

***ThermalTronix***  
TT-CXL-DVACS Series  
**Thermal Camera Specifications**

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**User Manual**



## Restriction

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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.

	<b>CAUTION</b> RISK OF ELECTRIC SHOCK. DO NOT OPEN	
<b>CAUTION:</b> TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK) NO USER SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.		



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.

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# 1 Introduction

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

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## 1.1 FEATURES

### Thermal camera

- Fixed athermalized lens
- AUTO calibration
- Manual or Automatic brightness/gain adjustment
- Image Noise Reduction function: reduce Image background noise
- Image enhancing function : enhance the ability to detect small object

### CCD camera

- With the state-of-the-art digital signal processing technology, full digital image processing and special algorithm of 600-line high resolution implemented.
- High Sensitivity: It implements images of high sensitivity using the up-to-date Super-HAD CCD.
- High performance surveillance camera, 25X optical zoom and 16X digital zoom

### PTZ

- Preset: 80 presets can be setup
- Support 0°~360°(pan) continuous rotation
- Top load of tilt is  $\pm 90^\circ$
- RS485, support PELCO-D/PELCO-P protocol
- IP66,full weatherproof

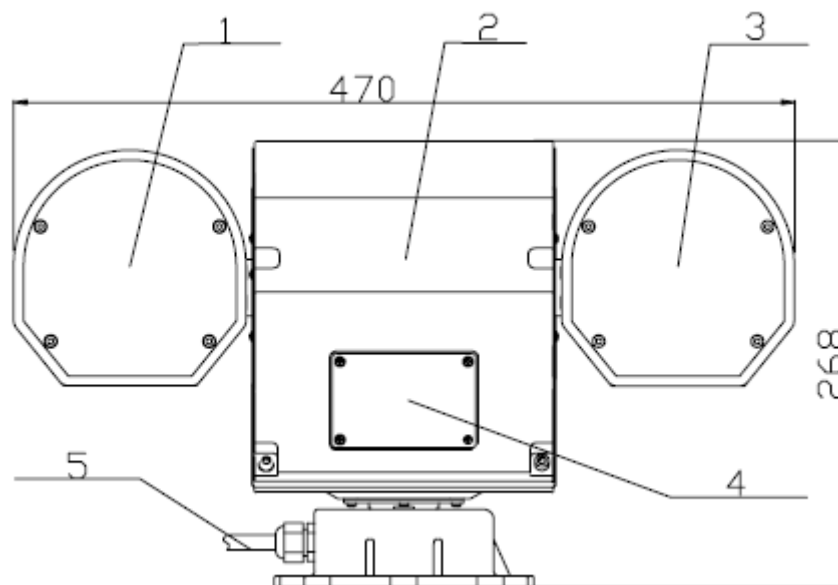
## 1.2 INCLUDED

TT-CXL-DVACS Series List for accessories and files:

<b>accessory</b>	<b>quantity</b>	<b>remark</b>
PTZ Camera	1	
AC24 Power Adapter	1	
User manual	1	
Packing list	1	
qualification	1	

## 2 Component names and function

### 2.1 Device appearance



Pic. 1

No.	Description	Remark
1	Thermal housing	Thermal camera
2	Rear cover	Address and function of PTZ DIP switch
3	CCD housing	Include CCD camera and protocol board
4	DIP switch cover	Definition refers to chapter 5
5	Wire hole	Used to connect power supply, monitor and RS485 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	GND	

