ThermalTronix

TT-CXS-DVACS

Thermal Camera Specifications

User Manual

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Warranty

If the product does not operate properly in normal conditions, please let us know. Intellisystem Technologies will resolve the problem for free of charge. The warranty period is 1 years. However, the followings are excluded:

● If the system behaves abnormally because you run a program irrelevant to the system operation.

● Deteriorated performance or natural worn-out in process of time.

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

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.

- 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.

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.

Contents

1 Introduction

TT-CXS-DVACS is composed of uncooled infrared thermal imaging module and visible light camera, which can be applied in the following fields: long-range seaports, border, airport; middle-range power stations, public places; short-range gate of entry and exit, equipment storage sites; day and night to monitor people, vehicles, and ships and so on.

4

1.1 FEATURES

Thermal Camera

1) Manual calibration

2) Start-up auto calibration

3) Manual brightness and gain adjustment

4) User configuration settings

5) User configuration settings

6) Image Noise Reduction function, reduce Image background noise

7) Image enhancing function : enhance the ability to detect small object

CCD Camera

1) With the state-of-the-art digital signal processing technology, full digital image processing and special algorithm of 600-line high resolution implemented.

2) High Sensitivity: It implements images of high sensitivity using the up-to–date Super-HAD IT CCD.

3) High performance surveillance camera, equipped with X25 zoom lens and digital zoom IC, enabling monitoring up to 400 times.

PTZ

1) Preset：80 presets can be setup

2) Support 0°~360°(pan) continuous rotation

3) Top load of tilt is ±90°

1.2 INCLUDED

TT-CXS-DVACS List for accessories and files：

accessory	quantity	remark
Pan-tilt	1	
AC24 Power Adapter	1	
User manual	1	
Packing list	1	
qualification	1	

2 Component names and functions

2.1 Device appearance
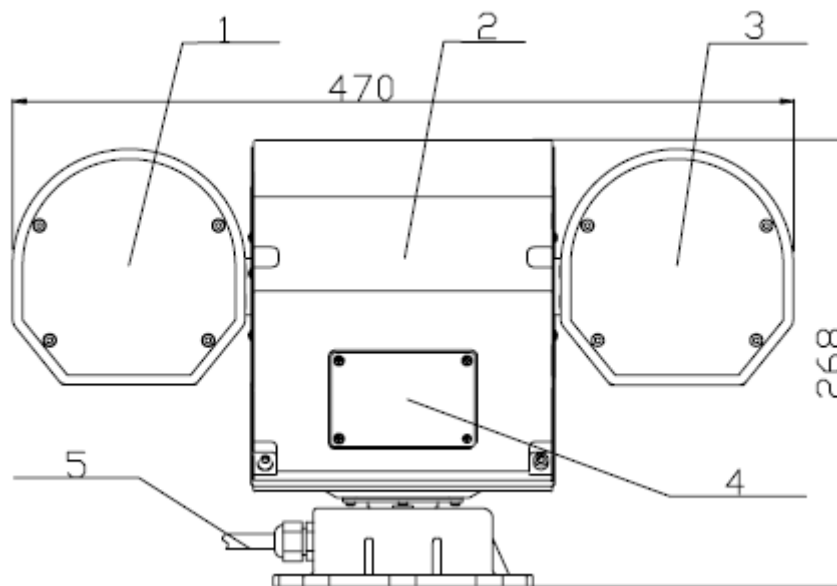
Fig. 1

No.	Description	Remark
1	Thermal housing	Thermal camera
2	Rear cover	
3	CCD housing	Include CCD camera and protocol board
4	DIP switch cover	definition refers to chapter 4.2
5	Wire hole	used to connect power supply, monitor and keyboard control

2.2 Connector definition

The control wire is from bottom of PT system.
Definition as follows:

No.	Description	Remark
1	RS485	RS485+
2		RS485-
4	CCD Video	Analog video output of CCD camera
5	IR Video	Analog video output of thermal imaging camera
6	AC24V	Power supply
7		

3 OPERATION GUIDE

3.1 Communication parameters

Thermal camera default address：PELCO-D、baud 9600、address 2

PT system default address：PELCO-D、baud 9600、address 1

Visual camera default address：PELCO-D、baud 9600、address 1

Protocol board address：PELCO-D、baud 9600、address 1

3.2 Operation key guide

3.2.1 Thermal camera control key description

Before operate thermal camera, please set address 2 firstly.

