

***ThermalTronix***  
**TT-1007D-MARINE**  
**Thermal Imaging Camera**

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**User Manual**



**Statement:**

1. The contents of this manual will be updated from time to time, updated content will be added in the new version of the manual, without prior notice.
2. This manual may contain technical inaccuracies or typographical errors.

**Safety precautions:**

- 1) When installing the device, please ask qualified service personnel or system installers to operate
- 2) The equipment should be installed in a lightning protection environment.
- 3) Protect the surface of the lens from being stained or damaged.
- 4) Protect the lens from being worn, scratched or even scratch.

**!** Never point the lens directly toward a strong radiation source (ie. Sun, direct or reflected laser beam, etc.), with power on or power off, as damage may result to the thermal detector used inside. **Permanent damage may result!**

- 5) The product is a sophisticated electronic equipment, so please handle with care in the use, storage and transportation process, prevent the device from being force falls strongly collision or other dangerous actions. Store the unit in its original case during transport.
- 6) Make sure the power supply is connected correctly before opening the device, It may cause equipment damage if the power connection error
- 7) Do not place any objects on or near the power cable
- 8) Contact manufacturer if unit operate abnormal, do not dismantle the device itself



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# 1 Overview

TT-1007D-MARINE integrate uncooled infrared imaging, high sensitivity and high precision PTZ cameras as system, and can produce clear images in total darkness, mist and other complex environments. The product can be monitored day and night, and can quickly and accurately identify and locate targets. TT-1007D-MARINE can be worked in the following locations: navigation, border fire protection, airports, ports, railways, construction, public security and reconnaissance.



## 1.1 Features

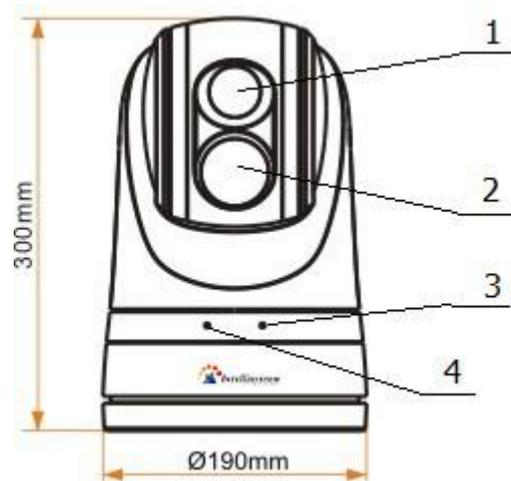
1. Built-in 384 \* 288 uncooled thermal imager with high thermal sensitivity, it could output clear video in total darkness.
2. Integrate high-sensitivity CCD camera, 550 TV lines, and illumination up to 0.01 Lux in black and white mode;
3. High-strength aluminum alloy body, sturdy and durable, effectively prevent the erosion from salt spray and seawater;
4. Fully sealed design, protection class up to IP67, built-in surge & lightning protection devices;
5. Internal integrated heating and demisting devices, operating temperature range -45 °C ~ 55 °C;
6. Provides three video outputs, thermal imager video, high-sensitivity CCD camera video and composite video;
7. Automatically identify control protocol and baud rate, support soft address, easy to use;
8. Support automatic tracking and gyro function.

## 1.2 Accessories

item	Accessory Name	No.	Remark
1	TT-1007D-MARINE	1	
2	mounting plate	1	
3	video tracker	1	
4	RS422 keyboard	1	
5	2 pin power cable	1	TT-1007D-MARINE power supply
6	AC adapter	1	
7	Vehicle power line	1	
8	Air plug cable	1	connect TT-1007D-MARINE and tracker
9	Air plug extension cable	1	
10	Standard power line	1	tracker and keyboard power supply
11	12V/5A AC adapter	1	
12	cross pan head screws	3	M4*10
13	cross pan head screws	1	M3*6

## 2 Structure and Cable Definition

### 2.1 PTZ appearance



PTZ

item	definition	remark
1	CCD camera	
2	Thermal camera	
3	Command Indicator	twinkle
4	Power-on indicator	Normally on