## 3 OPERATION GUIDE

### 3.1 Communication parameters

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

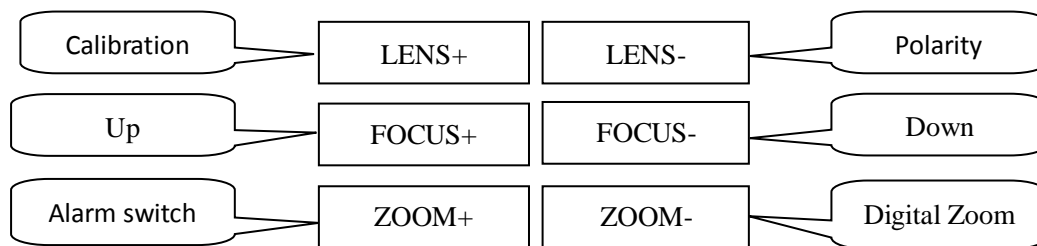
PT system default address: **PELCO-D**、 baud **9600**、 address **1**

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

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

### 3.2 Thermal camera control key description

Before the operation. Pls set address 2 firstly.



### 3.3 CCD camera keys description

Before the operation, pls 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

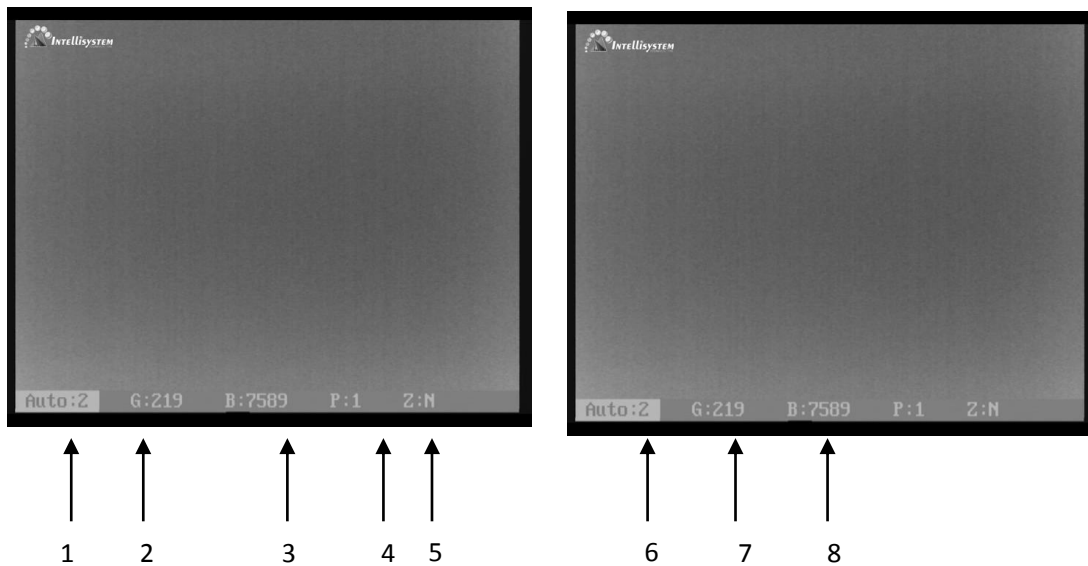


## 4 Thermal imaging camera menu

### 4.1 Main-menu operation

Before operate thermal camera .please set address 2 firstly

Without the menu call preset 100 to activate the main menu. Enter the main menu(pic 2):



Pic 2

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: 2X digital zoom

6、 **Level: X**      show the range of alarm: From 1 to 6, default is 4

7、 **Setting :**      Activate the setting secondary menu

Press key “FOCUS+” or “FOCUS-”, show the password dialogue

**Press “FOCUS+, FOCUS-, FOCUS+, FOCUS-, FOCUS+, FOCUS-” to enter setting menu dialogue. This password is suitable for all the password dialogue box in the thermal imaging camera**

8、 **EXIT :**      Press key “FOCUS+” or “FOCUS-” to exit

Note :

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

## 4.2 Setting secondary menu

In the main menu, move the cursor to “setting” , press key “FOCUS+” or “FOCUS-” show the password dialogue, refer to Pic 3, Input the password to enter, refer to Pic 4.