Operational keys	Function
Up	PTZ up
Down	PTZ down
Left	PTZ left
Right	PTZ right
LENS-	Enter the menu* or move the cursor from up to down
LENS+	Manual calibration
FOCUS-	1. When there is no menu, near Focus 2. when there is a menu, modify the option or reduce the value
FOCUS+	1. When there is no menu, far Focus 2. when there is a menu, modify the option or increase the value
ZOOM-	Auto focus
ZOOM+	Activate the setting menu

3.2.2 CCD camera keys description

Before operate, set address 1 firstly

Operational keys	Function
Up	PTZ up
Down	PTZ down
Left	PTZ left
Right	PTZ right
FOCUS-	Near Focus
FOCUS+	Far Focus
ZOOM-	Zoom out
ZOOM+	Zoom in

3.3 Thermal imaging camera menu

Before operate thermal camera, please set address 2 firstly.

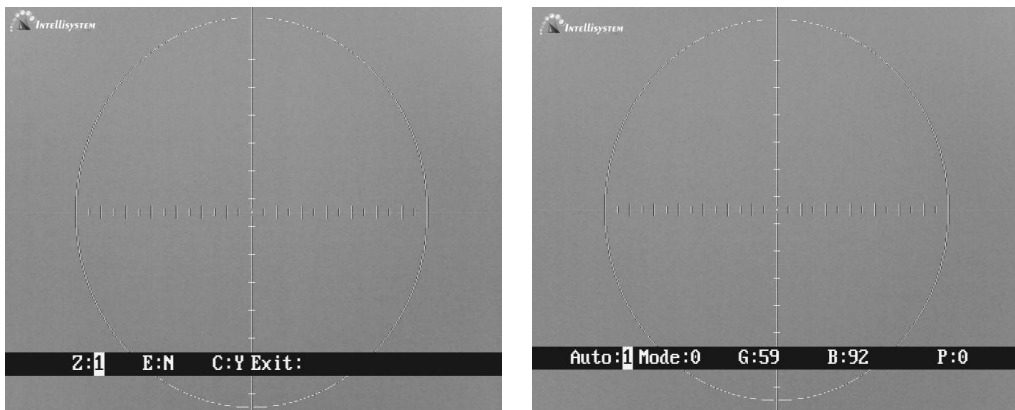## 3.3.1 Main menu

Trigger 〖**LENS-**〗to go to main menu, shown as Fig. 2：

Fig.2

When the menu pops-up, trigger the 〖**LENS-**〗to move the cursor , use〖**FOCUS+**〗and 〖**FOCUS-**〗

to modify the values or options. When you exit the menu, parameters automatically are saved.

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.

G: XXX   Gain value, range: 0-255

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

P: XXX   White/black hot display mode

               0: black hot   1: white hot

Z: XXX   Zoom status

               1: No zoom   2: 2X

E: XXX   Image enhancement status

               Y: on   N: off

C: XXX   Display the crosshair or not.

Exit: 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.

3.3.2 System menu

When there is no menu ,press 『**ZOOM+**』to activate the system menu

You need to input password when go to system menu, the password is 『**LENS-**』『**LENS +**』『**FOCUS +**』『**FOCUS-**』『**LENS-**』『**LENS+**』. With the correct password, you will come to the system menu shown as Fig. 3：

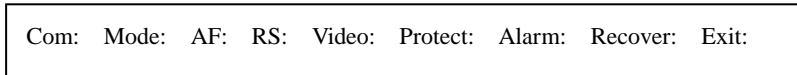| Com: Mode: AF: RS: Video: Protect: Alarm: Recover: Exit: |
|---|

Fig. 3

Trigger『**LENS-**』and move the cursor, use『**FOCUS+**』and 『**FOCUS-**』to modify the values or options.

When you exit the menu, parameters will automatically be saved.

1、   **Com：XXX**   use 『**FOCUS+**』and 『**FOCUS-**』to go to internal menu to setup

communication parameters, please refer to 3.3.3.

2、 <u>**Mode：XXX**</u>   use『**FOCUS+**』and 『**FOCUS-**』to go to internal menu to setup mode

parameters, please refer to 3.3.4.

3、 <u>**AF: XXX**</u>   Automatic focusing;

4、 <u>**RS: XXX**</u>   Set the zeroing parameter

5、 <u>**Video: XXX**</u>   Set the image quality

6、 <u>**Protect: XXX**</u> NC

7、 <u>**Alarm: XXX**</u>   Reserved for alarm;

8、 <u>**Recover: XXX**</u>   Recover all menus setting for factory default

9、 <u>**Exit:**</u>   Exit setting menu. Press 『**LENS-**』button to select the **Exit** option and

press 『**FOCUS +**』 button to exit the menu.