### 2.2 Tracker appearance



Tracker

## 2.3 RS422 control keyboard appearance

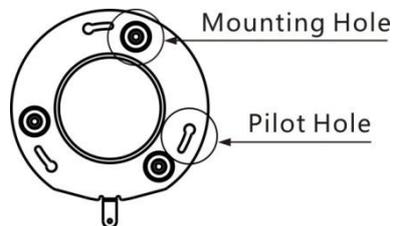


RS422 control keyboard

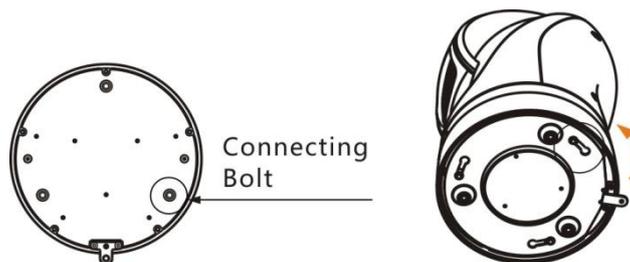


## 2.4 Installation instruction

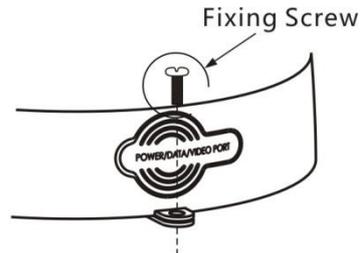
1. Remove the mounting plate from the package, fix mounting plate on the target with three bolts refer to the installation hole diameter, refer to the image below



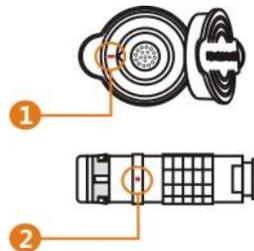
2. TT-1007D-MARINE has three columns at the bottom of the body, align columns with rounded end of the positioning hole of the mounting plate, rotate clockwise to the other end, refer to the image below



3. Fix TT-1007D-MARINE and mounting plate by cross pan head screws (Fixing Screw), refer to the image below



4. Connect Air plug cable and Air plug extension cable to air socket on the bottom of the TT-1007D-MARINE. Air plug and air socket have a positioning point (marked in red), connect correspondingly. Refer to the image below

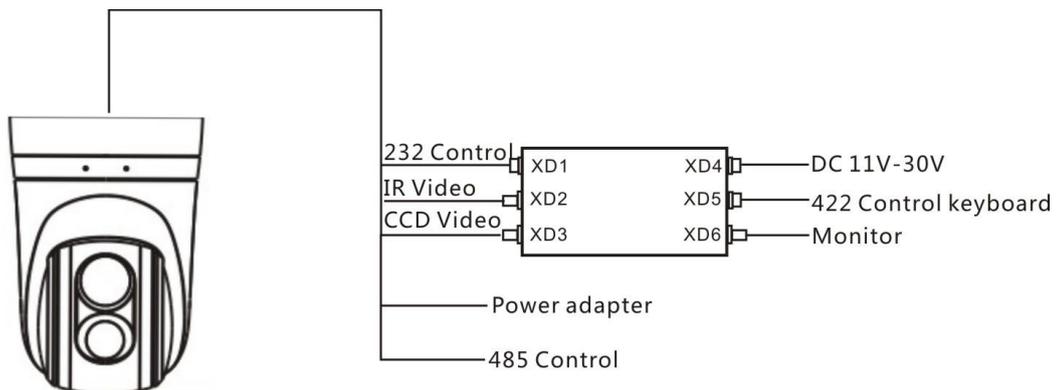


5. Connect TT-1007D-MARINE power supply, then connect RS485 control cable to 485 controller

6. Connect 232 control cable, IR video cable and CCD video cable to tracker

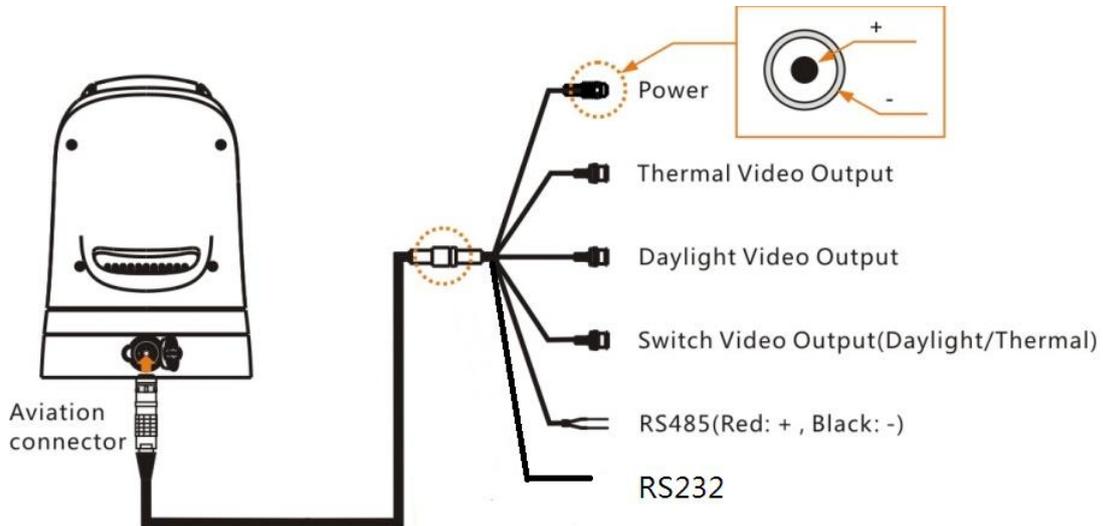
7. Connect tracker power supply, then connect XD5 to RS422 keyboard, XD6 to monitor. Detailed 422 control keyboard operation refer to “422 keyboard operation instruction”.