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Pic 3



↑    ↑    ↑    ↑    ↑  
 1    2    3    4    5

↑    ↑    ↑    ↑    ↑  
 6    7    8    9    10

Pic 4

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、 **AValue:**            Setup the alarm parameters.

4、 **Debug:** Debug option only for R&D department of manufacturer

5、 **RECOVER : H/L/N** Setup as H /L/N;

**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

7、 **Alarm: X** Show the status of gray alarm : N/Y

N: off; ( Default ) Y: On

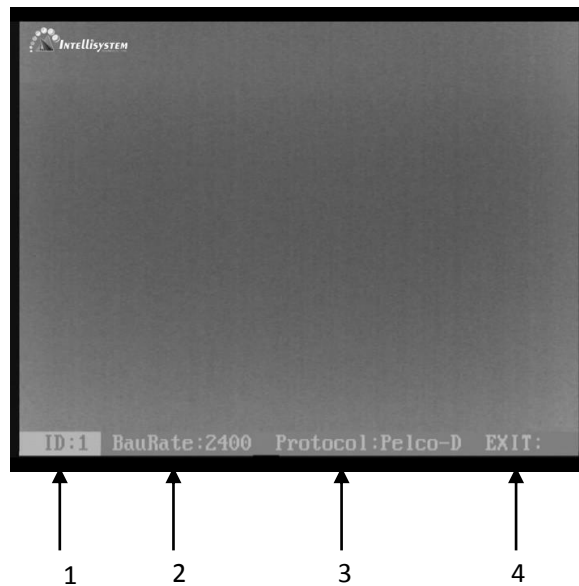
8、 **E: X** Show the status of image enhancement, setup as **C / 1/2**

C:Close; ( default ) 1/2: Open relatively enhancement grade

9、 **Backup:** Factory default

10、 **Exit : XXX** Press key "FOCUS+" or "FOCUS-" to exit

## 4.3 Com sub-menu



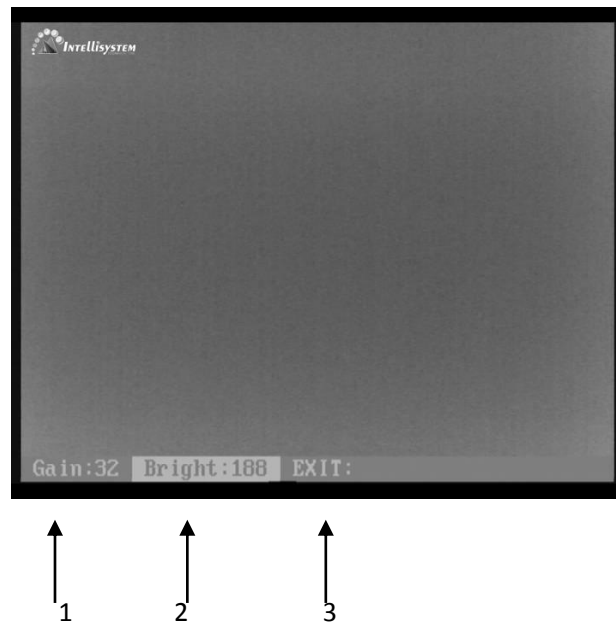
Pic 5

In the menu “COM”(chapter 4.2 shows how to activate the “com” option), Press key “LENS-” move the cursor , Press key “FOCUS+” or “FOCUS-” to change the value where the cursor is. Refer to Pic 5. Auto save when exit

