operation of crosshair position setup is invalidating

Press the **KEY1 (+)** or **KEY2 (-)** to move the crosshair position for a pixel. 0.5-pixel position movement can be customized.

7.7.9 Imaging configuration setup

Setup: Press **KEY4(M)** until **Mode: X** is activated, press **Key1(+)** or **Key2(-)** to set up needed mode.

Exit: Press **KEY4 (M)** continuously until menu hiding, namely exit imaging configuration mode.

Note:

Module has ten configuration setups under Auto2 mode. Configuration 0~1 are factory default. Configuration 2~9 are user-defined.

7.7.10 User-defined imaging configuration setup

Setup: Press **KEY4 (M)**, **KEY1 (+)**, **KEY2 (-)** at the same time to activate user-defined Configuration menu (Figure9). Press **KEY4(M)** to activate **Mode: X** or **Gain: XXX** or **Bright: XXXX** menu, press **KEY1(+)** or **KEY2(-)** to set up activated item parameter.

Exit: Press **KEY4(M)** until **Save** is activated, press **KEY1(+)** to save setup and exit user-defined Configuration setup; in case of no need to save, press **KEY4(M)** until **Exit** is activated, then press **KEY1(+)** to exit user-defined Configuration setup

Note:

When user-defined Configuration setup is activated, enter **Auto 2** modes automatically, exit current menu will restore original operation state.

7.7.11 Image enhancement setup

Setup: Press **KEY4 (M)** until **E: N/Y** menu option is activated, Press **KEY1 (+)** or **KEY2 (-)** to setup needed enhancing state.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

Note:

Image Enhancement can improve high-point surveillance effect, but may cause

7.7.12 Adjustment setup

Setup: Press **KEY4 (M)** until **C: N/Y** menu option is activated. Press **KEY1 (+)** or **KEY2 (-)** to setup needed enhancing state.

Exit: Press **KEY4 (M)** continuously until menu blanking, namely exit setup mode.

Note: Set the calibration parameter if the images are non-uniformity. This function only active by purchasing the lens and module together.