8. Connect 422 keyboard air plug cable



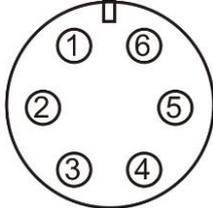
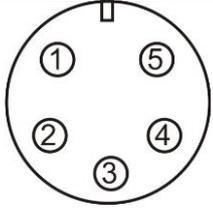
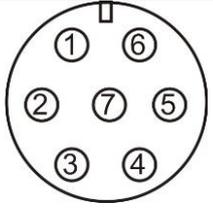
### PTZ and Tracker connection

## 2.5 TT-1007D-MARINE connection definition



control cable	Cable color
RS485+	Red
RS485-	Black
RS232+	Green
RS232-	Yellow
RS232 ground	Black

## 2.6 tracker interface definition

Tracker item	Pin item	Pin definition	description	Connect to	Jack image
XD1	1	GND_1	Tracker and load	reserved	
	2	VCC_1	tracker and load power supply	reserved	
	3	GND_2	Motor power	TT-1007D-MARINE	
	4	TTL_R	relative to tracker		
	5	TTL_T	relative to tracker		
	6	VCC_2	Motor power supply	reserved	
XD2		SMA plug	IR analogue video input	TT-1007D-MARINE	
XD3		SMA plug	CCD analogue video input	TT-1007D-MARINE	
XD4	1	GND_1	Tracker and load	DC power supply	
	2	VCC_1	tracker and load power supply		
	3	GND_2	Motor power		
	4	VCC_2	Motor power supply		
	5	blank			
XD5	1	232-TXD1	relative to tracker	reserved	
	2	232-RXD1	relative to tracker	reserved	
	3	422-R2-	relative to tracker	keyboard	
	4	422-R2+	relative to tracker		
	5	422-T2-	relative to tracker		
	6	422-T2+	relative to tracker		
	7	232-GND		reserved	
XD6		SMA plug	analogue video output	monitor	

## 2.7 422 keyboard interface definition

Keyboard output leads by a 6-pin air socket; connect air plug cable to air socket

External air plug cable is defined as follows:

item	pin definition	description	cable color
1	DV12V	DC 12V power input	red
2	GND		Black
3	RS422T-	RS422control cable	Green
4	RS422T+		Blue
5	NC	NC	Yellow
6	NC	NC	Orange
	NC	NC	Brown

## 3 RS485 key operation instruction

### 3.1 RS485 communication parameter

#### TT-1007D-MARINE default RS485 parameter

Thermal camera default setting: protocol PELCO-D, baud rate 2400, address 3

CCD camera default setting: protocol PELCO-D, baud rate 2400, address 1

PTZ default setting: protocol PELCO-D, baud rate 2400, address 1

## 3.2 Operation key instruction

### 3.2.1 Thermal Camera

Thermal camera default setting: baud rate 2400, address 3

Operation key	function
Call preset 100	enter into menu
aperture-(I-)	1 When no menu, polarity switching 2 when entering the menu, move the cursor from top to bottom circulation
aperture+(I+)	manual calibration
focus-	when entering the menu, change cursor position options or decrease the value
focus+	when entering the menu, change cursor position options or increase the value
(Z-)	digital zoom

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Note: thermal camera menu instruction refer to 5.1

### 3.2.2 CCD camera

CCD camera default setting: baud rate 2400, address 1

Operation key	function
zoom-	Zoom near
zoom+	Zoom far
focus-	manual focus
focus+	manual focus

### 3.2.3 PTZ

PTZ default setting: baud rate 2400, address1

**RS485 can't control TT-1007D-MARINE direction when opening gyro or tracking function**

Operation key	function	default state
direction up	Turning up control	
direction down	Turning down control	
direction left	Turning left control	
direction right	Turning right control	
preset number+ preset setting key	Preset setting	
preset number+ preset delete key	Preset delete	
preset number +preset call key	Preset call	
preset 21+preset call key	Manual video switch(CCD/thermal camera)	-
preset 22+preset call key	Automatic video switch(CCD/thermal camera)	√
preset 23+preset call key	Open/close wide dynamic	close
preset 24+preset call key	Open automatic wide dynamic	close
preset 25+preset call key	Open/close BLC	close
preset 26+preset call key	Open/close image flip	close
preset 27+preset call key	Open/close digital noise reduction	close
preset 28+preset call key	Open/close image freeze	close
preset 29+preset call key	Open/close image anti-shake	close
preset 37+preset call key	Open demist	-
preset 38+preset call key	Close demist	√
preset 39+preset call key	Open/close digital zoom	close
Preset40+preset call key	OSD open/close	open
preset 42+preset call key	left area scanning	-
preset 43+preset call key	Right area scanning	-
preset 48+preset call key	Intermittent scanning	-
preset 49+preset call key	Area scanning	-
preset 50+preset call key	Automatic cruise	-
preset 51+preset call key	Continuous scanning	-
preset 52+preset call key	Clear all settings	-
preset 53+preset call key	Restore factory settings	-
preset 57+preset call key	Open help tips/help tips page	-
preset 58+preset call key	Close help tips	-
preset 59+preset call key	PTZ speed-fast	-
preset 60+preset call key	PTZ speed-medium	√
preset 61+preset call key	PTZ speed-slow	-
preset 62+preset call key	CCD camera address -1	-
preset 63+preset call key	CCD camera address +1	-
preset 65+preset call key	Thermal camera lens enter into safety position	-
preset 66+preset call key	Thermal camera lens exit safety position	-