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

Default: Add:1 Baud:9600 Protocol: PELCO-D

## 4.4 Mode sub-menu



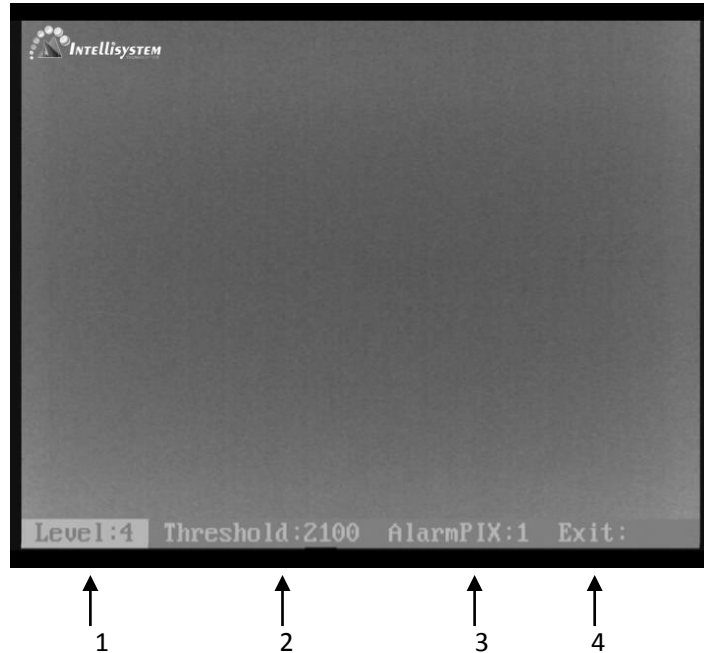
Pic 6

In the menu “Mode” (chapter 4.2 shows how to activate the “Mode” option), Press key “LENS-” move the cursor , Press key “FOCUS+” or “FOCUS-” to change the value where the cursor is. Refer to Pic 6.Auto save when exit

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

Default: Gain:32 Bright:188

## 4.5 Alarm Value sub-menu



Pic 7

In the menu “Avalue” (chapter 4.2 shows how to activate the “Avalue” option), Press key “LENS-” move the cursor , Press key “FOCUS+” or “FOCUS-” to change the value where the cursor is. Refer to Pic 7. Auto save when exit

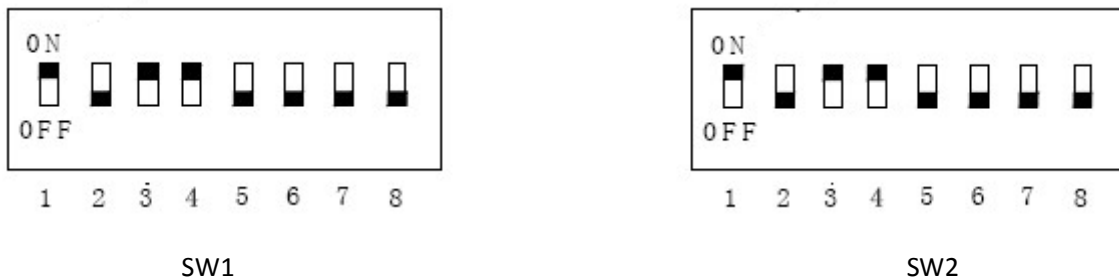
- 1、 **Level: X**      Range: 1~6。
- 2、 **Threshold: XXX**    Show the status of Alarm Valve 。
- 3、 **AlarmPIX: XXX**    minimum pixels of alarm.  
Such as alarm Number 2 .so the alarm pixel is 2\* 2 .totally 4 pixels
- 4、 **Exit:**      Press key LENS+ to exit。

Default: Level and Threshold :(Level 1: 650, relatively temperature difference is 30 °C. Level 2:1050, relatively temperature difference is 45 °C, Level 3:1450, relatively temperature difference is 60 °C, Level 4:2100, relatively temperature difference is 80 °C, Level 5:2800, relatively temperature difference is 100 °C, Level 5:3600, relatively temperature difference is 120°C) AlarmPIX :1

## 5 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 Pic.1), remove the DIP switch cover, you can see the circuit board DIP switch as shown in Pic8.



Pic8

Note : 1. address switch (SW1 )

2. function switch (SW2 ) ,pls contact our technical support to get the definition of SW2

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 below.