3.3.3 Communication menu

In system menu, move the cursor to "com", and use『**FOCUS+**』or『**FOCUS-**』 to go to
Communication menu.
You need to input password when go to Communication menu, the password is『**FOCUS +**』

『**FOCUS-**』『**LENS-**』『**LENS+**』『**FOCUS +**』『**FOCUS-**』. With the correct password, you will come

to the Communication menu shown as Fig. 4.

ID:	BaudRate:	Protocol:	Exit:

Fig. 4

Trigger 『**LENS-**』and move the cursor, use 『**FOCUS+**』and 『**FOCUS-**』to modify the values or

options. When you exit the menu, parameters will automatically be saved.

1、 <u>**ID：X**</u>   Display the current settings for communication address.

2、 <u>**BaudRate：XX**</u>   Must be 9600; otherwise the Thermal imaging camera cannot be
controlled.

3、 <u>**Protocol：XXX**</u>   Must be PELCO-D; otherwise the Thermal imaging camera cannot be
controlled.

4、 <u>**Exit：XXX**</u>   use 『**FOCUS+**』and 『**FOCUS-**』to exit the menu.

3.3.4 Mode menu

In the system menu, move the cursor to "mode", and use 〖**FOCUS+**〗and 〖**FOCUS-**〗 to go to mode menu.

You need to input password when go to system menu, the password is 〖**FOCUS +**〗〖**FOCUS-**〗 〖**LENS-**〗〖**LENS+**〗〖**FOCUS +**〗〖**FOCUS-**〗. With the correct password, you will come to the mode menu shown as Fig.5.

11

Mode: Gain: Bright: Save: Exit:

Fig.5

Trigger 〖**LENS-**〗and move the cursor, use 〖**FOCUS+**〗and 〖**FOCUS-**〗to modify the values or options.

Gain: XXX   Gain value, range: 0~+255;

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

Save: XXX   Save configuration setup;

Exit: Exit configuration setup. Press 〖**LENS-**〗button to select the **Exit** option and press 〖**FOCUS +**〗 button to exit the menu.

4 Change address

Change address according to steps as follows:

1、Change the address of thermal camera (Refer to chapter 3.3.3)

2、Change the address of PT system. The address value is address of thermal camera minus 1 (-1) for example: thermal camera address is 2. The PT address is 1 .if thermal camera address is 3 and PT system address is 2.

3、change the visual camera. It must same as the PT system

4、change the protocol address. It must same as the PT system

4.1 Change the address of PT system

PT System address is minus 1 of thermal camera.

Use a Phillips screwdriver to loosen four Phillips Screws on the DIP switch cover (refer to chapter

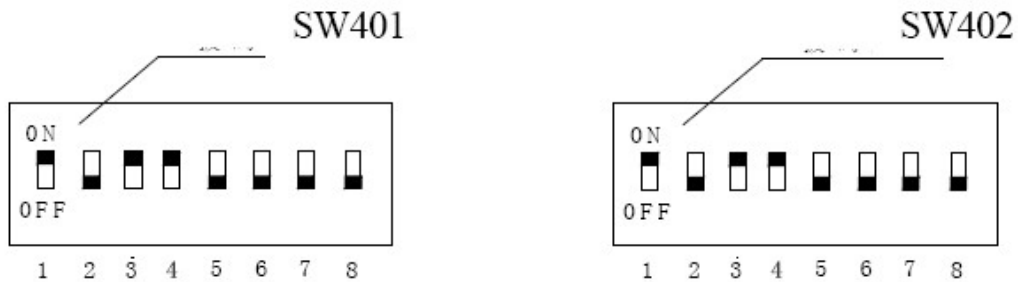2.1), remove the DIP switch cover, you can see the circuit board DIP switch as shown in Fig.6.

Fig. 6   SW1   SW2

Note ：1.   address switch (SW1）

          2.   function switch (SW2）

Both address (SW401）and function（SW402）are 8 DIP switch, the order from left to right is No. 1, 2, 3, 4 ,5, 6, 7, 8

Address switch（SW1）is for PTZ communication address (ID), using eight binary coding system

ranges from 1 to 255, specific DIP rules please refer to Table.

Note: when setup address dip, please cut off the power supply. Or else, pant tilt will not

identify.