\*<sup>1</sup> Note: <20 are normal presets, others are special function preset.

\*<sup>2</sup> PTZ scan at a constant speed in the horizontal direction and within the set area range. PTZ won't perform any action if not set the left and right border area scan.

\*<sup>3</sup>PTZ automatically move back and forth at predetermined time according to preset point sequence, this feature is only work for 0 to the 20th preset.

Note: “-” means the current function is not set or opened,” √”means the current function is in default state, “open” means the current function is turned on by default, “close” means the current function is turned off by default.

## 4 TT-1007D-MARINE operation instruction

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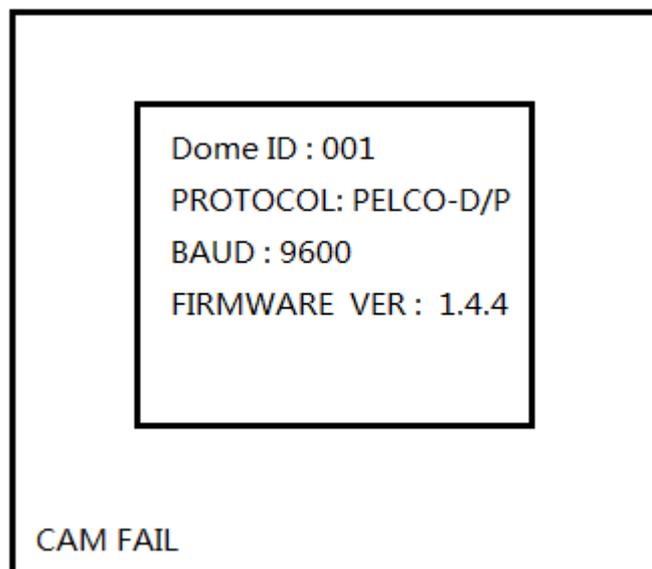
### 4.1 Turn on TT-1007D-MARINE

Connect the power and video cables correctly, Turn on power, TT-1007D-MARINE automatically start up, power indicator light.

CCD video output interface display system initialization, then camera pull the lens recently first and pushed to the farthest stop; PTZ automatically rotate at horizontal and vertical direction.

If system self-test succeed, CCD video display PTZ address, baud rate and protocol.

If system self-test fails, CCD video interface will display self-test failure message in the lower left corner. A feature hint system self test failed



Pic.10

Self-test fails with the message as below:

PAN FAIL—horizontal self-test failure

TITL FAIL-vertical self-test failure

CAM FAIL—module initialization failure

P/T FAIL—horizontal / vertical self-test failure

T/Z FAIL—vertical / module self-test failure;

P/T/Z FAIL—horizontal / module self-test failure

When the horizontal and vertical test fails, if the climate temperature is less than 5°C, TT-1007D-MARINE will automatically turn on heating function and self-check again after 20

minutes; if the climate temperature is more than 5°C ,user repower PTZ after excluding mechanical failure, if the self-test still fails, please contact the supplier or manufacturer.

note:

- If set number 0 as the preset, PTZ will automatically call number 0 preset after self-test is successful. If no set number 0 as preset, camera will return to the HOME position, ie horizontal and vertical angle is zero.
- Thermal camera will be calibrated after boot(refer to 4.11).If the camera doesn't output IR image, please call 100 preset position to enter the main menu, select Auto: X to "Auto 2" mode; then the device will automatically adjust the brightness and gain value to output infrared images.
- Do not turn off the device in 15 second after boot. Device can be only turned on again 30 seconds later after shutdown.
- **RS485 can't control TT-1007D-MARINE direction after opening gyro or tracking function.**

## 4.2 Focal length control

- **CCD Camera**

CCD camera default setting: baud rate 2400, address 1

Camera will be adjust focal length automatically, user could also manual adjust by pressing "focus-" or "focus+"

## 4.3 Digital zoom control

- **thermal camera**

Thermal camera default setting: baud rate 2400, address 3

Control device digital zoom by pressing "zoom-"

- **CCD camera**

CCD camera default setting: baud rate 2400, address 1

Control lens zoom by pressing "zoom+" or "zoom-"

## 4.4 video switch

PTZ default setting: baud rate 2400, address 1.