**Note: when setup address dip, please cut off the power supply. Or else, it will not identify.**

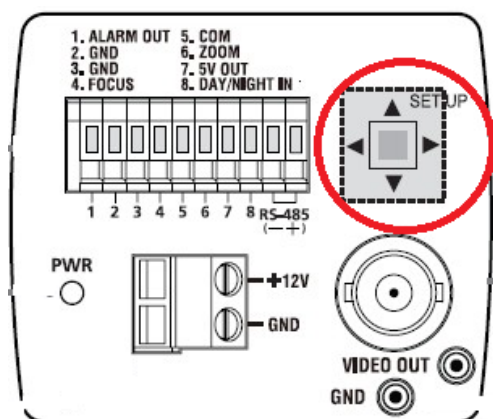
Address	No.1	No.2	No.3	No.4	No.5	No.6	No.7	No.8
1	ON	OFF	OFF	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF	OFF	OFF
3	ON	ON	OFF	OFF	OFF	OFF	OFF	OFF
4	OFF	OFF	ON	OFF	OFF	OFF	OFF	OFF
5	ON	OFF	ON	OFF	OFF	OFF	OFF	OFF
6	OFF	ON	ON	OFF	OFF	OFF	OFF	OFF
7	ON	ON	ON	OFF	OFF	OFF	OFF	OFF
8	OFF	OFF	OFF	ON	OFF	OFF	OFF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



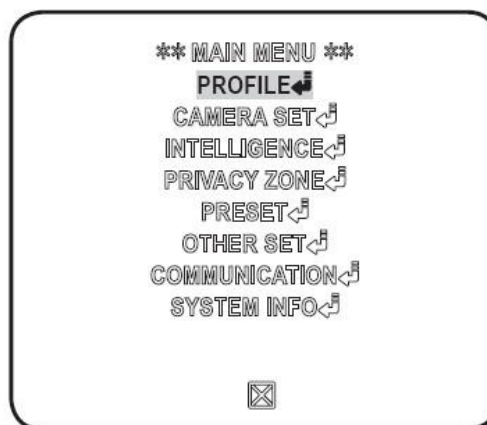
## 6 Change the address of CCD camera

CCD camera address is minus 1 of thermal camera, it means CCD camera has the same address as PT system

Open housing of CCD camera. Pressing the 『SETUP』 button(refer to Pic 9) on the rear of CCD camera about 2 seconds to pop up the menu of the camera. Refer to Pic 10



Pic 9

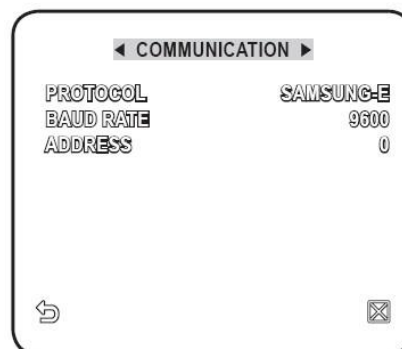



Pic 10

Pressing 『SETUP』 switch ▲ ▼ (up or down), move up or down on the menu to “COMMUNICATION”.

And press 『SETUP』 switch to enter “COMMUNICATION” menu, shown as Pic.11.

1. **Protocol** Must be PELCO-D; otherwise the CCD camera cannot be controlled.
2. **BaudRate** Must be 9600; otherwise the CCD 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.