Address	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF	OFF
....	....							
254	OFF	ON	ON	ON	ON	ON	ON	ON
255	ON	ON	ON	ON	ON	ON	ON	ON

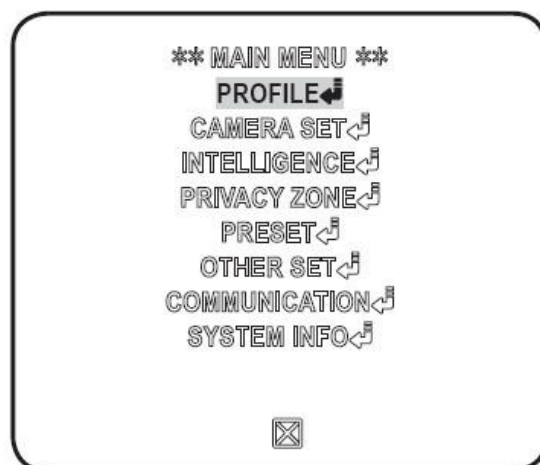## 4.3 Change the address of visual camera

SAME WITH PT system address

Open the housing. Check the SETUP in the rear of visual camera (Fig.7)
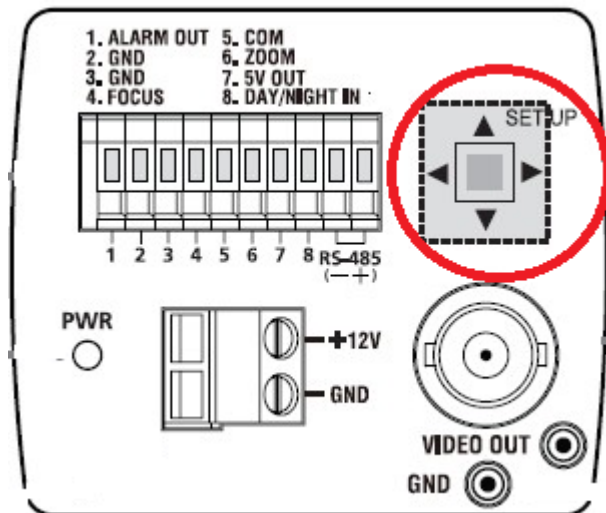
Popup the menu of camera after pressing the SETUP about 2 seconds refer to Fig.8

Pressing 『SETUP』switch ▲ ▼ (up or down), you can move up or down on the menu to "COMMUNICATION". And press 『SETUP』switch to enter "COMMUNICATION" menu, shown as Fig. 9.

1.**Protocol**   Must be PELCO-D; otherwise the Thermal imaging camera cannot be controlled.

2.**BaudRate**   Must be 9600; otherwise the Thermal imaging camera cannot be controlled.

3.**ADDRESS**   Setup the camera's address.

Moving cursor to ⊠ and pressing 『SETUP』 switch to exit the menu. Before exiting the setup screen, select 『SAVE』 to save your settings.
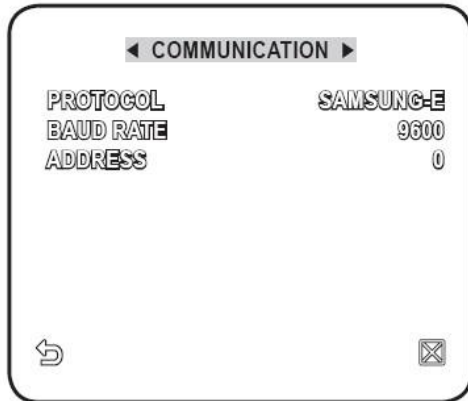
4.4 Change the address of protocol board

Same with the PT system address.

Only reboot the address will be valid after change address.