Composite video output can be switched to CCD video or thermal video through the command (manual mode), it can also automatically switch video output (automatic mode) according to light and dark.

Manual mode: turn on manual mode by calling number 21 preset, force composite video output mode switch to CCD or thermal imaging mode.

Auto Mode: The camera automatically switches CCD / thermal imaging video based on light and dark. Devices open automatic mode by default.

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## 4.5 Digital noise reduction function

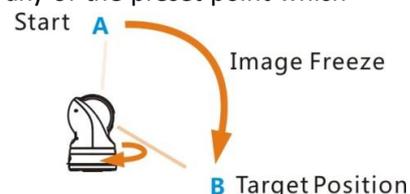
CCD camera default setting: baud rate 2400, address 1

Digital Noise Reduction function is off by default. When CCD camera output color image, the user is suggested turning off digital noise reduction function, otherwise the image will appear "smear" phenomenon. When CCD camera output black and white images, the user can open the digital noise reduction function by calling number 27 preset. DNR has 5 levels from 1 to 5, the higher the noise level, the better, but the "smear" phenomenon is more obvious, the user can change the DNR level by calling number 27 preset or close the digital noise function.

## 4.6 Image freeze open/close

PTZ default setting: baud rate 2400, address 1.

open image freeze function by calling number 28 preset, then call any of the preset point which has been set, the image is froze from point A, and continues to display the freeze image until the camera moves to point B, image freeze ends, namely switching to normal images. If call number 28 preset again c "image freeze" function will be close.



## 4.7 Image stabilization

PTZ default setting: baud rate 2400, address 1.

Image stabilization feature is off by default, can be turn on/off by calling number 29 preset. Open the image stabilization function when the image is affected by external jitter, so that the image can be displayed smoothly, but the video resolution will be declined relatively, when the image does not appear jitter, we suggest close the image stabilization feature.

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## 4.8 Defogging feature

PTZ default setting: baud rate 2400, address 1

Calling number 37 preset to open defogging function, then the top left of the image will display "DEFOGGING" which indicates this feature is turned on. If demisting has completed please close demisting function to avoid high temperature in internal body and save energy. Calling number 38 preset to turn off this feature, the image at the top left "DEFOGGING" disappears accordingly.

Note: When the camera internal temperature is below 0°C, the camera will open demisting function compulsory, then you can not shut down defogging function manually; when the camera internal temperature is higher than 55°C, the camera will close demisting function compulsory, then you can not open the demisting function manually.

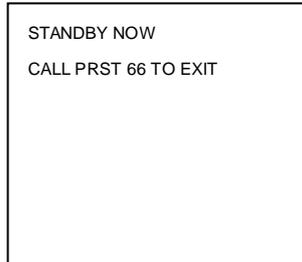
## 4.9 Area scanning

PTZ default setting: baud rate 2400, address 1

Calling number 49 preset to perform area scan function, the camera won't perform any action if not set the left margin area scan (number 42 presets), and right margin area (number 43 presets),

## 4.10 Thermal camera lens safety position

PTZ default setting: baud rate 2400, address 1



When the machine is idle, call number 65 preset and move  $-90^\circ$  vertical, hide thermal imaging camera inside PTZ to protect thermal imaging camera lens, the display will appear hint (as shown), under such circumstances, sending commands to the device camera will not get any action in response. When you need to use device, call number 66 preset, the device will exit the safety position, user could normally operate the device.

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## 4.11 Thermal camera image calibration

Thermal camera default setting: baud rate 2400, address 3

The device will calibrate automatically when starting up, user could also calibrate manually by pressing "aperture+" key. It's normal phenomenon to hear "click" during calibration.

## 4.12 thermal camera polarity switch

Thermal camera default setting: baud rate 2400, address 3, control thermal camera by switching address to number 3.

Switch thermal camera white hot/black hot display mode by pressing "aperture+" key.

## 5 Keyboard operation instruction

### 1. normal operation instruction

operational key	function	remark
ENTER/OPEN	reserved	
RETURN/CLOSE	reserved	
WIDE	zoom-	
TELE	zoom+	
FAR	Tracking boxes from small to big	(16*16,32*32,64*64,128*128) Each time press FAR key, tracking box size change accordingly, total of 4 gears
NEAR	Tracking boxes from big to small	
TRACK/STABLE	switch between manual and automatic operate mode	
IR/CCD	IR and CCD video output switch	Output IR or CCD video at XD6 outlet
GYRO ON/OFF	gyro open/close at manual mode	
MENU	When gyro opens, press menu, then press shift to enter into calibration mode, press save to save current state after calibration. In calibration mode, press any key except direction key, joystick and save key to exit calibration mode and not save the current status. The device can only remember current status after restart when saving the current status.	
SHIFT		
SAVE		

**Note: RS485 can't control the device direction after opening gyro or tracking function**

### 2. direction key and joystick operation instruction

#### 1) manual mode

Control direction key or joystick's up/down/left/right direction when the device in manual mode

#### 2) tracking mode

Open the device tracking function after lock the target, we suggest lock the tracking box to the target by operating direction key or joystick to ensure the reliability of tracking as the tracking box could not lock the target by itself when the target moving fast.