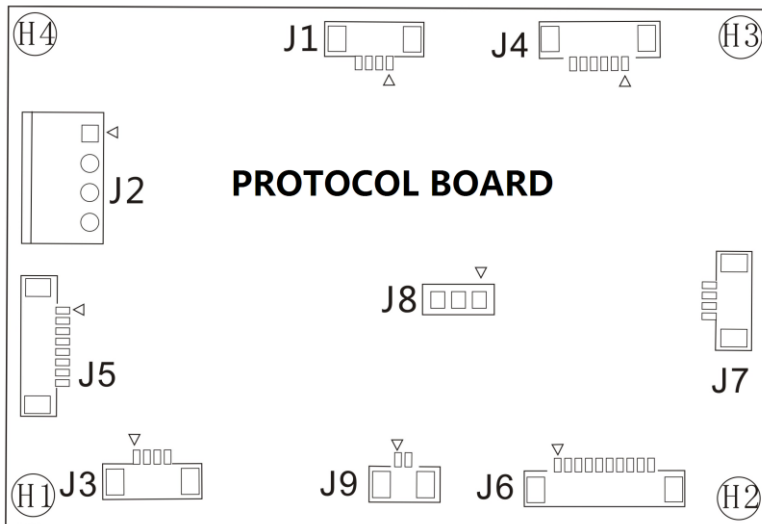
Pic.11

## 7 Change the address of protocol board

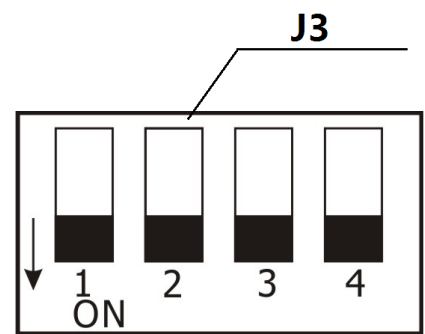
Same with the PT system address.

Only reboot the address will be valid after change address.

The address switch is interface J3 on the protocol circuit board (Refer to Fig.12) which installed in the CCD camera housing (Refer to Pic.1). Refer to Fig.12



Pic.12



Pic.13

J3 interface address switch 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
8	OFF	OFF	OFF	ON
.....				
15	ON	ON	ON	ON

## 8 Troubleshooting

Please follow the below table to diagnose and solve the problem. If problem is still existed, 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

## 9 Technical specifications

Items	<i>ThermalTronix TT-CXL-DVACS Series</i>		
<b>Thermal Imaging Camera</b>	<b>Detector characteristics</b>		
	Detector type	Un-cooled FPA micro-bolometer	
	Resolution	384*288	
	Detector pitch	25µm	
	Frame rate	50HZ	
	<b>Image characteristics</b>		
	Lens	<b>TT-C1009XL-DVACS</b>	f=9mm
		<b>TT-C1018XL-DVACS</b>	f=18mm
		<b>TT-C1037XL-DVACS</b>	f=37mm
		<b>TT-C1050XL-DVACS</b>	f=50mm
	NETD	≤100mk	
	Focus Range	Athermalized, focus-free	
	<b>Functions</b>		
	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	Yes		
Image	Yes		
Calibration	Automatic calibration		
<b>CCD Camera</b>	Resolution	Total pixels 795(H)x596(V), Effective pixels 752(H)x582(V)	
	Imaging Device lens	1/4"Super HAD CCD 3.66-91.36mm(F1.65-3.0), 25x optics, 16x digital	
<b>PTZ</b>	Horizontal Resolution	Color: 600TV lines, B/W:700TV lines	
	Horizontal rotation	0° ~ 360° continuous rotation	
	vertical rotation	-90° ~ +90°	
	Horizontal rotation	0.01° ~ 60°/S	
	vertical rotation	0.01° ~ 30°/S	
	Heater	YES	
	Fan	YES	
<b>Power supply</b>	Voltage	AC24V	
	Power	<250W ( including heating )	
<b>Environment</b>	Operating temperature	-20°C ~ +55°C	
	Storage temperature	-45°C ~ +70°C	
	Protection	IP66	
<b>Physical characteristics</b>	Weight	≤17Kg	
	Dimensions	322mm(W)x470mm(H)x268mm(D)	
<b>Interface</b>	Input voltage	AC24V	
	Analog video	2 BNC, PAL	
	Serial port	RS485 (PELCO-D/PELCO-P)	