The address switch is interface J3 on the protocol circuit board (Refer to Fig.10) which installed in the CCD camera housing (Refer to Pic.1).
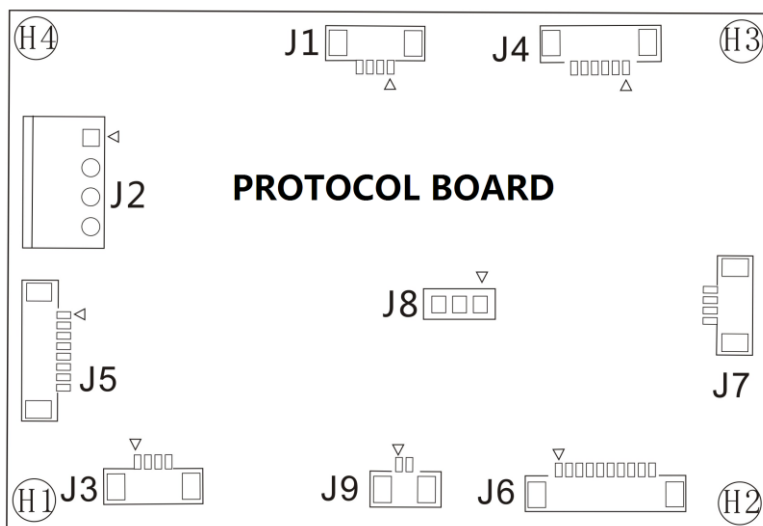
Fig.10
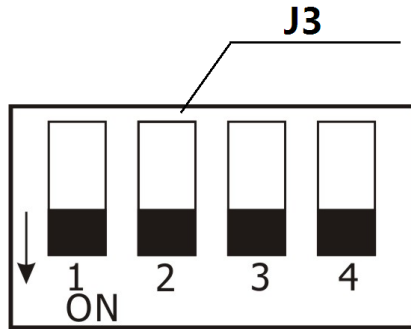
Fig.11

Switch (Fig.11) from left to right is note as 1 2 3 4 bit. Up means off, down means on

Address	No.1	No.2	No.3	No.4
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
....				
15	ON	ON	ON	ON

5 Troubleshooting

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

Trouble	Possible cause	Solution
After power-on, PTZ does not perform self-checking	Power wire connects wrong or not well	Again connect the power wire
	PT system is broken	Change the PT system
after power on the PT self-check successful but cannot operate	Address of PT is not right	Change the address of PT system refer to 4.2
		The address of PT and protocol must be same
	Address of protocol board is not right	change the protocol board address again refer to 4.4
		The address of PT and protocol must be same
Cannot operate the thermal camera	Address of thermal camera is not right	change the address of thermal camera refer to 4.1
		Protocol address is minus 1 of thermal camera address
	Protocol and baud rate of thermal camera is not right	The baud rate of thermal camera is 9600
		The protocol of thermal camera is Pelco-D
Cannot operate the visual camera	CCD address is not right	Change the address of Visual camera refer to 4.3
		The address of Visual camera must same with protocol board address
Cannot capture the image of camera when PT is rotating	Power consumption is not enough	Apply the right power supply
	Video wire connects not well	Check the video wire connection

6 Technical specifications

Items		ThermalTronix TT-CXS-DVACS	
Thermal imaging camera	**Detector characteristics**		
	Detector type	Un-cooled FPA micro-bolometer	
	Resolution	384*288	
	Detector pitch	25μm	
	Image characteristics		
	lens focus	**TT-1040CXS-DVACS**	f=40mm，F#=0.9
		TT-1075CXS-DVACS	f=75mm，F#=0.9
	Spatial resolution	0.33mrad	
	NETD	≤120mk@f/1,300k,50Hz	
	Focus	Auto focus according to scenery variety	
	Field of view	**TT-1040CXS-DVACS**	13.7º×10.3º
		TT-1075CXS-DVACS	7.3º×5.5º
	Functions		
	Brightness/gain control	Manual brightness/gain; Automatic brightness/manual gain; Automatic brightness/gain	
	Automatic brightness/gain configuration adjustment	2 fixed patterns, 8 users from definition establishment pattern	
	Polarity reversal	Black hot/white hot	
	Electronic zoom	2x	
	Noise reduction function	Yes	
	Image intensification function	Yes	
	Adjustment function	Starting automatic correction, normal work subsequent party dynamic correction	
Visible light camera	Resolution	600(H)x350(V)	
	CCD	Super-HAD IT CCD	
	lens	3.66～91.36mm (F1.65～3.0)，25x	
PTZ	Horizontal rotation degrees	0°~360° continuous rotation	
	Vertical rotation degrees	-90°～+90°	
	Horizontal rotation speed	0.01°～60°/S	
	vertical rotation speed	0.01°～30°/S	
	Heater	YES	
	Fan	YES	
	Sun shade	YES	
Power supply	Voltage	AC24V	
	Power loss	<250W（including heating）	
Environment	Operating temperature	-20℃ ~ +50℃	
	Storage temperature	-45℃ ~ +65℃	
	Protection	IP66	
Physical characteristics	Weight	≤17Kg	
	Dimensions (WxHxD)	320mm×470 mm×270mm	
Interface	Input voltage	AC24V	
	Analog video	2 BNC，PAL	
	Serial port	RS485	

Note: Specifications are subject to change without notice