#### 3) calibration mode

▲ or joystick up: When the video image drift upwards, press one time to reduce one drift distance; long press for more than 0.5s, continuous reduce drift discount

▼ or joystick down: When the video image drift downwards, press one time to reduce one drift distance; long press for more than 0.5s, continuous reduce drift discount

◀ or joystick left: When the video image drift left, press one time to reduce one drift distance; long press for more than 0.5s, continuous reduce drift discount

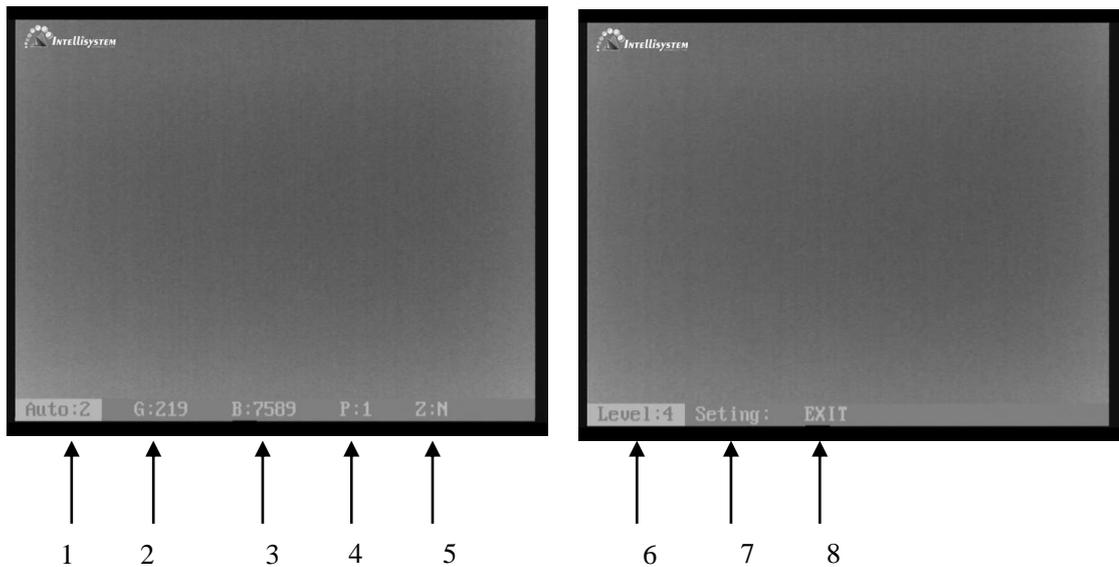
▶ or joystick right: When the video image drift right, press one time to reduce one drift distance; long press for more than 0.5s, continuous reduce drift discount

## 6 Thermal camera menu

Default address: 3, baudrate: 2400

### 6.1 Main menu

Without the menu call preset **100**, enter the main menu,



#### Main men

Press key "LENS-" move the cursor, Press key "FOCUS+" or "FOCUS-" to change the value where the cursor is . Auto save when exit

1、 **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; ( Factory default )

2、 **G: XXX** Gain value, range: 1~1023;

3、 **B: XXX** Brightness value, range

4、 **P: XXX** White/black hot display mode

0: black hot 1: white hot

- 5、 **Z: Y/N** Zoom status  
N: no zoom (default) Y: Zoom 2 times
- 6、 **Level: X** show the range of alarm: From 1 to 6, default is 4
- 7、 **Setting :** Press key “FOCUS+” or “FOCUS-”, show the password dialogue  
Press “FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-” to enter sub menu dialogue
- 8、 **EXIT:** Exit the menu

Note :

- 1) All parameters are save automatically after exit
- 2) The camera will run the last setup after reboot

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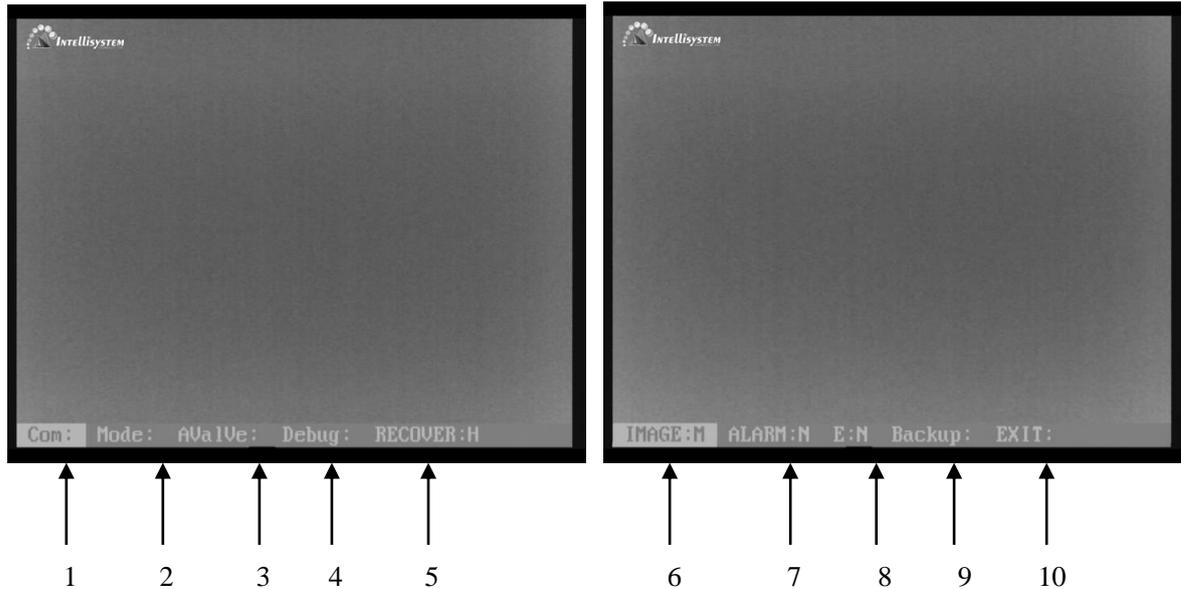
## 6.2 Sub-menu operation

In the main menu, move the cursor to “setting” , press key “FOCUS+” or “FOCUS-” show the password dialogue, Input the password ,



### Setup option

Press key : “FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-”, to enter ,



### Sub menu

Press key "LENS-" move the cursor, press key "FOCUS+" or "FOCUS-" to change the value or get into the submenu where the cursor is . Auto save when exit

- 1、 **COM:** Setup the communication parameters.
- 2、 **Mode :** Setup the mode parameters.
- 3、 **AValve:** Setup the alarm parameters.
- 4、 **Debug:** Debug option for R&D department
- 5、 **RECOVER : H/L/N** Setup as H(long) /L(short)/N(close);

**Setup as H:** Calibrate 1 time during the 1 minute if working time less than 10 minutes. Calibrate 1 time during 2 minutes if working time between 10 and 30 minutes .calibrate 1 time during 5 minutes if working time between 30 minutes and 1 hour. Calibrate 1 time during 10 minutes if working time more than 1 hour. Calibrate 1 time during 20 minutes if working time more than 2 hours.

**Setup as L:** Calibrate 1 time during the 1 minute if working time less than 0 minute. Calibrate 1 time during 2 minutes if working time between 10 and 30 minutes .calibrate 1 time during 5 minutes if working time more than 30 minutes

**Setup as /N:** calibrate manually ;

- 6、 **Image: high/middle/low** setup as high/middle/low;

Each grade relatively corresponds to a value. It could be setup in the TEST menu .default is middle



change the value where the cursor is . Auto save when exit

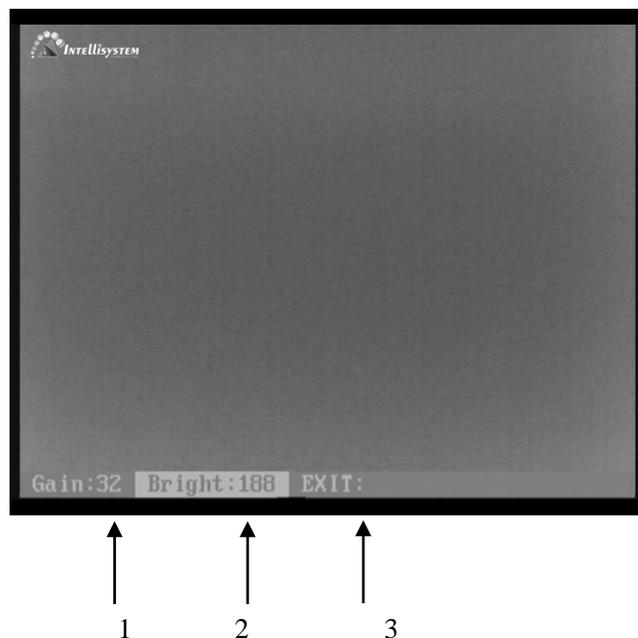
- 1、 **ID: XXX**    ADD: 0~254。
- 2、 **BauRate: XXX**    Baud :1200,2400,4800,9600,14400,19200,38400。
- 3、 **Protocol:**    PELCO-D/P。
- 4、 **Exit:**    Press key LENS+ to exit

**Default: Add:3    Baud:2400    Protocol: PELCO-D**

## 6.4 Mode sub menu

First: Without the menu call preset 100. Enter the main menu. In the main menu, press the key “LENS-“ move the cursor to “setting”, press key “FOCUS+“ or “FOCUS-“ show the password dialogue, Input the password. “FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-“ enter the sub menu.

Second: : After login Sub-menu. press the key “LENS-“ move the cursor to “Mode” key .press key “FOCUS+“ or “FOCUS-“ show the password dialogue, Input the password. “FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-、 FOCUS+、 FOCUS-“ enter the “Mode sub menu”.



**Mode sub menu**

In the menu “Mode”, Press key “LENS-“ move the cursor, Press key “FOCUS+“ or “FOCUS-“ to

change the value where the cursor is . Auto save when exit

- 1、 **Gain: XXX** Range: 0~255。
- 2、 **Bright: XXX** Range :0~255。
- 3、 **Exit:** Press key LENS+ to exit

## 7 Change RS485 configuration

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**Make sure to change 485 configuration as follow steps, or the camera may work improperly:**

- 1、 change the thermal camera 485 configuration;
- 2、 Change the PTZ 485 configuration;
- 3、 CCD camera was controlled via PTZ, so it's 485 configuration always keep the same as PTZ configuration.

### 7.1 Thermal camera 485 parameter modification

Refer to chapter 6.3 (COM sub-menu)

### 7.2 PTZ 485 parameter modification

#### 7.2.1 PTZ 485 address modification

Calling number 62 preset to modify PTZ address -1, Calling number 63 preset to modify PTZ address +1. The new address will be effective after restart or the PTZ keeps old address

Note: 1. CCD address always keeps the same as PTZ address  
2. CCD video output displays current PTZ485 address, baud rate and protocol information after PTZ restart.

#### 7.2.2 PTZ baud rate modification

The device automatically recognize PELCO-D and PPELCO-P protocol,2400,4800,9600 and 19200

baud rate. So every time when the device starts up, the first received order protocol and baud rate is the current protocol and baud rate. If user wants to modify protocol or baud rate, restart the device and send order as per new protocol and baud rate.

## 8 FAQ

Please solve by yourself as per below solution when the device has following problems. If can't please contact supplier

problems	cause	solution
PTZ can't self-inspection after starting up	power adapter fault	change power adapter
	power line plug loose	connect power line
could self-inspection, but can't control after starts up	RS485 control lines reversed or shorted	Check control line, ensure the line is correct and good contact
	PTZ address, baud rate or protocol setting are incorrect	Restart PTZ confirm PTZ address, baud rate and the protocol on CCD video output interface
Can't control thermal camera	thermal camera address settings is incorrect	Thermal camera default address is 3
	thermal camera baud rate and protocol settings are incorrect	2400 Thermal camera default baud rate is 2400 PELCO-D thermal camera default protocol is PELCO-D
CCD image lost when PTZ rotates	power is not enough	change suitable power
	camera cable connects incorrect	check video cable ,ensure connects right

## 9 Technical specifications

Items	<i>ThermalTronix TT-1007D-MARINE</i>	
<b>Thermal Imaging Camera</b>	Sensor type	Uncooled FPA microbolometer
	Resolution	384×288
	Pixel size	25µm
	Spectral range	8~14µm
	Focal length	37mm
	Lens type	Athermalize, focus-free
	NETD	≤100mk
	Brightness/Gain adjustment	Manual adjust brightness/gain; Automatic adjust brightness and manual adjust gain; Automatic adjust brightness/gain
	Polarity	White hot/Black hot
	Digital zoom	2×
	Calibration	Manual and Automatically
<b>CCD Camera</b>	Effective pixel	PAL:752(H)×582(V);NTSC:768(H)×494(V)
	Video sensor	1/4" SONY EX-view HAD CCD
	Resolution	550 TVL
	Optical zoom	36
	Focal length	f=3.4 mm - 122.4 mm
	Iris	F1.6 - F4.5
<b>PTZ</b>	Pan range	0°~360° continuous
	Pan speed	0.04° -90°/s
	Tilt range	-15° ~ 90°
	Tilt range	0.3° ~ 60°/S
	Preset	256
<b>Power</b>	Power input	DC12V
	Consumption	35W/50W(Heater on)
<b>Environment</b>	Operation temp	-45°C~55°C
	IP index	IP67
<b>Ph</b>	Weight	7KG
	Size	Φ190(mm)×300(mm) with damper
<b>Interface</b>	Video	1channel thermal imaging video 1channel visible imaging video 1channel mixed video
	Communication	RS485, RS232